

User's Manual

ACH550-PC/PD Packaged Drive with Disconnect
Supplement to ACH550-UH HVAC User's Manual



ACH550 Drive Manuals

GENERAL MANUALS

ACH550-UH HVAC User's Manual (1...550 HP)

- Safety
- Installation
- Start-Up
- Embedded Fieldbus
- Fieldbus Adapter
- Diagnostics
- Maintenance
- Technical Data

ACH550-PC/PD Packaged Drive with Disconnect Supplement for ACH550-UH HVAC User's Manual

- Safety
- Installation
- Start-Up
- Maintenance
- Technical Data








E-Bypass Configurations (BC, BD, VC or VD) for ACH550 Drives (1...400 HP)

- Safety
- Installation
- Start-Up
- Technical Data

ACH550-CC/CD Packaged Drive with Classic Bypass Supplement for ACH550-UH HVAC User's Manual

- Safety
- Installation
- Start-Up
- Technical Data

Safety

-  **WARNING!** The ACH550 adjustable speed AC drive with Input Disconnect 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 and U2, V2, W2 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 removed 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 drive units 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 units or an external supply.
-  **WARNING!** The ACH550 will start up automatically after an input voltage interruption if the external run command is on.
-  **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.
-

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

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:

-  **Dangerous voltage warning warns of high voltage which can cause physical injury and/or damage to the equipment.**
-



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

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Installation

Study these installation instructions carefully before proceeding. **Failure to observe the warnings and instructions may cause a malfunction or personal hazard.**



WARNING! Before you begin read "Safety" on page 1.



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.

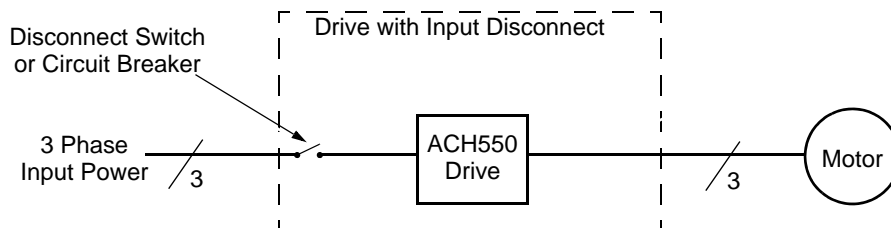
Application

This manual contains supplemental information that is unique to ACH550 input disconnect configurations (PC or PD). Refer to the base manual, ACH550-UH HVAC User's Manual (1...550 HP), for all other information.

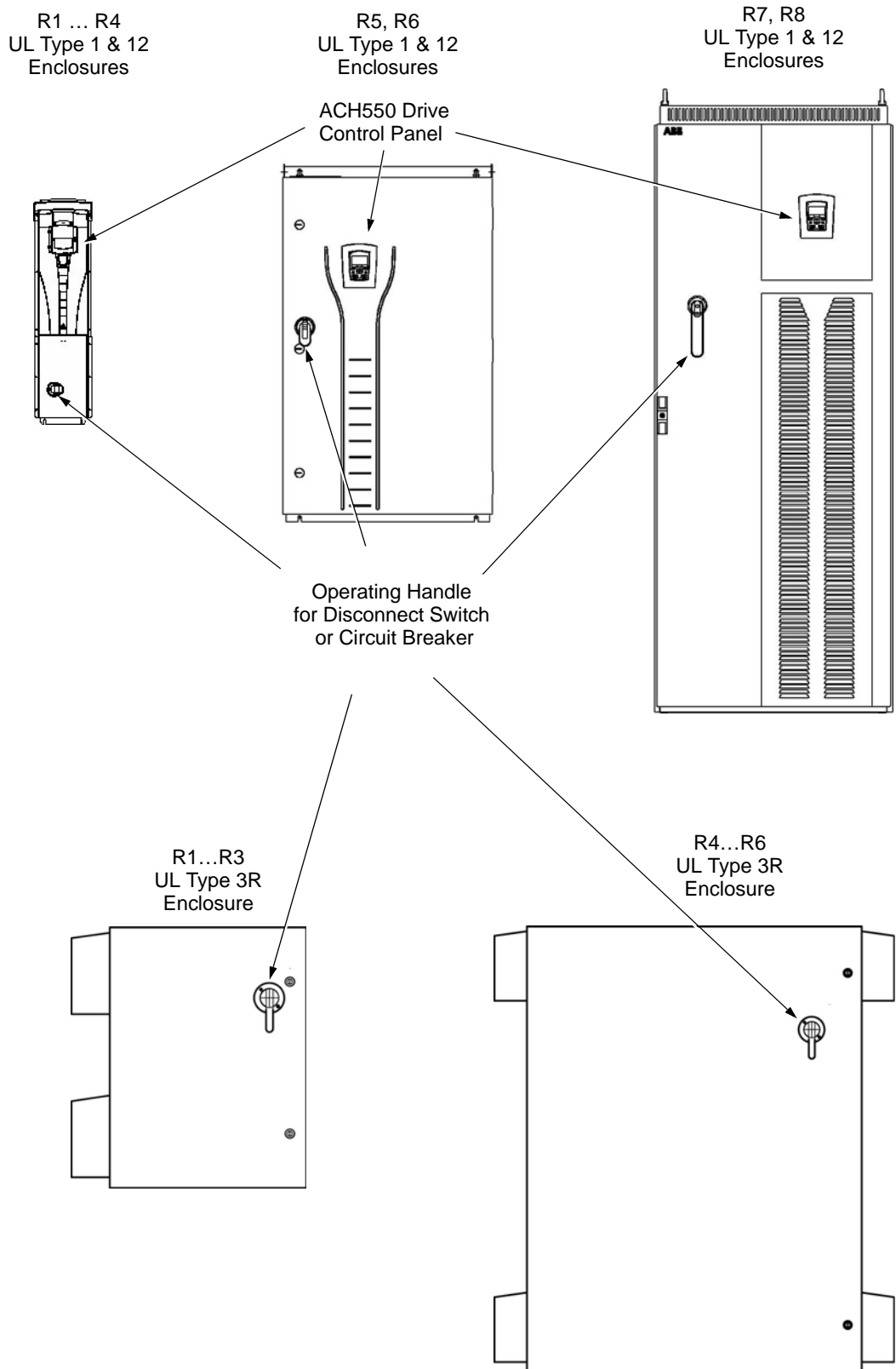
Input Disconnect Features and Functions

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 mounted, 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 Input Disconnect standard configurations, and identifies the major components.



Installation Flow Chart

The installation of Input Disconnect configurations for ACH550 drives follows the outline below. The steps must be carried out in the order shown. At the right of each step are references to the detailed information needed for the correct installation of the unit.

Note! References in the middle column below are to the ACH550-UH User's Manual. References in the third column below are to this manual.

Task	Refer to the ACH550-UH User's Manual "Installation" section	Additional Reference in this Manual
PREPARE for installation	"Preparing for Installation"	<ul style="list-style-type: none"> • "Drive Identification" on page 7. • "Note! Some instructions in this document vary, depending on the drive's frame size. To read the Ratings table, you need the "Output current rating" entry from the type code (see above). Suitable Mounting Location" on page 8.
PREPARE the Mounting Location	"Prepare the Mounting Location"	--
REMOVE the front cover	"Remove Front Cover"	--
MOUNT the drive	"Mount the Drive"	--
INSTALL wiring	"Wiring Overview" and "Install the Wiring"	"Installing the Wiring (Supplement to ACH550-UH User's Manual)" on page 8.
CHECK installation	"Check Installation"	--
RE-INSTALL the cover	"Re-install Cover"	--
APPLY power	"Apply Power"	--
START-UP	"Start-Up"	--

Preparing for Installation (Supplement to ACH550-UH User’s Manual)

Drive Identification

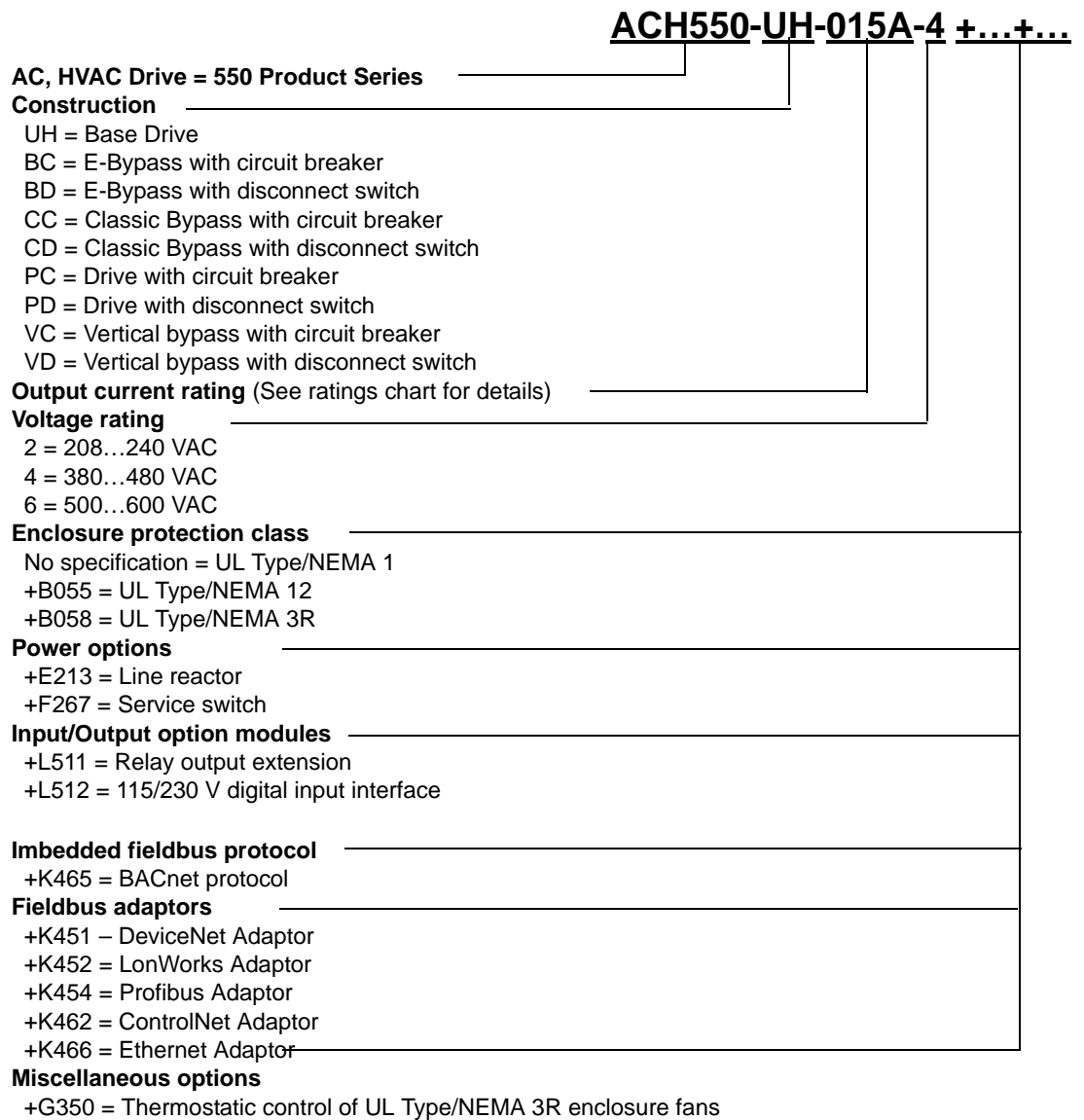
Drive Label

To identify the type of device you are installing, refer to the type code number on the device identification label.

- Wall mounting base drives – label attached on the side surface of the heat sink.
- Packaged drive with screw cover – label attached to outside surface on the left side of enclosure.
- Enclosure with hinged cover/door – label on inside surface of the cover/door.

Type Code

Use the following to interpret the type code found on the identification label.



Ratings and Frame Size

The charts in the "Ratings" sections of the ACH550-UH User's Manual and this manual list technical specifications, and identify the drive's frame size.

Note! Some instructions in this document vary, depending on the drive's frame size. To read the Ratings table, you need the "Output current rating" entry from the type code (see above). Suitable Mounting Location

Suitable Mounting Location

For selecting a suitable mounting location for PC/PD configurations, refer to:

- The ACH550-UH User's Manual, and
- The Technical Data in this manual for the appropriate information on dimensions and weights

Installing the Wiring (Supplement to ACH550-UH User's Manual)



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.**
-

Wiring Requirements

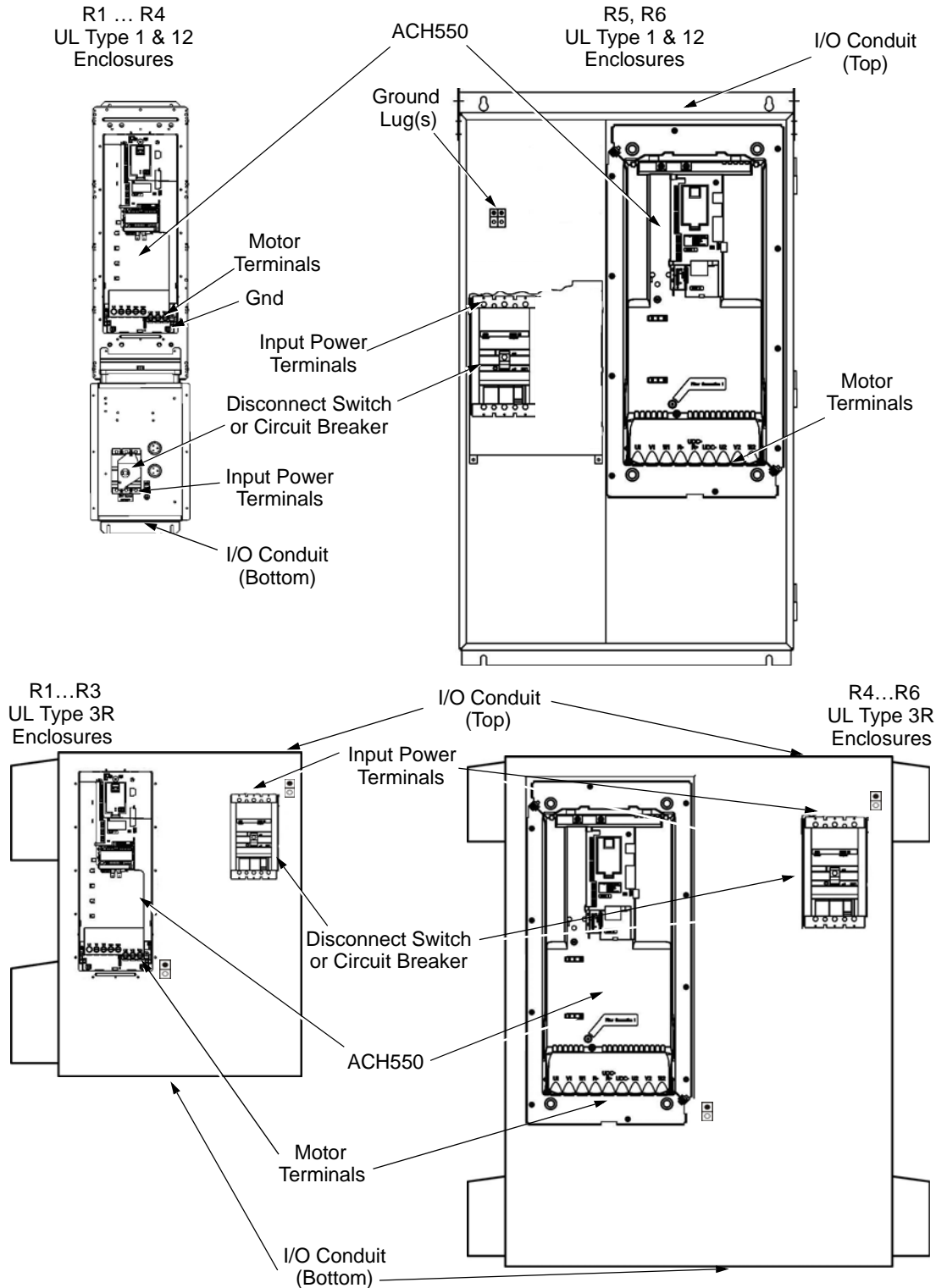
Refer to the "Wiring Requirements" Section in the ACH550-UH User's Manual. The requirements apply to all ACH550 drives. In particular:

- Use separate, metal conduit runs for the following different classes of wiring:
 - Input power wiring.
 - Motor wiring.
 - Control/communications wiring.
- Properly and individually ground the drive, the motor and cable shields.

Wiring Overview

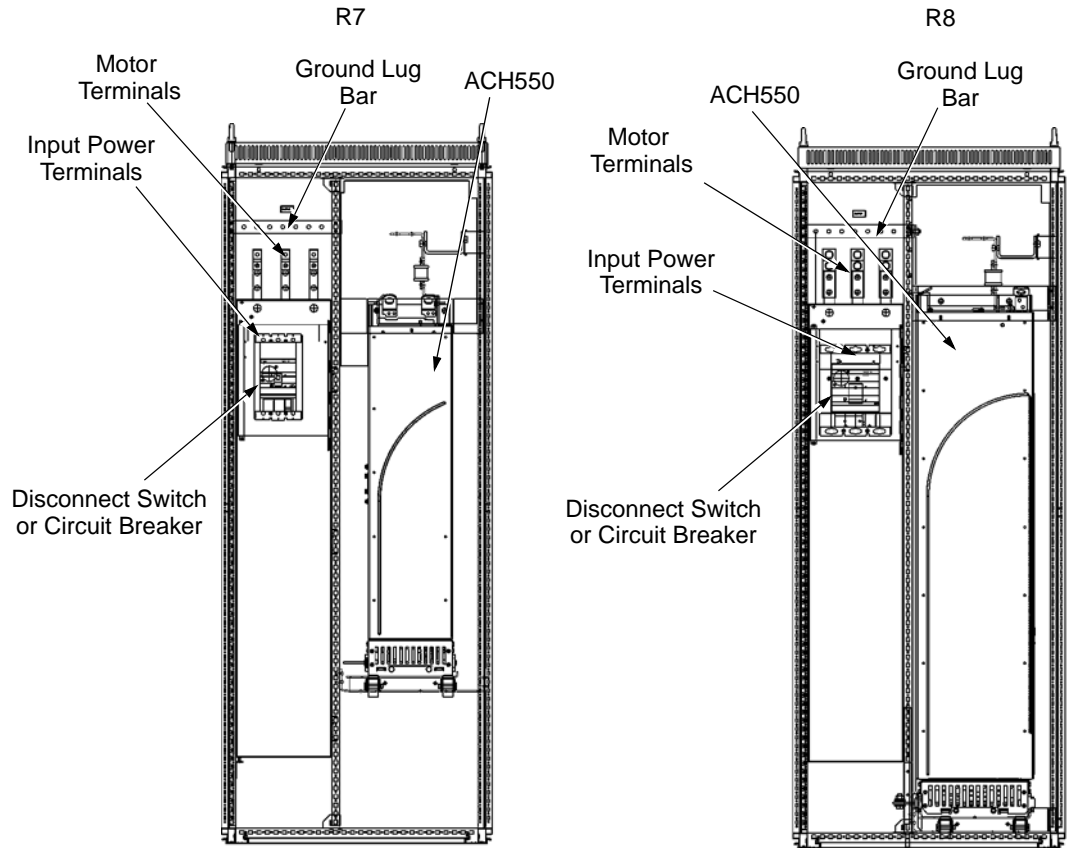
Connection Diagrams – Standard Input Disconnect (R1...R6, Wall Mounted)

The following figure shows the Standard Input Disconnect (wall mounted) wiring connection points. Refer to the ACH550-UH User's Manual for control connections to the drive.



Connection Diagrams – Standard Input Disconnect (R7...R8, Floor Mounted)

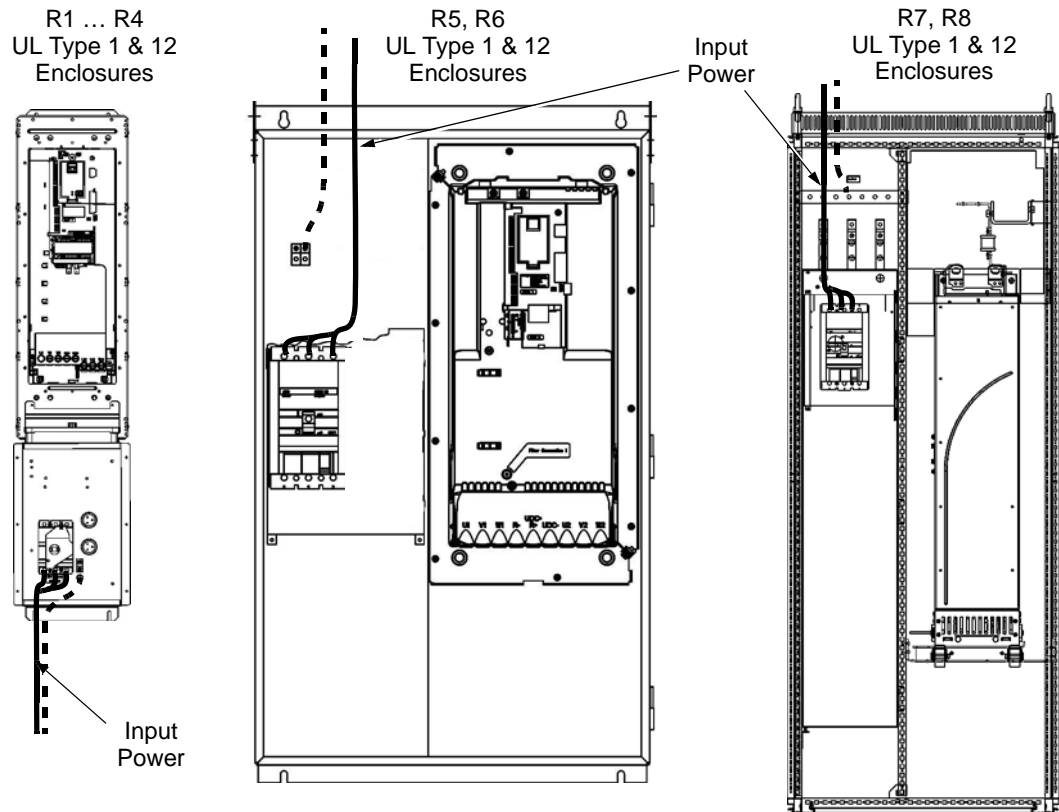
The R7 and R8 ACH550 Standard Input Disconnect units are configured for wiring access from the top and include a removable conduit mounting plate. The following figure shows the Standard Input Disconnect (floor mounted) wiring connection points. Refer to the ACH550-UH User's Manual for control connections to the drive.



Install the Line Input Wiring

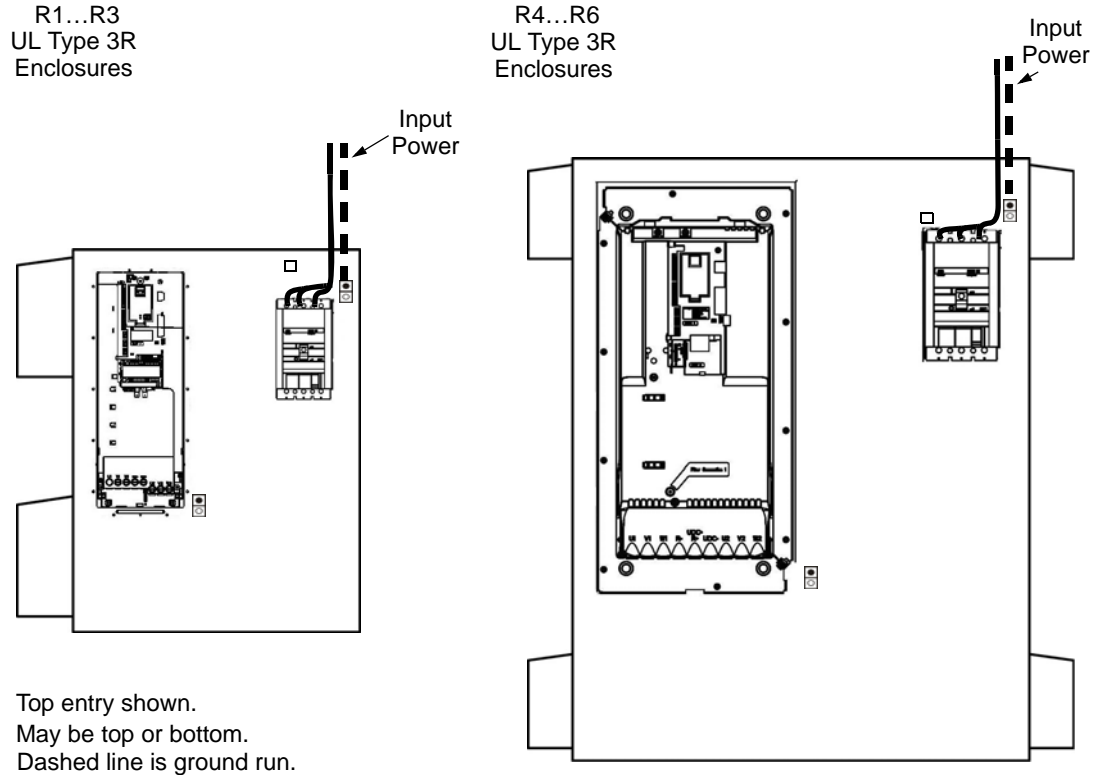
Line Input Connections – Standard Input Disconnect Configurations

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 Input Disconnect configurations.



Dashed line is ground run.

R7 shown
R8 similar to R7



WARNING! Check the motor and motor wiring insulation before connecting the ACH550 to line power. Follow the procedure in the ACH550-UH User's Manual. 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 the ACH550-UH User's Manual

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.

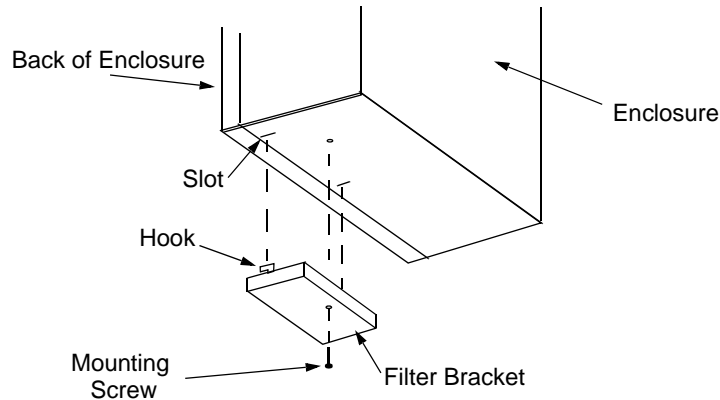
Maintenance	Configuration	Interval	Instruction
Check/replace R5/R6 enclosure inlet air filter	R5/R6 UL Type 12 enclosures	Check every 3 months. Replace as needed.	"Frame Sizes R5/R6 – Enclosure Inlet Air Filter" on page 14
Check/replace R7/R8 enclosure inlet air filter	R7/R8 UL Type 12 enclosures	Check every 3 months. Replace as needed.	See "Maintenance" in ACH550-UH User's Manual.
Check/replace NEMA 3R enclosure air filters	UL Type 3R enclosures	Check every 3 months. Replace as needed.	None (self evident).
Check/replace R7/R8 enclosure exhaust air filter.	R7/R8 UL Type 12 enclosures	Check every 6 months. Replace as needed.	See "Maintenance" in ACH550-UH User's Manual.
Check and clean heatsink.	All	Depends on the dustiness of the environment (every 6...12 months)	See "Maintenance" in ACH550-UH User's Manual.
Replace drive module fan.	All	Every six years	See "Maintenance" in ACH550-UH User's Manual.
Replace enclosure fan(s).	UL Type 12 enclosures	Every three years.	See "Maintenance" in ACH550-UH User's Manual.
Change capacitor.	Frame sizes R5 and R6	Every ten years	See "Maintenance" in ACH550-UH User's Manual.
Replace battery in the Assistant control panel	All	Every ten years	See "Maintenance" in ACH550-UH User's Manual.

Enclosure Air Filter Replacement – UL Type 12 Enclosures

Frame Sizes R5/R6 – Enclosure Inlet Air Filter

This procedure applies to disconnect configurations in R5 and R6 frame sizes with UL Type 12 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.

Technical Data

Ratings (Supplement to ACH550-UH User's Manual)

Note! The ratings listed below are an exception to the ratings listed in the ACH550-UH User's Manual.

Ratings, 380...480 Volt Drives

Type Code	Valid up to 40°C (104 °F)		Frame Size
	I_{2N} A	P_N HP	
-097A-4	96	75	R4/R5 ¹

1. For ACH550-PC or -PD, this unit is an R4 drive, in an R5 enclosure.

Input Power Connections (Supplement to ACH550-UH User's Manual)

Fuses (Drives with both disconnect switch and fuses)

NOTE! Although fuses listed are similar in functional characteristics to fuses listed in the ACH550-UH User's Manual, physical characteristics may differ. Fuses from other manufacturers can be used if they meet the functional characteristics of those in these tables.

Drive input fuses are provided to disconnect the drive from power in the event that a component fails in the drive's power circuitry.

208...240 Volt Fuses

208 ... 240 Volt		Frame Size	Drive Input Fuse Ratings	
HP	Type Code		Amps (600V)	Bussmann Type
1	ACH550-PD-04A6-2	R1	15	KTK-R-15
1.5	ACH550-PD-06A6-2	R1	15	KTK-R-15
2	ACH550-PD-07A5-2	R1	15	KTK-R-15
3	ACH550-PD-012A-2	R1	15	KTK-R-15
5	ACH550-PD-017A-2	R1	30	KTK-R-30
7.5	ACH550-PD-024A-2	R2	30	KTK-R-30
10	ACH550-PD-031A-2	R2	50	JJS-50
15	ACH550-PD-046A-2	R3	80	JJS-80
20	ACH550-PD-059A-2	R3	80	JJS-80
25	ACH550-PD-075A-2	R4	100	JJS-100
30	ACH550-PD-088A-2	R4	125	170M1368 ¹
40	ACH550-PD-114A-2	R4	160	170M1369 ¹
50	ACH550-PD-143A-2	R6	200	170M1370 ¹
60	ACH550-PD-178A-2	R6	250	170M1371 ¹
75	ACH550-PD-221A-2	R6	315	170M1372 ¹
100	ACH550-PD-248A-2	R6	315	170M1372 ¹

1. UL Type 3R enclosed units are provided with fuses as shown in the ACH550-UH User's Manual.

380...480 Volt Fuses

380 ... 480 Volt		Frame Size	Drive Input Fuse Ratings	
HP	Type Code		Amps (600V)	Bussmann Type
1/1.5	ACH550-PD-03A3-4	R1	15	KTK-R-15
2	ACH550-PD-04A1-4	R1	15	KTK-R-15
3	ACH550-PD-06A9-4	R1	15	KTK-R-15
5	ACH550-PD-08A8-4	R1	15	KTK-R-15
7.5	ACH550-PD-012A-4	R1	15	KTK-R-15
10	ACH550-PD-015A-4	R2	30	KTK-R-30
15	ACH550-PD-023A-4	R2	30	KTK-R-30
20	ACH550-PD-031A-4	R3	50	JJS-50
25	ACH550-PD-038A-4	R3	50	JJS-50
30	ACH550-PD-045A-4	R3	100	JJS-100
30	ACH550-PD-044A-4	R4	100	JJS-100
40	ACH550-PD-059A-4	R4	100	JJS-100
50	ACH550-PD-072A-4	R4	100	JJS-100
60	ACH550-PD-078A-4	R4	100	JJS-100
75	ACH550-PD-097A-4	R4/R5 ¹	125	170M1368 ²
60	ACH550-PD-077A-4	R5	125	170M1368
75	ACH550-PD-096A-4	R5	125	170M1368 ²
100	ACH550-PD-125A-4	R5	160	170M1369 ²
100	ACH550-PD-124A-4	R6	160	170M1369 ²
125	ACH550-PD-157A-4	R6	200	170M1370 ²
150	ACH550-PD-180A-4	R6	250	170M1371 ²
200	ACH550-PD-245A-4	R7	400	JJS-400
250	ACH550-PD-316A-4	R8	400	JJS-400
300	ACH550-PD-368A-4	R8	400	JJS-400
350	ACH550-PD-414A-4	R8	600	JJS-600
400	ACH550-PD-486A-4	R8	600	JJS-600
450	ACH550-PD-526A-4	R8	800	JJS-800
500	ACH550-PD-602A-4	R8	800	JJS-800
550	ACH550-PD-645A-4	R8	800	JJS-800

1. R4 drive in an R5 enclosure.

2. UL Type 3R enclosed units are provided with fuses as shown in the ACH550-UH User's Manual.

Fuses, 500...600 Volt, Fuses

500...600 Volt		Frame Size	Drive Input Fuse Ratings	
HP	Type Code		Amps (600V)	Bussmann Type
2	ACH550-PD-02A7-6	R2	15	KTK-R-15
3	ACH550-PD-03A9-6	R2	15	KTK-R-15
5	ACH550-PD-06A1-6	R2	15	KTK-R-15
7.5	ACH550-PD-09A0-6	R2	15	KTK-R-15
10	ACH550-PD-011A-6	R2	30	KTK-R-30
15	ACH550-PD-017A-6	R2	30	KTK-R-30
20	ACH550-PD-022A-6	R3	50	JJS-50
25	ACH550-PD-027A-6	R3	50	JJS-50
30	ACH550-PD-032A-6	R4	100	JJS-100
40	ACH550-PD-041A-6	R4	100	JJS-100
50	ACH550-PD-052A-6	R4	100	JJS-100
60	ACH550-PD-062A-6	R4	100	JJS-100
75	ACH550-PD-077A-6	R6	125	170M1368 ¹
100	ACH550-PD-099A-6	R6	125	170M1368 ¹
125	ACH550-PD-125A-6	R6	160	170M1369 ¹
150	ACH550-PD-144A-6	R6	200	170M1370 ¹

1. UL Type 3R enclosed units are provided with fuses as shown in the ACH550-UH User's Manual.

Drive's Power Connection Terminals

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

208...240 Volt, Terminals

208...240 Volt, Input Disconnect Power Terminal Data											
208...240 Volt			Maximum Wire Size Capacities of Power Terminals								
HP	Type Code ¹	Frame Size	Circuit Breaker	Disconnect Switch	Motor Terminals	Ground Lugs (UL Type 1&12)	Ground Lugs (UL Type 3R)				
1	ACH550-Px-04A6-2	R1	#1/0 62 in-lbs	#8 7 in-lbs	#8 12 in-lbs	#4 35 in-lbs	#2 15 in-lbs (#14 - #12) 40 in-lbs (#10 - #6) 50 in-lbs (#4 - #2)				
1.5	ACH550-Px-06A6-2	R1									
2	ACH550-Px-07A5-2	R1									
3	ACH550-Px-012A-2	R1									
5	ACH550-Px-017A-2	R1									
7.5	ACH550-Px-024A-2	R2									
10	ACH550-Px-031A-2	R2									
15	ACH550-Px-046A-2	R3									
20	ACH550-Px-059A-2	R3									
25	ACH550-Px-075A-2	R4									
30	ACH550-Px-088A-2	R4	350 MCM 200 in-lbs	#1/0 70 in-lbs	#1/0 180 in-lbs	#2 50 in-lbs	#2/0 275 in-lbs (#6 - #2) 375 in-lbs (#1 - #2/0)				
40	ACH550-Px-114A-2	R4									
50	ACH550-Px-143A-2	R6									
60	ACH550-Px-178A-2	R6		350 MCM 200 in-lbs				350 MCM 354 in-lbs	3 x #3/0 250 in-lbs		
75	ACH550-Px-221A-2	R6									
100	ACH550-Px-248A-2	R6		2 x 250 MCM 275 in-lbs						2 x 250 MCM 275 in-lbs	350 MCM 100 in-lbs

1. "Px" represents both PC and PD.

380...480 Volt, Terminals

380...480 Volt, Input Disconnect Power Terminal Data							
380...480 Volt		Frame Size	Maximum Wire Size Capacities of Power Terminals				
HP	Type Code ¹		Circuit Breaker	Disconnect Switch	Motor Terminals	Ground Lugs (UL Type 1 & 12)	Ground Lugs (UL Type 3R)
1/1.5	ACH550-Px-03A3-4	R1	#1/0 62 in-lbs	#8 7 in-lbs	#8 12 in-lbs	#4 35 in-lbs	#2 15 in-lbs (#14 - #12) 40 in-lbs (#10 - #6) 50 in-lbs (#4 - #2)
2	ACH550-Px-04A1-4	R1					
3	ACH550-Px-06A9-4	R1					
5	ACH550-Px-08A8-4	R1					
7.5	ACH550-Px-012A-4	R1					
10	ACH550-Px-015A-4	R2					
15	ACH550-Px-023A-4	R2		#1 18 in-lbs	#3 24 in-lbs	#2 50 in-lbs	
20	ACH550-Px-031A-4	R3					
25	ACH550-Px-038A-4	R3					
30	ACH550-Px-045A-4	R3					
30	ACH550-Px-044A-4	R4		#1 55 in-lbs	#1/0 180 in-lbs	#2 50 in-lbs	
40	ACH550-Px-059A-4	R4					
50	ACH550-Px-072A-4	R4	#1/0 62 in-lbs	#1/0 70 in-lbs	#2/0 132 in-lbs	3 x #3/0 250 in-lbs	
60	ACH550-Px-078A-4	R4					
75	ACH550-Px-097A-4	R4/R5 ²	350 MCM 200 in-lbs	350 MCM 200 in-lbs	350 MCM 354 in-lbs	#2/0 275 in-lbs (#6 - #2) 375 in-lbs (#1 - #2/0)	
60	ACH550-Px-077A-4	R5					
75	ACH550-Px-096A-4	R5					
100	ACH550-Px-125A-4	R5		2 x 250 MCM 275 in-lbs	2 x 250 MCM 275 in-lbs		350 MCM 350 in-lbs
100	ACH550-Px-124A-4	R6					
125	ACH550-Px-157A-4	R6					
150	ACH550-Px-180A-4	R6					
200	ACH550-Px-245A-4	R7	2 x 500 MCM 275 in-lbs	2 x 500 MCM 275 in-lbs	2 x 500 MCM 500 in-lbs	5 Bus Bar holes (13/32" bolts)	
250	ACH550-Px-316A-4	R8					
300	ACH550-Px-368A-4	R8	3 x 400 MCM 375 in-lbs	3 x 400 MCM 375 in-lbs	2 x 500 MCM 500 in-lbs	350 MCM 100 in-lbs	
350	ACH550-Px-414A-4	R8					
400	ACH550-Px-486A-4	R8	3 x 400 MCM 375 in-lbs	3 x 400 MCM 375 in-lbs	2 x 500 MCM 500 in-lbs	350 MCM 100 in-lbs	
450	ACH550-Px-526A-4	R8					
500	ACH550-Px-602A-4	R8					
550	ACH550-Px-645A-4	R8					

1. "Px" represents both PC and PD.

2. For ACH550-PC or -PD, this unit is an R4 drive in an R5 enclosure.

500...600 Volt, Terminals

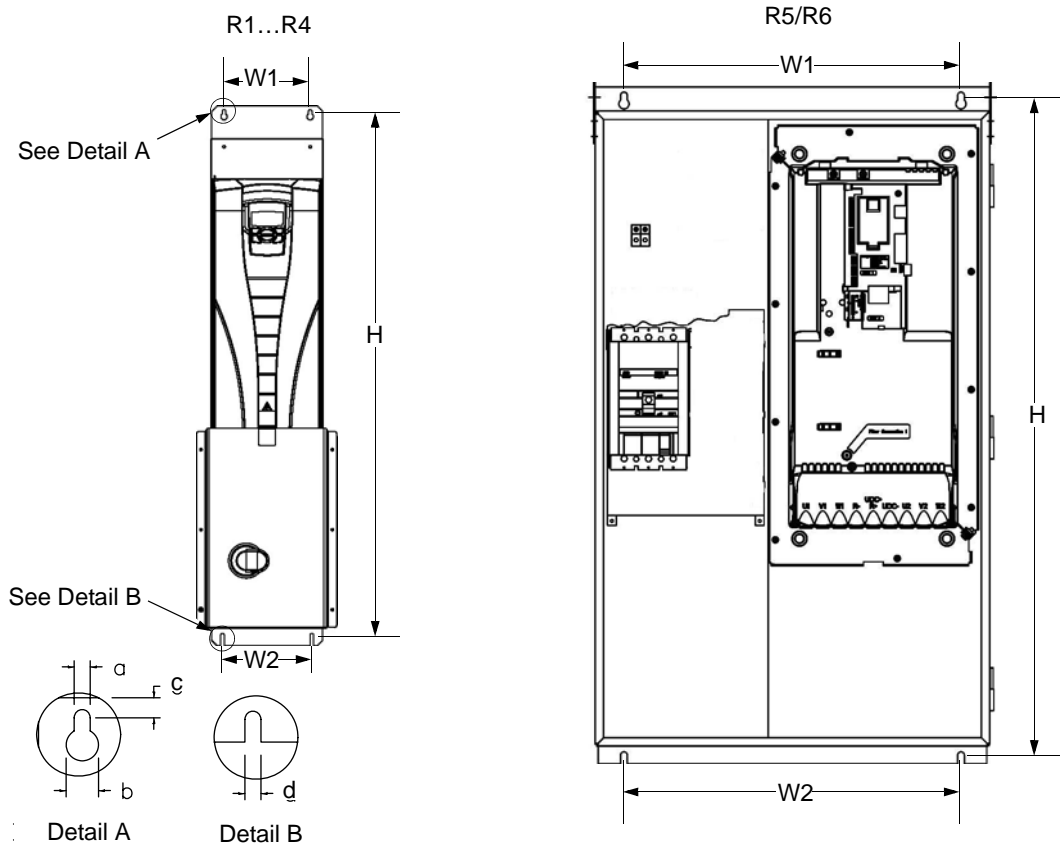
500...600 Volt, Input Disconnect Power Terminal Data							
500...600 Volt			Maximum Wire Size Capacities of Power Terminals				
HP	Type Code ¹	Frame Size	Circuit Breaker	Disconnect Switch	Motor Terminals	Ground Lugs (UL Type 1&12)	Ground Lugs (UL Type 3R)
2	ACH550-Px-02A7-6	R2	#1/0 62 in-lbs	#8 7 in-lbs	#8 12 in-lbs	#4 35 in-lbs	#2 15 in-lbs (#14 - #12) 40 in-lbs (#10 - #6) 50 in-lbs (#4 - #2)
3	ACH550-Px-03A9-6	R2					
5	ACH550-Px-06A1-6	R2					
7.5	ACH550-Px-09A0-6	R2					
10	ACH550-Px-011A-6	R2					
15	ACH550-Px-017A-6	R2		#1 18 in-lbs	#3 24 in-lbs	#2 50 in-lbs	
20	ACH550-Px-022A-6	R3					
25	ACH550-Px-027A-6	R3					
30	ACH550-Px-032A-6	R4					
40	ACH550-Px-041A-6	R4					
50	ACH550-Px-052A-6	R4	#1/0 62 in-lbs	#1/0 180 in-lbs			
60	ACH550-Px-062A-6	R4			350 MCM 200 in-lbs	#1/0 70 in-lbs	350 MCM 354 in-lbs
75	ACH550-Px-077A-6	R6					
100	ACH550-Px-099A-6	R6	350 MCM 200 in-lbs	350 MCM 200 in-lbs			
125	ACH550-Px-125A-6	R6			#2/0 275 in-lbs (#6 - #2) 375 in-lbs (#1 - #2/0)		
150	ACH550-Px-144A-6	R6					

1. "Px" represents both PC and PD.

Dimensions and Weights (Supplement to ACH550-UH User’s Manual)

Mounting Dimensions

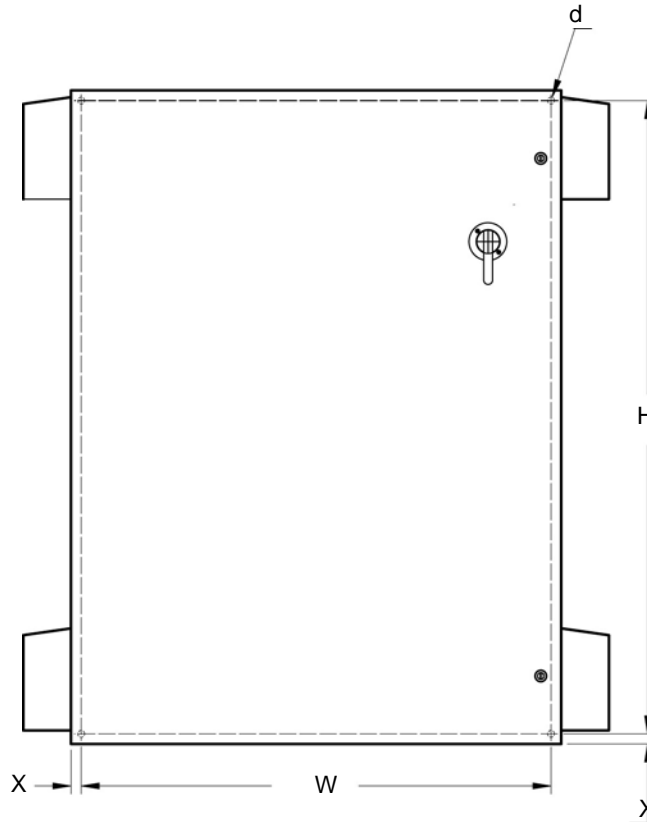
UL Type 1 & 12, R1...R6 Mounting Dimensions



IP 21 / UL Type 1 and IP 54 / UL Type 12 – Mounting Dimensions for each Frame Size												
Ref.	R1		R2		R3		R4		R5		R6	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
W1*	98	3.9	98	3.9	160	6.3	160	6.3	600	23.6	600	23.6
W2*	98	3.9	98	3.9	160	6.3	160	6.3	600	23.6	600	23.6
H*	712	28.0	812	32.0	983	38.7	1117	44.0	1175	46.3	1175	46.3
a	5.5	0.2	5.5	0.2	6.5	0.25	6.5	0.25	6.5	0.25	9.0	0.35
b	10.0	0.4	10.0	0.4	13.0	0.5	13.0	0.5	14.0	0.55	14.0	0.55
c	5.5	0.2	5.5	0.2	8.0	0.3	8.0	0.3	8.5	0.3	8.5	0.3
d	5.5	0.2	5.5	0.2	6.5	0.25	6.5	0.25	6.5	0.25	9.0	0.35
Mounting Hardware												
	M6	1/4	M6	1/4	M6	1/4	M6	1/4	M8	5/16	M8	5/16

* Measurements are center to center.

UL Type 3R, R1...R6 Mounting Dimensions



UL type 3R – Mounting Dimensions for each Frame Size												
Ref.	R1		R2		R3		R4		R5		R6	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
H	572	22.5	572	22.5	724	28.5	876	34.5	1181	46.5	1181	46.5
W	419	16.5	419	16.5	572	22.5	724	28.5	876	34.5	876	34.5
d	12.7	0.5	12.7	0.5	12.7	0.5	12.7	0.5	12.7	0.5	12.7	0.5
X	19.0	0.75	19.0	0.75	19	0.75	19	0.75	19	0.75	19	0.75
Mounting Hardware												
	M6	1/4	M6	1/4	M6	1/4	M6	1/4	M8	5/16	M8	5/16

* Measurements are center to center.

UL Type 1 & 12, R7...R8 Mounting Dimensions

IP 21 / UL Type 1 and IP 54 / UL Type 12 – Dimensions for each Frame Size			
Ref.	R7 & R8		Top View
	mm	in	
W	806	31.7	
D	659	25.9	
a	675	26.6	
b	474.5	18.7	
c	61	2.4	
d	65.5	2.6	
Mounting Hardware			
	11 mm	13/32	

Weights

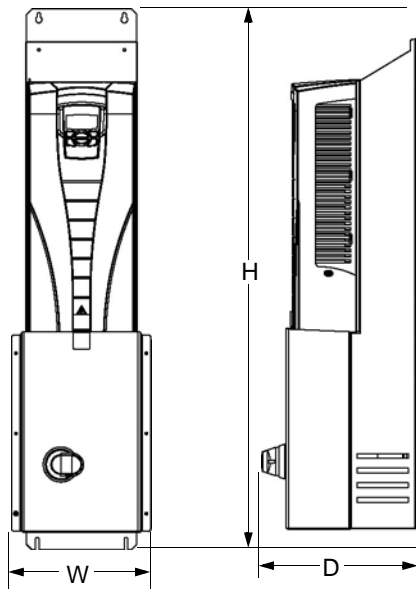
The following table lists typical maximum weights for each frame size. Variations within each frame size (due to components associated with voltage/current ratings, and options) are minor.

Enclosure	Weight															
	R1		R2		R3		R4		R5		R6		R7		R8	
	kg	lb.	kg	lb.	kg	lb.	kg	lb.	kg	lb.	kg	lb.	kg	lb.	kg	lb.
UL Type 1	13	28	17	37	45	100	55	121	121	266	163	360	230	506	360	793
UL Type 12	15	33	19	42	47	103	57	125	123	271	166	375	250	551	380	837
UL Type 3R	34	75	37	81	61	135	92	203	132	291	167	368	--	--	--	--

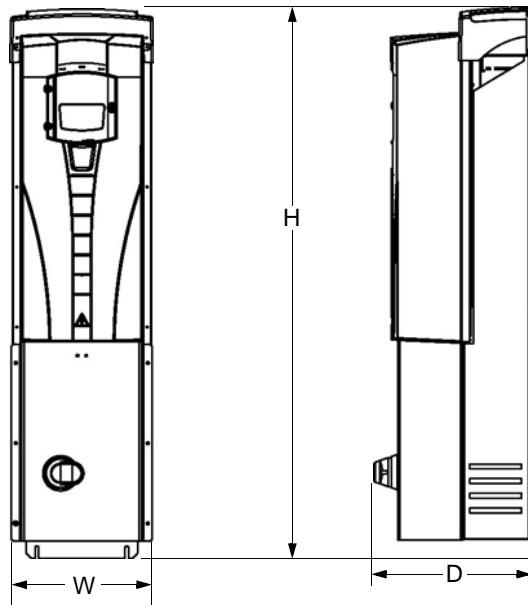
Outside Dimensions

The outside dimensions for input disconnect enclosures depend on the frame size and the enclosure type, as illustrated below.

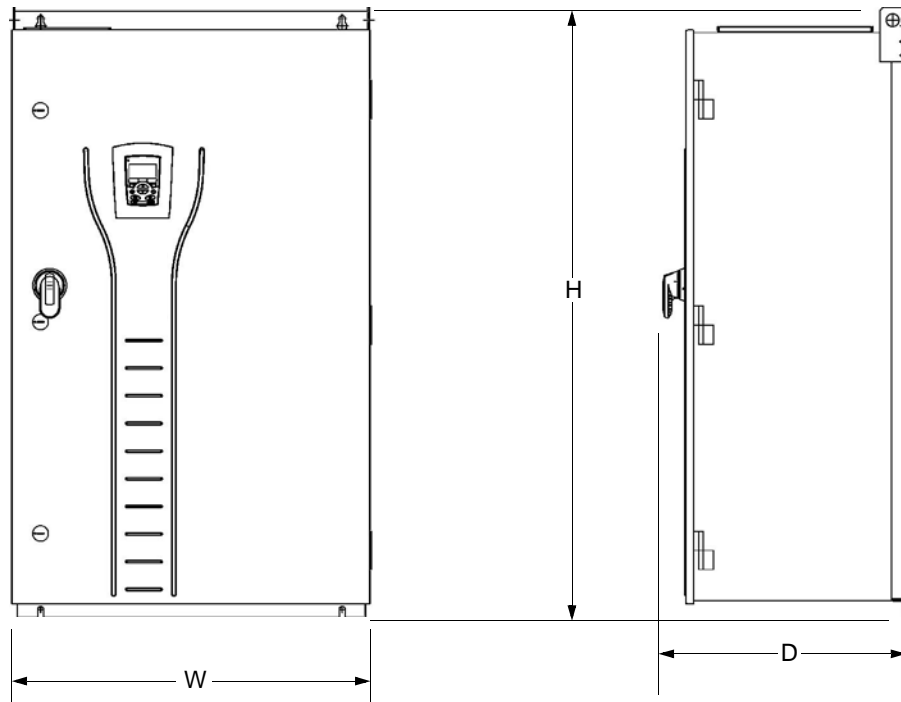
UL Type 1, R1...R4 Outside Dimensions



Input Disconnect, UL Type 1, R1...R4								
Dimensions Ref.	R1		R2		R3		R4	
	mm	in.	mm	in.	mm	in.	mm	in.
W	198	7.8	198	7.8	260	10.2	260	10.2
H	729	28.7	829	32.6	1013	39.9	1147	45.2
D	283	11.2	295	11.6	304	11.9	332	13.1

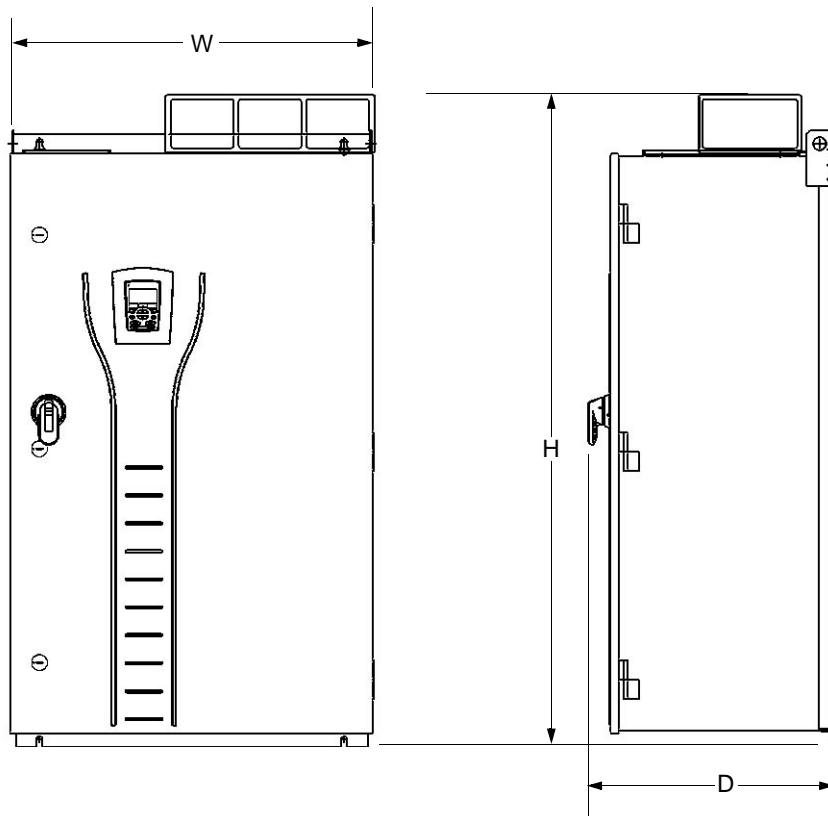
UL Type 12, R1...R4 Outside Dimensions

Input Disconnect, UL Type 12, R1...R4								
Dimensions Ref.	R1		R2		R3		R4	
	mm	in.	mm	in.	mm	in.	mm	in.
W	222	8.7	222	8.7	267	10.5	267	10.5
H	744	29.3	844	33.2	1030	40.6	1163	45.8
D	283	11.2	295	11.6	304	11.9	332	13.1

UL Type 1, R5, R6 Outside Dimensions

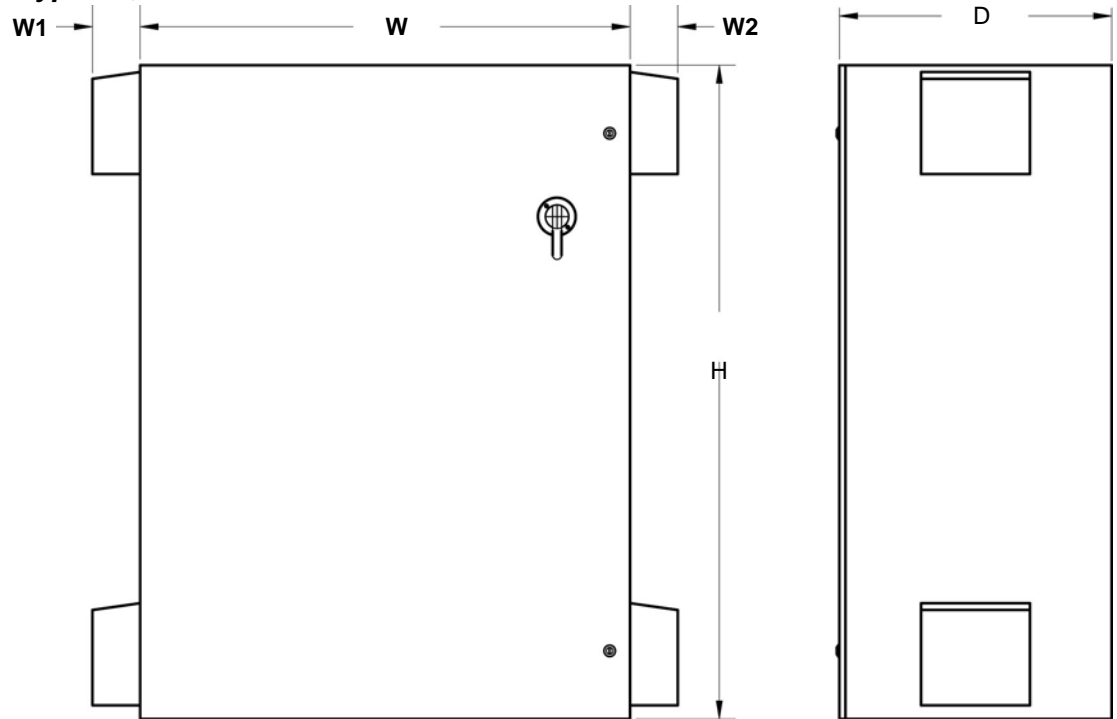
Input Disconnect, UL Type 1, R5, R6				
Dimensions Ref.	R5		R6	
	mm	in.	mm	in.
W	713	28.1	713	28.1
H	1212	47.7	1212	47.7
D	484	19.1	484	19.1

UL Type 12, R5, R6 Outside Dimensions

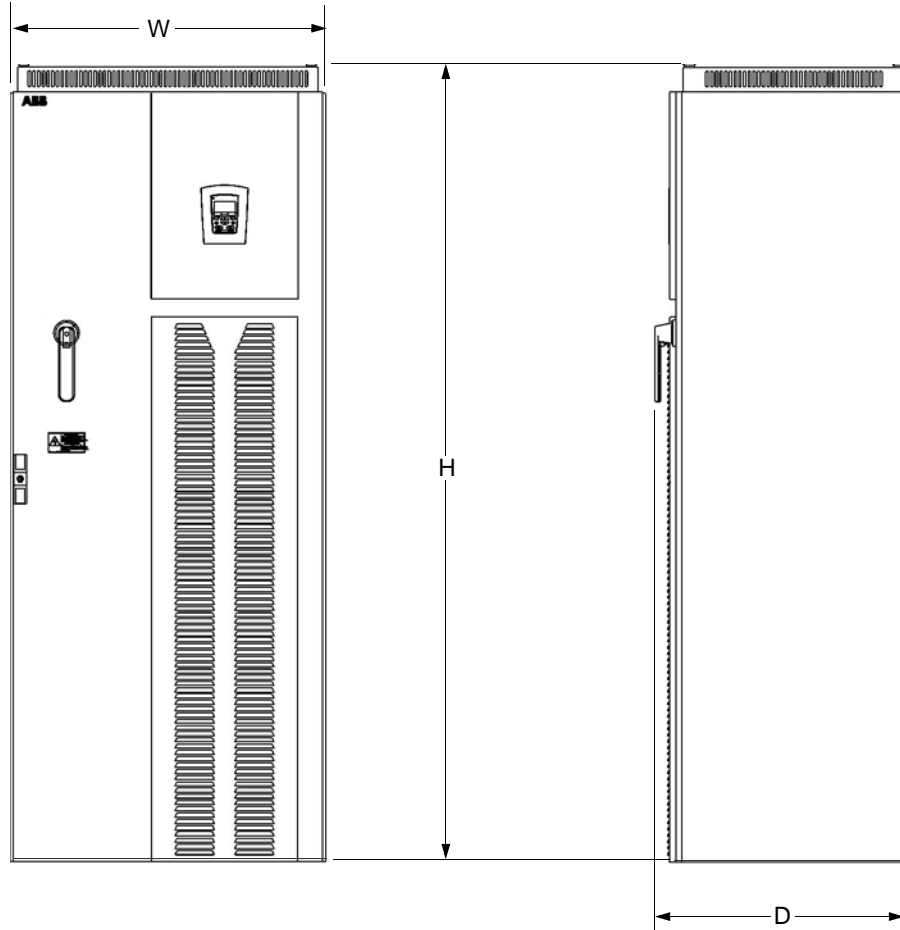


Input Disconnect, UL Type 12, R5, R6				
Dimensions Ref.	R5		R6	
	mm	in.	mm	in.
W	734	28.9	734	28.9
H	1371	54.0	1371	54.0
D	484	19.1	484	19.1

UL Type 3R, R1...R6 Outside Dimensions



Input Disconnect, UL Type 3R, R1...R6												
Dimensions Ref.	R1		R2		R3		R4		R5		R6	
	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
H	610	24	610	24	762	30	914	36	1219	48	1219	48
W	457	18	457	18	610	24	762	30	914	36	914	36
D	305	12	305	12	305	12	305	12	508	20	508	20
W1	89	3.5	89	3.5	89	3.5	89	3.5	89	3.5	89	3.5
W2	--	--	--	--	--	--	89	3.5	89	3.5	89	3.5

UL Type 1 & 12, R7...R8 Outside Dimensions

Outside Dimensions by Frame Size					
Enclosure	Ref.	R7		R8	
		mm	in	mm	in
IP 21 / UL Type 1	W	806	31.7	806	31.7
	H	2125	83.7	2125	83.7
	D	659	25.9	659	25.9
IP 54 / UL Type 12	W	806	31.7	806	31.7
	H	2377	93.6	2377	93.6
	D	659	25.9	659	25.9

Additional Free Space Recommendations

In addition to the free space requirements for cooling, shown in the ACH550-UH User's Manual, allow:

- 800 mm (31.5 in) in front of R7/R8 enclosures – room for the cabinet door to swing open.
- 305 mm (12 in) above R7/R8, IP54 / UL Type 12 enclosures – room for fan replacement.

Degrees of Protection




Available enclosures:

- UL Type 1 (NEMA 1 / IP 21) enclosure. The site must be free of airborne dust, corrosive gases or liquids, and conductive contaminants such as condensation, carbon dust, and metallic particles.
- UL Type 12 (NEMA 12 / IP 54) enclosure. This enclosure provides protection from airborne dust and light sprays or splashing water from all directions.
- UL Type 3R (NEMA 3R) enclosure. This enclosure provides protection from the ingress of water (rain, sleet, or snow). The external formation of ice does not damage this enclosure.

Plenum Rating: ACH550 drives have been evaluated in accordance with the requirements of UL508, meets all of the requirements for plenum rated drives, and is "Suitable for Installation in a Compartment Handling Conditioned Air".

Applicable Standards

Drive compliance with the following standards is identified by the standards "marks" on the type code label.

Mark	Applicable Standards	
	UL 508C and C22.2 No. 14	UL Standard for Safety, Power Conversion Equipment, and CSA Standard for Industrial Control Equipment
	UL 508A	UL Standard for Safety, Industrial Control Panels
	C22.2 No. 14	CSA Standard for Industrial Control Equipment

Compliance is valid with the following provisions:

- The motor and control cables are chosen as specified in this manual.
- The installation rules of this manual are followed.

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Refer to the ACH550-UH HVAC Drives (1...550 HP) User's Manual index for topics not listed here.

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