

User's Manual

ACS580-0P 3R Irrigation Packaged Drive Supplement to ACS580-U1 User's Manual



ACS580 Drive Manuals

GENERAL MANUALS

[ACS580-01 Hardware Manual \(3AXD50000044794\)](#)

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

[ACS580, general purpose drives catalog \(ACS580-PHTC01U-EN\)](#)

- Detailed Product Description
- Practical Engineering Guides

[ACS580 standard control program firmware manual \(3AXD50000016097\)](#)

- Control panel
- Settings
- Programming and macros
- Parameter details

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Safety



WARNING! The ACS580 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 ACS580, 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 ACS580 will start up automatically after an input voltage interruption if the external run command is on.



WARNING! When the ACS580 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 ACS580 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.

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 ACS580 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 ACS580 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.

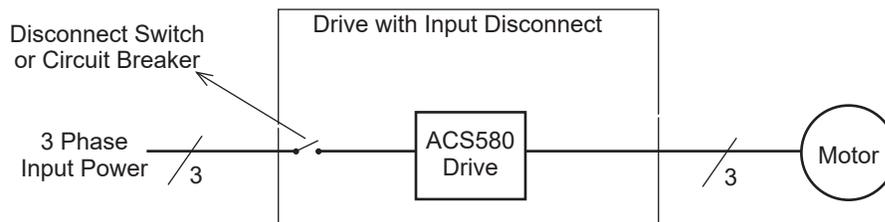
Application

This manual contains supplemental information that is unique to ACS580 input disconnect configurations (0P). Refer to the base manual, ACS580-01 User’s Manual, for all other information.

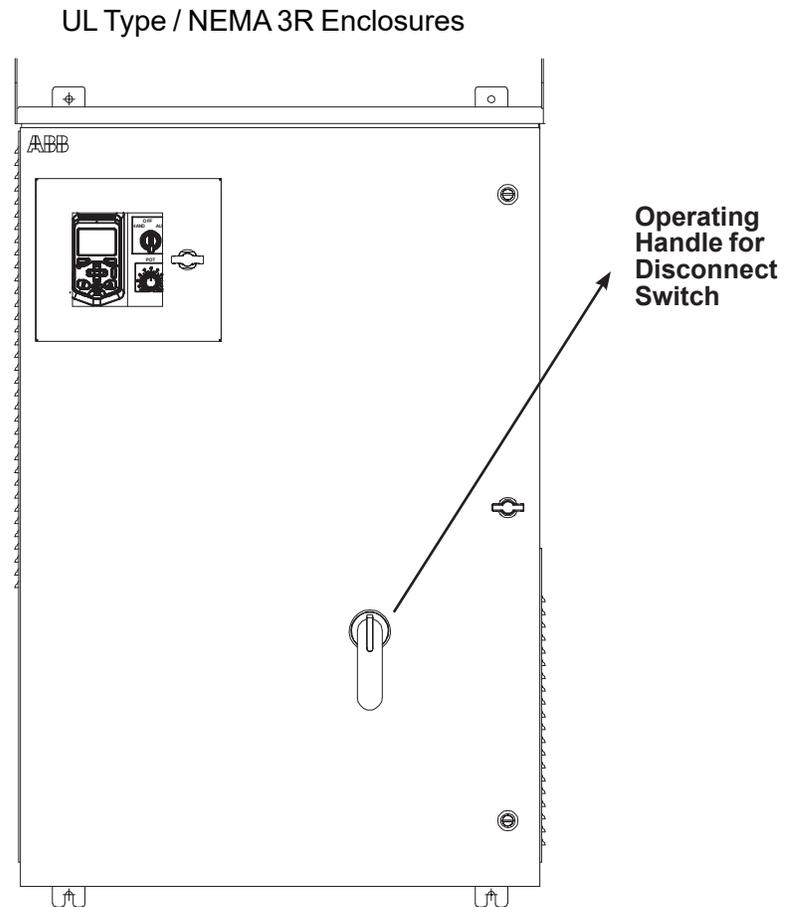
Input Disconnect Features and Functions

The ACS580 with Input Disconnect is an ACS580 AC adjustable frequency drive packaged with an input disconnect switch and with a door mounted, external operating handle. The operating handle can be padlocked in the OFF position (padlock not supplied). Enclosure are UL Type 3R (NEMA 3R).

The following is a typical power diagram.



The following figures show the front view of the ACS580 Drive with Input Disconnect standard configurations, and identify the major components.



Note! UL Type 3R enclosures are designed to be mounted on a wall. See section “Prepare the UL Type 3R ACS580 for UNISTRUT® mounting” for more details.

Installation Flow Chart

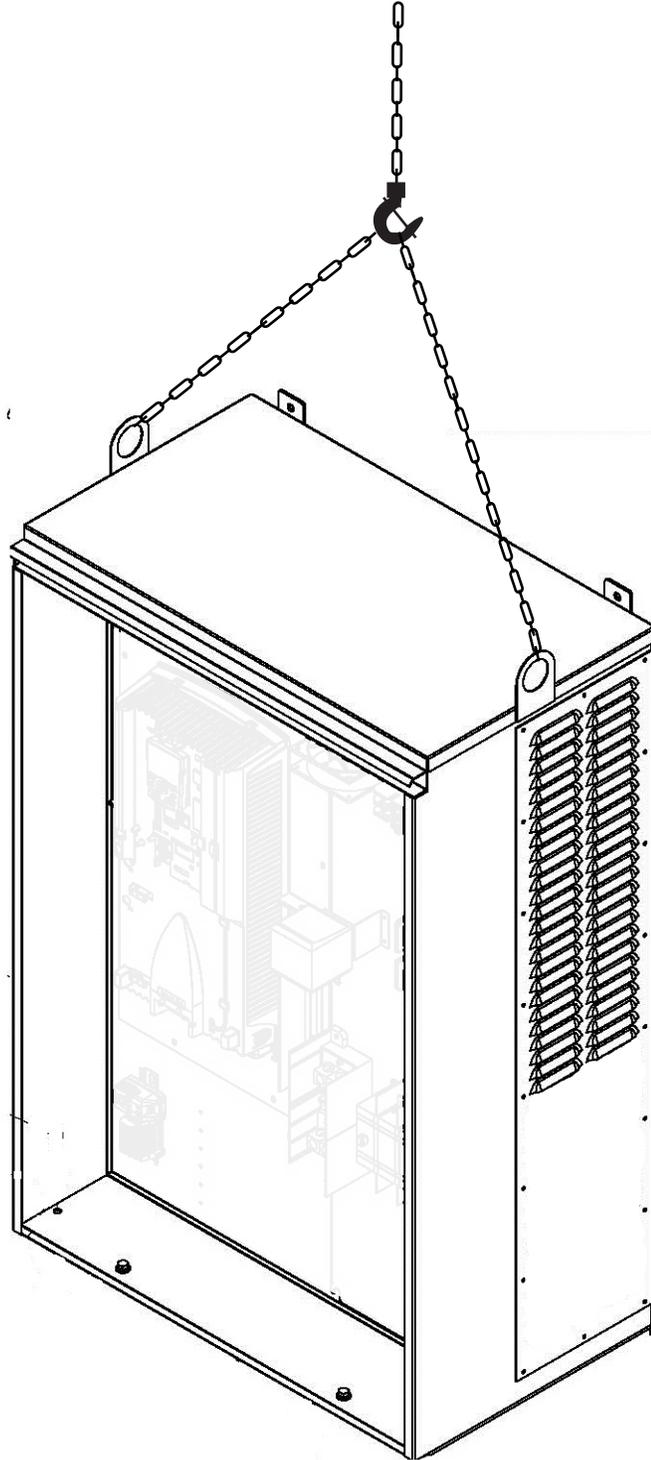
The installation of Input Disconnect configurations for ACS580 drives follows the outline below. The steps must be carried out in the order shown. At the right of each step are references to the detailed information needed for the correct installation of the unit.

Note! References in the middle column below are to the ACS580-01 User’s Manual. References in the third column below are to this manual.

Task	Refer to the ACS580-01 User’s Manual “Installation” section	Additional Reference in this Manual
<div style="border: 1px solid black; padding: 5px; text-align: center;">PREPARE for installation</div>	“Preparing for Installation”	<ul style="list-style-type: none"> • “Drive Identification” on page 9. • “Suitable Mounting Location” on page 10.
<div style="border: 1px solid black; padding: 5px; text-align: center;">PREPARE the Mounting Location</div>	“Prepare the Mounting Location”	• “Dimensions and Weights”
<div style="border: 1px solid black; padding: 5px; text-align: center;">MOUNT the drive</div>	“Mount the Drive”	--
<div style="border: 1px solid black; padding: 5px; text-align: center;">INSTALL wiring</div>	“Wiring Overview” and “Install the Wiring”	“Installing the Wiring”
<div style="border: 1px solid black; padding: 5px; text-align: center;">CHECK installation</div>	“Check Installation”	--
<div style="border: 1px solid black; padding: 5px; text-align: center;">APPLY power</div>	“Apply Power”	--
<div style="border: 1px solid black; padding: 5px; text-align: center;">START-UP</div>	“Start-Up”	--

Preparing for Installation (Supplement to ACS580-01 User's Manual)

Lifting the Drive



Installing the Drive (Supplement to ACS580-01 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.

Prepare the Mounting Location

The ACS580 should only be mounted where all of the requirements defined in "Preparing for Installation" are met.

Mount the Drive

1. Use a hoist to move the cabinet into position.

Note! If the cabinet location does not provide access to the cabinet sides, be sure to re-mount side panels before positioning cabinet.

2. Install and tighten mounting bolts.

Installing the Drive - continued

Prepare the UL Type 3R ACS580 for UNISTRUT® mounting or wall mounting

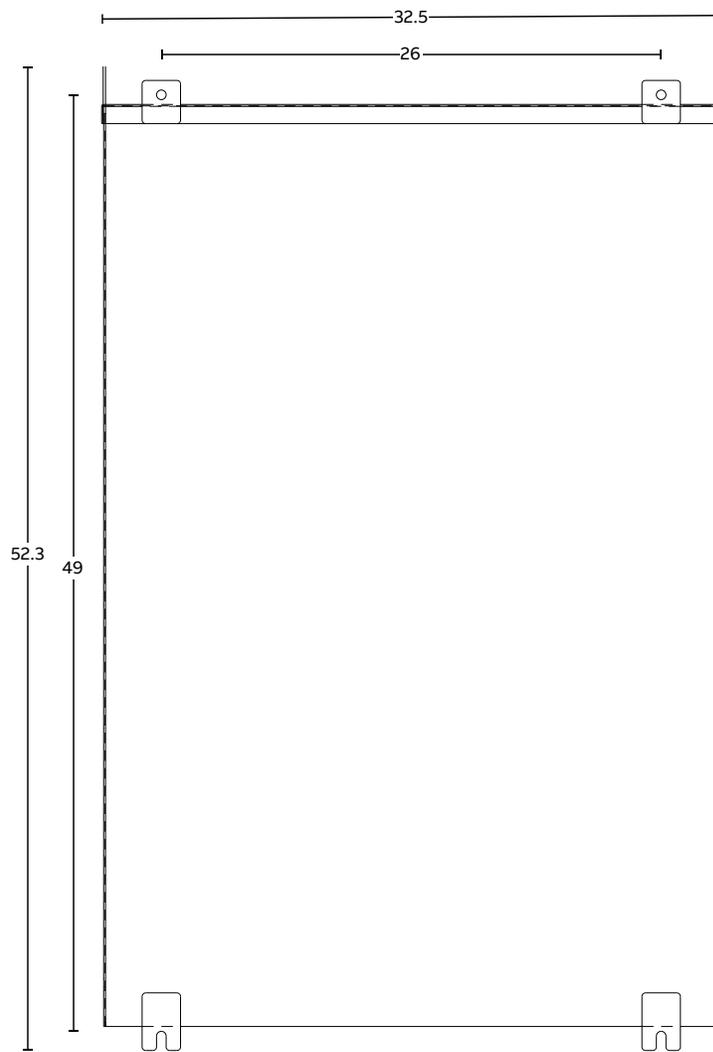
The ACS580 UL Type 3R cabinet frame sizes are designed to be mounted on a solid vertical surface or using UNISTRUT. An optional floor/ground mounting kit is available for purchase.

Installing the Wiring (Supplement to ACS580-01 User's Manual)

Wiring Requirements

Refer to the "Wiring Requirements" Section in the ACS580-01 User's Manual. The requirements apply to all ACS580 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.

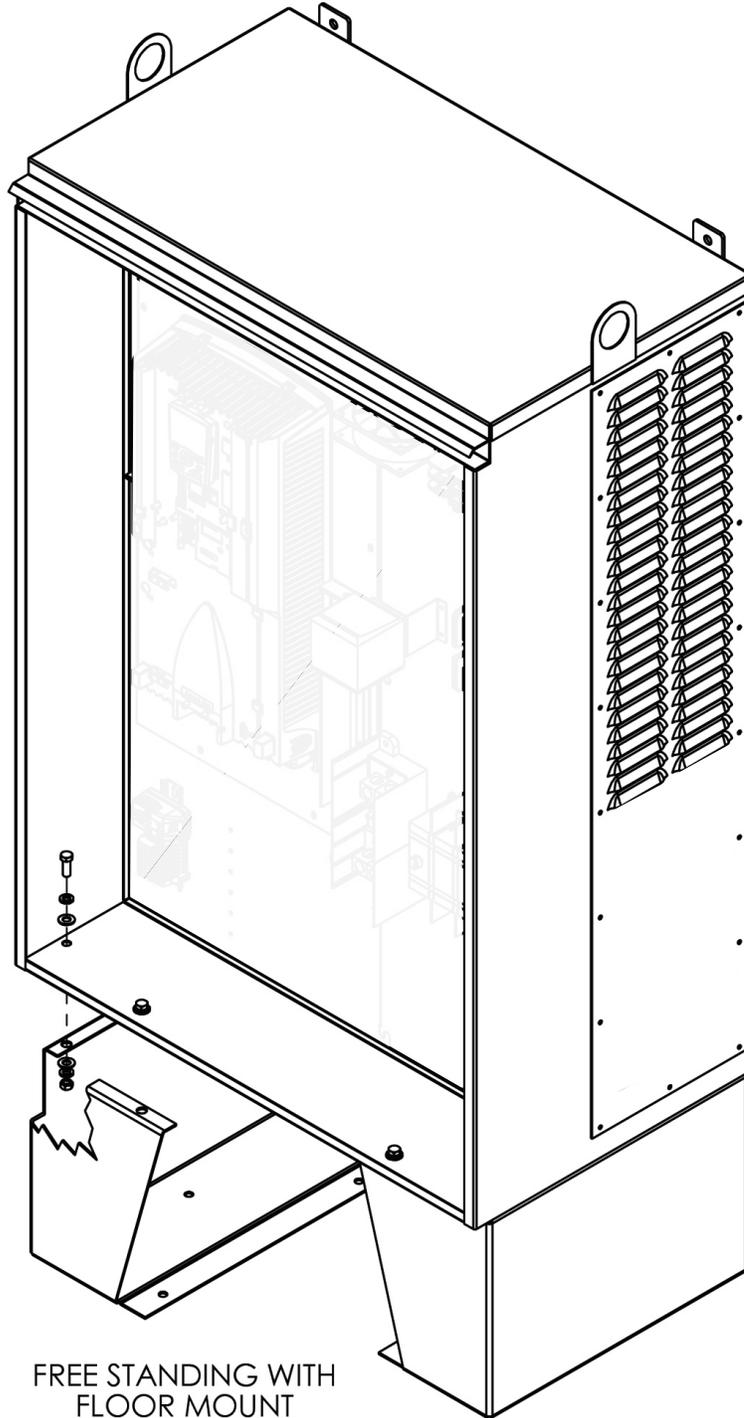


WALL MOUNT
BACK VIEW

Installing the Drive - continued

Optional Floor/Ground Mounting Kit

An optional floor/ground mounting kit is available for purchase.

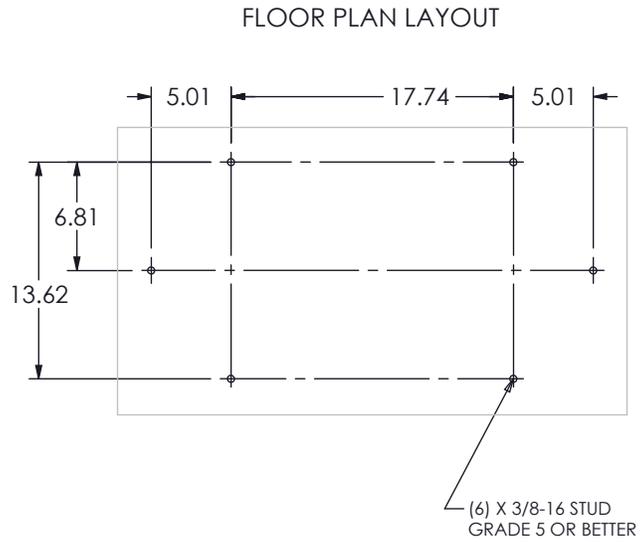


FREE STANDING WITH
FLOOR MOUNT
OPTION

Assembly instructions for mounting optional foot kit on 3R irrigation panel

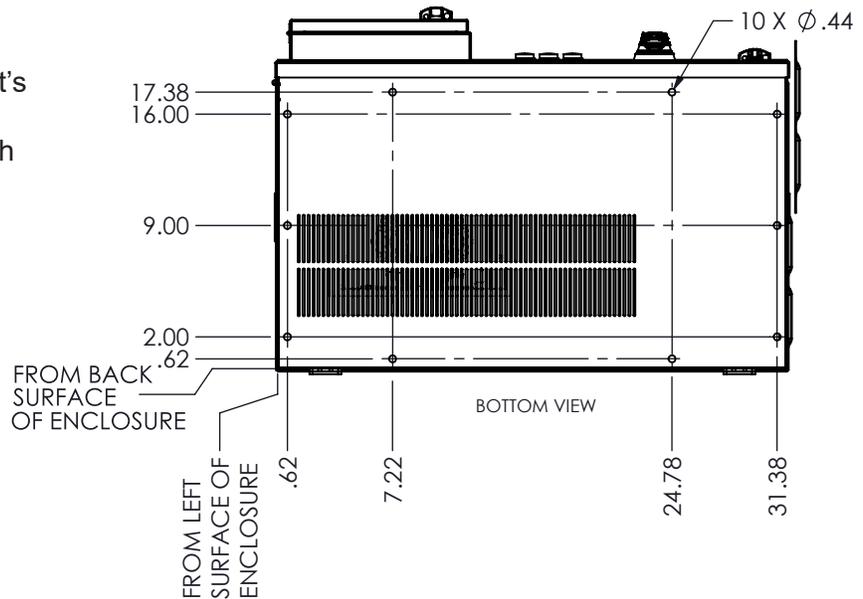
Step 1

Prepare mounting surface for enclosure.



Step 2

With the enclosure laying on it's back, drill the (10) holes as shown below using a 7/16 inch drill bit.

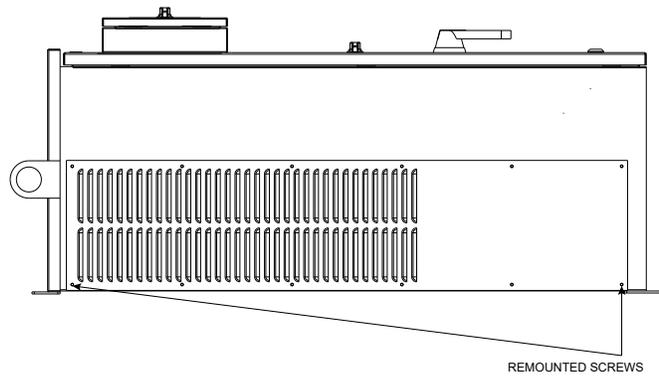


Assembly instructions for mounting optional foot kit on 3R irrigation panel

Step 3

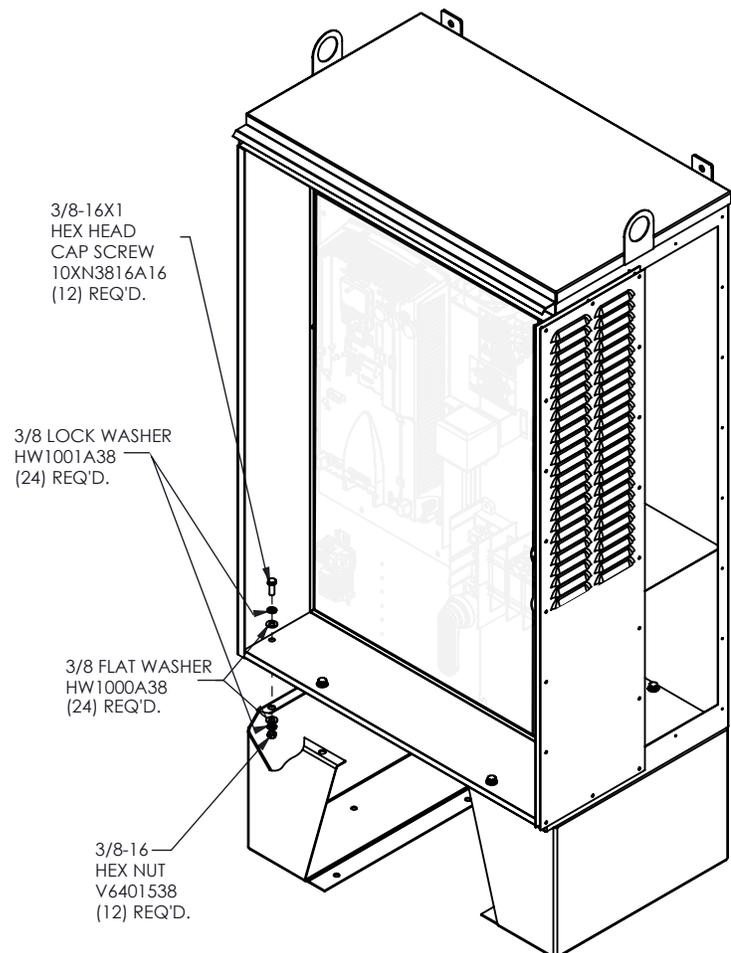
Remove the vent plate on the right side of the enclosure to be able to assemble the hardware for the mounting feet.

The vent plate can be remounted using two screws for safe keeping.



Step 4

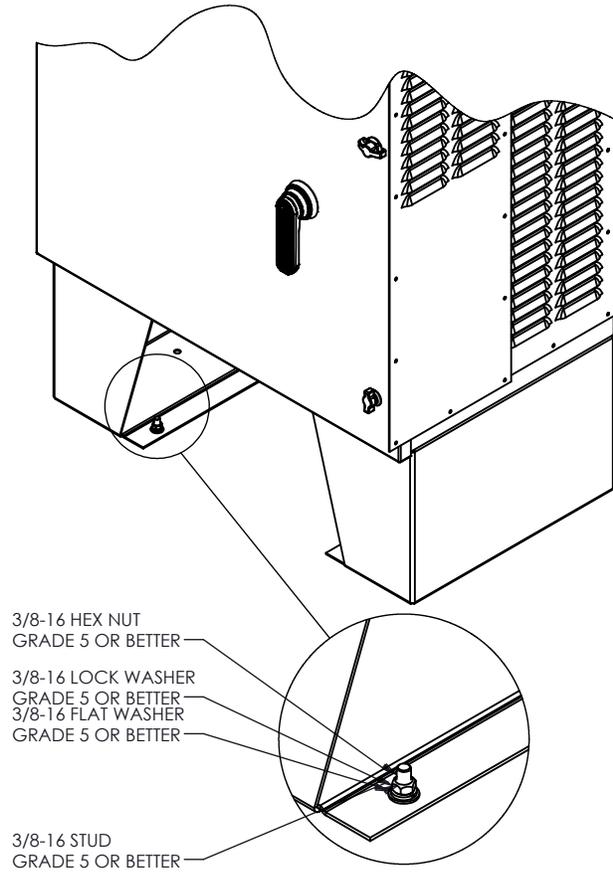
Assemble foot kit with mounting hardware.



Assembly instructions for mounting optional foot kit on 3R irrigation panel

Step 5

Using the lifting eyes, lift the enclosure and place onto mounting studs and assemble hardware.



Wiring Overview

Power Connection – Standard Drive with Input Disconnect (Wall Mounted)

The following figures show the Standard Drive with Input Disconnect (wall mounted) typical layout. (Refer to the ACS580-01 User's Manual and 3R Irrigation Control Schematic for control connections to the drive.)

Install the Line Input Wiring

Line Input Connections – Standard Drive with Input Disconnect Configurations

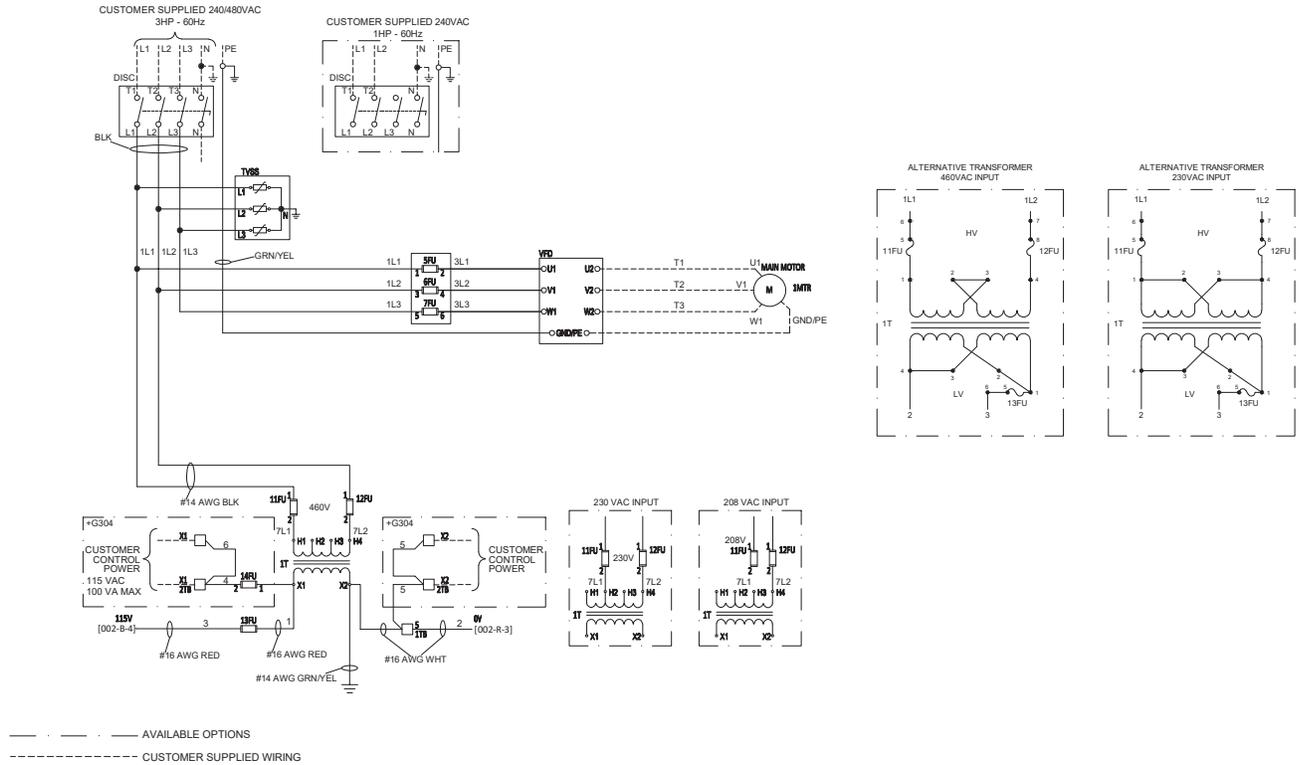
Connect input power to the terminals of the disconnect switch. Connect the equipment grounding conductor to the ground lug. The figure below shows typical connection points for Standard ACS580 Drive with Input Disconnect configurations.

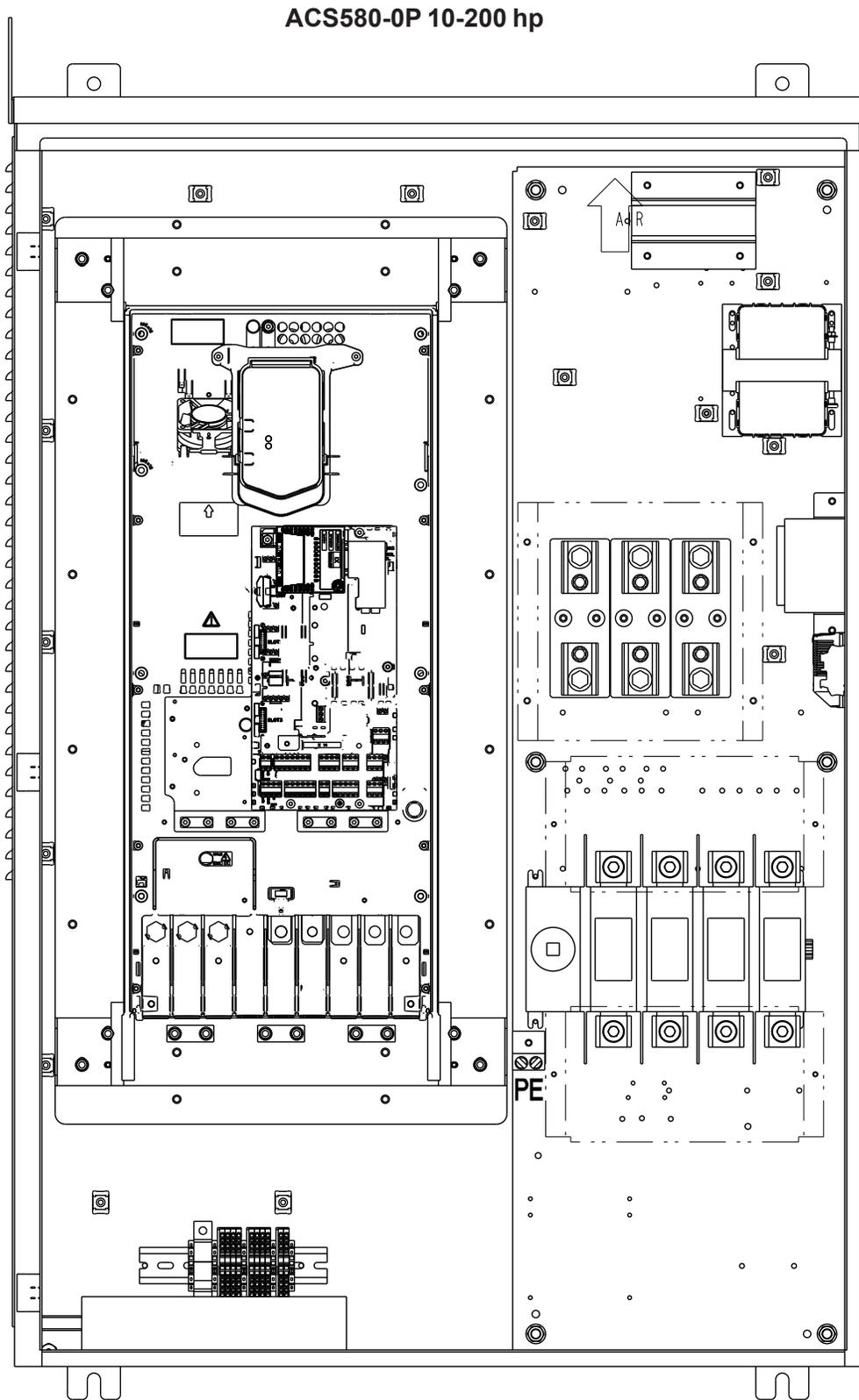


WARNING! Check the motor and motor wiring insulation before connecting the ACS580 to line power. Follow the procedure in the ACS580-01 User's Manual. Before proceeding with the insulation resistance measurements, check that the ACS580 is disconnected from incoming line power. Failure to disconnect line power could result in death or serious injury.

Note! For the remainder of the installation and start-up (motor and control wiring) refer to the ACS580-01 User's Manual.

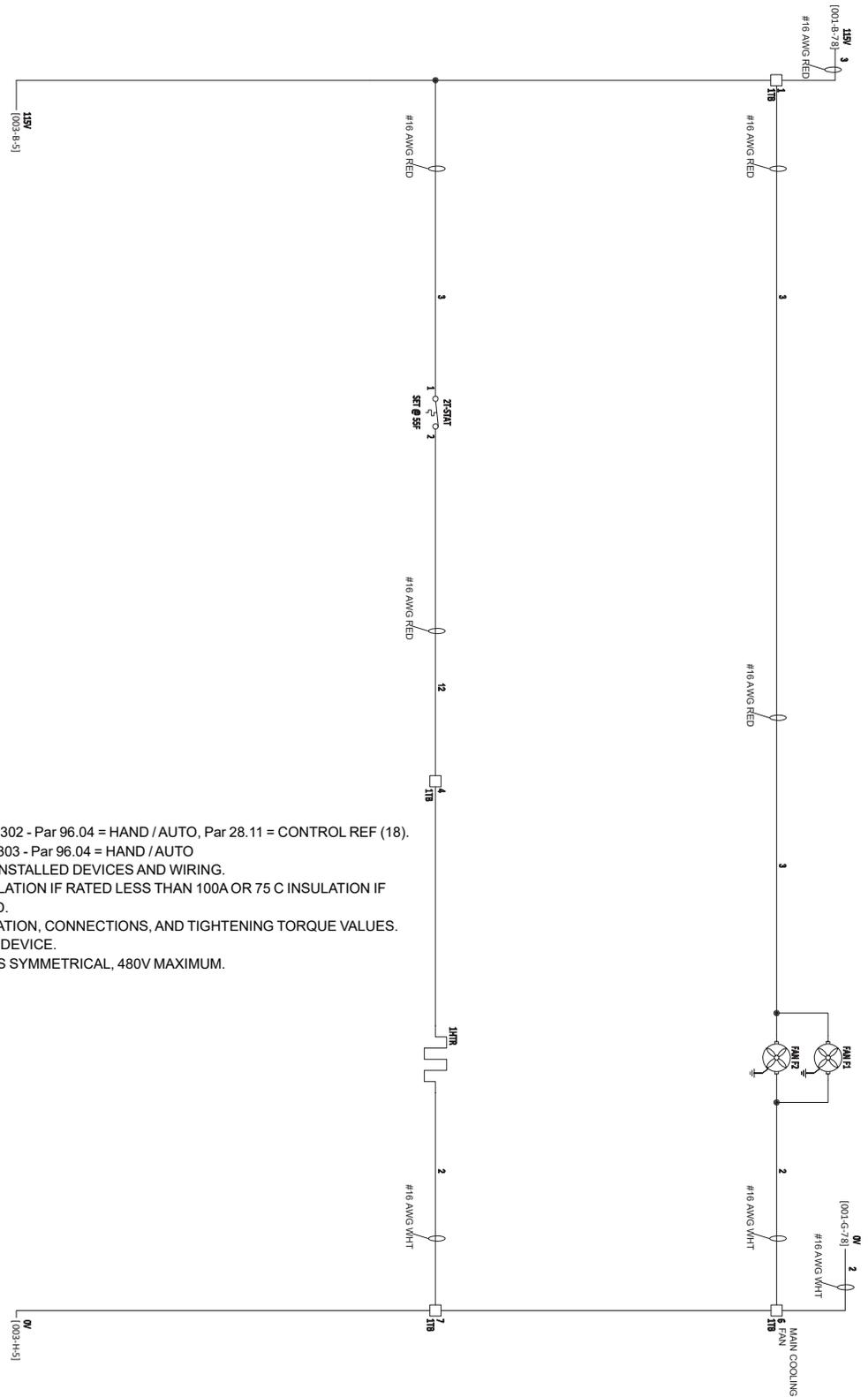
Typical Power Connections for Single and Three Phase





*Typical ACS580 3R irrigation panel layout

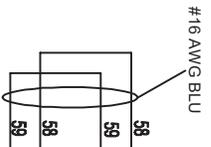
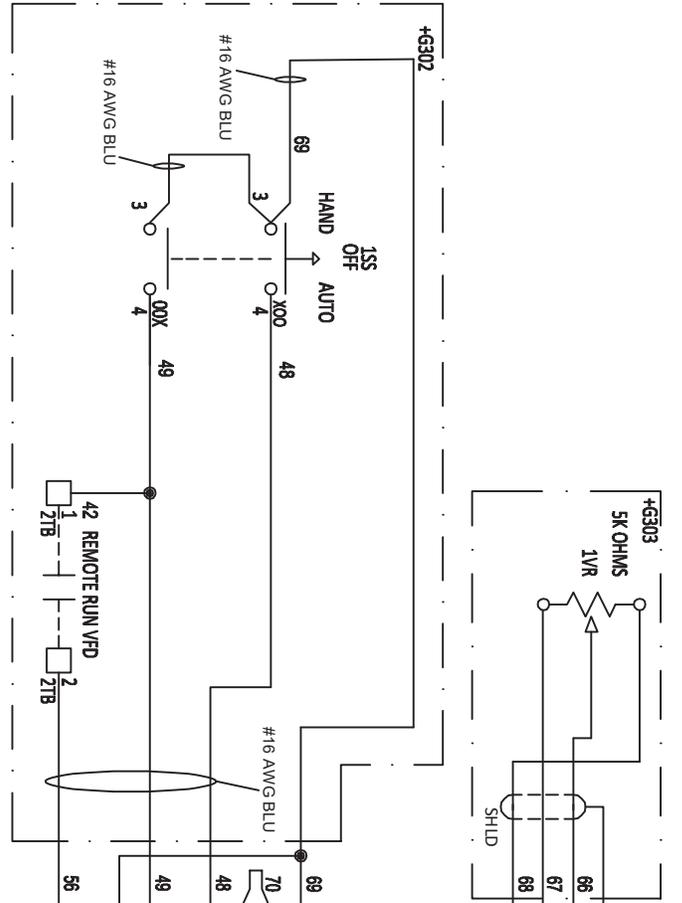
Typical Control Schematic



NOTES:

1. PROGRAMMING : NO OPTIONS OR +G302 - Par 96.04 = HAND / AUTO, Par 28.11 = CONTROL REF (18).
: +G302+G303 OR +G303 - Par 96.04 = HAND / AUTO
2. DASHED LINE INDICATE CUSTOMER INSTALLED DEVICES AND WIRING.
3. COPPER WIRE RATED FOR 60 C INSULATION IF RATED LESS THAN 100A OR 75 C INSULATION IF RATED 100A OR MORE MUST BE USED.
4. REFER TO USER MANUAL FOR OPERATION, CONNECTIONS, AND TIGHTENING TORQUE VALUES.
5. FUSE REPLACEMENT LABEL IS NEAR DEVICE.
6. SHORT CIRCUIT CURRENT: 100kA RMS SYMMETRICAL, 480V MAXIMUM.
7. REVERSE FED DISCONNECT

— — — — — AVAILABLE OPTIONS
 - - - - - CUSTOMER SUPPLIED WIRING

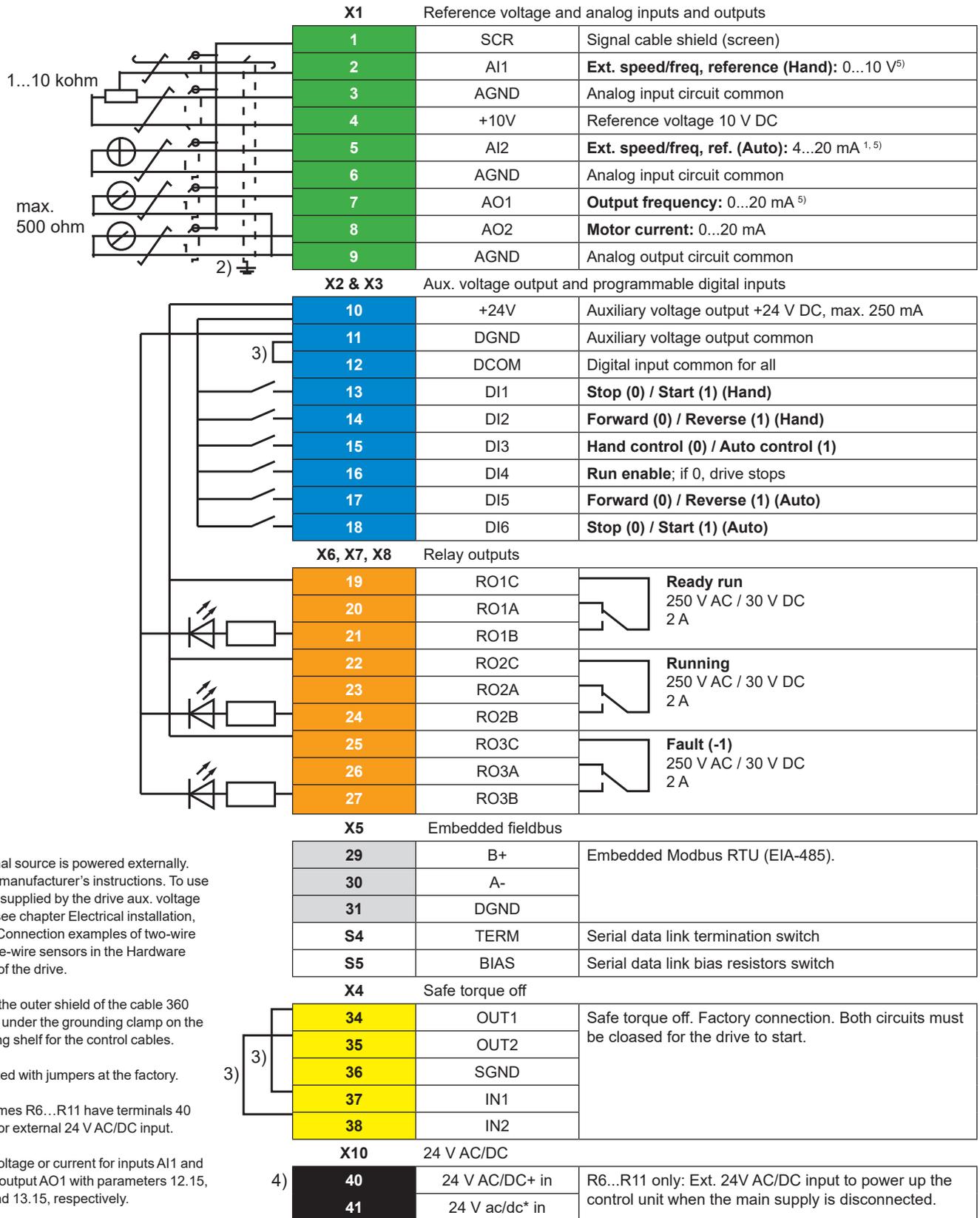


VFD		ACS580
X1	REFERENCE VOLTAGE AND ANALOG I/O	
1	SCR	SIGNAL CABLE SHIELD (SCREEN)
2	A11	OUTPUT FREQUENCY/SPEED REF 0-10 V, HAND
3	AGND	ANALOG INPUT CIRCUIT COMMON
4	+10V	REFERENCE VOLTAGE 10 VDC
5	A12	OUTPUT FREQUENCY/SPEED REF 4-20mA, AUTO
6	AGND	ANALOG INPUT CIRCUIT COMMON
7	A01	OUTPUT FREQUENCY 0-20mA
8	A02	MOTOR CURRENT 0-20 mA
9	AGND	ANALOG OUTPUT CIRCUIT COMMON
X2 AND X3	AUX VOLTAGE OUTPUT / PROGRAMMABLE DIGITAL INPUTS	
10	+24V	AUX VOLTAGE OUTPUT +24 VDC 250 mA MAX
11	DGND	AUX VOLTAGE OUTPUT COMMON
12	DCOM	DIGITAL INPUT COMMON FOR ALL
13	D11	START (1) / STOP (0) - HAND
14	D12	FORWARD (0) / REVERSE (1) HAND
15	D13	HAND (0) / AUTO (1)
16	D14	RUN ENABLE
17	D15	FORWARD (0) / REVERSE (1) AUTO
18	D16	STOP (0) / START (1) - AUTO
X6, X7, AND X8	RELAY OUTPUTS	
19	R01C	READY RUN
20	R01A	250VAC / 30VDC
21	R01B	2A
22	R02C	RUNNING
23	R02A	250VAC / 30VDC
24	R02B	2A
25	R03C	FAULT (-1)
26	R03A	250VAC / 30VDC
27	R03B	2A
X5	EMBEDDED FIELDBUS	
29	B+	EMBEDDED FIELDBUS
30	A-	EFB (EIA-485)
31	DGND	
34	TERM	TERMINATION SWITCH
35	BIAS	BIAS RESISTORS SWITCH
X4	SAFE TORQUE OFF	
34	OUT1	SAFE TORQUE OFF.
35	OUT2	FACTORY CONNECTION.
36	SGND	BOTH CIRCUITS MUST BE CLOSED
37	IN1	FOR THE DRIVE TO START.
38	IN2	
X10	24V AC / DC	
40	24VAC/DC+ IN	EXTERNAL 24V AC/DC INPUT TO POWER THE CONTROL UNIT WHEN THE MAIN SUPPLY IS DISCONNECTED.
41	24VAC/DC- IN	

NOTE: TERMINALS 40 AND 41 AVAILABLE ON R6 AND LARGER ONLY.

AVAILABLE OPTIONS
CUSTOMER SUPPLIED WIRING

Application Guides - Hand - Auto Macro



Ratings (Supplement to ACS580-01 User's Manual)

Note! The ratings listed below are exceptions to the ratings listed in the ACS580-01 User's Manual.

Input Power Connections and Power Connection Terminals (Supplement to ACS580-01 User's Manual)

1-Phase 230V

HP	ABB Product Code	Drive Input Fuse Rating		Incoming Power Connections			Ground Lugs UL Type 3R / NEMA 3R	Output Connections to Motor		
		Amps (600V)	Bussmann Type	Minimum Wire Size	Maximum Wire Size	Tightening Torque (lb/ft)		Minimum Wire Size	Maximum Wire Size	Tightening Torque (lb/ft)
10	ACS580-0P-075A-2+C192	100	JJS-100	8 AWG	1/0 AWG	4.6	14 AWG - 1/0 AWG	20 AWG	1 AWG	4
15	ACS580-0P-088A-2+C192	110	JJS-110	4 AWG	300 MCM	16.7		10 AWG	2/0 AWG	5.5
20	ACS580-0P-114A-2+C192	150	JJS-150	4 AWG	300 MCM	16.7	1.6 - 4.1 lb/ft	10 AWG	2/0 AWG	5.5
25	ACS580-0P-143A-2+C192	200	JJS-200	4 AWG	300 MCM	16.7		4 AWG	300 MCM	30
30	ACS580-0P-169A-2+C192	250	JJS-250	2 AWG	600 MCM	31.3		3/0 AWG	500 MCM	40
40	ACS580-0P-211A-2+C192	300	JJS-300	2 AWG	600 MCM	31.3		3/0 AWG	500 MCM	40
50	ACS580-0P-273A-2+C192	350	JJS-350	2 AWG	600 MCM	31.3		2x 1/0 AWG	2x 300 MCM	40

NOTE: For information regarding motor terminals, refer to "Drives Power Connection Terminals" in the ACS580-01 Manual

3-Phase 208/230V

HP	ABB Product Code	Drive Input Fuse Rating		Incoming Power Connections			Ground Lugs UL Type 3R / NEMA 3R	Output Connections to Motor		
		Amps (600V)	Bussmann Type	Minimum Wire Size	Maximum Wire Size	Tightening Torque (lb/ft)		Minimum Wire Size	Maximum Wire Size	Tightening Torque (lb/ft)
25	ACS580-0P-075A-2+C192	100	JJS-100	8 AWG	1/0 AWG	4.6	14 AWG - 1/0 AWG	20 AWG	1 AWG	4
30	ACS580-0P-088A-2+C192	110	JJS-110	4 AWG	300 MCM	16.7		10 AWG	2/0 AWG	5.5
40	ACS580-0P-114A-2+C192	150	JJS-150	4 AWG	300 MCM	16.7	1.6 - 4.1 lb/ft	10 AWG	2/0 AWG	5.5
50	ACS580-0P-143A-2+C192	200	JJS-200	4 AWG	300 MCM	16.7		4 AWG	300 MCM	30
60	ACS580-0P-169A-2+C192	250	JJS-250	2 AWG	600 MCM	31.3		3/0 AWG	500 MCM	40
75	ACS580-0P-211A-2+C192	300	JJS-300	2 AWG	600 MCM	31.3		3/0 AWG	500 MCM	40
100	ACS580-0P-273A-2+C192	350	JJS-350	2 AWG	600 MCM	31.3		2x 1/0 AWG	2x 300 MCM	40

NOTE: For information regarding motor terminals, refer to "Drives Power Connection Terminals" in the ACS580-01 Manual

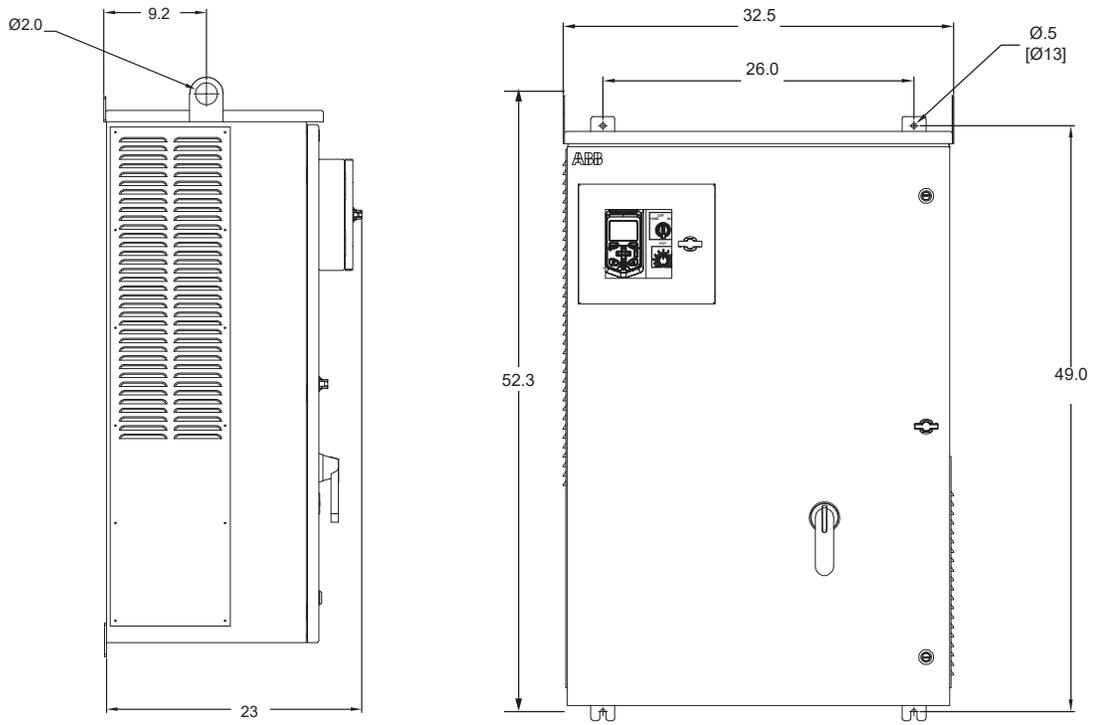
3-Phase 460V

HP	ABB Product Code	Drive Input Fuse Rating		Incoming Power Connections			Ground Lugs UL Type 3R / NEMA 3R	Output Connections to Motor		
		Amps (600V)	Bussmann Type	Minimum Wire Size	Maximum Wire Size	Tightening Torque (lb/ft)		Minimum Wire Size	Maximum Wire Size	Tightening Torque (lb/ft)
40	ACS580-0P-052A-4+C192	80	JJS-80	8 AWG	1/0 AWG	4.6	14 AWG - 1/0 AWG	20 AWG	1 AWG	3
50	ACS580-0P-065A-4+C192	90	JJS-90	8 AWG	1/0 AWG	4.6		20 AWG	1 AWG	3
60	ACS580-0P-077A-4+C192	100	JJS-100	8 AWG	1/0 AWG	4.6	1.6 - 4.1 lb/ft	20 AWG	1 AWG	3
75	ACS580-0P-096A-4+C192	150	JJS-150	4 AWG	300 MCM	16.7		10 AWG	2/0 AWG	4.1
100	ACS580-0P-124A-4+C192	200	JJS-200	4 AWG	300 MCM	16.7		4 AWG	300 MCM	22.1
125	ACS580-0P-156A-4+C192	225	JJS-225	4 AWG	300 MCM	16.7		3/0 AWG	500 MCM	29.4
150	ACS580-0P-180A-4+C192	300	JJS-300	2 AWG	600 MCM	31.3		3/0 AWG	500 MCM	29.4
200	ACS580-0P-240A-4+C192	350	JJS-350	2 AWG	600 MCM	31.3	2x1/0 AWG	2x 300 MCM	29.4	

NOTE: For information regarding motor terminals, refer to "Drives Power Connection Terminals" in the ACS580-01 Manual

Dimensions and Weights (Supplement to ACS580-01 User's Manual)

Dimensions: ACS580-0P UL Type / NEMA 3R



1-Phase 230V

HP	Weight (lbs)	Height (in)	Width (in)	Depth (in)
10	252			
15	266			
20	266			
25	312	52.3	32.5	23
30	341			
40	341			
50	376			

3-Phase 460V

HP	Weight (lbs)	Height (in)	Width (in)	Depth (in)
40	258			
50	258			
60	258			
75	265	52.3	32.5	23
100	311			
125	342			
150	342			
200	377			

3-Phase 208/230V

HP	Weight (lbs)	Height (in)	Width (in)	Depth (in)
25	252			
30	266			
40	266			
50	312	52.3	32.5	23
60	341			
75	341			
100	376			

Free Space Requirement

	Above (in)	Below (in)	Right Side (in)	Left Side (in)
All Sizes	12	12	8	8

NOTE: 16 inches of free space is required between heat generating panels/devices

Ambient Conditions

The following table lists the ACS580 Irrigation Drive environmental requirements

Ambient environment requirements

	Installation site	Storage and transportation
Altitude	<ul style="list-style-type: none"> 0...100m (0...330ft) 1000m...4000m (330...13120 ft) with derating of 1% every 100m (330 ft) 	
Ambient temperature	<ul style="list-style-type: none"> -20...+40°C (5...104°F) with heater -20...+50°C (5...122°F)with heater and derate For information on ambient temperature and switching frequency derating, refer to the Technical Data section of the ACS580-01 drives Hardware Manual (3AXD50000044794) No frost allowed 	<ul style="list-style-type: none"> -40...+70°C (-40...158°F)
Relative humidity	<ul style="list-style-type: none"> 5...95%, no condensation allowed 	

Applicable Standards

Panel compliance with the following standards is identified by the standards “marks” on the panel.

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

Compliance is valid with the following provision:

- The installation rules of this manual are followed.

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 and clean heatsink.	All	Depends on the dustiness of the environment (every 6...12 months)	See "Maintenance" in ACS580-01 User's Manual.
Replace drive module fan.	All	Every six years	See "Maintenance" in ACS580-01 User's Manual.
Replace enclosure fan(s).	NEMA 3R enclosures	Every three years	See "Enclosure Fan Replacement – UL Type / NEMA 3R. See "Maintenance" in ACS580-01 User's Manual.
Change capacitor.	Frame sizes R5 and R6	Every ten years	See "Maintenance" in ACS580-01 User's Manual.
Replace battery in the Assistant control panel.	All	Every ten years	See "Maintenance" in ACS580-01 User's Manual.

Drive Module Fan Replacement

The drive module fan cools the heatsink. Fan failure can be predicted by the increasing noise from fan bearings and the gradual rise in the heatsink temperature in spite of heatsink cleaning. If the drive is operated in a critical part of a process, fan replacement is recommended once these symptoms start appearing. Replacement fans are available from ABB. Do not use other than ABB specified spare parts.

To monitor the running time of the cooling fan, see "Group 29: Maintenance Trig" in the ACS580-01 Users's Manual.



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