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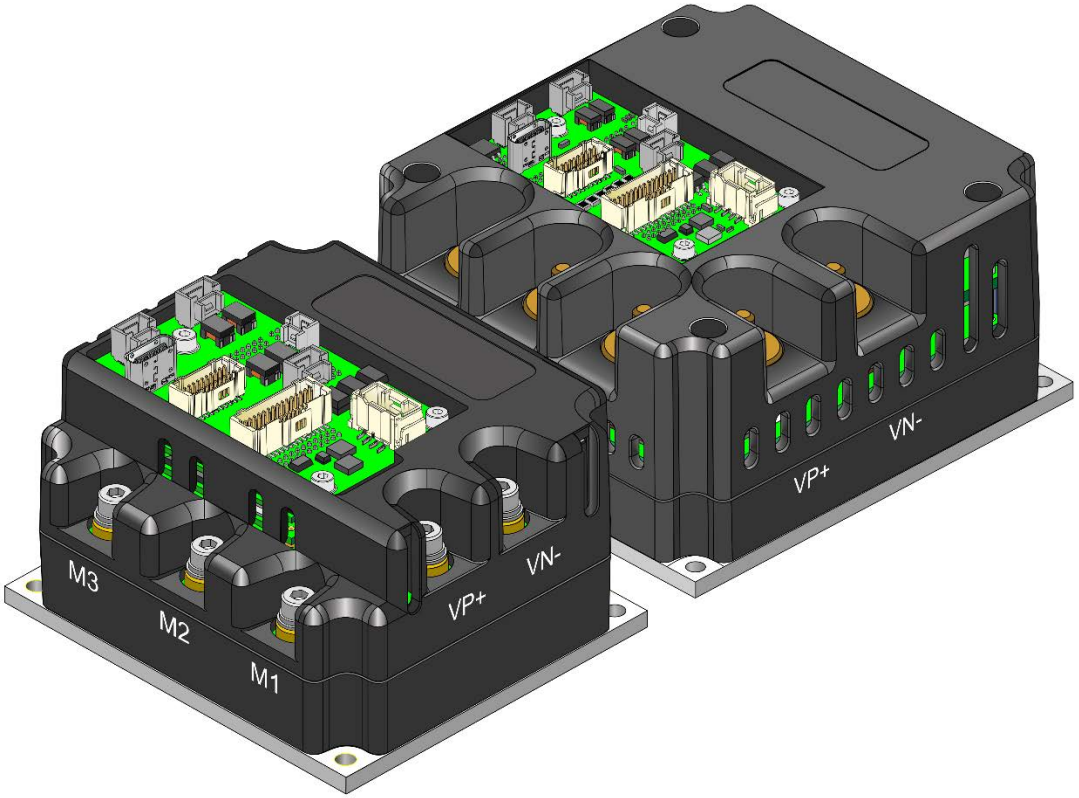
Platinum Jori Digital Servo Drive Installation Guide

Functional Safety

Safety Capability F, S, O

EtherCAT and CAN



September 2025 (Ver. 1.004)

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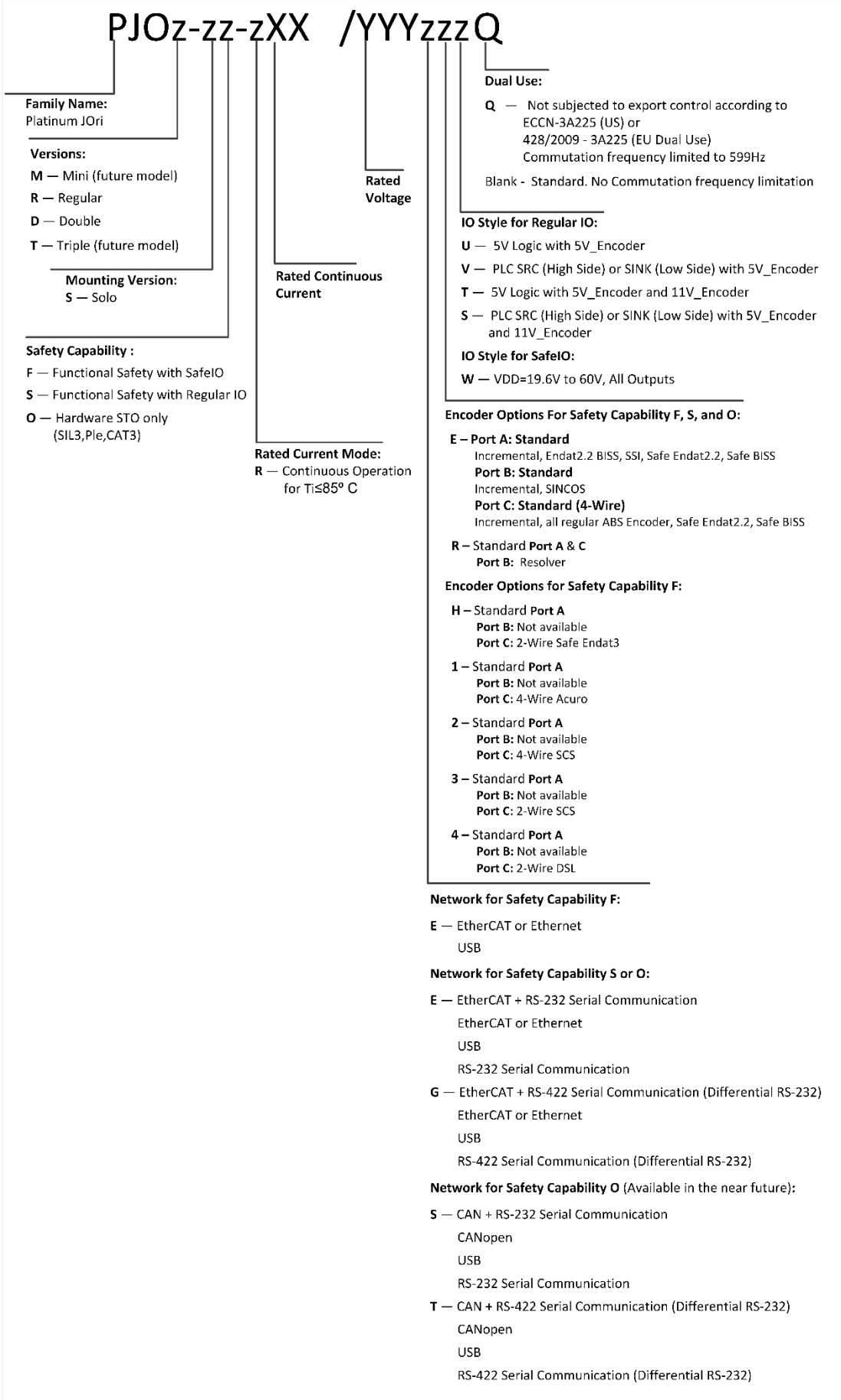

Revision History

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Ver. 1.001	Mar 2024	Minor correction
Ver. 1.002	June 2024	Updated drawing labels and some drawings Updated table in section 5.5.5 Digital Output
Ver. 1.003	Dec 2024	New Part Number. Updates to VDC, recommended VDD, and dimensions: Chapter 4, 5.1, 5.3, 5.5.5, 10.1, and 10.2
Ver. 1.004	Sept 2025	New Part Number. Added CANopen option. Throughout document: updated drawings 5.1: Updated weight 5.3: Updated details in table 5.4: Updated details in table 5.5.2: Updated details in table 5.5.4: Added IN5 and IN6 5.5.5: Updated details in the table 7.1: Added CAN and RS422/232 7.2: Added CAN and RS422/232 7.3: Added X4 mating connector details 7.13 New section for CANopen Connector and pinouts 7.14: New section for RS422/232 Connector and pinouts 8.2: Updated both ECAT connection diagrams and added CAN connections diagram 8.4.2: Updated Nm in step 3. 8.6.3: Added Important Note and updated diagram 8.10.3: New section for CAN Communications 8.10.4: New section for RS422/232 Communications 10: Updated Dimensions drawings 11: Added cable kit P/N to second table

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Chapter 1: This Installation Guide

This installation Guide details the technical data, pinouts, and power connectivity of the Platinum Jori.

For a comprehensive specification and detailed description of the functions, refer to the Platinum Safety Drive**.**

Chapter 2: Functional Safety

The Platinum family of servo drives support Functional Safety. It is necessary to implement the instructions in the Platinum Safety Manual (Platinum Safety Drive Manual**) regarding using STO, Feedback, IOs and Power supplies with Functional Safety.**

Chapter 3: Safety Information

In order to achieve the optimum, safe operation of the Platinum Jori, it is imperative that you implement the safety procedures included in this installation guide. This information is provided to protect you and to keep your work area safe when operating the Platinum Jori and accompanying equipment.

Please read this chapter carefully before you begin the installation process.

Before you start, ensure that all system components are connected to earth ground. Electrical safety is provided through a low-resistance earth connection.

Only qualified personnel may install, adjust, maintain and repair the servo drive. A qualified person has the knowledge and authorization to perform tasks such as transporting, assembling, installing, commissioning and operating motors.

The Platinum Jori contains electrostatic-sensitive components that can be damaged if handled incorrectly. To prevent any electrostatic damage, avoid contact with highly insulating materials, such as plastic film and synthetic fabrics. Place the product on a conductive surface and ground yourself in order to discharge any possible static electricity build-up.

To avoid any potential hazards that may cause severe personal injury or damage to the product during operation, keep all covers and cabinet doors shut.

The following safety symbols are used in this and all Elmo Motion Control manuals:

Warning:
This information is needed to avoid a safety hazard, which might cause bodily injury or death as a result of incorrect operation.

Hot Surface Warning:
To alert against surfaces that may reach high temperatures. The heatsink and wires may reach high temperatures.

Caution:
This information is necessary to prevent bodily injury, damage to the product or to other equipment.

Important:
Identifies information that is critical for successful application and understanding of the product.

The following symbols are used in this document:

Note: Information critical to the understanding and\or operating the feature.

Tip: Information that helps understanding a feature, is good practice or a possible different way of action.

3.1 Warnings

- To avoid electric arcing and hazards to personnel and electrical contacts, never connect/disconnect the servo drive while the power source is on.
- Power cables can carry a high voltage, even when the motor is not in motion. Disconnect the Platinum Jori from all voltage sources before servicing.
- The high voltage products within the Platinum Line range contain grounding conduits for electric current protection. Any disruption to these conduits may cause the instrument to become hot (live) and dangerous.

Capacitance Discharge
After shutting off the power and removing the power source from your equipment, wait at least [TBD] seconds before touching or disconnecting parts of the equipment that are normally loaded with electrical charges (such as capacitors or contacts). Measuring the electrical contact points with a meter, before touching the equipment, is recommended.

3.2 Cautions

- The maximum DC power supply connected to the instrument must comply with the parameters outlined in this guide.
- When connecting the Platinum Jori to an approved control supply, connect it through a line that is separated from hazardous live voltages using reinforced or double insulation in accordance with approved safety standards.
- Before switching on the Platinum Jori, verify that all safety precautions have been observed and that the installation procedures in this manual have been followed.
- Make sure that the Safe Torque Off is operational.

3.3 CE Marking Conformance

The Platinum Jori is intended for incorporation in a machine or end product. The actual end product must comply with all safety aspects of the relevant requirements of the European Safety of Machinery Directive 2006/42/EC as amended, and with those of the most recent versions of standards EN 60204-1 and EN ISO 12100 at the least, and in accordance with 2006/95/EC.

Concerning electrical equipment designed for use within certain voltage limits, the Platinum Jori meets the provisions outlined in 2006/95/EC. The party responsible for ensuring that the equipment meets the limits required by EMC regulations is the manufacturer of the end product.

3.4 Warranty Information

The products covered in this manual are warranted to be free of defects in material and workmanship and conform to the specifications stated either within this document or in the product catalog description. All Elmo drives are warranted for a period of 12 months from the date of shipment. No other warranties expressed or implied — and including a warranty of merchantability and fitness for a particular purpose — extend beyond this warranty.

Chapter 4: Product Description

The Platinum Jori is a “ready to use”, advanced Silicon Carbide MOSFET high power density, highly intelligent servo drive operating at ultra-high efficiency >99% for high voltage operation and for high PWM switching frequencies, delivering up to **40.0 kW power** in an compact package; 224.0 cm^3 (13.67 in^3) for the PJOR and 383.7 cm^3 (23.41 in^3) for the PJOD (refer to the table in section 5.1 for details). The servo-drive uses Elmo’s proprietary Power Conversion Technology driving the SIC (Silicon Carbide) Power MOSFET's.

Cable kits are available for easy and fast operation of the Platinum Jori. See Chapter 11: for details.

The Platinum Jori is provided in two power models, PJOR and PJOD.

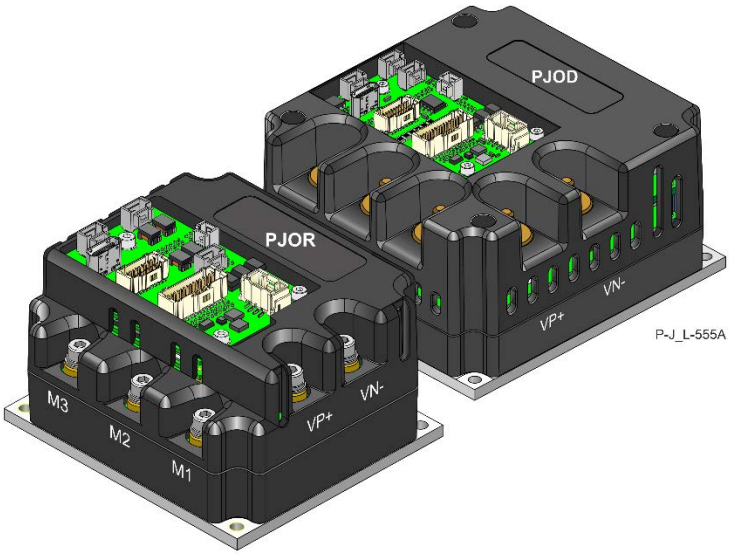


Figure 1: The Platinum Jori models PJOR and PJOD

Both models provide top performance, advanced networking and built-in certified safety, as well as a fully featured motion controller and local intelligence.

The Power to the drives is provided by a DC power source (not included with the Platinum Jori). The power stage is fully isolated from the control stage, and therefore the DC rectifier can be fed directly from the mains. A 24 VDC control power supply is required as the Platinum Jori does not operate without one. This 24 VDC control power supply also serves as backup functionality.

Note: The 24 VDC control power supply must operate from an isolated voltage source within the range of 22 to 52 VDC.

The drive can operate as a stand-alone device or as part of a multi-axis system in a distributed configuration on a real-time network.

The Platinum Jori drive is easily set up and tuned using the Elmo Application Studio (EASII) software tools. As part of the Platinum product line, it is fully programmable with the Elmo motion control language. For more information about software tools refer to the Elmo Application Studio (EASII) User Guide.

The Platinum Jori is available in a variety of models. There are different communications options, a number of feedback options and different I/O configuration possibilities.

Chapter 5: Technical Information

5.1 Physical Specifications

Feature	Units	All Types
Weight for PJOR version	g (oz)	~205 g (7.23 oz)
Weight for PJOD version	g (oz)	[TBD]
Dimensions for PJOR version	mm (in)	65.5 x 75.5 x 45.3 mm (2.76” x 2.97” x 1.78”)
Dimensions for PJOD version	mm (in)	85.4 x 90.4 x 49.7 mm (3.36” x 3.56” x 1.95”)
Mounting method		Solo mount
Degrees of Protection		IP00

Table 1: Physical Specifications

5.2 Technical Data

Feature	Units	R30/800 (PJOR)	R60/800 (PJOD)
Minimum supply voltage	VDC	50	
Nominal supply voltage	VDC	560 (when rectified from 3 x 400 VAC) 680 (when rectified from 3 x 480 VAC)	
Maximum supply voltage	VDC	780	
Maximum continuous Electrical power output	kW	20	40
Efficiency at rated power (at nominal conditions)	%	> 99	
Maximum output voltage		Up to 96% of DC bus voltage	
Amplitude sinusoidal continuous current	A	30	60
3-Phase Sinusoidal continuous RMS current limit (Ic)	A	21.2	42.4

Table 2: Technical Data

5.3 Control Supply

Feature		Unit	Details
Recommended Input Voltage Range		VDC	22 to 52
*Absolute Maximum Input Voltage		VDC	60
24V Control supply input power consumption	Without Encoder (VL Only)	W	4W for PJOR and xxW for PJOD
	With encoder up to 400mA@5V	W	7.5W for PJOR and xxW for PJOD
	With encoder up to 300mA@11V	W	8W for PJOR and xxW for PJOD

Table 3: Control Supply

Note: *If used outside the recommended input voltage but within the absolute maximum input voltage, the servo drive can shut down.

5.4 Encoder Supply

Feature	Details	Maximum Encoder Power Limit
5V supply	5V Nominal, 4.75V-5.25V, up to 400 mA	Not more than 3.3W
11V supply (for IO Style W, T, S)	11V Nominal, 10.6V-11.5V, up to 300 mA	

Table 4: Encoder Supply

5.5 Product Features

5.5.1 Analog Input

Feature	Details	Resolution	Presence and No.
Analog Input	Differential ±10V	14-bits	**1**
	Single ended ±10V	12-bits	**1**

Table 5: Analog Input

5.5.2 General Product Features

Main Feature	Details	Presence / No.	
Feedback	Standard Port A, B, and C	**√**	
Communication Option	USB	**√**	
	EtherCAT *or*	**√**	For Networks E and G
	CANopen	**√**	For Networks S and T
	RS-422 *or*	**√**	For Networks G and T
	RS-232	**√**	For Networks E and S with Safety Capability S or O

Table 6: Feedback and Communication

5.5.3 STO

Feature	Details	Presence and No.
STO	5V Logic, Opto Isolated, for IO TYPE = U or T	For Safety Capability S or O
	PLC source, Opto Isolated, for IO TYPE = V or S	
	PLC source, Opto Isolated, for IO TYPE = W	**√**

Table 7: STO

5.5.4 Digital Input

I/O Style	W	U or T	V or S
Safety/Regular	Safe IO PLC Source, Isolated	Regular IO 5V Logic	Regular IO PLC Source or Sink
Input	IN1, IN2, IN3, IN4, IN5, IN6	IN1, IN2, IN3, IN4, IN5, IN6	

Table 8: Digital Inputs

5.5.5 Digital Output

I/O Style	W	U or T	V or S
Safety/Regular	Safe IO PLC	Regular IO 5V Logic	Regular IO PLC
Absolute Maximum Voltage	60V	30V	60V
Nominal Recommended VDD	19.6V ÷ 53V	4 to 30V	19.6V ÷ 53V
OUT1	250mA	15mA	1000mA
OUT2	250mA	15mA	1000mA
OUT3	250mA	N/A	N/A
OUT4	250mA	N/A	N/A
OUT7	1000mA	15mA	1000mA
OUT8 (PLC SINK)	1000mA	15mA	1000mA
Total Current	1500mA		1250mA

Table 9: Digital Output and Current

5.6 Environmental Conditions

You can guarantee the safe operation of the Platinum Jori by ensuring that it is installed in an appropriate environment. The Functional Safety of the servo drive is certified according to the environmental conditions in the following table.

Warning:
During operation the Platinum Jori becomes hot to the touch (the heatsink and wires may heat up). Care should be taken when handling it.

Feature	Details
Operating ambient temperature	0 °C to 55 °C (32 °F to 131 °F) **Remark:** Functional Safety is applicable to the above operating temperature.
Storage temperature	-40 °C to +85 °C (-40 °F to +185 °F)
Altitude Operating conditions	2,000 m (6562 feet) It should be noted that servo drives capable of higher operating altitudes are available on request.
Maximum non-condensing humidity according to IEC60068-2-78	95%
Mechanical Shock according to IEC60068-2-27	15g / 11ms Half Sine
Vibration according to IEC60068-2-6	5 Hz ≤ f ≤ 10 Hz: ±10mm 10 Hz ≤ f ≤ 57 Hz: 4G 57 Hz ≤ f ≤ 500 Hz:5G

Table 10: Environmental Conditions

5.7 Standards and Certifications

The following table describes the Main Standards of the Platinum Jori servo drive. For further details, refer to Chapter 22 in the Platinum Safety Drive Manual.

5.7.1 Functional Safety

Standard	Item
In compliance with **IEC 61800-5-2:2017**	Adjustable speed electrical power drive systems – Safety requirements – Functional
In compliance with **EN ISO 13849-1:2015**	Safety of machinery — Safety-related parts of control systems.
In compliance with **EN 61508-1:2010**	Functional safety of electrical/electronic/ programmable electronic safety-related systems
In compliance with **EN 61508-2:2010**	Functional safety of electrical/electronic/ programmable electronic safety-related systems
In compliance with **EN 61508-3:2010**	Functional safety of electrical/electronic/ programmable electronic safety-related systems
In compliance with **IEC 61784-3:2016**	Functional Safety Filed Bus - FSOE

5.7.2 Electrical Safety

Specification	Details
In compliance with **IEC/EN 61800-5-1:2007**	Adjustable speed electrical power drive systems Part 5-1: Safety requirements – Electrical, thermal and energy
In compliance with **UL 61800-5-1**	Adjustable speed electrical power drive systems: Safety requirements – Electrical, thermal and energy
In compliance with **CSA C22.2 NO. 274-17**	Adjustable speed drives

5.7.3 Electromagnetic Compatibility

Specification	Details
In compliance with **EN 61800-3:2004/A1:2011**	Adjustable speed electrical power drive systems Part 3: EMC requirements and specific test methods
In compliance with **EN 61800-5-2: 2017 Annex E**	Adjustable speed electrical power drive systems Part 5-2: Safety requirements – Functional

5.7.4 Environmental

Specification	Details
In compliance with **IEC60068-2-78**	Damp heat, steady state
In compliance with **IEC60068-2-6**	Vibration (sinusoidal)
In compliance with **IEC60068-2-2**	Dry heat
In compliance with **IEC60068-2-27**	Shock
In compliance with **IEC60068-2-1**	Cold Test

5.7.5 Other Compliant Standards

For other compliant standards refer to the
Platinum Safety Drive Manual Section 22.5 or refer to the Elmo website:

https://www.elmomc.com/capabilities/standards-compliance/platinum-family/

5.7.6 Dual Use

No export license is required for the Platinum Line products signified with the suffix Q in the Part Number.

The operating frequency of the Platinum Line products is “factory limited” to ≤ 599 Hz, and therefore complies with the EU Dual Use Regulation 428/2009, 3A225, and the US Dual Use regulation EAR ECCN# 3A225.

This statement applies to all identical specimens and will become invalid if a change is made in the firmware.

Chapter 6: Installation

The Platinum Jori must be installed in a suitable environment and properly connected to its voltage supplies and the motor.

6.1 Unpacking the Drive Components

Before you begin working with the Platinum Jori, verify that you have all of its components, as follows:

- The Platinum Jori servo drive
- The Elmo Application Studio (EASII) software and software manual

The Platinum Jori is shipped in a cardboard box with Styrofoam protection.

To unpack the Platinum Jori:

1. Carefully remove the servo drive from the box and the Styrofoam.
2. Check the drive to ensure that there is no visible damage to the instrument. If any damage has occurred, report it immediately to the carrier that delivered your drive.
3. To ensure that the Platinum Jori you have unpacked is the appropriate type for your requirements, locate the part number sticker on the side of the Platinum Jori. It looks like this:

Figure 2: Label

4. Verify that the Platinum Jori type is the one that you ordered and ensure that the voltage meets your specific requirements.
5. The part number at the side provides the type designation. Refer to the appropriate part number in the section Catalog Number at the beginning of the installation guide.

6.2 Mounting the Platinum Jori to a Heat Sink

The selected heat sink must be screwed to the lower surface of the Platinum Jori.

To mount the heat sink:

1. Mount the heat sink under the base of the Platinum Jori.
2. Place the Thermal foil (Part No. IMT-PJORALH for PJOR or IMT-PJODALH for PJOD purchased from Elmo) between the lower surface of the servo drive, and the upper surface of the heat sink.
3. Use four M3 head cup Allen screws to secure the heat sink under the servo drive.
4. Tighten the screws to the relevant torque force applicable to an M3 stainless steel A2 screw.

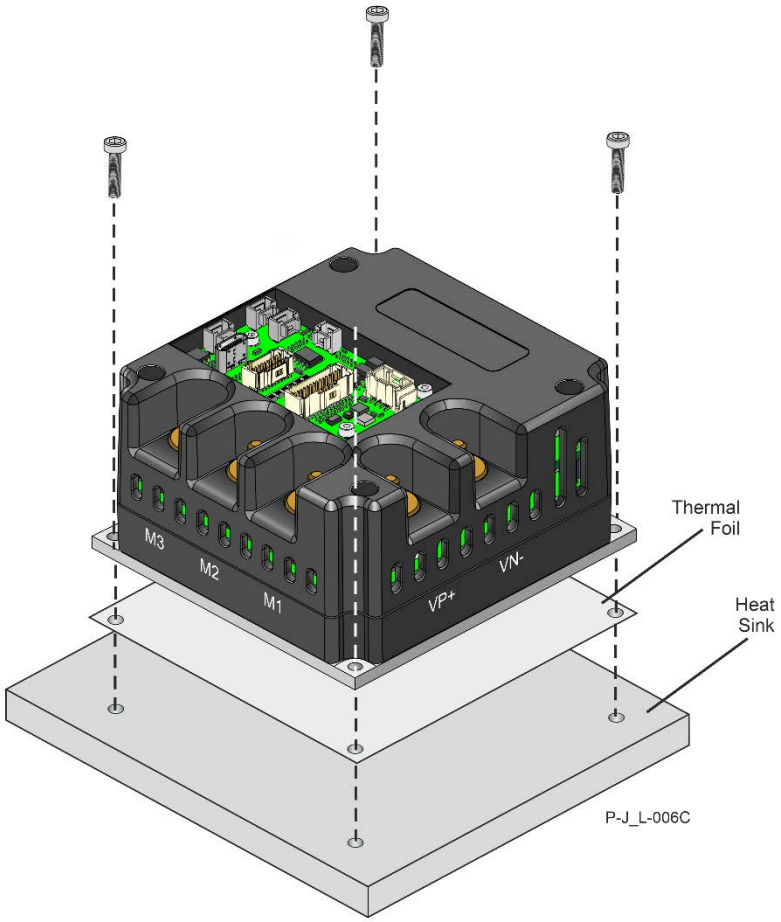
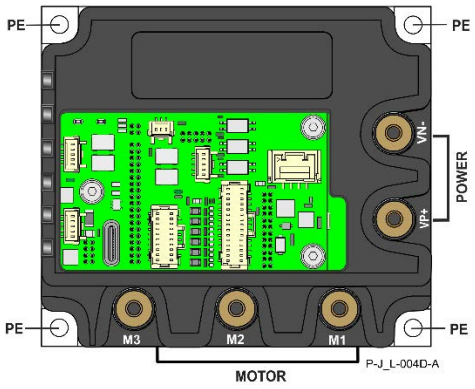


Figure 3: Mount the Heat Sink and Thermal Foil to the Platinum Jori

Chapter 7: Connectors

The following sub sections describe the connectors of the Platinum Jori.

7.1 PJOR Connectors

Port	Pins and Type		Function / Connector Location
Port	**Type**	**Function**	**Connector Location**
VP+, VN-	Terminal Lug + M3 Flat Washer + M3 Spring Washer + M3x6 Allen Screw	Power	
M1, M2, M3		Motor	
PE, PE PE, PE	+ M3 Flat Washer + M3 Spring Washer + M3 Screw	Earth Connection	
Recommended for M3 screw			Terminal Lug (FLEX) Stud Hall size: M3

Port	Pins	Type	Function
C1	2x10	2 rows x 10 Pins 1 mm pitch	Digital and analog I/O
C2	2x15	2 rows x 15 Pins 1 mm pitch	Feedback and Voltage Logic (VL)
C3	4	1 x 4 Pins	Brake
C4	3	1 x 3 Pins	STO inputs
X1	5	1 x 5 Pins 1 mm pitch	EtherCAT / CAN In
X2	5	1 x 5 Pins 1 mm pitch	EtherCAT / CAN Out
X3	2x12	USB Device Type C	USB2.0 Type C
X4	5	1 x 5 Pins 1 mm pitch	RS-422 / RS-232

Connector Locations

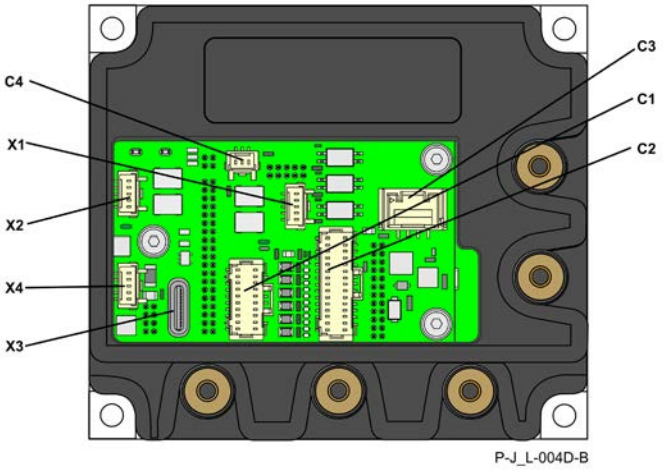
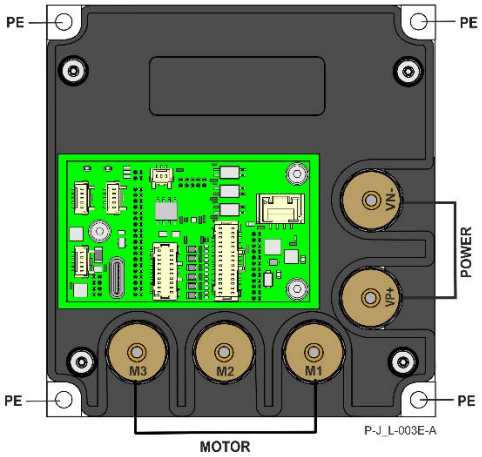


Table 11: PJOR Connectors

7.2 PJOD Connectors

Port	Pins and Type		Function / Connector Location
Port	**Type**	**Function**	**Connector Location**
VP+, VN-	Terminal Lug + M4 Flat Washer + M4 Spring Washer + M4 Nut	Power	
M1, M2, M3		Motor	
PE, PE PE, PE	+ M3 Flat Washer + M3 Spring Washer + M3 screw	Earth Connection	
Recommended for M4 screw			Terminal Lug (FLEX) Stud Hall size: M4

Port	Pins	Type	Function
C1	2x10	2 rows x 10 Pins 1 mm pitch	Digital and analog I/O
C2	2x15	2 rows x 15 Pins 1 mm pitch	Feedback and Voltage Logic (VL)
C3	4	1 x 4 Pins	Brake
C4	3	1 x 3 Pins	STO inputs
X1	5	1 x 5 Pins 1 mm pitch	EtherCAT / CAN In
X2	5	1 x 5 Pins 1 mm pitch	EtherCAT / CAN Out
X3	2x12	USB Device Type C	USB2.0 Type C
X4	5	1 x 5 Pins 1 mm pitch	RS-422 / RS-232

Connector Locations

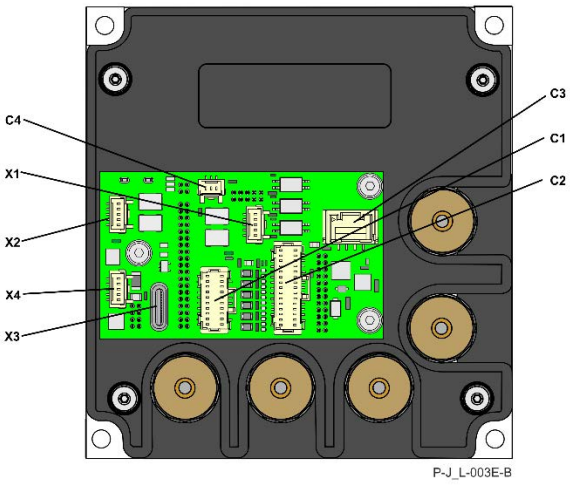


Table 12: PJOD Connectors

7.3 Mating Connectors

Connector	Mating Connector Type	Mating Crimping Pins
C1	Molex P/N: 5011892010	Molex P/N: 501193-3000 or 501193-7000
C2	Molex P/N: 5011893010	Molex P/N: 501193-3000 or 501193-7000
C3	Molex P/N: 5025780400	Molex P/N: 213029-1000 or 213029-1100 or 213028-1000 or 213028-1100
C4	Molex P/N: 5019390300	Molex P/N: 501193-3000 or 501193-7000
X1	Molex P/N: 5019390500	Molex P/N: 501193-3000 or 501193-7000
X2	Molex P/N: 5019390500	Molex P/N: 501193-3000 or 501193-7000
X3	The recommended mating cable: Type-C cable 2.0	
X4	Molex P/N: 5019390500	Molex P/N: 501193-3000 or 501193-7000

Table 13: Mating Connectors

7.3.1 Recommended Cable Lugs and Cabling

Elmo recommends the following cable lugs for motor and power depending on the cable to be installed. Refer to the specification drawings for the UL listed lug and cable application.

Copper Lug - One-Hole, Standard Flex Barrel

Current (A) (Up to)	Wire Type	Stud Size	Manufacturer
30 (for the PJOR)	#10 AWG	M3 (or 0.12”)	Panduit, PMNF6-3R-L/PMV6-3R-L (4-6mm) PMV2-3RB-C/PMNF2-3R-C (1.5-2.5mm)
60 (for the PJOD)	#6 AWG	M4 (or 0.16”)	Panduit, PV6-8R/PV8-8R/PV10-8R

Table 14: Recommended Cable Lugs and Cabling

For best noise immunity, twist the DC power wires. Do not twist or bundle the motor phase wires.

7.4 Motor Power Connectors

This section describes the Motor Power.

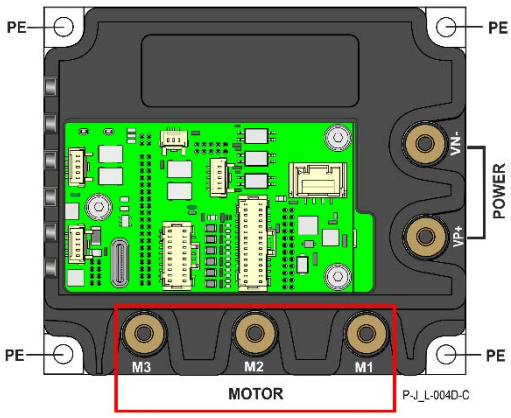
Pin	Function	Cable		Pin Positions
		Brushless Motor	Brushed DC Motor	
PE	Connection earth	Motor	Motor	
M1	Motor phase	Motor	N/C	
M2	Motor phase	Motor	Motor	
M3	Motor phase	Motor	Motor	

Table 15: Motor Power Pins

7.5 Main Power Connectors

This section describes the Main Power.

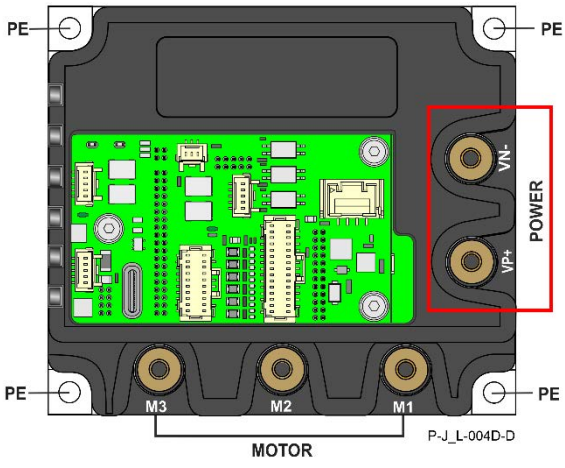
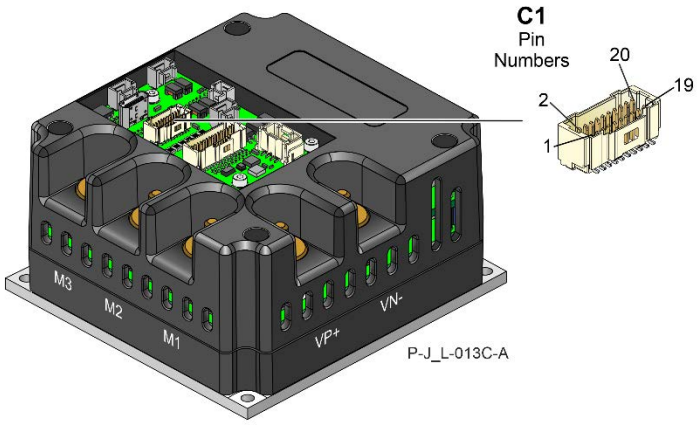
Pin	Function	Cable	Pin Positions
VP+	DC Pos. Power input	Power	
VN-	Power output return	Power	
PE	Protective earth	Power	

Table 16: Main Power Pins

7.6 Digital and Analog I/O (C1)

Pin# (C1)	Signal	Safe IO	Regular IO
1	IN1	Digital input 1	
2	VDD_RET	VDD Return	
	IN_COM		The Common of the digital inputs
3	IN2	Digital input 2	
4	Not Connected	Not Connected	
	OUT SEL		Output type selection
5	IN3	Digital input 3	
6	VDD_RET	VDD Return	
7	IN4	Digital input 4	
8	VDD	VDD	
9	IN5	Digital input 5	
10	Not Connected	Not Connected	
	VDD		VDD
11	IN6	Digital input 6	
12	AIN2	Analog input 2	
13	OUT1	Digital Output 1	
14	COMRET	Common return	
15	OUT2	Digital Output 2	
16	COMRET	Common return	
17	OUT3	D_{OUT3} (Digital Output 3)	
	VDD Return		VDD Return
18	ANALOG1-	Analog input 1 Negative	
19	OUT4	D_{OUT4} (Digital Output 4)	
	VDD Return		VDD Return
20	ANALOG1+	Analog input 1 Positive	

Pin Positions



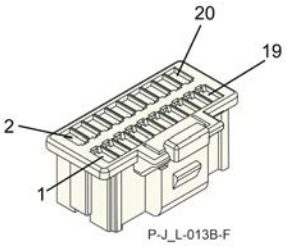
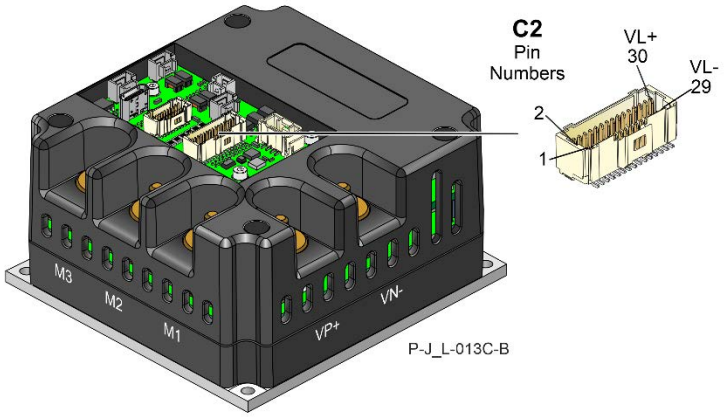


Table 17: Digital and Analog I/O pinouts (C1)

7.7 Feedback and Voltage Logic (C2)

Pin # (C2)	Signal	Function
1	PortA_A+	PortA: Channel A+
2	PortB_A-	PortB: Channel A-
3	PortA_A-	PortA: Channel A-
4	PortB_A+	PortB: Channel A+
5	PortA_B+	PortA: Channel B+
6	PortB_B-	PortB: Channel B-
7	PortA_B-	PortA: Channel B-
8	PortB_B+	PortB: Channel B+
9	PortA_I+	PortA: Channel Index+
10	PortB_I-	PortB: Channel Index-
11	PortA_I-	PortA: Channel Index-
12	PortB_I+	PortB: Channel Index+
13	HA	Hall sensor: Channel A
14	PortC_A-	PortC: Channel A-
15	HB	Hall sensor: channel B
16	PortC_A+	PortC: Channel A+
17	HC	Hall sensor: Channel C
18	PortC_B-	PortC: Channel B-
19	+5V	Encoder +5V supply with a total allowable maximum consumption of 400mA
20	PortC_B+	PortC: Channel B+
21	COMRET	Common return
22	PortC_INDEX-	PortC: Channel Index-
23	COMRET	Common return
24	PortC_INDEX+	PortC: Channel Index+
25	COMRET	Common return
26	+11V	Encoder +11V supply with a total allowable maximum consumption of 300mA for IO style W, S or T
	+5V	Encoder +5V supply with a total allowable maximum consumption of 400mA for IO style U or V
27	COMRET	Common return

Pin # (C2)	Signal	Function
28	COMRET	Common return
29	VL-	Logic power supply 24V supply input minus
30	VL+	Logic power supply 24V supply input plus
Pin Positions		



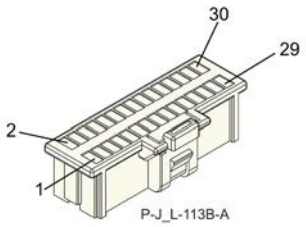


Table 18: Feedback and Voltage Logic pinouts (C2)

7.8 Drive Status Indicator

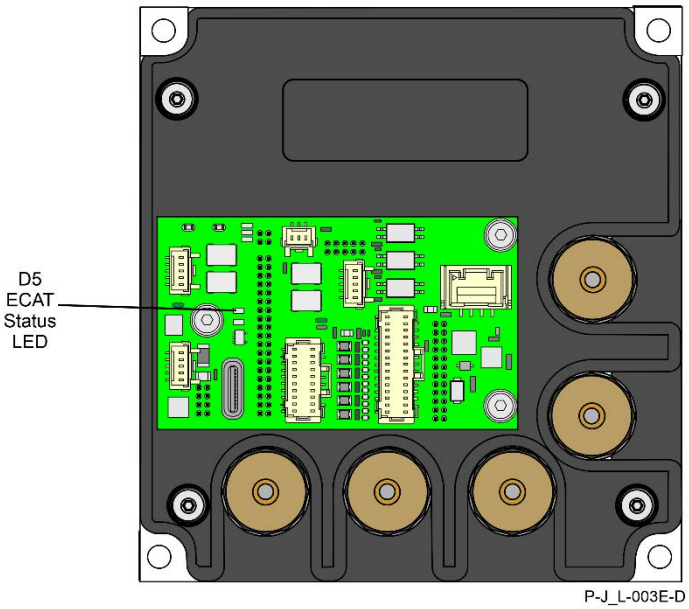


Figure 4: Platinum Jori Drive Status Indicator LED

Figure 4 shows the position of the Drive Status Indicator LED which is used for immediate indication of the Initiation and Working states.

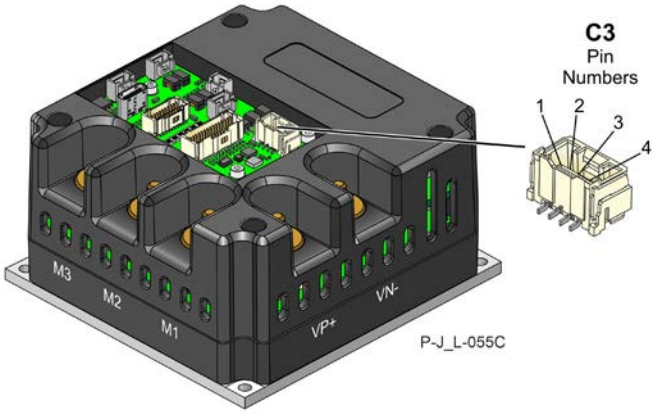
The red/green dual LED is used for immediate indication of the following states:

STATES	LED \ Time [msec]	Explanation
INITIATION STATE	Blinking: Red 200, Off: 200	If flashing RED ON/OFF then drive error. Parameter process failed during power up (**CD** command)
	Blinking: Red 600, Off 200	If slow flashing RED ON/OFF then drive Safety error Drive in Safety error (**BZ[2]\BZ[3]**)
WORKING STATE	Steady Green	Drive ready to enable the motor
	Steady Red	Drive is in an amplifier failure state Power state error: over\under voltage, over temperature etc.
FIRMWARE DOWNLOAD STATE	Blinking: Red 200, Green 200 Red 600, Green 200	Flashing RED/GREEN during burn Slow flashing RED/GREEN indicates stages of Firmware burn-in or validation. Frequency depends on the stage of burn-in/validation and the CPLD/FPGA that is been burned-in.

Table 19: LED Indicator States

7.9 Brake Connector (C3)

Pin # (C3)	Signal	Function
1	VDD	VDD
2	OUT7	Digital Output 7
3	OUT8	Digital Output 8
4	VDD_RET	VDD Return
Pin Positions		



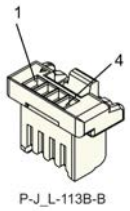


Table 20: Brake Connector Pinouts (C3)

7.10 STO (C4)

Pin # (C4)	Signal	Function
1	STO1	STO input 1
2	STO2	STO input 2
3	STO_RET	STO Return
Pin Positions		

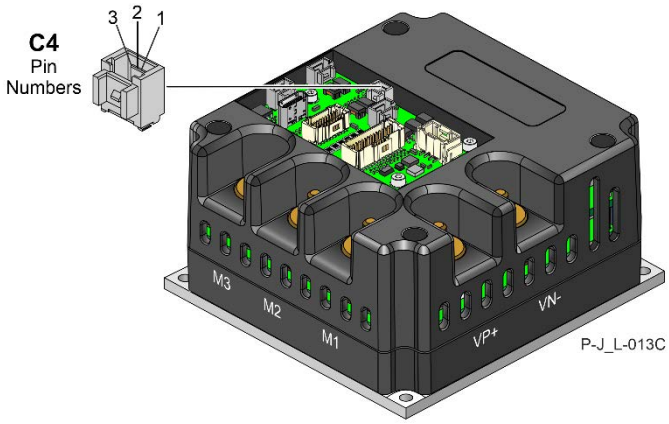


Table 21: STO Pinouts (C4)

7.11 EtherCAT IN (X1)

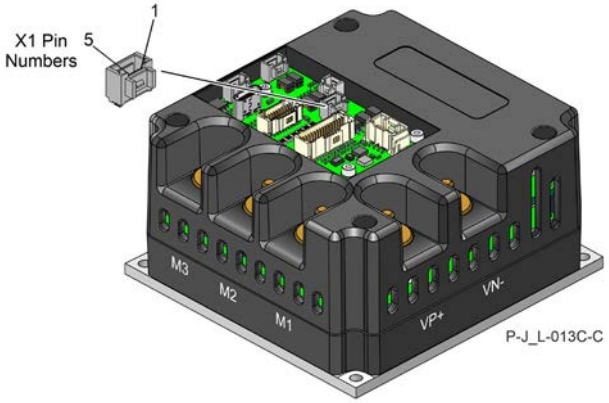
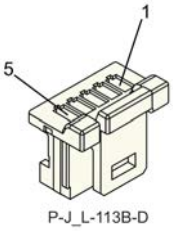
Pin # (X1)	Signal	Function
1	EtherCAT_IN_TX+	EtherCAT In / Transmission Data +
2	EtherCAT_IN_TX-	EtherCAT In / Transmission Data -
3	EtherCAT_IN_RX+	EtherCAT In / Receiver Data +
4	EtherCAT_IN_RX-	EtherCAT In / Receiver Data -
5	Shield	Cable shield
Pin Positions		
		

Table 22: EtherCAT IN Pinouts (X1)

7.12 EtherCAT OUT / Ethernet (X2)

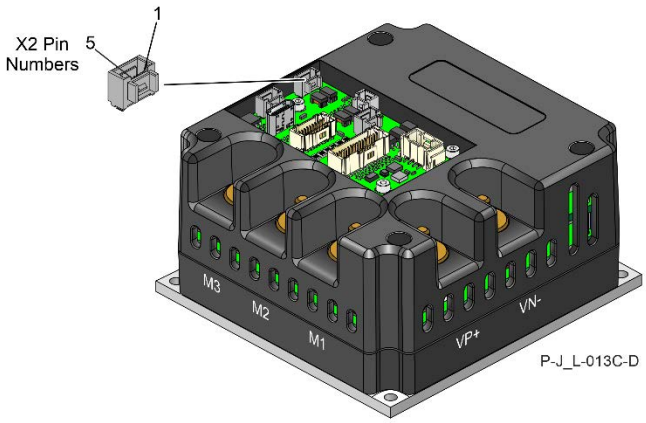
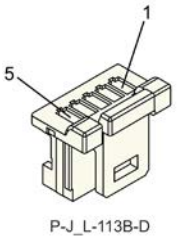
Pin # (X2)	Signal	Function
1	EtherCAT_OUT_TX+/Ethernet_TX+	EtherCAT Out / Transmission Data +
2	EtherCAT_OUT_TX-/Ethernet_TX-	EtherCAT Out / Transmission Data -
3	EtherCAT_OUT_RX+/Ethernet_RX+	EtherCAT Out / Receiver Data +
4	EtherCAT_OUT_RX-/Ethernet_RX-	EtherCAT Out / Receiver Data -
5	Shield	Cable shield
Pin Positions		
		

Table 23: EtherCAT OUT Pinouts (X2)

7.13 CANopen (X1 and X2)

Fieldbus communications are industrial network protocols for real-time distributed control that allows connection of servo drives. The Platinum Jori supports the following CAN fieldbus type industrial network protocol:

Fieldbus Type	Product Number
CANopen	PJOz-zz-zXX/YYY**T**zz-z
	PJOz-zz-zXX/YYY**S**zz-z

The following table describes the CAN connections to both of the 1 x 5 pin connectors.

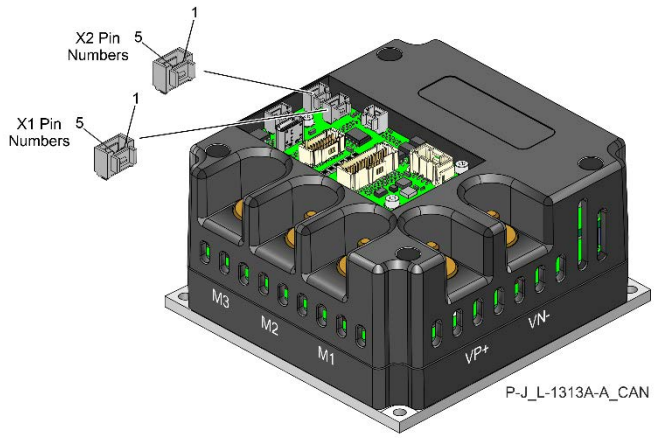
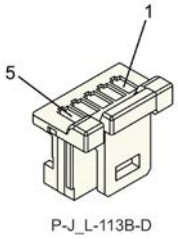
Pin (X1 and X2)	Signal	Function
1	Not Connected	Not Connected
2	CAN_ISO_RET	CAN Isolated Return
3	CAN_H	CAN_H bus line (dominant high)
4	CAN_L	CAN_L bus line (dominant low)
5	PE	Shield drain wire
Pin Positions		**Cable Connector**
 **Platinum Jori X1 and X2 CAN Connectors**		 **CAN Cable Connector**

Table 24: CAN Pin Assignments

7.14 RS422 and RS232 (X4)

The following table describes the X4 Isolated Serial Communication to the 1 x 5 pins connector.

Note: Applicable only to Safety Capability **S** or **O**.

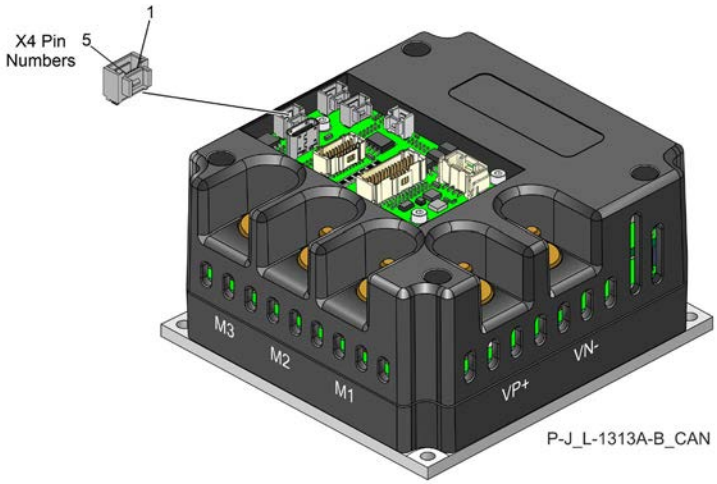
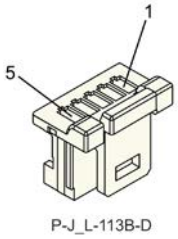
X4	RS-232: Network: E and S		RS-422: Network: G and T	
Pin#	**Signal**	**Function**	**Signal**	**Function**
1	RS232_TX	RS232 Level	RS422_TX+	Differential RS232 Transmit Level
2	Not Connected		RS422_TX-	Differential RS232 Transmit Level
3	RS232_RX	RS232 Level	RS422_RX+	Differential RS232 Receive Level
4	Not Connected		RS422_RX-	Differential RS232 Receive Level
5	ISO_GND	Isolated Ground	ISO_GND	Isolated Ground
Pin Positions				**Cable Connector**
				

Table 25: Platinum Jori Serial Communication

7.15 USB Connector (X3)

The Platinum Jori uses a standard USB 2.0 Type C connector.

Pin # (X3)	Signal	Description
A1	COMRET	Common return
A2	-	Not Connected
A3	-	Not Connected
A4	USB_VBUS	USB VBUS 5 V
A5	-	Not Connected
A6	USBD+	USB _P line
A7	USBD-	USB _N line
A8	-	Not Connected
A9	USB_VBUS	USB VBUS 5 V
A10	-	Not Connected
A11	-	Not Connected
A12	COMRET	Common return
B1	COMRET	Common return
B2	-	Not Connected
B3	-	Not Connected
B4	USB_VBUS	USB VBUS 5 V
B5	-	Not Connected
B6	USBD+	USB _P line
B7	USBD-	USB _N line
B8	-	Not Connected
B9	USB_VBUS	USB VBUS 5 V
B10	-	Not Connected
B11	-	Not Connected
B12	COMRET	Common return
Pin Positions		

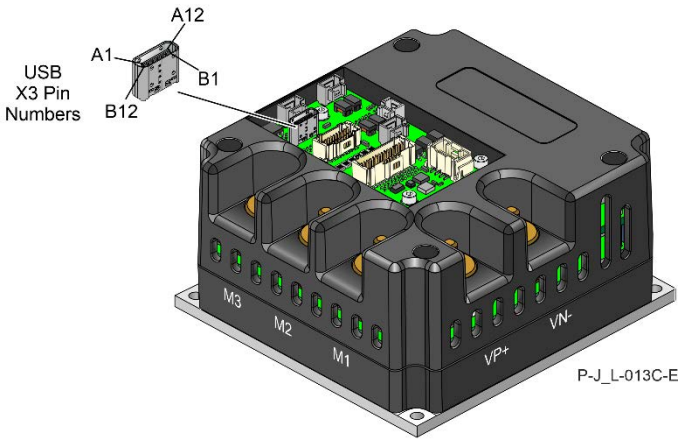
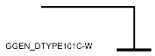
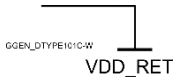
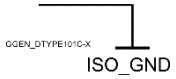
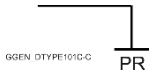
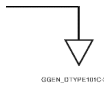
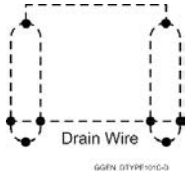
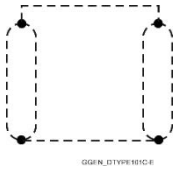
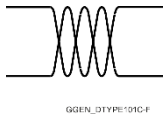
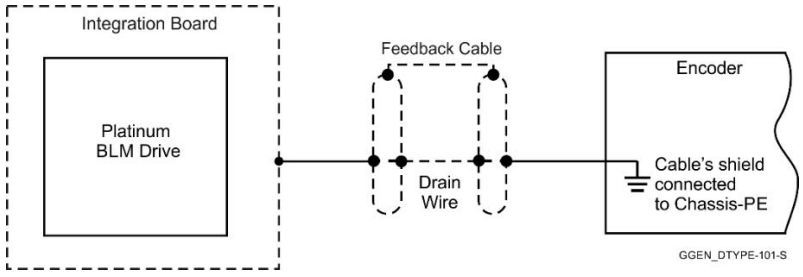


Table 26: USB Pinouts (X3)

Chapter 8: Wiring

8.1 Wiring Legend

The following table legend describes the wiring symbols detailed in all installation guides.

Wiring Symbol	Description
	Earth connection (PE)
	**User Side:** This symbol signifies that any type of grounding may be used on the user side
	VDD Return
	Isolated Ground
	Power Return
	COMRET Common at the Drive
	Shielded cable with drain wire. The drain wire is a non-insulated wire that is in direct contact with the braid (shielding). Shielded cable with drain wire significantly simplifies the wiring and earthing.
	Shielded cable braid only, without drain wire.
	Twisted-pair wires
	Encoder Earthing. The cable`s shield is connected to the chassis (PE) in the connector. The servo drive shield is connected to Earth.

8.2 The Platinum Jori Connection Diagram

8.2.1 EtherCAT Connections Diagram for Safety Capability F

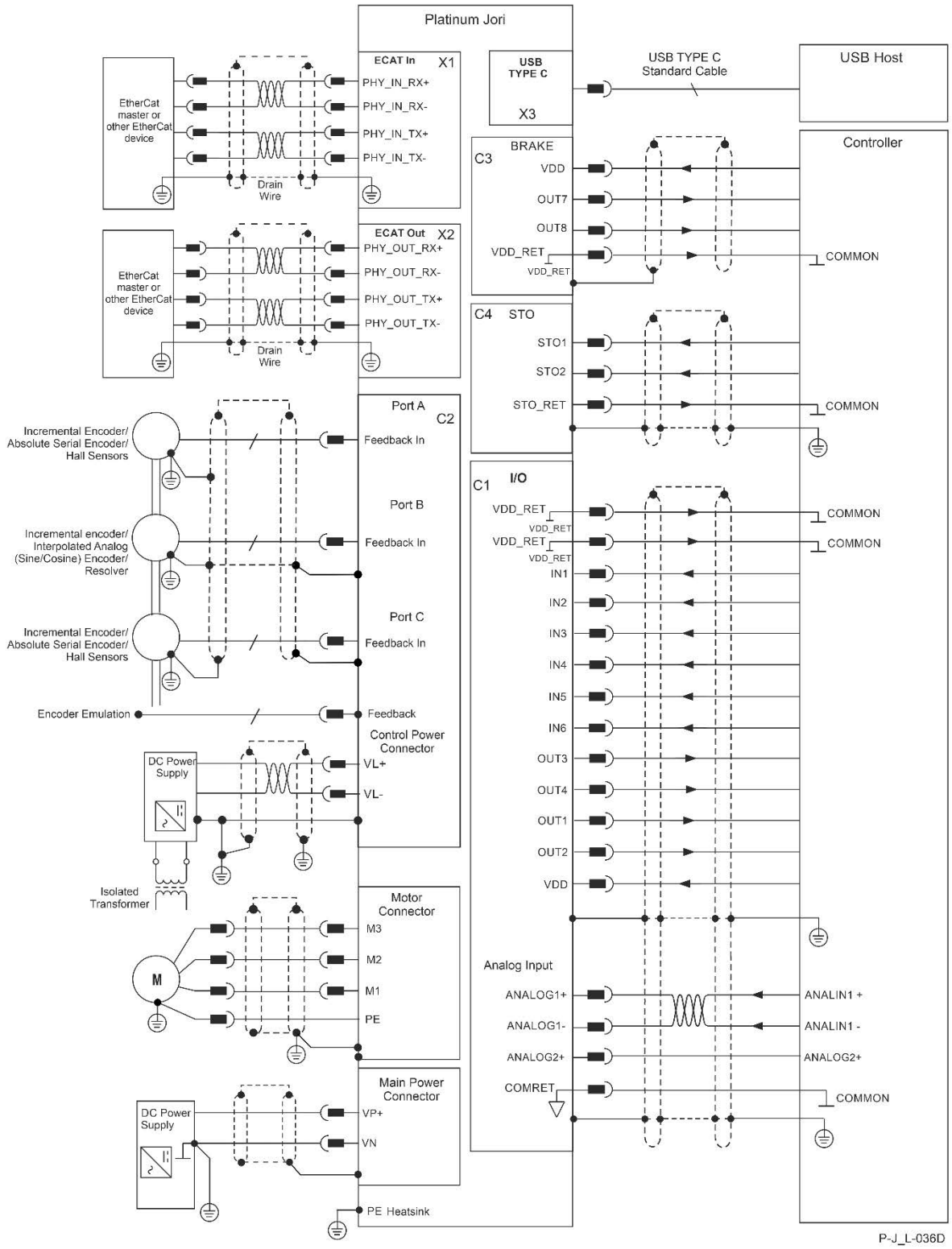


Figure 5: The Platinum Jori Connection Diagram for Safety Capability F – EtherCAT

8.2.2 EtherCAT Connections Diagram for Safety Capabilities S and O

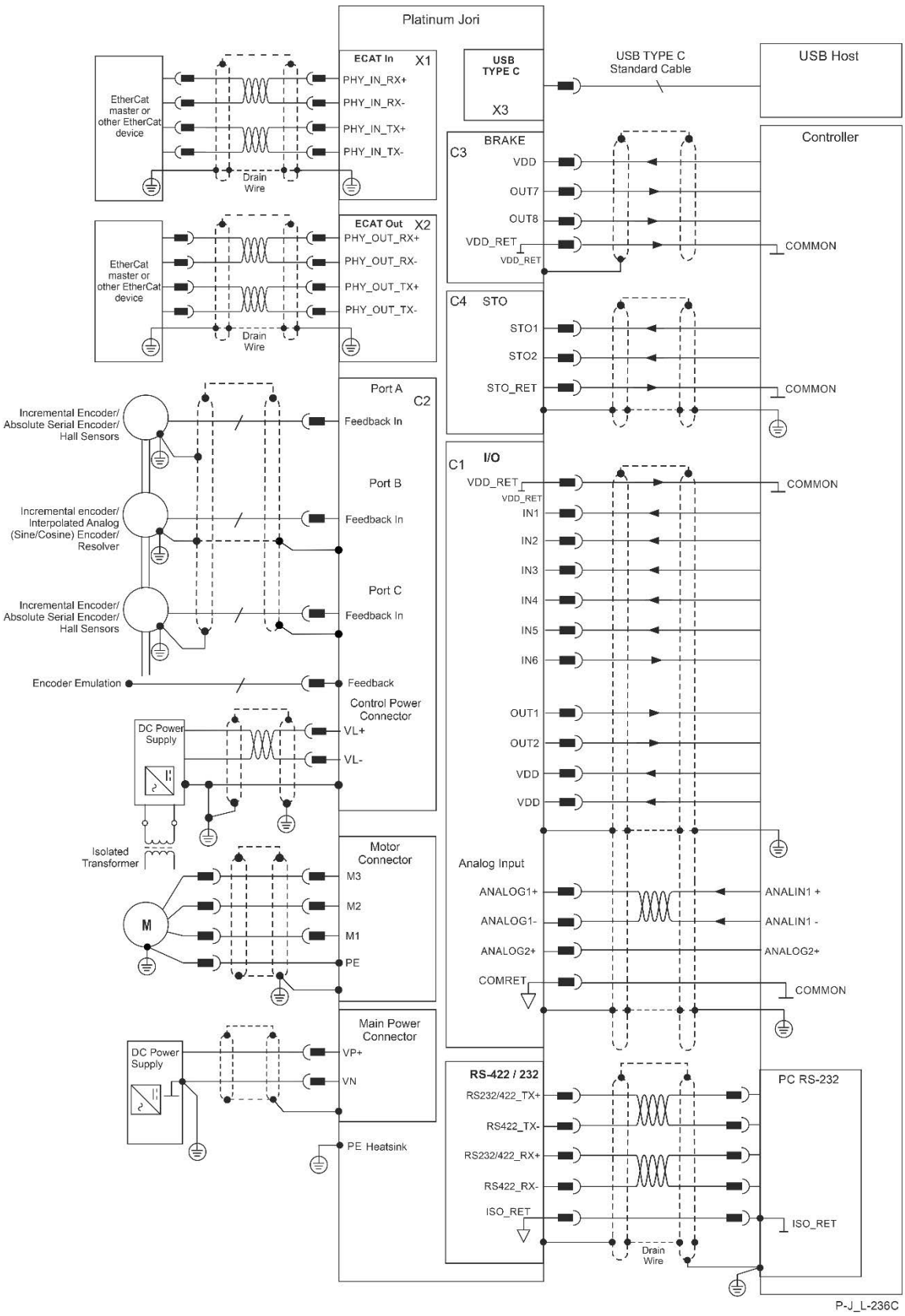


Figure 6: The Platinum Jori Connection Diagram for Safety Capabilities S and O – EtherCAT

8.2.3 CAN Connections Diagram for Safety Capabilities S and O

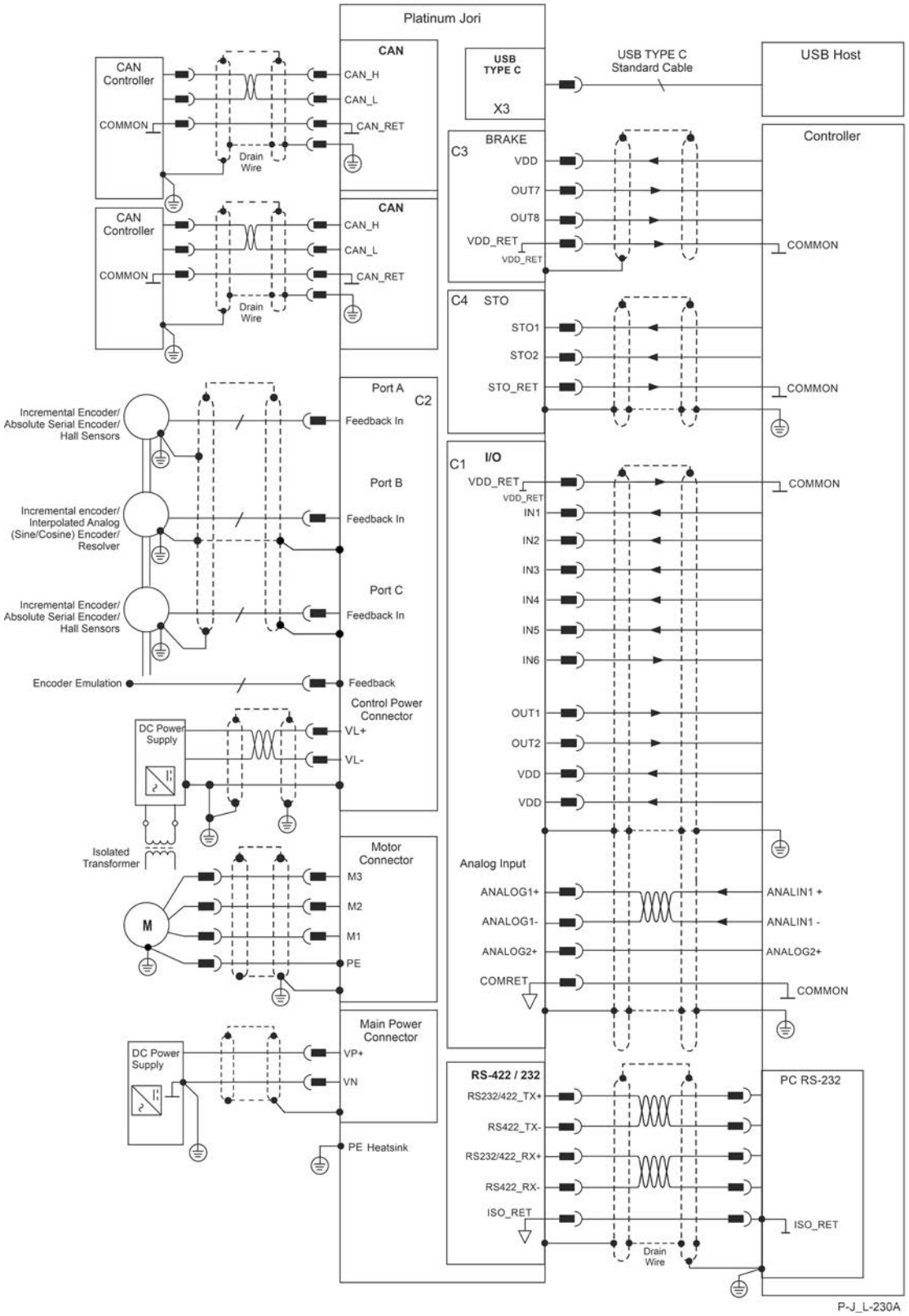


Figure 7: The Platinum Jori Connection Diagram for Safety Capabilities S and O – CANopen

8.3 Wiring the Female Connectors

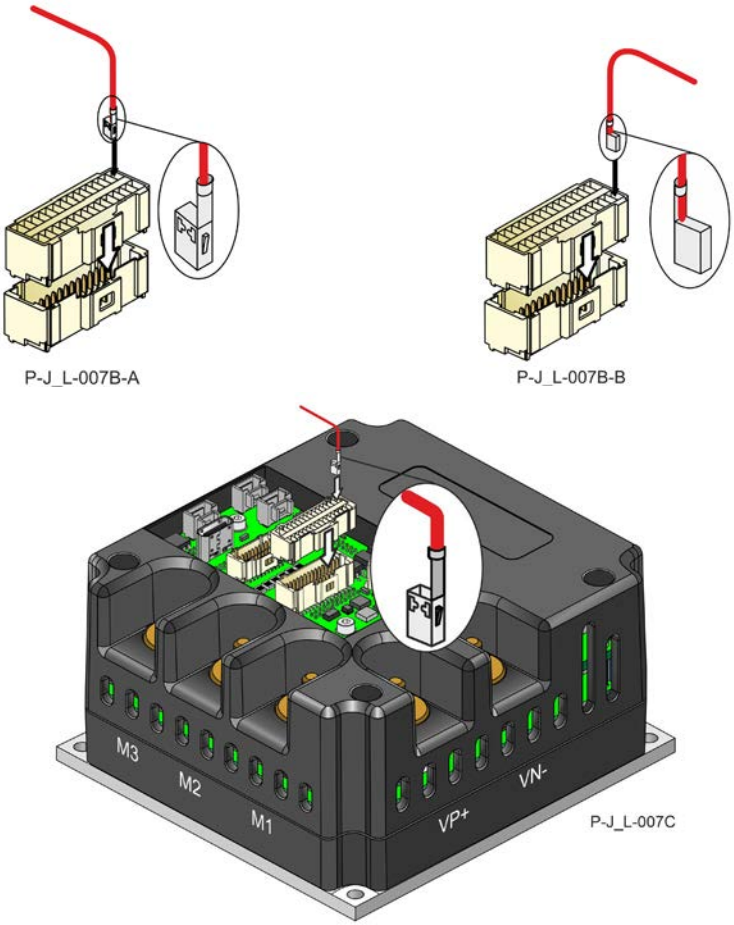


Figure 8: Inserting a wire/pin to the Female Connector

To insert a wire/pin into any of the female connectors C1, C2, C3, and C4, do the following:

1. Select the relevantly colored wire to insert to a specific rectangular compartment on the female connector.
2. Use the appropriate Molex crimping plier (Molex P/N 63819-1500) to fasten a pin connector to the end of the wire.
3. Place the connector on a flat surface, in the orientation as shown in Figure 8.
   Notice that the rectangular slot has a niche at the bottom of the slot.
4. Insert the wire connector to the slot as shown in Figure 8.
   a. Make sure that the connector protrusion is inserted to the bottom of the rectangular slot.
   b. When inserting the wire connector to a slot in the second row, make sure to rotate the connector in the opposite orientation.
5. Repeat the same procedure for any other wire connections.

8.4 Main and Motor Power

This section describes the Main and Control supplies, and Motor Power connections.

8.4.1 Connecting the DC Power and Motor Power Wires

This section describes the installation of the wire terminal lugs for both the Main Power wires to VP+, VN-, and PE terminals, and the Motor Power wires to the M1, M2, M3, and PE terminals on the Platinum Jori.

Note:
When connecting several identical motors, all the motor phases must be connected in an identical sequence in order to save repetition of the tuning process.

Step 1: PE Earth Connection

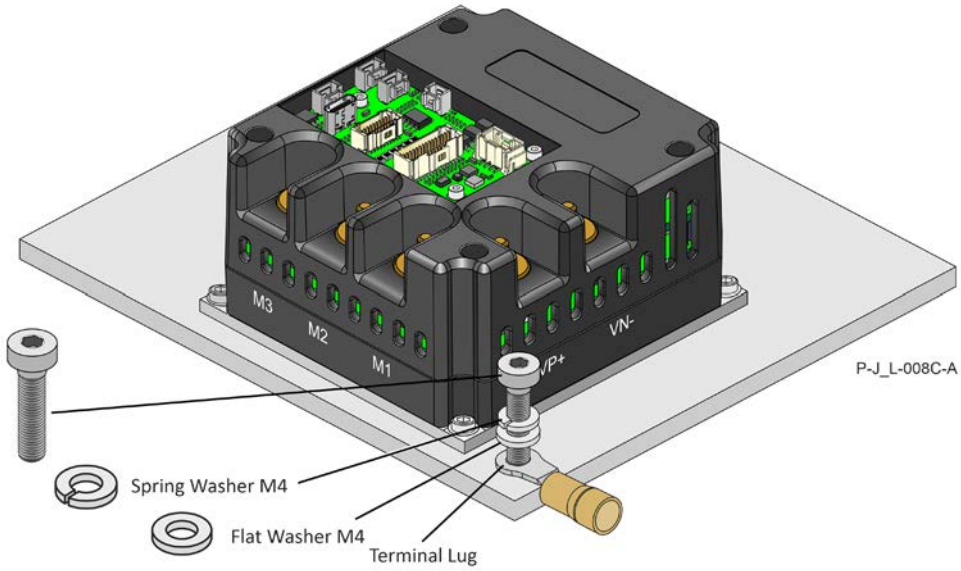


Figure 9: Earth Connection

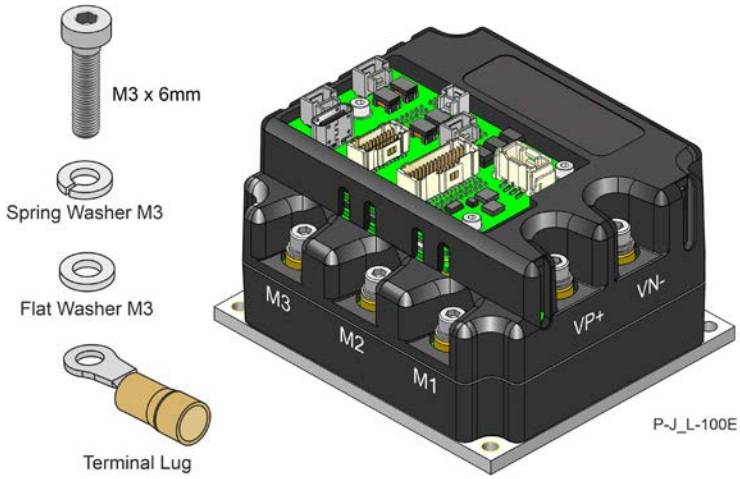
Place the Earth connection as close as possible to the corner of the drive.

Tighten the screw to the relevant torque force applicable to an M4 stainless steel A2 screw.

Step 2: Power and Motor Connection

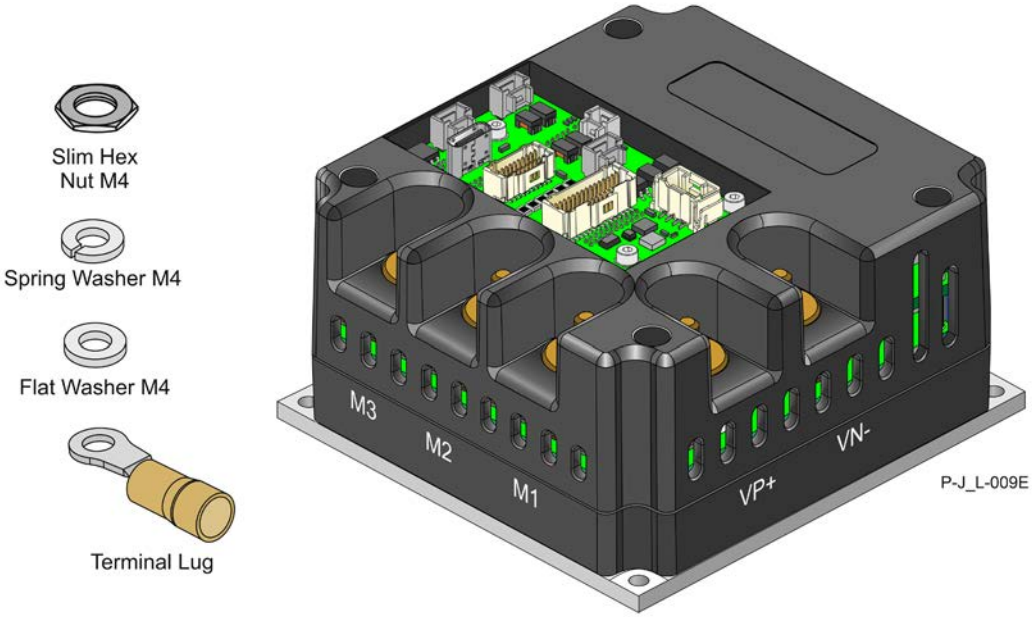
PJOR Model

The PJOR model uses 6 mm M3 Head Cup Allan Screws, suitable for M3 washers, for the installation of the wire terminal lugs for the Main Power and Motor Power wires.



PJOD Model

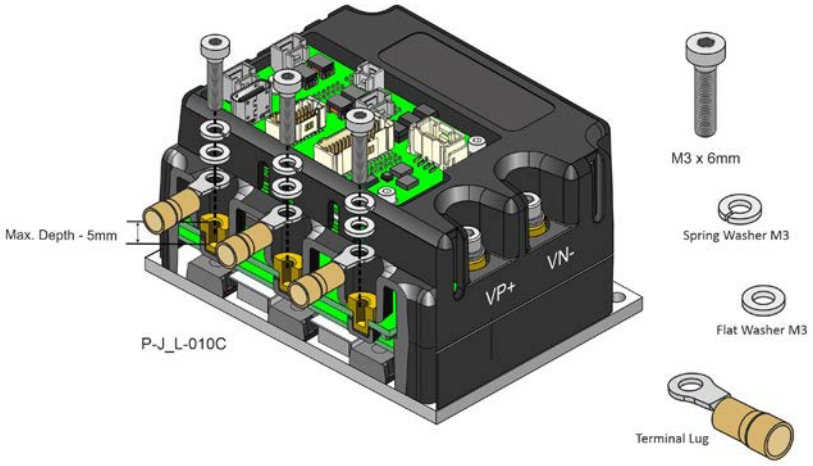
The PJOD model contains embedded screws, of length 6.5 mm, suitable for M4 washers and nuts, for the installation of the wire terminal lugs of the Main Power and Motor Power wires.

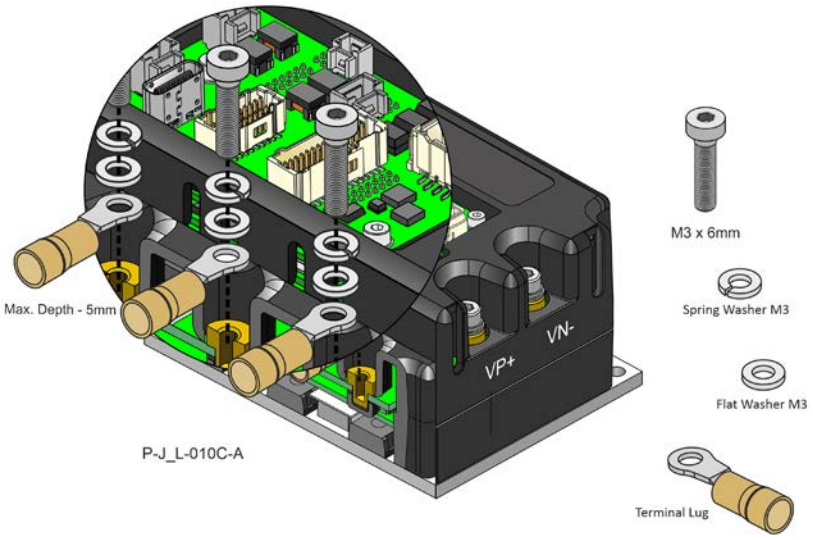


Step 2: Power and Motor Connection

PJOR Model - Insertion

Insert the M3 x 6mm screw, spring washer and flat washer to the terminal lug power and motor positions to a maximum depth of 5mm, as shown below.





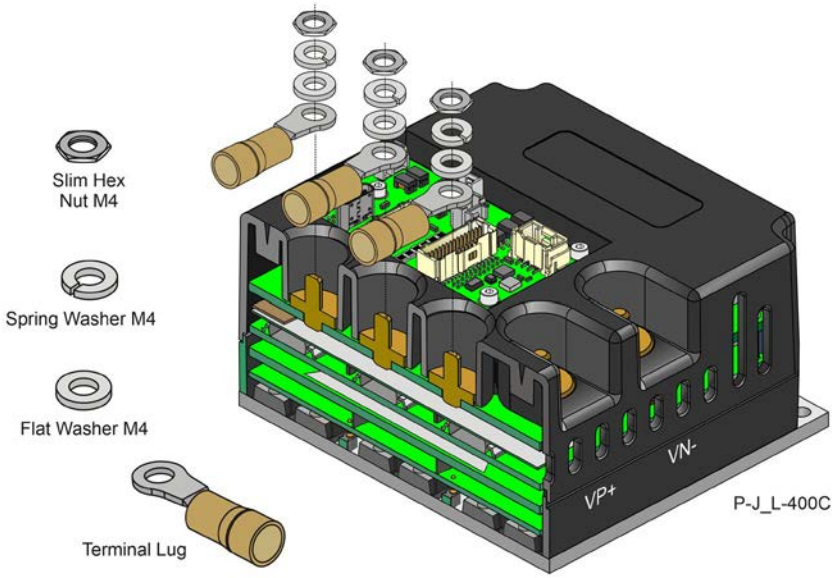
Step 2: Power and Motor Connection
PJOD Model - Insertion
Mount the M4 nut, spring washer and flat washer to the terminal lug power and motor positions, as shown below. 

Table 27: Connecting the Power and Motor Cables

8.4.2 Motor Power Connections

1. Ensure that the motor chassis is properly earthed.

2. Connect the appropriate terminal lugs from the Motor Power cables to the M1, M2, M3, and PE terminals on the Platinum Jori.

   The phase connection is arbitrary as Elmo Application Studio (EAS II) will establish the proper commutation automatically during setup. When tuning a number of drives, you can copy the setup file to the other drives and thus avoid tuning each drive separately. In this case the motor-phase order must be the same as on the first drive.

3. Install the recommended PE wire to the drive, using the recommended Terminal Lug (FLEX), M4 flat washer, M4 spring washer, and M4 screw. The required M4 torque is typically 1.0 Nm.
   For the **PJOR**:

   Install the motor cables to the drive using the recommended Terminal Lug (FLEX), M3 flat washer, M3 spring washer, and secure with an M3/6 head cup Allen screw (to the drive). The required M3/6 screw torque is typically 0.35 Nm.
   Make sure that the screws do not insert to the maximum depth of 5.0 mm as shown in Table 27 above.

   For the **PJOD**:

   Install the motor cables to the drive using the recommended Terminal Lug (FLEX), M4 flat washer, M4 spring washer, and secure with an M4 nut. The required M4 nut torque is typically 0.8 Nm.

4. For high EMI environment, it is highly recommended to use a 4-wire shielded (not twisted) cable for the motor connection. The gauge is determined by the actual RMS current consumption of the motor.
   Connect the cable shield to the closest ground connection at the motor end.

5. For better EMI performance, the shield should be connected to Earth Connection (heat sink mounting holes).

8.4.3 Motor Power

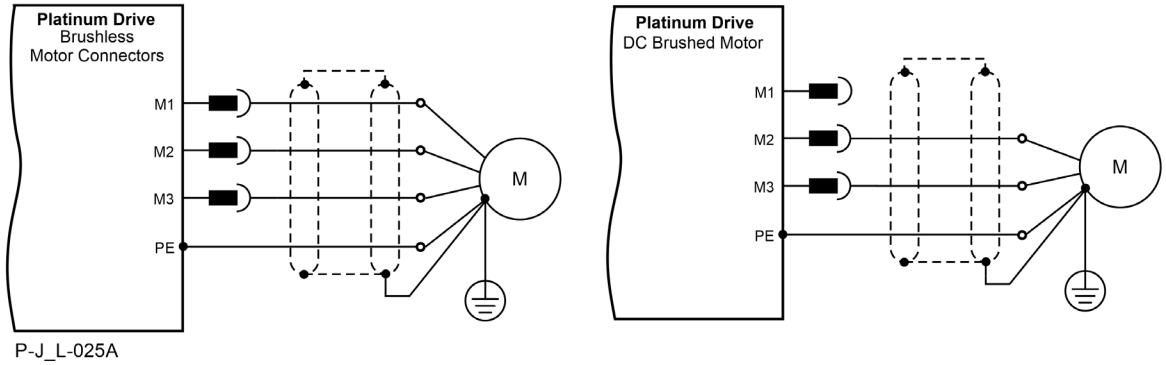


Figure 10: Brushless Motor Power and Brushed Motor Power Connection Diagram

Connect the motor power wires as shown in Figure 11. The green and yellow wire is the Grounding wire.

Make sure not to bundle the wires.

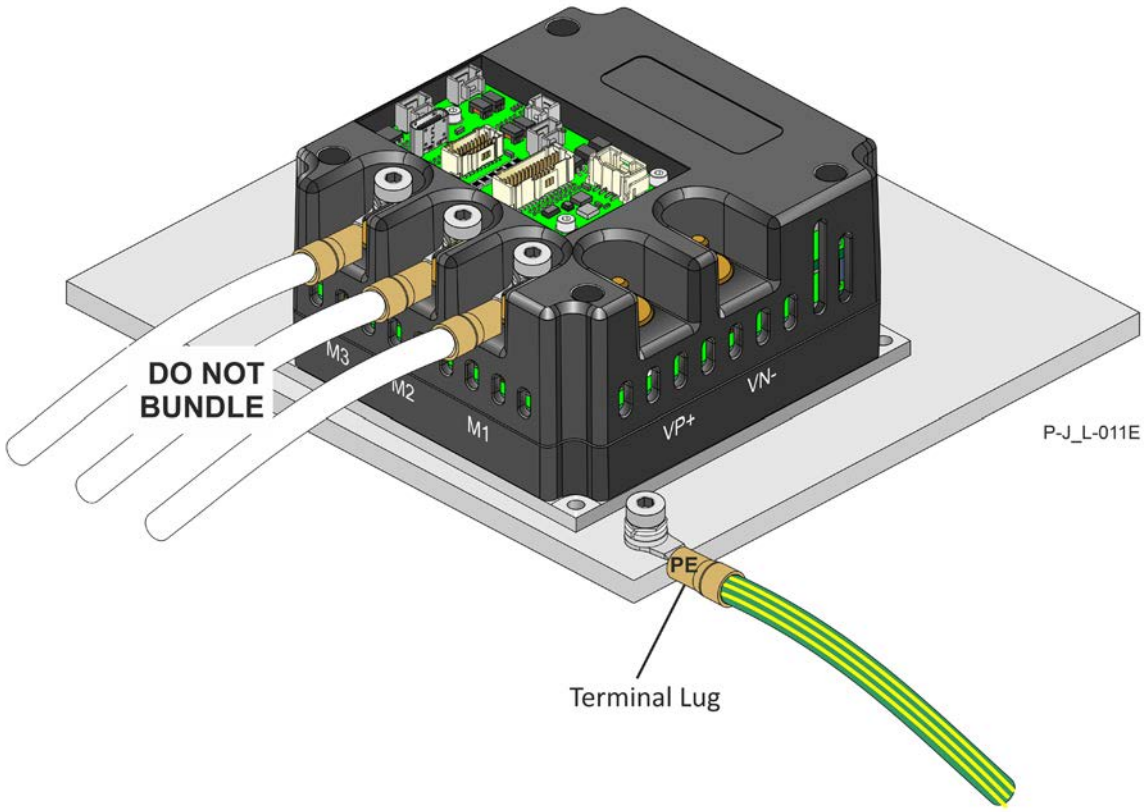


Figure 11: Connecting the Motor Power Wires

8.4.4 Main Power and Control Supply

The following sub-sections describe the Main Power and the Control supply connectors.

8.4.4.1 Main Supply

The DC power for the Platinum Jori is delivered from a separate rectifying unit (supplied by the user). Elmo recommends using the Tambourine rectifier specifically designed for use with Elmo drives which offers a range of versatile options.

The following sections contain topology recommendations for implementing three-phase supply chain.

The power stage of the Platinum Jori is fully isolated from the other sections of the Platinum Jori, such as the control-stage and the heat sink. **This isolation allows the user to connect the common of the control section to the PE, a connection that significantly contributes to proper functionality, safety, and EMI immunity, leading to better performance of the Platinum Jori**.

In addition, this isolation simplifies the requirements of the DC power supply that is used to power the DC bus of the Platinum Jori, by allowing it to operate with a non-isolated DC power source (a direct-to-mains connection) which eliminates the need for an isolation transformer.

However, as well as operating from a non-isolated/direct-to-mains DC power supply, the Platinum Jori can also operate from an isolated power supply or batteries.

When rectifying the AC voltage source, the AC voltage-level must be limited as follows:

Drive Model	AC voltage-level limit (VAC)	DC Maximum (VDC)
All models	528	747

Connect the DC power cable to the VP+ and VN- terminals as shown in Figure 12.

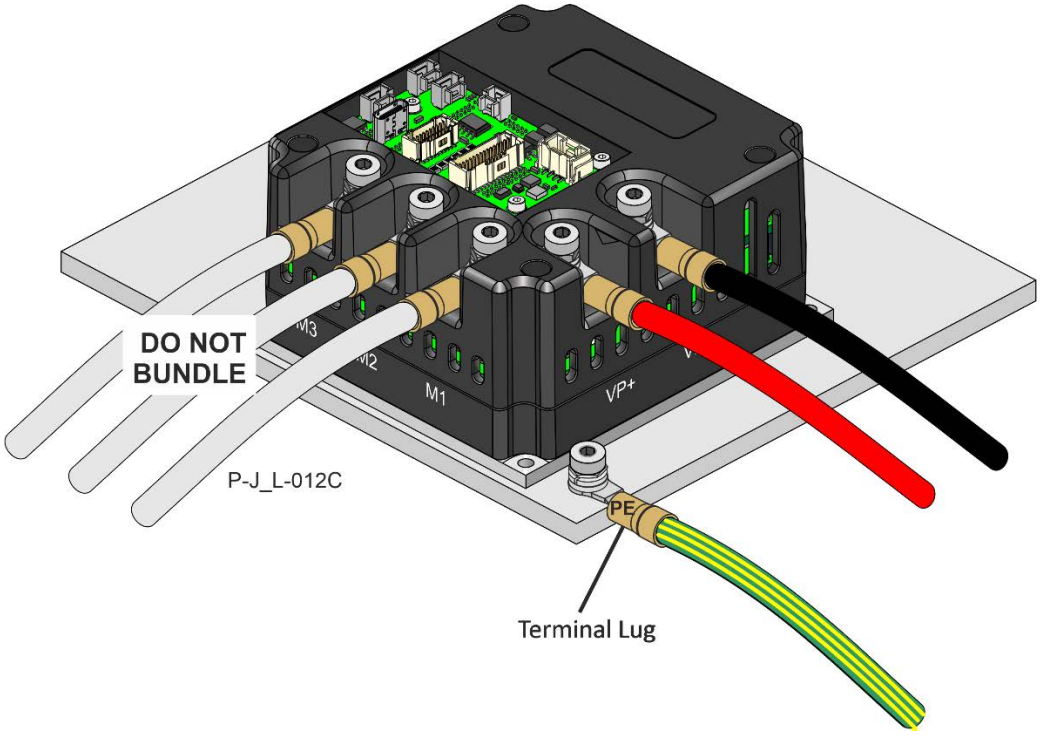


Figure 12: Connecting the Main Power Wires

8.4.4.2 Direct-to-Mains Power Source

This section relates to the configuration of the drive, which is connected directly to the mains.

To connect the non-isolated DC power supply:

1. For best immunity, it is highly recommended to use twisted cables for the DC power supply cable. A 3-wire shielded cable should be used. The gauge is determined by the actual current consumption of the motor.

2. Connect both ends of the cable shield to the closest ground connection, one end near the power supply and the other end to the PE terminal on the Platinum Jori's heat sink.
   Do not connect the VN- of the power supply to the ground connection in the power supply side. This connection is only for isolated connections.

3. Connect the appropriate terminal lugs from the DC Power Input cables to the VP, VN, and PE terminals on the Platinum Jori.
   For safety requirements, the green/yellow wire must be connected to the earth connection (PE terminal). Connect the Earth Connection wire to the PE terminal on the main power connector.

Caution For all the following non-isolated Topologies:

- Do not connect VN- to PE. **In a direct-to-mains connection the VN- must *not* be connected to the PE,** as this will cause irreparable damage to the system.
- Take care and note that in a direct-to-mains connection the Neutral point is *not* the most negative voltage level. It is the mid-point level of the rectified DC bus.

8.4.4.2.1 Three-Phase Direct-to-Mains Connection Topology

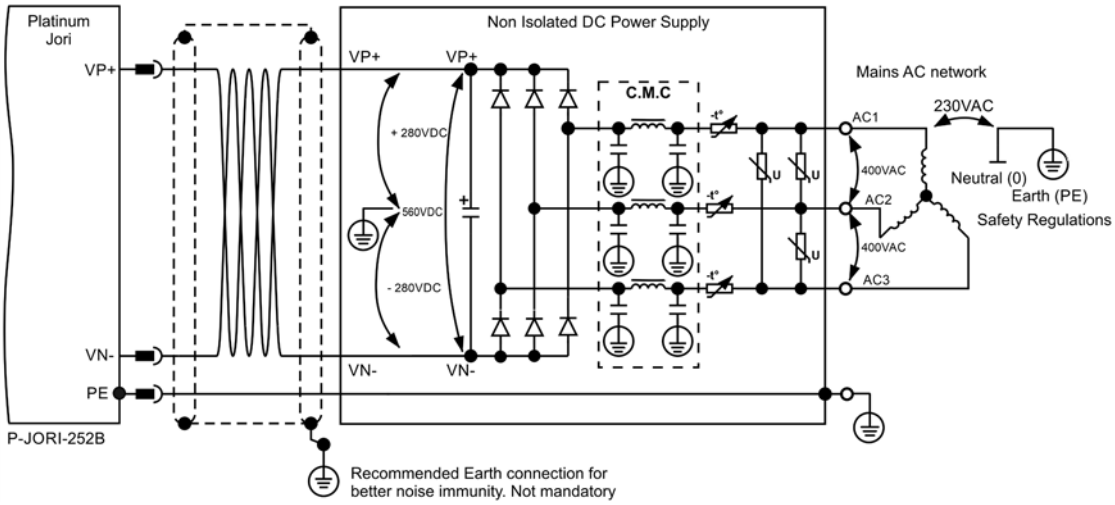


Figure 13: Non-Isolated Three-Phase Connection Topology

8.4.4.2.2 Single-Phase Direct-to-Mains Connection Topology

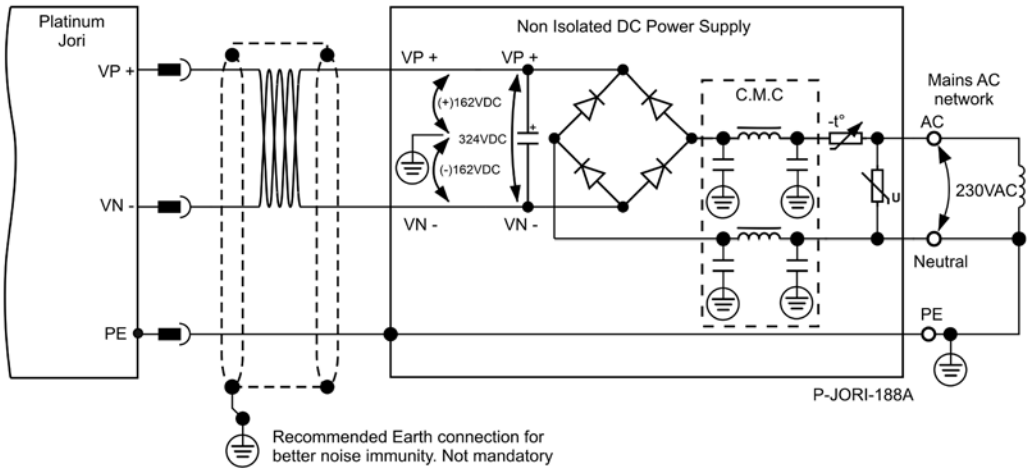


Figure 14: Non-Isolated Single-Phase Connection Topology

The Power Supply is connected directly to the mains AC line.

8.4.4.2.3 Multiple Connections Topology

In a multi-axis application, it is likely that a single power supply can feed several drives in parallel. The power supply is connected directly to the mains AC line which then feeds more than one drive.

This topology is efficient and cost saving, by reducing the number of power supplies and the amount of wiring. Most importantly it utilizes an energy sharing environment among all the drives that share the same DC bus network.

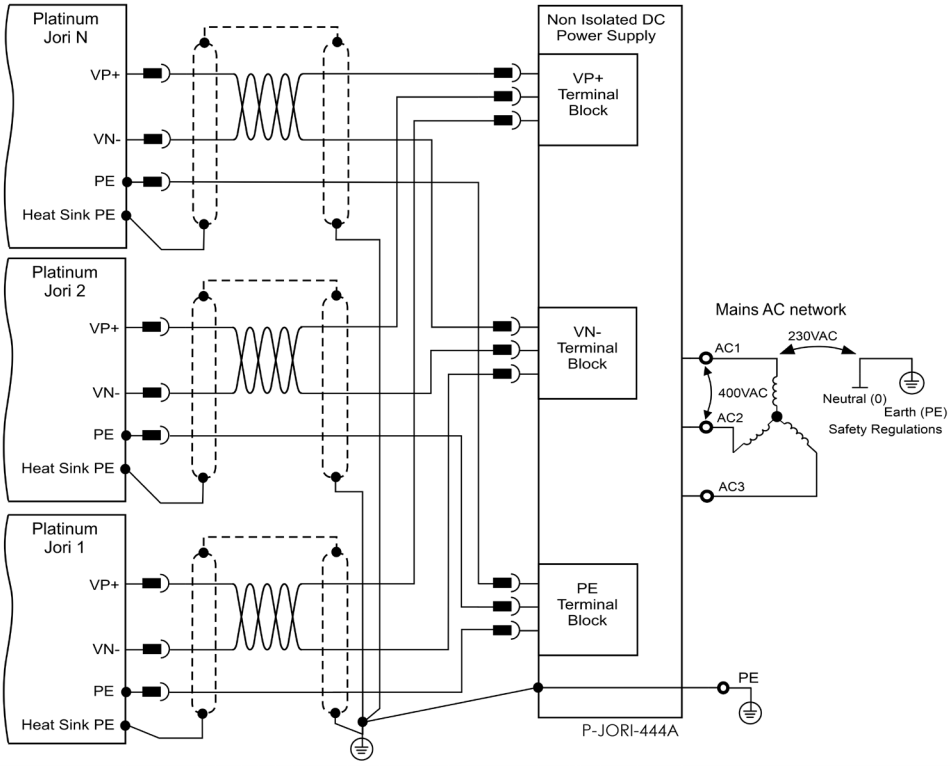


Figure 15: Non-Isolated Three-Phase Multiple Connection Topology

8.4.4.3 Battery Power Supply

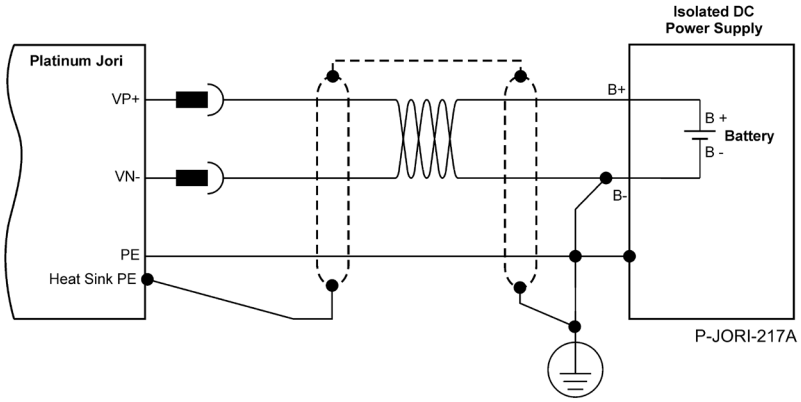


Figure 16: Battery Connection Topology

Caution:

When using batteries, it is recommended to connect the negative pole to the PE.

When doing so, the charger of the battery **must** be isolated from the mains by an isolation transformer.

8.4.4.4 Control Supply

To connect the VL+ and VL- to the control supply:

1. The source of the control supply must be isolated from the Mains.
2. For safety reasons, connect the return (common) of the control supply source to the closest earth connection near the control supply source.
3. Connect the cable shield to the closest earth connection near the control supply source.
4. Before applying power, verify the polarity of the connection.

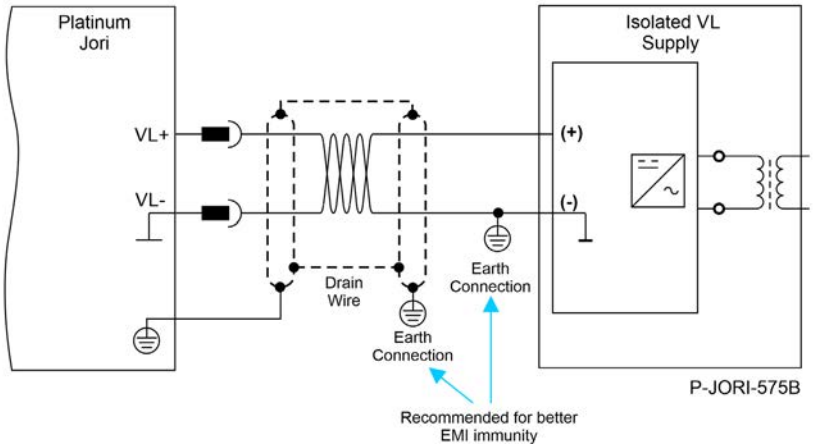


Figure 17: 24 VDC Control Supply VL Connection Diagram

8.5 Feedback

Refer to Chapter 13 Feedback, in the Platinum Safety Drive Manual for details, specification, and connections of the Feedback for safety.

8.5.1 Feedback Port A

Port A supports the following sensor inputs as described in the table below:

- Incremental Encoder or absolute serial Encoder
- Differential pulse-width modulation (PWM) signal input
- Differential Pulse & Direction signal inputs

Pin # (C2) for Port A		Incremental Encoder	Absolute Serial Encoder
	Signal	**Function**	**Function**
1	PortA_A+	Channel A +	Absolute encoder clock+
3	PortA_A-	Channel A -	Absolute encoder clock-
5	PortA_B+	Channel B+	Absolute encoder data+
7	PortA_B-	Channel B -	Absolute encoder data -
9	PortA_INDEX+	Channel Index+	
11	PortA_INDEX-	Channel Index-	
19	+5VE	Encoder +5V supply with a total allowable maximum consumption of 400mA	
26	+11V	Encoder +11V supply with a total allowable maximum consumption of 300mA for IO style W, S or T	
	+5VE	Encoder +5V supply with a total allowable maximum consumption of 400mA for IO style U or V	
21, 23, 25, 27, 28	COMRET	Common return	

Table 28: Feedback Port A pinouts (C2)

8.5.1.1 Incremental Encoder

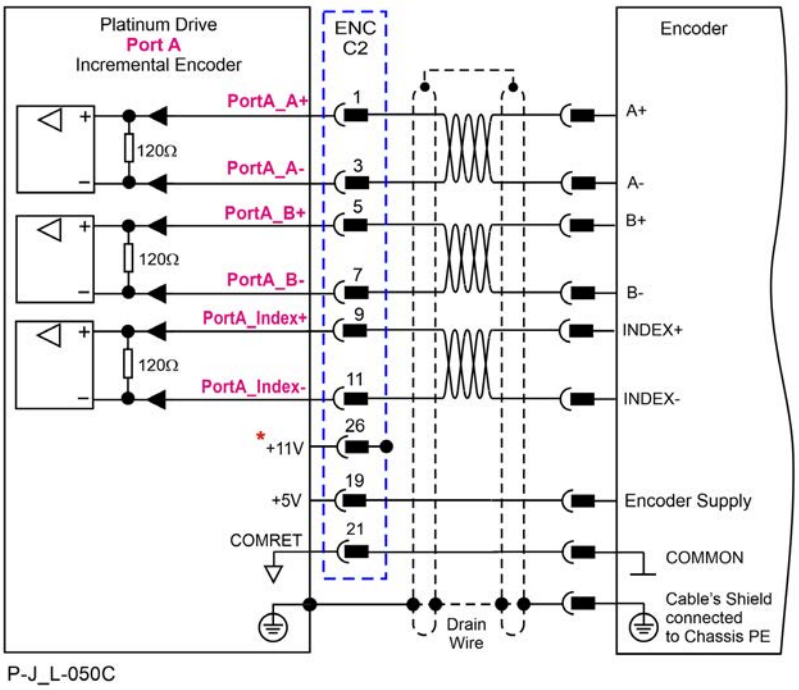


Figure 18: Port A Incremental Encoder Input – Recommended Connection Diagram

Note: * **IO Style W, S, or T provide 11 V to support the Encoder.**

8.5.1.2 Absolute Serial Encoder

The following Absolute Encoder types are supported:

- EnDat 2.2, Safe EnDat 2.2
- Biss C and Biss B
- SSI
- Hiperface

The following is the diagram connection of the EnDat, Biss, SSI:

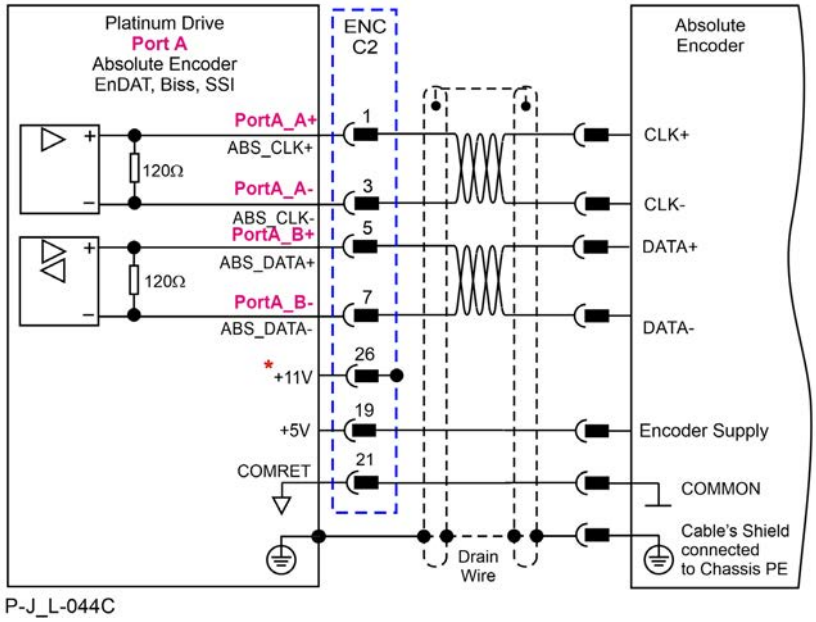


Figure 19: **Absolute Serial Encoder – Recommended Connection Diagram for Endat, Biss, SSI**

Note: * **IO Style W, S, or T provide 11 V to support the Encoder.**

8.5.1.3 Hiperface (Available for Safety Capability F)

The following figure describes the connection diagram.

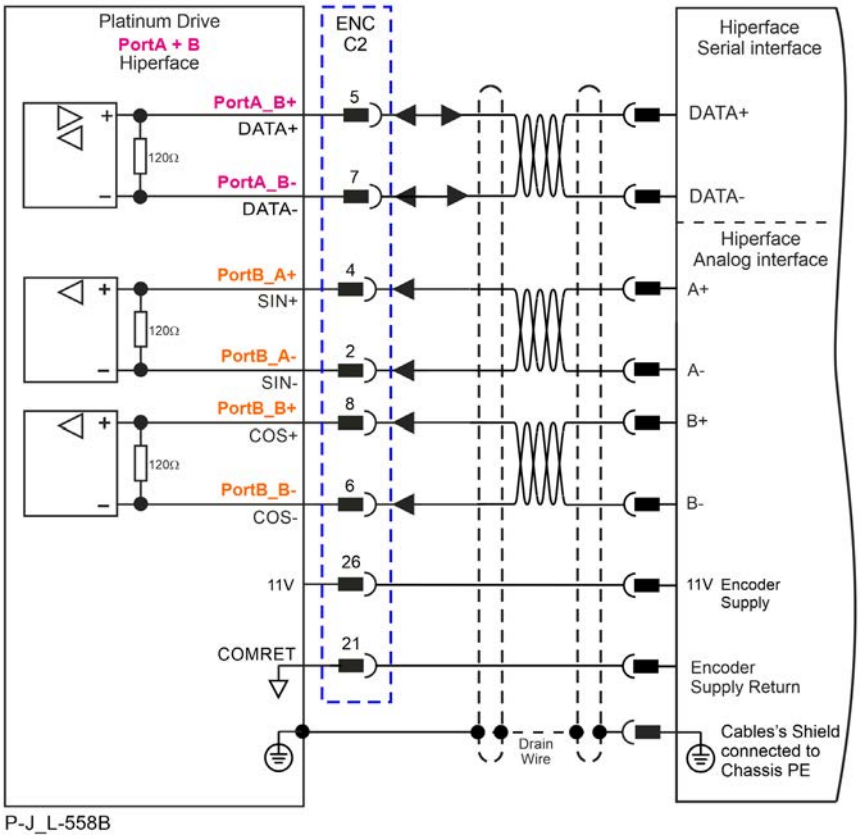


Figure 20: Absolute Serial Encoder – Recommended Connection Diagram for Hiperface – Safe IO

8.5.2 Feedback Port B

Port B supports any of the following sensors described in the table:

- Incremental Encoder, interpolated analog Encoder, ***or***
- Resolver (separate hardware option)

Pin # (C2) for Port B		Incremental Encoder	Interpolated Analog Encoder	Resolver
	Signal	**Function**	**Function**	**Function**
		PJOz-Sz-XX/YYYzEz		PJOz-Sz-XX/YYYzRz
2	PortB_A-	Channel A -	Sine-	Sine-
4	PortB_A+	Channel A+	Sine+	Sine+
6	PortB_B-	Channel B-	Cosine-	Cosine-
8	PortB_B+	Channel B+	Cosine+	Cosine+
10	PortB_INDEX-	Channel_Index-	Analog_Index-	Resolver Reference-
12	PortB_INDEX+	Channel_Index+	Analog_Index+	Resolver Reference+
19	+5V	Encoder +5V supply with a total allowable maximum consumption of 400mA		
26	+11V	Encoder +11V supply with a total allowable maximum consumption of 300mA for IO style W, S or T		
	+5V	Encoder +5V supply with a total allowable maximum consumption of 400mA for IO style U or V		
21, 23, 25, 27, 28	COMRET	Common return		

Table 29: Port B pinouts (C2)

8.5.2.1 Incremental Encoder

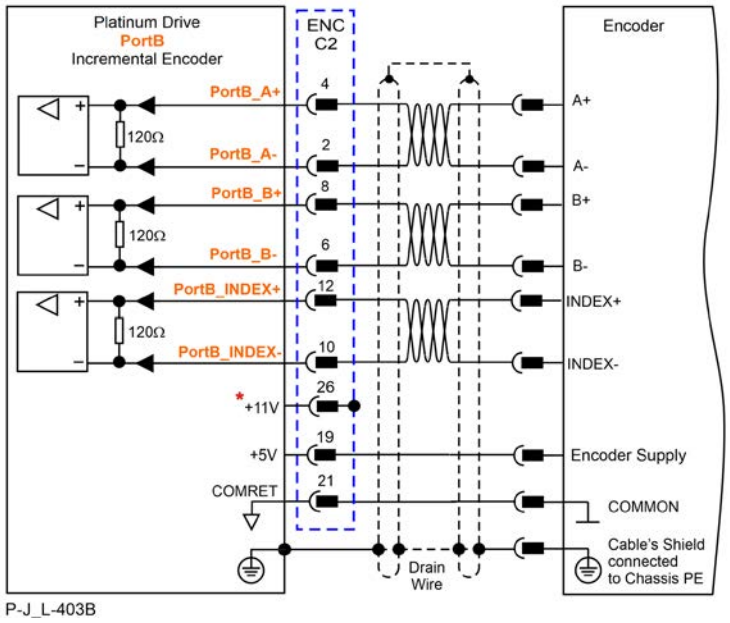


Figure 21: Port B Incremental Encoder Input – Recommended Connection Diagram

Note: * **IO Style W, S, or T provide 11 V to support the Encoder.**

8.5.2.2 Interpolated Analog (Sine/Cosine) Encoder

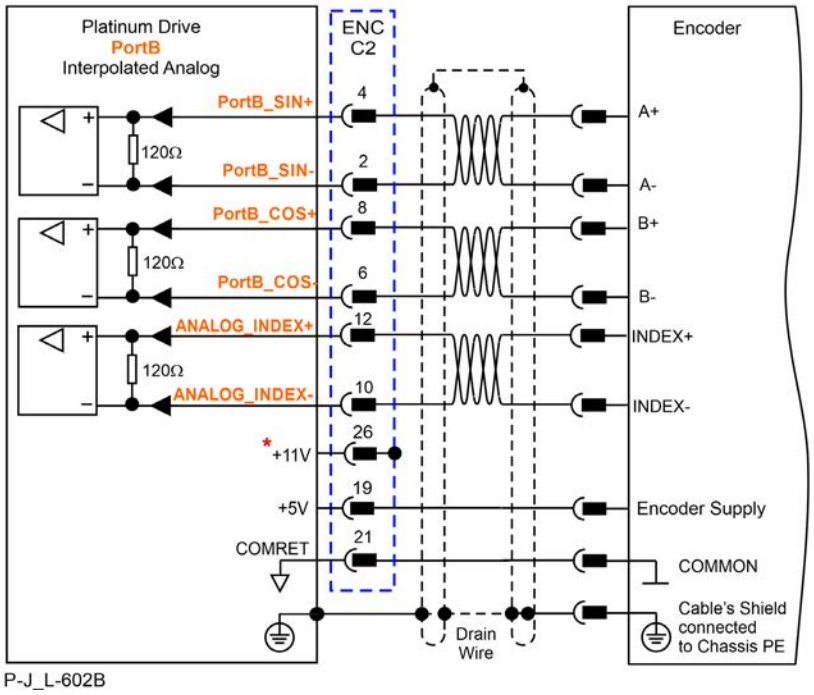


Figure 22: Port B - Interpolated Analog Encoder Connection Diagram

Note: * **IO Style W, S, or T provide 11 V to support the Encoder.**

8.5.2.3 Resolver

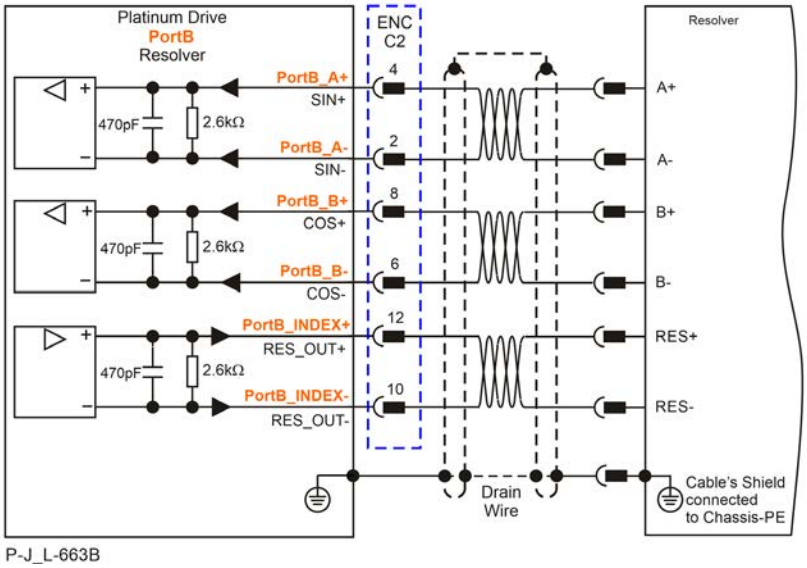


Figure 23: Port B – Resolver Connection Diagram

8.5.3 Feedback Port C

Port C provides the following as described in the table below:

- Incremental Encoder feedback
- Absolute Serial Encoder feedback
- Emulated Encoder output derived from port A, port B feedback inputs, or from internal variables

Pin (FDB Connector) Port C		Incremental Encoder	Absolute Serial Encoder	Emulated Encoder
Signal		**Function**	**Function**	**Function**
14	PORTC_A-	Channel A-	Absolute encoder clock-	Emulated Output A-
16	PORTC_A+	Channel A+	Absolute encoder clock+	Emulated Output A+
18	PORTC_B-	Channel B-	Absolute encoder data -	Emulated Output B- / DATADSL-
20	PORTC_B+	Channel B+	Absolute encoder data+	Emulated Output B+ / DATADSL+
22	PORTC_INDEX-	Channel Index -	Reserved	Emulated Output Index-
24	PORTC_INDEX+	Channel Index+	Reserved	Emulated Output Index+
19	+5V	Encoder +5V supply with a total allowable maximum consumption of 400mA		
26	+11V	Encoder +11V supply with a total allowable maximum consumption of 300mA for IO style W, S or T		
	+5V	Encoder +5V supply with a total allowable maximum consumption of 400mA for IO style U or V		
21, 23, 25, 27, 28	COMRET	Common return		

Table 30: Port C pinouts (C2)

8.5.3.1 Incremental Encoder

The following Incremental Encoder types are supported:

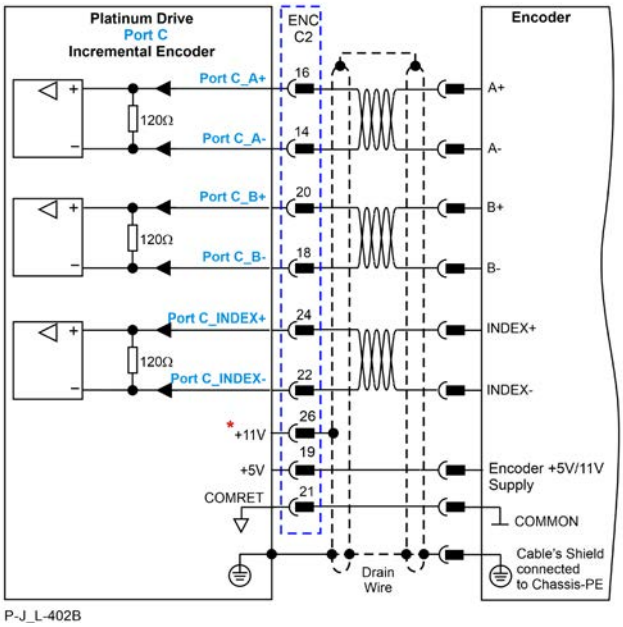


Figure 24: Port C Incremental Encoder Input – Recommended Connection Diagram

Note: * IO Style W, S, or T provide 11 V to support the Encoder.

8.5.3.2 Absolute Serial Encoder

Port C supports three types of encoder wire connections:

- Encoder 6-Wires
- Encoder 4-Wires
- Encoder 2-Wires

8.5.3.2.1 Encoder 6-Wires

The following encoders are supported (Encoder Option E):

- EnDat 2.2, Safe EnDat 2.2
- Biss C and Biss B, Safe BISS
- SSI

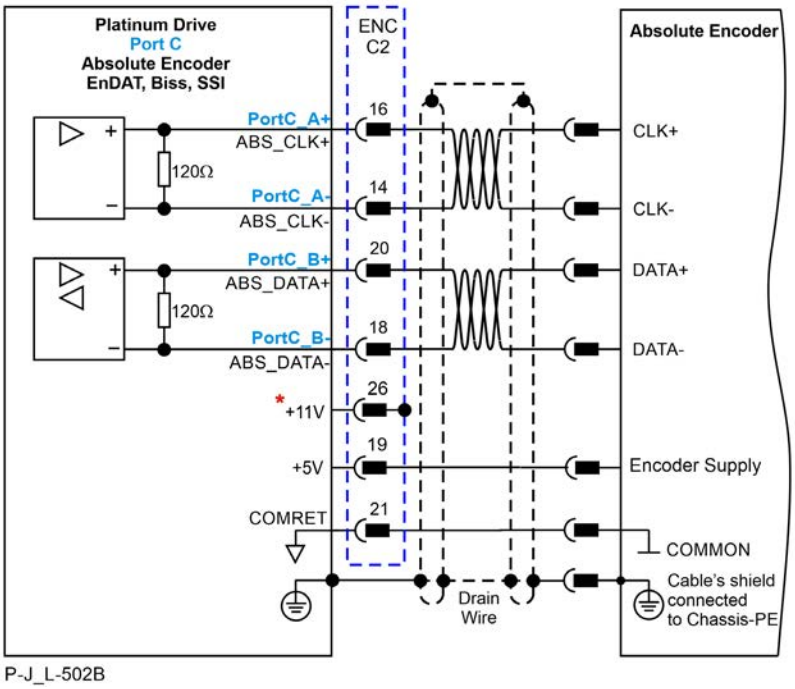


Figure 25: Absolute Serial Encoder– 6-Wires Connection Diagram Example

***Note: IO Style W, S, or T provide 11 V to support the Encoder.**

8.5.3.2.2 Encoder 4-Wires

The following encoders are supported:

- Panasonic (Encoder Option E)
- Tamagawa (Encoder Option E)
- Sanyo-Danki (Encoder Option E)
- Acuro Link (Safety Capability F and Encoder Option 1)
- SCS (Safety Capability F and Encoder Option 2)

The following is the feedback connection diagram:

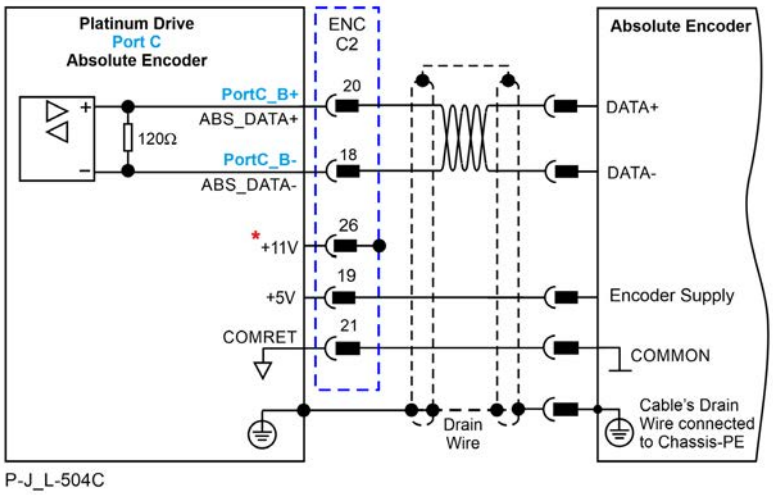


Figure 26: Absolute Serial Encoder – 4-Wires Connection Diagram Example

Note: * **IO Style W, S, or T provide 11 V to support the Encoder.**

8.5.3.2.3 Encoder 2-Wires

The following encoders are supported:

- Endat3, Safe Endat3 (Safety Capability F and Encoder Option H)
- SCS Open link (Safety Capability F and Encoder Option 3)
- Hiperface DSL (Safety Capability F and Encoder Option 4)

The following is the feedback connection diagram:

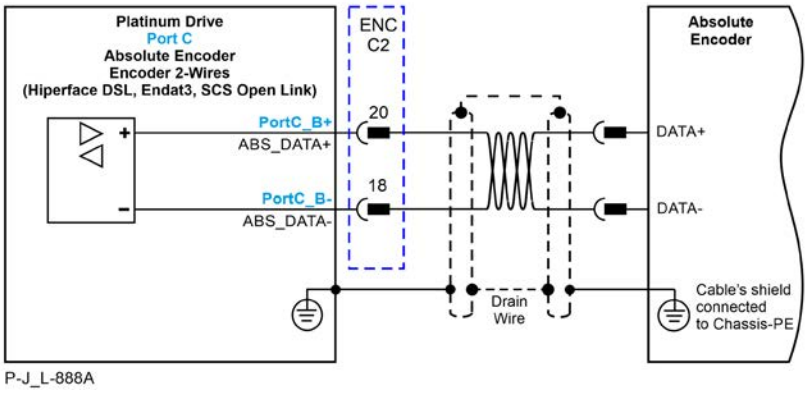


Figure 27: Absolute Serial Encoder – 2-Wires Connection Diagram Example

8.5.3.3 Emulated Encoder Output

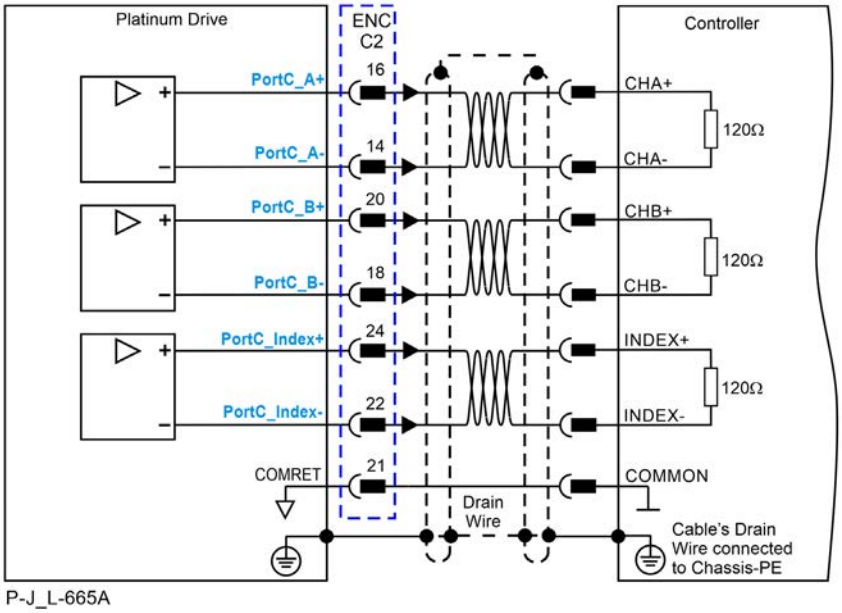


Figure 28: Emulated Encoder Differential Output – Recommended Connection Diagram

8.5.4 Feedback - Hall Sensors

Pin # (C2)	Signal	Function (Incremental Encoder)
13	HALL A	Hall Sensor: Channel A
15	HALL B	Hall Sensor: Channel B
17	HALL C	Hall Sensor: Channel C
19	+5V	Encoder +5V supply with a total allowable maximum consumption of 400mA
26	+11V	Encoder +11V supply with a total allowable maximum consumption of 300mA for IO style W, S or T
	+5V	Encoder +5V supply with a total allowable maximum consumption of 400mA for IO style U or V
21, 23, 25, 27, 28	COMRET	Common return

Table 31: Hall Sensor pinouts (C2)

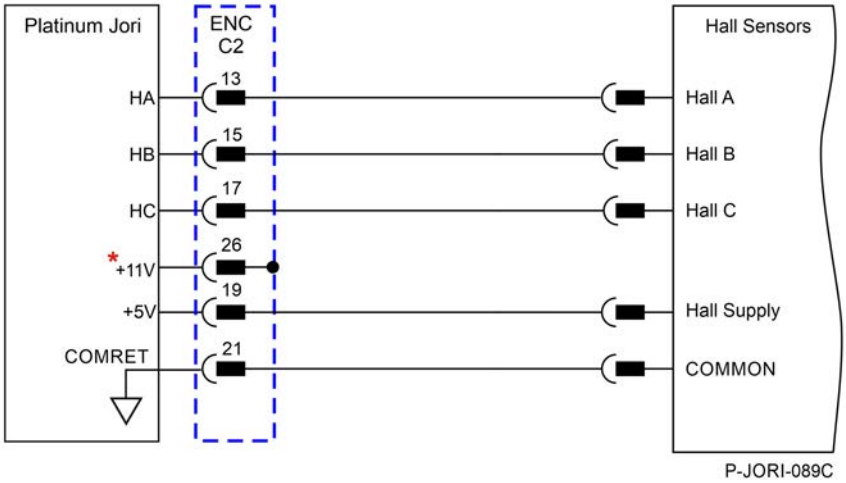


Figure 29: Hall Sensors Connection Diagram

Note: * **IO Style W, S, or T provide 11 V to support the Encoder.**

8.6 Safe Digital I/Os

Refer to the Chapter 14 Safe Digital IO section, in the Platinum Safety Drive Manual for details, specification and connection of IO for Safety.

8.6.1 Digital Input with Test Pulse

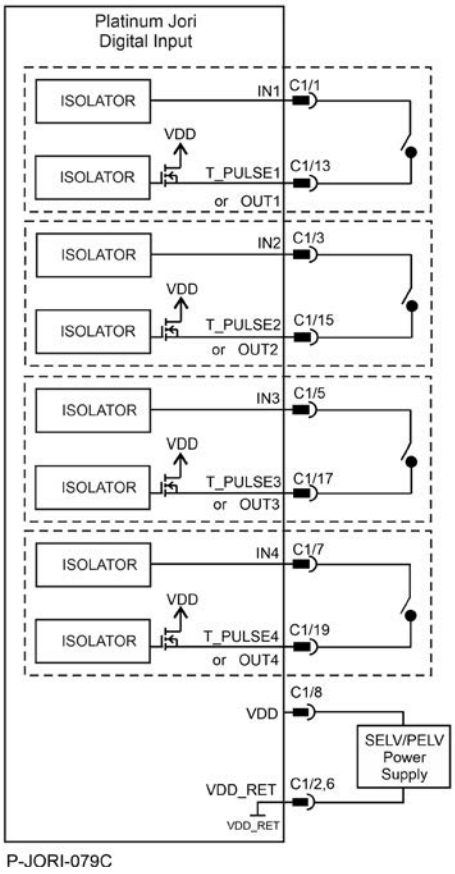


Figure 30: Digital Input with Test Pulse

8.6.2 OSSD Digital Input

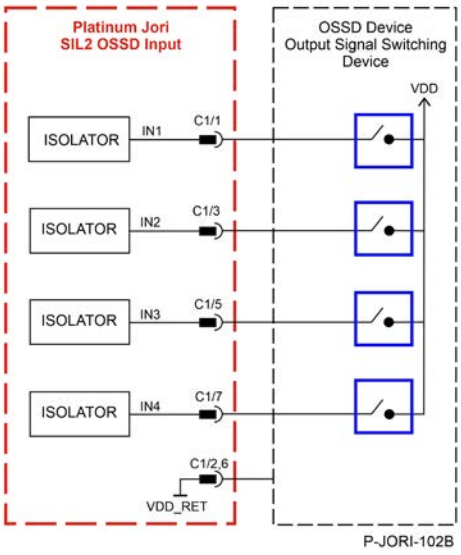


Figure 31: OSSD Digital Input

8.6.3 Digital Output W Configuration

The Platinum servo drive provides the configuration of the VDD connection as shown in the Catalog Number:

W — VDD, All Outputs:

Important:
When the OUT3 is used as Safe OUTPUT, the user must connect the IN5 to OUT3 externally.
When the OUT4 is used as Safe OUTPUT, The user must connect the IN6 to OUT4 externally.

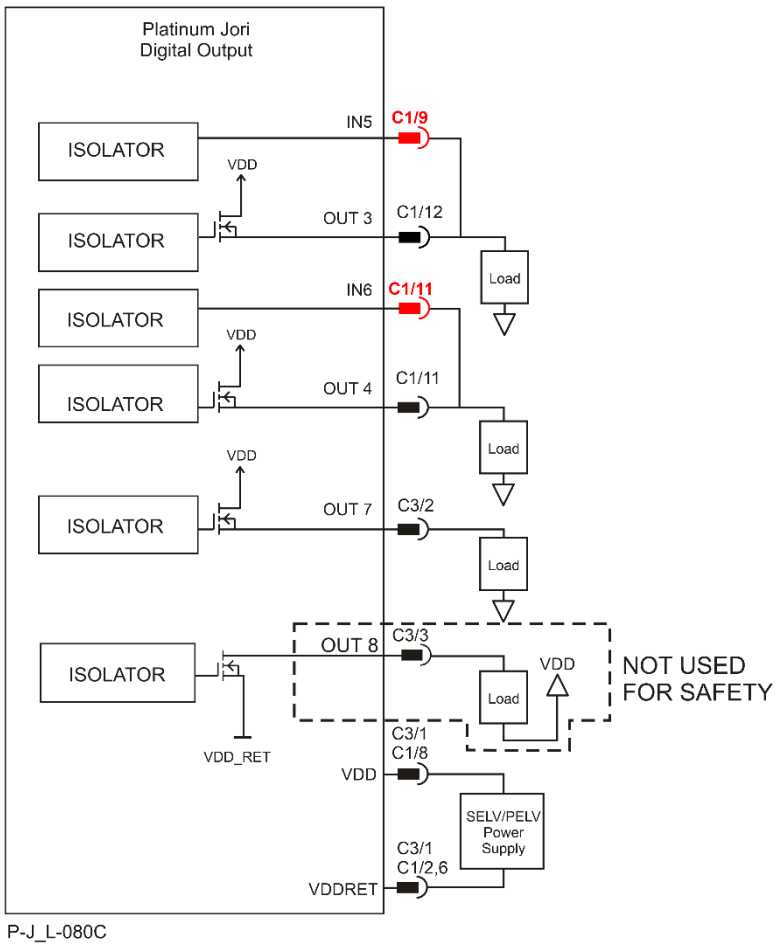


Figure 32: Digital Outputs for Option W Configuration

Note: The VDD Supply for D_{OUT7} and D_{OUT8} is from the C3 connector.

8.7 Regular Digital I/Os

Refer to the Chapter 15 Regular Digital IO section, in the Platinum Safety Drive Manual for specification details of the Regular IO connections.

8.7.1 Digital IO 5V Logic (IO Type: U or T)

The following figures describe the connections at the I/O Port for the Digital Input and Output 5V Logic.

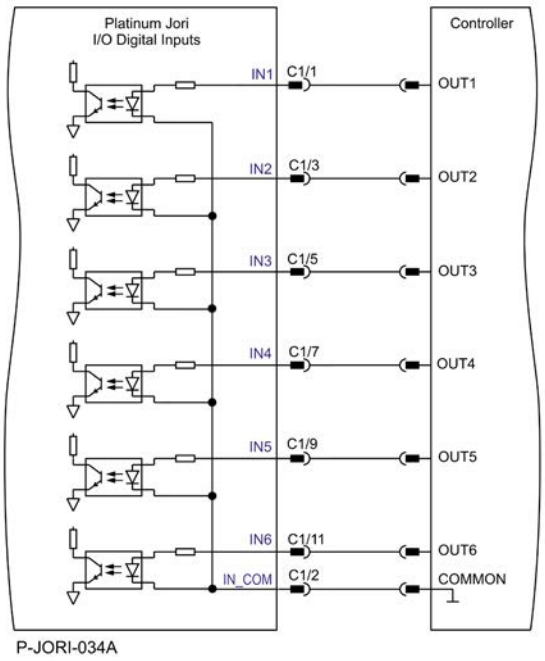


Figure 33: Regular Digital Input 5V Logic Connection Diagram

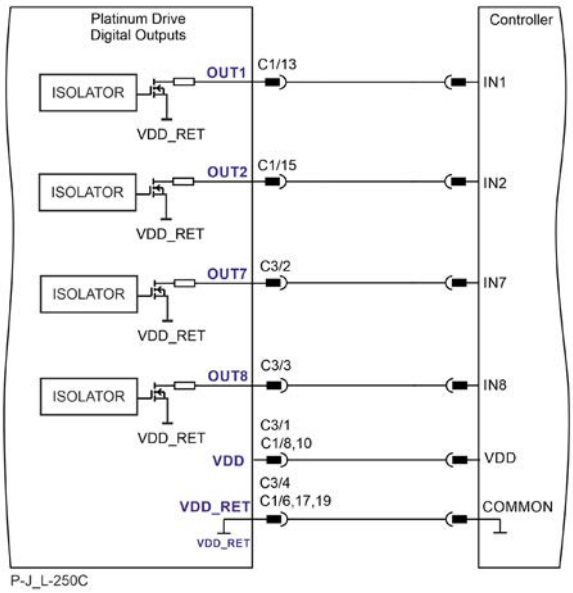


Figure 34: Regular Digital Output Connection Diagram – 5V Logic Option

8.7.2 Digital IO PLC Source and Sink Mode (IO Type: V or S)

8.7.2.1 Digital Input and Output PLC Source Mode

The following figures describe the connections at the I/O Port for the Digital Input and Output PLC Mode.

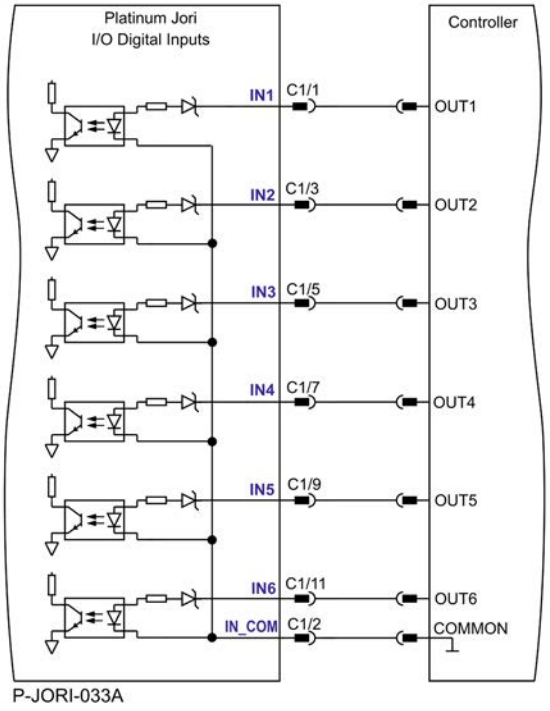


Figure 35: Regular Digital Input Connection Diagram – PLC Source Option

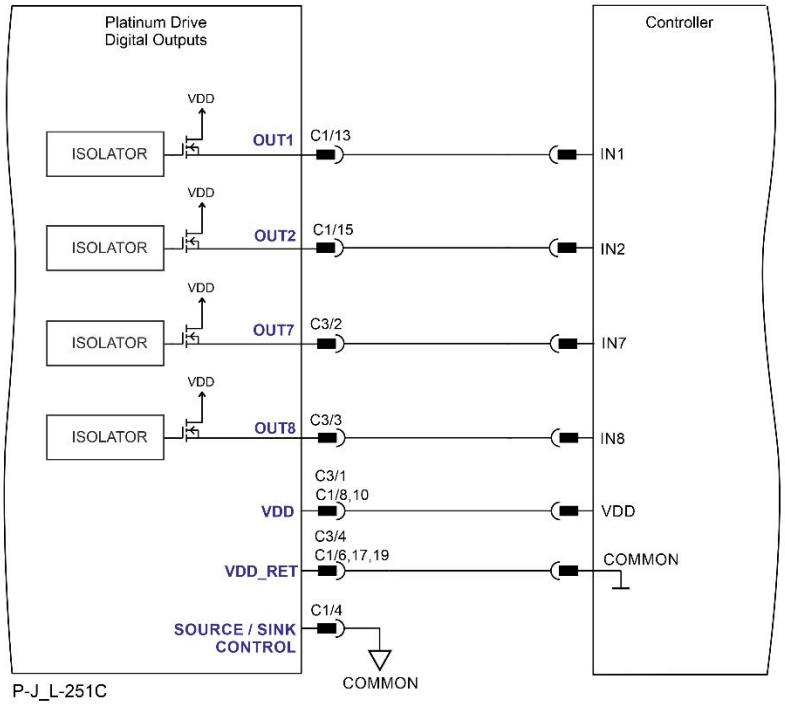


Figure 36: Regular Digital Output Connection Diagram – PLC Source Option

Note: The VDD Supply for D_{OUT7} and D_{OUT8} is from the C3 connector.

8.7.2.2 Digital Input and Output PLC Sink Mode

The following figures describe the connections at the I/O Port for the Digital Input and Output PLC Sink Mode.

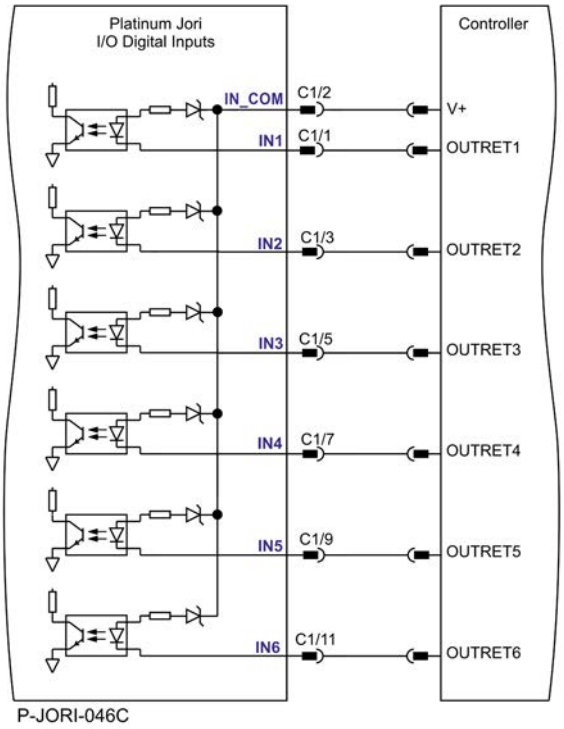
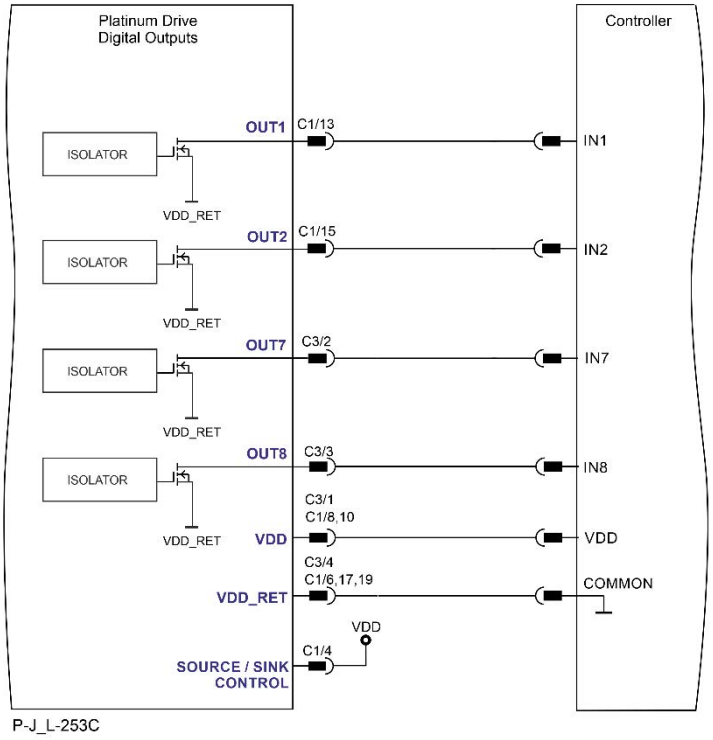


Figure 37: Regular Digital Input Connection Diagram – PLC Sink Option



Regular Digital Output Connection Diagram – PLC Sink Option

Note: The VDD Supply for D_{OUT7} and D_{OUT8} is from the C3 connector.

8.8 STO (Safe Torque Off)

Refer to the section 16.5 Safe Torque Off (STO) in the Platinum Safety Drive Manual for details, specification and connection of the STO.

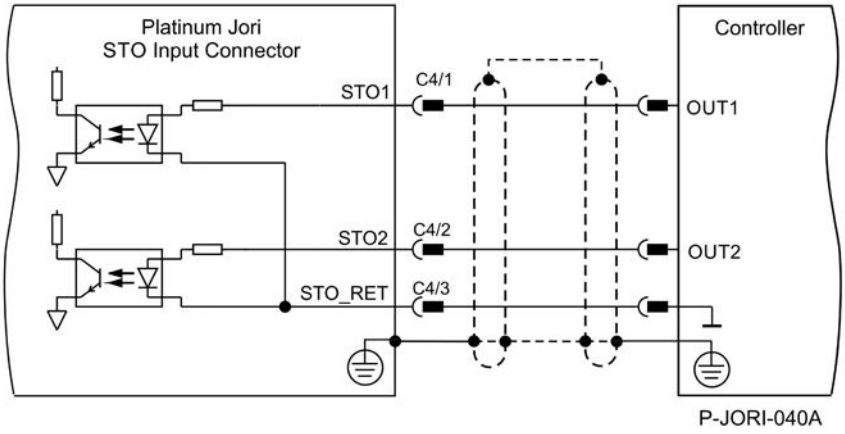


Figure 38: STO Input Connection – 5V Logic Level

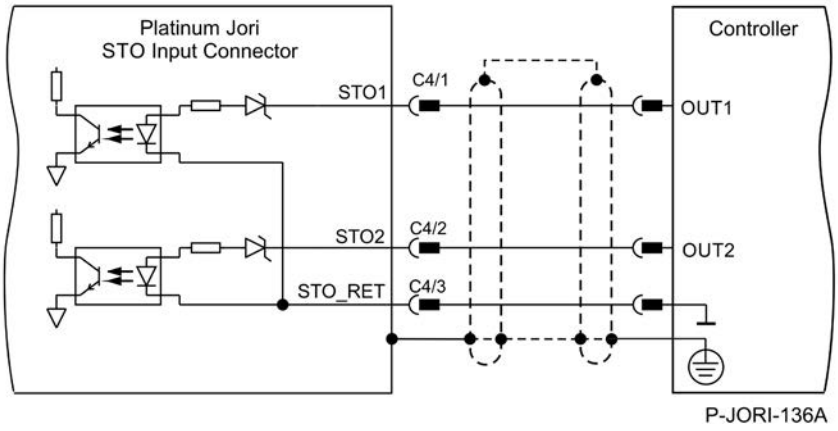


Figure 39: STO Input Connection – PLC Source

8.9 Analog Inputs

There are two types of Analog Input in the Platinum Jori:

- Analog Input 1 – Differential ±10 V
- Analog Input 2 – Single Ended ±10 V

Refer to the section 16.8 Analog Input in the Platinum Safety Drive Manual for details, specification and connection of the Analog Input.

Figure 40 describes the input interface of the Analog input 1 in the Platinum Jori:

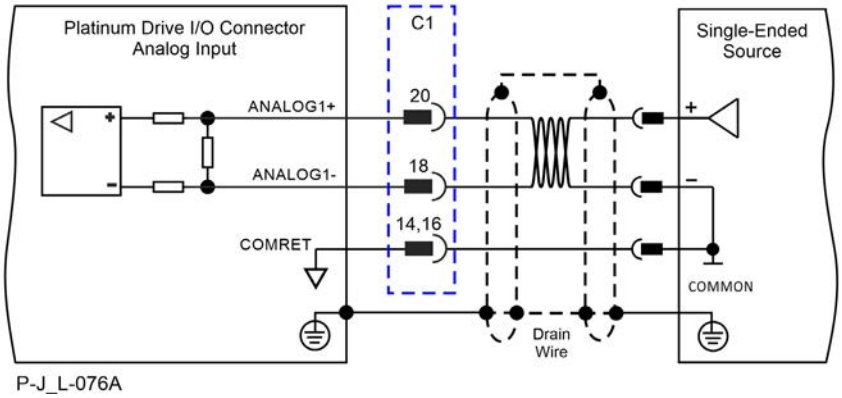


Figure 40: Analog Input 1

Figure 41 describes the input interface of the Analog input 2 in the Platinum Jori:

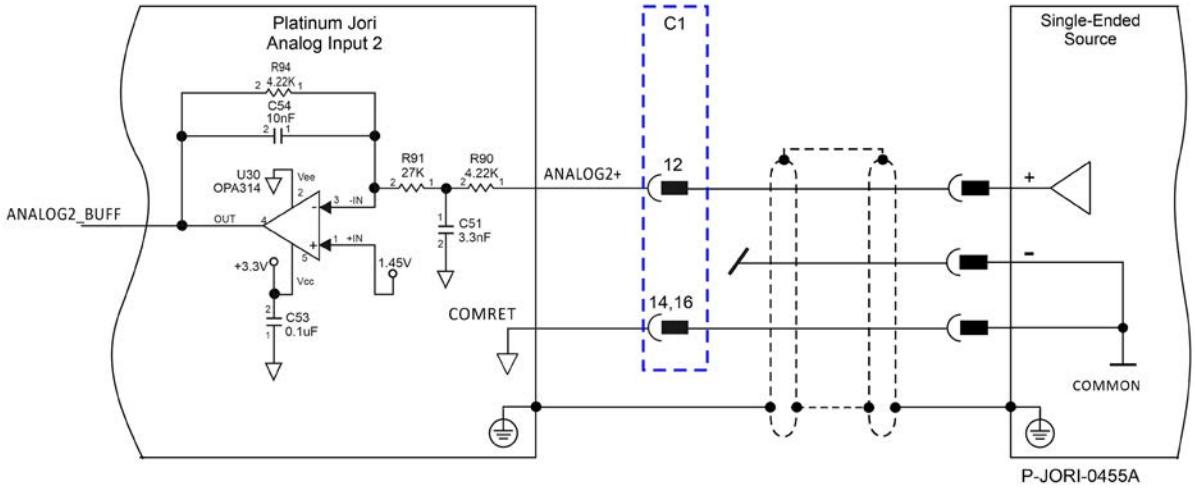


Figure 41: Analog Input 2

8.10 Communication

8.10.1 USB 2.0

Refer to section 16.10.1 USB in the Platinum Safety Drive Manual for details, specification and connection of the USB.

Use a standard USB 2.0 Type C cable and connector to connect the USB. Refer to section 15.1 in the Platinum Safety Drive Manual.

8.10.2 EtherCAT/Ethernet

This section describes the EtherCAT communication, and the pinout drawing of the connector.

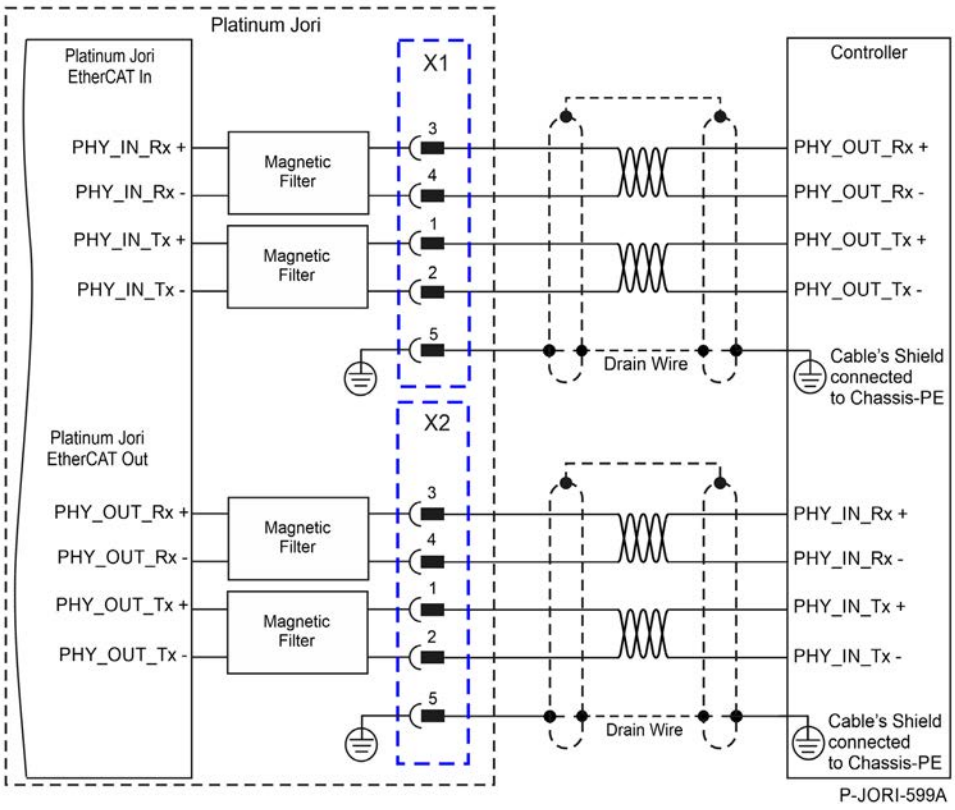


Figure 42: EtherCAT Connection Schematic Diagram

8.10.2.1 EtherCAT Status Indicator

Figure 43 describes the Pin associated with the EtherCAT status indicator.

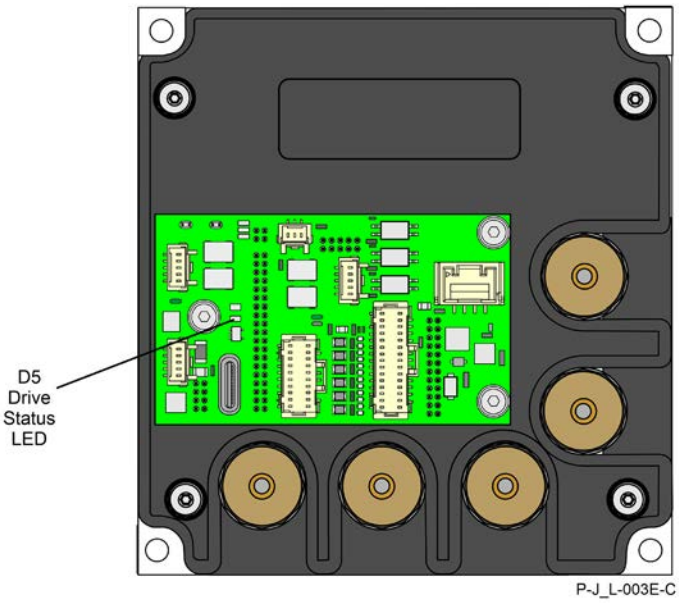


Figure 43: EtherCAT Status Indicator LED

The EtherCAT status indicator is a single red/green dual bi-colored LED that combines the green RUN indicator and the red ERROR indicator of the EtherCAT state machine. For further details, see the EtherCAT Application Manual.

8.10.2.2 EtherCAT Link Indicators

Each of the EtherCAT Ports has an EtherCAT Link In and EtherCAT Link Out LED (respectively), which are shown in Figure 44.

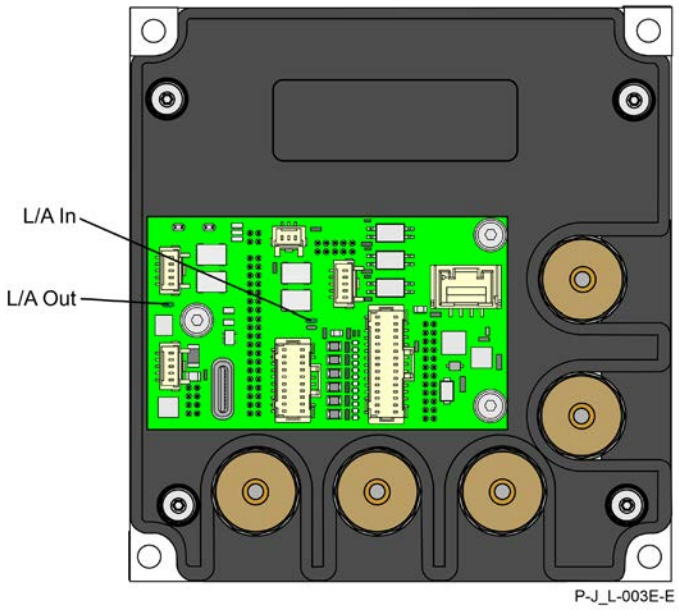


Figure 44: EtherCAT Link In and Out LEDs

The green LEDs are the link/activity indicators. They show the state of the applicable physical link and the activity on that link; blinking green, for both Link Act IN, and Link Act OUT.

8.10.3 CAN

Note:
It should be noted that all signals are isolated.

For full details on CANopen communication, see section 14.3 in the MAN-G-Board Level Modules Hardware manual.

8.10.3.1 CAN Schematic Connections – Interface

The Platinum Jori includes the CAN transceiver, common mode choke, and a CAN Bus Protector against ESD and other harmful transient voltage events.

The following signals describe how to connect CAN to the external connector.

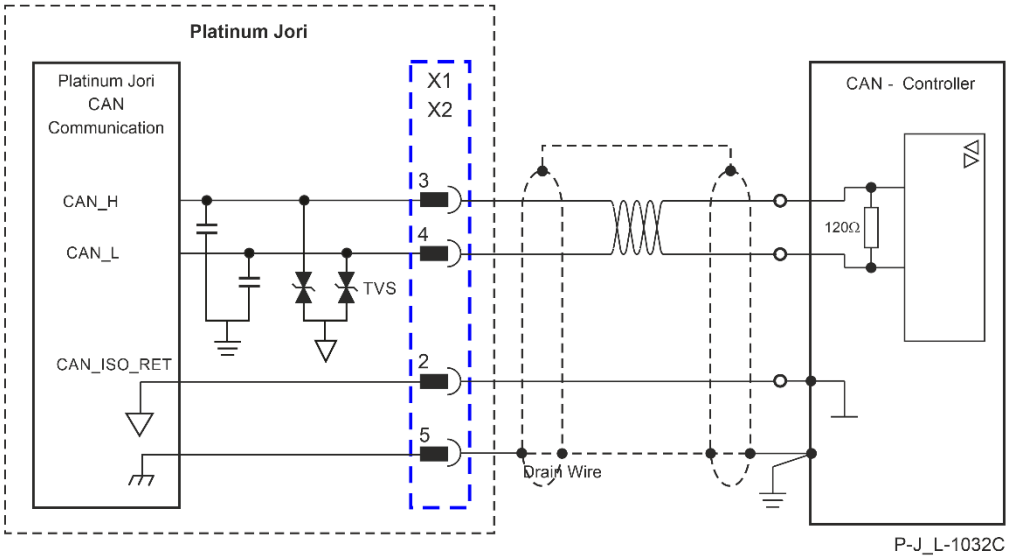


Figure 45: CAN Interface [update drawing!]

8.10.4 RS-232 and RS-422

8.10.4.1 Isolated RS-232 Serial Communication

Figure 46 describes the Isolated RS-232 connection diagram.

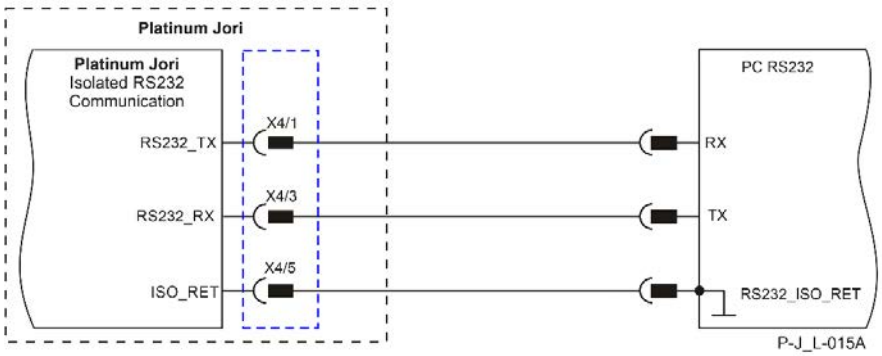


Figure 46: Isolated RS-232 Connection Diagram

8.10.4.2 Isolated RS-422 (Differential RS-232) Serial Communication

The following describes the RS-422 specification.

Specification	Details
Physical layer	Differential RS-232 Full duplex, serial communication
Interface	RS-422
Termination	120 Ohm It is required to connect termination of 120 ohm in the end of the TX signals (refer to the figure below)
Speed	Baud Rate of 0.0048 to 3.60 Mbps
Protocols	For setup and control

Table 32: RS-422 Specification

Figure 47 describes the Isolated RS-422 (Differential RS-232) Serial Communication diagram:

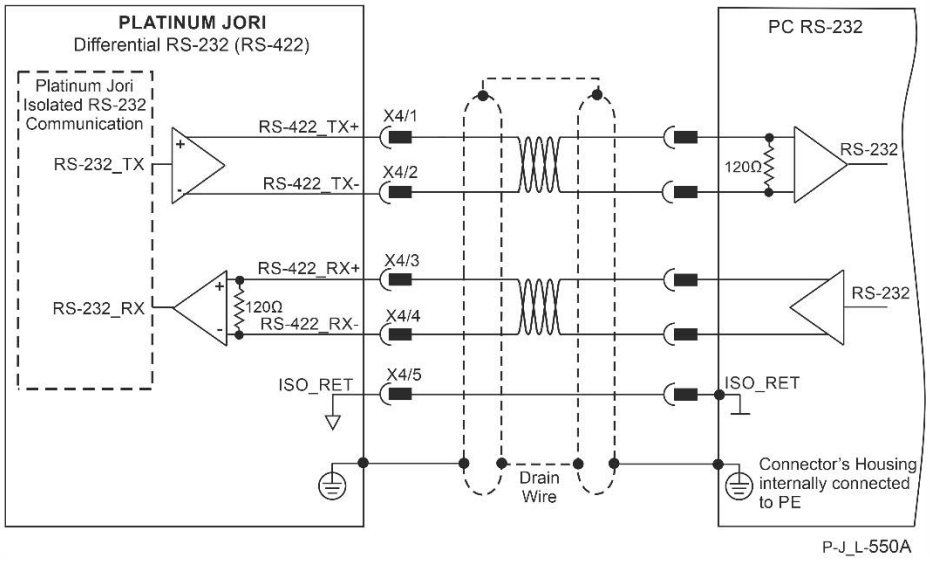


Figure 47: RS-422 Connection Diagram

Chapter 9: Powering Up

After the Platinum Jori is connected to its device, it is ready to be powered up.

Caution:
Before applying power, ensure that the DC supply is within the specified range and that the proper plus-minus connections are in order.

9.1 Initializing the System

After the Platinum Jori has been connected and mounted, the system must be set up and initialized. This is accomplished using the *EASII*, Elmo's Windows-based software application. Install the application and then perform setup and initialization according to the directions in the *EASII User Manual*.

9.2 Heat Dissipation

The best way to dissipate heat from the Platinum Jori is to mount it so that its heat-sink is attached to the machine chassis. If mounted with its heat-sink suspended, then for best results mount the servo drive faced upwards and leave approximately 10 mm of space between the Platinum Jori's heat-sink and any other assembly.

9.2.1 Thermal Dissipation Data

[TBD]

9.2.2 How to Use the Chart

[TBD]

Chapter 10: Dimensions

This chapter provides detailed technical dimensions regarding the Platinum Jori.

10.1 PJOR Version

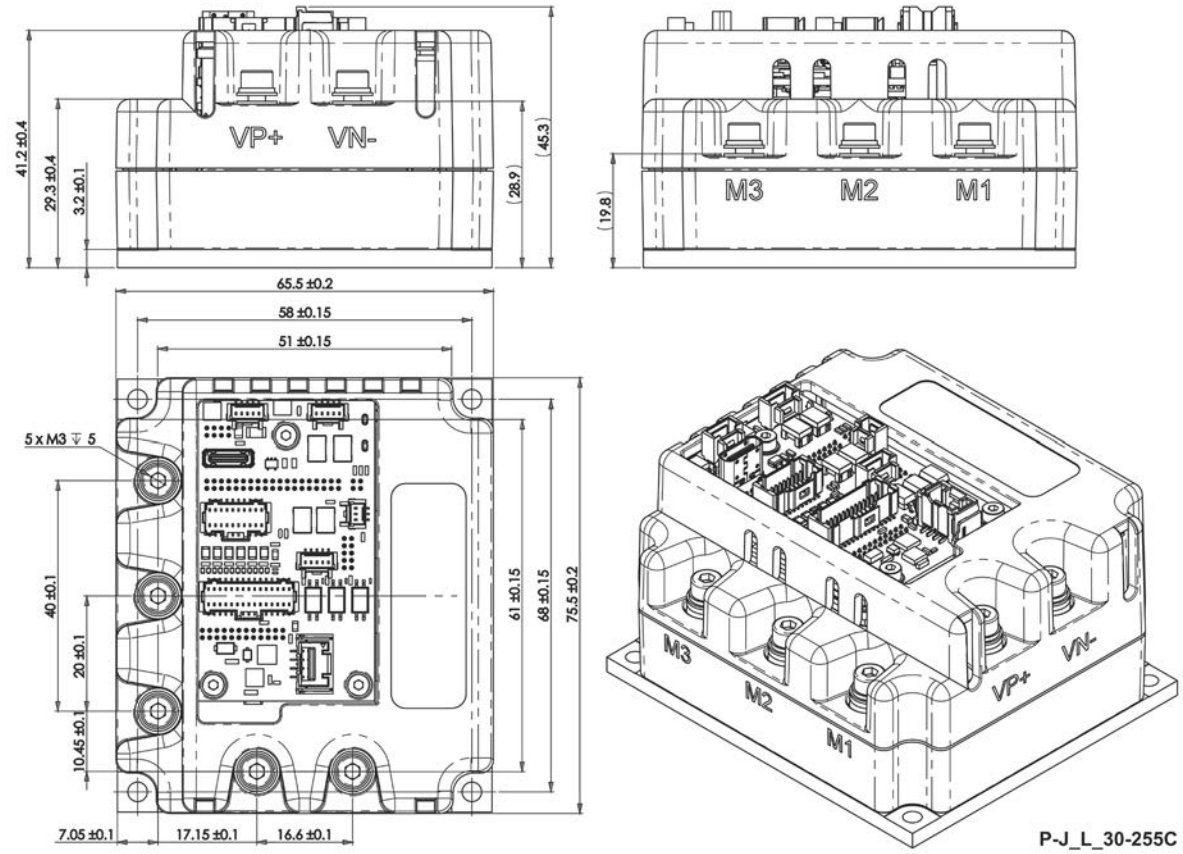


Figure 48: PJOR Dimensions

10.2 PJOD Version

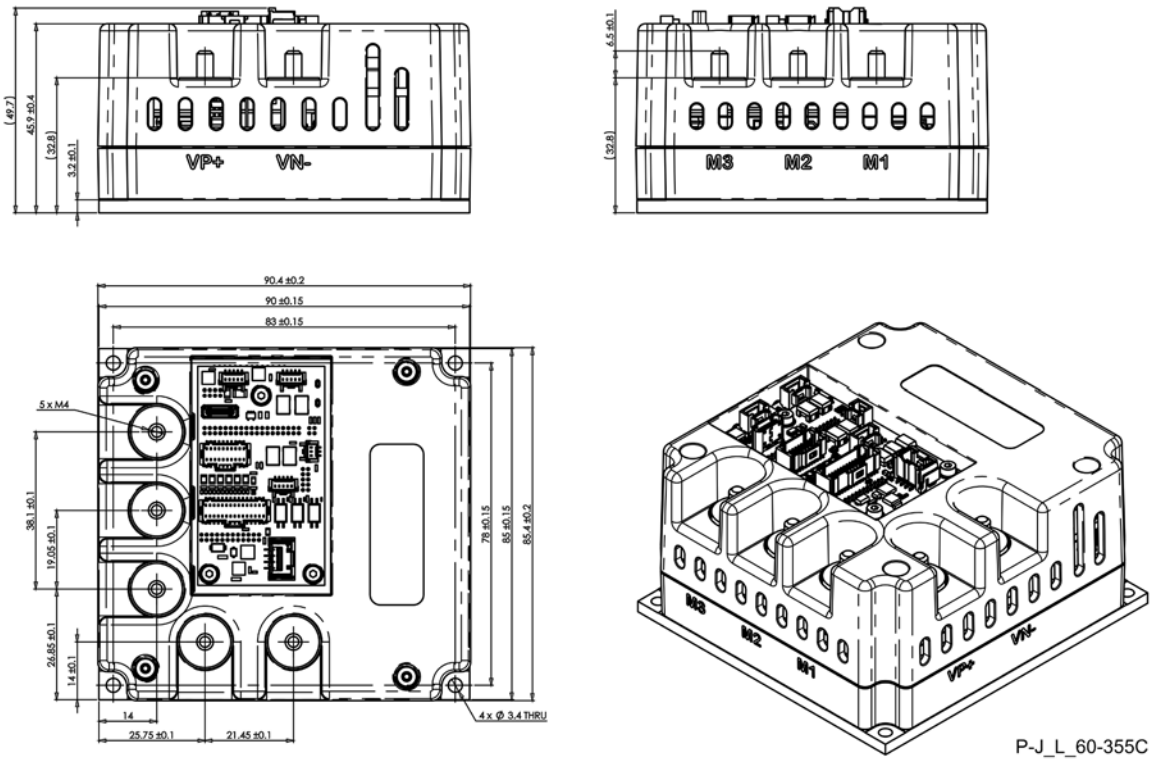


Figure 49: PJOD Dimensions

Chapter 11: Cables and Accessories

A Power cable kit can be purchased separately from Elmo for the Platinum Jori:

Part Number	Description (Gauge)
CBL-GSOLDTWIPOWKIT01	Cable Kit 6 AWG for PJOD
CBL-PJORKIT02	Cable Kit 10 AWG for PJOR

Table 33: Power Cable Kit

The following describes the accessory kits for communication and control available for the Platinum Jori.

Part Number	Description
CBL-PJORKIT01	Kit cable for EtherCAT model
CBL-PJORKIT04	CONNECTORS AND PINS KIT
CBL-PICOCLASP5P-1	RS-422/232 Communication Cable

Table 34: Accessory Kits for Communication and Control

A specific Crimping Tool (available for purchase from Elmo) is required to mount extra connecting pins on the wires. A number of wires are provided in the kit as pre-crimped for convenience:

Tool	Pins
	
Crimping Tool Molex P/N 63819-1500	**Pins for Single Row Connector:** MOLEX P/N 501334-0100
Elmo P/N TOOL-P000040	**Pins for Dual Row Connector:** MOLEX P/N 501193-3000

Table 35: Crimping Tools

Go Safer, Smarter, Smaller, Simpler.
Go Platinum.

Platinum by Elmo

www.elmomc.com