SAI Drive Solutions - XP Drive Series

Hazardous Location AC Drive

Instruction and User Manual

Types:	XP12 – 200-240V, Single Phase Input, 1/8HP thru 3HP
	XP32 – 200-240V, Three Phase Input, 1/4HP thru 10HP
	XP34 – 380-500V, Three Phase Input, 1/4HP thru 25HP

Before using this product, read this manual thoroughly and retain for easy reference, inspection, and maintenance.



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1. Preface

Thank you for your purchase of SAI's high performance, explosion-proof XP Drive. These devices are manufactured with high-quality components and to the highest standards available today. SAI Drive Solutions integrates a wide variety of drives, starters, and other power conversion equipment into finished packages for end-customer usage.

In this manual, you will find helpful information regarding mechanical installation, electrical wiring, operation, troubleshooting, and maintenance of the unit. To guarantee safe operation of the equipment, read the following safety guidelines before connecting power to the AC drive. Keep this manual handy for future reference and use.

1.1. Application

The XP Drive is a Type (NEMA) 7/4X drive package which is ETL-listed for use in Class I, Division 1, groups B, C, & D and Class II, Division 1, groups E, F, & G. This drive has been thoroughly tested for full load operation in ambient temperatures up to 50°C to ensure maximum performance in the most demanding industrial applications. Examples of this include the following:

- Oil and gas
- OEM integrators
- Petrochemicals
- Pharmaceuticals
- Food & beverage

1.2. General Safety Instructions



NOTE

- Any illustrations, photographs, or examples used in this manual are provided as examples only and may not apply to all products for which this manual is applicable.
- The products, specifications, and information in this manual may be changed without notice to improve the product and/or manual.
- If a nameplate becomes worn or damaged, order a replacement from the factory.



WARNING

Read and understand this manual before installing or operating the drive. The drive must be installed according to this manual and any applicable national or local codes.



WARNING

Indicates a hazardous situation, which, if not avoided, could result in equipment damage or severe injury.



DANGER

Indicates a hazardous situation, which, if not avoided, could result in equipment damage or death.



DANGER: HIGH VOLTAGE

Electrical power must be OFF before and during inspection or service. Ensure electrical supply to the enclosure is disconnected, locked out and tagged out. Personnel injury or damage to equipment can occur if all power upstream from the enclosure is not fully disconnected prior to opening.

Before commissioning the drive and putting it into service, make sure that the motor and all driven equipment are suitable for operation throughout the speed range provided by the drive. The drive can be adjusted to operate the motor at speeds above and below the speed provided by connecting the motor directly to the line power.



WARNING: HOT SURFACE

Disconnect handle and front-panel operators may become hot during prolonged operation and high ambient temperature environments. VFD enclosure operates as a heat sink for heat dissipation during normal operations. Exterior temperatures on enclosure may reach up to 50°C during normal operation. Exercise caution when working around enclosure.

1.3. Hazardous Area Safety Instructions



DANGER: EXPLOSION

FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT A LOSS OF EFFICACY OF THE EXPLOSION PROOF ENCLOSURE.

- **Conduit Entry:** All threaded conduit entry connections into the enclosure require a minimum of five (5) full threads of engagement. All unused conduit entry holes must be plugged using only UL Listed plugs with five (5) full threads of engagement and a minimum of 1/8" in thickness.
- **Conduit Seal Off:** Conduit sealing fittings must be installed in each attached conduit run within eighteen (18) inches of the enclosure.
- **Cover Fastening:** A petroleum jelly type thread-lubricant, such as STL8, will be used on all cover bolts prior to installation and final torqueing. After lubrication, cover bolts shall be torqued to 50 FT-LB (68 N-M).
- **Cover Flame Path:** To avoid personnel injury and property damage, clean any dirt and debris from the polished, flat joint surfaces before the enclosure lid is closed. NEVER energize this equipment if the flat joint has been scratched or damaged.

2. Receiving

2.1. Handling Safety

Before receiving the unit, inspect for any damage during shipping or removal of protective wrap and markings. If the unit has been damaged during shipping, consult with the carrier regarding procedures to make a claim.



WARNING: HEAVY OBJECT

Do not attempt to lift the unit by hand while on or out of pallet. Use a forklift or other approved lifting device to move the enclosure around prior to readying it for mounting.



WARNING: CRUSH HAZARD

- Do not stand unit up on its bottom. Doing this may damage drain device or threading located on bottom of the enclosure.
- Do not place any heavy objects or apply excessive pressure to front of the enclosure or operators. Doing this may damage front operators or threading.

2.2. Model Number & Nameplate Ratings

Verify receipt of correct model number per your purchase order. If the model number is incorrect, contact the factory. The model number will be located on the unit nameplate label located on the right side of the enclosure. This will be a stainless-steel plate with black lettering and the SAI logo located on the top left of it. Refer to Figure 2.# for an example of what it will look like. Whenever you call the factory for assistance, have this model number and serial number available for reference.

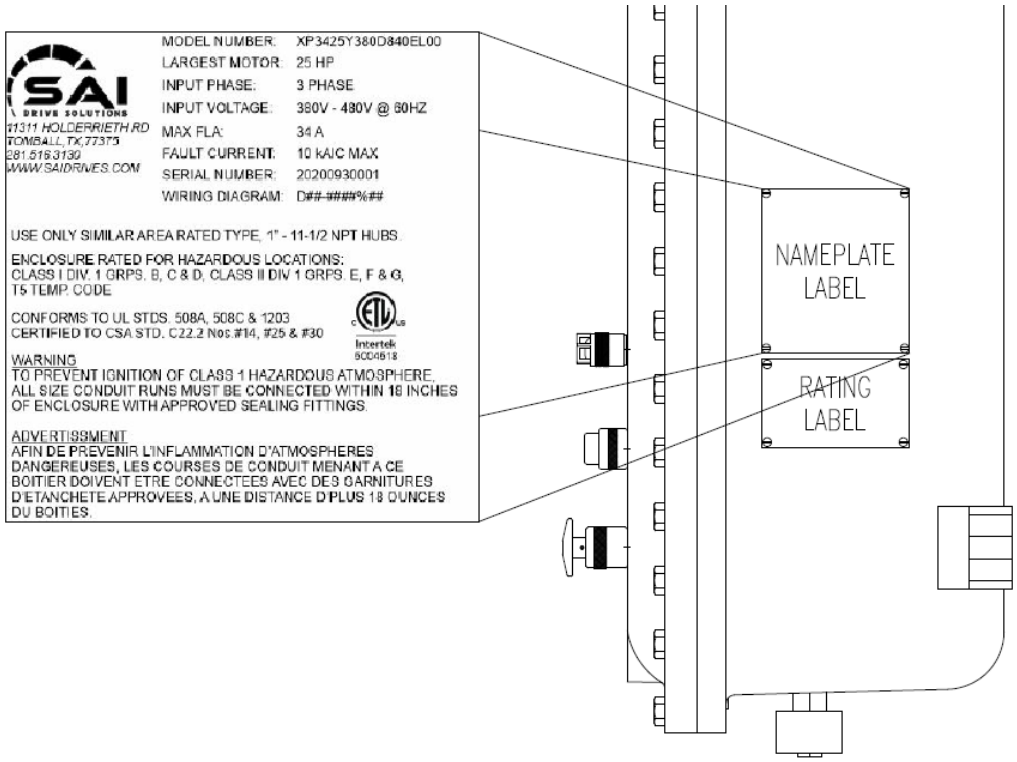


Figure 2.1 - Model Number Location

Information regarding the model numbers can be found in Table 2.1 thru 2.5 below.

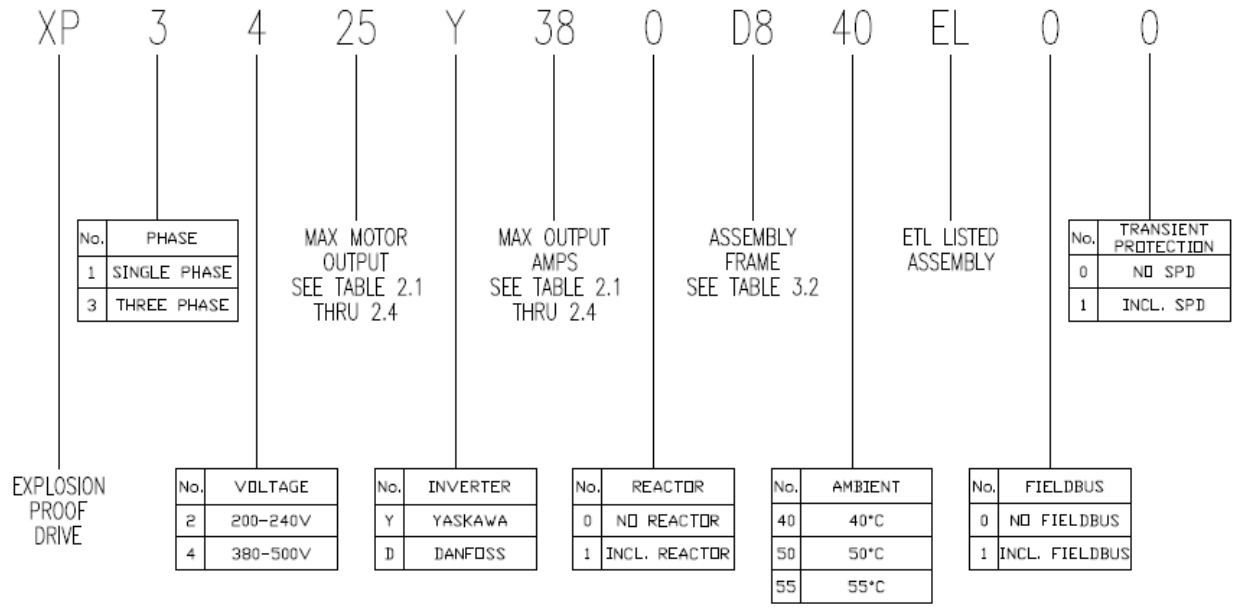


Figure 2.2 – Model Number Breakout

- **Single Phase, 200-240V**

Table 2.1 - 200-240V, Heavy Duty

Model	Heavy Duty		
	Rated Output Amps at 230V	Max Motor Output (HP)	Max Motor Output (kW)
120EY03	0.7	1/8	0.10
120QY03	1.2	1/4	0.19
120HY03	2.2	1/2	0.38
120TY06	3.2	3/4	0.56
1201Y06	4.2	1	0.75
1202Y10	6.8	2	1.50
1203Y12	9.6	3	2.25

- **Three Phase, 200-240V**

Table 2.2 - 200-240V, Heavy Duty

Model	Heavy Duty		
	Rated Output Amps at 230V	Max Motor Output (HP)	Max Motor Output (kW)
320QY06	1.2	1/4	0.19
320HY06	2.2	1/2	0.38
320TY06	3.2	3/4	0.56
3201Y06	4.2	1	0.75
3202Y10	6.8	2	1.50
3203Y20	9.6	3	2.25
3205Y20	15.2	5	3.73
3207Y20	22.0	7.5	5.60
3210Y40	28.0	10	7.46

- **Three Phase, 380-500V**

Table 2.3 - 380-500V, Heavy Duty

Model	Heavy Duty		
	Rated Output Amps at 460V	Max Motor Output (HP)	Max Motor Output (kW)
340QY04	0.8	1/4	0.19
340HY04	1.1	1/2	0.38
340TY04	1.6	3/4	0.56
3401Y04	2.1	1	0.75
3402Y05	3.4	2	1.50
3403Y05	4.8	3	2.25
3405Y11	7.6	5	3.73
3407Y23	11	7.5	5.60
3410Y23	14	10	7.46
3415Y31	21	15	11.25
3420Y38	27	20	15

Table 2.4 - 380-500V, Normal Duty

Model	Normal Duty		
	Rated Output Amps at 460V	Max Motor Output (HP)	Max Motor Output (kW)
3425Y38	34.0	25	18.75

2.3. Enclosure Types

Table 2.5 – Frame B8 Models

Single Phase, 200-240V	120EY030 thru 1202Y100
Three Phase, 200-240V	320QY060 thru 3205Y200
Three Phase, 380-500V	340QY040 thru 3405Y110

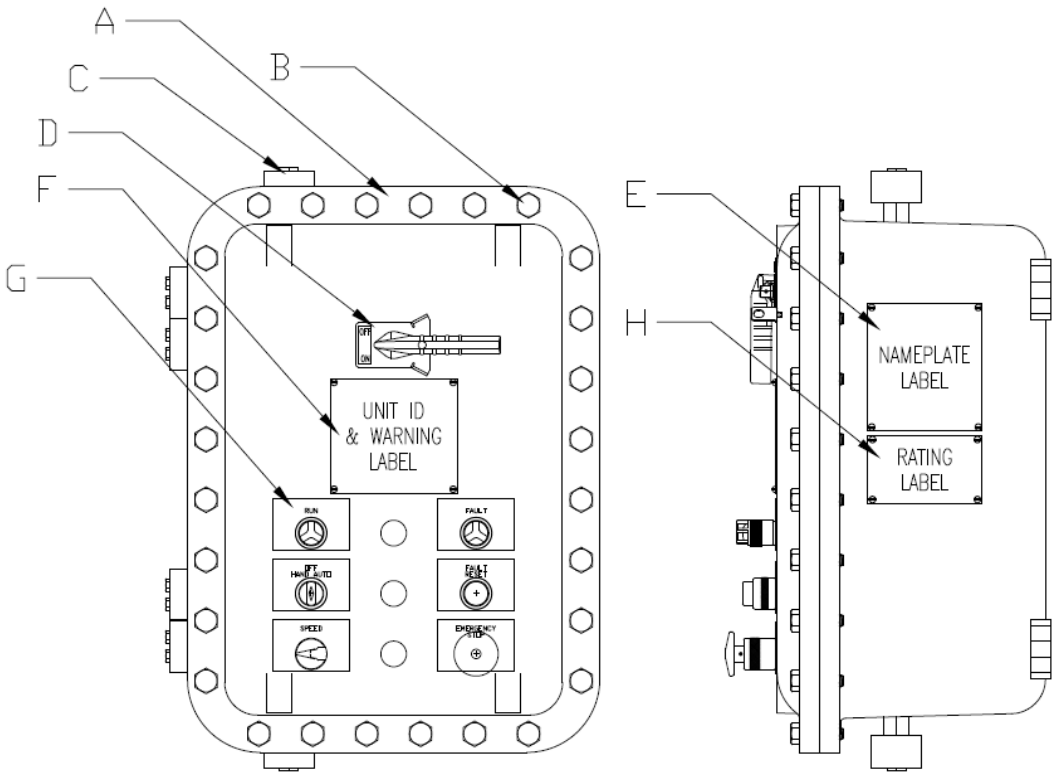


Figure 2.3 – Frame B8 Enclosure Layout

Table 2.7 – Frame B8 Legend

A – Enclosure Lid	E – Unit Nameplate
B – Enclosure Retaining Bolt	F – Unit ID Plate
C – Breather/Drain Device	G – Operating Devices
D – Main Disconnect Handle	H – Manufacturer Rating label

Table 2.8 – Frame C8 Models

Single Phase, 200-240V	1203Y120
Three Phase, 380-500V	3407Y230 thru 3410Y230

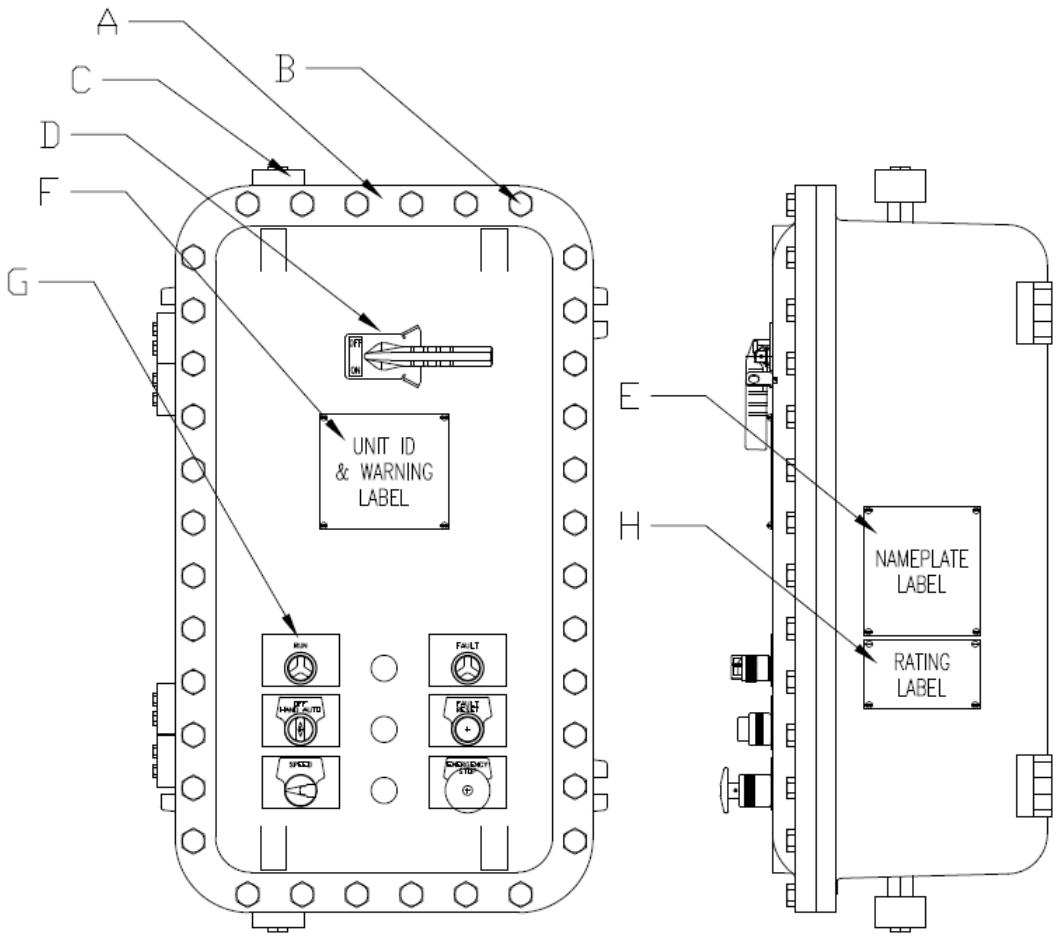


Figure 2.4 – Frame C8 Enclosure Layout

Table 2.9 – Frame C8 Legend

A – Enclosure Lid	E – Unit Nameplate
B – Enclosure Retaining Bolt	F – Unit ID Plate
C – Breather/Drain Device	G – Operating Devices
D – Main Disconnect Handle	H – Manufacturer Rating label

Table 2.10 – Frame D8 Models

Three Phase, 200-240V	3207Y200 thru 3210Y400
Three Phase, 380-500V	3415Y310 thru 3425Y380

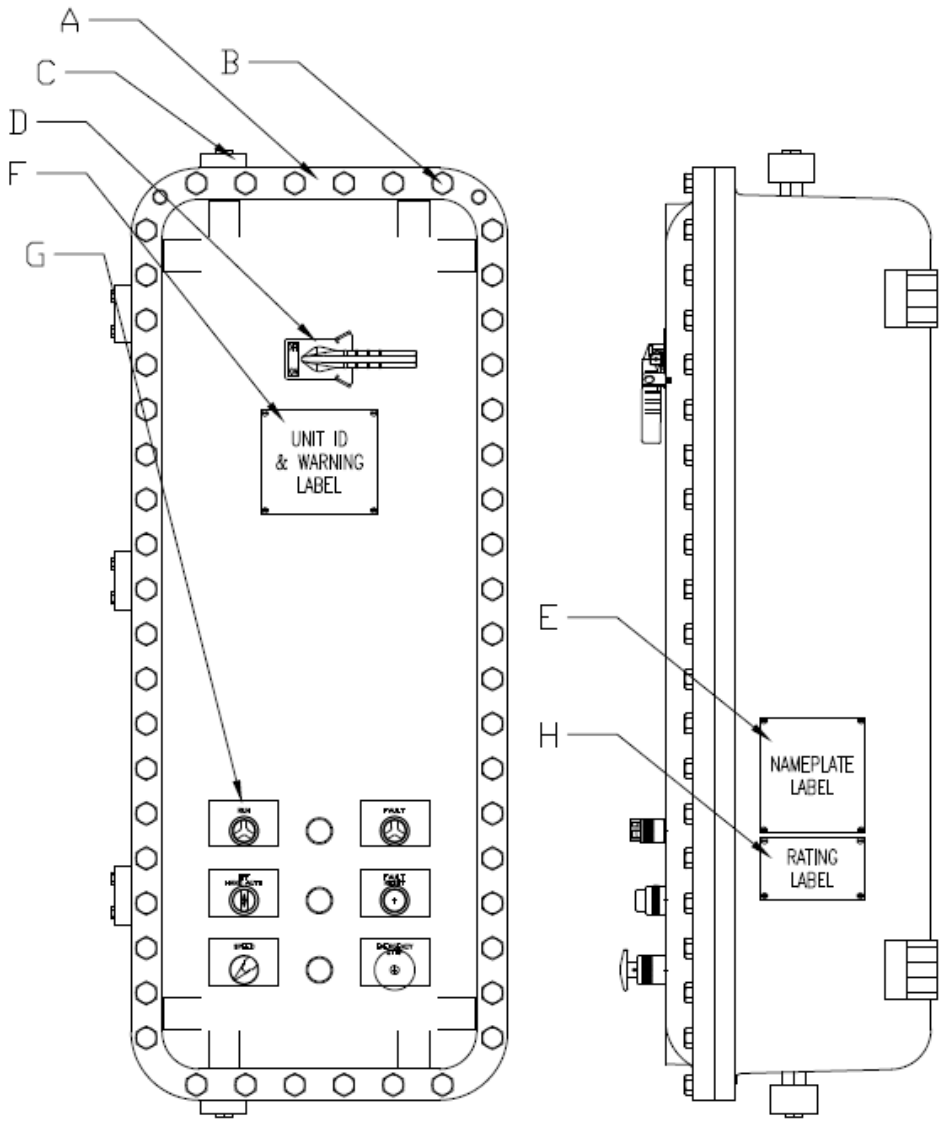


Figure 2.5 – Frame D8 Enclosure Layout

Table 2.11 – Frame D8 Legend

A – Enclosure Lid	E – Unit Nameplate
B – Enclosure Retaining Bolt	F – Unit ID Plate
C – Breather/Drain Device	G – Operating Devices
D – Main Disconnect Handle	H – Manufacturer Rating label

3. Mechanical Installation



NOTE

Strict adherence to the latest version of the National Electrical Code® (NEC) as well as any other applicable local or national requirements must be made. The following is meant to provide recommended guidelines for installation of the XP Drive. All work must be done by qualified and competent personnel.

3.1. Installation Environment

To ensure applicability of the XP Drive, verify that the conditions specified in Table 3.1 either match or exceed the specific conditions of your installation.

Table 3.1 – Installation Environment

	Conditions
Hazardous Area Classification	Class I, Division 1, Grp B, C, & D Class II, Division 1, Grp E, F, & G
Outdoor Rating	Type (NEMA) 7/4X
Exterior Ambient Temperature	-10°C to 40°C (14°F to 104°F) -10°C to 50°C[1] (14°F to 122°F) -10°C to 55°C[2] (14°F to 131°F)
Temperature Code	T5 (100°C)
Altitude	Up to 1000 meters without derating.
Orientation	Install the unit vertically to maintain appropriate cooling effects.

[1] Select models only. Contact factory for guidance of 50°C XP Drive offerings.
[2] Select models only. Contact factory for guidance of 55°C XP Drive offerings.

3.2. Installation Dimensions, Orientation and Spacing

Enclosure Weights & Dimensions

Using the information in Table 3.2 & Table 3.3, reference the specific model number of your product to the table for the expected dimensions and weight of the enclosure. Note that the weight shown is a worst-case estimate and may vary between individual products. Use the given frame size from Table 3.2 & Table 3.3 to find an outline drawing of your product.

Table 3.2 - Enclosure Frames & Dimensions for 40°C, No Reactor or Surge Protection Device

Voltage Class	Model Number	Output HP	Frame Size	Figure #	Width in. (mm)	Height in. (mm)	Depth in. (mm)	Approx. Wgt. Lb (kg)
Single Phase Input 200-240V	120EY030	1/8	B8	3.1	16.25 (412.75)	22.25 (565.15)	12.79 (324.94)	150 (68)
	120QY030	1/4	B8	3.1	16.25 (412.75)	22.25 (565.15)	12.79 (324.94)	150 (68)
	120HY030	1/2	B8	3.1	16.25 (412.75)	22.25 (565.15)	12.79 (324.94)	150 (68)
	120TY060	3/4	B8	3.1	16.25 (412.75)	22.25 (565.15)	12.79 (324.94)	150 (68)
	1201Y060	1	B8	3.1	16.25 (412.75)	22.25 (565.15)	12.79 (324.94)	150 (68)
	1202Y100	2	B8	3.1	16.25 (412.75)	22.25 (565.15)	12.79 (324.94)	150 (68)
	1203Y120	3	C8	3.2	16.25 (412.75)	28.25 (717.55)	12.92 (328.05)	205 (93)
Three Phase Input 200-240V	320QY060	¼	B8	3.1	16.25 (412.75)	22.25 (565.15)	12.79 (324.94)	150 (68)
	320HY060	½	B8	3.1	16.25 (412.75)	22.25 (565.15)	12.79 (324.94)	150 (68)
	320TY060	¾	B8	3.1	16.25 (412.75)	22.25 (565.15)	12.79 (324.94)	150 (68)
	3201Y060	1	B8	3.1	16.25 (412.75)	22.25 (565.15)	12.79 (324.94)	150 (68)
	3202Y100	2	B8	3.1	16.25 (412.75)	22.25 (565.15)	12.79 (324.94)	150 (68)
	3203Y200	3	B8	3.1	16.25 (412.75)	22.25 (565.15)	12.79 (324.94)	150 (68)
	3205Y200	5	B8	3.1	16.25 (412.75)	22.25 (565.15)	12.79 (324.94)	150 (68)
	3207Y200	7.5	D8	3.3	16.25 (412.75)	40.25 (1022.35)	13.66 (346.85)	310 (140)
	3210Y400	10	D8	3.3	16.25 (412.75)	40.25 (1022.35)	13.66 (346.85)	310 (140)
Three Phase Input 380-500V	340QY040	1/4	B8	3.1	16.25 (412.75)	22.25 (565.15)	12.79 (324.94)	150 (68)
	340HY040	1/2	B8	3.1	16.25 (412.75)	22.25 (565.15)	12.79 (324.94)	150 (68)
	340TY040	3/4	B8	3.1	16.25 (412.75)	22.25 (565.15)	12.79 (324.94)	150 (68)
	3401Y040	1	B8	3.1	16.25 (412.75)	22.25 (565.15)	12.79 (324.94)	150 (68)
	3402Y050	2	B8	3.1	16.25 (412.75)	22.25 (565.15)	12.79 (324.94)	150 (68)
	3403Y050	3	B8	3.1	16.25 (412.75)	22.25 (565.15)	12.79 (324.94)	150 (68)
	3405Y110	5	B8	3.1	16.25 (412.75)	22.25 (565.15)	12.79 (324.94)	150 (68)
	3407Y230	7.5	C8	3.2	16.25 (412.75)	22.25 (565.15)	12.79 (324.94)	205 (93)
	3410Y230	10	C8	3.2	16.25 (412.75)	22.25 (565.15)	12.79 (324.94)	205 (93)
	3415Y310	15	D8	3.3	16.25 (412.75)	40.25 (1022.35)	13.66 (346.85)	310 (140)
	3420Y380	20	D8	3.3	16.25 (412.75)	40.25 (1022.35)	13.66 (346.85)	310 (140)
	3425Y380	25	D8	3.3	16.25 (412.75)	40.25 (1022.35)	13.66 (346.85)	310 (140)

Table 3.3 - Enclosure Frames & Dimensions for 40°C, With Reactor or Surge Protection Device

Voltage Class	Model Number	Output HP	Frame Size	Figure #	Width in. (mm)	Height in. (mm)	Depth in. (mm)	Approx. Wgt. Lb (kg)
Single Phase Input 200-240V	120EY031	1/8	C8	3.2	16.25 (412.75)	28.25 (717.55)	12.92 (328.05)	240 (109)
	120QY031	1/4	C8	3.2	16.25 (412.75)	28.25 (717.55)	12.92 (328.05)	240 (109)
	120HY031	1/2	C8	3.2	16.25 (412.75)	28.25 (717.55)	12.92 (328.05)	240 (109)
	120TY061	3/4	C8	3.2	16.25 (412.75)	28.25 (717.55)	12.92 (328.05)	240 (109)
	1201Y061	1	C8	3.2	16.25 (412.75)	28.25 (717.55)	12.92 (328.05)	240 (109)
	1202Y101	2	C8	3.2	16.25 (412.75)	28.25 (717.55)	12.92 (328.05)	240 (109)
	1203Y121	3	D8	3.3	16.25 (412.75)	40.25 (1022.35)	13.66 (346.85)	330 (150)
Three Phase Input 200-240V	320QY061	¼	C8	3.2	16.25 (412.75)	28.25 (717.55)	12.92 (328.05)	240 (109)
	320HY061	½	C8	3.2	16.25 (412.75)	28.25 (717.55)	12.92 (328.05)	240 (109)
	320TY061	¾	C8	3.2	16.25 (412.75)	28.25 (717.55)	12.92 (328.05)	240 (109)
	3201Y061	1	C8	3.2	16.25 (412.75)	28.25 (717.55)	12.92 (328.05)	240 (109)
	3202Y101	2	C8	3.2	16.25 (412.75)	28.25 (717.55)	12.92 (328.05)	240 (109)
	3203Y201	3	C8	3.2	16.25 (412.75)	28.25 (717.55)	12.92 (328.05)	240 (109)
	3205Y201	5	C8	3.2	16.25 (412.75)	28.25 (717.55)	12.92 (328.05)	240 (109)
	3207Y201	7.5	D8	3.3	16.25 (412.75)	40.25 (1022.35)	13.66 (346.85)	330 (150)
	3210Y401	10	D8	3.3	16.25 (412.75)	40.25 (1022.35)	13.66 (346.85)	330 (150)
Three Phase Input 380-500V	340QY041	¼	C8	3.2	16.25 (412.75)	28.25 (717.55)	12.92 (328.05)	240 (109)
	340HY041	½	C8	3.2	16.25 (412.75)	28.25 (717.55)	12.92 (328.05)	240 (109)
	340TY041	¾	C8	3.2	16.25 (412.75)	28.25 (717.55)	12.92 (328.05)	240 (109)
	3401Y041	1	C8	3.2	16.25 (412.75)	28.25 (717.55)	12.92 (328.05)	240 (109)
	3402Y051	2	C8	3.2	16.25 (412.75)	28.25 (717.55)	12.92 (328.05)	240 (109)
	3403Y051	3	C8	3.2	16.25 (412.75)	28.25 (717.55)	12.92 (328.05)	240 (109)
	3405Y111	5	C8	3.2	16.25 (412.75)	28.25 (717.55)	12.92 (328.05)	240 (109)
	3407Y231	7.5	D8	3.3	16.25 (412.75)	40.25 (1022.35)	13.66 (346.85)	330 (150)
	3410Y231	10	D8	3.3	16.25 (412.75)	40.25 (1022.35)	13.66 (346.85)	330 (150)
	3415Y311	15	D8	3.3	16.25 (412.75)	40.25 (1022.35)	13.66 (346.85)	330 (150)
	3420Y381	20	D8	3.3	16.25 (412.75)	40.25 (1022.35)	13.66 (346.85)	330 (150)
	3425Y381	25	D8	3.3	16.25 (412.75)	40.25 (1022.35)	13.66 (346.85)	330 (150)

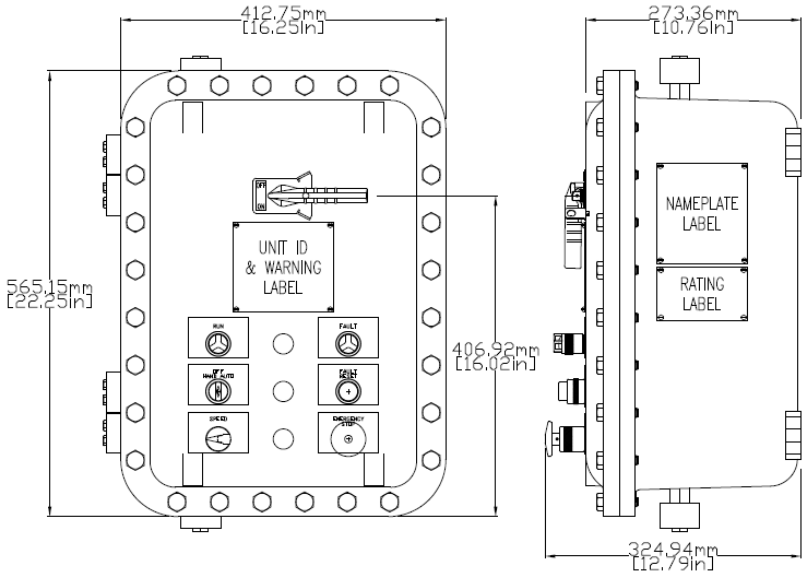


Figure 3.1 - Frame B8 Dimensions

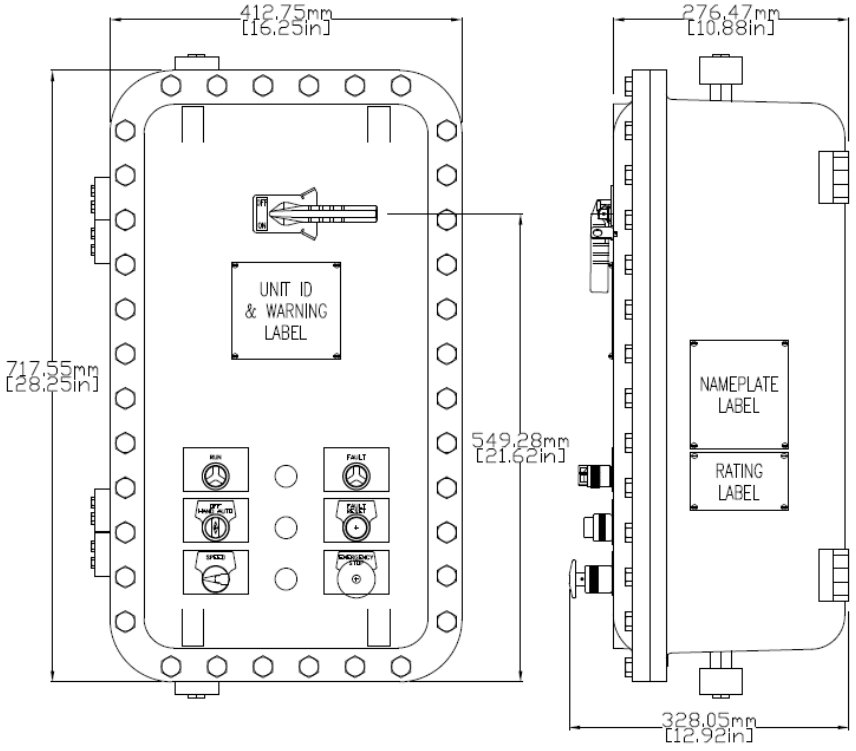


Figure 3.2 - Frame C8 Dimensions

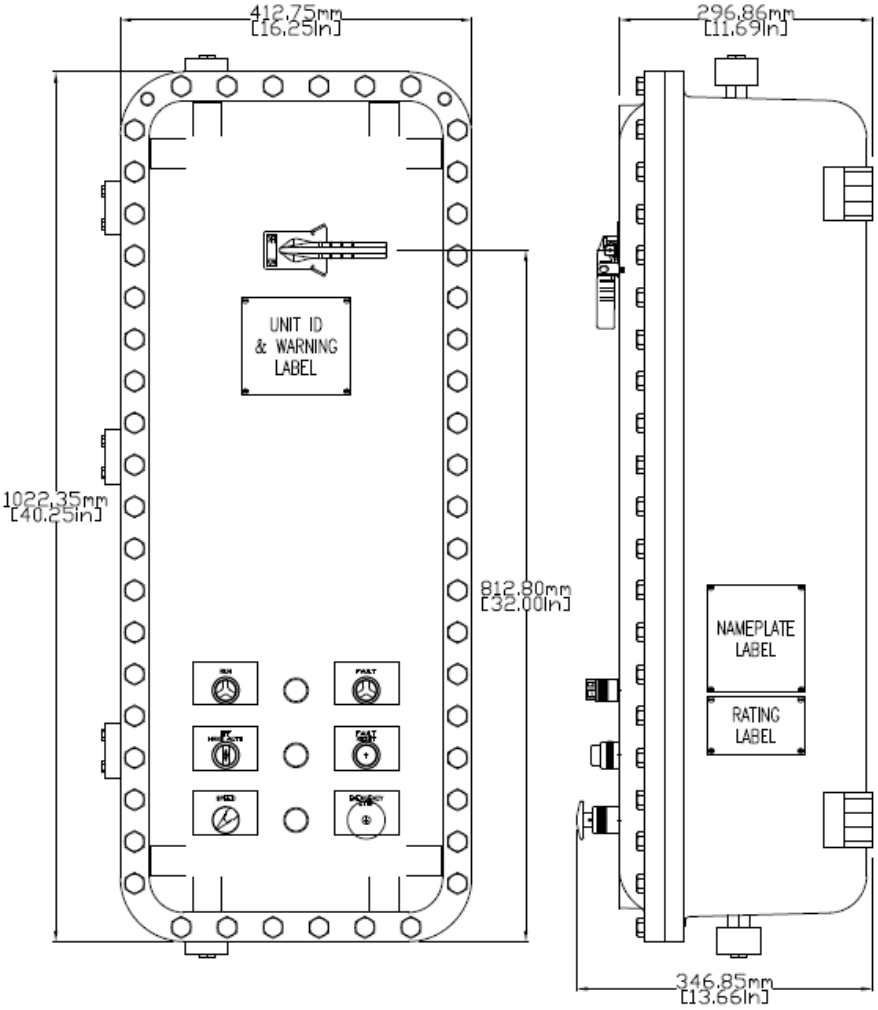


Figure 3.3 - Frame D8 Dimensions

Optional Metering Enclosure

If you have purchased the optional metering enclosure, this will add an additional maximum 10” to the height of the main unit. See Figure 3.4 for approximate dimensions of the optional metering enclosure.

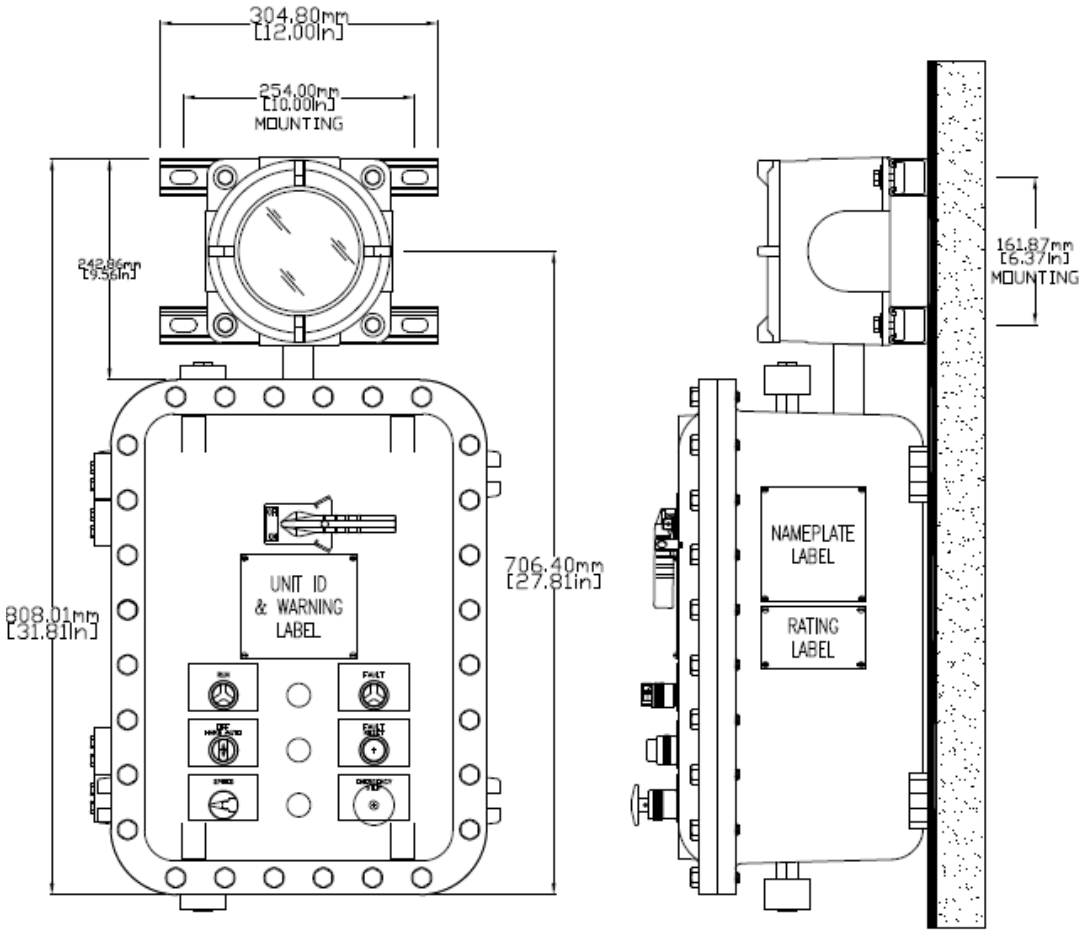


Figure 3.4 – Optional Meter Enclosure Dimensions

Orientation and Spacing

Install the enclosure vertically with the disconnect handle located on the top half of the enclosure. Ensure that the handle is located no more than 72” above the walk-way flooring. Ensure that any other applicable codes or requirements are followed in regards to location of enclosure and disconnect to ensure operators can access handle during normal operation.

Ensure a minimum of 6” (15.5 cm) of clearance between exterior side walls of the enclosure and any solid body that might restrict the movement of air around the enclosure as shown in Figure 3.5 and Figure 3.6. Additionally, ensure that the enclosure door has sufficient clearance such that it can be opened more than 90° for servicing.

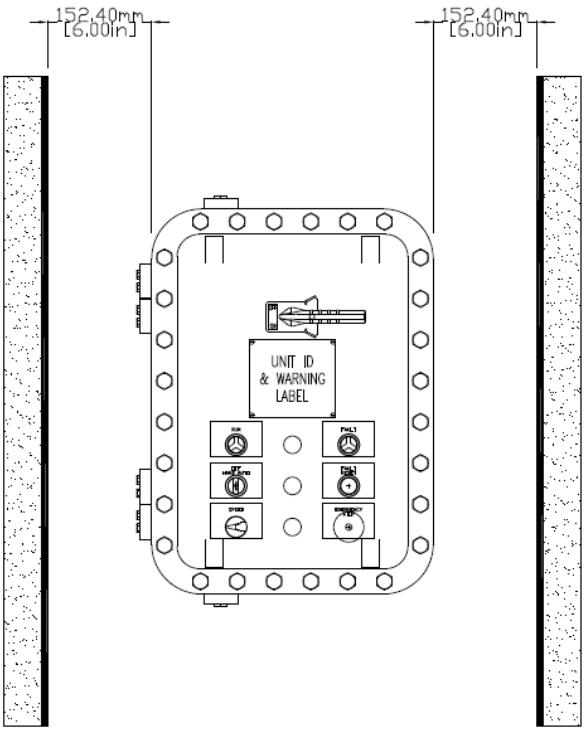


Figure 3.5 - Minimum Side Clearances

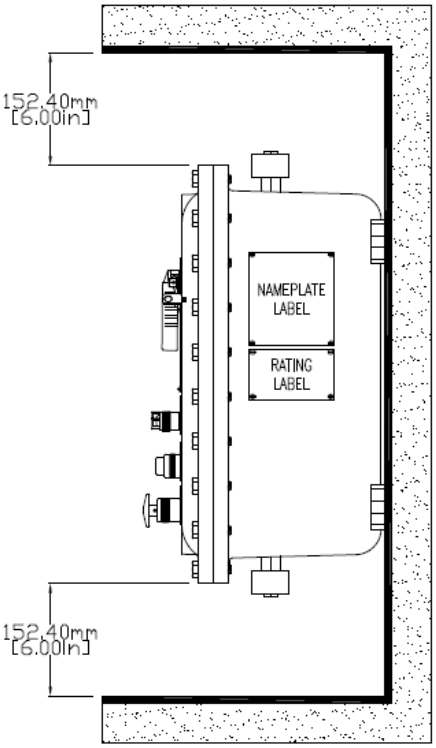


Figure 3.6 - Minimum Top & Bottom Clearances

3.3. Preparation

Mounting Location

Identify a suitable location as per section 3.1 and 3.2 above. Use an approved, heavy-duty, corrosion resistant mounting mechanism such as Unistrut or anchor bolts to provide a mounting pattern as show in Figure 3.7 thru Figure 3.9.

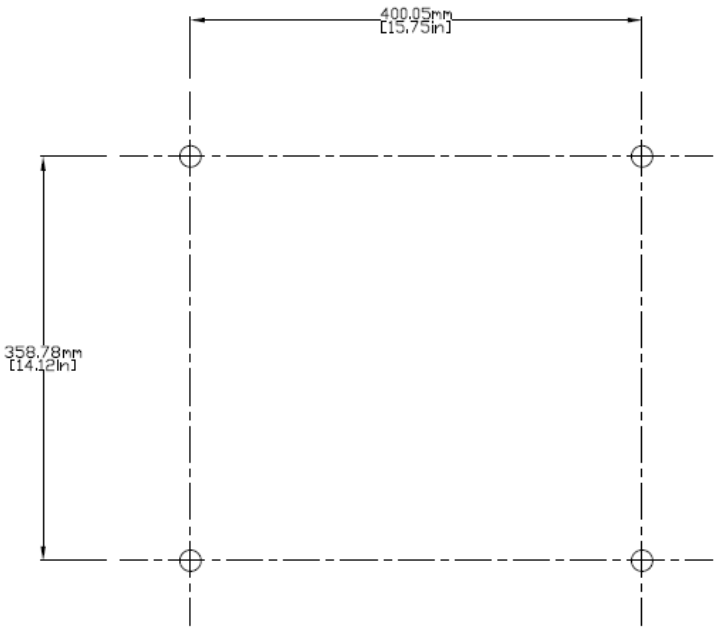


Figure 3.7 – Frame B8 Mounting Pattern

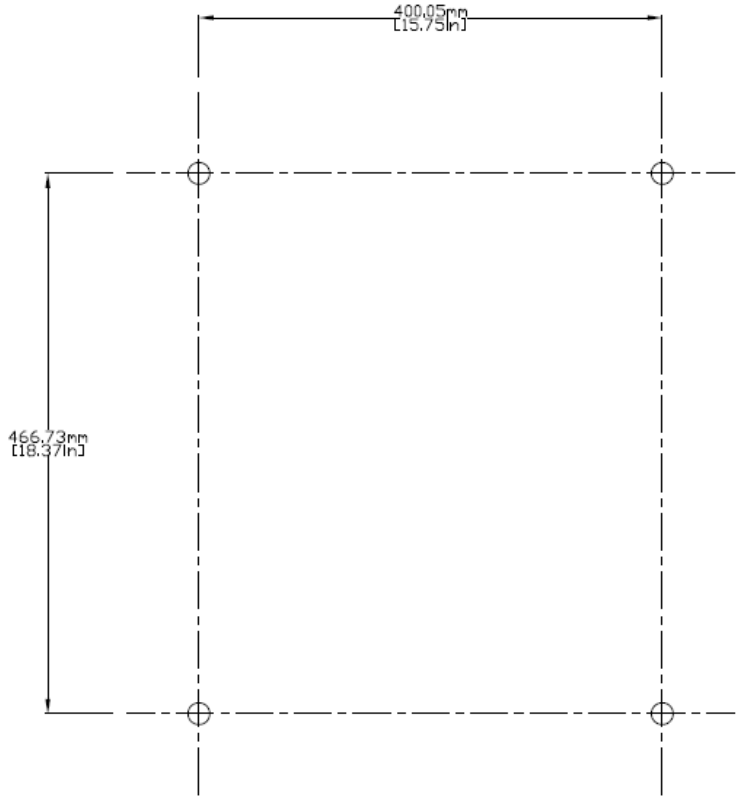


Figure 3.8 – Frame C8 Mounting Pattern

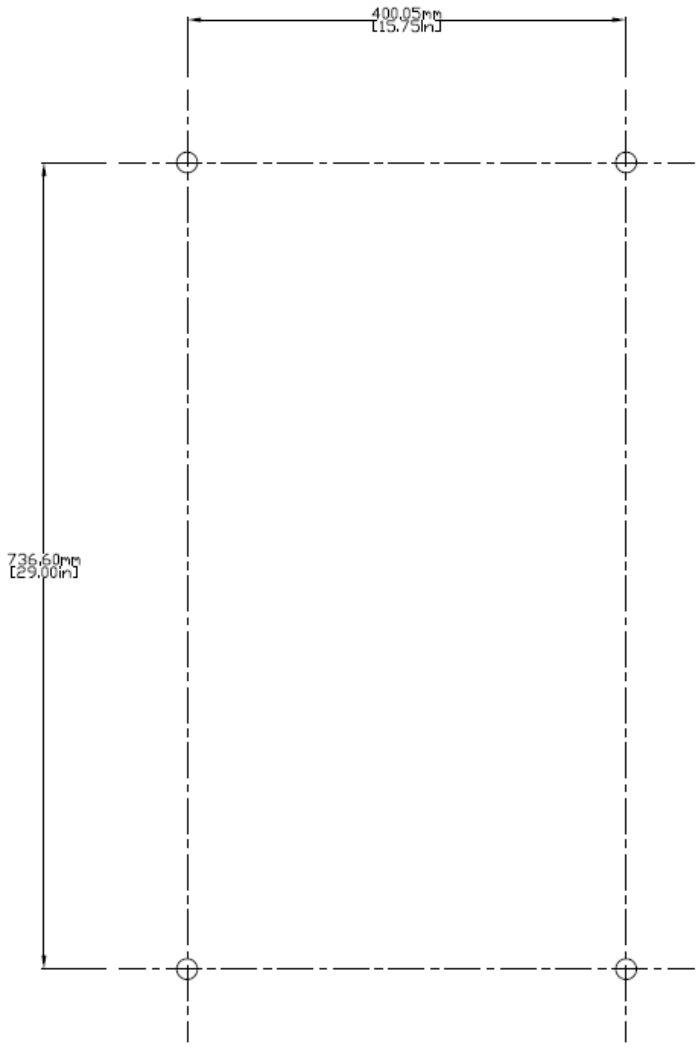


Figure 3.9 – Frame D8 Mounting Pattern

For all mounting mechanisms, ensure that the footing of the enclosure has adequate contact with a flat, fixed surface prior to tightening. If using a bolted, channel strut assembly such as Unistrut®, use appropriate flat channel washers affixed under the enclosure feet.

3.4. Lifting & Mounting



DANGER: HEAVY OBJECT

Never place any part of your body directly underneath the enclosure while it is being hoisted for mounting. Failure to do so may result in bodily injury.

Carefully wrap at least two heavy-duty, non-abrasive lifting straps around enclosure tub from top to bottom. Ensure the lifting straps tightly wrap around the enclosure and lock together above it.

Using a fork-lift or other approved lifting device connected to the top of the straps, carefully hoist XP Drive into position against the mounting location.

Use corrosion resistant, high quality bolts with matching washers and nuts for affixing enclosure to mounting location. It is recommended that a minimum of size ½"-13 UNC bolts be used.

Once all four (4) mounting bolts are all in place, use appropriate torque values to tighten all bolts for final mounting. Carefully remove tension from the lifting device and release the straps from the enclosure tub.

3.5. Conduit Connection



WARNING

All work, including routing and connection of rigid conduit, fittings, and devices must be done by qualified and competent personnel. Failure to install these devices in accordance with the guidelines in Section 1.4 and any applicable National Electrical Code® (NEC) sections can result in damage to equipment and personnel.



DANGER: EXPLOSION

FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT A LOSS OF EFFICACY OF THE EXPLOSION PROOF ENCLOSURE.

- **Conduit Entry:** All threaded conduit entry connections into the enclosure require a minimum of five (5) full threads of engagement. All unused conduit entry holes must be plugged using only UL Listed plugs with five (5) full threads of engagement and a minimum of 1/8" in thickness.
- **Conduit Seal Off:** Conduit sealing fittings must be installed in each attached conduit run within eighteen (18) inches of the enclosure.

Use only UL-listed, galvanized rigid metal conduit, nipples, and fittings for connection to the provided NPT holes on the enclosure. For conduit bodies, seal-offs, and other devices, use only UL-listed components made of malleable iron or better and suitable for use in the hazardous area installed.

Refer to section 1.4 for information on conduit installation safety. Install conduit and connect to the XP drive enclosure in the available NPT holes provided. A standard enclosure will include three (3) 1”x11.5 TPI NPT holes for control wiring, line power wiring, and load power wiring.

After wiring has been completed, ensure that all seal-off compound solutions are poured and left to cure for an appropriate amount of time.

3.6. Cover Bolting

All cover bolts should be hex head SS316 ½”-13, 1-3/4” length bolts. If bolts provided to you are not of this style, contact factory for support. All bolts should have a petroleum jelly type thread-lubricant, such as STL8, applied to the threads prior to bolting.

After conduit connection, wiring, and final commissioning, close the lid cover, thread all bolts into the enclosure. Prior to torqueing, review Figure 3.10 for required torqueing pattern of the first (8) bolts. After these first (8) bolts, the rest may be torqued in any sequence afterward. Torque all bolts to a minimum of 50 FT-LB (68 N-M) using a calibrated torque wrench.

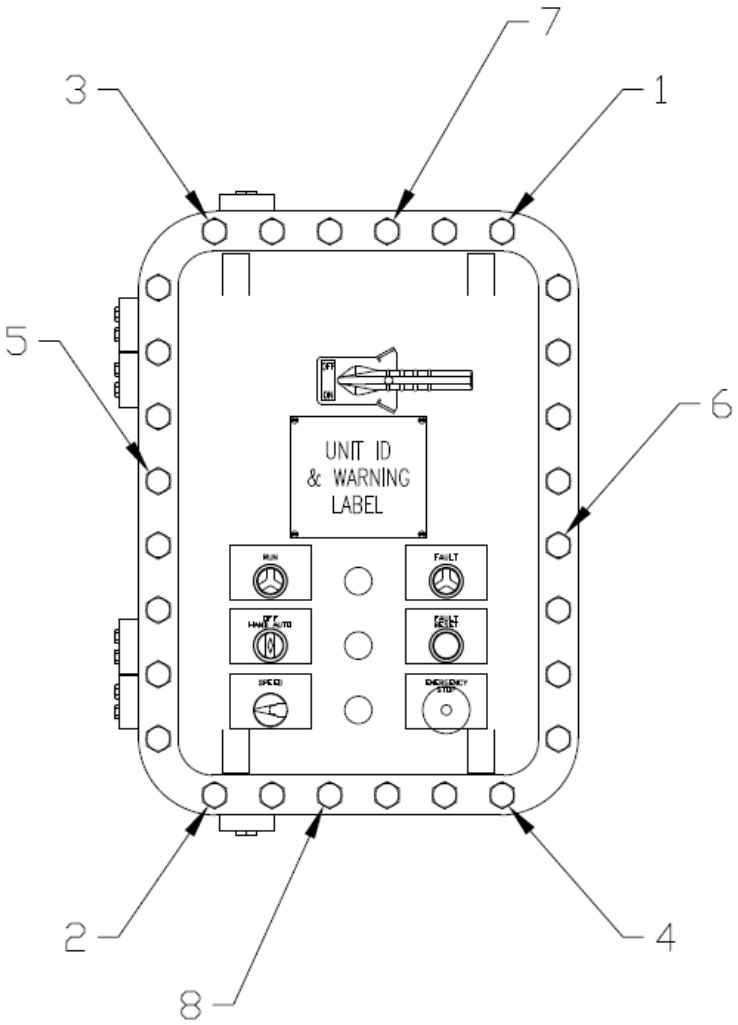


Figure 3.10 – Cover Bolt Torqueing Pattern

4. Electrical Installation

NOTE

Strict adherence to the latest version of the National Electrical Code® (NEC) as well as any other applicable local or national requirements must be made. The following is meant to provide recommended guidelines for installation of the XP Drive. All work must be done by qualified and competent personnel.

4.1. Standard Wiring Diagram

All customer interface wiring will be made at the bottom of the enclosure near the conduit entry points. Terminal blocks TB1 will be used for customer low voltage control wiring. Terminals blocks TB2 and TB3 will be used for customer power wiring for the line and load wire, respectively. Reference Figure 4.1 for an example image of the customer interface points.

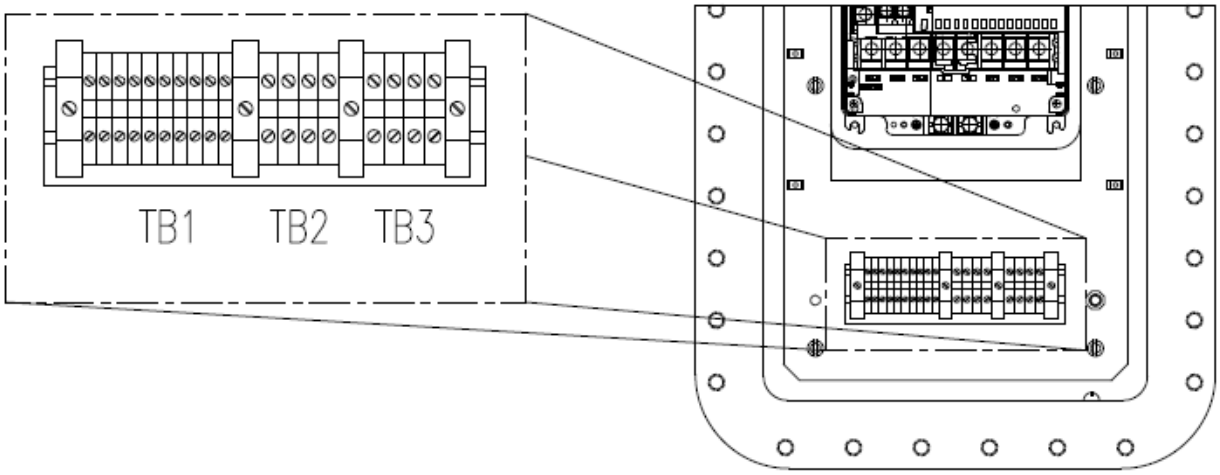


Figure 4.1 - Customer Interface Wiring Terminal Block Internal Layout

Refer to Figure 4.2 for the standard interconnect wire setup on the XP Drive. If your drive is a custom modified drive package, note that the interconnect setup may differ from what is shown. Always refer to provided schematic diagram with your order for troubleshooting and interconnection verification.

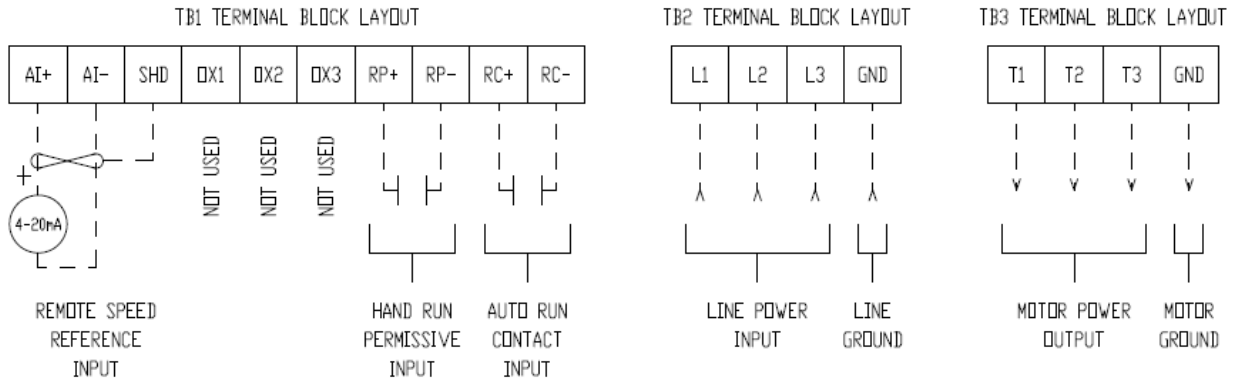


Figure 4.2 - Standard Wiring Diagram

4.2. Enclosure Grounding

Grounding of the enclosure case will be accomplished by connection of rigid metal conduit to the enclosure and an internal bonding wire connect to line ground. Ensure that any rigid metal conduit connected to the enclosure is solidly grounded to the facility's common ground point.

Inside the enclosure, connect the incoming line and outgoing motor ground wires to the provided ground terminals on TB2 and TB3 as shown in Figure 4.2.

Use a UL-listed conductor no smaller than a green #12 AWG and of type THHN or XHHW for incoming and outgoing ground wire connections. Ensure ground wire is sized in accordance with NEC specifications.

4.3. Line & Load Connections

Inside the enclosure, connect incoming line and load power wires to TB2 and TB3, respectively, as shown in Figure 4.2.

WARNING

Verify the correct operating line side voltage prior to connection to the line connections on TB2. Connection of a higher, 480V line potential to a 240V unit will cause severe damage to the inverter module and will likely render the unit inoperable.



WARNING

Take care not to mix up the line and load connections point on TB2 and TB3! Connection of line side power the motor leads on TB3 will cause severe damage to the inverter module and will likely render the unit inoperable.



WARNING

Prior to completion of commissioning, verify correct phase rotation of the output motor leads connected to TB3. Failure to verify correct rotation of the motor prior completion of commissioning could lead to injury to personnel or damage to equipment. Read section #.# for further information.

Use a UL-listed conductor no smaller than a black #12 AWG and of type THHN or XHHW for incoming and outgoing power wire connections. Ensure power wiring is sized in accordance with NEC specifications for lead length, ampacity, and applicable conduit and temperature derating.

After connection and final testing, it is recommended that these terminal points be tightened to 1 N-M (8.9 lb-in.) with an ANSI-calibrated torque screwdriver.

4.4. Control Wire Connections

For all control wires, use a UL-listed conductor no smaller than #14 AWG of type THHN or XHHW. Ensure that wiring is selected and ran in accordance with NEC specifications. Use Figure 4.2 as a reference for the standard control scheme. Note that if you have ordered a custom modified package drive solution, you will reference the provided schematic diagrams provided. Table 4.1 provides a short description of the three recommended customer connections for a standard package.

Table 4.1 – Control Wire Descriptions

Signal Reference	Terminals	Description
Remote Speed Reference	AI+ AI- SHD	Allows remote speed control while unit is in "AUTO" mode. Signal required is 4-20mA from isolated source/transmitter.
Hand Run Permissive	RP+ RP-	Permissive for "HAND" mode start. To use, remove factory installed jumper and wire to a NC external contact. Open contact to inhibit drive operation.
Auto Run Contact	RC+ RC-	Start contact for "AUTO" mode. Close contact via external controller to start drive while in this mode.

After connection and final testing, it is recommended that these terminal points be tightened to 0.6 N-M (5.3 lb-in.) with an ANSI-calibrated torque screwdriver.

4.5. Fieldbus Communications

If a fieldbus option is chosen, consult with factory for specific wiring advice and recommendations. Your supplied schematic will indicate landing location of interconnecting wires based on fieldbus type. Currently offered fieldbus solutions are the following:

- DeviceNet
- Ethernet/IP
- EtherCAT
- Modbus TCP/IP
- Modbus RTU
- Profibus-DP
- Profinet

5. General Operation & Final Commissioning

The standard assembly will come with six (6) operating devices and a disconnect handle. See the following sections 5.1 thru 5.3 for locations of them on the standard assembly.

5.1. Main Power Disconnect

Line power disconnecting will be accomplished by use of the front handle shown in Figure 5.1. When the handle is in the up position, the unit's MCCB is closed position and the drive can be energized by line power. When the handle is the down position, the unit's MCCB is in the open position.

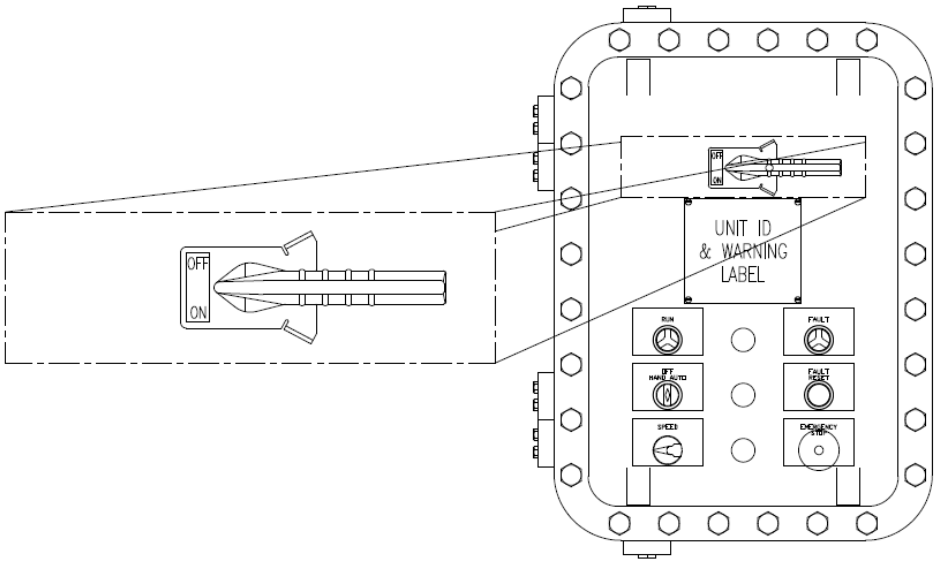


Figure 5.1 - XP Drive Main Disconnect Handle

Lock-Out/Tag-Out Procedures

To lock out the unit during a Lock-Out/Tag-Out procedure, use the main disconnect handle's Lock-Out hole for securing power to the inside of the enclosure. Follow the procedure below to do this:

- Place disconnect handle in the "OFF" position by pulling down the handle.
- Insert a pad-lock shackle (1/4" width maximum) through the hole of the handle and through the matching hole on the tab of the handle mount. Reference Figure 5.2 below.
- Lock the pad-lock. The unit is now securely locked out.

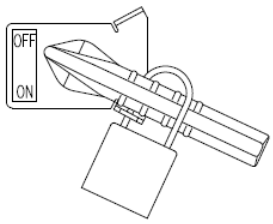


Figure 5.2 - Disconnect Lock-Out

5.2. Pilot Devices

The unit RUN and FAULT pilot devices are for operator annunciation to indicate the current drive state. These two operators are powered off 24VDC available inside the unit.

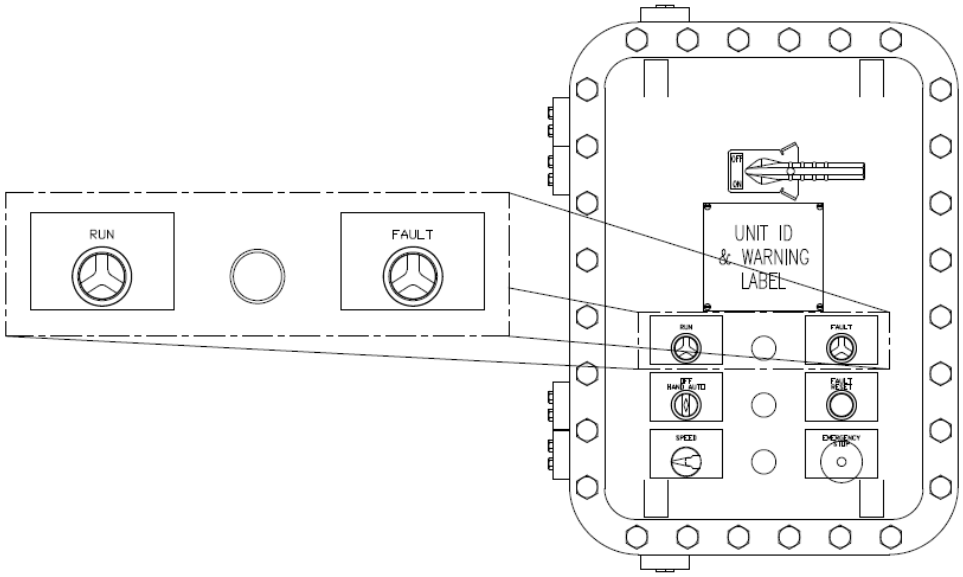


Figure 5.3 - XP Drive Pilot Devices

Run Pilot Light

While the drive is running, a green shrouded pilot light will illuminate to indicate this status.

Fault Pilot Light

When the inverter is in a fault state, a red shrouded pilot light will illuminate to indicate this status. To reset a fault state, follow the procedure below:

- Place the HOA operator in “OFF” position.
- Press the RESET operator.
- Observe that the FAULT pilot light is now off.
- If the fault does not clear during next run cycle, further troubleshooting may be necessary. Proceed to Troubleshooting section of this manual.

Optional Speed or Process Monitoring Indicator

If you purchased the optional speed/process monitoring indicator located on the top of the XP VFD, this device can be configured to view up to two (2) process values from the inverter.

Based on your order, this will come preconfigured from the factory to display values like motor output speed (RPM), motor output frequency (Hz), or motor output amperes (A). Refer to Figure 5.4 for the location of this display. The display will be located above the main enclosure.

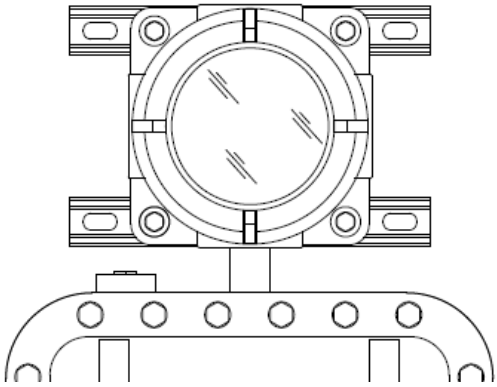


Figure 5.4 - Optional Speed or Process Monitoring Display

5.3. Operating Devices

The XP Drive will come with four (4) standard operating devices:

- HOA – Hand-Off-Auto Switch
- RESET – Fault Reset Push-Button
- SPEED – Speed Adjust Potentiometer
- ESTOP – Emergency Stop Maintained Push-Button

Reference Figure 5.5 for a layout of these operating devices on the standard configuration. Note that if you purchased a custom designed panel, the location and function of these devices may differ from what is written here. Refer to your factory provided drawings and any other supporting material for operation.

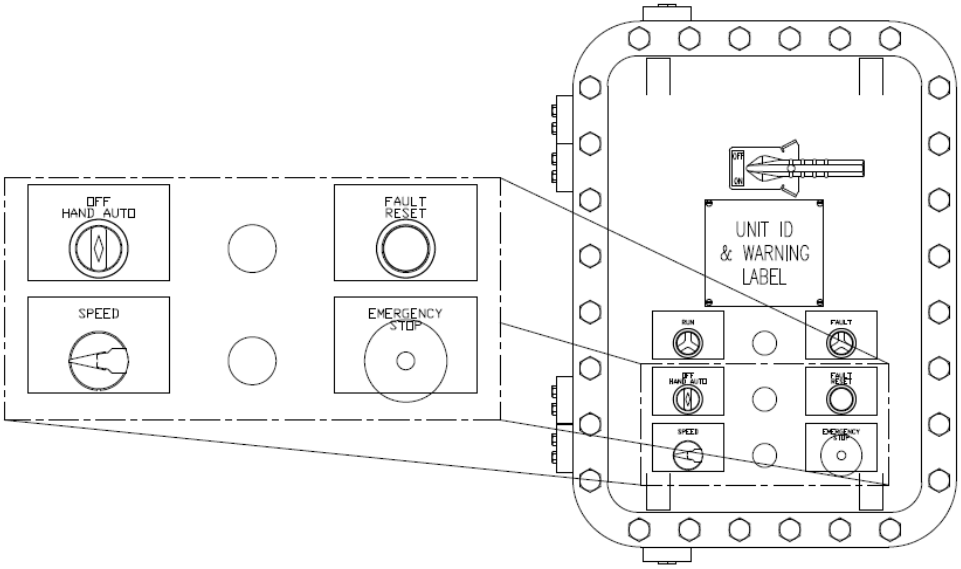


Figure 5.5 - XP Drive Operating Devices

Hand Operation – Local Start/Stop and Speed Control

During Hand operation, the drive is controlled from the front-face operators. To operate the drive in the Hand mode from a zero (0) speed start, follow the procedure below:

- Rotate SPEED operator into fully counter-clockwise position.
- Place HOA operator in “HAND” position.
- Ensure Hand Run Permissive is closed either by factory installed jumper or remote contact. See Table 4.1 for more information.
- Observe RUN pilot light now illuminated green; inverter is now active.
- Rotate SPEED operator clockwise to increase speed output to motor.
- Place HOA operator in “OFF” position to stop.

Automatic Operation – Remote Start/Stop and Speed Control

During Automatic operation, the drive is controlled from an external controller (e.g. PLC or DCS) and speed reference. To operate the drive from a zero (0) speed start, follow the procedure below:

- Place HOA operator in “AUTO” position.
- Ensure Auto Run Contact is closed by the external controller.
- Observe RUN pilot light now illuminated green; inverter is now active.
- Apply a 4-20mA signal to Remote Speed Reference signal wiring.
- After exceeding 4mA, the drive will increase speed starting at 0Hz until reaching 60Hz at 20mA.
- To stop drive, either place HOA in “OFF” position or open Auto Run Contact. Drive will retain current speed reference based on the current Speed Reference Signal present.

Emergency Stop

During an emergency condition or as part of a normal operation, the ESTOP button can be pressed to inhibit drive operation. While in the pressed-in position, the drive’s power circuit output will be inhibited, but the drive itself will still be active. To restart the drive, release the ESTOP button and then issue a new run command to the drive. The drive will restart at whatever the given frequency reference currently is.

5.4. Fieldbus Monitoring

If a fieldbus option is chosen, consult with factory for specific details on monitoring data values from the drive.

5.5. Inverter Configuration

From the factory, your inverter will be configured according to provided motor nameplate data and operating conditions. If you need to configure the inverter for a different application or motor nameplate data, this can be accomplished through the internal keypad or by the freely available software provided by the manufacturer.



DANGER: EXPLOSION

Do not energize the inverter for programming with the front cover open unless it has been deemed safe to do so in the immediate environment. Energization of the internal equipment in the presence of explosive gases or vapors could lead to serious injury or death to personnel along with damage to equipment.

Contact the factory directly for more information regarding setup of the inverter as well as links to detailed programming manuals and the configuration software. Additional cables and accessories may be required for use of these features.

5.6. Commissioning

The following is the recommended minimum for final commissioning of the XP Drive. These checks are not meant to be exhaustive of every unique situation or requirement that may exist on site. If you have detailed questions regarding the application setup, please contact the factory for assistance.

- Verify installation the XP Drive in accordance with Chapter 3, Mechanical Installation.
- Verify wiring of the XP Drive in accordance with Chapter 4, Electrical Installation.
- Perform phase rotation verification by ensuring that driven motor rotates in correct direction while unloaded.
    - Rotation can be confirmed by “bumping” the motor while it is uncoupled from the load. To do this, rotate the SPEED operator slightly clockwise until it is at the “9-o’-clock” position. Turn the HOA operator to “HAND” for no more than 2 seconds. Return HOA to the “OFF” position. Observe that rotation of the motor shaft and verify this is the correct direction.
    - If the motor does not rotate in the correct direction, reverse either two of the three leads either at the motor or at the output terminals TB3.
- Perform full speed test from 0 to 60Hz of the driven motor with no coupled load to verify correct operation of the inverter.
- Perform full speed test from 0 to 60Hz of the driven motor with full load to verify no overcurrent or overtemperature fault condition on the inverter.

6. Troubleshooting

The XP Drive series has been thoroughly tested in high ambient heat and full load conditions to ensure trouble-free operation for your application. This product uses only the highest quality and UL listed components from Eaton, Yaskawa, and other highly reputable manufacturers of industrial control components. Additionally, the product has been ETL certified to comply with stringent UL508A and UL1203 design requirements to ensure the highest level of safety and product craftsmanship.

If you are experiencing a problem, please review the list below in Table 6.1 for a set symptoms, problems, and proposed solutions.



DANGER: EXPLOSION

Do not energize any internal components with the front cover open unless it has been deemed safe to do so in the immediate environment. Energization of the internal equipment in the presence of explosive gases or vapors could lead to serious injury or death to personnel along with damage to equipment.



DANGER: HIGH VOLTAGE

Working on energized equipment, either during repair or in the troubleshooting process, exposes operators and technicians to risk of electrical shock. All troubleshooting work done on the enclosure while the internal circuitry, or line side of the main breaker, is energized must be done in the safest manner possible.

6.1. Troubleshooting

Use Table 6.1 for a list of problems and resolutions prior to contacting the factory for support.

Table 6.1 – Common Problem and Resolutions

Problem or Symptom	Possible Problem	Solution
General Operation		
I do not see the RUN pilot light illuminate after attempting to start the inverter.	Inverter is in active fault condition or ESTOP is pressed.	Verify ESTOP in pull-out position. Very no faults present on FAULT light. Verify FAULT pilot light operational by swapping bulbs.

	Pilot light bulb is burnt out.	Swap with FAULT pilot light bulb to verify problem. Order replacement bulb from factory.
	Pilot light fuse is in failed state.	Open enclosure, test internal 1A fuse located near MCCB for continuity. If fuse is burnt out, order replacement fuse from factory or replace with approved FNQ-1-R style.
	Pilot light is failed.	Swap with FAULT pilot light to verify problem. Contact factory for further support.
	Unit not receiving line side power.	Restore power to unit. Test for operation.
	Unit MCCB is tripped due to internal electrical fault.	Open enclosure, reset MCCB. Test for operation. If MCCB returns to trip state, contact factory for further support.
	Inverter is failing to power on.	Open enclosure, attempt to energize VFD. If VFD fails to energize, contact factory for further support.
I cannot disconnect main power when cycling main breaker disconnect.	Main breaker handle interface MCCB has become loose or inoperative.	Open enclosure and readjust the handle clevis assembly to allow correct operation.
“HAND” Mode Operation		
I cannot start the motor while in “HAND” mode.	Inverter is in active fault condition or ESTOP is pressed.	Verify ESTOP in pull-out position. Very no faults present on FAULT light. Verify FAULT pilot light operational by swapping bulbs.
	Hand Run Permissive contact not closed.	Verify external Hand Run Permissive contact closed. See Table 4.1 for more details.
I cannot control speed output while in “HAND” mode.	SPEED potentiometer no longer connected to inverter.	Check wiring and continuity between potentiometer and inverter. Contact factory for further support.
“AUTO” Mode Operation		
I cannot start the motor while in “AUTO” mode.	Inverter is in active fault condition or ESTOP is pressed.	Verify ESTOP in pull-out position. Very no faults present on FAULT light. Verify FAULT pilot light operational by swapping bulbs.
	Auto Run Contact not closed.	Verify external Auto Run Contact closed. See Table 4.1 for more details.

I cannot control speed output while in "AUTO" mode.	Remote speed reference no longer connected to inverter.	Check wiring and continuity between external controller speed reference and the inverter.
Inverter Fault		
FAULT indicator is illuminated and will not reset.	Inverter fault.	Inverter is faulted. Open enclosure, review alphanumeric flashing display on inverter keypad and cross reference in supplied inverter manual to diagnose fault condition. Use Yaskawa DriveWorksEZ diagnostic software to diagnose fault. Contact factory for further support.

If none of these are able resolve the issue with your XP Drive, please record your unit's Model Number and Serial Number from the side of the unit. Refer to Chapter 2, Section 2 for location of these values. Once you have these in hand, call the factory at the number listed at the end of this manual for phone technical support with our staff of engineers.

7. Maintenance

7.1. General Maintenance Check List

Due to the nature of this XP Drive package, very little continual maintenance is required on the unit. Table 7.1, listed below, is a list of recommended inspections that should be performed every 3-6 months. Inspections should be performed after unit power is completely deenergized and unit is allowed to discharge any remaining energy for at least three (3) minutes.



DANGER: EXPLOSION

Do not energize any internal components with the front cover open unless it has been deemed safe to do so in the immediate environment. Energization of the internal equipment in the presence of explosive gases or vapors could lead to serious injury or death to personnel along with damage to equipment.



DANGER: STORED ENERGY

Allow 3 minutes for inverter line and load side circuit to complete de-energized after operation. Do not touch any bare or exposed wiring associated with VFD power circuit until allowing for full draining of stored energy inside the inverter.

Table 7.1 - Periodic Check List

Area	Inspection Point
General	Overall inspection of front door operators.
	Overall inspection of nameplates and labels.
	Overall inspection of breather and drain vents.
	Overall inspection of legend plates.
	Clean any excessive dirt or grime from exterior.
	Clean any excessive dirt or grime from interior.
Wiring	Overall inspection of main power circuitry for frayed, discolored, or loose wiring.
	Verify correct torqueing of power wiring.
	Overall inspection of control circuity wiring for fray, discolored, or loose wiring.
	Verify correct torque of control wiring.

7.2. Torque Verification

Utilize Table 7.2 for verification of torque values for all internal components.

Table 7.2 – XP Drive Tightening Torque Chart

Component Group	Component Name	Terminal Number(s) / Wire Size(s)	Torque N-M (IN-LB)	Screwdriver Size
Circuit Breaker	Three Phase, 30A, GD-Series	#14-10	2.26 (20)	Variable
		#8	4.52 (40)	Variable
	Three Phase, 40A, GD-Series	#14-10	2.26 (20)	Variable
		#8	4.52 (40)	Variable
	Three Phase, 30A, PD-Series	#14-10	4.00 (35)	Variable
		#8	4.50 (40)	Variable
	Three Phase, 40A, PD-Series	#14-10	4.00 (35)	Variable
		#8	4.50 (40)	Variable
Fuse Holder	Three Phase, Illuminated	#18-16	2.80 (25)	Variable
Power Supply	10W, Single Phase	#22-12	0.46 (4.1)	Variable
	60W, Single Phase	#22-12	0.46 (4.1)	Variable
	60W, Three Phase	+ -	0.61 (5.4)	Variable
		L1 thru L3 GND	0.91 (8.1)	Variable
VFD Power Terminals	####-##BA0003###	All Terminals	0.8 – 1.0 (7.1 – 8.9)	M3.5
	####-##BA0006###	All Terminals	1.2 – 1.5 (10.6 – 13.3)	M4
	####-##BA0010###	All Terminals	1.2 – 1.5 (10.6 – 13.3)	M4
	####-##BA0012###	All Terminals	2.3 – 2.5 (20.4 – 22.1)	M4
	####-##2A0006###	All Terminals	0.8 – 1.0 (7.1 – 8.9)	M3.5
	####-##2A0010###	All Terminals	1.2 – 1.5 (10.6 – 13.3)	M4
	####-##2A0020###	All Terminals	1.2 – 1.5 (10.6 – 13.3)	M4
	####-##2A0040###	All Terminals	2.1 – 2.3 (18.6 – 20.4)	M4
	####-##4A0004###	All Terminals	1.2 – 1.5 (10.6 – 13.3)	M4
	####-##4A0005###	All Terminals	1.2 – 1.5 (10.6 – 13.3)	M4
	####-##4A0011###	All Terminals	1.2 – 1.5 (10.6 – 13.3)	M4
	####-##4A0023###	All Terminals	2.1 – 2.3 (18.6 – 20.4)	M4
	####-##4A0031###	L1 thru L3 T1 thru T3	3.6 – 4.0 (31.8 – 35.4)	M5
		Ground	5.4 – 6.0 (47.8 – 53.1)	M6
	####-##4A0038###	L1 thru L3 T1 thru T3	3.6 – 4.0 (31.8 – 35.4)	M5
		Ground	5.4 – 6.0 (47.8 – 53.1)	M6
VFD Control Terminals	All	S1 thru S7 SC RP +V A1 & A2 P1 & P2 PC MP AM AC S+ & S- R+ & R- IG	0.2 – 0.3 (1.9 – 2.2)	M2

VFD Relay Terminals	All	MA MB MC	0.5 – 0.6 (4.4 – 5.3)	M3
Terminal Blocks	TB1	All Terminals	0.4 – 0.6 (3.5 – 5.3)	Variable
	TB2 – TB3	All Terminals	0.8 – 1.0 (7.1 – 8.9)	Variable
Operator Terminals	BT4	All Terminals	0.8 – 1.0 (7.1 – 8.9)	Variable
	BT1A/B	All Terminals	0.8 – 1.0 (7.1 – 8.9)	Variable
	BT2	All Terminals	0.8 – 1.0 (7.1 – 8.9)	Variable
	BT3	All Terminals	0.8 – 1.0 (7.1 – 8.9)	Variable
Reactors	Single Phase 200V .5HP #0803	All Terminals	0.5 (4.5)	Variable
	Single Phase 200V, 1HP #1202	All Terminals	1.8 (16)	Variable
	Single Phase 200V, 2HP #1201	All Terminals	1.8 (16)	Variable
	Single Phase 200V, 3HP #1801	All Terminals	1.8 (16)	Variable
	Three Phase 200V, 1HP #0802	All Terminals	0.5 (4.5)	Variable
	Three Phase 200V, 2HP #0801	All Terminals	0.5 (4.5)	Variable
	Three Phase 200V, 5HP #1801	All Terminals	1.8 (16)	Variable
	Three Phase 200V,10HP #3501	All Terminals	1.8 (16)	Variable
	Three Phase 400V, 1HP #0201	All Terminals	0.5 (4.5)	Variable
	Three Phase 400V, 3HP #0803	All Terminals	0.5 (4.5)	Variable
	Three Phase 400V, 5HP #0802	All Terminals	0.5 (4.5)	Variable
	Three Phase 400V,10HP #1802	All Terminals	1.8 (16)	Variable
	Three Phase 400V,15HP #2502	All Terminals	1.8 (16)	Variable
	Three Phase 400V,25HP #3502	All Terminals	1.8 (16)	Variable

7.3. Explosive Event Required Maintenance

In the event of an explosion within the enclosure, all internal components, threading, and machined surfaces must be inspected. If any component is suspected of damage, contact that the factory for guidance on replacement or repair of any components.



DANGER: BURN HAZARD

To avoid personnel injury, allow sufficient time for enclosure to cool prior to servicing after explosive event.

8. Technical Data

8.1. Technical Data Charts

See Table 8.1 and 8.2 for a full list available 40°C XP Drive units. For more information regarding 50°C and 55°C offerings, contact the factory for available listings.

Table 8.1 – 200V thru 240V, 40°C XP Drive Technical Data Chart

Input Voltage Class	XP Drive Part Number	Nominal HP (kW)	Line/Load Impedance (%Z)	Enclosure Frame Size	Input Rating (Amps)	Max Output Rating (Amps)
SINGLE PHASE, 200-240V INPUT	XP120EY030B840EL00	1/8 (0.10)	0	B8	3	0.7
	XP120QY030B840EL00	1/4 (0.19)	0	B8	3	1.2
	XP120HY030B840EL00	1/2 (0.38)	0	B8	3	2.2
	XP120TY060B840EL00	3/4 (0.56)	0	B8	6	3.2
	XP1201Y060B840EL00	1 (0.75)	0	B8	6	4.2
	XP1202Y100B840EL00	2 (1.50)	0	B8	10	6.8
	XP1203Y120C840EL00	3 (2.25)	0	C8	12	9.6
	XP120EY031C840EL00	1/8 (0.10)	3	C8	3	0.7
	XP120QY031C840EL00	1/4 (0.19)	3	C8	3	1.2
	XP120HY031C840EL00	1/2 (0.38)	3	C8	3	2.2
	XP120TY061C840EL00	3/4 (0.56)	3	C8	6	3.2
	XP1201Y061C840EL00	1 (0.75)	3	C8	6	4.2
	XP1202Y101C840EL00	2 (1.50)	3	C8	10	6.8
	XP1203Y121D840EL00	3 (2.25)	3	D8	12	9.6
THREE PHASE, 200-240V INPUT	XP320QY060B840EL00	1/4 (0.19)	0	B8	6	1.2
	XP320HY060B840EL00	1/2 (0.38)	0	B8	6	2.2
	XP320TY060B840EL00	3/4 (0.56)	0	B8	6	3.2
	XP3201Y060B840EL00	1 (0.75)	0	B8	6	4.2
	XP3202Y100B840EL00	2 (1.50)	0	B8	10	6.8
	XP3203Y200B840EL00	3 (2.25)	0	B8	20	9.6
	XP3205Y200B840EL00	5 (3.73)	0	B8	20	15.2
	XP3207Y200D840EL00	7.5 (5.60)	0	D8	20	22.0
	XP3210Y400D840EL00	10 (7.46)	0	D8	40	28.0
	XP320QY061C840EL00	1/4 (0.19)	3	C8	6	1.2
	XP320HY061C840EL00	1/2 (0.38)	3	C8	6	2.2
	XP320TY061C840EL00	3/4 (0.56)	3	C8	6	3.2
	XP3201Y061C840EL00	1 (0.75)	3	C8	6	4.2
	XP3202Y101C840EL00	2 (1.50)	3	C8	10	6.8
	XP3203Y201C840EL00	3 (2.25)	3	C8	20	9.6
	XP3205Y201C840EL00	5 (3.73)	3	C8	20	15.2
	XP3207Y201D840EL00	7.5 (5.60)	3	D8	20	22.0
	XP3210Y401D840EL00	10 (7.46)	3	D8	40	28.0

Table 8.2 – 380V thru 500V, 40°C XP Drive Technical Data Chart

Input Voltage Class	XP Drive Part Number	Nominal HP (kW)	Line/Load Impedance (%Z)	Enclosure Frame Size	Input Rating (Amps)	Max Output Rating (Amps)
THREE PHASE, 380-	XP340QY040B840EL00	1/4 (0.19)	0	B8	4	0.8
	XP340HY040B840EL00	1/2 (0.38)	0	B8	4	1.1
	XP340TY040B840EL00	3/4 (0.56)	0	B8	4	1.6
	XP3401Y040B840EL00	1 (0.75)	0	B8	4	2.1

	XP3402Y050B840EL00	2 (1.50)	0	B8	5	3.4
	XP3403Y050B840EL00	3 (2.25)	0	B8	5	4.8
	XP3405Y110B840EL00	5 (3.73)	0	B8	11	7.6
	XP3407Y230C840EL00	7.5 (5.60)	0	C8	23	11
	XP3410Y230C840EL00	10 (7.46)	0	C8	23	14
	XP3415Y310D840EL00	15 (11.25)	0	D8	31	21
	XP3420Y380D840EL00	20 (15)	0	D8	38	27
	XP3425Y380D840EL00	25 (18.75)	0	D8	38	34
	XP340QY041C840EL00	1/4 (0.19)	3	C8	4	0.8
	XP340HY041C840EL00	1/2 (0.38)	3	C8	4	1.1
	XP340TY041C840EL00	3/4 (0.56)	3	C8	4	1.6
	XP3401Y041C840EL00	1 (0.75)	3	C8	4	2.1
	XP3402Y051C840EL00	2 (1.50)	3	C8	5	3.4
	XP3403Y051C840EL00	3 (2.25)	3	C8	5	4.8
	XP3405Y111C840EL00	5 (3.73)	3	C8	11	7.6
	XP3407Y231D840EL00	7.5 (5.60)	3	D8	23	11
	XP3410Y231D840EL00	10 (7.46)	3	D8	23	14
	XP3415Y311D840EL00	15 (11.25)	3	D8	31	21
	XP3420Y381D840EL00	20 (15)	3	D8	38	27
	XP3425Y381D840EL00	25 (18.75)	3	D8	38	34

8.2. XP Drive Derating

Ambient Temperature Derating

As standard, each XP Drive up to 20HP is rated for full output current in a constant torque (CT) application at 40°C ambient temperature. For the 25HP XP Drive, it is rated for variable torque (VT) at 40°C ambient temperature.

Select models are also available for operation in 50°C ambient temperature. Consult factory for guidance on appropriate drive selection.

Specialty models, rated for 380-500V, are also available for operation in 55°C ambient temperature. Consult factory for guidance on appropriate drive selection.

Altitude Derating

Each XP Drive is rated for operation up to 1,000M without derating. For operation between 1,000m and 3,000m (2380ft to 9840ft) above sea level, the de-rating factor is 1% per 100m (328ft).

Switching Frequency Derating

To reduce motor noise, a higher inverter switching frequency may be programmed. Note that this will increase heat output from the inverter.

Consult factory for guidance on appropriate derating associated with higher switching frequencies.

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SAI Drive Solutions - XP Drive Series

Hazardous Location AC Drive

Instruction and User Manual

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