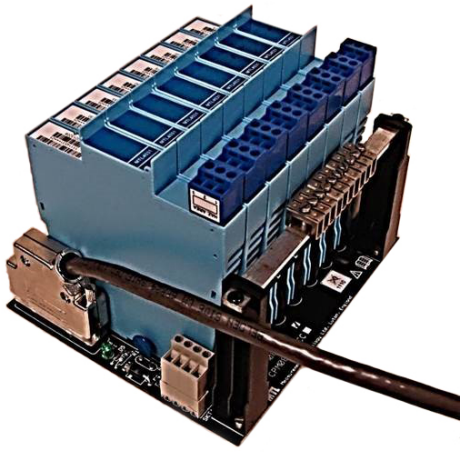
3500 System Galvanic Isolators

Datasheet

Bently Nevada Machinery Condition Monitoring



Description

The 3500 Galvanic Isolator Interface is an intrinsically safe interface that can be located between a transducer system installed in a hazardous environment and a 3500 monitoring system installed in a safe environment (The isolator interface must be in the safe environment). It consists of vibration transducer interface modules, temperature converter modules and/or process variable modules, backplanes, interface cables, earth rails and installation hardware. Both MTL and Pepperl+Fuchs versions are available.

The Isolator Modules work in an intrinsically safe system to provide galvanic isolation for Proximity, Acceleration, Temperature and Current transducer systems. The Vibration Transducer Interface Module takes a Proximitor sensor, REBAM MicroPROX sensor, accelerometer, accelerometer interface module or aeroderivative interface module input to connect directly to a 3500 monitor depending on the backplane as described below. The Temperature Converter Module takes a thermocouple or RTD input and gives a proportional 4 to 20 mA output for use with a 3500/62 Process Variable Monitor. The 4 to 20 mA Process Variable Module takes a 4 to 20 mA input from a 2 or 3 wire transmitter and gives a proportional 4 to 20 mA output for use with a 3500/62 Process Variable Monitor.

Temperature Converter Modules can be easily programmed for different configurations using the 143324 MTL Configurator or the 103M7100 P+F Programming Adapter (See ordering instructions).

There are three backplane types:

- Vibration Backplane is an 8 position (8-channel) backplane for Vibration measurements. It can be connected to any two of the following monitor types: 3500/40, 3500/42, 3500/44, and 3500/50.
- Keyphasor Backplane is a 4 position (4-channel) backplane for Keyphasor measurements using

Proximitor sensor inputs. It can be connected to the 3500/25 monitor.
- Temperature/PV Backplane is a 6 position (6-channel) backplane for Temperature or Process Variable measurements. It can be connected to the 3500/62 monitor.

The safe area signals between the backplane and the 3500 Monitoring System are connected using cable assemblies. The 3500 Monitor and 3500 Galvanic Isolator Interface backplane type determine the cable assembly type. See "Graphs and Figures" on page 10 shows the 3500 Monitor, Cable, Backplane and Transducer combinations that should be used with the 3500 Galvanic Isolator Interface. The 3500 Field Wiring Package (Document 130432, specifically drawings 141669 and 106M7817) shows how to connect transducers, power supplies and monitors to the 3500 Galvanic Isolator Interface.

Specifications

Isolators

MTL

Vibration Transducer Interface Module	MTL 4531
Temperature Converter Module	MTL 4575
2 or 3 Wire Transmitter Module	MTL 4541

For complete specifications and approvals information please visit the MTL website:

http://www.mtl-inst.com/

Pepperl+Fuchs (P+F)

Vibration Transducer Interface Module	KFD2-VR4-Ex1.26
Temperature Converter Module	KFD2-UT2-Ex1
2 or 3 Wire Transmitter Module	KFD2-STC4-Ex1

For complete specifications and approvals information please visit the P+F website:

http://www.pepperl-fuchs.com/

Backplanes

MTL

Environmental

Operating Temperature	-20°C to +60°C (-4°F to +140°F) continuous working
Storage Temperature	-40°C to +80°C (-40°F to +176°F)
Relative Humidity	5% to 95% noncondensing

Electrical

All values assume the device is at room temperature (20°C) unless otherwise specified. All values are per module unless otherwise specified.

Number of channels	
Vibration Backplane (288126)	Eight
Keyphasor Backplane (288127)	Four
Temperature/ Process Variable Backplane (288128)	Six
Supply Voltage, Vs	+20 Vdc to +35 Vdc
Power Supply Fuse Rating	2A
Power Supply Connectors	Accommodate conductors up to 14 AWG
LED Indicators	Green: Two provided for power indication
Permitted Location	Safe area only

Hazardous Area Approvals

The MTL backplanes do not require hazardous area approvals because they are in a safe area. All hazardous area wires connect directly to the isolator modules and not to the backplane. The backplane carries safe area signals only.

Pepperl+Fuchs (P+F)

Environmental

Operating Temperature	-20°C to +60°C (-4°F to +140°F) continuous working
Storage Temperature	-40°C to +70°C (-40°F to +176°F)
Relative Humidity	≤ 95% noncondensing

Electrical

All values assume the device is at room temperature (20°C) unless otherwise specified. All values are per module unless otherwise specified.

Number of channels	
Vibration Backplane (108M8641)	Eight
Keyphasor Backplane (103M8643)	Four

Temperature/ Process Variable Backplane (103M8642)	Six
Supply Voltage, Vs	+21 Vdc to +30 Vdc
Power Supply Fuse Rating	2A
Power Supply Connectors	24 - 4 AWG
LED Indicators	Green: Two provided for power indication Red: Two provided for fault indication
Permitted Location	Safe area only

Hazardous Area Approvals

The P+F backplanes do not require hazardous area approvals because they are in a safe area. All hazardous area wires connect directly to the isolator modules and not to the backplane. The backplane carries safe area signals only.

Enclosure (for MTL Backplanes only)

Environmental

Ambient Temperature Limits	-20°C to +50°C (-4°F to +122°F)

Physical

Protection	Dust-tight and water-jet proof to IEC529:IP65
Capacity	One backplane part number 141660A01. If an enclosure for part number 141660A02 or 143320 is required, please contact your Bently Nevada sales or service representative for a mod.
Construction	Base: GRP (glass-fiber reinforced polyester) Lid: transparent high-strength polycarbonate
Finish	Base: light grey Lid: transparent
Lid Fixing	Captive fixing screws
Gland Fixing	Side mounted gland plate, detachable for drilling by user
Permitted Location	Safe area only
Mounting	By exterior surface-fixing lugs (zinc passivated steel)
Weight (without backplanes and isolators)	3.7 kg

Ordering Considerations

General

The MTL and P+F isolator Intrinsic Safety Electrical Parameters may not allow for interchangeability with existing installations. Ensure that all Approvals requirements are met.

The 3500 Galvanic Isolator Interface (Vibration) can receive inputs from the following approved Bently Nevada transducers:

- 3300 XL Proximitor
- 3300 5/8mm Proximitor
- 7200 5/8mm Proximitor
- 330400 Accelerometer
- Acceleration Interface Module (p/n 23733-03)
- Aeroderivative Interface Module (p/n 86517) (Velocity only)(MTL Backplane version only)
- 3300 REBAM MicroPROX
- 7200 REBAM MicroPROX

The 3500 Galvanic Isolator Interface (Temperature) can receive inputs from the following transducers selectable with the appropriate configurator:

- B Type Thermocouple
- E Type Thermocouple
- J Type Thermocouple
- K Type Thermocouple
- N Type Thermocouple
- R Type Thermocouple
- S Type Thermocouple
- T Type Thermocouple
- 2 Wire RTD
- 3 Wire RTD
- 4 Wire RTD

If thermocouples will be used, the 3500 Temperature Isolator comes with Cold Junction Compensation (CJC) Signal Connectors for the hazardous area inputs.

If using thermocouples with the P+F Temperature Backplane, be sure to select Option G when ordering 103M9110. This will include the user-installed CJC Terminal Blocks. (See Ordering Information)

The 3500 Galvanic Isolator Interface can be used with the following 3500 Monitors. Note the I/O module type must be External Termination unless cable assemblies with flying leads are used.

- 3500/25 Keyphasor Monitor
- 3500/40 Proximitor Monitor
- 3500/42 Proximitor/Seismic Monitor
- 3500/44 Aeroderivative Monitor
- 3500/50 Tachometer Monitor
- 3500/62 Process Variable Monitor
- 3500/72 Rod Position Monitor

Ordering Information

For the detailed listing of country and product specific approvals, refer to the *Approvals Quick Reference Guide* (108M1756) available from **www.Bently.com**.

MTL

3500 MTL Galvanic Isolator Interface (Vibration)

141660-AA-BB-CC-DD-EE-FF-GG-HH-I I-JJ

A: Backplane Type	
01	8 Position Backplane – Vibration
02	4 Position Backplane – Keyphasor
B: Isolator Backplane Position 1	
0 0	No isolator
0 1	Isolator MTL 4531
C: Isolator Backplane Position 2	
0 0	No isolator
0 1	Isolator MTL 4531
D: Isolator Backplane Position 3	
0 0	No isolator
0 1	Isolator MTL 4531
E: Isolator Backplane Position 4	
0 0	No isolator
0 1	Isolator MTL 4531
F: Isolator Backplane Position 5	
0 0	No isolator
0 1	Isolator MTL 4531
G: Isolator Backplane Position 6	
0 0	No isolator
0 1	Isolator MTL 4531
H: Isolator Backplane Position 7	
00	No isolator
01	Isolator MTL 4531
I: Isolator Backplane Position 8	
00	No isolator
01	Isolator MTL 4531
J: Weatherproof Housing	
0 0	No housing
0 1	Weatherproof housing

3500 MTL Galvanic Isolator (Temperature/PV)

143320-AA-BB-CC-DD-EE-FF-GG

A: Isolator Backplane Position 1	
0 0	No isolator
0 1	Isolator MTL 4541, PV 4-20 mA input
0 3	Isolator MTL 4575, K type TC
B: Isolator Backplane Position 2	
0 0	No isolator
0 1	Isolator MTL 4541, PV 4-20 mA input
0 3	Isolator MTL 4575, K type TC
C: Isolator Backplane Position 3	
0 0	No isolator
0 1	Isolator MTL 4541, PV 4-20 mA input
0 3	Isolator MTL 4575, K type TC
D: Isolator Backplane Position 4	
0 0	No isolator
0 1	Isolator MTL 4541, PV 4-20 mA input
0 3	Isolator MTL 4575, K type TC
E: Isolator Backplane Position 5	
0 0	No isolator
0 1	Isolator MTL 4541, PV 4-20 mA input
0 3	Isolator MTL 4575, K type TC
F: Isolator Backplane Position 6	
0 0	No isolator
0 1	Isolator MTL 4541, PV 4-20 mA input
0 3	Isolator MTL 4575, K type TC
G: Weatherproof Housing	
0 0	No housing
0 1	Weatherproof housing

Spare components

288112	Isolator MTL 4575, K type TC
03639911	Weatherproof Housing
288766	Replacement Fuse

Spare components

288114	Isolator MTL 4575, K type TC
288416	Isolator MTL 4541, PV type 4-20 mA
03639911	Weatherproof Housing
288766	Replacement Fuse

Modification to mounting plate is required for the 6P Temperature/PV Backplane

PepperI+Fuchs

3500 P+F Galvanic Isolator Interface (Vibration)

103M9109-AA-BB-CC-DD-EE-FF-GG-HH-I I

A: Backplane Type	
0 1	8 Position Backplane – Vibration
0 2	4 Position Backplane – Keyphasor
B: Isolator Backplane Position 1	
0 0	No isolator
0 1	P+F KFD2-VR4-Ex1.26 Isolator
C: Isolator Backplane Position 2	
0 0	No isolator
0 1	P+F KFD2-VR4-Ex1.26 Isolator
D: Isolator Backplane Position 3	
0 0	No isolator
0 1	P+F KFD2-VR4-Ex1.26 Isolator
E: Isolator Backplane Position 4	
0 0	No isolator
0 1	P+F KFD2-VR4-Ex1.26 Isolator
F: Isolator Backplane Position 5	
0 0	No isolator
0 1	P+F KFD2-VR4-Ex1.26 Isolator
G: Isolator Backplane Position 6	
0 0	No isolator
0 1	P+F KFD2-VR4-Ex1.26 Isolator
H: Isolator Backplane Position 7	
0 0	No isolator
0 1	P+F KFD2-VR4-Ex1.26 Isolator
I: Isolator Backplane Position 8	
0 0	No isolator
0 1	P+F KFD2-VR4-Ex1.26 Isolator

Spare components

172436	P+F KFD2-VR4-Ex1.26 Isolator
103M7113	Replacement Fuse

3500 P+F Galvanic Isolator Interface (Temperature/PV)

103M9110-AA-BB-CC-DD-EE-FF-GG

A: Isolator Backplane Position 1	
0 0	No isolator
0 1	P+F KFD2-STC4-Ex1 PV 4-20
0 2	P+F KFD2-UT2-Ex1 TEMPERATURE
B: Isolator Backplane Position 2	
0 0	No isolator
0 1	P+F KFD2-STC4-Ex1 PV 4-20
0 2	P+F KFD2-UT2-Ex1 TEMPERATURE
C: Isolator Backplane Position 3	
0 0	No isolator
0 1	P+F KFD2-STC4-Ex1 PV 4-20
0 2	P+F KFD2-UT2-Ex1 TEMPERATURE
D: Isolator Backplane Position 4	
0 0	No isolator
0 1	P+F KFD2-STC4-Ex1 PV 4-20
0 2	P+F KFD2-UT2-Ex1 TEMPERATURE
E: Isolator Backplane Position 5	
0 0	No isolator
0 1	P+F KFD2-STC4-Ex1 PV 4-20
0 2	P+F KFD2-UT2-Ex1 TEMPERATURE
F: Isolator Backplane Position 6	
0 0	No isolator
0 1	P+F KFD2-STC4-Ex1 PV 4-20
0 2	P+F KFD2-UT2-Ex1 TEMPERATURE
G: Thermocouple CJC Term Blocks	
0 0	None (RTDs)
0 1	TC CJC Term Blocks

Spare components

102M4383	P+F KFD2-UT2-Ex1 TEMPERATURE
103M2798	P+F KFD2-STC4-Ex1 PV 4-20
103M7113	Replacement Fuse
103M9036	P+F Thermocouple CJC Term Block

Configurators

MTL

143324-AA

A: Configurator Type	
0 1	MTL PCS45/PCL45USB (software and cable)

P+F

103M7100	P+F K-ADP-USB (Cable only)

Software can be downloaded free of charge from P+F:

http://www.pepperl-fuchs.com/

Cables

3500 Galvanic Isolator Interface Cable (Vibration)

141707-AAAA-BB

A: Cable Length (ft)	
0 0 0 5	5 ft
0 0 0 7	7 ft
0 0 1 0	10 ft
0 0 1 5	15 ft
0 0 2 5	25 ft
0 0 5 0	50 ft
0 1 0 0	100 ft
B: Assembly	
0 1	Not assembled
0 2	Assembled
0 3	Assembled – Flying lead (no connector to 3500 monitor)

3500 Galvanic Isolator Interface Cable (Keyphasor)

141708-AAAA-BB

A: Cable Length (ft)	
0 0 0 5	5 ft
0 0 0 7	7 ft
0 0 1 0	10 ft
0 0 1 5	15 ft
0 0 2 5	25 ft
0 0 5 0	50 ft
0 1 0 0	100 ft
B: Assembly	
0 1	Not assembled
0 2	Assembled
0 3	Assembled – Flying lead (no connector to 3500 monitor)

3500 Galvanic Isolator Interface Cable (Temperature/PV)

141709-AAAA-BB

A: Cable Length (ft)	
0 0 0 5	5 ft
0 0 0 7	7 ft
0 0 1 0	10 ft
0 0 1 5	15 ft
0 0 2 5	25 ft
0 0 5 0	50 ft
0 1 0 0	100 ft
B: Assembly	
0 1	Not assembled
0 2	Assembled
0 3	Assembled – Flying lead (noconnector to 3500 monitor)

3500 Galvanic Isolator Interface Cable (Aeroderivative)

141710-AAAA-BB

A: Cable Length (ft)	
0 0 0 5	5 ft
0 0 0 7	7 ft
0 0 1 0	10 ft
0 0 1 5	15 ft
0 0 2 5	25 ft
0 0 5 0	50 ft
0 1 0 0	100 ft
B: Assembly	
0 1	Not assembled
0 2	Assembled
0 3	Assembled – Flying lead (no connector to 3500 monitor)

3500 Galvanic Isolator Interface Documentation

141706	3500 Galvanic Isolator Interface Manual
130432-01	3500 Field Wiring Package

Graphs and Figures

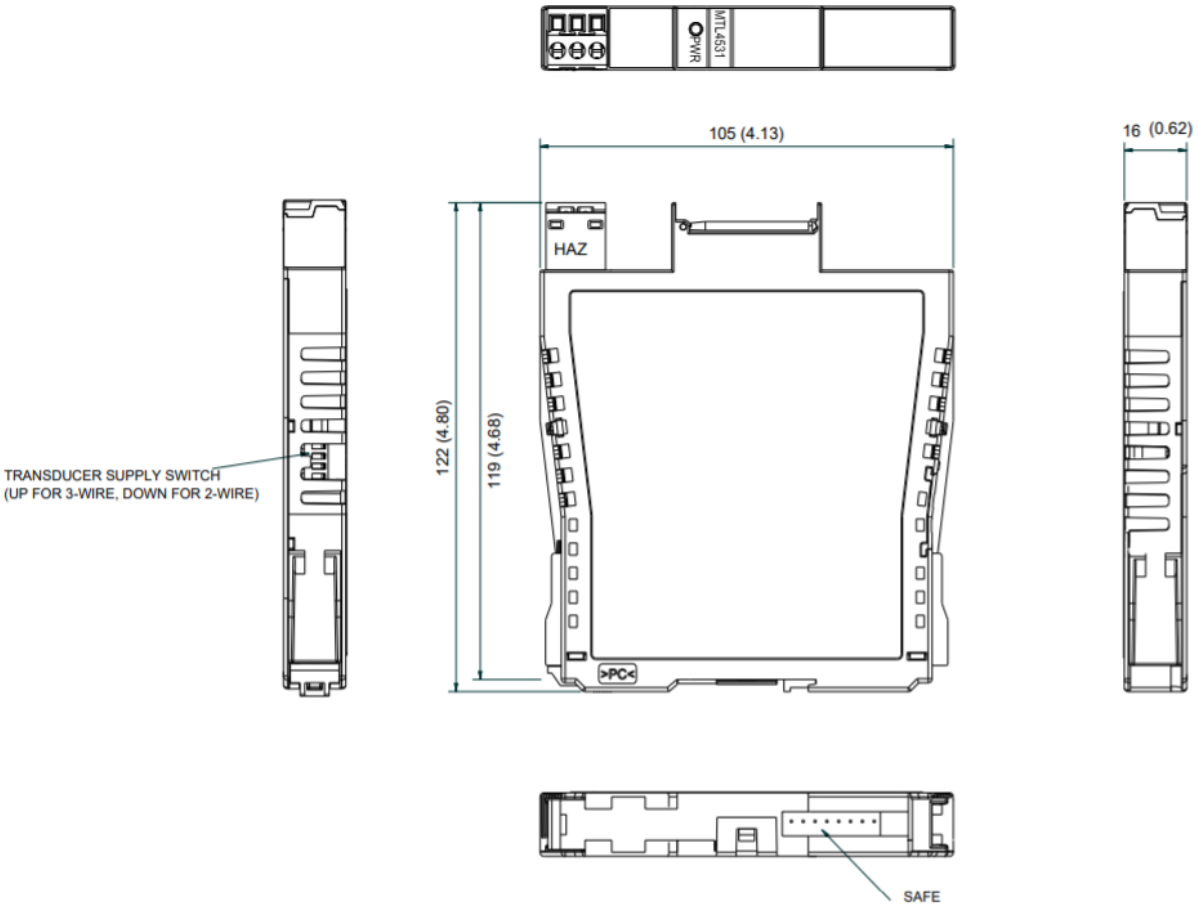
Table 1: 3500 Galvanic Isolator Interface – 3500 Monitor, Cable, Backplane and Transducer Type Combinations

3500 Monitor		Cable	Backplane#		Transducer
Type	Channel No.	Type	Type	Module No.	Type(s)
3500/25 Keyphasor	1 & 2 (top##) or 1 & 2 (bot##)	Keyphasor p/n 141708	Keyphasor p/n 141660A02 (MTL) p/n 103M9109A02 (P+F)	1 & 2 or 3 & 4	Proximitor/ Keyphasor
3500/40 Proximitor	1,2,3 & 4	Vibration p/n 141707	Vibration p/n 141660A01 (MTL) p/n 103M9109A01 (P+F)	1,2,3 & 4 or 5,6,7 & 8	Proximitor
3500/42 Proximitor /Seismic	1,2,3 & 4	Vibration p/n 141707	Vibration p/n 141660A01 (MTL) p/n 103M9109A01 (P+F)	1,2,3 & 4 or 5,6,7 & 8	Proximitor/ Accelerometer
3500/44 Aeroderivative	1,2,3 & 4	Aeroderivative. p/n 141710	Vibration p/n 141660A01 (MTL) p/n 103M9109A01 (P+F)	1,2,3 & 4 or 5,6,7 & 8	Accelerometer Interface (Velocity only)
3500/50 Tachometer	1 & 2	Vibration p/n 141707	Vibration p/n 141660A01 (MTL) p/n 103M9109A01 (P+F)	1 & 3### or 5 & 7###	Proximitor
3500/62 Process Variable	1, 2, 3,4, 5 & 6	Temperature/PV p/n 141709	Temperature/PV p/n 143320 (MTL) p/n 103M9110 (P+F)	1,2,3,4, 5 & 6	TC, RTD/ 2 or 3 wire transmitters
3500/72 Rod Position	1,2,3 & 4	Vibration p/n 141707	Vibration p/n 141660A01 (MTL) p/n 103M9109A01 (P+F)	1,2,3 & 4 or 5,6,7 & 8	Proximitor

 # Refer to backplane figures that follow.

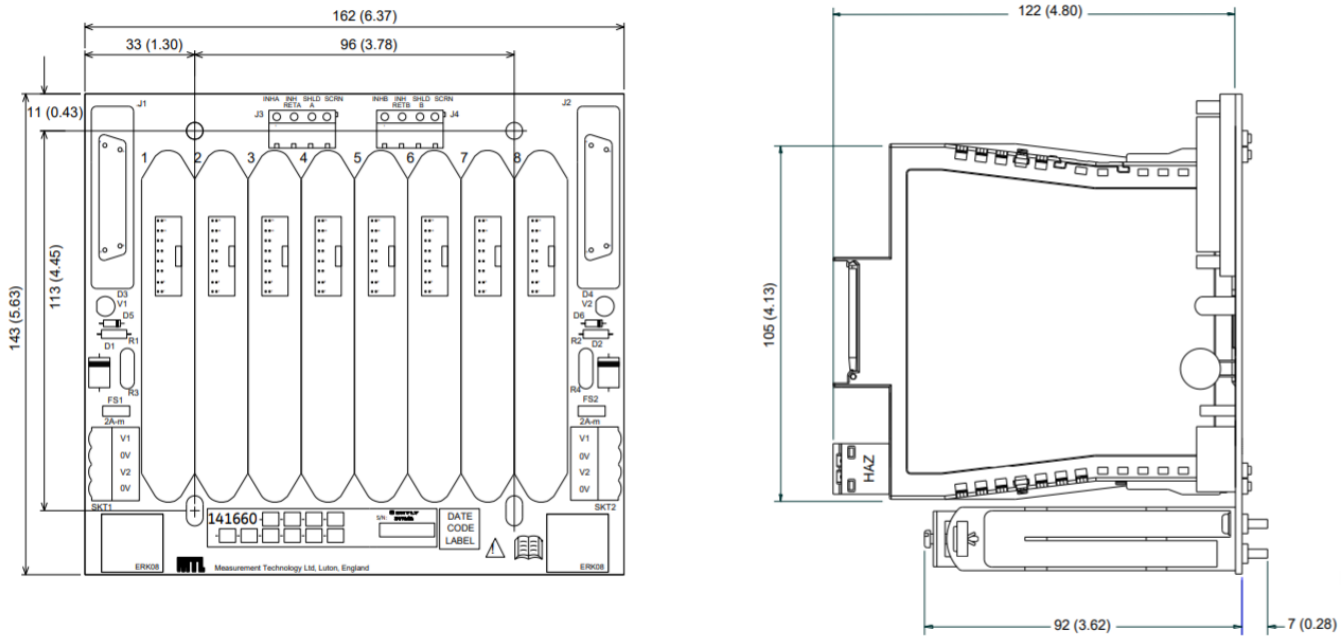
The 3500 Keyphasor Module is a half-height module. The top and bottom modules are connected separately.

/50 Tachometer: Positions 2 & 4 or 6 & 8 not available.



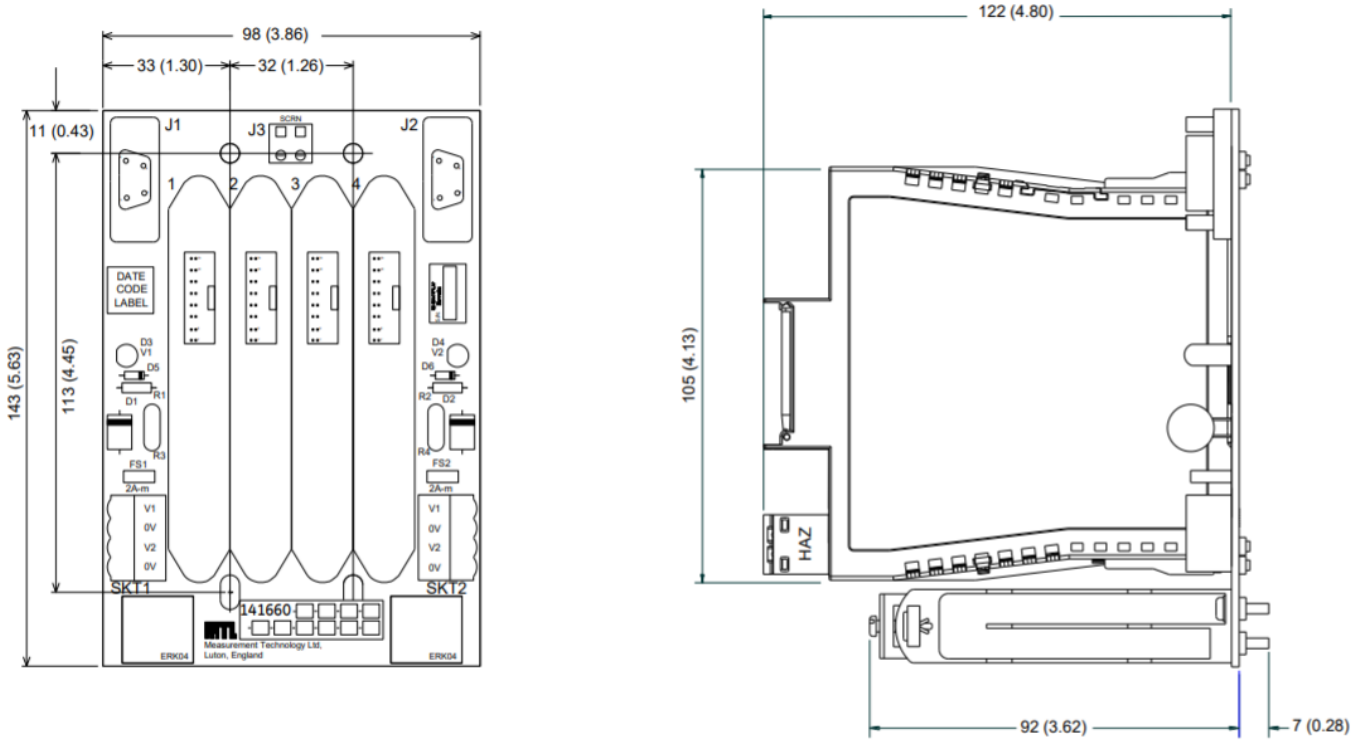
Millimetre (inch)

Figure 1: Dimensions of the MTL Vibration Galvanic Isolator Module, 288112



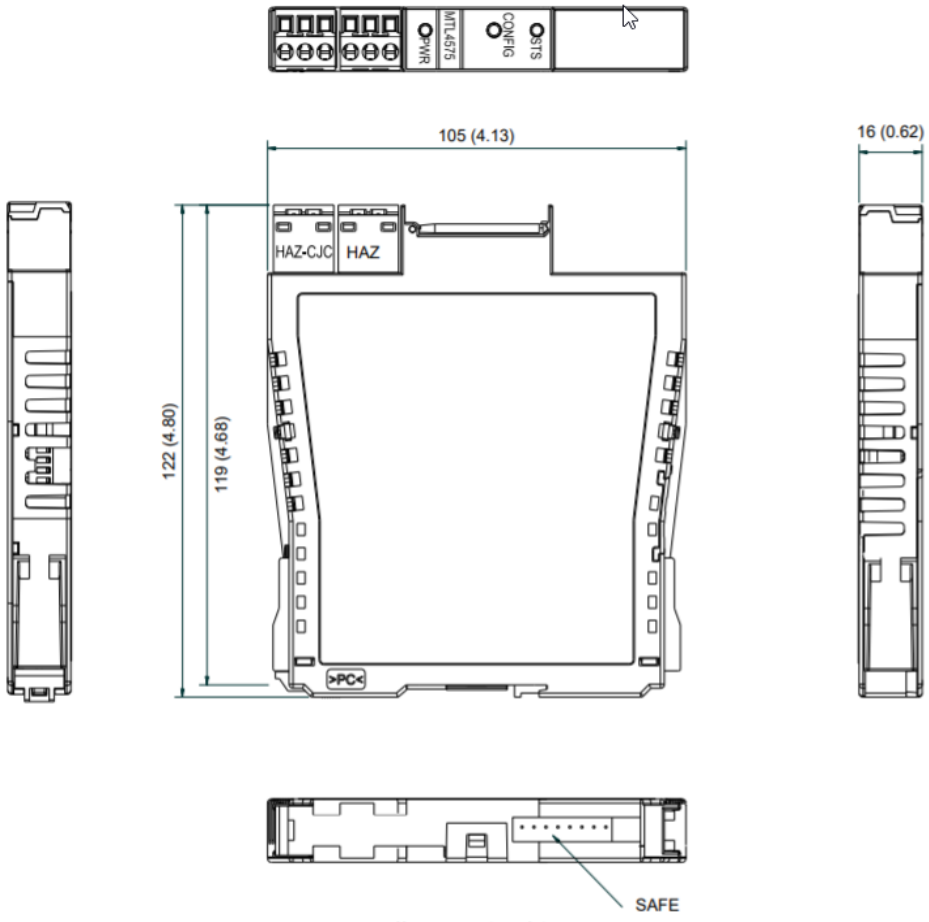
Millimetre (inch)

Figure 2: Dimensions of the MTL 8P Backplane, Vibration (288126)



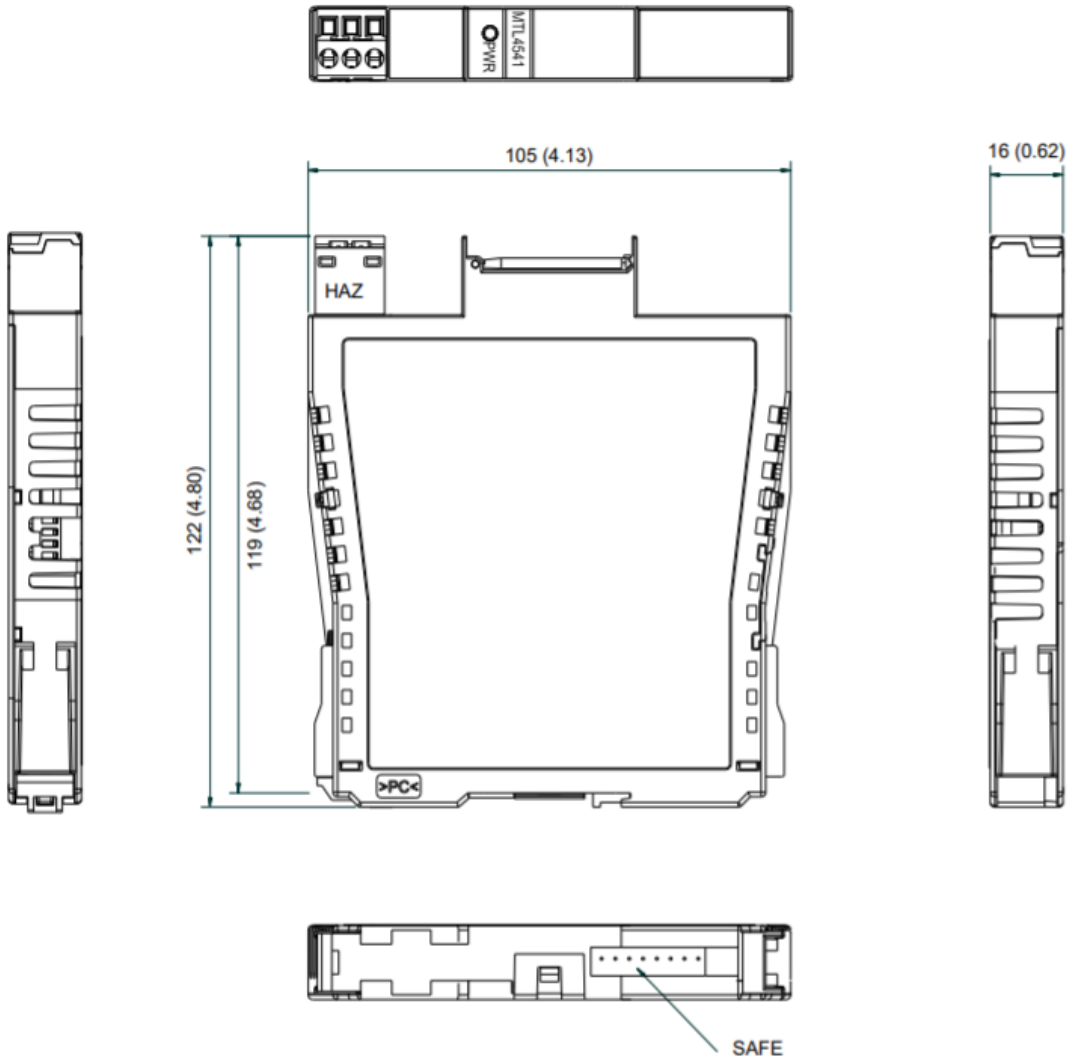
Millimetre (inch)

Figure 3: Dimensions of the MTL 4P Backplane, Keyphasor (288127)



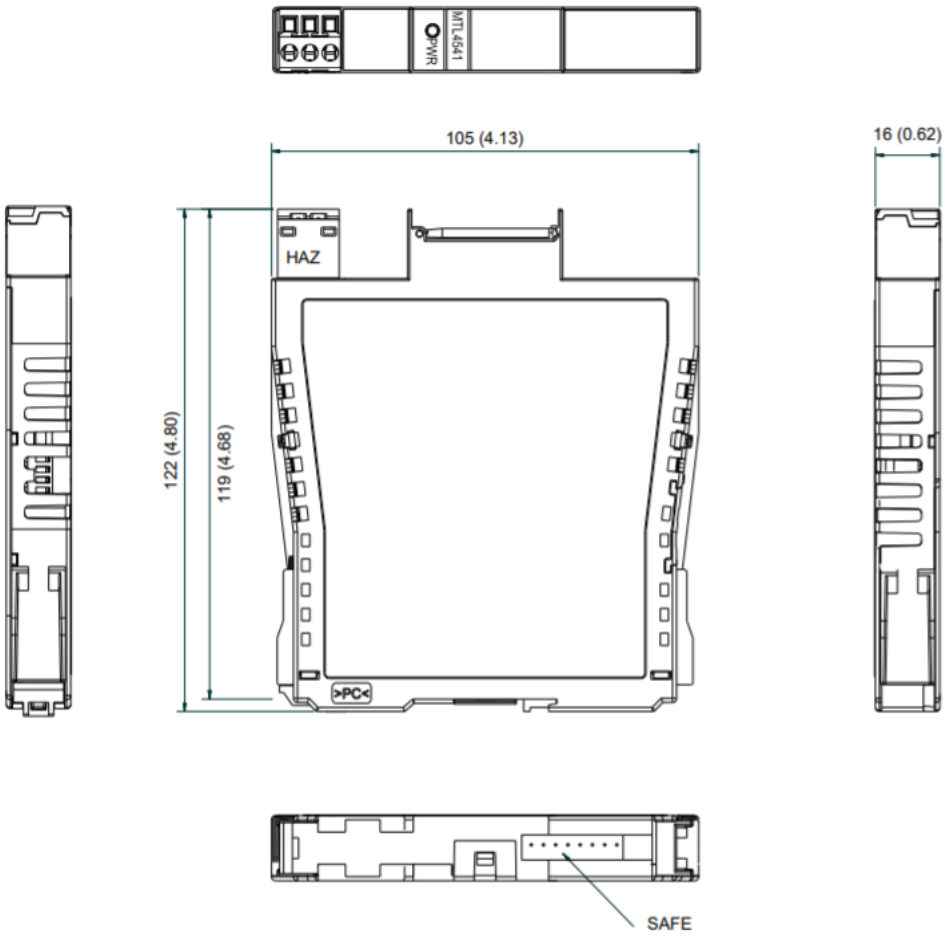
Millimetre (inch)

Figure 4: Dimensions of the MTL Temperature Galvanic Isolator Module, 288114



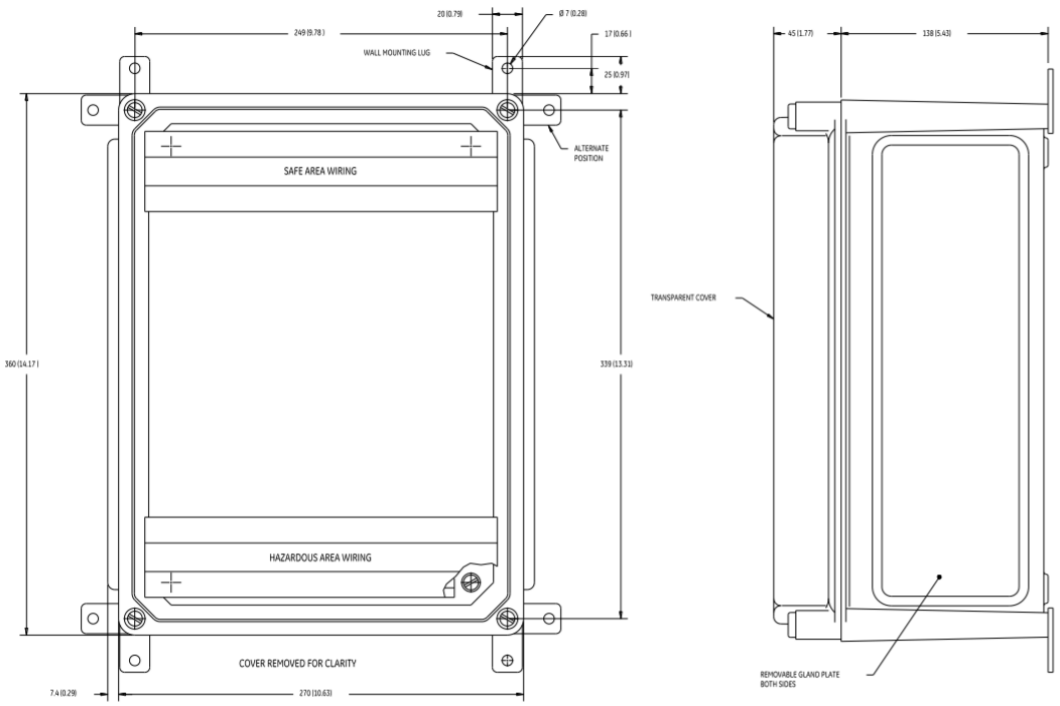
Millimetre (inch)

Figure 5: Dimensions of the MTL Process Variable Galvanic Isolator Module, 288416



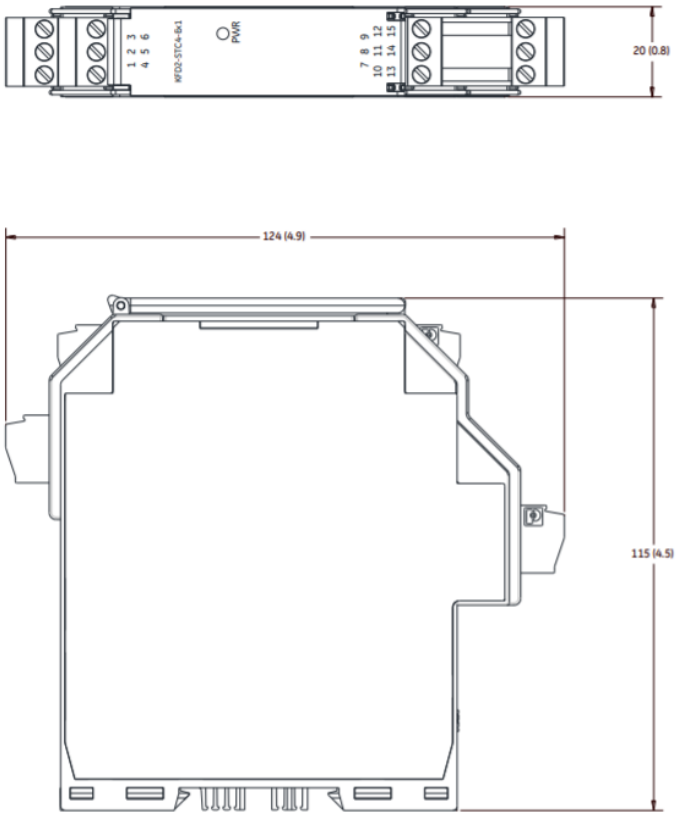
Millimetre (inch)

Figure 6: Dimensions of the MTL 6P Backplane, Temperature/PV (288128)



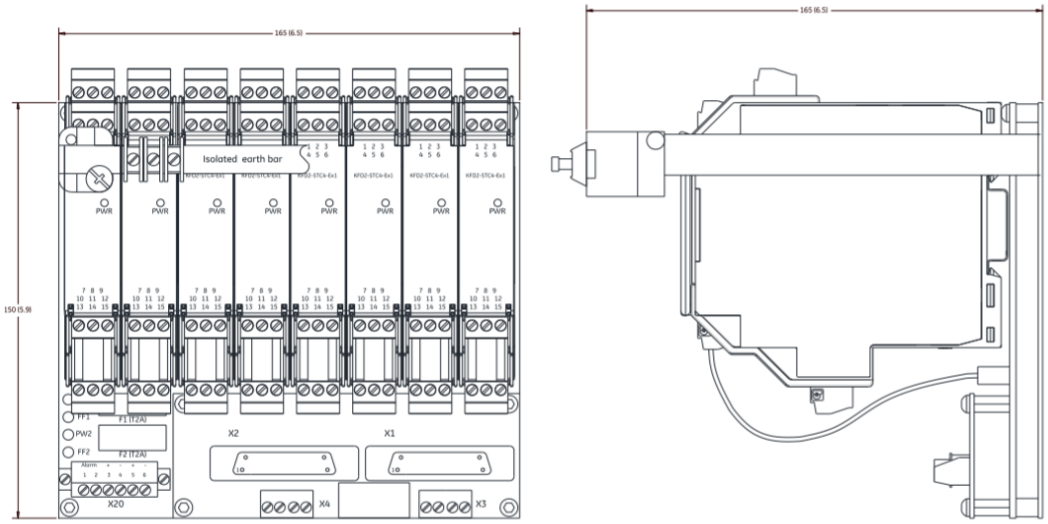
Millimetre (inch)

Figure 7: Dimensions of the MTL WP Housing (03639911)



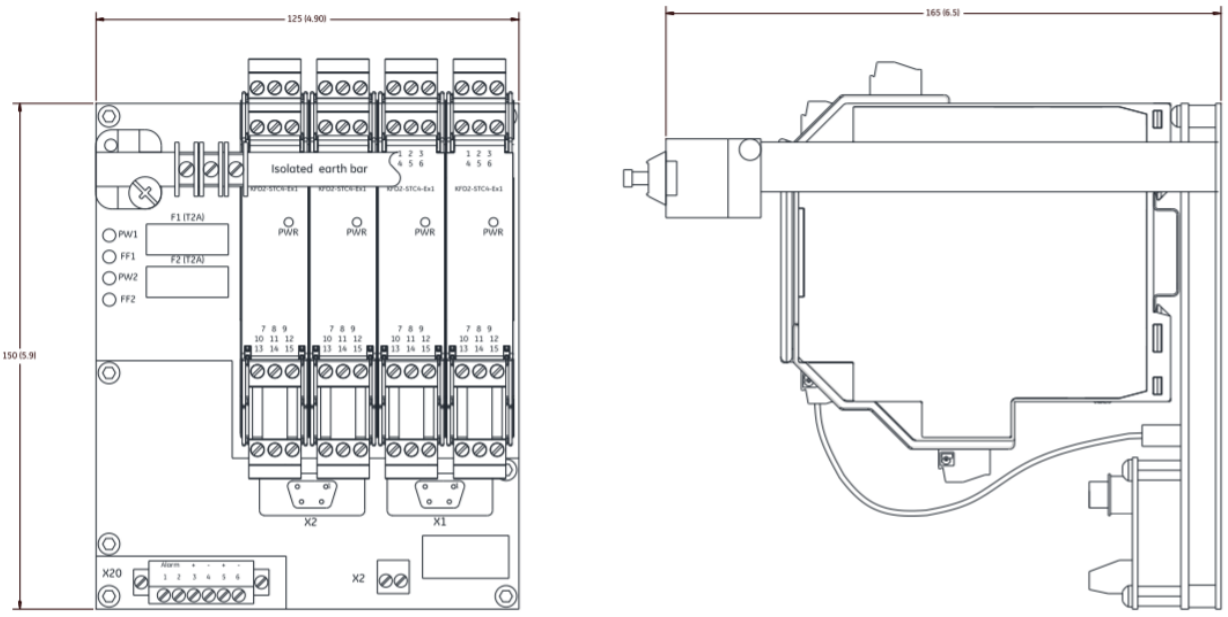
Millimetre (inch)

Figure 8: Dimensions of the P+F Isolator Modules (172436, 102M4383, 103M2798)



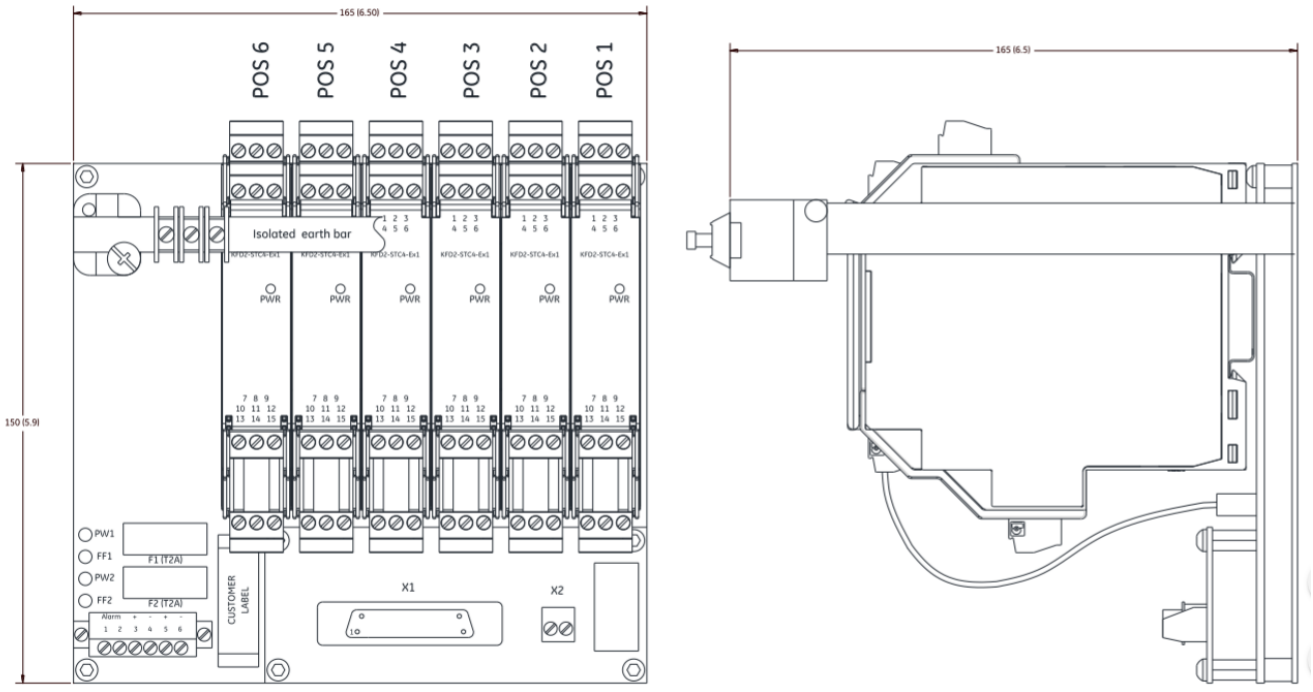
Millimetre (inch)

Figure 9: Dimensions of the P+F 8P Backplane, Vibration (103M8641)



Millimetre (inch)

Figure 10: Dimensions of the P+F 4P Backplane, Keyphasor (103M8643)



Millimetre (inch)

Figure 11: Dimensions of the P+F 6P Backplane, Temperature/PV (103M8642)

1631 Bently Parkway South, Minden, Nevada USA 89423
Phone: 1.775.782.3611 Bently.com