

ACH550

Installation, Operation and Maintenance Manual (I, O & M)

ACH550-UH HVAC Drives (1...550 HP)

ACH550-BCR/BDR/VCR/VDR E-Clipse Bypass Drives (1...400 HP)

ACH550-PCR/PDR Packaged Drives with Disconnect (1...550 HP)



Safety

Use of warnings and notes

There are two types of safety instructions throughout this manual:

- Notes draw attention to a particular condition or fact, or give information on a subject.
- Warnings caution you about conditions which can result in serious injury or death and/or damage to the equipment. They also tell you how to avoid the danger. The warning symbols are used as follows:



Electricity warning warns of hazards from electricity which can cause physical injury and/or damage to the equipment.

- **WARNING!** The ACH550 adjustable speed AC drive should ONLY be installed by a qualified electrician.
- **WARNING!** Even when the motor is stopped, dangerous voltage is present at the power circuit terminals U1, V1, W1 (L1, L2, L3) and U2, V2, W2 (T1, T2 T3) and, depending on the frame size, UDC+ and UDC-, or BRK+ and BRK-.
- **WARNING!** Dangerous voltage is present when input power is connected. After disconnecting the supply, wait at least 5 minutes (to let the intermediate circuit capacitors discharge) before removing the cover.
- **WARNING!** Even when power is switched off from the input terminals of the ACH550, there may be dangerous voltage (from external sources) on the terminals of the relay outputs.
- **WARNING!** When the control terminals of two or more drives are connected in parallel, the auxiliary voltage for these control connections must be taken from a single source which can either be one of the drives or an external supply.
- **WARNING!** Disconnect the internal EMC filter when installing the drive on an IT system (an ungrounded power system or a

high-resistance-grounded [over 30 ohm] power system).

- **WARNING!** Do not attempt to install or remove EM1, EM3, F1 or F2 screws while power is applied to the drive's input terminals.



General warning warns about conditions, other than those caused by electricity, which can result in physical injury and/or damage to the equipment.

- **WARNING!** Do not control the motor with the disconnecting device (disconnecting means); instead, use the control panel keys or commands via the I/O board of the drive. The maximum allowed number of charging cycles of the DC capacitors (i.e. power-ups by applying power) is five in ten minutes.
- **WARNING!** Never attempt to repair a malfunctioning ACH550; contact the factory or your local Authorized Service Center for repair or replacement.
- **WARNING!** The ACH550 will start up automatically after an input voltage interruption if the external run command is on.
- **WARNING!** The heat sink may reach a high temperature.

Note: For more technical information, contact the factory or your local ABB representative.



Contents


This manual is the Operation and Maintenance Manual for the ACH550 Drives. Complete technical details and programming information are available in the *ACH550 User's Manual*, publication number 3AUA0000081823.

1. To determine the type of your drive, refer to its construction code on either:

- Serial number label attached on upper part of the chokeplate between the mounting holes.
- Type code label attached on the heat sink – on the side of the enclosure.



Input	3 PH 48...63 Hz	1 PH 4...63 Hz	ABB Inc. Made in USA of foreign parts
Voltage (U1)	200...240 Vac	200...240 Vac	
Current (I1n)	59.4 A	59.4 A	
		kAIC	
Output	3 PH 0...500 Hz	3 PH 0...500 Hz	Mfg. Date: 01-December-2005 Org. Firmware: V.2.06B
Voltage (U2)	0...U1 Vac	0...U1 Vac	
Current (I2n)	59.4 A	28 A	 S/N 2030700001
Power (Pn)	20 HP	10 HP	


ACH550(UH)059A-2

Construction code

ACH550 E-Clipse Bypass

Installation – drive

Follow the [Installation](#) instructions for the drive on page 3. **Failure to observe the warnings and instructions may cause a malfunction or personal hazard.**



WARNING! Before you begin read [Safety](#) on page 2.

Installation – bypass



WARNING! When the ACH550 with E-Clipse Bypass is connected to the line power, the Motor Terminals T1, T2, and T3 are live even if the motor is not running. Do not make any connections when the ACH550 with E-Clipse Bypass is connected to the line. Disconnect and lock out power to the drive before servicing the drive. Failure to disconnect power may cause serious injury or death.

1. Install wiring – bypass



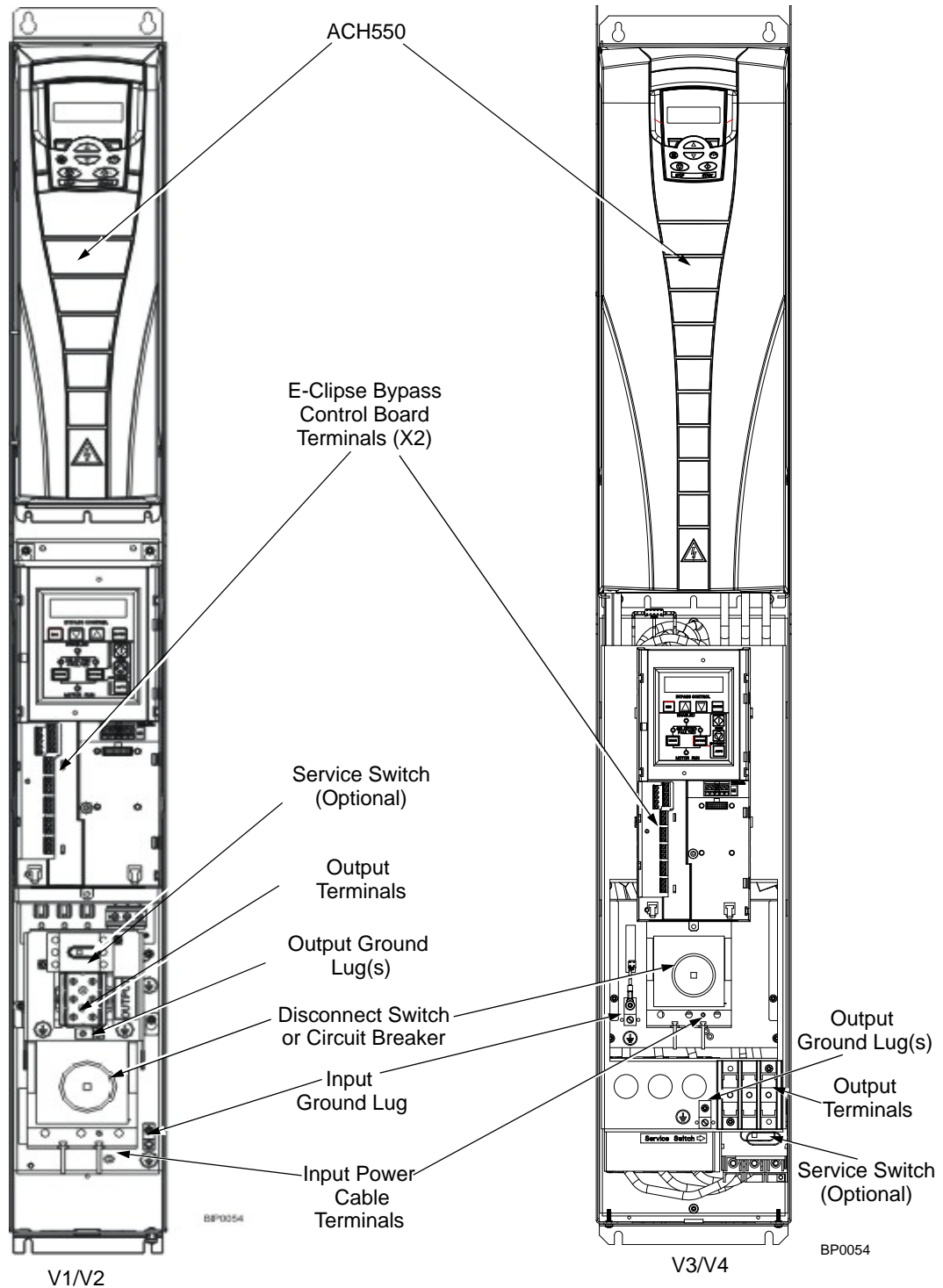
WARNING!

- Do not connect or disconnect input or output power wiring, or control wires, when power is applied.
 - Never connect line voltage to drive output Terminals T1, T2, and T3.
 - Do not make any voltage tolerance tests (Hi Pot or Megger) on any part of the unit. Disconnect motor wires before taking any measurements in the motor or motor wires.
 - Make sure that power factor correction capacitors are not connected between the drive and the motor.
-

Enclosure Designation	Horsepower Range by Voltage Rating		
	208/240V	480V	600V
V1/V2	1 to 7.5 HP	1 to 15 HP	2 to 15 HP
V3/V4	10 to 25 HP	20 to 60 HP	20 to 60 HP
B1	1 to 7.5 HP	1 to 15 HP	2 to 15 HP
B2	10 to 25 HP	20 to 60 HP	20 to 60 HP
B3	30 to 100 HP	75 to 200 HP	75 to 150 HP
B4	N/A	250 to 550 HP	N/A

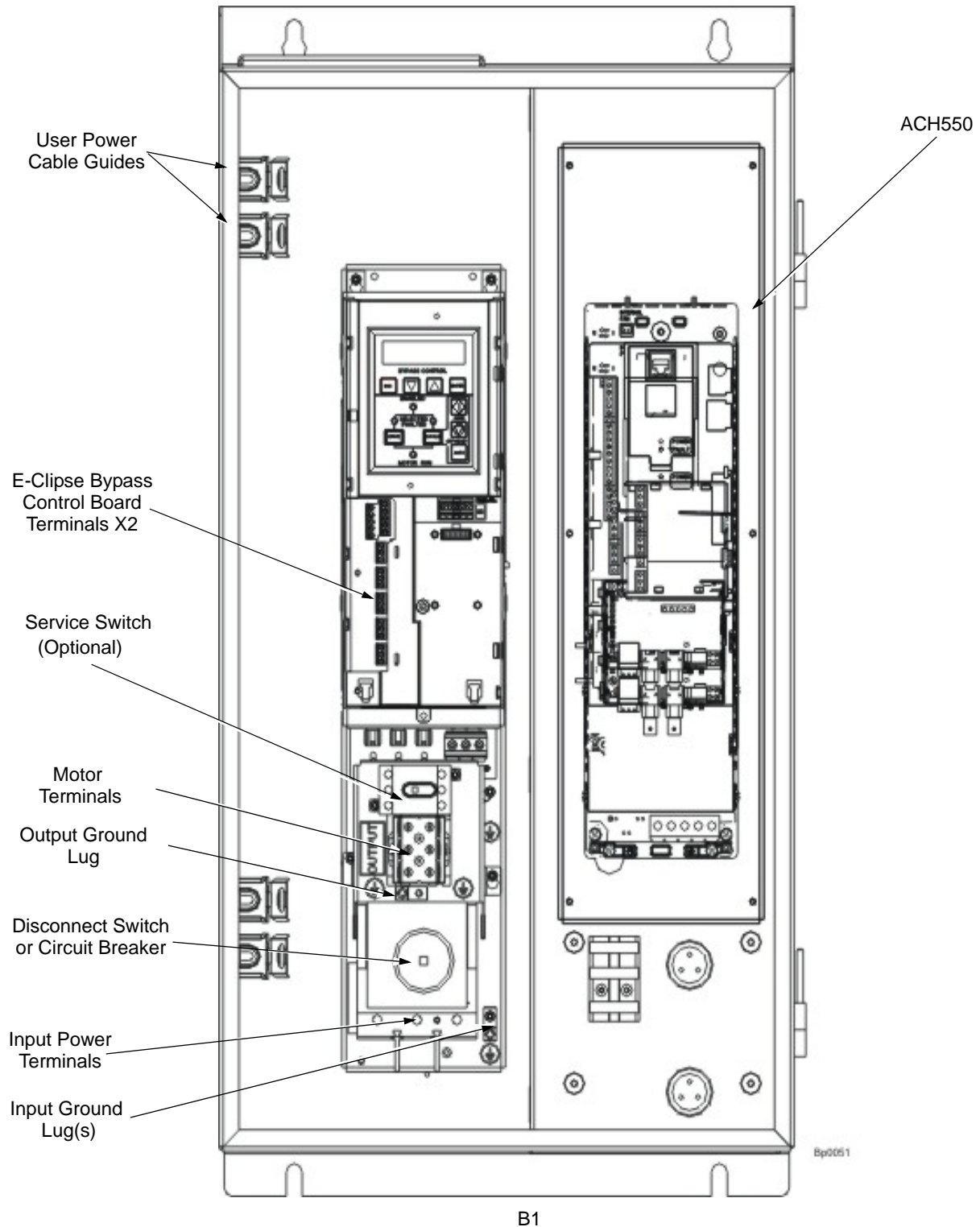
Connection diagrams – Vertical E-Clipse Bypass

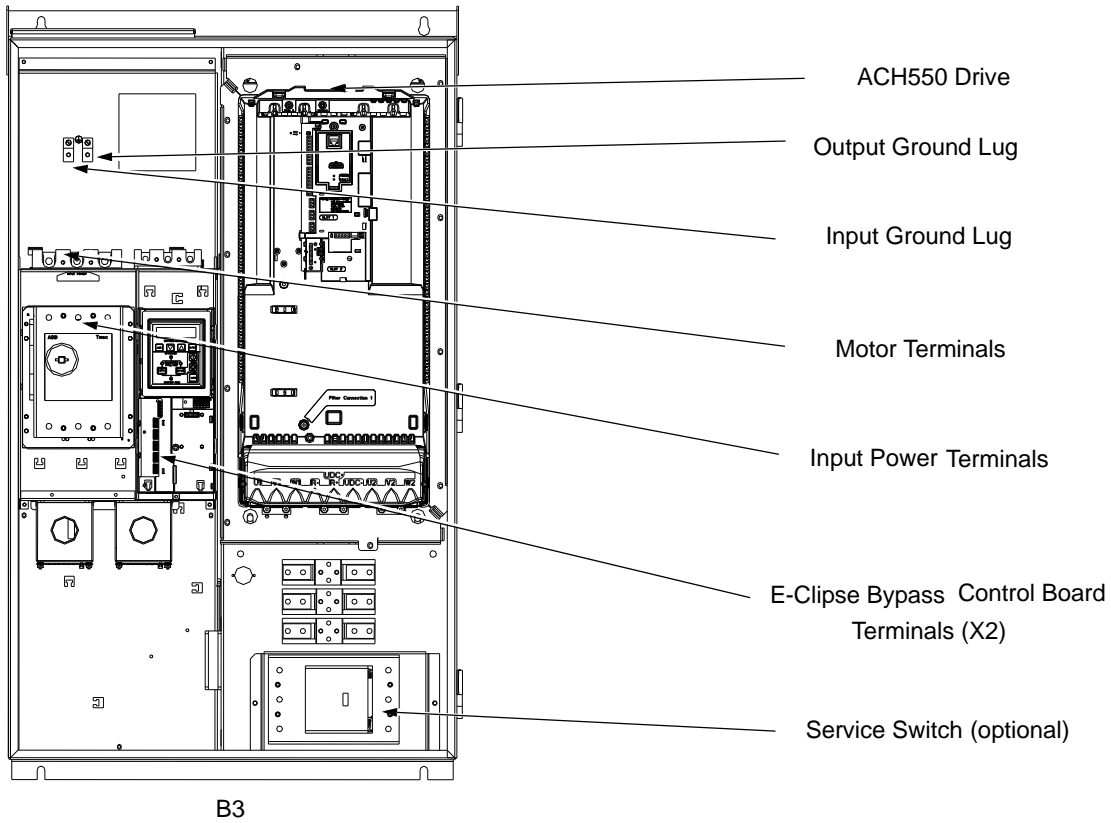
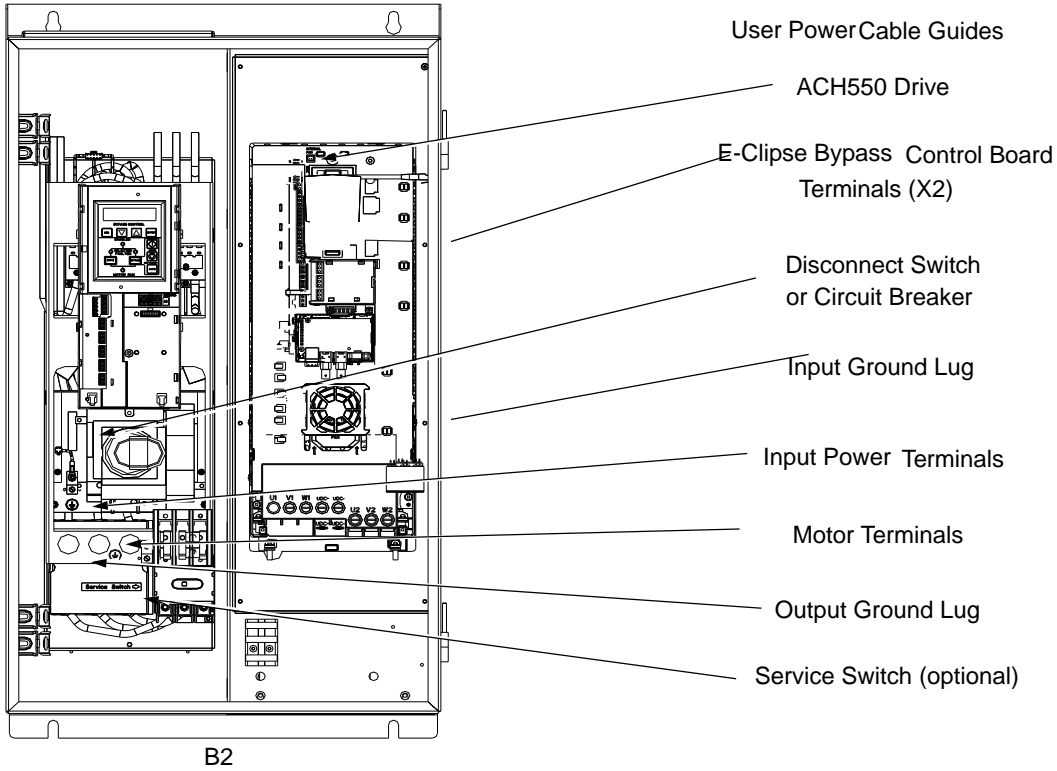
ACH550 Vertical E-Clipse Bypass units are configured for wiring access from the bottom only. The following figure shows the Vertical E-Clipse Bypass wiring connection points.



Connection diagrams – Standard E-Clipse Bypass (wall mounted)

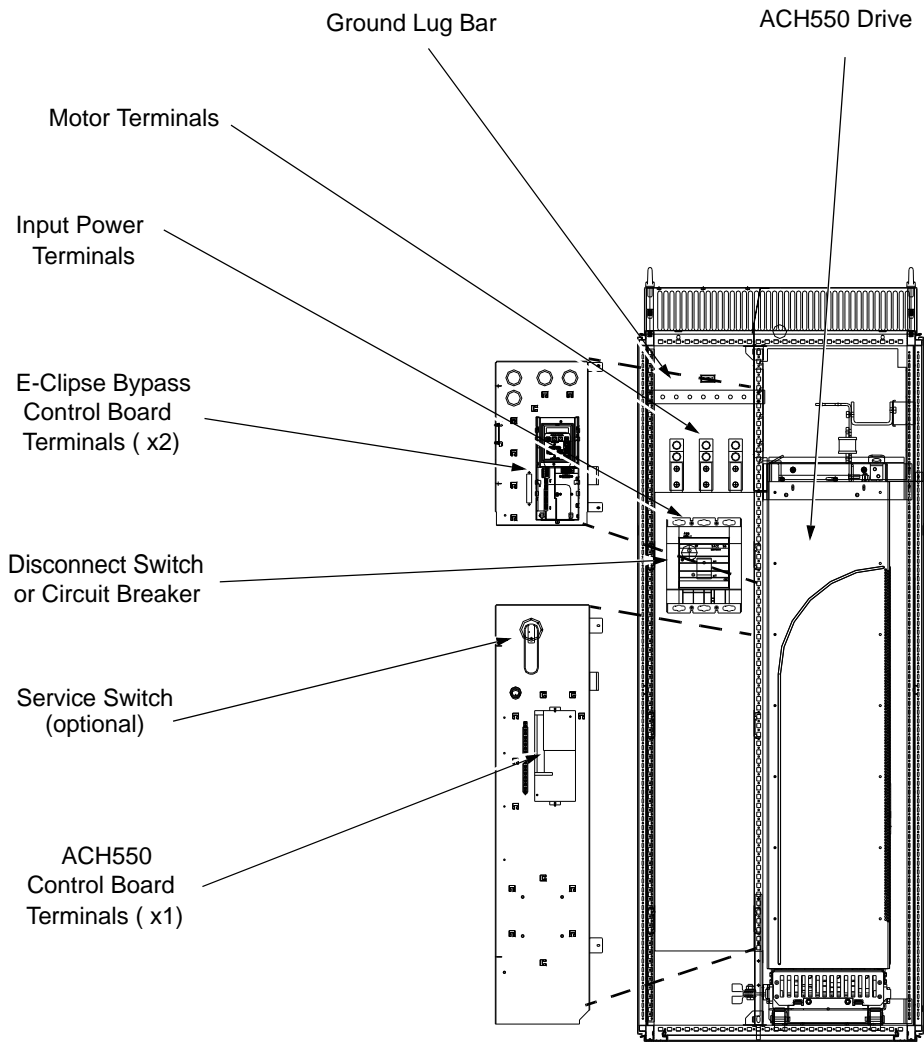
ACH550 Standard E-Clipse Bypass units are configured for wiring access from the top. The following figure shows the Standard E-Clipse Bypass (wall mounted) wiring connection points.





Connection diagrams – Standard E-Clipse Bypass (R8, floor mounted)

ACH550 Standard E-Clipse Bypass units are configured for wiring access from the top. The following figure shows the Standard E-Clipse Bypass (floor mounted) wiring connection points.



B4

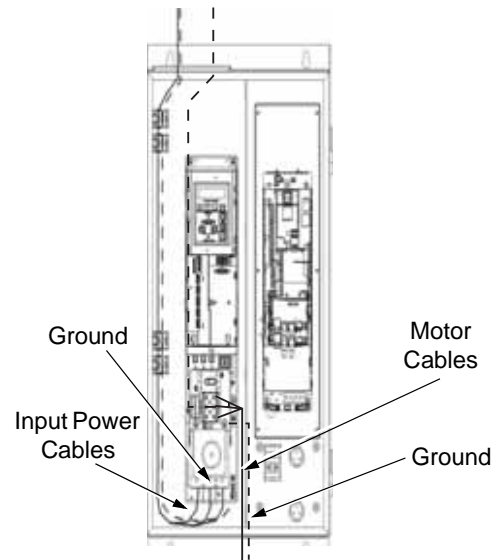
Power connections – Vertical E-Clipse Bypass configurations

Line input connections

Connect the input power to the terminals at the bottom of the disconnect switch or circuit breaker as shown below. Also see [Connection diagrams – Vertical E-Clipse Bypass](#) on page 40. Connect the equipment grounding conductor to the ground lug near the input power connection point.

Motor connections

Connect the motor cables to the terminals at the bottom of the bypass section as shown in the figure. Also see [Connection diagrams – Vertical E-Clipse Bypass](#) on page 43. Connect the motor grounding conductor to the ground lug near the motor cable terminal block connection point.



Power connections – Standard E-Clipse Bypass configurations (wall mounted)

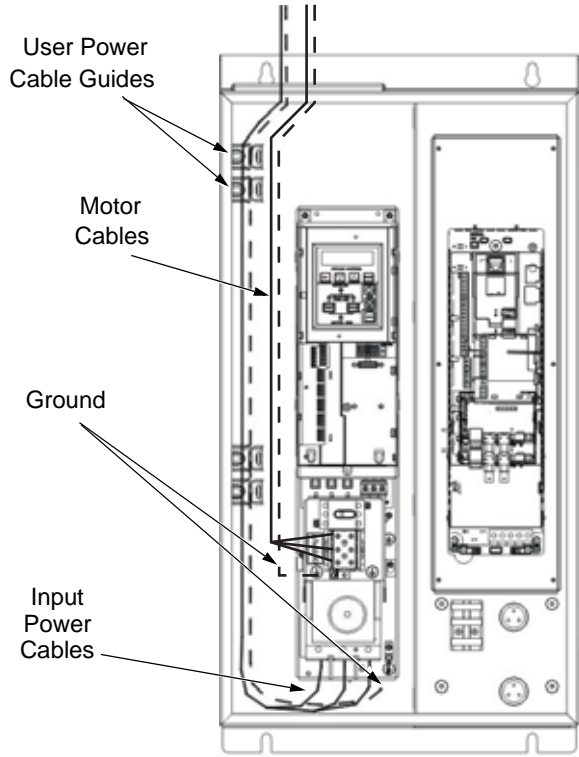
Line input connections

Connect input power to the terminals of the disconnect switch or circuit breaker. Connect the equipment grounding conductor to the ground lug at the top of the enclosure. The figure below shows the connection points for Standard E-Clipse Bypass configurations. Also see [Connection diagrams – Standard E-Clipse Bypass \(wall mounted\)](#) on page 41 and [Connection diagrams – Standard E-Clipse Bypass \(R8, floor mounted\)](#) on page 43.

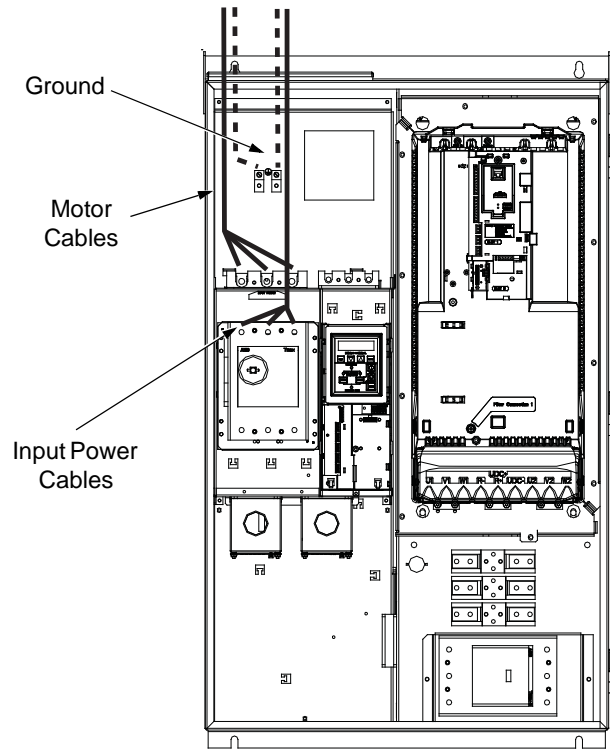
Motor connections

Connect the motor cables to the output terminal block as shown in the figure below. Also see [Connection diagrams – Standard E-Clipse Bypass \(wall mounted\)](#) on page 41 and [Connection diagrams – Standard E-Clipse Bypass \(R8, floor mounted\)](#) on page 43. The motor grounding conductor can be connected to the ground lug near the terminal block.

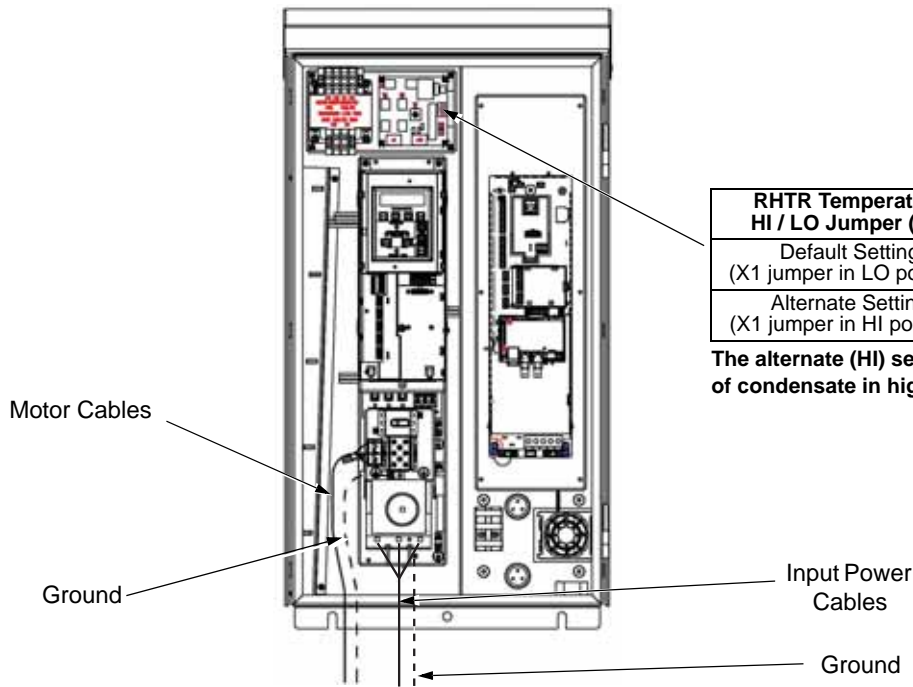
Note: Route cables through the cable guides on the left side of the enclosure. Use separate conduits for input power and motor cables. Follow the guides to separate the cables from each other.



Standard Configuration (B1/B2)



Standard Configuration (B3)



UL Type 3R Configuration (B1/B2)

RHTR Temperature HI / LO Jumper (X1)	Heater ON Temperature	Heater OFF Temperature
Default Setting (X1 jumper in LO position)	14.4 °C 58 °F	21.4 °C 70.5 °F
Alternate Setting (X1 jumper in HI position)	17.8 °C 64 °F	24.7 °C 76.5 °C

The alternate (HI) setting further reduces the likelihood of condensate in high humidity environments.

Note: UL Type 3R, B1/B2 enclosures are designed to be mounted on a wall. Mounting these 3R enclosures on an open rack system requires the use of the supplied 3R enclosure back plates to maintain 3R integrity.



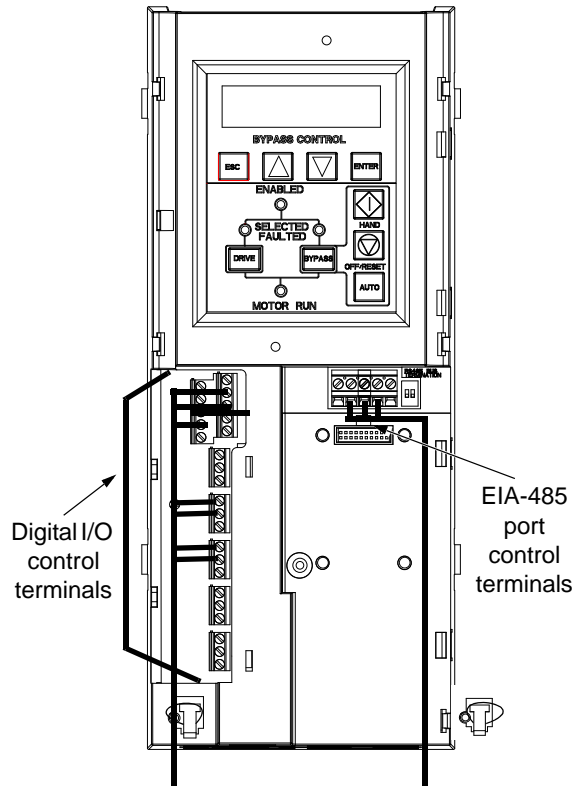
WARNING! Check the motor and motor wiring insulation before connecting the ACH550 to line power. Follow the procedure on page 12. Before proceeding with the insulation resistance measurements, check that the ACH550 is disconnected from incoming line power. Failure to disconnect line power could result in death or serious injury.

Install the control wiring

Connect control wiring to terminal block X1 on the ACH550 control board and to terminal block X2 on the E-Clipse Bypass control board. For more information on these connections, refer to the following:

- X1 terminal block location and terminal data are defined in the *ACH550-UH User's Manual*.
- X2 terminal block location is illustrated in the figures starting with [Connection diagrams – Vertical E-Clipse Bypass](#) on page 40.
- X2 terminal data are provided in [Basic control connections for E-Clipse HVAC Default](#) on page 53.
- Basic connections are described in the following paragraphs. Alternate configurations using the E-Clipse Bypass macro are described in the *ACH550 User's Manual*.
- On Terminal Block X1 inside the ACH550, analog inputs and outputs and additional digital input and relay output connections (AI1, AI2, AO1, AO2, DI1...DI6 and RO1...RO6) are available for use.

Note: The E-Clipse Bypass control circuitry uses serial communications connections (X1:28...X1:32) inside the ACH550. These connections are not available for any other purpose and must not be reconfigured.



Basic connections

The figure on page 53 shows the basic control connections for use with the E-Clipse Bypass HVAC Default macro. These connections are described in the following paragraphs.

In typical installations, only analog input wires connect to the ACH550 terminal block, with other control connections made on the E-Clipse Bypass control board.

Use wire ties to permanently affix control/communications wiring to the hooked wire race tie points provided, maintaining a minimum 6 mm (1/4") spacing from power wiring.

Drive's power connection terminals

The following tables list power and motor cable terminal sizes for connections to an input circuit breaker or disconnect switch, a motor terminal block and ground lugs. The tables also list torque that should be applied when tightening the terminals.

Vertical enclosure terminals

HP	Identification	Frame Size	Maximum Wire Size Capacities of Power Terminals			
			Circuit Breaker	Disconnect Switch	Motor Termination	Ground Lugs
208...240 Volt						
1	ACH550-VxR-04A6-2	R1	#10 35 in-lbs	#10 7 in-lbs	#6 30 in-lbs	#4 35 in-lbs
1.5	ACH550-VxR-06A6-2	R1				
2	ACH550-VxR-07A5-2	R1				
3	ACH550-VxR-012A-2	R1				
5	ACH550-VxR-017A-2	R1				
7.5	ACH550-VxR-024A-2	R2	#8 40 in-lbs	#8 7 in-lbs	#2 50 in-lbs	#2 50 in-lbs
10	ACH550-VxR-031A-2	R2	#2 50 in-lbs			
15	ACH550-VxR-046A-2	R3		#4 18 in-lbs	#2/0 120 in-lbs	
20	ACH550-VxR-059A-2	R3				
25	ACH550-VxR-075A-2	R4	#1 50 in-lbs	#1 55 in-lbs		
380...480 Volt						
1/1.5	ACH550-VxR-03A3-4	R1	#10 35 in-lbs	#10 7 in-lbs	#6 30 in-lbs	#4 35 in-lbs
2	ACH550-VxR-04A1-4	R1				
3	ACH550-VxR-06A9-4	R1				
5	ACH550-VxR-08A8-4	R1				
7.5	ACH550-VxR-012A-4	R1				
10	ACH550-VxR-015A-4	R2	#8 40 in-lbs	#8 7 in-lbs	#2 50 in-lbs	#2 50 in-lbs
15	ACH550-VxR-023A-4	R2	#3 50 in-lbs			
20	ACH550-VxR-031A-4	R3		#4 18 in-lbs	#2/0 120 in-lbs	
25	ACH550-VxR-038A-4	R3				
30	ACH550-VxR-045A-4	R3	#1 50 in-lbs	#1 55 in-lbs	#2/0 120 in-lbs	
40	ACH550-VxR-059A-4	R4				
50	ACH550-VxR-072A-4	R4				
60	ACH550-VxR-078A-4	R4	#1 70 in-lbs			

HP	Identification	Frame Size	Maximum Wire Size Capacities of Power Terminals			
			Circuit Breaker	Disconnect Switch	Motor Termination	Ground Lugs
500...600 Volt						
2	ACH550-VxR-02A7-6	R2	#8 62 in-lbs	#4 18 in-lbs	#6 30 in-lbs	#4 35 in-lbs
3	ACH550-VxR-03A9-6	R2				
5	ACH550-VxR-06A1-6	R2				
7.5	ACH550-VxR-09A0-6	R2				
10	ACH550-VxR-011A-6	R2				
15	ACH550-VxR-017A-6	R2	#4 62 in-lbs	#1 55 in-lbs	#2 50 in-lbs	#2 50 in-lbs
20	ACH550-VxR-022A-6	R3				
25	ACH550-VxR-027A-6	R3	#1 62 in-lbs	#2/0 120 in-lbs		
30	ACH550-VxR-032A-6	R4				
40	ACH550-VxR-041A-6	R4				
50	ACH550-VxR-052A-6	R4				
60	ACH550-VxR-062A-6	R4	#1 70 in-lbs			

Standard enclosure terminals

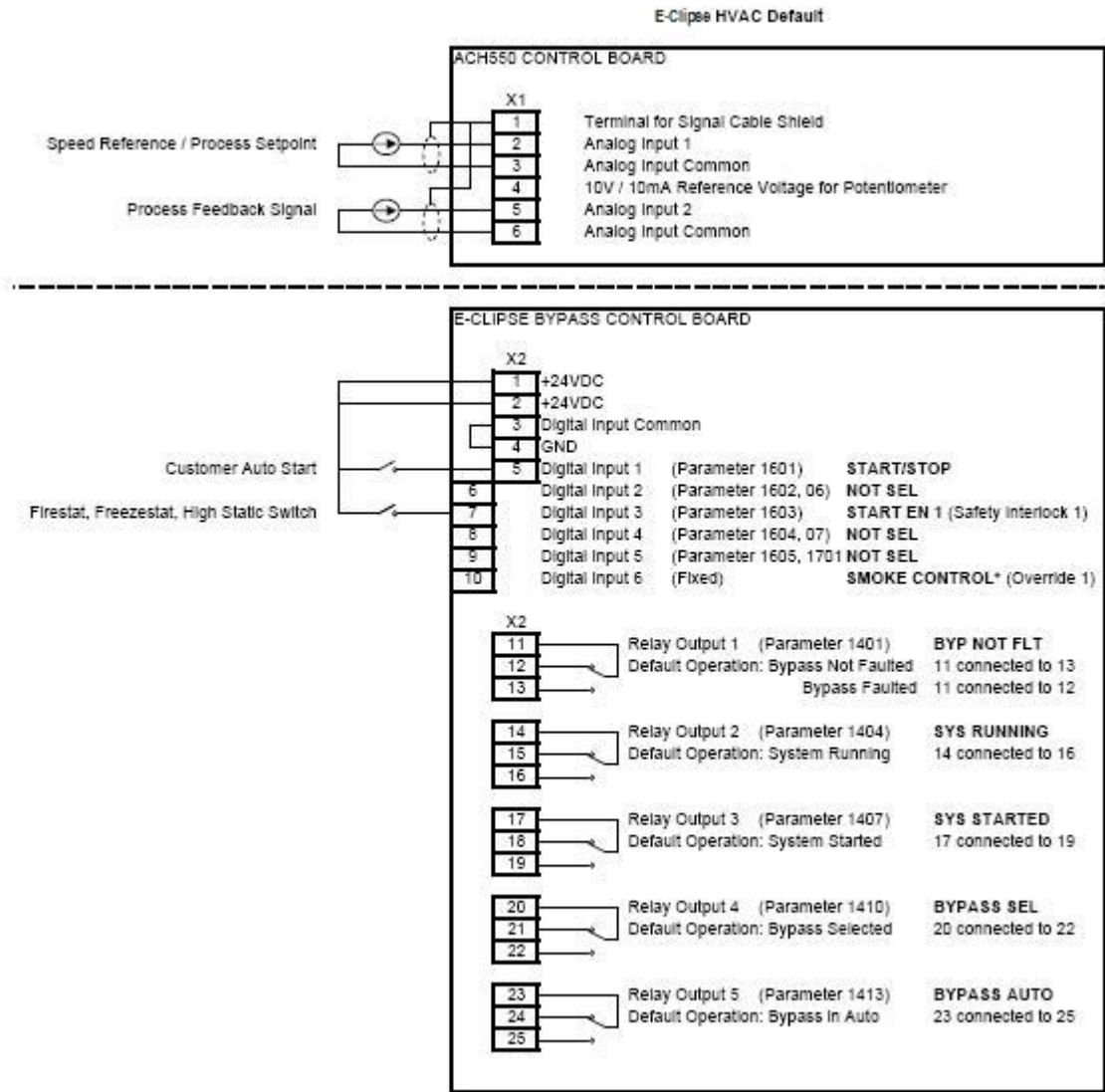
HP	Type Code ¹	Base Drive Frame Size	Power Wiring Data ²							
			Circuit Breaker UL Type/ NEMA 1 & 12	Circuit Breaker UL Type/ NEMA 3R	Disconnect Switch UL Type/ NEMA 1 & 12	Disconnect Switch UL Type/ NEMA 3R	Motor Terminals UL Type/ NEMA 1 & 2	Motor Terminals UL Type/ NEMA 3R	Ground Lugs UL Type/ NEMA 1 & 2	Ground Lugs UL Type/ NEMA 3R
208...240 Volt										
1	ACH550-BxR-04A6-2	R1	#8 40 in-lbs	#8 40 in-lbs	#8 7 in-lbs	#8 7 in-lbs	#6 30 in-lbs	#6 30 in-lbs	#4 35 in-lbs	#4 35 in-lbs
1.5	ACH550-BxR-06A6-2	R1								
2	ACH550-BxR-07A5-2	R1								
3	ACH550-BxR-012A-2	R1								
5	ACH550-BxR-017A-2	R1								
7.5	ACH550-BxR-024A-2	R2	#1 50 in-lbs	#1 50 in-lbs	#4 18 in-lbs	#4 18 in-lbs	#3 50 in-lbs	#3 50 in-lbs	#2 50 in-lbs	#2 50 in-lbs
10	ACH550-BxR-031A-2	R2								
15	ACH550-BxR-046A-2	R3								
20	ACH550-BxR-059A-2	R3								
25	ACH550-BxR-075A-2	R4								
30	ACH550-BxR-088A-2	R4	350 MCM 274 in-lbs	350 MCM 274 in-lbs	#1/0 70 in-lbs	#1/0 70 in-lbs	#1 53 in-lbs	#1 53 in-lbs	2 x #3/0 250 in-lbs	#2/0 375 in-lbs
40	ACH550-BxR-114A-2	R4								
50	ACH550-BxR-143A-2	R6								
60	ACH550-BxR-178A-2	R6								
75	ACH550-BxR-221A-2	R6								
100	ACH550-BxR-248A-2	R6	2 x 500 MCM 274 in-lbs	2 x 500 MCM 274 in-lbs	2 x 500 MCM 274 in-lbs	2 x 500 MCM 274 in-lbs	2 x 500 MCM 375 in-lbs	2 x 500 MCM 375 in-lbs	350 MCM 100 in-lbs	

HP	Type Code ¹	Base Drive Frame Size	Power Wiring Data ²							
			Circuit Breaker UL Type/ NEMA 1 & 12	Circuit Breaker UL Type/ NEMA 3R	Disconnect Switch UL Type/ NEMA 1 & 12	Disconnect Switch UL Type/ NEMA 3R	Motor Terminals UL Type/ NEMA 1 & 2	Motor Terminals UL Type/ NEMA 3R	Ground Lugs UL Type/ NEMA 1 & 2	Ground Lugs UL Type/ NEMA 3R
480 Volt										
1/1.5	ACH550-BxR-03A3-4	R1	#8 40 in-lbs	#8 40 in-lbs	#8 7 in-lbs	#8 7 in-lbs	#6 30 in-lbs	#6 30 in-lbs	#4 35 in-lbs	#4 35 in-lbs
2	ACH550-BxR-04A1-4	R1								
3	ACH550-BxR-06A9-4	R1								
5	ACH550-BxR-08A8-4	R1								
7.5	ACH550-BxR-012A-4	R1								
10	ACH550-BxR-015A-4	R2								
15	ACH550-BxR-023A-4	R2								
20	ACH550-BxR-031A-4	R3	#1 50 in-lbs	#1 50 in-lbs	#4 18 in-lbs	#4 18 in-lbs	#2 50 in-lbs	#2 50 in-lbs	#2 50 in-lbs	#2 50 in-lbs
25	ACH550-BxR-038A-4	R3								
30	ACH550-BxR-045A-4	R3								
40	ACH550-BxR-059A-4	R4			#1 55 in-lbs	#1 55 in-lbs	#2/0 120 in-lbs	#2/0 120 in-lbs		
50	ACH550-BxR-072A-4	R4								
60	ACH550-BxR-078A-4	R4			#1 70 in-lbs	#1 70 in-lbs	#1 53 in-lbs	#1 53 in-lbs		
75	ACH550-BxR-097A-4	R4								
100	ACH550-BxR-125A-4	R5	350 MCM 274 in-lbs	350 MCM 274 in-lbs	300 MCM 275 in-lbs	300 MCM 275 in-lbs	250 MCM 300 in-lbs	250 MCM 300 in-lbs	2 x #3/0 250 in-lbs	#2/0 375 in-lbs
125	ACH550-BxR-157A-4	R6								
150	ACH550-BxR-180A-4	R6								
200	ACH550-BxR-246A-4	R6	2 x 500 MCM 274 in-lbs	2 x 500 MCM 274 in-lbs	2 x 500 MCM 274 in-lbs	2 x 500 MCM 274 in-lbs	2 x 500 MCM 375 in-lbs	2 x 500 MCM 375 in-lbs	5 Bus bar holes (13/32" bolts)	350 MCM 100 in-lbs
250	ACH550-BxR-316A-4	R8		2 x 500 MCM 274 in-lbs						
300	ACH550-BxR-368A-4	R8								
350	ACH550-BxR-414A-4	R8								
400	ACH550-BxR-486A-4	R8								

HP	Type Code ¹	Base Drive Frame Size	Power Wiring Data ²								
			Circuit Breaker UL Type/ NEMA 1 & 12	Circuit Breaker UL Type/ NEMA 3R	Disconnect Switch UL Type/ NEMA 1 & 12	Disconnect Switch UL Type/ NEMA 3R	Motor Terminals UL Type/ NEMA 1 & 2	Motor Terminals UL Type/ NEMA 3R	Ground Lugs UL Type/ NEMA 1 & 2	Ground Lugs UL Type/ NEMA 3R	
600 Volt											
2	ACH550-BxR-02A7-6	R2	#8 62 in-lbs	#8 62 in-lbs	#4 18 in-lbs	#4 18 in-lbs	#6 30 in-lbs	#6 30 in-lbs	#4 35 in-lbs	#4 35 in-lbs	
3	ACH550-BxR-03A9-6	R2									
5	ACH550-BxR-06A1-6	R2									
7.5	ACH550-BxR-09A0-6	R2									
10	ACH550-BxR-011A-6	R2									
15	ACH550-BxR-017A-6	R2									
20	ACH550-BxR-022A-6	R3	#1 62 in-lbs	#1 62 in-lbs	#1 55 in-lbs	#1 55 in-lbs	#2 50 in-lbs	#2 50 in-lbs	#2 50 in-lbs	#2 50 in-lbs	
25	ACH550-BxR-027A-6	R3									
30	ACH550-BxR-032A-6	R4									
40	ACH550-BxR-041A-6	R4			#2/0 120 in-lbs	#2/0 120 in-lbs					
50	ACH550-BxR-052A-6	R4									
60	ACH550-BxR-062A-6	R4									
75	ACH550-BxR-077A-6	R6	300 MCM 274 in-lbs	300 MCM 274 in-lbs	#1/0 70 in-lbs	#1/0 70 in-lbs	#1 53 in-lbs	#1 53 in-lbs	3 x #3/0 250 in-lbs	#2/0 375 in-lbs	
100	ACH550-BxR-099A-6	R6									
125	ACH550-BxR-125A-6	R6			300 MCM 275 in-lbs	300 MCM 275 in-lbs	#1 250 MCM 300 in-lbs	#1 250 MCM 300 in-lbs			
150	ACH550-Bx-R144A-6	R6									

1. "BxR" represents both BCR and BDR.
2. Torque values shown relate to current production. Check component labels on previously installed units for required tightening torque.

Basic control connections for E-Clipse HVAC Default



Parameters Changed Relative to E-Clipse HVAC Default

Parameter Number	Description	Setting

* Smoke Control (Override1) is a fixed input. Closing Digital Input 6 will place the E-Clipse Bypass in Smoke Control mode which may reassign the function of the other Digital Inputs. Refer to the Smoke Control (Override1) documentation.

2. Check installation – bypass

Control panel settings and checks

Apply power to the E-Clipse Bypass unit. The ACH550 Control Panel should show the operating status of the drive. If the E-Clipse Bypass Control Panel displays a PHASE SEQ (Phase Sequence) fault, remove power, wait at least 5 minutes and then swap any two input phase wires. If the motor is a standard 208 V, 60 Hz motor connected to a 208 V drive or a 460 V, 60 Hz motor connected to a 480 V drive, the default parameter settings should be suitable for the initial tests described below. If the motor's rating is not 208 V or 460 V, 60 Hz, the MOTOR NOM VOLT and MOTOR NOM FREQ parameters will need to be properly set before proceeding. Refer to the *ACH550-UH User's Manual* and set the parameters as required.

Note: The settings for ALL external serial communication between the ACH550 with E-Clipse Bypass and any Building Automation System are configured using the E-Clipse Bypass operator panel. DO NOT attempt to configure the external serial communication connection using the ACH550 operator panel!

The settings for internal communication between the ACH550 and the E-Clipse Bypass are configured at the factory and require no adjustment.

Drive Link recovery procedure

If the ACH550 Drive communication settings are unintentionally changed during setup a "Drive Link Fault", "Drive Link Error" or "Drive Setup" alarm may be displayed. Should this occur, accomplish the following steps in order.

Using the ACH550 Drive Keypad

1. Set Parameter 9802 to "STD MODBUS"
2. Set Parameter 9902 to "E-CLIPSE"
3. Cycle Power

Following the above steps, in order, should restore proper communications between the ACH550 Drive and the E-Clipse Bypass. Should the E-Clipse Keypad continue to display a "Drive Link Fault", "Drive Link Error" or "Drive Setup" alarm, check the following parameter settings to ensure they have been recovered. If necessary, individually set the correct parameter settings as indicated below and cycle power.

The only ACH550 Drive macro that provides the proper configuration settings by default is the E-Clipse Bypass macro. If any other ACH550 Drive macro is used, that macro should be selected after completing the initial tests. When using any other macro the following ACH550 Drive parameter values must be set and power cycled or the E-Clipse Bypass will not function properly:

- Parameter 9802 must be set to "STD MODBUS"
- Parameter 1001 must be set to "Comm"
- Parameter 1002 must be set to "Comm"
- Parameter 1601 must be set to "Comm"

- Parameter 1608 must be set to “Comm”
- Parameter 5303 must be set to “76.8 kb/s”
- Parameter 5304 must be set to “8 EVEN 1”
- Parameter 5305 must be set to “DCU PROFILE”
- Parameter 5310 must be set to “103”
- Parameter 5311 must be set to “104”
- Power must be cycled

Refer to the *ACH550-UH User’s Manual* for additional information.

Note: Run motor from drive before attempting bypass operation.

System check: motor connected to ACH550 with E-Clipse Bypass

After performing the control panel checks and setting the ACH550 Drive Start-up Data parameters, check the operation of the ACH550 Drive with E-Clipse Bypass with the motor connected as follows:

1. Disconnect and lock out power to the E-Clipse Bypass unit, wait at least five minutes before disconnecting power.
2. Connect the motor to the output terminals.



CAUTION: If the Advanced Override (Override 2) input contact is closed, the motor will start across the line as soon as power is applied.

If the Safety Interlock and Run Enable input contacts are closed and the Smoke Control (Override 1) input contact is closed, the motor will start across the line as soon as power is applied.

If the Start/Stop, Safety Interlock and Run Enable input contacts are closed and the system is in the Bypass mode and in either Hand or Auto, the motor will start across the line as soon as power is applied.

If the Start/Stop, Safety Interlock and Run Enable input contacts are closed and the system is in the Drive mode with the drive in either Hand or Auto mode, the motor will start on the drive as soon as power is applied.

In order to prevent the motor from starting, the system should be in the Drive mode and the drive should be OFF when the power is disconnected at the end of the previous series of control panel settings and checks.

In order to prevent the motor from running without disconnecting the motor, open the Run Enable and Safety Interlock contacts on bypass control board terminals X2:2, X2:3 and X2:4 before applying power. Set the bypass to Drive mode and the drive to OFF.

3. Apply power to the E-Clipse Bypass unit. The ACH550 Control Panel display should be illuminated. On the bypass control panel, both the display and Enabled LED should be illuminated. If the Enabled LED is not illuminated solid green, check to see that closed contacts or jumpers connect terminal X2:3 to X2:4 and X2:2 to X2:7 on the bypass control board.
4. The Drive Selected LED should be illuminated. If not, press the Drive Select key to switch to Drive mode. Leave the system in the Drive mode when proceeding to the next step.
5. Press the Hand key on the ACH550 Control Panel. Press and hold the UP key until the motor just starts rotating.

Note: If the ACH550 Control Panel displays an OVERCURRENT or EARTH FAULT, disconnect and lock out power to the E-Clipse Bypass unit. Wait at least 5 minutes. Disconnect the motor leads from the E-Clipse Bypass unit and Megger each motor lead to ground to determine if the motor is good. Check the power leads from the Drive / Bypass to the motor for damaged or improper wiring. If the ACH550 Control Panel displays any other drive faults, correct the fault condition before proceeding to the next step.



CAUTION: Check motor rotation direction as soon as the motor begins to move. If motor does not rotate in the correct direction, shut down the drive, disconnect and lock out power to the drive and wait five minutes. Swap any two motor output wires (T1, T2, and T3). Incorrect motor rotation direction may cause equipment damage.

6. Increase the speed to 60 Hz or the highest safe operating speed.
7. Press the OFF key on the drive control panel. The motor should stop.

If the drive does not operate according to these steps, refer to the ACH550-UH User's Manual.

If the drive operates according to these steps, your ACH550 with E-Clipse Bypass is ready to use with preset or modified macro settings.

Note: The settings for ALL external serial communication between the ACH550 with E-Clipse Bypass and any Building Automation System are configured using the E-Clipse Bypass operator panel. DO NOT attempt to configure the external serial communication connection using the ACH550 operator panel!

The settings for internal communication between the ACH550 and the E-Clipse Bypass are configured at the factory and require no adjustment.

Note: Both the ACH550 Drive and the E-Clipse Bypass include preset application macros. The only ACH550 Drive macro that provides the proper configuration settings by default is the *E-Clipse HVAC Default macro* (9902 = 15). If any other ACH550 drive macro or any modified setting of the *E-Clipse HVAC Default macro* is used the following ACH550 Drive parameter values must be set and power cycled or the E-Clipse Bypass will not function properly:

- Parameter 9802 must be set to “STD MODBUS”
- Parameter 1001 must be set to “Comm”
- Parameter 1002 must be set to “Comm”
- Parameter 1601 must be set to “Comm”
- Parameter 1608 must be set to “Comm”
- Parameter 5303 must be set to “76.8 kb/s”
- Parameter 5304 must be set to “8 EVEN 1”
- Parameter 5305 must be set to “DCU PROFILE”
- Parameter 5310 must be set to “103”
- Parameter 5311 must be set to “104”
- Power must be cycled

Refer to the *ACH550-UH User’s Manual* for programming instructions.

Note: Run motor from drive before attempting bypass operation.

System check: motor disconnected from the ACH550 with E-Clipse Bypass

If you are familiar with the E-Clipse Bypass operation, you may skip the following section. Otherwise, after performing the system checks and setting the ACH550 Drive Start-up Data parameters, become familiar with the operation of the ACH550 Drive with E-Clipse Bypass without the motor connected as follows:

1. Disconnect and lock out power to the E-Clipse Bypass unit, wait at least five minutes after disconnecting power.
2. Disconnect the motor from the E-Clipse Bypass unit.
3. Apply power to the E-Clipse Bypass unit by turning on the branch circuit disconnect device and the bypass disconnect switch or circuit breaker.
4. The ACH550 Control Panel display should be illuminated. On the E-Clipse Bypass control panel, both the display and *Enabled* LED should be illuminated. If the *Enabled* LED is not illuminated solid green, check to see that closed contacts or jumpers connect terminal X2:3 to X2:4 and X2:2 to X2:7 on the bypass control board.

5. On the E-Clipse Bypass control panel, either the *Drive Selected* or *Bypass Selected* LED should be illuminated. Pressing the *Drive Select* or *Bypass Select* key should switch the bypass back and forth between the *Drive* mode and the *Bypass* mode as indicated by the LEDs above each button. Check that the bypass control panel switches the system between modes. Leave the system in the *Bypass* mode when proceeding to the next step.
6. Check to see that pressing the:
 - *Auto* key on the bypass control panel causes the bottom line on the E-Clipse Bypass display to indicate "*Bypass in Auto*"
 - *Hand* key on the bypass control panel generates a Motor Phase Fault.
 - Under normal conditions (motor connected) pressing the *Hand* key on the bypass control panel causes the bottom line on the E-Clipse Bypass display to indicate "*Hand #A Run*"
 - *OFF* key on the bypass control panel causes the bottom line on the E-Clipse Bypass display to indicate "*Off Stop*"
7. For Steps 8 through 14, ACH550 Drive Parameter 9904 must be set to "*Scalar: Freq*". After successful completion of Step 13, Parameter 9904 may be set to "*Vector: Speed*" if very specific application requirements make it necessary to use this type of motor control. Operation using the "*Vector: Speed*" setting is unnecessary for control of almost all fan and pump applications. Refer to the *ACH550-UH User's Manual* for details on setting parameters.
8. Press the *Drive Select* key on the E-Clipse Bypass control panel. The *Drive Select* LED should be illuminated.
9. Check to see that pressing the:
 - *Auto* key on the bypass control panel causes the E-Clipse Bypass display to indicate "*Bypass in Auto*"
 - *Hand* key on the bypass control panel causes no change to the E-Clipse Bypass display
 - *OFF* key on the bypass control panel causes the E-Clipse Bypass display to indicate "*Bypass in Off*"
10. Press the *HAND* key on the drive control panel. Note that the top line of the control panel display indicates "*HAND*" and run as a clockwise rotating arrow. The *Drive Run* LED on the E-Clipse Bypass control panel should be illuminated.
11. Press the *UP* arrow on the drive control panel. Note that the speed reference indication in the top line of the drive control panel display increases from "*0.0% SP*."
12. In the middle line of the drive control panel display, the output current indication should indicate "*0.0 A*."
13. Press the *DOWN* arrow on the drive control panel until the speed and frequency indications return to "*0.0*."
14. Press the *OFF* key on the drive control panel. Note that the bottom line of the drive control panel display indicates "*Off*."

If the ACH550 Drive and E-Clipse Bypass operate according to these steps, and you have familiarized yourself with their operation, disconnect and lock out power to prepare for the next test.



WARNING! Wait at least five minutes after disconnecting power from the drive before you attempt to service the drive. Bus capacitors in the intermediate DC circuit must discharge before servicing the drive. Using a meter rated for 1000 VDC, check for zero volts at:

- Terminals BRK+ to GND and BRK- to GND (frame size R1/R2)
- Terminals UC+ and UC- (frame size R3...R8).

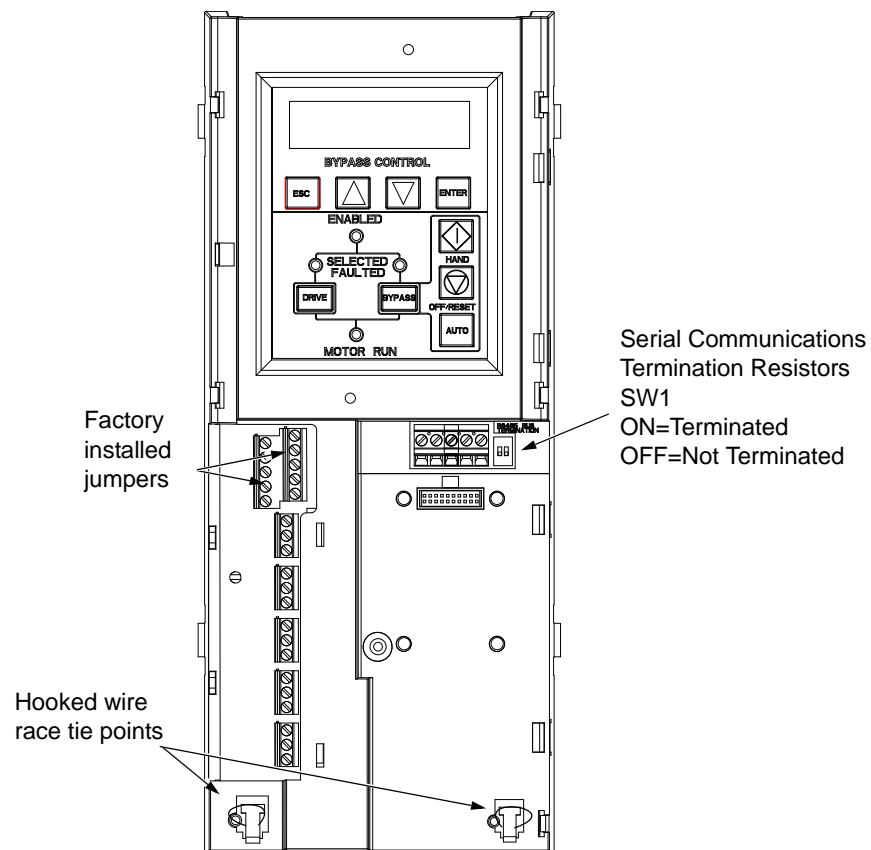
If the drive does not operate according to these steps, refer to the ACH550-UH User's Manual.

3. Check jumpers and switches

The settings described in this section are factory set and, for most situations, do not require adjustment. However, it is a good practice to review these settings to confirm that they are appropriate for the configuration installed.

Jumper and switch locations

The figure below shows the locations of the SW1 DIP switch on the E-Clipse Bypass control board. The function and setting of this switch is explained in the following paragraph.



DIP switch settings

The DIP switch is used to configure the serial communications termination resistors.

To reduce noise on the serial communications network, terminate the EIA-485 network using 120 ohm resistors at both ends of the network. Use the DIP switches to connect or disconnect the on-board termination resistors. Both switches must be positioned in the ON or OFF position to correctly configure the termination resistors.

Note: When using embedded protocols, set SW1 in the OFF position.

Circuit breaker settings

On some ACH550 E-Clipse Bypasses, the circuit breaker has adjustable settings for instantaneous current protection. The factory default settings are practical for most applications. Refer to the “ABB SACE Instruction Sheet” (supplied with these units) for additional information on the adjustment of these settings.

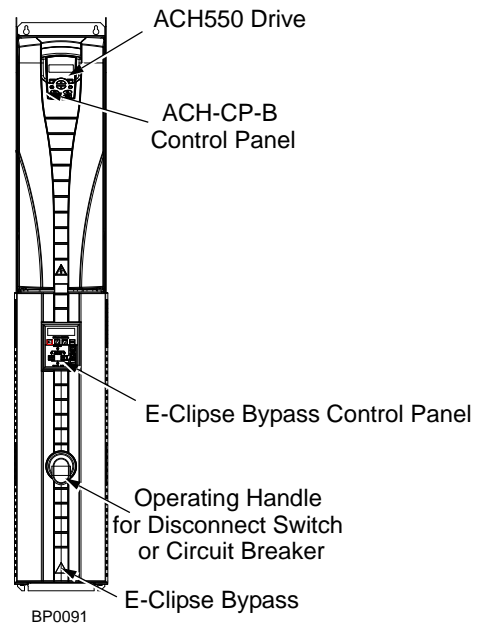
Operation

E-Clipse bypass configurations

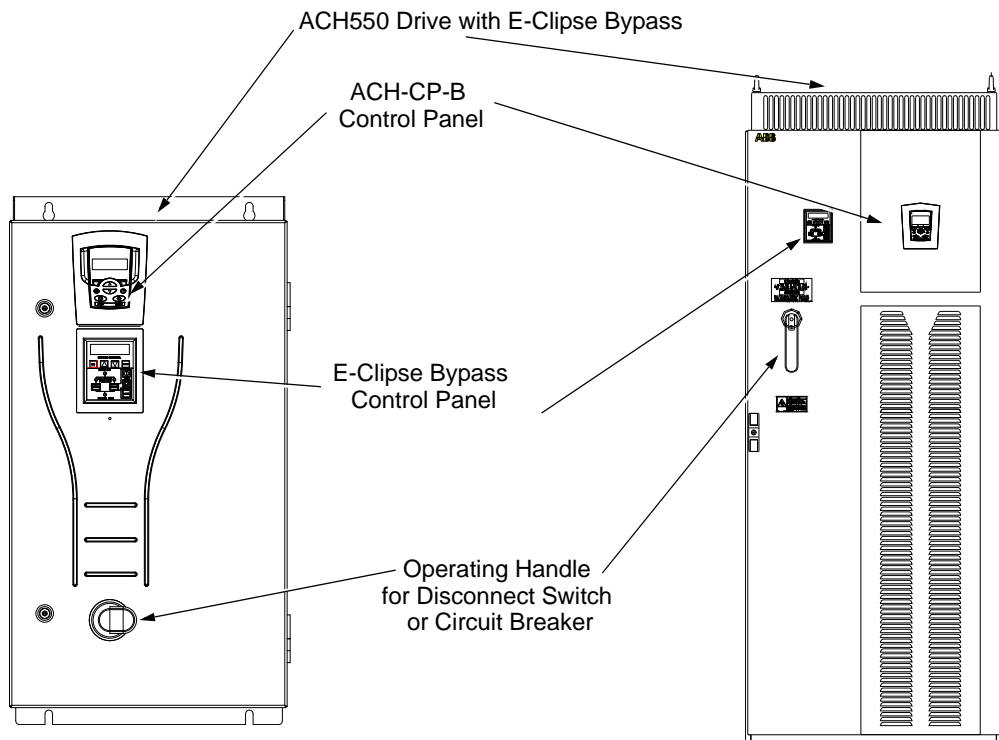
The ACH550 with E-Clipse Bypass is an ACH550 AC adjustable frequency drive in an integrated UL type 1, UL type 12 or UL type 3R package with a bypass motor starter. The ACH550 with E-Clipse Bypass provides:

- Disconnect switch or circuit breaker with door mounted control lever. The lever can be padlocked in the OFF position (padlock not supplied).
- Bypass starter.
- Motor overload protection.
- Local operator panel with indicating lights and multifunction display.
- Provisions for external control connections.
- Embedded communications for major BMS protocols including BACnet, Johnson Controls International N2, Siemens Building Technologies FLN, and Modbus
- Optional fieldbus adapters for connection to additional BMS protocols including LonWorks and Ethernet
- Optional drive service switch (drive input disconnect), the functional equivalent of a three-contactor bypass arrangement.

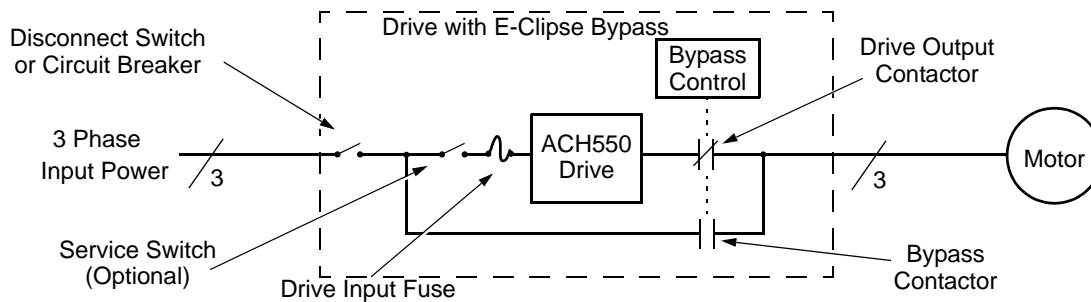
The following shows the front view of the ACH550 E-Clipse Bypass vertical configuration, and identifies the major components.



The following shows the front view of the ACH550 E-Clipse Bypass standard configurations, and identifies the major components.

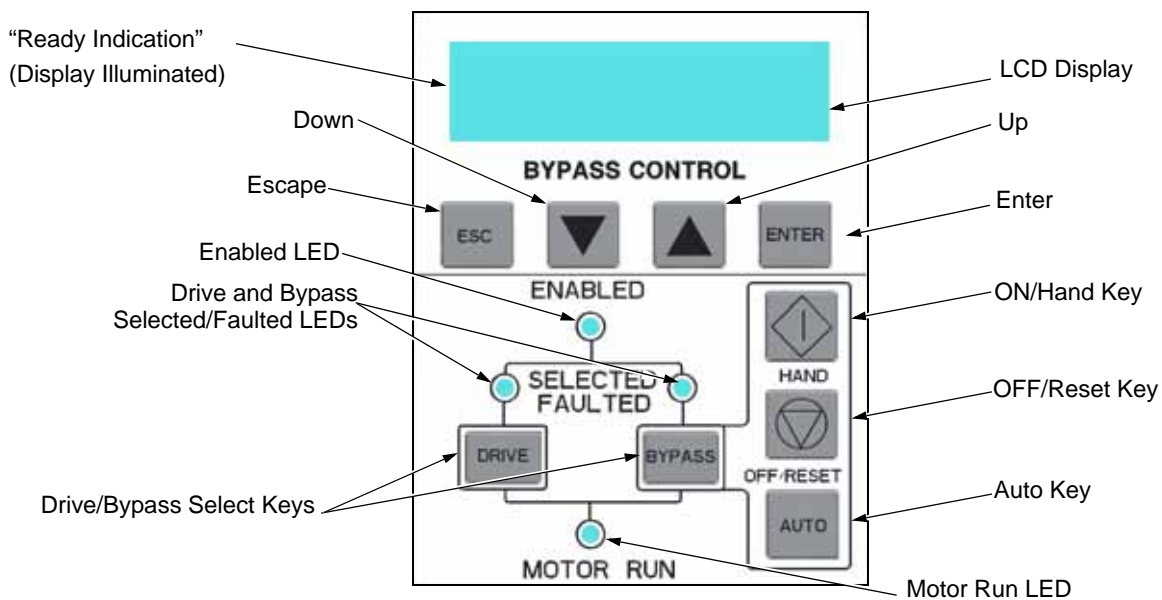


The following is a typical power diagram.



Bypass control

The bypass control panel features:



Ready (Power On) Indication

The *Ready (Power On) indication* is provided by the bypass control panel. The bypass control panel display will be illuminated and text will be displayed when the disconnect switch or circuit breaker is closed and control power is applied to the bypass.

Enabled LED

The *Enabled LED* is illuminated green under the following conditions:

- Both the Safety Interlock(s) and Run Enable contacts are closed.
- The Safety Interlock contact(s) are closed with no Start command present.

The Enabled LED flashes green if the Run Enable contact is open and when the Safety Interlock contact(s) are closed and a Start command is present.

The Enabled LED is illuminated red when the Safety Interlock contact(s) are open.

Motor Run LED

The *Motor Run LED* is illuminated green when the motor is running in either bypass mode or in drive mode. The Motor Run LED flashes green to indicate the system has been placed in an Override condition.

Bypass Faulted LED

The *Bypass Faulted LED* is illuminated or flashes red when the motor or bypass protection functions have shut down the bypass. The specific nature of the fault is indicated on the bypass control display. Refer to the [Diagnostics](#) section of this manual for more details.

Drive Selected LED

The *Drive Selected LED* is illuminated green when the drive has been selected as the power source for the motor and no drive fault is present.

Bypass Selected LED

The *Bypass Selected LED* is illuminated or flashes green when the bypass has been selected as the power source for the motor and no bypass fault is present.

Drive Faulted LED

The *Drive Faulted LED* is illuminated red when the bypass has lost its communications link with the drive or when the motor or drive protection functions have shut down the drive. The specific nature of the fault is indicated on the drive control panel display. Refer to the [Diagnostics](#) section on page 66 of the ACH550-UH User's Manual for more details.

Automatic Transfer

The *Automatic Transfer* indication is provided on the bypass control panel. The bypass control display will continuously flash an alarm to indicate the system has automatically transferred to Bypass after a Drive fault. The Bypass Selected LED flashes green when the system has automatically transferred to bypass operation. The bypass event log will also record this event.

Auto Indication

The *Auto Indication* is provided on the bypass control panel default display when the bypass control panel Auto key is pressed. Normally this indicates that the Auto Start contact or serial communications has been selected as the means for starting and stopping the motor in the bypass mode.

Off Indication

The *Off Indication* is provided on the bypass control panel default display when bypass control panel Off key is pressed.

Hand Indication

The *Hand Indication* is provided on the bypass control panel default display when the motor has been started manually in the bypass mode.

Drive Select Key

The *Drive Select Key* selects the drive as the power source for the motor.

Bypass Select Key

The *Bypass Select Key* selects the bypass as the power source for the motor.

Off/Reset Key

The *Off/Reset Key* may be used to manually stop the motor if the motor has been running on bypass power. The Off/Reset key also resets most bypass faults. It may take several minutes before the bypass can be reset after an overload trip. If a bypass fault condition is present the second press of this key places the bypass in the OFF mode.

Auto Key

The *Auto Key* selects the Auto Start contact or serial communications as the means for starting and stopping the motor in the bypass mode.

Hand Key

The *Hand Key* can be used to manually start the motor when the bypass has been selected as the power source for the motor.


Bypass control panel modes












The HVAC Bypass Control Panel has several different modes for configuring, operating and diagnosing the bypass. Select MENU and use the UP/DOWN buttons to select modes. The modes are:

- Default Display mode – Provides (HAND/OFF/AUTO) indication of the bypass operating control mode.
- Bypass Status mode – Provides status indications of the current system operating conditions.
- Start-Up Parameter Mode – Provides a list of parameters or operating conditions that may be configured or viewed during startup.
- Parameter List mode – Used to edit parameter values individually.
- Changed Parameter mode – Displays changed parameters.
- Bypass Fault Display mode – If there is an active bypass fault, the control panel will flash the fault number and fault diagnostic indication in English.
- Bypass Alarm Display mode – If there is an active bypass alarm, the control panel will flash the alarm number and alarm diagnostic indication in English.

Start-up by changing the parameters from the start-up list

















To change the parameters, follow these steps:

1	The Default Display indicates the Bypass Control mode.		DRIVE SELECTED BYPASS IN OFF
2	Press ENTER to enter the Main Menu .		*BYPASS STATUS STARTUP PARAMS

3	Select the Startup Params with the Up/Down arrows and press ENTER .	  	BYPASS STATUS *STARTUP PARAMS
4	Select the appropriate Parameter with the Up/Down arrows and press ENTER .	  	*1601 START/STOP 1613 BP DISABLE
5	Press the Up/Down arrows to change the Parameter Value .	 	1601 START/STOP [1:DI1]
6	Press ENTER to store the modified value or press ESC to leave the Parameter Edit mode.	 or 	*1601 START/STOP 1613 BP DISABLE
7	Press ESC to return to the Main Menu , and again to return to the Default Display .		DRIVE SELECTED BYPASS IN OFF

Start-up by changing the parameters individually from the parameter list

To change the parameters, follow these steps:

1	The Default Display indicates the Bypass Control mode.		DRIVE SELECTED BYPASS IN OFF
2	Press ENTER to enter the Main Menu .		*BYPASS STATUS STARTUP PARAMS
3	Select the Parameter List with the Up/Down arrows and press ENTER .	  	STARTUP PARAMS *PARAMETER LIST
4	Select the appropriate Parameter Group with the Up/Down arrows and press ENTER .	  	14 RELAY OUT *16 SYSTEM CTRL
5	Select the appropriate Parameter in a group with the Up/Down arrows and press ENTER .	  	*1601 START/STOP 1602 RUN ENABLE
6	Press the Up/Down arrows to change the Parameter Value .	 	1601 START/STOP [1:DI1]
7	Press ENTER to store the modified value or press ESC to leave the Parameter Edit mode.	 or 	*1601 START/STOP 1602 RUN ENABLE
8	Press ESC to return to the listing of Parameter Groups , and again to return to the Main Menu .	 	*16 SYSTEM CTRL 17 OVERRIDE

9	Press ESC to return to the Default Display from the Main Menu .		
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Note: In the Parameter Edit mode the current parameter value appears below the parameter name.

Note: To view the default parameter value, press the **Up/Down** arrows simultaneously. Press **Enter** to restore the default parameter value or press **ESC** to leave the **Parameter Edit** mode.

Diagnosics

Fault listing

Fault Code	Fault Name In Panel	Fault	Possible Cause	Corrective Action
3001	COIL CURR FBK	RBCU is sensing abnormal current feedback when neither contactor should be energized	Defective component on RBCU	Change RBCU
3002	BYP CONTACT STUCK	M2 contactor indicates it is not prepared to move on a power up check of the contactor or after contact is commanded to open	Defective Contactor Defective RBCU	Disconnect incoming power from unit Check if contactor armature moves freely. If armature moves freely, then change the RBCU. If armature does not move freely, then change individual contactor (M2) or the complete assembly (RCSA-0x)
3003	DRV CONTACT STUCK	M1 contactor indicates it is not prepared to move on a power up check of the contactor or after contact is commanded to open	Defective Contactor Defective RBCU	Disconnect incoming power from unit Check if contactor armature moves freely. If armature moves freely, then change the RBCU. If armature does not move freely, then change individual contactor (M1) or the complete assembly (RCSA-0x)

Fault Code	Fault Name In Panel	Fault	Possible Cause	Corrective Action
3004	BYPASS COIL OPEN	M2 contactor will not close when commanded to do so	Loose J8 connector on RBCU Loose wires on contactor terminals A1 and/or A2 Bad Output on RBCU Bad Contactor	Verify that J8 connector is firmly seated. With incoming power disconnected, check for tightness of A1 and A2 terminals Swap RBCU Change Contactor/ Assembly
3005	DRIVE COIL OPEN	M1 contactor will not close when commanded to do so	Loose J8 connector on RBCU Loose wires on contactor terminals A1 and/or A2 Bad Output on RBCU Bad Contactor	Verify that J8 connector is firmly seated. With incoming power disconnected, check for tightness of A1 and A2 terminals Swap RBCU Change Contactor/ Assembly
3006	UNDERVOLTAGE	Fault will be generated only if the drive is controlling the motor and the power to the bypass is removed before the drive shuts down. This fault is generated when the drive contactor opens while the drive is operating.	Loose J7 connector on RBCU unit Loose input wiring Incoming power problems	Check that J7 connector is firmly seated in RBCU Check tightness of incoming connections Check Parameter 0413 to view voltage level at time of trip Check upstream protection
3008	DRIVE AI2 LOSS	Only displayed when in Supervisory mode. Indicates that AI2 on the drive has failed.	Check ACH550 manual for AI2 loss	Check ACH550 manual for AI2 loss
3009	MTR OVERLOAD	Bypass opens on motor overload conditions defined in the drive	Drive Mode: Bad Motor Bad CT's Bad RBCU Bypass mode: Bad motor Bad CT's Bad RBCU Either mode: low input voltage	Check if overload condition exists Drive Mode: Refer to 550 manual for proper troubleshooting techniques Bypass Mode: Check that J2 connector is firmly seated in RBCU Use clamp meter to verify mtr current vs. display in parameter 0101 Check input voltage

Fault Code	Fault Name In Panel	Fault	Possible Cause	Corrective Action
3010	INP PHASE A LOSS	Fault will be generated when the bypass contactor is requested to be closed and the RBCU does not sense voltage on Phase A	Loose J7 connector Loose wiring on Contactor assembly. Blown upstream fuse	Check J7 connector Check yellow wire on input block Check incoming voltage, phase to ground
3011	INP PHASE B LOSS	Fault will be generated when the bypass contactor is requested to be closed and the RBCU does not sense voltage on Phase B	Loose J7 connector Loose wiring on Contactor assembly. Blown upstream fuse	Check J7 connector Check black wire on input block Check incoming voltage, phase to ground
3012	INP PHASE C LOSS	Fault will be generated when the bypass contactor is requested to be closed and the RBCU does not sense voltage on Phase C	Loose J7 connector Loose wiring on Contactor assembly. Blown upstream fuse	Check J7 connector Check red on input block Check incoming voltage, phase to ground
3013	DRIVE 1ST START	Fault generated if attempting to close the bypass contactor with out running the bypass in drive mode first.	NA	Run bypass unit in drive mode before attempting bypass mode
3014	COIL POW SUPPLY	Coil power supply has failed to reach rated voltage	Internal failure on RBCU unit Shorted contactor coil	Cycle power on bypass unit. If contactor coil is shorted, fault 3023 or 3024 will be generated. If 3023 or 3024 is generated, replace respective contactor If 3023 or 3024 is not generated on power up, replace RBCU unit.
3016	EARTH FAULT	Declared if attempting to close the bypass contactor when the drive has earth fault declared	Earth fault in motor	Refer to the fault code 16 on page 25 .
3017	MTR UNDERLOAD	If motor power(%) level falls below minimum power level establish in parameter 3003 for the time (s) set in parameter 3002 fault will be generated. Parameter 3003 is a percentage of motor power as defined in the drive via parameter 9909. Fault only applies to bypass mode	Broken belt	Check load Reset bypass keypad Check fault code 17 on page 25 , for further action

Fault Code	Fault Name In Panel	Fault	Possible Cause	Corrective Action
3018	MAX CYCLE FAULT	Supervisory Mode only. Declared if bypass contactor is closed by supervisory control 16 times within a 1 hour period.	High and low levels of hysteresis band are too tight	Check parameters 3202-3205. Increase time delays on parameters 3204 and 3205
3019	DRIVE LINK FAULT	Supervisory Mode Only. Fault generated if RS-485 link between drive and bypass stops communicating.	Bad cable/connection between drive and bypass. Communication improperly set in drive Parameter 9802. Application Macro improperly set in drive parameter 9902.	Proper seating of cable in drive and RBCU(connector J3) Check drive parameter 9802 (Modbus) and 9902 (E-Clipse) Check drive Group 53 Follow DriveLink recovery procedure
3020	PHASE SEQ	Sequence of 3 phase voltage input is such that bypass operation will result in motor rotation opposite of drive forward operation.	Phase sequence unknown at time of wiring	Swap any two of the three input wires to the bypass unit
3021	PH A CURR FBK	Fault is generated when current in Phase A is detected and the bypass contactor is open	Loose CT connection Bad RBCU Bad CT	Check J2 connector for proper seating Check connector on Current Assembly Replace RBCU Replace RCSA unit
3022	PH C CURR FBK	Fault is generated when current in Phase C is detected and the bypass contactor is open	Loose CT connection Bad RBCU Bad CT	Check J2 connector for proper seating Check connector on Current Assembly Replace RBCU Replace RCSA unit
3023	BYP COIL SHORTED	Coil characteristics are checked only on power up and coil current is greater than allowable values	Shorted contactor coil Shorted/damaged cable Bad RBCU	Replace RBCU Replace RCSA unit
3024	DRV COIL SHORTED	Coil characteristics are checked only on power up and coil current is greater than allowable values	Shorted contactor coil Shorted/damaged cable Bad RBCU	Replace RBCU Replace RCSA unit
3027	INVALID SUB ASM	Contactor assembly as recorded in the RBCU unit does not match drive information communicated via 485 link	RBCU unit from a different size bypass used to replace a defective RBCU. Parameters not matched after Firmware change.	Contact ABB at 1-800-HELP-365 Option 4

Fault Code	Fault Name In Panel	Fault	Possible Cause	Corrective Action
3028	EXT COMM LOSS	Time between fieldbus messages has exceeded timeout interval set with parameter 3005	Incorrect Communication settings in Group 51 & 53. Poor Connections Noise on Communication Line	Check Group 51 & 53 Tighten Connections Check Communication Cable Grounding
3029	EFB CONFIG FILE	Error reading configuration file for embedded fieldbus	Internal Startup error	Cycle Power Replace RBCU
3030	FORCE TRIP	Fault trip forced by external fieldbus	Overriding Control System tripped E-Clipse unit via fieldbus.	Check Overriding Control System
3031 ... 3033	EFB 1...EFB 3	Fault code reserved for embedded fieldbus.	For Bacnet: Device object instances for the drive and or bypass are set greater than 4194302 in paramters 5011 5017 and or 5311 5317 respectively	Check Parameters 5011, 5017 and/or 5311, 5317
3034	MTR PHASE	Detects open motor phase. Detection is done by current transformers in bypass unit.	Internal problem Cable problem Motor problem	Check wiring in E-Clipse Unit Check motor cabling Check Motor Check if 3006 is Disabled
3037	PCB TEMP	RBCU unit has reached 190 degrees Fahrenheit, 88 degrees Celsius	Cabinet cooling has failed Ambient conditions too high Bad RBCU unit	Stop drive and let cool down and restart Add additional cooling Replace RBCU
3038	NO DRIVE DATA	No drive data available (Group 112)	Bypass not able to extract drive data on initial power up due to: Bad cable/connection between drive and bypass. Communication improperly set in drive Parameter 9802. Application Macro improperly set in drive parameter 9902.	Proper seating of cable in drive and RBCU (connector J3) Check drive parameter 9802 (Modbus) and 9902 (E-Clipse) Check drive Group 53 Follow DriveLink recovery procedure then cycle power to bypass.
3039	FBA PAR CONF	Non embedded fieldbus has detected an error in Group 51 parameters	Incorrect settings in Group 51	Verify Group 51 parameters
3101	SFLASH CORRUPT	Internal checksum error	NA	Cycle power Replace RBCU Upgrade firmware

Fault Code	Fault Name In Panel	Fault	Possible Cause	Corrective Action
3102	PMP FILE	Parameter file is corrupt		Cycle Power Contact ABB with information that preceded fault
3201	T1 OVERLOAD	T1 program cycle is overloaded	NA	Contact ABB with information that preceded fault Cycle Power Replace RBCU
3202	T2 OVERLOAD	T2 program cycle is overloaded	NA	Contact ABB with information that preceded fault Cycle Power Replace RBCU
3203	T3 OVERLOAD	T3 program cycle is overloaded	NA	Contact ABB with information that preceded fault Cycle Power Replace RBCU
3204	STACK OVERFLOW	Program cycle is overloaded	NA	Contact ABB with information that preceded fault Cycle Power Replace RBCU
3205	UNKNOWN CB	Bypass control board type is unknown.	Firmware is not compatible with control board in RBCU.	Firmware 93F and greater compatible with all RCBU hardware. Firmware 93D and earlier can only be loaded in RCBU Rev D and earlier.
3206	UNKNOWN DRIVE	Drive reports rating not found in bypass software	Drive does not match drives configured in bypass RCBU	Replace RCBU or reload with most current firmware
3207	UNKNOWN BYPASS	NA	NA	Replace RCBU or load most current firmware Contact ABB at 1-800-HELP-365 option 4 Replace RCBU or load most current firmware

Fault History

See page [28](#).

Alarm listing

The following table lists the alarms by code number and describes each.

Alarm Code	Alarm Name In Panel	Alarm	Possible Cause	Corrective Action
4001	INP PHASE A LOSS	Alarm will occur in drive mode. In bypass, alarm will occur if bypass contactor has not closed. Unit will trip on Fault 3010 if the bypass contactor is closed	Loose J8 connector Loose wiring on Contactor assembly. Blown upstream fuse	Check J8 connector Check yellow wire on input block Check incoming voltage, phase to ground
4002	INP PHASE B LOSS	Alarm will occur in drive mode. In bypass, alarm will occur if bypass contactor has not closed. Unit will trip on Fault 3011 if the bypass contactor is closed	Loose J8 connector Loose wiring on Contactor assembly. Blown upstream fuse	Check J8 connector Check black wire on input block Check incoming voltage, phase to ground
4003	INP PHASE C LOSS	Alarm will occur in drive mode. In bypass, alarm will occur if bypass contactor has not closed. Unit will trip on Fault 3012 if the bypass contactor is closed	Loose J8 connector Loose wiring on Contactor assembly. Blown upstream fuse	Check J8 connector Check red wire on input block Check incoming voltage, phase to ground
4004	AUTO TRANSFER	Message is displayed when the drive faults and the bypass switches to bypass mode as configured in Parameter 1608	Drive fault	Check drive
4005	EXT COMM ERR	Time between fieldbus messages has exceeded timeout interval set with parameter 3005	Incorrect Communication settings in Group 51 & 53. Poor Connections Noise on Communication Line	Check Group 51 & 53 Tighten Connections Check Communication Cable Grounding
4006	Selected by PAR 1620: RUN ENABLE DAMPER END SWITCH VALVE OPENING PRE-LUBE CYCLE	Alarm will occur when start order is given and the "RUN Enable" is not present	Run Enable condition is not satisfied. Bad 24v supply Bad digital input	Check 24 Volts on RBCU unit Check for 24 volts on respective DI when condition is satisfied Check Parameter 0103 for status of digital input
4007	PCB TEMP	RBCU unit reached 181 degrees Fahrenheit, 83 degrees Celsius	Cabinet cooling has failed Ambient conditions too high Bad RBCU unit	Stop drive and let cool down and restart Add additional cooling Replace RBCU

Alarm Code	Alarm Name In Panel	Alarm	Possible Cause	Corrective Action
4008	DRIVE SETUP	Alarm generated when configuration of drive is such that bypass can not properly control the drive. Specifically, drive parameters 1001,1002,1601, 1608	Incorrect parameters settings	Set Parameter 1001 to "COMM" Set Parameter 1002 to "COMM" Set Parameter 1601 to "COMM" Set Parameter 1608 to "COMM"
4009	BYPASS RUN DELAY	Alarm is generated when a bypass start command is issued and there is non zero time value in bypass parameter 1614	NA	NA
4010	MTR OVERLOAD	Bypass warning if motor overload conditions exist as defined in the drive	Drive Mode: Bad Motor Bad Ct's Bad RBCU Bypass mode: Bad motor Bad CT's Bad RBCU Either mode: low input voltage	Drive Mode: Refer to 550 manual for proper troubleshooting techniques Bypass Mode: Check that J2 connector is firmly seated in RBCU Check input voltage Does overload condition exist?
4011	MTR UNDERLOAD	Alarm comes at half the time of a mtr underload fault. See fault 3017 for further text	NA	Parameter 3002 is the time Parameter 3003 is the level
4012	BYPASS DISABLED	Alarm will be generated if parameter 1613 is set to "Disable"	NA	NA
4013	DRIVE LINK ERROR	Same as Fault 3019 however will occur when not in supervisory mode	Bad cable between drive and bypass Communication improperly set in drive Parameter 98.02(Modbus) Application Macro in 99.02 set to 15 (text)	Proper seating of cable in drive and RBCU(connector J3) Check drive parameter 98.02 and 99.02 Check drive Group 53 Follow DriveLink recovery procedure
4014	DRIVE TEST	Alarm is generated when bypass parameter 1617 is set to "enable"	NA	NA
4015	START DRIVE 1ST	Message displayed on initial "out of box" power up sequence	NA	Run drive in Hand

Alarm Code	Alarm Name In Panel	Alarm	Possible Cause	Corrective Action
4016	INP VOLTAGE LOW	3-Phase input voltage has not reached a sufficient level to enable editing of parameters via the keypad. This message is generated within a few seconds of power up	NA	Loose J7 connector Low input voltage. Incoming voltage has not reached at least 155 VAC within a few seconds of powerup
4019	OVERRIDE 1	Alarm is generated when override 1 is active	NA	Check Parameter 0103 and 0104 for digital input status
4020	OVRD2 BYP	Alarm is generated when override 2 is active and the bypass is controlling the motor	NA	Check Parameter 0103 and 0104 for digital input status
4021	Selected by PAR 1621 START ENABLE 1 VIBRATION SWITCH FIRESTAT FREEZESTAT OVERPRESSURE VIBRATION TRIP SMOKE ALARM SAFETY OPEN LOW SUCTION PRES	Alarm will occur when start order is given and the "RUN Enable" is not present	Run Enable condition is not satisfied. Bad 24v supply Bad digital input 24 V common is not tied to Digital input common on bypass when using external 24 v supply	Check 24 Volts on RBCU unit Check for 24 volts on respective DI when condition is satisfied Check Parameter 0103 For status of digital input
4022	Selected by PAR 1622 START ENABLE 2 VIBRATION SWITCH ... LOW SUCTION PRES	Alarm will occur when start order is given and the "RUN Enable" is not present	Run Enable condition is not satisfied. Bad 24v supply Bad digital input 24 V common is not tied to Digital input common on bypass when using external 24 v supply	Check 24 Volts on RBCU unit Check for 24 volts on respective DI when condition is satisfied Check Parameter 0103 For status of digital input
4023	Selected by PAR 1623 START ENABLE 3 VIBRATION SWITCH ... LOW SUCTION PRES	Alarm will occur when start order is given and the "RUN Enable" is not present	Run Enable condition is not satisfied. Bad 24v supply Bad digital input 24 V common is not tied to Digital input common on bypass when using external 24 v supply	Check 24 Volts on RBCU unit Check for 24 volts on respective DI when condition is satisfied Check Parameter 0103 For status of digital input

Alarm Code	Alarm Name In Panel	Alarm	Possible Cause	Corrective Action
4024	Selected by PAR 1624 START ENABLE 4 VIBRATION SWITCH ... LOW SUCTION PRES	Alarm will occur when start order is given and the "RUN Enable" is not present	Run Enable condition is not satisfied. Bad 24v supply Bad digital input 24 V common is not tied to Digital input common on bypass when using external 24 v supply	Check 24 Volts on RBCU unit Check for 24 volts on respective DI when condition is satisfied Check Parameter 0103 For status of digital input
4025	LOCAL DISABLED	Alarm is displayed if MODE LOCK (16.29) is set to AUTO MODE and the Hand or Off key is pressed		
4026	AUTO DISABLED	This alarm is displayed if MODE LOCK (1629) is set to LOCAL MODE and the Auto key is pressed.		
4027	COMM CONFIG ERR	Alarm is displayed if the drive and bypass MAC addresses are equal or invalid.	E-Clipse parameters 5002(BP MAC ID) & 5302 (DV MAC ID) are set to the same value	Change MAC address to unique values
4028	FBA PAR CONF	Non embedded fieldbus has detected an error in Group 51 parameters		Verify Group 51 parameters
4029	DRIVE FAULTED	The drive is faulted.		Reset drive
4030	OVRD2 VFD	Alarm is generated when override 2 is active and the drive is controlling the motor	NA	Check Parameter 0103 and 0104 for digital input status
4031	OVRD2 STOP	Alarm is generated when override 2 is active and both the bypass and drive output contactors are deenergized	NA	Check Parameter 0103 and 0104 for digital input status

Bypass status listing

Bypass Status (16 Characters)	Condition	Description
DRIVE/BYPASS?	DRIVE SELECTED BYPASS SELECTED	Displays which one is selected, drive or bypass
SAFETIES?	OPEN CLOSED	Displays if safeties (=START ENABLE 1 and/or START ENABLE 2) have been applied, or if they are missing
RUN PERMISSIVES?	OPEN CLOSED	Displays if RUN ENABLE is present or not
START REQUEST?	NOT PRESENT PRESENT	Displays if start request has been applied to the system
AUTO TRANSFER?	NOT TRANSFERRED TRANSFERRED	Displays if the system is in Auto Transfer state or not. Does not reflect to PAR 16.08 AUTO XFER value itself
BYP OVERRIDE 1?	NOT ACTIVATED ACTIVATED	Status of Override 1
BYP OVERRIDE 2?	NOT ACTIVATED ACTIVATED	Status of Override 2
DRIVE FAULTED?	NO YES	Displays if drive is faulted or not
BYPASS FAULTED?	NO YES	Displays if bypass is faulted or not
SYSTEM STARTED?	NO YES	Displays if system is started or not
SYSTEM RUNNING?	NO YES	Displays if system is running or not
BYPASS ALARMS?	NO ALARMS ALARM ACTIVE	Displays if there is an active alarm(s) in bypass or not
HAND/OFF/AUTO?	OFF MODE HAND MODE AUTO MODE	Displays operating mode of the bypass - OFF, HAND or AUTO

Error messages

#	Error Message	Description
1	CAN'T EDIT PAR IS READ ONLY	Try to save value (=press the ENTER key in Parameter Edit State) of a read-only parameter. E.g. try to change value PAR 01.02 INPUT VOLT
2	CAN'T EDIT WHEN STARTED	Try to change value of a parameter, which is allowed to be changed only when system is not started. E.g. PAR 16.02 RUN ENABLE
3	CAN'T EDIT UP+DOWN ONLY	Try to change value of a "reset only" parameter other than zero. UP+DOWN buttons must be pressed simultaneously for requesting default value of the PAR on the display (value zero), and after that ENTER pressed for saving it (reset the parameter). E.g. PAR 04.01 LAST FAULT
4	CAN'T EDIT INP VOLTAGE LOW	Input voltage too low. Changing of parameters prohibited since system cannot save values to nv-mem w/ insufficient voltage.
5	CAN'T EDIT PAR IS HIDDEN	Try to save value (=press the ENTER key in Parameter Edit State) of a hidden parameter. Should not be possible. If hidden parameters are turned visible, this message is not given.
6	CAN'T EDIT UNDER LO-LIMIT	Try to save value which is over LO-LIMIT of the parameter. Should not be possible when changing parameters from control panel.
7	CAN'T EDIT UNDER HI-LIMIT	Try to save value which is over HI-LIMIT of the parameter. Should not be possible when changing parameters from control panel.
8	CAN'T EDIT ENUM VAL ONLY	Try to save value which is out of enumerated value list. Should not be possible when changing parameters from control panel.
9	CAN'T EDIT NO DEFAULT	Try to request default value (=press UP and DOWN buttons simultaneously) for a parameter which is defined not to have a default value. Should not be possible when changing parameters from control panel.
10	CAN'T EDIT TRY AGAIN.	Parameter system is busy, e.g. application macro change is in process at the same time when someone is trying to save a value for a parameter. Should not be possible when changing parameters from control panel.

Maintenance

See [Maintenance](#) for the ACH550-UH on page 31.

Complete ACH550 Drive Parameter List

GROUP 01	
OPERATING DATA	
101	SPEED & DIR
102	SPEED
103	OUTPUT FREQ
104	CURRENT
105	TORQUE
106	POWER
107	DC BUS VOLTAGE
109	OUTPUT VOLTAGE
110	DRIVE TEMP
111	EXTERNAL REF 1
112	EXTERNAL REF 2
113	CTRL LOCATION
114	RUN TIME (R)
115	KWH COUNTER (R)
116	APPL BLK OUTPUT
118	DI 1-3 STATUS
119	DI 4-6 STATUS
120	AI 1
121	AI 2
122	RO 1-3 STATUS
123	RO 4-6 STATUS
124	AO 1
125	AO 2
126	PID 1 OUTPUT
127	PID 2 OUTPUT
128	PID 1 SETPNT
129	PID 2 SETPNT
130	PID 1 FBK
131	PID 2 FBK
132	PID 1 DEVIATION
133	PID 2 DEVIATION
134	COMM RO WORD
135	COMM VALUE 1
136	COMM VALUE 2
137	PROCESS VAR 1
138	PROCESS VAR 2
139	PROCESS VAR 3
140	RUN TIME
141	MWH COUNTER
142	REVOLUTION
143	CNTR
143	DRIVE ON TIME HI
144	DRIVE ON TIME LO
145	MOTOR TEMP
150	CB TEMP
153	MOT THERM
	STRESS
158	PID COMM VALUE 1
159	PID COMM VALUE 2
174	SAVED KWH
175	SAVED MWH
176	SAVED AMOUNT 1
177	SAVED AMOUNT 2
178	SAVED CO2
GROUP 03	
FB ACTUAL SIGNALS	
301	FB CMD WORD 1
302	FB CMD WORD 2
303	FB STS WORD 1
304	FB STS WORD 2
305	FAULT WORD 1
306	FAULT WORD 2
307	FAULT WORD 3
308	ALARM WORD 1
309	ALARM WORD 2
GROUP 04	
FAULT HISTORY	
401	LAST FAULT
402	FAULT TIME 1
403	FAULT TIME 2
404	SPEED AT FLT
405	FREQ AT FLT
406	VOLTAGE AT FLT
407	CURRENT AT FLT
408	TORQUE AT FLT
409	STATUS AT FLT
410	DI 1-3 AT FLT
411	DI 4-6 AT FLT
412	PREVIOUS FAULT 1
413	PREVIOUS FAULT 2
GROUP 10	
START/STOP/DIR	
1001	EXT1 COMMANDS
1002	EXT2 COMMANDS
1003	DIRECTION
GROUP 11	
REFERENCE SELECT	
1101	KEYPAD REF SEL
1102	EXT1/EXT2 SEL
1103	REF1 SELECT
1104	REF 1 MIN
1105	REF 1 MAX
1106	REF2 SELECT
1107	REF 2 MIN
1108	REF 2 MAX
GROUP 12	
CONSTANT SPEEDS	
1201	CONST SPEED SEL
1202	CONST SPEED 1
1203	CONST SPEED 2
1204	CONST SPEED 3
1205	CONST SPEED 4
1206	CONST SPEED 5
1207	CONST SPEED 6
1208	CONST SPEED 7
1209	TIMED MODE SEL
GROUP 13	
ANALOG INPUTS	
1301	MINIMUM AI1
1302	MAXIMUM AI1
1303	FILTER AI1
1304	MINIMUM AI2
1305	MAXIMUM AI2
1306	FILTER AI2
GROUP 14	
RELAY OUTPUTS	
1401	RELAY OUTPUT 1
1402	RELAY OUTPUT 2
1403	RELAY OUTPUT 3
1404	RO 1 ON DELAY
1405	RO 1 OFF DELAY
1406	RO 2 ON DELAY
1407	RO 2 OFF DELAY
1408	RO 3 ON DELAY
1409	RO 3 OFF DELAY
1410	RELAY OUTPUT 4
1411	RELAY OUTPUT 5
1412	RELAY OUTPUT 6
1413	RO 4 ON DELAY
1414	RO 4 OFF DELAY
1415	RO 5 ON DELAY
1416	RO 5 OFF DELAY
1417	RO 6 ON DELAY
1418	RO 6 OFF DELAY
GROUP 15	
ANALOG OUTPUTS	
1501	AO1 CONTENT
1502	AO1 CONTENT MIN
1503	AO1 CONTENT MAX
1504	MINIMUM AO1
1505	MAXIMUM AO1
1506	FILTER AO1
1507	AO2 CONTENT
1508	AO2 CONTENT MIN
1509	AO2 CONTENT MAX
1510	MINIMUM AO2
1511	MAXIMUM AO2
1512	FILTER AO2
GROUP 16	
SYSTEM CONTROLS	
1601	RUN ENABLE
1602	PARAMETER LOCK
1603	PASS CODE
1604	FAULT RESET SEL
1605	USER PAR SET
	CHG
1606	LOCAL LOCK
1607	PARAM SAVE
1608	START ENABLE 1
1609	START ENABLE 2
1610	DISPLAY ALARMS
1611	PARAMETER VIEW
1612	FAN CONTROL
1613	FAULT RESET
GROUP 17	
OVERRIDE	
1701	OVERRIDE SEL
1702	OVERRIDE FREQ
1703	OVERRIDE SPEED
1704	OVERR PASS
	CODE
1705	OVERRIDE
1706	OVERRIDE DIR
1707	OVERRIDE REF
GROUP 20	
LIMITS	
2001	MINIMUM SPEED
2002	MAXIMUM SPEED
2003	MAX CURRENT
2006	UNDERVOLT CTRL
2007	MINIMUM FREQ
2008	MAXIMUM FREQ
2013	MIN TORQUE SEL
2014	MAX TORQUE SEL
2015	MIN TORQUE 1
2016	MIN TORQUE 2
2017	MAX TORQUE 1
2018	MAX TORQUE 2
GROUP 21	
START/STOP	
2101	START FUNCTION
2102	STOP FUNCTION
2103	DC MAGN TIME
2104	DC HOLD CTL
2105	DC HOLD SPEED
2106	DC CURR REF
2107	DC BRAKE TIME
2108	START INHIBIT
2109	EM STOP SEL
2110	TORQ BOOST
	CURR
2113	START DELAY
GROUP 22	
ACCEL/DECCEL	
2201	ACC/DEC 1/2 SEL
2202	ACCELER TIME 1
2203	DECELER TIME 1
2204	RAMP SHAPE 1
2205	ACCELER TIME 2
2206	DECELER TIME 2
2207	RAMP SHAPE 2
2208	EM DEC TIME
2209	RAMP INPUT 0
GROUP 23	
SPEED CONTROL	
2301	PROP GAIN
2302	INTEGRATION TIME
2303	DERIVATION TIME
2304	ACC
	COMPENSATION
2305	AUTOTUNE RUN
GROUP 25	
CRITICAL SPEEDS	
2501	CRIT SPEED SEL
2502	CRIT SPEED 1 LO
2503	CRIT SPEED 1 HI
2504	CRIT SPEED 2 LO
2505	CRIT SPEED 2 HI
2506	CRIT SPEED 3 LO
2507	CRIT SPEED 3 HI
GROUP 26	
MOTOR CONTROL	
2601	FLUX OPT ENABLE
2602	FLUX BRAKING
2603	IR COMP VOLT
2604	IR COMP FREQ
2605	U/F RATIO
2606	SWITCHING FREQ
2607	SW FREQ CTRL
2608	SLIP COMP RATIO
2609	NOISE
	SMOOTHING
2619	DC STABILIZER
2625	OVERMODULATION
	CHG
GROUP 29	
MAINTENANCE TRIG	
2901	COOLING FAN TRIG
2902	COOLING FAN ACT
2903	REVOLUTION TRIG
2904	REVOLUTION ACT
2905	RUN TIME TRIG
2906	RUN TIME ACT
2907	USER MWH TRIG
2908	USER MWH ACT
GROUP 30	
FAULT FUNCTIONS	
3001	AI<MIN FUNCTION
3002	PANEL COMM ERR
3003	EXTERNAL FAULT 1
3004	EXTERNAL FAULT 2
3005	MOT THERM PROT
3006	MOT THERM TIME
3007	MOT LOAD CURVE
3008	ZERO SPEED LOAD
3009	BREAK POINT
	FREQ
3010	STALL FUNCTION
3011	STALL
	FREQUENCY
3012	STALL TIME
3017	EARTH FAULT
3018	COMM FAULT
	FUNC
3019	COMM FAULT TIME
3021	AI1 FAULT LIMIT
3022	AI2 FAULT LIMIT
3023	WIRING FAULT
3024	CB TEMP FAULT
3028	EARTH FAULT LVL
GROUP 31	
AUTOMATIC RESET	
3101	NR OF TRIALS
3102	TRIAL TIME
3103	DELAY TIME
3104	AR OVERCURRENT
3105	AR OVERVOLTAGE
3106	AR
	UNDERVOLTAGE
3107	AR AI-MIN
3108	AR EXTERNAL FLT
GROUP 32	
SUPERVISION	
3201	SUPERV 1 PARAM
3202	SUPERV 1 LIM LO
3203	SUPERV 1 LIM HI
3204	SUPERV 2 PARAM
3205	SUPERV 2 LIM LO
3206	SUPERV 2 LIM HI
3207	SUPERV 3 PARAM
3208	SUPERV 3 LIM LO
3209	SUPERV 3 LIM HI
GROUP 33	
INFORMATION	
3301	FW VERSION
3302	LP VERSION
3303	TEST DATE
3304	DRIVE RATING
3305	PARTABLE
	VERSION
GROUP 34	
PANEL DISPLAY	
3401	SIGNAL 1 PARAM
3402	SIGNAL 1 MIN
3403	SIGNAL 1 MAX
3404	OUTPUT 1 DSP
	FORM
3405	OUTPUT 1 UNIT
3406	OUTPUT 1 MIN
3407	OUTPUT 1 MAX
3408	SIGNAL 2 PARAM
3409	SIGNAL 2 MIN
3410	SIGNAL 2 MAX
3411	OUTPUT 2 DSP
	FORM
3412	OUTPUT 2 UNIT
3413	OUTPUT 2 MIN
3414	OUTPUT 2 MAX
3415	SIGNAL 3 PARAM
3416	SIGNAL 3 MIN
3417	SIGNAL 3 MAX
3418	OUTPUT 3 DSP
	FORM
3419	OUTPUT 3 UNIT
3420	OUTPUT 3 MIN
3421	OUTPUT 3 MAX
GROUP 35	
MOTOR TEMP MEAS	
3501	SENSOR TYPE
3502	INPUT SELECTION
3503	ALARM LIMIT
3504	FAULT LIMIT
GROUP 36	
TIMED FUNCTIONS	
3601	TIMERS ENABLE
3602	START TIME 1
3603	STOP TIME 1
3604	START DAY 1
3605	STOP DAY 1
3606	START TIME 2
3607	STOP TIME 2
3608	START DAY 2
3609	STOP DAY 2
3610	START TIME 3
3611	STOP TIME 3
3612	START DAY 3
3613	STOP DAY 3
3614	START TIME 4
3615	STOP TIME 4
3616	START DAY 4
3617	STOP DAY 4
3622	BOOST SEL
3623	BOOST TIME
3626	TIMER 1 SRC
3627	TIMER 2 SRC
3628	TIMER 3 SRC
3629	TIMER 4 SRC
GROUP 37	
USER LOAD CURVE	
3701	USER LOAD C
	MODE
3702	USER LOAD C
	FUNC
3703	USER LOAD C TIME
3704	LOAD FREQ 1
3705	LOAD TORQ LOW 1
3706	LOAD TORQ HIGH 1
3707	LOAD FREQ 2
3708	LOAD TORQ LOW 2
3709	LOAD TORQ HIGH 2
3710	LOAD FREQ 3
3711	LOAD TORQ LOW 3
3712	LOAD TORQ HIGH 3
3713	LOAD FREQ 4
3714	LOAD TORQ LOW 4
3715	LOAD TORQ HIGH 4
3716	LOAD FREQ 5
3717	LOAD TORQ LOW 5
3718	LOAD TORQ HIGH 5
GROUP 40	
PROCESS PID SET 1	
4001	GAIN
4002	INTEGRATION TIME
4003	DERIVATION TIME
4004	PID DERIV FILTER
4005	ERROR VALUE INV
4006	UNITS
4007	DSP FORMAT
4008	0% VALUE
4009	100% VALUE
4010	SET POINT SEL
4011	INTERNAL SETPNT
4012	SETPOINT MIN
4013	SETPOINT MAX
4014	FBK SEL
4015	FBK MULTIPLIER
4016	ACT1 INPUT
4017	ACT2 INPUT
4018	ACT1 MINIMUM
4019	ACT1 MAXIMUM
4020	ACT2 MINIMUM
4021	ACT2 MAXIMUM
4022	SLEEP SELECTION
4023	PID SLEEP LEVEL
4024	PID SLEEP DELAY
4025	WAKE-UP DEV
4026	WAKE-UP DELAY
4027	PID 1 PARAM SET
GROUP 41	
PROCESS PID SET 2	
4101	GAIN
4102	INTEGRATION TIME
4103	DERIVATION TIME
4104	PID DERIV FILTER
4105	ERROR VALUE INV
4106	UNITS
4107	UNIT SCALE
4108	0% VALUE
4109	100% VALUE
4110	SET POINT SEL
4111	INTERNAL SETPNT
4112	SETPOINT MIN
4113	SETPOINT MAX
4114	FBK SEL
4115	FBK MULTIPLIER
4116	ACT1 INPUT

4117	ACT2 INPUT
4118	ACT1 MINIMUM
4119	ACT1 MAXIMUM
4120	ACT2 MINIMUM
4121	ACT2 MAXIMUM
4122	SLEEP SELECTION
4123	PID SLEEP LEVEL
4124	PID SLEEP DELAY
4125	WAKE-UP DEV
4126	WAKE-UP DELAY
GROUP 42	
EXT / TRIM PID	
4201	GAIN
4202	INTEGRATION TIME
4203	DERIVATION TIME
4204	PID DERIV FILTER
4205	ERROR VALUE INV
4206	UNITS
4207	DSP FORMAT
4208	0% VALUE
4209	100% VALUE
4210	SET POINT SEL
4211	INTERNAL SETPNT
4212	SETPOINT MIN
4213	SETPOINT MAX
4214	FBK SEL
4215	FBK MULTIPLIER
4216	ACT1 INPUT
4217	ACT2 INPUT
4218	ACT1 MINIMUM
4219	ACT1 MAXIMUM
4220	ACT2 MINIMUM
4221	ACT2 MAXIMUM
4228	ACTIVATE
4229	OFFSET
4230	TRIM MODE
4231	TRIM SCALE
4232	CORRECTION SRC
GROUP 45	
ENERGY SAVING	
4502	ENERGY PRICE
4507	CO2 CONV FACTOR
4508	PUMP POWER
4509	ENERGY RESET
GROUP 51	
EXT COMM MODULE	
5101	FBA TYPE
5102	FBA PAR 2...26
5127	FBA PAR REFRESH
5128	FILE CPI FW REV
5129	FILE CONFIG ID
2130	FILE CONFIG REV
5131	FBA STATUS
5132	FBA CPI FW REV
5133	FBA APPL FW REV
GROUP 52	
PANEL COMM	
5201	STATION ID
5202	BAUD RATE
5203	PARITY
5204	OK MESSAGES
5205	PARITY ERRORS
5206	FRAME ERRORS
5207	BUFFER
	OVERRUNS
5208	CRC ERRORS
GROUP 53	
EFB PROTOCOL	
5301	EFB PROTOCOL ID
5302	EFB STATION ID
5303	EFB BAUD RATE
5304	EFB PARITY
5305	EFB CTRL PROFILE
5306	EFB OK
	MESSAGES
5307	EFB CRC ERRORS
5308	EFB UART ERRORS
5309	EFB STATUS
5310	EFB PAR 10-18
5319	EFB PAR 19-20
GROUP 64	
LOAD ANALYZER	
6401	PVL SIGNAL
6402	PVL FILTER TIME
6403	LOGGERS RESET
6404	AL2 SIGNAL
6405	AL2 SIGNAL BASE
6406	PEAK VALUE
6407	PEAK TIME 1
6408	PEAK TIME 2
6409	CURRENT AT PEAK

6410	UDC AT PEAK
6411	FREQ AT PEAK
6412	TIME OF RESET 1
6413	TIME OF RESET 2
6414	AL1RANGE0TO10
6415	AL1RANGE10TO20
6416	AL1RANGE20TO30
6417	AL1RANGE30TO40
6418	AL1RANGE40TO50
6419	AL1RANGE50TO60
6420	AL1RANGE60TO70
6421	AL1RANGE70TO80
6422	AL1RANGE80TO90
6423	AL1RANGE90TO
6424	AL2RANGE0TO10
6425	AL2RANGE10TO20
6426	AL2RANGE20TO30
6427	AL2RANGE30TO40
6428	AL2RANGE40TO50
6429	AL2RANGE50TO60
6430	AL2RANGE60TO70
6431	AL2RANGE70TO80
6432	AL2RANGE80TO90
6433	AL2RANGE90TO
GROUP 81	
PFA CONTROL	
8103	REFERENCE STEP
	1
8104	REFERENCE STEP
	2
8105	REFERENCE STEP
	3
8109	START FREQ 1
8110	START FREQ 2
8111	START FREQ 3
8112	LOW FREQ 1
8113	LOW FREQ 2
8114	LOW FREQ 3
8115	AUX MOT START D
8116	AUX MOT STOP D
8117	NR OF AUX MOT
8118	AUTOCHNG
	INTERV
8119	AUTOCHNG LEVEL
8120	INTERLOCKS
8121	REG BYPASS CTRL
8122	PFA START DELAY
8123	PFA ENABLE
8124	ACC IN AUX STOP
8125	DEC IN AUX START
8126	TIMED AUTOCHNG
8127	MOTORS
8128	AUX START ORDER
GROUP 98	
OPTIONS	
9802	COMM PROT SEL
GROUP 99	
START-UP DATA	
9901	LANGUAGE
9902	APPLIC MACRO
9904	MOTOR CTRL
	MODE
9905	MOTOR NOM VOLT
9906	MOTOR NOM CURR
9907	MOTOR NOM FREQ
9908	MOTOR NOM
	SPEED
9909	MOTOR NOM
	POWER
9915	MOTOR COSPHI

For E-Clipse Bypass Drive

GROUP 01	
ACTUAL DATA	
0101	MOTOR CURR
0102	INPUT VOLT
0103	DI STATUS
0104	RO STATUS
0105	PCB TEMP
0106	KW HOURS
0107	COMM RO
0108	RUN TIME
0109	ON TIME 1
0110	ON TIME 2

0111	A-B VOLT
0112	B-C VOLT
0113	C-A VOLT
0114	MWH SAVED
0115	COST SAVED
0116	CO2 SAVED
0117	KWH SAVE L
0118	KWH SAVE H
GROUP 03	
STATUS	
0301	FBUS CW 1
0303	FBUS SW 1
0305	FLT WORD 1
0306	FLT WORD 2
0307	FLT WORD 3
0308	ALR WORD 1
0309	ALR WORD 2
GROUP 04	
FAULT LOG	
0401	LAST FAULT
0402	F1 TIME 1
0403	F1 TIME 2
0404	F1 VOLTAGE
0405	F1 CURRENT
0406	F1 EVENT 1
0407	F1 E1 TIME
0408	F1 EVENT 2
0409	F1 E2 TIME
0410	FAULT 2
0411	F2 TIME 1
0412	F2 TIME 2
0413	F2 VOLTAGE
0414	F2 CURRENT
0415	F2 EVENT 1
0416	F2 E1 TIME
0417	F2 EVENT 2
0418	F2 E2 TIME
0419	FAULT 3
0420	FAULT 4
0421	FAULT 5
GROUP 05	
EVENT LOG	
0501	LAST EVENT
0502	E1 TIME 1
0503	E1 TIME 2
0504	EVENT 2
0505	E2 TIME 1
0506	E2 TIME 2
0507	EVENT 3
0508	E3 TIME 1
0509	E3 TIME 2
0510	EVENT 4
0511	E4 TIME 1
0512	E4 TIME 2
GROUP 14	
RELAY OUT	
1401	RO1 SELECT
1402	R1 ON DLY
1403	R1 OFF DLY
1404	RO2 SELECT
1405	R2 ON DLY
1406	R2 OFF DLY
1407	RO3 SELECT
1408	R3 ON DLY
1409	R3 OFF DLY
1410	RO4 SELECT
1411	R4 ON DLY
1412	R4 OFF DLY
1413	RO5 SELECT
1414	R5 ON DLY
1415	R5 OFF DLY
GROUP 16	
SYSTEM CTRL	
1601	START/STOP
1602	RUN ENABLE
1603	START EN 1
1604	START EN 2
1605	START EN 3
1606	START EN 4
1607	RESET SRC
1608	AUTO XFR
1609	OC TRANSFR
1610	OV TRANSFR
1611	UV TRANSFR
1612	AI TRANSFR
1613	BP DISABLE
1614	BP RUN DLY
1615	SAVE PARAM
1616	DISP ALRMS
1617	DRIVE TEST
1618	PASS CODE
1619	PAR LOCK

1620	RUN EN TXT
1621	ST EN1 TXT
1622	ST EN2 TXT
1623	ST EN3 TXT
1624	ST EN4 TXT
1625	COMM CTRL
1626	MODE LOCK
1627	COST/KWH
1628	LEARN MODE
1629	LEARN TIME
1630	REVERSE REQ
1631	DRV/BYPASS
GROUP 17	
OVERRIDE 2	
1701	OVERRIDE 2
1702	RUN EN OVR
1703	ST EN1 OVR
1704	ST EN2 OVR
1706	ST EN4 OVR
1707	FAULTS OVR
1708	OVRD2 MODE
GROUP 30	
FLT FUNCTION	
3001	UL ACTION
3002	UL TIME
3003	UL TRIP %
3004	COMM LOSS
3005	COMM TIME
3006	PHASE LOSS
3007	PHASE SEQ
3008	BYPASS MOL
GROUP 32	
SUPERV CTRL	
3201	SUPER CTRL
3202	START LVL
3203	STOP LEVEL
3204	START DLY
3205	STOP DLY
3206	FBK LOSS
GROUP 33	
INFORMATION	
3301	FW VERSION
3302	PT VERSION
3303	LP VERSION
3304	CB VERSION
3305	TEST DATE
3306	DRIVE TYPE
3307	SUB ASMBLY
3308	PLANT CODE
3309	MFG DATE
3310	UNIT NUM
GROUP 50	
BYPASS EFB	
5001	BP PROT ID
5002	BP MAC ID
5003	BAUD RATE
5004	EFB PARITY
5005	PROFILE
5006	BP OK MSG
5007	BP CRC ERR
5008	UART ERROR
5009	BP STATUS
5010	BP PAR 10
5011	BP PAR 11
5012	BP PAR 12
5013	BP PAR 13
5014	BP PAR 14
5015	BP PAR 15
5016	BP PAR 16
5017	BP PAR 17
5018	BP PAR 18
5019	BP PAR 19
5020	BP PAR 20
GROUP 51	
EXT COMM MOD	
5101	FBA TYPE
5102	FBA PAR 2
5103	FBA PAR 3
5104	FBA PAR 4
5105	FBA PAR 5
5106	FBA PAR 6
5107	FBA PAR 7
5108	FBA PAR 8
5109	FBA PAR 9
5110	FBA PAR 10
5111	FBA PAR 11
5112	FBA PAR 12
5113	FBA PAR 13
5114	FBA PAR 14
5115	FBA PAR 15
5116	FBA PAR 16
5117	FBA PAR 17

5118	FBA PAR 18
5119	FBA PAR 19
5120	FBA PAR 20
5121	FBA PAR 21
5122	FBA PAR 22
5123	FBA PAR 23
5124	FBA PAR 24
5125	FBA PAR 25
5126	FBA PAR 26
5127	REFRESH
5128	FBA PAR 28
5129	FBA PAR 29
5130	FBA PAR 30
5131	FBA STATUS
5132	FBA PAR 32
5133	FBA PAR 33
GROUP 53	
DRIVE EFB	
5301	DV PROT ID
5302	DV MAC ID
5303	BAUD RATE
5304	EFB PARITY
5305	PROFILE
5306	DV OK MSG
5307	DV CRC ERR
5308	UART ERROR
5309	DV STATUS
5310	DV PAR 10
5311	DV PAR 11
5312	DV PAR 12
5313	DV PAR 13
5314	DV PAR 14
5315	DV PAR 15
5316	DV PAR 16
5317	DV PAR 17
5318	DV PAR 18
5319	DV PAR 19
5320	DV PAR 20
GROUP 54	
FBA DATA IN	
5401	DATA IN 1
5402	DATA IN 2
5403	DATA IN 3
5404	DATA IN 4
5405	DATA IN 5
5406	DATA IN 6
5407	DATA IN 7
5408	DATA IN 8
5409	DATA IN 9
GROUP 55	
FBA DATA OUT	
5501	DATA OUT 1
5502	DATA OUT 2
5503	DATA OUT 3
5504	DATA OUT 4
5505	DATA OUT 5
5506	DATA OUT 6
5507	DATA OUT 7
5508	DATA OUT 8
5509	DATA OUT 9
5510	DATA OUT 10
GROUP 98	
OPTIONS	
9802	COMM PROT SEL
GROUP 99	
STARTUP DATA	
9902	B.P. MACRO



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