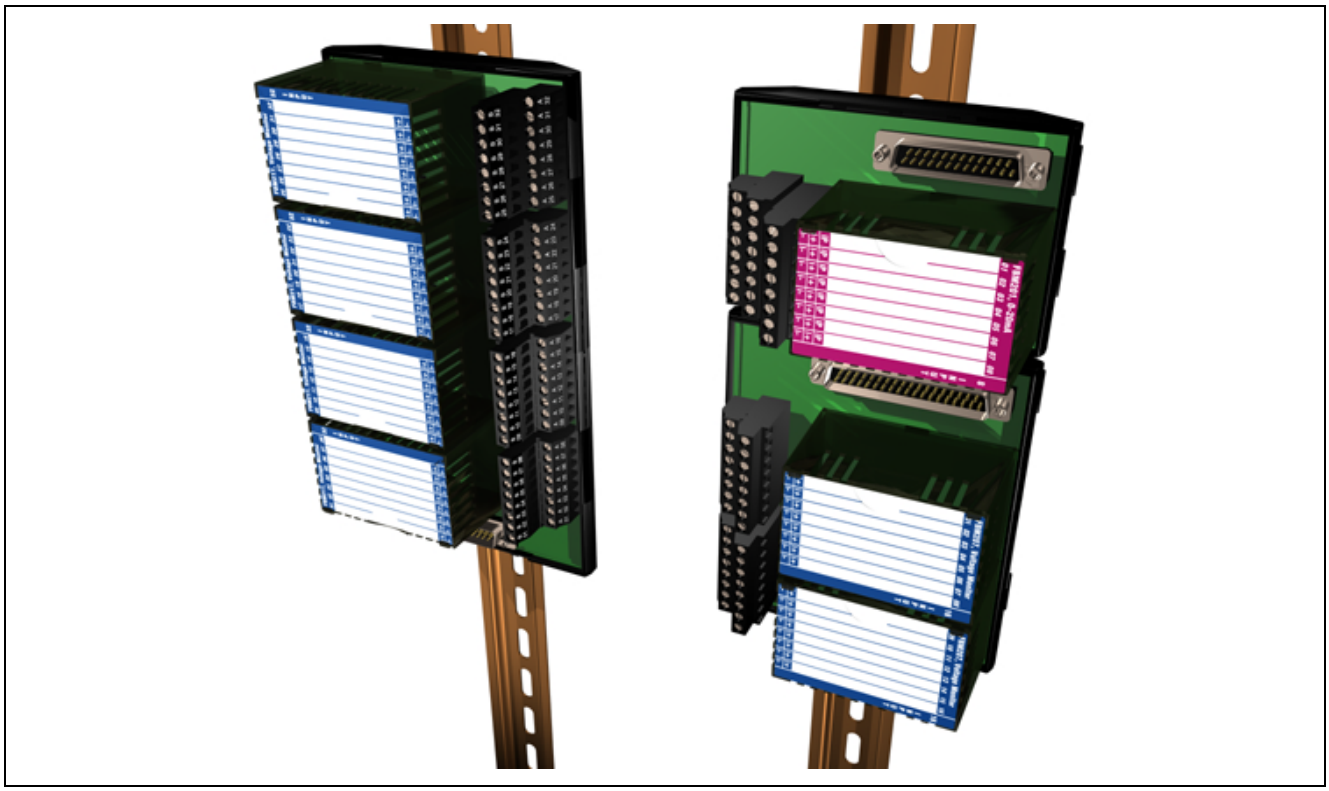
FOXBORO®

PSS 21H-2Y4 B3

I/A Series® Hardware
DIN Rail Mounted Field I/O Signal Termination Assemblies



Field I/O signals connect to the FBM subsystem via DIN rail mounted termination assemblies (TAs). Multiple types of TAs are available with FBMs to provide I/O signal connections, signal conditioning, optical isolation from signal surges, temperature compensation for thermocouples, external power connections, and fusing for protection of the FBM and/or field device as required by the particular FBM. Since these features are built into the termination assemblies (where required), in most applications there is no need for additional termination equipment for field circuit functions such as circuit protection or signal conditioning (including fusing, power distribution, relay interfaces, and so forth).

The DIN rail mounted termination assemblies connect to the FBM subsystem baseplate by means of removable termination cables. The cables are available in a variety of lengths, up to 30 meters, allowing the termination assemblies to be mounted in either the same cabinet or in a cabinet remote from the FBM subsystem.

FEATURES

Features of the termination assemblies include:

- Built-in signal conditioning for discrete I/O signals
- Support for a variety of signals and power
- Easy installation
- Support for a variety of field wiring.

Built-In Signal Conditioning

Signal conditioning applies to discrete inputs and outputs. It allows multiple signal types to be used with a single type of Fieldbus Module.

Through the use of signal conditioning, a single FBM type:

- Can handle any voltage range or current range,
- Can be used to sense contact or switch closures, regardless of voltage range, or
- Can handle <60 V dc outputs, as well as relay outputs for any voltage range.

Signal conditioning is available on both channel isolated and differential channel isolated digital I/O FBMs. However, it is most advantageous on differential channel isolated FBMs, since field circuit power on high voltage circuits is not isolated channel to channel.

Support for Variety of Signals and Power

The termination assemblies support:

- Discrete signals:
  - Signal conditioning as described above
  - Optical isolation from signal surges on digital inputs
- Analog signals
  - Pass-through for 0 to 20 mA, RTD, and pulse analog signals to/from FBM
  - Built-in temperature compensation for thermocouple inputs
- Power
  - FBM auxiliary power for contact wetting
  - Connections for FBM powered or externally powered field devices
  - Connection of external power for digital inputs.

Ease of Installation

The termination assemblies and their associated cables are designed for simple installation on standard DIN rails. Termination assemblies snap onto standard DIN rails, and termination cables are secured by screws to the cable connectors on the assemblies. The termination assemblies and cables have labels to aid the installation process and ensure proper placement of field wires, and an area to allow you to write in signal tags.

The fully functional, compact termination assemblies allow you to create a self-contained enclosure for a complete subsystem, eliminating the need for marshalling cabinets.

Contents

SUPPORT FOR VARIETY OF FIELD WIRING

Field I/O termination assemblies are available with either compression-type or ring lug-type screw terminals for accepting a range of field wiring.

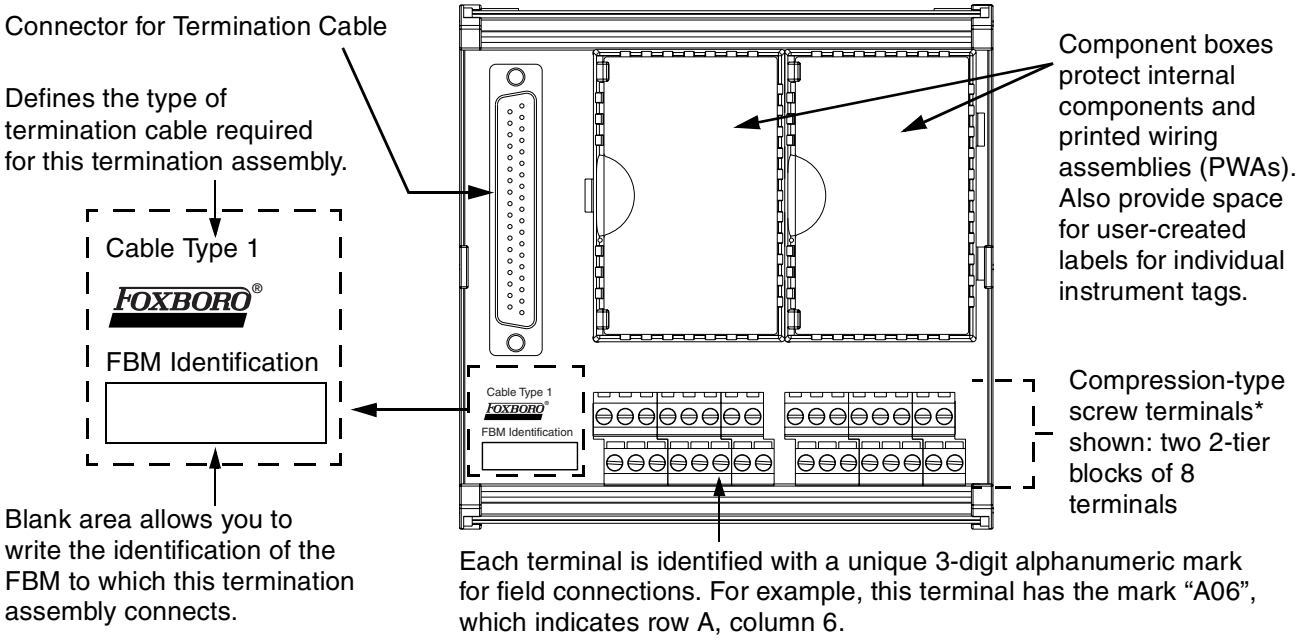
Compression-type screw terminals can accept field device wiring with sizes ranging from 0.2 mm^2 (24 AWG) to 2.5 mm^2 (12 AWG) stranded wire, solid wire, or stranded wire with ferrules (with or without plastic collar) for each channel.

Ring lug-type screw terminals can accept field device wiring with #6 size spade or ring lug connectors (0.375 in [9.5 mm]) for each channel. The larger spacing between the terminals aids in wire marking in applications where larger sizes and a high degree of connection integrity is required.

Each screw termination is labelled and numbered for easy installation.

TERMINATION ASSEMBLIES OVERVIEW

The termination assemblies provide a convenient connection point for field device I/O wiring. Termination assemblies connect the signals to/from a field device to an FBM’s baseplate connector via a termination cable. Termination cables are available in a variety of lengths, up to 30 m (98 ft). The major parts of a typical termination assembly are identified in Figure 1.



* Termination assemblies with ring lug-type screw terminals are available as well.

Figure 1. Typical Termination Assembly (Compression-Type Screw Terminals)

To identify which field wiring connects to the assemblies’ terminals, Foxboro provides a set of blank labels which can be affixed to each component box on the assembly. These labels can be loaded into a laser printer and marked with individual instrument tags derived from your database.

Termination assemblies are available for analog or digital types of I/O signal wiring.

Terms

The termination assembly descriptions below use the following terms:

- Channel isolation indicates that an I/O channel is galvanically isolated from all other channels and earth (ground). When used with a termination assembly with channel isolation, a Fieldbus module withstands, without damage, a potential of 600 V ac applied for one minute between any channel and ground, or between a given isolated channel and any other isolated channel.
- Group isolation indicates that all of the input and/or output channels in a termination assembly are isolated as a group from earth (ground). When used with a termination assembly with group isolation, a Fieldbus module withstands, without damage, a potential of 600 V ac applied for one minute between the group isolated channels and earth (ground).
- Differential isolation indicates that each channel has a differential input to allow voltage differences between channels without inducing errors. Channels are not galvanically isolated from each other but are isolated from ground and the FBM. When used with a termination assembly with differential isolation, a Fieldbus module withstands, without damage, a potential of 600 V ac applied for one minute between the differential isolated channels and earth (ground).
- External source indicates that power is supplied to the loop from a source other than the Fieldbus module.
- Voltage source supplied in loop indicates that power is supplied to the loop from a source located between the termination assembly and the I/O device in the loop.
- Voltage source supplied outside loop indicates that power is supplied to the loop from a source which connects to the power distribution terminals of the termination assembly.

ANALOG INPUTS/OUTPUTS

Analog signal termination assemblies support the following analog field device signals: 0 to 20 mA, thermocouple, RTD, or pulse.

0 to 20 mA Analog Inputs

Table 1 lists the FBMs and termination assemblies that support 0 to 20 mA analog inputs.

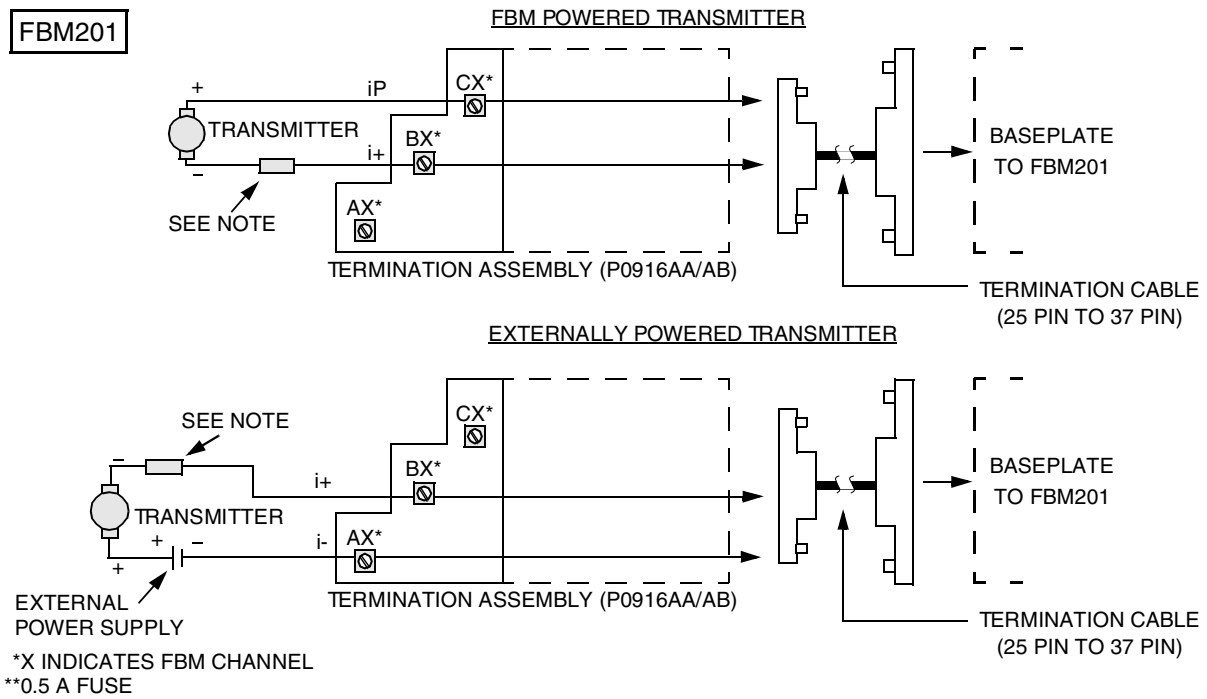
Field connections for these termination assemblies are shown in Figure 2 and Figure 3.

Dimensions for termination assembly sizes A and C are available in Figure 22 and Figure 23.

Table 1. 0 to 20 mA Analog Inputs – FBMs and Termination Assemblies

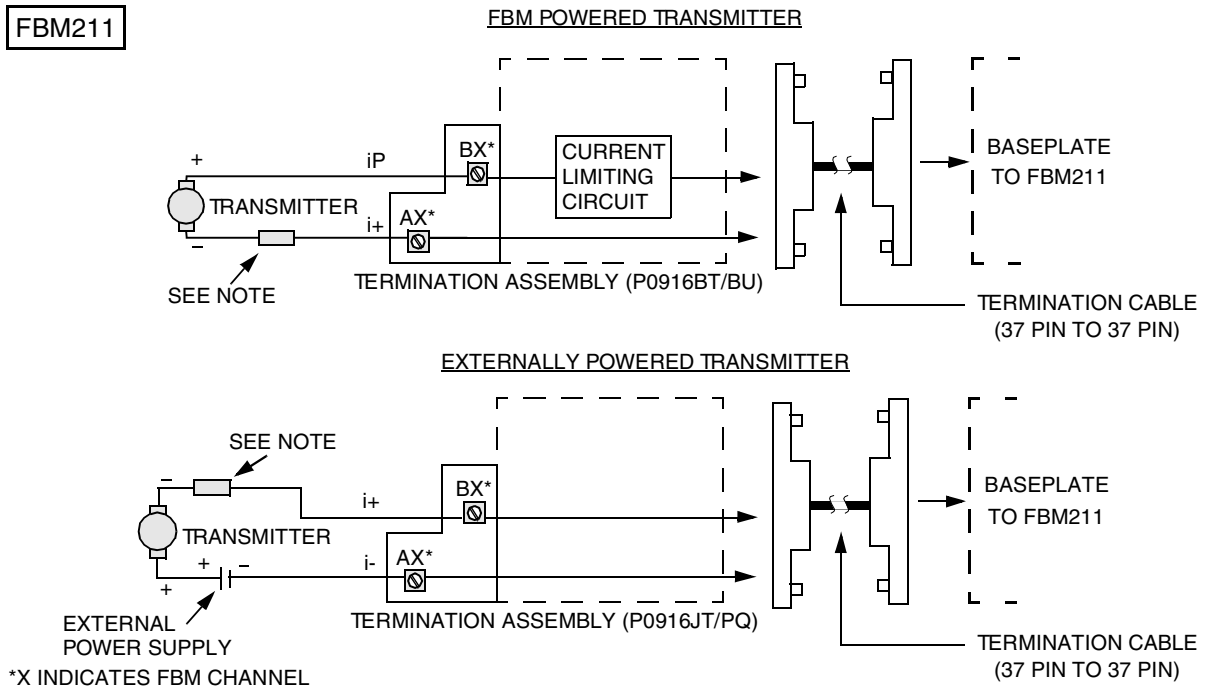
FBM Type	Isolation	Input		Output		PWA (Electrical)	TA P/N[(a)]	TA Size
		#	Signal	#	Signal			
FBM201	Channel	8	0 to 20 mA	0	N/A	Passive	P0916AA/ P0916AB	A
FBM211	Differential	16	0 to 20 mA, FBM power	0	N/A	Current limiting	P0916BT/ P0916BU	C
	Differential	16	0 to 20 mA, external power	0	N/A	Passive	P0916JT/ P0916PQ	C

(a) Two part numbers are provided. The first part number is for the compression-type termination assemblies, and the second part number is for the ring lug-type termination assemblies.



NOTE: IF AN I/A Series INTELLIGENT TRANSMITTER WITH A HAND-HELD TRANSMITTER IS USED WITH FBM201, AN IN-LINE RESISTOR ASSEMBLY (200 OHMS), P0902VY, MUST BE ADDED.

Figure 2. 0 to 20 mA Analog Input Field Connections (FBM201)



NOTE: IF AN I/A Series INTELLIGENT TRANSMITTER WITH A HAND-HELD TRANSMITTER IS USED WITH FBM211, AN IN-LINE RESISTOR ASSEMBLY (200 OHMS), P0902VY, MUST BE ADDED.

Figure 3. 0 to 20 mA Analog Input Field Connections (FBM211)

0 to 20 mA Analog Outputs

Table 2 lists the FBM and termination assembly that supports 0 to 20 mA analog outputs.

This analog signal termination assembly supports redundant FBM237s. When redundant FBM237s are used, a redundancy adapter at the baseplate connects the redundant FBM237s together.

The redundancy adapter connects a single termination cable to a single TA.

Field connections for this termination assembly are shown in Figure 4.

Dimensions for termination assembly size A is available in Figure 22.

Table 2. 0 to 20 mA Analog Outputs – FBM and Termination Assembly

FBM Type	Isolation	Input		Output		PWA (Electrical)	TA P/N[(a)]	TA Size
		#	Signal	#	Signal			
FBM237	Channel	0	N/A	8	0 to 20 mA	Passive	P0916CC/ P0916QC	A
FBM237 (redundant)	Channel	0	N/A	8	0 to 20 mA	Passive	P0916CC/ P0916QC	A
Note: Redundant FBM237s require a redundancy adapter.								

(a) Two part numbers are provided. The first part number is for the compression-type termination assemblies, and the second part number is for the ring lug-type termination assemblies.

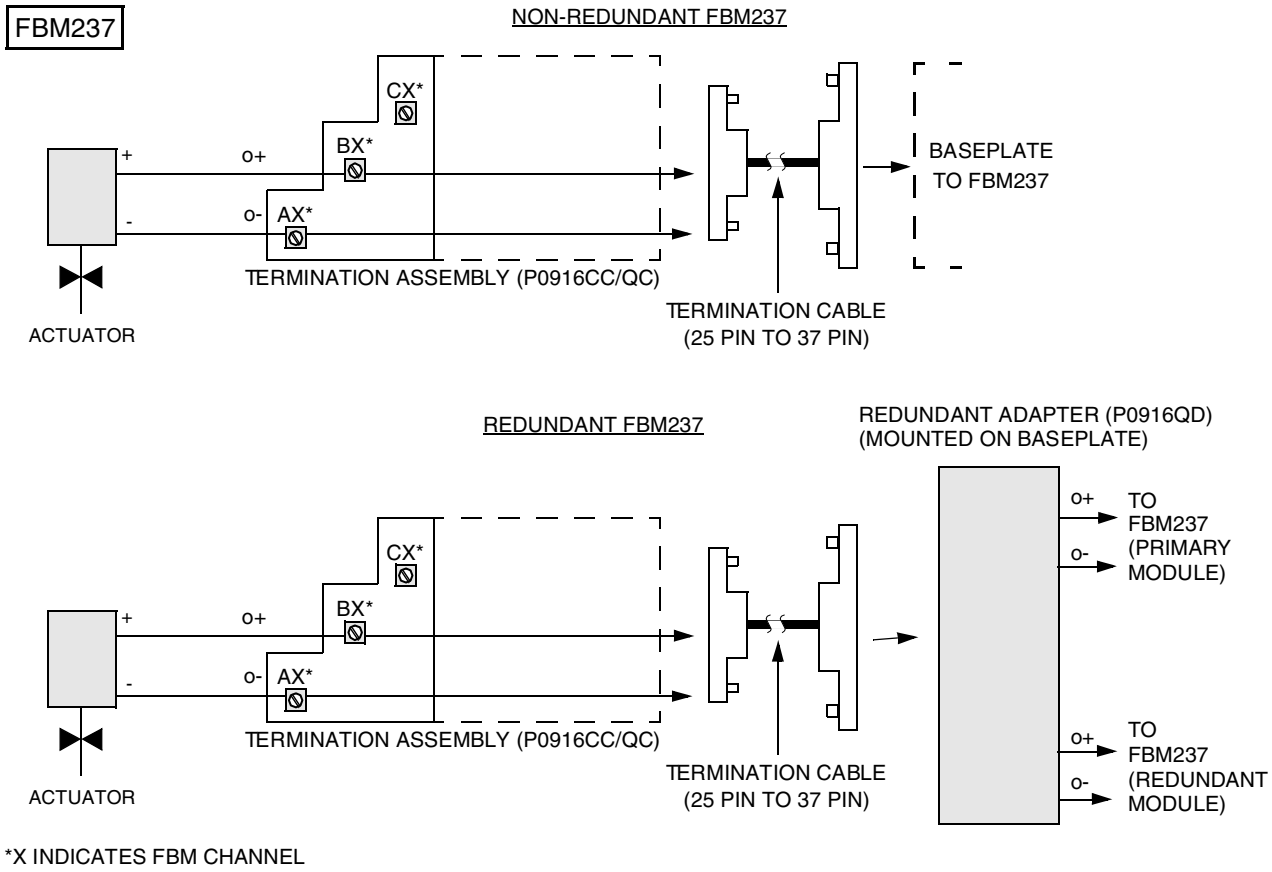


Figure 4. 0 to 20 mA Analog Output Field Connections (FBM237)

0 to 20 mA Analog Inputs and Outputs

Table 3 lists the FBMs and termination assemblies that support 0 to 20 mA analog inputs and outputs.

Analog signal termination assemblies support redundant FBM205s. Redundant or redundant ready FBM205s require the same redundant adapter.

The redundant adapter connects the redundant or non-redundant FBMs baseplate input/output connectors together. The redundant adapter provides a single termination connection to a single TA.

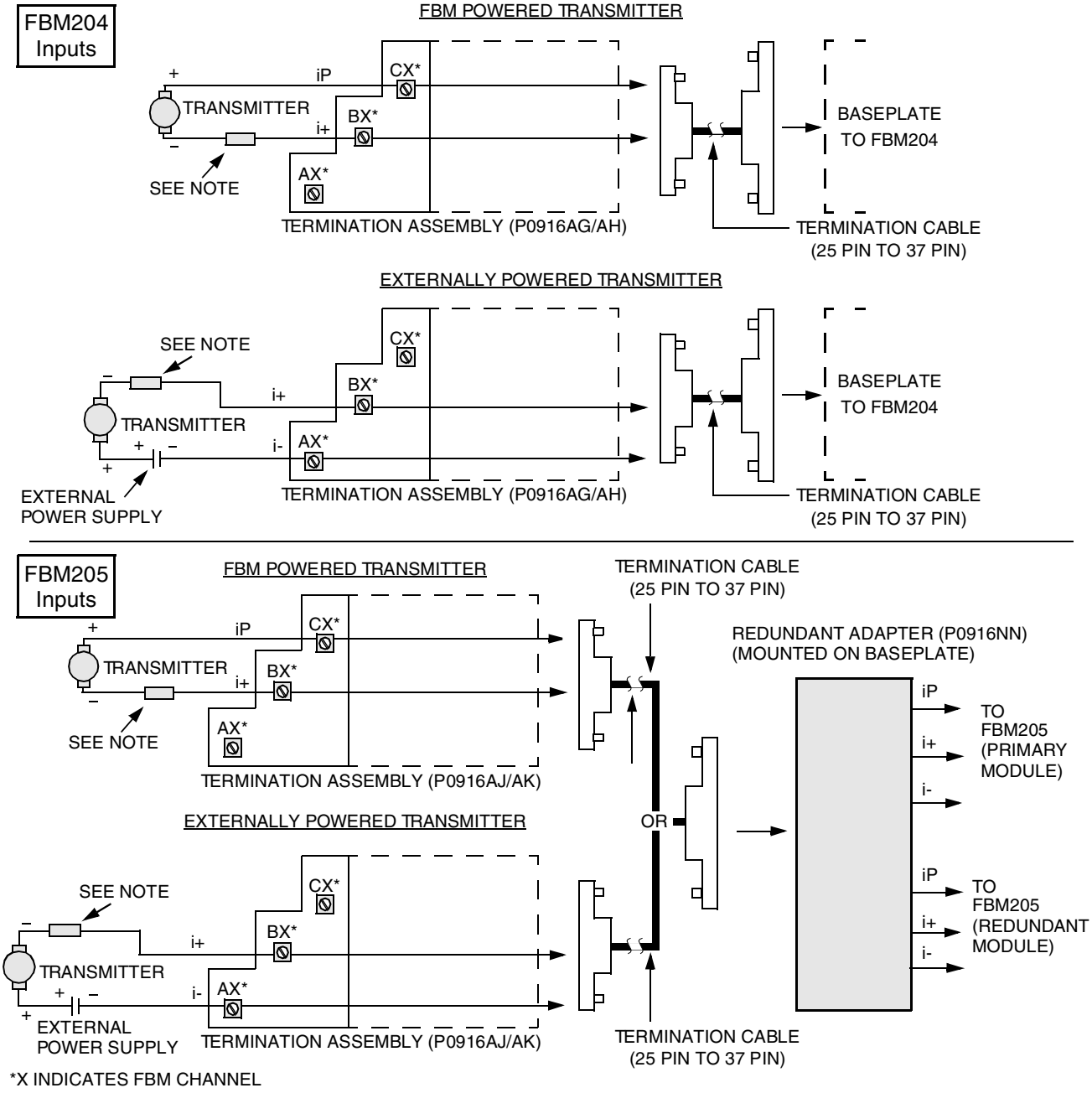
Field connections and internal schematics for these termination assemblies are shown in Figure 5 for inputs and Figure 6 for outputs.

Dimensions for termination assembly size A are available in Figure 22.

Table 3. 0 to 20 mA Analog Inputs/Outputs – FBMs and Termination Assemblies

FBM Type	Isolation	Input		Output		PWA (Electrical)	TA P/N[(a)]	TA Size
		#	Signal	#	Signal			
FBM204	Channel	4	0 to 20 mA	4	0 to 20 mA	Passive	P0916AG/ P0916AH	A
FBM205 (redundant)	Channel	4	0 to 20 mA	4	0 to 20 mA	Passive	P0916AJ/ P0916AK	A
Note: On TAs P0916AG/AH and P0916AJ/AK, the first four screw terminals connect to the FBM inputs and the last four screw terminals connect to the FBM outputs. The labelling for these TAs reflects this. Redundant and non-redundant FBM205s require a redundancy adapter.								

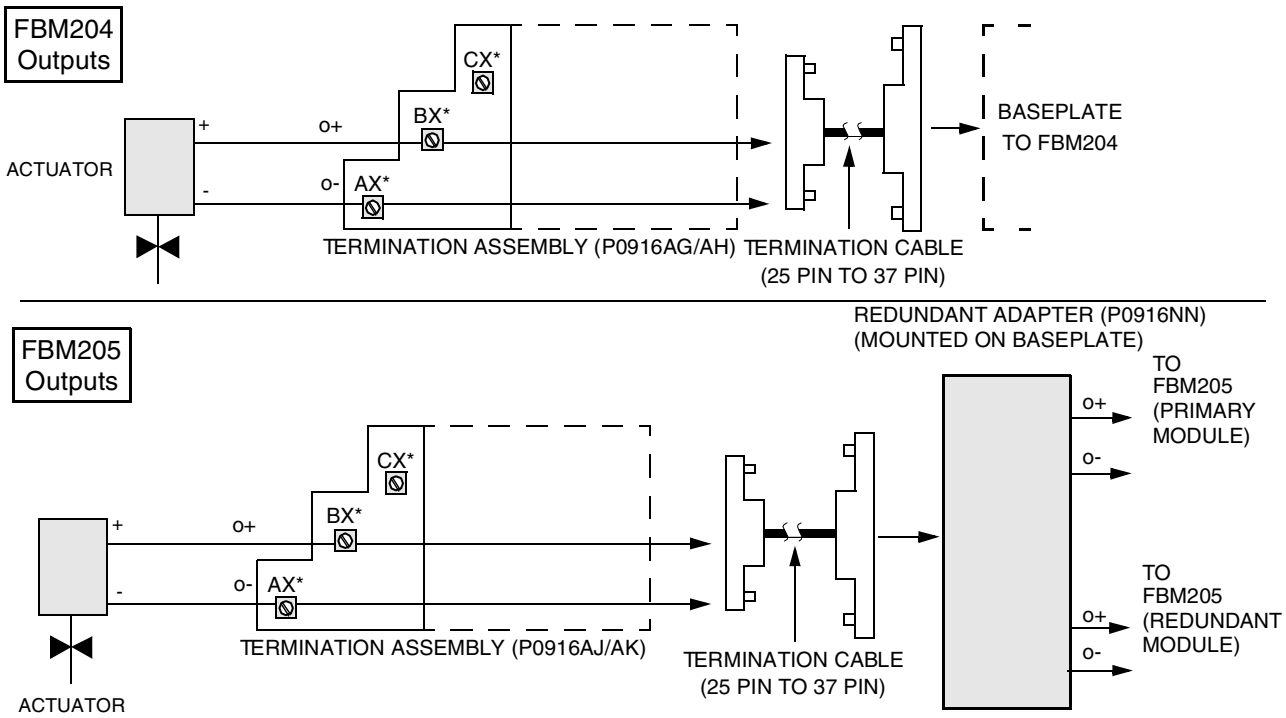
(a) Two part numbers are provided. The first part number is for the compression-type termination assemblies, and the second part number is for the ring lug-type termination assemblies.



*X INDICATES FBM CHANNEL

NOTE: IF AN I/A Series INTELLIGENT TRANSMITTER WITH A HAND-HELD TRANSMITTER IS USED WITH FBM204 OR FBM205, AN IN-LINE RESISTOR ASSEMBLY (200 OHMS), P0902VY, MUST BE ADDED.

Figure 5. 0 to 20 mA Analog Input Field Connections (FBM204 and FBM205)



*X INDICATES FBM CHANNEL

Figure 6. 0 to 20 mA Analog Output Field Connections (FBM204 and FBM205)

Thermocouple/mV Analog Inputs

Table 4 lists the FBMs and termination assemblies that support thermocouple analog inputs, and provides internal electrical specifications for the termination assemblies.

These termination assemblies contain a platinum RTD for local temperature reference junction compensation to support the thermocouple/mV analog inputs.

Field connections for these termination assemblies are shown in Figure 7.

Dimensions for termination assembly sizes B and E are available in Figure 22 and Figure 24.

Table 4. Thermocouple/mV Analog Inputs – FBMs and Termination Assemblies

FBM Type	Isolation	Input		Output		PWA (Electrical)	TA P/N[(a)]	TA Size
		#	Signal	#	Signal			
FBM202	Channel	8	Thermocouple/mV	0	N/A	Passive, 100 Ω platinum RTD (IEC 751, Class B) for local temperature reference junction compensation	P0916AC/ P0916AD	B
FBM212	Differential	14	Thermocouple/mV	0	N/A	Passive, 100 Ω platinum RTD (IEC 751, Class B) for local temperature reference junction compensation	P0916BV/ P0916BW	E

(a) Two part numbers are provided. The first part number is for the compression-type termination assemblies, and the second part number is for the ring lug-type termination assemblies.

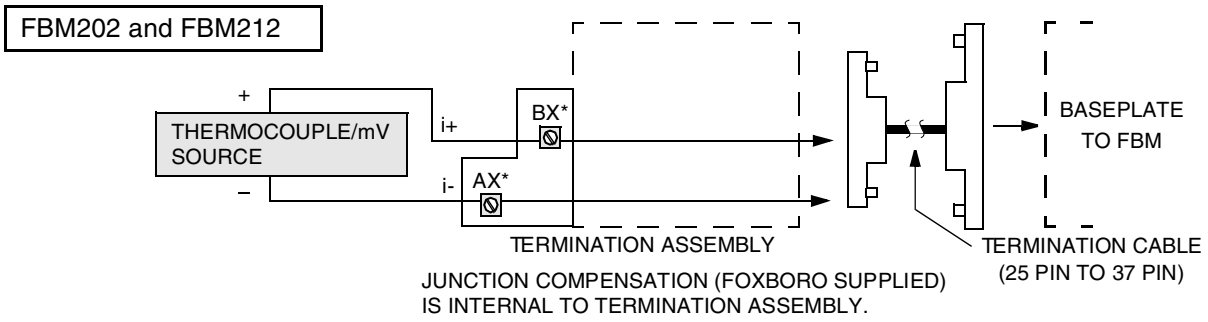


Figure 7. Thermocouple/mV Analog Input Field Connections (FBM202 and FBM212)

RTD Analog Inputs

Table 5 lists the FBMs and termination assemblies that support RTD analog inputs for platinum or nickel RTDs.

Field connections for these termination assemblies are shown in Figure 8.

Dimensions for termination assembly size A are available in Figure 22.

Table 5. RTD Analog Inputs – FBMs and Termination Assemblies

FBM Type	Isolation	Input		Output		PWA (Electrical)	TA P/N[(a)]	TA Size
		#	Signal	#	Signal			
FBM203	Channel	8	RTD (platinum and nickel)	0	N/A	Passive	P0916AE/ P0916AF	A
FBM213	Differential	8	RTD (platinum and nickel)	0	N/A	Passive	P0916JR/ P0916PR	A

(a) Two part numbers are provided. The first part number is for the compression-type termination assemblies, and the second part number is for the ring lug-type termination assemblies.

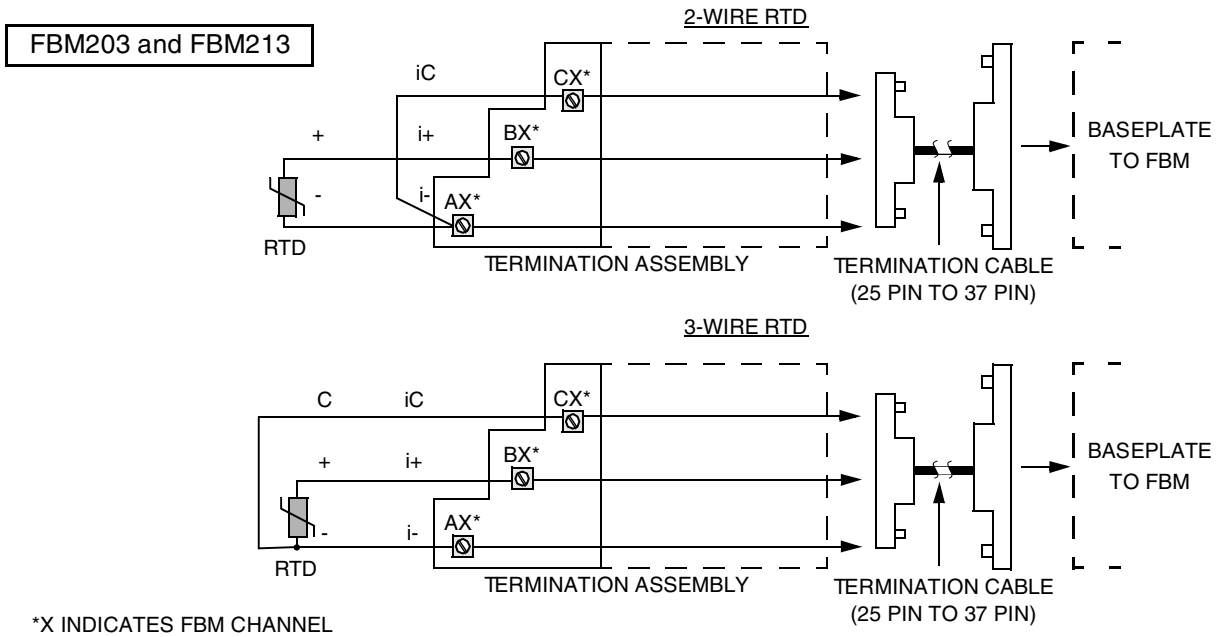


Figure 8. RTD Analog Input Field Connections (FBM203 and FBM213)

15 to 60 V dc Pulse Analog Inputs

Table 6 lists the FBM and termination assemblies that support 15 to 60 V dc analog pulse inputs.

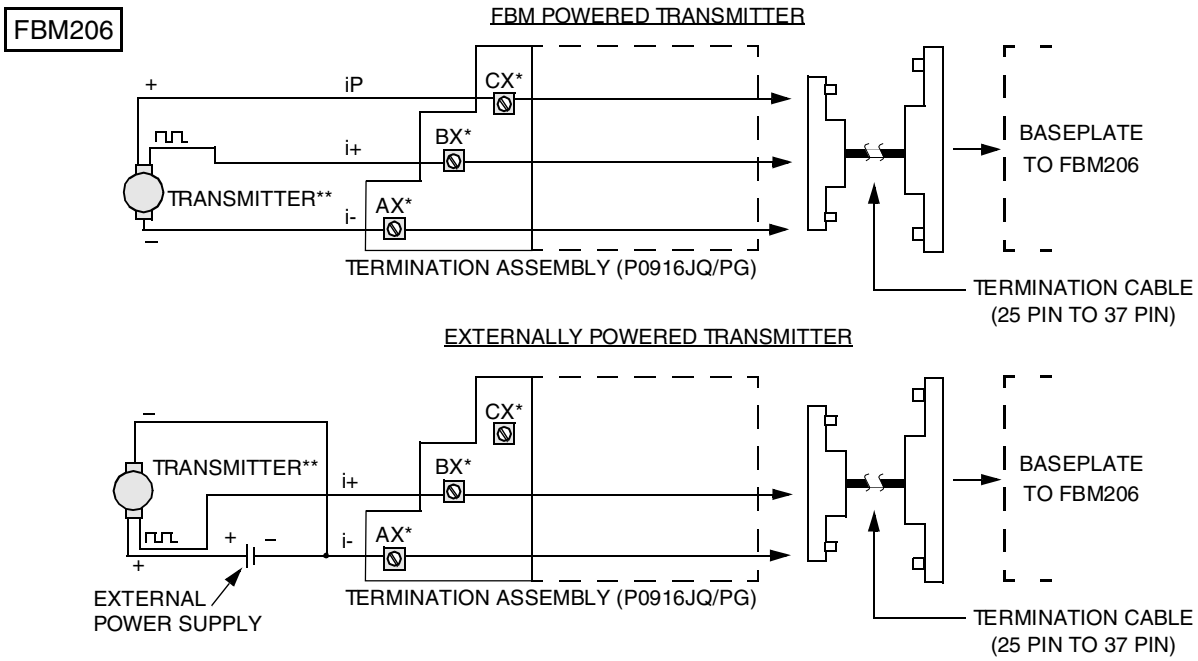
Field connections for this termination assembly are shown in Figure 9.

Dimensions for termination assembly size A are available in Figure 22.

Table 6. 15 to 60 V dc Pulse Analog Inputs – FBMs and Termination Assemblies

FBM Type	Isolation	Input		Output		PWA (Electrical)	TA P/N(a)	TA Size
		#	Signal	#	Signal			
FBM206	Channel	8	Pulse (15 to 60 V dc)	0	N/A	Passive	P0916JQ/ P0916PG	A

(a) Two part numbers are provided. The first part number is for the compression-type termination assemblies, and the second part number is for the ring lug-type termination assemblies.



*X INDICATES FBM CHANNEL

**EXTERNALLY POWERED TRANSMITTER SUCH AS VORTEX METER, MAGNETIC FLOWMETER, OR TURBINE METER.

Figure 9. 15 to 60 V dc Pulse Analog Input Field Connections (FBM206)

Analog Inputs/Output Electrical Specifications

See the Product Specification Sheet (PSS) on the individual FBM type for specifications on input/output functionality.

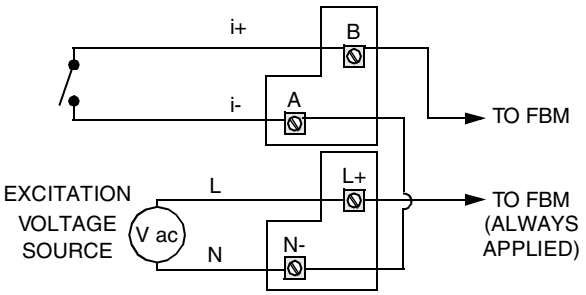
DISCRETE INPUTS

Discrete signal termination assemblies support discrete input signals at voltages of under 60 V dc, 125 V dc, 120 V ac, or 240 V ac. Certain discrete signal termination assemblies support signal conditioning for FBMs requiring these functions. The signal conditioning function is built into the termination assembly. To condition signals, these TAs contain current limiting devices, relays, and/or terminal blocks to connect with externally sourced power, depending on the signal used. The installer is responsible for separating the field wires used with these assemblies, as specified by local and national electric codes and installation regulations(1).

Termination assemblies for discrete inputs can be used to sense switch inputs or voltage monitor inputs for:

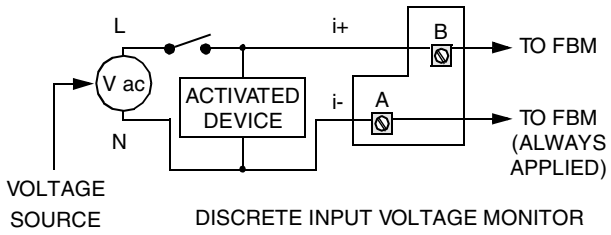
- loops with switch inputs that have a constant externally sourced voltage applied to the TA.
- loops with voltage monitor inputs that apply an externally sourced voltage to the TA only when the switch is closed.

These two types of discrete inputs are shown in Figure 10.



SWITCH INPUTS TERMINATION
ASSEMBLY WITH SIGNAL CONDITIONING

EXAMPLE 1: VOLTAGE IS CONSTANT IN LOOP. THIS LOOP REQUIRES A SWITCH INPUT TERMINATION ASSEMBLY.



DISCRETE INPUT VOLTAGE MONITOR
TERMINATION ASSEMBLY
WITH SIGNAL CONDITIONING

EXAMPLE 2: VOLTAGE IS EITHER PRESENT OR NOT PRESENT IN LOOP. THIS LOOP REQUIRES A DISCRETE INPUT VOLTAGE MONITOR TERMINATION ASSEMBLY.

Figure 10. Examples of Loops with Switch Inputs or Voltage Monitor Inputs

24 V dc Contact Sense Inputs

Termination assemblies supporting contact sense inputs interface switch closures where a 24 V dc (or 48 V dc) wetting voltage is supplied by the FBM. Contact sense inputs are commonly used on the per channel isolated contact sense FBMs, where each channel has an independent power source with built-in current limiting.

Contact sense inputs are also available on the group isolated FBM217, where the FBM subsystem power supply provides a 24 V dc wetting voltage.

Table 7 lists the FBMs and associated termination assemblies that support contact sense inputs, and provides signal conditioning specifications for the termination assemblies.

Field connections and internal schematics for these termination assemblies are provided in Figure 11.

Dimensions for termination assembly sizes C, F, I, and J are available in Figure 23, Figure 24, and Figure 26.

Table 7. 15 to 60 V dc Contact Sense Inputs – FBMs and Termination Assemblies

FBM Type	Isolation	Input		Output		PWA (Electrical)	TA P/N[a]	TA Size
		#	Signal	#	Signal			
FBM207b	Channel	16	24 V dc	0	N/A	Passive	P0916JS/ P0916PP	C
FBM207c	Channel	16	48 V dc	0	N/A	Passive	P0917MF/ P0917MH	C

(1) Refer to the I/A Series *DIN Rail Mounted FBM Subsystem User's Guide* (B0400FA) for more information on these regulations.

Table 7. 15 to 60 V dc Contact Sense Inputs – FBMs and Termination Assemblies (Continued)

FBM Type	Isolation	Input		Output		PWA (Electrical)	TA P/N[(a)]	TA Size
		#	Signal	#	Signal			
FBM217	Group	32	24 V dc	0	N/A	Fused (24 V dc auxiliary power)	P0916PW/ P0916PX	F
FBM219	Group	24	24 V dc Current Limited	8	15 to 60 V dc at 0.25 A Switch, fuse protected (external source)	Passive	P0917LH	F
FBM241c	Channel	8	24 V dc	8	15 to 60 V dc at 2 A Switch, unprotected (external source)	Passive	P0916UD/ P0916SS	C
	Channel	8	24 V dc	8	15 to 60 V dc at 2 A Switch, fuse protected (external source)	Passive	P0916JW/ P0916QP	C
	Channel	8	24 V dc	8	30 V dc at 5 A (external source)*	Relay	P0916AW/ P0916AX	I
	Input: Channel Output: Group	8	24 V dc	8	30 V dc at 5 A, (external source)*	Relay	P0916QQ/ P0916QR	J
FBM241d	Channel	8	24 V dc	8	12 V dc at 15 mA Switch (internal source)	Passive	P0916JX/ P0916QS	C

* Refer to "Termination Assembly Relay Functional Specifications" on page 34 for more information on the relay.

Note: FBM219 and FBM241 termination assemblies P0917LH, P0916AW/AX, and P0916QQ/QR use mixed signal voltages between its inputs and outputs (see above). It is recommended that you use one signal voltage per assembly. You are responsible for maintaining this segregation.

(a) Two part numbers are provided. The first part number is for the compression-type termination assemblies, and the second part number is for the ring lug-type termination assemblies.

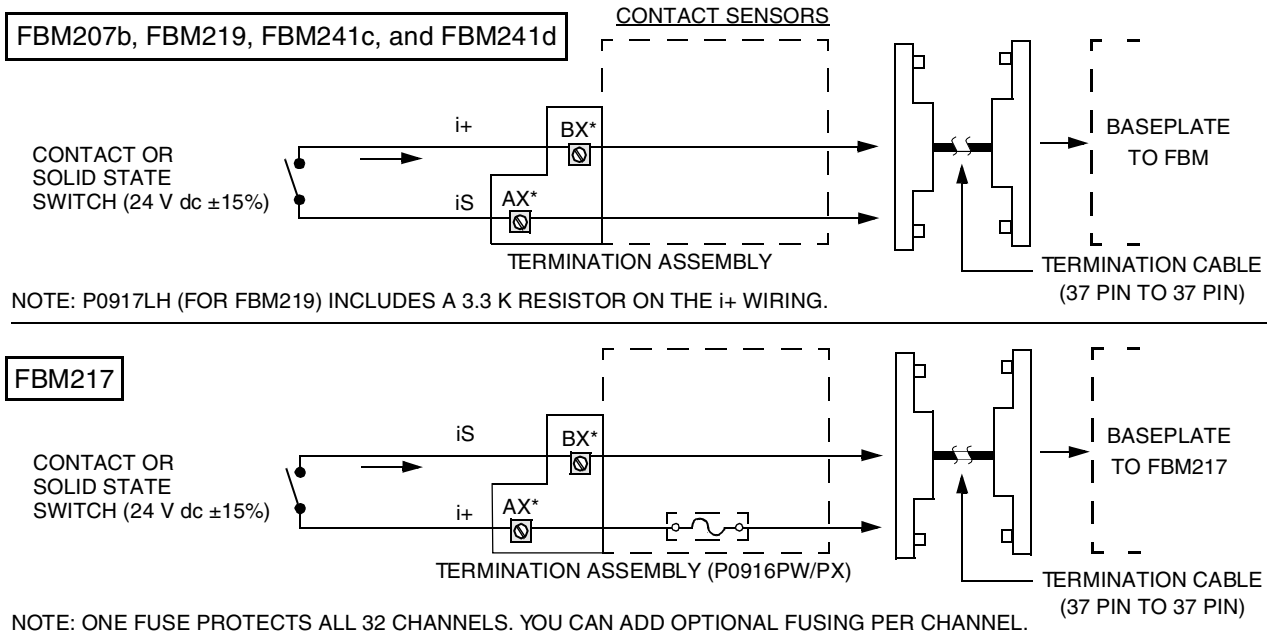


Figure 11. Contact Sense Input Field Connections (FBM207b, FBM217, FBM219, FBM241c and FBM241d)

Contact Sense Input Electrical Specifications

Table 8 lists the contact sense input electrical specifications of the FBM that are changed by using the termination assembly.

Table 8. Contact Sense Inputs Electrical Specifications

FUNCTIONAL SPECIFICATIONS CONTACT SENSE INPUTS
Since the termination assemblies are of straight-through construction (except for P0916PW/PX), they do not change the specifications of the individual FBM. See the Product Specification Sheet (PSS) on the individual FBM type for specifications on input/output functionality. FBM subsystem power supply supplies 24 V dc to the TA for contact wetting. P0916PW/PX provides a single fused 24 V dc for all 32 channels. Also, the following specifications apply to the FBM217, with respect to field circuit power: OPEN CIRCUIT VOLTAGE 24 V dc +15%, -10% SHORT CIRCUIT CURRENT 75 m A

120 V ac, 240 V ac and 125 V dc Switch Inputs

These termination assemblies interface switch closures (see Figure 10), where the desired wetting voltage is 120 V ac, 240 V ac, or 125 V dc. The termination assemblies maintain channel isolation, provide signal conditioning to reduce the high voltage field signals to levels acceptable for the FBM inputs and to isolate each channel optically.

Each termination assembly provides two pairs of connection terminals for externally sourced wetting voltage. Wetting voltage connected to the power input terminals is distributed by the termination assembly to each input circuit. If wetting voltage is applied to the TA, this negates the FBM channel isolation, since the common power group limits all inputs on the TA.

Table 9 lists the FBMs and termination assemblies that support 120 V ac, 240 V ac, and 125 V dc switch inputs.

Field connections and simplified schematics for these termination assemblies are provided in Figure 12.

Dimensions for termination assembly sizes D, G, K, O, and P are available in Figure 23, Figure 25, Figure 27, Figure 29, and Figure 30 respectively.

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Table 9. 120 V ac, 240 V ac and 125 V dc Switch Inputs – FBMs and Termination Assemblies

FBM Type	Isolation	Input		Output		PWA (Electrical)	TA P/N[(a)]	TA Size
		#	Signal	#	Signal			
FBM207	Group	16	120 V ac/ 125 V dc Switch	0	N/A	Isolation, voltage sense, signal conditioning, noise reduction	P0916PK/ P0916PL	D
FBM217	Group	32	120 V ac/ 125 V dc Switch	0	N/A	Isolation, voltage sense, signal conditioning, noise reduction	P0916PY/ P0916PZ	G

Table 9. 120 V ac, 240 V ac and 125 V dc Switch Inputs – FBMs and Termination Assemblies (Continued)

FBM Type	Isolation	Input		Output		PWA (Electrical)	TA P/N[(a)]	TA Size
		#	Signal	#	Signal			
FBM219	Input: Group Output: Channel	24	120 V ac/ 125 V dc Switch	8	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or 120 V ac at 5 A Switch (external source)*	Isolation, voltage sense, signal conditioning, noise reduction	P0917LS	O
	Group	24	120 V ac/ 125 V dc Switch	8	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load or 120 V ac at 5 A Switch (external source) with power distribution*	Isolation, voltage sense, signal conditioning, noise reduction	P0917LV	P
FBM241	Input: Group Output: Channel	8	120 V ac/ 125 V dc Switch	8	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or 120 V ac at 5 A Switch (external source)*	Isolation, voltage sense, signal conditioning, noise reduction	P0916QT/ P0916QU	K
	Group	8	120 V ac/ 125 V dc Switch	8	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or 120 V ac at 5 A Switch (external source) with power distribution*	Isolation, voltage sense, signal conditioning, noise reduction	P0916QV/ P0916QW	K
FBM207	Group	16	240 V ac Switch	0	N/A	Isolation, voltage sense, signal conditioning, noise reduction	P0916PM/ P0916PN	D
FBM217	Group	32	240 V ac Switch	0	N/A	Isolation, voltage sense, signal conditioning, noise reduction	P0916QA/ P0916QB	G
FBM241	Input: Group Output: Channel	8	240 V ac Switch	8	240 V ac at 5 A Switch (external source)*	Isolation, voltage sense, signal conditioning, noise reduction	P0916QX/ P0916QY	K
	Group	8	240 V ac Switch	8	240 V ac at 5 A Switch (external source) with power distribution*	Isolation, voltage sense, signal conditioning, noise reduction	P0916QZ/ P0916NZ	K

* Refer to “Termination Assembly Relay Functional Specifications” on page 34 for more information on the relay.

Note: For FBM219 and FBM241, termination assemblies P0917LS, P0917LV, P0916QX/QY, P0916QZ/NZ, P0916QT/QU, and P0916QV/QW use mixed signal voltages between input and output. It is recommended that one signal voltage is used per assembly. You are responsible for maintaining this segregation.

(a) Two part numbers are provided. The first part number is for the compression-type termination assemblies, and the second part number is for the ring lug-type termination assemblies.

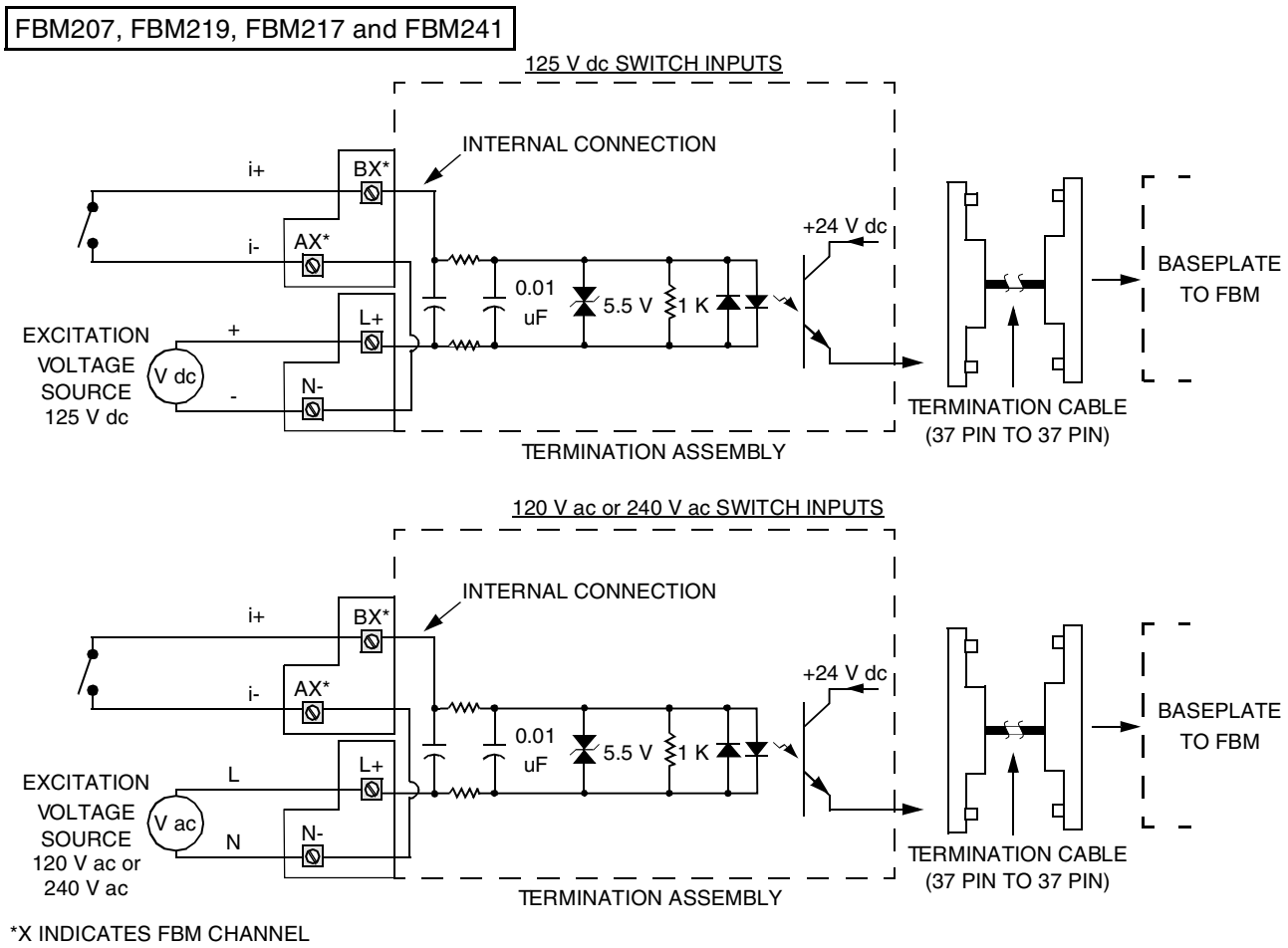


Figure 12. 120 V ac, 240 V ac and 125 V dc Switch Input Field Connections
(FBM207, FBM217, FBM219, and FBM241)

Switch Input Electrical Specifications

Table 10 lists the switch input electrical specifications of the FBM that are changed by using the termination assemblies.

Table 10. Switch Input Electrical Specifications

FUNCTIONAL SPECIFICATIONS **125 V dc, 120 V ac, OR 240 V ac SWITCH INPUTS**	
125 V dc Input ON-STATE VOLTAGE 65 to 150 V dc OFF-STATE VOLTAGE 0 to 20 V dc ON/OFF TRANSITIONS Between 20 and 65 V dc CURRENT 2.5 mA (typical) at 125 V dc INPUT IMPEDANCE 51 k Ω NOMINAL VOLTAGE 125 V dc POWER CONSUMPTION 312 mW/channel HEAT DISSIPATION 312 mW/channel **120 V ac Input** ON-STATE VOLTAGE 80 to 132 V ac OFF-STATE VOLTAGE 0 to 20 V ac ON/OFF TRANSITIONS Between 20 and 80 V ac CURRENT 2.4 mA (typical) at 120 V ac INPUT IMPEDANCE 51 k Ω	**120 V ac Input (Cont.)** NOMINAL VOLTAGE 120 V ac, 50/60 Hz POWER CONSUMPTION 565 mW peak/channel HEAT DISSIPATION 565 mW peak/channel **240 V ac Input** ON-STATE VOLTAGE 160 to 280 V ac OFF-STATE VOLTAGE 0 to 40 V ac ON/OFF TRANSITIONS Between 40 and 160 V ac CURRENT 2.2 mA (typical) at 240 V ac INPUT IMPEDANCE 107 k Ω VOLTAGE RANGE 160 V ac to 280 V ac NOMINAL VOLTAGE 240 V ac, 50/60 Hz POWER CONSUMPTION 840 mW/channel HEAT DISSIPATION 840 mW/channel

15 to 60 V dc Discrete Input Voltage Monitor

Voltage monitor termination assemblies are used by their associated FBMs to determine if a 15 to 60 V dc signal is applied to the FBM (see Figure 10). The termination assemblies for 15 to 60 V dc are passive.

Table 11 lists the termination assemblies required for use with FBMs used as voltage monitor inputs for signals with voltages under 60 V dc.

Field connections and internal schematics for these termination assemblies are provided in Figure 13.

Dimensions for termination assembly sizes C, F, and H are available in Figure 23, Figure 24, and Figure 25.

Table 11. 15 to 60 V dc Discrete Input Voltage Monitor – FBMs and Termination Assemblies

FBM Type	Isolation	Input		Output		PWA (Electrical)	TA P/N[a]	TA Size
		#	Signal	#	Signal			
FBM207	Channel	16	15 to 60 V dc Switch	0	N/A	Passive	P0916AL/ P0916AN	C
FBM217	Group	32	15 to 30 V dc Switch	0	N/A	Passive	P0916CA/ P0916CB	F
FBM219	Group	24	15 to 30 V dc Switch	8	15 to 60 V dc at 0.25 A Switch, fuse protected (external source)	Passive	P0917LE	F
FBM241	Channel	8	15 to 60 V dc Switch	8	15 to 60 V dc at 2 A Switch, unprotected (external source)	Passive	P0916UY/ P0916UZ	C
	Channel	8	15 to 60 V dc Switch	8	15 to 60 V dc at 2 A Switch, fuse protected (external source)	Passive	P0916AQ/ P0916AR	C
	Channel	8	15 to 60 V dc Switch	8	30 V dc at 5 A, or 125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or 120 V ac at 5 A, or 240 V ac at 5 A Switch (external source)*	Passive	P0916QE/ P0916QF	H
FBM241b	Channel	8	15 to 60 V dc Switch	8	12 V dc at 15 mA Switch (internal source)	Passive	P0916JV/ P0916QN	C

* Refer to “Termination Assembly Relay Functional Specifications” on page 34 for more information on the relay.

Note: For FBM241, P0916QE/QF uses mixed signal voltages (15 to 60 V dc inputs with 120/240 V ac outputs). The assembly provides adequate signal segregation by locating the low voltage inputs on the same side as the termination cable to the FBM. You are responsible for maintaining this segregation.

(a) Two part numbers are provided. The first part number is for the compression-type termination assemblies, and the second part number is for the ring lug-type termination assemblies.

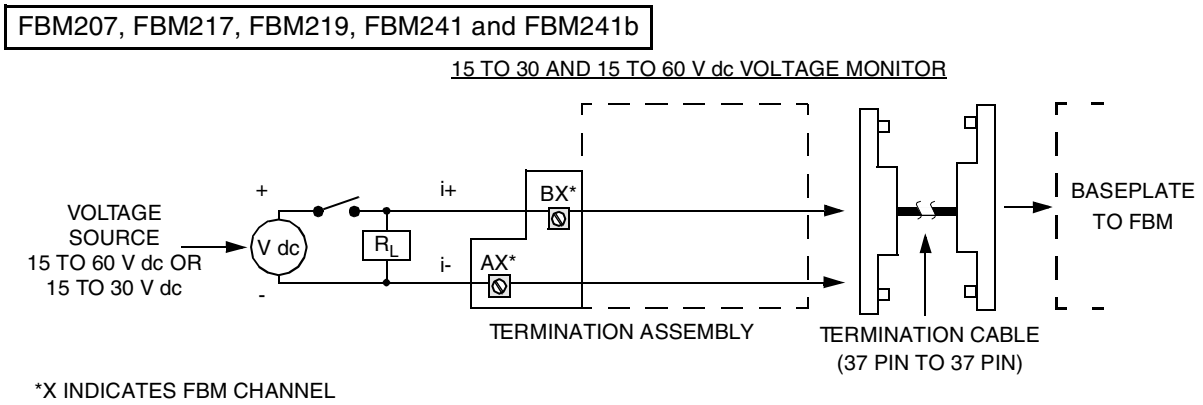


Figure 13. 15 to 30 V dc and 15 to 60 V dc Discrete Input Voltage Monitor Field Connections

Analog Inputs/Outputs Electrical Specifications

Table 12 lists the electrical specifications of the FBM that are changed by using the termination assembly.

Table 12. 15 to 30 V dc and 15 to 60 V dc Discrete Input Voltage Monitor Electrical Specifications

FUNCTIONAL SPECIFICATIONS **15 TO 60 V dc VOLTAGE MONITOR INPUTS**
Since the termination assemblies are of straight-through construction, they do not change the specifications of the individual FBM. See the Product Specification Sheet (PSS) on the individual FBM type for specifications on input/output functionality.

125 V dc, 120 V ac and 240 V ac Discrete Input Voltage Monitor

Voltage monitor termination assemblies are used by their associated FBMs to determine if a 125 V dc, 120 V ac, or a 240 V ac voltage is applied to the FBM (see Figure 10). The termination assemblies maintain channel isolation, provide signal conditioning to reduce the high voltage field signals to levels acceptable for the FBM inputs and to isolate each channel optically.

Table 13 lists the termination assemblies required for use with FBMs used as voltage monitor inputs for signals with 120 V ac, 125 V dc, and 240 V ac voltages.

Field connections and simplified schematics for these termination assemblies are provided in Figure 14.

Dimensions for termination assembly sizes C, F, I, J, M, N, and Q are available in Figure 23, Figure 24, Figure 26, Figure 29, and Figure 30.

Table 13.
125 V dc, 120 V ac and 240 V ac Discrete Input Voltage Monitor – FBMs and Termination Assemblies

FBM Type	Isolation	Input		Output		PWA (Electrical)	TA P/N[(a)]	TA Size
		#	Signal	#	Signal			
FBM207	Channel	16	120 V ac/ 125 V dc Switch	0	N/A	Isolation, voltage sense, signal conditioning, noise reduction	P0916AM/ P0916AP	Q
FBM217	Channel	32	120 V ac/ 125 V dc Switch	0	N/A	Isolation, voltage sense, signal conditioning, noise reduction	P0916PS/ P0916PT	F

Table 13.
125 V dc, 120 V ac and 240 V ac Discrete Input Voltage Monitor – FBMs and Termination Assemblies

FBM Type	Isolation	Input		Output		PWA (Electrical)	TA P/N[a]	TA Size
		#	Signal	#	Signal			
FBM219	Channel	24	120 V ac/ 125 V dc Switch	8	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or 120 V ac at 5 A Switch (external source)*	Isolation, voltage sense, signal conditioning, noise reduction	P0917LL	M
	Input: Channel Output: Group	24	120 V ac/ 125 V dc Switch	8	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load or 120 V ac at 5 A Switch (external source) with power distribution*	Isolation, voltage sense, signal conditioning, noise reduction	P0917LP	N
FBM241	Channel	8	120 V ac/ 125 V dc Switch	8	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or 120 V ac at 5 A Switch (external source)*	Isolation, voltage sense, signal conditioning, noise reduction	P0916AS/ P0916AT	I
	Input: Channel Output: Group	8	120 V ac/ 125 V dc Switch	8	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or 120 V ac at 5 A Switch (external source) with power distribution*	Isolation, voltage sense, signal conditioning, noise reduction	P0916QG/ P0916QH	J
FBM207	Channel	16	240 V ac Switch	0	N/A	Isolation, voltage sense, signal conditioning, noise reduction	P0916PH/ P0916PJ	Q
FBM217	Channel	32	240 V ac Switch	0	N/A	Isolation, voltage sense, signal conditioning, noise reduction	P0916PU/ P0916PV	F
FBM241	Channel	8	240 V ac Switch	8	240 V ac at 5 A Switch (external source)*	Isolation, voltage sense, signal conditioning, noise reduction	P0916QJ/ P0916QK	I
	Input: Channel Output: Group	8	240 V ac Switch	8	240 V ac at 5 A Switch (external source) with power distribution*	Isolation, voltage sense, signal conditioning, noise reduction	P0916QL/ P0916QM	J

* Refer to “Termination Assembly Relay Functional Specifications” on page 34 for more information on the relay.

Note: For FBM219 and FBM241, termination assemblies P0917LL, P0917LP, P0916QJ/QK, P0916QL/QM, P0916AS/AT and P0916QG/QH use mixed signal voltages between input and output. It is recommended that one signal voltage is used per assembly. You are responsible for maintaining this segregation.

(a) Two part numbers are provided. The first part number is for the compression-type termination assemblies, and the second part number is for the ring lug-type termination assemblies.

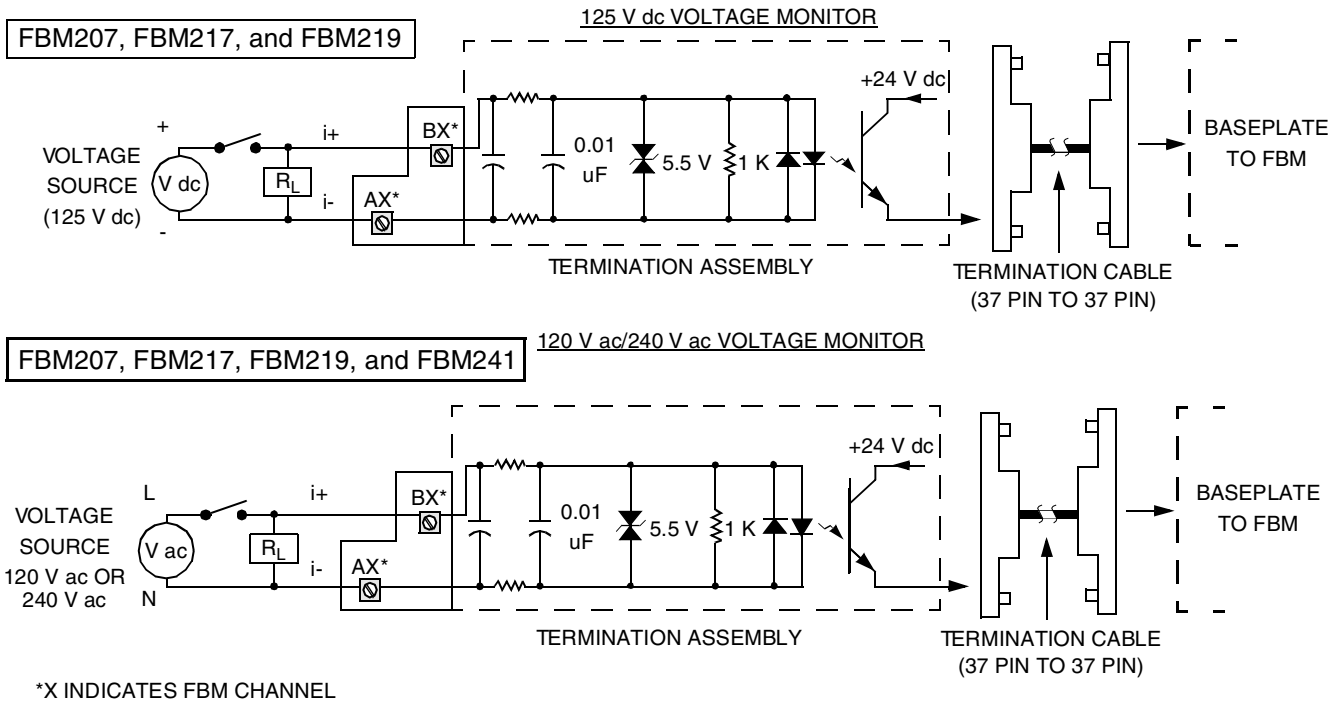


Figure 14. 125 V dc, 120 V ac and 240 V ac
Discrete Input Voltage Monitor Field Connections (FBM207, FBM217, FBM219, and FBM241)

Discrete Input Voltage Monitor Electrical Specifications

Table 14 lists the discrete input voltage monitor electrical specifications of the FBM that are changed by using the termination assemblies.

Table 14. 125 V dc, 120 V ac, and 240 V ac Voltage Monitor Electrical Specifications

FUNCTIONAL SPECIFICATIONS **125 V dc, 120 V ac, OR 240 V dc VOLTAGE MONITOR INPUTS**	
125 V dc Input ON-STATE VOLTAGE 65 to 150 V dc OFF-STATE VOLTAGE 0 to 20 V dc ON/OFF TRANSITIONS Between 20 and 65 V dc CURRENT 2.5 mA (typical) at 125 V dc INPUT IMPEDANCE 51 k Ω NOMINAL VOLTAGE 125 V dc POWER CONSUMPTION 312 mW/channel HEAT DISSIPATION 312 mW/channel **120 V ac Input** ON-STATE VOLTAGE 80 to 132 V ac OFF-STATE VOLTAGE 0 to 20 V ac ON/OFF TRANSITIONS Between 20 and 80 V ac CURRENT 2.4 mA (typical) at 120 V ac INPUT IMPEDANCE 51 k Ω	**120 V ac Input (Cont.)** NOMINAL VOLTAGE 120 V ac, 50/60 Hz POWER CONSUMPTION 565 mW peak/channel HEAT DISSIPATION 565 mW peak/channel **240 V ac Input** ON-STATE VOLTAGE 160 to 280 V ac OFF-STATE VOLTAGE 0 to 40 V ac ON/OFF TRANSITIONS Between 40 and 160 V ac CURRENT 2.2 mA (typical) at 240 V ac INPUT IMPEDANCE 107 k Ω VOLTAGE RANGE 160 V ac to 280 V ac NOMINAL VOLTAGE 240 V ac, 50/60 Hz POWER CONSUMPTION 840 mW/channel HEAT DISSIPATION 840 mW/channel

DISCRETE OUTPUTS

Discrete signal termination assemblies support discrete output signals at voltages of under 60 V dc, 120 V ac/125 V dc, or 240 V ac. To condition signals, these TAs contain current limiting devices, relays, and/or terminal blocks to connect with externally sourced power, depending on the signal used. The signal conditioning function is built into the termination assembly. The installer is responsible for separating the field wires used with these assemblies, as specified by local and national electric codes and installation regulations(2).

TAs supporting high voltage signals (over 60 V) contain an unsealed electromechanical relay for each output channel, and therefore, these TAs are rated for general purpose applications only. Power is supplied to the relays from within the loop or from a local external source via a pair of input terminals on the TA. Output current for these TAs is limited to 5 A maximum.

The following paragraphs describe the available discrete outputs of the termination assemblies.

15 to 60 V dc Switch Outputs without Relays

These termination assemblies support output signals with 15 to 60 V dc at 2 A current. The TA is passive and does not require relays, since this TA supports only low voltage signals.

TAs installed in externally powered loops are protected or unprotected depending on whether or not they contain user-serviceable individual 5 mm x 20 mm fuse holders. The fuses must limit current output to 2 A, to provide protection for the output of the FBMs. Unprotected TAs are purely passive devices, and require additional components such as custom interposing relays or fused terminal blocks between the TA and the field device.

Table 15 lists the FBMs and termination assemblies that support 15 to 60 V dc outputs, and provides specifications for the termination assemblies.

Field connections and internal schematics for these termination assemblies are provided in Figure 15.

Dimensions for termination assembly size C and F are available in Figure 23 and Figure 24.

Table 15. 15 to 60 V dc Switch Outputs – FBMs and Termination Assemblies

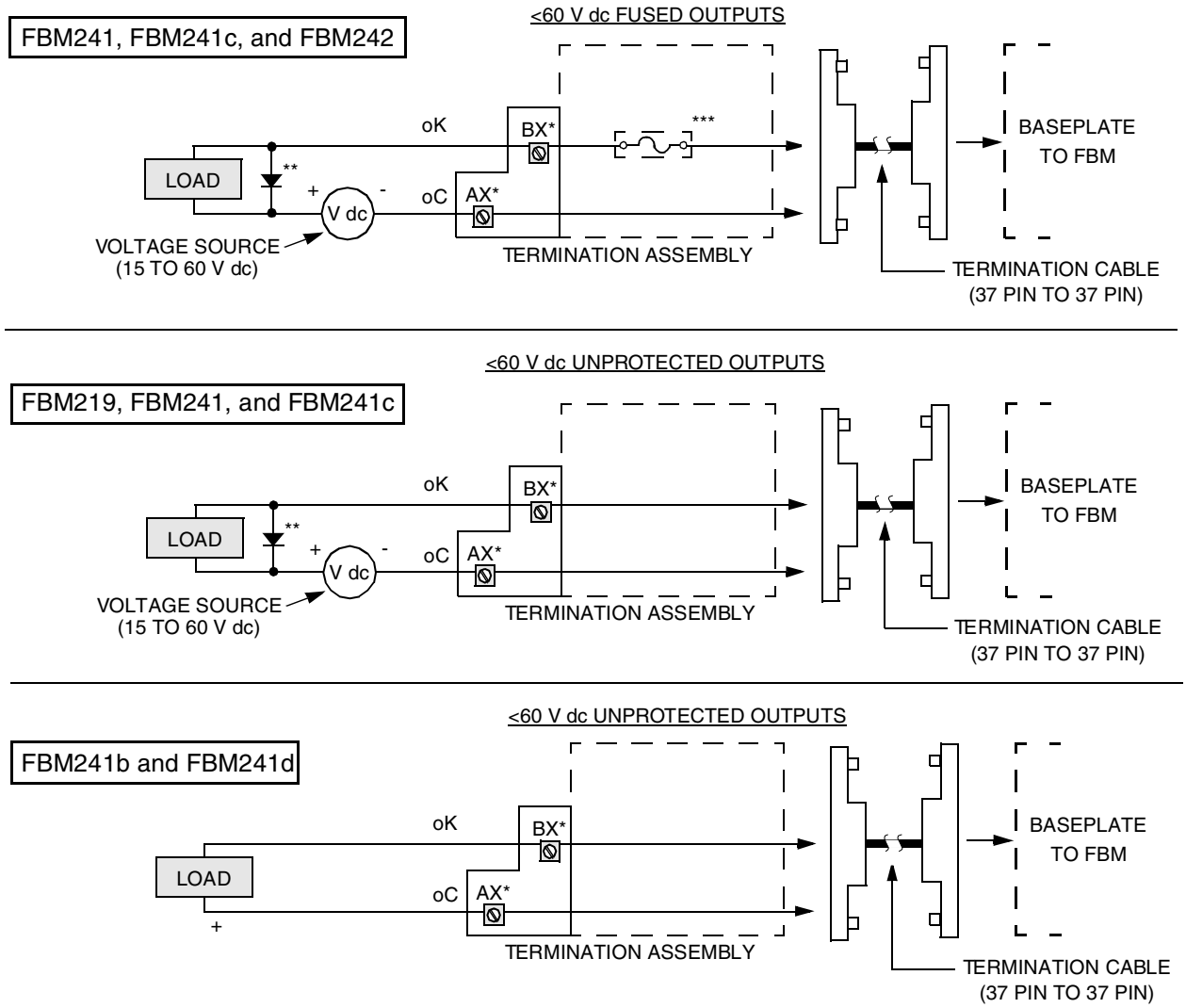
FBM Type	Isolation	Input		Output		PWA (Electrical)	TA P/N[a]	TA Size
		#	Signal	#	Signal			
FBM219	Group	24	15 to 30 V dc Switch	8	15 to 60 V dc at 0.25 A Switch, fuse protected (external source)	Fused	P0917LE	F
	Group	24	24 V dc Contact, Current Limited	8	15 to 60 V dc at 0.25 A Switch, fuse protected (external source)	Fused	P0917LH	F
FBM241	Channel	8	15 to 60 V dc Switch	8	15 to 60 V dc at 2 A Switch, fuse protected (external source)	Fused	P0916AQ/ P0916AR	C
	Channel	8	15 to 60 V dc Switch	8	15 to 60 V dc at 2 A Switch, unprotected (external source)	Passive	P0916UY/ P0916UZ	C
FBM241b	Channel	8	15 to 60 V dc Switch	8	15 V dc at 15 mA Switch (internal source)	Passive	P0916JV/ P0916QN	C
FBM241c	Channel	8	15 to 60 V dc Contact	8	15 to 60 V dc at 2 A, Switch, fuse protected (external source)	Fused	P0916JW/ P0916QP	C
FBM241c	Channel	8	15 to 60 V dc Contact	8	15 to 60 V dc at 2 A Switch, unprotected (external source)	Passive	P0916UD/ P0916SS	C
FBM241d	Channel	8	15 to 60 V dc Contact	8	12 V dc at 15 mA Switch (internal source)	Passive	P0916JX/ P0916QS	C

(2) Refer to the I/A Series DIN Rail Mounted FBM Subsystem User's Guide (B0400FA) for more information on these regulations.

Table 15. 15 to 60 V dc Switch Outputs – FBMs and Termination Assemblies (Continued)

FBM Type	Isolation	Input		Output		PWA (Electrical)	TA P/N[(a)]	TA Size
		#	Signal	#	Signal			
FBM242	Channel	0	N/A	16	15 to 60 V dc at 2 A Switch (external source)	Fused	P0916JY/ P0916RJ	C
Note: For FBM241, FBM241b, FBM241c, and FBM241d, respectively, termination assemblies P0916UY/UZ, P0916JV/QN, P0916UD/SS, and P0916JX/QS provide no protection for the outputs of the FBM. If the output exceeds 2 A or is shorted, damage to the FBMs may occur. If using P0916UY/UZ, you must add additional components between the termination assembly and the field device, such as custom interposing relays, or fused terminal blocks.								

(a) Two part numbers are provided. The first part number is for the compression-type termination assemblies, and the second part number is for the ring lug-type termination assemblies.



*X INDICATES FBM CHANNEL
**PROTECTIVE DIODE (CUSTOMER-SUPPLIED) IS RECOMMENDED FOR A dc INDUCTIVE LOAD ONLY.
MOV (METAL OXIDE VARISTOR) IS RECOMMENDED FOR AN ac INDUCTIVE LOAD ONLY.
***TA CONTAINS USER-ACCESSIBLE FUSES, ONE PER OUTPUT CHANNEL.

Figure 15. 15 to 60 V dc Switch Output Field Connections
(FBM219, FBM241, FBM241b, FBM241c, FBM241d and FBM242)

Analog Inputs/Outputs Electrical Specifications

Table 16 lists the analog inputs/outputs electrical specifications of the FBM that are changed by using the termination assembly.

Table 16. 15 to 30 V dc and 15 to 60 V dc Discrete Input Voltage Monitor Electrical Specifications

FUNCTIONAL SPECIFICATIONS 15 TO 60 V dc VOLTAGE MONITOR INPUTS
Since the termination assemblies are of straight-through construction, they do not change the specifications of the individual FBM. See the Product Specification Sheet (PSS) on the individual FBM type for specifications on input/output functionality.

30 V dc, 120 V ac, 125 V dc, or 240 V ac Relay Outputs

These termination assemblies support output signals with 30 V dc, 120 V ac, 125 V dc, or 240 V ac. The TAs contain an unsealed electromechanical relay for each output channel. The POLE, NC, and NO contacts of the relay are connected to a 3-tier terminal block with eight outputs on the TA.

These TAs are rated for general purpose applications only. Relay voltage is supplied by an external source located in the loop. Output current is limited to 5 A maximum.

Table 17 lists the FBMs and termination assemblies that support 30 V dc, 120 V ac, 125 V dc, or 240 V ac relay outputs, and provides specifications for the termination assemblies.

Field connections and internal schematics for these termination assemblies are provided in Figure 16 and Figure 17.

Table 18 lists the specifications for relay outputs.

Dimensions for termination assembly sizes H, I, K, L, M, and P are available in Figure 25, Figure 26, Figure 27, Figure 28, Figure 29, and Figure 30 respectively.

Table 17. Relay Outputs – FBMs and Termination Assemblies

FBM Type	Isolation	Input		Output		PWA (Electrical)	TA P/N[(a)]	TA Size
		#	Signal	#	Signal			
FBM219	Channel	24	120 V ac/ 125 V dc Switch	8	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or 120 V ac at 5 A Switch (external source)*	Shunt diodes Relay: 5 A at 240 V ac	P0917LL	M
	Input: Group Output: Channel	24	120 V ac/ 125 V dc Switch (External Source)	8	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or 120 V ac at 5 A Switch (external source)*	Shunt diodes Relay: 5 A at 240 V ac	P0917LS	O
FBM241	Channel	8	15 to 60 V dc Switch	8	30 V dc at 5 A Switch (external source)*	Shunt diodes Relay: 5 A at 30 V dc	P0916QE/ P0916QF	H
	Channel	8	15 to 60 V dc Switch	8	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or 120 V ac at 5 A, Switch (external source)*	Shunt diodes Relay: 5 A at 240 V ac	P0916QE/ P0916QF	H

Table 17. Relay Outputs – FBMs and Termination Assemblies (Continued)

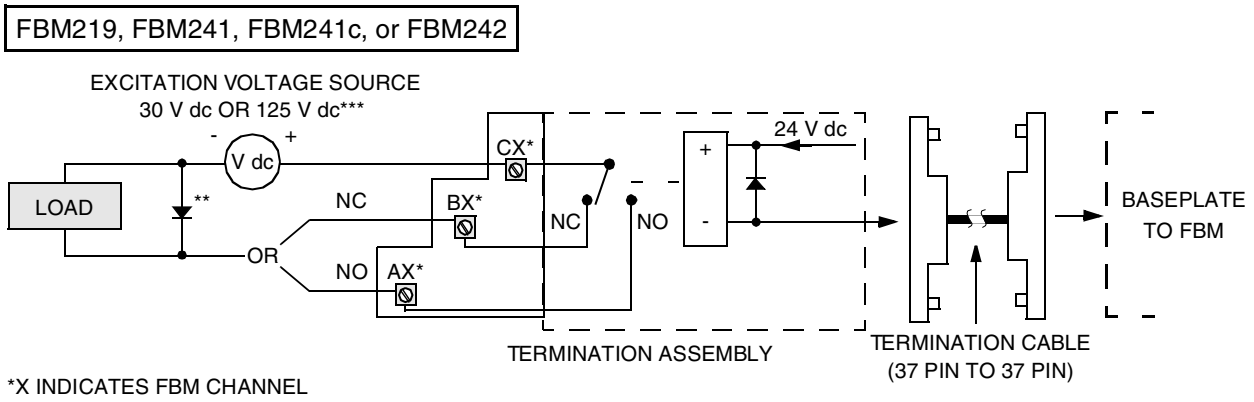
FBM Type	Isolation	Input		Output		PWA (Electrical)	TA P/N[(a)]	TA Size
		#	Signal	#	Signal			
FBM241	Channel	8	120 V ac/ 125 V dc Switch	8	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or 120 V ac at 5 A Switch (external source)*	Shunt diodes Relay: 5 A at 240 V ac	P0916AS/ P0916AT	I
	Input: Group Output: Channel	8	120 V ac/ 125 V dc Switch (External Source)	8	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or 120 V ac at 5 A Switch (external source)*	Shunt diodes Relay: 5 A at 240 V ac	P0916QT/ P0916QU	K
	Channel	8	15 to 60 V dc Switch	8	240 V ac at 5 A Switch (external source)*	Shunt diodes Relay: 5 A at 240 V ac	P0916QE/ P0916QF	H
	Channel	8	240 V ac Switch	8	240 V ac at 5 A Switch (external source)*	Shunt diodes Relay: 5 A at 240 V ac	P0916QJ/ P0916QK	I
	Input: Group Output: Channel	8	240 V ac Switch (External Source)	8	240 V ac at 5 A Switch (external source)*	Shunt diodes Relay: 5 A at 240 V ac	P0916QX/ P0916QY	K
FBM241c	Channel	8	15 to 60 V dc Contact	8	30 V dc at 5 A Switch (external source)*	Shunt diodes Relay: 5 A at 30 V dc	P0916AW/ P0916AX	I
FBM242	Channel	0	N/A	16	30 V dc at 5 A Switch (external source)*	Shunt diodes Relay: 5 A at 30 V dc	P0916NG/ P0916RK	L
	Channel	0	N/A	16	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or 120 V ac at 5 A Switch (external source)*	Shunt diodes Relay: 5 A at 240 V ac	P0916NG/ P0916RK	L
	Channel	0	N/A	16	240 V ac at 5 A Switch (external source)*	Shunt diodes Relay: 5 A at 240 V ac	P0916NG/ P0916RK	L

* Refer to “Termination Assembly Relay Functional Specifications” on page 34 for more information on the relay.

Note: For FBM219, FBM241, and FBM242, termination assemblies P0917LL, P0917LP, P0917LS, P0916AS/AT, P0916QJ/QK, P0916QT/QU, P0916QX/QY, and P0916NG/RK use mixed signal voltages between input and output. It is recommended that one signal voltage is used per assembly. You are responsible for maintaining this segregation. Termination assembly P0916QE/QF also uses mixed signal voltages (15 to 60 V dc inputs with 120/240 V ac outputs). The assembly provides adequate signal segregation by locating the low voltage inputs on the same side as the termination cable to the FBM. You are responsible for maintaining this segregation.

(a) Two part numbers are provided. The first part number is for the compression-type termination assemblies, and the second part number is for the ring lug-type termination assemblies.

30 V dc/125 V dc AT 5 A RELAY OUTPUTS



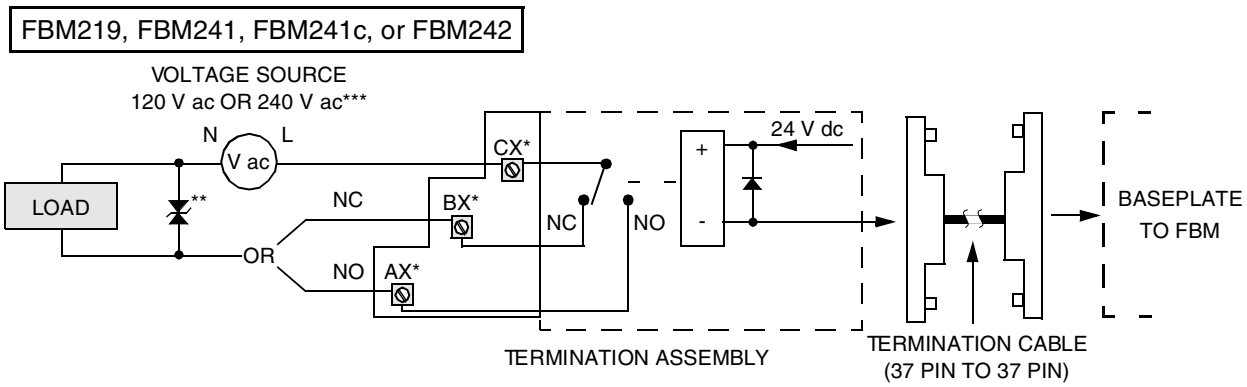
*X INDICATES FBM CHANNEL

**PROTECTIVE DIODE (CUSTOMER-SUPPLIED) IS RECOMMENDED FOR A dc INDUCTIVE LOAD ONLY.
MOV (METAL OXIDE VARISTOR) IS RECOMMENDED FOR AN ac INDUCTIVE LOAD ONLY.

***SEE "TERMINATION ASSEMBLY RELAY FUNCTIONAL SPECIFICATIONS" FOR RELAY CONTACT SPECIFICATIONS.

Figure 16. 30 V dc or 125 V dc Relay Output Field Connections (FBM219, FBM241, FBM241c, and FBM242)

120 V ac/240 V ac AT 5 A RELAY OUTPUTS



*X INDICATES FBM CHANNEL

**PROTECTIVE DIODE (CUSTOMER-SUPPLIED) IS RECOMMENDED FOR A dc INDUCTIVE LOAD ONLY.
MOV (METAL OXIDE VARISTOR) IS RECOMMENDED FOR AN ac INDUCTIVE LOAD ONLY.

***SEE "TERMINATION ASSEMBLY RELAY FUNCTIONAL SPECIFICATIONS" FOR RELAY CONTACT SPECIFICATIONS.

Figure 17. 120 V ac or 240 V ac Relay Output Field Connections (FBM219, FBM241, FBM241c, and FBM242)

Table 18. Relay Output Electrical Specifications

FUNCTIONAL SPECIFICATIONS **30 V dc, 125 V dc, 120 V ac, OR 240 V ac RELAY OUTPUT**	
TA Input Channels RELAY COIL INPUT VOLTAGE *On-State Voltage* 24 V dc +15%, -10% *Off-State Voltage* 0 to 5 V dc POWER CONSUMPTION 530 mW (maximum) at 24 V dc HEAT DISSIPATION 530 mW (maximum) at 24 V dc **TA Output Channels** NUMBER OF RELAY CHANNELS 8 or 16 relay channels RANGE (EACH CHANNEL) Contact open (off) or closed (on) or Contact open (on) or closed (off) SHORT-CIRCUIT CURRENT (EACH CHANNEL) 10 A (maximum) LOAD CURRENT (EACH CHANNEL) 5 A (maximum)	**Power Distribution Voltage (Excitation)** 30 V dc POWER 30 V dc (nominal) 60 V dc (maximum 125 V dc POWER 125 V dc (nominal) 130 V dc (maximum) 120 V ac POWER 125 V ac (nominal) 130 V ac (maximum) 240 V ac POWER 240 V ac (nominal) 250 V ac (maximum) **Inductive Loads** TA output may require a protective diode or metal oxide varistor (MOV) connected across the inductive load.

30 V dc, 120 V ac, 125 V dc, 240 V ac Relay Outputs with Power Distribution

These termination assemblies support output signals with 30 V dc, 120 V ac, 125 V dc, or 240 V ac. The TA contains an unsealed electromechanical relay for each output channel. The POLE, NC, and NO contacts of the relay are connected to a 3-tier terminal block with 8 outputs on the TA.

Each group of 8 relays has a pair of power terminals to accept local power. A fuse on these power terminals provides protection for each group of 8 relays. These power terminals allow for daisy-chaining of local power.

These TAs are rated for general purpose applications only. Output current is limited to 5 A maximum per channel.

Table 19 lists the FBMs and termination assemblies that support 30 V dc, 120 V ac, 125 V dc, or 240 V ac relay outputs with local power distribution.

Field connections and simplified schematics for these termination assemblies are provided in Figure 18 and Figure 19.

Table 20 lists the specifications for relay outputs with power distribution.

Dimensions for termination assembly sizes J, K, L, O, and P are available in Figure 26, Figure 27, Figure 28, Figure 29, and Figure 30 respectively.

Table 19. Relay Output with Power Distribution – FBMs and Termination Assemblies

FBM Type	Isolation	Input		Output		PWA (Electrical)	TA P/N[(a)]	TA Size
		#	Signal	#	Signal			
FBM219	Input: Channel Output: Group	24	120 V ac/ 125 V dc Switch	8	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load or 120 V ac at 5 A Switch (external source) with power distribution*	Shunt diodes Relay: 5 A at 240 V ac	P0917LP	N
	Group	24	120 V ac/ 125 V dc Switch	8	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load or 120 V ac at 5 A Switch (external source) with power distribution*	Shunt diodes Relay: 5 A at 240 V ac	P0917LV	P
FBM241	Input: Channel Output: Group	8	120 V ac/ 125 V dc Switch	8	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or Switch (external source) with power distribution*	Shunt diodes Relay: 5 A at 240 V ac	P0916QG/ P0916QH	J
	Group	8	120 V ac/ 125 V dc Switch (External Source)	8	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or Switch (external source) with power distribution*	Shunt diodes Relay: 5 A at 240 V ac	P0916QV/ P0916QW	K

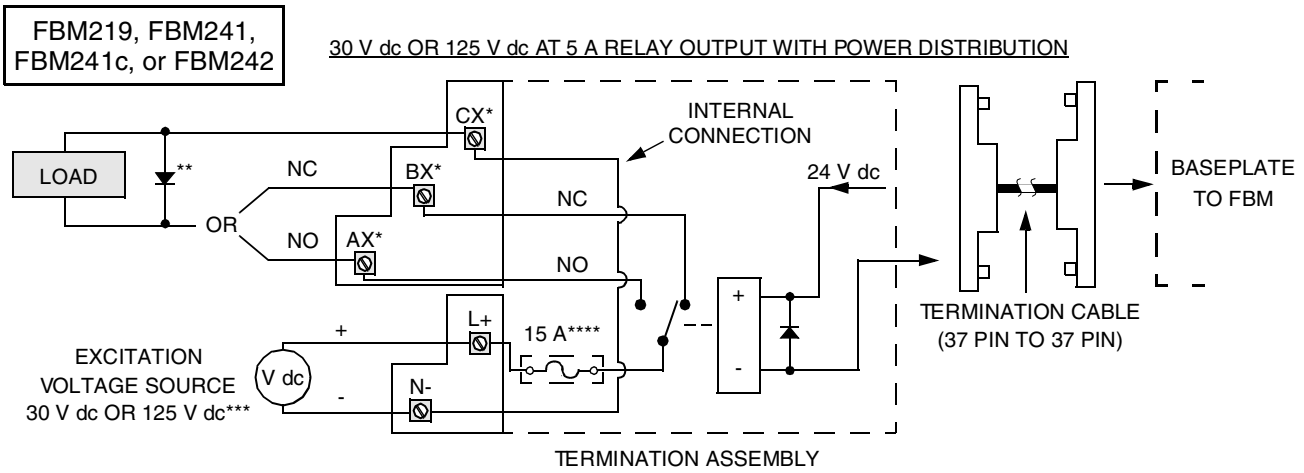
Table 19. Relay Output with Power Distribution – FBMs and Termination Assemblies (Continued)

FBM Type	Isolation	Input		Output		PWA (Electrical)	TA P/N[(a)]	TA Size
		#	Signal	#	Signal			
FBM241	Input: Channel Output: Group	8	240 V ac Switch	8	240 V ac at 5 A Switch (external source) with power distribution*	Shunt diodes Relay: 5 A at 240 V ac, fused	P0916QL/ P0916QM	J
	Group	8	240 V ac Switch	8	240 V ac at 5 A Switch (external source) with power distribution*	Shunt diodes Relay: 5 A at 240 V ac, fused	P0916QZ/ P0916NZ	K
FBM241c	Input: Channel Output: Group	8	15 to 60 V dc Contact	8	30 V dc at 5 A Switch (external source) with power distribution*	Shunt diodes Relay: 5 A at 240 V ac, fused	P0916QQ/ P0916QR	J
FBM242	Group	0	N/A	16	30 V dc at 5 A Switch (external source) with power distribution*	Shunt diodes Relay: 5 A at 240 v ac, fused	P0916JZ/ P0916RL	L
	Group	0	N/A	16	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or 120 V ac at 5 A Switch (external source) with power distribution*	Shunt diodes Relay: 5 A at 240 V ac	P0916JZ/ P0916RL	L
	Group	0	N/A	16	240 V ac at 5 A Switch (external source) with power distribution*	Shunt diodes Relay: 5 A at 240 V ac, fused	P0916JZ/ P0916RL	L

* Refer to “Termination Assembly Relay Functional Specifications” on page 34 for more information on the relay.

Note: For FBM219, FBM241, and FBM242, termination assemblies P0917LV, P0916QG/QH, P0916QL/QM, P0916QV/QW, P0916QQ/QR, P0916QZ/NZ, and P0916JZ/RL use mixed signal voltages between input and output. It is recommended that one signal voltage is used per assembly. You are responsible for maintaining this segregation.

(a) Two part numbers are provided. The first part number is for the compression-type termination assemblies, and the second part number is for the ring lug-type termination assemblies.



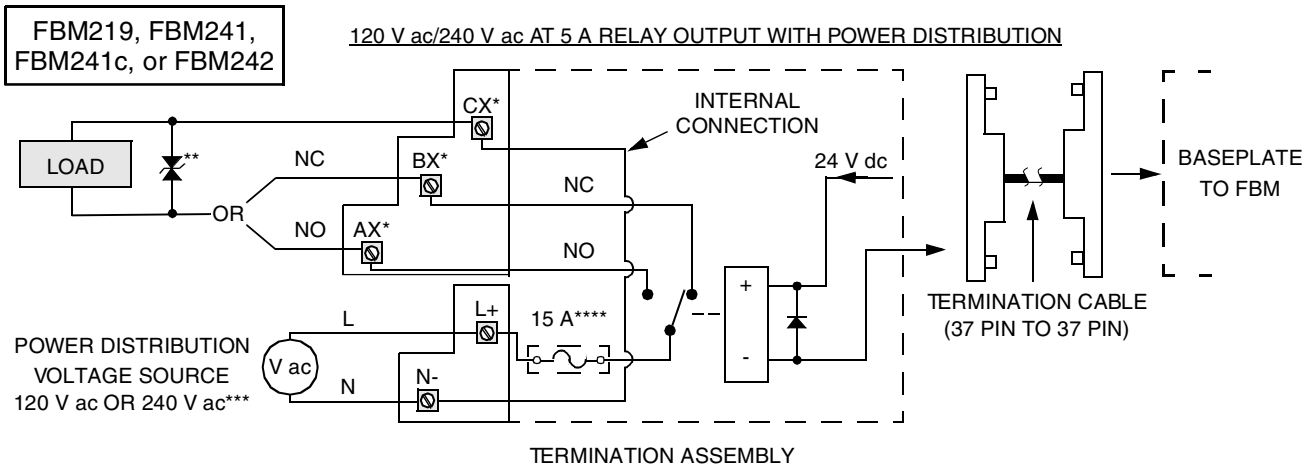
*X INDICATES FBM CHANNEL
**PROTECTIVE DIODE (CUSTOMER-SUPPLIED) IS RECOMMENDED FOR A dc INDUCTIVE LOAD ONLY.
MOV (METAL OXIDE VARISTOR) IS RECOMMENDED FOR AN ac INDUCTIVE LOAD ONLY.

***SEE "TERMINATION ASSEMBLY RELAY FUNCTIONAL SPECIFICATIONS" FOR RELAY CONTACT SPECIFICATIONS.

**** A SINGLE FUSE PROVIDES SHORT CIRCUIT PROTECTION PER 8 CHANNELS; TWO FUSES ARE PRESENT FOR THE 16 CHANNELS IN THIS TERMINATION ASSEMBLY. CURRENT IS LIMITED FOR ALL 8 CHANNELS TO 12 AMPS TOTAL.

NOTE: 30 V dc TERMINATION ASSEMBLY IS NOT PROVIDED FOR FBM241.

Figure 18. 30 V dc or 125 V dc Relay Output with Power Distribution Field Connections (FBM219, FBM241, FBM241c and FBM242)



*X INDICATES FBM CHANNEL
**PROTECTIVE DIODE (CUSTOMER-SUPPLIED) IS RECOMMENDED FOR A dc INDUCTIVE LOAD ONLY.
MOV (METAL OXIDE VARISTOR) IS RECOMMENDED FOR AN ac INDUCTIVE LOAD ONLY.

***SEE "TERMINATION ASSEMBLY RELAY FUNCTIONAL SPECIFICATIONS" FOR RELAY CONTACT SPECIFICATIONS.

**** A SINGLE FUSE PROVIDES SHORT CIRCUIT PROTECTION PER 8 CHANNELS; TWO FUSES ARE PRESENT FOR THE 16 CHANNELS IN THIS TERMINATION ASSEMBLY. CURRENT IS LIMITED FOR ALL 8 CHANNELS TO 12 AMPS TOTAL.

Figure 19. 120 V ac, or 240 V ac Relay Output with Power Distribution Field Connections (FBM219, FBM241, FBM241c and FBM242)

Table 20. Relay Outputs with Power Distribution Electrical Specifications

FUNCTIONAL SPECIFICATIONS **30 V dc, 125 V dc, 125 V ac, OR 240 V ac RELAY OUTPUTS WITH POWER DISTRIBUTION**	
TA Input Channels RELAY COIL INPUT VOLTAGE *On-State Voltage* 24 V dc +15%, -10% *Off-State Voltage* 0 to 5 V dc POWER CONSUMPTION 530 mW (maximum) at 24 V dc HEAT DISSIPATION 530 mW (maximum) at 24 V dc **TA Output Channels** NUMBER OF RELAY CHANNELS 8 or 16 relay channels RANGE (EACH CHANNEL) Contact open (off) or closed (on) or Contact open (on) or closed (off) SHORT-CIRCUIT CURRENT (EACH CHANNEL) 10 A (maximum) LOAD CURRENT (EACH CHANNEL) 5 A (maximum)	**Power Distribution Voltage (Excitation)** 30 V dc POWER 30 V dc (nominal) 60 V dc (maximum 125 V dc POWER 125 V dc (nominal) 130 V dc (maximum) 120 V ac POWER 125 V ac (nominal) 130 V ac (maximum) 240 V ac POWER 240 V ac (nominal) 250 V ac (maximum) POWER DISTRIBUTION FUSE 15 A **Inductive Loads** TA output may require a protective diode or metal oxide varistor (MOV) connected across the inductive load.

TERMINATION CABLES

Termination cables provide the link between the termination assemblies and the FBM baseplate. All assemblies and baseplates have D-type straight post connectors; baseplates have 37-pin connectors and assemblies have either 25 or 37-pin connectors. For strain relief, the D-type connectors are locked to their printed circuit boards using solder cups. For corrosion protection, all connector contact areas are gold-plated.

Each termination cable attaches to a connector on the termination assembly and,

- in non-redundant configurations, a connector on the DIN rail baseplate below or adjacent to the associated FBM.
- for FBM205 and FBM237, a connector on the redundancy adapter on the associated DIN rail baseplate.

Termination cables are shielded, and have PVC insulation on the inner wires, and a polyurethane outer jacket. Each termination cable is internally shielded to reduce noise.

The cross sectional diameter of each termination cable is compatible with standard wireways in a 8/16-position or a 32-position FBM enclosure. For example, up to 30 cables can be installed in a B04 (IE32) enclosure.

Labels are affixed to the termination cables which define the part number and identification of the FBM to which it connects.

Termination cables are available in a variety of lengths, up to 30 m (98 ft). These cables are available in the following materials:

- Polyurethane
- Hypalon
- XLP Hypalon.

TERMINATION ASSEMBLY FUNCTIONAL SPECIFICATIONS

Regulatory Compliance	**Regulatory Compliance (Cont.)**
ELECTROMAGNETIC COMPATIBILITY (EMC) *European EMC Directive 89/336/EEC* EN 50081-2 Emission standard EN 50082-2 Immunity standard *IEC 61000-4-2 ESD Immunity* Contact 4 kV, air 8 kV *IEC 61000-4-3 Radiated Field Immunity* 10 V/m at 80 to 1000 MHz *IEC 61000-4-4 Electrical Fast Transient/Burst Immunity* 2 kV *IEC 61000-4-5 Surge Immunity* 2 kV	ELECTROMAGNETIC COMPATIBILITY (EMC) (CONT.) *IEC 61000-4-6 Immunity to Conducted Disturbances* 10 V *IEC 61000-4-8 Power Frequency Magnetic Field Immunity* 30 A/m *IEC 61000-4-11 Voltage Dips, Short Interruptions and Voltage Variations Immunity* SURGE RATING 3600 V ac for 1 second PRODUCT SAFETY European Low Voltage Directive 73/23/EEC SAFETY CERTIFICATION See Table 21 on page 45.

TERMINATION ASSEMBLY ENVIRONMENTAL SPECIFICATIONS[A]	
Operating TEMPERATURE -20 to +70°C (-4 to +158°F) RELATIVE HUMIDITY 5 to 95% (noncondensing) ALTITUDE -300 to +3,000 m (-1,000 to +10,000 ft) **Mechanical Vibration** 0.5 g at 5 to 500 Hz	**Storage** TEMPERATURE -40 to +85°C (-40 to +185°F) RELATIVE HUMIDITY 5 to 95% (noncondensing) ALTITUDE -300 to +12,000 m (-1,000 to +40,000 ft) **Contamination** Class G3 (Harsh) as defined in ISA Standard, S71.04. Pollution degree 2 as defined in IEC 664-1.

(a) The environmental limits of these assemblies may be enhanced by the type of enclosure containing the assembly. [Refer to the applicable Product Specification Sheet (PSS) which describes the specific type of enclosure that is to be used.]

TERMINATION ASSEMBLY PHYSICAL SPECIFICATIONS	
Termination Assembly Housing PWA WIDTH 107.5 mm DIN RAIL MOUNTING Accommodates multiple DIN styles including 32 mm (1.26 in) and 35 mm (1.38 in) EXTRUDED TRAY Polyvinylchloride (PVC), UL94 V0 and, Polyamide PA, UL94 V2-V0 **Termination Assembly Dimensions** HEIGHT 69.8 mm (2.75 in) LENGTH Refer to Figure 22 through Figure 30 DEPTH 125 mm (4.93 in) **Termination Assembly Input Terminals** COMPRESSION-TYPE *MATERIAL* Polyamide *FLAMMABILITY* UL94 V0 *RATED VOLTAGE* 250 V or higher	**Termination Assembly Input Terminals** COMPRESSION-TYPE (CONTINUED) *ACCEPTED WIRING SIZES* Solid/Stranded/AWG 0.2 to 4 mm^2/0.2 to 2.5 mm^2/24 to 12 AWG Stranded with Ferrules 0.2 to 2.5 mm^2 with or without plastic collar *APPROVAL DATA* UL 300 V/15 A/30 to 12 AWG CSA 300 V/10 A/28 to 12 AWG RING LUG-TYPE *MATERIAL* Polypropylene *FLAMMABILITY* UL94 V0 *RATED VOLTAGE* 300 V or higher *ACCEPTED WIRING SIZES* #6 size connectors (0.375 in (9.5 mm)) 0.5 to 4 mm^2/22 AWG to 12 AWG *APPROVAL DATA* UL 300 V/20-25 A/22 to 12 AWG CSA 300 V/20 A/22 to 12 AWG

TERMINATION ASSEMBLY RELAY FUNCTIONAL SPECIFICATIONS	
1-Pole Contact Resistive Load (p.f.=1)	**1-Pole Contact Inductive Load (p.f.=0.4) (L/R=7 ms)**
RATED LOAD 10 A at 250 V ac 10 A at 30 V dc	RATED LOAD 7.5 A at 250 V ac 5 A at 30 V dc
CONTACT MATERIAL AgCdO	CONTACT MATERIAL AgCdO
CARRY CURRENT 10 A	CARRY CURRENT 10 A
MAXIMUM OPERATING VOLTAGE 380 V ac, 125 V ac	MAXIMUM OPERATING VOLTAGE 380 V ac, 125 V ac
MAXIMUM OPERATING CURRENT 10 A	MAXIMUM OPERATING CURRENT 10 A
MAXIMUM SWITCHING CAPACITY 2500 VA, 300 W	MAXIMUM SWITCHING CAPACITY 1875 VA, 150 W
MINIMUM PERMISSIBLE LOAD 100 mA, 5 V dc	MINIMUM PERMISSIBLE LOAD 100 mA, 5 V dc

TERMINATION ASSEMBLY CABLE ENVIRONMENTAL SPECIFICATIONS	
Polyurethane Termination Cable	**Hypalon Termination Cable[(a)]**
OUTER JACKET MATERIAL Polyurethane	OUTER JACKET MATERIAL Hypalon
PRIMARY CONDUCTOR INSULATION Polyvinylchloride (PVC)	PRIMARY CONDUCTOR INSULATION Crosslinked polyethylene (XLPE)
OPERATING/STORAGE TEMPERATURE -20 to +80°C (-4 to +176°F)	OPERATING/STORAGE TEMPERATURE -40 to +90°C (-40 to +194°F)
FLAME RETARDANCE Vertical flame test UL VW-1 and CSA FT1	FLAME RETARDANCE Vertical flame test UL VW-1, ICEA S-66-524 and ANI modified 210,000 BTU corner burner vertical tray flame test per IEEE-STD-383-1974 para 2.5 and 2.6 with chlorine emissions to be <20% of the insulation consumed by the fire.
REGULATORY COMPLIANCE UL and CSA approved cable	REGULATORY COMPLIANCE UL and CSA approved cable

(a) This cable is optionally available in XLP Hypalon to meet CSA/UL certification for plenum rated cable.

Characteristic Data

The following illustrations show characteristic data for the termination assembly relays.

Maximum Switching Capacity

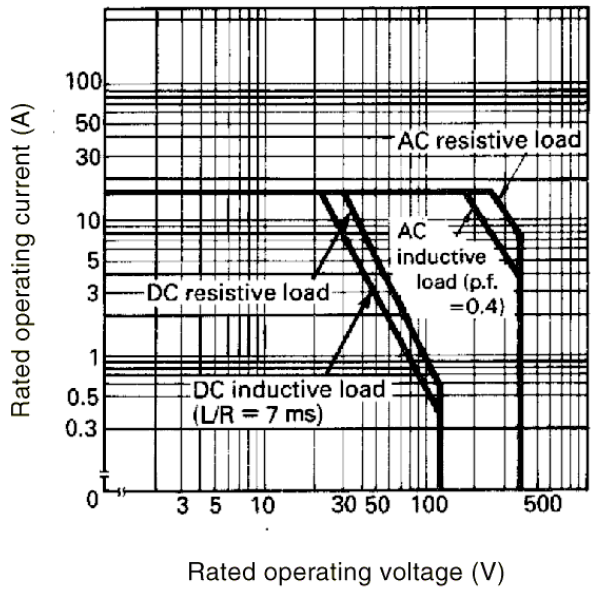


Figure 20. Maximum Switching Capacity for Relays

Electrical Service Life

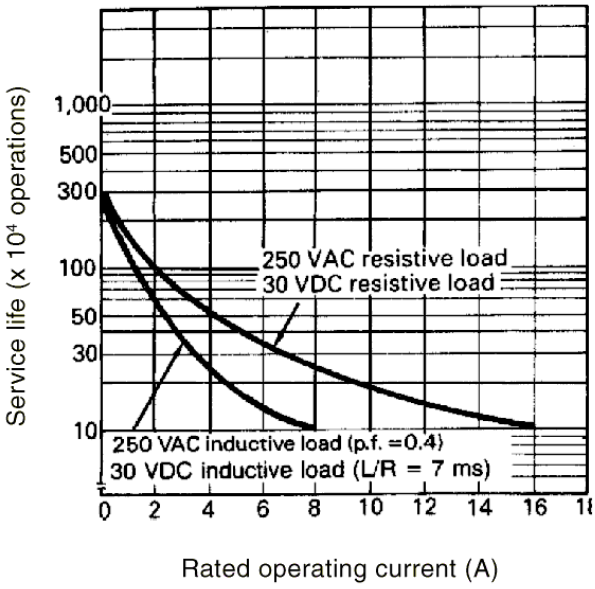


Figure 21. Electrical Service Life

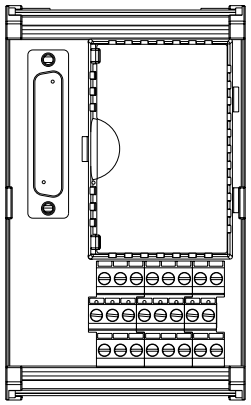
The termination assembly design limits of 5 A per channel results in an electrical service life for the relay of:

- 200,000 operations at 250 V ac at 5 A (inductive loading)
- 250,000 operations at 30 V dc at 5 A (resistive loading)
- 250,000 operations at 250 V ac at 5 A (resistive loading).

mm
in

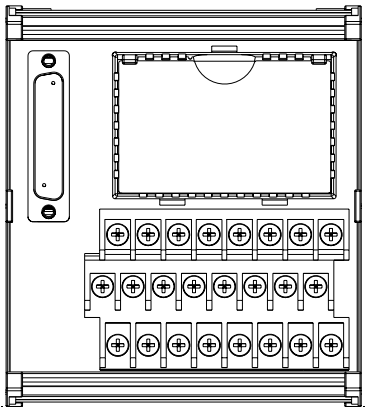
(A)

Compression-Type Termination Assembly



For FBM201 (P0916AA), FBM203 (P0916AE), FBM204 (P0916AG), FBM205 (P0916AJ), FBM206 (P0916JQ), FBM213 (P0916JR), and FBM237 (P0916CC)

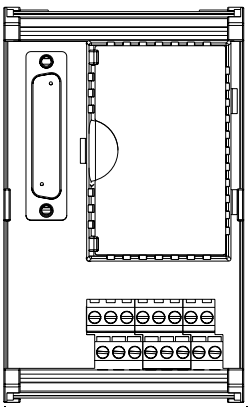
Ring Lug-Type Termination Assembly



For FBM201 (P0916AB), FBM203 (P0916AF), FBM204 (P0916AH), FBM205 (P0916AK), FBM206 (P0916PG), FBM213 (P0916PR), and FBM237 (P0916QC)

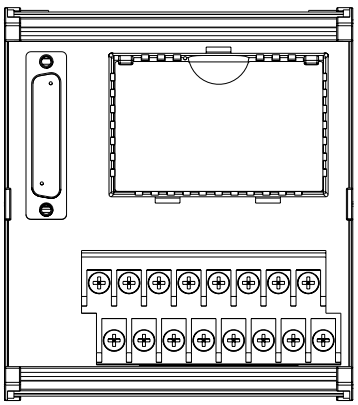
(B)

Compression-Type Termination Assembly



For FBM202 (P0916AC)

Ring Lug-Type Termination Assembly



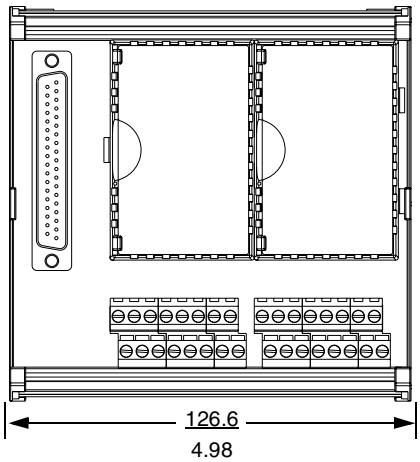
For FBM202 (P0916AD)

All termination assemblies are 69.8 mm (2.75 in) high and 125 mm (4.93 in) deep.

Figure 22. Termination Assembly Dimensions (Size A and B)

mm
in

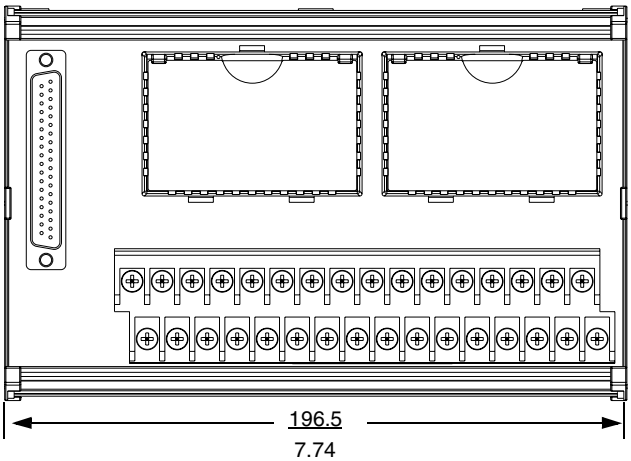
Compression-Type Termination Assembly



For FBM207 (P0916AL),
FBM207b (P0916JS),
FBM207c (P0917MF),
FBM241d (P0916JX),
FBM211 (P0916JT and P0916BT),
FBM241 (P0916UY and P0916AQ),
FBM241b (P0916JV),
FBM241c (P0916UD and P0916JW),
and FBM242 (P0916JY)

C

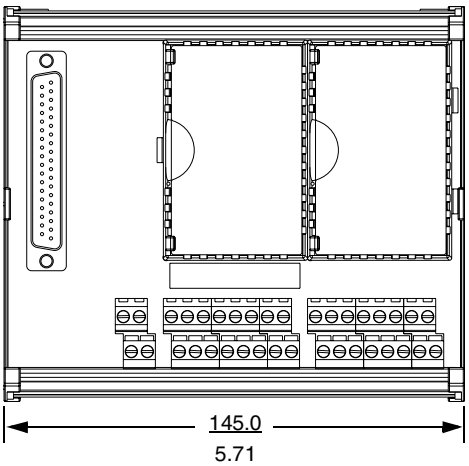
Ring Lug-Type Termination Assembly



For FBM207 (P0916AN),
FBM207b (P0916PP),
FBM207c (P0917MH),
FBM241d (P0916QS),
FBM211 (P0916PQ and P0916BU),
FBM241 (P0916UZ and P0916AR),
FBM241b (P0916QN),
FBM241c (P0916SS and P0916QP),
and FBM242 (P0916RJ)

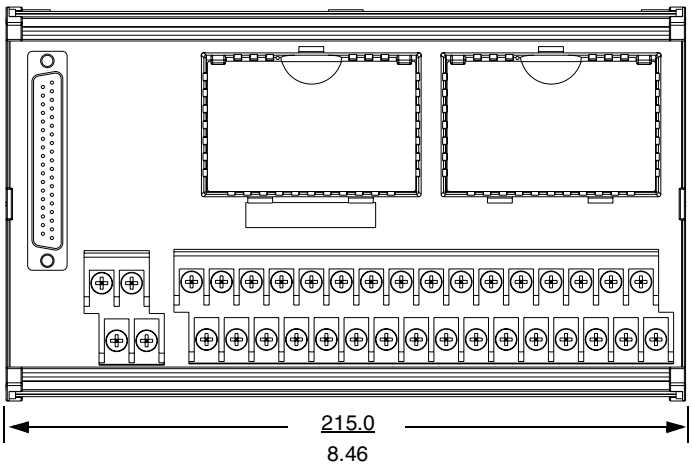
D

Compression-Type Termination Assembly



For FBM207 (P0916PK and P0916PM)

Ring Lug-Type Termination Assembly



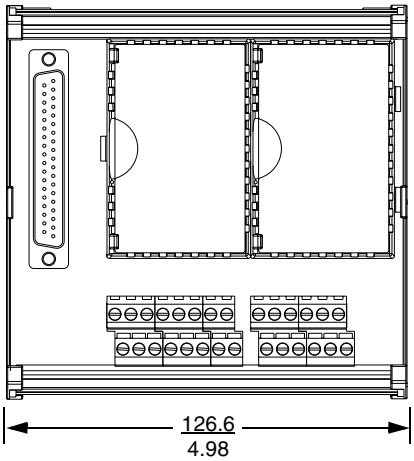
For FBM207 (P0916PL and P0916PN)

All termination assemblies are 69.8 mm (2.75 in) high and 125 mm (4.93 in) deep.

Figure 23. Termination Assembly Dimensions (Size C and D)

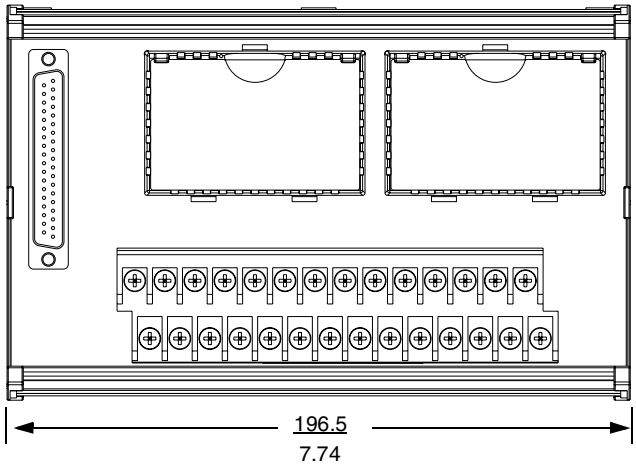
mm
in

Compression-Type Termination Assembly



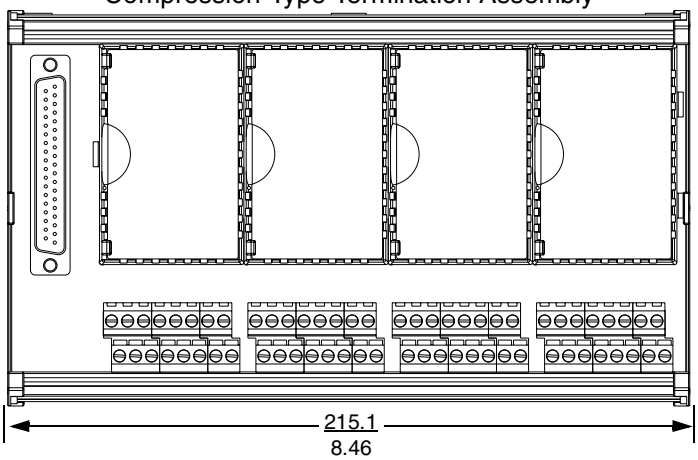
For FBM212 (P0916BV) only

(E) Ring Lug-Type Termination Assembly



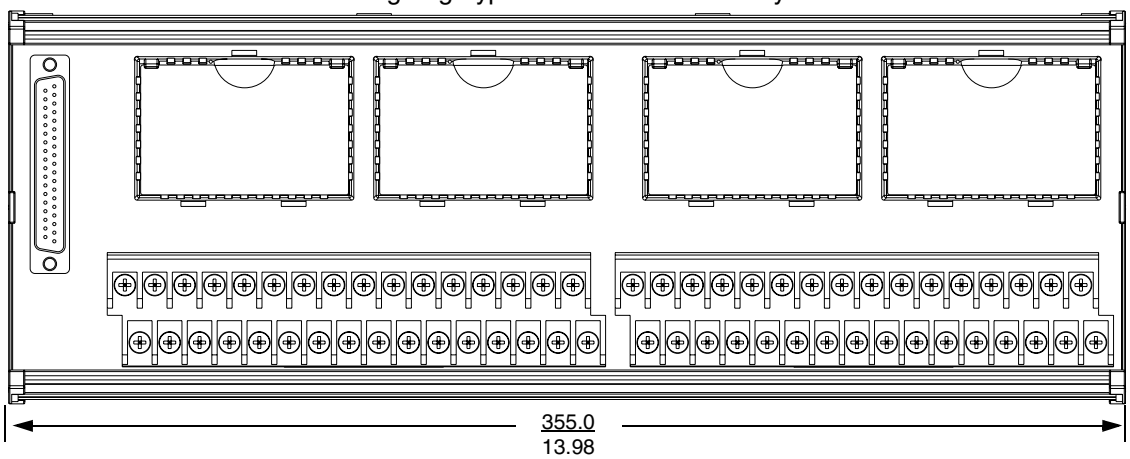
For FBM212 (P0916BW) only

(F)
Compression-Type Termination Assembly



For FBM217 (P0916PW, P0916CA, P0916PS, and P0916PU) and FBM219 (P0917LE and P0917LH)

Ring Lug-Type Termination Assembly



For FBM217 (P0916PX, P0916CB, P0916PT, and P0916PV)

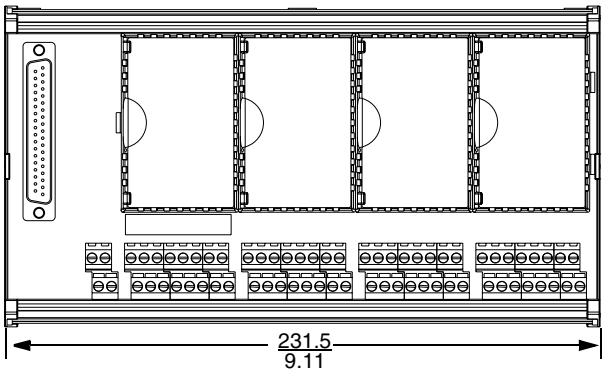
All termination assemblies are 69.8 mm (2.75 in) high and 125 mm (4.93 in) deep.

Figure 24. Termination Assembly Dimensions (Size E and F)

mm
in

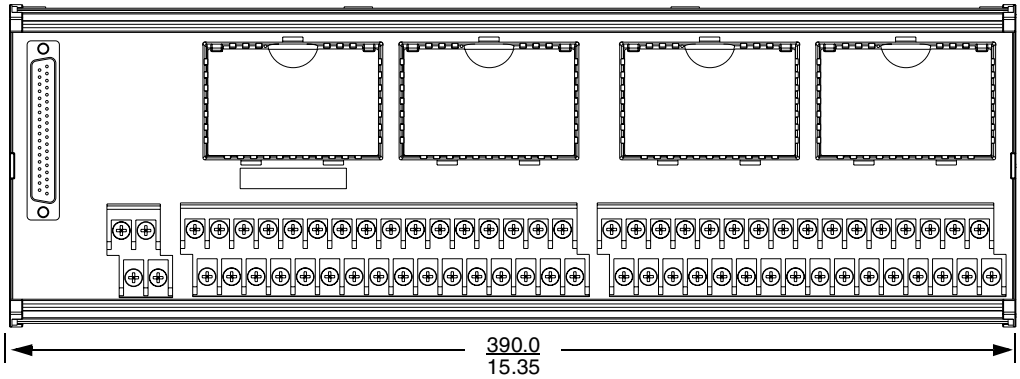
(G)

Compression-Type Termination Assembly



For FBM217 (P0916PY and P0916QA)

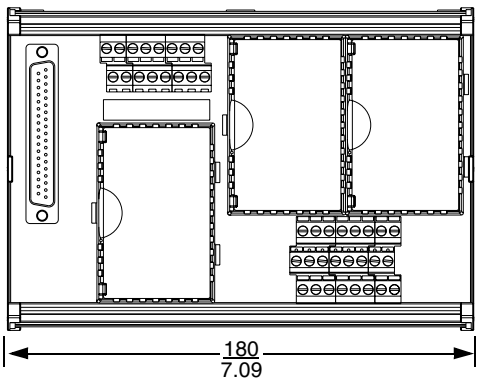
Ring Lug-Type Termination Assembly



For FBM217 (P0916PZ and P0916QB)

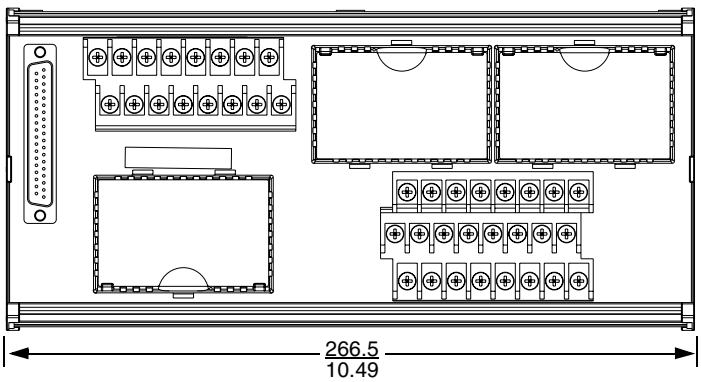
(H)

Compression-Type Termination Assembly



For FBM241 (P0916QE) only

Ring Lug-Type Termination Assembly



For FBM241 (P0916QF) only

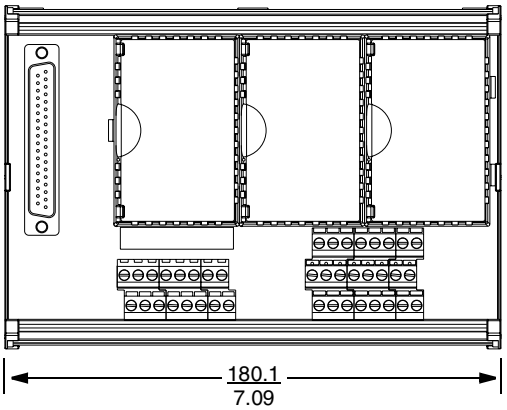
All termination assemblies are 69.8 mm (2.75 in) high and 125 mm (4.93 in) deep.

Figure 25. Termination Assembly Dimensions (Size G and H)

mm
in

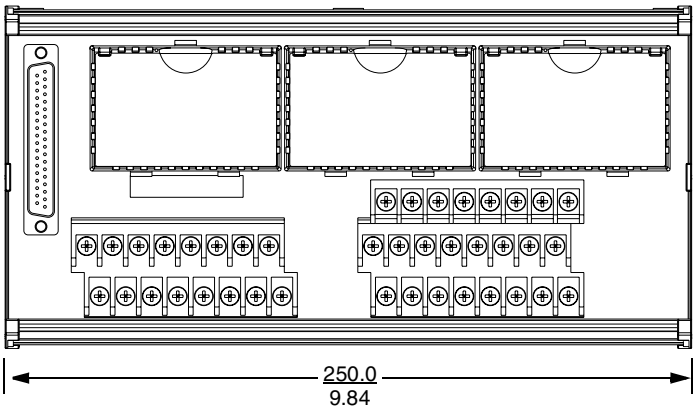
(I)

Compression-Type Termination Assembly



For FBM241 (P0916AS and P0916QJ)
and FBM241c (P0916AW)

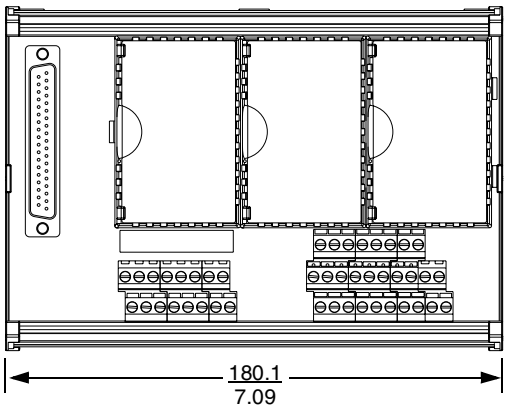
Ring Lug-Type Termination Assembly



For FBM241 (P0916AT and P0916QK)
and FBM241c (P0916AX)

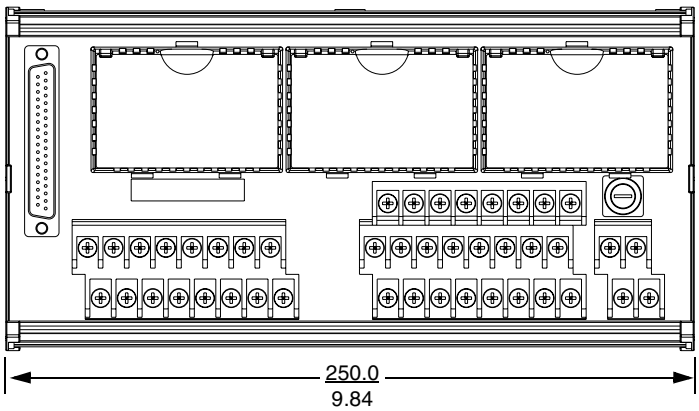
(J)

Compression-Type Termination Assembly



For FBM241 (P0916QG and P0916QL)
and FBM241c (P0916QQ)

Ring Lug-Type Termination Assembly



For FBM241 (P0916QH and P0916QM)
and FBM241c (P0916QR)

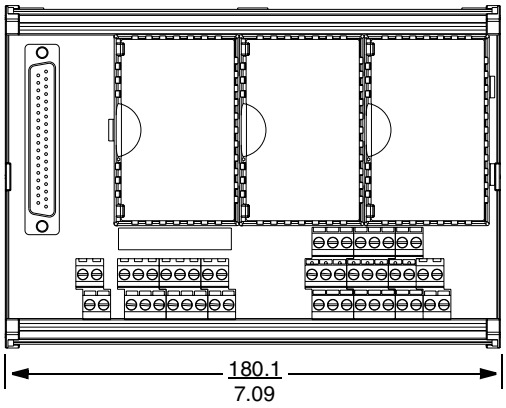
All termination assemblies are 69.8 mm (2.75 in) high and 125 mm (4.93 in) deep.

Figure 26. Termination Assembly Dimensions (Size I and J)

mm
in

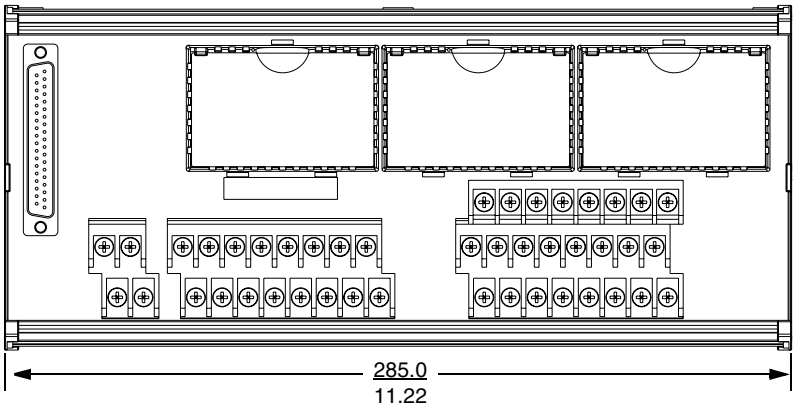
(K)

Compression-Type Termination Assembly

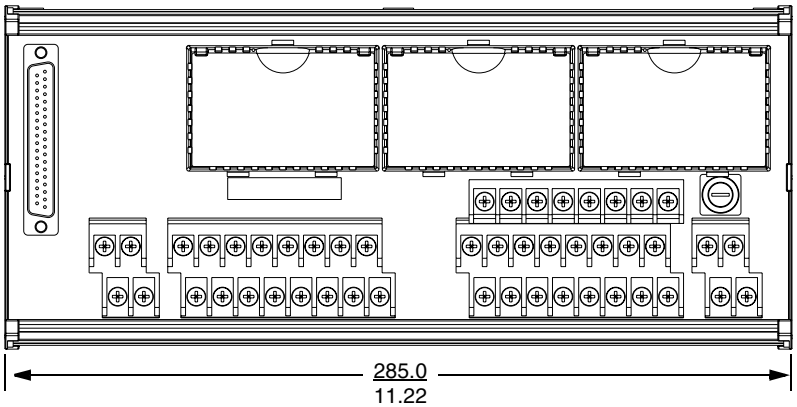


For FBM241 (P0916QT, P0916QV, P0916QX and P0916QZ)

Ring Lug-Type Termination Assemblies



For FBM241 (P0916NZ, P0916QU, and P0916QY)



For FBM241 (P0916QW)

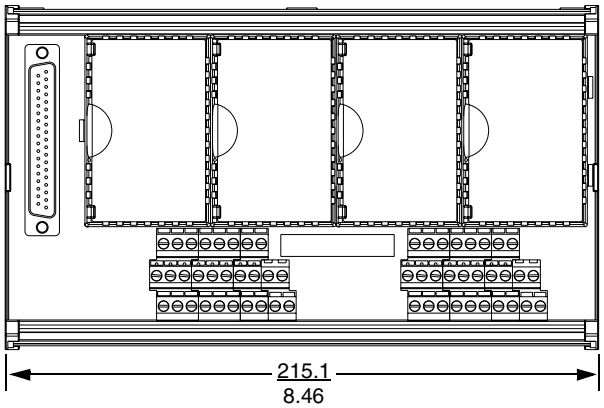
All termination assemblies are 69.8 mm (2.75 in) high and 125 mm (4.93 in) deep.

Figure 27. Termination Assembly Dimensions (Size K)

mm
in

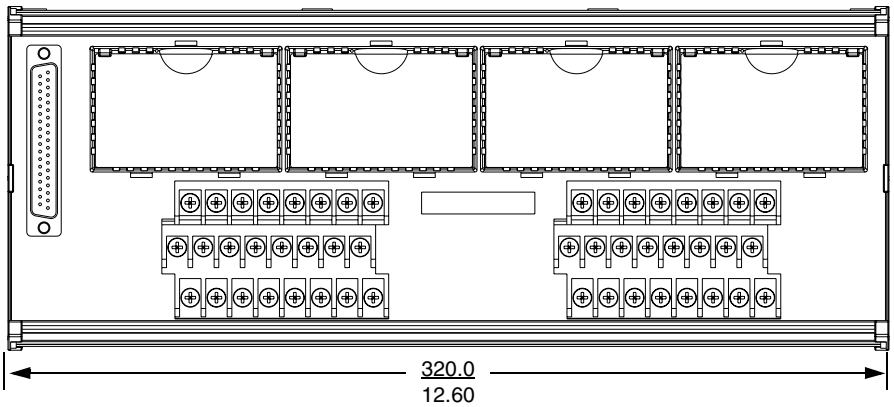
Ⓛ

Compression-Type Termination Assembly

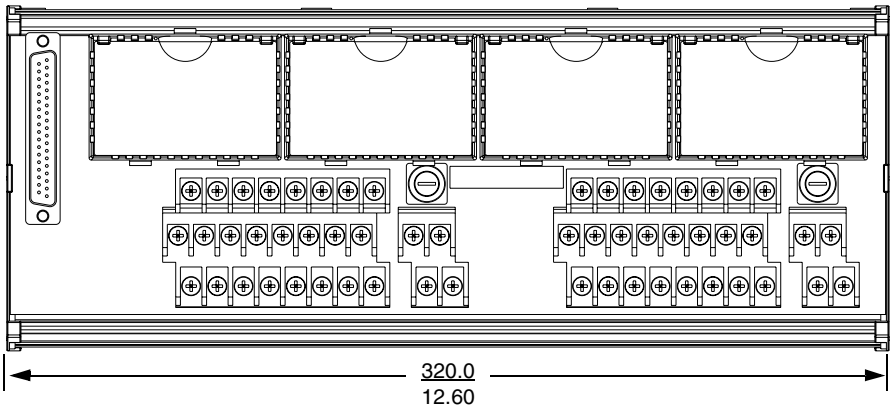


For FBM242 (P0916NG and P0916JZ) only

Ring Lug-Type Termination Assemblies



For FBM242 (P0916RK) only



For FBM242 (P0916RL) only

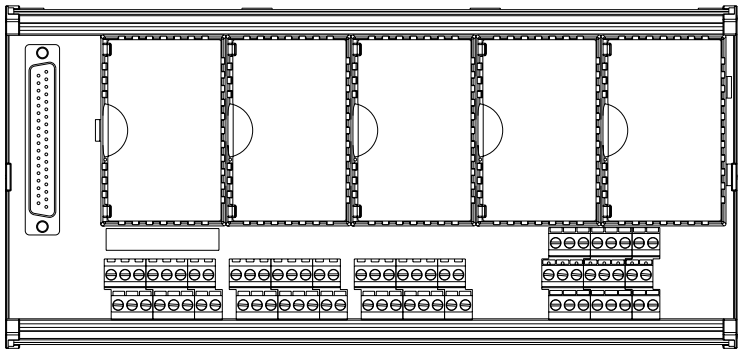
All termination assemblies are 69.8 mm (2.75 in) high and 125 mm (4.93 in) deep.

Figure 28. Termination Assembly Dimensions (Size L)

mm
in

(M)

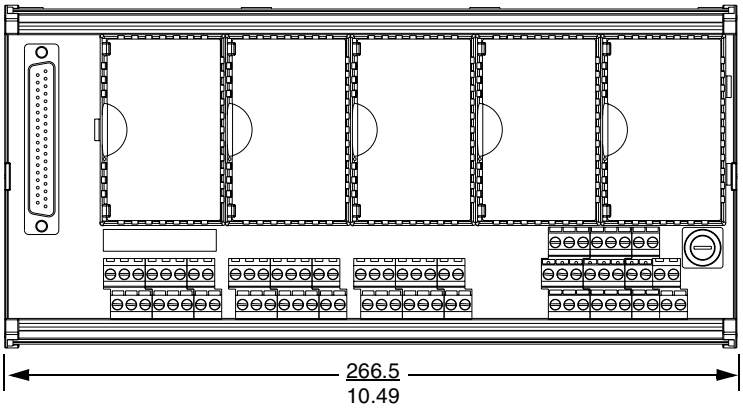
Compression-Type Termination Assembly



For FBM219 (P0917LL) only

(N)

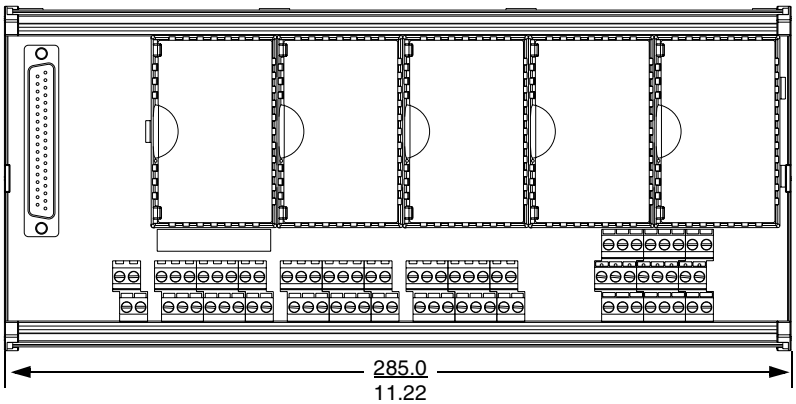
Compression-Type Termination Assembly



For FBM219 (P0917LP) only

(O)

Compression-Type Termination Assembly



For FBM219 (P0917LS)

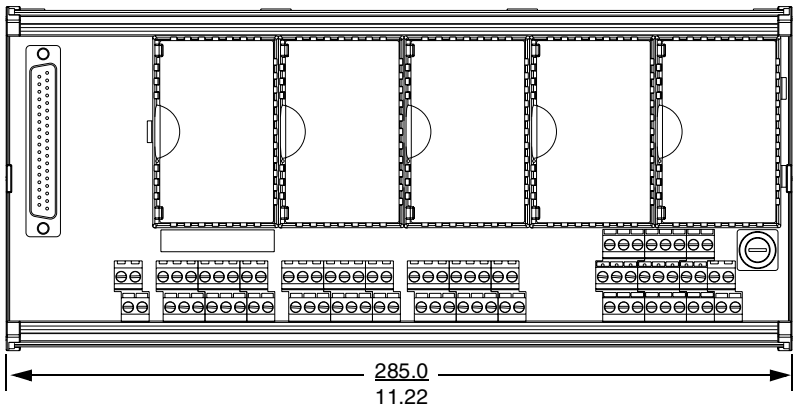
All termination assemblies are 69.8 mm (2.75 in) high and 125 mm (4.93 in) deep.

Figure 29. Termination Assembly Dimensions (Size M, N, and O)

mm
in

(P)

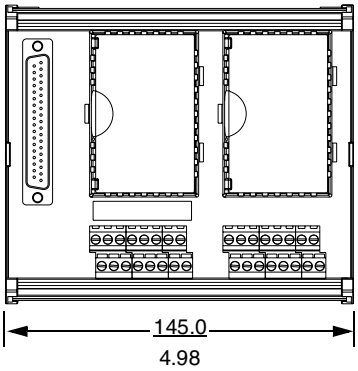
Compression-Type Termination Assembly



For FBM219 (P0917LV)

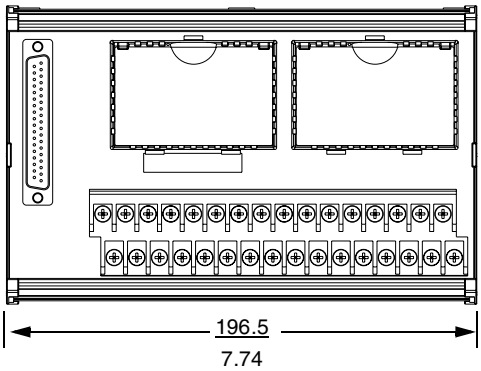
(Q)

Compression-Type Termination Assembly



For FBM207 (P0916AM and P0916PH)

Ring Lug-Type Termination Assembly



For FBM207 (P0916AP and P0916PJ)

All termination assemblies are 69.8 mm (2.75 in) high and 125 mm (4.93 in) deep.

Figure 30. Termination Assembly Dimensions (Size P and Q)

SUMMARY OF TERMINATION ASSEMBLIES

Table 21 provides a summary of the termination assemblies provided in the DIN rail mounted FBM subsystem. Table 22 provides the agency certifications for the termination assemblies.

Table 21. Termination Assembly Types and Associated Certifications

Signal Inputs		Signal Outputs		TA Part Number[a]	FBM Number	Certification Types
Type	#	Type	#			
0 to 20 mA Inputs/Outputs						
0 to 20 mA	8		0	P0916AA/AB	FBM201	1, 2
0 to 20 mA, External Power	16		0	P0916JT/PQ	FBM211	1, 2
0 to 20 mA, FBM Power	16		0	P0916BT/BU	FBM211	1, 4
	0	0 to 20 mA	8	P0916CC/QC	FBM237	1, 2
0 to 20 mA	4	0 to 20 mA	4	P0916AG/AH	FBM204	1, 2
0 to 20 mA	4	0 to 20 mA	4	P0916AJ/AK	FBM205	1, 2
Thermocouple/mV Inputs						
Thermocouple/mV	8		0	P0916AC/AD	FBM202	1, 2
Thermocouple/mV	14		0	P0916BV/BW	FBM212	1, 2
RTD Inputs						
RTD (platinum and nickel)	8		0	P0916AE/AF	FBM203	1, 2
RTD (platinum and nickel)	8		0	P0916JR/PR	FBM213	1, 2
Pulse Inputs						
Pulse (15 to 60 V dc)	8		0	P0916JQ/PG	FBM206	1, 2
15 to 60 V dc Contact Inputs/ Switch Outputs						
24 V dc Contact	32		0	P0916PW/PX	FBM217	1, 4
24 V dc Contact	16		0	P0916JS/PP	FBM207b	1, 2
48 V dc Contact	16		0	P0917MF/MH	FBM207c	???1, 2
24 V dc Contact, Current Limited	24	15 to 60 V dc at 0.25 A Switch, fuse protected (external source)	8	P0917LH	FBM219	1, 2
15 to 60 V dc Contact	8	15 to 60 V dc at 2 A Switch, unprotected (external source)	8	P0916UD/SS	FBM241c	1, 2
15 to 60 V dc Contact	8	15 to 60 V dc at 2 A Switch, fuse protected (external source)	8	P0916JW/QP	FBM241c	1, 2
15 to 60 V dc Contact	8	30 V dc at 5 A (external source)	8	P0916AW/AX	FBM241c	3
15 to 60 V dc Contact	8	30 V dc at 5 A (external source) with power distribution[b]	8	P0916QQ/QR	FBM241c	3
15 to 60 V dc Contact	8	15 V dc at 15 mA Switch (internal source)	8	P0916JX/QS	FBM241d	1, 2
15 to 60 V dc Switch Inputs/ Switch Outputs						
15 to 30 V dc Switch	32		0	P0916CA/CB	FBM217	1, 2
15 to 30 V dc Switch	24	15 to 60 V dc at 0.25 A Switch, fuse protected (external source)	8	P0917LE	FBM219	1, 2
15 to 60 V dc Switch	16		0	P0916AL/AN	FBM207	1, 2

Table 21. Termination Assembly Types and Associated Certifications (Continued)

Signal Inputs		Signal Outputs		TA Part Number[a]	FBM Number	Certification Types
Type	**#**	**Type**	**#**			
15 to 60 V dc Switch	8	12 V dc at 15 mA Switch (internal source)	8	P0916JV/QN	FBM241b	1, 2
15 to 60 V dc Switch	8	15 to 60 V dc at 2 A Switch, unprotected (external source)	8	P0916UY/UZ	FBM241	1, 2
15 to 60 V dc Switch	8	15 to 60 V dc at 2 A Switch, fuse protected (external source)	8	P0916AQ/AR	FBM241	1, 2
15 to 60 V dc Switch	8	30 V dc at 5 A, or 125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load Switch (external source)[b]	8	P0916QE/QF	FBM241	3
120 V ac/125 V dc Switch Inputs/Switch Outputs						
120 V ac/125 V dc Switch	16		0	P0916AM/AP	FBM207	1
120 V ac/125 V dc Switch	32		0	P0916PS/PT	FBM217	1
120 V ac/125 V dc Switch (External Source)	32		0	P0916PY/PZ	FBM217	1
120 V ac/125 V dc Switch (External Source)	16		0	P0916PK/PL	FBM207	1
120 V ac/125 V dc Switch	24	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or 120 V ac at 5 A Switch (external source)[b]	8	P0917LL	FBM219	1
120 V ac/125 V dc Switch	24	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load or 120 V ac at 5 A Switch (external source) with power distribution[b]	8	P0917LP	FBM219	1
120 V ac/125 V dc Switch (External Source)	24	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or 120 V ac at 5 A Switch (external source)[b]	8	P0917LS	FBM219	1
120 V ac/125 V dc Switch (External Source)	24	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load or 120 V ac at 5 A Switch (external source) with power distribution[b]	8	P0917LV	FBM219	1

Table 21. Termination Assembly Types and Associated Certifications (Continued)

Signal Inputs		Signal Outputs		TA Part Number[a]	FBM Number	Certification Types
Type	**#**	**Type**	**#**			
120 V ac/125 V dc Switch	8	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or 120 V ac at 5 A Switch (external source)[b]	8	P0916AS/AT	FBM241	5
120 V ac/125 V dc Switch	8	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or 120 V ac at 5 A Switch (external source) with power distribution[b]	8	P0916QG/QH	FBM241	5
120 V ac/125 V dc Switch (External Source)	8	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or 120 V ac at 5 A Switch (external source)[b]	8	P0916QT/QU	FBM241	5
120 V ac/125 V dc Switch (External Source)	8	125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or 120 V ac at 5 A Switch (external source) with power distribution[b]	8	P0916QV/QW	FBM241	5
240 V ac Switch Inputs/Switch Outputs						
240 V ac Switch	16		0	P0916PH/PJ	FBM207	1
240 V ac Switch	32		0	P0916PU/PV	FBM217	1
240 V ac Switch	8	240 V ac at 5 A Switch (external source)[b]	8	P0916QJ/QK	FBM241	5
240 V ac Switch	8	240 V ac at 5 A Switch (external source) with power distribution[b]	8	P0916QL/QM	FBM241	5
240 V ac Switch (External Source)	16		0	P0916PM/PN	FBM207	1
240 V ac Switch (External Source)	32		0	P0916QA/QB	FBM217	1
240 V ac Switch (External Source)	8	240 V ac at 5 A Switch (external source)[b]	8	P0916QX/QY	FBM241	5
240 V ac Switch (External Source)	8	240 V ac at 5 A Switch (external source) with power distribution[b]	8	P0916QZ/NZ	FBM241	5
15 to 60 V dc Switch Outputs						
	0	15 to 60 V dc at 2 A Switch (external source)	16	P0916JY/RJ	FBM242	1, 2

Table 21. Termination Assembly Types and Associated Certifications (Continued)

Signal Inputs		Signal Outputs		TA Part Number[a]	FBM Number	Certification Types
Type	#	Type	#			
30 V dc, 120 V ac, 125 V dc, or 240 V ac Switch Outputs						
	0	30 V dc at 5 A, or 125 V dc at 600 mA w/resistive load, or 125 V dc at 250 mA w/inductive load, or 120 V ac at 5 A, or 240 V ac at 5 A Switch (external source)[b]	16	P0916NG/RK	FBM242	5
	0	30 V dc at 5 A, or 125 V dc at 5 A, or 120 V ac at 5 A, or 240 V ac at 5 A Switch (external source) with power distribution[b]	16	P0916JZ/RL	FBM242	5

(a) Two part numbers are provided. The first part number is for the compression-type termination assemblies, and the second part number is for the ring lug-type termination assemblies.
(b) Refer to "Termination Assembly Relay Functional Specifications" on page 34 for more information on the relay.

Table 22. Termination Assembly Certifications

Type 1

TAs are UL/UL-C listed as suitable for use in Class I, Division 2, Groups A-D, T4 hazardous locations. They are CENELEC (DEMKO) certified EEx n IIC T4 for use in Zone 2 potentially explosive atmospheres.

Type 2

TAs are UL/UL-C listed as associated apparatus for supplying nonincendive field circuits Classes I, II, and III; Groups A-D, F and G, Division 2 hazardous locations when connected to specified DIN rail mounted FBMs and field circuits meeting entity parameter constraints specified in the *I/A Series DIN Rail Mounted FBM Subsystem User's Guide* (B0400FA). They are also CENELEC (DEMKO) certified as associated apparatus EEx [n] IIC T4 for supplying field circuits for Group IIC, Zone 2 potentially explosive atmospheres. Field circuits are also Class 2 limited energy (60 V dc, 30 V ac, 100 VA or less) if customer supplied equipment meets Class 2 limits.

Type 3

Same as Type 2 above except that only input circuits are non-incendive/Class 2.

Type 4

All field circuits are Class 2 limited energy (60 V dc, 30 V ac, 100 VA or less) if customer-supplied equipment meets Class 2 limits.

Type 5

The TA and its field circuitry are for use in only ordinary (non-hazardous) locations.

Note: All TAs are UL/UL-C listed to comply with applicable ordinary location safety standards for fire and shock hazards. They also comply with the requirements of the European Low Voltage Directive. All listings/certifications require installation and use within the constraints specified in the *I/A Series DIN Rail Mounted FBM Subsystem User's Guide* (B0400FA) and the conditions stated in UL and DEMKO reports.

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