

SmartDRIVE® ACH580 Variable Speed Drives

Submittal Data

Submittal No: 301-3001 | Effective: July 10, 2024 | Supersedes: NEW

JOB: _____

REPRESENTATIVE: _____

ENGINEER: _____

CONTRACTOR: _____

All Taco SmartDrives ACH580 are ABB ACH580 variable frequency drives.

MOTOR DESIGN DATA

ITEM NO. _____ HP _____ VOLTAGE / PHASE / CYCLE (HZ) _____

DRIVE OPTIONS

Enclosure	NEMA Type 1 / IP21	NEMA Type 12 / IP55
Disconnect Switch	N/A	Mechanical Circuit Breaker
I/O Switch	External 24V DC/AC and digital IO extension (2xRO and 1xDO)	
	BACnet/IP	Modbus TCP LonWorks Ethernet/IP

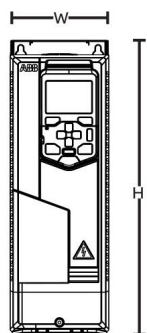
TECHNICAL SPECIFICATIONS

PRODUCT COMPLIANCE			
ACH580-PxR	UL508A		
SUPPLY CONNECTION			
Input Voltage (U _i)	208/240V, 480V, 600V		
Input Voltage Tolerance	+10% / -15%		
Phase	3-phase (1-phase, 240 V)		
Frequency	48 to 63 Hz		
Line Limitations	Max ±3% of nominal phase to phase input voltage		
Power Factor (cos ϕ) at nominal load	0.98		
Efficiency at Rated Power	98.0%		
Power Loss	Approximately 2% of rated power		
MOTOR CONNECTION			
Supported Motor Control	Scalar and Vector		
Supported Motor Types	Asynchronous motor, permanent magnet motor (vector), SynRM (vector)		
Voltage	3-phase, from 0 to supply voltage		
Frequency	0 to 500 Hz		
Short Term Overload Capacity Variable Torque	110% for 1 min/10min		
Peak Overload Capacity Variable Torque	1.35 for 2 second (2 sec / 10 min)		
Switching Frequency	2, 4, 8 or 12 kHz Automatic fold back in case of overload		
Acceleration/Deceleration Time	0 to 1800 s		
Short Circuit Current Rating (SCCR)	240V	480V	600V
-PCR	100 kA	100 kA	≤60 Hp: 25 kA ≥75 Hp: 10 kA
-PDR	100 kA	100 kA	100 kA
INPUTS AND OUTPUTS (DRIVE)			
2 Analog Inputs	Selection of Current/Voltage input mode is user programmable.		
Voltage Reference	0 (2) to 10 V, R _{in} ≥ 200 kΩ		
Current Reference	0 (4) to 20 mA, R _{in} = 100 Ω		
Potentiometer Reference Value	10 V ±1% max. 20 mA		

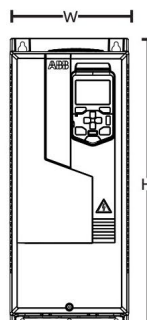
INPUTS AND OUTPUTS (DRIVE) CONTINUED	
2 Analog Outputs	AO1 is user programmable for current or voltage. AO2 current
Voltage Reference	0 to 10 V, R _{load} > 100 kΩ
Current Reference	0 to 20 mA, R _{load} < 500 Ω
Applicable Potentiometer	1 kΩ to 10 kΩ
Internal Auxiliary Voltage	24 V DC ±10%, max. 250 mA
Accuracy	+/- 1% full scale range at 25°C (77°F)
Output Updating Time	2 ms
6 Digital Inputs	12 to 24 V DC, 10 to 24 V AC, Connectivity of PTC sensors supported by a single digital input. PNP or NPN connection (5 DIs with NPN connection). Programmable
Input Updating Time	2 ms
3 Relay Outputs	Maximum switching voltage 250 V AC/30 V DC. Maximum continuous current 2 A rms Programmable, Form C
Contact Material	Silver Tin Oxide (AgSnO ₂)
PTC, PT100 and PT1000	Any of the analog inputs, or digital input 6, are configurable for PTC with up to 6 sensors.
Adjustable Filters on Analog Inputs and Outputs	
All Control Inputs Isolated from Ground and Power	
OPERATION	
Air Temperature	-15 to +50 °C (5 to 122 °F): No frost allowed. Output derated above +40 °C (104 °F)
Installation Site Altitude	0 to 1000 m (3281 ft) above sea level Output derated above 1000 m (3281 ft)
Relative Humidity	5 to 95% No condensation allowed. Maximum relative humidity is 60% in the presence of corrosive gasses
Atmospheric Pressure	70 to 106 kPa (10.2 to 15.4 PSI) 0.7 to 1.05 atmospheres
Seismic	Risk category IV Certified (IBC 2018)

Dimensions

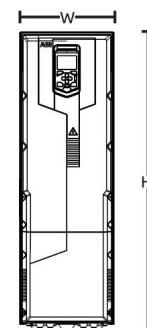
Wall Mounted



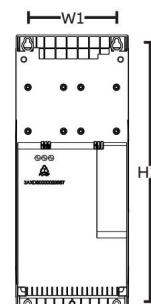
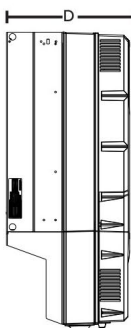
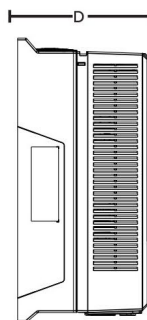
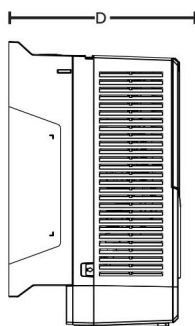
R1 - R2 with removeable conduit box



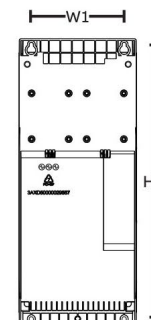
R3-R4 with integrated conduit box



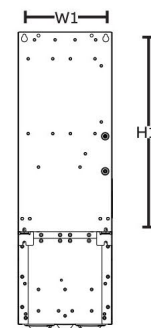
R5 - R9 with removeable conduit box



R1 - R2 Mounting dimensions



R3 - R4 Mounting dimensions



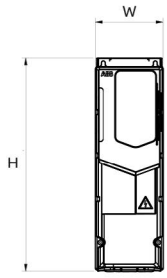
R5-R9 Mounting dimensions

Dim Ref	Power Range [HP]			Height (H)		Width (W)		Depth (D)		Weight		Mounting Dimensions					
	240V	480V	600V	in.	mm	in.	mm	in.	mm	lb.	Kg	Height (H1)		Width (W1)		Width (W2)	
												in.	mm	in.	mm	in.	mm
Wall Mounted: NEMA Type 1																	
01-01-R1	1 - 5	1 - 7.5	N/A	14.69	373	4.92	125	8.78	223	10.1	4.6	12.48	317	3.86	98	-	-
01-01-R2	7.5 - 10	10 - 15	2 - 15	18.62	473	4.92	125	9.02	229	14.6	6.6	16.42	417	3.86	98	-	-
01-01-R3	15 - 20	20 - 30	20 - 30	19.29	490	7.99	203	9.02	229	26.0	11.8	18.62	473	6.30	160	-	-
01-01-R4	25	40 - 60	N/A	25.04	636	7.99	203	10.12	257	41.9	19.0	24.37	619	6.30	160	3.86	98
01-01-R5	30 - 40	75	40 - 75	28.82	732	7.99	203	11.61	295	62.4	28.3	22.87	581	6.30	160	3.86	98
01-01-R6	50	100	N/A	28.62	727	9.92	252	14.53	369	93.5	42.4	20.91	531	8.37	213	6.30	160
01-01-R7	60	125 - 150	100-125	34.65	880	11.18	284	14.57	370	119.1	54.0	22.95	583	9.65	245	6.30	160
01-01-R8	N/A	200	150	37.99	965	11.81	300	15.47	393	152.2	69.0	25.91	658	10.33	263	8.43	214
01-01-R9	N/A	250 - 350	N/A	37.60	955	14.96	380	16.46	418	213.9	97.0	25.91	658	13.58	345	7.87	200

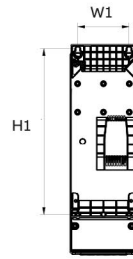
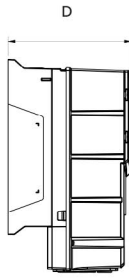
Standard configuration dimensions for reference only.

Dimensions

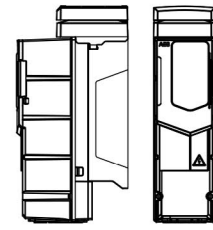
Wall Mounted (continued)



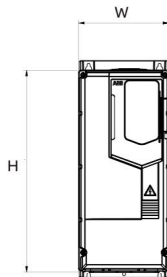
R1 - R2 integrated conduit box



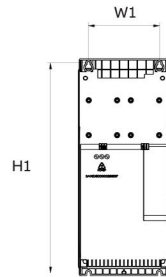
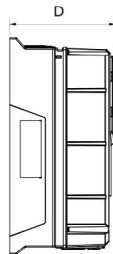
R1 - R2 mounting dimensions



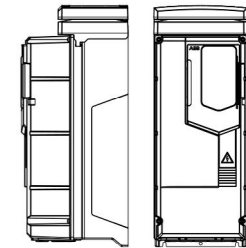
R1 - R2 integrated conduit box with hood



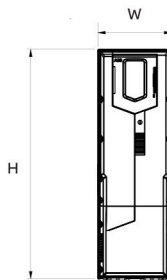
R3 - R4 integrated conduit box



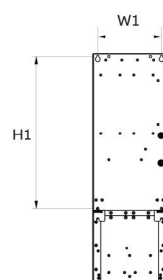
R3 - R4 mounting dimensions



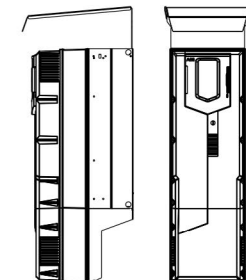
R3 - R4 integrated conduit box with hood



R5 - R9 removeable conduit box



R5 - R9 mounting dimensions



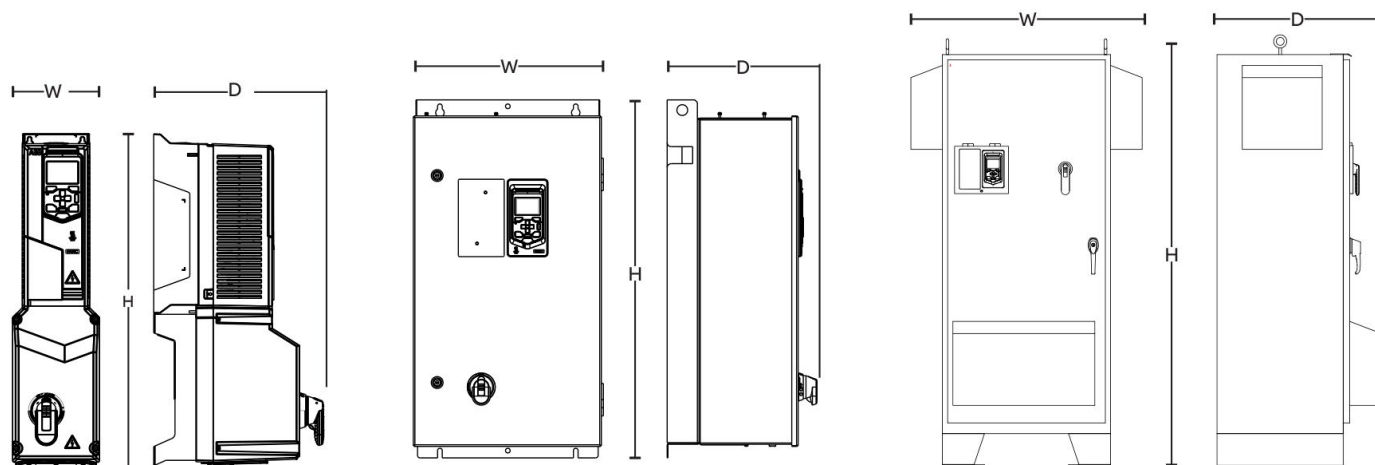
R5 - R9 removeable conduit box with hood

Dim Ref	Power Range [HP]			Height (H)		Height (H5)	Width (W)		Depth (D)		Weight		Mounting Dimensions						
													Height (H1)		Width (W1)		Width (W2)		
	240V	480V	600V	in.	mm		in.	mm	in.	mm	lb.	Kg	in.	mm	in.	mm	in.	mm	
Wall Mounted: NEMA Type 12																			
01-12-R1	1 - 5	1 - 7.5	N/A	15.87	403	17.78	452	5.04	128	9.17	233	10.6	4.8	12.48	317	3.86	98	-	-
01-12-R2	7.5 - 10	10 - 15	2 - 15	19.80	503	21.49	546	5.04	128	9.41	239	15.0	6.8	16.42	417	3.86	98	-	-
01-12-R3	15 - 20	20 - 30	20 - 30	19.29	490	20.93	532	8.11	206	9.33	237	28.7	13.0	18.62	473	6.30	160	-	-
01-12-R4	25	40 - 60	N/A	25.04	636	27.03	686	7.99	203	10.43	265	44.1	20.0	24.37	619	6.30	160	3.86	98
01-12-R5	30 - 40	75	40 - 75	28.82	732	32.01	813	7.99	203	12.60	320	63.9	29.0	22.87	581	6.30	160	3.86	98
01-12-R6	50	100	N/A	28.62	727	34.81	884	9.92	252	14.96	380	94.8	43.0	20.91	531	8.37	213	6.30	160
01-12-R7	60	125 - 150	100 - 125	34.65	880	40.86	1038	11.18	284	15.00	381	123.5	56.0	22.95	583	9.65	245	6.30	160
01-12-R8	N/A	200	150	37.99	965	44.23	1123	11.81	300	17.80	452	169.8	77.0	25.91	658	10.33	263	8.43	214
01-12-R9	N/A	250 - 350	N/A	37.60	955	46.75	1188	14.96	380	18.78	477	227.1	103.0	25.91	658	13.58	345	7.87	200

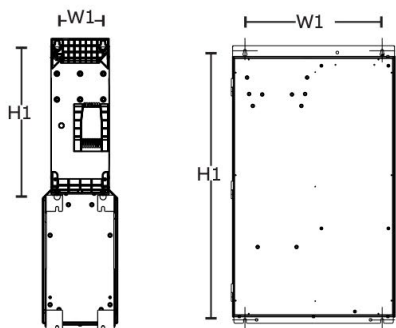
Standard configuration dimensions for reference only.

Dimensions

Wall Mount with Disconnect



Mounting Dimensions



Dim Ref	Power Range [HP]			Height (H)		Width (W)		Depth (D)		Weight		Mounting Dimensions			
	240V	480V	600V	in.	mm	in.	mm	in.	mm	lb.	Kg	Height (H1)		Width (W1)	
												in.	mm	in.	mm

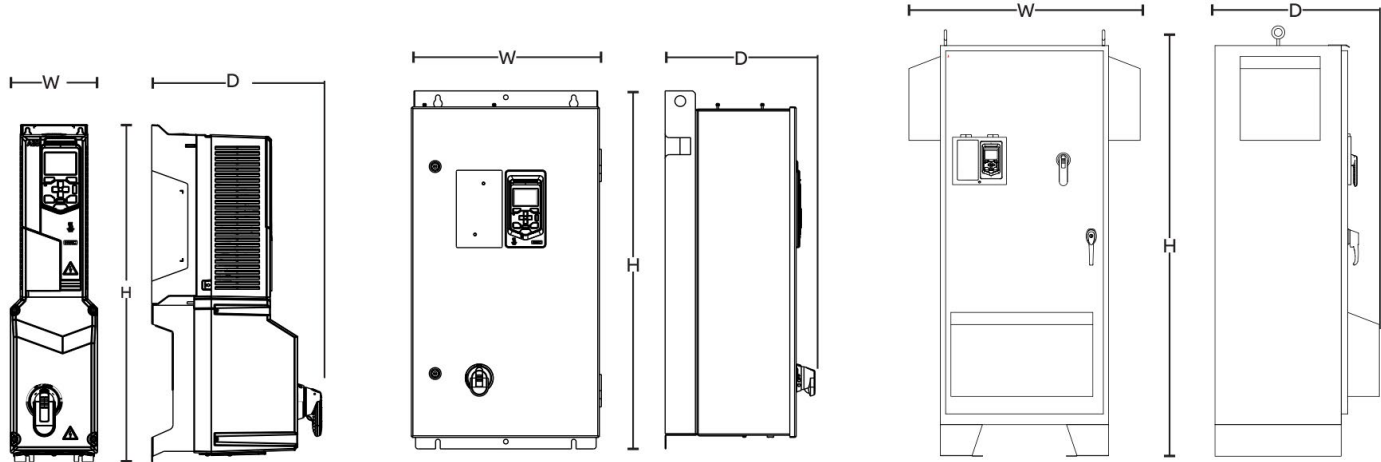
Wall Mount with Disconnect NEMA Type 1

Px1-1	1 - 5	1 - 7.5	N/A	24.60	625	6.34	161	12.42	316	18.1	8.2	12.48	317	3.9	98
Px1-2	7.5 - 10	10 - 15	2 - 15	28.49	725	6.34	161	12.63	321	22.0	10.0	16.42	417	3.9	98
Px1-3	15 - 20	20 - 30	N/A	34.86	885	8.39	213	13.22	336	39.0	17.7	18.75	476	6.3	160
Px1-4	25	40 - 60	20 - 30	40.61	1032	8.39	213	14.26	362	60.0	27.2	24.49	622	6.3	160
Px1-5	N/A		40 - 75	56.82	1443	8.35	212	13.34	338	117.0	53.0	55.70	1415	6.3	160
PxB1-3	30 - 60	75 - 200	100 - 150	47.72	1212	28.24	213	19.04	484	359.0	163.0	46.26	1175	23.6	600
PxB1-6	N/A	250 - 350	N/A	78.00	1981	32	813	27.30	693	765.0	347.0	Free Standing			

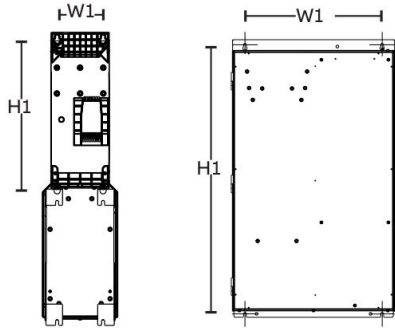
Standard configuration dimensions for reference only.

Dimensions

Wall Mount with Disconnect (continued)



Mounting Dimensions



Dim Ref	Power Range [HP]			Height (H)		Width (W)		Depth (D)		Weight		Mounting Dimensions			
												Height (H1)		Width (W1)	
	240V	480V	600V	in.	mm	in.	mm	in.	mm	lb.	Kg	in.	mm	in.	mm

Wall Mount with Disconnect NEMA Type 12

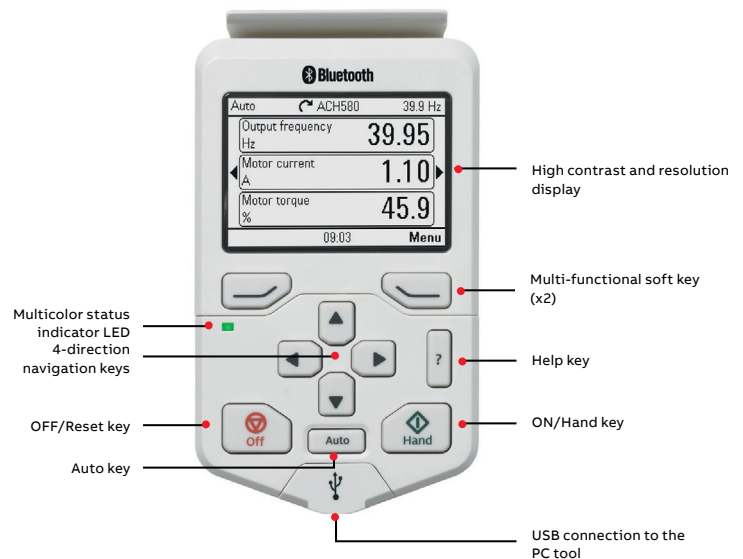
Px12-1	1 - 5	1 - 7.5	N/A	26.50	673	6.5	164	12.40	316	18.1	8.2	12.48	317	3.9	98
Px12-2	7.5 - 10	10 - 15	2 - 15	30.22	768	6.5	164	12.64	321	22.0	10.0	16.42	417	3.9	98
Px12-3	15 - 20	20 - 30	20 - 30	36.51	927	8.39	213	13.22	336	39.0	17.7	18.75	476	6.3	160
Px12-4	25	40 - 60	N/A	42.54	1081	8.4	213	14.26	362	60.0	27.2	24.49	622	6.3	160
PxB12-3	30 - 60	75 - 200	40 - 150	54.17	1376	28.2	717	19.04	483	393.0	178.3	46.26	1175	23.6	600
PxB12-6	N/A	250 - 350	N/A	78.00	1981	32.0	813	27.30	693	765.0	347.0	Free Standing			

Standard configuration dimensions for reference only.

CONTROL PANEL FEATURES

The SmartDrive® ACH580 Assistant Control Panel features:

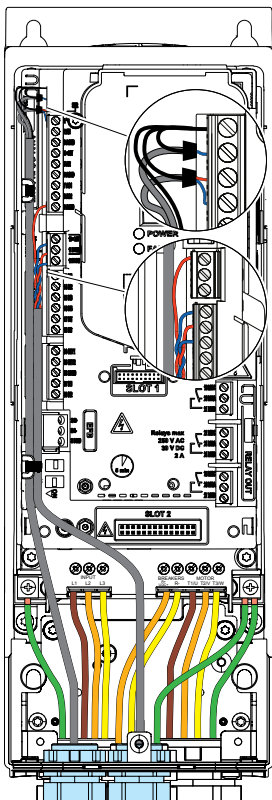
- Intuitive to operate
- Primary Setting menu to ease drive commissioning
- Real-time clock
- Diagnostic and maintenance functions
- Full-graphic display, including chart, graph, and meter options
- 21 editable home views
- USB interface for PC and tool connection as standard
- Parameters are alpha-numeric
- North American version supports 14 languages as standard
- Dedicated "Help" key
- 4 user sets
- Parameter stored in control panel memory for later transfer to other drives or for backup of a particular system
- Back-up and restore parameters and/or motor data
- Automatic back-up 2 hours after parameter change
- Modified parameter display
- Creates unique short menu
- Shows parameters that differ from the default



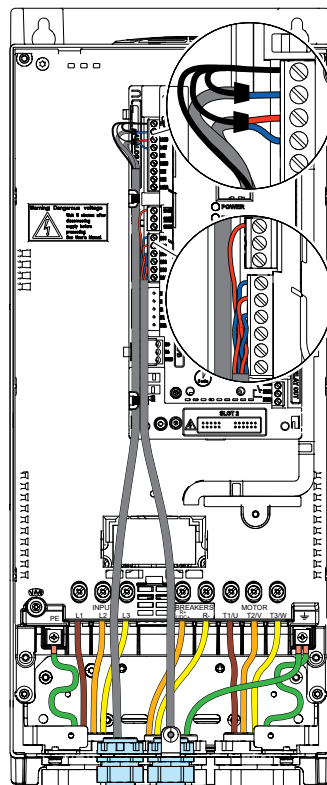
BASIC DRIVE CABLE CONNECTIONS

The following illustrations show the ACH580-01 cable connection points for the base drive. The illustrations indicate the location of input and output power connections as well as equipment and motor grounding connection points.

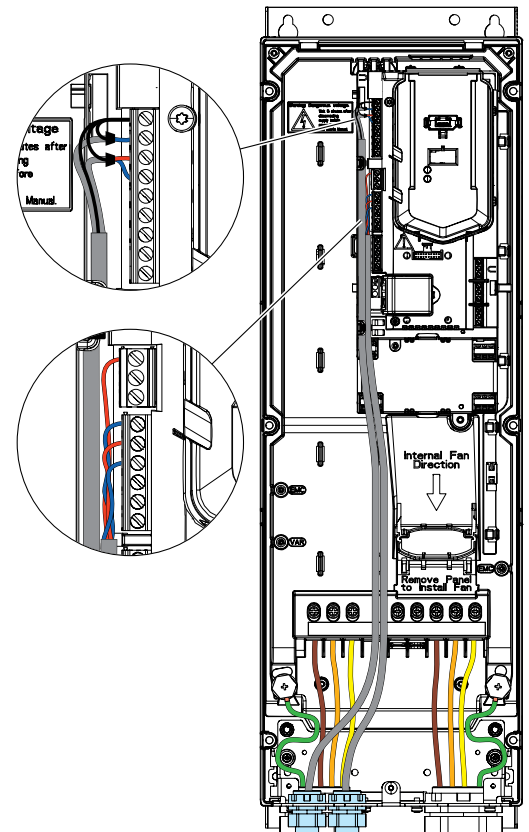
ACH580 drives are configured for wiring access from the bottom only. At least three separate metallic conduits are required, one for input power, one for output power to the motor and one for control signals.



ACH580-01, R1-R2, UL (NEMA) Type 1 and 12

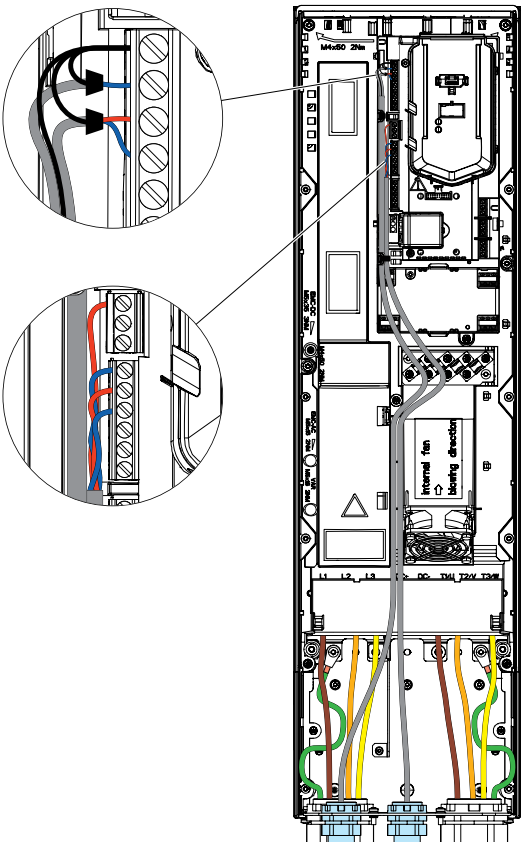


ACH580-01, R3, UL (NEMA) Type 1 and 12

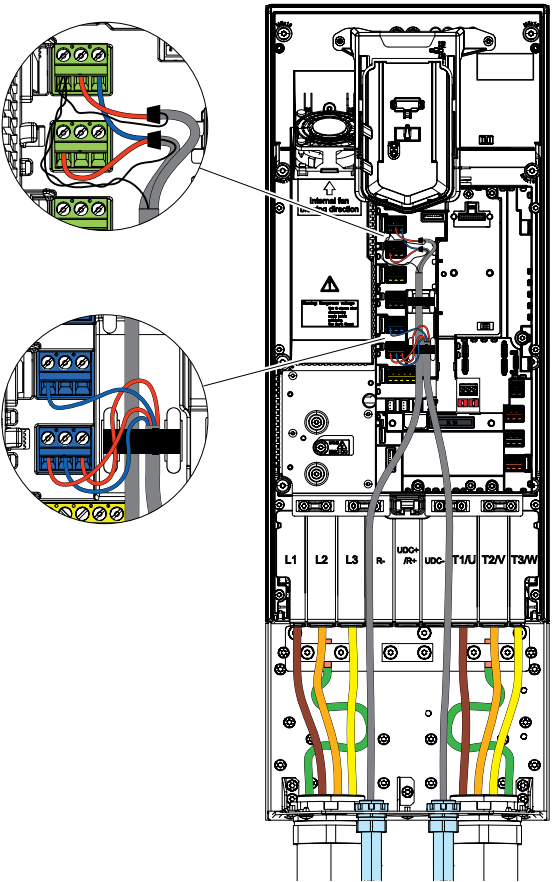


ACH580-01, R4, UL (NEMA) Type 1 and 12

BASIC DRIVE CABLE CONNECTIONS



ACH580-01, R5, UL (NEMA) Type 1 and 12

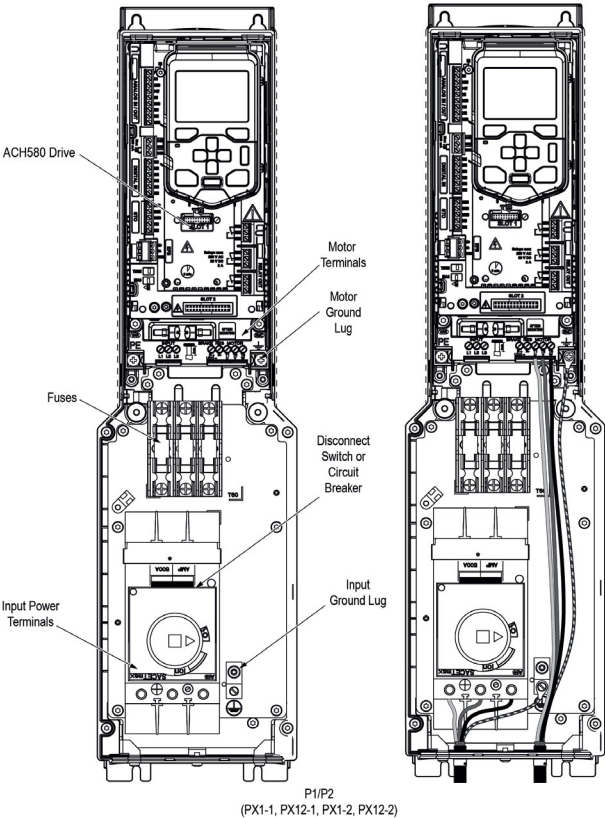


ACH580-01, R6-9, UL (NEMA) Type 1 and 12

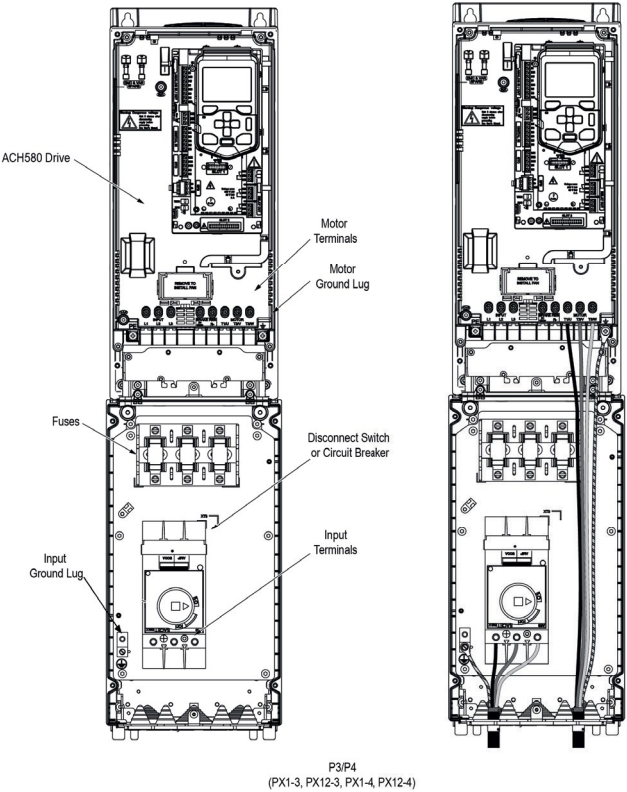
PACKAGED DRIVE CABLE CONNECTIONS

The following illustrations show the ACH580 Packaged Drive cable connection points for the various enclosure styles. The illustrations indicate the location of input and output power connections as well as equipment and motor grounding connection points.

ACH580-PCR and PDR packages are configured for wiring access from the bottom only on vertical wall mount units and from the top only on UL (NEMA) Type 1 and 12 standard wall mount units. At least three separate metallic conduits are required, one for input power, one for output power to the motor and one for control signals.

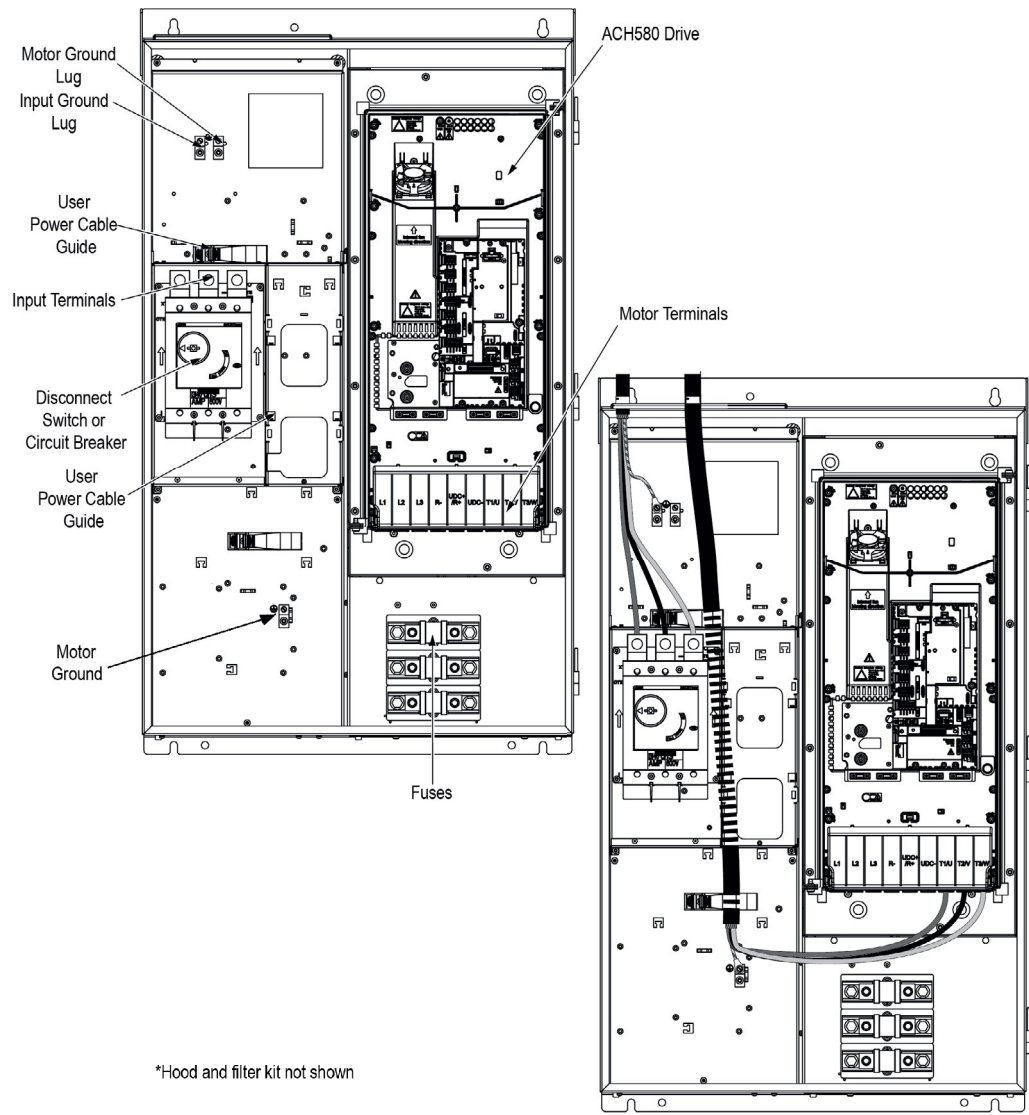


PX1-1, PX1-2, PX12-1, PX12-2



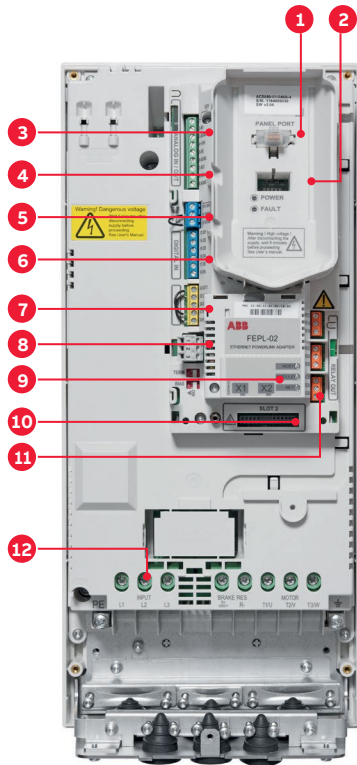
PX1-3, PX1-4, PX12-3, PX12-4

PACKAGED DRIVE CABLE CONNECTIONS

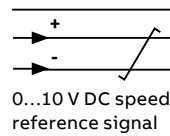


PXB1-3, PXB12-3

DEFAULT CONTROL CONNECTIONS



1. Panel port (PC tools, control panel)
2. ABB drive customizer port for programming the drive without mains
3. Analog inputs (2 × AI)
4. Analog outputs (2 × AO)
5. 24 V DC output
6. Digital inputs (6 × DI)
7. Safe torque off (STO)
8. Embedded fieldbus
9. Communication options (fieldbuses)
10. Analog and digital I/O extensions
11. Relay outputs (3 × RO)
12. Mains connection



Terminal	Meaning	Default macro connections	
X1 Reference voltage and analog inputs and outputs			
1	SCR	Signal cable shield (screen)	
2	AI1	Output frequency/speed reference: 0 to 10 V	
3	AGND	Analog input circuit common	
4	+10 V	Reference voltage 10 V DC	
5	AI2	Actual feedback: 0 to 20 mA	
6	AGND	Analog input circuit common	
7	AO1	Output frequency: 0 to 10 V	
8	AO2	Motor current: 0 to 20 mA	
9	AGND	Analog output circuit common	
X2 & X3 Aux. voltage output and programmable digital inputs			
10	+24 V	Aux. voltage output +24 V DC, max. 250 mA	
11	DGND	Aux. voltage output common	
12	DCOM	Digital input common for all	
13	DI1	Stop (0)/Start (1)	
14	DI2	Not configured	
15	DI3	Constant frequency/speed selection	
16	DI4	Start interlock 1 (1 = allow start)	
17	DI5	Not configured	
18	DI6	Not configured	
X6, X7, X8 Relay outputs			
19	RO1C	 Damper control 250 V AC/30 V DC 2 A	Energize damper 19 connected to 21
20	RO1A		
21	RO1B		
22	RO2C	 Running 250 V AC/30 V DC 2 A	Running 22 connected to 24
23	RO2A		
24	RO2B		
25	RO3C	 Fault (-1) 250 V AC/30 V DC 2 A	Fault condition 25 connected to 26
26	RO3A		
27	RO3B		
X5 Embedded fieldbus			
29	B+	Embedded fieldbus, EFB (EIA-485)	
30	A-		
31	DGND		
S4	TERM	Termination switch	
S5	BIAS	Bias resistors switch	
X4 Safe torque off			
34	OUT1	Safe torque off. Factory connection. Both circuits must be closed for the drive to start. See chapter <i>The Safe torque off function</i> in the <i>hardware manual</i> of the drive.	
35	OUT2		
36	SGND		
37	IN1		
38	IN2		
X10 24 V AC/DC			
40	24 V AC/DC+ in	R6-R11 only: Ext. 24V AC/DC input to power up the control unit when the main supply is disconnected.	
41	24 V AC/DC- in		

Notes:

¹⁾ Connected with jumpers at the factory.

²⁾ Only frames R6-R11 have terminals 40 and 41 for external 24 V AC/DC input.