Application manual





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Cover Photo: Eaton PowerXL® Series Drives

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Safety



WARNING! **DANGEROUS ELECTRICAL VOLTAGE!**

Read this manual thoroughly and make sure you understand the procedures before you attempt to install, set up, operate or carry out any maintenance work on this PowerXL Adjustable Frequency Drive.

Definitions and symbols



WARNING

This symbol indicates high voltage. It calls your attention to items or operations that could be dangerous to you and other persons operating this equipment. Read the message and follow the instructions carefully.



This symbol is the "Safety Alert Symbol." It occurs with either of two signal words: CAUTION or WARNING, as described below.

WARNING

Indicates a potentially hazardous situation which, if not avoided, can result in serious injury or death.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, can result in minor to moderate injury, or serious damage to the product. The situation described in the CAUTION may, if not avoided, lead to serious results. Important safety measures are described in CAUTION (as well as WARNING).

Hazardous high voltage



WARNING

Motor control equipment and electronic controllers are connected to hazardous line voltages. When servicing drives and electronic controllers, there may be exposed components with housings or protrusions at or above line potential. Extreme care should be taken to protect against shock.

- Stand on an insulating pad and make it a habit to use only one hand when checking components.
- · Always work with another person in case an emergency occurs.
- Disconnect power before checking controllers or performing maintenance.
- · Be sure equipment is properly earthed.
- Wear safety glasses whenever working on electronic controllers or rotating machinery.

WARNING

The components in the drive's power section remain energized after the supply voltage has been switched off. After disconnecting the supply, wait at least five minutes before removing the cover to allow the intermediate circuit capacitors to discharge.

Pay attention to hazard warnings!



WARNING

Electric shock hazard-risk of injuries! Carry out wiring work only if the unit is de-energized.

WARNING

Do not perform any modifications on the AC drive when it is connected to mains.

Warnings and cautions

WARNING

Be sure to ground the unit following the instructions in this manual. Ungrounded units may cause electric shock and/or fire.

WARNING

This equipment should only be installed, adjusted, and serviced by qualified electrical maintenance personnel familiar with the construction and operation of this type of equipment and the hazards involved. Failure to observe this precaution could result in death or severe injury.

WARNING

Components within the drive are live when it is connected to power. Contact with this voltage is extremely dangerous and may cause death or severe injury.

WARNING

Line terminals (L1, L2, L3), motor terminals (U, V, W) and the brake resistor terminals (R+, R-) are live when the drive is connected to power, even if the motor is not running. Contact with this voltage is extremely dangerous and may cause death or severe injury.

EMC warnings and cautions

WARNING

In a residential environment, this product may cause radio interference, in which case supplementary mitigation measures may be required.

WARNING

- This type of PDS is not intended to be used on a low-voltage public network which supplies residential premises.
- Radio frequency interference is expected if used on such a network.

A CAUTION

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

WARNING

Even though the control I/O-terminals are isolated from line voltage, the relay outputs and other I/O-terminals may have dangerous voltage present even when the drive is disconnected from power. Contact with this voltage is extremely dangerous and may cause death or severe injury.

A WARNING

This equipment has a large capacitive leakage current during operation, which can cause enclosure parts to be above ground potential. Proper grounding, as described in this manual, is required. Failure to observe this precaution could result in death or severe injury.

WARNING

Before applying power to this drive, make sure that the front and cable covers are closed and fastened to prevent exposure to potential electrical fault conditions. Failure to observe this precaution could result in death or severe injury.

A WARNING

An upstream disconnect/protective device must be provided as required by the National Electric Code® (NEC®). Failure to follow this precaution may result in death or severe injury.

WARNING

This drive can cause a DC current in the protective earthing conductor. Where a residual current-operated protective (RCD) or monitoring (RCM) device is used for protection in case of direct or indirect contact, only an RCD or RCM of Type B is allowed on the supply side of this product.

WARNING

Carry out wiring work only after the drive has been correctly mounted and secured.

WARNING

Before opening the drive covers:

- Disconnect all power to the drive, including external control power that may be present
- Wait a minimum of five minutes after all the lights on the keypad are off. This allows time for the DC bus capacitors to discharge
- A hazard voltage may still remain in the DC bus capacitors even if the power has been turned off.
 Confirm that the capacitors have fully discharged by measuring their voltage using a multimeter set to measure the DC voltage

Failure to follow these precautions may cause death or severe injury.

WARNING

The opening of the branch-circuit protective device may be an indication that a fault current has been interrupted. To reduce the risk of fire or electric shock, current-carrying parts and other components of the controller should be examined and replaced if damaged. If burnout of the current element of an overload relay occurs, the complete overload relay must be replaced.

WARNING

Operation of this equipment requires detailed installation and operation instructions provided in the Installation/Operation manual intended for use with this product. It should be retained with this device at all times. A hard copy of this information may be ordered from literature fulfillment.

WARNING

Before servicing the drive:

- Disconnect all power to the drive, including external control power that may be present.
- Place a "DO NOTTURN ON" label on the disconnect device Lock the disconnect device in the open position.

Failure to follow these precautions may cause death or severe injury.

WARNING

The drive outputs (U, V, W) must not be connected to the input voltage or the utility line power as severe damage to the device may occur and there may be a risk of fire.

WARNING

The heat sink and/or outer enclosure may reach a high temperature.

Pay attention to hazard warnings!



Hot Surface-Risk of Burn. DO NOT TOUCH!



In a domestic environment, this product may cause radio interference, in which case supplementary mitigation measures may be required.

Chapter 1 - PowerXL DM1 series overview

This chapter describes the purpose and contents of this manual, the receiving inspection recommendations and the PowerXL Series Open Drive catalog numbering system.

How to use this manual

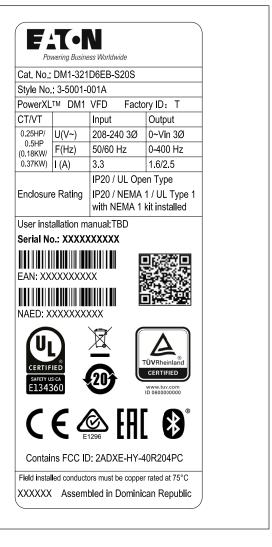
The purpose of this manual is to provide you with information necessary to install, set and customize parameters, start up, troubleshoot, and maintain the Eaton PowerXL Series variable frequency drive (VFD). To provide for safe installation and operation of the equipment, read the safety guidelines at the beginning of this manual and follow the procedures outlined in the following chapters before connecting power to the PowerXL Series VFD. Keep this operating manual handy and distribute to all users, technicians and maintenance personnel for reference.

Table 1. Common abbreviations.

Abbreviation	Definition	
СТ	Constant torque with high overload rating (150%)	
VT	Variable torque with low overload rating (110%)	
IH	High overload current (150%)	
I _L	Low overload current (110%)	
VFD	Variable frequency drive	
RTC	Real time clock	

Rating label

Figure 1. Rating label.



1

Carton labels (U.S. and Europe)

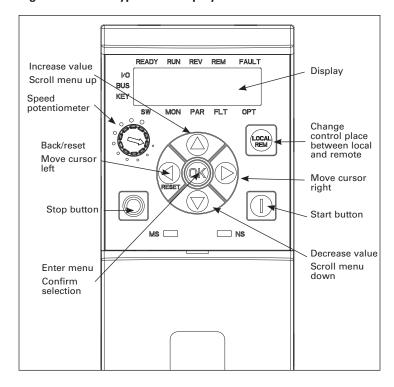
Figure 2. Carton rating label.



Chapter 2 - Keypad overview

The keypad is the interface between the drive and the user. It features an LCD display, speed potentiometer, and navigation buttons. With the control keypad, it is possible to control the speed of a motor, to supervise the state of the equipment, and to set the frequency converter's parameters (see **Figure 3**.

Figure 3. Main keypad and display.



Main keypad buttons

Buttons description

Table 2. Keypad buttons.

lcon	Button	Description
LOCAL	Local/Remote	Local/Remote: Switches between LOCAL and REMOTE control for start and speed reference. The control locations corresponding to local and remote shall be selected within an application.
	Start	Start: This button operates as motor start button for normal operation when the "Keypad" is selected as the active control source. When Keypad is the reference place after hitting the start button, it will jump directly to the Keypad Ref Screen.
	Stop	 Stop: This button operates as motor stop button for normal operation when the "Keypad" is selected as the control source and keypad stop button is active, or stop button is always enabled regardless of control source. Motor stop from the keypad.
	Up	 Up and Down arrows: Move either up or down a menu list to select the desired menu item. Editing a parameter bit by bit, while the active digit is scrolled. Increase/decrease the reference value of the selected parameter. In parameter page when in read mode, move to the previous or next brother parameter of this parameter.
RESET	Left/Back/Reset	 Left arrow: Navigation button, movement to left when editing a parameter digit by digit. Backs up one step. At Main Menu page by hitting Back/Reset takes to Default Page. Back/Reset: This button has three integrated functions. The button operates as backward button during normal mode. In edit mode, it is used as cancel operate. It is also used to reset faults when faults occur. Backs up one step Cancels Modify in edit mode Resets the active faults (all the active faults shall be reset by pressing this button more than 2s in any page) Hold Stop and Back Reset for 5 seconds to return drive to factory default At Main Menu page by hitting Back/Reset takes to Default Page.

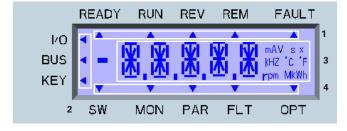
Table 2. Keypad buttons (Cont.).

Icon	Button	Description
	Right	Right arrow:
		 Enter parameter group mode. Enter parameter mode from group mode. Enter parameter whole edit mode when this parameter can be written. Enter parameter bit by bit edit mode from whole edit mode. Navigation button, movement to right when editing a parameter bit by bit.
	OK	OK:
((OK))		• To clear all the Fault History if pressed for more than 5 s (including 5 s) in any page.
		This button is used in the parameter edit mode to save the parameter setting. To confirm the start up list at the and of the Start Up Wiscard.
		 To confirm the start-up list at the end of the Start-Up Wizard. To confirm the comparison item in parameters comparison mode.
		The following is the same with Right key:
		Enter parameter whole edit mode when this parameter can be written.
		Enter parameter group mode.
		Enter parameter mode from group mode.

Main keypad display

The main keypad LCD display indicates the status of the motor and the drive and any faults in motor or drive functions. On the display, the user sees information about the current location in the menu structure and the item displayed.

Figure 4. Main keypad display and labels.



Overview

The display on the main keypad is a customized LCD with four information areas:

- 1. (**Top line**) The top line is state line and indicates whether the device state is:
 - Ready/NRD; Remote/Local;
 - RUN/STP;
 - REV/FWD;
 - Remote/Local; or
 - Fault (lit)/Warning (flashing).

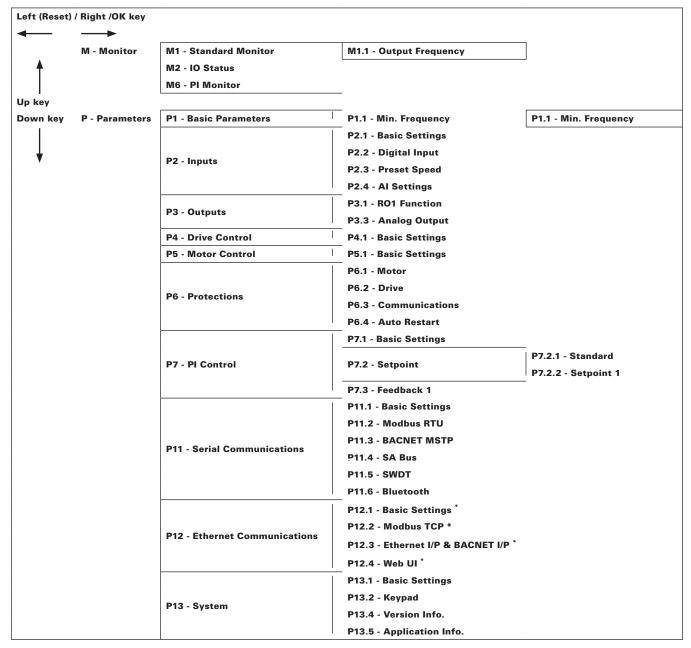
- 2. (**Left line**) The left line indicates the control source:
 - IO;
 - BUS; or
 - KEY.
- 3. (Middle line) The middle line is the parameter:
 - Path;
 - Value; or
 - Unit.
- 4. (Bottom line) The bottom line is the menu line. It indicates which parameter menu is selected. The choices are:
 - SW: Start-up wizard;
 - MON: Monitor;
 - PAR: Parameter;
 - FLT: Fault; or
 - OPT: Option cards.

5

Menu navigation - main keypad

This section provides basic instruction on navigating each section in the menu structure from the main keypad.

Figure 5. Main keypad menu navigation.

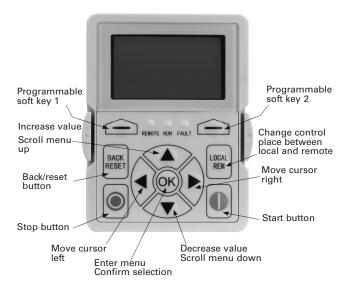


^{* =} DM1 PRO Only.

Remote keypad overview

The remote keypad is another interface between the drive and the user. It features an LCD display, 3 LED lights and 11 buttons. With the control keypad, it is possible to control the speed of a motor, to supervise the state of the equipment, and to set the frequency converter's parameters.

Figure 6. Remote keypad and display.



Remote keypad buttons

Buttons description

Table 3. Remote keypad buttons.

lcon	Button	Description
	Soft key 1, Soft key 2	Soft key 1, soft key 2: Soft keys 1 and 2 have no functionality with the DM1 device.
BACK RESET	Back/Reset	 Back/Reset: This button has three integrated functions. The button operates as backward button during normal mode. In edit mode, it is used as cancel operate. It is also used to reset faults when faults occur. Backs up one step. Cancels Modify in edit mode. Resets the active faults (all the active faults shall be reset by pressing this button more than 2 seconds in any page). Hold Stop and Back Reset for 5 seconds to return drive to factory default. At Main Menu page, pressing Back/Reset takes the user to the Default page.
LOCAL	Local/Remote	Local/Remote: Switches between Local and Remote control for start and speed reference. The control locations corresponding to Local and Remote shall be selected within an application.
	Up Down	 Up and down arrows: Move either up or down a menu list to select the desired menu item. Editing a parameter bit by bit, while the active digit is scrolled. Increase/decrease the reference value of the selected parameter. In Parameter Comparison mode, scroll through the parameters of which current value is different from the comparison parameter value. In the Parameter page when in read mode, move to the previous or next brother parameter of this parameter.

Table 3. Remote keypad buttons (Cont.).



Left

Left arrow:

- · Navigation button, movement to left when editing a parameter digit by digit.
- · Backs up one step.
- · At Main Menu page by hitting Back/Reset takes the user to the Default page.



Right

Right arrow:

- · Enter parameter group mode.
- · Enter parameter mode from group mode.
- Enter parameter whole edit mode when this parameter can be written.
- · Enter parameter bit by bit edit mode from whole edit mode.
- · Navigation button, movement to right when editing a parameter bit by bit.



0K

OK:

- To clear all the Fault History if pressed for more than 5 seconds (including 5 seconds) in any page.
- This button is used in the parameter edit mode to save the parameter setting.
- . To confirm the start-up list at the end of the Start-Up Wizard.
- To confirm the comparison item in parameters comparison mode.

The following is the same with Right key:

- Enter parameter whole edit mode when this parameter can be written.
- Enter parameter group mode.
- Enter parameter mode from group mode..



Stop

Stop

This button operates as motor stop button for normal operation when the "Keypad" is selected as the control source and keypad stop button is active, or stop button is always enabled regardless of control source.

Motor stop from the keypad.



Start

Start:

This button operates as motor start button for normal operation when the "Keypad" is selected as the active control source. When Keypad is the reference place after hitting the start button, it will jump directly to the Keypad Ref Screen.

LED lights

Table 4. LED state indicators.

Indicator	Description
Run	Green Run: Indicates that the VFD is running and controlling the load in Drive or Bypass.
	Blinks when a stop command has been given but the drive is still ramping down. $ \\$
Fault	Red Fault: Turns on when there is one or more active drive fault(s).
Remote	Yellow Local/Remote: Local: If the local control place is selected, turns off the light.
	Remote: If the remote control place is selected, turns on the light.

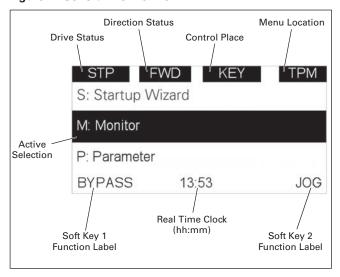
LCD display

The keypad LCD indicates the status of the motor and the drive and any faults in motor or drive functions. On the LCD, the user sees information about the current location in the menu structure and the item displayed.

Overview

Five lines shall be displayed in the screen. General view is as following in Figure 3.

Figure 7. General view of LCD.



The lines definition is as below.

The first line is State line, shows:

- RUN/STP/NRD/FIM/TFM If motor is running, the run state shall display "RUN", otherwise the state display "STP". "RUN" blinks when the stop command is sent but the drive is decelerating. "NRD" is displayed if the drive is not ready or does not have a signal "FIM" is displayed to indicate it is in Fire Mode and the drive is in a Run state. "TFM" is displayed when in the Fire Mode Test Mode and the drive is in a Run State.
- FWD/REV/JOG If the motor running direction is clockwise, display "FWD", otherwise display "REV".
 "Jog" if the drive is in Jog mode the status indication will occur.
- KEY/I/O/BPS/RBP/BUS/OFF If it is in bypass currently, display "BPS"; when run command is given it will got to "RBP" otherwise, if the current control source is I/O terminal, display "I/O". If it is keypad, then display "KEY"; otherwise display "BUS." If HOA enabled and switch to OFF, it shall show OFF.
- PAR/MON/FLT/OPE/QSW/FAV/TPM/MS1/SL1/SL2/SL3/SL4/BUx If the current page is parameter menu, display "PAR". If monitor menu, then display "MON". If fault menu, then display "FLT". If operation menu, then display "OPE". If quick start wizard, then display "QSW". If optional card menu, then display "BOA". If favorite menu, then display "FAV". If main menu, then display "TPM". When doing the Multi-drive Pump and Fan mode, the drive mode will be defined with MS- Master and SL being a slave drive. The 1 through 5 will indicate the number in the series it is. "BUx" indicates the drive being a backup drive when in the redundant drive system.

The second line is Code line, shows the menu code.

The third line is Name line, shows the menu name or parameters name.

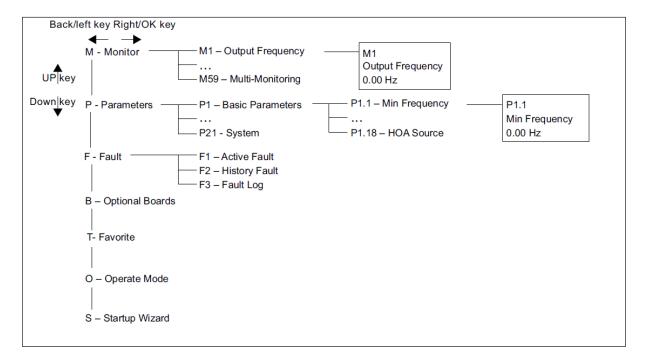
The fourth line is Value line, shows the submenu name or parameters value.

The fifth line is Soft Key line, the functions of Soft Key 1 and Soft Key 2 are changeable, and the real time is in the middle.

Menu navigation - remote keypad

This section provides basic instruction on navigating each section in the menu structure from the remote keypad.

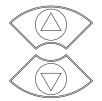
Figure 8. Remote keypad menu navigation.



Chapter 3 - Startup

Start-up wizard

In the Start-up Wizard, you will be prompted for essential information needed by the drive so that it can start controlling your process. In the Wizard, you will need the following keypad buttons:



Up/down buttons.

Use these to changes value(s).



OK button.

Confirm selection with this button, and enter into next question.



Left/back/reset button.

If this button was pressed at the first question, the Start-up Wizard will be cancelled.

If this button is pressed in any step on the Start-up Wizard, the Start-up Wizard will be cancelled.

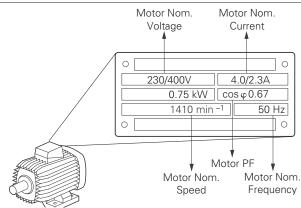
Once you have connected power to your Eaton PowerXL frequency converter, and the Start-up Wizard is enabled, follow these instructions to easily set up your drive.

Table 5. Start-up wizard instructions

P13.1.7	Parameter lock	PIN			ID 624		
Minimum value:	0	Maximum value:	9999	Default value:	0		
Description:	The application selection can be protected against unauthorized changes with the password function. When the password function is enabled, the user will be prompted to enter a password before application changes, parameter value changes, or password changes.						
	By default, the password function is not in use. If you want to activate the password, change the value of this parameter to any number between 1 and 9999.						
	To deactivate the	password, reset the parameter va	alue to 0.				
P1.1 ²	Minimum frequ	iency			ID 101		
Minimum value:	0.00 HZ	Maximum value:	400.00 Hz	Default value:	0.00 Hz		
Description:	These define the frequency limits of the frequency converter. The maximum value for these parameters is 400 Hz. The minimum frequency has to be below the maximum frequency level. These will limit other frequency parameter settings; preset speeds, jog speed, 4 mA fault preset speed, fire mode speed, and brake speed settings.						
P1.2 ²	Maximum frequ	iency			ID 102		
Minimum value:	0.00 HZ	Maximum value:	400.00 Hz	Default value:	MaxFreqMFG		
Description:	frequency has to b		level. These will limi	num value for these parameters is it other frequency parameter setti			

Table 5. Start-up wizard instructions (Cont.).

P1.6 ^①	ID 486				
Minimum value:	DriveNomCurrCT*1/10 A Maximum value:	DriveNomCurrCT*2 A	Default value:	DriveNomCurrCT	
Description:	Motor nominal nameplate full load current. Find this value on the rating plate of the motor.				



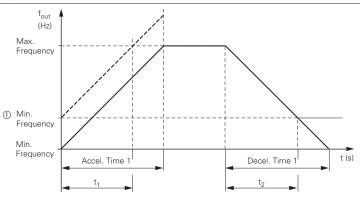
P1.7 ^①	Motor nominal speed	1			ID 489
Minimum value:	300 rpm	Maximum value:	20,000 rpm	Default value:	MotorNomSpeedMF0
Description:	Motor nominal nameplate	e base speed. Find this val	ue on the rating plate o	f the motor.	
P1.8 ^①	Motor power factor				ID 490
Minimum value:	0.30	Maximum value:	1.00	Default value:	0.85
Description:	Motor nominal nameplate	e full load power factor. Fi	nd this value on the rati	ing plate of the motor.	
P1.9 ^①	Motor nominal voltag	ge			ID 487
Minimum value:	180 V	Maximum value:	690 V	Default value:	MotorNomVoltMFG
Description:	Motor nominal nameplate	e base voltage. Find this v	alue on the rating plate	of the motor.	
P1.10 ^①	Motor nominal frequ	ency			ID 488
Minimum value:	8.00 Hz	Maximum value:	400.00 Hz	Default value:	MotorNomFreqMFG
Description:	Motor nominal nameplat point (P8.4) to the same .		value on the rating pla	te of the motor. This paramete	r sets the field weakening
P1.3 ^②	Acceleration time 1				ID 103
Minimum value:	0.1 s	Maximum value:	3000.0 s	Default value:	20 .0 s
Description:		output frequency to accele s, the acceleration time wil		cy to maximum frequency (P1.2) tal ramp time.). When accelerating from

Table 5. Start-up wizard instructions (Cont.).

P1.4 ²	Deceleration time 1	ID 104			
Minimum value:	0.1 s	Maximum value:	3000.0 s	Default value:	20 .0 s

Description:

The time required for the output frequency to decelerate from maximum frequency (P1.2) to zero frequency. When decelerating from different frequency levels, the deceleration time will be a fraction of the total deceleration time.



The values for the acceleration time t_1 and the deceleration time t_2 are calculated as follows: $t_1 = \frac{\text{(Max. Frequency - Min. Frequency)} \times \text{Accel. Time 1}}{\text{Max. Frequency}} \quad t_2 = \frac{\text{(Max. Frequency - Min. Frequency)} \times \text{Decel. Time 1}}{\text{Max. Frequency}}$

 \bigcirc When setting a minimum output frequency (decal time greater than 0 Hz), the acceleration and deceleration time of the drive is reduced to t_1 or t_2

P1.13 ^②	Remote control place				ID 135				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0				
Options:	0 = IO terminal; 1 = Fieldbus; or 3 = Keypad.								
Description:				cation: I/O terminals would be from indicate what mode is selected	m the digital hard-wired				
P1.14 ^{①②}	Remote reference				ID 137				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0				
Options:	0 = Al; 1 = Drive reference pot; 2 = Al joystick; 3 = Motor pot; 4 = Maximum frequency; 5 = Pl control output; 6 = Keypad; or 7 = Fieldbus reference.								
Description:	This parameter determine reference signal	s the reference for remot	e 1 control mode. Th	is value can be fed from an analog	input, keypad, or fieldbus				
P13.5.3	Keypad lock PIN				ID 75				
Minimum value:	0	Maximum value:	9999	Default value:	0				
Description:	The keypad can be protec	ted against unauthorized	changes with the key	pad lock function after no keys are	e pressed after five minutes.				
	When the password function is enabled, the user will be prompted to enter a password before the keypad display parameter or response to key press except up/down/left/right.								
	By default, the password between 1 and 9999.	By default, the password function is not in use. If you want to activate the password, change the value of this parameter to any number between 1 and 9999.							

Table 5. Start-up wizard instructions (Cont.).

P11.6.1	Blue tooth enabled				ID 1895
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Disabled; or 1 = Enable.				
Description:	Blue tooth enable.				

Parameter value can only be changed after the drive has stopped.
 Parameter value will be set to be default when changing macros.

Now the Start-up Wizard is done. It will not show again at the next power up. If you want to reset it, please select it from the main menu ("Start-up Wizard").

The PID Mini-Wizard is activated in the Quick Setup menu

Chapter 4 - Standard

On the next pages you will find the lists of parameters within the respective parameter groups. Each parameter section within the table lists:

- Parameter code (location indication on the keypad; shows the operator the present parameter number);.
- · Parameter name;
- ID (number of the parameter);

and where applicable:

- · Minimum value and units;
- · Maximum value and units;
- · Default value and units;
- · Options (when available); and
- · Description of the parameter.

Table 6. Monitor.

M1 - standard.					
M1.1	Output frequency				ID 1
Minimum value:	Hz Ma	aximum value:	Hz	Default value:	Hz
Description:	Output frequency (Hz).				
M1.2	Frequency reference				ID 24
Minimum value:	Hz Ma	aximum value:	Hz	Default value:	Hz
Description:	Reference frequency (Hz).				
M1.3	Motor speed				ID 2
Minimum value:	rpm M a	aximum value:	rpm	Default value:	rpm
Description:	Motor output speed (rpm).				
M1.4	Motor current				ID 3
Minimum value:	A Ma	aximum value:	А	Default value:	А
Description:	Motor output current RMS (Am	nps).			
M1.5	Motor torque				ID 4
Minimum value:	% M a	aximum value:	%	Default value:	%
Description:	Percent motor torque calculate	ed from nameplate val	ues and measured r	notor current (%).	
M1.6	Motor power				ID 5
Minimum value:	% M a	aximum value:	%	Default value:	%
Description:	Percent motor power calculate	d from nameplate val	ues and measured r	notor current (%).	
M1.7	Motor voltage				ID 6
Minimum value:	∨ Ma	aximum value:	V	Default value:	V
Description:	Output ac motor voltage (Vac).				
M1.8	DC-link voltage				ID 7
Minimum value:	∨ Ma	aximum value:	V	Default value:	V
Description:	DC bus voltage (Vdc).				
M1.9	Unit temperature				ID 8
Minimum value:	°C Ma	aximum value:	°C	Default value:	°C
Description:	Heat sink temperature (deg C).				

Table 6. Monitor (Cont.).

M1 - standard (Cont.	-1-				
M1.10	Motor temperatur	е			ID 9
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Motor temperature va	alue calculated from nameplat	e values and measure	ed motor current (%).	
W1.11	Latest fault code				ID 28
Vlinimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Last active fault code	value. See fault codes for the	value shown here.		
W1.12	Instant motor pov	ver		'	ID 1686
Minimum value:	kW	Maximum value:	kW	Default value:	kW
Description:	Instantaneous motor	power (kW).			
/12 - I/O status.					
W2.1	Analog input 1				ID 10
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies
Description:		red value (Vdc or Amps) selec	table with dipswitch.	1	
VI2.2	Keypad pot voltag				ID 1858
Minimum value:	V	Maximum value:	V	Default value:	V
Description:	Keypad potentiomete	r measured value (Vdc). DM1	PRO only.		
M2.3	Analog output				ID 25
/linimum value:	Varies	Maximum value:	Varies	Default value:	Varies
Description:	Analog output 1 meas	sured value (Vdc or Amps) sele	ctable with paramete	er.	
12.4	DI1, DI2, DI3				ID 12
linimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
escription:	Digital input 1/2/3 sta	atus.			
12.5	DI4				ID 13
/linimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Digital input 4 status				
VI2.8	RO1, RO2	,		'	ID 557
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Relay output 1 and 2	4 status.			
M5 - PI monitor.					
VI5.1	PI set point				ID 16
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies
Description:	PI set point in process	s units.			
VI5.2	PI feedback				ID 18
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies
Description:	PI feedback level in p	rocess units.			
M5.3	PI error value				ID 20
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies
Description:	PI error in process un	ts.			
M5.4	PI output				ID 22
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	PI output.				

Table 6. Monitor (Cont.).

M5.5	PI status	'	'		ID 23
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Stopped; 1 = Running; or 2 = Sleep mode.				
Description:	PI status indication, indication	cates if drive is stopped, ru	nning in PI mode, o	r in PI sleep mode.	

M9 - Multi-monitoring.

M9.1	Multi-monitoring	,	'	'	ID 30
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0, 1, 2.
Description:	Displays any three monitor see three lines of monitori editing the value then by g	ng values. Up and down ke	n. The values are s eys can be used to s	electable via the keypad menu. Nelect the row and then hitting the	fulti-monitor page could left arrow key will allow for

Table 7. Operate mode - O.

Code	Parameter	Min.	Max.	Unit	Default	ID	Note
01	Output frequency			Hz		1	
02	Freq. reference			Hz		24	
03	Motor speed			rpm		2	
04	Motor current			А		3	
05	Motor torque			%		4	
06	Motor power			%		5	
07	Motor voltage			V		6	
08	DC-link voltage			V		7	
09	Unit temperature			°C		8	
010	Motor temperature			%		9	
R11 [®]	Keypad reference	Minimum frequency	Maximum frequency	Hz	0.00	141	
R12 [®]	PI keypad setpoint 1	PI process minimum	PI process maximum	Varies	0.00	1307	

 $[\]ensuremath{^{\circ}}$ Parameter value will be set to be default when changing macros.

Table 8. Parameters .

P1 - Basic parameters.					
P1.1 ^②	Minimum frequ	iency	'	'	ID 101
Minimum value:	0.00 Hz	Maximum value:	400.00 Hz	Default value:	0.00 Hz
Description:	Defines the lowes 1 = Fire mode mini 2 = Derag. 3 = MPFC staging 4 = MPFC master 5 = Prime pump fr 6 = Prime pump fr	frequency. fixed frequency. requency.	ll operate. This setting	will limit other frequency paran	neter settings.

Table 8. Parameters (Cont.).

P1.2 ^②	Maximum frequency				ID 102
Minimum value:	0.00 Hz	Maximum value:	400.00 Hz	Default value:	MaxFreqMFG
Description:	Defines the highest frequence 1 = Keypad reference. 3 = Motor potentiometer 3 = Jog speed. 4 = 2nd stage ramp frequence 5 = Fire mode minimum ference 6 = Derag. 7 = MPFC staging frequence 7 = MPFC master fixed frequency 10 = Prime pump frequence 11 = Preset speed frequence 12 = Frequency limit valuence 13 = Reference limit valuence 14 = Speed control_fs2. 15 = Stall frequency limit 16 = 4 mA fault frequence 17 = MPFC de-staging frequence 19 = Pipe fill loss frequence 19 = Pipe fill loss frequence 20 = Broken pipe frequence 19 = Proken pipe frequence 20 = Broken pipe frequence 20 =	iency. requency. requency. requency. ry. rocy 2. rocy. e. e y. squency. rocy low. rocy low. rocy light.	Il operate. This will limit oth	er frequency parameters.	
P1.3 ^②	Accel. time 1				ID 103
Minimum value:	0.1 s	Maximum value:	3,000.0 s	Default value:	20.0 s
Description:	Defines the time require	d for the output frequency	o accelerate from zero frequ	ency to maximum frequency	/.
P1.4 ²	Decel. time 1				ID 104
Minimum value:	0.1 s	Maximum value:	3,000.0 s	Default value:	20.0 s
Description:	Defines the time required	d for the output frequency	o decelerate from maximum	frequency to zero frequency	у.
P1.6 ^①	Motor nom. current				ID 486
Minimum value:	DriveNomCurrCT*1/10 A	Maximum value:	DriveNomCurrCT*2 A	Default value:	DriveNomCurrCT A
Description:	Motor nameplate rated f	ull load current. This value	is found on the rating plate	of the motor.	
P1.7 ^①	Motor nom. speed				ID 489
Minimum value:	300 rpm	Maximum value:	20,000 rpm	Default value:	MotorNomSpeedMFG
Description:	Motor nameplate rated s	peed. This value is found	on the rating plate of the mot	or.	
P1.8 ^①	Motor PF				ID 490
Minimum value:	0.30	Maximum value:	1.00	Default value:	0.85
Description:	Motor nameplate rated p	ower factor. This value is	found on the rating plate of t	he motor.	
P1.9 ^①	Motor nom. voltage				ID 487
Minimum value:	180 V	Maximum value:	690 V	Default value:	MotorNomVoltMFG V
Description:	Motor nameplate rated v	oltage. This value is found	on the rating plate of the mo	otor.	,
P1.10 ^①	Motor nom. frequenc	ey .			ID 488
Minimum value:	8.00 Hz	Maximum value:	400.00 Hz	Default value:	MotorNomFreqMFG Hz
Description:	Motor nameplate rated f	requency. This value is for	nd on the rating plate of the	motor.	
P1.11 ^②	Local control place				ID 1695
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = keypad; 1 = IO terminal; or 3 = fieldbus.				
Description:	Defines the signal location Start/Stop buttons on the	on for the start command in e drive. Keypad display wi	n local mode. I/O terminals w Il indicate which mode is sele	yould be from the digital ha	rd-wired inputs or keypad fo

Table 8. Parameters (Cont.).

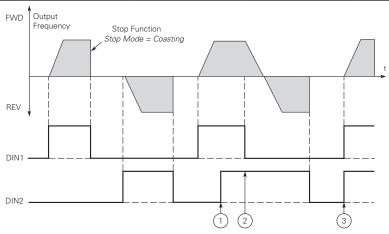
P1.12 ^{①②}	Local reference				ID 136
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Al; 1 = drive ref. pot; 4 = maximum frequency; 6 = keypad; or 7 = fieldbus ref.				
Description:	Defines the signal location	n for the speed reference	in local mode.		
P1.13 ^②	Remote control place	•			ID 135
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = IO terminal; 1 = fieldbus; or 3 = keypad.				
Description:		n for the start command in the drive. Keypad display		O terminals would be from the digital the mode is selected.	hard-wired inputs or keypad
P1.14 ^{①②}	Remote reference				ID 137
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Al; 1 = drive reference pot; 4 = maximum frequency; 6 = keypad; or 7 = fieldbus reference.				
Description:	Defines the signal location	n for the speed reference	in remote mode.		

① Parameter value can only be changed after the drive has stopped. ② Parameter value will be set to be default when changing macros.

Table 9. Inputs.

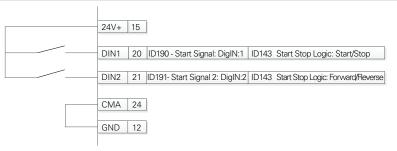
P2.1 - Basic settings					'
P2.1.3 ^{①②}	IO terminal Star	t/Stop logic			ID 143
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	1 = Start - reverse: 2 = Start - enable: ı	maintained input on start signal maintained input on start signal	1 to run forward I to run forward a	ard and a maintained signal on start sig and a maintained signal on start signal and a maintained signal on start signal nal 1 uses a normally open start and st	2 for reverse. 2 to enable the drive to run.
Description:	Defines the functio	nality for start signal 1 and start	signal 2. By defa	ault, start signal 1 is DI1 and start signa	al 2 is DI2.
			art REV comman 15 20 ID190 - Start Si	ct = start reverse. This would be conds. When contacts open, the motor ignal: DigIN:1 ID143 Start Stop Logic: Start gnal 2: DigIN:2 ID143 Start Stop Logic: Start	stops.

Table 9. Inputs (Cont.).



- Notes: ① The first selected direction has the highest priority.
 ② When the DIN1 contact opens the direction of rotation starts to change.
 - (DIN1) and start reverse (DIN2) signals are active simultaneously the start forward signal (DIN1)

1 = P3.2: DI closed contact = start /open contact = stop P3.3: DI closed contact = reverse / open contact = forward. This would be considered 2-wire control with a contact on start/stop, contact open it stops and direction on 2nd start signal.



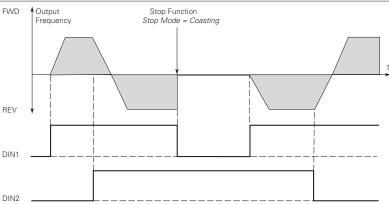
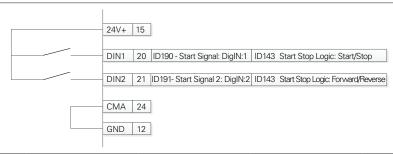


Table 9. Inputs (Cont.).

2 = P3.2: DI closed contact = start/open contact = stop P3.3: DI closed contact = start enabled/open contact = start disabled and drive stopped if running motor direction keeps forward. This would be considered 3-wire control with start signal 2 required to be closed to enable start on start signal 1.



3 = Three-wire connection (pulse control): P3.2: DI changes from open to closed = start pulse P3.3: DI changes from closed to open = stop pulse P3.5: DI closed contact = reverse/open contact = forward. This would be considered 3-wire control with start signal 1 being the start pulse and start signal 2 being the NC stop.



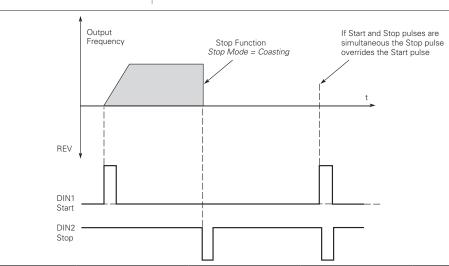


Table 9. Inputs (Cont.).

Minimum value:

Description:

P2.2 - Digital input.						
P2.2.5 ^②	DI3 function				ID 1805	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	4	
Options:	by P2.1.3. 2 = I0 terminal star by P2.1.3. 3 = Reverse - when S 4 = Ext. fault 1 - whe 7 = Fault reset - whe 8 = Run enable - whe 9 = Preset speed B0 10 = Preset speed B1 11 = Preset speed B2 16 = Accel./decel. tir 19 = Remote control 20 = Local control - v 22 = Pl controller - w 23 = Pl setpoint selection 24 = Motor interlock 29 = DC brake active	t signal 1 - when the control so t signal 2 - when the control so Start/Stop logic is set to 3 start oclosed, ext. fault 1 will be ac n closed, all active faults will be closed the drive will allow a the seven preset speeds are set - the seven preset speeds are the seven preset speeds are when closed, the drive will be then closed, the drive will be finen closed, the drive will force then closed, the drive will force then closed, the drive will force then closed, the drive will be then closed, the drive will be then closed, the drive will be then closed, the drive will force then closed, the drive will be then closed, the drive will be then closed, the drive will be then closed, DC injection browhen clo	pulse stop pulse, the tivated. e reset. start command and selected via three be selected via three be selected via three be selected via three be time 1 will be use forced to the local count 1 is active, who enabled to run. aking will be active.	nary inputs, this is least significant inary inputs. inary inputs. inary inputs, this is most significated, when closed accel./decel. time te control place. ntrol place. te to Pl controller output. en closed, setpoint 2 is active.	erform the action defined or in the reverse direction is bit in that binary input.	
Description:	Defines the function	when closed. The Derag. cycle of digital input 3.	: ioi puilips will be i	ilitiateu.		
P2.2.7 [©]	DI4 function		1		ID 1807	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	7	
	by P2.1.3. 2 = 10 terminal start by P2.1.3. 3 = Reverse - when S 4 = Ext. fault 1 - whe 7 = Fault reset - whe 8 = Run enable - whe 9 = Preset speed B0 10 = Preset speed B1 11 = Preset speed B2 16 = Accel./decel. tir 19 = Remote control 20 = Local control - v 22 = PI controller - w 23 = PI setpoint selecate 24 = Motor interlock	action. art signal 1 - when the control source is set to IO terminal, this input when closed will perform the action define art signal 2 - when the control source is set to IO terminal, this input when closed will perform the action define an Start/Stop logic is set to 3 start pulse stop pulse, this input will cause the drive to start in the reverse direct when closed, ext. fault 1 will be activated. when closed, all active faults will be reset. when closed the drive will allow a start command and be in the ready state. BO - the seven preset speeds are selected via three binary inputs, this is least significant bit in that binary input B1 - the seven preset speeds are selected via three binary inputs, this is most significant bit in that binary input Lime set - when open, accel./decel. time 1 will be used, when closed accel./decel. time 2 will be used. rol - when closed, the drive will be forced to the remote control place. I - when closed, the drive will be forced to the local control place. - when closed, the drive will force the reference source to Pl controller output. elect - when open, parameter setpoint 1 is active, when closed, setpoint 2 is active. ock 1 - when closed, motor will be enabled to run. tive - when closed, DC injection braking will be active.				
Description:	Defines the function	of digital input 4.				
P2.3 - Preset speed.	. Preset speed 1				ID 105	
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	5.00 Hz	
Description:	Preset speed is selec	cted with digital inputs using a	binary input.			
P2.3.2 ^②	Preset speed 2	-		,	ID 106	
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	10.00 Hz	
Description:	Preset speed is selec	cted with digital inputs using a	binary input.			
P2.3.3 ^②	Preset speed 3			,	ID 118	
	• •					

MaxFreq Hz

Default value:

15.00 Hz

Maximum value:

Preset speed is selected with digital inputs using a binary input.

Table 9. Inputs (Cont.).

P2.3.4 ²	Preset speed 4				ID 119
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	20.00 Hz
Description:	Preset speed is selecte	d with digital inputs using a	binary input.		
P2.3.5 ^②	Preset speed 5				ID 120
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	25.00 Hz
Description:	Preset speed is selecte	d with digital inputs using a	binary input.		
P2.3.6 ^②	Preset speed 6				ID 121
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	30.00 Hz
Description:	Preset speed is selecte	d with digital inputs using a	binary input.		
P2.3.7 ^②	Preset speed 7				ID 122
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	35.00 Hz
Description:	Preset speed is selecte	d with digital inputs using a	binary input.		

P2.4 - Al settings.

P2.4.1	Al mode				ID 222
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = 0 - 20 mA; or 1 = 0 - 10 V.				

Description:

Defines the analog input mode to current or voltage the DIP switches on control board will need to be set to the same mode as this parameter.

*DM1 PRO CN5 terminals 8 and 9 for current or voltage, also need to set DIP switches SW2 2 and 3 on control board, near the RJ45 port.

DIP switches SW2 2 and 3 off for voltage.

Current mode, if using the ± 10 V supply on CN5 terminals 13 of the DM1 / DM1 Pro, it will require DIP switches SW2 2 and 3 on to complete the current loop. When doing a current loop with an external supply, the DIP switches SW2 2 off and 3 on.

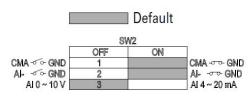
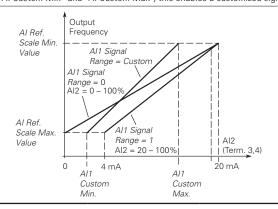


Table 9. Inputs (Cont.).

P2.4.2 ^②	Al signal rang	e			ID 175
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = 0-100%/0-20 1 = 20-100%/4-2				
Description:	With this parameter, you can select the analog input 1 signal range.				
	For selection "Customized" see "Al Custom Min" and "Al Custom May" this enables a customized signal range				



^① Parameter value can only be changed after the drive has stopped. ^② Parameter value will be set to be default when changing macros.

Table 10. Outputs.

P3.1.1 ²	RO1 function	'		'	ID 152
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	6 = Reverse - drive is 7 = At speed - output 8 = Zero frequency - 24 = STO fault outpu 26 = Remote control	eady for operation. ning. ulted.	et reference. cy.		
Description:	Defines the function	associated with changing the	state of relay output 1.		
P3.1.4 ^②	RO2 function				ID 153
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	3
Options:	7 = At speed - output 8 = Zero frequency - 24 = STO fault outpu 26 = Remote control	eady for operation. ning. ulted. e is not faulted.	et reference. cy.		

Table 10. Outputs (Cont.).

P3.3 - Analog output.						
P3.3.1 ^②	AO mode			ID 227		
Minimum value:	N.A. Maximum value	: N.A.	Default value:	0		
Options:	0 = 0 - 20 mA; or 1 = 0 - 10 V.					
Description:	Defines the analog output mode to current or v	oltage.				
P3.3.2 ^②	AO function			ID 146		
Minimum value:	N.A. Maximum value	: N.A.	Default value:	1		
Options:	1 = Output frequency (0 - maximum frequency). 2 = Frequency reference (0 - max frequency). 3 = Motor speed rpm (0 - nameplate rpm). 4 = Motor current (0 - nameplate current). 5 = Motor torque (0 - calculated nominal). 6 = Motor power (0 - calculated nominal). 7 = Motor voltage (0 - nameplate voltage.; 8 = DC bus voltage (0 - 1,000 Vdc). 12 = Analog input (0% - 100%).					
Description:	Select the function desired to the terminal AO	l.				

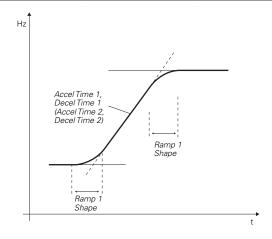
^② Parameter value will be set to be default when changing macros.

Table 11. Drive control.

P4.1 - Basic settings	S.				
P4.1.1 ^②	Keypad reference				ID 141
Minimum value:	MinFreq	Maximum value:	MaxFreq	Default value:	0.00 Hz
Description:	Keypad reference value.				
P4.1.3 ^②	Keypad stop				ID 114
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:				perate when the control source is rive regardless of control mode.	s set to keypad.
Description:	Enabled or always enab	led keypad operation.			
P4.1.4 ^①	Reverse enabled				ID 1679
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Disabled; or 1 = Enabled.				
Description:	Enables or disables the	reverse motor direction.			
P4.1.5	Change phase seque	ence motor			ID 2515
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Change disable; or 1 = Change enable.				
Description:	This parameter allows for	or swapping the motor phas	e output from u, v, w	to u, w, v.	
P4.1.6 ^②	Power up local remo	ote select			ID 1685
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Hold last; 1 = Local control; or 2 = Remote control.				
Description:	Selects what control pla when powered down, se	ice the drive will start at af	ter power is applied. Il cause the drive to st	The default setting will hold the I tart in that mode regardless of las	ast state that the drive wast state.

Table 11. Drive control (Cont.).

P4.1.8 ^②	Start mode		<u> </u>		ID 252
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	1 = Flying start fror last operating f 2 = Flying start fror	requency as a starting point.	catch a spinning r will catch a spin	erence value. notor. This setting searches for the online motor. This setting searches for	1 / 0
Description:	Selects the start m	ode operation.			
P4.1.9 ^②	Stop mode	'		'	ID 253
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:		a stop command, the motor coa e stop command, the speed of th		ntrolled by the drive. rated according to the set deceleration	on parameters.
Description:	Selects the stop mo	ode operation.			
P4.1.10 ^②	Ramp 1 shape				ID 247
Minimum value:	0.0 s	Maximum value:	10.0 s	Default value:	0.0 s
Description:	gives a linear ramp	shape that causes acceleration a	and deceleration t	smoothed with these parameters. So to react immediately to the changes i as an S-shaped acceleration/decelera	n the reference signal.



[©] Parameter value can only be changed after the drive has stopped. © Parameter value will be set to be default when changing macros.

Table 12. Motor control.

P5.1.1 ^{①②}	Motor control	mode			ID 287
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	1 = Speed contro 2 = Open loop ve identification	· ·	y giving a frequency rd speed control mod	reference to it with slip compensa	tion requires running a moto

Table 12. Motor control (Cont.).

P5.1.2 ^①	Current limit				ID 107
Minimum value:	DriveNomCurrCT*1/10 A	Maximum value:	DriveNomCurrCT*2 A	Default value:	DriveNomCurrCT*3/2 A
Description:			rent allowed from the drive. ne current limiter controller a		
P5.1.3 ^{①②}	V/Hz optimization		'		ID 109
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disable torque boost f 1 = Enable torque boost fu				
Description:	Automatic torque boost - and run at low frequencie		ncreases automatically, whic	h assists the motor to pro	duce sufficient torque to start
P5.1.4 ^{①②}	V/Hz ratio		,		ID 108
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	where the nominal vol 1 = Squared - the voltage weakening point wher produces less torque e the load is proportiona 2 = Programmable V/Hz cu voltage, midpoint, and the application. 3 = Linear with flux optim	tage is supplied. A linear of the motor changes follower the motor changes follower the nominal voltage is sound electromechanical noisel to the square of the speurve - the V/Hz curve can tweakening point. A progization - the drive starts to	V/Hz ratio should be used in owing a squared curve with t upplied. The motor runs und se. A squared V/Hz ratio can ed. oe programmed with three di rammable V/Hz curve can be	constant torque application the frequency in the area for magnetized below the formation to be used in applications with the formation to the second the second to the sec	rom 0 Hz to the field rield weakening point and where the torque demand of the are the 0 frequency do not satisfy the needs of the energy. This mode is called
Description:	Selects the V/Hz ratio. 0 = Linear; 1 = Squared; 2 = Programmable; or 3 = Linear + flux optimizat	ion.			

U[V] Un Default: Nominal Voltage of the Motor Field Weakening Point Voltage at FWP Squared Default: Nominal Frequency of the Motor f [Hz]

			0 = Linear and 1 = Squ	ared.		
P5.1.10 ^②	Switching frequenc	;y	'			
Minimum value:	MinSwitchFreq kHz	Maximum value:	MaxSwitchFreq kHz	Default value:	DefaultSwitchFreqCT kHz	
Description:	Sets the switching freq	uency for the PWM output	waveform.			
P5.1.16 ^{①②}	Identification				ID 299	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0	
Options:	2 = Identification with r 3 = Identification no rur	run - motor stator resistor is n - motor is supplied with cu	n the motor. This can be don completed then the motor is rrent and voltage but at zero e system inertia only.	run. This must be comple	eted with unloaded motor.	
Description:	4 = Identification only inertia - identification for the system inertia only. This parameter enables the drive to make an motor identification cycle of the motor once complete the drive will adjust tuning parameters to improve starting torque and open loop vector control performance. Once set and a run command is given, the operatic will be active then set back to 0 when completed. When a run command is issued, the message on the keypad will indicate "Auto tuning" is being performed. If there is an issue with the motor identification, a fault message will be displayed.					

① Parameter value can only be changed after the drive has stopped. ② Parameter value will be set to be default when changing macros.

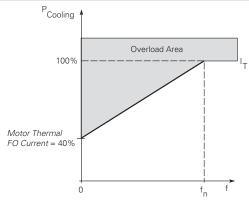
Table 13. Protections.

P6.1 - Motor. P6.1.4^{①②} Motor thermal protection ID 310 Minimum value: Default value: 2 N.A. Maximum value: N.A. Options: 0 = No response.= Warning. 2 = Fault, stop mode after fault according to parameter stop mode. 3 = Fault, stop mode after fault always by coasting. **Description:** If a fault condition is selected, the drive will stop and activate the fault stage based off the % of calculated motor temperature. The calculated motor temp is based off the install power on values of the drive and monitoring values as the drive is running. Deactivating this protection, i.e., setting parameter to 0, will reset the thermal stage of the motor to 0%. Motor thermal FO current ID 311 P6.1.5² Minimum value: 0.00% Maximum value: 150.00% Default value: 100.00% **Description:** The current can be set between 0 - 150.0% x InMotor. This parameter sets the value for thermal current at zero frequency.

90% (or even higher). Note: The value is set as a percentage of the motor nameplate data, P1.6 (nominal current of the motor), not the drive's nominal output current. The motor's nominal current is the current that the motor can withstand in direct on-line use without being overheated.

The default value is set assuming that there is no external fan cooling the motor. If an external fan is used, this parameter can be set to

If you change the parameter nominal current of motor, this parameter is automatically restored to the default value. Setting this parameter does not affect the maximum output current of the drive.



P6.2 - Drive.

P6.2.2 ^{①②}	Input phase fau	lt			ID 332
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:		de after fault according to parame de after fault always by coasting; ower limit.			
Description:	The input phase su	pervision ensures that the input p	hases of the frequ	ency converter have approximately	equal current draw.
P6.2.3 ^{①②}	4 mA input faul	lt	'	,	ID 306
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	3 = Warning, the p 4 = Fault, stop mod	requency from 10 seconds back is reset frequency P6.2.4 is set as re de after fault according to parame de after fault always by coasting.	eference.		
Description:				reference signal is used and the sign e programmed into relay outputs RO	

Table 13. Protections (Cont.).

P6.2.4 ^{①②}	4 mA fault freque	ency			ID 331			
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	0.00			
Description:	When 4 mA fault hap	pens, the output frequency of	drive goes to this preset	speed when P6.2.3 = 3.				
P6.2.5 ^{①②}	External fault		,	'	ID 307			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2			
Options:		after fault according to parame after fault always by coasting.	eter stop mode.					
Description:				It signal in the programmable (o output relay outputs RO1 and I				
P6.2.11 ²	STO fault respons	e			ID 2427			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2			
Options:	1 = Warning - drive ir	0 = No Action - drive will stop, no indication shown, no reset required, have to cycle start command. 1 = Warning - drive indicate warning/if STO clears drive will run without reset. 2 = Fault - drive will indicate fault/require reset to start again.						
Description:	STO fault response d	efines the function of how the	STO input will be seen of	on the keypad and how the driv	e functions to it.			
P6.2.12 ^①	PI feedback Al los	ID 2401						
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	0 = No action; 1 = Warning; 2 = Fault; or 3 = Warning: preset f	requency (P6.2.13).						
Description:	This parameter defin feedback.	es the function of the PI feedba	ack analog input loss res	ponse. If the AI feedback is lo	st based off the programed A			
P6.2.13 ^{①②}	PI feedback Al lo	ss pre-frequency			ID 2402			
Minimum value:	0.00 Hz	Maximum value:	400.00 Hz	Default value:	0.00 Hz			
Description:	This parameter defin	es the frequency the master w	ould run to if a feedback	is lost and P6.2.12 was set to	option 3.			
P6.2.14 ^②	PI feedback Al los	ss pipe fill			ID 2403			
Minimum value:	0.00 varies	Maximum value:	1000.00 varies	Default value:	0.00 varies			
Description:		e in the pump based off the me 2.13 "loss of prime" occurs.	asured level. If the value	e drops below this level for the	time in P6.2.15 and below,			
P6.2.15 ^②	PI feedback AI lo	ss pre-frequency timeout			ID 2404			
Minimum value:	0.0 s	Maximum value:	6,000.0 s	Default value:	0.0 s			
Description:	PI feedback AI loss p frequency in P6.2.15 0 seconds.	re-frequency timeout - when P for the time set here. After thi	6.2.12 is set to 3 or 4, wh s time, the drive will fau	nen the feedback signal is lost, It out on "feedback loss". The	the drive will run at the time is disabled when set to			

P6.3 - Communications.

P6.3.1 [©] Minimum value:	Fieldbus fault resp	ID 334			
	N.A.	Maximum value:	N.A.	Default value:	2
Options:	0 = No action; 1 = Warning; 2 = Fault; or 3 = Fault, coast.				
Description:	communication port.			e is used and communication is los eldbus control to set fault or warni	

Table 13. Protections (Cont.).

P6.3.2 ^{①②}	OPTcard fault response					
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2	
Options:	0 = No action; 1 = Warning; 2 = Fault; or 3 = Fault, coast.					
Description:	This sets the response mode for a board slot fault caused by a missing or failed option board not commun processor.					

^① Parameter value can only be changed after the drive has stopped. ^② Parameter value will be set to be default when changing macros.

Table 14. Pl Controller.

P7.1 - Basic settings	3.	,	,		
P7.1.1 ^②	PI control gair	1			ID 1294
Minimum value:	0.00%	Maximum value:	200.00%	Default value:	100.00%
Description:		of the PI Controller. It adjust the s of 10% in the error value causes th			ne load. If this value is set to
P7.1.2 ^②	PI control itim	ne			ID 1295
Minimum value:	0.00 s	Maximum value:	600.00 s	Default value:	1.00 s
Description:		gration time of the PI controller. Ov c signal. If this value is set to 1.00			

Table 14. PI Controller (Cont.).

P7.1.3 ^{①②}	PI process unit				ID 1297
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = %; 1 = 1/min.; 2 = rpm; 3 = ppm; 4 = pps; 5 = 1/s; 6 = 1/min.; 7 = 1/h; 8 = kg/s; 9 = kg/min.; 10 = kg/h; 11 = m3/s; 12 = m3/min.; 13 = m3/h; 14 = m/s; 15 = mbar; 16 = bar; 17 = Pa; 18 = kPa; 19 = mVS; 20 = kW; 21 = Deg. C; 22 = GPM; 23 = gal/m; 25 = gal/m; 25 = gal/m; 26 = lb/s; 27 = lb/min.; 28 = lb/h; 30 = ft³/h; 31 = ft³/min.; 32 = ft³/h; 33 = ft sy; 34 = in. wg; 35 = ft wg; 36 = PSI; 37 = lb/in.2; 38 = HP; 39 = Deg. F; 40 = PA; 41 = WC; 42 = HG; 43 = ft; 44 = m;		N.A.		U
escription:	Defines the unit type f	or PI feedback unit.			
7.1.4 ^②	PI process unit mir	nimum			ID 1298
linimum value:	-99999.99 varies	Maximum value:	PI Process Unit Max	Default value:	0.00 varies
escription:	Defines the minimum p	process unit value.	,		
7.1.5 ^②	PI process unit ma	ximum			ID 1300
inimum value:	PI Process Unit Min	Maximum value:	99999.99 varies	Default value:	100.00 varies
escription:	Defines the maximum	process unit value.			
7.1.6 ^{①②}	PI error inversion				ID 1303
linimum value:	N.A.	Maximum value:	N.A.	Default value:	0
ptions:		ck is less than set-point, PI co			
	Defines the way the pr		· · · · · · · · · · · · · · · · · · ·		

① Parameter value can only be changed after the drive has stopped. ② Parameter value will be set to be default when changing macros.

Table 15. Setpoint.

P7.2.1 - Standard.								
P7.2.1.1 ^②	PI keypad setpoint	ID 1307						
Minimum value:	PI Process Unit Min	Maximum value:	PI Process Unit Max	Default value:	0.00 varies			
Description:	Keypad PI reference va	ue set point 1.						
P7.2.1.3 ^②	PI wake-up action				ID 2466			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:								
Description:	This parameter defines	the wake-up function action	1.					

P7.2.2 - Setpoint 1.

P7.2.2.1 ^①	PI setpoint 1 sour	ce			ID 1312
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Not used; 1 = PI keypad setpoin 2 = PI keypad setpoin 3 = AI; 4 = Drive reference pi 5 = FB process data ir 7 = FB process data ir 8 = FB process data ir 9 = FB process data ir 10 = FB process data 11 = FB process data 12 = FB process data 13 = FB PI setpoint 1; 14 = FB PI setpoint 2.	t 2; put 1; put 1; put 2; put 3; put 4; put 5; input 6; input 6; input 8;			
Description:	Defines source of the fieldbus message.	setpoint value the drive uses.	This can either be an inte	ernal preset value, keypad se	tpoint, analog signal, or
P7.2.2.2 ^①	PI setpoint 1 sleep	o enable			ID 1315
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disabled; or 1 = Enabled.				
Description:		ible the output when the frequence of the couple of the wake-up		ep frequency for the sleep de	ay time. The output
P7.2.2.3 ^②	PI setpoint 1 sleep	o delay			ID 1317
Minimum value:	0 s	Maximum value:	3,000 s	Default value:	0 s
Description:	This parameter sets t shut off till the wake	he delay time after the setpoir up level is met. It is to preven	nt drops below the sleep le t large fluctuations when	evel for this amount of time a going into the sleep function	nd then the drives output wil to save motor run time.
P7.2.2.4 ^②	PI setpoint 1 wake	e-up level	'	,	ID 1318
Minimum value:	-99999.99 varies	Maximum value:	99999.99 varies	Default value:	0.00 varies
Description:		he PI feedback value to go ab e scaled based off the PI unit		ut to be re enabled. This valu	ue is based of the % of
P7.2.2.5 ^②	PI setpoint 1 boos	t			ID 1320
Minimum value:	-2.00 varies	Maximum value:	2.00 varies	Default value:	1.00 varies
Description:	The setpoint can be b	oosted via a multiplier value.			

Table 15. Setpoint (Cont.).

P7.2.2.6 ^②	PI setpoint 1 slee		ID 2450		
Minimum value:	MinFreqMin Hz	Maximum value:	MaxFreq Hz	Default value:	0.00 Hz
Description:		which the unit value is used to the drive into the sleep mode.		sleep mode. When the unit drops	below this level for the sleep
P7.2.2.7 ^②	SP1 sleep mode o	over cycle time			ID 1842
Minimum value:	0	Maximum value:	10	Default value:	0
Description:	cycle" fault. One cycle is defined	e drive come in and out of slee when the drive transfers from t do the sleep over cycle check	normal mode to sleep		lrive would trip on "pump ove
P7.2.2.8 ^②	SP1 sleep mode i	naximum cycle time	'		ID 1843
Minimum value:	0 s	Maximum value:	3,600 s	Default value:	300 s
Description:	Defines the maximum	m time for sleep over cycle che	cking.		

[©] Parameter value can only be changed after the drive has stopped.
© Parameter value will be set to be default when changing macros.

Table 16. Feedback.

P7.3.2 - Feedback 1.						
P7.3.2.1 ^①	PI feedback 1	source	,	'	ID 1332	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2	
Options:	0 = Not used; 1 = Al; 2 = Drive referen 3 = FB process da 11 = FB PI feedba	ata input 1; or				
Description:	Defines where fe	edback signal is being fed into the	drive, via analog o	r fieldbus data value.		

^① Parameter value can only be changed after the drive has stopped.

Table 17. Serial communication.

P11.1 - Basic settings.								
P11.1.1 ^①	Serial communication	on		,	ID 586			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	0 = Modbus RTU; 1 = BACnet MSTP; or 2 = SWD.							
Description:	This parameter defines t	he communication protocol	for RS-485.					

P11.2 - Modbus RTU.

P11.2.1 ^①	Slave address	,			ID 587
Minimum value:	1	Maximum value:	247	Default value:	1
Description:	This parameter defin	nes the slave address for RS-48	5 communication.		

Table 17. Serial communication (Cont.).

	Baud rate				ID 584	
Viinimum value:	N.A.	Maximum value:	N.A.	Default value:	1	
Options:	0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 57,600; or 4 = 115,200					
Description:	This parameter defines c	ommunication speed for RS	-485 communication.			
P11.2.3 ^①	Parity type				ID 585	
Viinimum value:	N.A.	Maximum value:	N.A.	Default value:	2	
Options:	0 = None; 1 = Odd; or 2 = Even.					
Description:	This parameter defines p	arity type for RS-485 comn	nunication.			
P11.2.4	Modbus RTU protoco	l status			ID 588	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.	
Options:	0 = Initial; 1 = Stopped; 2 = Operational; or 3 = Faulted.					
Description:	This parameter shows th	e protocol status for RS-48	5 communication.			
P11.2.5	Communication time	out modbus RTU			ID 593	
Minimum value:	0 ms	Maximum value:	60,000 ms	Default value:	10,000 ms	
Description:	Selects the time to wait	before a communication fac	ılt occurs over modbus f	RTU if a message is not receive	d.	
P11.2.6	Modbus RTU fault re	sponse			ID 2516	
Vlinimum value:	N.A.	Maximum value:	N.A.	Default value:	0	
Options:	O - Only in fieldbus control mode. When fieldbus is the control place and fieldbus fault is active, the drive will fault on communications; if not in fieldbus control, place will not fault. 1 - In all control modes. No matter the control place setting, if communication is lost, fieldbus fault response will occu					
	1 - In all control modes.	No matter the control place	, secting, it communicat		oc will occur.	
Description:		t condition for modbus RTU			oc will occur.	
<u> </u>	Defines the fieldbus faul	<u>.</u>				
P11.3 - BACnet RTU I	Defines the fieldbus faul	<u>.</u>			ID 594	
Description: P11.3 - BACnet RTU I P11.3.1 ^① Minimum value:	Defines the fieldbus faul	<u>.</u>		Default value:		
P11.3 - BACnet RTU I	Defines the fieldbus faul WSTP. MSTP baud rate	t condition for modbus RTU	communication.		ID 594	
P11.3 - BACnet RTU I P11.3.1 [©] Minimum value:	Defines the fieldbus faul WSTP. WSTP baud rate N.A. 0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 76,800; or 4 = 115,200.	t condition for modbus RTU	communication. N.A.	Default value:	ID 594	
P11.3 - BACnet RTU I P11.3.1 [©] Minimum value: Options: Description:	Defines the fieldbus faul WSTP. WSTP baud rate N.A. 0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 76,800; or 4 = 115,200.	Maximum value:	communication. N.A.	Default value:	ID 594	
P11.3 - BACnet RTU I P11.3.1 [©] Minimum value: Options: Description: P11.3.2 [©]	Defines the fieldbus faul WSTP. WSTP baud rate N.A. 0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 76,800; or 4 = 115,200. This parameter defines to	Maximum value:	communication. N.A.	Default value:	ID 594 2	
P11.3 - BACnet RTU I P11.3.1 [©] Minimum value: Options: Description: P11.3.2 [©] Minimum value:	Defines the fieldbus faul MSTP. MSTP baud rate N.A. 0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 76,800; or 4 = 115,200. This parameter defines the state of the s	Maximum value: he communication speed for	N.A. r RS-485 communicatio	Default value:	ID 594 2 ID 595	
P11.3 - BACnet RTU I P11.3.1 [©] Minimum value: Options: Description: P11.3.2 [©] Minimum value: Description:	Defines the fieldbus faul MSTP. MSTP baud rate N.A. 0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 76,800; or 4 = 115,200. This parameter defines the state of the s	Maximum value: Maximum value: Maximum value: Maximum value: ss of the drive on the BACr	N.A. r RS-485 communicatio	Default value:	ID 594 2 ID 595	
P11.3 - BACnet RTU I P11.3.1 Minimum value: Options: Description: P11.3.2 Minimum value: Description: P11.3.3	MSTP baud rate N.A. 0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 76,800; or 4 = 115,200. This parameter defines to MSTP device address 0 Defines the device address	Maximum value: Maximum value: Maximum value: Maximum value: ss of the drive on the BACr	N.A. r RS-485 communicatio	Default value:	ID 594 2 ID 595	
P11.3 - BACnet RTU I P11.3.1 [©] Minimum value: Options:	MSTP baud rate N.A. 0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 76,800; or 4 = 115,200. This parameter defines ti MSTP device address 0 Defines the device addre MSTP instance numb	Maximum value: Maximum value: Maximum value: So of the drive on the BACr	N.A. N.A. r RS-485 communicatio 127 ret MSTP network. 4,194,302	Default value:	ID 594 2 ID 595 1 ID 596	
P11.3 - BACnet RTU I P11.3.1 © Minimum value: Options: Description: P11.3.2 © Minimum value: Description: P11.3.3 © Minimum value:	MSTP baud rate N.A. 0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 76,800; or 4 = 115,200. This parameter defines ti MSTP device address 0 Defines the device addre MSTP instance numb	Maximum value: Maximum value: Maximum value: ss of the drive on the BACr mer Maximum value: her of the drive on the BACr	N.A. N.A. r RS-485 communicatio 127 ret MSTP network. 4,194,302	Default value:	ID 594 2 ID 595 1 ID 596	

Table 17. Serial communication (Cont.).

	MSTP protocol status				ID 599
Minimum value:	N.A.	/laximum value:	N.A.	Default value:	N.A.
Options:	0 = Stopped; 1 = Operational; or 2 = Faulted.				
Description:	This parameter shows the pro	otocol status for BACno	et MSTP communicati	on.	
P11.3.6	MSTP fault code				ID 600
Minimum value:	N.A.	/laximum value:	N.A.	Default value:	N.A.
Options:	0 = None; 1 = Sole master; 2 = Duplicate MAC ID; or 3 = Baud rate fault.				
Description:	This parameter shows the pro	otocol status for BACno	et MSTP communicati	on.	
P11.3.7	MSTP fault response				ID 2526
Minimum value:	N.A.	/laximum value:	N.A.	Default value:	0
Options:	communications. If not in	fieldbus control, place	will not fault.	fieldbus fault is active, the drive vacation is lost, fieldbus fault respo	
Description:	Defines the fieldbus fault con	dition for BACnet MS1	P communication.		
P11.3.8	MSTP maximum master				ID 1537
Minimum value:	1 N	laximum value:	127	Default value:	127
Description:	Defines the maximum number	r of masters that can e	stablish connections v	with the drive.	
					ID 4726
P11.4.1 ^①	SA bus device address	Javimum value:	254	Default value	ID 1726
P11.4.1 ^① Minimum value:	204 N	Maximum value:	254	Default value:	ID 1726 204
P11.4.1 ^① Minimum value: Description:	204 No. This parameter is used to set				204
P11.4.1 [©] Minimum value: Description: P11.4.2 [©]	204 N This parameter is used to set SA bus baud rate	the SA bus address at	which the drive will b	pe located on instance node.	204 ID 1727
P11.4 - SA bus. P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value:	204 N This parameter is used to set SA bus baud rate N.A. N				204
P11.4.1 [©] Minimum value: Description: P11.4.2 [©]	204 N This parameter is used to set SA bus baud rate	the SA bus address at	which the drive will b	pe located on instance node.	204 ID 1727
P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value: Options:	204 N This parameter is used to set SA bus baud rate N.A. N 0 = 9,600; 1 = 19,200; 2 = 38,000; 3 = 57,600; or	the SA bus address at	which the drive will b	pe located on instance node.	204 ID 1727
P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value: Options:	204 N This parameter is used to set SA bus baud rate N.A. N 0 = 9,600; 1 = 19,200; 2 = 38,000; 3 = 57,600; or 4 = 115,200.	the SA bus address at	which the drive will b	pe located on instance node.	204 ID 1727
P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value:	204 N This parameter is used to set SA bus baud rate N.A. N 0 = 9,600; 1 = 19,200; 2 = 38,000; 3 = 57,600; or 4 = 115,200. This parameter defines comm SA instance number	the SA bus address at	which the drive will b	pe located on instance node.	204 ID 1727 2
P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value: Options: Description: P11.4.3 [©] Minimum value:	204 N This parameter is used to set SA bus baud rate N.A. N 0 = 9,600; 1 = 19,200; 2 = 38,000; 3 = 57,600; or 4 = 115,200. This parameter defines comm SA instance number	the SA bus address at Maximum value: nunication speed for SA Maximum value:	N.A. A bus communication. 4,194,302	Default value:	204 ID 1727 2
P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value: Options: Description: P11.4.3 [©] Minimum value: Description:	204 N This parameter is used to set SA bus baud rate N.A. N 0 = 9,600; 1 = 19,200; 2 = 38,000; 3 = 57,600; or 4 = 115,200. This parameter defines comm SA instance number 0 N	the SA bus address at Maximum value: nunication speed for SA Maximum value: of the drive on the SA	N.A. A bus communication. 4,194,302	Default value:	204 ID 1727 2
P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value: Options: Description: P11.4.3 [©] Minimum value: Description: P11.4.3 [©] P11.4.4	This parameter is used to set SA bus baud rate N.A. 0 = 9,600; 1 = 19,200; 2 = 38,000; 3 = 57,600; or 4 = 115,200. This parameter defines comm SA instance number 0 N Defines the instance number SA communication times	the SA bus address at Maximum value: nunication speed for SA Maximum value: of the drive on the SA	N.A. A bus communication. 4,194,302	Default value:	204 ID 1727 2 ID 1728 0
P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value: Options: Description: P11.4.3 [©] Minimum value: Description: P11.4.4 Minimum value:	This parameter is used to set SA bus baud rate N.A. 0 = 9,600; 1 = 19,200; 2 = 38,000; 3 = 57,600; or 4 = 115,200. This parameter defines comm SA instance number 0 N Defines the instance number SA communication times	the SA bus address at Maximum value: nunication speed for SA Maximum value: of the drive on the SA out Maximum value:	N.A. N.A. A bus communication. 4,194,302 bus network. 60,000	Default value: Default value:	204 ID 1727 2 ID 1728 0 ID 1730
P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value: Options: Description: P11.4.3 [©]	This parameter is used to set SA bus baud rate N.A. 0 = 9,600; 1 = 19,200; 2 = 38,000; 3 = 57,600; or 4 = 115,200. This parameter defines comm SA instance number 0 N Defines the instance number SA communication times 0 N	the SA bus address at Maximum value: nunication speed for SA Maximum value: of the drive on the SA out Maximum value:	N.A. N.A. A bus communication. 4,194,302 bus network. 60,000	Default value: Default value:	204 ID 1727 2 ID 1728 0 ID 1730
P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value: Options: Description: P11.4.3 [©] Minimum value: Description: P11.4.4 Minimum value: Description:	This parameter is used to set SA bus baud rate N.A. 0 = 9,600; 1 = 19,200; 2 = 38,000; 3 = 57,600; or 4 = 115,200. This parameter defines comm SA instance number 0 N Defines the instance number SA communication times 0 N Selects the time to wait before SA bus protocol status	the SA bus address at Maximum value: nunication speed for SA Maximum value: of the drive on the SA out Maximum value:	N.A. N.A. A bus communication. 4,194,302 bus network. 60,000	Default value: Default value:	204 ID 1727 2 ID 1728 0 ID 1730 10,000
P11.4.1 [©] Minimum value: Description: P11.4.2 [©] Minimum value: Options: Description: P11.4.3 [©] Minimum value: Description: P11.4.4 Minimum value: Description: P11.4.5	This parameter is used to set SA bus baud rate N.A. 0 = 9,600; 1 = 19,200; 2 = 38,000; 3 = 57,600; or 4 = 115,200. This parameter defines comm SA instance number 0 N Defines the instance number SA communication times 0 N Selects the time to wait before SA bus protocol status	the SA bus address at Maximum value: nunication speed for SA Maximum value: of the drive on the SA out Maximum value: re a communication fal	N.A. A bus communication. 4,194,302 bus network. 60,000 ult occurs over SA bus	Default value: Default value: Default value:	204 ID 1727 2 ID 1728 0 ID 1730 10,000

Table 17. Serial communication (Cont.).

Options:

Description:

0 = Disabled; or 1 = Enabled.

Bluetooth enabled.

P11.4.6	SA bus fault respons	e			ID 1732			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	communications. If n	 0 = Only in fieldbus control mode - when fieldbus is the control place and fieldbus fault is active. The drive will fault on communications. If not in fieldbus control, place will not fault. 1 = In all control modes - no matter the control place setting, if communication is lost, fieldbus fault response will occur 						
Description:	Defines the fieldbus faul	t condition for SA bus com	munication.					
D44 F 0WD								
P11.5 - SWD. P11.5.1					ID 2020			
	Parameter access	Maximum value:		D () ()	ID 2630			
Minimum value:	N.A.		N.A.	Default value:	1			
Options:	0 = No permission to read 1 = Acyclic read/write ar	d/write on acyclic channel. e allowed on Profibus.						
Description:	PNU927 which specifies	the operation priority of pa	arameters for acyclic	communication.				
P11.5.2 ^①	Parameter data acce	ss			ID 2631			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	4			
Options:	0 = Local control; 1 = Fieldbus; 2 = Mixed interface; 4 = NET, local on fault; or 5 = Dual mode.							
Description:	PNU928 which specifies	the control priority of the o	device for cyclic com	munication.				
P11.5.3	Fault situation count	er			ID 2632			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.			
Description:	PNU952 which specifies Only write of 0 is allowed (parameter 944) are eras	the fault situation counter. d, then the whole fault buff ed.	fer (actual fault situa	ation and all other fault situations) a	and the fault message co			
P11.5.4	Board status		,	'	ID 2609			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Description:	Status of the board. B0-DCOM communication B1-Board HW fault B2-IO1 24 volt overload for B3-Profibus communication B4-fieldbus fault.	ault.						
P11.5.5	Firmware version				ID 2610			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.			
Description:	This parameter provides	the firmware version of the	e SWD.					
P11.5.6	Protocol status		,		ID 2612			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	0 = Not configured; 1 = Operational; or 2 = Diagnostics.							
Description:	This parameter specifies	the protocol status for SW	/D card.					
P11.6 - Bluetooth.								
o - Didetootil.								
P11.6.1	Bluetooth enabled				ID 1895			

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Table 17. Serial communication (Cont.).

P11.6.2 ²	Bluetooth broadcast	mode			ID 2920
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Off; or 1 = On.				
Description:	Bluetooth broadcast mod	de.			
P11.6.3	Bluetooth pairing re	set		,	ID 2935
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Not reset; or 1 = Reset.				
Description:	Bluetooth pairing reset.				

[©] Parameter value can only be changed after the drive has stopped. © Parameter value will be set to be default when changing macros.

Table 18. Ethernet communication.

P12.1.1 ^①	IP address mod	9			ID 1500
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Static IP; or 1 = DHCP with Aut	oIP.			
Description:	This parameter def	ined the IP address configuration	mode for EIP/modbus T	CP.	
P12.1.2	Active IP addres	SS			ID 1507
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Reads the current a	active IP address.			
P12.1.3	Active subnet n	nask			ID 1509
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Reads the current a	active subnet mask.			
P12.1.4	Active default g	ateway			ID 1511
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Reads the current a	active default gateway.			
P12.1.5	MAC address				ID 1513
Vinimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Reads the current I	MAC address.			
P12.1.6 ^①	Static IP addres	s			ID 1501
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	192.168.1.254
Description:	Defines the static	P address.			
P12.1.7 ^①	Static subnet m	ask			ID 1503
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	255.255.255.0
Description:	Defines the static :	subnet mask.	,		
P12.1.8 ^①	Static default g	ateway		1	ID 1505
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	192.168.1.1
Description:	Defines the static	default gateway.			
P12.1.9	Ethernet comm	unication timeout			ID 611
Minimum value:	0 ms	Maximum value:	60,000 ms	Default value:	10,000 ms
Description:	Selects the time it	waits before a communication fa	ult occurs over ethernet	 f.	

Table 18.	Ethernet	communication	(Cont.).
Iable 10.	Fillellier	COMMINICATION	(C OIIL. / .

P12.2 - Trusted IP filter (DM1 PRO only).							
P12.2.1	Trusted IP white I	ist			ID 68		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0.0.0.0 0.0.0.0 192.168.1.255		
Description:	Defines the IP addres	ses in the white list. A setting	g of 192.168.1.255 er	nables all connections on the local	subnet.		
P12.2.2	Trusted IP filter e	nable		'	ID 76		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1		
Options:	0 = Disabled; or 1 = Enabled.						

P12.3 - Modbus TCP (DM1 PRO only).

P12.3.1 ^①	Modbus TCP enab	le			ID 1942
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disable; or 1 = Enable.				
Description:	Enables modbus TCP	communications, must be enal	oled to connect to Po	ower Xpert inControl.	
P12.3.2	Modbus TCP conn	ection limit			ID 609
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	5
Description:	Maximum number of	connections allowed to the dri	ve.		
P12.3.3	Modbus TCP unit	identifier number			ID 610
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Description:	Unit identifier unit val	ue for modbus TCP.			
P12.3.4	Modbus TCP proto	ocol status			ID 612
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Stopped; 1 = Operational; or 2 = Faulted.				
Description:	This parameter shows	s the protocol status for modb	us TCP communicati	on.	
P12.3.5	Modbus TCP fault	response			ID 2517
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	communications.	If not in fieldbus control, place	will not fault.	d fieldbus fault is active, the drive nication is lost, fieldbus fault respons	
Description:	Defines the fieldbus f	ault condition for modbus TCP	communication.		

P12.4 - Ethernet IP (DM1 PRO only).

P12.4.1 ^①	Ethernet based protocol select					
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0	
Options:	0 = Disabled; or 2 = BACnet IP.					
Description:	Selects the active communication protocol on the ethernet I/P port.					
P12.4.2	Ethernet IP protoco	ol status			ID 608	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.	
Options:	0 = Off; 1 = Operational; or 2 = Faulted.					
Description:	Indicates if ethernet pr	otocol is active or not.				

Table 18. Ethernet communication (Cont.).

P12.4.3	Ethernet IP fa	ID 2518			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	communication	ons. If not in fieldbus control, plac	e will not fault.	nd Fieldbus fault is active, the drive inication is lost, fieldbus fault respo	
Description:	Defines the field	bus fault condition for ethernet IP (communication.		

P12.5 - BACnet IP (DM1 PRO only).

P12.5.1 ^①	BACnet IP UDP por	rt number			ID 1733
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	47,808
Options:	47808 = BACO; 47809 = BAC1; 47810 = BAC2; 47811 = BAC3; 47813 = BAC4; 47813 = BAC5; 47814 = BAC6; 47815 = BAC7; 47816 = BAC8; 47817 = BAC9; 47818 = BAC0; 47819 = BACC; 47821 = BACC; 47821 = BACC; 47821 = BACC;				
Description:	Defines the BACnet UI	DP port number.			
P12.5.2 ^①	BACnet IP foreign	devise			ID 1734
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disabled; or 1 = Enabled.				
Description:	Enables BACNET IP for	reign device configuration.			
P12.5.3 ^①	BACnet IP BBMD II	•			ID 1735
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0.0.0.0
Description:	Displays the BACnet B	BMD IP address.			
P12.5.4 ^①	BACnet IP UDP por	rt			ID 1737
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	47,808
Options:	47808 = BAC0; 47809 = BAC1; 47810 = BAC2; 47811 = BAC3; 47813 = BAC4; 47813 = BAC6; 47815 = BAC6; 47816 = BAC8; 47817 = BAC9; 47818 = BACA; 47819 = BACB; 47820 = BACC; 47821 = BACD; 47821 = BACD; 47822 = BACE; or 47823 = BACF.				
Description:	Displays the BACnet B	BMD UDP port number.			
P12.5.5 ^①	BACnet IP registra	tion interval			ID 1738
Minimum value:	0	Maximum value:	65,535	Default value:	10
Description:	Defines the registratio	n interval			

P12.5.6	BACnet IP comm	nunication timeout			ID 1739	
Minimum value:	0	Maximum value:	60,000	Default value:	0	
Description:	Selects the time it v	vaits before a communication fa	ult occurs over BACnet	: IP.		
P12.5.7	BACnet IP proto	col status			ID 1740	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0	
Options:	0 = Stopped; 1 = Operational; or 2 = Faulted.					
Description:	This parameter show	ws the protocol status for BACn	et IP communication.			
P12.5.8	BACnet IP fault i	behavior			ID 1741	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0	
Options:	0 = Only in fieldbus control mode - when fieldbus is the control place and Fieldbus fault is active, the drive will fault on loss of communications. If not in fieldbus control, place will not fault. 1 = In all control modes - no matter the control place setting. If communication is lost, fieldbus fault response will occur.					
				ation is lost, fieldbus fault respo	nse will occur.	
Description:	1 = In all control mo		e setting. If communica	ation is lost, fieldbus fault respo	nse will occur.	
Description:	1 = In all control mo	des - no matter the control plac s fault condition for BACnet IP co	e setting. If communica	ation is lost, fieldbus fault respo	ID 1742	
<u> </u>	1 = In all control mo Defines the fieldbus	des - no matter the control plac s fault condition for BACnet IP co	e setting. If communica	ation is lost, fieldbus fault response. Default value:		
P12.5.9 ^①	1 = In all control mo Defines the fieldbus BACnet IP instan	des - no matter the control place s fault condition for BACnet IP conce number Maximum value:	e setting. If communication.		ID 1742	
P12.5.9 ^① Minimum value:	1 = In all control mo Defines the fieldbus BACnet IP instar 0 Displays the BACne	des - no matter the control place fault condition for BACnet IP conce number Maximum value: t instance number.	e setting. If communication.		ID 1742	
P12.5.9 [©] Minimum value: Description: P12.6 - Web UI (DM	1 = In all control mo Defines the fieldbus BACnet IP instan 0 Displays the BACne 1 PRO only).	des - no matter the control place fault condition for BACnet IP conce number Maximum value: t instance number.	e setting. If communication.		ID 1742	
P12.5.9 [©] Minimum value: Description: P12.6 - Web UI (DM:	1 = In all control mo Defines the fieldbus BACnet IP instar 0 Displays the BACne 1 PRO only). Web UI protocol	des - no matter the control places fault condition for BACnet IP conce number Maximum value: t instance number.	e setting. If communication. 4,194,302	Default value:	ID 1742 0	
P12.5.9 [©] Minimum value: Description: P12.6 - Web UI (DMP12.6.1 Minimum value:	1 = In all control mo Defines the fieldbus BACnet IP instar 0 Displays the BACne 1 PRO only). Web UI protocol N.A. 0 = Off; 1 = Operational; or 2 = Faulted.	des - no matter the control places fault condition for BACnet IP conce number Maximum value: t instance number.	e setting. If communication. 4,194,302 N.A.	Default value:	ID 1742 0	
P12.5.9 [©] Minimum value: Description: P12.6 - Web UI (DMP12.6.1 Minimum value: Options:	1 = In all control mo Defines the fieldbus BACnet IP instar 0 Displays the BACne 1 PRO only). Web UI protocol N.A. 0 = Off; 1 = Operational; or 2 = Faulted.	des - no matter the control place fault condition for BACnet IP conce number Maximum value: t instance number. status Maximum value: ws the protocol status for web s	e setting. If communication. 4,194,302 N.A.	Default value:	ID 1742 0	

Options:	0 = Off; 1 = Operational; or 2 = Faulted.
Description:	This parameter shows the protocol status for web server communication.

Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	communica	ations. If not in fieldbus control, place	will not fault	ace and fieldbus fault is active, the drive w t. ommunication is lost, fieldbus fault respon	
Description:	Dofings the fig	aldhus fault condition for woh corver s	ommunication	n	

Web UI communic	ID 2919				
30,000 ms	Maximum value:	60,000 ms	Default value:	60,000 ms	
Selects the time it wa	aits before a communication fa	ault occurs over the we	b server.		
Web UI enable	'		,	ID 2921	
N.A.	Maximum value:	N.A.	Default value:	0	
0 = Disabled; or 1 = Enabled.					
Enables web server o	onfiguration and monitoring pa	age.			
	30,000 ms Selects the time it was web UI enable N.A. 0 = Disabled; or 1 = Enabled.	Selects the time it waits before a communication for Web UI enable N.A. Maximum value: 0 = Disabled; or 1 = Enabled.	30,000 ms	30,000 ms	30,000 ms

P12.7.2	ID 3001					
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0	
Options:	0 = Disconnected; or 1 = Connected.					
Description:	IOT connection status.					

Table 18. Ethernet communication (Cont.).

P12.7.3	Proxy enable				ID 3003
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Disabled; or 1 = Enabled.				
Description:	Proxy enable.				

 $^{^{\}scriptsize \textcircled{\tiny 1}}$ Parameter value can only be changed after the drive has stopped.

Table 19. System.

P13.1 - Basic setting	ıs.				
P13.1.1	Language			,	ID 340
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = English; 1 = English; or 2 = English.				
Description:	This parameter offers the al available language is Englisl		uency converter throu	ugh the keypad in the language of	your choice. Currentl
P13.1.2 ^①	Application				ID 142
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Standard; 1 = Pump; 2 = Fan; or 3 = Multi-purpose.				
Description:	This parameter sets the acti	ve application if multipl	e applications have b	peen loaded.	
P13.1.3 ^①	Parameter sets				ID 619
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = No; 1 = Reload defaults; 2 = Reload set 1; 3 = Reload set 2; 4 = Store set 1; 5 = Store set 2; 6 = Reset; or 7 = Reload defaults VM.				
Description:	This parameter allows you t	o reload the factory def	ault parameter value:	s, and to store and load two custo	mized parameter sets
P13.1.4	Up to keypad				ID 620
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = No; or 1 = Yes (all parameters).				
Description:	This function uploads all exi	sting parameter groups	to the keypad.		
P13.1.5 ^①	Down from keypad			,	ID 621
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = No; 1 = All parameters; 2 = All, no motor; or 3 = Application parameters.				
Description:	This function downloads one		f 11 1 11	46 - 400 -	

Table 19. System (Cont.).

P13.1.7	Parameter lock PIN				ID 624				
Minimum value:	0	Maximum value:	9,999	Default value:	0				
Description:				ith the password function. Wh changes, parameter value chan					
	By default, the password between 1 and 9,999.	By default, the password function is not in use. If you want to activate the password, change the value of this parameter to any number between 1 and 9,999.							
	To deactivate the passwo	ord, reset the parameter va	alue to 0.						
P13.1.8	Keypad parameter lo	ck			ID 625				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0				
Options:	0 = Change enable; or 1 = Change disable.								
Description:	This function allows the the display if you try to e		the parameters. If the p	parameter lock is activated, the	e text "locked" will appear or				
	Note: This function does	not prevent unauthorized	editing of parameter val	ues.					
P13.1.9	Start-up Wizard				ID 626				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0				
Options:	0 = Enabled. 1 = Disabled.								
Description:	the application desired an completion, it allows the	nd then advances paramet user to go to the main mer	ers through the start-up nu or default page and th	nable", the Start-up Wizard propagation Min parameter list/Application Min his parameter is set to "Disable	ii wizard in keypad. After d". The Start-up Wizard is				
	always enabled for the in Wizard, it will not cause Wizard will be "Enabled"	nitial power up of the DM1 it to be active on start-up.	PRO. By setting this par	rameter to "Disable" without g up Wizard after completion, or 	oing through the Start-up defaults drive, the Start-up				
P13.2 - Keypad.	Wizard, it will not cause Wizard will be "Enabled"	nitial power up of the DM1 it to be active on start-up.	PRO. By setting this par	rameter to "Disable" without g up Wizard after completion, or d	defaults drive, the Start-up				
P13.2 - Keypad. P13.2.4 Minimum value:	Wizard, it will not cause i Wizard will be "Enabled" Timeout time	itial power up of the DM1 it to be active on start-up.	PRO. By setting this par If user goes into Start-u	rameter to "Disable" without gup Wizard after completion, or description of the completion of the comp	ID 629				
P13.2.4 Minimum value:	Wizard, it will not cause Wizard will be "Enabled" Timeout time 1 s	itial power up of the DM1 it to be active on start-up.	PRO. By setting this pailf user goes into Start-u	up Wizard after completion, or o	defaults drive, the Start-up				
P13.2.4	Wizard, it will not cause Wizard will be "Enabled" Timeout time 1 s The timeout time setting	itial power up of the DM1 it to be active on start-up. Maximum value: defines the time after whi	PRO. By setting this par If user goes into Start-u 65,535 s. ch the keypad display re	Default value:	ID 629				
P13.2.4 Minimum value: Description:	Wizard, it will not cause Wizard will be "Enabled" Timeout time 1 s The timeout time setting Note: If the default page	itial power up of the DM1 it to be active on start-up.	PRO. By setting this par If user goes into Start-u 65,535 s. ch the keypad display re	Default value:	ID 629				
P13.2.4 Minimum value: Description:	Wizard, it will not cause in Wizard will be "Enabled" Timeout time 1 s The timeout time setting Note: If the default page	itial power up of the DM1 it to be active on start-up. Maximum value: defines the time after while a value is 0, the timeout time.	PRO. By setting this pailf user goes into Start-user goes into Start-u65,535 s. ch the keypad display resetting has no effect.	Default value:	ID 629 30 s				
P13.2.4 Minimum value: Description: P13.2.5 Minimum value:	Wizard, it will not cause Wizard will be "Enabled" Timeout time 1 s The timeout time setting Note: If the default page Contrast adjust 5	Maximum value: was to be active on start-up. Maximum value: defines the time after while a value is 0, the timeout time walue:	PRO. By setting this part of user goes into Start-user goes goes into Start-user goes goes goes goes goes goes goes goes	Default value: Default value: Default Page.	ID 629				
P13.2.4 Minimum value: Description: P13.2.5 Minimum value: Description:	Wizard, it will not cause Wizard will be "Enabled" Timeout time 1 s The timeout time setting Note: If the default page Contrast adjust 5 If the remote keypad disp	itial power up of the DM1 it to be active on start-up. Maximum value: defines the time after while a value is 0, the timeout time.	PRO. By setting this part of user goes into Start-user goes goes into Start-user goes goes goes goes goes goes goes goes	Default value: Default value: Default Page.	ID 629 30 s ID 630				
P13.2.4 Minimum value: Description: P13.2.5 Minimum value: Description: P13.2.6	Wizard, it will not cause Wizard will be "Enabled" Timeout time 1 s The timeout time setting Note: If the default page Contrast adjust 5 If the remote keypad disp Backlight time	Maximum value: defines the time after whi e value is 0, the timeout tim Maximum value:	PRO. By setting this pailf user goes into Start-user goes goes into Start-user goes goes goes goes goes goes goes goes	Default value: turns to the Default Page. Default value: t with this parameter.	ID 629 30 s ID 630 12 ID 631				
P13.2.4 Minimum value: Description: P13.2.5 Minimum value: Description: P13.2.6 Minimum value:	Wizard, it will not cause Wizard will be "Enabled" Timeout time 1 s The timeout time setting Note: If the default page Contrast adjust 5 If the remote keypad disp Backlight time 1 min.	Maximum value: Maximum value: defines the time after whi e value is 0, the timeout tim Maximum value: Olay is not clear, you can ac Maximum value:	PRO. By setting this pailf user goes into Start-user goes goes into Start-user goes goes goes goes goes goes goes goes	Default value: Default value: Eturns to the Default Page. Default value: t with this parameter. Default value:	ID 629 30 s ID 630				
P13.2.4 Minimum value: Description: P13.2.5 Minimum value: Description: P13.2.6 Minimum value:	Wizard, it will not cause Wizard will be "Enabled" Timeout time 1 s The timeout time setting Note: If the default page Contrast adjust 5 If the remote keypad disp Backlight time 1 min.	Maximum value: defines the time after whi e value is 0, the timeout tim Maximum value:	PRO. By setting this pailf user goes into Start-user goes goes into Start-user goes goes goes goes goes goes goes goes	Default value: Default value: Eturns to the Default Page. Default value: t with this parameter. Default value:	ID 629 30 s ID 630 12 ID 631				
P13.2.4 Minimum value: Description: P13.2.5 Minimum value: Description: P13.2.6 Minimum value: Description: P13.2.7	Wizard, it will not cause Wizard will be "Enabled" Timeout time 1 s The timeout time setting Note: If the default page Contrast adjust 5 If the remote keypad disp Backlight time 1 min.	Maximum value: Waximum value: defines the time after whi e value is 0, the timeout tim Maximum value: blay is not clear, you can ac Maximum value: es how long the backlight s	PRO. By setting this pailf user goes into Start-user goes goes into Start-user goes goes goes goes goes goes goes goes	Default value: turns to the Default Page. Default value: t with this parameter. Default value: t.	ID 629 30 s ID 630 12 ID 631 10 min.				
P13.2.4 Minimum value: Description: P13.2.5 Minimum value: Description: P13.2.6 Minimum value: Description: P13.2.7	Wizard, it will not cause Wizard will be "Enabled" Timeout time 1 s The timeout time setting Note: If the default page Contrast adjust 5 If the remote keypad disp Backlight time 1 min. This parameter determine	Maximum value: Maximum value: defines the time after whi e value is 0, the timeout tim Maximum value: Olay is not clear, you can ac Maximum value:	PRO. By setting this pailf user goes into Start-user goes goes into Start-user goes goes goes goes goes goes goes goes	Default value: Default value: Eturns to the Default Page. Default value: t with this parameter. Default value:	ID 629 30 s ID 630 12 ID 631 10 min.				
P13.2.4 Minimum value: Description: P13.2.5 Minimum value: Description: P13.2.6	Wizard, it will not cause Wizard will be "Enabled" Timeout time 1 s The timeout time setting Note: If the default page Contrast adjust 5 If the remote keypad disp Backlight time 1 min. This parameter determine Fan control N.A. 0 = Continuous - fan runs 1 = Temperature - based 60°C (140°F). The far minute after receiving the ste "Temperature". 2 = Run follow - after pow	Maximum value: Maximum value: defines the time after whi e value is 0, the timeout time Maximum value: clay is not clear, you can accomply the search of	PRO. By setting this pailf user goes into Start-the user goes into Start-the setting has no effect. 18 Iljust the keypad contrast 65,535 min. Stays on before going ou N.A. unit. The fan is switched when the heat sink term on the power, as well as until the run command is	Default value: turns to the Default Page. Default value: t with this parameter. Default value: t.	ID 629 30 s ID 630 12 ID 631 10 min. ID 632 2 eat sink temperature reaches The fan runs for about a "Continuous" to				

Table 19. System (Cont.).

P13.4 - Version info	rmation.					
P13.4.1	Keypad software ver	rsion			ID 640	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.	
Description:	Keypad firmware version	n.				
P13.4.2	Motor control softw	are version			ID 642	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.	
Description:	DSP/motor control softv	vare version.				
P13.4.3	Application softwar	e version			ID 644	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.	
Description:	MCU/application softwa	are version.				
P13.4.4	Software bundle ver	rsion		,	ID 1714	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.	
Description:	Software bundle version).				
P13.5.1	Serial number				ID 648	
P13.5 - Application P13.5.1			,	,	ID 648	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.	
Description:	Product serial number.					
P13.5.2	Multi-monitor set				ID 627	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0	
Options:	0 = Change enable; or 1 = Change disable.					
Description:	The keypad display can replace the values moni		ed values at the sam	e time. This parameter determine	s if the operator is allowed t	
P13.5.3	Keypad lock PIN			'	ID 75	
Minimum value:	0	Maximum value:	9,999	Default value:	0	
Description:	The keypad can be protected against unauthorized changes with the keypad lock function after keys are not pressed five minutes. When the password function is enabled, the user will be prompted to enter a password before the keypad display parameter or response to key press except up/down/left/right.					
			ou want to activate t	the password, change the value of	this parameter to any number	
	By default, the password between 1 and 9,999.	d function is not in use. If y	ou want to activate t			
	between 1 and 9,999.	d function is not in use. If y				
P13.5.4	between 1 and 9,999.	ord, reset the parameter va			ID 2922	

 $^{^{\}scriptsize \textcircled{\tiny 1}}$ Parameter value can only be changed after the drive has stopped.

Introduction

The fan application builds on the features included in standard. In addition to all of the features in the standard application, the fan application provides features specific for HVAC applications and fan related protective features.

Fan application includes functions:

- · Damper control;
- · Fire mode;
- · Smoke purge; and
- · Broken belt protection.

I/O controls

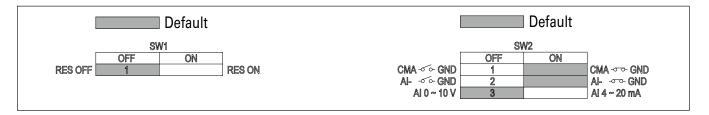
"Function to terminal" (FTT) programming

The design behind programming of the digital inputs and outs of the DM1 uses "function to terminal" programming. It is composed of a terminal, be it a relay output or a digital output, that is assigned a parameter. Within that parameter, it has different functions that can be set.

Control I/O configuration

- Run 240 Vac and 24 Vdc control wiring in separate conduit.
- · Communication wire to be shielded.

Table 20. Fan application default I/O connection.



External wiring	Terminal	Short name	Name	Default setting	Description
	. 1	DI1	Digital input 1	Run forward	Starts the motor in the forward direction.
<u> </u>	- 2	DI2	Digital input 2	Run reverse	Start the motor in the reverse direction.
<u> </u>	. 3	DI3	Digital input 3	External fault	Triggers a fault in the drive.
	. 4	DI4	Digital input 4	Fault reset	Resets active faults in the drive.
	- 5	CMA	DI1 to DI4 common	Grounded	Allows for sourced input.
	- 6	Α	RS-485 signal A	_	Fieldbus communication (Modbus RTU, BACNet).
	- 7	В	RS-485 signal B	_	Fieldbus communication (Modbus RTU, BACNet).
Res	. 8	Al1+ ①	Analog input 1	0 - 10 V	Voltage speed reference (programmable to 4 mA to 20 mA).
년	9	Al1-	Analog input 1 ground	_	Analog input 1 common (ground).
	- 10	GND	I/O signal ground	_	I/O ground for reference and control.
	- 11	A01+	Analog output 1	Output frequency	Shows output frequency to motor 0 - 60 Hz (4 mA to 20 mA).
	12	GND	I/O signal ground	_	I/O ground for reference and control.
	- 13	10 V	10 Vdc reference output	10.3 Vdc +/- 3%	10 Vdc reference voltage.
	- 14	24 V	24 Vdc control output	24 Vdc In/Out	Control voltage input/output (100 mA max.).
	15	STO_com	Safe torque common	_	Safe torque Off common.
-	16	ST02	Safe torque Off 2	_	Safe torque Off 2 input.
	17	ST01	Safe torque Off 1	_	Safe torque Off 1 input.
¥ .	- 18	R1NO	Relay 1 normally open	Run	Changes state when the drive is in the run state.
τ	- 19	R1CM	Relay 1 common		
	20	R1NC	Relay 1 normally closed		
75	- 21	R2N0	Relay 2 normally open	Fault	Changes state when the drive is in the fault state.
	- 22	R2CM	Relay 2 common		

Notes:

The above wiring demonstrates a SINK configuration. It is important that CMA is wired to ground (as shown by dashed line).

If a SOURCE configuration is desired, wire 24 V to CMA and close the inputs to ground. When using the +10 V for Al1, it is important to wire Al1- to ground (as shown by dashed line). If using +10 V for Al1, terminals 9 and 10 need to be jumpered together.

① Al1+ support 10 K potentiometer.

Fan application - parameters list

On the next pages you will find the lists of parameters within the respective parameter groups. Each parameter section within the table lists:

- Parameter code (location indication on the keypad; shows the operator the present parameter number);.
- · Parameter name;
- ID (number of the parameter);

and where applicable:

- · Minimum value and units;
- · Maximum value and units;
- · Default value and units;
- · Options (when available); and
- · Description of the parameter.

Table 21. Monitor.

M1.1	Output frequency				ID 1
Minimum value:	Hz	Maximum value:	Hz	Default value:	Hz
Description:	Output frequency (Hz).				
M1.2	Frequency reference				ID 24
Minimum value:	Hz	Maximum value:	Hz	Default value:	Hz
Description:	Reference frequency (Hz).				
M1.3	Motor speed				ID 2
Minimum value:	rpm	Maximum value:	rpm	Default value:	rpm
Description:	Motor output speed (rpm)				
M1.4	Motor current				ID 3
Minimum value:	А	Maximum value:	А	Default value:	А
Description:	Motor output current RMS	S (Amps).			
M1.5	Motor torque				ID 4
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Percent motor torque calc	ulated from nameplate va	lues and measured n	notor current (%).	
M1.6	Motor power				ID 5
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Percent motor power calc	ulated from nameplate va	ues and measured n	notor current (%).	
M1.7	Motor voltage				ID 6
Minimum value:	V	Maximum value:	V	Default value:	V
Description:	Output ac motor voltage (Vac).			
M1.8	DC-link voltage				ID 7
Minimum value:	V	Maximum value:	V	Default value:	V
Description:	DC bus voltage (Vdc).				

Table 21. Monitor (Cont.).

	. (00:10.)	1		1		
M1 - standard (Cont	.).					
M1.9	Unit temperature				ID 8	
Minimum value:	°C	Maximum value:	°C	Default value:	°C	
Description:	Heat sink temperatur	e (deg. C).			,	
M1.10	Motor temperatur	re			ID 9	
Minimum value:	%	Maximum value:	%	Default value:	%	
Description:	Motor temperature va	alue calculated from nameplat	e values and measure	ed motor current (%).		
M1.11	Latest fault code				ID 28	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.	
Description:	Last active fault code	e value. See fault codes for the	e value shown here.			
M1.12	Instant motor pov	ver			ID 1686	
Minimum value:	kW	Maximum value:	kW	Default value:	kW	
Description:	Instantaneous motor	power (kW).				
M2 - I/O status.						
M2.1	Analog input 1				ID 10	
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies	
Description:	Analog input 1 measu	ured value (Vdc or Amps) selec	table with dipswitch.			
M2.2	Keypad pot voltag	уе		'	ID 1858	
Minimum value:	V	Maximum value:	V	Default value:	V	
Description:	Keypad potentiomete	er measured value (Vdc). DM1	PRO only.			
M2.3	Analog output				ID 25	
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies	
Description:	Analog output 1 mea	sured value (Vdc or Amps) sele	ctable with paramete	er.		
M2.4	DI1, DI2, DI3				ID 12	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.	
Description:	Digital input 1/2/3 st	atus.				
M2.5	DI4				ID 13	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.	
Description:	Digital input 4 status					
M2.8	RO1, RO2				ID 557	_
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.	
Description:	Relay output 1 and 2	status.				
	, , ,					
M5 - PI monitor.						
M5.1	PI setpoint				ID 16	
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies	
Description:	PI setpoint in process	s units.				
M5.2	PI feedback	-			ID 18	
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies	
Description:	PI feedback level in p	process units				
M5.3	PI error value				ID 20	
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies	
Description:	PI error in process un		*41100		*41100	—
	i i eiroi iii þrocess uii					

Table 21. Monitor (Cont.).

M5.4	PI output	'	,	,	ID 22
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	PI output.				
M5.5	PI status				ID 23
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Stopped; 1 = Running; or 2 = Sleep mode.				
Description:	PI status indication, in	dicates if drive is stopped, ru	nning in PI mode, or	in PI sleep mode.	

M9 - Multi-monitoring.

M9.1	Multi-monitor	ing	'	ID 30
Minimum value:	N.A.	Maximum value:	N.A.	Default value: 0, 1, 2.
Description:	see three lines o	ee monitoring values in a single scre f monitoring values. Up and down k then by going up and down.	en. The values eys can be use	are selectable via the keypad menu. Multi-monitor page could d to select the row and then hitting the left arrow key will allow for

Table 22. Parameters -

P1 - Basic parameters.					
P1.1 ²	Minimum freque	псу		,	ID 101
Minimum value:	0.00 Hz	Maximum value:	400.00 Hz	Default value:	0.00 Hz
Description:	Defines the lowest 1 = Fire mode minin 2 = Derag. 3 = MPFC staging fi 4 = MPFC master fi 5 = Prime pump fre 6 = Prime pump fre	num frequency. equency. ked frequency. quency.	ll operate. This setting	will limit other frequency paran	neter settings.
P1.2 ^②	Maximum freque	ency			ID 102
Minimum value:	0.00 Hz	Maximum value:	400.00 Hz	Default value:	MaxFreqMFG
Description:	1 = Keypad referent 3 = Motor potentior 3 = Jog speed. 4 = 2nd stage ramp 5 = Fire mode minin 6 = Derag. 7 = MPFC staging fi 8 = MPFC master fi: 9 = Prime pump fret 10 = Prime pump fret 11 = Preset speed fi 12 = Frequency limit 13 = Reference limit 14 = Speed control 15 = Stall frequency 16 = 4 mA fault fret 17 = MPFC de-stagi 18 = Pipe fill loss fr 19 = Pipe fill loss fr 20 = Broken pipe fret	re. reter. frequency. requency. relimit. requency. requency. requency. requency. requency. requency. requency. requency. requency.	iii uperate. Tiiis wiii iiii	nit other frequency parameters.	
P1.3 ^②	Accel. time 1				ID 103
Minimum value:	0.1 s	Maximum value:	3,000.0 s	Default value:	20.0 s
Description:	Defines the time re	guired for the output frequency	to accelerate from zero	frequency to maximum frequen	CV

Table 22. Parameters (Cont.)

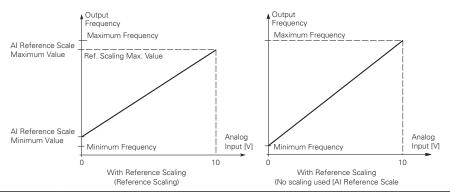
P1.4 ^②	Decel. time 1				ID 104
Minimum value:	0.1 s	Maximum value:	3,000.0 s	Default value:	20.0 s
Description:	Defines the time required	I for the output frequency t	o decelerate from maximum	frequency to zero frequen	Cy.
P1.6 ^①	Motor nom. current		'	,	ID 486
Minimum value:	DriveNomCurrCT*1/10 A	Maximum value:	DriveNomCurrCT*2 A	Default value:	DriveNomCurrCT A
Description:	Motor nameplate rated for	ull load current. This value	is found on the rating plate of	of the motor.	
P1.7 ^①	Motor nom. speed				ID 489
Minimum value:	300 rpm	Maximum value:	20,000 rpm	Default value:	MotorNomSpeedMFG
Description:	Motor nameplate rated s	peed. This value is found o	on the rating plate of the mot	or.	
P1.8 ^①	Motor PF				ID 490
Minimum value:	0.30	Maximum value:	1.00	Default value:	0.85
Description:	Motor nameplate rated p	ower factor. This value is	found on the rating plate of t	he motor.	
P1.9 ^①	Motor nom. voltage				ID 487
Minimum value:	180 V	Maximum value:	690 V	Default value:	MotorNomVoltMFG V
Description:	Motor nameplate rated v	oltage. This value is found	on the rating plate of the mo	otor.	
P1.10 ^①	Motor nom. frequenc	ey .			ID 488
Minimum value:	8.00 Hz	Maximum value:	400.00 Hz	Default value:	MotorNomFreqMFG Hz
Description:	Motor nameplate rated fi	requency. This value is fou	nd on the rating plate of the	motor.	
P1.11 ²	Local control place		*	,	ID 1695
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = keypad; 1 = IO terminal; or 3 = fieldbus.				
Description:			local mode. I/O terminals w Il indicate which mode is sele		ard-wired inputs or keypad fo
P1.12 ^{①②}	Local reference				ID 136
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Al; 1 = drive ref. pot; 4 = maximum frequency; 6 = keypad; or				
	7 = fieldbus ref.				
Description:		on for the speed reference	in local mode.		
Description:		· · · · · · · · · · · · · · · · · · ·	in local mode.		ID 135
	Defines the signal location	· · · · · · · · · · · · · · · · · · ·	in local mode.	Default value:	ID 135
P1.13 ^②	Defines the signal location	•		Default value:	
P1.13 ^② Minimum value:	Defines the signal location Remote control place N.A. 0 = 10 terminal; 1 = fieldbus; or 3 = keypad. Defines the signal location	Maximum value:	N.A.	would be from the digita	
P1.13 [©] Minimum value: Options:	Defines the signal location Remote control place N.A. 0 = 10 terminal; 1 = fieldbus; or 3 = keypad. Defines the signal location	Maximum value:	N.A.	would be from the digita	0
P1.13 [©] Minimum value: Options: Description:	Defines the signal location Remote control place N.A. 0 = IO terminal; 1 = fieldbus; or 3 = keypad. Defines the signal location for Start/Stop buttons or	Maximum value:	N.A.	would be from the digita	0 hard-wired inputs or keypad
P1.13 [©] Minimum value: Options: Description: P1.14 ^{©©}	Defines the signal location Remote control place N.A. 0 = I0 terminal; 1 = fieldbus; or 3 = keypad. Defines the signal location for Start/Stop buttons or Remote reference	Maximum value: on for the start command in the drive. Keypad display	N.A. n remote mode. I/O terminals will indicate which mode is	would be from the digital selected.	0 hard-wired inputs or keypad

Table 23. Inputs.

P2.1 - Basic setting	s.				
P2.1.1 ^②	Al reference scale	minimum value	'		ID 144
Minimum value:	0.00 Hz	Maximum value:	RefScaleMax Hz	Default value:	0.00 Hz
Description:	Defines the minimum	frequency associated with 0%	/ input from the analog inp	out Catting Al reference and	ala minimum valua and Al
	reference scale maxir	num value both to zero will ca	use the analog input to sca	ale to the minimum and maxi	mum frequencies.
P2.1.2 [©]	reference scale maxir	num value both to zero will ca	use the analog input to sca	ale to the minimum and maxi	mum frequencies. ID 145

Description:

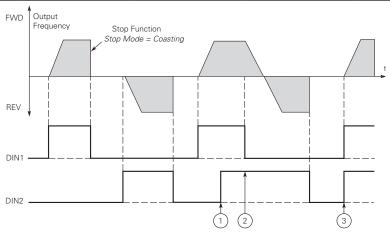
Defines the maximum frequency associated with 100% input from the analog input. Setting AI reference scale minimum value and AI reference scale maximum value both to zero will cause the analog input to scale to the minimum and maximum frequencies.



P2.1.3 ^{①②}	IO terminal Sta	rt/Stop logic	,	,	ID 143
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	1 = Start - reverse 2 = Start - enable:	: maintained input on start signal maintained input on start signal	1 to run forward 1 to run forward	vard and a maintained signal on start d and a maintained signal on start sign l and a maintained signal on start sign nal 1 uses a normally open start and s	nal 2 for reverse. nal 2 to enable the drive to run.
Description:	Defines the function	onality for start signal 1 and start	signal 2. By det	fault, start signal 1 is DI1 and start si	gnal 2 is DI2.
		3		minal start signal 2 = start reverse. or start REV commands. When con	



Table 23. Inputs (Cont.).



Notes: ① The first selected direction has the highest priority.
② When the DIN1 contact opens the direction of rotation

starts to change.

DIN1

DIN2

- (DIN1) and start reverse (DIN2) signals are active simultaneously the start forward signal (DIN1)
- 1 = P3.2: IO terminal start signal 1 = start forward P3.3: IO terminal start signal 2 = start reverse. This would be considered 2-wire control with a contact on start/stop, contact open it stops and direction on 2nd start signal.

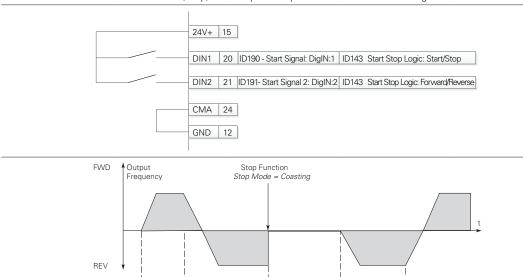
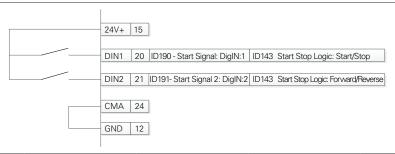


Table 23. Inputs (Cont.).

2 = P3.2: DI closed contact = start/open contact = stop P3.3: IO terminal start signal 1 = start forward - P3.3: IO terminal start signal 2 = start reverse. This would be considered 3-wire control with start signal 2 required to be closed to enable start on start signal 1.



3 = Three-wire connection (pulse control): P3.2: IO terminal start signal 1 = start forward - P3.3: IO terminal start signal 2 = start reverse. This would be considered 3-wire control with start signal 1 being the start pulse and start signal 2 being the NC stop.



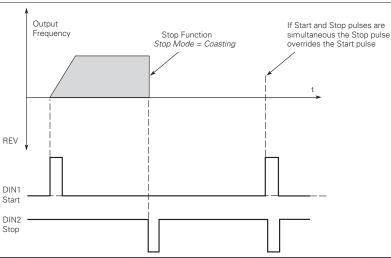


Table 23. Inputs (Cont.).

P2.2 - Digital input.							
P2.2.1 ^②	DI1 function		'	'	ID 1801		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1		
Minimum value: Options:	0 = Not used, no act 1 = I0 terminal start P2.1.3. 2 = I0 terminal start P2.1.3. 3 = Reverse, when \$\frac{4}{2} = \text{Ext. fault 1, whe} \text{6} = \text{Ext. fault 2, whe} \text{6} = \text{Ext. fault 3, whe} \text{7} = \text{Fault reset, whe} \text{8} = \text{Run enable, whe} \text{9} = \text{Preset speed B} \text{10} = \text{Preset speed B} \text{12} = \text{Jog enable, wh} \text{13} = \text{Accel. pot valu} \text{14} = \text{Decel. t} \text{17} = \text{Accel./Decel. t} \text{17} = \text{Accel./Decel. t} \text{17} = \text{Accel./Decel. t} \text{17} = \text{Accel./Decel. t} \text{18} = \text{No access to p} \text{19} = \text{Remote control} \text{20} = \text{Pl controller, w} \text{23} = \text{Pl setpoint sele} \text{24} = \text{Motor interlock} \text{25} = \text{Smoke mode, w} \text{26} = \text{Fire mode Ref.} \text{27} = \text{Fire mode Ref.} \text{28} \text{Il be a}	tion. It signal 1, when the control soil It signal 2, when the closed, Ext. fault 2 will be a sen closed, Ext. fault 3 will be a sen closed all active faults will be a closed and active faults will be a closed and the control soil soil signal soil soil signal soil soil soil soil soil soil signal soil soil soil soil soil soil soil soi	truce is set to 10 terms of the pulse stop pulse, ctivated. Ctivated. Ctivated. Ctivated. Ctivated of the pulse selected via three of the pulse selected via three of the pulse selected via three of the pulse of th	minal, this input when closed will perminal, this input when closed will perminal, this input when closed will perminal, this input when closed will perminal will cause the drive to start the sinary inputs. This is least significant in the sinary inputs. This is most significant increment at the rate defined by more than the significant increment at the rate defined by more significant in the significant in t	rform the action defined by It in the reverse direction. It bit in that binary input. Int bit in that binary input. Intoor pot ramp time. Into ramp time. Intoor pot ramp time. Into ramp time		
	29 = DC brake active, when closed, DC injection braking will be active. 30 = Preheat active, when closed, the preheat mode will be active. 31 = Derag, enable, when closed, the Derag, cycle for pumps will be initiated.						
Description:	Defines the function	. ,	TOT PUTTIPS WITH DE	illitiatea.			

Table 23. Inputs (Cont.).

P2.2.3 ^②	DI2 function				ID 1803
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Minimum value: Options:	0 = Not used, no act 1 = IO terminal star P2.1.3. 2 = IO terminal star P2.1.3. 3 = Reverse, when 4 = Ext. fault 1, who 5 = Ext. fault 2, who 6 = Ext. fault 2, who 6 = Ext. fault 3, who 7 = Fault reset, who 8 = Run enable, who 9 = Preset speed Ext. fault 2 = Jog enable, who 13 = Accel. pot values 14 = Decel. pot values 15 = Reset pot zero 16 = Accel./decel. provided 17 = Accel./decel. provided 18 = No access to provided 19 = Remote control 20 = Local control, 21 = Parameter 1/2 = PI controller, version 19 = Remoteller, version 1 = Version 1	ction. It signal 1, when the control sounts is signal 2, when the consed, Ext. fault 1 will be a en closed, Ext. fault 3 will be a en closed, Ext. fault 3 will be a en closed, the drive will allow a control of the cont	urce is set to 10 term urce is set to 10 term start pulse stop pulptivated. Citivated. C	ninal, this input when closed will peninal, this input when closed will peninal, this input when closed will pense, this input will cause the drive to define the frequency inputs. This is least significate binary inputs. This is most significate increment at the rate defined by increment at the rate defined by increment at the rate defined by reset to zero. Sed. When closed, accel./decel. time the frequency and ignore changes to the setting in the drive. The control place. The control place. It is active. It closed. Parameter set 2 is active.	erform the action defined by erform the action defined by a start in the reverse direction that in that binary input. In the potential in the potential in that binary input. In the potential in
	25 = Smoke mode, 26 = Fire mode, wh 27 = Fire mode Ref. Ref. 2 will be a	k 1, when closed, the motor wi when closed, smoke mode will en closed, fire mode will be act . 1/2 Sel., when fire mode is ac active.	Il be enabled to run. be active. :ive. tive and this input is	s open, fire mode Ref. 1 will be activ	
	25 = Smoke mode, variable 25 = Fire mode, who who was a Fire mode Ref. Ref. 2 will be a series as a Fire mode reverse. 28 = Fire mode reverse. 29 = DC brake active was a Freheat active and was a Freheat active and was a Freheat active and was a Fireheat active	k 1, when closed, the motor wi when closed, smoke mode will en closed, fire mode will be act . 1/2 Sel., when fire mode is ac active.	I be enabled to run. be active. ive. tive and this input is and this input is and this input is ope raking will be active will be active.	s open, fire mode Ref. 1 will be activen, the direction will be forward. W	
Description:	25 = Smoke mode, varieties and produced and	k 1, when closed, the motor wi when closed, smoke mode will en closed, fire mode will be act .1/2 Sel., when fire mode is ac active. erse, when fire mode is active a /e, when closed, DC injection be s, when closed, preheat mode v , when closed, the Derag. cycle	I be enabled to run. be active. ive. tive and this input is and this input is and this input is ope raking will be active will be active.	s open, fire mode Ref. 1 will be activen, the direction will be forward. W	
	25 = Smoke mode, '26 = Fire mode, wh 27 = Fire mode Ref. Ref. 2 will be a 28 = Fire mode reve be reverse. 29 = DC brake active 31 = Derag. enable,	k 1, when closed, the motor wi when closed, smoke mode will en closed, fire mode will be act .1/2 Sel., when fire mode is ac active. erse, when fire mode is active a /e, when closed, DC injection be s, when closed, preheat mode v , when closed, the Derag. cycle	I be enabled to run. be active. ive. tive and this input is and this input is and this input is ope raking will be active will be active.	s open, fire mode Ref. 1 will be activen, the direction will be forward. W	
P2.2.5 ^② Minimum value:	25 = Smoke mode, 26 = Fire mode, wh 27 = Fire mode Ref. Ref. 2 will be a 28 = Fire mode reve be reverse. 29 = DC brake activ 30 = Preheat active 31 = Derag. enable, Defines the function N.A.	k 1, when closed, the motor wi when closed, smoke mode will en closed, fire mode will be act 1/2 Sel., when fire mode is ac active. erse, when fire mode is active a we, when closed, DC injection be e, when closed, preheat mode v when closed, the Derag. cycle of digital input 2.	I be enabled to run. be active. ive. tive and this input is and this input is and this input is ope raking will be active will be active.	s open, fire mode Ref. 1 will be activen, the direction will be forward. W	hen closed, the direction wil
Description: P2.2.5 ^② Minimum value: Options:	25 = Smoke mode, 26 = Fire mode, wh 27 = Fire mode, wh 27 = Fire mode Ref. Ref. 2 will be a 28 = Fire mode reve be reverse. 29 = DC brake activ 30 = Preheat active 31 = Derag. enable, Defines the function DI3 function N.A. 0 = Not used, no active 10 terminal start by P2.1.3. 2 = 10 terminal start by P2.1.3. 3 = Reverse - when \$4 = Ext. fault 1 - whe 7 = Fault reset - whe 8 = Run enable - whe 9 = Preset speed B1 11 = Preset speed B1 11 = Preset speed B1 11 = Preset speed B1 12 = Preset speed B1 13 = Preset speed B1 14 = Preset speed B1 15 = Preset speed B1 16 = Accel./decel. It is 19 = Remote control 20 = Local control - was 19 = Preset speed B2 = Pr	ik 1, when closed, the motor wi when closed, smoke mode will be act and closed, sire mode will be act and closed, sire mode is active. It is a closed, preheat mode is active. It is a closed, preheat mode is active. It is a closed, preheat mode is active of digital input 2. Maximum value:	Il be enabled to run. be active. ive. ive. ive. and this input is ope raking will be active will be active. If the active will be active. If the active will be active. If the active will be in the active will be active. If the active will be in the active will be in the active. If the active will be active. If the active will be active will be active will be active. If the active will be active will be active. If the active will be active.	Default value: In the direction will be forward. We are the control place. The control place. The controller output.	ID 1805 4 rform the action defined rform the action defined at in the reverse direction. bit in that binary input.

Table 23. Inputs (Cont.).

P2.2.7 ^②	DI4 function				ID 1807
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	7
Options:	P2.1.3; 2 = I0 terminal st P2.1.3; 3 = Reverse - wh 4 = Ext. fault 1 - v 5 = Ext. fault 2 - v 6 = Ext. fault 2 - v 7 = Fault reset - v 8 = Run enable - v 9 = Preset speed 10 = Preset speed 11 = Preset speed 12 = Jog enable - v 13 = Accel. pot v 14 = Decel. pot v 15 = Reset pot z 16 = Accel./decel 17 = Accel./decel 18 = No access t 19 = Remote cont 20 = Local control 21 = Parameter 1 22 = Pl controller 23 = Pl set point 24 = Motor interl 25 = Smoke mode 26 = Fire mode re 27 = Fire mode re 28 = Fire mode re 29 = DC brake ac 30 = Preheat acti	art signal 1 - when the control sou art signal 2 - when the control sou art signal 2 - when the control sou art signal 2 - when the control sou the start/stop logic is set to 3 start when closed, ext. fault 1 will be acwhen closed, ext. fault 2 will be acwhen closed, ext. fault 3 will be acwhen closed, all active faults will be when closed, the drive will allow a B0 - the 7 preset speeds are select B2 - the 7 preset speeds are select when closed, the jog speed define alue - when closed, the motor poten closed, the motor poten consultation when closed, the motor poten time set - when open, accel./dec. prohibit - when closed, the drive will be 1 - when closed, the drive will be 1 - when closed, the drive will be 1 - when closed, the drive will force select - when open, parameter set ock 1 - when closed, motor will be 2 - when closed, smoke mode will be when closed, fire mode will be actiference 1/2 sel when fire mode if terence 2 will be active;	pulse stop pulse, t tivated; tivated; tivated; tivated; e reset; start command an ted via 3 binary in ted via 3 binary in ted via 3 binary in ted via 3 binary in ted via 3 binary in det via 4 binary in det via 6 binary in det via 6 binary in det via 6 binary in det via 7 binary in det via 7 binary in det via 7 binary in det via 7 binary in det via 8 binary in det via 8 binary in det via 8 binary in det via 9 binary in det via 10 bina	puts, this is least significant bit in the iputs; iputs, this is most significant bit in the rride the frequency reference; Il increment at the rate defined by mill decrement at the rate defined by mill decrement at the rate defined by reset to zero; sed; when closed accel./decel. time to frequency and ignore changes to the to any setting in the drive; ote control place; control place; closed parameter set 2 is active; rece to PI controller output; when closed, set point 2 is active; input is open, fire mode reference 1 very den, direction will be forward: when closes;	form the action defined by in the reverse direction; at binary input; at binary input; otor pot ramp time; otor pot ramp time; 2 will be used; e reference value;
Description:	Defines the funct	ion of digital input 4.			

P2.3 - Preset speed.	Preset speed 1				105	
P2.3.1 ^②	Preset speed 1				ID 105	
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	5.00 Hz	
Description:	Preset speed is sele	ected with digital inputs using a	binary input.			
P2.3.2 ^②	Preset speed 2				ID 106	
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	5.00 Hz	
Description:	Preset speed is sele	ected with digital inputs using a	binary input.			
P2.3.3 ^②	Preset speed 3				ID 118	
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	15.00 Hz	
Description:	Preset speed is selected with digital inputs using a binary input.					
P2.3.4 ^②	Preset speed 4				ID 119	
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	20.00 Hz	
Description:	Preset speed is sele	ected with digital inputs using a	binary input.			
P2.3.5 ^②	Preset speed 5				ID 120	
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	25.00 Hz	
Description:	Preset speed is sele	ected with digital inputs using a	binary input.			
P2.3.6 ^②	Preset speed 6				ID 121	
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	30.00 Hz	

Description:

Preset speed is selected with digital inputs using a binary input.

Table 23. Inputs (Cont.).

P2.3.7 ^②	Preset speed 7	,			ID 122		
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	35.00 Hz		
Description:	Preset speed is se	Preset speed is selected with digital inputs using a binary input.					

P2.4 - Al settings.

P2.4.1	Al mode				ID 222		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1		
Options:	0 = 0 - 20 mA; or 1 = 0 - 10 V.						
Description:	Defines the analog input mode to current or voltage the DIP switches on control board will need to be set to the same mode as this parameter.						
	*DM1 PRO CN5 terminals 8 and 9 for current or voltage, also need to set DIP switches SW2 2 and 3 on control board, near the RJ45 port.						
	DIP switches SW2 2 and 3 off for voltage.						
				11 / DM1 Pro, it will require DIP swith supply, the DIP switches SW2 2 of			

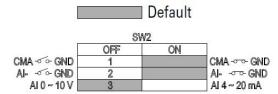


Table 23. Inputs (Cont.).

P2.4.2 ^②	Al signal range				ID 175	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0	
Options:	0 = 0-100%/0-20 mA/0 1 = 20-100%/4-20 mA/					
Description:	Description: With this parameter, you can select the analog input 1 signal range. For selection "Customized," see "AI Custom Min" and "AI Custom Max", this enables a customized signal range.					
			Output Frequency Al1 Signal Range = Custor Al1 Signal Range = 0 Al2 = 0 - 100%			
		AI Ref. Scale Max. Value	Al1 Signa Range = Al2 = 20 4 mA Al1 Custom Min.	1 Al2		

Parameter value can only be changed after the drive has stopped.
 Parameter value will be set to be default when changing macros.

Table 24. Outputs.

P3.1 - Digital outpu	t.				
P3.1.1 ^②	RO1 function				ID 152
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	2 = Run - 'drive is 3 = Fault - drive is 4 = Fault invert - (5 = Warning - driv 6 = Reverse - driv 7 = At speed - dri 8 = Zero frequence 9 = Frequency lim 10 = Pl supervisio 11 = Torque limit 12 = Reference lim 13 = Power limit s 14 = Temperature 15 = Analog input 16 = Motor currer 17 = Over heat fa 18 = Over current 19 = Over volt reg 20 = Under volt reg 20 = Under volt reg 21 = 4 mA fault - 22 = External fau 23 = Motor therm 24 = STO fault ou 25 = Control from 26 = Remote cont 27 = Unrequested 28 = Fire mode - (29 = Damper cont 30 = Valve contro 31 = Jog speed - (32 = Fieldbus input 33 = Fieldbus input 34 = DC charge s 35 = Preheat acti 36 = Cold weathe 37 = Pl sleep - Pl 38 = 2nd stage ra 39 = Prime pump 40 = Master drive 41 = Slave drive s 43 = Single drive	is ready for operation; running; s faulted; drive is not faulted; re has a warning message; e is outputting reverse phase rota ve output frequency has reached t y - drive output is at zero frequenc it supervision - supervision for fre n - supervision for PI controller is supervision - supervision for rorqu nit supervision - supervision for powe limit supervision - supervision for and ts supervision - supervision for and the supervision - supervision for moult - regular - over current regulator is ult - over volt regulator is enable sigular - over difficult is enable sigular - over difficult is enable sigular - over difficult is enable sigular - over current regulator is curred; al fault has occurred; al fault - motor thermal fault has oct tot - external fault has occurred; al fault - motor thermal fault has oct tot - external fault has occurred; al fault - motor thermal fault has occurred; al fault - over out regulator is enable such - over out regulator is enable such - over out regulator is enable such - over out regulator is difficult - over out regulator such - over out reg	he set reference; cy; quency limit 1 is acceptated; e limit; ference limit; limit; drive temperature og input limit; urred; enabled; d; coccurred; vated; nand location; on is not the same word; word; s closed; tive; I time 2 is active ump mode; drive in the multi-pum enctor is open or clo	limit; as the reference direction; ump control mode; o control mode; or se in multi-pump control mode.	
Description:	Defines the funct	ion associated with changing the	state of relay outpi	ut 1.	

Table 24. Outputs (Cont.).

P3.1.4 ^②	RO2 function				ID 153
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	3
Options:	7 = At speed - drive output 8 = Zero frequency - drive 9 = Frequency limit supervision - supe 11 = Torque limit supervision - supe 11 = Torque limit supervisi 12 = Reference limit supervisi 14 = Temperature limit supervisi 14 = Temperature limit supervisi 16 = Motor current supervi 16 = Motor current supervi 17 = Over heat fault - driv 18 = Over current regular - over volt regular -	into faulted; warning message; butting reverse phase rotat it frequency has reached it output is at zero frequency ision - supervision for freq rvision or PI controller is a ion - supervision for torque rvision - supervision for power pervision - supervision for analo ision - supervision for analo rision - supervision for mot e over heat fault has occu - over current regulator is enabled inder volt regulator is enabled in fine in the soccurred; in other in the socc	e set reference; // uency limit 1 is a ctivated; limit; erence limit; limit; erence limit; limit; or current limit; or current limit; red; enabled; ; led; curred; and location; n is not the same word; word; closed; ed; ive; time 2 is active mp mode; rive in the multi- in the multi- pur ctor is open or cl	e limit; e as the reference direction; pump control mode; np control mode; or ose in multi-pump control mode.	
Description:	Defines the function asso	ciated with changing the s	tate of relay outp	out 2.	
P3.3 - Analog output. P3.3.1 ²	AO mode				ID 227
P3.3.1♥ Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = 0 - 20 mA; or	maximum value.	IV.A.	Delault value.	U
	1 = 0 - 10 V.				
Description:	Defines the analog output	t mode to current or voltage	е.		

Table 24. Outputs (Cont.).

P3.3.2 ^②	AO function				ID 146	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1	
Options:	2 = Frequency ref 3 = Motor speed I 4 = Motor current 5 = Motor torque 6 = Motor power 7 = Motor voltage 8 = DC bus voltag 9 = PI setpoint (pr 10 = PI error value 11 = PI output (pr 12 = Analog input 13 = Drive referer 14 = Fieldbus prod 15 = Fieldbus prod 16 = Fieldbus prod 17 = Fieldbus prod 18 = Fieldbus prod 20 = Fieldbus prod 21 = Fieldbus prod 22 = User defined 23 = Motor torque	ocess unit minimum - process unit grocess unit minimum - process ocess unit minimum - process unit minimum - process unit (0% - 100%); ocess data input 1 (0% - 100%); ocess data input 2 (0% - 100%); ocess data input 3 (0% - 100%); ocess data input 4 (0% - 100%); ocess data input 5 (0% - 100%); ocess data input 6 (0% - 100%); ocess data input 7 (0% - 100%); ocess data input 7 (0% - 100%); ocess data input 8 (0% - 100%); ocess data input 8 (0% - 100%); output (user defined minimum - u	unit maximum); maximum););		
Description:	Select the function	in desired to the terminal AO1.				

^② Parameter value will be set to be default when changing macros.

Table 25. Drive control.

P4.1 - Basic setting	s.				
P4.1.1 ^②	Keypad reference				ID 141
Minimum value:	MinFreq	Maximum value:	MaxFreq	Default value:	0.00 Hz
Description:	Keypad reference value	9.			
P4.1.3 ^②	Keypad stop				ID 114
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Enabled - keypad o 1 = Always enabled - Ir	peration - In this mode, the k	eypad stop will only op will always stop the dr	perate when the control source is ive regardless of control mode.	s set to keypad.
Description:	Enabled or always ena	bled keypad operation.			
P4.1.4 ^①	Reverse enabled				ID 1679
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Disabled; or 1 = Enabled.				
Description:	Enables or disables the	reverse motor direction.			
P4.1.5	Change phase sequ	ence motor			ID 2515
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Change disable; or 1 = Change enable.				
Description:	This parameter allows	for swapping the motor phas	e output from u, v, w t	0 U, W, V.	

Table 25. Drive control (Cont.)

P4.1.6 ^②	Power up local remote select			ID 1685		
Minimum value:	N.A. Ma ximur	n value: N.A.	Default value:	0		
Options:	0 = Hold last; 1 = Local control; or 2 = Remote control.					
Description:	Selects what control place the drive w when powered down, selecting Local of					
P4.1.8 ^②	Start mode		'	ID 252		
Minimum value:	N.A. Ma ximur	n value: N.A.	Default value:	0		
Description:	Flying start from stop frequency - 1 last operating frequency as a start Flying start from maximum frequer the maximum operating frequency Selects the start mode operation.	ing point. icy - The drive will catch a spir	3	, , ,		
P4.1.9 ^②	Stop mode	,	,	ID 253		
Minimum value:	N.A. Maximur	n value: N.A.	Default value:	1		
Options:	0 = Coasting - After a stop command, t 1 = Ramp - After the stop command, th			n parameters.		
Description:	Selects the stop mode operation.					
P4.1.10 ^②	Ramp 1 shape			ID 247		
Minimum value:	0.0 s Maximur	n value: 10.0 s	Default value:	0.0 s		
Description:	The start and end of the acceleration and deceleration ramps can be smoothed with these parameters. Setting a value of 0.00 seconds gives a linear ramp shape that causes acceleration and deceleration to react immediately to the changes in the reference signal.					

The start and end of the acceleration and deceleration ramps can be smoothed with these parameters. Setting a value of 0.00 seconds gives a linear ramp shape that causes acceleration and deceleration to react immediately to the changes in the reference signal. Setting a value from 0.10 to 10.00 seconds for this parameter produces an S-shaped acceleration/deceleration at the start and stop of the slope.

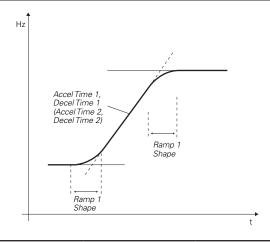


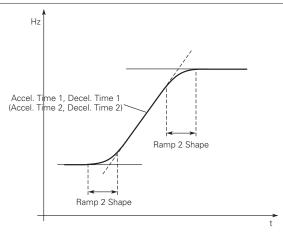
Table 25. Drive control (Cont.)

P4.1.11 ^②	Ramp 2 shape				ID 248
Minimum value:	0.0 s	Maximum value:	10.0 s	Default value:	0.0 s
Descriptions	TI	1 6 11 1 6			· · · · · · · · · · · · · · · · · · ·

Description:

The start and end of the acceleration and deceleration ramps can be smoothed with these parameters. Setting a value of 0.00 gives a linear ramp shape that causes acceleration and deceleration to react immediately to the changes in the reference signal.

Setting a value from 0.10 to 10.00 seconds for this parameter produces an S-shaped acceleration/deceleration at the start and stop of the slope.

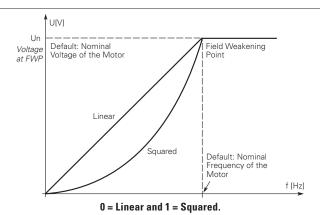


P4.1.12 ²	Accel. time 2				ID 249			
Minimum value:	0.1 s	Maximum value:	3000.0 s	Default value:	10.0 s			
Description:	These values corre frequency.	spond to the time required for th	e output frequency to	accelerate from the zero frequen	cy to the set maximum			
		provide the possibility to set two e programmable digital input.	different acceleratio	n/deceleration time sets for one a	application. The active set can			
P4.1.13 ^②	Decel. time 2		,		ID 250			
Minimum value:	0.1 s	Maximum value:	3000.0 s	Default value:	10.0 s			
Description:	These values corre frequency.	These values correspond to the time required for the output frequency to decelerate from the set maximum frequency to the zero frequency.						
		provide the possibility to set two se programmable digital input.	different acceleratio	n/deceleration time sets for one a	application. The active set can			
P4.1.14 ^{①②}	2nd Stage ramp	frequency	,	'	ID 2444			
Minimum value:	MinFreq.	Maximum value:	MaxFreq.	Default value:	30.00 Hz			
Description:		mp frequency is the frequency le ed for other inputs or devices to		e will enable the 2nd stage ramp f	requency output function.			

^① Parameter value can only be changed after the drive has stopped. ^② Parameter value will be set to be default when changing macros.

Table 26. Motor control.

P5.1 - Basic settings	3.			
P5.1.1 ^{①②}	Motor control mode			ID 287
Minimum value:	N.A. Maximum valu	ie: N.A.	Default value:	0
Options:	0 = Frequency control - Output frequency is of 1 = Speed control - Output frequency is control 2 = Open loop vector control - Similar to the identification. 3 = PM control 1 - PM motor control mode 1, 4 = PM control 2 - PM motor control mode 2,	rolled by giving a frequence standard speed control mo used for SPM (surface mo	cy reference to it with slip compens ode, higher performance slip calcula ounted permanent magnet) and it al	ation requires running a motor lso can be used for IPM.
Description:	Selects the motor control mode.			
P5.1.2 ^①	Current limit	,	'	ID 107
Minimum value:	DriveNomCurrCT*1/10 A Maximum valu	e: DriveNomCurr	CT*2 A Default value:	DriveNomCurrCT*3/2 A
Description:	This parameter determines the maximum out Once the motor current hits this level, it goes			
P5.1.3 ^{①②}	V/Hz optimization	,	'	ID 109
Minimum value:	N.A. Maximum valu	ie: N.A.	Default value:	0
Options:	0 = Disable torque boost function. 1 = Enable torque boost function.			
Description:	Automatic torque boost - the voltage to the rand run at low frequencies with high loads.	motor increases automation	cally, which assists the motor to pro	oduce sufficient torque to start
P5.1.4 ^{①②}	V/Hz ratio			ID 108
Minimum value:	N.A. Maximum valu	ie: N.A.	Default value:	0
Options:	0 = Linear - the voltage of the motor changes where the nominal voltage is supplied. At 1 = Squared - the voltage of the motor chang weakening point where the nominal voltage produces less torque and electromechanisthe load is proportional to the square of the 2 = Programmable V/Hz curve - the V/Hz curve voltage, midpoint, and weakening point. The application. 3 = Linear with flux optimization - the drive section's Active Energy Control which will	I linear V/Hz ratio should I es following a squared cu ige is supplied. The moto cal noise. A squared V/H the speed. re can be programmed with A programmable V/Hz cur tarts to search for the mir	De used in constant torque applicat rve with the frequency in the area r runs under magnetized below the z ratio can be used in applications with three different points. These poince rue can be used if the other settings nimum motor current in order to say	ions. from 0 Hz to the field field weakening point and where the torque demand of ints are the 0 frequency s do not satisfy the needs of we energy. This mode is called
Description:	Selects the V/Hz ratio. 0 = Linear; 1 = Squared; 2 = Programmable; or 3 = Linear + flux optimization.			



P5.1.10 ²	Switching frequenc	ID 288			
Minimum value:	MinSwitchFreq kHz	Maximum value:	MaxSwitchFreq kHz	Default value:	DefaultSwitchFreqCT kHz
Description:	Sets the switching freq	uency for the PWM output v	vaveform.		

Table 26. Motor control (Cont.).

P5.1.16 ^{①②}	Identification	'		'	ID 299
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	2 = Identification 3 = Identification	only stator resistor - does not spin with run - motor stator resistor is no run - motor is supplied with cur only inertia - identification for the	completed then t rent and voltage	the motor is run. This must be complete but at zero frequency.	d with unloaded motor.
Description:	parameters to imp will be active ther	prove starting torque and open loon set back to 0 when completed. \	p vector controĺ Vhen a run comr	cle of the motor once complete the drive performance. Once set and a run comma mand is issued, the message on the keyp ification, a fault message will be display	and is given, the operation ad will indicate "Auto

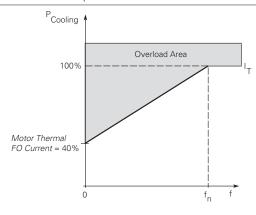
^① Parameter value can only be changed after the drive has stopped. ^② Parameter value will be set to be default when changing macros.

Table 27. Protections.

P6.1 - Motor.					
P6.1.4 ^{①②}	Motor thermal	protection			ID 310
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:		de after fault according to param de after fault always by coasting			
Description:	calculated motor to	is selected, the drive will stop ar emp is based off the install powe ., setting parameter to 0, will reso	r on values of the driv	re and monitoring values as the di	
P6.1.5 ^②	Motor thermal	FO current			ID 311
Minimum value:	0.00%	Maximum value:	150.00%	Default value:	100.00%
Description:		e set between 0 - 150.0% x InMot is set assuming that there is no e			

90% (or even higher).

Note: The value is set as a percentage of the motor nameplate data, P1.6 (nominal current of the motor), not the drive's nominal output current. The motor's nominal current is the current that the motor can withstand in direct on-line use without being overheated. If you change the parameter nominal current of motor, this parameter is automatically restored to the default value. Setting this parameter does not affect the maximum output current of the drive.



Chapter 5 - Fan control application

Table 27. Protections (Cont.).

P6.2.2 ^{①②}	Input phase fault				ID 332			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2			
Options:	0 = No response; 1 = Warning; 2 = Fault, stop mode a 3 = Fault, stop mode a 4 = Single phase pow	ofter fault according to parame ofter fault always by coasting; er limit.	eter stop mode; or					
Description:	The input phase supe	rvision ensures that the input	phases of the frequency	converter have approximately	equal current draw.			
P6.2.3 ^{①②}	4 mA input fault	'	'	,	ID 306			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	3 = Warning, the pres 4 = Fault, stop mode a	uency from 10 seconds back is et frequency P6.2.4 is set as r ofter fault according to parame ofter fault always by coasting.	eference.					
Description:		warning or a fault action and message is generated if the 4 - 20 mA reference signal is used and the signal falls below 4 mA for 5 conds, or below 0.5 mA for 0.5 seconds. The information can also be programmed into relay outputs RO1 and RO2.						
P6.2.4 [©]	4 mA fault freque	псу			ID 331			
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	0.00 Hz			
Description:	When 4 mA fault hap	pens, the output frequency of	drive goes to this preset	speed when P6.2.3 = 3.				
P6.2.5 ^{①②}	External fault	,	,	,	ID 307			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2			
Options: Description:	3 = Fault, stop mode a							
			programmed into digital o	output relay outputs RO1 and F				
P6.2.11 ^②	STO fault respons				ID 2427			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2			
Options:	1 = Warning - drive in	will stop, no indication shown, dicate warning/if STO clears o ndicate fault/require reset to s	lrive will run without res					
Description:	STO fault response de	efines the function of how the	STO input will be seen o	n the keypad and how the driv	e functions to it.			
P6.2.12 ^①	PI feedback Al los	s response			ID 2401			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	0 = No action; 1 = Warning; 2 = Fault; or 3 = Warning: preset for	requency (P6.2.13).						
Description:	This parameter define feedback.	es the function of the PI feedba	ack analog input loss resp	oonse. If the AI feedback is lo	st based off the programed A			
P6.2.13 ^{①②}	PI feedback AI los	s pre-frequency			ID 2402			
Minimum value:	0.00 Hz	Maximum value:	400.00 Hz	Default value:	0.00 Hz			
Description:	This parameter define	s the frequency the master w	ould run to if a feedback	is lost and P6.2.12 was set to	option 3.			
P6.2.14 ^②	PI feedback Al los	s pipe fill			ID 2403			
Minimum value:	0.0 varies	Maximum value:	1000.0 varies	Default value:	0.0 varies			
Description:		in the pump based off the mea 13 "loss of prime" occurs.	asured level. If the value	drops below this level for the	time in P6.2.15 and below,			

Table 27. Protections (Cont.).

P6.2.15 ^②	ID 2404				
Minimum value:	0 s	Maximum value:	6,000 s	Default value:	0 s
Description:				when the feedback signal is lost, fault out on "feedback loss". The	

P6.3 - Communications.

P6.3.1 ^{①②}	Fieldbus fault respon	ID 334			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	0 = No action; 1 = Warning; 2 = Fault; or 3 = Fault, coast.				
Description:	communication port.			e is used and communication is los eldbus control to set fault or warni	
P6.3.2 ^{①②}	OPTcard fault respon	'	ID 335		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	0 = No action; 1 = Warning; 2 = Fault; or 3 = Fault, coast.				

Table 28. PI Controller.

P7.1 - Basic settings.								
P7.1.1 ^②	PI control itim	е			ID 1294			
Minimum value:	0.00%	Maximum value:	200.00%	Default value:	100.00%			
Description:		of the PI Controller. It adjust the s of 10% in the error value causes th			ne load. If this value is set to			
P7.1.2 ^②	PI control gain	1			ID 1295			
Minimum value:	0.00 s	Maximum value:	600.00 s	Default value:	1.00 s			
Description:	Defines the integ	ration time of the PI controller. Ov	var tha time the integr	al time contributes to the deviati	on botwoon the reference			

[©] Parameter value can only be changed after the drive has stopped. © Parameter value will be set to be default when changing macros.

Table 28. PI Controller (Cont.).

P7.1.3 ^{①②}	PI process unit		'		ID 1297
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = %; 1 = 1/min.; 2 = rpm; 3 = ppm; 4 = pps; 5 = 1/s; 6 = 1/min.; 7 = 1/h; 8 = kg/s; 9 = kg/min.; 10 = kg/h; 11 = m3/s; 12 = m3/min.; 13 = m3/h; 14 = m/s; 15 = mbar; 16 = bar; 17 = Pa; 18 = kPa; 19 = mVS; 20 = kW; 21 = Deg. C; 22 = GPM; 23 = gal/m; 25 = gal/min.; 25 = gal/min.; 25 = gal/h; 26 = lb/s; 27 = lb/min.; 28 = lb/h; 29 = CFM; 30 = ft³/s; 31 = ft³/min.; 32 = ft³/h; 33 = ft/s; 34 = in. wg; 35 = ft wg; 36 = PSI; 37 = lb/in.2; 38 = HP; 39 = Deg. F; 40 = PA; 41 = WC; 42 = HG; 43 = ft; 44 = m;		N.A.		
Description:	Defines the unit type for				
P7.1.4 ^②	PI process unit mini				ID 1298
Ainimum value:	-99999.99 varies	Maximum value:	PID1_ProcessUnitMax varies	Default value:	0.00 varies
Description:	Defines the minimum pro	ocess unit value.			
77.1.5 ^②	PI process unit maxi	mum			ID 1300
linimum value:	PID1_ProcessUnitMin	Maximum value:	99999.99 varies	Default value:	100.00 varies
Description:	Defines the maximum pr	ocess unit value.			
P7.1.6 ^{①②}	PI error inversion				ID 1303
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Normal - if feedback 1 = Inverted - if feedback	is less than set-point, PI co k is less than set-point, PI c	ontroller output increases.		
		cess value output reacts to			

Table 28. Pl Controller (Cont.).

P7.1.7 ^②	PI dead band				ID 1304
Minimum value:	-99999.99 varies	Maximum value:	99999.99 varies	Default value:	0 varies
Description:		etpoint in process units. This ler. The PI output is locked it			on or repeated activation/
P7.1.8 ^②	PI dead band delay	,			ID 1306
Minimum value:	0.00 s	Maximum value:	320.00 s	Default value:	0.00 s
Description:	If the PI process value level out again.	goes out of the dead band ar	ea for the desired time de	lay, at that point the controlle	er will re-initialize and try to
P7.1.9 ^②	PI ramp time	'	,	,	ID 1311
Minimum value:	0.00 s	Maximum value:	300.00 s	Default value:	0.00 s
			es in the process value.		

^① Parameter value can only be changed after the drive has stopped. ^② Parameter value will be set to be default when changing macros.

Table 29. Setpoint.

P7.2.1 - Standard.								
P7.2.1.1 ^②	PI keypad setpoint	1			ID 1307			
Minimum value:	PI Process Unit Min	Maximum value:	PI Process Unit Max	Default value:	0.00 varies			
Description:	Keypad PI reference val	ue setpoint 1.						
P7.2.1.2 ^②	PI keypad setpoint	2			ID 1309			
Minimum value:	PI Process Unit Min	Maximum value:	PI Process Unit Max	Default value:	0.00 varies			
Description:	Keypad PI reference val	ue setpoint 2.						
P7.2.1.3 ^②	PI wake-up action				ID 2466			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	1 = Wake-up when abou 2 = Wake-up when belo	0 = Wake-up when below wake-up level. 1 = Wake-up when above wake-up-level. 2 = Wake-up when below wake-up level % from PI setpoint. 3 = Wake-up when above wake-up level %from PI setpoint.						
Description:	This parameter defines	the wake-up function action	1.					

P7.2.2 - Setpoint 1.

P7.2.2.1 ^{①②}	PI setpoint 1 source				ID 1312
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Not used; 1 = PI keypad setpoint 1, 2 = PI keypad setpoint 2, 3 = AI; 4 = Drive reference pot; 5 = FB process data input 6 = FB process data input 7 = FB process data input 9 = FB process data input 10 = FB process data input 11 = FB process data input 12 = FB process data input 13 = FB PI setpoint 1; or 14 = FB PI setpoint 2.	; ut 1; ut 2; ut 3; ut 4; ut 5; uut 6; uut 7;			
Description:	Defines source of the se fieldbus message.	etpoint value the drive uses.	This can either be a	an internal preset value, keypad se	tpoint, analog signal, or

Table 29. Setpoint (Cont.).

P7.2.2.2 ^{①②}	PI setpoint 1 slee	o enable			ID 1315			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	0 = Disabled; or 1 = Enabled.							
Description:		able the output when the frequence of the wake-up		leep frequency for the sleep de	lay time. The output			
P7.2.2.3 ^②	PI setpoint 1 slee	o delay			ID 1317			
Minimum value:	0 s	Maximum value:	3,000 s	Default value:	0 s			
Description:	This parameter sets t shut off till the wake	he delay time after the setpoir up level is met. It is to preven	nt drops below the sleep t large fluctuations whe	p level for this amount of time a en going into the sleep function	nd then the drives output wil to save motor run time.			
P7.2.2.4 ^②	PI setpoint 1 wak	e-up level	'	'	ID 1318			
Minimum value:	-99999.99 varies	Maximum value:	99999.99 varies	Default value:	0.00 varies			
Description:	Defines the level for feedback which can b	Defines the level for the PI feedback value to go above top enable the PI output to be re enabled. This value is based of the % of feedback which can be scaled based off the PI unit min./max, values.						
P7.2.2.5 ^②	PI setpoint 1 boos	et .	'	,	ID 1320			
Minimum value:	-2.00 varies	Maximum value:	2.00 varies	Default value:	1.00 varies			
Description:	The setpoint can be b	oosted via a multiplier value.						
P7.2.2.6 ^②	PI setpoint 1 slee	o level			ID 2450			
Minimum value:	Min Freq	Maximum value:	Max Freq	Default value:	0.00 Hz			
Description:		hich the unit value is used to the drive into the sleep mode.		eep mode. When the unit drops	below this level for the slee			
P7.2.2.7 ^②	SP1 sleep mode o	ver cycle time		,	ID 1842			
Minimum value:	0	Maximum value:	10	Default value:	0			
Description:	cycle" fault. One cycle is defined v	drive come in and out of sleep when the drive transfers from do the sleep over cycle check	normal mode to sleep m		rive would trip on "pump ove			
P7.2.2.8 ^②	SP1 sleep mode n	naximum cycle time			ID 1843			
Minimum value:	0	Maximum value:	3,600	Default value:	0			
Description:	Defines the maximum	time for sleep over cycle chec	cking.					

P7.2.3 - Setpoint 2.

P7.2.3.1 ^{①②}	PI setpoint 2 sou	ID 1321			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Not used; 1 = PI keypad setpoi 2 = PI keypad setpoi 3 = AI; 4 = Drive reference p 5 = Fieldbus process 6 = Fieldbus process 7 = Fieldbus process 8 = Fieldbus process 9 = Fieldbus process 10 = Fieldbus proces 11 = Fieldbus proces 12 = Fieldbus proces 13 = Fieldbus PI setp 14 = Fieldbus PI setp	nt 2; data input 1; data input 2; data input 3; data input 4; data input 5; s data input 6; s data input 6; s data input 8; oint 1; or			
Description:	Defines source of th fieldbus message.	e setpoint value the drive uses.	This can either be	an internal preset value, keypad se	tpoint, analog signal, or

Table 29. Setpoint (Cont.).

P7.2.3.2 ^{①②}	PI setpoint 2 sleep	o enable			ID 1324
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disabled; or 1 = Enabled.				
Description:		ble the output when the frequ dback rises above the wake-up		ep frequency for the sleep de	lay time. The output
P7.2.3.3 ^②	PI setpoint 2 sleep	delay			ID 1326
Minimum value:	0 s	Maximum value:	3,000 s	Default value:	0 s
Description:	This parameter sets the shut off till the wake	ne delay time after the setpoir up level is met. It is to preven	nt drops below the sleep le t large fluctuations when	evel for this amount of time a going into the sleep function	and then the drives output wi to save motor run time.
P7.2.3.4 ^②	PI setpoint 2 wake	e-up level	,		ID 1327
Minimum value:	-99999.99 varies	Maximum value:	99999.99 varies	Default value:	0.00 varies
Description:		he PI feedback value to go abo e scaled based off the PI unit		ut to be re enabled. This val	ue is based of the % of
P7.2.3.5 ^②	PI setpoint 2 boos	t	,		ID 1329
Minimum value:	-2.00 varies	Maximum value:	2.00 varies	Default value:	1.00 varies
Description:	The setpoint can be b	oosted via a multiplier value.			
P7.2.3.6 ^②	PI setpoint 2 sleep	level			ID 2452
Minimum value:	Min Freq	Maximum value:	Max Freq	Default value:	0.00 Hz
Description:		which the unit value is used to the drive into the sleep mode.		mode. When the unit drops	s below this level for the slee
P7.2.3.7 ^②	SP2 sleep mode o	ver cycle time		'	ID 1844
Minimum value:	0	Maximum value:	10	Default value:	0
Description:	cycle" fault. One cycle is defined v	drive come in and out of sleep when the drive transfers from do the sleep over cycle check	normal mode to sleep mod	le.	drive would trip on "pump ove
P7.2.3.8 ^②	SP2 sleep mode m	aximum cycle time			ID 1845
Minimum value:	0	Maximum value:	3,600	Default value:	0

Table 30. Feedback.

P7.3.1 - Standard.									
P7.3.1.1 ²	PI feedback gair	1		'	ID 1331				
Minimum value:	-1,000.00%	Maximum value:	1,000.00%	Default value:	100.00%				
Description:	Defines gain associ	Defines gain associated with the feedback signal from the measuring device.							

[©] Parameter value can only be changed after the drive has stopped. @ Parameter value will be set to be default when changing macros.

Table 30. Feedback (Cont.).

P7.3.2 - Feedback 1.								
P7.3.2.1 ^{①②}	PI feedback 1 s	ource	,		ID 1332			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2			
Options:	0 = Not used; 1 = Al; 2 = Drive reference; 3 = Fieldbus proces; 4 = Fieldbus proce; 5 = Fieldbus proce; 6 = Fieldbus proces; 8 = Fieldbus proces; 9 = Fieldbus proces; 10 = Fieldbus Pl ference;	ss data input 1; ss data input 2; ss data input 3; ss data input 4; ss data input 5; ss data input 6; ss data input 7; ess data input 7;						
Description:	Defines where fee	dback signal is being fed into the	drive, via analog or fie	eldbus data value.				
P7.3.2.2 ^②	PI feedback 1 n	ninimum			ID 1333			
Minimum value:	-200.00 %	Maximum value:	200.00%	Default value:	0.00%			
Description:	Minimum unit valu	e for the feedback signal.						
P7.3.2.3 ^②	PI feedback 1 n	naximim			ID 1334			
Minimum value:	-200.00 %	Maximum value:	200.00%	Default value:	100.00%			
Description:	Maximim unit valu	e for the feedback signal.						

Table 31. HVAC parameters.

P8.1 - Damper (*DM	1 PRO).	'		'	'
P8.1.1 ^{①②}	Damper start				ID 483
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Normal; 1 = Damper start; 2 = Damper tout; or 3 = Damper delay.				
Description:	This parameter determi	nes the function of th damp	er.		
P8.1.2 ^{①②}	Damper time out				ID 484
Minimum value:	1 s	Maximum value:	32,500 s	Default value:	5 s
Description:	The time out time used is received.	for an interlocked time start	, after which the start	sequence must be restarted if n	o acknowledgement contac
P8.1.3 ^{①②}	Damper delay				ID 485
Minimum value:	1 s	Maximum value:	32,500 s	Default value:	5 s
Description:	The delay time followin	g a delay start, after which	the frequency converte	er will be started.	

P8.2 - Fire mode (*DM1 PRO).

P8.2.1 ^{①②}	Fire mode prote	ID 535					
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0		
Options:	0 = Closing contac 1 = Opening conta	t initiates fire mode function. ct initiates fire mode function.					
Description:	This parameter determines whether the fire mode function is determined by a contact closure or contact opening on the desired digital input function select fire mode.						
		mode is enabled, this causes the the drive causes issues to the sy		fault and run till its death. Warranty	y will be non-valid in the case		

 $^{^{\}circledR}$ Parameter value can only be changed after the drive has stopped. $^{\circledcirc}$ Parameter value will be set to be default when changing macros.

Table 31. HVAC parameters (Cont.).

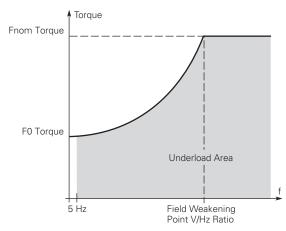
P8.2.2 ^{①②}	Fire mode refere	nce select function			ID 536			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	3 = AI; or		,					
Description:	This parameter allow	vs for setting the reference loca	ation for when the fire r	mode is enabled.				
P8.2.3 ^②	Fire mode minim	um frequency	,	,	ID 537			
Minimum value:	MinFreq Hz	Maximum value:	MaxFreq Hz	Default value:	15.00 Hz			
Description:	This parameter sets	the minimum output frequency	for fire mode. This can	n be used as a selection for refer	ence command.			
P8.2.4 ^②	Fire mode freque	ncy reference 1			ID 565			
Minimum value:	0.00%	Maximum value:	100.00%	Default value:	75.00%			
Description:		This parameter sets the drive operating percentage based off the 0% being minimum frequency (P1.1) and 100% being maximum frequency (P1.2) for fire mode reference 1.						
P8.2.5 ^②	Fire mode freque	ncy reference 2			ID 564			
Minimum value:	0.00%	Maximum value:	100.00%	Default value:	100.00%			
Description:		the drive operating percentage fire mode reference 2.	based off the 0% being	g minimum frequency (P1.1) and	100% being maximum			
P8.2.6	Fire mode test er	nable	,	,	ID 2443			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.			
Options:	0 = Disabled; or 1 = Enabled.							
Description:		vs for testing the fire mode fear speed desired but all faults are		ter set to enable and fire mode i	nput enabled, the drive will			
P8.2.7 [©]	Smoke purge fre	quency			ID 554			
Minimum value:	0.00%	Maximum value:	100.00%	Default value:	50.00%			
Description:		r smoke purge. Preset speed u 100% being maximum frequenc		election. The percentage is bas	ed off the 0% being minimum			
P8.3 - Protections (*	*DM1 PRO).							
P8.3.1 [©]	Broken belt prote	ection			ID 317			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	0 = No action; 1 = Warning; 2 = Fault; or 3 = Fault, coast.							
Description:	status of the motor.		w the Fnom and F0 torg	e based on the parameter condi ue levels for the time limit, the p derload time counter to zero.				

Table 31. HVAC parameters (Cont.).

P8.3.2 ^②	Broken belt Fnom to	rque			ID 318
Minimum value:	10.00%	Maximum value:	150.00%	Default value:	50.00%

Description:

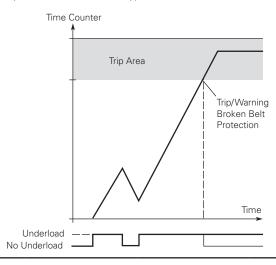
The torque limit can be set between 10.0-150.0 % x TnMotor. This parameter gives the value for the minimum torque allowed when the output frequency is at or above the field weakening point. If you change P1.6, nominal motor current, this parameter is automatically restored to the default value.



P8.3.3 ^②	Broken belt FC) torque	'	'	ID 319
Minimum value:	5.00%	Maximum value:	150.00%	Default value:	10.00%
Description:	The torque limit of frequency. If you	can be set between 5.0—150.0 % x u change the value of P1.6, nominal	TnMotor. This parame motor current, this par	eter gives the value for the minin rameter is automatically restore	num torque allowed at zero d to the default value.
P8.3.4 ²	Broken belt til	me limit			ID 320
Minimum value:	2.00 s	Maximum value:	600.00 s	Default value:	20.00 s

Description:

This time can be set between 2.00 and 600.00 seconds. This is the time allowed for an fault state to exist. An internal up/down counter counts the accumulated underload time. If the underload counter value goes above this limit, the protection will cause a trip according to protection parameter. If the drive is stopped, the counter is reset to zero.



Parameter value can only be changed after the drive has stopped. [®] Parameter value will be set to be default when changing macros.

Table 32. Serial communication.

Description:

P11.1 - Basic setting	JS	1		1	
P11.1.1 ^①	Serial communication	on			ID 586
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Modbus RTU; 1 = BACnet MS/TP (DM 2 = SWD (DM1 PRO).	1 PRO); or			
Description:	This parameter defines	the communication protocol	for RS-485.		
P11.2 - Modbus RTU					
P11.2.1 ^①	Slave address	,	,	,	ID 587
Minimum value:	1	Maximum value:	247	Default value:	1
Description:	This parameter defines	the slave address for RS-48	5 communication.		
P11.2.2 ^①	Baud rate	,			ID 584
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 57,600; or 4 = 115,200				
Description:	This parameter defines	communication speed for RS	S-485 communication.		
P11.2.3 ^①	Parity type				ID 585
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	0 = None; 1 = Odd; or 2 = Even.				
Description:	This parameter defines	parity type for RS-485 comr	nunication.		
211.2.4	Modbus RTU protoc	ol status			ID 588
Viinimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
)ptions:	0 = Initial; 1 = Stopped; 2 = Operational; or 3 = Faulted.				
Description:	This parameter shows the	ne protocol status for RS-48	35 communication.		
P11.2.5	Communication time	eout modbus RTU			ID 593
Vinimum value:	0 ms	Maximum value:	60,000 ms	Default value:	10,000 ms
Description:	Selects the time to wait	before a communication fa	ult occurs over modbus	RTU if a message is not receive	d
P11.2.6	Modbus RTU fault re	esponse			ID 2516
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	communications; if no	ot in fieldbus control, place	will not fault.	fieldbus fault is active, the drive vation is lost, fieldbus fault respon	
Description:	Defines the fieldbus fau	It condition for modbus RTU	communication.	,	
P11.3 - BACnet RTU	MSTP.				
P11.3.1 ^①	MSTP baud rate	,	1	,	ID 594
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 76,800; or				

This parameter defines the communication speed for RS-485 communication.

Table 32. Serial communication (Cont.).

P11.3.2 ^①	MSTP device addres	s			ID 595
Minimum value:	0	Maximum value:	127	Default value:	1
Description:	Defines the device addr	ess of the drive on the BACr	net MSTP network.		
P11.3.3 ^①	MSTP instance num	ber			ID 596
Minimum value:	0	Maximum value:	4,194,302	Default value:	0
Description:	Defines the instance nu	mber of the drive on the BA	Cnet MSTP network.		
P11.3.4	MSTP communication	on timeout			ID 598
Minimum value:	0 ms	Maximum value:	60,000 ms	Default value:	10,000 ms
Description:	Selects the time to wait	before a communication fa	ult occurs over BACnet	MSTP if a message is not receive	/ed.
P11.3.5	MSTP protocol statu	ıs			ID 599
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Stopped; 1 = Operational; or 2 = Faulted.				
Description:	This parameter shows the	ne protocol status for BACne	et MSTP communicatio	n.	
P11.3.6	MSTP fault code				ID 600
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = None; 1 = Sole master; 2 = Duplicate MAC ID; o 3 = Baud rate fault.	r			
Description:	This parameter shows the	ne protocol status for BACne	et MSTP communication	n.	
P11.3.7	MSTP fault response	•	,	'	ID 2526
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	communications. If	not in fieldbus control, place	e will not fault.	ieldbus fault is active, the drive ation is lost, fieldbus fault respo	
Description:	Defines the fieldbus fau	It condition for BACnet MST	TP communication.	,	
	Defines the fieldbus fau MSTP maximum mas		TP communication.		ID 1537
P11.3.8			TP communication.	Default value:	ID 1537
P11.3.8 Minimum value:	MSTP maximum mas	ster	127		
P11.3.8 Minimum value:	MSTP maximum mas	Ster Maximum value:	127		
P11.3.8 Minimum value: Description:	MSTP maximum mas	Ster Maximum value:	127		
P11.3.8 Minimum value: Description: P11.5 - SWD.	MSTP maximum mas	Ster Maximum value:	127		
P11.3.8 Minimum value: Description: P11.5 - SWD.	MSTP maximum mass 1 Defines the maximum no	Ster Maximum value:	127		127
P11.3.8 Minimum value: Description: P11.5 - SWD. P11.5.1 Minimum value:	MSTP maximum mass 1 Defines the maximum num Parameter access N.A.	Maximum value: umber of masters that can e Maximum value: ud/write on acyclic channel.	127 establish connections w	ith the drive.	127 ID 2630
P11.3.8 Minimum value: Description: P11.5 - SWD. P11.5.1 Minimum value: Options:	MSTP maximum mass 1 Defines the maximum num Parameter access N.A. 0 = No permission to real 1 = Acyclic read/write a	Maximum value: umber of masters that can e Maximum value: ud/write on acyclic channel.	127 establish connections w N.A.	ith the drive. Default value:	127 ID 2630
P11.3.8 Minimum value: Description: P11.5 - SWD. P11.5.1 Minimum value: Options:	MSTP maximum mass 1 Defines the maximum num Parameter access N.A. 0 = No permission to real 1 = Acyclic read/write a	Maximum value: Maximum value: Maximum value: Id/write on acyclic channel. It allowed on Profibus. It the operation priority of pa	127 establish connections w N.A.	ith the drive. Default value:	127 ID 2630
Description: P11.3.8 Minimum value: Description: P11.5 - SWD. P11.5.1 Minimum value: Options: Description: P11.5.2 [©] Minimum value:	Parameter access N.A. 0 = No permission to real 1 = Acyclic read/write a PNU927 which specifies	Maximum value: Maximum value: Maximum value: Id/write on acyclic channel. It allowed on Profibus. It the operation priority of pa	127 establish connections w N.A.	ith the drive. Default value:	127 ID 2630
P11.3.8 Minimum value: Description: P11.5 - SWD. P11.5.1 Minimum value: Options: Description: P11.5.2 [©]	Parameter access N.A. 0 = No permission to real a Acyclic read/write a PNU927 which specifies Parameter data acces	Maximum value: umber of masters that can e Maximum value: Id/write on acyclic channel. re allowed on Profibus. It he operation priority of pages Maximum value:	127 establish connections w N.A. arameters for acyclic co	Default value:	127 ID 2630 1

Table 32. Serial communication (Cont.)

P11.5.3	Fault situation cou	ınter			ID 2632
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	PNU952 which specifi	es the fault situation counter.			
	Only write of 0 is allow (parameter 944) are en		fer (actual fault situa	tion and all other fault situations)	and the fault message coun
P11.5.4	Board status				ID 2609
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Description:	Status of the board. B0-DCOM communica B1-Board HW fault B2-IO1 24 volt overloa B3-Profibus communic B4-fieldbus fault.	d fault.			
P11.5.5	Firmware version				ID 2610
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	This parameter provid	es the firmware version of the	e SWD.		
P11.5.6	Protocol status				ID 2612
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Not configured; 1 = Operational; or 2 = Diagnostics.				
Description:	This parameter specifi	es the protocol status for SW	/D card.		
P11.6 - Bluetooth.					
P11.6.1	Bluetooth enabled				ID 1895
Minimum value:	NΑ	Maximum value:	NΑ	Default value:	Λ

P11.6.1	Bluetooth enabled				ID 1895
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disabled; or 1 = Enabled.				
Description:	Bluetooth enabled.				
P11.6.2 ^②	Bluetooth broadcast	mode	,		ID 2920
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Off; or 1 = On.				
Description:	Bluetooth broadcast mod	le.			
P11.6.3	Bluetooth pairing res	set			ID 2935
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Not reset; or 1 = Reset.				
Description:	Bluetooth pairing reset.				

[©] Parameter value can only be changed after the drive has stopped. © Parameter value will be set to be default when changing macros.

Table 33. Ethernet communication.

P12.1 - Basic setting	js.					
P12.1.1 ^①	IP address mode				ID 1500	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0	
Options:	0 = Static IP; or 1 = DHCP with AutoIP.					
Description:	This parameter defined t	he IP address configuration	mode for EIP/modb	us TCP.		

^{0 0}

Table 33. Ethernet communication (Cont.).

P12.1.2	Active IP addre	ess		,	ID 1507
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Reads the current	active IP address.			
P12.1.3	Active subnet i	nask			ID 1509
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Reads the current	active subnet mask.			
P12.1.4	Active default	gateway		'	ID 1511
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Reads the current	active default gateway.			
P12.1.5	MAC address				ID 1513
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Reads the current	MAC address.			
P12.1.6 ^①	Static IP addre	ss			ID 1501
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	192.168.1.254
Description:	Defines the static	IP address.			
P12.1.7 ^①	Static subnet n	nask			ID 1503
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	255.255.255.0
Description:	Defines the static	subnet mask.			
P12.1.8 ^①	Static default g	gateway			ID 1505
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	192.168.1.1
Description:	Defines the static	default gateway.			
P12.1.9	Ethernet comm	nunication timeout			ID 611
Minimum value:	0 ms	Maximum value:	60,000 ms	Default value:	10,000 ms
Description:	Selects the time it	t waits before a communication fa	nult occurs over ethernet	t.	

P12.2 - Trusted IP filter (DM1 PRO only).

P12.2.1	Trusted IP white list	t			ID 68
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0.0.0.0 0.0.0.0 192.168.1.254
Description:	Defines the IP addresse	s in the white list. A setting	g of 192.168.1.255	enables all connections on the local	subnet.
P12.2.2	Trusted IP filter ena	ble	'	'	ID 76
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Disabled; or 1 = Enabled.				
Description:	Enables IP white listing.	. Devices not in the white li	st will not be able	to establish communications with th	e drive.

P12.3 - Modbus TCP (DM1 PRO only).

P12.3.1 ^①	Modbus TCP en	able		'	ID 1942
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disable; or 1 = Enable.				
Description:	Enables modbus TO	CP communications, must be enal	oled to connect to Po	wer Xpert inControl.	
P12.3.2	Modbus TCP co	nnection limit			ID 609
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	5
Description:	Maximum number	of connections allowed to the dri	ve.		

Table 33. Ethernet communication (Cont.).

P12.3.3	Modbus TCP unit id	lentifier number			ID 610
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Description:	Unit identifier unit valu	e for modbus TCP.			
P12.3.4	Modbus TCP protoc	col status		·	ID 612
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Stopped; 1 = Operational; or 2 = Faulted.				
Description:	This parameter shows	the protocol status for modb	us TCP communicat	ion.	
P12.3.5	Modbus TCP fault r	esponse			ID 2517
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	communications. If	not in fieldbus control, place	e will not fault.	nd fieldbus fault is active, the drive	
Description:	Defines the fieldbus far	ult condition for modbus TCP	communication.		

P12.4 - Ethernet IP (DM1 PRO only).

P12.4.1 ^①	Ethernet based pro	otocol select			ID 1997
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disabled; or 2 = BACnet IP.				
Description:	Selects the active con	nmunication protocol on the e	thernet I/P port.		
P12.4.2	Ethernet IP protoc	ol status			ID 608
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Off; 1 = Operational; or 2 = Faulted.				
Description:	Indicates if ethernet p	rotocol is active or not.			
P12.4.3	Ethernet IP fault re	esponse			ID 2518
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	communications.	f not in fieldbus control, place	e will not fault.	d Fieldbus fault is active, the drive nication is lost, fieldbus fault respo	
Description:	Defines the fieldhus fa	ault condition for ethernet IP o	ommunication.		

Table 33. Ethernet communication (Cont.).

P12.5 - BACnet IP (D	M1 PRO only).				
P12.5.1 ^①	BACnet IP UDP po	rt number			ID 1733
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	47,808
Options:	47808 = BACO; 47809 = BAC1; 47810 = BAC2; 47811 = BAC3; 47812 = BAC4; 47813 = BAC5; 47814 = BAC6; 47815 = BAC7; 47816 = BAC8; 47817 = BAC9; 47818 = BACA; 47819 = BACB; 47820 = BACC; 47821 = BACD; 47822 = BACE; or 47823 = BACF.				
Description:	Defines the BACnet U	DP port number.			1
P12.5.2 ^①	BACnet IP foreign	devise			ID 1734
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disabled; or 1 = Enabled.				
Description:	Enables BACNET IP fo	reign device configuration.			
P12.5.3 ^①	BACnet IP BBMD I	P			ID 1735
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0.0.0.0
Description:	Displays the BACnet E	BBMD IP address.			
P12.5.4 ^①	BACnet IP UDP po	rt			ID 1737
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	47,808
Options:	47808 = BACO; 47809 = BAC1; 47810 = BAC2; 47811 = BAC3; 47812 = BAC4; 47813 = BAC5; 47814 = BAC6; 47815 = BAC7; 47816 = BAC8; 47817 = BAC9; 47818 = BACA; 47819 = BACC; 47820 = BACC; 47821 = BACD; 47822 = BACE; or 47823 = BACF.				
Description:	Displays the BACnet E	BBMD UDP port number.			
P12.5.5 ^①	BACnet IP registra	tion interval			ID 1738
Minimum value:	0	Maximum value:	65,535	Default value:	10
Description:	Defines the registration	on interval.			
		nication timeout			ID 1739
P12.5.6	BACnet IP commun	incation timeout			

Table 33. Ethernet communication (Cont.).

P12.5.7	BACnet IP protocol state	us		· · ·	ID 1740
Minimum value:	N.A.	Vlaximum value:	N.A.	Default value:	0
Options:	0 = Stopped; 1 = Operational; or 2 = Faulted.				
Description:	This parameter shows the pr	otocol status for BACne	et IP communication	1.	
P12.5.8	BACnet IP fault behavio	r			ID 1741
Minimum value:	N.A.	Vlaximum value:	N.A.	Default value:	0
Options:	communications. If not in	n fieldbus control, place	will not fault.	nd Fieldbus fault is active, the drive v unication is lost, fieldbus fault respor	
Description:	Defines the fieldbus fault cor	ndition for BACnet IP co	mmunication.		
P12.5.9 ^①	BACnet IP instance num	ber			ID 1742
Minimum value:	0	Vlaximum value:	4,194,302	Default value:	0
Description:	Displays the BACnet instance	e number.			

P12.6 - Web UI (DM1 PRO only).

P12.6.1	Web UI protocol	status			ID 2915
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Off; 1 = Operational; or 2 = Faulted.				
Description:	This parameter show	vs the protocol status for web s	erver communication.		
P12.6.2	Web UI fault resp	oonse			ID 2916
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	communications.	: ontrol mode - when heldbus is . If not in fieldbus control, place des - no matter the control plac	e will not fault.	ieldbus fault is active, the drive	
Description:	Defines the fieldbus	fault condition for web server of		ation is lost, notabas rault respo	mise will occur.
Description: P12.6.3	Defines the fieldbus				ID 2919
<u>·</u>				Default value:	
P12.6.3	Web UI communi 30,000 ms	cation timeout	communication. 60,000 ms	Default value:	ID 2919
P12.6.3 Minimum value:	Web UI communi 30,000 ms	cation timeout Maximum value:	communication. 60,000 ms	Default value:	ID 2919
P12.6.3 Minimum value: Description:	Web UI communi 30,000 ms Selects the time it w	cation timeout Maximum value:	communication. 60,000 ms	Default value:	ID 2919 60,000 ms
P12.6.3 Minimum value: Description: P12.6.4 [©]	Web UI communi 30,000 ms Selects the time it w Web UI enable	Maximum value: vaits before a communication fa	60,000 ms	Default value:	ID 2919 60,000 ms

① Parameter value can only be changed after the drive has stopped.

Table 34. System.

P13.1.1	Language				ID 340
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = English; 1 = English; or 2 = English.				
Description:	This parameter offe available language		uency converter th	nrough the keypad in the language of	your choice. Currently

Chapter 5 - Fan control application

Table 34. System (Cont.).

P13.1.2 ^①	Application				ID 142
Minimum value:	N.A.	/laximum value:	N.A.	Default value:	N.A.
Options:	0 = Standard;; 1 = Pump; 2 = Fan; or 3 = Multi-purpose.				
Description:	This parameter sets the activ	e application if multipl	e applications have	been loaded.	
P13.1.3 ^①	Parameter sets				ID 619
Minimum value:	N.A.	/laximum value:	N.A.	Default value:	N.A.
Options:	0 = No; 1 = Reload defaults; 2 = Reload set 1; 3 = Reload set 2; 4 = Store set 1; 5 = Store set 2; 6 = Reset; or 7 = Reload defaults VM.				
Description:	This parameter allows you to	reload the factory def	ault parameter valu	es, and to store and load two custor	nized parameter sets.
P13.1.4	Up to keypad			'	ID 620
Minimum value:	N.A.	/laximum value:	N.A.	Default value:	N.A.
Options:	0 = No; or 1 = Yes (all parameters).				
Description:	This function uploads all exis	ting parameter groups	to the keypad.		
P13.1.5 ^①	Down from keypad			·	ID 621
Minimum value:	N.A.	/laximum value:	N.A.	Default value:	N.A.
Options:	0 = No; 1 = All parameters; 2 = All, no motor; or 3 = Application parameters.				
Description:	This function downloads one	or all parameter group	s from the keypad t	to the drive.	
P13.1.7	Parameter lock PIN				ID 624
Minimum value:	0	/laximum value:	9,999	Default value:	0
Description:	The application selection can enabled, the user will be pror	be protected against unpted to enter a passw	unauthorized chang vord before applicat	es with the password function. Who	en the password function is jes, or password changes.
	By default, the password funbetween 1 and 9,999.	ction is not in use. If y	ou want to activate	the password, change the value of	this parameter to any numbe
	To deactivate the password,	reset the parameter va	lue to 0.		
P13.1.8	Keypad parameter lock	· · · · · · · · · · · · · · · · · · ·		,	ID 625
Minimum value:	N.A.	/laximum value:	N.A.	Default value:	0
Options:	0 = Change enable; or 1 = Change disable.				
Description:	This function allows the user the display if you try to edit a		the parameters. If	the parameter lock is activated, the	text "locked" will appear on
	Note: This function does not	prevent unauthorized (editing of paramete	er values	

Table 34. System (Cont.).

P13.1.9	Start-up Wizard	'		'	ID 626
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Enabled. 1 = Disabled.				
Description:	the application desire completion, it allows always enabled for th	d and then advances paramete the user to go to the main mer e initial power up of the DM1 ise it to be active on start-up.	ers through the s ou or default page PRO. By setting	ected "Enable", the Start-up Wizard pro tart-up parameter list/Application Mini e and this parameter is set to "Disable this parameter to "Disable" without go start-up Wizard after completion, or d	i wizard in keypad. After d". The Start-up Wizard is bing through the Start-up

P13.2 - Keypad.

P13.2.4	-				ID 629
P13.2.4	Timeout time				ID 629
Minimum value:	1 s	Maximum value:	65,535 s.	Default value:	30 s
Description:	The timeout time	setting defines the time after whi	ch the keypad display re	eturns to the Default Page.	
	Note: If the defa	ult page value is 0, the timeout tin	ne setting has no effect.		
P13.2.5	Contrast adjus	t	'	'	ID 630
Minimum value:	5	Maximum value:	18	Default value:	12
Description:	If the remote key	pad display is not clear, you can ac	djust the keypad contras	t with this parameter.	
P13.2.6	Backlight time	,		'	ID 631
Minimum value:	1 min.	Maximum value:	65,535 min.	Default value:	10 min.
Description:	This parameter de	etermines how long the backlight	stays on before going ou	ıt.	
P13.2.7	Fan control	,			ID 632
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	1 = Temperature 60°C (140°F). minute after receivin "Temperature 2 = Run follow - a	fan runs continuously based on the temperature of the The fan receives a stop command g the stop command or switching "." ofter power up, the fan is stopped IC-bus systems to prevent cooling	d when the heat sink ter on the power, as well as until the run command i	mperature falls to 55°C (131°F). s after changing the value from s given and then fan runs contin	The fan runs for about a "Continuous" to
Description:	This function allo	ws you to control the DM1 PRO's (cooling fan.	· · · · · ·	

P13.4 - Version information.

P13.4.1	Keypad softw	are version		·	ID 640
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Keypad firmware	e version.			
P13.4.2	Motor control	software version			ID 642
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	DSP/motor contr	ol software version.			
P13.4.3	Application se	oftware version			ID 644
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	MCU/application	software version.			
P13.4.4	Software bun	dle version			ID 1714
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Software bundle	version.			

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Table 34. System (Cont.).

P13.5 - Application	information.				
P13.5.1	Serial number				ID 648
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Product serial number				
P13.5.2	Multi-monitor set	,			ID 627
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Change enable; or 1 = Change disable.				
Description:		n display three actual moniton nitored with other values.	ed values at the s	ame time. This parameter determine	es if the operator is allowed t
P13.5.3	Keypad lock PIN	,		'	ID 75
Minimum value:	0	Maximum value:	9,999	Default value:	0
Description:	When the password f			keypad lock function after keys are no enter a password before the keypad	
	By default, the passw between 1 and 9,999.	ord function is not in use. If y	ou want to activat	te the password, change the value of	this parameter to any number
	To deactivate the pas	sword, reset the parameter va	lue to 0.		
P13.5.4	Drive application	name			ID 2922
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Drive application nam				

^① Parameter value can only be changed after the drive has stopped.

Introduction

The pump application builds on the features included in standard. In addition to all of the features in the standard application, the pump application provides features specific for pumping applications and pump related protective features.

Fan application includes functions:

- · Pump derag mode;
- · Valve control;
- · Backspin control;
- · Minimum run time;
- · Separate minimum frequency ramp time;
- Multi-pump control;
- · Pipe fill mode;
- · Loss of prime detection; and
- · Broken pipe detection.

I/O controls

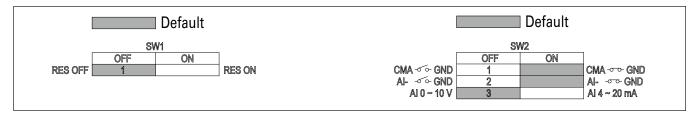
"Function to terminal" (FTT) programming

The design behind programming of the digital inputs and outs of the DM1 uses "function to terminal" programming. It is composed of a terminal, be it a relay output or a digital output, that is assigned a parameter. Within that parameter, it has different functions that can be set.

Control I/O configuration

- Run 240 Vac and 24 Vdc control wiring in separate conduit.
- · Communication wire to be shielded.

Table 35. Multi-Pump application default I/O connection.



External wiring	Terminal	Short name	Name	Default setting	Description
	- 1	DI1	Digital input 1	Run forward	Starts the motor in the forward direction.
	- 2	DI2	Digital input 2	Run reverse	Start the motor in the reverse direction.
<u> </u>	- 3	DI3	Digital input 3	External fault	Triggers a fault in the drive.
	- 4	DI4	Digital input 4	Fault reset	Resets active faults in the drive.
	- 5	CMA	DI1 to DI4 common	Grounded	Allows for sourced input.
	- 6	Α	RS-485 signal A	_	Fieldbus communication (Modbus RTU, BACNet).
	- 7	В	RS-485 signal B	_	Fieldbus communication (Modbus RTU, BACNet).
Seg 	_8	Al1+ ①	Analog input 1	0 - 10 V	Voltage speed reference (programmable to 4 mA to 20 mA).
1 "\"	9	AI1-	Analog input 1 ground	_	Analog input 1 common (ground).
	_ 10	GND	I/O signal ground	_	I/O ground for reference and control.
	- 11	A01+	Analog output 1	Output frequency	Shows output frequency to motor 0 - 60 Hz (4 mA to 20 mA).
	12	GND	I/O signal ground	_	I/O ground for reference and control.
	- 13	10 V	10 Vdc reference output	10.3 Vdc +/- 3%	10 Vdc reference voltage.
	- 14	24 V	24 Vdc control output	24 Vdc In/Out	Control voltage input/output (100 mA max.).
	- 15	STO_com	Safe torque common	_	Safe torque Off common.
-	- 16	ST02	Safe torque Off 2	_	Safe torque Off 2 input.
	- 17	ST01	Safe torque Off 1	_	Safe torque Off 1 input.
74	- 18	R1N0	Relay 1 normally open	Run	Changes state when the drive is in the run state.
Υ	- 19	R1CM	Relay 1 common		
	20	R1NC	Relay 1 normally closed		
<u></u>	- 21	R2N0	Relay 2 normally open	Fault	Changes state when the drive is in the fault state.
<u>`</u> ` <u>`</u> `	- 22	R2CM	Relay 2 common		

Notes:

The above wiring demonstrates a SINK configuration. It is important that CMA is wired to ground (as shown by dashed line). If a SOURCE configuration is desired, wire 24 V to CMA and close the inputs to ground. When using the +10 V for Al1, it is important to wire Al1- to ground (as shown by dashed line). If using +10 V for Al1, terminals 9 and 10 need to be jumpered together.

① Al1+ support 10 K potentiometer.

Pump application - parameters list

On the next pages you will find the lists of parameters within the respective parameter groups. Each parameter section within the table lists:

- Parameter code (location indication on the keypad; shows the operator the present parameter number);.
- · Parameter name;
- ID (number of the parameter);

and where applicable:

- · Minimum value and units;
- · Maximum value and units;
- · Default value and units;
- · Options (when available); and
- · Description of the parameter.

Table 36. Monitor.

M1.1	Output frequency				ID 1
Minimum value:	Hz	Maximum value:	Hz	Default value:	Hz
Description:	Output frequency (Hz).				
M1.2	Frequency reference		,	'	ID 24
Minimum value:	Hz	Maximum value:	Hz	Default value:	Hz
Description:	Reference frequency (Hz).				
M1.3	Motor speed				ID 2
Minimum value:	rpm	Maximum value:	rpm	Default value:	rpm
Description:	Motor output speed (rpm)				
M1.4	Motor current				ID 3
Minimum value:	A	Maximum value:	А	Default value:	А
Description:	Motor output current RM	S (Amps).			
M1.5	Motor torque				ID 4
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Percent motor torque calc	ulated from nameplate va	ues and measured n	notor current (%).	
M1.6	Motor power	'		'	ID 5
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Percent motor power calc	ulated from nameplate va	ues and measured m	notor current (%).	
M1.7	Motor voltage	1		,	ID 6
Minimum value:	V	Maximum value:	V	Default value:	V
Description:	Output ac motor voltage (Vac).			
M1.8	DC-link voltage				ID 7
Minimum value:	V	Maximum value:	V	Default value:	V
Description:	DC bus voltage (Vdc).				

Table 36. Monitor (Cont.).

M1.9	Unit temperature		"		ID 8
Minimum value:	°C	Maximum value:	°C	Default value:	°C
Description:	Heat sink temperature (de	eg. C).			
M1 - standard (Cont.).		,		'
M1.10	Motor temperature				ID 9
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Motor temperature value	calculated from nameplat	e values and measured	motor current (%).	
M1.11	Latest fault code		'	,	ID 28
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Last active fault code value	ue. See fault codes for the	value shown here.		
M1.12	Instant motor power		'	,	ID 1686
Minimum value:	kW	Maximum value:	kW	Default value:	kW
Description:	Instantaneous motor pow	ver (kW).			
M2 - I/O status.					
M2.1	Analog input 1	,	,	,	ID 10
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies
Description:	Analog input 1 measured	value (Vdc or Amps) selec	table with dipswitch.		
M2.2	Keypad pot voltage	,	,		ID 1858
Minimum value:	V	Maximum value:	V	Default value:	V
Description:	Keypad potentiometer me	easured value (Vdc). DM1	PRO only.		
M2.3	Analog output		· · · · · · · · · · · · · · · · · · ·		ID 25
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies
Description:	Analog output 1 measure	d value (Vdc or Amps) sele	ctable with parameter.		
M2.4	DI1, DI2, DI3		'		ID 12
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Digital input 1/2/3 status	•			
M2.5	DI4	1	,		ID 13
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Digital input 4 status.	-			
M2.8	RO1, RO2				ID 557
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Relay output 1 and 2 state	 US.			
M5 - PI monitor.					
M5.1	PI setpoint				ID 16
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies
Description:	PI setpoint in process uni	ts.			
M5.2	PI feedback				ID 18
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies
Description:	PI feedback level in proce	ess units.			
M5.3	PI error value				ID 20
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies
Description:	PI error in process units.				

Table 36. Monitor (Cont.).

M5.4	PI output	'		'	ID 22
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	PI output.				
M5.5	PI status				ID 23
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Stopped; 1 = Running; or 2 = Sleep mode.				
Description:	PI status indication, in	dicates if drive is stopped, ru	nning in PI mode, or	in PI sleep mode.	

Table 37. Multi-pump status.

M7.1 - Operation mode.							
M7.1.1	Drive 1				ID 2218		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.		
Options:	0 = Offline; 1 = Slave drive; or 2 = Master drive.						
Description:	Provides the operating	mode of drive 1 while using	multi-pump mode.				
M7.1.2	Drive 2	·		,	ID 2230		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.		
Options:	0 = Offline; 1 = Slave drive; or 2 = Master drive.						
Description:	Provides the operating	mode of drive 2 while using	multi-pump mode.				
M7.1.3	Drive 3	'		'	ID 2242		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.		
Options:	0 = Offline; 1 = Slave drive; or 2 = Master drive.						
Description:	Provides the operating	mode of drive 3 while using	multi-pump mode.				
M7.1.4	Drive 4				ID 2254		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.		
Options:	0 = Offline; 1 = Slave drive; or 2 = Master drive.						
Description:	Provides the operating	mode of drive 4 while using	multi-pump mode.				
M7.1.5	Drive 5				ID 2266		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.		
Options:	0 = Offline; 1 = Slave drive; or 2 = Master drive.						
Description:	Provides the operating	mode of drive 5 while using	multi-pump mode.				

Table 37. Multi-pump status (Cont.).

M7.2 - Multi-pump s	tatus.				
M7.2.1	Drive 1	'			ID 2219
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	5
Options:	0 = Stopped; 1 = Sleep; 2 = Regulating; 3 = Wait for CMD 4 = Following; or 5 = Unknown.				
Description:	Provides the run state	us of drive 1 while using the m	ulti-pump mode.		
M7.2.2	Drive 2	'	'	'	ID 2231
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	5
Options:	0 = Stopped; 1 = Sleep; 2 = Regulating; 3 = Wait for CMD 4 = Following; or 5 = Unknown.				
Description:	Provides the run stati	us of drive 2 while using the m	ulti-pump mode.		
M7.2.3	Drive 3				ID 2243
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	5
Options:	0 = Stopped; 1 = Sleep; 2 = Regulating; 3 = Wait for CMD 4 = Following; or 5 = Unknown.				
Description:	Provides the run stati	us of drive 3 while using the m	ulti-pump mode.		
M7.2.4	Drive 4				ID 2255
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	5
Options:	0 = Stopped; 1 = Sleep; 2 = Regulating; 3 = Wait for CMD 4 = Following; or 5 = Unknown.				
Description:	Provides the run stati	us of drive 4 while using the m	ulti-pump mode.		
M7.2.5	Drive 5				ID 2267
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	5
Options:	0 = Stopped; 1 = Sleep; 2 = Regulating; 3 = Wait for CMD 4 = Following; or 5 = Unknown.				
Description:	Provides the run state	us of drive 5 while using the m	ulti-pump mode.		
					1
M7.3 - Network stat	us.				
M7.3.1	Drive 1				ID 2220

M7.3.1	Drive 1				ID 2220		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.		
Options:	0 = Disconnected; 1 = Fault; 2 = Pump lost; 3 = Need alternation; or 4 = No error.						
Description:	Provides the network status of drive 1 while using the multi-pump mode.						

Table 37. Multi-pump status (Cont.).

M7.3.2	Drive 2				ID 2232		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.		
Options:	0 = Disconnected; 1 = Fault; 2 = Pump lost; 3 = Need alternation; or 4 = No error.						
Description:	Provides the network sta	tus of drive 2 while using t	he multi-pump mode.				
M7.3.3	Drive 3				ID 2244		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.		
Options:	0 = Disconnected; 1 = Fault; 2 = Pump lost; 3 = Need alternation; or 4 = No error.						
Description:	Provides the network sta	tus of drive 3 while using t	he multi-pump mode.				
M7.3.4	Drive 4			,	ID 2256		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.		
Options:	0 = Disconnected; 1 = Fault; 2 = Pump lost; 3 = Need alternation; or 4 = No error.						
Description:	Provides the network sta	tus of drive 4 while using t	he multi-pump mode.				
M7.3.5	Drive 5	,		,	ID 2268		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.		
Options:	0 = Disconnected; 1 = Fault; 2 = Pump lost; 3 = Need alternation; or 4 = No error.						
	Provides the network status of drive 5 while using the multi-pump mode.						

Table 38. Multi-pump measurement.

M8.1 - Latest fault o	code.		
M8.1.1	Drive 1		ID 2221
Minimum value:	Maximum value:	Default value:	
Description:	Provides the latest fault code of drive 1 while using the multi-pump mode.		
M8.1.2	Drive 2		ID 2233
Minimum value:	Maximum value:	Default value:	
Description:	Provides the latest fault code of drive 2 while using the multi-pump mode.		
M8.1.3	Drive 3	,	ID 2245
Minimum value:	Maximum value:	Default value:	
Description:	Provides the latest fault code of drive 3 while using the multi-pump mode.		
M8.1.4	Drive 4		ID 2257
Minimum value:	Maximum value:	Default value:	
Description:	Provides the latest fault code of drive 4 while using the multi-pump mode.		
M8.1.5	Drive 5		ID 2269
Minimum value:	Maximum value:	Default value:	
Description:	Provides the latest fault code of drive 5 while using the multi-pump mode.		

M8.2 - Output frequ	ency.				
M8.2.1	Drive 1				ID 2222
Minimum value:	Hz	Maximum value:	Hz	Default value:	Hz
Description:	Provides the outpu	t frequency (Hz) of drive 1 while	using the multi-pum	ıp mode.	
M8.2.2	Drive 2				ID 2234
Minimum value:	Hz	Maximum value:	Hz	Default value:	Hz
Description:	Provides the outpu	t frequency (Hz) of drive 2 while	using the multi-pum	ip mode.	
M8.2.3	Drive 3	'		'	ID 2246
Minimum value:	Hz	Maximum value:	Hz	Default value:	Hz
Description:	Provides the outpu	t frequency (Hz) of drive 3 while	using the multi-pum	ip mode.	
M8.2.4	Drive 4			'	ID 2258
Minimum value:	Hz	Maximum value:	Hz	Default value:	Hz
Description:	Provides the outpu	t frequency (Hz) of drive 4 while	using the multi-pum	ip mode.	
M8.2.5	Drive 5	,		'	ID 2270
Minimum value:	Hz	Maximum value:	Hz	Default value:	Hz
Description:	Provides the outpu	t frequency (Hz) of drive 5 while	using the multi-pum	ip mode.	
	'				
M8.3 - Motor voltag	e.				
M8.3.1	Drive 1				ID 2223
Minimum value:	V	Maximum value:	V	Default value:	V

M8.3.1	Drive 1				ID 2223
Minimum value:	V	Maximum value:	V	Default value:	V
Description:	Provides the moto	or voltage (Vac) of drive 1 while us	ing the multi-pum	p mode.	
M8.3.2	Drive 2				ID 2235
Minimum value:	V	Maximum value:	V	Default value:	V
Description:	Provides the moto	or voltage (Vac) of drive 2 while us	ing the multi-pum	p mode.	
M8.3.3	Drive 3	'		'	ID 2247
Minimum value:	V	Maximum value:	V	Default value:	V
Description:	Provides the moto	or voltage (Vac) of drive 3 while us	ing the multi-pum	p mode.	
M8.3.4	Drive 4				ID 2259
Minimum value:	V	Maximum value:	V	Default value:	V
Description:	Provides the moto	or voltage (Vac) of drive 4 while us	ing the multi-pum	p mode.	
M8.3.5	Drive 5				ID 2271
Minimum value:	V	Maximum value:	V	Default value:	V
Description:	Provides the moto	or voltage (Vac) of drive 5 while us	ing the multi-pum	p mode.	

M8.4 - Motor current.

M8.4.1	Drive 1				ID 2224
Minimum value:	А	Maximum value:	А	Default value:	А
Description:	Provides the motor of	current (Amps) of drive 1 while o	ısing the multi-pum	np mode.	
M8.4.2	Drive 2	,			ID 2236
Minimum value:	А	Maximum value:	А	Default value:	А
Description:	Provides the motor of	current (Amps) of drive 2 while i	ısing the multi-pum	np mode.	
M8.4.3	Drive 3				ID 2248
Minimum value:	А	Maximum value:	А	Default value:	А
Description:	Provides the motor of	current (Amps) of drive 3 while i	ısing the multi-pum	np mode.	

Table 38. Multi-pump measurement (Con	Table 38.	t (Cont.).
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M8.4.4	Drive 4				ID 2260
Minimum value:	А	Maximum value:	А	Default value:	A
Description:	Provides the mo	otor current (Amps) of drive 4 while u	using the multi-pum	p mode.	
M8.4.5	Drive 5				ID 2272
Minimum value:	А	Maximum value:	A	Default value:	A
Description:	Provides the mo	otor current (Amps) of drive 5 while u	ısina the multi-num	n mode	

M8.5 - Motor torque.

M8.5.1	Drive 1	,		'	ID 2225
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Provides the moto	r torque (%) of drive 1 while using	the multi-pump mod	le.	
M8.5.2	Drive 2			,	ID 2237
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Provides the moto	r torque (%) of drive 2 while using	the multi-pump mod	le.	
M8.5.3	Drive 3	,		, ,	ID 2249
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Provides the moto	r torque (%) of drive 3 while using	the multi-pump mod	le.	
M8.5.4	Drive 4	,		'	ID 2261
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Provides the moto	r torque (%) of drive 4 while using	the multi-pump mod	le.	
M8.5.5	Drive 5				ID 2273
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Provides the moto	r torque (%) of drive 5 while using	the multi-pump mod	le.	

M8.6 - Motor power.

M8.6.1	Drive 1				ID 2226
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Provides the moto	or power (%) of drive 1 while using	the multi-pump mo	de.	
M8.6.2	Drive 2				ID 2238
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Provides the moto	or power (%) of drive 2 while using	the multi-pump mo	de.	
M8.6.3	Drive 3				ID 2250
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Provides the moto	or power (%) of drive 3 while using	the multi-pump mo	de.	
M8.6.4	Drive 4				ID 2262
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Provides the moto	or power (%) of drive 4 while using	the multi-pump mo	de.	
M8.6.5	Drive 5				ID 2274
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Provides the moto	or power (%) of drive 5 while using	the multi-pump mo	de.	

M8.7 - Motor speed.

M8.7.1	Drive 1				ID 2227	
Minimum value:	rpm	Maximum value:	rpm	Default value:	rpm	
Description:	Provides the m	Provides the motor speed (rpm) of drive 1 while using the multi-pump mode.				

Table 38. Multi-pump measurement (Con

M8.7.2	Drive 2				ID 2239				
Minimum value:	rpm	Maximum value:	rpm	Default value:	rpm				
Description:	Provides the motor sp	peed (rpm) of drive 2 while usir	ng the multi-pump mo	de.					
M8.7.3	Drive 3				ID 2251				
Minimum value:	rpm	Maximum value:	rpm	Default value:	rpm				
Description:	Provides the motor sp	Provides the motor speed (rpm) of drive 3 while using the multi-pump mode.							
M8.7.4	Drive 4				ID 2263				
Minimum value:	rpm	Maximum value:	rpm	Default value:	rpm				
Description:	Provides the motor sp	peed (rpm) of drive 4 while usir	ng the multi-pump mo	de.					
M8.7.5	Drive 5				ID 2275				
Minimum value:	rpm	Maximum value:	rpm	Default value:	rpm				
Description:	Provides the motor sp	peed (rpm) of drive 5 while usir	ng the multi-pump mo	de.					
M8.8 - Run time.									
M8.8.1	Drive 1				ID 2228				
Viinimum value:	Hours	Maximum value:	Hours	Default value:	Hours				
Description:	Provides the motor ru	Provides the motor run time (h) of drive 1 while using the multi-pump mode.							
W8.8.2	Drive 2				ID 2240				
Viinimum value:	Hours	Maximum value:	Hours	Default value:	Hours				
Description:	Provides the motor ru	Provides the motor run time (h) of drive 2 while using the multi-pump mode.							
VI8.8.3	Drive 3				ID 2252				
Minimum value:	Hours	Maximum value:	Hours	Default value:	Hours				
Description:	Provides the motor ru	ın time (h) of drive 3 while usin	g the multi-pump mod	de.					
VI8.8.4	Drive 4	,		,	ID 2264				
Minimum value:	Hours	Maximum value:	Hours	Default value:	Hours				
Description:	Provides the motor ru	ın time (h) of drive 4 while usin	g the multi-pump mod	de.					
W8.8.5	Drive 5	,		,	ID 2276				
Minimum value:	Hours	Maximum value:	Hours	Default value:	Hours				
Description:	Provides the motor ru	ın time (h) of drive 5 while usin	g the multi-pump mod	de.					
				'					
M9 - Multi-monitori	ng.								
M9.1	Multi-monitoring	,		,	ID 30				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0, 1, 2.				
Description:	Displays any three monitoring values in a single screen. The values are selectable via the keypad menu. Multi-monitor page could see three lines of monitoring values. Up and down keys can be used to select the row and then hitting the left arrow key will allow editing the value then by going up and down.								

Table 39. Parameters.

P1 - Basic paramete	rs.			,			
P1.1 ²	Minimum frequenc	ey .			ID 101		
Minimum value:	0.00 Hz	Maximum value:	400.00 Hz	Default value:	0.00 Hz		
Description:	Defines the lowest frequency at which the drive will operate. This setting will limit other frequency parameter settings. 1 = Fire mode minimum frequency. 2 = Derag. 3 = MPFC staging frequency. 4 = MPFC master fixed frequency. 5 = Prime pump frequency. 6 = Prime pump frequency 2.						
P1.2 ^②	Maximum frequen	Maximum frequency					
Minimum value:	0.00 Hz	Maximum value:	400.00 Hz	Default value:	MaxFreqMFG		
Description:	Defines the highest fr 1 = Keypad reference. 2 = Motor potentiome 3 = Jog speed. 4 = 2nd stage ramp fre 5 = Fire mode minimur 6 = Derag. 7 = MPFC staging freq 8 = MPFC master fixet 9 = Prime pump freque 10 = Prime pump freq 11 = Preset speed frec 12 = Frequency limit vi 13 = Reference limit vi 14 = Speed control_fs 15 = Stall frequency li 16 = 4 mA fault freque 17 = MPFC de-staging 18 = Pipe fill loss frequency 19 = Pipe fill loss frequency 20 = Presetan pieces						
P1.3 ^②	20 = Broken pipe frequ	Jency limit.			ID 103		
Minimum value:	0.1 s	Maximum value:	3.000.0 s	Default value:	20.0 s		
Description:		red for the output frequency t					
P1.4 ^②	Decel. time 1	,			ID 104		
Minimum value:	0.1 s	Maximum value:	3,000.0 s	Default value:	20.0 s		
Description:		red for the output frequency t	· · · · · · · · · · · · · · · · · · ·	frequency to zero frequen			
P1.6 ^①	Motor nom. curren	ID 486					
Minimum value:	DriveNomCurrCT*1/10) A Maximum value:	DriveNomCurrCT*2 A	Default value:	DriveNomCurrCT A		
Description:	Motor nameplate rate						
P1.7 ^①	Motor nom. speed	ID 489					
Minimum value:	300 rpm	Maximum value:	20,000 rpm	Default value:	MotorNomSpeedMFG		
Description:	Motor nameplate rate	d speed. This value is found of	on the rating plate of the mot	or.	·		
P1.8 ^①	Motor PF	•			ID 490		
Minimum value:	0.30	Maximum value:	1.00	Default value:	0.85		
Description:	Motor nameplate rate	d power factor. This value is	found on the rating plate of t	he motor.			
P1.9 ^①	Motor nom. voltag	· .	01		ID 487		
Minimum value:	180 V	Maximum value:	690 V	Default value:	MotorNomVoltMFG V		
Description:		d voltage. This value is found	on the rating plate of the mo	otor.			
P1.10 ^①	Motor nom. freque				ID 488		
			400.00.11	D (1/ 1			
Minimum value:	8.00 Hz	Maximum value:	400.00 Hz	Default value:	MotorNomFregMFG Hz		

Table 39. Parameters (Cont.).

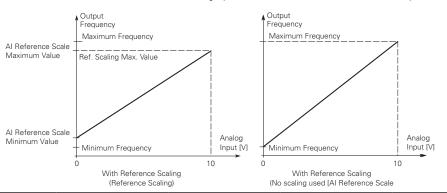
P1.11 ²	Local control place				ID 1695			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	0 = keypad; 1 = IO terminal; or 3 = fieldbus.							
Description:	Defines the signal location for the start command in local mode. I/O terminals would be from the digital hard-wired inputs or keypad for Start/Stop buttons on the drive. Keypad display will indicate which mode is selected.							
P1.12 ^{①②}	Local reference				ID 136			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1			
Options:	0 = Al; 1 = drive ref. pot; 4 = maximum frequency; 6 = keypad; or 7 = fieldbus ref.							
Description:	Defines the signal location for the speed reference in local mode.							
P1.13 ^②	Remote control place ID 135							
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	0 = IO terminal; 1 = fieldbus; or 3 = keypad.							
Description:	Defines the signal location for the start command in remote mode. I/O terminals would be from the digital hard-wired inputs or keyp for Start/Stop buttons on the drive. Keypad display will indicate which mode is selected.							
P1.14 ^{①②}	Remote reference				ID 137			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	0 = Al; 1 = drive reference pot; 4 = maximum frequency; 6 = keypad; or 7 = fieldbus reference.							
	Defines the signal location for the speed reference in remote mode.							

Table 40. Inputs.

P2.1 - Basic settings.								
P2.1.1 ^②	Al reference scale minimum value			ID 144				
Minimum value:	0.00 Hz	Maximum value:	RefScaleMax Hz	Default value:	0.00 Hz			
Description:	Defines the minimum frequency associated with 0% input from the analog input. Setting AI reference scale minimum value and AI reference scale maximum value both to zero will cause the analog input to scale to the minimum and maximum frequencies.							
P2.1.2 ^②	Al reference scale maximim value				ID 145			
Minimum value:	RefScaleMin Hz	Maximum value:	400.00 Hz	Default value:	0.00 Hz			

Description:

Defines the maximum frequency associated with 100% input from the analog input. Setting AI reference scale minimum value and AI reference scale maximum value both to zero will cause the analog input to scale to the minimum and maximum frequencies.

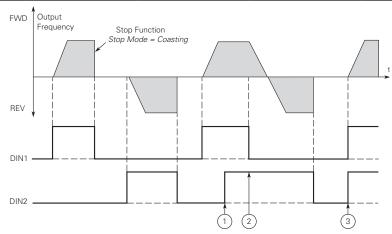


P2.1.3 ^{①②}	IO terminal Start/Stop logic			ID 143			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0		
Options:	0 = Forward - reverse: maintained input on start signal 1 to run forward and a maintained signal on start signal 2 for run 1 = Start - reverse: maintained input on start signal 1 to run forward and a maintained signal on start signal 2 for reve 2 = Start - enable: maintained input on start signal 1 to run forward and a maintained signal on start signal 2 to enable 3 = Start pulse - stop pulse: used for three-wire operation, start signal 1 uses a normally open start and start signal 2 closed stop.						
Description:	Defines the func	tionality for start signal 1 and start	signal 2. By de	fault, start signal 1 is DI1 and start sign	nal 2 is DI2.		

0 = P3.2: 10 terminal start signal 1 = start forward - P3.3: 10 terminal start signal 2 = start reverse. This would be considered 2-wire control with either a contact used on the start FWD or start REV commands. When contacts open, the motor stops.

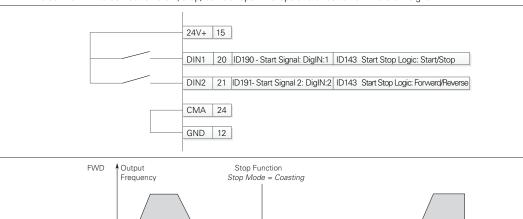


Table 40. Inputs (Cont.).



- **Notes:** ① The first selected direction has the highest priority. ② When the DIN1 contact opens the direction of rotation

 - If start forward (DIN1) and start reverse (DIN2) signals are active simultaneously the start forward signal (DIN1)
- 1 = P3.2: IO terminal start signal 1 = start forward P3.3: IO terminal start signal 2 = start reverse. This would be considered 2-wire control with a contact on start/stop, contact open it stops and direction on 2nd start signal.



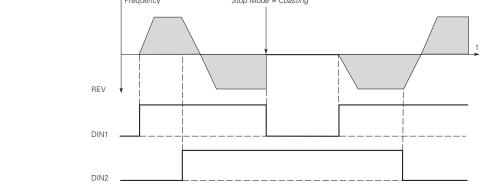
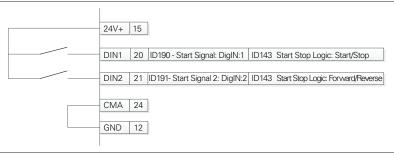
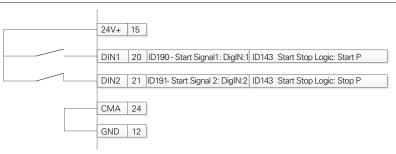


Table 40. Inputs (Cont.).

2 = P3.2: DI closed contact = start/open contact = stop P3.3: IO terminal start signal 1 = start forward - P3.3: IO terminal start signal 2 = start reverse. This would be considered 3-wire control with start signal 2 required to be closed to enable start on start signal 1.



3 = Three-wire connection (pulse control): P3.2: I0 terminal start signal 1 = start forward - P3.3: I0 terminal start signal 2 = start reverse. This would be considered 3-wire control with start signal 1 being the start pulse and start signal 2 being the NC stop.



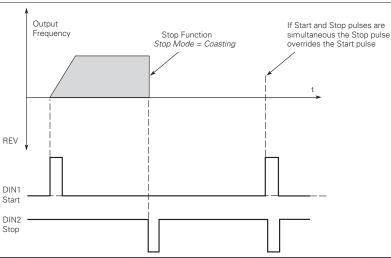


Table 40. Inputs (Cont.).

P2.2 - Digital input.					
P2.2.1 ^②	DI1 function	'		'	ID 1801
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	P2.1.3; 2 = IO terminal start signar P2.1.3; 3 = Reverse - when start/4 = Ext. fault 1 - when clo 5 = Ext. fault 2 - when clo 6 = Ext. fault 3 - when clo 7 = Fault reset - when clo 8 = Run enable - when clo 9 = Preset speed B0 - the 10 = Preset speed B1 - the 11 = Preset speed B1 - the 11 = Preset speed B1 - the 12 = Jog enable - when cl 13 = Accel. pot value - wh 14 = Decel. pot value - wh 15 = Reset pot zero - whe 16 = Accel./decel. time se 17 = Accel./decel. prohibit 18 = No access to parame 19 = Remote control - when 20 = Local control - when 21 = Parameter 1/2 sel v 22 = Pl controller - when 22 = Pl set point select - v 24 = Motor interlock 1 - w 25 = Smoke mode - when clo 27 = Fire mode reference fire mode reference 28 = Fire mode reverse - v 29 = DC brake active - wh 30 = Preheat active - when 31 = Preheat act	stop logic is set to 3 start p sed, ext. fault 1 will be act sed, ext. fault 2 will be act sed, ext. fault 2 will be act sed, ext. fault 3 will be act sed, all active faults will be sed, the drive will allow a 7 preset speeds are select e 7 preset speeds are select e 7 preset speeds are select e 7 preset speeds are select e 1 preset speed definer ten closed, the motor potent en closed, the motor potent en closed, the motor potent et - when open, accel./dece t - when closed, the drive vill et et when open, parameter set when open, parameter set when closed, motor will be active. The closed, smoke mode will be active. 1/2 sel when fire mode is 2 will be active;	ce is set to IO to consider the considerate of the	inputs, this is least significant bit in tha inputs; inputs, this is most significant bit in the override the frequency reference; will increment at the rate defined by moverlide the frequency reference; will increment at the rate defined by moverlide to zero; used; when closed accel./decel. time: put frequency and ignore changes to the de to any setting in the drive; mote control place; al control place; n closed parameter set 2 is active; purce to Pl controller output; when closed, set point 2 is active; sinput is open, fire mode reference 1 we pen, direction will be forward: when closed, in closed, when closed the controller output;	orm the action defined by in the reverse direction; t binary input; at binary input; btor pot ramp time; otor pot ramp time; 2 will be used; e reference value; when closed,
Description:	Defines the function of di	gital input 1.			

Table 40. Inputs (Cont.).

P2.2.3 ^②	DI2 function				ID 1803
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	0 = Not Used, no a 1 = I0 terminal sta P2.1.3; 2 = I0 terminal sta P2.1.3; 3 = Reverse - wher 4 = Ext. fault 1 - w 5 = Ext. fault 2 - w 6 = Ext. fault 3 - w 7 = Fault reset - wl 8 = Run enable - w 9 = Preset speed 11 = Preset speed 12 = Jog enable - v 13 = Accel. pot val 14 = Decel. pot val 15 = Reset pot zerc 16 = Accel./decel. 17 = Accel./decel. 18 = No access to 19 = Remote control 21 = Parameter 1/2 22 = Pl controller - 23 = Pl set point se 24 = Motor interlor 25 = Smoke mode - w 27 = Fire mode refe fire mode refe 28 = Fire mode refe 29 = DC brake acti 30 = Preheat active	ction; rt signal 1 - when the control sou rt signal 2 - when the control sou n start/stop logic is set to 3 start hen closed, ext. fault 1 will be act hen closed, ext. fault 2 will be act hen closed, ext. fault 3 will be act hen closed, ext. fault 3 will be act hen closed, ext. fault 3 will be act hen closed, the drive will allow a 0 - the 7 preset speeds are sele B1 - the 7 preset speeds are sele B2 - the 7 preset poeds a	pulse stop pulse, the trivated; stivated; stivated; stivated; stivated; stivated; stivated; stivated; stivated; stivated; stivated is a start command and ted via 3 binary inported via 4 binary inported via 4 binary inported via 5 binary inported via 6 binary inpor	ninal this input when closed will per ninal this input when closed will per nis input will cause the drive to star d be in the ready state; uts, this is least significant bit in the puts; puts, this is most significant bit in the rite the frequency reference; Il increment at the rate defined by reset to zero; led; when closed accel./decel. time to any setting in the drive; both control place; control place; control place; cother control place; co	form the action defined by form the action defined by form the action defined by in the reverse direction; at binary input; notor pot ramp time; notor pot ramp time; 2 will be used; he reference value; will be active: when closed,
Description:	Defines the function	on of digital input 2			

Table 40. Inputs (Cont.).

P2.2.5 ^②	DI3 function		,	ID 1805
Minimum value:	N.A. Maximum value:	N.A.	Default value:	4
Options:	0 = Not Used, no action; 1 = IO terminal start signal 1 - when the control P2.1.3; 2 = IO terminal start signal 2 - when the control P2.1.3; 3 = Reverse - when start/stop logic is set to 3 s' 4 = Ext. fault 1 - when closed, ext. fault 1 will bt 5 = Ext. fault 2 - when closed, ext. fault 2 will bt 6 = Ext. fault 3 - when closed, ext. fault 3 will bt 7 = Fault reset - when closed, all active faults wt 8 = Run enable - when closed, the drive will allo 9 = Preset speed B0 - the 7 preset speeds are st 10 = Preset speed B2 - the 7 preset speeds are st 11 = Preset speed B2 - the 7 preset speeds are st 12 = Jog enable - when closed, the motor pt 14 = Decel. pot value - when closed, the motor pt 15 = Reset pot zero - when closed, the motor pt 16 = Accel./decel. time set - when open, accel./ 17 = Accel./decel. prohibit - when closed, the drive will st 20 = Local control - when closed, the drive will st 21 = Parameter 1/2 sel when open, parameter 22 = Pl controller - when closed, the drive will st 23 = Pl set point select - when open, parameter 24 = Motor interlock 1 - when closed, motor will st 25 = Smoke mode - when closed, fire mode will be 27 = Fire mode reference 2 will be active; 28 = Fire mode reference 2 will be active; 29 = DC brake active - when closed, DC injection 30 = Preheat active - when closed, the Derag. cy	source is set to 10 te tart pulse stop pulse, a activated; a activated; a activated; a activated; a start command a elected via 3 binary inselected via 3 binary in before the result be offered to the result be inselected via active; and this inselected via active; and this insput is on braking will be active; or	rminal this input when closed will per this input will cause the drive to start and be in the ready state; nputs, this is least significant bit in the inputs; inputs, this is most significant bit in the verride the frequency reference; will increment at the rate defined by mill decrement at the rate defined by mill reset to zero; used; when closed accel./decel. time the to any setting in the drive; note control place; I control place; I control place; I control place; I control place; urce to PI controller output; when closed, set point 2 is active; input is open, fire mode reference 1 when, direction will be forward: when closed, when closed, when closed when closed per mode reference 1 when, direction will be forward: when closed, when closed, when closed when c	form the action defined by in the reverse direction; it binary input; at binary input; otor pot ramp time; lotor pot ramp time; 2 will be used; e reference value;
Description:	Defines the function of digital input 3.			

P2.2.7 ^②	DI4 function				ID 1807
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	7
Options:	0 = Not Used, no actio 1 = I0 terminal start si P2.1.3; 2 = I0 terminal start si P2.1.3; 3 = Reverse - when startsi 4 = Ext. fault 1 - when 5 = Ext. fault 2 - when 6 = Ext. fault 3 - when 7 = Fault reset - when 8 = Run enable - when 9 = Preset speed B0 - 1 10 = Preset speed B1 - 1 11 = Preset speed B2 -	gnal 1 - when the control sou gnal 2 - when the control sou art/stop logic is set to 3 start closed, ext. fault 1 will be ac closed, ext. fault 2 will be ac closed, ext. fault 3 will be ac closed, all active faults will be closed, the drive will allow a the 7 preset speeds are selec the 7 preset speeds are selec	rce is set to IO terminal to rce is set to IO terminal to pulse stop pulse, this inputivated; tivated; tivated; e reset; start command and be inted via 3 binary inputs, to cted via 3 binary inputs, sted via 3 binary inputs,	this input when closed will per this input when closed will per out will cause the drive to start in the ready state; his is least significant bit in the	form the action defined by form the action defined by t in the reverse direction; at binary input;
	14 = Decel. pot value - 15 = Reset pot zero - w 16 = Accel./decel. time 17 = Accel./decel. prof 18 = No access to para 19 = Remote control - v 20 = Local control - w 21 = Parameter 1/2 sel 22 = Pl controller - wh 23 = Pl set point select 24 = Motor interlock 1 25 = Smoke mode - w 26 = Fire mode - when 27 = Fire mode referen	when closed, the motor poter when closed, the motor potent is set - when open, accel./dec when closed, the drive ameters - when closed, the drive will be nen closed, the drive will be fel when open, parameter set en closed, the drive will force t - when open, parameter set - when closed, motor will be nen closed, the drive will be nen closed, smoke mode will be closed, fire mode will be act closed, fire mode will be act closed, fire mode will be act closed when fire mode	ntiometer value will decriometer value will reset el. time 1 will be used; v will hold the output frequences can be made to an forced to the remote co corced to the Local control is active: when closed the reference source to point 1 is active: when cenabled to run; be active; ve;	when closed accel./decel. time uency and ignore changes to th y setting in the drive; introl place; il place; d parameter set 2 is active; Pl controller output;	notor pot ramp time; 2 will be used; ne reference value;
escription:	29 = DC brake active - 30 = Preheat active - v	e - when fire mode is active a when closed, DC injection br when closed, preheat mode w hen closed, the Derag. cycle	aking will be active; ill be active; or	ection will be forward: when cl	losed, reverse;
<u> </u>	28 = Fire mode reverse 29 = DC brake active - 30 = Preheat active - v 31 = Derag. enable - w Defines the function o	e - when fire mode is active a when closed, DC injection br when closed, preheat mode w hen closed, the Derag. cycle	aking will be active; ill be active; or		
2.3 - Preset speed.	28 = Fire mode reverse 29 = DC brake active - 30 = Preheat active - v 31 = Derag. enable - w Defines the function of	e - when fire mode is active a when closed, DC injection br when closed, preheat mode w hen closed, the Derag. cycle	aking will be active; ill be active; or		105
2.3 - Preset speed. 2.3.1 [©]	28 = Fire mode reverse 29 = DC brake active - 30 = Preheat active - v 31 = Derag. enable - w Defines the function o	e - when fire mode is active a when closed, DC injection br when closed, preheat mode w hen closed, the Derag. cycle	aking will be active; ill be active; or		105
2.3 - Preset speed. 2.3.1 [©] linimum value:	28 = Fire mode reverse 29 = DC brake active - 30 = Preheat active - v 31 = Derag. enable - w Defines the function of Preset speed 1 Preset speed 1	e - when fire mode is active a when closed, DC injection br when closed, preheat mode w when closed, the Derag. cycle f digital input 4.	aking will be active; Ill be active; or for pumps will be initiate MaxFreq Hz	ed.	105 ID 105
P2.3 - Preset speed. P2.3.1 [©] Minimum value: Description:	28 = Fire mode reverse 29 = DC brake active - 30 = Preheat active - v 31 = Derag. enable - w Defines the function of Preset speed 1 Preset speed 1	e - when fire mode is active a when closed, DC injection br when closed, preheat mode w when closed, the Derag. cycle f digital input 4.	aking will be active; Ill be active; or for pumps will be initiate MaxFreq Hz	ed.	105 ID 105
22.3 - Preset speed. 22.3.1 [®] //inimum value: Description:	28 = Fire mode reverse 29 = DC brake active - 30 = Preheat active - v 31 = Derag. enable - w Defines the function of Preset speed 1 Preset speed 1 0.00 Hz Preset speed is selected	e - when fire mode is active a when closed, DC injection br when closed, preheat mode w when closed, the Derag. cycle f digital input 4.	aking will be active; Ill be active; or for pumps will be initiate MaxFreq Hz	ed.	105 ID 105 5.00 Hz
22.3 - Preset speed. 22.3.1 [©] Minimum value: Description: 22.3.2 [©] Minimum value:	28 = Fire mode reverse 29 = DC brake active - 30 = Preheat active - v 31 = Derag. enable - w Defines the function of Preset speed 1 0.00 Hz Preset speed 2 0.00 Hz	e - when fire mode is active a when closed, DC injection bry when closed, preheat mode when closed, the Derag. cycle f digital input 4. Maximum value: ed with digital inputs using a	aking will be active; Ill be active; or for pumps will be initiate MaxFreq Hz binary input. MaxFreq Hz	Default value:	105 ID 105 5.00 Hz ID 106
P2.3 - Preset speed. P2.3.1 [®] Minimum value: Pescription: P2.3.2 [®] Minimum value: Pescription:	28 = Fire mode reverse 29 = DC brake active - 30 = Preheat active - v 31 = Derag. enable - w Defines the function of Preset speed 1 0.00 Hz Preset speed 2 0.00 Hz	e - when fire mode is active a when closed, DC injection bry when closed, preheat mode when closed, the Derag. cycle of digital input 4. Maximum value: ed with digital inputs using a Maximum value:	aking will be active; Ill be active; or for pumps will be initiate MaxFreq Hz binary input. MaxFreq Hz	Default value:	105 ID 105 5.00 Hz ID 106
P2.3 - Preset speed. P2.3.1® Winimum value: Description: P2.3.2® Winimum value: Description: P2.3.3®	28 = Fire mode reverse 29 = DC brake active - 30 = Preheat active - v 31 = Derag. enable - w Defines the function of Preset speed 1 Preset speed 1 0.00 Hz Preset speed 2 0.00 Hz Preset speed is selected Preset speed is selected	e - when fire mode is active a when closed, DC injection bry when closed, preheat mode when closed, the Derag. cycle of digital input 4. Maximum value: ed with digital inputs using a Maximum value:	aking will be active; Ill be active; or for pumps will be initiate MaxFreq Hz binary input. MaxFreq Hz	Default value:	105 ID 105 5.00 Hz ID 106 10.00 Hz
P2.3 - Preset speed. P2.3.1 [®] Minimum value: P2.3.2 [®] Minimum value: P2.3.3 [®] Minimum value: P2.3.3 [®] Minimum value:	28 = Fire mode reverse 29 = DC brake active - v 30 = Preheat active - v 31 = Derag. enable - w Defines the function or Preset speed 1 0.00 Hz Preset speed 2 0.00 Hz Preset speed is selected Preset speed 3 0.00 Hz	e - when fire mode is active a when closed, DC injection browner closed, preheat mode when closed, the Derag. cycle of digital input 4. Maximum value: ed with digital inputs using a maximum value: ed with digital inputs using a with digital inputs using a maximum value:	MaxFreq Hz	Default value: Default value:	105 ID 105 5.00 Hz ID 106 10.00 Hz
22.3 - Preset speed. 22.3.1 [®] //inimum value: // Description: 22.3.2 [®] //inimum value: // Description: 22.3.3 [®] //inimum value: // Description: // Description:	28 = Fire mode reverse 29 = DC brake active - v 30 = Preheat active - v 31 = Derag. enable - w Defines the function or Preset speed 1 0.00 Hz Preset speed 2 0.00 Hz Preset speed is selected Preset speed 3 0.00 Hz	when fire mode is active a when closed, DC injection browner closed, preheat mode when closed, the Derag. cycle of digital input 4. Maximum value: ed with digital inputs using a maximum value: ed with digital inputs using a maximum value:	MaxFreq Hz	Default value: Default value:	105 ID 105 5.00 Hz ID 106 10.00 Hz
2.3 - Preset speed. 2.3.1 [©] Minimum value: Description: 2.3.2 [©] Minimum value: Description: 2.3.3 [©] Minimum value: Description: 2.3.4 [©]	28 = Fire mode reverse 29 = DC brake active - 30 = Preheat active - 31 = Derag. enable - w Defines the function of Preset speed 1 Preset speed 1 0.00 Hz Preset speed 2 0.00 Hz Preset speed is selected Preset speed 3 0.00 Hz Preset speed 3 Preset speed is selected	when fire mode is active a when closed, DC injection browner closed, preheat mode when closed, the Derag. cycle of digital input 4. Maximum value: ed with digital inputs using a maximum value: ed with digital inputs using a maximum value:	MaxFreq Hz	Default value:	105 ID 105 5.00 Hz ID 106 10.00 Hz ID 118 15.00 Hz
22.3 - Preset speed. 22.3.1 [©] Minimum value: Description: 22.3.2 [©] Minimum value: Description: 22.3.3 [©] Minimum value: Description: 22.3.4 [©] Minimum value:	28 = Fire mode reverse 29 = DC brake active - v 30 = Preheat active - v 31 = Derag. enable - w Defines the function or Preset speed 1 Preset speed 1 0.00 Hz Preset speed is selected Preset speed 3 0.00 Hz Preset speed is selected Preset speed 4 0.00 Hz	when fire mode is active a when closed, DC injection browner closed, preheat mode when closed, the Derag. cycle of digital input 4. Maximum value: ed with digital inputs using a maximum value:	MaxFreq Hz MaxFreq Hz MaxFreq Hz MaxFreq Hz binary input. MaxFreq Hz binary input.	Default value: Default value: Default value:	105 ID 105 5.00 Hz ID 106 10.00 Hz ID 118 15.00 Hz
P2.3 - Preset speed. P2.3.1 [®] Winimum value: P2.3.2 [®] Winimum value: P2.3.3 [®] Winimum value: P2.3.3 [®] Winimum value: P2.3.4 [®] Winimum value: P2.3.4 [®] Winimum value: P2.3.4 [®] Winimum value:	28 = Fire mode reverse 29 = DC brake active - v 30 = Preheat active - v 31 = Derag. enable - w Defines the function or Preset speed 1 Preset speed 1 0.00 Hz Preset speed is selected Preset speed 3 0.00 Hz Preset speed is selected Preset speed 4 0.00 Hz	when fire mode is active a when closed, DC injection browner closed, preheat mode when closed, the Derag. cycle of digital input 4. Maximum value: ed with digital inputs using a maximum value:	MaxFreq Hz MaxFreq Hz MaxFreq Hz MaxFreq Hz binary input. MaxFreq Hz binary input.	Default value: Default value: Default value:	105 ID 105 5.00 Hz ID 106 10.00 Hz ID 118 15.00 Hz
P2.3 - Preset speed. P2.3.1® Winimum value: P2.3.2® Winimum value: P2.3.3® Winimum value: P2.3.3® Winimum value: P2.3.4® Winimum value: P2.3.4® Winimum value: P2.3.5®	28 = Fire mode reverse 29 = DC brake active - 30 = Preheat active - 31 = Derag. enable - w Defines the function o Preset speed 1 Quantification of the preset speed 1 Quantification of the preset speed 2 Quantification of the preset speed 2 Quantification of the preset speed 3 Quantification of the preset speed 4 Quantification of the preset speed 4	when fire mode is active a when closed, DC injection browner closed, preheat mode when closed, the Derag. cycle of digital input 4. Maximum value: ed with digital inputs using a maximum value:	MaxFreq Hz MaxFreq Hz MaxFreq Hz MaxFreq Hz binary input. MaxFreq Hz binary input.	Default value: Default value: Default value:	105 ID 105 5.00 Hz ID 106 10.00 Hz ID 118 15.00 Hz ID 119 20.00 Hz
P2.3 - Preset speed. P2.3.1 [©] Minimum value: P2.3.2 [©] Minimum value: P2.3.3 [©] Minimum value: P2.3.3 [©] Minimum value: P2.3.3 [©] Minimum value: P2.3.4 [©] Minimum value: P2.3.5 [©] Minimum value: P2.3.5 [©] Minimum value:	28 = Fire mode reverse 29 = DC brake active - 30 = Preheat active - v 31 = Derag. enable - w Defines the function of Preset speed 1 Preset speed 1 0.00 Hz Preset speed 3 0.00 Hz Preset speed is selected Preset speed 4 0.00 Hz Preset speed 4 0.00 Hz Preset speed 5 0.00 Hz Preset speed 5 0.00 Hz	when fire mode is active a when closed, DC injection browner closed, preheat mode when closed, the Derag. cycle of digital input 4. Maximum value: ed with digital inputs using a maximum value:	MaxFreq Hz binary input.	Default value: Default value: Default value: Default value:	105 ID 105 5.00 Hz ID 106 10.00 Hz ID 118 15.00 Hz ID 119 20.00 Hz
Description: P2.3 - Preset speed. P2.3.1® Minimum value: Description: P2.3.2® Minimum value: Description: P2.3.3® Minimum value: Description: P2.3.4® Minimum value: Description: P2.3.5® Minimum value: Description: P2.3.6®	28 = Fire mode reverse 29 = DC brake active - 30 = Preheat active - v 31 = Derag. enable - w Defines the function of Preset speed 1 Preset speed 1 0.00 Hz Preset speed 3 0.00 Hz Preset speed is selected Preset speed 4 0.00 Hz Preset speed 4 0.00 Hz Preset speed 5 0.00 Hz Preset speed 5 0.00 Hz	when fire mode is active a when closed, DC injection browner closed, preheat mode when closed, the Derag. cycle of digital input 4. Maximum value: ed with digital inputs using a maximum value:	MaxFreq Hz binary input.	Default value: Default value: Default value: Default value:	105 ID 105 5.00 Hz ID 106 10.00 Hz ID 118 15.00 Hz ID 119 20.00 Hz
P2.3 - Preset speed. P2.3.1® Winimum value: P2.3.2® Winimum value: P2.3.3® Winimum value: P2.3.3® Winimum value: P2.3.3® Winimum value: P2.3.4® Winimum value: P2.3.5® Winimum value: P2.3.5® Winimum value: P2.3.5® Winimum value:	28 = Fire mode reverse 29 = DC brake active - 30 = Preheat active - 31 = Derag. enable - w 31 = Derag. enable - w Defines the function of Preset speed 1 0.00 Hz Preset speed is selected Preset speed 3 0.00 Hz Preset speed is selected Preset speed 4 0.00 Hz Preset speed 4 0.00 Hz Preset speed 5 0.00 Hz Preset speed 5 0.00 Hz Preset speed 5 0.00 Hz	when fire mode is active a when closed, DC injection browner closed, preheat mode when closed, the Derag. cycle of digital input 4. Maximum value: ed with digital inputs using a maximum value:	MaxFreq Hz binary input.	Default value: Default value: Default value: Default value:	105 ID 105 5.00 Hz ID 106 10.00 Hz ID 118 15.00 Hz ID 119 20.00 Hz ID 120 25.00 Hz

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Table 40. Inputs (Cont.).

P2.3.7 ^②	Preset speed 7	,			ID 122
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	35.00 Hz
Description:	Preset speed is se	elected with digital inputs using a	binary input.		

P2.4 - Al settings.

P2.4.1	Al mode	'	'	'	ID 222
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = 0 - 20 mA; or 1 = 0 - 10 V.				

Description:

Defines the analog input mode to current or voltage the DIP switches on control board will need to be set to the same mode as this parameter.

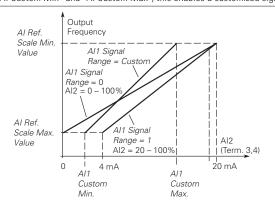
*DM1 PRO CN5 terminals 8 and 9 for current or voltage, also need to set DIP switches SW2 2 and 3 on control board, near the RJ45 port.

DIP switches SW2 2 and 3 off for voltage.

Current mode, if using the +10 V supply on CN5 terminals 13 of the DM1 / DM1 Pro, it will require DIP switches SW2 2 and 3 on to complete the current loop. When doing a current loop with an external supply, the DIP switches SW2 2 off and 3 on.

Table 40. Inputs (Cont.).

P2.4.2 ^②	Al signal range	•			ID 175	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0	
Options:	0 = 0-100%/0-20 1 = 20-100%/4-20					
Description:	With this parameter, you can select the analog input 1 signal range.					
	For selection "Cus	stomized " see "Al Custom Min" a	nd "ΔI Custom Max"	this enables a customized signal r	anne	



[©] Parameter value can only be changed after the drive has stopped.
© Parameter value will be set to be default when changing macros.

P3.1 - Digital outpu	ıt.				
P3.1.1 ^②	RO1 function	,	'		ID 152
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	2 = Run - 'drive is I 3 = Fault - drive is 4 = Fault invert - c 5 = Warning - driv 6 = Reverse - driv 7 = At speed - driv 8 = Zero frequenc 9 = Frequency limi 10 = PI supervisio 11 = Torque limit s 12 = Reference lini 13 = Power limit s 14 = Temperature 15 = Analog input 16 = Motor curren 17 = Over heat fau 18 = Over current 19 = Over volt reg 20 = Under volt reg 20 = Under volt reg 21 = 4 mA fault - 4 22 = External faul 23 = Motor therm 24 = STO fault out 25 = Control from 26 = Remote cont 27 = Unrequested 28 = Fire mode - d 29 = Damper cont 30 = Valve control 31 = Jog speed - 6 32 = Fieldbus inpu 33 = Fieldbus inpu 34 = DC charge s 35 = Preheat activ 36 = Cold weathe 37 = PI sleep - PI o 38 = 2nd stage ra 39 = Prime pump a 40 = Master drive 41 = Slave drive s	s ready for operation; running;	ne set reference; y; quency limit 1 is activated; e limit; ference limit; limit; drive temperature ling input limit; or current limit; rred; enabled; d; ccurred; rated; nand location; n is not the same as word; word; s closed; ted; time 2 is active ump mode; Irive in the multi-pure in the multi-purp of	mit; the reference direction; mp control mode; control mode;	

Table 41. Outputs (Cont.).

P3.1.4 ^②	RO2 function				ID 153
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	3
Options:	7 = At speed - drive output 8 = Zero frequency - drive 9 = Frequency limit super 10 = Pl supervision - supe 11 = Torque limit supervis 12 = Reference limit super 13 = Power limit supervis 14 = Temperature limit su 15 = Analog input supervi 16 = Motor current superv 17 = Over heat fault - driv 18 = Over current regular 19 = Over volt regular - ov 20 = Under volt regular - ov 20 = Under volt regular - ov 21 = 4 mA fault - 4 mA fau 22 = External fault - exter 23 = Motor thermal fault - 24 = STO fault output - sa 25 = Control from IO - I/O 26 = Remote control - rem 27 = Unrequested rotation 28 = Fire mode - drive is in 29 = Damper control - dar 30 = Valve control - valve 31 = Jog speed - drive is in 22 = Fieldbus input 1 - cor 33 = Fieldbus input 1 - cor 34 = DC charge switch clc 35 = Preheat active - pre 36 = Cold weather active 37 = Pl sleep - Pl controlle 38 = 2nd stage ramp freq 39 = Prime pump active - 40 = Master drive state - 41 = Slave drive state -	into taulted; warning message; butting reverse phase rota ut frequency has reached t output is at zero frequency vision - supervision for free rvision for Pl controller is a ion - supervision for torque rvision - supervision for torque pervision - supervision for power pervision - supervision for mor e over heat fault has occu- over current regulator is rer volt regulator is enable under volt regulator is enable unter volt regulat	ne set reference; y; yuency limit 1 is activities activated; e limit; ference limit; limit; drive temperature linit; or current limit; rred; enabled; d; ccurred; enabled; d; ccurred; enabled; d; ccurred; enabled; d; ccurred; enabled; d; dime 2 is active ump mode; lime 2 is active ump mode; linte multi-pume in the multi-pume	nit; the reference direction; np control mode;	
Description: P3.3 - Analog output.	Defines the function asso	ciated with changing the s	state of relay output 2	<u>L</u> .	
P3.3.1 [©]	AO mode				ID 227
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = 0 - 20 mA; or 1 = 0 - 10 V.				
Description:	Defines the analog output	t mode to current or voltag	e.		

Table 41. Outputs (Cont.).

P3.3.2 ^②	AO function	'			ID 146	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1	
Options:	2 = Frequency re 3 = Motor speed 4 = Motor speed 4 = Motor curren 5 = Motor torque 6 = Motor voltag 8 = DC bus volta; 9 = Pl setpoint (p 10 = Pl error valu 11 = Pl output (p 12 = Analog inpu 13 = Drive refere 14 = Fieldbus pro 15 = Fieldbus pro 16 = Fieldbus pro 17 = Fieldbus pro 18 = Fieldbus pro 19 = Fieldbus pro 20 = Fieldbus pro 21 = Fieldbus pro 22 = User define 23 = Motor torqu	ency (0 -max frequency); ference (0 - max frequency); RPM (0 - nameplate RPM); t (0 - calculated nominal); (0 - calculated nominal); e (0 - nameplate voltage); ge (0 - 1000 Vdc); rocess unit minimum - process unit e (process unit minimum - process unit t (0% - 100%); nces data input 1 (0% - 100%); ncess data input 1 (0% - 100%); ncess data input 2 (0% - 100%); ncess data input 3 (0% - 100%); ncess data input 4 (0% - 100%); ncess data input 5 (0% - 100%); ncess data input 5 (0% - 100%); ncess data input 8 (0% - 100%);	unit maximum); maximum);	um);		
Description:	Select the functi	on desired to the terminal AO1.		·	·	

^② Parameter value will be set to be default when changing macros.

Table 42. Drive control.

P4.1 - Basic settings	s.				
P4.1.1 ^②	Keypad reference				ID 141
Minimum value:	MinFreq	Maximum value:	MaxFreq	Default value:	0.00 Hz
Description:	Keypad reference valu	е.			
P4.1.3 ^②	Keypad stop	'		'	ID 114
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:				operate when the control source is drive regardless of control mode.	s set to keypad.
Description:	Enabled or always ena	bled keypad operation.			
P4.1.4 ^①	Reverse enabled	'		,	ID 1679
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Disabled; or 1 = Enabled.				
Description:	Enables or disables th	e reverse motor direction.			
P4.1.5	Change phase seq	uence motor	,	'	ID 2515
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Change disable; or 1 = Change enable.				
Description:	This parameter allows	for swapping the motor phas	e output from u, v, w	to u, w, v.	

Table 42. Drive control (Cont.).

P4.1.6 ^②	Power up local remo	ote select			ID 1685
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Hold last; 1 = Local control; or 2 = Remote control.				
Description:				d. The default setting will hold the lostart in that mode regardless of la	
P4.1.8 ^②	Start mode			,	ID 252
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Description:	last operating frequence 2 = Flying start from ma	ency as a starting point. ximum frequency - The driv ting frequency as a starting	e will catch a spinni	otor. This setting searches for the or ing motor. This setting searches for	, , ,
P4.1.9 ²	Stop mode			,	ID 253
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:		top command, the motor coa op command, the speed of th		ntrolled by the drive. ated according to the set deceleration	on parameters.
Description:	Selects the stop mode of	pperation.			
P4.1.10 ^②	Ramp 1 shape				ID 247
Minimum value:	0.0 s	Maximum value:	10.0 s	Default value:	0.0 s
Description:				moothed with these parameters. So o react immediately to the changes i	

The start and end of the acceleration and deceleration ramps can be smoothed with these parameters. Setting a value of 0.00 seconds gives a linear ramp shape that causes acceleration and deceleration to react immediately to the changes in the reference signal. Setting a value from 0.10 to 10.00 seconds for this parameter produces an S-shaped acceleration/deceleration at the start and stop of the slope.

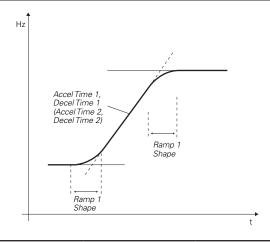


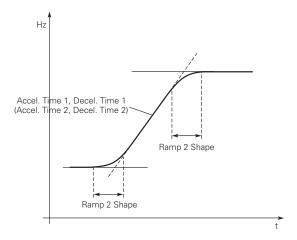
Table 42. Drive control (Cont.).

P4.1.11 ^②	Ramp 2 shape				ID 248
Minimum value:	0.0 s	Maximum value:	10.0 s	Default value:	0.0 s

Description:

The start and end of the acceleration and deceleration ramps can be smoothed with these parameters. Setting a value of 0.00 gives a linear ramp shape that causes acceleration and deceleration to react immediately to the changes in the reference signal.

Setting a value from 0.10 to 10.00 seconds for this parameter produces an S-shaped acceleration/deceleration at the start and stop of the slope.

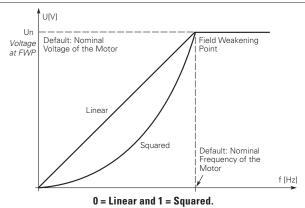


P4.1.12 ^②	Accel. time 2				ID 249				
Minimum value:	0.1 s	Maximum value:	3000.0 s	Default value:	10.0 s				
Description:	These values corre frequency.	These values correspond to the time required for the output frequency to accelerate from the zero frequency to the set maximum frequency.							
		provide the possibility to set two e programmable digital input.	different acceleratio	n/deceleration time sets for one a	application. The active set can				
P4.1.13 ^②	Decel. time 2				ID 250				
Minimum value:	0.1 s	Maximum value:	3000.0 s	Default value:	10.0 s				
Description:	These values corre frequency.	These values correspond to the time required for the output frequency to decelerate from the set maximum frequency to the zero frequency.							
		provide the possibility to set two e programmable digital input.	different acceleratio	n/deceleration time sets for one a	application. The active set can				
P4.1.14 ^{①②}	2nd Stage ramp	frequency			ID 2444				
Minimum value:	MinFreq.	Maximum value:	MaxFreq.	Default value:	30.00 Hz				
Description:		mp frequency is the frequency le ed for other inputs or devices to		e will enable the 2nd stage ramp f vel.	requency output function.				

 $^{^{\}scriptsize \textcircled{\tiny 1}}$ Parameter value can only be changed after the drive has stopped. $^{\scriptsize \textcircled{\tiny 2}}$ Parameter value will be set to be default when changing macros.

Table 43. Motor control.

P5.1 - Basic settings	s.			
P5.1.1 ^{①②}	Motor control mode	-		ID 287
Minimum value:	N.A. Maximum value:	N.A.	Default value:	0
Options:	0 = Frequency control - Output frequency is contr 1 = Speed control - Output frequency is controlle 2 = Open loop vector control - Similar to the stan identification. 3 = PM control 1 - PM motor control mode 1, use 4 = PM control 2 - PM motor control mode 2, use	d by giving a frequenc dard speed control mo d for SPM (surface mo	y reference to it with slip compensa de, higher performance slip calcula unted permanent magnet) and it als	tion requires running a motor so can be used for IPM.
Description:	Selects the motor control mode.			
P5.1.2 ^①	Current limit		'	ID 107
Minimum value:	DriveNomCurrCT*1/10 A Maximum value:	DriveNomCurr(CT*2 A Default value:	DriveNomCurrCT*3/2 A
Description:	This parameter determines the maximum output Once the motor current hits this level, it goes into			
P5.1.3 [©]	V/Hz optimization	'	,	ID 109
Minimum value:	N.A. Maximum value:	N.A.	Default value:	0
Options:	0 = Disable torque boost function. 1 = Enable torque boost function.			
Description:	Automatic torque boost - the voltage to the moto and run at low frequencies with high loads.	or increases automatic	ally, which assists the motor to pro	duce sufficient torque to start
P5.1.4 ^{①②}	V/Hz ratio		,	ID 108
Minimum value:	N.A. Maximum value:	N.A.	Default value:	0
Options:	0 = Linear - the voltage of the motor changes line where the nominal voltage is supplied. A line 1 = Squared - the voltage of the motor changes for weakening point where the nominal voltage is produces less torque and electromechanical the load is proportional to the square of the second the load is proportional to the square of the second the load is proportional to the square of the second the load is proportional to the square of the second the load is proportional to the square of the second the load is proportional to the square of the square control to the square control which will reduce the load is square to the load is proportional to the square control which will reduce the load is square to the load is square control which will reduce the load is square to the load is sq	ear V/Hz ratio should bollowing a squared cur so supplied. The motor noise. A squared V/Hz speed. an be programmed with ogrammable V/Hz curv s to search for the min	é used in constant torque applicative with the frequency in the area from under magnetized below the tratio can be used in applications when three different points. These points can be used if the other settings imum motor current in order to savi	ons. rom 0 Hz to the field field weakening point and where the torque demand of hts are the 0 frequency do not satisfy the needs of the energy. This mode is called
Description:	Selects the V/Hz ratio. 0 = Linear; 1 = Squared; 2 = Programmable; or 3 = Linear + flux optimization.			



P5.1.10 ^②	Switching frequenc	Switching frequency					
Minimum value:	MinSwitchFreq kHz	Maximum value:	MaxSwitchFreq kHz	Default value:	DefaultSwitchFreqCT kHz		
Description:	Sets the switching freq	uency for the PWM output v	vaveform.				

Table 43. Motor control (Cont.).

P5.1.16 ^{①②}	Identification			'	ID 299
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:		motor stator resistor is otor is supplied with cur	completed then t rent and voltage	can be done with load attached. the motor is run. This must be comple but at zero frequency. nly.	ted with unloaded motor.
Description:	parameters to improve start will be active then set back	ing torque and open loo to 0 when completed. \	p vector control բ Vhen a run comn	cle of the motor once complete the driv performance. Once set and a run command is issued, the message on the key ification, a fault message will be displ	mand is given, the operation ypad will indicate "Auto

Parameter value can only be changed after the drive has stopped.
 Parameter value will be set to be default when changing macros.

Table 44. Protections

P6.1 - Motor.									
P6.1.4 ^{©©} Minimum value:	Motor thermal p	protection			ID 310				
	N.A.	Maximum value:	N.A.	Default value:	2				
Options:		de after fault according to param de after fault always by coasting							
Description:	calculated motor to		r on values of the di	stage based off the % of calculate rive and monitoring values as the di e of the motor to 0%.					
P6.1.5 ^②	Motor thermal I	O current			ID 311				
Minimum value:	0.00%	Maximum value:	150.00%	Default value:	100.00%				
Description:	The current can be	set between 0 - 150.0% x InMot	or. This parameter	sets the value for thermal current a	at zero frequency				

The current can be set between 0 - 150.0% x InMotor. This parameter sets the value for thermal current at zero frequency.

The default value is set assuming that there is no external fan cooling the motor. If an external fan is used, this parameter can be set to

Note: The value is set as a percentage of the motor nameplate data, P1.6 (nominal current of the motor), not the drive's nominal output current. The motor's nominal current is the current that the motor can withstand in direct on-line use without being overheated. If you change the parameter nominal current of motor, this parameter is automatically restored to the default value. Setting this parameter does not affect the maximum output current of the drive.

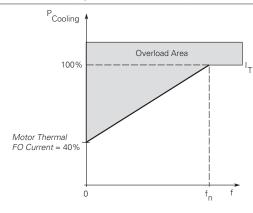


Table 44. Protections (Cont.).

P6.2 - Drive.		1	1		1				
P6.2.2 ^{①②}	Input phase fault				ID 332				
Viinimum value:	N.A.	Maximum value:	N.A.	Default value:	2				
Options:	3 = Fault, stop mode a								
Description:	The input phase supe	rvision ensures that the input	phases of the frequency of	converter have approximately	equal current draw.				
P6.2.3 ^{①②}	4 mA input fault				ID 306				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0				
Options:	3 = Warning, the pres 4 = Fault, stop mode a								
Description:				nce signal is used and the sign rammed into relay outputs RO					
P6.2.4 ^{①②}	4 mA fault freque	псу			ID 331				
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	0.00				
Description:	When 4 mA fault hap	pens, the output frequency of	drive goes to this preset	speed when P6.2.3 = 3.					
P6.2.5 ^{①②}	External fault	,		'	ID 307				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2				
Options:	0 = No action; 1 = Warning; 2 = Fault, stop mode a 3 = Fault, stop mode a	ofter fault according to parame ofter fault always by coasting.	eter stop mode.						
Description:				t signal in the programmable (o					
P6.2.11 ^②	STO fault respons	е	'	'	ID 2427				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2				
Options:	1 = Warning - drive in	will stop, no indication shown, dicate warning/if STO clears o ndicate fault/require reset to s	drive will run without rese						
Description:	STO fault response de	efines the function of how the	STO input will be seen or	n the keypad and how the driv	e functions to it.				
P6.2.12 ^①	PI feedback AI los	s response			ID 2401				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0				
Options:	0 = No action; 1 = Warning; 2 = Fault; or 3 = Warning: preset for	requency (P6.2.13).							
Description:	This parameter define feedback.	es the function of the PI feedba	ack analog input loss resp	oonse. If the AI feedback is lo	st based off the programed A				
P6.2.13 ^{①②}	PI feedback Al los	s pre-frequency			ID 2402				
Viinimum value:	0.00 Hz	Maximum value:	400.00 Hz	Default value:	0.00 Hz				
Description:	This parameter define	s the frequency the master w	ould run to if a feedback	is lost and P6.2.12 was set to	option 3.				
P6.2.14 ^②	PI feedback AI los	s pipe fill			ID 2403				
Viinimum value:	0.0 varies	Maximum value:	1000.0 varies	Default value:	0.0 varies				
Description:		in the pump based off the me 13 "loss of prime" occurs.	asured level. If the value	drops below this level for the	time in P6.2.15 and below,				

Table 44. Protections (Cont.).

P6.2.15 ^②	PI feedback AI	ID 2404			
Minimum value:	0.0 s	Maximum value:	6,000.0 s	Default value:	0.0 s
Description:	PI feedback AI los frequency in P6.2. 0 seconds.	s pre-frequency timeout - when P 15 for the time set here. After thi	6.2.12 is set to 3 or 4, v s time, the drive will fa	when the feedback signal is lost, ault out on "feedback loss". The	the drive will run at the time is disabled when set to

P6.3 - Communications.

P6.3.1 ^{①②}	Fieldbus fault resp	onse			ID 334	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2	
Options:	0 = No action; 1 = Warning; 2 = Fault; or 3 = Fault, coast.					
Description:	communication port.			e is used and communication is lost eldbus control to set fault or warnir		
	OPTcard fault response ID 33					
P6.3.2 ^{①②}	OPTcard fault resp	onse			ID 335	
P6.3.2 ^{①②} Minimum value:	OPTcard fault resp	onse Maximum value:	N.A.	Default value:	2 2	
	<u>·</u>		N.A.	Default value:		

Table 45. PI Controller.

P7.1 - Basic setting	s.				
P7.1.1 ^②	PI control gain				ID 1294
Minimum value:	0.00%	Maximum value:	200.00%	Default value:	100.00%
Description:	Defines the gain of 100%, a change of	f the PI Controller. It adjust the s f 10% in the error value causes th	lope of the speed incre e controller output to c	ease according to the initial of the	ne load. If this value is set to
P7.1.2 ^②	PI control itime	•		'	ID 1295
			202.22	54 1: 1	
Minimum value:	0.00 s	Maximum value:	600.00 s	Default value:	1.00 s

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① Parameter value can only be changed after the drive has stopped. ② Parameter value will be set to be default when changing macros.

Table 45. Pl Controller (Cont.).

P7.1.3 ^{①②}	PI process unit				ID 1297
linimum value:	N.A.	Maximum value:	N.A.	Default value:	0
ptions:	0 = %;				
	1 = 1/min.; 2 = rpm;				
	3 = ppm;				
	4 = pps; 5 = l/s;				
	6 = I/min.;				
	7 = I/h;				
	8 = kg/s; 9 = kg/min.;				
	10 = kg/h;				
	11 = m3/s; 12 = m3/min.;				
	13 = m3/h;				
	14 = m/s; 15 = mbar;				
	16 = bar;				
	17 = Pa; 18 = kPa;				
	19 = MVS;				
	20 = kW;				
	21 = Deg. C; 22 = GPM;				
	23 = gal/s;				
	24 = gal/min.; 25 = gal/h;				
	26 = lb/s;				
	27 = lb/min.; 28 = lb/h;				
	29 = CFM;				
	30 = ft ³ /s; 31 = ft ³ /min.;				
	$31 = 11 / 11111.$, $32 = ft^3/h$;				
	33 = ft/s;				
	34 = in. wg; 35 = ft wg;				
	36 = PSI;				
	37 = lb/in.2; 38 = HP;				
	39 = Deg. F;				
	40 = PA; 41 = WC;				
	42 = HG;				
	43 = ft; 44 = m;				
escription:	Defines the unit type fo	r PI feedback unit.			
7.1.4 ^②	PI process unit min	imum			ID 1298
inimum value:	-99999.99 varies	Maximum value:	PI Process Unit Max	Default value:	0.00 varies
escription:	Defines the minimum p	rocess unit value.			
7.1.5 ^②	PI process unit max				ID 1300
linimum value:	PI Process Unit Min	Maximum value:	99999.99 varies	Default value:	100.00 varies
escription:	Defines the maximum p	rocess unit value.			
7.1.6 ^{①②}	PI error inversion				ID 1303
inimum value:	N.A.	Maximum value:	N.A.	Default value:	0
ptions:	U = Normal - if feedbac 1 = Inverted - if feedbac	k is less than set-point, PI co ck is less than set-point, PI c	introller output increases. ontroller output decreases.		
escription:	Defines the way the pro	ocess value output reacts to	the feedback signal.		
7.1.7 ^②	PI dead band				ID 1304
inimum value:	-99999.99 varies	Maximum value:	99999.99 varies	Default value:	0 varies
escription:	PI doad hand around so	tnoint in process units. This	is the hand where no action	ons occur to prevent oscillati	on or reneated activation/

Table 45. PI Controller (Cont.).

P7.1.8 ^②	PI dead band d	lelay			ID 1306	
Minimum value:	0.00 s	Maximum value:	320.00 s	Default value:	0.00 s	
Description:	If the PI process v level out again.	value goes out of the dead band ar	ea for the desired time	e delay, at that point the controll	er will re-initialize and try to	
P7.1.9 ^②	PI ramp time	'			ID 1311	
Minimum value:	0.00 s	Maximum value:	300.00 s	Default value:	0.00 s	
Description:	D.C. (1	Defines the rising and falling ramp times for changes in the process value.				

[©] Parameter value can only be changed after the drive has stopped. © Parameter value will be set to be default when changing macros.

Table 46. Setpoint.

P7.2.1 - Standard.	'	'	'	'	'
P7.2.1.1 ^②	PI keypad setpoint	1			ID 1307
Minimum value:	PI Process Unit Min	Maximum value:	PI Process Unit Max	Default value:	0.00 varies
Description:	Keypad PI reference va	lue setpoint 1.			
P7.2.1.2 ^②	PI keypad setpoint	2	,		ID 1309
Minimum value:	PI Process Unit Min	Maximum value:	PI Process Unit Max	Default value:	0.00 varies
Description:	Keypad PI reference va	lue setpoint 2.			
P7.2.1.3 ^②	PI wake-up action		,	,	ID 2466
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:					
Description:	This parameter defines	the wake-up function action	l.		

P7.2.2.1 ^①	PI setpoint 1 source				ID 1312
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Not used; 1 = PI keypad setpoint 1; 2 = PI keypad setpoint 2; 3 = AI; 4 = Drive reference pot; 5 = FB process data input 6 = FB process data input 7 = FB process data input 8 = FB process data input 9 = FB process data input 10 = FB process data input 11 = FB process data input 12 = FB process data input 13 = FB PI setpoint 1; or 14 = FB PI setpoint 2.	2; 3; 4; 5; t 6; t 7;			
Description:	Defines source of the setp fieldbus message.	point value the drive uses.	This can either be	an internal preset value, keypad se	tpoint, analog signal, o
P7.2.2.2 ^①	PI setpoint 1 sleep en	able			ID 1315
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disabled; or 1 = Enabled.				
Description:	This function will disable t			ne sleep frequency for the sleep de	ay time. The output

Table 46. Setpoint (Cont.).

P7.2.2.3 ^②	PI setpoint 1 sleep d	elay			ID 1317
Minimum value:	0.00 s	Maximum value:	3,000.00 s	Default value:	0.00 s
Description:			nt drops below the sleep level t large fluctuations when goi		
P7.2.2.4 ^②	PI setpoint 1 wake-u	p level	,		ID 1318
Minimum value:	-99999.99 varies	Maximum value:	99999.99 varies	Default value:	0.00 varies
Description:		PI feedback value to go abcaled based off the PI unit	ove top enable the PI output t min./max, values.	o be re enabled. This val	ue is based of the % of
P7.2.2.5 ^②	PI setpoint 1 boost				ID 1320
Minimum value:	-2.00 varies	Maximum value:	2.00 varies	Default value:	1.00 varies
Description:	The setpoint can be boos	sted via a multiplier value.			
P7.2.2.6 ^②	PI setpoint 1 sleep le	evel			ID 2450
Minimum value:	PID1_ProcessUnitMin Hz	Maximum value:	PID1_ProcessUnitMax Hz	Default value:	0.00 Hz
Description:		th the unit value is used to drive into the sleep mode.	look at to go into the sleep m	ode. When the unit drops	s below this level for the slee
P7.2.2.7 ^②	SP1 sleep mode over	cycle time			ID 1842
Minimum value:	0.00 varies	Maximum value:	10.00 varies	Default value:	0.00 varies
Description:	cycle" fault. One cycle is defined whe	en the drive transfers from	o mode. If multiple times don normal mode to sleep mode. and clear "pump over cycle" f	•	drive would trip on "pump ove
P7.2.2.8 ^②	SP1 sleep mode max	imum cycle time			ID 1843
Minimum value:	0.00 s	Maximum value:	3,600.00 s	Default value:	300.00 s
Description:	Defines the maximum tin	ne for sleep over cycle che	cking.		

P7.2.3 - Setpoint 2.

P7.2.3.1 ^①	PI setpoint 2 sour	ce			ID 1321
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Not used; 1 = PI keypad setpoin 2 = PI keypad setpoin 3 = AI; 4 = Drive reference p. 5 = FB process data in 7 = FB process data in 8 = FB process data in 9 = FB process data 10 = FB process data 11 = FB process data 12 = FB process data 13 = FB PI setpoint 1; 14 = FB PI setpoint 2.	t 2; pot; nput 1; nput 2; nput 3; nput 4; nput 5; nput 6; input 6; input 7; input 8;			
Description:	Defines source of the fieldbus message.	setpoint value the drive uses.	This can either be	e an internal preset value, keypad se	tpoint, analog signal, or
P7.2.3.2 ^①	PI setpoint 2 sleep	o enable		,	ID 1324
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disabled; or 1 = Enabled.				
Description:		able the output when the frequency		the sleep frequency for the sleep del	ay time. The output

Table 46. Setpoint (Cont.).

P7.2.3.3 ^②	PI setpoint 2 sleep de	elay			ID 1326			
Minimum value:	0.00 s	Maximum value:	3,000.00 s	Default value:	0.00 s			
Description:			nt drops below the sleep level t large fluctuations when goin					
P7.2.3.4 ^②	PI setpoint 2 wake-up	level			ID 1327			
Minimum value:	-99999.99 varies	Maximum value:	99999.99 varies	Default value:	0.00 varies			
Description:		PI feedback value to go aborated based off the PI unit	ove top enable the PI output t min./max, values.	o be re enabled. This val	ue is based of the % of			
P7.2.3.5 ^②	PI setpoint 2 boost		'		ID 1329			
Minimum value:	-2.00 varies	Maximum value:	2.00 varies	Default value:	1.00 varies			
Description:	The setpoint can be boos	The setpoint can be boosted via a multiplier value.						
P7.2.3.6 ^②	PI setpoint 2 sleep le	vel			ID 2452			
Minimum value:	PID1_ProcessUnitMin Hz	Maximum value:	PID1_ProcessUnitMax Hz	Default value:	0.00 Hz			
Description:		n the unit value is used to drive into the sleep mode.	ook at to go into the sleep mo	ode. When the unit drops	s below this level for the slee			
P7.2.3.7 ^②	SP2 sleep mode over	cycle time			ID 1844			
Minimum value:	0.00 varies	Maximum value:	10.00 varies	Default value:	0.00 varies			
Description:	cycle" fault. One cycle is defined whe	n the drive transfers from	o mode. If multiple times don normal mode to sleep mode. and clear "pump over cycle" f	•	drive would trip on ″pump ονε			
P7.2.3.8 ^②	SP2 sleep mode maxi	mum cycle time			ID 1845			
Minimum value:	0.00 s	Maximum value:	3,600.00 s	Default value:	300.00 s			
Description:	Defines the maximum tim	e for sleep over cycle ched	cking.					

[©] Parameter value can only be changed after the drive has stopped.
© Parameter value will be set to be default when changing macros.

Table 47. Feedback .

P7.3.1 - Standard.									
P7.3.1.1 ^②	PI feedback gair	1			ID 1331				
Minimum value:	-1,000.00%	Maximum value:	1,000.00%	Default value:	100.00%				
Description:	Defines gain associ	ated with the feedback signal fr	om the measuring devic	ce.					

P7.3.2 - Feedback 1.

P7.3.2.1 ^①	PI feedback 1 so	ource		'	ID 1332	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2	
Options:	0 = Not used; 1 = Al; 2 = Drive reference 3 = FB process data 11 = FB PI feedback	input 1; or				
Description:	Defines where feed	back signal is being fed into the	drive, via analog or fi	eldbus data value.		
P7.3.2.2 ^②	PI feedback 1 m	inimum	,		ID 1333	
Minimum value:	-200.00 %	Maximum value:	200.00%	Default value:	0.00%	
Description:	Minimum unit value	e for the feedback signal.				

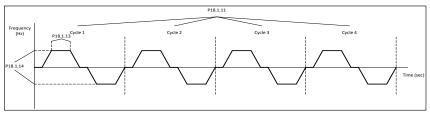
Table 47. Feedback (Cont.).

P7.3.2.3 ^②	PI feedback 1 n	naximim			ID 1334
Minimum value:	-200.00 %	Maximum value:	200.00%	Default value:	100.00%
Description:	Maximim unit valu	e for the feedback signal.			

[©] Parameter value can only be changed after the drive has stopped. @ Parameter value will be set to be default when changing macros.

Table 48. Pump parameters.

•					
P9.1 - Derag (*DM1	PRO).				
P9.1.1 ^②	Derag cycles	'	'	'	ID 2468
Minimum value:	0.00	Maximum value:	10.00	Default value:	3.00
Description:	This parameter defin	es the number of cycles in the	forward/reverse direction	on for removing any debris in sy	/stem.
P9.1.2 ^②	Derag at Start/St	ор			ID 2469
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0.00
Options:	0 = Off; 1 = Start; 2 = Stop; 3 = Start and stop; 4 = Digital input; or 5 = Current.				
Description:	Defines how the dera	age function will become activa	ated; start, stop, both, o	r based off the digital input.	
P9.1.3 ^②	Deragging run tin	ne			ID 2470
Minimum value:	1.00 s	Maximum value:	3,600.00 s	Default value:	0.00 s
Description:	Defines the length of	f time the drive will run at the o	derag speed in the forwa	ard and reverse direction.	
P9.1.4 ^②	Derag speed				ID 2471
Minimum value:	MinFreq Hz	Maximum value:	MaxFreq Hz	Default value:	5.00 Hz
Description:	Defines the frequenc	y the drive will run at in the fo	rward/reverse direction	when in the derag mode.	



P9.1.5 ^②	Derag off delay	'			ID 2472
Minimum value:	1.00 s	Maximum value:	600.00 s	Default value:	10.00 s
Description:	Defines the length of	of time the drive will run the der	ag function when enal	bled at stop.	
P9.1.6 ^{①②}	Derag current	'			ID 1879
Minimum value:	А	Maximum value:	А	Default value:	0.00 A

P9.2 - Start/stop timing (*DM1 PRO).

P9.2.1 ^{①②}	Valve start				ID 1847
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Normal; 1 = Damper start; 2 = Damper tout; or 3 = Damper delay.				
Description:	This parameter determines	the function of damper.			

Table 48. Pump parameters (Cont.).

P9.2.2 ^{①②}	Valve timeout	ID 1848							
Minimum value:	1.00 s	Maximum value:	32,500.00 s	Default value:	5.00 s				
Description:	The timeout time used treceived.	The timeout time used for an interlocked time start, after which the start sequence must be restarted if no received.							
P9.2.3 ^{①②}	Valve delay				ID 1849				
Minimum value:	1.00 s	Maximum value:	32,500.00 s	Default value:	5.00 s				
Description:	The delay time followin	g a delay start, after which	the frequency converter v	will be started.					
P9.2.4 ^{①②}	Back spin delay				ID 2423				
Minimum value:	0.00 s	Maximum value:	32,500.00 s	Default value:	0.00 s				
Description:				another run command can be will then start. This is true fo					
P9.2.5 ^{①②}	Minimum run time				ID 1813				
Minimum value:	0.00 s	Maximum value:	32,500.00 s	Default value:	0.00 s				
Description:	Drive minimum run time	l.							
P9.2.6 ^②	Minimum frequency	ramp time	,		ID 1850				
Minimum value:	0.10 s	Maximum value:	2,000.00 s	Default value:	10.00				
Description:	Ramp time for output to	minimum frequency.							
P9.3 - Multi-pump n	nulti-drive (*DM1 PRO).								
P9.3.1 ^{①②}	Multi-pump mode				ID 2279				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0				
Options:	0 = Disabled or 1 = Multi-drive network								
Description:	0 = Single drive - single	of drives being used in the drive for main motor, contac ollower sequence with mult	ctors used on other motor	: rs; or					
P9.3.2 ^{①②}	Number of drives				ID 2449				
Minimum value:	1	Maximum value:	5	Default value:	1				
Description:		r of drives active when doing		nd fan scheme. By default, the					

Table 34. Pump parameters (Cont.).

P9.3.3 ^{①②}	Drive ID				ID 2278
Minimum value:	0	Maximum value:	5	Default value:	0
Description:		the drive address when usir onitored at this drive ID valu		. Based off this ID, the drive	enables in the desired
P9.3.4 ^{①②}	Regulation source	'		'	ID 2284
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Network only or 1 = PI controller.				
Description:	For drives that have bee to be the master.	en connected with both star	t/stop signal and PI feedb	ack - can be set up as "Feedb	ack", so they will have ability
P9.3.5 ²	PI bandwidth				ID 2458
Minimum value:	0.00 varies	Maximum value:	6,000.00 varies	Default value:	10.00 varies
Description:	Percentage based off th	ne setpoint above and below	which defines when the	auxiliary motor will come onli	ne or offline.

Table 34. Pump parameters (Cont.).

P9.3.6 ^{①②}	Staging frequency				ID 2315
Minimum value:	MinFreq	Maximum value:	400.00	Default value:	50.00
Description:	Output frequency is above	ve stagging frequency and F	PI error is out of PI band	width - motor should add to sys	tem.
P9.3.7 [©]	De-staging frequenc	у			ID 2316
Minimum value:	0.00	Maximum value:	MaxFreq	Default value:	0.00
Description:	Output frequency is belo	w de-stagging frequency a	nd PI error is out of PI ba	andwidth - motor should remove	e from system.
P9.3.8 ^②	Add/remove delay				ID 344
Minimum value:	0.00 s	Maximum value:	3,600.00 s	Default value:	10.00 s
Description:	With feedback outside t	ne bandwidth, this time mu	st pass before motors/p	umps are added or removed fro	m the system.
P9.3.9 ^②	Interlock enabled				ID 350
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disabled or 1 = Enabled.				
Description:	This parameter enables offline.	the drive to look at the digit	al input interlocks to tel	l which motor is available for ru	unning or if they were brough
P9.3.10 ^{①②}	Recovery method				ID 2285
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Automatic or 1 = Stop.				
Description:		slave when multi-drive sys will stop immediately if it		e slave drive can continue run	if it set to be "Automatic".
P9.3.11 ^②	Add/remove drive se	lection			ID 2311
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Drive ID or 1 = Run time.				
Description:	In default, MPFC system drive's running time: add	will add/remove pump acc the drive that has shortest	ording to their drive ID, f running time and remov	rom small to large. The order over the drive that has longest ru	can also depend on each slav nning time first.
P9.3.12 ^②	Run time enabled				ID 2280
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disabled or 1 = Enabled.				
Description:	The run time counter wil	I start counting only if this	parameter is enabled.		
P9.3.13 ^②	Run time limit	,	'	,	ID 2281
Minimum value:	0.00 h	Maximum value:	300,000.00 h	Default value:	0.00 h
Description:	If drive run time is over t	his limit, its network status	will be "Need Alternati	ion". Limit equals 0 means run	time counter disabled.
P9.3.14	Run time reset				ID 2283
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = No action or 1 = Reset.				
Description:	One-time parameter, set	to be 1 will clear run time	counter.		
P9.3.15 ^②	Master drive mode				ID 2473
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Follow PI; 1 = Fixed speed; or 2 = Turn off.				
Description:	Defines how the master	drive will maintain the freq	uency control when slav	res are brought in; follow PI, fix	ed speed or turn off

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Table 34. Pump parameters (Cont.).

P9.3.16 ^②	Master fixed spe	eed			ID 2474
Minimum value:	MinFreq Hz	Maximum value:	MaxFreq Hz	Default value:	50.00 Hz
Description:	Defines the fixed sp	peed frequency when the master	r drive mode is set for fi	xed speed control when slaves	are brought in.
P9.3.17 ^②	Master fixed spe	eed delay	'		ID 2475
Minimum value:	0.00 s	Maximum value:	1,000.00 s	Default value:	5.00 s
Description:	Defines the delay to or turn off.	me before the master drive begi	ins running at the fixed	speed or turns off if the maste	r mode is set for fixed spe

P9.4 - Pipe fill (Loss of prime) (*DM1 PRO).

P9.4.1 [©]	Pipe fill loss respon	nse			ID 2410
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = No action; 1 = Warning; 2 = Fault; or 3 = Fault, coast.				
Description:	Defines the response r	nethod when a "loss of prime	" condition occurs.		
P9.4.2 ^{①②}	Pipe fill loss detec	tion method	,	'	ID 2406
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Motor current; 1 = Motor power (%); c 2 = Motor torque (%).	or			
Description:	Defines the value for lo	ooking at a loss of prime.			
P9.4.3 ^②	Pipe fill loss low le	evel			ID 2407
Minimum value:	0.00 varies	Maximum value:	1,000.00 varies	Default value:	0.00 varies
Description:	If the monitor value is	less than low level value and	the output frequency is m	ore than low frequency, chec	k the pipe fill loss start.
P9.4.4 ^{①②}	Pipe fill loss low fr	equency			ID 2409
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	0.00 Hz
Description:	Defines the frequency disabled.	point at which the drive need	ls to be above to enable th	ne "loss of prime" feature. W	hen set to 0 Hz, protection
P9.4.5 ^②	Pipe fill loss high l	evel			ID 1851
Minimum value:	0.00 varies	Maximum value:	1,000.00 varies	Default value:	0.00 varies
Description:	If the monitor value is loss start.	more than high level (the high	n level is not 0) and the ou	tput frequency is more than h	nigh frequency, check pipe f
P9.4.6 ^{①②}	Pipe fill loss high f	requency	,	,	ID 1852
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	0.00 Hz
Description:	Defines high frequency is disabled.	point at which the drive nee	ds to be above to enabled	the "loss of prime" feature.	When set to 0 Hz, protection
P9.4.7 ^②	Pipe fill loss time	,	,	'	ID 2408
Minimum value:	0.00 s	Maximum value:	600.00 s	Default value:	0.00 s
Description:	Defines the delay time	before a "loss of prime" cond	dition will occur based of t	he detection method and prir	me loss level.
P9.4.8 ^②	Pipe fill loss attem	pts			ID 2411
Minimum value:	0.00	Maximum value:	10.00	Default value:	1.00
Description:	Defines the amount of	attemps to auto restart the o	drive on a "prime loss" con	dition.	

Table 34. Pump parameters (Cont.).

P9.5 - Prime pump (DM1 PRO).				
P9.5.1 ^②	Prime pump enable				ID 2428
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disabled; or 1 = Enabled.				
Description:	Prime pump enable.				
P9.5.2 ^②	Prime pump level				ID 2429
Minimum value:	0.00 varies	Maximum value:	6,000.00 varies	Default value:	0.00 varies
Description:	This defines the level at w deactivated. If the level is			edback level raises above th	is value, pre-charge becomes
P9.5.3 ^②	Prime pump frequency	,	'	'	ID 2431
Minimum value:	MinFreq Hz	Maximum value:	MaxFreq Hz	Default value:	0.00 Hz
Description:	Frequency at which the pre	-charge function will ope	rate when enabled.		
P9.5.4 ^②	Prime pump delay time	9		'	ID 2432
Minimum value:	0.00 min.	Maximum value:	3,600.00 min.	Default value:	0.00 min.
Description:	This is the time that the dr	ive will run the pre-charg	e function on start up. Wh	nen set to "O Hz", this functio	n is not enabled.
P9.5.5 ^②	Prime pump loss of pr	ime level			ID 2433
Minimum value:	0.00 varies	Maximum value:	1,000.00 varies	Default value:	0.00 varies
Description:	Selects the limit to indicate the prime loss of time sett				value for the value assigned i
P9.5.6 ^②	Prime pump level 2				ID 2434
Minimum value:	0.00 varies	Maximum value:	6,000.00 varies	Default value:	0.00 varies
Description:	This defines the level at w deactivated. If the level is	hich the pre-charge funct not reached, it will switc	ion will drop out. If the fee h after the delay time.	edback level raises above th	is value, pre-charge becomes
P9.5.7 ^②	Prime pump frequency	2	'	'	ID 2436
Minimum value:	MinFreq Hz	Maximum value:	MaxFreq Hz	Default value:	0.00 Hz
Description:	Frequency at which the pre	-charge level 2 will opera	ate at when enabled.		
P9.5.8 ^②	Prime pump delay time	e 2			ID 2437
Minimum value:	0.00 s	Maximum value:	3,600.00 s	Default value:	0.00 s
Description:	This is the time that the dr	ive will run at the 2nd lev	el pre-charge function leve	el. When set to "O Hz", this f	unction is not enabled.
P9.5.9 ^②	Prime pump loss of pr	ime level 2			ID 2438
Minimum value:	0.00 varies	Maximum value:	1,600.00 varies	Default value:	0.00 varies
Description:	Selects the limit to indicate the prime loss of time sett	e a loss of prime in pump. ing, the drive will display	If the measured current d pre-charge loss of prime.	lrops below the determined	value for the value assigned i
P9.6 - Broken pipe (*	DM1 PRO).				
P9.6.1 ^{①②}	Broken pipe fault resp	onse			ID 1853
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = No action; 1 = Warning; 2 = Fault, coast; or 3 = Fault.				
Description:	Broken pipe fault/warning broke pipe frequency for de		I feedback is less than bro	ken pipe level and the drive	output frequency is more tha
P9.6.2 ^②	Broken pipe level				ID 1854
Minimum value:	0.00 varies	Maximum value:	6,000.00 varies	Default value:	15 varies
Description:	Broken pipe level.				

Table 34. Pump parameters (Cont.).

P9.6.3 ^②	Broken pipe frequenc	ID 1856			
Minimum value:	1.00 Hz	Maximum value:	MaxFreq Hz	Default value:	25.00 Hz
Description:	Broken pipe frequency.				
P9.6.4 ^②	Broken pipe delay				ID 1855
Minimum value:	1.00 s	Maximum value:	120.00 s	Default value:	15.00 s
Description:	Broken pipe delay time.				

[©] Parameter value can only be changed after the drive has stopped. @ Parameter value will be set to be default when changing macros.

Table 49. Serial communication.

P11.1.1 ^①	Serial communicati	on			ID 586
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Modbus RTU; 1 = BACnet MSTP; or 2 = SWD.				
Description:	This parameter defines	the communication protocol	for RS-485.		

P11.2.1 ^①	Slave address				ID 587
Minimum value:	1.00 varies	Maximum value:	247.00 varies	Default value:	1.00 varies
Description:	This parameter defines	the slave address for RS-48	5 communication.		
P11.2.2 ^①	Baud rate				ID 584
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 57,600; or 4 = 115,200				
Description:	This parameter defines	communication speed for RS	S-485 communication.		
P11.2.3 ^①	Parity type				ID 585
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	0 = None; 1 = Odd; or 2 = Even.				
Description:	This parameter defines	parity type for RS-485 comr	nunication.		
P11.2.4	Modbus RTU protoc	col status			ID 588
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Initial; 1 = Stopped; 2 = Operational; or 3 = Faulted.				
Description:	This parameter shows	the protocol status for RS-48	35 communication.		
P11.2.5	Communication tin	neout modbus RTU			ID 593
Minimum value:	0.00 ms	Maximum value:	60,000.00 ms	Default value:	10,000.00 ms
Description:	Selects the time to wai	t hefore a communication fa	ult occurs over modbus R	TU if a message is not receive	ıd

Table 49. Serial communication (Cont.)

P11.2.6	Modbus RTU fault re	esponse			ID 2516
Minimum value:	N.A.	Default value:	0		
Options:	communications; if n	ot in fieldbus control, place	e will not fault.	and fieldbus fault is active, the drive vunication is lost, fieldbus fault respon	
Description:	Defines the fieldbus faul	It condition for modbus RTL	J communication.		
Description: P11.3 - BACnet RTU		lt condition for modbus RTL	J communication.		
•		lt condition for modbus RTL	J communication.		ID 594

P11.3.1 ^①	MSTP baud rate				ID 594
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 76,800; or 4 = 115,200.				
Description:	This parameter defines th	e communication speed fo	or RS-485 communica	tion.	
P11.3.2 ^①	MSTP device address				ID 595
Minimum value:	0	Maximum value:	127	Default value:	1
Description:	Defines the device addres	s of the drive on the BAC	net MSTP network.		
P11.3.3 ^①	MSTP instance number	er			ID 596
Minimum value:	0	Maximum value:	4,194,302	Default value:	0
Description:	Defines the instance num	per of the drive on the BA	Cnet MSTP network.		
P11.3.4	MSTP communication	timeout			ID 598
Minimum value:	0 ms	Maximum value:	60,000 ms	Default value:	10,000 ms
Description:	Selects the time to wait b	efore a communication fa	ult occurs over BACn	et MSTP if a message is not receiv	/ed.
P11.3.5	MSTP protocol status				ID 599
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Stopped; 1 = Operational; or 2 = Faulted.				
Description:	This parameter shows the	protocol status for BACn	et MSTP communicat	ion.	
P11.3.6	MSTP fault code		'		ID 600
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = None; 1 = Sole master; 2 = Duplicate MAC ID; or 3 = Baud rate fault.				
Description:	This parameter shows the	protocol status for BACn	et MSTP communicat	ion.	
P11.3.7	MSTP fault response				ID 2526
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	communications. If no	et in fieldbus control, place	e will not fault.	fieldbus fault is active, the drive vication is lost, fieldbus fault respo	
Description:	Defines the fieldbus fault	condition for BACnet MS	ΓP communication.		
P11.3.8 ^①	MSTP maximum mast	er			ID 1537
Minimum value:	1	Maximum value:	127	Default value:	127

Table 49. Serial communication (Cont.).

P11.5 - SWD.					
P11.5.1	Parameter access				ID 2630
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:		ad/write on acyclic channel. are allowed on Profibus.			
Description:	PNU927 which specifie	s the operation priority of pa	rameters for acyclic	communication.	
P11.5.2 ^①	Parameter data acc	ess	,	'	ID 2631
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	4
Options:	0 = Local control; 1 = Fieldbus; 2 = Mixed interface; 4 = NET, local on fault; 5 = Dual mode.	or			
Description:	PNU928 which specifie	s the control priority of the c	evice for cyclic com	munication.	
P11.5.3	Fault situation cour	nter			ID 2632
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	PNU952 which specifie	s the fault situation counter.			
	Only write of 0 is allow (parameter 944) are era		er (actual fault situa	tion and all other fault situations)	and the fault message co
P11.5.4	Board status				ID 2609
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
	B0-DCOM communicati B1-Board HW fault B2-I01 24 volt overload B3-Profibus communica B4-fieldbus fault.	fault.			
P11.5.5	Firmware version				ID 2610
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	This parameter provide	s the firmware version of the	SWD.		
P11.5.6	Protocol status	'	,	'	ID 2612
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Not configured; 1 = Operational; or 2 = Diagnostics.				
Description:	This parameter specifie	s the protocol status for SW	D card.		
		1	,	,	,
P11.6 - Bluetooth.					
P11.6.1	Bluetooth enabled				ID 1895
F 11.0.1	N.A.	Maximum value:	N.A.	Default value:	0
	N.A.				
Minimum value:	0 = Disabled; or 1 = Enabled.				
Minimum value: Options:	0 = Disabled; or				
Minimum value: Options: Description: P11.6.2 [©]	0 = Disabled; or 1 = Enabled.	t mode			ID 2920
Minimum value: Options: Description:	0 = Disabled; or 1 = Enabled. Bluetooth enabled.	t mode Maximum value:	N.A.	Default value:	ID 2920
Minimum value: Options: Description: P11.6.2 [©]	0 = Disabled; or 1 = Enabled. Bluetooth enabled.		N.A.	Default value:	

Table 49. Serial communication (Cont.).

P11.6.3	Bluetooth pairing res	Bluetooth pairing reset					
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.		
Options:	0 = Not reset; or 1 = Reset.						
Description:	Bluetooth pairing reset.						

^① Parameter value can only be changed after the drive has stopped. ^② Parameter value will be set to be default when changing macros.

Table 50. Ethernet communication.

P12.1 - Basic setting	gs.				
P12.1.1 ^①	IP address mod	le		,	ID 1500
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Static IP; or 1 = DHCP with Au	toIP.			
Description:	This parameter de	fined the IP address configuration	n mode for EIP/modbus T	CP.	
P12.1.2	Active IP addre	ess			ID 1507
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Reads the current	active IP address.			
P12.1.3	Active subnet i	mask			ID 1509
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Reads the current	active subnet mask.			
P12.1.4	Active default	gateway			ID 1511
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Reads the current	active default gateway.			
P12.1.5	MAC address				ID 1513
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Reads the current	MAC address.			
P12.1.6 ^①	Static IP addre	ss			ID 1501
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	192.168.1.254
Description:	Defines the static	IP address.			
P12.1.7 ^①	Static subnet n	nask			ID 1503
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	255.255.255.0
Description:	Defines the static	subnet mask.			
P12.1.8 ^①	Static default g	gateway			ID 1505
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	192.168.1.1
Description:	Defines the static	default gateway.			
P12.1.9	Ethernet comm	nunication timeout			ID 611
Minimum value:	0 ms	Maximum value:	60,000 ms	Default value:	10,000 ms
Description:	Selects the time it	t waits before a communication fa	ault occurs over etherne	t.	

	Iter (DM1 PRO only).				ID 60
P12.2.1	Trusted IP white list				ID 68
Viinimum value:	N.A. Maxi n	num value:	N.A.	Default value:	192.168.1.255 0.0.0. 0.0.0.0
Description:	Defines the IP addresses in the wh	ite list. A setting	of 192.168.1.255 en	ables all connections on the local	subnet.
212.2.2	Trusted IP filter enable				ID 76
Minimum value:	N.A. Maxin	num value:	N.A.	Default value:	1
Options:	0 = Disabled; or 1 = Enabled.				
Description:	Enables IP white listing. Devices n	ot in the white li	st will not be able to	establish communications with the	e drive.
P12.3 - Modbus TCP	(DM1 PRO only).				
P12.3.1 ^①	Modbus TCP enable				ID 1942
Minimum value:	N.A. Maxin	num value:	N.A.	Default value:	0
Options:	0 = Disable; or 1 = Enable.				
Description:	Enables modbus TCP communication	ons, must be enab	led to connect to Po	wer Xpert inControl.	
P12.3.2	Modbus TCP connection limit	t			ID 609
Vinimum value:	N.A. Ma xin	num value:	N.A.	Default value:	5
Description:	Maximum number of connections a	Illowed to the dri	ve.		
212.3.3	Modbus TCP unit identifier n	umber			ID 610
Minimum value:	N.A. Ma xin	num value:	N.A.	Default value:	1
Description:	Unit identifier unit value for modbu	is TCP.			
P12.3.4	Modbus TCP protocol status				ID 612
Minimum value:	N.A. Ma xin	num value:	N.A.	Default value:	N.A.
Options:	0 = Stopped; 1 = Operational; or 2 = Faulted.				
Description:	This parameter shows the protocol	status for modb	ıs TCP communicatio	on.	
P12.3.5	Modbus TCP fault response			,	ID 2517
Viinimum value:	N.A. Maxi n	num value:	N.A.	Default value:	0
Options:	0 = Only in fieldbus control mode - communications. If not in fieldl 1 = In all control modes - no matter	bus control, place	will not fault.		
Description:	Defines the fieldbus fault condition	for modbus TCP	communication.		
P12.4 - Ethernet IP (DM1 PRO only).				
P12.4.1 ^①	Ethernet based protocol sele	ct			ID 1997
Minimum value:	N.A. Maxi n	num value:	N.A.	Default value:	0
Options:	0 = Disabled; or 2 = BACnet IP.				
Description:	Selects the active communication p	protocol on the e	hernet I/P port.		
P12.4.2	Ethernet IP protocol status				ID 608
Minimum value:	N.A. Ma xin	num value:	N.A.	Default value:	N.A.
Options:	0 = Off; 1 = Operational; or 2 = Faulted.				

Description:

Indicates if ethernet protocol is active or not.

Table 50. Ethernet communication (Cont.).

P12.4.3	Ethernet IP fa	ID 2518			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	communicati	ons. If not in fieldbus control, place	e will not fault.	and Fieldbus fault is active, the drive nunication is lost, fieldbus fault respo	
Description:	Defines the field	lbus fault condition for ethernet IP (communication.		

P12.5.1 ^①	BACnet IP UDP po	rt number			ID 1733
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	47,808
Options:	47808 = BACO; 47809 = BAC1; 47810 = BAC2; 47811 = BAC3; 47812 = BAC4; 47813 = BAC5; 47814 = BAC5; 47815 = BAC7; 47816 = BAC8; 47817 = BAC9; 47818 = BACA; 47819 = BACC; 47821 = BACD; 47821 = BACC; 47821 = BACE; or 47822 = BACE; or				
Description:	Defines the BACnet U	DP port number.			
P12.5.2 ^①	BACnet IP foreign	devise		,	ID 1734
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disabled; or 1 = Enabled.				
Description:	Enables BACNET IP fo	reign device configuration.			
P12.5.3 ^①	BACnet IP BBMD I	P			ID 1735
Vlinimum value:	N.A.	Maximum value:	N.A.	Default value:	0.0.0.0
Description:	Displays the BACnet E	BBMD IP address.			
P12.5.4 ^①	BACnet IP UDP po	rt			ID 1737
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	47,808
Options:	47808 = BAC0; 47809 = BAC1; 47810 = BAC2; 47811 = BAC3; 47813 = BAC5; 47814 = BAC6; 47815 = BAC6; 47815 = BAC6; 47817 = BAC9; 47818 = BAC8; 47819 = BAC6; 47820 = BACC; 47821 = BACC; 47821 = BACC; 47822 = BACE; or 47823 = BACF.				
Description:	Displays the BACnet E	BBMD UDP port number.			
	BACnet IP registra	ntion interval			ID 1738
P12.5.5 ^①					

Table 50. Ethernet communication (Cont.).

P12.5.6	BACnet IP comm	nunication timeout		'	ID 1739
Minimum value:	0.00	Maximum value:	60,000	Default value:	0
Description:	Selects the time it	waits before a communication fa	ault occurs over BAC	net IP.	
P12.5.7	BACnet IP proto	ocol status			ID 1740
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Stopped; 1 = Operational; or 2 = Faulted.				
Description:	This parameter sho	ws the protocol status for BACn	et IP communication		
P12.5.8	BACnet IP fault	behavior		,	ID 1741
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	communication	 If not in fieldbus control, place 	e will not fault.	d Fieldbus fault is active, the drive nication is lost, fieldbus fault respo	
Description:	Defines the fieldbu	s fault condition for BACnet IP co	ommunication.		
P12.5.9 ^①	BACnet IP insta	nce number			ID 1742
Minimum value:	0	Maximum value:	4,194,302	Default value:	0
Description:	Displays the BACne	et instance number.			

P12.6 - Web UI (*DM1 PRO only).

P12.6.1	Web UI protocol st	atus			ID 2915			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.			
Options:	0 = Off; 1 = Operational; or 2 = Faulted.							
Description:	This parameter shows	the protocol status for web s	erver communication.					
P12.6.2	Web UI fault respo	Web UI fault response ID 2916						
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options: Description:	communications. I 1 = In all control mode	f not in fieldbus control, place	e will not fault. e setting. If communica	eldbus fault is active, the drive				
P12.6.3	Web UI communica	ntion timeout			ID 2919			
P12.6.3 Minimum value:	Web UI communica 30,000 ms	Maximum value:	60,000 ms	Default value:	ID 2919 60,000 ms			
	30,000 ms							
Minimum value:	30,000 ms	Maximum value:						
Minimum value: Description:	30,000 ms Selects the time it wai	Maximum value:			60,000 ms			
Minimum value: Description: P12.6.4 [©]	30,000 ms Selects the time it wai	Maximum value: ts before a communication fa	ault occurs over the web) server.	60,000 ms			

 $^{^{\}scriptsize \textcircled{\tiny 1}}$ Parameter value can only be changed after the drive has stopped.

Table 51. System.

P13.1.1	Language				ID 340
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = English; 1 = English; or 2 = English.				
Description:	This parameter offers the available language is Eng		uency converter throu	igh the keypad in the language of	your choice. Currently
P13.1.2 ^①	Application		'	'	ID 142
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Standard;; 1 = Pump; or 2 = Fan 3 = Multi-purpose.				
Description:	This parameter sets the a	active application if multipl	e applications have b	een loaded.	
P13.1.3 ^①	Parameter sets		,		ID 619
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = No; 1 = Reload defaults; 2 = Reload set 1; 3 = Reload set 2; 4 = Store set 1; 5 = Store set 2; 6 = Reset; or 7 = Reload defaults VM.				
Description:	This parameter allows yo	u to reload the factory def	ault parameter values	s, and to store and load two custo	mized parameter sets.
P13.1.4	Up to keypad				ID 620
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = No; or 1 = Yes (all parameters).				
Description:	This function uploads all	existing parameter groups	to the keypad.		
P13.1.5 ^①	Down from keypad		,	'	ID 621
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = No; 1 = All parameters; 2 = All, no motor; or 3 = Application paramete	ors.			
Description:	This function downloads	one or all parameter group	s from the keypad to	the drive.	
P13.1.7	Parameter lock PIN				ID 624
Minimum value:	0	Maximum value:	9,999	Default value:	0
Description:	enabled, the user will be By default, the password	prompted to enter a passv	vord before application	s with the password function. When changes, parameter value chan the password, change the value of	ges, or password changes.
	between 1 and 9,999.				
	To donativate the person	ord, reset the parameter va	lue to 0		

Table 51. System (Cont.).

P13.1.8	Keypad paramete	rlock			ID 625
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Change enable; o 1 = Change disable.	r			
Description:		the user to prohibit changes to to edit a parameter value.	the parameters. If the p	parameter lock is activated, the	e text "locked" will appear or
	Note: This function of	loes not prevent unauthorized	editing of parameter valu	ies.	
P13.1.9	Start-up Wizard				ID 626
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Enabled. 1 = Disabled.				
Description:	the application desire completion, it allows always enabled for th	ed and then advances paramete the user to go to the main mer ne initial power up of the DM1 use it to be active on start-up.	ers through the start-up nu or default page and th PRO. By setting this par	nable", the Start-up Wizard proparameter list/Application Min is parameter is set to "Disable ameter to "Disable" without grop Wizard after completion, or o	ii wizard in keypad. After d". The Start-up Wizard is oing through the Start-up
P13.2 - Keypad.					
P13.2.4	Timeout time			1	ID 629
Minimum value:	1 s	Maximum value:	65.535 s.	Default value:	30 s
Description:		ting defines the time after whi page value is 0, the timeout tim		turns to the Default Page.	
P13.2.5	Contrast adjust				ID 630
Minimum value:	5	Maximum value:	18	Default value:	12
Description:	If the remote keypad	display is not clear, you can ad	ljust the keypad contrast	with this parameter.	
P13.2.6	Backlight time				ID 631
Minimum value:	1 min.	Maximum value:	65,535 min.	Default value:	10 min.
Description:	This parameter deter	mines how long the backlight s	stays on before going out	t.	
P13.2.7	Fan control				ID 632
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	60°C (140°F). Th minute after receiving th "Temperature". 2 = Run follow - after	sed on the temperature of the e fan receives a stop command e stop command or switching of power up, the fan is stopped (I when the heat sink tem on the power, as well as until the run command is	d on automatically when the he perature falls to 55°C (131°F). after changing the value from given and then fan runs contin istors on power up moment.	The fan runs for about a "Continuous" to uously. This is mainly made
Description:		you to control the DM1 PRO's c			
P13.4 - Version info	rmation.				
	Keypad software	version			ID 640
P13.4.1					
P13.4.1 Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.

P13.4.1	Keypad software vers	ID 640				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.	
Description:	Keypad firmware version.					

Table 51. System (Cont.).

P13.4.2	Motor control	software version			ID 642
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	DSP/motor contro	ol software version.			
P13.4.3	Application so	ftware version		'	ID 644
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	MCU/application	software version.			
P13.4.4	Software bund	lle version		'	ID 1714
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Software bundle	version.			

P13.5 - Application information.

P13.5.1	Serial number				ID 648		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.		
Description:	Product serial number.						
P13.5.2	Multi-monitor set		,		ID 627		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0		
Options:	0 = Change enable; or 1 = Change disable.						
Description:		n display three actual monitor nitored with other values.	ed values at the same time.	This parameter determine	es if the operator is allowed to		
P13.5.3	Keypad lock PIN			,	ID 75		
Minimum value:	0	Maximum value:	9,999	Default value:	0		
Description:	The keypad can be protected against unauthorized changes with the keypad lock function after keys are not pressed five minutes. When the password function is enabled, the user will be prompted to enter a password before the keypad display parameter or response to key press except up/down/left/right.						
	By default, the password function is not in use. If you want to activate the password, change the value of this parameter to any number between 1 and 9,999.						
	To deactivate the pass	word, reset the parameter va	ue to 0.				
					ID 2922		
P13.5.4	Drive application n	ame			ID 2922		
P13.5.4 Minimum value:	Drive application n N.A.	Maximum value:	N.A.	Default value:	N.A.		

 $^{^{\}scriptsize \textcircled{\tiny 1}}$ Parameter value can only be changed after the drive has stopped.

Chapter 7- Multi-purpose application

Introduction

The multi-purpose application is designed for a large set of applications with the ability to have advanced motor control systems. It takes the same functions provided in the standard, fan, and multi-pump applications and adds in some additional control techniques. The application is designed with two control places that use eight digital inputs, two analog inputs, three relay outputs, one digital output, and two analog outputs that are programmable. Motor control-wise, it provides the ability to do frequency and speed control and adds open loop speed control as well as torque control. For tuning the V/Hz curve, it has the ability to go out and ID the motor characteristic and enters those specific measurements into its parameters for better control. Drive/motor protections are programmable for desired actions depending on the application. Below is a list of additional features available in addition to the standard, fan, and multi-pump application features that are available in the multi-purpose application.

- Motor potentiometer reference control;
- · External brake control;
- · Droop function with multiple loads;
- · Motor identification;
- · Motor control modes; and
- I/O controls:
 - "Terminal to function" (TTF) programming

The design behind the programming of the digital inputs in the DM1 drive is to use "terminal to function" programming. It is composed of multiple functions that get assigned a digital input to that function. The parameters in the drive are set up with specific functions and by defining the digital input and slot in some cases depending on the what options are available. For use of the drives control board inputs, they will be referred to as DigIN:1 through DigIN:8. When additional option cards are used, they will be defined as DigIN:X:IOY:Z. The X indicates the slot that the card is being installed in which will be either A or B, then the IOY determines the type of card it is, which would be IO1 or IO5, and the Z would indicate which input is being used on that available option card.

• "Function to terminal" (FTT) programming

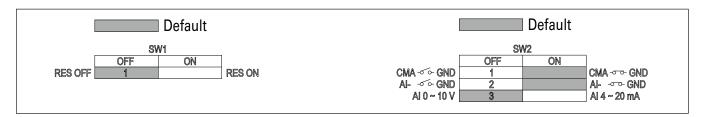
The design behind the programming of the relay outputs and digital output in the DM1 drive is to use "function to terminal" programming. It is composed of a terminal be it a relay output or a digital output that is assigned a parameter. Within that parameter, it has different functions that can be set.

For the DI function, we use terminal programming method to function (TTF), where there is a fixed input that gets programmed to a list of functions. This allows for multiple inputs to be used for different functions. Connecting a certain input with a certain parameter function is done by giving a parameter an appropriate value. The value is formed by the location of the input, either being on the standard control board or an external option board and the slot in which it is located.

Control I/O configuration

- Run 240 Vac and 24 Vdc control wiring in separate conduit.
- · Communication wire to be shielded.

Table 52. Multi-purpose application default I/O connection.



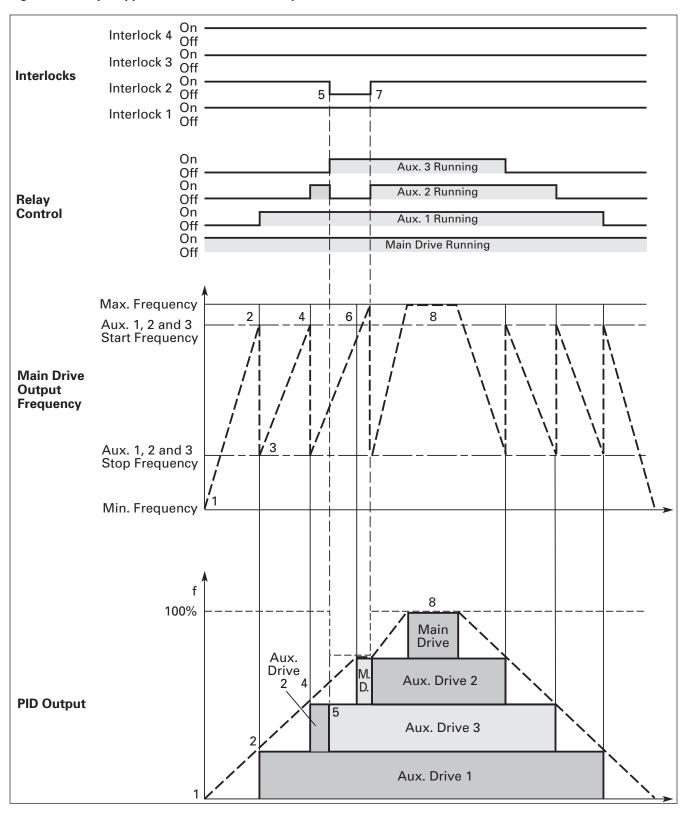
External wiring	Terminal	Short name	Name	Default setting	Description
	- 1	DI1	Digital input 1	Run forward	Starts the motor in the forward direction.
<u> </u>	- 2	DI2	Digital input 2	Run reverse	Start the motor in the reverse direction.
<u> </u>	- 3	DI3	Digital input 3	External fault	Triggers a fault in the drive.
	4	DI4	Digital input 4	Fault reset	Resets active faults in the drive.
	- 5	CMA	DI1 to DI4 common	Grounded	Allows for sourced input.
	- 6	А	RS-485 signal A	_	Fieldbus communication (Modbus RTU, BACNet).
	- 7	В	RS-485 signal B	_	Fieldbus communication (Modbus RTU, BACNet).
Kesi	8	Al1+ ①	Analog input 1	0 - 10 V	Voltage speed reference (programmable to 4 mA to 20 mA).
\tau_	9	Al1-	Analog input 1 ground	_	Analog input 1 common (ground).
	- 10	GND	I/O signal ground	_	I/O ground for reference and control.
	- 11	A01+	Analog output 1	Output frequency	Shows output frequency to motor 0 - 60 Hz (4 mA to 20 mA).
	12	GND	I/O signal ground	_	I/O ground for reference and control.
	- 13	10 V	10 Vdc reference output	10.3 Vdc +/- 3%	10 Vdc reference voltage.
	- 14	24 V	24 Vdc control output	24 Vdc In/Out	Control voltage input/output (100 mA max.).
	- 15	ST01	Safe torque Off 1	_	Safe torque Off 1 input.
	- 16	ST02	Safe torque Off 2	_	Safe torque Off 2 input.
	- 17	STO_COM	Safe torque common	_	Safe torque Off common.
4	- 18	R1N0	Relay 1 normally open	Run	Changes state when the drive is in the run state.
Υ	- 19	R1CM	Relay 1 common		
	20	R1NC	Relay 1 normally closed		
, ,	- 21	R2N0	Relay 2 normally open	Fault	Changes state when the drive is in the fault state.
	- 22	R2CM	Relay 2 common		

Notes:

The above wiring demonstrates a SINK configuration. It is important that CMA is wired to ground (as shown by dashed line). If a SOURCE configuration is desired, wire 24 V to CMA and close the inputs to ground. When using the +10 V for Al1, it is important to wire Al1- to ground (as shown by dashed line). If using +10 V for Al1, terminals 9 and 10 need to be jumpered together.

① Al1+ support 10 K potentiometer.

Figure 9. Example application with three auxiliary drives.



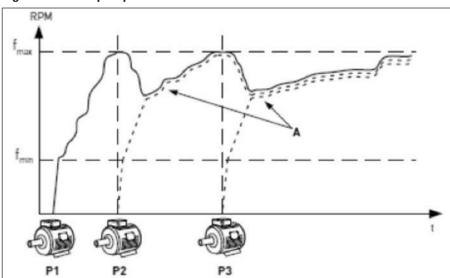


Figure 10. Multi-pump control curve.

Figure 11. Multi-drive/multi-pump layout.

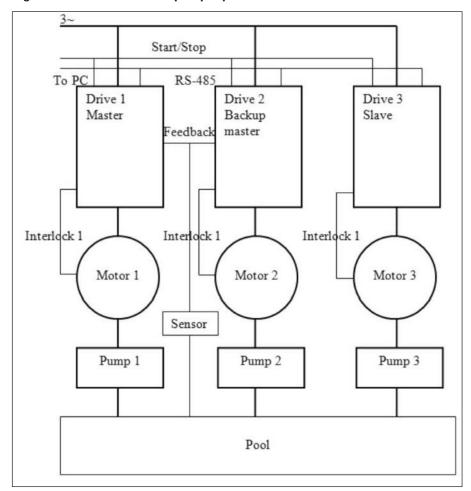
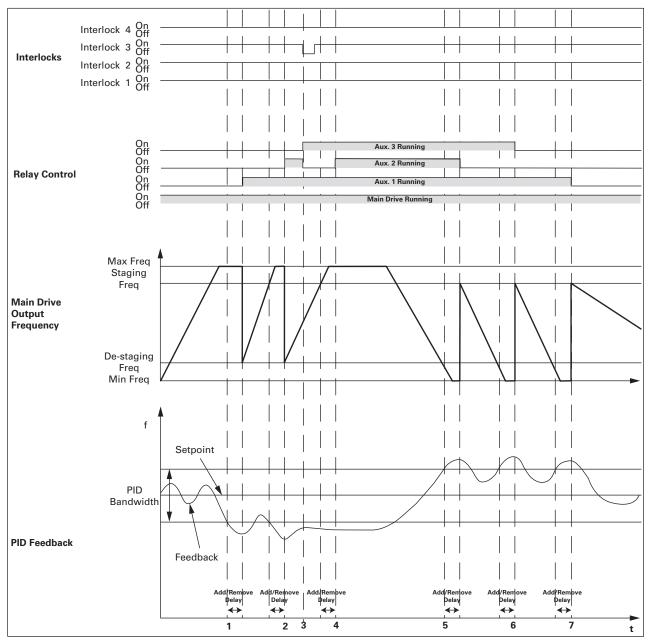


Figure 12. Bandwidth feedback.



- 1. Feedback out of bandwidth, output frequency over staging frequency, start delay counter; delay times out, and interlock 2 is OK, add aux. 1 motor by closing its corresponding relay.
- 2. As above, add aux. 2 motor.
- 3. Aux. 2's interlock lost, add aux. 3 as backup immediately.
- 4. Add aux. 2 motor again since its interlock resumed.
- 5. Feedback out of bandwidth, output frequency below de-staging frequency, start delay counter; delay times out, remove aux. 2 motor first because it's the last one which been added.
- 6. As above, remove aux. 3 motor.
- 7. As above, remove aux. 1 motor.

Multi-purpose application - parameters list

On the next pages you will find the lists of parameters within the respective parameter groups. Each parameter section within the table lists:

- Parameter code (location indication on the keypad; shows the operator the present parameter number);.
- · Parameter name;
- ID (number of the parameter);

and where applicable:

- · Minimum value and units;
- · Maximum value and units;
- · Default value and units;
- · Options (when available); and
- Description of the parameter.

Table 53. Monitor.

M1 - standard.					
M1.1	Output frequency				ID 1
Minimum value:	Hz	Maximum value:	Hz	Default value:	Hz
Description:	Output frequency (Hz).				
M1.2	Frequency referenc	e			ID 24
Minimum value:	Hz	Maximum value:	Hz	Default value:	Hz
Description:	Reference frequency (H	z).			
M1.3	Motor speed				ID 2
Minimum value:	rpm	Maximum value:	rpm	Default value:	rpm
Description:	Motor output speed (rp	m).			
M1.4	Motor current				ID 3
Minimum value:	A	Maximum value:	А	Default value:	А
Description:	Motor output current R	MS (Amps).			
M1.5	Motor torque		'		ID 4
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Percent motor torque ca	alculated from nameplate va	lues and measured	motor current (%).	
VI1.6	Motor power				ID 5
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Percent motor power ca	alculated from nameplate va	ues and measured	motor current (%).	
VI1.7	Motor voltage				ID 6
Minimum value:	V	Maximum value:	V	Default value:	V
Description:	Output ac motor voltag	e (Vac).			
W1.8	DC-link voltage				ID 7
Minimum value:	V	Maximum value:	V	Default value:	V
Description:	DC bus voltage (Vdc).				
VI1.9	Unit temperature				ID 8
Minimum value:	°C	Maximum value:	°C	Default value:	°C
Description:	Heat sink temperature	'den C)			

Table 53. Monitor (Cont.).

M1 - standard (Cont.).				
M1.10	Motor temperature				ID 9
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Motor temperature valu	e calculated from nameplat	e values and measured i	motor current (%).	
M1.11	Latest fault code		,	'	ID 28
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Last active fault code va	alue. See fault codes for the	e value shown here.		
M1.12	Instant motor powe	r			ID 1686
Minimum value:	kW	Maximum value:	kW	Default value:	kW
Description:	Instantaneous motor po	ower (kW).			
M2 - I/O status.					
W2 - 1/0 status.	Analog input 1				ID 10
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies
Description:		ed value (Vdc or Amps) selec			varios
M2.2	Keypad pot voltage		table with dipswitch.		ID 1858
Minimum value:	V	Maximum value:	V	Default value:	V
Description:		measured value (Vdc). DM1		Dordan Value	V
M2.3			i no only.		ID 25
Minimum value:	Analog output Varies	Maximum value:	Varies	Default value:	Varies
Description:				Delault Value.	varies
M2.4		red value (Vdc or Amps) sele	Ctable With parameter.	,	ID 12
Minimum value:	DI1, DI2, DI3	Maximum value:	NI A	Default value:	
	N.A.		N.A.	Default value:	N.A.
Description:	Digital input 1/2/3 statu	JS.			ID 40
M2.5	DI4		NI A	Defends makes	ID 13
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Digital input 4 status.			,	
M2.6	Virtual DI1, Virtual				ID 1998
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Virtual digital output sta The virtual RO1 as virtu The virtual RO2 as virtu	atus. Internal use, not exteri al DI1 input. al DI2 input.	nal output.		
M2.7	Virtual RO1, Virtual	RO2		,	ID 1817
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Virtual relay output 1 ar	nd 2 status.			
M2.8	RO1, RO2	,			ID 557
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Relay output 1 and 2 4 s	status.			
M3 - Energy savings M3.1 ^②	Energy savings				ID 2120
Minimum value:	Varies	Maximum value:	Varies	Default value:	0.000 varies
Description:		rings of the drive compared t			

Table 53. Monitor (Cont.).

M3.2 ^②	CO2 savings				ID 1818
Minimum value:	mt/y	Maximum value:	mt/y	Default value:	0.000 mt/y
Description:	Displays the CO2 savings	of the drive compared to li	near V/f curve.		

M4.1	Control board DIDO	status			ID 2209
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	Bit 0 = DI1_Status; Bit 1 = DI2_Status; Bit 2 = DI3_Status; Bit 3 = DI4_Status; Bit 4 = RO1_Status; Bit 5 = RO2_Status; Bit 6 = SlotA with board; Bit 7 = Virtual_RO1_Status; Bit 8 = Virtual_RO2_Status;	tus; or			
Description:	Control board digital inpo	ut and relay output status p	rovides the status of inputs a	and outputs on the control	l board.
VI4.2	Application status w	vord			ID 29
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	Bit 0 = MC_Ready; Bit 1 = MC_Run; Bit 2 = MC_Fault or Faul Bit 3 = FB_Ref_Active; Bit 4 = MC_Stopping; Bit 5 = MC_Reverse; Bit 6 = MC_Warning or A Bit 7 = MC_ZeroSpeed; Bit 8 = IO control indicat Bit 9 = Panel control indi Bit 10 = Panel fieldbus co Bit 11 = MC_DC_Brake; Bit 12 = Run enable; Bit 13 = Run bypass; Bit 14 = External brake c Bit 15 = In bypass mode.	AR-Fault; or; cator; ontrol indicator;			
Description:	Application status word	will provide additional state	us indication of the health of	the drive.	
W4.3	Standard status wor	d			ID 2414
Viinimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	Bit 1 = See STD status w Bit 2 = See STD status w Bit 3 = See STD status w Bit 4 = See STD status w Bit 5 = See STD status w Bit 6 = See STD status w	vord B0 Sel (default = ready vord B1 Sel (default = run); vord B2 Sel (default = fault); vord B3 Sel (default = fault); vord B4 Sel (default = warni vord B5 Sel (default = revers vord B6 Sel (default = at spevord B7 Sel (default = zero f	Invert); ng); sed); sed);		
Description:		defined based of the param ese bits are based off the s	neter setting in the fieldbus pr standard relay functions.	rocess data group, define	the first 8 bits of this sta
W4.4	FB PI setpoint 1				ID 2542
/linimum value:	Varies	Maximum value:	PID1_ProcessUnit Max	Default value:	Varies.
Description:	PID setpoint 1 value from	n fieldbus.			
W4.5	FB PI setpoint 2				ID 2544
	DID1 Draggallni+Min	Maximum value:	PID1 ProcessUnit Max	Default value:	Varies.
Minimum value:	PID1_ProcessUnitMin	waxiiiaiii valae.	TIDI_TIOCCSSOINTIVIAX		varios.

Table 53. Monitor (Cont.).

M4.6	FB PI feedback	•	'	,	ID 2550
Minimum value:	% varies	Maximum value:	% varies	Default value:	% varies.
Description:	PID feedback 1 value from	m fieldbus.			

M5 - PI monitor.

IVIS - PI MONITOR.	,				
M5.1	PI set point				ID 16
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies
Description:	PI set point in process	units.			
M5.2	PI feedback	"		'	ID 18
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies
Description:	PI feedback level in pr	ocess units.			
M5.3	PI error value				ID 20
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies
Description:	PI error in process uni	ts.			
M5.4	PI output				ID 22
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	PI output.				
M5.5	PI status	"		, ,	ID 23
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Stopped; 1 = Running; or 2 = Sleep mode.				
Description:	PI status indication, in	dicates if drive is stopped, ru	nning in PI mode, or in	n PI sleep mode.	

M6 - User defined scale.

M6.1	Output				ID 2445
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies
Description:	User defined outp	out value that can be configured w	ith the users desired	unit and scale.	
M6.2	Reference				ID 2447
Minimum value:	Varies	Maximum value:	Varies	Default value:	Varies
Description:	User defined refe	erence value that can be configured	with the users desir	ed unit and scale.	

Table 54. Multi-pump status.

M7.1 - Operation mo	M7.1 - Operation mode.							
M7.1.1	Drive 1	'	,	,	ID 2218			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.			
Options:	0 = Offline; 1 = Slave drive; 2 = Master drive; or 3 = Redundant drive.							
Description:	Provides the operating n	node of drive 1 while using	multi-pump mode.					

Table 54. Multi-pump status (Cont.).

Description:

M7.1.2	Drive 2				ID 2230
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Offline; 1 = Slave drive; 2 = Master drive; or 3 = Redundant drive.				
Description:	Provides the operating r	node of drive 2 while using	multi-pump mode.		
M7.1.3	Drive 3	'		'	ID 2242
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Offline; 1 = Slave drive; 2 = Master drive; or 3 = Redundant drive.				
Description:	Provides the operating r	mode of drive 3 while using	multi-pump mode.		
M7.1.4	Drive 4				ID 2254
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Offline; 1 = Slave drive; 2 = Master drive; or 3 = Redundant drive.				
Description:	Provides the operating r	mode of drive 4 while using	multi-pump mode.		
M7.1.5	Drive 5				ID 2266
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Offline; 1 = Slave drive; 2 = Master drive; or 3 = Redundant drive.				
Description:	Provides the operating r	node of drive 5 while using	multi-pump mode.		
				,	,
M7.2 - Multi-pump s	status.				
VI7.2.1	Drive 1				ID 2219
Vinimum value:	N.A.	Maximum value:	N.A.	Default value:	5
Options:	0 = Stopped; 1 = Sleep; 2 = Regulating; 3 = Wait for CMD 4 = Following; or 5 = Unknown.				
Description:	Provides the run status	of drive 1 while using the m	ulti-pump mode.		
M7.2.2	Drive 2				ID 2231
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	5
Options:	0 = Stopped; 1 = Sleep; 2 = Regulating; 3 = Wait for CMD 4 = Following; or				

Provides the run status of drive 2 while using the multi-pump mode.

Table 54. Multi-pump status (Cont.).

M7.2.3	Drive 3				ID 2243
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	5
Options:	0 = Stopped; 1 = Sleep; 2 = Regulating; 3 = Wait for CMD 4 = Following; or 5 = Unknown.				
Description:	Provides the run status	of drive 3 while using the m	ulti-pump mode.		
M7.2.4	Drive 4	,			ID 2255
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	5
Options:	0 = Stopped; 1 = Sleep; 2 = Regulating; 3 = Wait for CMD 4 = Following; or 5 = Unknown.				
Description:	Provides the run status	of drive 4 while using the m	ulti-pump mode.		
M7.2.5	Drive 5				ID 2267
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	5
Options:	0 = Stopped; 1 = Sleep; 2 = Regulating; 3 = Wait for CMD 4 = Following; or 5 = Unknown.				
Description:	Provides the run status	of drive 5 while using the m	ulti-pump mode.		

M7.3 - Network status.

M7.3.1	Drive 1				ID 2220
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Disconnected; 1 = Fault; 2 = Pump lost; 3 = Need alternation; or 4 = No error.				
Description:	Provides the network sta	tus of drive 1 while using t	he multi-pump mode	l.	
M7.3.2	Drive 2				ID 2232
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Disconnected; 1 = Fault; 2 = Pump lost; 3 = Need alternation; or 4 = No error.				
Description:	Provides the network sta	tus of drive 2 while using t	he multi-pump mode).	
M7.3.3	Drive 3				ID 2244
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Disconnected; 1 = Fault; 2 = Pump lost; 3 = Need alternation; or 4 = No error.				
Description:	Provides the network sta	tus of drive 3 while using t	ha multi-numn mada		

Table 54. Multi-pump status (Cont.).

M7.3.4	Drive 4			'	ID 2256
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Disconnected; 1 = Fault; 2 = Pump lost; 3 = Need alternation; or 4 = No error.				
Description:	Provides the network sta	tus of drive 4 while using t	he multi-pump mode		
M7.3.5	Drive 5			,	ID 2268
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Disconnected; 1 = Fault; 2 = Pump lost; 3 = Need alternation; or 4 = No error.				
Description:	Provides the network sta	tus of drive 5 while using t	he multi-pump mode		

Table 55. Multi-pump measurement.

M8.1 - Latest fault code.						
M8.1.1	Drive 1	'	ID 2221			
Minimum value:	Maximum value:	Default value:				
Description:	Provides the latest fault code of drive 1 while using the multi-pump mode.					
M8.1.2	Drive 2		ID 2233			
Minimum value:	Maximum value:	Default value:				
Description:	Provides the latest fault code of drive 2 while using the multi-pump mode.					
M8.1.3	Drive 3		ID 2245			
Minimum value:	Maximum value:	Default value:				
Description:	Provides the latest fault code of drive 3 while using the multi-pump mode.					
M8.1.4	Drive 4	,	ID 2257			
Minimum value:	Maximum value:	Default value:				
Description:	Provides the latest fault code of drive 4 while using the multi-pump mode.					
M8.1.5	Drive 5		ID 2269			
Minimum value:	Maximum value:	Default value:				
Description:	Provides the latest fault code of drive 5 while using the multi-pump mode.					

M8.2 - Output frequency.

M8.2.1	Drive 1				ID 2222		
Minimum value:	Hz Ma	ximum value:	Hz	Default value:	Hz		
Description:	Provides the output frequency (H	Hz) of drive 1 while us	sing the multi-pump mode				
M8.2.2	Drive 2				ID 2234		
Minimum value:	Hz Ma	ximum value:	Hz	Default value:	Hz		
Description:	Provides the output frequency (Hz) of drive 2 while using the multi-pump mode.						
M8.2.3	Drive 3				ID 2246		
Minimum value:	Hz Ma	ximum value:	Hz	Default value:	Hz		
Description:	Provides the output frequency (F	Hz) of drive 3 while u	sing the multi-pump mode				

	Table 55.	Multi-pump	measurement	(Cont.)	١.
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M8.2.4	Drive 4				ID 2258
Minimum value:	Hz	Maximum value:	Hz	Default value:	Hz
Description:	Provides the outpu	ut frequency (Hz) of drive 4 while u	using the multi-pump	p mode.	
M8.2.5	Drive 5				ID 2270
Minimum value:	Hz	Maximum value:	Hz	Default value:	Hz

M8.3 - Motor voltage.

M8.3.1	Drive 1	,			ID 2223
Minimum value:	V	Maximum value:	V	Default value:	V
Description:	Provides the moto	r voltage (Vac) of drive 1 while us	ing the multi-pump	o mode.	
M8.3.2	Drive 2				ID 2235
Minimum value:	V	Maximum value:	V	Default value:	V
Description:	Provides the moto	r voltage (Vac) of drive 2 while us	ing the multi-pump	o mode.	
M8.3.3	Drive 3	'			ID 2247
Minimum value:	V	Maximum value:	V	Default value:	V
Description:	Provides the moto	r voltage (Vac) of drive 3 while us	ing the multi-pump	p mode.	
M8.3.4	Drive 4	,			ID 2259
Minimum value:	V	Maximum value:	V	Default value:	V
Description:	Provides the moto	r voltage (Vac) of drive 4 while us	ing the multi-pump	o mode.	
M8.3.5	Drive 5			·	ID 2271
Minimum value:	V	Maximum value:	V	Default value:	V
Description:	Provides the moto	r voltage (Vac) of drive 5 while us	ing the multi-pump	o mode.	

M8.4 - Motor current.

M8.4.1	Drive 1				ID 2224
Minimum value:	А	Maximum value:	А	Default value:	А
Description:	Provides the moto	r current (Amps) of drive 1 while i	using the multi-pum	np mode.	
M8.4.2	Drive 2				ID 2236
Minimum value:	А	Maximum value:	Α	Default value:	А
Description:	Provides the moto	r current (Amps) of drive 2 while i	using the multi-pum	np mode.	
M8.4.3	Drive 3				ID 2248
Minimum value:	А	Maximum value:	Α	Default value:	А
Description:	Provides the moto	r current (Amps) of drive 3 while i	using the multi-pum	np mode.	
M8.4.4	Drive 4		,	,	ID 2260
Minimum value:	А	Maximum value:	А	Default value:	А
Description:	Provides the moto	r current (Amps) of drive 4 while (using the multi-pum	np mode.	
M8.4.5	Drive 5				ID 2272
Minimum value:	А	Maximum value:	А	Default value:	А
Description:	Provides the motor current (Amps) of drive 5 while using the multi-pump mode.				

M8.5.1	Drive 1				ID 2225
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Provides the motor t	torque (%) of drive 1 while using	the multi-pump mode.		
M8.5.2	Drive 2				ID 2237
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Provides the motor t	torque (%) of drive 2 while using	the multi-pump mode.		
M8.5.3	Drive 3				ID 2249
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Provides the motor t	torque (%) of drive 3 while using	the multi-pump mode.		
M8.5.4	Drive 4			,	ID 2261
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Provides the motor t	torque (%) of drive 4 while using	the multi-pump mode.		
M8.5.5	Drive 5				ID 2273
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Provides the motor t	torque (%) of drive 5 while using	the multi-numn mode		

M8.6 - Motor power.

M8.6.1	Drive 1				ID 2226
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Provides the motor	power (%) of drive 1 while using	the multi-pump mod	е.	
M8.6.2	Drive 2				ID 2238
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Provides the motor	power (%) of drive 2 while using	the multi-pump mod	е.	
M8.6.3	Drive 3				ID 2250
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Provides the motor	power (%) of drive 3 while using	the multi-pump mod	е.	
M8.6.4	Drive 4				ID 2262
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Provides the motor	power (%) of drive 4 while using	the multi-pump mod	е.	
M8.6.5	Drive 5				ID 2274
Minimum value:	%	Maximum value:	%	Default value:	%
Description:	Provides the motor	power (%) of drive 5 while using	the multi-pump mod	е.	

M8.7 - Motor speed.

M8.7.1	Drive 1				ID 2227
Minimum value:	rpm	Maximum value:	rpm	Default value:	rpm
Description:	Provides the moto	or speed (rpm) of drive 1 while usin	g the multi-pump m	iode.	
M8.7.2	Drive 2	'		'	ID 2239
Minimum value:	rpm	Maximum value:	rpm	Default value:	rpm
Description:	Provides the moto	or speed (rpm) of drive 2 while usin	g the multi-pump m	iode.	
M8.7.3	Drive 3			'	ID 2251
Minimum value:	rpm	Maximum value:	rpm	Default value:	rpm
Description:	Provides the moto	or speed (rpm) of drive 3 while usin	g the multi-pump m	iode.	

Table 55. Multi-pump measurement (Cont.).

M8.7.4	Drive 4	'	'	'	ID 2263			
Minimum value:	rpm	Maximum value:	rpm	Default value:	rpm			
Description:	Provides the mot	Provides the motor speed (rpm) of drive 4 while using the multi-pump mode.						
M8.7.5	Drive 5				ID 2275			
Minimum value:	rpm	Maximum value:	rpm	Default value:	rpm			
Description:	Provides the motor speed (rpm) of drive 5 while using the multi-pump mode.							

M8.8 - Run time.

M8.8.1	Drive 1				ID 2228
Minimum value:	Hours	Maximum value:	Hours	Default value:	Hours
Description:	Provides the moto	r run time (h) of drive 1 while usin	g the multi-pump mod	de.	
M8.8.2	Drive 2				ID 2240
Minimum value:	Hours	Maximum value:	Hours	Default value:	Hours
Description:	Provides the moto	r run time (h) of drive 2 while usin	g the multi-pump mod	de.	
M8.8.3	Drive 3				ID 2252
Minimum value:	Hours	Maximum value:	Hours	Default value:	Hours
Description:	Provides the moto	r run time (h) of drive 3 while usin	g the multi-pump mod	de.	
M8.8.4	Drive 4				ID 2264
Minimum value:	Hours	Maximum value:	Hours	Default value:	Hours
Description:	Provides the moto	r run time (h) of drive 4 while usin	g the multi-pump mod	de.	
M8.8.5	Drive 5				ID 2276
Minimum value:	Hours	Maximum value:	Hours	Default value:	Hours
Description:	Provides the moto	r run time (h) of drive 5 while usin	g the multi-pump mod	de.	

M9 - Multi-monitoring.

M9.1	Multi-monito	ID 30			
Minimum value:	N.A.	Maximum value:	N.A.	Default value: 0, 1, 2.	
Description:	see three lines of			are selectable via the keypad menu. Multi-monitor page cou to select the row and then hitting the left arrow key will allo	

Table 56. Parameters.

P1 - Basic parameters.				'	
P1.1 ^②	Minimum frequ	iency			ID 101
Minimum value:	0.00 Hz	Maximum value:	400.00 Hz	Default value:	0.00 Hz
Description:	Defines the lowes 1 = Fire mode mini 2 = Derag. 3 = MPFC staging 4 = MPFC master 5 = Prime pump fr 6 = Prime pump fr	frequency. fixed frequency. requency.	ill operate. This setting	will limit other frequency paran	neter settings.

Table 56. Parameters (Cont.).

P1.2 ²	Maximum frequency			ID 102
Minimum value:	0.00 Hz Maximum va	alue: 400.00 Hz	Default value:	MaxFreqMFG
Description:	Defines the highest frequency at which the 1 = Keypad reference. 2 = Motor potentiometer. 3 = Jog speed. 4 = 2nd stage ramp frequency. 5 = Fire mode minimum frequency. 6 = Derag. 7 = MPFC staging frequency. 8 = MPFC master fixed frequency. 9 = Prime pump frequency. 10 = Prime pump frequency 2. 11 = Preset speed frequency. 12 = Frequency limit value. 13 = Reference limit value. 14 = Speed control_fs2. 15 = Stall frequency limit. 16 = 4 mA fault frequency. 17 = MPFC de-staging frequency. 18 = Pipe fill loss frequency low. 19 = Pipe fill loss frequency limit. 20 = Broken pipe frequency limit.	e drive will operate. This will limit	other frequency parameters.	
P1.3 ^②	Accel. time 1			ID 103
Minimum value:	0.1 s Maximum va	alue: 3,000.0 s	Default value:	20.0 s
Description:	Defines the time required for the output fro	equency to accelerate from zero fr	equency to maximum frequenc	cy.
P1.4 ^②	Decel. time 1	,	'	ID 104
Minimum value:	0.1 s Maximum va	alue: 3,000.0 s	Default value:	20.0 s
Description:	Defines the time required for the output from	equency to decelerate from maxim	num frequency to zero frequenc	cy.
P1.5 ^②	Motor type selection			ID 1820
Minimum value:	N.A. Maximum va	alue: N.A.	Default value:	0
Options: Description:	0 = Inverter duty; 1 = IPM; or 2 = SPM. Defines the type of motor connected to the	e drive: standard induction motor,	internally mounted permanent	magnet, or surface mount
	permanent magnet.			
P1.6 ^①	Motor nom. current			ID 486
Minimum value:	DriveNomCurrCT*1/10 A Maximum va			DriveNomCurrCT A
Description:	Motor nameplate rated full load current. T	his value is found on the rating pl	ate of the motor.	
P1.7 ^①	Motor nom. speed			ID 489
Minimum value:	300 rpm Maximum va	20,000 19111	Default value:	MotorNomSpeedMFG
Description:	Motor nameplate rated speed. This value	is found on the rating plate of the	motor.	ID 400
P1.8 ^①	Motor PF	100	D (); 1	ID 490
Vinimum value:	0.30 Maximum va		Default value:	0.85
Description:	Motor nameplate rated power factor. This	value is round on the rating plate	or the motor.	ID 487
P1.9 ^①	Motor nom. voltage	600 V	Default value	
Minimum value:	180 V Maximum va		Default value:	MotorNomVoltMFG V
Description:	Motor nameplate rated voltage. This value	e is round on the rating plate of th	e motor.	ID 488
P1.10 ^①	Motor nom. frequency	400.00.11-	Default l	
Minimum value:	8.00 Hz Maximum va	alue: 400.00 Hz	Default value:	MotorNomFregMFG Hz

Table 56. Parameters (Cont.).

P1.11 ²	Local control place				ID 1695
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = keypad; 1 = I0 terminal; or 3 = fieldbus.				
Description:		n for the start command in e drive. Keypad display wi		erminals would be from the digital hoode is selected.	ard-wired inputs or keypad fo
P1.12 ^{①②}	Local reference	•			ID 136
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Al; 1 = Drive reference pot; 2 = Al joystick; 3 = Motor pot; 4 = Maximum frequency; 5 = Pl control output; 6 = Keypad; or 7 = Fieldbus reference.				
Description:	Defines the signal location	n for the speed reference	in local mode.		
P1.13 ^②	Remote control place	,			ID 135
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = I0 terminal; 1 = fieldbus; or 3 = keypad.				
Description:		n for the start command in the drive. Keypad display		terminals would be from the digital node is selected.	hard-wired inputs or keypad
P1.14 ^{①②}	Remote reference				ID 137
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Al; 1 = Drive reference pot; 2 = Al joystick; 3 = Motor pot; 4 = Maximum frequency; 5 = Pl control output; 6 = Keypad; or 7 = Fieldbus reference.				
Description:	Defines the signal location	n for the speed reference	in remote mode.		

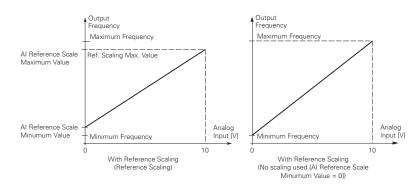
Table 57. Inputs .

P2.1 - Basic settings.								
P2.1.1 ^②	Al reference so	ID 144						
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	0.00 Hz			
Description:	Defines the minin scale maximum v	Defines the minimum frequency associated with 0% input from the analog input. Setting AI ref scale minimum value and AI reference scale maximum value both to zero will cause the analog input to scale to the minimum and maximum frequencies.						

P2.1.2 ^②	Al reference scale m	ID 145			
Minimum value:	RefScaleMin Hz	Maximum value:	400.00 Hz	Default value:	0.00 Hz

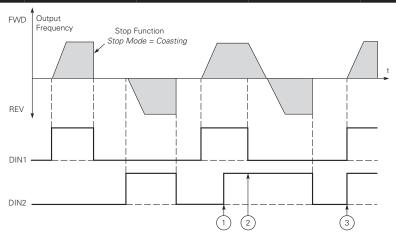
Description:

Defines the maximum frequency associated with 100% input from the analog input. Setting AI reference scale minimum value and AI reference scale maximum value both to zero will cause the analog input to scale to the minimum and maximum frequencies.



P2.1.3 ^{①②}	IO terminal S	tart/Stop logic			ID 143
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	1 = Start - rever 2 = Start - enabl	se: maintained input on start signal e: maintained input on start signal	1 to run forward 1 to run forward	ard and a maintained signal on start s and a maintained signal on start sign and a maintained signal on start signa aal 1 uses a normally open start and st	al 2 for reverse. I 2 to enable the drive to run.
Description:	Defines the fund	tionality for start signal 1 and star	t signal 2. By det	ault, start signal 1 is DI1 and start sig	nal 2 is DI2.
		erol with either a contact used on 24V+ DIN1	15 20 ID190 - Start S	ninal start signal 2 = start reverse. or start REV commands. When cont signal: DiglN:1 ID143 Start Stop Logic: Star gnal 2: DiglN:2 ID143 Start Stop Logic: Star	acts open, the motor stops.
		GND	12		

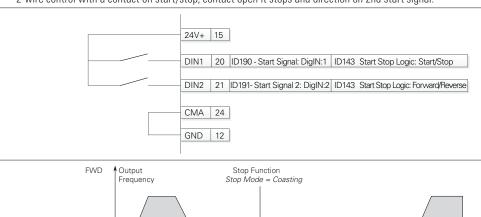
Table 57. Inputs (Cont.).

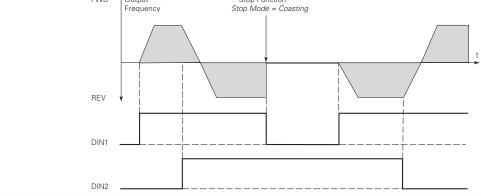


Notes: ① The first selected direction has the highest priority.
② When the DIN1 contact opens the direction of rotation

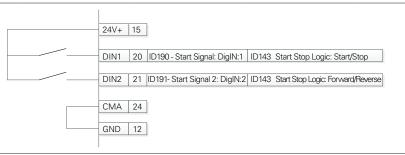
starts to change.

- (DIN1) and start reverse (DIN2) signals are active simultaneously the start forward signal (DIN1)
- 1 = P3.2: IO terminal start signal 1 = start forward P3.3: IO terminal start signal 2 = start reverse. This would be considered 2-wire control with a contact on start/stop, contact open it stops and direction on 2nd start signal.

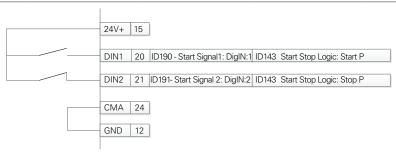




2 = P3.2: IO terminal start signal 1 = start forward - P3.3: IO terminal start signal 2 = start reverse. This would be considered 3-wire control with start signal 2 required to be closed to enable start on start signal 1.



3 = Three-wire connection (pulse control): P3.2: IO terminal start signal 1 = start forward - P3.3: IO terminal start signal 2 = start reverse. This would be considered 3-wire control with start signal 1 being the start pulse and start signal 2 being the NC ston



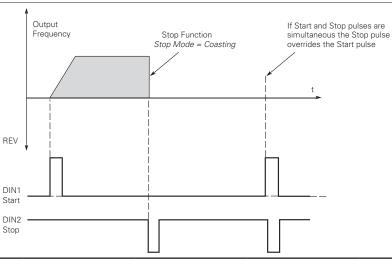


Table 57. Inputs (Cont.).

P2.1.4 ^②	External fault 1 text				ID 2227
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = External fault; 1 = Vibration cutout; 2 = High motor temperat 3 = Low pressure; 4 = High pressure; 5 = Low water; 6 = Damper interlock; 7 = Run enable; 8 = Freeze stat trip; 9 = Smoke detect; 10 = Seal leakage; 11 = Rod breakage; or 12 = Belt break.	ure;			
Description:	Defines the text to be dis PowerXpert inControl, or		t 1 NO or NC is triggere	d. This text will be viewable us	ing a remote keypad,
P2.1.5 ^②	External fault 2 text				ID 2298
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = External fault; 1 = Vibration cutout; 2 = High motor temperat 3 = Low pressure; 4 = High pressure; 5 = Low water; 6 = Damper interlock; 7 = Run enable; 8 = Freeze stat trip; 9 = Smoke detect; 10 = Seal leakage; 11 = Rod breakage; or 12 = Belt break.	ure;			
Description: P2.1.6 [©]	Defines the text to be dis PowerXpert inControl, or External fault 3 text		t 2 NO or NC is triggere	d. This text will be viewable us	ing a remote keypad,
P2.1.6° Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	0 = External fault; 1 = Vibration cutout; 2 = High motor temperat 3 = Low pressure; 4 = High pressure; 5 = Low water; 6 = Damper interlock; 7 = Run enable; 8 = Freeze stat trip; 9 = Smoke detect; 10 = Seal leakage; 11 = Rod breakage; or 12 = Belt break.	ure;			
Description:	Defines the text to be dis PowerXpert inControl, or		t 3 NO or NC is triggere	d. This text will be viewable us	ing a remote keypad,
P2.1.7 ^②	Motor pot ramp time				ID 156
Viinimum value:	0.1 Hz/s	Maximum value:	2,000.0 Hz/s	Default value:	10.0 Hz/s
Description:	Defines the speed of char	nge for the motor potention	meter reference value.		
P2.1.8 ^②	Motor pot reference i	eset			ID 169
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = No reset - reference s 1 = Memory reset in stop 2 = Memory reset in powe	and power down - referen		ve is stopped or the power is cy ered down only.	cled to the drive; or
Description:	Defines how the motor po	t reference signal is hand	ed on shutting down fre	equency converter output or pov	vering down the freque

P2.2 - Digital input.					
P2.2.1 ²	DI1 function				ID 1801
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	P2.1.3. 2 = IO terminal start P2.1.3. 3 = Reverse, when S 4 = Ext. fault 1, whe 5 = Ext. fault 2, whe 6 = Ext. fault 3, whe 7 = Fault reset, whe 8 = Run enable, whe 9 = Preset speed B 11 = Preset speed B 12 = Jog enable, wh 13 = Accel. pot valu 14 = Decel. pot valu 15 = Reset pot zero, 16 = Accel./Decel. p 17 = Accel./Decel. p 18 = No access to p 19 = Remote control 20 = Local control, v 21 = Parameter 1/2 22 = Pl controller, w 23 = Pl setpoint sele 24 = Motor interlock 25 = Smoke mode, v 26 = Fire mode Ref. Ref. 2 will be a 28 = Fire mode reve be reverse. 29 = DC brake active, 30 = Preheat active,	signal 1, when the control sor signal 2, when the control sor clark (Stop logic is set to 3 starn closed, Ext. fault 1 will be an n closed, Ext. fault 2 will be an n closed, Ext. fault 3 will be an closed, the drive will allow at the seven preset speeds are 1, the seven preset speeds are 2, the motor pote when closed, the motor pote when closed, the motor pote when closed, the motor pote or will be when closed, the drive will be the closed, the drive will be the closed, the drive will be then closed, motor will be then closed, the fire mode will be 1/2 select, when fire mode will be 1/2 select, when fire mode is ctive.	t pulse stop pulse, t tivated. stivated. sterest. start command and selected via three b selected via three b selected via three lead at P2.3.8 will oventiometer value will intometer value will stime to will hold the outpu s can be made to are forced to the local cut to the remorced to the local cut to the reference sour coint 1 is active. When the reference sour coint 1 is active. We enabled to run. se active. active and this input is operaking will be active le will be active le will be active.	inary inputs. This is least significabinary inputs. binary inputs. This is most significaerride the frequency reference. I increment at the rate defined by related to zero. I increment at the rate defined by reset to zero. I issed. When closed, Accel./Decel. to the frequency and ignore changes to the setting in the drive. It is control place. I is active. I can be control place. I is active. I can be control place. I is active. I is open, fire mode Ref. 1 will be active. It is open, fire mode Ref. 1 will be active, the direction will be forward.	erform the action defined by out in the reverse direction. Int bit in that binary input. Interpretation of the control of th
Description:	Defines the function	of digital input 1.			
P2.2.2 ^②	DI1 invert				ID 1802
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disabled; or 1 = Enabled.				
Description:	When enabled, the fu				

P2.2.3 ^②	DI2 function				ID 1803
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	P2.1.3. 2 = IO terminal star P2.1.3. 3 = Reverse, when 4 = Ext. fault 1, who 6 = Ext. fault 2, who 6 = Ext. fault 3, who 7 = Fault reset, who 8 = Run enable, who 9 = Preset speed E 10 = Preset speed E 12 = Jog enable, who 13 = Accel. pot value 14 = Decel. pot value 15 = Reset pot zero 16 = Accel./decel. to 17 = Accel./decel. to 18 = No access to 19 = Remote control 20 = Local control, 21 = Parameter 1, 22 = Pl controller, who 23 = Pl setpoint selection 24 = Motor interloc 25 = Smoke mode, 26 = Fire mode Ref. Ref. 2 will be a 28 = Fire mode reverses. 29 = DC brake active 30 = Preheat active 30 = Pr	t signal 1, when the control sout signal 2, when the control sout signal 2, when the control sout start/Stop logic is set to three en closed, Ext. fault 1 will be at en closed, Ext. fault 2 will be at en closed, Ext. fault 3 will be at en closed, Ext. fault 3 will be at en closed, en closed, en closed, en closed, en closed, the drive sill allow at en closed, the drive will allow at en closed, the seven preset speeds are en closed, the jog speed define, when closed, the motor poter, when closed, the motor poter in the closed, the motor poter in the closed, the motor poter in the closed, the drive will be when closed, the drive will be compared to the closed, the motor will when closed, the motor will when closed, fire mode will be act 1/2 Sel., when fire mode is act active.	start pulse stop putivated. ctivated. ctivated. ctivated. ctivated. a start command a selected via three selected via three selected via three selected via three to a triomater value with the selected via three selected via three control of the selected via three selected via three selected via three selected via three to at P2.3.8 will or entiometer value with the selection of	binary inputs. This is least significar a binary inputs. e binary inputs. This is most significar verride the frequency reference. Will increment at the rate defined by now ill decrement in the drive. It frequency and ignore changes to the any setting in the drive. In control place. It is active. In the direction will be active. In the direction will be forward. Will decrement in the direction will be forward. Will decrement in the direction will be forward. Will decrement in the direction will be forward.	reform the action defined by start in the reverse direction. In that bit in that binary input. In that bit in that binary input. In that bit in that binary input. In the reference value. In that bit in that binary input. In that bit in that binary input.
Description:	Defines the function	of digital input 2.			
P2.2.4 ²	DI2 invert				ID 1804
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disable; or 1 = Enable.				
Description:	When enabled, the f	unction assigned to DI2 will be	activated with the	e opposite state of DI2	

P2.2.5 ²	DI3 function				ID 1805
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	4
Options:	P2.1.3. 2 = 10 terminal star P2.1.3. 3 = Reverse, when 4 = Ext. fault 1, who 5 = Ext. fault 2, who 6 = Ext. fault 3, who 7 = Fault reset, who 8 = Run enable, who 9 = Preset speed E 12 = Jog enable, who 13 = Accel. pot value 14 = Decel. pot value 15 = Reset pot zero 16 = Accel./decel. to 17 = Accel./decel. to 17 = Accel./decel. to 18 = No access to 19 = Remote control 20 = Local control, 21 = Parameter 1, 22 = Pl controller, who should be a parameter 1, 22 = Pl controller, who should be should be seen and to should be s	t signal 1, when the control sout signal 2, when the control sout start/Stop logic is set to three en closed, Ext. fault 1 will be at en closed, Ext. fault 2 will be at en closed, Ext. fault 3 will be at en closed, Ext. fault 3 will be at en closed, Ext. fault 3 will be at en closed, the drive faults will be not enclosed, the drive will allow at 20, the seven preset speeds are 81, the seven preset speeds are 100 sed, the jog speed definite, when closed, the motor poter, when closed, the drive will be when closed, the motor will be cet, when open, parameter set k 1, when closed, the motor will when closed, fire mode will be act 1/2 Sel., when fire mode is act active.	start pulse stop pulsitivated. stivated. stivated. stivated. stivated. se reset. selected via three biselected via three biselected via three biselected via three biselected via three light one and selected via three biselected via the search to the reference sourt on the seative. When the reference sourt on the seative with this input is operating will be active. It is active to the seative will be active. It is active to the seative will be active.	inary inputs. This is least significationary inputs. binary inputs. This is most significationary inputs. This is most significationary inputs. This is most signification in the frequency reference. I increment at the rate defined by reset to zero. I decrement	erform the action defined by a start in the reverse direction. Int bit in that binary input. Interpretation of the start in the start in that binary input. Interpretation of the start in the start in that binary input. Interpretation of the start in the reverse direction.
Description:	Defines the function	of digital input 3.			
P2.2.6 ^②	DI3 invert				ID 1806
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disable; or				
	1 = Enable.				

P2.2.7 ^②	DI4 function				ID 1807
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	7
Options:	P2.1.3. 2 = IO terminal start P2.1.3. 3 = Reverse, when Start P2.1.3. 3 = Reverse, when Start P2.1.3. 4 = Ext. fault 1, wher Start P2.1.3. 5 = Ext. fault 2, wher Start P2.1.3. 8 = Run enable, wher P2 = Preset speed B1. 10 = Preset speed B2. 10 = Preset speed B2. 11 = Preset speed B2. 12 = Jog enable, wher P2. 13 = Accel. pot value P3. 14 = Decel. pot value P4. 15 = Reset pot zero, value P4. 16 = Accel./decel. tin P4. 17 = Accel./decel. tin P4. 18 = No access to part P4. 19 = Remote control, P4. 20 = Local control, wall P4. 21 = Parameter 1/2 Start P4. 22 = Pl controller, wall P4. 23 = Pl setpoint select P4. 24 = Motor interlock P4. 25 = Smoke mode, wher P4. 26 = Fire mode Ref. P4. 27 = Fire mode Ref. P4. 28 = Fire mode Ref. P4. 29 = DC brake active, P4. 31 = Derag. enable, value.	signal 1, when the control social signal 3, when the control social signal s	start pulse stop tivated. ctivated. ctivated. ctivated. stivated. se reset. a start command selected via thr	ree binary inputs. This is least significal ree binary inputs. This is most significal reree binary inputs. This is most significall override the frequency reference. It override the frequency reference. It will decrement at the rate defined by rewill reset to zero. It was a comment of the reset to zero. It was a constant of the constant of the constant of the constant of the control place. It was a control place was a control place. It was a control place was a control place. It was a control place was a control place. It was a control place was a control place. It was a control place was a control place was a control place. It was a control place was a control place was a control place was a control place. It was a control place was a control place was a control place was a control place. It was a control place was a	erform the action defined by a start in the reverse direction. In the bit in that binary input. In the standard in that binary input. In the standard in the standard input. In the standard input
Description:	Defines the function o	i uigitai input 4.			ID 1808
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disable; or 1 = Enable.		14.7 (.		<u> </u>
Description:	When enabled, the fur	nction assigned to DI4 will be	activated with	the opposite state of DI4.	

P2.2.9 ^②	Virtual RO1 input				ID 1809
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	P2.1.3. 2 = IO terminal start sign P2.1.3. 3 = Reverse, when Start, 4 = Ext. fault 1, when clo 5 = Ext. fault 2, when clo 6 = Ext. fault 3, when clo 7 = Fault reset, when clo 8 = Run enable, when clo 9 = Preset speed B0, the 10 = Preset speed B1, the 12 = Jog enable, when clo 13 = Accel. pot value, wh 14 = Decel. pot value, wh 15 = Reset pot zero, whe 16 = Accel./decel. time s 17 = Accel./decel. time s 17 = Accel./decel. prohib 18 = No access to param 19 = Remote control, when 21 = Parameter 1/2 Sel., 22 = PI controller, when 23 = PI setpoint select, when 24 = Motor interlock 1, when 25 = Smoke mode, when 26 = Fire mode Ref. 1/2 Sel., 27 = Fire mode Ref. 1/2 Sel. 28 = Fire mode reverse, whe reverse. 29 = DC brake active, wh 30 = Preheat active, whe	/Stop logic is set to three setsed, Ext. fault 1 will be act seed, Ext. fault 2 will be act seed, Ext. fault 2 will be act seed, Ext. fault 3 will be act seed, Ext. fault 3 will be act seed, Ext. fault 3 will be act seed, all active faults will be seed, the drive will allow a seven preset speeds are see seven preset speeds are see seven preset speeds are en closed, the motor potent of the property of the proper	start pulse stop putivated. tivated. tivated. tivated. tivated. tivated. te reset. start command a selected via three selected to the local to the selected to the local to the sective. Whe the reference so soint 1 is active. The enabled to run se active. Whe the selected via three selected	binary inputs. This is least significar binary inputs. This is most significar be binary inputs. This is most significar verride the frequency reference. Will increment at the rate defined by mill decrement at the rate def	rform the action defined by start in the reverse direction. In the bit in that binary input. Into bit in that binary input. Into pot ramp time. I
Description:	Defines the function of vir	tual RO1.			
P2.2.10 ^②	Virtual RO1 invert				ID 1810
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disable; or 1 = Enable.				

P2.2.11 ²	Virtual RO2 inpo	ut			ID 1811
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	P2.1.3. 2 = 10 terminal st P2.1.3. 3 = Reverse, whe 4 = Ext. fault 1, w 5 = Ext. fault 2, w 6 = Ext. fault 3, w 7 = Fault reset, w 8 = Run enable, w	action. art signal 1, when the control sou art signal 3, when the control sou art signal 3, when the control sou art signal 3, when the control sou by Start/Stop logic is set to three hen closed, Ext. fault 1 will be at hen closed, Ext. fault 2 will be at hen closed, all active faults will the closed, the drive will allow a by the seven preset speeds are	start pulse stop pulse, to tivated. stivated. stivated. stivated. stivated. see reset.	I, this input when closed will pe this input will cause the drive to	erform the action defined by o start in the reverse direction
	11 = Preset speed 12 = Jog enable, v 13 = Accel. pot va 14 = Decel. pot va 15 = Reset pot ze 16 = Accel./decel 17 = Accel./decel 18 = No access to 19 = Remote cont 20 = Local control 21 = Parameter 1, 22 = Pl controller, 23 = Pl setpoint s 24 = Motor interlo 25 = Smoke mode 26 = Fire mode Re Ref. 2 will be 28 = Fire mode re be reverse. 29 = DC brake act 30 = Preheat activ	IB1, the seven preset speeds are B2, the seven preset speeds are When closed, the jog speed defin lue, when closed, the motor pote of the when closed, the motor potent ime set, when open, accel./dec prohibit, when closed, the drive param When closed, the drive param When closed, the drive will be	selected via three bina ed at P2.3.8 will overrid mitometer value will incentiometer value will detiometer value will detiometer value will be used. will hold the output frese can be made to any see forced to the local contract at its active. When close the reference source to the local contract is active. When labe eactive. When the enabled to run, be active, ive. tive and this input is open, the taking will be active.	ary inputs. This is most significate the frequency reference, comment at the rate defined by a comment at the rate defined by a comment at the rate defined by at to zero. When closed, accel./decel. tin quency and ignore changes to the etting in the drive. The control place of place. Sed, Parameter set 2 is active. Or I controller output. Closed, setpoint 2 is active. The mode Ref. 1 will be active. The direction will be forward.	motor pot ramp time. motor pot ramp time. ne 2 will be used. the reference value. ve. When closed, fire mode
Description:	Defines the function	n of virtual RO2.			
P2.2.12 ²	Virtual RO2 inve	ert			ID 1810
<u>.</u>	Virtual RO2 inve	Maximum value:	N.A.	Default value:	ID 1810
P2.2.12 ^②	N.A. 0 = Disable; or		N.A.	Default value:	
P2.2.12 [©] Minimum value: Options:	N.A. 0 = Disable; or 1 = Enable.	Maximum value:			0
P2.2.12 ^② Minimum value:	N.A. 0 = Disable; or 1 = Enable.				0
P2.2.12 [©] Minimum value: Options:	N.A. 0 = Disable; or 1 = Enable. When enabled, the	Maximum value:			0
P2.2.12 [©] Minimum value: Options: Description: P2.3 - Preset speed	N.A. 0 = Disable; or 1 = Enable. When enabled, the	Maximum value:			0
P2.2.12 [©] Minimum value: Options: Description:	N.A. 0 = Disable; or 1 = Enable. When enabled, the	Maximum value:			0 ual RO2 input.
P2.2.12 [®] Minimum value: Options: Description: P2.3 - Preset speed. P2.3.1 [®]	N.A. 0 = Disable; or 1 = Enable. When enabled, the Preset speed 1 0.00 Hz	Maximum value: function assigned to virtual RO2	input will be activated MaxFreq Hz	with the opposite state of virtu	0 ual RO2 input.
P2.2.12 [©] Minimum value: Options: Description: P2.3 - Preset speed. P2.3.1 [©] Minimum value:	N.A. 0 = Disable; or 1 = Enable. When enabled, the Preset speed 1 0.00 Hz	Maximum value: function assigned to virtual RO2 Maximum value:	input will be activated MaxFreq Hz	with the opposite state of virtu	0 ual RO2 input.
P2.2.12 [®] Minimum value: Options: Description: P2.3 - Preset speed P2.3.1 [®] Minimum value: Description:	N.A. 0 = Disable; or 1 = Enable. When enabled, the Preset speed 1 0.00 Hz Preset speed is sel	Maximum value: function assigned to virtual RO2 Maximum value:	input will be activated MaxFreq Hz	with the opposite state of virtu	0 ual R02 input. ID 105 5.00 Hz
P2.2.12® Minimum value: Options: Description: P2.3 - Preset speed. P2.3.1® Minimum value: Description: P2.3.2®	N.A. 0 = Disable; or 1 = Enable. When enabled, the Preset speed 1 0.00 Hz Preset speed is sel Preset speed 2 0.00 Hz	Maximum value: function assigned to virtual RO2 Maximum value: ected with digital inputs using a	input will be activated MaxFreq Hz binary input. MaxFreq Hz	with the opposite state of virtu	0 Jual RO2 input. JD 105 5.00 Hz JD 106
P2.2.12® Minimum value: Options: Description: P2.3 - Preset speed P2.3.1® Minimum value: Description: P2.3.2® Minimum value:	N.A. 0 = Disable; or 1 = Enable. When enabled, the Preset speed 1 0.00 Hz Preset speed is sel Preset speed 2 0.00 Hz	Maximum value: function assigned to virtual RO2 Maximum value: ected with digital inputs using a Maximum value:	input will be activated MaxFreq Hz binary input. MaxFreq Hz	with the opposite state of virtu	0 Jual RO2 input. JD 105 5.00 Hz JD 106
P2.2.12® Minimum value: Options: Description: P2.3 - Preset speed. P2.3.1® Minimum value: Description: P2.3.2® Minimum value: Description:	N.A. 0 = Disable; or 1 = Enable. When enabled, the Preset speed 1 0.00 Hz Preset speed 2 0.00 Hz Preset speed 2 Preset speed is sel	Maximum value: function assigned to virtual RO2 Maximum value: ected with digital inputs using a Maximum value:	input will be activated MaxFreq Hz binary input. MaxFreq Hz	with the opposite state of virtu	0 Jual R02 input. JD 105 5.00 Hz JD 106 10.00 Hz

P2.3.4²

Minimum value:

Description:

Preset speed 4

0.00 Hz

MaxFreq Hz

Maximum value:

Preset speed is selected with digital inputs using a binary input.

ID 119

20.00 Hz

Default value:

P2.3.5 ^②	Preset speed 5				ID 120
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	25.00 Hz
Description:	Preset speed is sele	ected with digital inputs using a	binary input.		
P2.3.6 ^②	Preset speed 6	"		'	ID 121
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	30.00 Hz
Description:	Preset speed is sele	ected with digital inputs using a	binary input.		
P2.3.7 ^②	Preset speed 7				ID 122
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	35.00 Hz
Description:	Preset speed is sele	ected with digital inputs using a	binary input.		
P2.3.8 ^②	Jog reference				ID 117
Minimum value:	MinFreq Hz	Maximum value:	MaxFreq Hz	Default value:	0.00 Hz
Description:	Defines the jogging drive starts and ram	speed set point - this speed is s aps to this speed, input removed	elected with the digital drive stops.	input programmed for jogging	speed. When enabled, th

P2.4 - Al settings.

P2.4.1	Al mode			ID 222
Minimum value:	N.A. Maximum val	ue: N.A.	Default value:	1
Options:	0 = 0 - 20 mA; or 1 = 0 - 10 V.			
Description:	Defines the analog input mode to current or parameter.	voltage the DIP switches o	n control board will need to be set	to the same mode as this
	*DM1 PRO CN5 terminals 8 and 9 for curren port.	t or voltage, also need to se	et DIP switches SW2 2 and 3 on co	ntrol board, near the RJ45
	DIP switches SW2 2 and 3 off for voltage.			

Current mode, if using the ± 10 V supply on CN5 terminals 13 of the DM1 / DM1 Pro, it will require DIP switches SW2 2 and 3 on to complete the current loop. When doing a current loop with an external supply, the DIP switches SW2 2 off and 3 on.

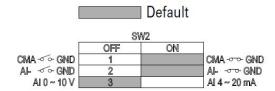
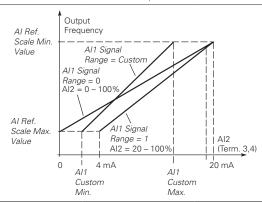


Table 57. Inputs (Cont.).

P2.4.2 ^②	Al signal range	e			ID 175
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = 0-100%/0-20 1 = 20-100%/4-20 2 = Customized.				
Description:	With this parame	eter, you can select the analog inpu	it 1 signal range.		

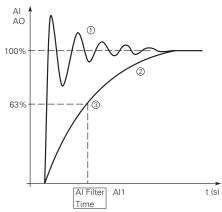
For selection "Customized," see "Al Custom Min" and "Al Custom Max", this enables a customized signal range.



P2.4.3 ^②	Al custom minimu	n		·	ID 176
Minimum value:	0.00%	Maximum value:	Ai1CustomMax %	Default value:	0.00%
Descriptions:	Defines the minimum p	percentage for the input rang	e to be associated with Al ı	eference minimum scale.	
P2.4.4 ^②	Al custom maximii	n			ID 177
Minimum value:	Ai1CustomMin %	Maximum value:	100.00%	Default value:	100.00%
Descriptions:	Defines the minimum p	percentage for the input rang	e to be associated with Al ı	eference maximum scale.	
P2.4.5 ^②	Al filter time				ID 174
Minimum value:	0.00 s	Maximum value:	10.00 s	Default value:	0.10 s

Descriptions:

Defines the filter time applied to the analog input signal, zero equals no filtering.



Notes: ① Analog signal with faults (unfiltered).

② Filtered analog signal.

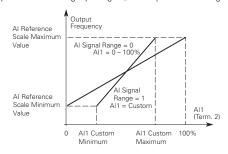
3 Filter time constant at 63% of the set value.

Table 57. Inputs (Cont.).

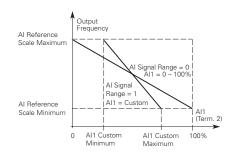
P2.4.6 ^②	Al signal invert	,		ID 181
Minimum value:		Maximum value:	Default value:	0
Options:	0 = Not invert; or 1 = Invert.			

Descriptions:

Defines the filter time applied to the analog input signal, zero equals no filtering.



Al1 Signal Inversion

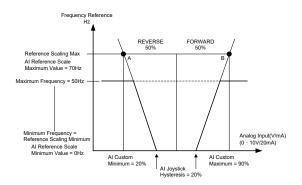


Maximum Al1 signal = minimum set speed. Minimum Al1 signal = maximum set speed.

P2.4.7 ^②	Al joystick hy	steresis		'	ID 178	
Minimum value:	0.00%	Maximum value:	20.00%	Default value:	0.00%	

Descriptions:

Defines the joystick hysteresis - when the analog input is within this range, the drive will interpret this as a zero speed reference.

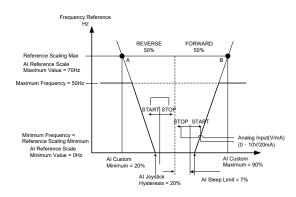


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P2.4.8 ^②	Al sleep limit				ID 179
Minimum value:	0.00%	Maximum value:	100.00%	Default value:	0.00%

Descriptions:

Defines the sleep level of the analog input - if the analog input signal is below this level for a time greater than the analog sleep delay, the drive will transition to a sleep state and restart when the analog input increases above this level.



P2.4.9 ^②	Al sleep delay	,			ID 180	
Minimum value:	0.00 s	Maximum value:	320.00 s	Default value:	0.00 s	
Descriptions:	Defines the delay	for the analog input sleep level.				
P2.4.10 ^②	Al joystick offs	et			ID 133	
Minimum value:	-50.00%	Maximum value:	50.00%	Default value:	0.00%	
Descriptions:		nt by default is the middle of Al ra analog input center point.	ange. Joystick offset o	defines how much the zero point	is moved in the forward	or

P2.5 - Drive reference pot.

P2.5.1 ²	Pot custom minimum				ID 1814
Minimum value:	0.00%	Maximum value:	100.00%	Default value:	20.00%
Description:	Defines the minimum perce	ntage for the input range	e to be associated with	h Al reference minimum scale.	
P2.5.2 ^②	Pot custom maximim		,		ID 1815
Minimum value:	0.00%	Maximum value:	100.00%	Default value:	100.00%
Description:	Defines the maximum perce	entage for the input rang	e to be associated wit	th AI reference maximum scale.	
P2.5.3 ^②	Pot filter time				ID 1816
Minimum value:	0.00 s	Maximum value:	10.00 s	Default value:	1.00 s
Description:	Defines the filter time appli	ed to the analog input si	gnal - zero equals no f	iltering.	

[©] Parameter value can only be changed after the drive has stopped. © Parameter value will be set to be default when changing macros.

Table 58. Outputs.

P3.1 - Digital output					
P3.1.1 ^②	RO1 function	,		,	ID 152
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	6 = Reverse - drive is 7 = At speed - the ot 8 = Zero frequency - 9 = Frequency limit s 10 = Pl supervision - 11 = Torque limit sup 12 = Reference limit 13 = Power limit sup 14 = Temperature lim 15 = Analog input su 16 = Motor current s 17 = Over heat fault 18 = Over current re 19 = Over volt regula 20 = Under volt regula 20 = Under volt regula 21 = 4 mA fault - 4 m 22 = External fault - 23 = Motor thermal s 24 = STO fault output 25 = Control from IO 26 = Remote control 27 = Un-requested r 28 = Fire mode - driv 29 = Damper control 30 = Valve control - 31 = Jog speed - driv 32 = Fieldbus input 1 33 = Fieldbus input 1 33 = Fieldbus input 1 34 = DC charge swit 35 = Preheat active - 36 = Cold weather active - 36 = Cold weather active - 37 = Pl sleep - Pl cor 38 = 2nd stage ramp 39 = Prime pump act 40 = Master drive stat 43 = Single drive cor	ready for operation; ming; uilted; re is not faulted; nas a warning message; soutputting reverse phase rota utput frequency has reached the drive output is at zero frequenc repervision - supervision for fre- supervision - supervision for rorqu supervision - supervision for rorqu supervision - supervision for power it supervision - supervision for power it supervision - supervision for mo- ervision - supervision for power- it supervision - supervision for mo- ervision - supervision for power- it supervision - supervision for mo- ervision - supervision for power- it supervision - supervision for mo- ervision - supervision for power- it supervision - supervision for mo- ervision - supervision for power- it supervision - supervision for power- it supervision - supervision for power- it supervision - supervision for frequency ervision - supervision for frequ	e set reference; cy; quency limit 1 is activated; e limit; ference limit; 'limit; drive temperature lir og input limit; tor current limit; urred; enabled; d; oled; ccurred; vated; nand location; ection isn't the same word; word; s closed; ted; tive; l. time 2 is active; ump mode; drive in the multi-pum c into the multi-pum cictor is open or close	nit; e as the reference direction; np control mode; ontrol mode; or in multi-pump control mode.	
Description:	RO1 on delay	associated with changing the	state of relay output	1.	ID 2112
P3.1.2 ^② Minimum value:		Maximum value:	220.0 -	Default value:	
	0.0 s		320.0 s	Detault value:	0.0 s
Description: P3.1.3 ²	RO1 off delay	elay to turn on after signal rece	ived.		ID 2113
	0.0 s	Maximum value:	320.0 s		
Minimum value:				Default value:	0.0 s

Table 58. Outputs (Cont.).

P3.1.4 ^②	RO2 function				ID 153	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	3	
Options:	0 = Not used - no action; 1 = Ready - drive is ready 2 = Run - drive is running; 3 = Fault - drive is faulted 4 = Fault invert - drive is 5 5 = Warning - drive has a 6 = Reverse - drive is out; 7 = At speed - the output 8 = Zero frequency - drive; 9 = Frequency limit super; 10 = Pl supervision - supe; 11 = Torque limit supervis; 12 = Reference limit supervis; 13 = Power limit supervis; 14 = Temperature limit su; 15 = Analog input supervi; 16 = Motor current super; 17 = Over heat fault - driv; 18 = Over current regular - ov; 20 = Under volt regular - ov; 21 = 4 mA fault - 4 mA fa; 22 = External fault - exte; 23 = Motor thermal fault; 24 = STO fault output - sa; 25 = Control from IO - I/O; 26 = Remote control - ren; 27 = Un-requested rotati; 28 = Fire mode - drive is; 29 = Damper control - da; 30 = Valve control - valve; 31 = Jog speed - drive is; 32 = Fieldbus input 1 - co; 33 = Fieldbus input 2 - co; 34 = DC charge switch cl; 35 = Preheat active - prel; 36 = Cold weather active; 37 = Pl sleep - Pl controll; 38 = 2nd stage ramp freq; 39 = Prime pump active - 40 = Master drive state - ir	into faulted; warning message; putting reverse phase rota frequency has reached the eutput is at zero frequenc vision - supervision for fre rivision for Pl controller is a ision - supervision for torquivision - supervision for power pervision - supervision for mover pervision for mover puttable put	tion; e set reference; cy; quency limit 1 is act activated; e limit; ference limit; r limit; drive temperature l og input limit; tor current limit; urred; enabled; d; bled; cccurred; vated; nand location; rection isn't the sam word; word; s closed; uted; titve; l. time 2 is active; ump mode; drive in the multi-pue e in the multi-pue	limit; ne as the reference direction; ump control mode; control mode;		
Description:		ociated with changing the s	sion for power limit; upervision for drive temperature limit; vision for analog input limit; vision for motor current limit; fault has occurred; t regulator is enabled; ator is enabled; gulator is enabled; qualtor is enabled; red; occurred; nal fault has occurred; finput is activated; ed start command location; introl place; the active direction isn't the same as the reference direction; output; ut; vidibus control word; charge relay is closed; node is activated; ener mode is activ			
P3.1.5 ^②	RO2 on delay	Maximum value:	220.0 -	Default value		
Minimum value:	0.0 s	Maximum value:		Detault value:	U.U S	
Description:	1	to turn on after signal rece	eivea.		ID 2445	
P3.1.6 ^②	RO2 off delay					
Minimum value:	0.0 s	Maximum value:		Default value:	0.0 s	
Description:		to turn off after signal rem	oved.			
P3.1.7 ^②	RO2 reverse				ID 2118	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0	
Options:	0 = No; or 1 = Yes.		inase rotation; acached the set reference; to frequency; to frequency limit 1 is activated; trottorie is activated; for torque limit; for power limit; for power limit; for power limit; for power limit; to for motor current limit; to for motor current limit; to for motor current limit; to far analog input limit; to a scaled; gulator is enabled; to ris enabled; to ris enabled; for limit as occurred; put is activated; for limit as occurred; put a scrivated; to eactive direction isn't the same as the reference direction; tput; sus control word; sus control word; sus control word; sus control word; for relay is closed; e is activated; mode is active; tate; cocl./decel. time 2 is active; in prime pump mode; e master drive in the multi-pump control mode; or solor contactor is open or close in multi-pump control mode. ID 2114 ratue: 320.0 s Default value: 0.0 s signal received. ID 2115 ratue: 320.0 s Default value: 0.0 s signal removed.			

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Table 58. Outputs (Cont.).

P3.1.8 ^②	Virtual RO1 fund	ction			ID 2463
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	2 = Run - 'drive is ru 3 = Fault - drive is ru 4 = Fault invert - dr 5 = Warning - drive 6 = Reverse - the dr 7 = At speed - the dr 8 = Zero frequency 9 = Frequency limit 10 = Pl supervision 11 = Torque limit su 12 = Reference limit 13 = Power limit su 14 = Temperature limit su 15 = Analog input si 16 = Motor current 17 = Over heat fault 18 = Over current rri 19 = Over volt regu 20 = Under volt regu 20 = Under volt regu 20 = Under volt regu 21 = 4 mA fault - 4 22 = External fault 23 = Motor therma 24 = STO fault outp 25 = Control from li 26 = Remode - dr 27 = Unrequested ri 28 = Fire mode - dr 29 = Damper control 31 = Jog speed - dr 32 = Fieldbus input 33 = Fieldbus input 34 = DC charge sw 35 = Preheat active 36 = Cold weather 37 = Pl sleep - Pl co 38 = 2nd stage ram 39 = Prime pump ar 40 = Master drive st	ready for operation; inning; faulted; faulted; faulted; has a warning message; rive is outputting reverse phase output frequency has reached the drive output is at zero frequenc supervision - supervision for free - supervision for PI controller is a pervision - supervision for ror expervision - supervision for ror expervision - supervision for power mit supervision - supervision for analy supervision - supervision for most to drive over heat fault has occured; and the supervision regulator is enable ular - under volt reg	e set reference; ry; quency limit 1 is acti activated; e limit; ference limit; elimit; drive temperature li og input limit; tor current limit; trred; enabled; d; accurred; accurred; action is not the sam continue temperature ection is not the sam di tive; tive; l. time 2 is active; limit is active; limit is active; limit is active; limit is multi-pure e in the multi-pure	mp control mode;	
Description:	Defines the function				

Table 58. Outputs (Cont.).

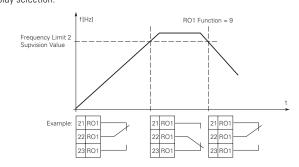
P3.1.9 ^②	Virtual RO2 function			'	ID 2464
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	7 = At speed - the output 8 = Zero frequency - drive 9 = Frequency limit supervision - supe 11 = Torque limit supervision - supe 11 = Torque limit supervisi 12 = Reference limit supervisi 14 = Temperature limit supervisi 14 = Temperature limit supervisi 16 = Motor current supervi 16 = Motor current supervi 17 = Over heat fault - driv 18 = Over current regular - over volt regular - ov	into taulted; warning message; outputting reverse phase re frequency has reached the output is at zero frequency vision - supervision for freq rvision - supervision for torque rvision - supervision for power pervision - supervision for analo vision - supervision for torque vision - supervision for torque vision - supervision for freq vision - supervision for forque vision - supervision for freq vision - supervision for forque vis	set reference; ; uency limit 1 is activate ; tivated; limit; erence limit; limit; grence limit; grence limit; grence limit; grence limit; grence limit; gred; grence limit; g	s the reference direction; control mode; rol mode;	
Description:	Defines the function asso	ciated with changing the st	ate of virtual RO.		

P3.2 - Supervisions.

P3.2.1 ^②	Frequency limi	it supervision			ID 154
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = No limit; 1 = Low limit sup 2 = High limit Sup				
Description:	Selects how the	drives frequency limit supervision	controller functions.		
P3.2.2 ^②	Frequency limit	it display			ID 1821
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Enable DO; 1 = Warning (W/0 2 = Warning (W S 3 = Fault/enable l	S)/enable DO; or			
Description:	Supervision displ	ay selection.			

Table 58. Outputs (Cont.).

P3.2.3 ²	Frequency limi	t supervision value			ID 155	
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	0.00 Hz	
Description:	Selects the freque	ency value supervised by the frequ	iency limit supervision fu	unction.		
P3.2.4 ^②	Frequency limi	t supervision hysteresis	,	,	ID 2200	
Minimum value:	0.10 Hz	Maximum value:	1.00 Hz	Default value:	0.10 Hz	
Description:	This value selects the bandwidth between when the output frequency supervision enables and disables.					
P3.2.5 ^②	Torque limit su	pervision			ID 159	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0	
Options:	0 = No limit; 1 = Low limit supe 2 = High limit supe					
Description:	Supervision displa	ay selection.				



P3.2.6 ^②	Torque limit disp	olay			ID 1822	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0	
Options:	0 = Enable DO; 1 = Warning (W/O S 2 = Warning (W S)/ 3 = Fault/enable DO	enable DO; or				
Description:	Supervision display	selection.				
P3.2.7 ^②	Torque limit sup	ervision value			ID 160	
Minimum value:	-1,000.00%	Maximum value:	1,000.00%	Default value:	100.00%	
Description:	Selects the torque	value supervised by the torque li	mit supervision function	1.		
P3.2.8 ²	Torque limit supervision hysteresis					
Minimum value:	1.00%	Maximum value:	5.00%	Default value:	1.00%	
Description:	This value selects the bandwidth between when the torque supervision enables and disables.					
P3.2.9 ^②	Reference limit	supervision			ID 161	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0	
Options:	0 = No limit; 1 = Low limit super 2 = High limit super					
Description:	This value selects t	ne bandwidth between when th	e torque supervision en	ables and disables.		
P3.2.10 ^②	Reference limit display				ID 1823	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0	
Options:	0 = Enable DO; 1 = Warning (W/O S) 2 = Warning (W S)/ 3 = Fault/enable DO	enable DO; or				
Description:	Supervision display	selection.				

Table 58. Outputs (Cont.).

P3.2.11 [©]	Reference limit supervision	on value			ID 162
Minimum value:	0.00 Hz M	aximum value:	MaxFreq Hz	Default value:	0.00 Hz
Description:	Selects the reference frequenc	cy value supervised b	by the reference frequenc	cy limit supervision function.	
P3.2.12 ^②	Reference limit supervision	on hysteresis	,	'	ID 12203
Minimum value:	0.10 Hz M	aximum value:	1.00 Hz	Default value:	0.10 Hz
Description:	This value selects the bandwid	dth between when th	ne reference limit superv	ision enables and disables.	
P3.2.13 ^②	Temperature limit superv	ision			ID 165
Minimum value:	N.A. M	aximum value:	N.A.	Default value:	0
Options:	0 = No limit; 1 = Low limit supervision; or 2 = High limit supervision.				
Description:	Selects how the drives temper	ature limit supervisio	on controller functions.		
P3.2.14 ^②	Temperature limit display	,	,	·	ID 1842
Minimum value:	N.A. M	aximum value:	N.A.	Default value:	0
Options:	0 = Enable DO; 1 = Warning (W/O S)/enable D 2 = Warning (W S)/enable DO; 3 = Fault/enable DO.	O; or			
Description:	Supervision display selection.				
P3.2.15 ^②	Temperature limit superv	ision value			ID 166
Minimum value:	-10.0°C M	aximum value:	75.0°C	Default value:	40.0°C
Description:	Selects the drive temperature	value supervised by	the drive temperature lin	nit supervision function.	
P3.2.16 ^②	Temperature limit superv	ision hysteresis	,	'	ID 2204
Minimum value:	1.0°C M	aximum value:	10.0°C	Default value:	1.0°C
Description:	This value selects the bandwid	dth between when th	ne temperature limit supe	ervision enables and disables.	
P3.2.17 ^②	Power limit supervision		,		ID 167
Minimum value:	N.A. M	aximum value:	N.A.	Default value:	0
Options:	0 = No limit; 1 = Low limit supervision; or 2 = High limit supervision.				
Description:	Selects how the drives power	limit supervision con	troller function.		
P3.2.18 ^②	Power limit display				ID 1825
Minimum value:	N.A. M	aximum value:	N.A.	Default value:	0
Options:	0 = Enable D0; 1 = Warning (W/O S)/enable D 2 = Warning (W S)/enable D0; 3 = Fault/enable D0.	O; or			
Description:	Supervision display selection.				
P3.2.19 ^②	Power limit supervision v	alue			ID 168
Minimum value:	-200.0% M	aximum value:	200.0%	Default value:	0.0%
Description:	Selects the output power value	e supervised by the p	power limit supervision f	unction.	
P3.2.20 ^②	Power limit supervision h	ysteresis			ID 2205
Minimum value:	0.1% M	aximum value:	10.0%	Default value:	0.1%
			ne power limit supervisio		

Table 58. Outputs (Cont.).

P3.2.21 ²	Al supervision select				ID 170
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Analog reference from A 1 = Analog reference from ke				
Description:	Selects analog signal to use	for the analog input sup	pervision.		
P3.2.22 ^②	Al limit supervision				ID 171
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = No limit; 1 = Low limit supervision; or 2 = High limit supervision.				
Description:	Selects analog signal to use	for the analog input sup	pervision.		
P3.2.23 ^②	Al limit display				ID 1826
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Enable DO; 1 = Warning (W/O S)/enable 2 = Warning (W S)/enable DO 3 = Fault/enable DO.	DO; O; or			
Description:	Supervision display selection	١.			
P3.2.24 ^②	Al limit supervision valu	ie			ID 172
Minimum value:	1.00%	Maximum value:	10.00%	Default value:	0.00%
Description:	Selects the analog reference	value supervised by th	e analog reference limit supe	ervision function.	
P3.2.25 ^②	Al supervision hysteresi	is			ID 2198
Minimum value:	1.00%	Maximum value:	10.00%	Default value:	1.00%
Description:	This value selects the bandw	vidth between when the	e AI supervision enables and	disables.	
P3.2.26 ^②	Motor current supervisi	on			ID 2189
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = No limit; 1 = Low limit supervision; or 2 = High limit supervision.				
Description:	Selects how the motor curre	nt limit supervision con	troller functions.		
P3.2.27 ^②	Motor current limit disp	olay			ID 1827
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Enable DO; 1 = Warning (W/O S)/enable 2 = Warning (W S)/enable DO 3 = Fault/enable DO.	D0; 0; or			
Description:	Supervision display selection	1.		-	
P3.2.28 ^②	Motor current supervisi				ID 2190
Minimum value:	0.00 A	Maximum value:	DriveNomCurrCT*2 A	Default value:	DriveNomCurrCT A
Description:	Selects the motor current va	lue supervised by the m	otor current limit supervision	n function.	
P3.2.29 ^②	Motor current supervisi	on hysteresis			ID 2196
Minimum value:	0.10 A	Maximum value:	1.00 A	Default value:	0.10 A
Description:	This value selects the bandw	vidth between when the	e motor current supervision e	enables and disables.	

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Table 58. Outputs (Cont.).

P3.2.30 ^②	PI supervision enab	le			ID 1346
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disabled; or 1 = Enabled.				
Description:	delay timer will increme	nt. When the actual value i	When the actual value go s within the allowed area, th ctivated. This function is us	ne delay counter decremen	ts. After the delay time
P3.2.31 ^②	PI supervision displ	ay			ID 1828
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Enable DO; 1 = Warning (W/O S)/en 2 = Warning (W S)/enab 3 = Fault/enable DO.				
Description:	Supervision display sele	ection.			
P3.2.32 ^②	PI supervision uppe	r limit	,	,	ID 1347
Minimum value:	PI Process Unit Min varies	Maximum value:	PI Process Unit Max varies	Default value:	0.00 varies
Description:	Upper limit for PI feedba	ack value used with the PI su	upervision controller.		
P3.2.33 ^②	PI supervision lowe	r limit			ID 1349
Minimum value:	PI Process Unit Min varies	Maximum value:	PI Process Unit Max varies	Default value:	0.00 varies
Description:	Lower limit for PI feedba	ack value used with the PI s	upervision controller.		
P3.2.34 ^②	PI supervision delay	,			ID 1351
Minimum value:	0 s	Maximum value:	3,000 s	Default value:	0 s
Description:	Defines the delay time t	hat the PI feedback value m	ust be out of range before a	ctivating the PI supervision	n nutnut

P3.3 - Analog output.

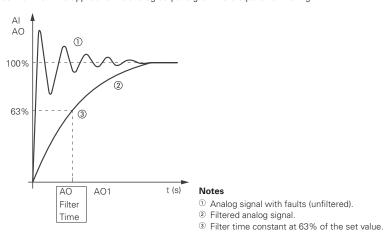
P3.3.1 ^②	AO mode	,		'	ID 227
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = 0 - 20 mA; or 1 = 0 - 10 V.				
Description:	Defines the analog out	tput mode to current or voltag	e.		

Table 58. Outputs (Cont.).

P3.3.2 ^②	AO function				ID 146
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	2 = Frequency refer 3 = Motor speed RF 4 = Motor current (() 5 = Motor voltage () 6 = Motor power (0) 7 = Motor voltage () 8 = DC bus voltage 9 = Pl setpoint (proc 10 = Pl error value () 11 = Pl output (proc 12 = Analog input () 13 = Drive reference 14 = Fieldbus proce 15 = Fieldbus proce 16 = Fieldbus proce 17 = Fieldbus proce 18 = Fieldbus proce 19 = Fieldbus proce 20 = Fieldbus proce 21 = Fieldbus proce 22 = User defined of 23 = Motor torque ()	sess unit minimum - process unit process unit minimum - process ess unit minimum - process unit minimum - process unit now, - 100%); es potentiometer (0% - 100%); es data input 1 (0% - 100%); es data input 3 (0% - 100%); es data input 4 (0% - 100%); es data input 5 (0% - 100%); es data input 6 (0% - 100%); es data input 6 (0% - 100%); es data input 7 (0% - 100%); es data input 7 (0% - 100%); es data input 8 (0% - 100%); utput (user defined minimum - u	unit maximum); maximum);		
Description:	Select the function	desired to the terminal AO1.			
P3.3.3 ^②	AO filter time				ID 147

Description:

Defines the filter time applied to the analog output signal. Zero equals no filtering.



P3.3.4 ^②	AO custom mini	imum			ID 1863
Minimum value:	N.A.%	Maximum value:	N.A.%	Default value:	0.00%
Description:	Negative value sha	int x1, define AO function selecte all be allowed for x1. x2, y2) will get gain and offset. T	· ·	ue (percent) that user wants. Def I calculate from gain and offset.	ault value is 0.
P3.3.5 ^②	AO custom max	ximum			ID 1865
Minimum value:	N.A.%	Maximum value:	N.A.%	Default value:	100.00%
Description:	Default value is 100 Negative value sha	nt x2, define A0 function selected 0%. all be allowed for x2. 2,y2) will get gain and offset. Th	· ·	,	

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Table 58. Outputs (Cont.).

P3.3.6 ^②	AO value minim	um			ID 1867
Minimum value:	0.00 varies	Maximum value:	100.00 varies	Default value:	0.00 varies
Description:	Default value is 0 m	uxis y1, define AO value selected nA. Ly2) will get gain and offset. Th	, , ,		
P3.3.7 ²	AO value maxim	um	'	'	ID 1868
Minimum value:	0.00 varies	Maximum value:	100.00 varies	Default value:	20.00 varies
Description:	Default value is 20	is y2, define AO value selected mA. ,y2) will get gain and offset. Th	, , , , ,		

^② Parameter value will be set to be default when changing macros.

Table 59. Drive control.

P4.1 - Basic settings	s.				
P4.1.1 ^②	Keypad reference		,	'	ID 141
Minimum value:	MinFreq Hz	Maximum value:	MaxFreq HZ	Default value:	0.00 Hz
Description:	Keypad reference value.				
P4.1.2 ^②	Keypad/drive referen	ce pot direction			ID 141
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options"	0 = Forward; or 1 = Reverse.				
Description:				the keypad is the active contro n, when the keypad is the acti	
P4.1.3 ^②	Keypad stop		,	,	ID 114
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Enabled - keypad ope 1 = Always enabled - In t	eration - In this mode, the k	eypad stop will only ope will always stop the driv	rate when the control source is e regardless of control mode.	s set to keypad.
Description:	Enabled or always enabl	ed keypad operation.			
P4.1.4 ^①	Reverse enabled			'	ID 1679
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Disabled; or 1 = Enabled.				
Description:	Enables or disables the r	everse motor direction.			
P4.1.5	Change phase seque	nce motor			ID 2515
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Change disable; or 1 = Change enable.				
Description:	This parameter allows fo	r swapping the motor phas	e output from u, v, w to	u, w, v.	
P4.1.6 ^②	Power up local remo	te select			ID 1685
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Hold last; 1 = Local control; or 2 = Remote control.				
Description:				e default setting will hold the I t in that mode regardless of las	

Table 59. Drive control (Cont.).

P4.1.8 ^②	Start mode				ID 252
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	1 = Flying start fr last operating 2 = Flying start fr	frequency as a starting point.	catch a spinning m will catch a spinr	rence value. notor. This setting searches for the c ning motor. This setting searches for	, , ,
Description:	Selects the start	mode operation.			
P4.1.9 ^②	Stop mode				ID 253
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:		er a stop command, the motor coa the stop command, the speed of th		ntrolled by the drive. ated according to the set deceleration	on parameters.
Description:	Selects the stop r	node operation.			
P4.1.10 ^②	Ramp 1 shape				ID 247
Minimum value:	0.0 s	Maximum value:	10.0 s	Default value:	0.0 s
Description:	gives a linear ram	p shape that causes acceleration	and deceleration to	moothed with these parameters. Se o react immediately to the changes in s an S-shaped acceleration/decelera	n the reference signal.

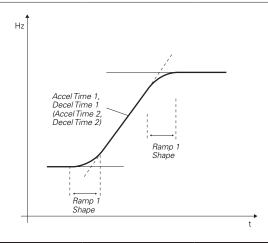


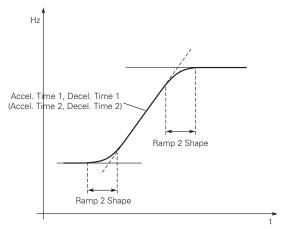
Table 59. Drive control (Cont.).

P4.1.11 ²	Ramp 2 shape				ID 248
Minimum value:	0.0 s	Maximum value:	10.0 s	Default value:	0.0 s

Description:

The start and end of the acceleration and deceleration ramps can be smoothed with these parameters. Setting a value of 0.00 gives a linear ramp shape that causes acceleration and deceleration to react immediately to the changes in the reference signal.

Setting a value from 0.10 to 10.00 seconds for this parameter produces an S-shaped acceleration/deceleration at the start and stop of the slope.



P4.1.12 ^②	Accel. time 2			ID 249
Minimum value:	0.1 s Maximum value:	3000.0 s	Default value:	10.0 s
Description:	These values correspond to the time required for t frequency.	he output frequency to ac	celerate from the zero frequer	ncy to the set maximum
	These parameters provide the possibility to set tw be selected with the programmable digital input.	o different acceleration/o	deceleration time sets for one a	application. The active set o
P4.1.13 ^②	Decel. time 2			ID 250
Minimum value:	0.1 s Maximum value:	3000.0 s	Default value:	10.0 s
Description:	These values correspond to the time required for t	he output frequency to de	ecelerate from the set maximum	m frequency to the zero
Docomption.	frequency.	no output noquency to us		. ,
2000 Priori				
P4.1.14 [©]	frequency. These parameters provide the possibility to set tw			
	frequency. These parameters provide the possibility to set tw be selected with the programmable digital input.			application. The active set c
P4.1.14 ^{©®}	frequency. These parameters provide the possibility to set two be selected with the programmable digital input. 2nd Stage ramp frequency	o different acceleration/o MaxFreq Hz level at which the drive w	Default value:	application. The active set of ID 2444 30.00 Hz
P4.1.14 [©] @ Minimum value:	frequency. These parameters provide the possibility to set two be selected with the programmable digital input. 2nd Stage ramp frequency MinFreq Hz Maximum value: When 2nd stage ramp frequency is the frequency	o different acceleration/o MaxFreq Hz level at which the drive w	Default value:	application. The active set of ID 2444 30.00 Hz
P4.1.14 ^{©®} Minimum value: Description:	frequency. These parameters provide the possibility to set tw be selected with the programmable digital input. 2nd Stage ramp frequency MinFreq Hz Maximum value: When 2nd stage ramp frequency is the frequency This then can be used for other inputs or devices to	o different acceleration/o MaxFreq Hz level at which the drive w	Default value:	application. The active set of the set of th
P4.1.14 [©] 2 Minimum value: Description: P4.1.15 [©] 2	frequency. These parameters provide the possibility to set tw be selected with the programmable digital input. 2nd Stage ramp frequency MinFreq Hz When 2nd stage ramp frequency is the frequency This then can be used for other inputs or devices to full reset start	MaxFreq Hz level at which the drive woo signal a frequency level N.A. has to be cycled to restai	Default value: Default value: Default value: Default value:	application. The active set of ID 2444 30.00 Hz frequency output function. ID 2483 0

P4.2 - Brake.

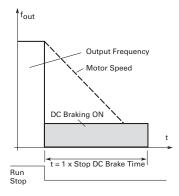
P4.2.1 ^{①②}	Brake choppe	r enable			ID 829
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disable - dyn 1 = Enable - dyna	amic brake OFF; or amic brake ON.			
Description:	If an external res		ing, this paramete	r to enabled will allow excess DC bu	s voltage to be bled off

Table 59. Drive control (Cont.).

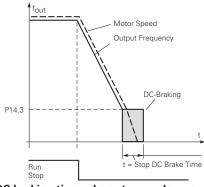
P4.2.2 ^{①②}	DC brake current		·		ID 254
Minimum value:	DriveNomCurrCT*15/100 A	Maximum value:	DriveNomCurrCT*15/10 A	Default value:	DriveNomCurrCT*1/2 A
Description:	Defines the current level in	njected into the motor dur	ing DC-braking.		
P4.2.3 ^{①②}	Start DC brake time				ID 263
Minimum value:	0.00 s	Maximum value:	600.00 s	Default value:	0.00 s
Description:			braking current before starti		
	spinning before a run comi		or before ramping to reference	e level. This is to stop m	otors that are potentially
P4.2.4 ^{①②}		mand is given.	or before ramping to reference	e level. This is to stop mi	otors that are potentially ID 262
P4.2.4 ^{①②} Minimum value:	spinning before a run comi	mand is given.	or before ramping to reference	e level. This is to stop m	. ,
	spinning before a run comi Stop DC brake freques 0.10 Hz	mand is given. ncy Maximum value:		Default value:	ID 262
Minimum value:	spinning before a run comi Stop DC brake freques 0.10 Hz	mand is given. ncy Maximum value:	10.00 Hz	Default value:	ID 262

Determines the length of DC braking while stopping. 0.00 = DC brake is not used; or **Description:**

>0.0 = The amount of time DC-braking will occur after falling below the stop DC brake frequency.



DC braking time when stop mode = coasting.



DC braking time when stop mode = ramp.

Table 59. Drive control (Cont.).

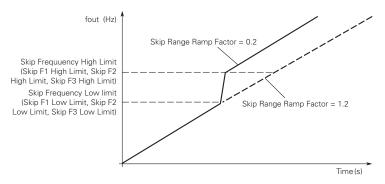
P4.2.6 ^{①②}	Flux brake	'	'	'	ID 266				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0				
Options:	0 = Flux braking OFF; or 1 = Flux braking ON.								
Description:		While stopping, the output frequency is reduced and the flux in the motor is increased, which in turn increases the motor's capability to brake. Unlike DC braking, the motor speed remains controlled during braking. The flux braking can be set ON or OFF.							
	Note: Flux braking damage.	converts the energy in	to heat in the mot	or and should be used caref	ully to avoid motor				
P4.2.7 ^{①②}	Flux brake current				ID 265				
Minimum value:	MotorNomCurr*1/10	Maximum value:	CurrLimit A	Default value:	MotorNomCurr*1/2 A				
Description:	Defines the flux braking	current value output when	flux brake is enabled.						

P4.3 - Skip frequency.

P4.3.1 ^②	Skip range	ramp factor			ID 264
Minimum value:	0.1	Maximum value:	10.0	Default value:	1.0

Description:

Defines the acceleration/deceleration time when the output frequency is between the selected prohibit frequency range limits. The ramping speed (selected acceleration/deceleration time 1 or 2) is multiplied with this factor: e.g., value 0.1 makes the acceleration time 10 times shorter than outside the prohibit frequency range limits.



Ramp speed scaling between skip frequencies.

P4.3.2 ^②	Skip F1 low limit				ID 256
Minimum value:	0.00 Hz	Maximum value:	SkipRange1HighLimit Hz	Default value:	0.00 Hz
Description:	ramping speed (selected		e output frequency is betweer time 1 or 2) is multiplied with t range limits.		
P4.3.3 ^②	Skip F1 high limit		'		ID 257
Minimum value:	SkipRange1LowLimit Hz	Maximum value:	400.00 Hz	Default value:	0.00 Hz
Description:	ramping speed (selected		e output frequency is betweer time 1 or 2) is multiplied with t range limits.		
P4.3.4 ^②	Skip F2 low limit	'	'		ID 258
Minimum value:	0.00 HZ	Maximum value:	SkipRange2HighLimit Hz	Default value:	0.00 Hz
Description:	ramping speed (selected		e output frequency is betweer time 1 or 2) is multiplied with t range limits.		
P4.3.5 ^②	Skip F2 high limit				ID 259
Minimum value:	SkipRange2LowLimit HZ	Maximum value:	400.00 Hz	Default value:	0.00 Hz
Description:	ramping speed (selected	/deceleration time when th acceleration/deceleration t tside the prohibit frequency	e output frequency is betweer time 1 or 2) is multiplied with t range limits.	n the selected prohibit fr his factor: e.g., value 0.1	equency range limits. The makes the acceleration time

Table 59. Drive control (Cont.).

P4.3.6 ^②	Skip F3 low limit		'		ID 260
Minimum value:	0.00 HZ	Maximum value:	SkipRange3HighLimit Hz	Default value:	0.00 Hz
Description:		cceleration/deceleration t	e output frequency is betweer ime 1 or 2) is multiplied with t range limits.		
P4.3.7 ²	Skip F3 high limit		'		ID 261
Minimum value:	SkipRange3LowLimit HZ	Maximum value:	400.00 Hz	Default value:	0.00 Hz
Description:	Defines the acceleration/d	leceleration time when th	e output frequency is between	the selected prohibit fro	equency range limits. The makes the acceleration time

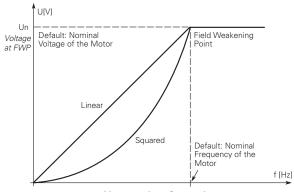
P4.4.1 ²	Currency				ID 2122
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = \$; 1 = £; 2 = €; 3 = ¥; 4 = Rs; 5 = R\$; 6 = Fr; or 7 = kr.				
Description:	Sets the local currency us	sed for energy savings esti	mation.		
P4.4.2 ^②	Energy cost	'			ID 2123
Minimum value:	Varies	Maximum value:	Varies	Default value:	0.00 varies
Description:	Sets the local energy cos	t per kW. Used for energy	savings estimation.		
P4.4.3 ^②	Data type				ID 2124
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Cumulative; 1 = Daily average; 2 = Weekly average; 3 = Monthly average; or 4 = Yearly average.				
Description:				gs in an hour and then calculates rgy usage compared to a across t	
P4.4.4	Energy savings reset				ID 2125
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Not reset; or 1 = Reset.				
Description:	Resets the energy saving	s value			

^① Parameter value can only be changed after the drive has stopped. ^② Parameter value will be set to be default when changing macros.

Table 60. Motor control.

P5.1.1 ^{①②}	Motor control mo	ode			ID 287
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	1 = Speed control - C 2 = Open loop vector identification. 3 = PM control 1 - PN	ol - Output frequency is controll Output frequency is controlled by r control - Similar to the standa M motor control mode 1, used f M motor control mode 2, used f	oy giving a fréquency referen rd speed control mode, highe or SPM (surface mounted pe	nce to it with slip compensa er performance slip calcula ermanent magnet) and it als	tion requires running a motor so can be used for IPM.
Description:	Selects the motor co	ontrol mode.			
P5.1.2 ^①	Current limit				ID 107
Minimum value:	DriveNomCurrCT*1/	10 A Maximum value:	DriveNomCurrCT*2 A	Default value:	DriveNomCurrCT*3/2 A
Description:		rmines the maximum output cu ent hits this level, it goes into t			
P5.1.3 ^{①②}	V/Hz optimization	n	'	'	ID 109
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disable torque bo 1 = Enable torque bo				
Description:		oost - the voltage to the motor i encies with high loads.	ncreases automatically, which	ch assists the motor to prod	duce sufficient torque to start
P5.1.4 ^{©2}	V/Hz ratio				ID 108
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	where the nomin 1 = Squared - the voi weakening point produces less toi the load is propo 2 = Programmable V, voltage, midpoin the application. 3 = Linear with flux (age of the motor changes linear hal voltage is supplied. A linear ltage of the motor changes followhere the nominal voltage is s rque and electromechanical noi rtional to the square of the spe /Hz curve - the V/Hz curve can lt and weakening point. A progroptimization - the drive starts thergy Control which will reduce	V/Hz ratio should be used in powing a squared curve with upplied. The motor runs und se. A squared V/Hz ratio ca ed. be programmed with three d rammable V/Hz curve can be be search for the minimum mo	n constant torque application the frequency in the area finder magnetized below the fin be used in applications which is the points. These points used if the other settings of the current in order to save	ons. rom 0 Hz to the field ield weakening point and where the torque demand of ats are the 0 frequency do not satisfy the needs of e energy. This mode is called
Description:	Selects the V/Hz rati 0 = Linear; 1 = Squared; 2 = Programmable; 3 = Linear + flux onti	or	Ü		

3 = Linear + flux optimization.



0 = Linear and 1 = Squared.

P5.1.5 ^{①②}	Field weakenin	g point			ID 289
Minimum value:	8.00 Hz	Maximum value:	400.00 Hz	Default value:	FieldWeakPointMFG Hz
Description:	The field weakening		the output voltage re	aches the set maximum value.	This value is usually determined

Table 60. Motor control (Cont.).

P5.1.6 ^{①②}	Voltage at FWP				ID 290			
Minimum value:	10.00%	Maximum value:	200.00%	Default value:	00.00%			
Description:	Defines the voltage at t constant.	he field weakening point, w	hen the output frequency exc	eeds the field weakening	point, the voltage will remain			
P5.1.7 ^{①②}	VV/Hz mid frequenc	у		'	ID 291			
Minimum value:	0.00 H	Maximum value:	FieldWeakPoint Hz	Default value:	VHzCurveMidFreqMFG Hz			
Description:	anywhere between 0 ar	Hz curve has been selected, nd the field weakening point e all the way up the curve.	this parameter defines the m . To either have a different V	idpoint frequency of the c //Hz ramp or if set to the F	urve. This value can be set WP, it will provide the field			
P5.1.8 ^{①②}	VV/Hz mid voltage		•		ID 292			
Minimum value:	0.00%	Maximum value:	100.00%	Default value:	100.00%			
Description:		the programmable V/Hz curve has been selected, this parameter defines the mid-point voltage of the curve. This value can be set ywhere between zero frequency volt and the field weakening point voltage.						
P5.1.9 ^{①②}	Zero frequency volt	age	'		ID 293			
Minimum value:	0.00%	Maximum value:	40.00%	Default value:	0.00%			
Description:	If the programmable V/I	dz curve has been selected,	this parameter defines the ze	ero frequency voltage of th	ne curve.			
P5.1.10 ^②	Switching frequenc	у			ID 288			
Minimum value:	MinSwitchFreq kHz	Maximum value:	MaxSwitchFreq kHz	Default value:	DefaultSwitchFreqCT kHz			
Description:	Sets the switching freq	uency for the PWM output v	vaveform.					
P5.1.11 ²	Sine filter enabled	Sets the switching frequency for the PWM output waveform.						
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	0 = Disabled; or 1 = Enabled.							
Description:		the drive to have a fixed sw e switching frequency base	ritching frequency which is red on the unit temperature.	quired by some sine filter	s. The drive no longer			
P5.1.12 ^{①②}	Over voltage contro	ller			ID 294			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	3			
Options:	2 = The maximum contr	oller output frequency is the oller output frequency is the	(ramp frequency + 8 Hz); maximum frequency; or (maximum frequency + 8 Hz)					
Description:			voltage below the preset limi		ontrol is enabled, the drive will itor to use the energy.			
P5.1.13 ^①	Over voltage contro	ller reference	,		ID 1874			
Minimum value:	DCLinkUnderVolt-	Maximum value:	DCLinkOverVoltBrake- ChopperStartLimit V	Default value:	DCLinkRegenerating- EnergyControlExcursion V			
William value.	ResumeExcursion V							
Description:		nce defines the preset limit	value used in the overvoltage	controller.				
		nce defines the preset limit	value used in the overvoltage	controller.	ID 298			
Description:	The over voltage refere	nce defines the preset limit	value used in the overvoltage	controller. Default value:	ID 298 0.00%			
Description: P5.1.14 [®]	The over voltage reference Load drooping 0.00%	Maximum value:	<u> </u>	Default value:	0.00%			
Description: P5.1.14 [©] Minimum value:	The over voltage reference Load drooping 0.00% The drooping function e	Maximum value: nables speed drop as a func	100.00%	Default value:	0.00%			
Description: P5.1.14 [®] Minimum value: Description:	The over voltage reference Load drooping 0.00% The drooping function e of the motor.	Maximum value: nables speed drop as a func	100.00%	Default value:	0.00% onding to the nominal torque			

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Table 60. Motor control (Cont.).

P5.1.16 ^{①②}	Identification				ID 299			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	2 = Identification with rur 3 = Identification no run -	 Not action. Identification only stator resistor - does not spin the motor. This can be done with load attached. Identification with run - motor stator resistor is completed then the motor is run. This must be completed with unloaded motor. Identification no run - motor is supplied with current and voltage but at zero frequency. Identification only inertia - identification for the system inertia only. 						
Description:	parameters to improve st will be active then set ba	arting torque and open loop ck to 0 when completed. V	o vector control performan Vhen a run command is iss	notor once complete the driv ce. Once set and a run com ued, the message on the ke a fault message will be displa	mand is given, the operation pad will indicate "Auto			
P5.1.17 ^①	Stator resistor				ID 771			
Minimum value:	0.001 ohm	Maximum value:	65.535 ohm	Default value:	Base on motor.			
Description:	Motor stator resistor real performing identification.		ntor winding resistance of	the windings in the motor. 1	he value is measured when			
P5.1.18 ^①	Rotor resistor				ID 772			
Minimum value:	0.001 ohm	Maximum value:	65.535 ohm	Default value:	Base on motor.			
Description:	Motor rotor resistor real	value - this value is the roto	r resistance of the motor.	The value is measured whe	n performing identification.			
P5.1.19 ^①	Leak inductance				ID 773			
Minimum value:	0.01 mh	Maximum value:	655.35 mh	Default value:	Base on motor.			
Description:	Motor leakage inductance value is measured when p		ne amount of magnetic inc	uctance that does not link to	a winding in the motor. The			
P5.1.20 ^①	Mutual inductance				ID 774			
Minimum value:	0.10 mh	Maximum value:	6553.50 mh	Default value:	Base on motor.			
Description:	Motor mutual inductance measured when performi		e amount of inductance be	tween two sets of windings	in the motor. The value is			
P5.1.21 ^①	Excitation current				ID 775			
Minimum value:	0.01 A	Maximum value:	655.35 A	Default value:	Base on motor.			
Description:		al value - this value is the a cured when performing iden		required to generate a rota	ting magnetic field in the			
P5.1.22 ^①	Motor inertia			,	ID 1881			
Minimum value:	0.000 kgm ²	Maximum value:	65.535 kgm²	Default value:	Base on motor.			
Description:	System rotation inertia -	real value for speed loop pa	arameter tuning. The valu	e is measured when perform	ing identification.			
P5.1.23 ^①	PM back electromoti	ve force (BEMF) voltage	е		ID 1882			
Minimum value:	0.0 V	Maximum value:	6553.5 V	Default value:	0.1 V			
Description:	Back electromotive force	(BEMF) voltage. The value	is measured when perfor	ming identification.				
P5.1.24 ^①	PM d-axis stator indu	ctance			ID 1884			
Minimum value:	0.00 mh	Maximum value:	655.35 mh	Default value:	0.01 mh			
Description:		stator inductance of the Pl lue is measured when perfo		r current and the rated moto	r frequency displayed in line-			
P5.1.25 ^①	PM q-axis stator indu	ctance			ID 1883			
Minimum value:	0.00 mh	Maximum value:	655.35 mh	Default value:	0.01 mh			
Description:		stator inductance of the Pl lue is measured when perfo		r current and the rated moto	r frequency displayed in line-			
P5.1.26	Slip compensation co	pefficient	-		ID 1664			
Minimum value:	0%	Maximum value:	500%	Default value:	100%			
Description:	The linear coefficient of t	he slip compensation frequ	ency which is valid only in	the speed control mode				

Table 60. Motor control (Cont.).

P5.1.27	VF stable Kd				ID 1888		
Minimum value:	0%	Maximum value:	1,000%	Default value:	100%		
Description:	The compensation co	efficient of the d-axis, which i	s used to suppress osc	cillation.			
P5.1.28	VF stable Kq	·		,	ID 1889		
Minimum value:	0%	Maximum value:	1,000%	Default value:	100%		
Description:	The compensation co	efficient of the q-axis, which i	s used to suppress osc	cillation.			
P5.1.29 [©]	Over-modulation 6	Maximum value: 1,000% Default value: 100% mpensation coefficient of the q-axis, which is used to suppress oscillation. modulation enable ID 2835 Maximum value: N.A. Default value: 0					
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0		
Options:	0 = Disabled; or 1 = Enabled.						
Description:	The linear coefficient	of the slip compensation frequency	uency, which is valid o	nly in the speed control mode.			

P5.2 - Sensorless Vector Control parameters.

P5.2.1 ^②	Speed error filter ti	me constant			ID 1591
Minimum value:	0 ms	Maximum value:	3,000 ms	Default value:	20 ms
Description:	Filter time constant for	speed reference and actual	speed error.		
P5.2.2	Speed control Kp1				ID 1830
Minimum value:	0.0%	Maximum value:	6,000.0%	Default value:	100.0%
Description:	Sets P-gain of "Vector"	control mode when in frequ	ency region 1 for faster speed	response.	
P5.2.3	Speed control Ti1	'		•	ID 1831
Minimum value:	1 ms	Maximum value:	3,000 ms	Default value:	100 ms
Description:	Sets time constant of "	Vector" control mode when	in frequency region 1 for faste	r speed response.	
P5.2.4 ^②	Speed control FS1	,			ID 1832
Minimum value:	0.00 Hz	Maximum value:	SPEED_CONTROL_FS2 Hz	Default value:	5.00 Hz
Description:	Sets the "Vector" contr	ol mode frequency.			
P5.2.5 ^②	Speed control FS2				ID 1833
Minimum value:	SPEED_CONTROL_ FS1 Hz	Maximum value:	MaxFreq Hz	Default value:	10.00 Hz
Description:	Sets the "Vector" contr	ol mode frequency.			
P5.2.6 ^②	Speed control Kp2	'			ID 1834
Minimum value:	0.0%	Maximum value:	6,000.0%	Default value:	50.0%
Description:	Sets P-gain of "Vector"	control mode when in frequ	ency region two for faster spe	ed response.	
P5.2.7 ^②	Speed control Ti2				ID 1835
Minimum value:	1 ms	Maximum value:	3,000 ms	Default value:	100 ms
Description:	Sets time constant of "	Vector" control mode when	in frequency region two for fa	ster speed response.	
P5.2.8 ^②	Motoring torque lim	nit FWD			ID 1836
Minimum value:	0.0%	Maximum value:	300.0%	Default value:	300.0%
Description:	Motoring torque limit in	the forward direction.			
P5.2.9 ^②	Generator torque lis	nit FWD			ID 1837
Minimum value:	0.0%	Maximum value:	300.0%	Default value:	300.0%
Description:	Generation torque limit	in the forward direction.			

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Table 60. Motor control (Cont.).

P5.2.10 ²	Motoring torque li	nit REV			ID 1838		
Minimum value:	0.0%	Maximum value:	300.0%	Default value:	300.0%		
Description:	Motoring torque limit i	n the reverse direction.					
P5.2.11 ^②	Generator torque I	imit REV	,	'	ID 1839		
Minimum value:	0.0%	Maximum value:	300.0%	Default value:	300.0%		
Description:	Generation torque limi	t in the reverse direction.					
P5.2.12 ^②	Motoring power lin	nit			ID 1607		
Minimum value:	0.0%	Maximum value:	300.0%	Default value:	300.0%		
Description:	Motor power limit sett	ing.					
P5.2.13 ^②	Generator power li	mit			ID 1608		
Minimum value:	0.0%	Maximum value:	300.0%	Default value:	300.0%		
Description:	Generator power limit	setting.					
P5.2.14 ^{①②}	Flux reference				ID 1620		
Minimum value:	0.0%	Maximum value:	500.0%	Default value:	100.0%		
Description:	This parameter defines	This parameter defines the amount of flux that is output to the motor, which is valid only in open loop vector control.					
P5.2.15 ^①	PM initial selection	1		'	ID 1890		
Minimum value:	N.S.	Maximum value:	N.A.	Default value:	1		
Options:	0 = Align; 1 = Six pluse; or 2 = HFl.						
Description:	PM initial angle detect	method.					
P5.2.16 ^①	PM initial time	'	,	'	ID 1891		
Minimum value:	0.0 s	Maximum value:	60.0 s	Default value:	0.7 s		
Description:	PM initial angle detect	time.					
P5.2.17 ^①	PM excited current	;			ID 1892		
Minimum value:	0%	Maximum value:	200%	Default value:	20%		
Description:	PM excited current du	ing the low speed.					
P5.2.18 ^①	PM excited current	off frequency			ID 1893		
Minimum value:	10.00%	Maximum value:	MotorNomFreq %	Default value:	20.00%		
Description:	PM excited current cut	off frequency.					
P5.2.19	Observer Kp				ID 2901		
Minimum value:	1%	Maximum value:	3,000%	Default value:	100%		
Description:	Linear gain of the PM/						

[©] Parameter value can only be changed after the drive has stopped. © Parameter value will be set to be default when changing macros.

Table 61. Protections.

P6.1 - Motor.									
P6.1.1 ^{①②}	Output phase	fault			ID 308				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2				
Options:	0 = No response; 1 = Warning; 2 = Fault - stop m 3 = Fault - stop m	ode after fault according to param	eter stop mode; or						

Table 61. Protections (Cont.).

Description:		n of the motor ensures that onverter will respond corre		have equal currents. If phases are 5 etting.	% difference from one
P6.1.2 ^{①②}	Ground fault				ID 309
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:		er fault according to param er fault always by coasting		r	
Description:	ground fault limit that all	ows for setting the allowa otects the frequency conve	ble ground current	se currents is zero. There is a current level based off the total drive curren ults with high currents. Frequency co	t. The overcurrent protection
P6.1.3 ^{①②}	Ground fault limit				ID 2158
Minimum value:	0%	Maximum value:	30%	Default value:	15%
Description:	Sets the level of the grou	ınd fault protection. This p	rotection is based	off the amount of leakage current th	at is seen to ground on the
P6.1.4 ^{①②}	Motor thermal protect	ction			ID 310
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:		er fault according to param er fault always by coasting		r	
Description:	calculated motor temp is		r on values of the	It stage based off the % of calculated drive and monitoring values as the dr ge of the motor to 0%.	
P6.1.5 ^②	Motor thermal FO cu	rrent			ID 311
Minimum value:	0.00%	Maximum value:	150.00%	Default value:	100.00%
			T1.1		

Description:

The current can be set between 0 - 150.0% x InMotor. This parameter sets the value for thermal current at zero frequency. The default value is set assuming that there is no external fan cooling the motor. If an external fan is used, this parameter can be set to 90% (or even higher).

Note: The value is set as a percentage of the motor nameplate data, P1.6 (nominal current of the motor), not the drive's nominal output current. The motor's nominal current is the current that the motor can withstand in direct on-line use without being overheated. If you change the parameter nominal current of motor, this parameter is automatically restored to the default value. Setting this parameter does not affect the maximum output current of the drive.

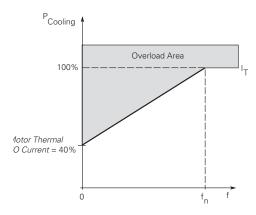
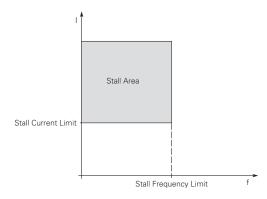


Table 61. Protections (Cont.).

P6.1.6 ^{①②}	Stall protection		,		ID 313
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = No action; 1 = Warning; 2 = Fault; or 3 = Fault, coast.				
Description:	Stall protection is a user def This is customer selectable l				situations like a stalled shaft.
P6.1.7 ^②	Stall current limit				ID 314
Minimum value:	0.10 A	Maximum value:	2 * MotorNomCurr A	Default value:	1.3 * MotoNomCurr A
Description:	The current can be set to 0.1	-InMotor*2. For a stall	stage to occur, the current	must have exceeded this l	imit.

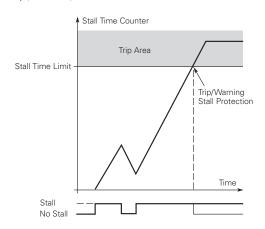
The software does not allow entering a greater value than InMotor*2. If P1.6, nominal motor current is changed, this parameter is automatically restored to the default value (IL).



P6.1.8 ^②	Stall time limit				ID 315
Minimum value:	1.0 s	Maximum value:	120.0 s	Default value:	15.0 s

Description:

This time can be set between 1.0 and 120.0s. This is the maximum time allowed for a stall stage. The stall time is counted by an internal up/down counter based off the current being above the limit setting. If the stall time counter value goes above this limit the protection will cause a trip (see P6.1.6).



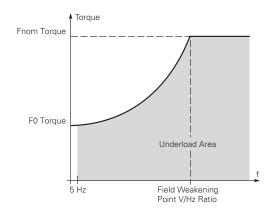
P6.1.9 ^②	Stall frequenc	y limit	,	'	ID 316
Minimum value:	1.00 Hz	Maximum value:	MaxFreq Hz	Default value:	25.00 Hz
Description:		n be set between 1—fmax (P1.2). I limit for the stall time to occur.	For a stall state to occur	, the output frequency must ha	ve remained below this limit,

Table 61. Protections (Cont.).

P6.1.10 ^{①②}	Underload protecti	on			ID 317
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:		fter fault according to param fter fault always by coasting			
Description:	status of the motor. If	the motor torque drops belov	v the Fnom and FO, t	tage based on the parameter condi torque levels for the time limit the underload time counter to zero.	
P6.1.11 ^{①②}	Underload Fnom to	rque			ID 318
Minimum value:	10.0%	Maximum value:	150.0%	Default value:	50.0%
Dogovintion	The targue limit can be	act between 10.0 150.0 %	v ToMotor This nor	romotor gives the value for the min	imum targua allaurad url

Description:

The torque limit can be set between $10.0 - 150.0 \% \times TnMotor$. This parameter gives the value for the minimum torque allowed when the output frequency is at or above the field weakening point. If you change P1.6, nominal motor current, this parameter is automatically restored to the default value.



P6.1.12 ²	Underload F0 t	orque			ID 319
Minimum value:	5.0%	Maximum value:	150.0%	Default value:	10.0%
Description:		an be set between 5.00 - 150.00% change the value of P1.6, nominal			

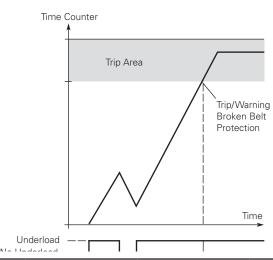
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Table 61. Protections (Cont.).

P6.1.13 ^②	Underload time limit				ID 320
Minimum value:	2.00 s	Maximum value:	600.00 s	Default value:	20.00 s

Description:

This time can be set between 2.00 and 600.00 seconds. This is the time allowed for an fault state to exist. An internal up/down counter counts the accumulated underload time. If the underload counter value goes above this limit, the protection will cause a trip according to protection parameter. If the drive is stopped, the counter is reset to zero.



P6.1.14 ²	Preheat mode				ID 2159
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disable; or 1 = Enable				
Description:		bles/disables the preheat functi current to flow to the motor, thi		where the temperature being rea en the motor is not running.	d from the drive will turn o
P6.1.15 ²	Preheat control	source			ID 2160
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = DI function; or 1 = Drive temperate	ure.			
Description:	Selects the source could be at a differ		ning from, either digit	al input or the drive heat sink tem	perature, which potentially
P6.1.16 ^②	Preheat enter te	emperature			ID 2161
Minimum value:	-10.0°C	Maximum value:	20.0°C	Default value:	10.0°C
Description:	Temperature when some current.	the preheat is enabled - drive go	oes into a run state to	all the preheat voltage to flow th	rough the motor an create
P6.1.17 ²	Preheat quit ten	nperature		'	ID 2162
Minimum value:	-10.0°C	Maximum value:	39.9°C	Default value:	20.0°C
Description:	Temperature when	the preheat is disabled - drive q	oes into a stop state	if the temperature is above this ra	tina.

Table 61. Protections (Cont.).

P6.2 - Drive.									
P6.2.1 ^②	Line start locke	out	,		ID 750				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2				
Options:	(Run command 1 = Do not respond respond. (Run 2 = Respond to I/C maintained rur 3 = Do not respond	has to be cycled.) I to I/O run command when powe command has to be cycled.) I commands when power is applied command.	r is applied. If in anoted.	ntrol place and switched to I/O, c ther control place and switched to ol place and switched to I/O cont r control place and switched to I/	o I/O, control does not rol, the drive will respond to				
Description:	Determines the re	sponse of frequency converter go	ing to a run state cycl	e with I/O run command is still ac	ctive as the control place.				
P6.2.2 ^{①②}	Input phase fau	ılt			ID 332				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2				
Options:	3 = Fault, stop mod	0 = No response;							
Description:	The input phase su	upervision ensures that the input	phases of the frequen	cy converter have approximately	equal current draw.				
P6.2.3 ^{①②}	4 mA input fau	lt	,		ID 306				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0				
Options:	3 = Warning - the 4 = Fault - stop mo	requency from 10 seconds back is preset frequency P6.2.4 is set as ide after fault according to param ide after fault always by coasting	reference; eter stop mode; or						
Description:				erence signal is used and the sig programmed into relay outputs RO					
P6.2.4 ^{①②}	4 mA fault freq	uency			ID 331				
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	0.00 Hz				
Description:	When 4 mA fault h	nappens, the output frequency of	drive goes to this pres	set speed when P6.2.3 = 3.					
P6.2.5 [©]	External fault				ID 307				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2				
Options:		de after fault according to parame de after fault always by coasting.	eter stop mode; or						
Description:	A warning or a fau external fault). Th	It action and message is generate e status information can also be	ed from the external f programmed into digit	ault signal in the programmable (tal output relay outputs RO1 and I	digital inputs function select RO2.				
P6.2.6 ^{①②}	Undervoltage fa	ault response			ID 330				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2				
Options:	0 = No response; 1 = Warning; 2 = Fault, stop mod 3 = Fault, stop mod	de after fault according to parame de after fault always by coasting.	eter stop mode; or						
Description:		er monitors DC Bus voltage if it dond corresponding to this setting.		via trouble shooting guide for mor	re information on fault level),				

Table 61. Protections (Cont.).

P6.2.7 [©]	Unit under temperate	ure protection			ID 1564				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2				
Options:	0 = No action; 1 = Warning; 2 = Fault; or 3 = Fault, coast.								
Description:	This protection sets the r	response to a low frequenc	y converter temperature	on the heat sink.					
P6.2.8 ^②	Cold weather mode		'	'	ID 2126				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0				
Options:	0 = Disabled; or 1 = Enabled.								
Description:	from -10°C to -30°C. Thi when given a run comma to warm up. If it does no	s then enables a warm-up ind, will turn on for the colo	feature when the freque I weather time-out and o ter that the time frequen	causing the frequency conver ncy converter is between -30° utput the cold weather voltag cy converter will fault on unde	C and -20°C. The motor, e at 0.5 Hz to allow the motor				
P6.2.10 ^②	Cold weather time or	ut			ID 2128				
Minimum value:	0 min	Maximum value:	10 min	Default value:	3 min				
Description:	With this parameter, you	are able to select the time	limit that the frequency	converter will run in the warm	ı-up period.				
P6.2.11 ^②	STO fault response		'		ID 2427				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2				
Options:	1 = Warning - drive indica	0 = No Action - drive will stop, no indication shown, no reset required, have to cycle start command. 1 = Warning - drive indicate warning/if STO clears drive will run without reset. 2 = Fault - drive will indicate fault/require reset to start again.							
Description:	STO fault response defin	es the function of how the	STO input will be seen o	n the keypad and how the driv	e functions to it.				
P6.2.12 ^①	PI feedback Al loss r	esponse			ID 2401				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0				
Options:	0 = No action; 1 = Warning; 2 = Fault; or 3 = Warning: preset frequ	uency (P6.2.13).							
Description:	This parameter defines the feedback.	he function of the PI feedb	ack analog input loss res	ponse. If the AI feedback is lo	st based off the programed A				
P6.2.13 ^{①②}	PI feedback Al loss p	ore-frequency			ID 2402				
Minimum value:	0.00 Hz	Maximum value:	400.00 Hz	Default value:	0.00 Hz				
Description:	This parameter defines the	he frequency the master w	ould run to if a feedback	is lost and P6.2.12 was set to	option 3.				
P6.2.14 ^②	PI feedback Al loss p	pipe fill			ID 2403				
Minimum value:	0.0 varies	Maximum value:	1000.0 varies	Default value:	0.0 varies				
Description:	Detects loss of prime in t the frequency in P6.2.13	the pump based off the me "loss of prime" occurs.	asured level. If the value	e drops below this level for the	time in P6.2.15 and below,				
P6.2.15 ^②	PI feedback Al loss p	ore-frequency timeout			ID 2404				
Minimum value:	0 s	Maximum value:	6,000 s	Default value:	0 s				
Description:				en the feedback signal is lost, t out on "feedback loss". The					
P6.2.16 ^{①②}	Overvoltage controll	er response			ID 1840				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0				
Options:	0 = No action; 1 = Warning (W/O S); or 2 = Warning (W S).								
	z – waiting (w o).								

Table 61. Protections (Cont.).

P6.2.17 ^{①②}	Overcurrent controll	er response			ID 1841			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	0 = No action; 1 = Warning (W/O S); or 2 = Warning (W S).							
Description:	Display options for curre	nt limit controller warning.						
P6.2.18	Cold weather passwe	Cold weather password ID 2129						
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Description:	This password allows ac soft keys on the keypad.	cess to override the under to Password should be set to	emperature fault pr 62385. This value	otection. This parameter is seen b gets reset on cycle of power.	y pressing the left and righ			
P6.2.19	Under-temperature f	ault override			ID 2130			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	0 = No; or 1 = Yes.							
Description:	With the password set to function gets reset when		ameter is enabled a	nd will give the ability to override t	he under temp fault. This			

P6.3 - Communications

P6.3.1 ^{①②}	Fieldbus fault respons	ie .			ID 334			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2			
Options:	0 = No action; 1 = Warning; 2 = Fault; or 3 = Fault, coast.							
Description:	communication port.			e is used and communication is lost eldbus control to set fault or warnin				
P6.3.2 ^{①②}	OPTcard fault respons	e			ID 335			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2			
Options:	0 = No action; 1 = Warning; 2 = Fault; or 3 = Fault, coast.							
Description:	This sets the response mo processor.	de for a board slot fault c	aused by a missing c	or failed option board not communic	cating to the central			
P6.3.3 ^{①②}	IP address confliction	response			ID 1678			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1			
	0 = No action; 1 = Warning; 2 = Fault - stop mode after fault according to parameter stop mode; or							
Options:	1 = Warning;							
Options: Description:	1 = Warning; 2 = Fault - stop mode afte 3 = Fault - stop mode afte	fault always by coasting		cally meaning there are multiple dev	vices with the same IF			
-	1 = Warning; 2 = Fault - stop mode after 3 = Fault - stop mode after Indicates there is a conflic	fault always by coasting t in the IP address assign		cally meaning there are multiple dev	vices with the same IF			
Description:	1 = Warning, 2 = Fault - stop mode afte 3 = Fault - stop mode afte Indicates there is a conflic address assigned	fault always by coasting t in the IP address assign		cally meaning there are multiple dev				
Description:	1 = Warning, 2 = Fault - stop mode after 3 = Fault - stop mode after Indicates there is a conflict address assigned. Keypad communication	fault always by coasting t in the IP address assign on fault response	ed to the drive, typic		ID 2157			

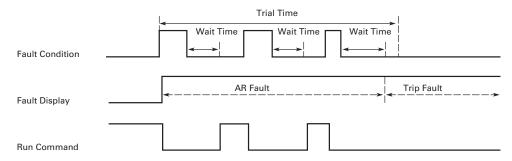
Table 61. Protections (Cont.).

P6.4 - Auto restart.					
P6.4.1 ^②	AR wait time			'	ID 321
Minimum value:	1.00 s	Maximum value:	300.00 s	Default value:	1.00 s
Description:	Defines the time before	the frequency converter trie	es to automatically res	start the motor after a specific fa	ult condition has been clear.
P6.4.2 ^②	AR trail time				ID 322
Minimum value:	1.00 s	Maximum value:	600.00 s	Default value:	30.00 s

Description:

Amount of time after fault set that the drive uses the restart attempts to reset the fault and restart the motor, after this time has run out without resetting the alarm drive will fault.

P6.4.4 to P6.4.11 determine the maximum number of automatic restarts during the trial time set by P6.4.2. The time count starts from the first auto restart. If the number of faults occurring during the trial time exceeds the values of P6.4.4 to P6.4.11, the fault state becomes active. Otherwise the fault is cleared after the trial time has elapsed and the next fault starts the trial time count again. If a single fault remains during the trial time, a fault state is true.



Auto Restart Fail (Try Number >2.)

P6.4.3 ^②	AR start funct	tion			ID 323			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	1 = Start accordi	rom stop frequency; ng to parameter stop mode; or rom maximum frequency.						
Description:	The start functio condition. Defin been clear.	n for automatic restart is selected es the time before the frequency co	with this paramet onverter tries to a	ter. The parameter defines the start n utomatically restart the motor after a	node upon an auto restart specific fault condition has			
P6.4.4 ^②	Undervoltage	attempts	'	'	ID 324			
Minimum value:	0	Maximum value:	10	Default value:	1			
Description:	This parameter determines how many automatic restarts can be made during the trial time after an undervoltage trip.							
	0 = No automatic restart. >0 = Number of automatic restarts after undervoltage fault.							
	The fault is reset and the drive is started automatically after the DC-link voltage has returned to the normal level.							
P6.4.5 ^②	Overvoltage a	ttempts			ID 325			
Minimum value:	0	Maximum value:	10	Default value:	1			
Description:	This parameter determines how many automatic restarts can be made during the trial time after an overvoltage trip.							
	0 = No automatic restart after overvoltage fault trip. >0 = Number of automatic restarts after overvoltage fault trip.							
	The fault is reset	t and the drive is started automatic	ally after the DC-	link voltage has returned to the norma	l level.			

Table 61. Protections (Cont.).

P6.4.6 ^②	Overcurrent attem	pts			ID 326			
Minimum value:	0	Maximum value:	3	Default value:	1			
Description:	This parameter deterr	This parameter determines how many automatic restarts can be made during the trial time.						
	Note: An IGBT tempe	Note: An IGBT temperature fault, saturation fault, and overcurrent faults are included as part of this fault.						
		art after overcurrent fault trip. natic restarts after an overcuri		trip, or IGBT temperature fault.				
P6.4.7 ^②	4 mA fault attemp	ts			ID 327			
Minimum value:	0	Maximum value:	10	Default value:	1			
Description:	This parameter deterr	mines how many automatic res	starts can be made	during the trial time.				
		art after reference fault trip. natic restarts after the analog	current signal (4–2)	0 mA) has returned to the normal le	vel (>4 mA).			
P6.4.8 ^②	Motor temperatur	e fault attempts		'	ID 329			
Minimum value:	0	Maximum value:	10	Default value:	1			
Description:	This parameter determines how many automatic restarts can be made during the trial time.							
		art after Motor temperature fa natic restarts after the motor t		urned to its normal level.				
P6.4.9 ^②	External fault atte	mpts			ID 328			
Minimum value:	0	Maximum value:	10	Default value:	0			
Description:	This parameter deterr	mines how many automatic res	starts can be made	during the trial time.				
	N - No automatic rest	art after external fault trip.	ult trip.					
	>0 = Number of auton	natic restarts after external fa						
P6.4.10 [©]	>0 = Number of auton				ID 336			
P6.4.10 [®] Minimum value:	>0 = Number of auton		10	Default value:	ID 336			
P6.4.10 [©] Minimum value: Description:	>0 = Number of auton **Underload attemp** 0	ts						
Minimum value:	>0 = Number of auton Underload attemp 0 This parameter detern 0 = No automatic rest	fs Maximum value:	starts can be made					
Minimum value:	>0 = Number of auton Underload attemp 0 This parameter detern 0 = No automatic rest	Maximum value: mines how many automatic restart after an underload fault trinatic restarts after an underload	starts can be made					
Minimum value: Description:	>0 = Number of auton Underload attemp 0 This parameter deterr 0 = No automatic rest >0 = Number of auton	Maximum value: mines how many automatic restart after an underload fault trinatic restarts after an underload	starts can be made		1			

[©] Parameter value can only be changed after the drive has stopped. © Parameter value will be set to be default when changing macros.

Table 62. PI Controller.

P7.1 - Basic settings	s.				
P7.1.1 ^②	PI control gain				ID 1294
Minimum value:	0.00%	Maximum value:	200.00%	Default value:	100.00%
Description:		of the PI Controller. It adjust the s f 10% in the error value causes th			ne load. If this value is set to
P7.1.2 ^②	PI control itime	e			ID 1295
P7.1.2 ^② Minimum value:	PI control itime	e Maximum value:	600.00 s	Default value:	ID 1295 1.00 s

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Table 62. PI Controller (Cont.).

P7.1.3 ^{①②}	PI process unit		, , , , , , , , , , , , , , , , , , ,		ID 1297
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = %; 1 = 1/min.; 2 = rpm; 3 = ppm; 4 = pps; 5 = 1/s; 6 = 1/min.; 7 = 1/h; 8 = kg/s; 9 = kg/min.; 10 = kg/h; 11 = m3/s; 12 = m3/min.; 13 = m3/h; 14 = m/s; 15 = mbar; 16 = bar; 17 = Pa; 18 = kPa; 19 = mVS; 20 = kW; 21 = Deg. C; 22 = GPM; 23 = gal/s; 24 = gal/min.; 25 = gal/s; 26 = lb/s; 27 = lb/min.; 28 = lb/h; 29 = CFM; 30 = ft³/s; 31 = ft³/min.; 32 = ft³/h; 33 = ft/s; 34 = in. wg; 35 = ft wg; 36 = PSI; 37 = lb/in.2; 38 = HP; 39 = Deg. F; 40 = PA; 41 = WC; 42 = HG; 43 = ft; or 44 = m.		IV.A.		
Description:	Defines the unit type for				ID 4200
P7.1.4 [©] Winimum value:	-99999.99 varies	nimum 	PI Process Unit Max	Default value:	1D 1298
value.	-55555.53 Vd1168	muximulli value.	varies	Dordant value.	0.00 varies
Description:	Defines the minimum p	rocess unit value.			
7.1.5 ^②	PI process unit max	kimum			ID 1300
linimum value:	PI Process Unit Min	Maximum value:	99999.99 varies	Default value:	100.00 varies
Description:	Defines the maximum p	process unit value.			
P7.1.6 ^{①②}	PI error inversion				ID 1303
/linimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Normal - if feedbac 1 = Inverted - if feedba	ck is less than set-point, PI co ck is less than set-point, PI c	ontroller output increases. controller output decreases.		
Description:	Defines the way the pr	ocess value output reacts to	the feedback signal		

Table 62. Pl Controller (Cont.).

P7.1.7 ^②	PI dead band				ID 1304
Minimum value:	-99999.99 varies	Maximum value:	99999.99 varies	Default value:	0 varies
Description:		etpoint in process units. This ler. The PI output is locked it			ion or repeated activation/
P7.1.8 ^②	PI dead band delay	,			ID 1306
Minimum value:	0.00 s	Maximum value:	320.00 s	Default value:	0.00 s
Description:	If the PI process value level out again.	goes out of the dead band ar	ea for the desired time de	lay, at that point the controlle	er will re-initialize and try t
P7.1.9 ^②	PI ramp time	'	,	,	ID 1311
Minimum value:	0.00 s	Maximum value:	300.00 s	Default value:	0.00 s
				,	

^① Parameter value can only be changed after the drive has stopped. ^② Parameter value will be set to be default when changing macros.

Table 63. Setpoint .

P7.2.1 - Standard.							
P7.2.1.1 ^②	PI keypad setpoint	1			ID 1307		
Minimum value:	PI Process Unit Min	Maximum value:	PI Process Unit Max	Default value:	0.00 varies		
Description:	Keypad PI reference va	ue setpoint 1.					
P7.2.1.2 ^②	PI keypad setpoint	2			ID 1309		
Minimum value:	PI Process Unit Min	Maximum value:	PI Process Unit Max	Default value:	0.00 varies		
Description:	Keypad PI reference va	ue setpoint 2.					
P7.2.1.3 ^②	PI wake-up action	,	'	,	ID 2466		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0		
Options:	1 = Wake-up when abo 2 = Wake-up when belo	0 = Wake-up when below wake-up level. 1 = Wake-up when above wake-up-level. 2 = Wake-up when below wake-up level % from PI setpoint. 3 = Wake-up when above wake-up level %from PI setpoint.					
Description:	This parameter defines	the wake-up function action					

P7.2.2 - Setpoint 1.

P7.2.2.1 ^①	PI setpoint 1 source				ID 1312
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Not used; 1 = PI keypad setpoint 1; 2 = PI keypad setpoint 2; 3 = AI; 4 = Drive reference pot; 5 = FB process data input 6 = FB process data input 7 = FB process data input 8 = FB process data input 9 = FB process data input 10 = FB process data input 11 = FB process data input 12 = FB process data input 13 = FB PI setpoint 1; or 14 = FB PI setpoint 2.	2; 3; 4; 5; t 6; t 7;			
Description:	Defines source of the setp fieldbus message.	point value the drive uses.	This can either be	an internal preset value, keypad se	tpoint, analog signal, or

Table 63. Setpoint (Cont.).

P7.2.2.2 ^①	PI setpoint 1 slee	p enable			ID 1315				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0				
Options:	0 = Disabled; or 1 = Enabled.								
Description:		able the output when the frequ dback rises above the wake-u		sleep frequency for the sleep de	lay time. The output				
P7.2.2.3 ^②	PI setpoint 1 slee	p delay		,	ID 1317				
Minimum value:	0 s	Maximum value:	3,000 s	Default value:	0 s				
Description:	This parameter sets t shut off till the wake	he delay time after the setpoin up level is met. It is to preven	nt drops below the slee It large fluctuations wh	p level for this amount of time a en going into the sleep function	nd then the drives output wil to save motor run time.				
P7.2.2.4 ^②	PI setpoint 1 wak	e-up level		,	ID 1318				
Minimum value:	-99999.99 varies	Maximum value:	99999.99 varies	Default value:	0.00 varies				
Description:	Defines the level for feedback which can b	Defines the level for the PI feedback value to go above top enable the PI output to be re enabled. This value is based of the % of feedback which can be scaled based off the PI unit min./max, values.							
P7.2.2.5 ^②	PI setpoint 1 boos	st	'	,	ID 1320				
Minimum value:	-2.00 varies	Maximum value:	2.00 varies	Default value:	1.00 varies				
Description:	The setpoint can be b	poosted via a multiplier value.							
P7.2.2.6 ^②	PI setpoint 1 slee	p level		,	ID 2450				
Minimum value:	MinFreq Hz	Maximum value:	MaxFreq Hz	Default value:	0.00 Hz				
Description:		which the unit value is used to the drive into the sleep mode.		eep mode. When the unit drops	below this level for the sleep				
P7.2.2.7 ^②	SP1 sleep mode o	ver cycle time			ID 1842				
Minimum value:	0	Maximum value:	10	Default value:	0				
Description:	cycle" fault. One cycle is defined	e drive come in and out of sleep when the drive transfers from do the sleep over cycle check	normal mode to sleep n		rive would trip on "pump ove				
P7.2.2.8 ^②	SP1 sleep mode n	naximum cycle time	,		ID 1843				
Minimum value:	0 s	Maximum value:	3,600 s	Default value:	300 s				
Description:	Defines the maximun	n time for sleep over cycle chec	cking.						

P7.2.3 - Setpoint 2.

P7.2.3.1 ^①	PI setpoint 2 source	•			ID 1321
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Not used; 1 = PI keypad setpoint 2 2 = PI keypad setpoint 2 3 = AI; 4 = Drive reference pot 5 = FB process data inp 6 = FB process data inp 7 = FB process data inp 8 = FB process data inp 10 = FB process data inp 11 = FB process data in 12 = FB process data in 13 = FB PI setpoint 1; or 14 = FB PI setpoint 2.	out 1; ut 1; ut 2; ut 3; ut 4; ut 5; put 6; put 7; put 8;			
Description:	Defines source of the s fieldbus message.	etpoint value the drive uses.	This can either be	an internal preset value, keypad se	tpoint, analog signal, or

Table 63. Setpoint (Cont.).

P7.2.3.2 ^①	PI setpoint 2 sleep	enable			ID 1324
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disabled; or 1 = Enabled.				
Description:		ble the output when the frequ lback rises above the wake-up		leep frequency for the sleep de	lay time. The output
P7.2.3.3 ^②	PI setpoint 2 sleep	delay			ID 1326
Minimum value:	0 s	Maximum value:	3,000 s	Default value:	0 s
Description:				o level for this amount of time a en going into the sleep function	
P7.2.3.4 ^②	PI setpoint 2 wake	-up level			ID 1327
Minimum value:	-99999.99 varies	Maximum value:	99999.99 varies	Default value:	0.00 varies
Description:		ne PI feedback value to go abo e scaled based off the PI unit		tput to be re enabled. This valu	ue is based of the % of
P7.2.3.5 ^②	PI setpoint 2 boos	t			ID 1329
Minimum value:	-2.00 varies	Maximum value:	2.00 varies	Default value:	1.00 varies
Description:	The setpoint can be bo	posted via a multiplier value.			
P7.2.3.6 ^②	PI setpoint 2 sleep	level			ID 2452
Minimum value:	MinFreq Hz	Maximum value:	MaxFreq Hz	Default value:	0.00 Hz
Description:		hich the unit value is used to the drive into the sleep mode.		eep mode. When the unit drops	below this level for the slee
P7.2.3.7 ^②	SP2 sleep mode ov	ver cycle time		,	ID 1844
Minimum value:	0	Maximum value:	10	Default value:	0
Description:	cycle" fault. One cycle is defined w	drive come in and out of sleep then the drive transfers from to do the sleep over cycle check	normal mode to sleep m		lrive would trip on "pump ove
P7.2.3.8 ^②	SP2 sleep mode m	aximum cycle time			ID 1845
Minimum value:	0 s	Maximum value:	3,600 s	Default value:	300 s
Description:	Defines the maximum	time for sleep over cycle chec	cking.		

① Parameter value can only be changed after the drive has stopped. ② Parameter value will be set to be default when changing macros.

Table 64. Feedback.

P7.3.1 - Standard.								
P7.3.1.1 ^②	PI feedback gai	n			ID 1331			
Minimum value:	-1,000.0%	Maximum value:	1,000.0%	Default value:	100.0%			
Description:	Defines gain assoc	iated with the feedback signal fr	om the measuring devi	Ce.				

P7 3 2 - Feedback 1

P7.3.2.1 ^①	PI feedback 1 se	ource			ID 1332
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	0 = Not used; 1 = Al; 2 = Drive reference 3 = FB process Dat; 4 = FB Process Dat; 5 = FB Process Dat; 6 = FB Process Dat; 7 = FB Process Dat; 9 = FB Process Dat; 10 = FB Process Dat; 11 = FB PI feedback	input 1; a Input 2; a Input 3; a Input 4; a Input 5; a Input 6; a Input 7; ta Input 8; or		Delault Value.	
Description:	Defines where feed	back signal is being fed into the	drive, via analog or fie	eldbus data value.	
P7.3.2.2 ^②	PI feedback 1 m	inimum			ID 1333
Minimum value:	-200.00 %	Maximum value:	200.00%	Default value:	0.00%
Description:	Minimum unit value	e for the feedback signal.			
P7.3.2.3 ^②	PI feedback 1 m	aximim			ID 1334
Minimum value:	-200.00 %	Maximum value:	200.00%	Default value:	100.00%
Description:		for the feedback signal.			

① Parameter value can only be changed after the drive has stopped. ② Parameter value will be set to be default when changing macros.

Table 65. HVAC parameters.

P8.1 - Damper (*DM	1 PRO).	,		,	'
P8.1.1 ^{①②}	Damper start		,	'	ID 483
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	input function m such as a dampe digital input, the 2 = Interlock time st received within restarted. 3 = Delay start: This	t: To use this, a relay output, RO just be programmed for selection er, seal water solenoid, or a pre- frequency converter will start. art: This functions the same as the interlock timeout, a "prevention"	n "RunEnable". The lube pump. Upon a the interlocked start t-up start" fault is di d start, except that	programmed for selections 29 "Dar relay output is used to energize an return acknowledgement of contact , except that if the return acknowle splayed in keypad and the start se a return contact is not used. After	element of the driven syste t closure to the programmed edgement contact is not quence will need to be
Description:	This parameter dete	ermines the function of the damp	oer.		
P8.1.2 ^{①②}	Damper time out	t			ID 484
Minimum value:	1 s	Maximum value:	32,500 s	Default value:	5 s
Description:	The time out time us is received.	sed for an interlocked time start	, after which the sta	rt sequence must be restarted if n	o acknowledgement contac
P8.1.3 ^{①②}	Damper delay				ID 485
Minimum value:	1 s	Maximum value:	32,500 s	Default value:	5 s
Description:	The delay time follow	wing a delay start, after which t	he frequency conve	rter will be started.	

Table 65. HVAC parameters (Cont.).

P8.2 - Fire mode (*D					
P8.2.1 [©]	Fire mode protec				ID 535
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:		nitiates fire mode function. initiates fire mode function.			
Description:	This parameter deter input function select	rmines whether the fire mode f fire mode.	unction is determined by	a contact closure or contact o	pening on the desired digita
		ode is enabled, this causes the ne drive causes issues to the sy		and run till its death. Warrant	y will be non-valid in the ca
P8.2.2 ^{①②}	Fire mode referen	ice select function			ID 536
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	3 = AI; or				
Description:	This parameter allow	s for setting the reference loca	ation for when the fire mo	ode is enabled.	
P8.2.3 ^②	Fire mode minim	um frequency			ID 537
Minimum value:	MinFreq. Hz	Maximum value:	MaxFreq. Hz	Default value:	15.00
Description:	This parameter sets	the minimum output frequency	for fire mode. This can b	pe used as a selection for refer	ence command.
P8.2.4 ^②	Fire mode freque	ncy reference 1	,		ID 565
Minimum value:	0.0%	Maximum value:	100.0%	Default value:	75.0%
Description:		the drive operating percentage ire mode reference 1.	based off the 0% being	minimum frequency (P1.1) and	100% being maximum
P8.2.5 ^②	Fire mode freque	ncy reference 2			ID 564
Minimum value:	0.0%	Maximum value:	100.0%	Default value:	100.0%
Description:		the drive operating percentage ire mode reference 2.	based off the 0% being	minimum frequency (P1.1) and	100% being maximum
P8.2.6	Fire mode test en	able		,	ID 2443
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Disabled; or 1 = Enabled.				
Description:	This parameter allow run at the fire mode	rs for testing the fire mode fea speed desired but all faults are	ture. With the parameter enabled.	r set to enable and fire mode i	nput enabled, the drive will
P8.2.7 ^{①②}	Smoke purge free	quency			ID 554
Minimum value:	0.0%	Maximum value:	100.0%	Default value:	50.0%
Description:	Frequency setting for	r smoke purge. Preset speed u 100% being maximum frequen	sed for a digital input sel	ection. The percentage is bas	ed off the 0% being minimu

P8.3 - Protections (*DM1 PRO).

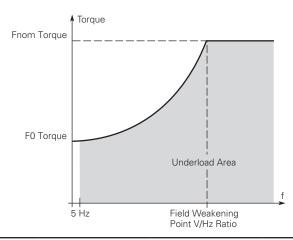
P8.3.1 ^{①②}	Broken belt pr	otection	,	,	ID 317
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:		ode after fault according to param			
Description:	status of the mot		w the Fnom and FO	stage based on the parameter condi torque levels for the time limit, the p e underload time counter to zero.	

Table 65. HVAC parameters (Cont.).

P8.3.2 ^②	Broken belt Fnom torque				ID 318
Minimum value:	10.0%	Maximum value:	150.0%	Default value:	50.0%

Description:

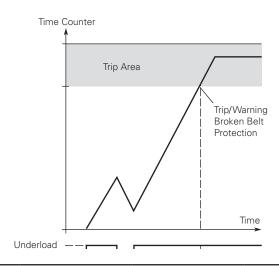
The torque limit can be set between 10.0-150.0 % x TnMotor. This parameter gives the value for the minimum torque allowed when the output frequency is at or above the field weakening point. If you change P1.6, nominal motor current, this parameter is automatically restored to the default value.



P8.3.3 ^②	Broken belt F0	torque	ID			
Minimum value:	5.0%	Maximum value:	150.0%	Default value:	10.0%	
Description:	The torque limit c frequency. If you	an be set between 5.0—150.0 % x change the value of P1.6, nominal	TnMotor. This parame motor current, this pa	eter gives the value for the minim trameter is automatically restored	num torque allowed at zero d to the default value.	
P8.3.4 ^②	Broken belt tin	ne limit			ID 320	
Minimum value:	2.00 s	Maximum value:	600.00 s	Default value:	20.00 s	

Description:

This time can be set between 2.00 and 600.00 seconds. This is the time allowed for a fault state to exist. An internal up/down counter counts the accumulated underload time. If the underload counter value goes above this limit, the protection will cause a trip according to protection parameter. If the drive is stopped, the counter is reset to zero.

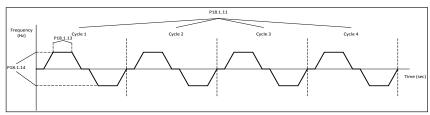


^① Parameter value can only be changed after the drive has stopped.

^② Parameter value will be set to be default when changing macros.

Table 66. Pump parameters.

-	PRO).		-		
P9.1.1 ^②	Derag cycles				ID 2468
Minimum value:	0	Maximum value:	10	Default value:	3
Description:	This parameter define	es the number of cycles in the	forward/reverse directio	on for removing any debris in sy	stem.
P9.1.2 ^②	Derag at Start/Sto	pp			ID 2469
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Off; 1 = Start; 2 = Stop; 3 = Start and stop; 4 = Digital input; or 5 = Current.				
Description:	Defines how the dera	ge function will become activa	ated; start, stop, both, or	r based off the digital input.	
P9.1.3 ^②	Deragging run tim	e			ID 2470
Minimum value:	1 s	Maximum value:	3,600 s	Default value:	0 s
Description:	Defines the length of	time the drive will run at the o	lerag speed in the forwa	ard and reverse direction.	
	Derag speed			'	ID 2471
P9.1.4 ²			MaxFreg Hz	Default value:	5.00 Hz
P9.1.4 ^② Minimum value:	MinFreq Hz	Maximum value:	Maxi 164 112		3.00 112
	•	the drive will run at in the for	· ·	when in the derag mode.	3.00 112



P9.1.5 ^②	Derag off delay	/			ID 2472	
Minimum value:	1 s	Maximum value:	600 s	Default value:	10 s	
Description:	Defines the length	n of time the drive will run the der	ag function when en	abled at stop.		
P9.1.6 ^{①②}	Derag current			'	ID 1879	
Minimum value:	N.A. A	Maximum value:	N.A. A	Default value:	0.00 A	

P9.2 - Start/stop timing (*DM1 PRO).

P9.2.1 ^{①②}	Valve start				ID 1847
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Normal; 1 = Damper start; 2 = Damper tout; or 3 = Damper delay.				
Description:	This parameter determine	nes the function of damper.			
P9.2.2 ^{①②}	Valve timeout			,	ID 1848
Minimum value:	1 s	Maximum value:	32,500 s	Default value:	5 s
Description:	The timeout time used f received.	for an interlocked time start	, after which the start :	sequence must be restarted if no	acknowledgement contact is
P9.2.3 ^{①②}	Valve delay			,	ID 1849
Minimum value:	1 s	Maximum value:	32,500 s	Default value:	5 s
Description:	The delay time following	g a delay start, after which	the frequency converte	er will be started.	

P9.2.4 ^{①②}	Back spin delay				ID 2423
Minimum value:	0 s	Maximum value:	32,500 s	Default value:	0 s
Description:				re another run command can be it will then start. This is true fo	
P9.2.5 [©]	Minimum run time			'	ID 1813
Minimum value:	0 s	Maximum value:	32,500 s	Default value:	0 s
Description:	Drive minimum run time				
P9.2.6 ^②	Minimum frequency	ramp time			ID 1850
Minimum value:	0.1 s	Maximum value:	2,000.0 s	Default value:	10.0 s
Description:	Ramp time for output to	minimum frequency.			
P9.3.1 ^{①②}					ID 2270
	Multi-pump mode				ID 2279
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	ID 2279
Minimum value: Options:			N.A.	Default value:	
Options:	N.A. 0 = Disabled or 1 = Multi-drive network Determines the number 0 = Disabled - single driv	of drives being used in the	multi-pump configurati		
Options: Description:	N.A. 0 = Disabled or 1 = Multi-drive network Determines the number 0 = Disabled - single driv	of drives being used in the live for motor; or	multi-pump configurati		
Options: Description: P9.3.2 ^{©®}	N.A. 0 = Disabled or 1 = Multi-drive network Determines the number 0 = Disabled - single driv 1 = Multi-drive - multi-fo	of drives being used in the live for motor; or	multi-pump configurati		0
Options: Description: P9.3.2 ^{©2} Minimum value:	N.A. 0 = Disabled or 1 = Multi-drive network Determines the number 0 = Disabled - single driv 1 = Multi-drive - multi-fo Number of drives 1 This defines the number	of drives being used in the vector motor; or obligation of the sequence with multiple of the sequence with multiple of drives active when doing of the sequence with the sequence of drives active when doing of the sequence of drives active when doing of the sequence of drives active when doing of the sequence of the s	multi-pump configurati iple drives. 5	on:	ID 2449 1 ere will be always one driv.
Options: Description: P9.3.2 ^{©®} Minimum value: Description:	N.A. 0 = Disabled or 1 = Multi-drive network Determines the number 0 = Disabled - single driv 1 = Multi-drive - multi-fo Number of drives 1 This defines the number	of drives being used in the vector motor; or obligation of the sequence with multiple of the sequence with multiple of drives active when doing of the sequence with the sequence of drives active when doing of the sequence of drives active when doing of the sequence of drives active when doing of the sequence of the s	multi-pump configurati iple drives. 5	on: Default value: and fan scheme. By default, the	ID 2449 1 ere will be always one driv.
	N.A. 0 = Disabled or 1 = Multi-drive network Determines the number 0 = Disabled - single driv 1 = Multi-drive - multi-fo Number of drives 1 This defines the number active at one time. By s	of drives being used in the vector motor; or obligation of the sequence with multiple of the sequence with multiple of drives active when doing of the sequence with the sequence of drives active when doing of the sequence of drives active when doing of the sequence of drives active when doing of the sequence of the s	multi-pump configurati iple drives. 5	on: Default value: and fan scheme. By default, the	ID 2449 1 ere will be always one drive

Description: This parameter defines the drive address when using mult- drive pump mode. Based off this sequence and can be monitored at this drive ID value in the monitor screen.

P9.3.4 ^{①②}	Regulation source		,		ID 2284
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Network only; or 1 = PI controller.				
Description:	For drives that have bee	n connected with both star	t/stop signal and Pl	feedback - can be set up as "Feedba	ck", so they will have ability

	to be the master.				
P9.3.5 ^②	PI bandwidth				ID 2458
Minimum value:	0.00 varies	Maximum value:	6,000.00 varies	Default value:	10.00 varies
Description:	Percentage based of	f the setpoint above and below	which defines when the	auxiliary motor will come onl	ine or offline.
P9.3.6 ^{①②}	Staging frequenc	y		,	ID 2315
Minimum value:	MinFreq	Maximum value:	400.00	Default value:	50.00
Description:	Output frequency is a	above stagging frequency and	PI error is out of PI bandw	idth - motor should add to sy:	stem.
P9.3.7 [©]	De-staging freque	ency			ID 2316
Minimum value:	0.00	Maximum value:	MaxFreq	Default value:	0.00
Description:	Output frequency is b	pelow de-stagging frequency a	nd PI error is out of PI ban	dwidth - motor should remov	e from system.
P9.3.8 ^②	Add/remove delay	,			ID 344
Minimum value:	0 s	Maximum value:	3,600 s	Default value:	10 s

With feedback outside the bandwidth, this time must pass before motors/pumps are added or removed from the system.

Description:

Table 66. Pump parameters (Cont.).

P9.3.9 ²	Interlock enabled				ID 350				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0				
Options:	0 = Disabled; or 1 = Enabled.								
Description:	This parameter enables offline.	the drive to look at the digit	tal input interlocks to tell	l which motor is available for r	unning or if they were brough				
P9.3.10 ^{①②}	Recovery method		,		ID 2285				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0				
Options:	0 = Automatic; or 1 = Stop.								
Description:		This parameter is for the slave when multi-drive system lost the master. The slave drive can continue run if it set to be "Automatic". However, the slave drive will stop immediately if it is set to be "Stop".							
P9.3.11 ²	Add/remove drive se	election			ID 2311				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0				
Options:	0 = Drive ID; or 1 = Run time.								
Description:	In default, MPFC system drive's running time: add	n will add/remove pump acc If the drive that has shortest	ording to their drive ID, f running time and remov	rom small to large. The order of the drive that has longest rule.	can also depend on each slav nning time first.				
P9.3.12 ²	Run time enabled				ID 2280				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0				
Options:	0 = Disabled; or 1 = Enabled.								
Description:	The run time counter wi	ll start counting only if this	parameter is enabled.						
P9.3.13 ^②	Run time limit				ID 2281				
Minimum value:	0.0 h	Maximum value:	300,000.0 h	Default value:	0.0 h				
Description:	If drive run time is over	this limit, its network status	s will be "Need Alternati	on". Limit equals 0 means run	time counter disabled.				
P9.3.14	Run time reset				ID 2283				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.				
Options:	0 = No action; or 1 = Reset.								
Description:	One-time parameter, se	t to be 1 will clear run time	counter.						
P9.3.15 ²	Master drive mode				ID 2473				
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0				
Options:	0 = Follow PI; 1 = Fixed speed; or 2 = Turn off.								
Description:	Defines how the master	drive will maintain the freq	uency control when slav	es are brought in; follow PI, fix	ed speed, or turn off.				
P9.3.16 ^②	Master fixed speed				ID 2474				
Minimum value:	MinFreq Hz	Maximum value:	MaxFreq Hz	Default value:	50.00 Hz				
Description:	Defines the fixed speed	frequency when the master	r drive mode is set for fix	ed speed control when slaves	are brought in.				
P9.3.17 ^②	Master fixed speed	delay			ID 2475				
Minimum value:	0 s	Maximum value:	1,000 s	Default value:	5 s				
Description:	Defines the delay time bor turn off.	pefore the master drive begi	ns running at the fixed s	speed or turns off if the master	r mode is set for fixed speed				

Table 66. Pump parameters (Cont.).

P9.4.1 ^{①②}	Pipe fill loss respon	se			ID 2410
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = No action; 1 = Warning; 2 = Fault; or 3 = Fault, coast.				
Description:	Defines the response m	ethod when a "loss of prime	" condition occurs.		
P9.4.2 ^{①②}	Pipe fill loss detect	ion method	,		ID 2406
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Motor current; 1 = Motor power (%); or 2 = Motor torque (%).				
Description:	Defines the value for lo	oking at a loss of prime.			
P9.4.3 ^②	Pipe fill loss low let	/el			ID 2407
Minimum value:	0.00 varies	Maximum value:	1,000.00 varies	Default value:	0.00 varies
Description:	If the monitor value is l	ess than low level value and	the output frequency is m	nore than low frequency, chec	k the pipe fill loss start.
P9.4.4 [©]	Pipe fill loss low fre	equency	,		ID 2409
Minimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	0.00 Hz
Description:	Defines the frequency p disabled.	point at which the drive need	s to be above to enable th	he "loss of prime" feature. W	hen set to 0 Hz, protection
P9.4.5 ^②	Pipe fill loss high le	vel	,		ID 1851
Minimum value:	0.0 varies	Maximum value:	1,000.0 varies	Default value:	0.0 varies
Description:	If the monitor value is n loss start.	nore than high level (the high	n level is not 0) and the ou	tput frequency is more than h	iigh frequency, check pipe f
P9.4.6 ^{①②}	Pipe fill loss high fr	equency	,		ID 1852
Vinimum value:	0.00 Hz	Maximum value:	MaxFreq Hz	Default value:	0.00 Hz
Description:	Defines high frequency is disabled.	point at which the drive nee	ds to be above to enabled	d the "loss of prime" feature.	When set to 0 Hz, protection
P9.4.7 ^②	Pipe fill loss time				ID 2408
Minimum value:	0 s	Maximum value:	600 s	Default value:	0 s
Description:	Defines the delay time	pefore a "loss of prime" cond	lition will occur based of t	the detection method and prin	ne loss level.
P9.4.8 ^②	Pipe fill loss attemp	ots			ID 2411
Minimum value:	0	Maximum value:	10	Default value:	1
Description:	Defines the amount of a	attemps to auto restart the d	Irive on a "prime loss" con	ndition.	

P9.5.1 ^②	Prime pump enable				ID 2428
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disabled; or 1 = Enabled.				
Description:	Prime pump enable.				

Table 66. Pump parameters (Cont.).

P9.5.2 ^②	Prime pump leve	I			ID 2429				
Minimum value:	0.00 varies	Maximum value:	6,000.00 varies	Default value:	0.00 varies				
Description:	This defines the level becomes deactivate	This defines the level at which the prime pump function will drop out. If the feedback level raises above this value, prime pump becomes deactivated. If the level is not reached, it will switch after the delay time.							
P9.5.3 ^②	Prime pump freq	uency			ID 2431				
Minimum value:	MinFreq Hz	Maximum value:	MaxFreq Hz	Default value:	0.00 Hz				
Description:	Frequency at which	Frequency at which the prime pump function will operate when enabled.							
P9.5.4 ^②	Prime pump dela	y time			ID 2432				
Minimum value:	0 min.	Maximum value:	3,600 min.	Default value:	0 min.				
Description:	This is the time that	the drive will run the pre-charg	e function on start up.						
P9.5.5 ^②	Prime pump loss	of prime level		'	ID 2433				
Minimum value:	0.00 varies	Maximum value:	1,000.00 varies	Default value:	0.00 varies				
Description:	Selects the limit to the prime loss of time	Selects the limit to indicate a loss of prime in pump. If the measured current drops below the determined value for the value assigned in the prime loss of time setting, the drive will display "pipe fill loss".							
P9.5.6 ^②	Prime pump leve	12	'	'	ID 2434				
Minimum value:	0.00 varies	Maximum value:	6,000.00 varies	Default value:	0.00 varies				
Description:		el at which the prime pump func d. If the level is not reached, it			nis value, prime pump				
P9.5.7 ^②	Prime pump freq	uency 2			ID 2436				
Minimum value:	MinFreq Hz	Maximum value:	MaxFreq Hz	Default value:	0.00 Hz				
Description:	Frequency at which	the prime pump level 2 will ope	rate at when enabled.						
P9.5.8 ^②	Prime pump dela	y time 2			ID 2437				
Minimum value:	0.0 min	Maximum value:	3,600.0 min	Default value:	0.0 min				
Description:	This is the time that	the drive will run at the 2nd lev	vel prime pump function le	vel.					
P9.5.9 ^②	Prime pump loss	of prime level 2			ID 2438				
Minimum value:	0.00 varies	Maximum value:	1,000.00 varies	Default value:	0.00 varies				
Description:	0.00 varies Maximum value: 1,000.00 varies Default value: 0.00 varies Selects the limit to indicate a loss of prime in pump. If the measured current drops below the determined value for the value assigned in the prime loss of time setting, the drive will display pipe fill loss.								

P9.6 - Broken pipe (*DM1 PRO).

P9.6.1 ^{①②}	Broken pipe fault re	sponse			ID 1853
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = No action; 1 = Warning; 2 = Fault, coast; or 3 = Fault.				
Description:	Broken pipe fault/warnin broke pipe frequency for		PI feedback is less than b	roken pipe level and the drive	output frequency is more than
P9.6.2 ²	Broken pipe level	,			ID 1854
Minimum value:	0.0 varies	Maximum value:	6,000.0 varies	Default value:	15.0 varies
Description:	Broken pipe level.				
P9.6.3 ^②	Broken pipe frequen	су			ID 1856
Minimum value:	1.00 Hz	Maximum value:	MaxFreq Hz	Default value:	25.00 Hz

Table 66. Pump parameters (Cont.).

P9.6.4 ^②	Broken pipe delay				ID 1855
Minimum value:	1.0 s	Maximum value:	120.0 s	Default value:	15.0 s
Description:	Broken pipe delay time.				

Table 67. Fieldbus (FB) status.

F 10.1 - FB process t	lata input selection.				
P10.1.1 ^②	FB process data	input 1 selection	,		ID 2533
Minimum value:	0	Maximum value:	12,464	Default value:	0
Description:		ata output selections, parameter ord for process data. Any drive p		ssigned to these registers and the can be read over these values.	en read over the desired
	Process data IN3 = F Process data IN4 = F Process data IN5 = F	NULL = ID 0; FB PI Set Point1= ID 2542; FB PI Feedback1= ID 2550; Acceleration time 1= ID 103; Deceleration time 1= ID 104; Current limit= ID 107; NULL= ID 0; or			
P10.1.2 ^②	FB process data	input 2 selection		,	ID 2534
Minimum value:	0	Maximum value:	12,464	Default value:	2,542
240.4.0 [®]	Process data IN3 = I Process data IN4 = I Process data IN5 = I Process data IN6 = I Process data IN7 = I Process data IN8 = I	NULL = ID 0; FB PI Set Point1= ID 2542; FB PI Feedback1= ID 2550; Acceleration time 1= ID 103; Deceleration time 1= ID 104; Current limit= ID 107; NULL= ID 0; or			ID 2535
P10.1.3 ^②			40.404		
BA:	^				
Minimum value:	0 With the fieldbus da	Maximum value:	12,464	Default value:	2,550
Minimum value: Description:	With the fieldbus da		r/monitor IDs can be a	ssigned to these registers and the	

^① Parameter value can only be changed after the drive has stopped. ^② Parameter value will be set to be default when changing macros.

Table 67. Fieldbus (FB) status (Cont.).

P10.1.4 ^②	FB process data	input 4 selection			ID 2536
Minimum value:	0	Maximum value:	12,464	Default value:	103
Description:		data output selections, paramete vord for process data. Any drive		assigned to these registers and the D can be read over these values.	en read over the desired
	Process data IN3 = Process data IN4 = Process data IN5 =	NULL = ID 0; FB PI Set Point1= ID 2542; FB PI Feedback1= ID 2550; Acceleration time 1= ID 103; Deceleration time 1= ID 104; Current limit= ID 107; NULL= ID 0; or			
P10.1.5 ^②	FB process data	input 5 selection			ID 2537
Minimum value:	0	Maximum value:	12,464	Default value:	104
Description:		data output selections, paramete vord for process data. Any drive		assigned to these registers and the D can be read over these values.	en read over the desired
	Process data IN3 = Process data IN4 = Process data IN5 =	NULL = ID 0; FB PI Set Point1= ID 2542; FB PI Feedback1= ID 2550; Acceleration time 1= ID 103; Deceleration time 1= ID 104; Current limit= ID 107; NULL= ID 0; or			
P10.1.6 ^②	FB process data	input 6 selection			ID 2538
Minimum value:	0	Maximum value:	12,464	Default value:	107
Description:	fieldbus network v Default values for Process data IN1 = Process data IN2 = Process data IN3 = Process data IN4 = Process data IN5 =	process data in: NULL = ID 0; FB PI Set Point1= ID 2542; FB PI Feedback1= ID 2550; Acceleration time 1= ID 103; Deceleration time 1= ID 104; Current limit= ID 107; NULL= ID 0; or		assigned to these registers and the D can be read over these values.	en read over the desired
P10.1.7 ^②	FB process data	input 7 selection			ID 2539
Minimum value:	0	Maximum value:	12,464	Default value:	0
Description:	fieldbus network v Default values for Process data IN1 = Process data IN2 = Process data IN3 = Process data IN4 =	vord for process data. Any drive process data in:		assigned to these registers and the D can be read over these values.	en read over the desired

Table 67. Fieldbus (FB) status (Cont.).

P10.1.8 ^②	FB process data input 8 selection		ID 2540
Minimum value:	0 Maximum value:	12,464	Default value: ()
Description:	With the fieldbus data output selections, param fieldbus network word for process data. Any dr		re assigned to these registers and then read over the desire ID can be read over these values.
	Default values for process data in: Process data IN1 = NULL = ID 0; Process data IN2 = FB PI Set Point1= ID 2542; Process data IN3 = FB PI Feedback1= ID 2550; Process data IN4 = Acceleration time 1= ID 103; Process data IN5 = Deceleration time 1= ID 104; Process data IN6 = Current limit= ID 107; Process data IN7 = NULL= ID 0; or Process data IN8 = NULL= ID 0.		

P10.2.1 ²	FB process dat	a output 1 selection			ID 1556
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Description:		data output selections, paramete word for process data. Any drive		assigned to these registers and the D can be read over these values.	en read over the desired
	Process data Out Process data Out Process data Out Process data Out Process data Out Process data Out Process data Out	process data out in fieldbus (build 1 = Output frequency = ID 1; 2 = Motor speed = ID 2; 3 = Motor current = ID 3; 4 = Motor torque = ID 4; 5 = Motor power = ID 5; 6 = Motor voltage = ID 6; 7 = DC link voltage = ID 7; or 8 = Latest fault code = ID 28.	d table for below val	ues):	
P10.2.2 ^②	FB process dat	a output 2 selection			ID 1557
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
	Process data Out Process data Out Process data Out Process data Out Process data Out	process data out in fieldbus (build 1 = Output frequency = ID 1; 2 = Motor speed = ID 2; 3 = Motor current = ID 3; 4 = Motor torque = ID 4; 5 = Motor power = ID 5; 6 = Motor voltage = ID 6;	d table for below val	ues):	
	Process data Out	7 = DC link voltage = ID 7; or 8 = Latest fault code = ID 28.			
P10.2.3 ^②	Process data Out	7 = DC link voltage = ID 7; or			ID 1558
P10.2.3 [©] Minimum value:	Process data Out	7 = DC link voltage = ID 7; or 3 = Latest fault code = ID 28.	N.A.	Default value:	ID 1558
	Process data Out: Process data Out: FB process dat N.A. With the fieldbus	7 = DC link voltage = ID 7; or 8 = Latest fault code = ID 28. 24 output 3 selection Maximum value:	r/monitor IDs can be	assigned to these registers and the	3

Table 67. Fieldbus (FB) status (Cont.).

P10.2.4 ^②	FB process data	output 4 selection			ID 1559
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	4
Description:		lata output selections, paramete rord for process data. Any drive		ssigned to these registers and the can be read over these values.	en read over the desired
	Process data Out1 Process data Out2 Process data Out3 Process data Out4 Process data Out5 Process data Out6 Process data Out6 Process data Out7	orocess data out in fieldbus (buil = Output frequency = ID 1; = Motor speed = ID 2; = Motor current = ID 3; = Motor torque = ID 4; = Motor power = ID 5; = Motor voltage = ID 6; = DC link voltage = ID 7; or = Latest fault code = ID 28.	d table for below value	es):	
P10.2.5 ^②	FB process data	output 5 selection			ID 1560
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	5
Description:		lata output selections, paramete ord for process data. Any drive		ssigned to these registers and the can be read over these values.	en read over the desired
	Process data Out1 Process data Out2 Process data Out3 Process data Out4 Process data Out5 Process data Out6 Process data Out6 Process data Out7	orocess data out in fieldbus (buil = Output frequency = ID 1; = Motor speed = ID 2; = Motor current = ID 3; = Motor torque = ID 4; = Motor power = ID 5; = Motor voltage = ID 6; = DC link voltage = ID 7; or = Latest fault code = ID 28.	d table for below value	es):	
P10.2.6 ^②	FB process data	output 6 selection			ID 1561
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	6
Description:	fieldbus network w Default values for I Process data Out1 Process data Out2 Process data Out3 Process data Out4 Process data Out6 Process data Out6 Process data Out6	lata output selections, paramete vord for process data. Any drive process data out in fieldbus (buil = Output frequency = ID 1; = Motor speed = ID 2; = Motor current = ID 3; = Motor torque = ID 4; = Motor power = ID 5; = Motor voltage = ID 6; = DC link voltage = ID 7; or = Latest fault code = ID 28.	parameter with an ID		en read over the desired
P10.2.7 ^②	FB process data	output 7 selection			ID 1562
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	7
Description:	fieldbus network w Default values for Process data Out1 Process data Out2 Process data Out3 Process data Out4	vord for process data. Any drive process data out in fieldbus (buil = Output frequency = ID 1; = Motor speed = ID 2; = Motor current = ID 3; = Motor torque = ID 4;	parameter with an ID		en read over the desired
	Process data Outb	= Motor power = ID 5; = Motor voltage = ID 6;			

Table 67. Fieldbus (FB) status (Cont.).

P10.2.8 ^②	FB process data	output 8 selection		'	ID 1563
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	28
Description:	With the fieldbus defieldbus network with the fieldbus network with the fieldbus network with the fieldbus network with the fieldbus network data Out 1 = Process data Out 2 = Process data Out 4 = Process data Out 5 = Pr	ord for process data. Any drive process data out in fieldbus (buil = Output frequency = ID 1; = Motor speed = ID 2; = Motor current = ID 3; = Motor torque = ID 4; = Motor power = ID 5;	parameter with a	be assigned to these registers and then re n ID can be read over these values. values):	
	Process data Out7 =	= Motor voltage = ID 6; = DC link voltage = ID 7; or = Latest fault code = ID 28.			

P10.3.1 ^②	Standard status wo	ord Bit0 function select			ID 2415
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Not used; 1 = Ready; 2 = Run; 3 = Fault; 4 = Fault invert; 5 = Warning; 6 = Reversed; 7 = At speed; 8 = Zero frequency; 9 = Frequency limit supen 10 = Pl supervision; 11 = Torque limit super 12 = Reference limit super 14 = Temperature limit 15 = Analog input supe 16 = Motor current sup 17 = Over heat fault; 18 = Overcurrent regula 19 = Overvoltage regul 20 = Undervoltage regul 20 = Undervoltage regul 21 = 4 mA reference fa 22 = External fault/wa 23 = Motor thermal pro 24 = STO fault output; 25 = Control from I/O; 26 = Remote control; 27 = Un-requested rote 28 = Fire mode; 29 = Damper control; 31 = Jog speed select; 32 = Fieldbus digital in; 33 = Fieldbus digital in; 33 = Fieldbus digital in; 33 = Fieldbus digital in; 34 = DC charge switch 35 = Preheat active; 36 = Cold weather acti 37 = Pl Sleep 38 = 2nd stage ramp fr 39 = Prime pump active 40 = Master drive state; 41 = Slave drive state; 43 = Single drive control	vision; pervision; vision; supervision; rvision; ervision; ervision; er; ar; ular; ult/warning; rning; tection; tion direction; out 1; out 2; close; ve; equency active; o;			
Description:	This parameter allows	for setting one of the RO fun	rtions to a status wo	ord that then can be read over the	communication standard

Table 67. Fieldbus (FB) status (Cont.).

10 = PI super		N.A.	Default value:	2
1 = Ready; 2 = Run; 3 = Fault; 4 = Fault inve 5 = Warning; 6 = Reversed 7 = At speed 8 = Zero freq 9 = Frequenc 10 = P1 super				
12 = Referen 13 = Power li 14 = Tempera 15 = Analog 16 = Motor c 17 = Over he 18 = Overcur 19 = Overcur 19 = Overvoi 20 = Undervo 21 = 4 mA re 22 = Externa 23 = Motor t 24 = STO fau 25 = Control 26 = Remote 27 = Un-requ 28 = Fire mo 29 = Damper 30 = Valve co 31 = Jog spe 32 = Fieldbus 33 = Fieldbus 34 = DC char 35 = Preheat 36 = Cold we 37 = PI Sleep	uency; / limit supervision; vision; mit supervision; mit supervision; mit supervision; mit supervision; nutre limit supervision; nput supervision; urrent supervision;			

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Table 67. Fieldbus (FB) status (Cont.).

P10.3.3 ^②	Standard status	word Bit 2 function select			ID 2417
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	3
ptions:	0 = Not used; 1 = Ready; 2 = Run; 3 = Fault; 4 = Fault invert; 5 = Warning; 6 = Reversed; 7 = At speed; 8 = Zero frequency, 9 = Frequency limit 10 = Pl supervision; 11 = Torque limit su 12 = Reference limit 13 = Power limit su 14 = Temperature li 15 = Analog input s 16 = Motor current 17 = Over heat faul 18 = Overcurrent re 19 = Overvoltage 20 = Undervoltage 21 = 4 mA referenc 22 = External fault, 23 = Motor therma 24 = STO fault outp 25 = Control from l, 26 = Remote control 27 = Un-requested 28 = Fire mode; 29 = Damper control 31 = Jog speed sel 32 = Fieldbus digita 34 = Dc Charge sw 35 = Preheat active 36 = Cold weather 37 = Pl Sleep 38 = 2nd stage ram 39 = Prime pump ac 40 = Master drive s 41 = Slave drive sta 43 = Single drive of	supervision; pervision; t supervision; pervision; mit supervision; upervision; supervision; gular; gular; egular; egular; eregular; eregular; protection; ut; O; l; rotation direction; act; I input 1; I input 2; tch close; cative; p frequency active; tive; tate; tate; te; or			
Description:	43 = Single drive co	ntrol.	ctions to a status wo	ord that then can be read over the o	communication standard

Table 67. Fieldbus (FB) status (Cont.).

Minimum value: N.A. Default value: 4
1 = Ready, 2 = Rur, 3 = Fault, 4 = Fault invert; 5 = Warning; 6 = Reversed; 7 = At speed; 8 = Zero frequency; 9 = Frequency limit supervision; 10 = Pl supervision; 11 = forque limit supervision; 12 = Reference limit supervision; 13 = Power limit supervision; 14 = Temperature limit supervision; 15 = Analog input supervision; 16 = Motor current supervision; 17 = Over heat fault; 18 = Overcurrent regular; 19 = Overcurrent regular; 20 = Undervoltage regular; 21 = 4 mA reference fault/warning; 22 = External fault/warning; 23 = Motor thermal protection; 24 = STO fault output; 25 = Control from I/O; 26 = Remote control; 37 = Un-requested rotation direction; 38 = Fire mode; 39 = Damper control; 31 = Jog speed select; 31 = Fieldbus digital input 2; 33 = Fieldbus digital input 2; 34 = DC charge switch close; 35 = Preheat active; 36 = Cold weather active; 37 = Il Sleep
39 = Prime pump active; 40 = Master drive state; 41 = Slave drive state; or 43 = Single drive control. Description: This parameter allows for setting one of the RO functions to a status word that then can be read over the communication standard

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Table 67. Fieldbus (FB) status (Cont.).

Minimum value: N.A. Maximum value: N.A. Default value: 5 Dptions: 0
1 = Ready; 2 = Run; 3 = Fault; 4 = Fault invert; 5 = Warning; 6 = Reversed; 7 = At speed; 8 = Zero frequency; 9 = Frequency limit supervision; 10 = Pl supervision; 11 = Torque limit supervision; 12 = Reference limit supervision; 13 = Power limit supervision; 14 = Temperature limit supervision; 15 = Analog input supervision; 16 = Motor current supervision; 17 = Over heat fault; 18 = Overcurrent regular; 20 = Undervoltage regular; 21 = 4 m A reference fault/warning; 22 = External fault/warning; 23 = Motor thermal protection; 24 = STO fault output; 25 = Control from I/O; 26 = Remote control; 27 = Un-requested rotation direction; 28 = Fire mode; 29 = Damper control; 31 = Jog speed select; 32 = Fieldbus digital input 1; 33 = Fieldbus digital input 2; 34 = DC charge switch close; 35 = Preheat active; 36 = Cold weather active; 37 = Pl Sleep 38 = 2nd stage ramp frequency active;
39 = Prime pump active; 40 = Master drive state; 41 = Slave drive state; or 43 = Single drive control.

Table 67. Fieldbus (FB) status (Cont.).

Detions: 0 = Not used; 1 = Ready; 2 = Bun; 3 = Fault; 4 = Fault invert; 5 = Warning; 6 = Reversed; 7 = At speed; 8 = Zero frequency; 9 = Frequency [limit supervision; 10 = PI supervision; 11 = Torque limit supervision; 12 = Reference limit supervision; 13 = Power limit supervision; 14 = Temperature limit supervision; 15 = Analog input supervision; 16 = Motor current supervision; 17 = Over leaf fault; 18 = Overcurrent regular; 19 = Overvoltage regular; 20 = Undervoltage regular; 21 = 4 mA reference fault/warning; 22 = External fault/warning; 23 = Motor thermal protection; 24 = STO fault output; 25 = Control from I/O; 26 = Remote control; 31 = Jos speed select; 32 = Fire mode; 33 = Pieldbus digital input 1; 34 = Fieldbus digital input 2; 34 = DC charge switch close; 35 = Frieldbus digital input 1; 33 = Fieldbus digital input 2; 34 = DC charge switch close; 35 = Prime pump active; 36 = Cold weather active; 37 = PI Sleep 38 = And salege ramp frequency active; 39 = Prime pump active; 41 = Slave drive state;	P10.3.6 ^②	Standard statu	ıs word Bit 5 function select			ID 2420
1 = Ready, 2 = Run, 3 = Fault; 4 = Fault invert; 5 = Warning; 6 = Reversed; 7 = At speed; 8 = Zero frequency; 9 = Frequency limit supervision; 10 = Pl supervision; 11 = Torque limit supervision; 12 = Reference limit supervision; 13 = Power limit supervision; 14 = Temperature limit supervision; 15 = Analog input supervision; 16 = Motor current supervision; 17 = Over heaf tault; 18 = Overcurrent regular; 19 = Overvoltage regular; 20 = Undervoltage regular; 21 = 4 mA reference fault/warning; 22 = External fault/warning; 23 = Motor thermal protection; 24 = STO fault output; 25 = Control from I/O; 26 = Remote control; 27 = Un-requested rotation direction; 28 = Fire mode; 29 = Damper control; 30 = Valve control; 31 = Jog speed select; 32 = Fieldbus digital input 1; 33 = Fieldbus digital input 2; 34 = DC charge switch close; 35 = Preheaf active; 36 = Cold weather active; 37 = Il Sleep 38 = And stage ramp frequency active; 39 = Prime pump active; 41 = Slave drive state; 41 = Master drive state; 41 = Slave drive state;	Minimum value:	N.A.	Maximum value:	N.A.	Default value:	6
43 = Single drive control.	Options:	1 = Ready; 2 = Run; 3 = Fault; 4 = Fault invert; 5 = Warning, 6 = Reversed; 7 = At speed; 8 = Zero frequency lim 10 = Pl supervisic 11 = Torque limit 12 = Reference lim 13 = Power limit s 14 = Temperature 15 = Analog input 16 = Motor curree 17 = Over heat fa 18 = Overcurrent 19 = Overvoltage 20 = Undervoltage 20 = Undervoltage 21 = 4 mA referei 22 = External fau 23 = Motor therm 24 = STO fault ou 25 = Control from 26 = Remote cont 27 = Un-requeste 28 = Fire mode; 29 = Damper cont 30 = Valve contro 31 = Jog speed s 32 = Fieldbus digi 33 = Fieldbus digi 34 = DC charge s 35 = Preheat acti 36 = Cold weathe 37 = Pl Sleep 38 = 2nd stage ra 39 = Prime pump 40 = Master drive	if supervision; in; supervision; mit supervision; supervision; supervision; supervision; supervision; supervision; that supervision; ult; regular; regular; regular; nee fault/warning; lt/warning; nal protection; tput; tput; l/O; trol; d rotation direction; trol; did input 1; ttal input 2; witch close; ve; er active; estate; state; state; state;			

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Chapter 7- Multi-purpose application

Table 67. Fieldbus (FB) status (Cont.).

Minimum value: N.A. Maximum value: N.A. Default value: 7
1 = Ready; 2 = Run; 3 = Fault; 4 = Fault invert; 5 = Warning; 6 = Reversed; 7 = At speed; 8 = Zero frequency; 9 = Frequency limit supervision; 10 = Pl supervision; 11 = Torque limit supervision; 12 = Reference limit supervision; 13 = Power limit supervision; 14 = Temperature limit supervision; 15 = Analog input supervision; 16 = Motor current supervision; 17 = Over heat fault; 18 = Overcurrent regular; 19 = Overvitage regular; 20 = Undervoltage regular; 21 = 4 mA reference fault/warning; 22 = External fault/warning; 23 = Motor thermal protection; 24 = STO fault output; 25 = Control from I/O; 26 = Remote control; 27 = Un-requested rotation direction; 28 = Fire mode; 29 = Damper control; 30 = Valve control; 31 = Jog speed select; 32 = Fieldbus digital input 2; 33 = Fieldbus digital input 2; 34 = DC charge switch close; 35 = Preheat active; 36 = Cold weather active; 37 = I's I seep
38 = 2nd stage ramp frequency active; 39 = Prime pump active; 40 = Master drive state; 41 = Slave drive state; or 43 = Single drive control.

Table 67. Fieldbus (FB) status (Cont.).

^① Parameter value can only be changed after the drive has stopped. ^② Parameter value will be set to be default when changing macros.

Table 68. Serial communication.

P11.1.1 ^①	Serial commu	ınication		·	ID 586		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0		
Options:	0 = Modbus RTU 1 = BACnet MS ² 2 = SWD (*DM1	ΓΡ (*DM1 PR0); or					
Description:	This parameter	This parameter defines the communication protocol for RS-485.					
P11.2 - Modbus RTU	1.						
P11.2.1 ^①	Slave address	s			ID 587		
Minimum value:	1	Maximum value:	247	Default value:	1		
Description:	This parameter	defines the slave address for RS-48	5 communication.				

Table 68. Serial communication (Cont.).

P11.2.2 ^①	Baud rate			'	ID 584
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 57,600; or 4 = 115,200				
Description:	This parameter defines com	munication speed for RS	-485 communication.		
P11.2.3 ^①	Parity type			,	ID 585
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	0 = None; 1 = Odd; or 2 = Even.				
Description:	This parameter defines parit	y type for RS-485 comm	nunication.		
P11.2.4	Modbus RTU protocol s	tatus			ID 588
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Initial; 1 = Stopped; 2 = Operational; or 3 = Faulted.				
Description:	This parameter shows the pr	rotocol status for RS-48	5 communication.		
P11.2.5	Communication timeou	t modbus RTU			ID 593
Minimum value:	0 ms	Maximum value:	60,000 ms	Default value:	10,000 ms
Description:	Selects the time to wait before	ore a communication fac	ult occurs over modbus R	TU if a message is not receive	d.
P11.2.6	Modbus RTU fault respo	onse		'	ID 2516
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	communications; if not in	fieldbus control, place	will not fault.	dbus fault is active, the drive von is lost, fieldbus fault respon	
Description:	Defines the fieldbus fault co	ndition for modbus RTU	communication.		
P11.3 - BACnet MST	Р.				
P11.3.1 ^①	MSTP baud rate				ID 594
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	2
Options:	0 = 9,600; 1 = 19,200; 2 = 38,400; 3 = 76,800; or				
	4 = 115,200.				
Description:	4 = 115,200. This parameter defines the c	communication speed fo	r RS-485 communication		
	<u> </u>	communication speed fo	r RS-485 communication		ID 595
P11.3.2 ^①	This parameter defines the o	communication speed fo	r RS-485 communication	Default value:	ID 595
P11.3.2 ^① Minimum value:	This parameter defines the o	Maximum value:	127		
P11.3.2 [©] Minimum value: Description:	This parameter defines the comments of the com	Maximum value:	127		
P11.3.2 [©] Minimum value: Description: P11.3.3 [©]	This parameter defines the commstrp device address 0 Defines the device address of the	Maximum value:	127		1
Description: P11.3.2 ^① Minimum value: Description: P11.3.3 ^① Minimum value: Description:	This parameter defines the commstrp device address 0 Defines the device address of the	Maximum value: of the drive on the BACr Maximum value:	127 net MSTP network. 4,194,302	Default value:	1 ID 596
P11.3.2 [©] Minimum value: Description: P11.3.3 [©] Minimum value:	This parameter defines the comments of the com	Maximum value: of the drive on the BACr Maximum value: r of the drive on the BAC	127 net MSTP network. 4,194,302	Default value:	1 ID 596
P11.3.2 [©] Minimum value: Description: P11.3.3 [©] Minimum value: Description:	This parameter defines the communication to	Maximum value: of the drive on the BACr Maximum value: r of the drive on the BAC	127 net MSTP network. 4,194,302	Default value:	1 ID 596

Table 68. Serial communication (Cont.).

P11.3.5	MSTP protocol status				ID 599
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Stopped; 1 = Operational; or 2 = Faulted.				
Description:	This parameter shows the p	protocol status for BACne	et MSTP communic	ation.	
P11.3.6	MSTP fault code				ID 600
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = None; 1 = Sole master; 2 = Duplicate MAC ID; or 3 = Baud rate fault.				
Description:	This parameter shows the p	protocol status for BACne	et MSTP communic	ation.	
P11.3.7	MSTP fault response				ID 2526
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	communications. If not	in fieldbus control, place	will not fault.	nd fieldbus fault is active, the drive vunication is lost, fieldbus fault respo	
Description:	Defines the fieldbus fault c	ondition for BACnet MST	P communication.		
P11.3.8	MSTP maximum maste	r			ID 1537
Minimum value:	1	Maximum value:	127	Default value:	127
Description:	Defines the maximum numb	per of masters that can e	stablish connection	ns with the drive.	
Minimum value: Options:	N.A. 0 = No permission to read/v		N.A.	Default value:	1
	1 = Acyclic read/write are a				
Description:	PNU927 which specifies th	e operation priority of pa	rameters for acycli	c communication.	
P11.5.2 ^①	Parameter data access				ID 2631
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	4
Options:	0 = Local control; 1 = Fieldbus; 2 = Mixed interface; 4 = NET, local on fault; or 5 = Dual mode.				
Description:	PNU928 which specifies th	e control priority of the d	evice for cyclic con	mmunication.	
P11.5.3	Fault situation counter		1		ID 2632
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	PNU952 which specifies th Only write of 0 is allowed, (parameter 944) are erased	then the whole fault buff	er (actual fault situ	ation and all other fault situations) a	nd the fault message counte
P11.5.4	Board status				ID 2609
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Description:	Status of the board: B0-DCOM communication f B1-Board HW fault; B2-I01 24 volt overload fau B3-Profibus communication B4-fieldbus fault.	lt;			

Table 68. Serial communication (Cont.).

P11.5.5	Firmware version	'			ID 2610			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.			
Description:	This parameter provide	This parameter provides the firmware version of the SWD.						
P11.5.6	Protocol status				ID 2612			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	0 = Not configured; 1 = Operational; or 2 = Diagnostics.							
Description:	This parameter specific	This parameter specifies the protocol status for SWD card.						

P11.6 - Bluetooth.

P11.6.1	Bluetooth enabled				ID 1895
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disabled; or 1 = Enabled.				
Description:	Bluetooth enabled.				
P11.6.2 ^②	Bluetooth broadcast	mode	'		ID 2920
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Off; or 1 = On.				
Description:	Bluetooth broadcast mod	le.			
P11.6.3	Bluetooth pairing res	set			ID 2935
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = Not reset; or 1 = Reset.				
Description:	Bluetooth pairing reset.				

 $^{^{\}scriptsize \textcircled{\tiny 1}}$ Parameter value can only be changed after the drive has stopped. $^{\scriptsize \textcircled{\tiny 2}}$ Parameter value will be set to be default when changing macros.

Table 69. Ethernet communication.

P12.1 - Basic settings.							
P12.1.1 ^①	IP address mode				ID 1500		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0		
Options:	0 = Static IP; or 1 = DHCP with AutoIP.						
Description:	This parameter defined	the IP address configuration	mode for EIP/modb	us TCP.			
P12.1.2	Active IP address	,			ID 1507		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.		
Description:	Reads the current activ	ve IP address.					
P12.1.3	Active subnet mas	k			ID 1509		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.		
Description:	Reads the current activ	ve subnet mask.					
P12.1.4	Active default gate	way	'		ID 1511		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.		
Description:	Reads the current activ	ve default gateway.					

Table 69. Ethernet communication (Cont.).

P12.1.5	MAC address	,		,	ID 1513		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.		
Description:	Reads the current	MAC address.					
P12.1.6 ^①	Static IP addre	ss			ID 1501		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	192.168.1.254		
Description:	Defines the static	Defines the static IP address.					
P12.1.7 ^①	Static subnet n	Static subnet mask					
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	255.255.255.0		
Description:	Defines the static	subnet mask.					
P12.1.8 ^①	Static default g	gateway			ID 1505		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	192.168.1.1		
Description:	Defines the static	default gateway.					
P12.1.9	Ethernet comm	nunication timeout			ID 611		
Minimum value:	0 ms	Maximum value:	60,000 ms	Default value:	10,000 ms		
Description:	Selects the time in	Selects the time it waits before a communication fault occurs over ethernet.					

P12.2 - Trusted IP filter (DM1 PRO only).

P12.2.1	Trusted IP white li	st		'	ID 68
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0.0.0.0 0.0.0.0 192.168.1.255
Description:	Defines the IP address	ses in the white list. A setting	g of 192.168.1.255 er	nables all connections on the local	subnet.
P12.2.2	Trusted IP filter en	able			ID 76
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	0 = Disabled; or 1 = Enabled.				
Description:	Enables IP white listing. Devices not in the white list will not be able to establish communications with the drive.				

P12.3 - Modbus TCP (DM1 PRO only).

P12.3.1 ^①	Modbus TCP ena	ble			ID 1942		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0		
Options:	0 = Disable; or 1 = Enable.						
Description:	Enables modbus TCF	communications, must be enal	oled to connect to Po	ower Xpert inControl.			
P12.3.2	Modbus TCP con	Modbus TCP connection limit ID 609					
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	5		
Description:	Maximum number of	connections allowed to the dri	ve.				
P12.3.3	Modbus TCP unit identifier number						
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	1		
Description:	Unit identifier unit v	alue for modbus TCP.					
P12.3.4	Modbus TCP prot	ocol status			ID 612		
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.		
Options:	0 = Stopped; 1 = Operational; or 2 = Faulted.						
Description:	This parameter show	s the protocol status for modb	us TCP communication	on.			

Table 69. Ethernet communication (Cont.).

P12.3.5	Modbus TCP fault response	,	ID 2517				
Minimum value:	N.A. Maximum value	N.A.	Default value:	0			
Options:	0 = Only in fieldbus control mode - when fieldbus is the control place and fieldbus fault is active, the drive will fault on loss of communications. If not in fieldbus control, place will not fault. 1 = In all control modes - no matter the control place setting, if communication is lost, fieldbus fault response will occur.						
Description:	Defines the fieldbus fault condition for modbus	TCP communication					

P12.4 - Ethernet IP (DM1 PRO only).

P12.4.1 ^①	Ethernet based p	Ethernet based protocol select						
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	0 = Disabled; or 2 = BACnet IP.							
Description:	Selects the active co	ommunication protocol on the e	thernet I/P port.					
P12.4.2	Ethernet IP proto	Ethernet IP protocol status						
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.			
Options:	0 = Off; 1 = Operational; or 2 = Faulted.							
Description:	Indicates if ethernet	protocol is active or not.						
P12.4.3	Ethernet IP fault	response			ID 2518			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0			
Options:	communications.	0 = Only in fieldbus control mode - when fieldbus is the control place and Fieldbus fault is active, the drive will fault on loss of communications. If not in fieldbus control, place will not fault. 1 = In all control modes - no matter the control place setting. If communication is lost, fieldbus fault response will occur.						
Description:	Defines the fieldbus	fault condition for ethernet IP o	communication.					

P12.5 - BACnet IP (DM1 PRO only).

P12.5.1 ^①	BACnet IP UDP po	ort number			ID 1733
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	47,808
Options:	47808 = BACO; 47809 = BAC1; 47810 = BAC2; 47811 = BAC3; 47813 = BAC4; 47813 = BAC6; 47815 = BAC7; 47816 = BAC8; 47817 = BAC9; 47819 = BAC8; 47819 = BACC; 47820 = BACC; 47821 = BACC; 47822 = BACE; or 47823 = BACF.				
Description:	Defines the BACnet L	JDP port number.			
P12.5.2 ^①	BACnet IP foreign	devise			ID 1734
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disabled; or 1 = Enabled.				
Description:	Enables BACNET IP fo	oreign device configuration.			

Table 69. Ethernet communication (Cont.).

P12.5.3 ^①	BACnet IP BBMD IF				ID 1735
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0.0.0.0
Description:	Displays the BACnet B	BMD IP address.			
P12.5.4 ^①	BACnet IP UDP por	t			ID 1737
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	47,808
Options:	47808 = BACO; 47809 = BAC1; 47810 = BAC2; 47811 = BAC3; 47812 = BAC4; 47813 = BAC5; 47814 = BAC6; 47815 = BAC7; 47816 = BAC8; 47817 = BAC9; 47818 = BACB; 47819 = BACB; 47820 = BACC; 47821 = BACD; 47822 = BACE; or 47823 = BACF.				
Description:		BMD UDP port number.			
P12.5.5 ^①	BACnet IP registrat	tion interval			ID 1738
Minimum value:	0	Maximum value:	65,535	Default value:	10
Description:	Defines the registratio	n interval.			
P12.5.6	BACnet IP commun	ication timeout	'	,	ID 1739
Minimum value:	0 ms	Maximum value:	60,000 ms	Default value:	0 ms
Description:	Selects the time it wai	ts before a communication fa	ault occurs over BACnet	IP.	
P12.5.7	BACnet IP protocol	status		'	ID 1740
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Stopped; 1 = Operational; or 2 = Faulted.				
Description:	This parameter shows	the protocol status for BACn	et IP communication.		
P12.5.8	BACnet IP fault bel	havior			ID 1741
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	communications. I	f not in fieldbus control, place	e will not fault.	eldbus fault is active, the drive	
Description:	Defines the fieldbus fa	ult condition for BACnet IP co	ommunication.		
P12.5.9 ^①	BACnet IP instance	number			ID 1742
Minimum value:	0	Maximum value:	4,194,302	Default value:	0
Description:	Displays the BACnet in				

P12.6 - Web UI (DM1 PRO only).

P12.6.1	Web UI protocol st	atus			ID 2915	
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.	
Options:	0 = Off; 1 = Operational; or 2 = Faulted.					
Description:	This parameter shows	the protocol status for web s	erver communication	on.		

Table 69. Ethernet communication (Cont.).

P12.6.2	Web UI fault respo	onse		,	ID 2916
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	communications.	If not in fieldbus control, place	e will not fault.	ieldbus fault is active, the drive ation is lost, fieldbus fault respo	
Description:	Defines the fieldbus f	ault condition for web server	communication.		
P12.6.3	Web UI communic	ation timeout			ID 2919
Minimum value:	30,000 ms	Maximum value:	60,000 ms	Default value:	60,000 ms
Description:	Selects the time it wa	aits before a communication fa	ult occurs over the web	o server.	
P12.6.4 ^①	Web UI enable				ID 2921
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Disabled; or 1 = Enabled.				
Description:	Enables web server c	onfiguration and monitoring pa	age.		

[©] Parameter value can only be changed after the drive has stopped. © Parameter value will be set to be default when changing macros.

Table 70. System.

<u> </u>				
js.				
Language	'			ID 340
N.A.	Maximum value:	N.A.	Default value:	0
0 = English; 1 = English; or 2 = English.				
		uency converter thro	ough the keypad in the language of	your choice. Currently
Application				ID 142
N.A.	Maximum value:	N.A.	Default value:	N.A.
0 = Standard;; 1 = Pump; 2 = Fan; or 3 = Multi-purpose.				
This parameter sets the	active application if multipl	e applications have	been loaded.	
Parameter sets				ID 619
N.A.	Maximum value:	N.A.	Default value:	N.A.
2 = Reload set 1; 3 = Reload set 2; 4 = Store parameter set 5 = Store parameter set 6 = Reset; or	1; 2;			
This parameter allows y	ou to reload the factory def	ault parameter value	es, and to store and load two custo	mized parameter sets.
Up to keypad	'			ID 620
N.A.	Maximum value:	N.A.	Default value:	N.A.
0 = No; or 1 = Yes (all parameters)				
	N.A. 0 = English; 1 = English; or 2 = English. This parameter offers the available language is English. N.A. 0 = Standard;; 1 = Pump; 2 = Fan; or 3 = Multi-purpose. This parameter sets the Parameter sets N.A. 0 = No; 1 = Load factory default 2 = Reload set 1; 3 = Reload set 2; 4 = Store parameter set 5 = Store parameter set 6 = Reset; or 7 = Reload defaults VM This parameter allows y	N.A. Maximum value: 0 = English; 1 = English; or 2 = English. This parameter offers the ability to control the frequavailable language is English only. Application N.A. Maximum value: 0 = Standard;; 1 = Pump; 2 = Fan; or 3 = Multi-purpose. This parameter sets the active application if multiple Parameter sets N.A. Maximum value: 0 = No; 1 = Load factory default parameters; 2 = Reload set 1; 3 = Reload set 2; 4 = Store parameter set 1; 5 = Store parameter set 2; 6 = Reset; or 7 = Reload defaults VM. This parameter allows you to reload the factory defunction of the factory default parameter set 2; 6 = Reset; or 7 = Reload defaults VM.	N.A. Maximum value: N.A. D = English; 1 = English; or 2 = English. This parameter offers the ability to control the frequency converter throavailable language is English only. Application N.A. Maximum value: N.A. D = Standard;; 1 = Pump; 2 = Fan; or 3 = Multi-purpose. This parameter sets the active application if multiple applications have Parameter sets N.A. Maximum value: N.A. D = No; 1 = Load factory default parameters; 2 = Reload set 1; 3 = Reload set 2; 4 = Store parameter set 1; 5 = Store parameter set 2; 6 = Reset; or 7 = Reload defaults VM. This parameter allows you to reload the factory default parameter value Up to keypad	N.A. Maximum value: N.A. Default value: 0 = English; 1 = English; or 2 = English. This parameter offers the ability to control the frequency converter through the keypad in the language of available language is English only. Application N.A. Maximum value: N.A. Default value: 0 = Standard;; 1 = Pump; 2 = Fan; or 3 = Multi-purpose. This parameter sets the active application if multiple applications have been loaded. Parameter sets N.A. Maximum value: N.A. Default value: 0 = No; 1 = Load factory default parameters; 2 = Reload set 1; 3 = Reload set 2; 4 = Store parameter set 1; 5 = Store parameter set 2; 6 = Reset; or 7 = Reload defaults VM. This parameter allows you to reload the factory default parameter values, and to store and load two custo Up to keypad

Table 70. System (Cont.).

P13.1.5 ^①	Down from keypad				ID 621
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = No; 1 = All parameters; 2 = All, no motor; or 3 = Application parameter	rs.			
Description:	This function downloads	one or all parameter group	s from the keypa	d to the drive.	
P13.1.6	Parameter compariso	n		'	ID 623
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Options:	0 = No; 1 = Compare with keypad 2 = Compare with default 3 = Compare with Set 1; c 4 = Compare with Set 2.				
Description:	With the parameter comp and those loaded to the c		ompare the actua	al parameter values to the values of you	ur customized parameter sets
	The actual parameter valued displayed on the lowermo		hose of the custo	omized parameter Set 1. If no difference	es are detected, a "0" is
	If any of the parameter va	llues differ from those of t	he Set 1 parame	ters, the number of the deviations is di	splayed together.
	value on the description li	w button, once again you vine (in the middle) is the dealue by pushing the right a	fault value, and	actual value and the value it was comp the one on the value line (lowermost lin	pared to. In this display, the ne) is the edited value. You
	Actual values can also be	compared to Set 2, factor	y settings, and k	eypad set values.	
P13.1.7	Parameter lock PIN			'	ID 624
Minimum value:	0	Maximum value:	9,999	Default value:	0
Description:	enabled, the user will be By default, the password	prompted to enter a passw	ord before appli	nges with the password function. Who cation changes, parameter value change the password, change the value of	es, or password changes.
	between 1 and 9,999. To deactivate the passwo	rd, reset the parameter va	lue to 0.		
P13.1.8	Keypad parameter loc	ek			ID 625
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Change enable; or 1 = Change disable.				
Description:	This function allows the u		the parameters.	If the parameter lock is activated, the	text "locked" will appear on
	Note: This function does	not prevent unauthorized (editing of parame	eter values.	
P13.1.9	Start-up Wizard				ID 626
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Enabled. 1 = Disabled.				
Description:	the application desired ar completion, it allows the always enabled for the in	nd then advances paramete user to go to the main mer itial power up of the DM1 t to be active on start-up.	ers through the so ou or default page PRO. By setting	cted "Enable", the Start-up Wizard pro tart-up parameter list/Application Mini e and this parameter is set to "Disable this parameter to "Disable" without go Start-up Wizard after completion, or d	wizard in keypad. After I". The Start-up Wizard is ing through the Start-up

Table 70. System (Cont.).

P13.2 - Keypad.	1			,	
P13.2.1	Local default page				ID 1875
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = None; or 1 = Monitor.				
Description:	Local default page selecti	on.			
13.2.2	Local monitor parame	eter set			ID 1876
/linimum value:	N.A.	Maximum value:	N.A.	Default value:	1,1,0
Description:	Local monitor parameter (oath. Default path is M1.1			
13.2.3	Default page			'	ID 628
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = None; 1 = Main menu; 2 = Multi-monitor; 3 = Favorite menu; or 4 = Keypad reference.				
Description:	switched on.		·	the timeout time expires or whe	
P13.2.4	Timeout time	s o, the function is not act	ivateu. i.e., the last dis	played page remains on the key	ID 629
713.2.4 Minimum value:		Maximum value	CE EQE -	Default value:	
	1 s	Maximum value:	65,535 s.		30 s
Description:	The timeout time setting	defines the time after whi	ch the keypad display ri	eturns to the Default Page.	
	Note: If the default page	value is 0, the timeout tim	e setting has no effect		
213.2.5	Contrast adjust				ID 630
/linimum value:	5	Maximum value:	18	Default value:	12
Description:	If the remote keypad disp	lay is not clear, you can ad	ljust the keypad contras	t with this parameter.	
P13.2.6	Backlight time				ID 631
Minimum value:	1 min.	Maximum value:	65,535 min.	Default value:	10 min.
Description:	This parameter determine	s how long the backlight s	stays on before going or	ıt.	
213.2.7	Fan control				ID 632
/linimum value:	N.A.	Maximum value:	N.A.	Default value:	1
Options:	60°C (140°F). The far minute	on the temperature of the receives a stop command	I when the heat sink ter	ed on automatically when the he nperature falls to 55°C (131°F).	The fan runs for about a
	"Temperature". 2 = Run follow - after pow	ver up, the fan is stopped u	until the run command i	s after changing the value from ' s given and then fan runs contin	
				sistors on power up moment.	
Description:		o control the DM1 PRO's o	cooling fan. You can se	t the fan to run as stated in the	•
P13.2.8	Keypad ACK timeout				ID 633
Viinimum value:	200 ms	Maximum value:	5,000 ms	Default value:	200 ms
Description:	between the control mode keypad to delay message	ule and the keypad. This v		edgement time. This is the com n using long communication cabl	
	= The value of HMI ackno	the frequency converter a wledge timeout is set to 1 ng shall be entered in the	200.00 ms (2 x 600.00,	sending delay + receiving delay).
	la accesa al calle a canadal con c	والمراجعة والمراوا والمراوع والمراوا	at tinat to the	and the same of th	n frequency converter drive

Table 70. System (Cont.).

P13.2.9	Keypad retry	number number			ID 634
Minimum value:	1	Maximum value:	10	Default value:	5
Description:	With this parar within the ackr	meter you can set the number of time nowledgement time (HMI acknowledg	s the drive will tr ge timeout) or if th	y to receive acknowledgement when he received acknowledgement is faul	it has not been received ty.

P13.3.1 ^②	Output display unit	t			ID 2424
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	45
Options:	0 = %;				
	1 = 1/min;				
	2 = rpm;				
	3 = ppm;				
	4 = pps;				
	5 = l/s; 6 = l/min;				
	7 = I/h;				
	8 = kg/s;				
	9 = kg/min;				
	10 = kg/h;				
	11 = m3/s;				
	12 = m3/min;				
	13 = m3/h;				
	14 = m/s; 15 = mbar;				
	16 = bar;				
	17 = Pa;				
	18 = kPa;				
	19 = mVS;				
	20 = kW;				
	21 = Deg. C;				
	22 = GPM;				
	23 = gal/s;				
	24 = gal/min; 25 = gal/h;				
	26 = lb/s;				
	27 = lb/min;				
	28 = lb/h;				
	29 = CFM;				
	30 = ft3/s;				
	31 = ft3/min;				
	32 = ft3/h;				
	33 = ft/s;				
	34 = in wg; 35 = ft wg;				
	36 = PSI;				
	37 = lb/in2;				
	38 = HP;				
	39 = Deg. F;				
	40 = PA;				
	41 = WC;				
	42 = HG;				
	43 = ft; 44 = m;				
	45 = Hz;				
	46 = strokes/min.				
Description:			esired unit that will reflect the value to display desired outp		with P13.3.2 and P13.3.3, i
P13.3.2 ^②	Output display unit	t minimum	· · · · · · · · · · · · · · · · · · ·		ID 2460
Vinimum value:	-60,000.00 varies	Maximum value:	OutputDisplayUnitMax	Default value:	0.00 varies

Table	70.	System	(Cont.)	١

P13.3.3 ^②	Output display unit n	naximum			ID 2425
Minimum value:	OutputDisplayUnitMin varies	Maximum value:	60,000.00 varies	Default value:	MotorNomFreqMFG varies
Description:	Sets the maximum scaled	I value when changing the	display unit to a value oth	er than the default Hz.	

P13.4.1	Keypad softwa	ID 640			
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Keypad firmware	version.			
P13.4.2	Motor control	software version			ID 642
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	DSP/motor contro	ol software version.			
P13.4.3	Application so	oftware version		,	ID 644
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	MCU/application	software version.			
P13.4.4	Software bund	dle version	'		ID 1714
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Software bundle	version.			

P13.5 - Application information.

P13.5.1	Serial number				ID 648
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Product serial numb	per.			
P13.5.2	Multi-monitor se	et			ID 627
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Change enable; 1 = Change disable.				
Description:		can display three actual monitor nonitored with other values.	ed values at the sam	e time. This parameter determine	s if the operator is allowed to
P13.5.3	Keypad lock PIN	1	,		ID 75
Minimum value:	0	Maximum value:	9,999	Default value:	0
Description:	When the passwore response to key pre	d function is enabled, the user was except up/down/left/right.	ill be prompted to en	pad lock function after keys are noter a password before the keypad the password, change the value of	display parameter or
	To deactivate the n	assword, reset the parameter va	lue to O		
	Drive application	· · ·		_	ID 2922
P13.5.4					

P13.6 - User information.

P13.6.1	Total MWh count				ID 601
Minimum value:	N.A. MWh	Maximum value:	N.A. MWh	Default value:	N.A. MWh
Description:	Megawatt hours total operation time counter of the drive output active.				

Table 70. System (Cont.).

P13.6.2	Total power da	ny count			ID 603
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Number of days t	he drive has been supplied with po	ower.		
P13.6.3	Total power ho	our count			ID 606
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Number of hours	the drive has been supplied with p	ower.		
P13.6.4	Total motor ho	our count		'	ID 1872
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	h
Description:	Number of hours	the DM1 PRO has been running a	motor.		
P13.6.5	Trip MWh cour	nt			ID 604
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	MWh
Description:	Megawatts hours	s of the drive output active since la	ast reset.		
P13.6.6	TClear trip MV	Vh count			ID 639
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	0
Options:	0 = Not reset; 1 = Clear trip MW 2 = Clear trip pow				
Description:	Resets the day ar	nd hour motor or drive running cou	nter and resets the	motor run time in the menu.	
P13.6.7	Trip power day	count		-	ID 636
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Number of days s	ince the last reset.			
P13.6.8	Trip power hou	ır count			ID 637
Minimum value:	N.A.	Maximum value:	N.A.	Default value:	N.A.
Description:	Number of hours	the DM1 PRO has been running a	motor since the last	reset.	

[©] Parameter value can only be changed after the drive has stopped. @ Parameter value will be set to be default when changing macros.

Application notes

Faults and warning codes

Under this menu, you can find active faults, history faults, and fault codes.

Table 71. Active faults.

Active faults	When a fault/faults appear(s), the display with the name and fault time of the fault will be pop. Press DETAIL to see the fault data.	The fault remains active until it is cleared with the Reset button push for 2s) or with a reset signal from the I/O terminal or fieldbus.
	The active faults submenu shows the list of faults. Select the fault and push DETAIL to see the fault data.	The memory of active faults can store the maximum of 10 faults in the order of appearance.
Table 72. History faults.	Function	Note
History faults	10 latest faults are stored in the fault history. Select the fault and push DETAIL to see the fault data.	The history fault will be stored until it is cleared with the OK button (push for 5 s).

The memory of active faults can store the maximum of 10 faults in

the order of appearance.

Fault codes and descriptions

Configurable 1 = The fault type of this fault is configurable, fault type can be configured as: 0 = No action; 1 = Warning; 2 = Fault; 3= Fault, Coast.

Fault code	Fault name/ description	Fault type	Default configuration	Possible cause	Remedy
1	Over current	Fault		AC drive has detected too high a current (>4*IH) in the motor cable: • Sudden heavy load increase; • Short circuit in motor cables; • Unsuitable motor.	 Check loading. Check motor. Check cables and connections. Make identification run. Check ramp times.
2	Over voltage	Fault		The DC-link voltage has exceeded the limits defined: • Too short a deceleration time; • Brake chopper is disabled; • High overvoltage spikes in supply; • Start/stop sequence too fast.	 Make deceleration time longer. Use brake chopper or brake resistor (available as options). Activate overvoltage controller. Check input voltage.
3	Earth fault	Fault	Configurable	Current measurement has detected that the sum of motor phase current is not zero: • Insulation failure in cables or motor.	Check motor cables and motor.
9	Under voltage	Fault	Configurable	DC link voltage is under the voltage limits defined: • Most probable cause: Too low a supply voltage; • AC drive internal fault; • Defect input fuse; • External charge switch not closed. Note: This fault is activated only if the drive is in the Run state.	 In case of temporary supply voltage break reset the fault and restart the AC drive. Check the supply voltage. If it is adequate, an internal failure has occurred. Contact the distributor near you.
10	Input phase superv	No action	Configurable	Input line phase is missing.	Check supply voltage, fuses, and cable.
11	Output phase superv	Fault	Configurable	Current measurement has detected that there is no current in one motor phase.	Check motor cable and motor.
13	Drive under temp	Warning	Configurable	Too low temperature measured in power. Unit's heat sink or board. Heat sink temperature is under -10°C.	
14	Drive over temp	Fault		Too high temperature measured in power. Unit's heat sink or board. Heat sink temperature is over 90°C.	Check the correct amount and flow of cooling air. Check the heat sink for dust. Check the ambient temperature. Make sure that the switching frequency is not too high in relation to ambient temperature and motor load.
15	Motor stalled	No action	Configurable	Motor is stalled.	Check motor and load.

code	Fault name/ description	Fault type	Default configuration	Possible cause	Remedy
16	Motor over load	No action	Configurable	Motor is too hot, based on either the drive's estimate or on temperature feedback.	Decrease motor load. If no motor overload exists, check the temperature model parameters.
17	Motor under load	No action	Configurable	Condition defined by parameter underload protection, underload Fnom torque, underload F0 torque, valid longer than the time defined by underload time limit.	Check load.
18	IP address conflict	Warning	Configurable	IP setting issue.	Check settings for IP address. Verify no duplicates are on the network.
19	Power board EEPROM fault	Fault		Power board EEPROM fault, memory lost in EEPROM.	Cycle power to drive. Try updating software. If issue continues, contact distributor near you.
20	Control board EEPROM fault (MCU EEPROM fault)	Fault		EEPROM data error in EEPROM memory.	Cycle power to drive. Try updating software. If issue continues, contact a distributor near you.
21	S-flash fault	Warning		Serial flash error; serial flash memory failed.	Cycle power to drive. Try updating software. If issue continues, contact a distributor near you.
22	Speed deviation	Fault		Estimated speed is greater than 115% of maximum frequency. Or current loop is oscillating.	Check motor parameters and run identification. Adjust the Observer Kp.
23	STO circuit fault	Fault		STO switch is broken; STO circuit failure.	Check STO switch and STO circuit. If issue continues, contact a distributor near you.
25	MCU watchdog fault	Fault		Watchdog register overflows in MCU.	Cycle power to drive. Try updating software. If issue continues, contact a distributor near you.
26	Start-up prevent	Fault		The time when interlock signal activates is over setting time.	Stop drive and resend start command.
37	Device change	Warning		Power board or option card change.	Alarm will reset.
38	Device added	Warning		Power board or option board added.	Device is ready for use. Old parameter settings will be used.
39	Device removed	Fault		Optional board removed from slot; or power board removed from control board.	Device no longer available in drive.
40	Device unknown	Fault		Unknown device connected (power board/option board).	Check EEPROM connection. Check board connection on slot A/B. Power cycle to drive
41	IGBT over temp	Fault		IGBT temperature is too high.	 Check output loading. Check motor size. Decrease switching frequency.
50	AI < 4 mA (4 to 20 mA)	No action	Configurable	Loss in analog input signal, dropped below 4 mA.	Verify analog input current reference value on either Al1 or Al2, check cabling.
51	External fault	Fault	Configurable	Digital input is activated for external fault input.	Check digital input settings and verify input level, could be an external device causing fault.
52	Keypad comm. Fault	Fault	Configurable	The connection between the control keypad and frequency converter is broken, and the local reference is keypad reference or the local control place is keypad, and the keypad communication fault protection is not "NO action"	Check keypad connection and possible keypad cable.
54	Option card fault	Fault	Configurable	Defective option card or option card slot.	Check right option card and option card slot connections. Check board status on keypad for exact cause of fault. Contact distributor nearest you.
57	Motor ID fault	Fault		The motor parameters identification running was not completed successfully.	Check motor size. Verify the input and output wiring is connected properly.
58	Current measure fault	Fault		Current measurement is out of range.	Restart the drive again. Should the fault re-occur, contact the distributor nearest to you.
66	Safety torque off	Fault	Configurable	STO triggered; STO input is open.	Reset STO trigger and verify wiring. Reset fault after input is enabled.
67	Current limit control	Warning		The output current has reached the current limit value.	Check the load. Set the acceleration time longer.

Application notes

Fault code	Fault name/ description	Fault type	Default configuration	Possible cause	Remedy
68	Over voltage control	Warning		The DC link voltage has reached its voltage limit value.	Check the input voltage. Set the acceleration/deceleration time longer.
70	System fault	Fault		MCU sending wrong parameters to DSP.	Restart the drive again. Should the fault re-occur, contact the distributor nearest to you.
80	Fieldbus fault	Fault	Configurable	BACnet IP fieldbus fault.	Check the fieldbus communication wiring. Verify drive parameters are set correctly. Check BACnet master programming to verify proper addressing.
81	Fieldbus fault	Fault	Configurable	SA bus fieldbus fault.	Check the fieldbus communication wiring on A/B terminal. Verify drive parameters are set correctly. Check SA bus master programming to verify proper addressing.
83	Fieldbus fault	Fault	Configurable	(1) DCl_ubRTUBacNetFaultBehavior parameter's value is 0, loss of communication with modbus RTU, and the fieldbus reference is the remote reference or the fieldbus control place is the remote control place ,and the fault protection is not "NO action"; (2) DCl_ubRTUBacNetFaultBehavior parameter's value is 1,	Check RS485 communication wiring. Verify drive parameters are set correctly. Check master programming to verify proper addressing.
84	Fieldbus fault	Fault	Configurable	loss of communication with modbus RTU. (1) DCI_ubTCPFaultBehavior parameter's value is 0, loss of communication with modbus TCP, and the fieldbus reference is the remote reference or the fieldbus control place is the remote control place, and the fault protection is not "NO action";(2)DCI_ubTCPFaultBehavior parameter's value is 1, loss of communication with modbus TCP.	Check ethernet communication wiring. Verify drive parameter are set correctly. Check master programming to verify proper addressing.
85	Fieldbus fault	Fault	Configurable	Loss of communication with BACnet, and the fieldbus reference is the remote reference OR the fieldbus control place is the remote control place, and the fault protection is not "NO action".	Check RS485 communication wiring. Verify drive parameters are set correctly. Check BACnet master configuration programming to verify proper addressing.
86	Fieldbus fault	Fault	Configurable	Loss of communication with ethernet IP, and the fieldbus reference is the remote reference OR the fieldbus control place is the remote control place, and the fault protection is not "NO action".	Check ethernet communication wiring. Verify drive parameters are set correctly. Check EIP master configuration programming to verify proper addressing.
87	Fieldbus fault	Fault	Configurable	Loss of communication with Profibus/Canopen/Devicenet master on Slot A, and the fieldbus reference is the remote reference OR the fieldbus control place is the remote control place, and the fault protection is not "NO action".	Profibus/Canopen/Devicenet communication wiring. Verify drive parameters are set correctly. Check Profibus/Canopen/Devicenet master configuration programming to verify proper addressing.
90	Drive under temp. (Cold weather drive under temp.)	Warning		 Cold weather mode is not enabled, and unit temperature is less than -10°C. Cold weather mode is enabled and Under Temp Fault Override is not set, unit temperature is less than -30°C. Cold weather mode is enabled and Under Temp Fault Override is not set, unit temperature is -20 ~ -30°C. The temp <-20°C when cold weather start time out. 	If unit temp -20 \sim -10°C, start motor in cold weather mode. If unit temp <-20°C, warm up unit above -20°C for proper operation using cold weather mode. If still < -20°C when cold weather mode time out, try higher output voltage in cold weather mode.
92	External fault (External fault 2)	Fault	Configurable	Digital input is activated for external fault input.	Check digital input settings and verify input level, could be an external device causing fault.
93	External fault (External fault 3)	Fault	Configurable	Digital input is activated for external fault input.	Check digital input settings and verify input level, could be an external device causing fault.
97	Pipe fill loss (Prime loss)	No action	Configurable	 In single drive control mode of MPFC, include FC, interlock enable, and all interlock signals lost. In single drive control mode of MPFC, not include FC, interlock enable, and interlock 1 lost. In multi drive network mode of MPFC, interlock enable, and interlock 1 lost. 	Check digital inputs for interlock.
98	PI feedback AI loss	No action	Configurable	The feedback function has a relationship with feedback 1/2 and the feedback 1/2 source has relationship with AI. The AI signal range is 1 (20-100%/2-10 V/4-20m A). The AI value is out of range (AI mode: 0~20 mA, AI < 4 mA or AI > 20 mA, AI mode: 0~10 V, AI < 2 V or AI > 10 V) of PID1 feedback.	Check the AI of PI1 feedback, the AI value whether is out of range or not, the AI range shall be 2~10 V (AI mode is 0~10 V) or 4~20 mA (AI mode is 0~20 mA).

Fault code	Fault name/ description	Fault type	Default configuration	Possible cause	Remedy
100	Fieldbus fault (Fieldbus SMDT fault)	Fault	Configurable	Smart wire sus fieldbus fault.	Check SmartWire DT card.
101	Option card fault	Fault	Configurable	SMDT board hardware fault.	Check SmartWire DT card.
102	External fault (External fault from SWD)	Fault	Configurable	External fault from SWD.	Check SmartWire DT card.
103	Drive over temperature	Warning		Drive degree greater than (DCI_wDriveOverTempThreshold value - 10 degree) and less than DCI_wDriveOverTempThreshold value,report drive over temperature warning.	Check the drive degree.
111	Profibus firmware incompatible	Warning		Profibus card firmware is not compatible with MCB firmware.	Check the Profibus card firmware revision.
113	CANOpen firmware incompatible	Warning		CANOpen card firmware is not compatible with MCB firmware.	Check the CANOpen firmware revision.
114	SWD firmware incompatible	Warning		SWD card firmware is not compatible with MCB firmware.	Check the SWD card firmware revision.
115	Fieldbus fault	Fault	Configurable	FieldBus EIP idle fault	Check ethernet IP master programming to verify proper addressing and ensure idle communication bit is not set.
117	Pump over cycle	Warning		During a period, the times which the drive sleeps and wakes up exceed a user configurable value.	Check the reason that drive is not stable. Check why the drive sleeps and wakes up frequently.
118	Broken pipe	Warning	Configurable	PID feedback is less than broken pipe level and the drive output frequency is more than broke pipe frequency for delay time.	
125	Freq. limit supv. (Freq. limit)	No action		The output frequency exceeds the range of frequency supervision limit.	Check the output frequency and check the setting of frequency supervision limit.
126	Torque limit supv. (Torque limit)	No action		The motor torque exceeds the range of torque supervision limit.	Check the motor torque and check the setting of torque supervision limit.
127	Ref. limit supv. (Ref. limit)	No action		The frequency reference exceeds the range of freq. reference supervision limit.	Check the frequency reference and check the setting of frequency reference supervision limit.
128	Power limit supv. (Power limit)	No action		The motor power exceeds the range of power supervision limit.	Check the motor power and check the setting of power supervision limit.
129	Temp. limit supv. (Temp. limit)	No action		The unit temperature exceeds the range of temperature supervision limit.	Check the unit temperature and check the setting of temperature supervision limit.
130	Al limit supv. (Al limit)	No action		The Al value exceeds the range of Al supervision limit.	Check the AI value and check the setting of AI supervision limit.
131	Motor current supv. (Motor current limit)	No action		The motor current exceeds the range of current supervision limit	Check the motor current and check the setting of current supervision limit.
132	PI superv.	No action		The PI1 feedback exceeds the range of PI1 supervision limit.	Check the PI1 feedback and check the setting of PI1 supervision limit.
133	Fieldbus fault (Fieldbus web Ul fault)	Fault	Configurable	FieldBus web UI fault.	Check the web connection with RJ45 connector. Verify drive parameters are set correctly. Check the web UI tool to know if there is proper request going to drive or not.

Recommended secure hardening guidelines

Introduction

This section "secure configuration" or "hardening" guidelines provide information to the users to securely deploy and maintain this product to adequately minimize the cybersecurity risks to their system.

Eaton is committed to minimizing the Cybersecurity risk in its products and deploys cybersecurity best practices and latest cybersecurity technologies in its products and solutions; making them more secure, reliable and competitive for our customers. Eaton also offers Cybersecurity Best Practices whitepapers to its customers that can be referenced at www.eaton.com/cybersecurity

PowerXL - secure configuration guidelines

Category	Description			
Asset identification and Inventory	Keeping track of all the devices in the system is a pre-requisite for effective management of Cybersecurity of a system. Ensure you maintain an inventory of all the components in your system in a manner in which you unique identify each component. To facilitate this PowerXL Series VFD supports the following identifying information - manufacturer, type, serial number, f/w version number, and location.			
	Customers/users can read following information from product label			
	Model Number			
	Serial Number			
	Device Name			
	Information specific to communication protocols is available form parameter menu as below			
	IP Address Mode			
	Active IP Address			
	MAC Address			
	See application manual for these parameter locations.			
Restrict Physical access	Industrial Control Protocols don't offer cryptographic protections at protocol level leaving them exposed to Cybersecurity risk. Physical security is an important layer of defense in such cases. PowerXL Series VFD is designed with the consideration that it would be deployed and operated in a physically secure location.			
	 Eaton suggests that physical access to cabinets and/or enclosures containing PowerXL Series VFD and the associated system should be restricted, monitored and logged at all times. 			
	 Physical access to the communication lines should be restricted to prevent any attempts of wiretapping, sabotage. It's a best practice to use metal conduits for the communication lines running between one cabinet to another cabinet. 			
	 Attacker with unauthorized physical access to the device could cause serious disruption of the device functionality. A combination of physical access controls to the location should be used, such as locks, card readers, and/or guards etc. 			
	 PowerXL Series VFD supports the following physical access ports, 			
	 RJ45 connector for removable keypad as well as Modbus RTU communications 			
	 RJ45 for EtherNet IP/Modbus TCP communications 			
	 Terminal block for Modbus RTU and other Digital IOs 			
	Eaton suggests access to above physical ports need to be restricted.			

Category

Description

Restrict logical access to PowerXL series drive

It is extremely important to securely configure the logical access mechanisms provided in PowerXL Series VFD to safeguard the device from unauthorized access. PowerXL Series VFD provides various types of administrative, operational, configuration privilege levels. Eaton recommends that the available access control mechanisms be used properly to ensure that access to the system is restricted to legitimate users only. And, such users are restricted to only the privilege levels necessary to complete their job roles/functions.

Eaton recommends below best practices to be followed to ensure adequate cybersecurity of the setup/system

- Default credentials are changed upon first login. PowerXL Series VFD should not be commissioned for
 production with Default credentials, it's a serious Cybersecurity flaw as the default credentials are published
 in the manuals. Restrict administrative privileges Threat actors are increasingly focused on gaining control
 of legitimate credentials, especially those associated with highly privileged accounts. Limit privileges to
 only those needed for a user's duties. Make sure that the password used in the device is only available to
 authorized users like Configuring Engineers and not shared among all operational users.
- Perform periodic account maintenance to make sure that password is changed whenever there is personnel change.
- Change passwords and other system access credentials as appropriate
- PowerXL Series VFD is provided with data/access protection mechanism on keypad, follow below steps to
 utilize it

PowerXL Series VFD provides four levels of data protection for users to ensure the security:

- Lock parameters on keypad. User can lock the parameters through DI or disable change, in which way all the parameters cannot be edited.
- 2. Lock parameters while motor running. Motor control parameters can only be modified when motor is in stop mode. In which way to enhance the motor security. The parameters are listed in the application manual.
- 3. Through Power Xpert inControl tool, facility to hide parameters on keypad is available. User can hide the parameters he/she thinks are significant for himself/herself. Such as IP address and so on.
- 4. Password on keypad.
 - 0000 means no password, which is the default.
 - Password range is 0001 ~ 9999.
 - With password, user can monitor parameters value but need enter password if he/she wants to edit parameters.
 - User needs to re-enter the password if there is no key operation in 1 min after enter the password.
 - User needs to enter the old password if he/she wants to change to a new one.

Restrict network access

PowerXL Series VFD provides network access to facilitate communication with other devices in the systems and configuration. But this capability could open up a big security hole if it's not configured securely.

Eaton recommends segmentation of networks into logical enclaves and restrict the communication to host-to-host paths. This helps protect sensitive information and critical services and limits damage from network perimeter breaches. At a minimum, a utility Industrial Control Systems network should be segmented into a three-tiered architecture (as recommended by NIST SP800-82[R3]) for better security control.

Deploy adequate network protection devices like Firewalls, Intrusion Detection / Protection devices,

Below are the protocols and their port details available on PowerXL Series VFD. Use below information for configuring the firewalls.

PowerXL Series VFD provides below communication protocols -

- EtherNet IP protocols on RJ45 connector enabled by default on port 44818 and 2222
- Modbus TCP protocol on RJ45 connector enabled by default on port 502
- Modbus RTU on RS485 physical layer enabled by default
- BACnet MS/TP on RS485 physical layer disabled by default, when this is enabled, Modbus RTU is disabled.

All the protocols have dedicated menu structure, and details are described in User's Manual for how to activate or configure them.

 Eaton has published detailed information about various Network level protection strategies in Eaton Cybersecurity Considerations for Electrical Distribution Systems [R1].

Application notes

Category	Description			
Logging and event management	Best practices			
	• PowerXL Series VFD provides parameters change log and fault log functions for user, to help diagnose the drive			
	1. Parameters change log:			
	 PowerXL Series VFD will log the parameter information in FRAM when the parameter changes. The max number of 66 items can be logged. New log will rewrite the old one. User cannot clear this fault information. 			
	2. Fault log:			
	 PowerXL Series VFD will log the drive information in FRAM when fault occurs. The max number of 10 items can be logged. New log will rewrite the old one. User can clear the history fault by pressing OK key more than 5 Sec. 			
	 PowerXL Series VFD will log the fault information in FRAM when fault occurs. The max number of 50 items can be logged. New log will rewrite the old one. User cannot clear this fault information. 			
Secure maintenance	Best practices			
	Apply firmware updates and patches regularly			
	Due to rapidly increasing Cyber Threats in Industrial Control Systems, Eaton implements a comprehensive patch and update process for its products. Users are encouraged to maintain a consistent process to promptly monitor for fresh firmware updates and apply the update whenever required.			
	 The latest firmware can be acquired from the www.eaton.com/drives website. There will be separate link for PowerXL Series VFD FR0 to FR6 and PowerXL Series VFD FR7 & FR8 			
	 Users can also sign up on our website to get emails when new material is released to the site if desired. 			
	 Using the PC Tool or verifying on the keypad the current version of firmware can be verified. 			
	 For additional information or technical support on Eaton's Variable frequency drive products contact us at TRCDrives@eaton.com or by phone at 800-386-2273 for US customers. For European customers contact us at AfterSalesEGBonn@eaton.com or by phone at +49 (0) 228602-3640 			
	Eaton also has a robust vulnerability response process. In the event of any security vulnerability getting discovered in its products, Eaton patches the vulnerability and releases information bulletin through its cybersecurity website - http://www.eaton.com/cybersecurity and patches through www.eaton.com/drives.			

References

[R1] Cybersecurity Considerations for Electrical Distribution Systems (WP152002EN):

 $http://www.eaton.com/ecm/groups/public/@pub/@eaton/@corp/documents/content/pct_1603172.pdf$

[R2] Cybersecurity Best Practices Checklist Reminder (WP910003EN):

 $http://www.cooperindustries.com/content/dam/public/powersystems/resources/library/1100_EAS/WP910003EN.pdf$

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