H-Max Series Drives IntelliPass®/IntelliDisconnect®
Frames 4-7

Powering Business Worldwide

Important Notice – Please Read

The product discussed in this literature is subject to terms and conditions outlined in Eaton Electrical Inc. selling policies. The sole source governing the rights and remedies of any purchaser of this equipment is the relevant Eaton Electrical Inc. selling policy.

NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, OR WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE, ARE MADE REGARDING THE INFORMATION, RECOMMENDATIONS AND DESCRIPTIONS CONTAINED HEREIN.

In no event will Eaton Electrical Inc. be responsible to the purchaser or user in contract, in tort (including negligence), strict liability or otherwise for any special, indirect, incidental or consequential damage or loss whatsoever, including but not limited to damage or loss of use of equipment, plant or power system, cost of capital, loss of power, additional expenses in the use of existing power facilities, or claims against the purchaser or user by its customers resulting from the use of the information, recommendations and descriptions contained herein. The information contained in this manual is subject to change without notice.

Safety

Read and follow all safety information shown in the H-Max installation Manual MN04008005E.

Contents

General

This document provides supplement information to the H-Max installation Manual MN04008005E specific to the H-Max IntelliPass and IntelliDisconnect products. These products are offered with input/output voltages of 208, 230 & 480 VAC with HP ranges from 1 to 75hp. Both UL Type 1,12 and Type 3R enclosures are available along with several factory wired power and plug in options.

For drive setup and operation I.e. Application, Keypad use, Drive and motor parameters setup, see the quick start guide MN04008005E included with the drive. The drive start up wizard can be used to complete the process. For more information on speed control and other H-Max drive features see H-Max Application Manual MN04008006E. The Application Manual and can be found at

http://www.eaton.com/Electrical/USA/ProductsandServices/Automation and Control/Adjustable Frequency Drives/H-Max/index.htm

Catalog/Style Numbering

Eaton HMAX IntelliPass and IntelliDisconnect Catalog Number Matrix

HMX 011 3 4 N A P3

Product:

HMX = HVAC Drive (VT)

Software Options:

A - Standard

Enclosure/Style:

3 = IntelliPass NEMA Type 1
4 = IntelliPass NEMA Type 12
5 = IntelliPass NEMA Type 3R
A = IntelliDisconnect NEMA Type 1
B = IntelliDisconnect NEMA Type 12
C = IntelliDisconnect NEMA Type 3R

Voltage:

1 = 208V
2 = 230V
4 = 480V
5 = 575V

Braking:

N = No Brake Chopper (Low Overload)
B = Internal Brake Chopper Low

Intellipass/Options:
00 =None
P3 = Drive Isolation Fuses
(for FS 4-7 not available with M1, P6 or PE options)
P6 = Drive Isolation Contactor includes drive test switch
(For FS 4-7 not available with M1, P3 or PE options)
L4 = Pilot Lights (not available with M1)
M1 = Manual Bypass - includes pilot lights and Isolation contactor (not available with any other wired option)
IS = Isolation Switch not available with M1, P6 or PE options
SA = Space Heater w/Xformer (Type 3R only)
K9 = Aux Contacts

Intellidisconnect Options:
00 = None
P3 = Drive Isolation Fuses
PE = Drive Output contactor
L3 = HMAX Pilot Lights
SA = Space Heater w/Xformer (Type 3R only)
K9 = Aux Contacts

Extended I/O Options in Slot D & E:
B1 = 6 DI or DO, 1 ext +24V DC/EXT +24V DC Programmable
B2 = 1 RO (NC/NO), 1 RO (NO), 1 Thermistor
B4 = 1 AI (mA isolated), 2 AO (mA isolated)
B5 = Card-3 Relay Dry Contact
B9 = 1 RO (NO), 5 DI 42 – 240V AC Input
BF = Expander IO - 1*AO, 1*DO, 1*RO

I/O Options in Slot B
F2 = 2 relay and 1 Thermistor- not available with L3/L4 Pilot light option replaces standard Relay1 pcb in Slot B and Fault Relay function

Optional Communications in Slot D & E:
C4 = OPTC4: Lonworks

NEC 208 Volts:

4D6 = 4.6 Amp = 1.0 HP
7D5 = 7.5 Amp = 2 HP
011 = 11 Amp = 3 HP
017 = 17 Amp = 5 HP
025 = 24 Amp = 7.5 HP
031 = 31 Amp = 10 HP
047 = 47 Amp = 15 HP
060 = 60 Amp = 20 HP
075 = 75 Amp = 25 HP
088 = 88 Amp = 30 HP

NEC 230 Volts:

4D2 = 4.2 Amp = 1.0 HP
6D8 = 6.8 Amp = 2 HP
9D6 = 9.6 Amp = 3 HP
016 = 16 Amp = 5 HP
022 = 22 Amp = 7.5 HP
028 = 28 Amp = 10 HP
042 = 42 Amp = 15 HP
054 = 54 Amp = 20 HP
068 = 68 Amp = 25 HP
080 = 80 Amp = 30 HP
104 = 104 Amp = 40 HP

NEC 480 Volts:

2D1 = 2.1 Amp = 1 HP
3D4 = 3.4 Amp = 2 HP
5D6 = 5.6 Amp = 3 HP
7D6 = 7.6 Amp = 5 HP
011 = 11 Amp = 7.5 HP
014 = 14 Amp = 10 HP
021 = 21 Amp = 15 HP
027 = 27 Amp = 20HP
034 = 34 Amp = 25 HP
040 = 40 Amp = 30 HP
052 = 52 Amp = 40 HP
065 = 65 Amp = 50 HP
077 = 77 Amp = 60 HP
096 = 96 Amp = 75 HP

Notes:
All Boards are Varnished
Battery Included in all drives for real time clock
EMC = EMC C2 Standard
Graphic keypad on all drives
Bypass & HOA Keypad

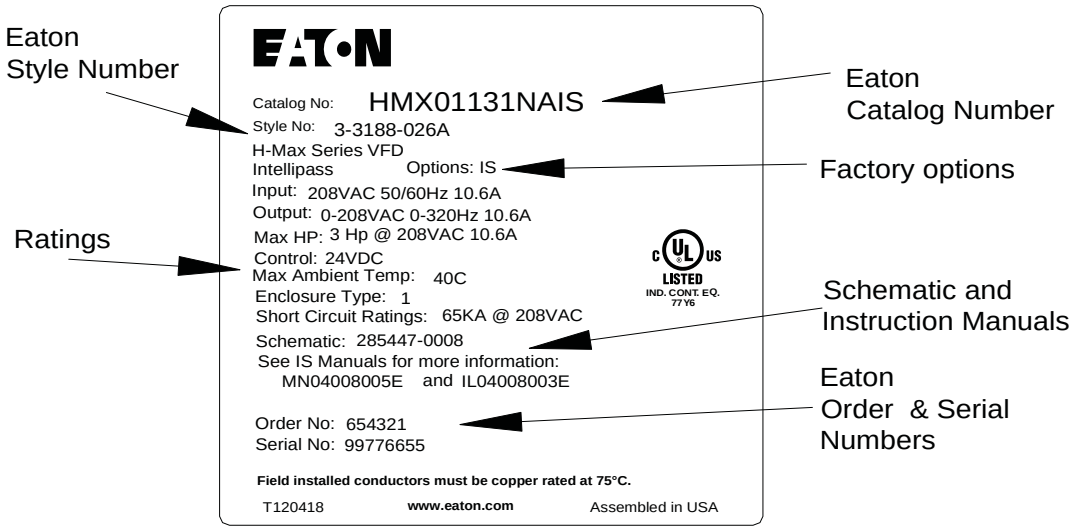
On Board Base RS485 Communications:
BACnet MS/TP = MS/TP = Master Slave / Token Protocol (Universal BACnet)
RS 485 ModbusRTU RS485, ASCII or RTU, remote terminal unit 32 Nodes

On Board Ethernet Based Communications:
BACnet/IP Ethernet Industrial Protocol
M = Modbus/TCP Transmission Control Protocol (Ethernet Based) Note
All Boards are Varnished

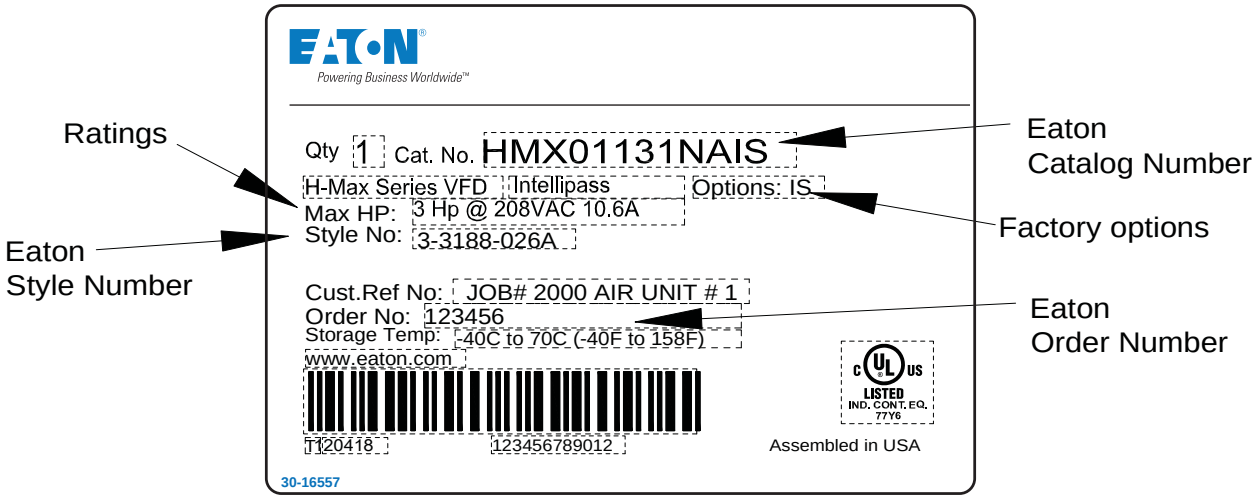
Identification

Unit ID labels

H-Max IntelliPass/IntelliDisconnect Carton Label



H-Max IntelliPass/IntelliDisconnect Nameplate



Use table below to determine enclosure size and frame size based on Hp.

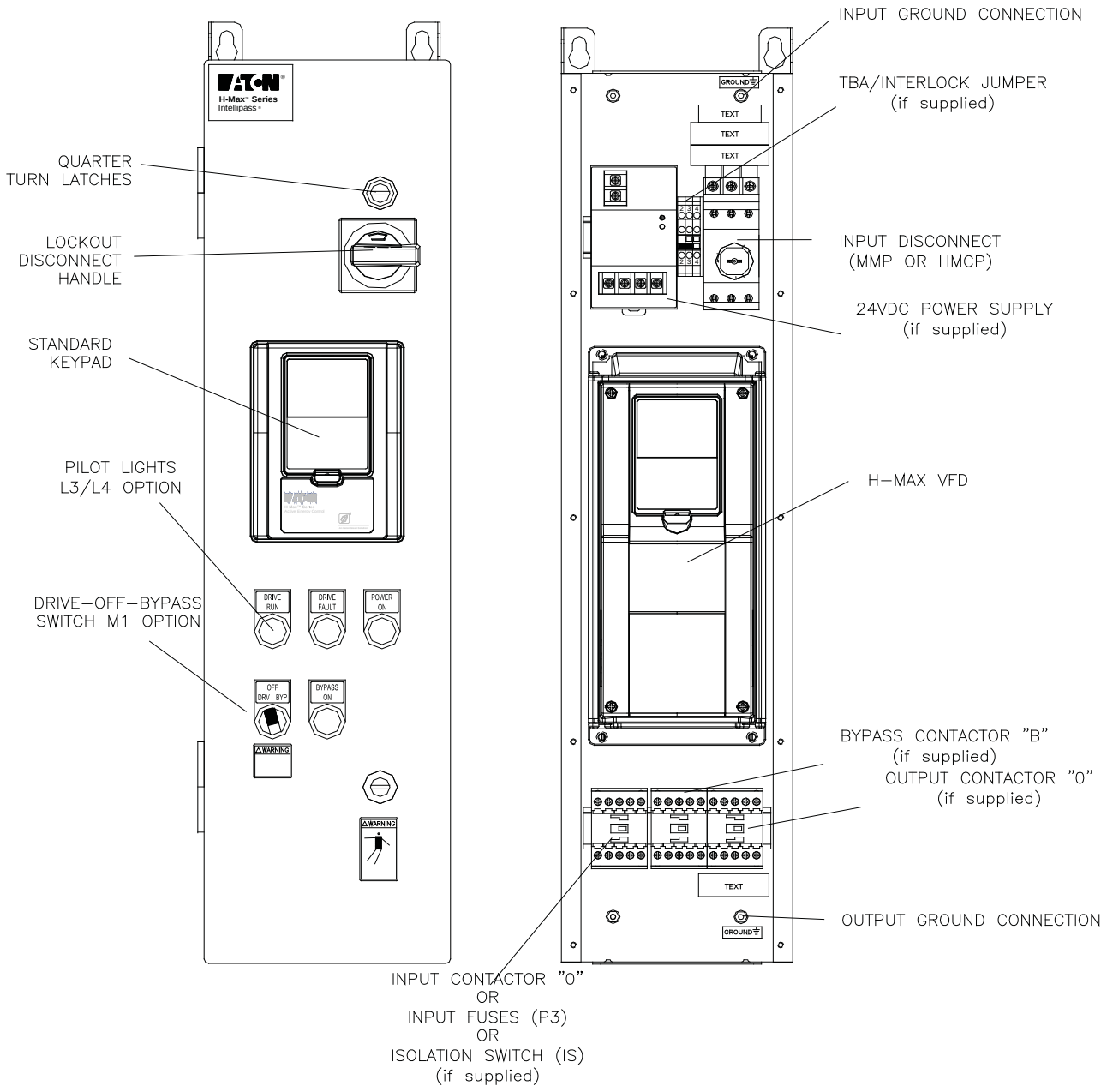
Enclosure Size and drive Frame size Indenfication

Volts	Hp	Current	Drive Size	Standard Enclosure Type 1/12	3R and Oversize Enclosure type 1/12
208	1	4.6			
	2	7.5			
	3	10.6			
230	1	4.2			
	2	6.8			
	3	9.6	4	Size 4	
480Y/277	1	2.1			
	2	3.4			
	3	4.8			
	5	7.6			
	7.5	11			A
208	5	16.7			
	7.5	24.2			
	10	30.8			
230	5	15.2			
	7.5	22	5	Size 5	
	10	28			
480Y/277	10	14			
	15	21			
	20	27			
208	15	46.2			
230	15	42			
480Y/277	25	34	6	Size 6	B
	30	40			
	40	52			
208	20	59.4	6		
	25	74.8	7		
	30	88			
230	20	54	6		
	25	68			
	30	80		Size 7	C
	40	104	7		
480	50	65			
	60	77			
	75	96			

Components

IPass and IDisc Typical Component locations.

Typical Component Locations



Components

IPass and IDisc Typical Component locations.

Factory Wired Options

The Intellpass and IntelliDisconnect can be supplied with serveral factory wired power options. The sections below describe the options.

Options

HMAX Option Matrix	IPass	IDisc
P3 - Drive Isolation Fuses	X	X
P6 - Drive Isolation Contactor includes manual switch	X	N/A
PE - Drive Output contactor	N/A	X
IS - Isolation Switch	X	N/A
SA - Space Heater (3R only)	X	X
K9 - Aux Contacts	X	X
M1 - Manual Bypass includes L4 and drive isolation contactor and door switch	X	N/A
L3 - H-Max Pilot Lights	N/A	X
L4 - H-Max Pilot Lights	X	N/A

P3- Drive Isolation Fuses

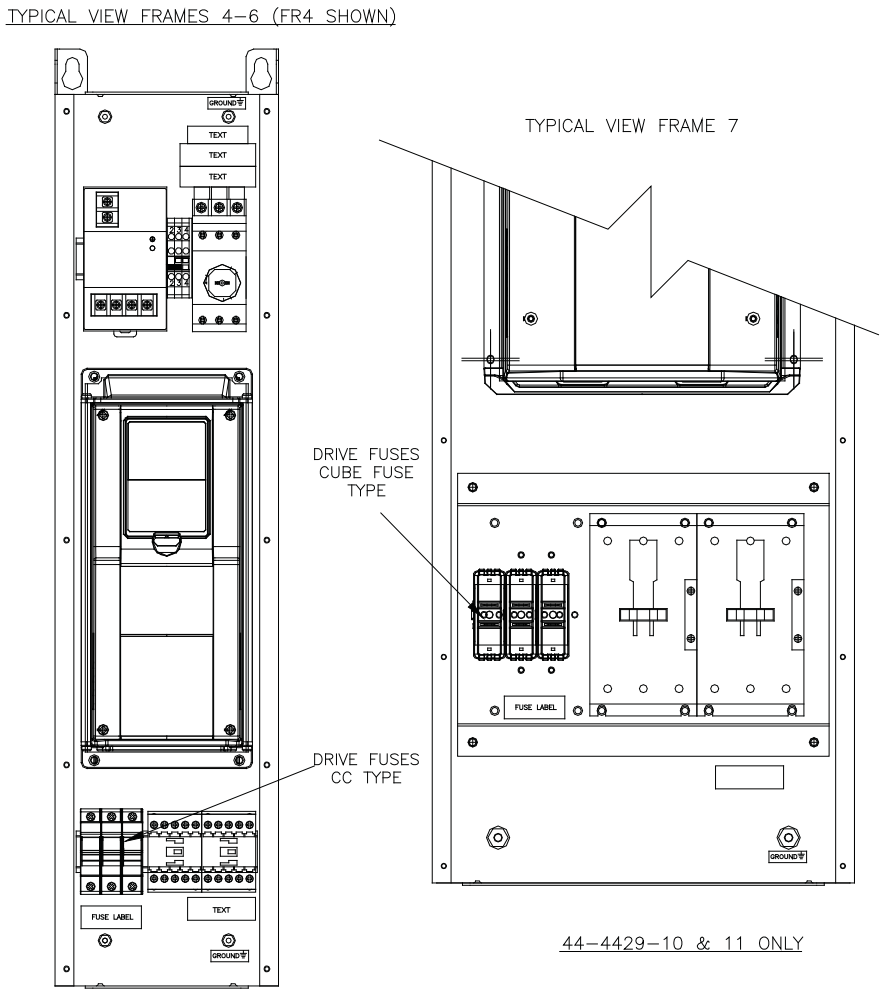
This option is available for both the IntelliPass and IntelliDisconnect designs 208/230V up to 30Hp and 480V models up to 75 hp.

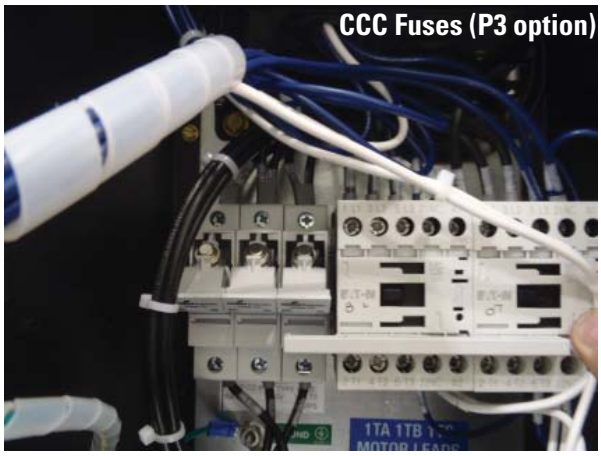
3 Power Fuses are supplied wired to the Drive input. They are provided between the disconnect device and drive. The fuses are not used in the bypass mode. The fuses are for drive protection only. They are listed, Class CC or Special Purpose Fuse cube fuses sized according to the following table. This option cannot be used with IS Isolation switch or P6 isolation contactor options. See IntelliDisconnnect or Typical IntelliPass schematic.

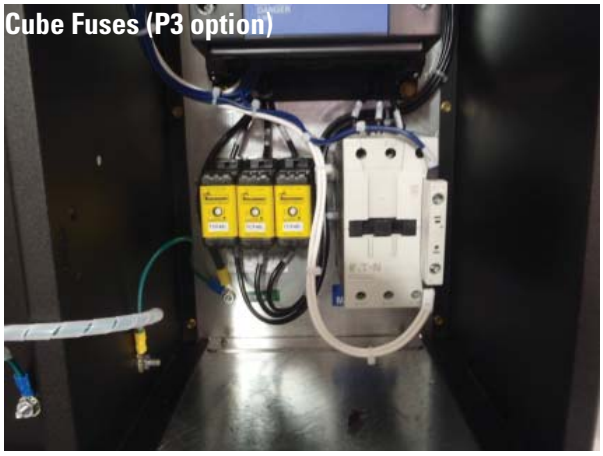
Hp Rating and Fuse Rating (A)

HP	208 V Fuse	230 V Fuse	460 V Fuse
1	6	6	5
2	12	12	6
3	20	20	8
5	25	25	12
7.5	30	30	20
10	45	45	25
15	60	60	30
20	80	80	45
25	90	90	45
30	100	100	50
40	N/A	N/A	60
50	N/A	N/A	80
60	N/A	N/A	90
75	N/A	N/A	100

P3 Drive Fuse Option





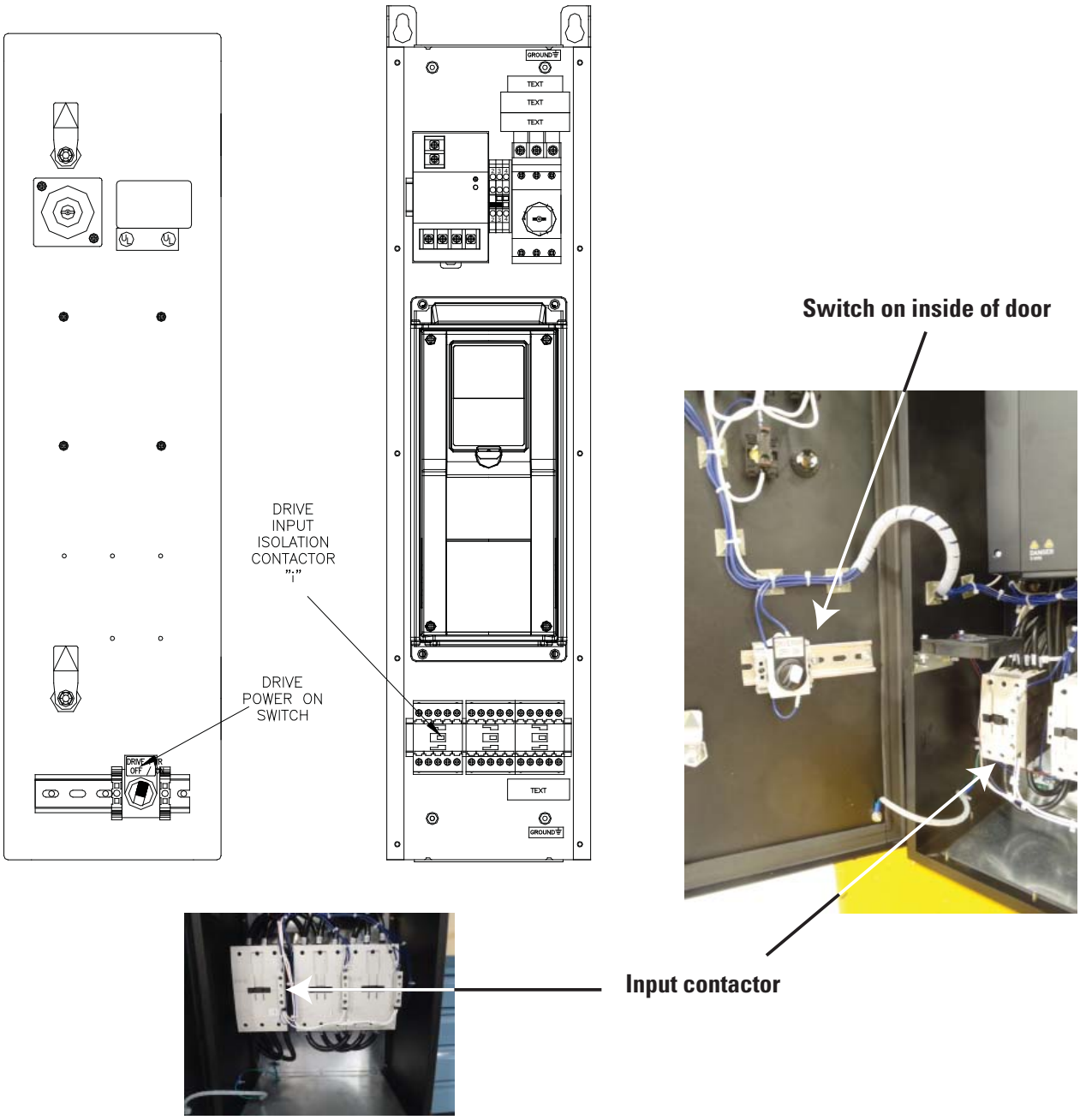


P6 – Drive Isolation Contactor includes Drive test switch

This option is only available on the IntelliPass models. An input contactor is supplied wired to the drive input and a manual 2 position selector switch is provided to control the contactor. The switch is located inside the enclosure on the door. The enclosure door must be opened to operate this switch. See typical IntelliPass schematic.

The contactor removes main power from the Drive. The Drive display and logic will remain active because of the separate 24Volt power supply, but the Drive will not run. The Drive Keypad is still powered and the bypass feature remains operational and the motor can be run in bypass using the keypad. The input contactor "I" is energized at all times while in the drive mode if the door mounted selector switch us in the on position. This option cannot be used with M1 Manual Bypass, IS Isolation switch or P3 fuse options.

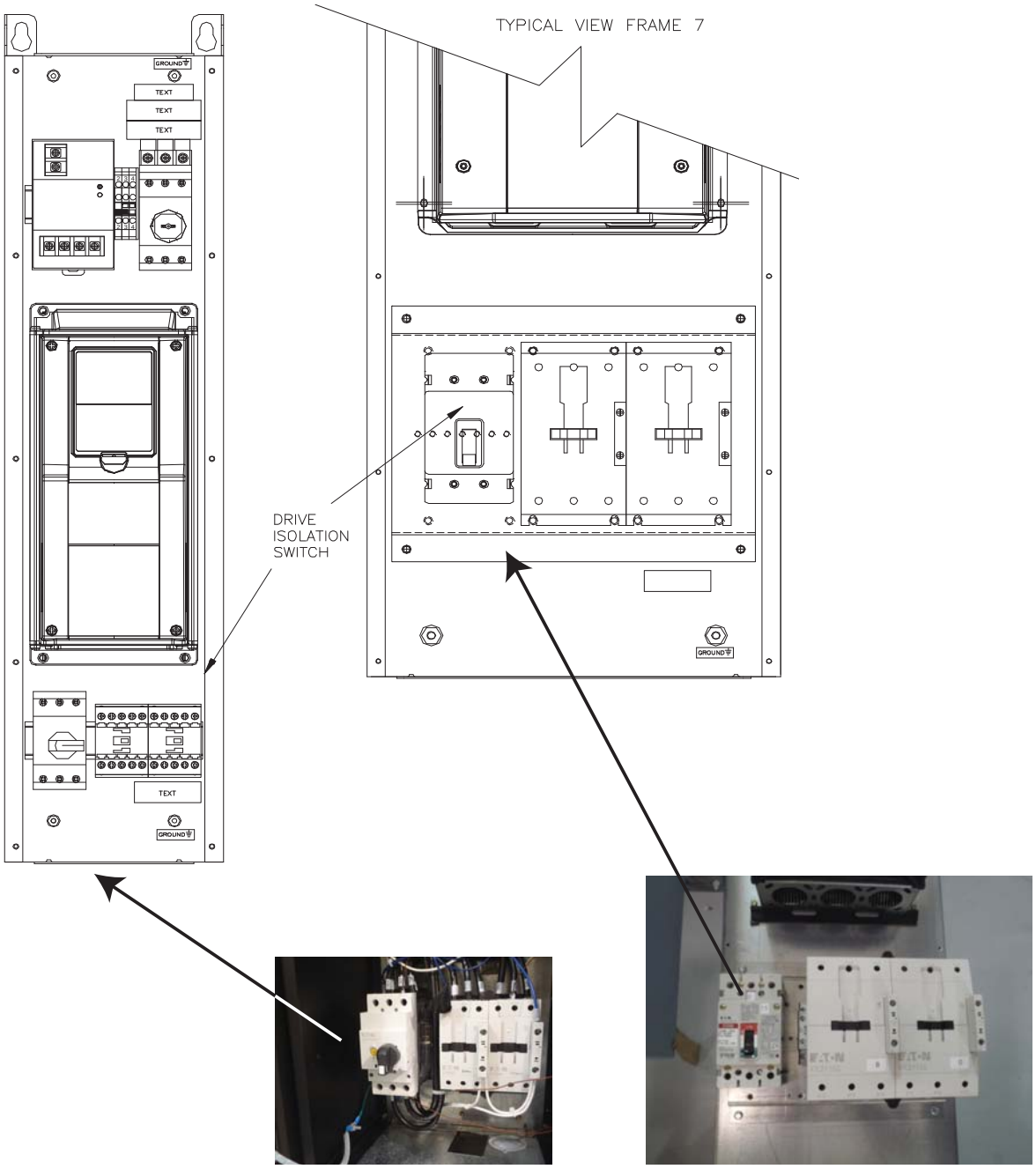
P6 Drive Isolation Contactor Option Typical View Frames 4 - 6 (FR4 Shown)



IS - Drive Isolation Switch

This option is available on the IntelliPass models only. This is an MMP or molded case switch, installed at the input of the Drive to be used as a switch only to isolate the drive from input power. The IntelliPass door must be opened to operate this switch – a thru the door operator is not supplied. The switch removes main power from the Drive. The Drive display and logic will remain active because of the separate 24Volt power supply, but the drive will not run. The drive Keypad is still powered and the bypass feature remains operational and the motor can be run in bypass using the keypad. This option cannot be used with P3 or P6 options. See Typical IntelliPass Schematic.

Drive Isolation Switch Option IS



M1 - Manual Bypass (forced) Switch

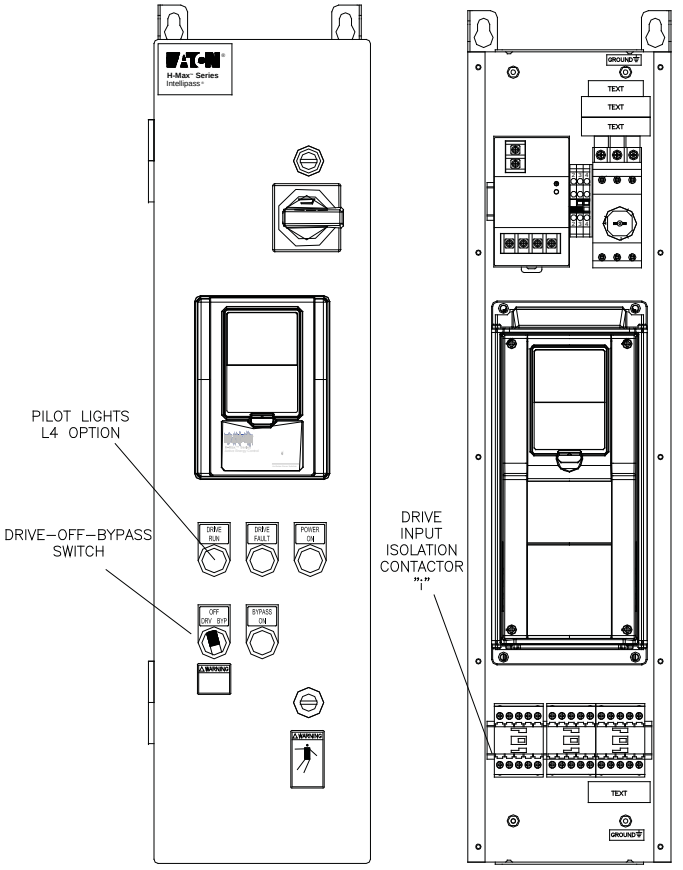
This option is available on the IntelliPass models only. This option includes an input contactor "I", L4 pilot light option and a 3 position door mounted selector switch - marked Drives/Off/Bypass. This switch manually overrides the Bypass control from the system (keypad) and puts unit in bypass or in an OFF mode. See IntelliPass Schematic with M1 option.

When the door switch is in the Drive position, the H-Max Drive logic controls the motor and the keypad selects the operation (Drive or Bypass), the control source and place (HOA, KEYPAD or Terminal block). The input contactor "I" is energized at all times while in the drive mode.

When the door switch is moved to Bypass, three actions occur: 1) Drive input isolation contactor is forced open, 2) Drive output contactor will be forced open and the bypass contactor will be forced closed. The motor will immediately start and run full speed across the line regardless of the state of the system or drive.3) The Drive will be forced to the bypass mode and the Keypad Display will show "Bypass". When the switch is moved back the Drive position, Drive operation is restored and the system may need to be restarted.

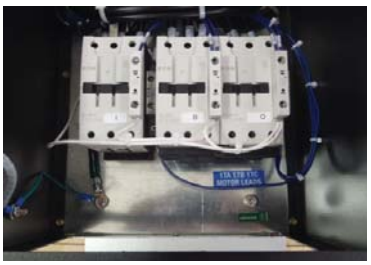
When the switch is in the off position neither the drive or bypass operation is possible. Moving the Switch to the off or bypass position while the Drive is operating may cause the Drive to fault because the input power to the drive is removed by the input contactor. See L4 for description/operation of the door mounted pilot lights.

Manual Bypass Option M1



3R Versions have Bypass switch located in Keypad Enclosure

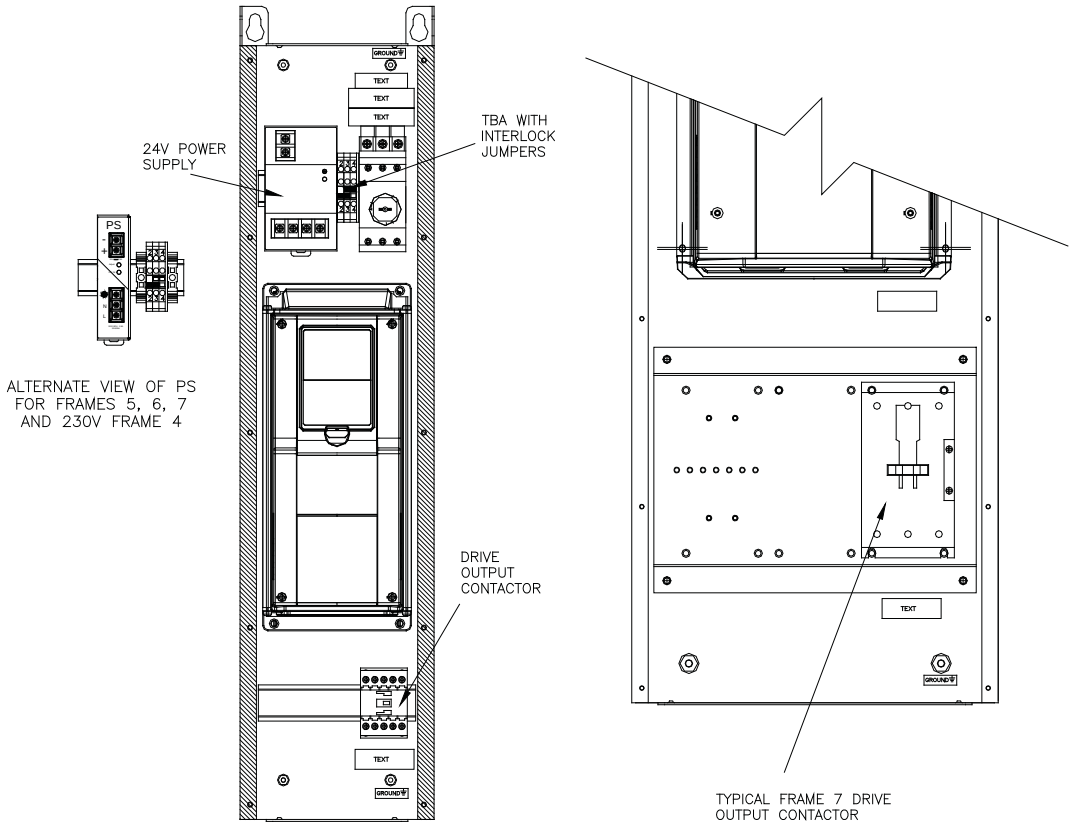
M1 Option



PE- Drive Output contactor

This option is available for IntelliDisconnect models only. This option provides a contactor wired to the Drive output. The motor is then wired to the contactor. The output contactor is controlled by the Drive so when the Drive is stopped the contactor drops out and when the Drive is in a run mode, the output contactor is energized and connects the Drive to the motor. A 24 volt power supply is also provided to power the contactor. Provisions for and external interlock is also provided. See IntelliPass schematic with PE option.

IntelliDisconnect PE Output Contactor Option

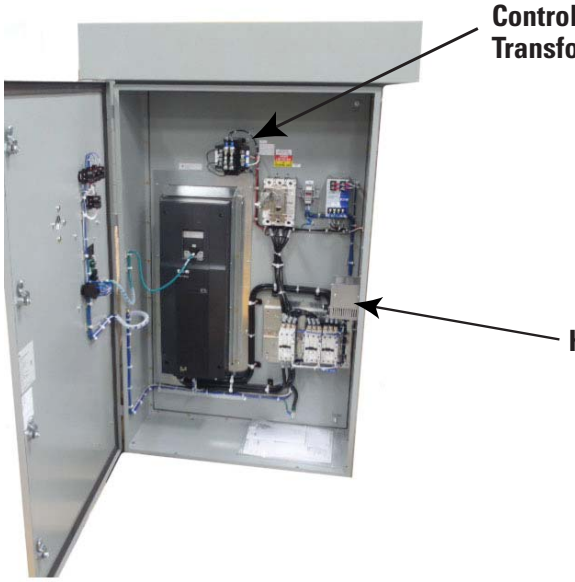


SA - Space Heater Option (Type 3R enclosures only)

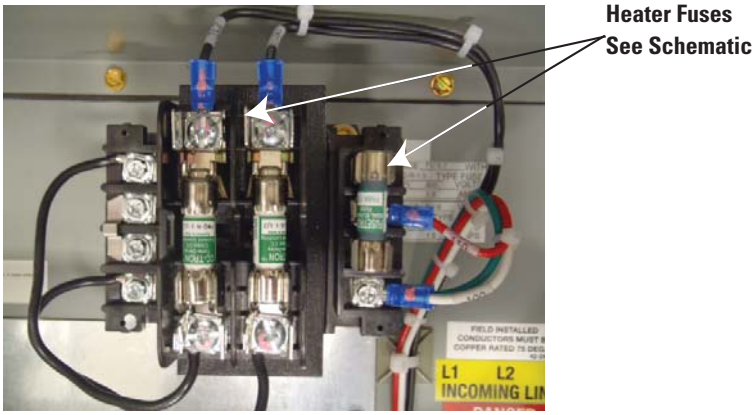
This option aids in preventing or reducing condensation from forming in the enclosure when the drive is inactive. A 120V 100W heater is installed in 3R enclosures size A & B and a 200W heater are installed in enclosure size C. A control transformer and fusing is also provided to power the heater. See schematics for more information. The heater includes a user adjustable thermostat for variable temperature control and an internal fan. See pictures

SETTING THE THERMOSTAT

The heater is controlled by an adjustable thermostat. Set the thermostat to the desired temperature. It is recommended not to exceed 75 F for most applications. The heater is active at all times when the main disconnect is closed including when in the Drive, Off or Bypass operation. However, depending on the setting of the thermostat, the internal heat generated by the system when in operation should be enough to turn off the heater. Generally the heater requires no maintenance since the fan bearings are permanently lubricated and sealed.

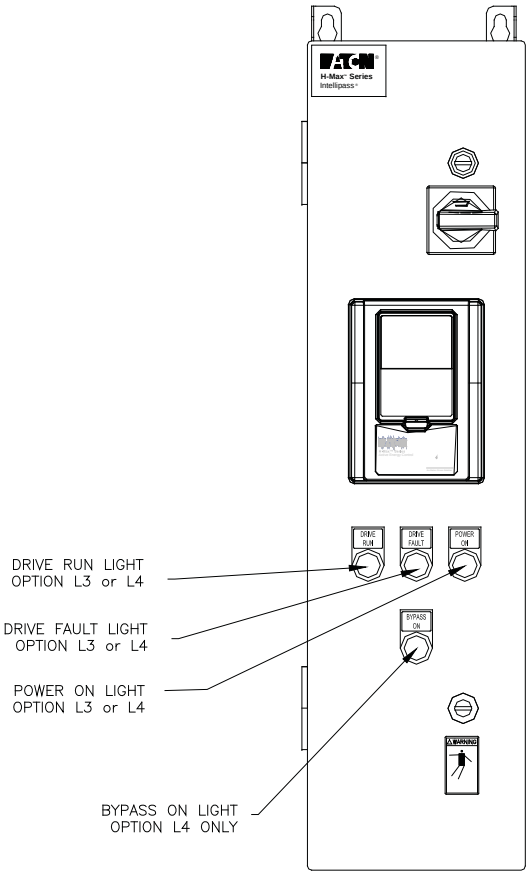

Control
Transformer
Heater

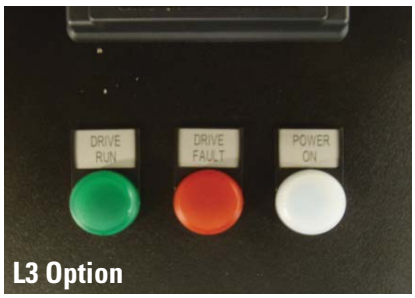

Heater Thermostat
Adjustment


Heater Fuses
See Schematic
L1
L2

L3/L4 - HMAX Pilot Lights

The L3 option is available only on the IntelliDisconnect models and provides 3 door mounted pilot lights, 1 red, 1 white and 1 green. The L4 option is available on the IntelliPass models and provides 4 door mounted pilot lights: 1 red, 1 white, 1 green and 1 amber.





The white "Power On" light indicates that 24VDC power is active. However, Caution is advised if the light is not illuminated, as this is may not be an indication that main power has been removed. If the light fails or the 24V power supply fails, main power may still be present. Always follow proper safety procedures to determine the presence of main power on the unit

The red "Drive Fault" light indicates a Drive fault is present.

The green light indicates the system is commanded to run from the Drive and the Drive is in the "run" mode, the drive output contactor is also energized if the PE option is supplied. The speed of the motor will depend on the Drive speed signal. The motor may not be rotating if commanded at zero speed.

The amber light indicates the system has been commanded to run in bypass. The bypass contactor should be energized and the motor running across the line.

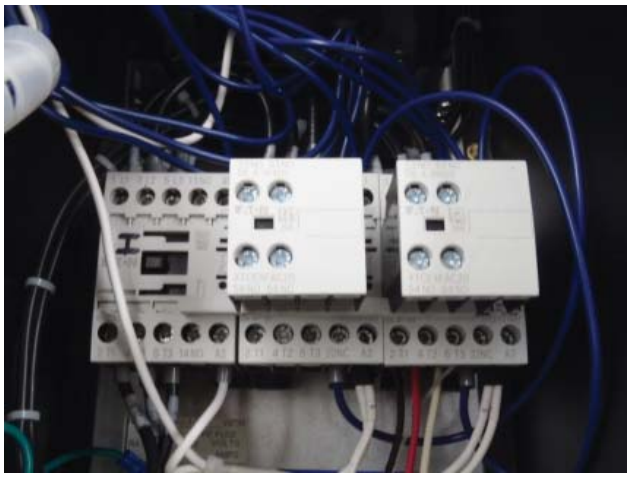
Plug in options

K9 Aux Contacts

This option adds 1 N.O. & N.C. auxiliary contacts to both the Drive output and bypass contactors for customer use.

K9 Aux Contact Applications

Product	Frame	Hp	Voltage	Qty	Eaton P/N	Description
IPass	4	ALL	ALL	2	XTCEXFAC11	Aux NO, NC Contact, B/C frame Top Mount
IPass	5	ALL	ALL	2	XTCEXFAC11	Aux NO, NC Contact, B/C frame Top Mount
IPass	6	ALL	ALL	2	XTCEXFAG11	Aux NO, NC Contact, D/F/G frame Top Mount
IPass	7	ALL	ALL	2	XTCEXFAG11	Aux NO, NC Contact, D/F/G frame Top Mount
IDisc	4	ALL	ALL	1	XTCEXFAC11	Aux NO, NC Contact, B/C frame Top Mount
IDisc	5	ALL	ALL	1	XTCEXFAC11	Aux NO, NC Contact, B/C frame Top Mount
IDisc	6	ALL	ALL	1	XTCEXFAG11	Aux NO, NC Contact, D/F/G frame Top Mount
IDisc	7	ALL	ALL	1	XTCEXFAG11	Aux NO, NC Contact, D/F/G frame Top Mount



Optional plug in PCBS

A number of plug in option cards are available. A maximum of 2 option cards may be factory installed in the control module slots. Available options are shown in the table below.

Typical Plug in Option PCB

See the option manual included with each PCB for more information.

Also see H-Max Installation manual MN04008005E for more information on control wiring, control board layout and options PCBs.

Option	Brand	Config	VFD Frame	Voltage	HP	Qty	P/N	Style Number	Description
B1	All	All	ALL	ALL	ALL	1	XMX-IO-B1-A	3-3131-0003A	I/O Expander Card, 6 DI/DO, Slot D/E
B2	All	All	ALL	ALL	ALL	1	XMX-IO-B2-A	3-3131-0004A	I/O Expander Card 2 x RO + Thermistor, Slot D/E
B4	All	All	ALL	ALL	ALL	1	XMX-IO-B4-A	3-3131-0005A	I/O Expander Card 1 x AI, 2 x AO (isolated), Slot D/E
B5	All	All	ALL	ALL	ALL	1	XMX-IO-B5-A	3-3131-0006A	I/O Expander Card 3 x RO, Slot D/E
B9	All	All	ALL	ALL	ALL	1	XMX-IO-B9-A	3-3131-0007A	I/O Expander Card 1 x RO, 5 x DI (42-240VAC), Slot D/E
BF	All	All	ALL	ALL	ALL	1	XMX-IO-BF-A	3-3131-0008A	I/O expander Card, 1 x AO, 1 x DO, 1 x RO, Slot D/E
C4	All	All	ALL	ALL	ALL	1	XMX-COM-C4-A	3-3131-0009A	LonWorks, Slot D/E

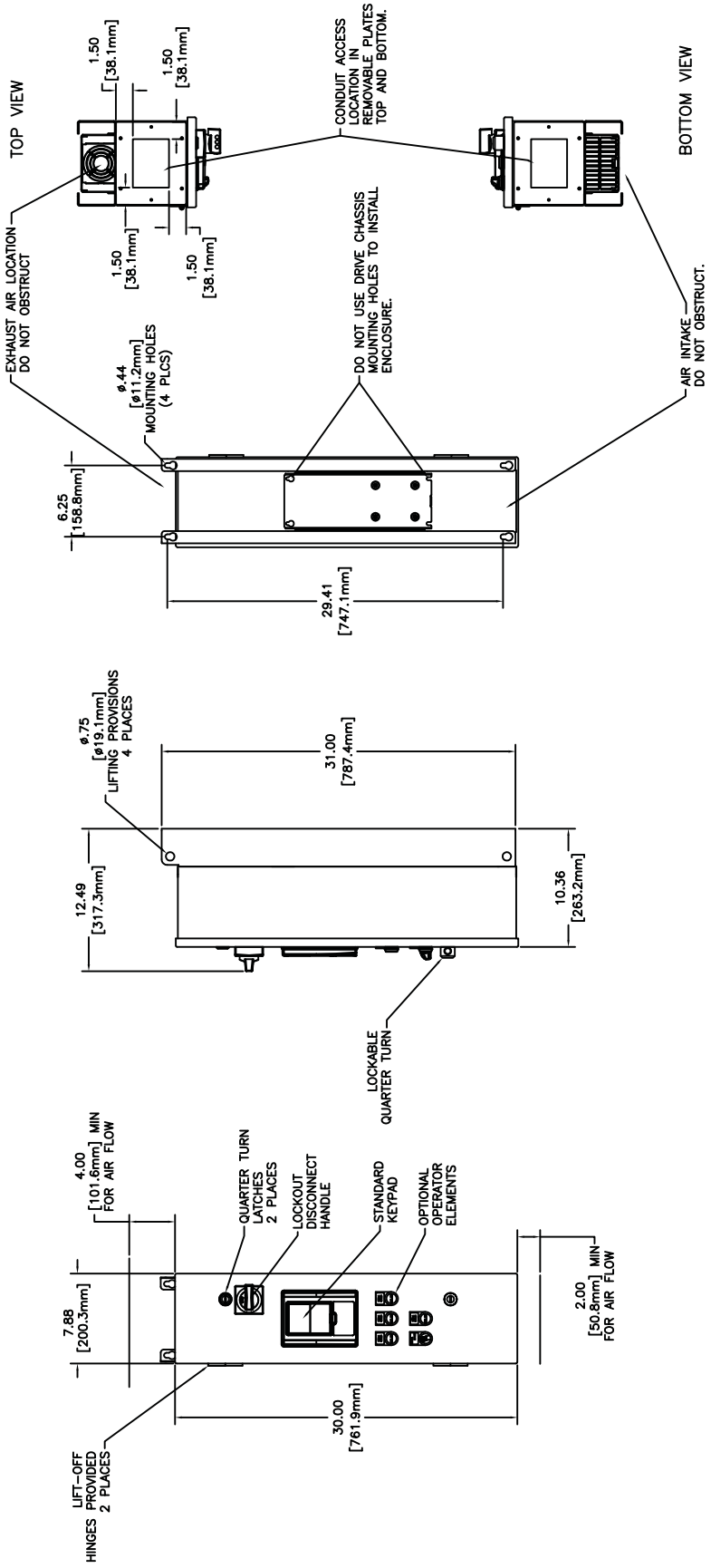
See option manual included with each PCB for more information also see H-Max Installation manual MN04008005E for more information on control wiring and control board layout and options PCBs.

Dimensions & Mounting

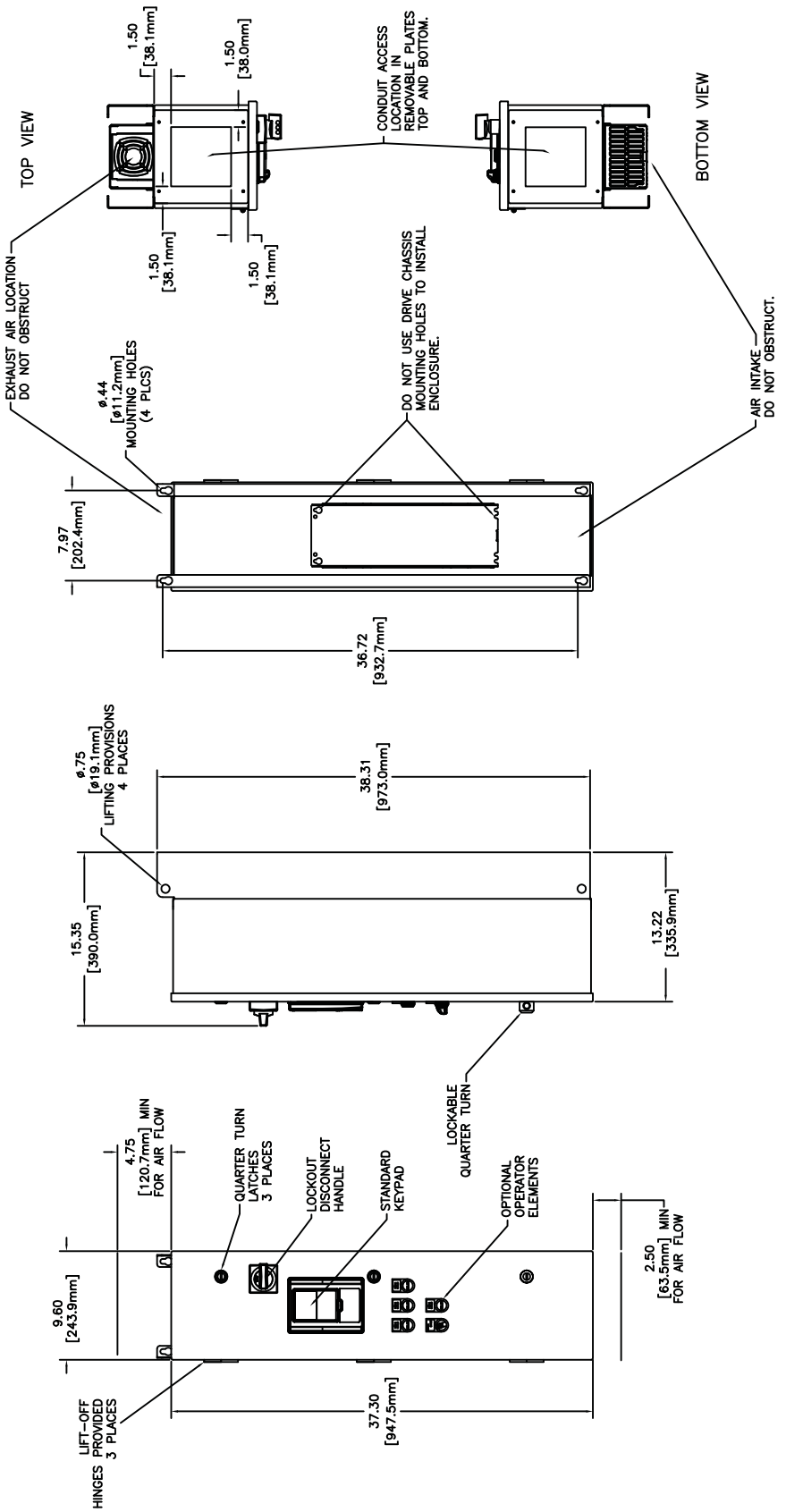
The IntelliPass/IntelliDisconnect physical dims are based on the Enclosure frame size. See Table to determine the enclosure frame size based on Hp and voltage.

- Weights and lifting provisions are on the dimension section and with the drawing provided with the unit
- Attach "load-rated" hooks or shackles to lifting eyes on back panel.
- Always maintain a maximum of 45 degrees between the lifting cables and the vertical plane.
- Do not pass ropes or cables through the lifting eyes as sharp edges may cause excessive wear and possible failure.
- Select or adjust rigging lengths to compensate for unequal weight distribution of the load to keep unit in the upright position.

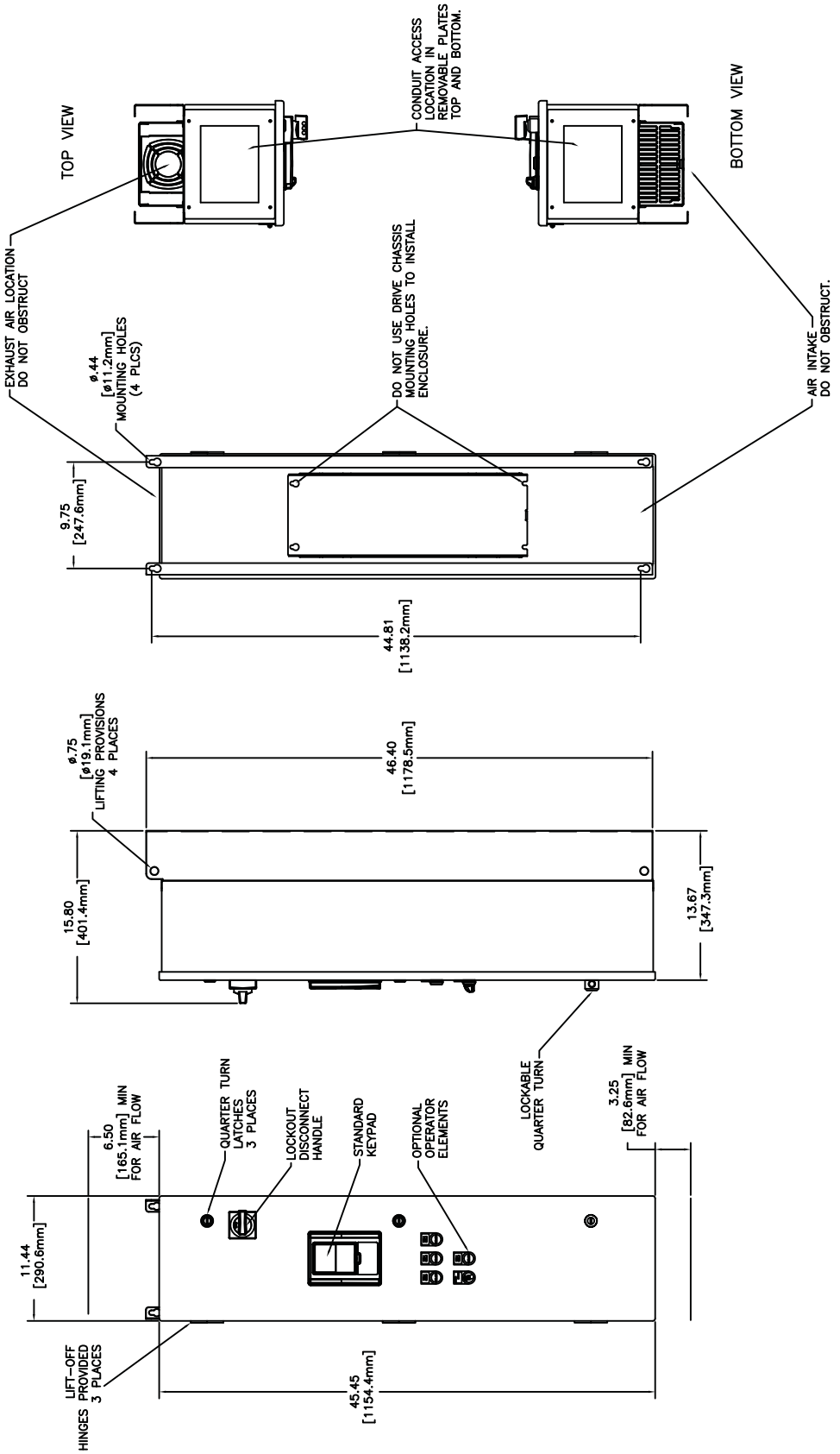
STANDARD ENCLOSURE SIZE 4 TYPE 1/12
DIMENSIONS & MOUNTING



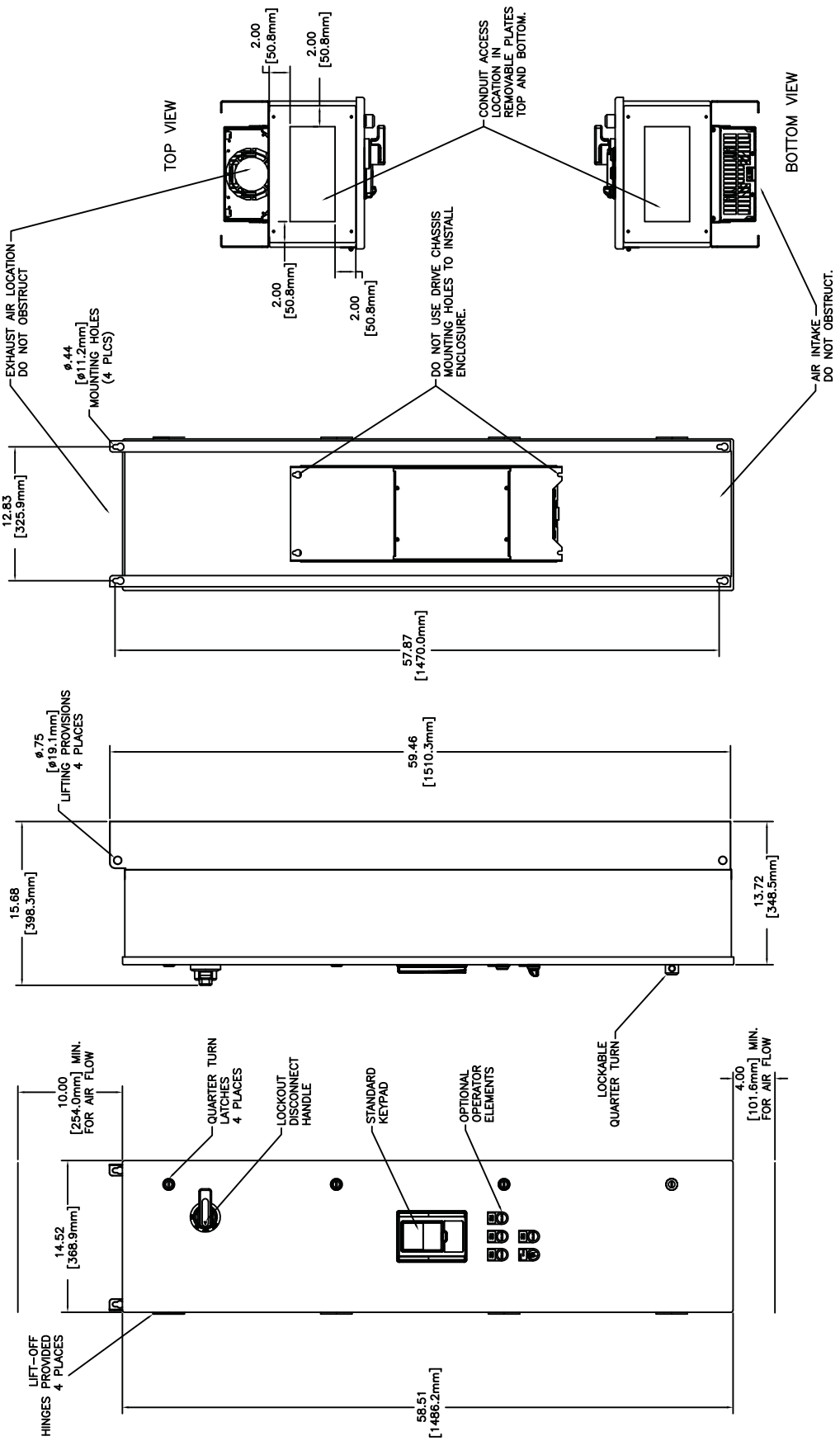
STANDARD ENCLOSURE SIZE 5 TYPE 1/12
DIMENSIONS & MOUNTING



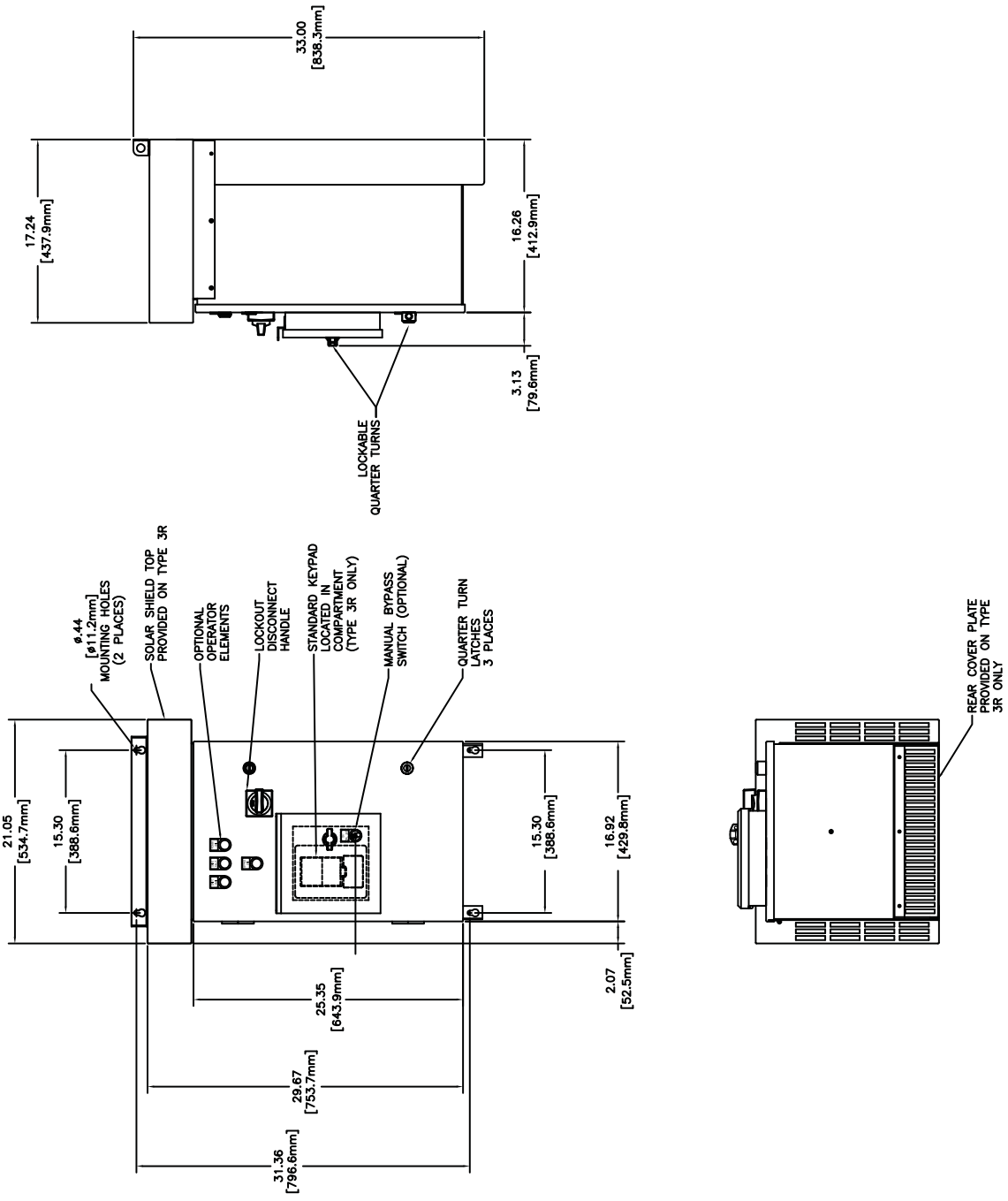
STANDARD ENCLOSURE SIZE 6 TYPE 1/12
DIMENSIONS & MOUNTING



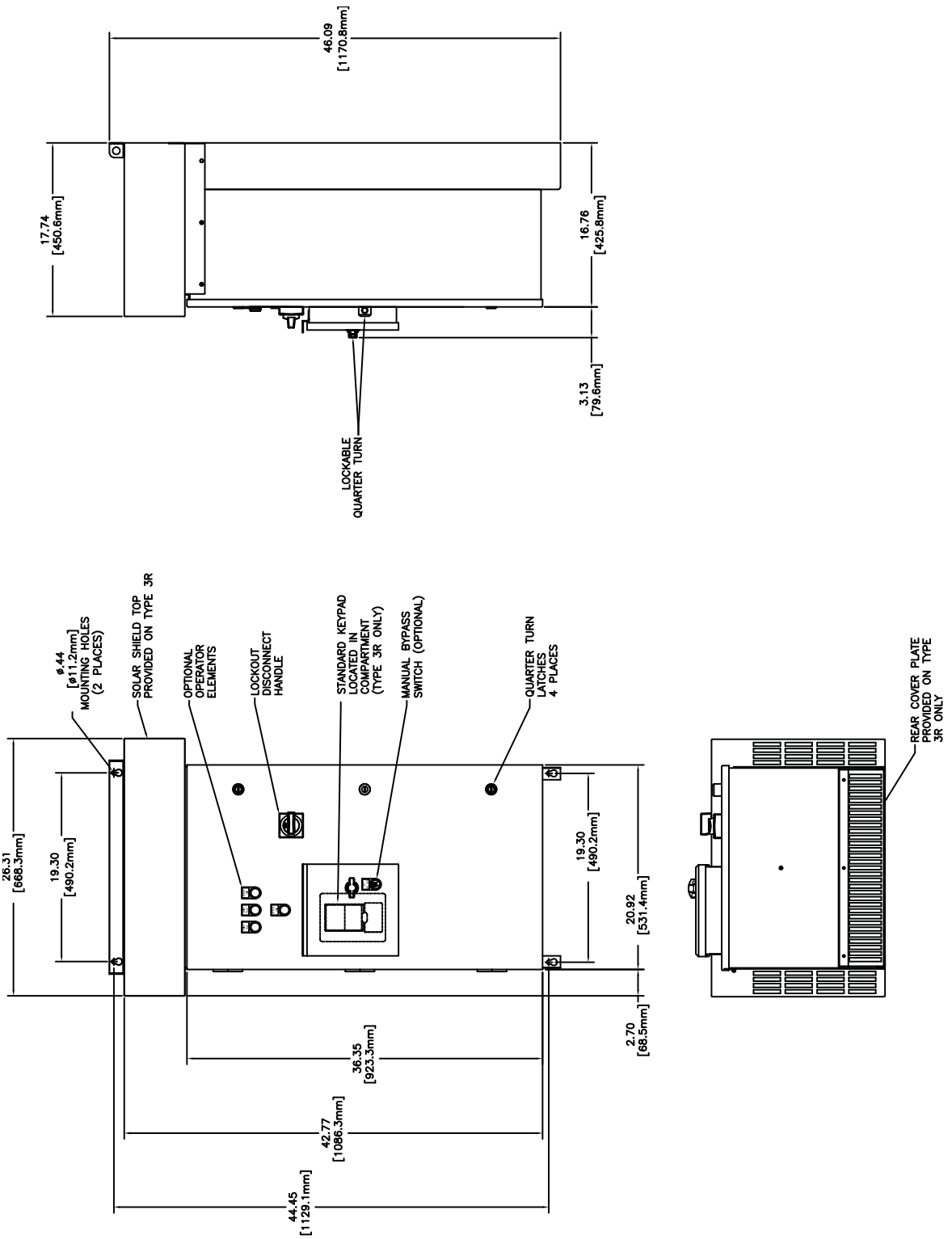
STANDARD ENCLOSURE SIZE 7 TYPE 1/12
DIMENSIONS & MOUNTING



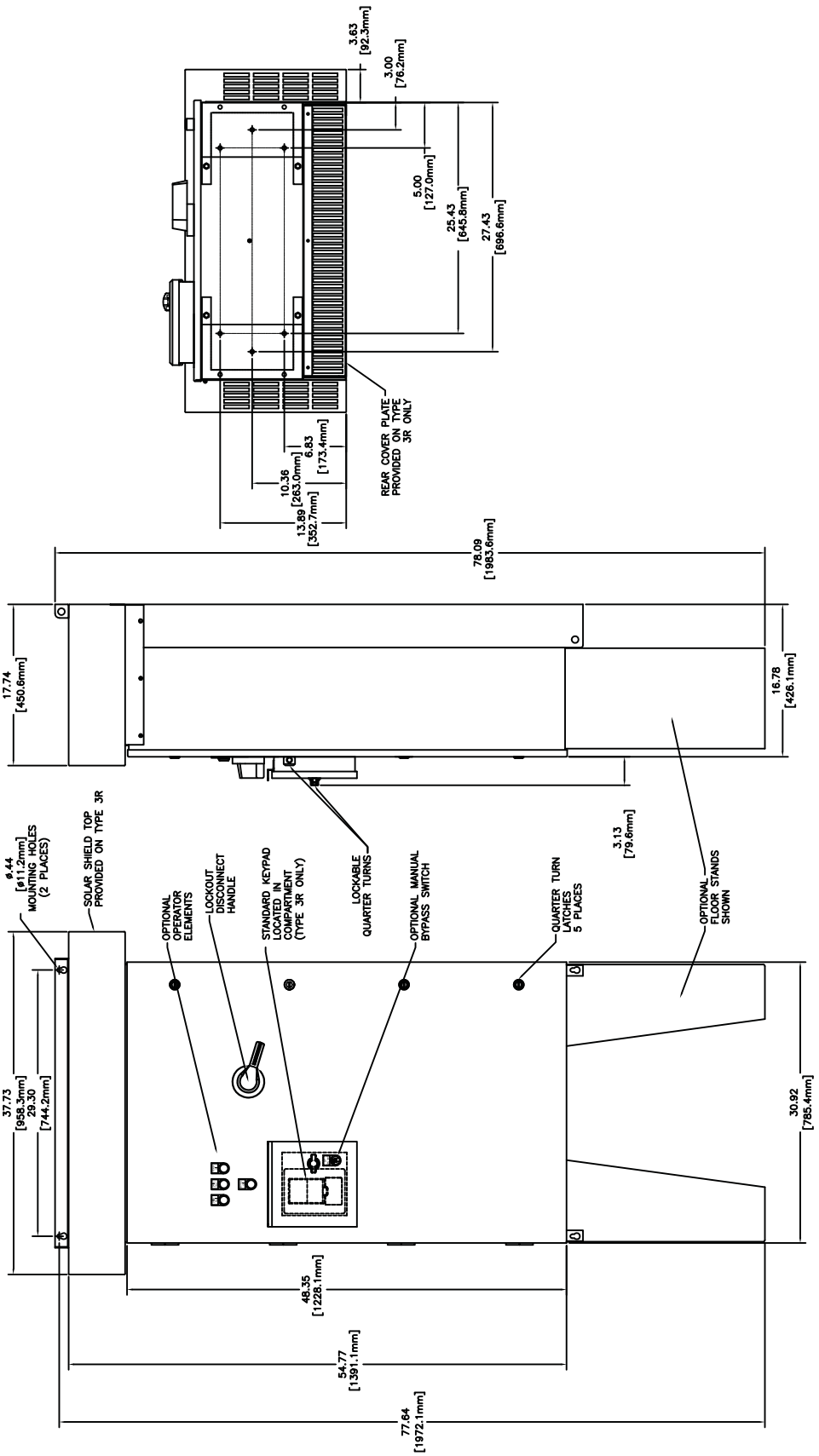
ENCLOSURE SIZE A TYPE 3R / OVERSIZE TYPE 1/12
DIMENSIONS & MOUNTING



ENCLOSURE SIZE B TYPE 3R / OVERSIZE TYPE 1/12
DIMENSIONS & MOUNTING



ENCLOSURE SIZE C TYPE 3R / OVERSIZE TYPE 1/12
DIMENSIONS & MOUNTING



Wiring

Schematic

A schematic is included with each product. The schematic number can be found on the product nameplate.

Typical schematics are shown on the next few pages.

NOTE:

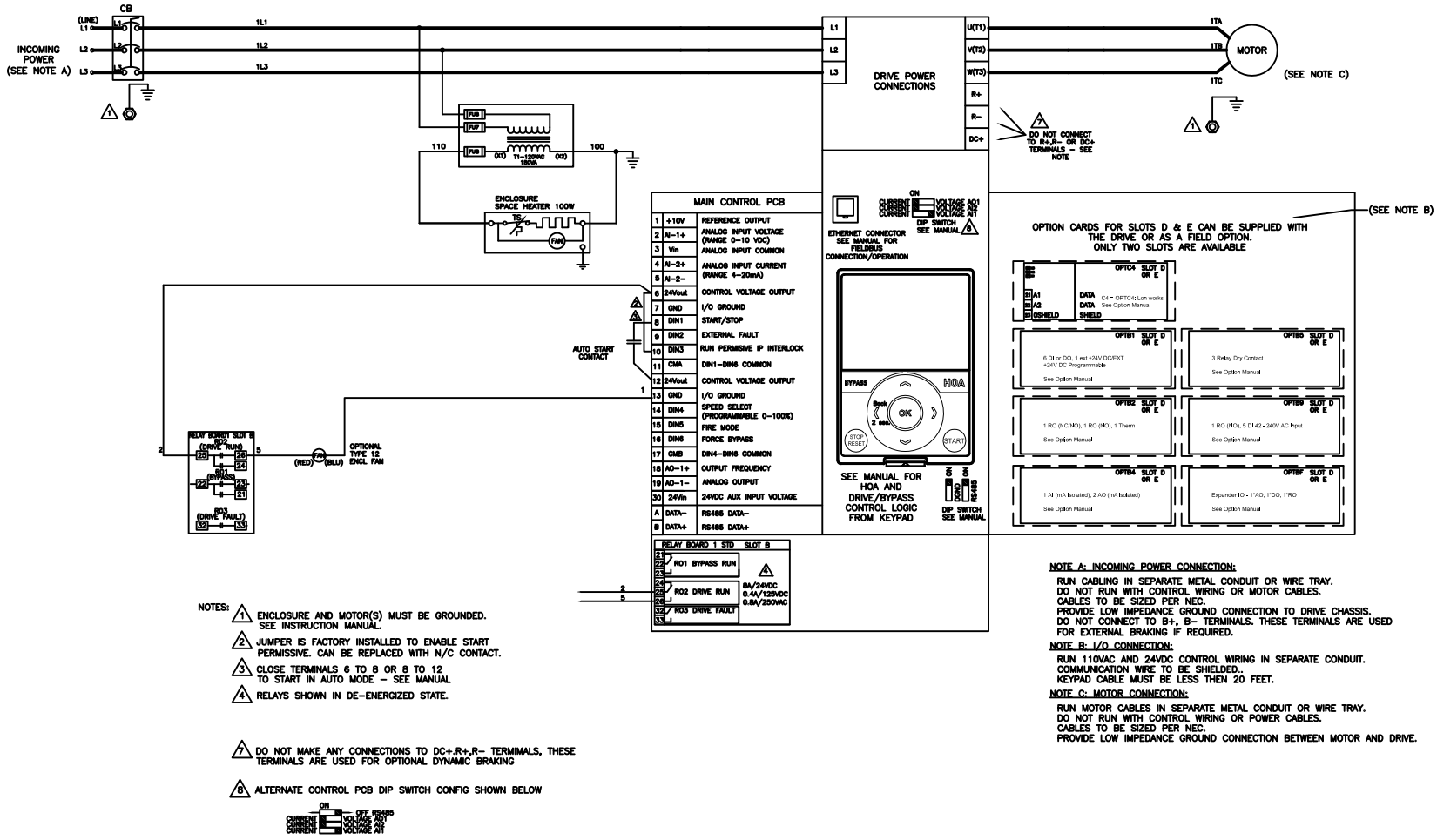
Power and Motor Leads must be in separate conduit.

Do not run control wires in same conduit as input power or motor wires

Two grounding points are provided, input ground and output ground

Ground unit properly – improper grounding could damage the unit

Intellidisconnect Standard - (SA option shown)



NOTES:

1. ENCLOSURE AND MOTOR(S) MUST BE GROUNDED. SEE INSTRUCTION MANUAL.
2. JUMPER IS FACTORY INSTALLED TO ENABLE START PERMISSIVE. CAN BE REPLACED WITH N/C CONTACT.
3. CLOSE TERMINALS 6 TO 8 OR 8 TO 12 TO START IN AUTO MODE − SEE MANUAL
4. RELAYS SHOWN IN DE−ENERGIZED STATE.

7. DO NOT MAKE ANY CONNECTIONS TO DC+,R+,R− TERMIMALS, THESE TERMINALS ARE USED FOR OPTIONAL DYNAMIC BRAKING

8. ALTERNATE CONTROL PCB DIP SWITCH CONFIG SHOWN BELOW

NOTE A: INCOMING POWER CONNECTION:

RUN CABLING IN SEPARATE METAL CONDUIT OR WIRE TRAY.
DO NOT RUN WITH CONTROL WIRING OR MOTOR CABLES.
CABLES TO BE SIZED PER NEC.
PROVIDE LOW IMPEDANCE GROUND CONNECTION TO DRIVE CHASSIS.
DO NOT CONNECT TO B+, B− TERMINALS. THESE TERMINALS ARE USED FOR EXTERNAL BRAKING IF REQUIRED.

NOTE B: I/O CONNECTION:

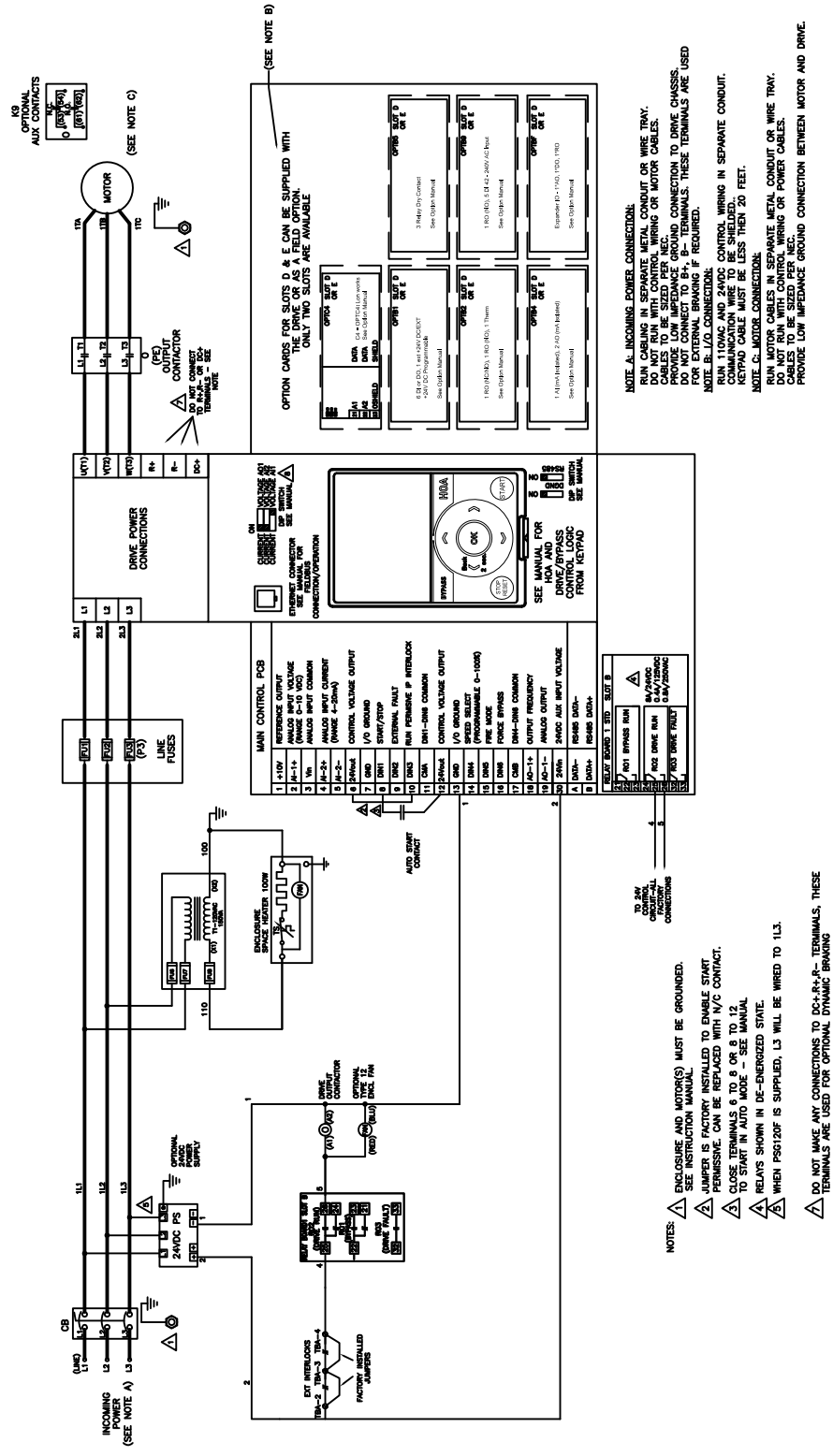
RUN 110VAC AND 24VDC CONTROL WIRING IN SEPARATE CONDUIT.
COMMUNICATION WIRE TO BE SHIELDED..
KEYPAD CABLE MUST BE LESS THEN 20 FEET.

NOTE C: MOTOR CONNECTION:

RUN MOTOR CABLES IN SEPARATE METAL CONDUIT OR WIRE TRAY.
DO NOT RUN WITH CONTROL WIRING OR POWER CABLES.
CABLES TO BE SIZED PER NEC.
PROVIDE LOW IMPEDANCE GROUND CONNECTION BETWEEN MOTOR AND DRIVE.

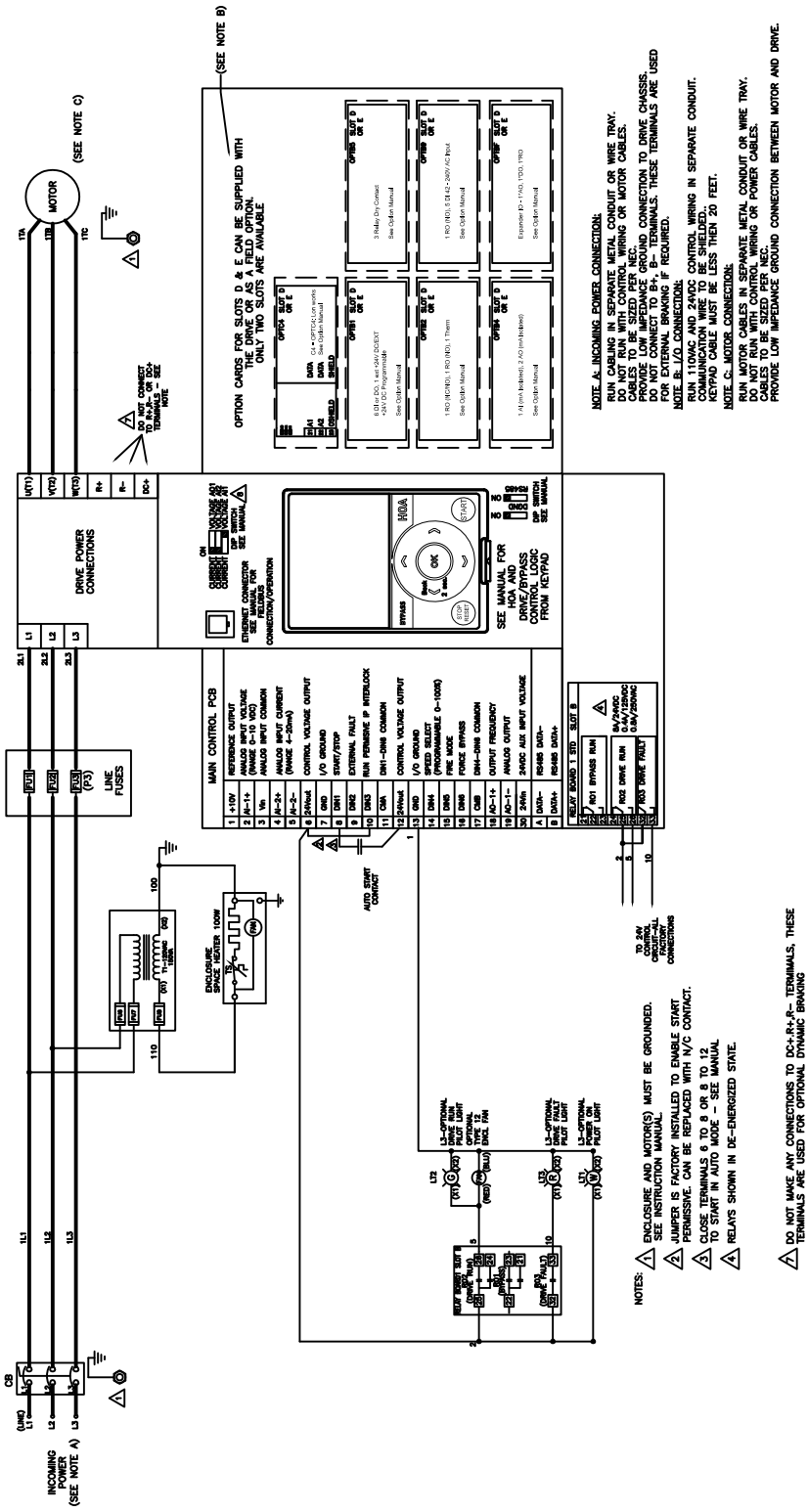
Dwg Ref: 285446-0009

Intellidisconnect with PE option Output Contactor and P3 option Isolation Fuses, (SA option shown)



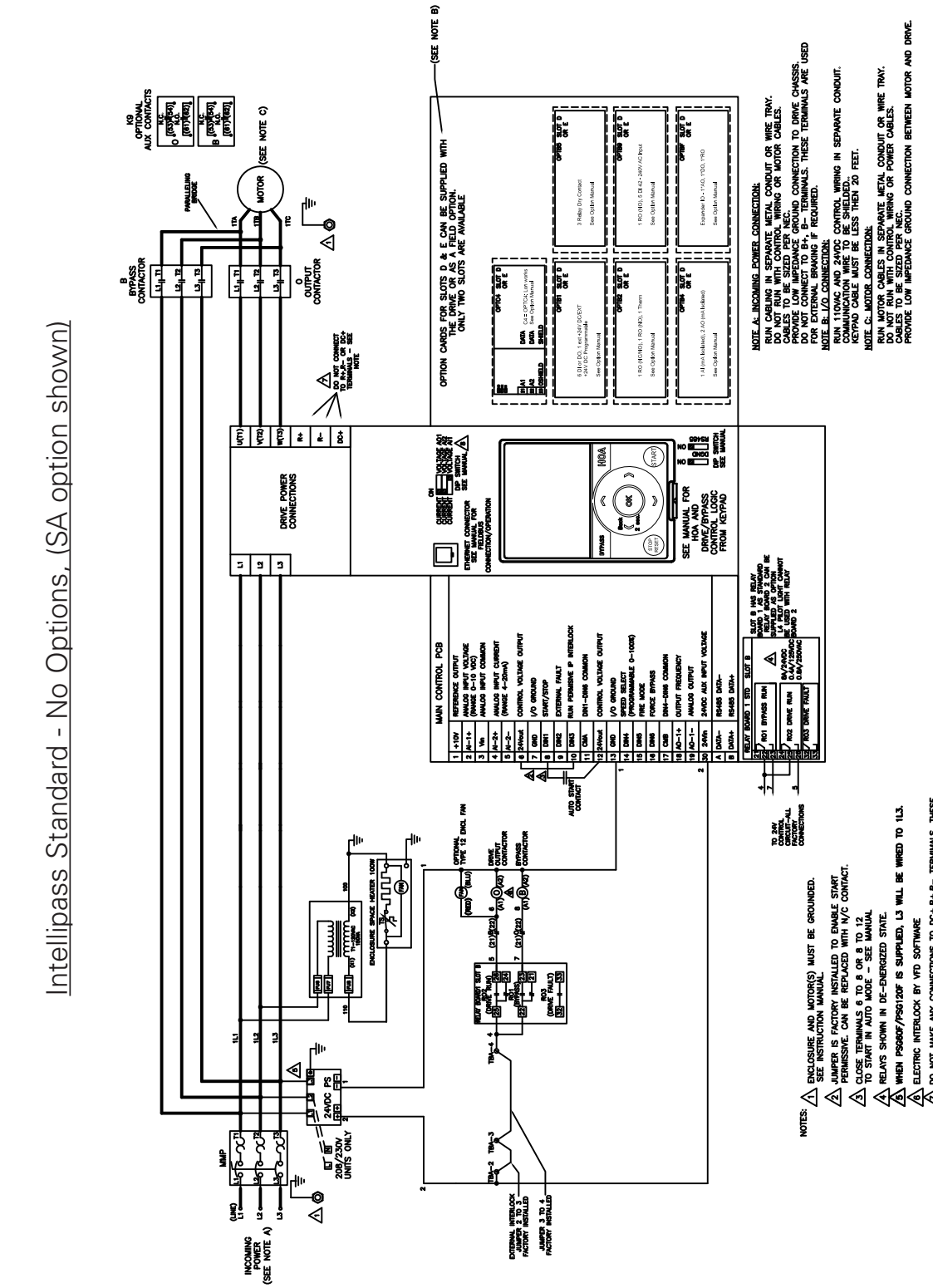
Dwg Ref: 285446-0015

Intellidisconnect with P3 option Isolation Fuses, (SA option shown)



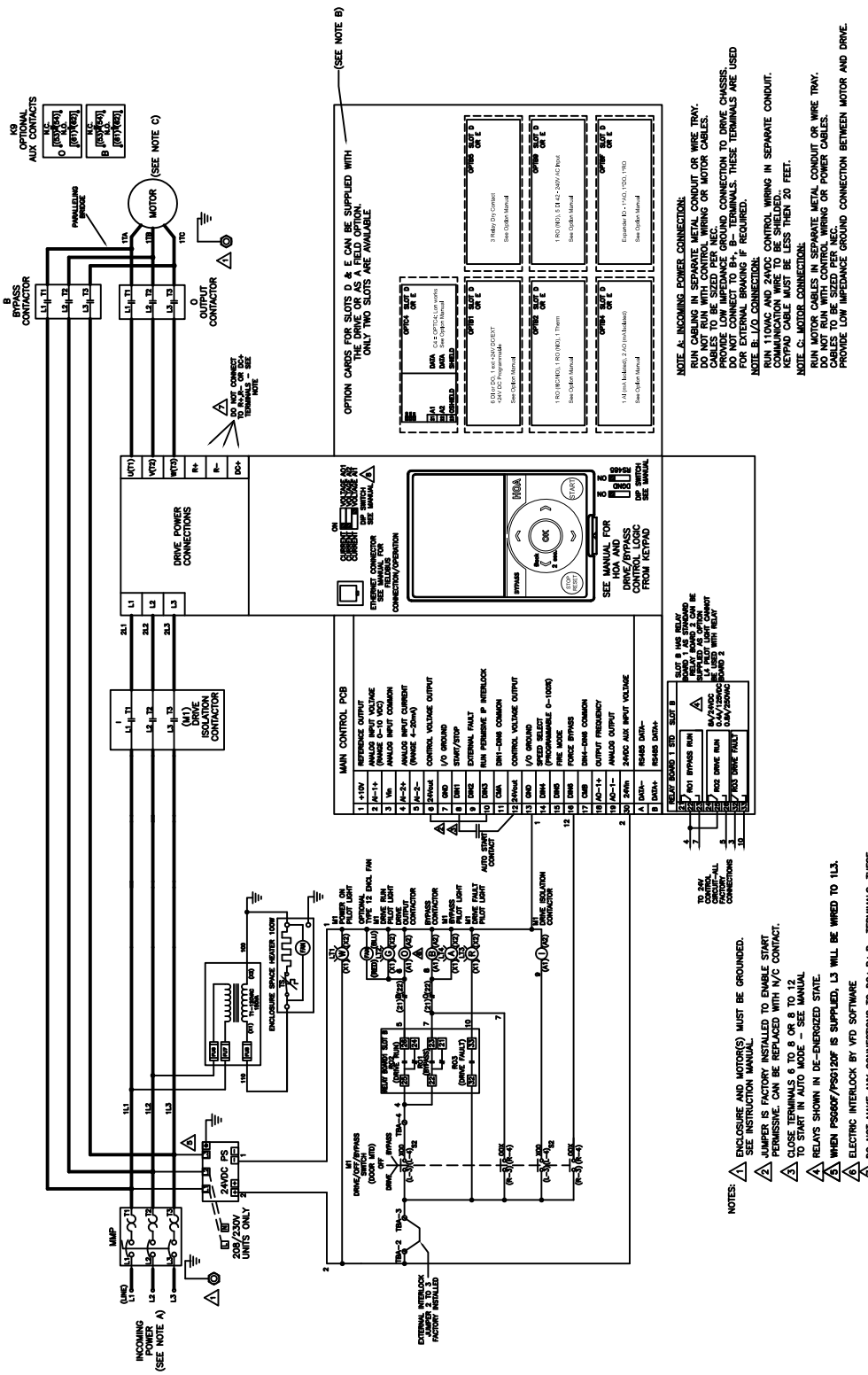
Dwg Ref: 2854446-0011

Intellipass Standard - No Options, (SA option shown)



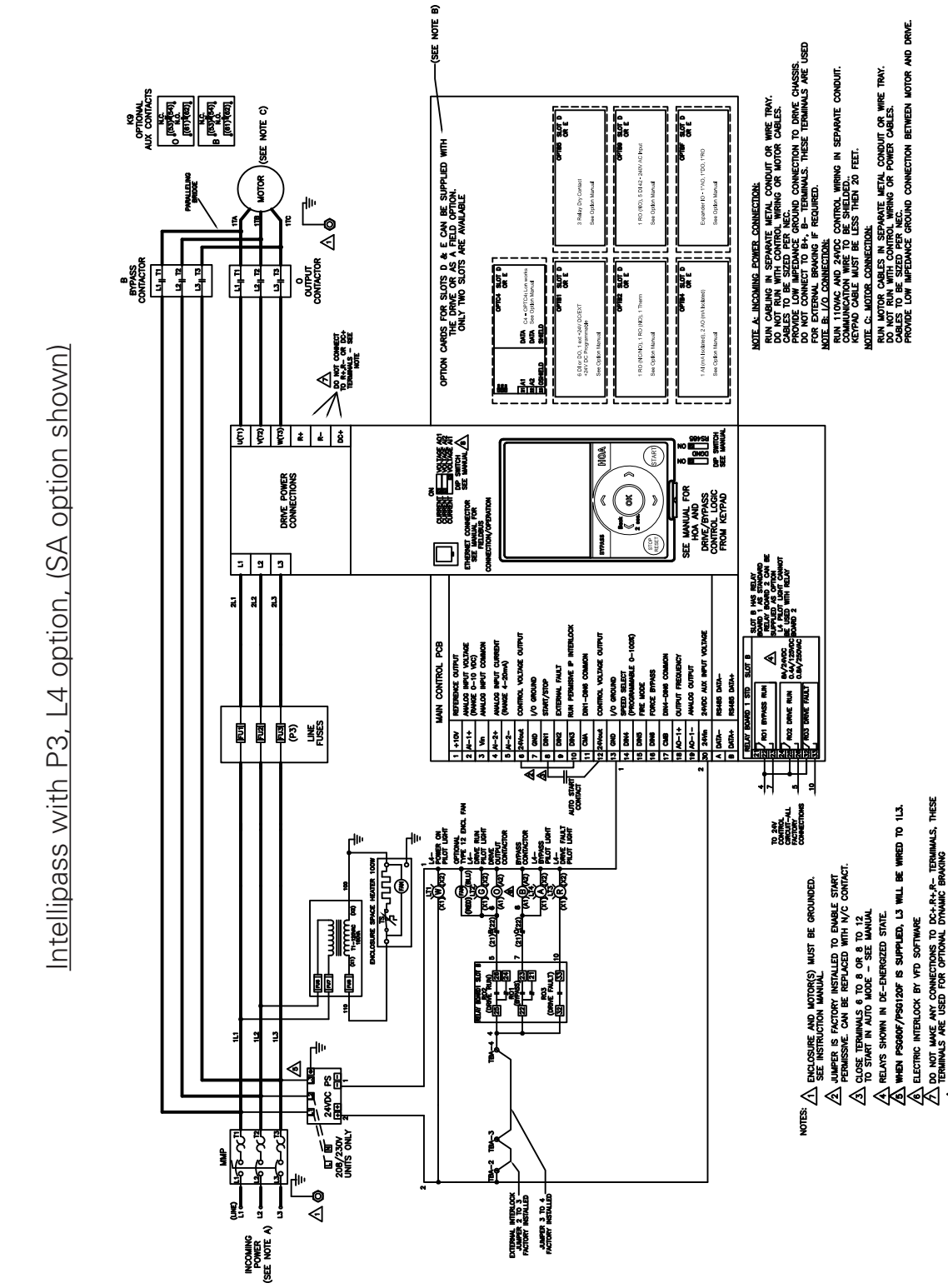
Dwg Ref: 285447-0010

Intellipass with M1 option Manual Bypass, (SA option shown)



Dwg Ref: 285447-0011

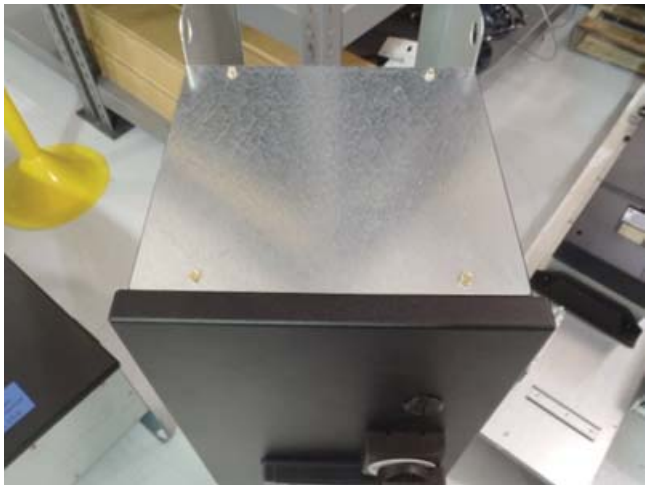
Intellipass with P3, L4 option, (SA option shown)



Dwg Ref: 285447-0014

Conduit plates

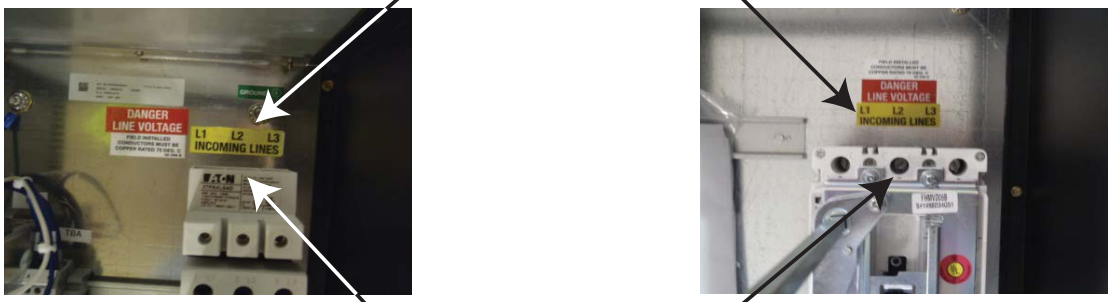
Enclosure Standard Sizes 4-7 have removable top and bottom conduit plates to make wiring and conduit connections easier. See Dimension and Mounting section for access areas.



Input Power wiring

Input power connection are made to the disconnect device. Input power connection points are identified by Label (L1, L2 and L3).

Typical Input Power Connection Point Labels



Connect Input Power Wires here

Both Intellidisconnect and Intellipass provide an input disconnect by using a UL Listed, Manual Self-protected Combination Motor Controllers (Type E), Model XTPR or a listed molded case circuit breaker, Models HFD sized as indicated in Input Wiring Table. Line Side Adapter (Eaton model XTPAXLSA or XTPAXLSAD) is also provided with the XTPR Type E devices.

These devices provide a disconnect function and the IntelliPass models branch protection/short circuit protection and Class 10 Motor overload protection while running in bypass. These devices are factory adjusted to the nameplate value of unit- See Input Wiring Table. If necessary adjust the dial for proper Motor FLA -see examples below.

If Necessary,
Set Motor FLA here
Value is Factory Set to Nameplate Value
See Input Wiring Table

If Necessary, Remove Operator Mechanism to Access Setting Dials to set Motor FLA
Value is Factory Set to Nameplate Value See Input Wiring Table

Input Wiring Details

Volts	Hp	Current	Eaton P/N Branch protection or Disconnect	FLA Adj Range	Instructions See Eaton.com	Eaton P/N LSA Adapter	Wire range	Torque lb-in	Torque N-m	Tool
208	1	4.6	XTPR6P3BC1	4-6.3	PUB51173 MN03402005e	XTPAXLSA				
	2	7.5	XTPR010BC1	6.3-11						
	3	10.6	XTPR012BC1	8-12						
230	1	4.2	XTPR6P3BC1	4-6.3						
	2	6.8	XTPR010BC1	6.3-11						0.8 x 5.5 1 x 6 mm (flat) Size 2 pozidriv
	3	9.6	XTPR012BC1	8-12			14-6	35	4	
480Y/277	1	2.1	XTPR2P5BC1	1.6-2.5						
	2	3.4	XTPR004BC1	2.5-4						
	3	4.8	XTPR6P3BC1	4-6.3						
	5	7.6	XTPR010BC1	6.3-11						
	7.5	11	XTPR012BC1	8-12						
208	5	16.7	XTPR025DC1	20-25	MN03402004e	XTPAXLSD				
	7.5	24.2	XTPR025DC1	20-25						
	10	30.8	XTPR032DC1	25-32						
230	5	15.2	XTPR016DC1	10-16						
	7.5	22	XTPR025DC1	16-25						
	10	28	XTPR032DC1	25-32						
480Y/277	10	14	XTPR016DC1	10-16						4mm Hexagon socket-head spanner
	15	21	XTPR025DC1	16-25			8-0	54	6	
	20	27	XTPR032DC1	25-32						
208	15	46.2	XTPR050DC1	40-50						
230	15	42	XTPR050DC1	40-50						
480Y/277	25	34	XTPR040DC1	32-40						
	30	40	XTPR050DC1	40-50						
	40	52	XTPR058DC1	50-58						

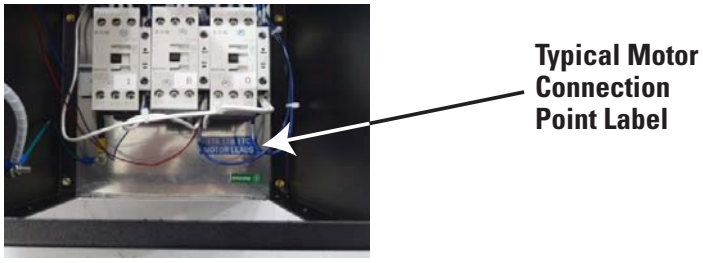
Volts	Hp	Current	Eaton P/N Branch protection or Disconnect	FLA Adj Range	Instructions See Eaton.com	Eaton P/N LSA Adapter	Wire range	Torque lb-in	Torque N-m	Tool
208	20	59.4	HFDMP3080JL	40-80	IL29C115C	N/A				
	25	74.8	HFDMP3080JL	40-81			14-10	35	4	
	30	88	HFDMP3100JL	80-100						
230	20	54	HFDMP3080JL	40-80						
	25	68	HFDMP3080JL	40-80			8	40	4.5	
	30	80	HFDMP3100JL	80-100						Slotted Head
	40	104	HFDMP3160JL	100-160			6-4	45	5.1	
480	50	65	HFDMP3080JL	40-80						
	60	77	HFDMP3080JL	40-80			3 - 4/0	50	5.6	
	75	96	HFDMP3100JL	80-100						

HFDMP FLA DIAL setting

HFDMP	A	B	C	D	E
80A	40	50	60	70	80
100A	80	*	90	*	100
160A	100	115	130	145	160

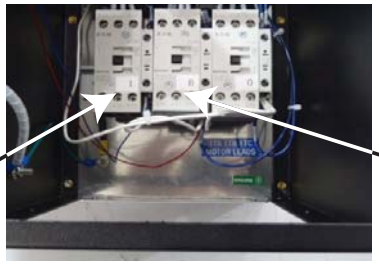
Motor Wiring

Motor connection points are identified by a label (1TA,1TB,1TC). See Output wiring table in technical section for wiring and torque information. Also see H-Max Installation manual MN04008005E for more details on connections to drive output terminals when an output contactor is not supplied.

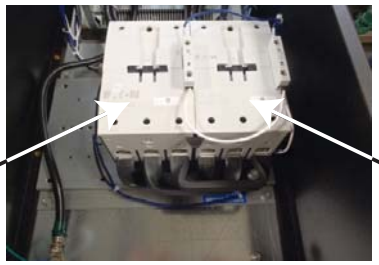


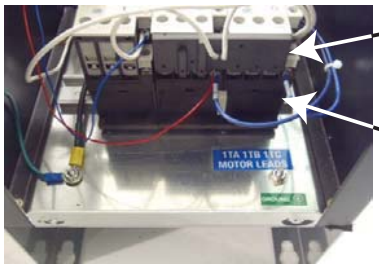
For IntelliPass models, wire the motor leads directly to the output contactor O. Motor connections are made directly to the bottom of the output contactor on the lower right side (see examples below)

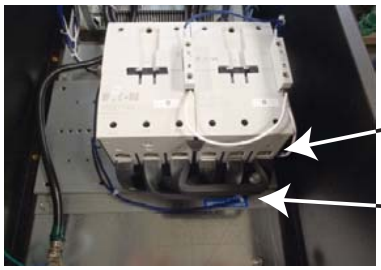
Typical IntelliPass with 3 Contactors



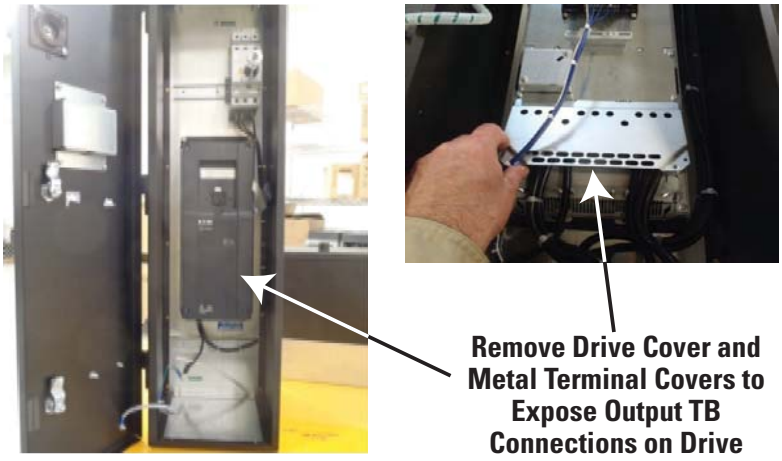
Typical IntelliPass with 2 Contactors

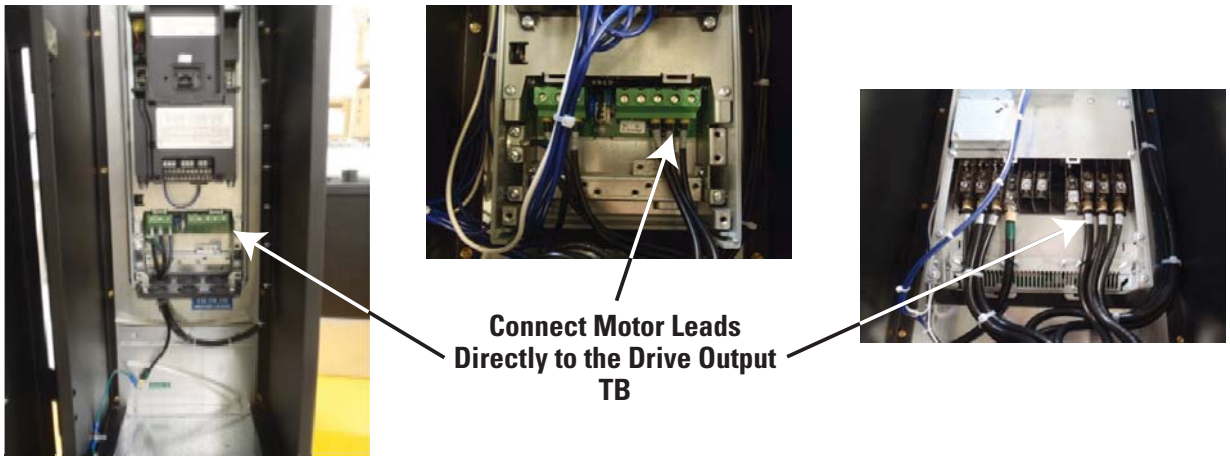






For IntelliDisconnect models, wire directly to the drive output terminals or to the output contactor if the PE option is supplied.





Output Wiring Details

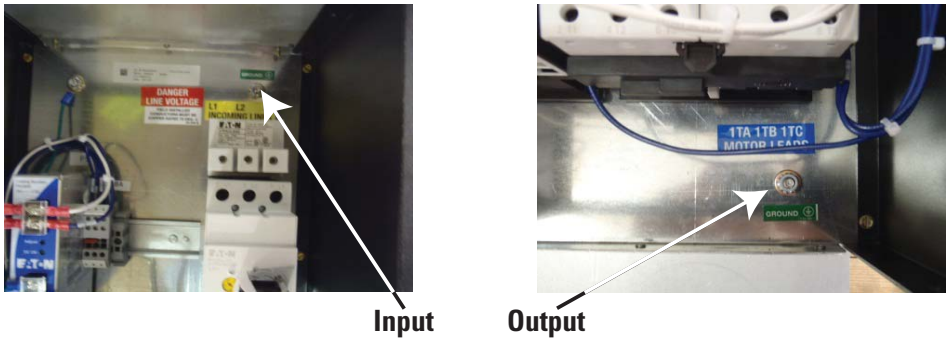
Horse Power Rating			Contactor's Current Rating(Amps) {AC-1}	Eaton Contactor P/N	Instructions See Eaton.com	Wire range see note	Torque		Tool
208 V	230 V	460 V					lb.-in	N-m	
1, 2, 3	1, 2, 3	1,2,3, 5, 7.5,	22	XTCE007B	pub51210 IL03407014Z	18-14 single/ double	11	1.2	0.8 x 5.5 1 x 6 mm (flat) Size 2 pozidriv
5, 7.5, 10	5, 7.5, 10	10, 15, 20	40	XTCE018C	pub51232 pub51211 IL03407014Z	14-8 single/ double	28	3.2	0.8 x 5.5 1 x 6 mm (flat) Size 2 pozidriv
15, 20	15, 20	25, 30,40	60	XTCE040D	pub51216 IL03407033Z	14-1 single 12-2 dual	29.2	3.3	0.8 x 5.5 1 x 6 mm (flat) Size 2 pozidriv
-	-	50	98	XTCE065D					
25, 30	25, 30	60	110	XTCE080F	pub51188 IL03407039Z	8-3/0 single 8- 2/0 double	124	14	5mm Hexagon socket-head
-	40	75	160	XTCE115G					

Note: For IntelliPass models two wires per terminal is not allowed because the factory installed paralleling bridge uses one connection point

Ground Wiring

Both input and output ground studs are provided and marked with label. Hardware is also supplied.

Typical Ground Stud and Labels



Frames 4 thru 6 have 10-32 studs on the back panel, and the supplied nut, flat washer and lock washer should be torqued to 30 lb-in

Frame 7 has 1/4-20 studs on the back panel, and the supplied nut, flat washer and lock washer should be torqued to 65 lb-in

Control Wiring

No additional control wiring is necessary for basic operation - see schematic for Auto Start contact, Auto reference connections and interlock connections to control PCB terminal block if required.

See H-Max Installation manual MN04008005E for more information on control wiring and control board layout and connections.

For ease of access the control terminals blocks can be unplugged for wiring.

All control I/O wiring must be segregated from line (mains) and motor cabling.

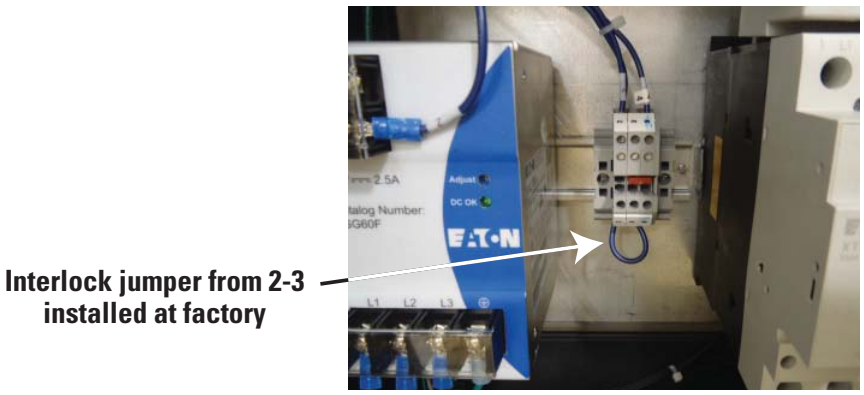
Run 120 Vac and +24 Vdc control I/O in separate conduit if applicable.

Control I/O terminals must be tightened to 4.5 lb (0.5 Nm).

In addition, the IntelliPass models provide an additional "External Interlock" input on TBA 2 & 3. This can be used to remove the 24V power from the contactors and door control elements. If is factory jumpered. If removed, it removes 24V power to the bypass and drive contactors. It does not disable the drive from running, only from being connected to a motor. Under some circumstances the drive/bypass could still be commanded to run but since the contactors are disabled, the motor will not run, however the drive keypad may indicate it is running. Refer to the schematic

This external interlock input is not supplied on the IntelliDisconnect models unless the output contactor with power supply option is supplied. Refer to the schematic.

Typical TBA Interlock

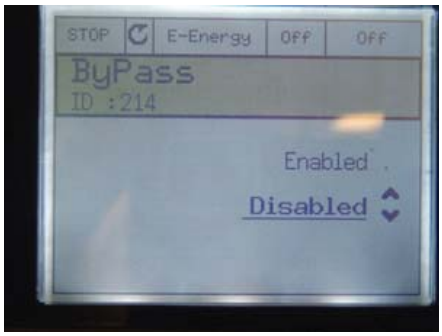


Initial Power up - IntelliPass and IntelliDisconnect

When the IntelliPass or IntelliDisconnect is first powered up, the startup wizard command should be displayed.

Follow the Quick Setup guide MN040008004E to set up Drive for your specific application with the following exceptions:

When the **Bypass screen appears** set it to "Enabled" for IntelliPass and "Disabled" for IntelliDisconnect Models



IntelliDisconnect Operation (starting/stopping of the motor)

IntelliDisconnect operation is the identical to a standard H-Max open Drive. The only difference is that an input disconnect is provided. For more information on Speed control and other Drive features see Application Manual MN04008006E. See option sections for more information on operation of IntelliDisconnect options i.e. Drive output contactor.

IntelliPass Operation (starting/stopping of the motor)

The IntelliPass operation is similar to the IntelliDisconnect but has the added feature of a built in Drive Bypass. This section gives basic information on operations for controlling the starting and stopping of the motor in both the Drive and Bypass modes. For more information on Speed control and other Drive features see Application Manual MN04008006E

The IntelliPass has 2 modes:

Drive mode (normal VFD operation),

Bypass mode (across the line).

The mode is selected via the Keypad. The actual starting and stopping of the motor is determined by the HOA selection and the Control Place selections. The Control place is defined as the location from where the Drive is started and stopped. The control place can be: Keypad start button, I/O contacts wired to the logic terminal blocks, Fieldbus control or PC. See Quick Start Guide MN04008005E or Application Manual MN04008006E for more information.

The only exception is if the M1 Manual Bypass option is supplied, this option can override the Drive logic and can start the motor in Bypass immediately.

Drive Mode

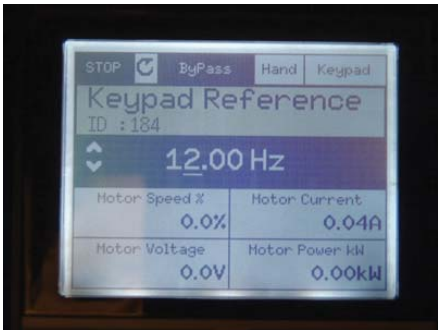
When the IntelliPass is in the Drive mode, the text "E-Energy" is shown on status bar. (If E-Energy function is not active the text "Ready" will be shown)

When the system is first commanded to run, the output contactor O is energized and the motor is connected to the Drive. The "O" contactor is controlled by the IntelliPass logic via Relay 2 output. The speed of the motor is determined by the speed set point of the H-Max Drive. When the H-Max is commanded to stop, the Drive will reduce the speed of the motor and when the motor speed reaches zero, the output contactor "O" is de-energized and the motor is disconnected from the IntelliPass. The output contactor also opens immediately if there is a Drive fault. (See Schematic)

The IntelliPass system is also interlocked. When the output contactor "O" is energized, the Bypass contactor "B" is prevented from being energized by electrical interlocks in each contactor coil control circuit and a logic interlock built in to the IntelliPass software. (See Schematic)

Bypass Mode

When the IntelliPass is in the Bypass mode, the text "Bypass" is shown on status bar.



When the system is commanded to run in the Bypass mode, the motor is connected to the line through the Bypass contactor (B). The B contactor is controlled by the Drive logic via a Relay 1 output.

The Bypass mode can be selected in 3 ways:

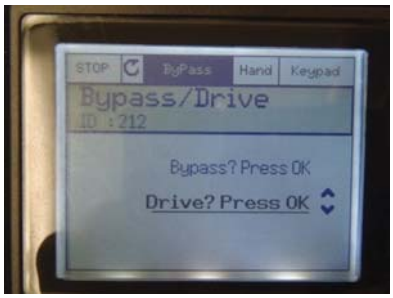
- Manually via the Drive logic controls (i.e. Keypad, Fieldbus or I/O).
- Automatically after a Drive fault - if the Auto Bypass feature is active.
- Manually by a door switch (Option) - Manually using the manual Bypass switch as part of the option M1.

Manual Bypass

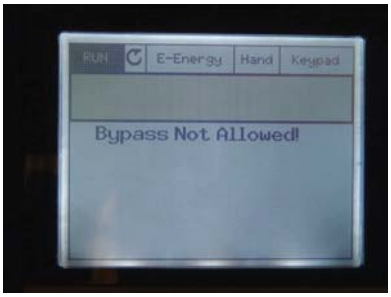
Manual Bypass can be activated either by using the Bypass button on the keypad, by using a digital input on the control TB or from the Fieldbus. The user can toggle between Bypass and Drive modes by pressing the keypad Bypass button or the TB inputs. Once in the Bypass mode, the start command can be given through any control place (I/O, Keypad, and Fieldbus) in the same manner as starting in the Drive mode.

Using the keypad to select Bypass Mode:

When the Bypass button is pressed, the following options are shown to the user. Select the desired mode by using the arrow keys and pressing the OK key.



The user can toggle between modes by pressing the Bypass button again. If Bypass button is pressed while the Drive is running, the keypads will display "Bypass is not allowed". The system must be stopped to allow a change from Drive to Bypass mode. Likewise if the system is running in Bypass and the Bypass key is pressed the display will indicated "Motor Running in Bypass" To change state back to Drive the system must be stopped. The keypad will display Bypass in the Status display when in the Bypass mode and Ready or E-Energy when in the Drive mode



Using the digital input to select Bypass Mode:

If the digital input (Force Bypass) is used to select the Bypass mode, the Drive is set to the Bypass mode the next time the unit is stopped. If the command is given while the unit is running in the Drive mode, there is no effect unit the stop command is given and the Drive reaches zero speed. Once the Drive stops, the Bypass mode is active and the keypad will display the Bypass mode. The Bypass and motor will start when a valid start command is received. Note that the Force Bypass function is the factory default for Digital Input #6 P2.3.6.2 located at TB16 on the control module and is also factory wired to the M1 Manual Bypass option if supplied.

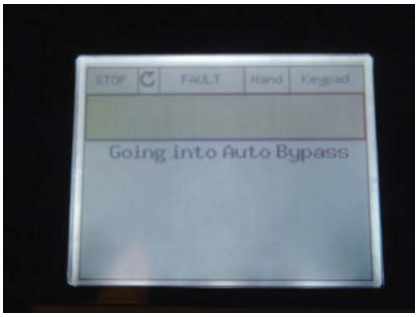
Using the Fieldbus to select Bypass Mode:

The Fieldbus command works the same as the digital input.

Auto Bypass operation

The Drive can also be Bypassed automatically if certain faults occur. When the selected fault occurs, the Drive is first stopped. Then, depending on the Automatic Reset parameter, the Drive is either Bypassed instantly or the fault is first tried to reset. If the reset fails, the motor is automatically started in Bypass.

When the Drive goes to Auto Bypass, the keypad displays "Going into AutoBypass" for 10 seconds. After the delay, the Drive goes to the Bypass mode and starts the motor (the run command must still be present).



When the fault condition is not active, the Drive is set back to Drive mode automatically and the Bypass running signal is reset. The Drive returns to the normal operation.

Automatic Reset selections

0 = Not used

1 =Auto Bypass (Visible only if Bypass is enabled)

2 = Reset faults

3 = Reset/Bypass (Visible only if Bypass is enabled)

Activate the Automatic Reset functions with this parameter.

For option 1, if the Drive faults, the Drive switches automatically to Bypass and leaves the fault active on the Drive. For option 3, the Drive will first try to auto reset the faults but if not successful, it will then switch to Bypass. Option 2 just tries to reset the fault without going into Bypass. See the application manual for more information on Auto reset operation.

Manual Bypass (forced) - M1 option

The IntelliPass also has a forced manual Bypass option. This is controlled by a door mounted Drive/Off /Bypass switch. The door switch will start the motor in Bypass immediately regardless of Drive logic or state. This switch manually overrides the system (keypad) and forces the unit into Bypass mode even if the Drive is in operative or removed from the system - See schematic and the factory wired option section for more information.

HOA Control- IntelliPass

The Keypad HOA button is used for fast and easy changing between Hand, Off and Auto control places the change the speed set point source. HOA Control works in both the Drive and Bypass modes of operation. However speed set point has no functions when in Bypass since the motor runs full speed across the line.

Control place is defined as the location from where the Drive or Bypass is started and stopped. Hand and Auto are two different control places.

There are four parameters for selecting a control source and reference source for them: P2.1.3 HOA Control Source, P2.1.4 Start Source Hand, P2.1.5 Speed Set point Hand, P2.1.6 Start Source Auto & P2.1.7 Speed Set point Auto. The Start Source selections are: Keypad, I/O Terminal, I/O 3-wire & Fieldbus Ctrl. For the Drive mode, the Speed set point the selections are: Keypad Ref, Fieldbus, AI1, AI2, AI1+AI2, & PID1 (if PID is activated). See Quick Start Guide MN04008005E or Application Manual MN04008006E for more information.

When control place Off is selected, the Drive cannot be started anywhere. It prohibits the start command for both Drive and Bypass. If the M1 option is supplied, the Bypass may force started in the HOA off mode by using the Door switch.

Key Parameters related to proper IntelliPass Bypass operation

The following parameters are related to Bypass functionality and are factory default set. Changing them will affect proper IntelliPass operation.

P2.1.2 Bypass: This parameter is for activating the Bypass functionality. It is factory enabled. If disabled the Bypass keypad button is inactive and some parameters may be hidden. This is part of the Start-up wizard

P2.3.2.2.1 (RO1 Function) set to Bypass Run. This signal is active if the Bypass mode has been selected and the run command is active - this relay output controls the Bypass contactor it should not be changed.

P2.3.2.2.5 (RO2 Function) set to Run. This signal is active if the Drive mode has been selected and the run command is active - this relay output controls the output contactor if should not be changed

P (DI2 Function) - (DI6 Function): set to Force Bypass.

If Force Bypass option has been selected for digital input and the input is activated, the Drive goes to Bypass the next time it is started. If the M1 option is supplied, this input should not be changed.

IntelliPass/IntelliDisconnect Technical information

See H-Max Installation manual MN04008005E for additional data

Enclosure: Type 1 or Type 3R as ordered

Max Ambient Temp: 40° C

Wire temperature rating of field installed conductors: Use 75° C copper conductors only

IntelliPass" Short Circuit Rating

Frame	Voltage	Available current
4-6	240 Vac, 480Y/277 Vac	65,000 A
7	480 Vac	65,000 A

Intellidisconnect" Short Circuit Rating

Frame	Voltage	Available current	Breaker/Disconnect
4-6	240 Vac, 480Y/277 Vac	65,000 A	MMP
7	480 Vac	65,000 A	HFDMP

Eaton Corporation
Electrical Sector
1111 Superior Ave.
Cleveland, OH 44114
United States
877-ETN-CARE (877-386-2273)
Eaton.com

© 2012 Eaton Corporation
All Rights Reserved
Publication No. IL04008003E / 004
April 2013

All trademarks are property of their respective owners.

Powering Business Worldwide