

# 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

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## 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.

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

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# 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-PCR/PDR

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## Installation

This information is unique to ACH550 input disconnect configurations (PCR or PDR). The ACH550 with Input Disconnect is an ACH550 AC adjustable frequency drive packaged with an input disconnect switch or circuit breaker. Refer to the [Installation](#) instructions on page 3, for all other information. **Failure to observe the warnings and instructions may cause a malfunction or personal hazard.**



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

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**WARNING!** When the ACH550 with Input Disconnect 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 Input Disconnect 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.

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### 1. Install wiring

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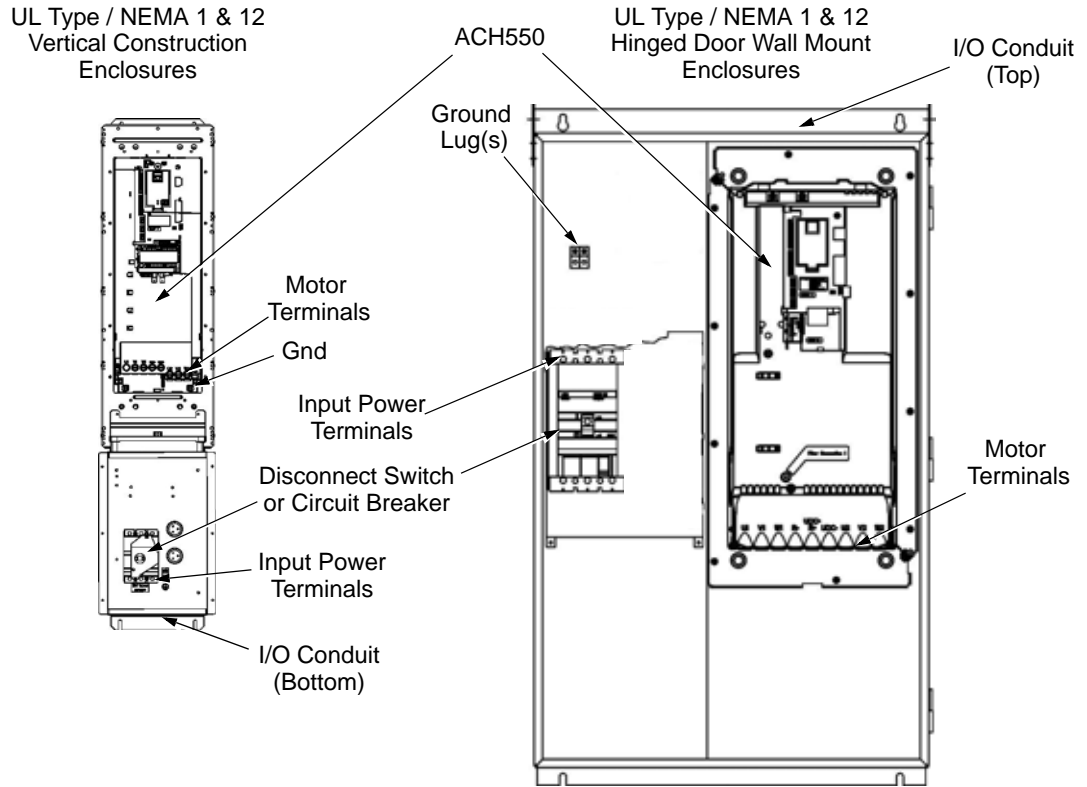


**WARNING!**

- Metal shavings or debris in the enclosure can damage electrical equipment and create a hazardous condition. Where parts, such as conduit plates require cutting or drilling, first remove the part. If that is not practical, cover nearby electrical components to protect them from all shavings or debris.
  - 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.
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Connection diagrams – standard drive with input disconnect (wall mounted)

The following figure shows the Standard Drive with Input Disconnect (wall mounted) wiring connection points.



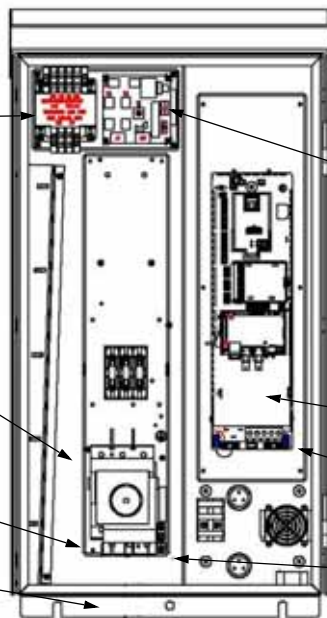
UL Type / NEMA 3R Enclosures

Fan/Space Heater Power Supply & Control Assembly

Disconnect Switch or Circuit Breaker

Input Power Terminals

I/O Conduit (Bottom)



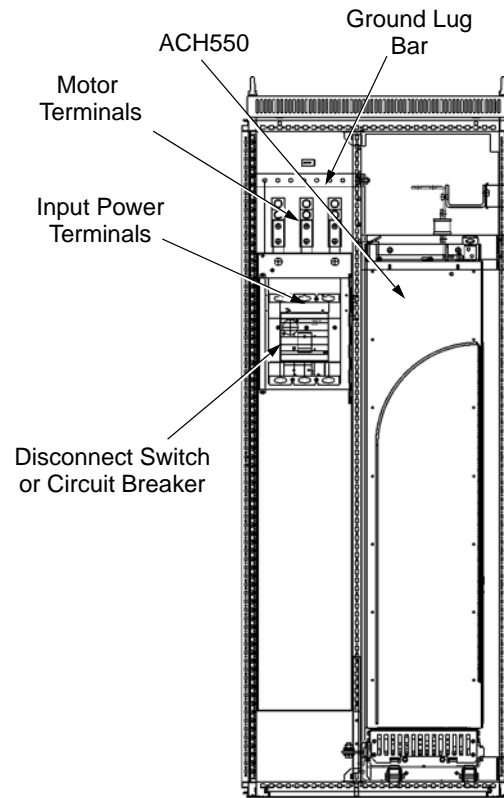
RHTR Temperature HI / LO Jumper (X1)	Heater ON Temperature	Heater OFF Temperature
Default Setting (X1 jumper in LO position)	14.4 °C 58 °F	21.4 °C 70.5 °F
Alternate Setting (X1 jumper in HI position)	17.8 °C 64 °F	24.7 °C 76.5 °C

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

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

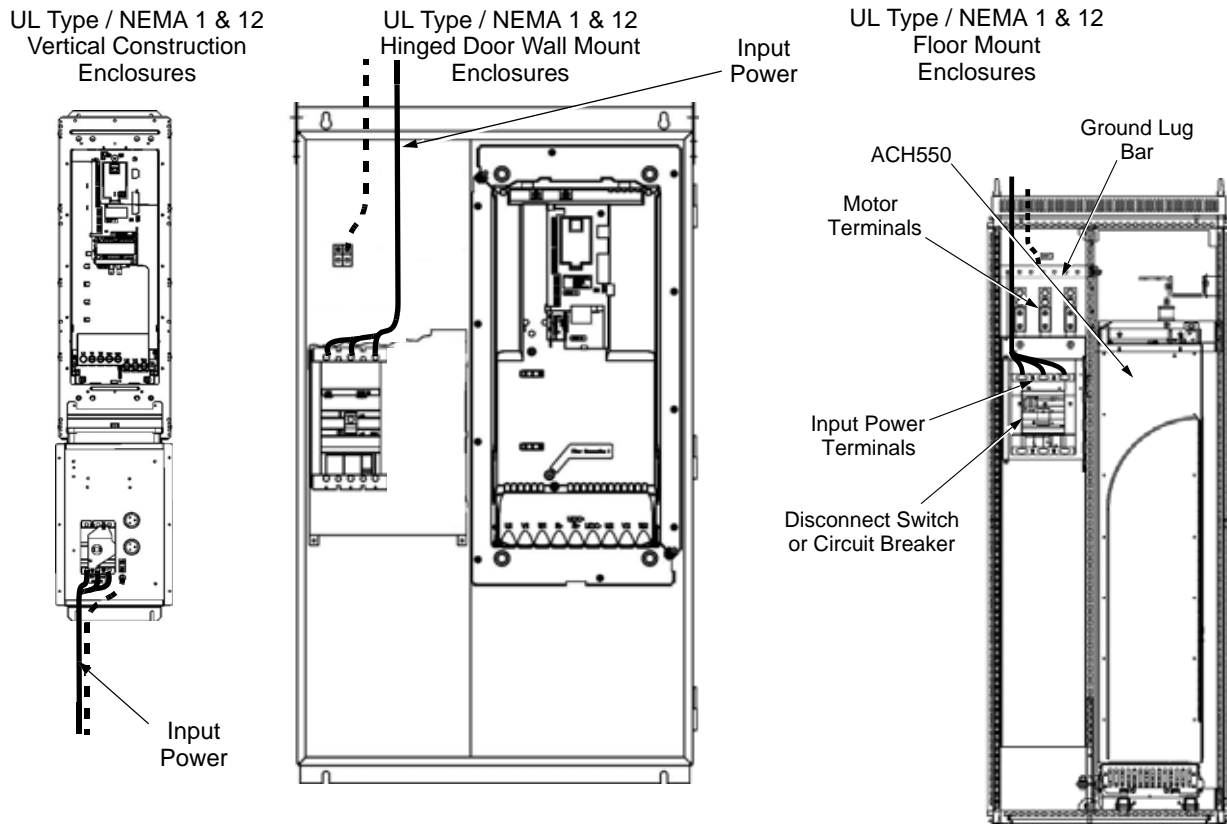
*Connection diagrams – standard drive with input disconnect (floor mounted)*

Floor mounted UL Type / NEMA 1 & 12 Drive with Input Disconnect units are configured for wiring access from the top and include a removable conduit mounting plate. The following figure shows the wiring connection points.



*Line input connections – standard drive with input disconnect configurations*

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 Drive with Input Disconnect configurations.



Dashed line is ground run.

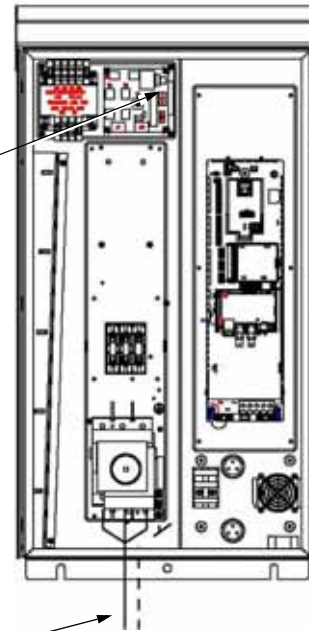
**Note:** The terminals on disconnect switches for the following rated ACH550-PDR products is 7 in-lbs. Do not use a power driver or over tighten to prevent breaking screw heads or stripping the terminal.

230 VAC	460 VAC	600 VAC
-04A6-2	-03A3-4	-02A7-6
-06A6-2	-04A1-4	-03A9-6
-07A5-2	-06A9-4	-06A1-6
-012A-2	-08A8-4	-09A0-6
-017A-2	-012A-4	-011A-6
-024A-2	-015A-4	-017A-6
-031A-2	-023A-4	

UL Type / NEMA 3R Enclosures

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.



Input Power



**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.

**Note:** For the remainder of the wiring (motor and control wiring) refer to page 7.



### Power connection terminals

The following tables show maximum wire size and required tightening torque for incoming power, grounding and motor terminals.

208/240 Volt		Base Drive Frame Size	Power Wiring Data <sup>2</sup>						
HP	Type Code <sup>1</sup>		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	Ground Lugs UL Type/ NEMA 1&12	Ground Lugs UL Type / NEMA 3R
1	ACH550-PxR-04A6-2	R1	#10 35 in-lbs	#10 35 in-lbs	#10 7 in-lbs	#10 7 in-lbs	Refer to Drive's power connection terminals	#10 35 in-lbs	#10 35 in-lbs
1.5	ACH550-PxR-06A6-2	R1							
2	ACH550-PxR-07A5-2	R1							
3	ACH550-PxR-012A-2	R1							
5	ACH550-PxR-017A-2	R1							
7.5	ACH550-PxR-024A-2	R2	#6 45 in-lbs	#6 45 in-lbs	#8 7 in-lbs	#8 7 in-lbs		#6 35 in-lbs	#6 35 in-lbs
10	ACH550-PxR-031A-2	R2	#3 50 in-lbs	#3 50 in-lbs	#4 18 in-lbs	#4 18 in-lbs		#3 50 in-lbs	#3 50 in-lbs
15	ACH550-PxR-046A-2	R3							
20	ACH550-PxR-059A-2	R3							
25	ACH550-PxR-075A-2	R4	#1 50 in-lbs	#1 50 in-lbs	#1 55 in-lbs	#1 55 in-lbs		#2 50 in-lbs	#2 50 in-lbs
30	ACH550-PxR-088A-2	R4	350 MCM 274 in-lbs	300 MCM 200 in-lbs	#1/0 70 in-lbs	#1/0 70 in-lbs			
40	ACH550-PxR-114A-2	R4			300 MCM 275 in-lbs	300 MCM 200 in-lbs			
50	ACH550-PxR-143A-2	R6							
60	ACH550-PxR-178A-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	3 x #3/0 250 in-lbs
75	ACH550-PxR-221A-2	R6							
100	ACH550-PxR-248A-2	R6	350 MCM 100 in-lbs						

1. "PxR" represents both PCR and PDR.

2. Torque values shown relate to current production. Check component labels on previously installed units for required tightening torque.

480 Volt		Base Drive Frame Size	Power Wiring Data <sup>2</sup>						
HP	Type Code <sup>1</sup>		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	Ground Lugs UL Type/ NEMA 1&12	Ground Lugs UL Type/ NEMA 3R
1/1.5	ACH550-PxR-03A3-4	R1	#10 35 in-lbs	#10 35 in-lbs	#10 7 in-lbs	#10 7 in-lbs	Refer to Drive's power connection terminals	#10 35 in-lbs	#10 35 in-lbs
2	ACH550-PxR-04A1-4	R1							
3	ACH550-PxR-06A9-4	R1							
5	ACH550-PxR-08A8-4	R1							
7.5	ACH550-PxR-012A-4	R1							
10	ACH550-PxR-015A-4	R2	#6 45 in-lbs	#6 45 in-lbs	#8 7 in-lbs	#8 7 in-lbs		#6 35 in-lbs	#6 35 in-lbs
15	ACH550-PxR-023A-4	R2							
20	ACH550-PxR-031A-4	R3	#3 50 in-lbs	#3 50 in-lbs	#4 18 in-lbs	#4 18 in-lbs		#3 50 in-lbs	#3 50 in-lbs
25	ACH550-PxR-038A-4	R3							
30	ACH550-PxR-045A-4	R3							
40	ACH550-PxR-059A-4	R4	#1 50 in-lbs	#1 50 in-lbs	#1 55 in-lbs	#1 55 in-lbs		#1 50 in-lbs	#1 50 in-lbs
50	ACH550-PxR-072A-4	R4							
60	ACH550-PxR-078A-4	R4							
75	ACH550-PxR-097A-4	R4	350 MCM 274 in-lbs	300 MCM 200 in-lbs	#1/0 70 in-lbs	#1/0 70 in-lbs		3 x #3/0 250 in-lbs	#2 50 in-lbs
100	ACH550-PxR-125A-4	R5			300 MCM 275 in-lbs	300 MCM 200 in-lbs			
125	ACH550-PxR-157A-4	R6					300 MCM 275 in-lbs		300 MCM 200 in-lbs
150	ACH550-PxR-180A-4	R6							
200	ACH550-PxR-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	5 Bus Bar Holes (13/32")	350 MCM 100 in-lbs	
250	ACH550-PxR-316A-4	R8	2 x 500 MCM 274 in-lbs		2 x 500 MCM 274 in-lbs				
300	ACH550-PxR-368A-4	R8							
350	ACH550-PxR-414A-4	R8							
400	ACH550-PxR-486A-4	R8							
450	ACH550-PxR-526A-4	R8	3 x 400 MCM 375 in-lbs		3 x 400 MCM 375 in-lbs				
500	ACH550-PxR-602A-4	R8							
550	ACH550-PxR-645A-4	R8							

1. "PxR" represents both PCR and PDR.

2. Torque values shown relate to current production. Check component labels on previously installed units for required tightening torque.

600 Volt		Frame Size	Power Wiring Data <sup>2</sup>						
HP	Type Code <sup>1</sup>		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	Ground Lugs UL Type / NEMA 1&12	Ground Lugs UL Type / NEMA 3R
2	ACH550-PxR-02A7-6	R2	#6 62 in-lbs	#6 62 in-lbs	#8 7 in-lbs	#8 7 in-lbs	Refer to Drive's power connection terminals	#6 35 in-lbs	#6 35 in-lbs
3	ACH550-PxR-03A9-6	R2							
5	ACH550-PxR-06A1-6	R2							
7.5	ACH550-PxR-09A0-6	R2							
10	ACH550-PxR-011A-6	R2							
15	ACH550-PxR-017A-6	R2	#3 62 in-lbs	#3 62 in-lbs	#4 18 in-lbs	#4 18 in-lbs		#3 50 in-lbs	#3 50 in-lbs
20	ACH550-PxR-022A-6	R3							
25	ACH550-PxR-027A-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
30	ACH550-PxR-032A-6	R4							
40	ACH550-PxR-041A-6	R4							
50	ACH550-PxR-052A-6	R4			#1 62 in-lbs	#1 62 in-lbs	#1/0 70 in-lbs		
60	ACH550-PxR-062A-6	R4							
75	ACH550-PxR-077A-6	R6	350 MCM 274 in-lbs	300 MCM 275 in-lbs	300 MCM 275 in-lbs	300 MCM 200 in-lbs			
100	ACH550-PxR-099A-6	R6							
125	ACH550-PxR-125A-6	R6							
150	ACH550-PxR-144A-6	R6							

1. "PxR" represents both PCR and PDR.

2. Torque values shown relate to current production. Check component labels on previously installed units for required tightening torque.

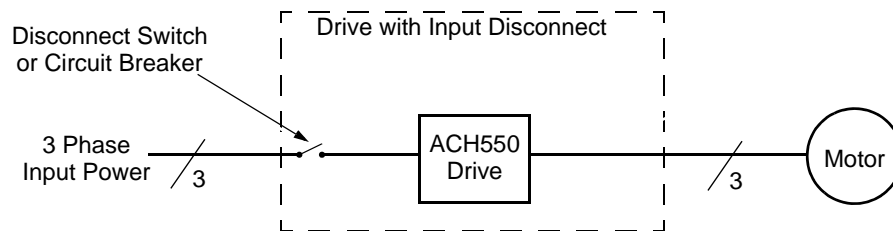
## Operation

This information is unique to ACH550 input disconnect configurations (PCR or PDR). Refer to the [Operation](#) instructions on page 21 for all other information.

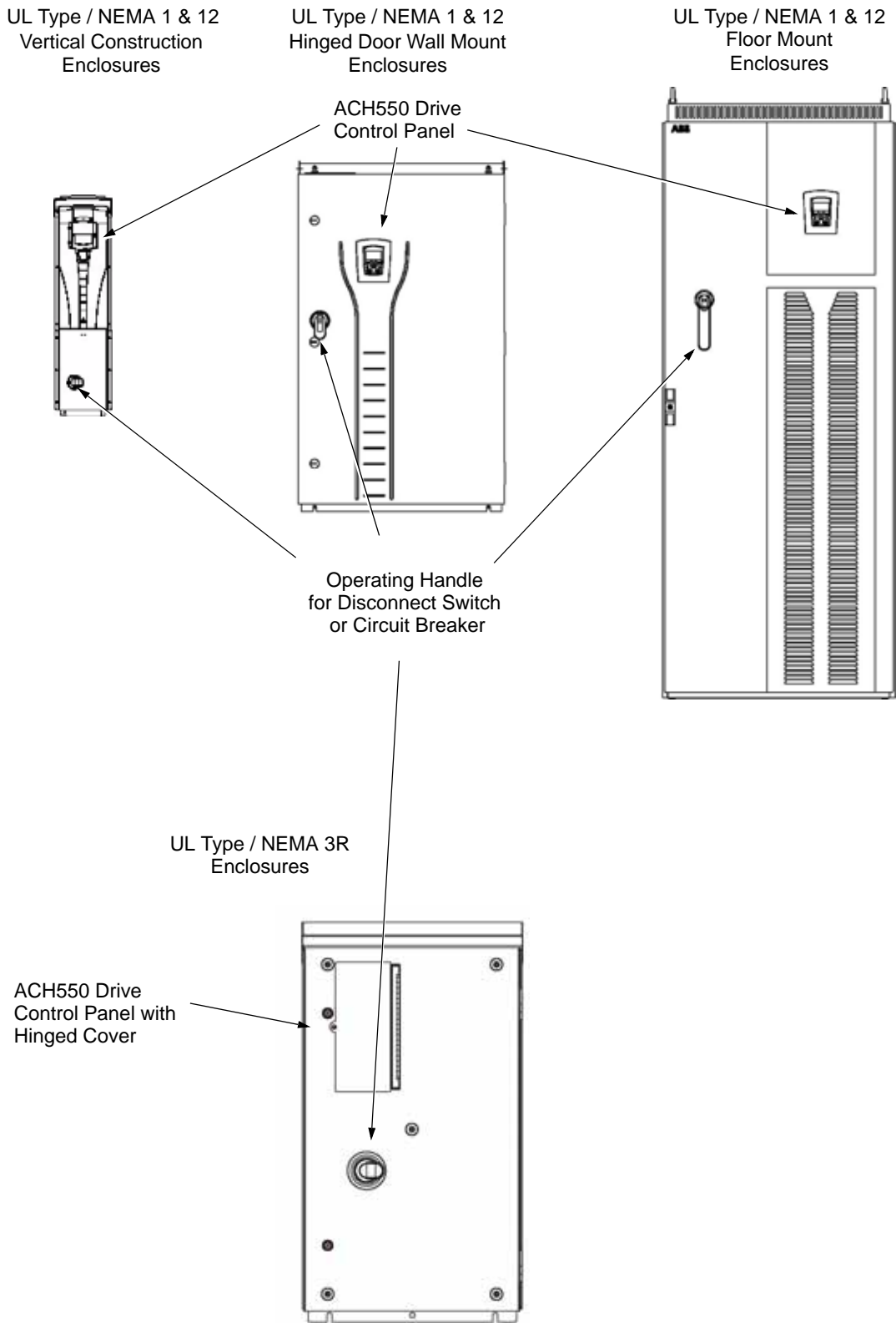
### Input disconnect configuration

The ACH550 with Input Disconnect is an ACH550 AC adjustable frequency drive packaged with an input disconnect switch or circuit breaker, and with a door interlocked, external operating handle. The operating handle can be padlocked in the OFF position (padlock not supplied). Enclosure options are UL Type 1, UL Type 12, and UL Type 3R (NEMA 1, NEMA 12, and NEMA 3R).

The following is a typical power diagram.



The following shows the front view of the ACH550 Drive with Input Disconnect standard configurations, and identifies the major components.



## Maintenance

### Maintenance intervals

If installed in an appropriate environment, the drive requires very little maintenance. This table lists the routine maintenance intervals recommended by ABB for ACH550 enclosures in addition to the intervals on page 31.

Maintenance	Configuration	Interval	Instruction
Check/replace hinged door wall mount enclosure inlet air filter	Hinged door wall mount UL Type / NEMA 12 enclosures	Check every 3 months. Replace as needed.	<a href="#">Enclosure air filter replacement – UL Type / NEMA 12 hinged door wall mount enclosures</a> on page 89.
Check/replace floor mount enclosure inlet air filter	Floor mount UL Type / NEMA 12 enclosures	Check every 3 months. Replace as needed.	See <a href="#">Maintenance</a> on page 34 and <a href="#">Enclosure air filter replacement – UL Type / NEMA 12 hinged door wall mount enclosures</a> on page 89.
Check/replace NEMA 3R enclosure air filters	UL Type / NEMA 3R enclosures - PX3R-5 and higher	Check every 3 months. Replace as needed.	See PX3R dimensional information.
Check/replace floor mount enclosure exhaust air filter.	Floor mount UL Type / NEMA 12 enclosures	Check every 6 months. Replace as needed.	See <a href="#">Maintenance</a> on page 35 and <a href="#">Enclosure air filter replacement – UL Type / NEMA 12 hinged door wall mount enclosures</a> on page 89.

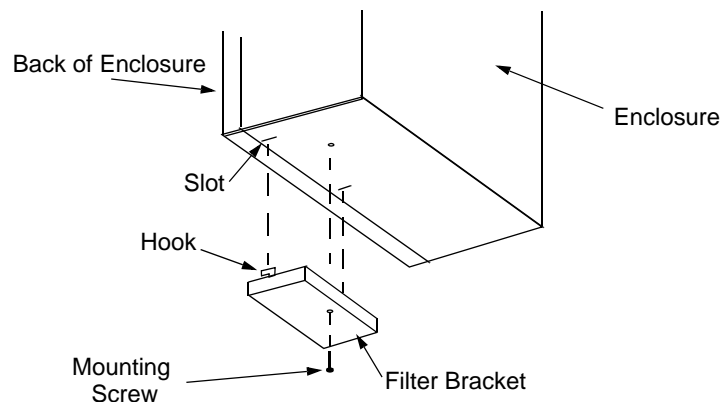
### Enclosure air filter replacement – UL Type / NEMA 12 hinged door wall mount enclosures

#### Filter material

Material	Filter Type
American Air Filter (358-35-06A-12A)	Polykleon White 12.7 mm x 152.4 mm x 304.6 mm stk

This procedure applies to drive with input disconnect configurations in UL Type / NEMA 12 hinged door wall mount enclosures. This filter is located at the bottom of the enclosure. Use the following procedure to check and replace filters.

1. On the enclosure, remove the screw holding the filter bracket in place.
2. Slide the filter bracket forward until the hooks on the bracket clear the slots on the enclosure base. This step allows the filter and bracket to drop free from the enclosure.



3. Lift the filter out of the filter bracket and replace as appropriate.
4. With the filter in the filter bracket, align the hooks on the bracket with the slots in the enclosure base, and press the hooks up into the slots.
5. Slide the filter bracket back, making sure that the hooks catch on the enclosure.
6. Replace the mounting screw. Tighten until the gasket on the bracket is about 50% compressed.

### Enclosure air filter replacement – UL Type / NEMA 12 floor mount enclosures

#### Filter material

Enclosure Type	Inlet (door)	Outlet (roof)
UL Type / NEMA 12	3AUA0000006723 (qty 1)	3AUA0000006722 (qty 2)

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**Note:** When installing the filter media, the white side must face the outside of the cabinet and the colored side must face the inside of the cabinet. Refer to page [34](#).

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## Diagnostics

Refer to the [Diagnostics](#) instructions on page [24](#).

## Complete ACH550 Drive Parameter List

<b>GROUP 01</b>	
<b>OPERATING DATA</b>	
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
<b>GROUP 03</b>	
<b>FB ACTUAL SIGNALS</b>	
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
<b>GROUP 04</b>	
<b>FAULT HISTORY</b>	
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
<b>GROUP 10</b>	
<b>START/STOP/DIR</b>	
1001	EXT1 COMMANDS
1002	EXT2 COMMANDS
1003	DIRECTION
<b>GROUP 11</b>	
<b>REFERENCE SELECT</b>	
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
<b>GROUP 12</b>	
<b>CONSTANT SPEEDS</b>	
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
<b>GROUP 13</b>	
<b>ANALOG INPUTS</b>	
1301	MINIMUM AI1
1302	MAXIMUM AI1
1303	FILTER AI1
1304	MINIMUM AI2
1305	MAXIMUM AI2
1306	FILTER AI2
<b>GROUP 14</b>	
<b>RELAY OUTPUTS</b>	
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
<b>GROUP 15</b>	
<b>ANALOG OUTPUTS</b>	
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
<b>GROUP 16</b>	
<b>SYSTEM CONTROLS</b>	
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
<b>GROUP 17</b>	
<b>OVERRIDE</b>	
1701	OVERRIDE SEL
1702	OVERRIDE FREQ
1703	OVERRIDE SPEED
1704	OVERR PASS
	CODE
1705	OVERRIDE
1706	OVERRIDE DIR
1707	OVERRIDE REF
<b>GROUP 20</b>	
<b>LIMITS</b>	
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
<b>GROUP 21</b>	
<b>START/STOP</b>	
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
<b>GROUP 22</b>	
<b>ACCEL/DECCEL</b>	
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
<b>GROUP 23</b>	
<b>SPEED CONTROL</b>	
2301	PROP GAIN
2302	INTEGRATION TIME
2303	DERIVATION TIME
2304	ACC
	COMPENSATION
2305	AUTOTUNE RUN
<b>GROUP 25</b>	
<b>CRITICAL SPEEDS</b>	
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
<b>GROUP 26</b>	
<b>MOTOR CONTROL</b>	
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
<b>GROUP 29</b>	
<b>MAINTENANCE TRIG</b>	
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
<b>GROUP 30</b>	
<b>FAULT FUNCTIONS</b>	
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
<b>GROUP 31</b>	
<b>AUTOMATIC RESET</b>	
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
<b>GROUP 32</b>	
<b>SUPERVISION</b>	
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
<b>GROUP 33</b>	
<b>INFORMATION</b>	
3301	FW VERSION
3302	LP VERSION
3303	TEST DATE
3304	DRIVE RATING
3305	PARTABLE
	VERSION
<b>GROUP 34</b>	
<b>PANEL DISPLAY</b>	
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
<b>GROUP 35</b>	
<b>MOTOR TEMP MEAS</b>	
3501	SENSOR TYPE
3502	INPUT SELECTION
3503	ALARM LIMIT
3504	FAULT LIMIT
<b>GROUP 36</b>	
<b>TIMED FUNCTIONS</b>	
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
<b>GROUP 37</b>	
<b>USER LOAD CURVE</b>	
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
<b>GROUP 40</b>	
<b>PROCESS PID SET 1</b>	
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
<b>GROUP 41</b>	
<b>PROCESS PID SET 2</b>	
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
<b>GROUP 42</b>	
<b>EXT / TRIM PID</b>	
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
<b>GROUP 45</b>	
<b>ENERGY SAVING</b>	
4502	ENERGY PRICE
4507	CO2 CONV FACTOR
4508	PUMP POWER
4509	ENERGY RESET
<b>GROUP 51</b>	
<b>EXT COMM MODULE</b>	
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
<b>GROUP 52</b>	
<b>PANEL COMM</b>	
5201	STATION ID
5202	BAUD RATE
5203	PARITY
5204	OK MESSAGES
5205	PARITY ERRORS
5206	FRAME ERRORS
5207	BUFFER
	OVERRUNS
5208	CRC ERRORS
<b>GROUP 53</b>	
<b>EFB PROTOCOL</b>	
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
<b>GROUP 64</b>	
<b>LOAD ANALYZER</b>	
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
<b>GROUP 81</b>	
<b>PFA CONTROL</b>	
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
<b>GROUP 98</b>	
<b>OPTIONS</b>	
9802	COMM PROT SEL
<b>GROUP 99</b>	
<b>START-UP DATA</b>	
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

<b>GROUP 01</b>	
<b>ACTUAL DATA</b>	
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
<b>GROUP 03</b>	
<b>STATUS</b>	
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
<b>GROUP 04</b>	
<b>FAULT LOG</b>	
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
<b>GROUP 05</b>	
<b>EVENT LOG</b>	
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
<b>GROUP 14</b>	
<b>RELAY OUT</b>	
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
<b>GROUP 16</b>	
<b>SYSTEM CTRL</b>	
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
<b>GROUP 17</b>	
<b>OVERRIDE 2</b>	
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
<b>GROUP 30</b>	
<b>FLT FUNCTION</b>	
3001	UL ACTION
3002	UL TIME
3003	UL TRIP %
3004	COMM LOSS
3005	COMM TIME
3006	PHASE LOSS
3007	PHASE SEQ
3008	BYPASS MOL
<b>GROUP 32</b>	
<b>SUPERV CTRL</b>	
3201	SUPER CTRL
3202	START LVL
3203	STOP LEVEL
3204	START DLY
3205	STOP DLY
3206	FBK LOSS
<b>GROUP 33</b>	
<b>INFORMATION</b>	
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
<b>GROUP 50</b>	
<b>BYPASS EFB</b>	
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
<b>GROUP 51</b>	
<b>EXT COMM MOD</b>	
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
<b>GROUP 53</b>	
<b>DRIVE EFB</b>	
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
<b>GROUP 54</b>	
<b>FBA DATA IN</b>	
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
<b>GROUP 55</b>	
<b>FBA DATA OUT</b>	
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
<b>GROUP 98</b>	
<b>OPTIONS</b>	
9802	COMM PROT SEL
<b>GROUP 99</b>	
<b>STARTUP DATA</b>	
9902	B.P. MACRO



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