

# Foxboro™ DCS

## Compact FBM217 Discrete Input Module

### PSS 41H-2C217

Product Specification

August 2019



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# Overview

The Compact FBM217 Discrete Input Interface Module provides 32 input channels, each accepting a 2-wire input from a dc voltage source. Associated termination assemblies (TAs) provide for discrete inputs of under 60 V ac, 120 V ac/125 V dc or 240 V ac. The module performs signal conversion required to interface the electrical input signals from the field sensors to the FCP or ZCP. It is part of the Compact 200 Series I/O subsystem described in *Compact 200 Series I/O Subsystem Overview* (PSS 41H-2COV).

Depending on the type of I/O signal required, the TAs contain current limiting devices, high voltage attenuation circuits, optical isolation and external power source connections.

The module with its associated TA supports the following discrete inputs:

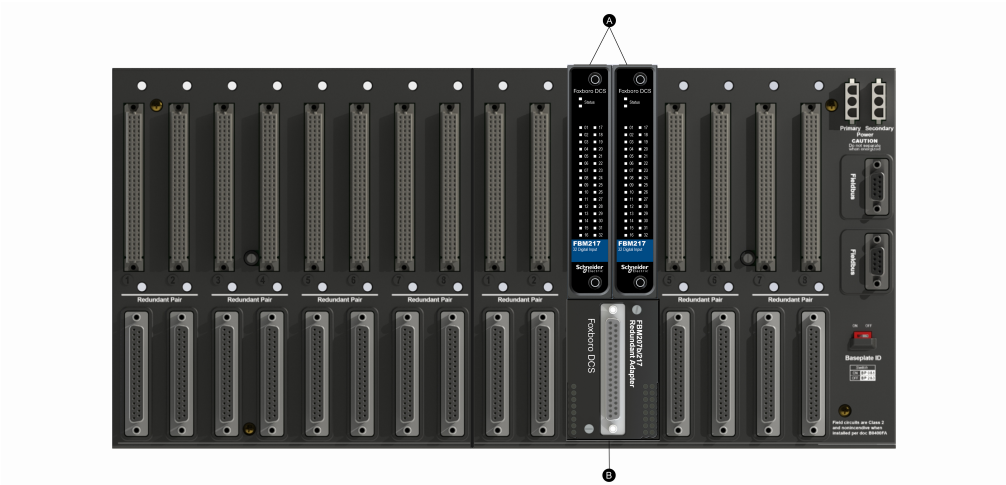
FBM	Inputs
Compact FBM217	30 V dc, 125 V dc, 120 V ac, or 240 V ac Voltage monitor or Contact sense

The module can be used as a single unit, or as a redundant pair. When used as a redundant pair, the modules combine to provide redundancy at the Foxboro DCS Fieldbus Module (FBM) level, with field input signals received from one common termination assembly though a redundant adapter affixed to the FBMs' baseplate. The field input current for redundant modules is doubled. A redundant digital input block in the control software validates each input in conjunction with information to/from the module, and selects the input with the higher quality for processing in the control strategy.

In a redundant configuration, contact sense power from each module is diode OR'd together in the redundant adapter to verify redundant power.

A redundant contact input function block, CINR, is used for each pair of inputs. The CINR block handles input reads and initialization logic for the redundant channels. On each execution cycle of the CINR block, identical reads are queried from each module, fully exercising the fieldbus and the logic circuitry of each module.

Figure 1 - Compact FBM217 Redundant Module Configuration



Legend	
A	Redundant Compact FBM217 Fieldbus Modules
B	Compact FBM207b/FBM217 Redundant Adapter (RH101AZ)

## Features

- 32 discrete inputs
- Supports discrete input signals at voltages of:
  - 15 to 60 V dc
  - 120 V ac/125 V dc
  - 240 V ac
- Single or redundant modules
- Compact, rugged design suitable for enclosure in Class G3 (harsh) environments
- Executes the programs for Discrete Input, Ladder Logic, Pulse Count, and Sequence of Events, with the configurable options: Input Filter Time and Fail-Safe Configuration
- Various Termination Assemblies (TAs) that contain:
  - High voltage attenuation and optical isolation for inputs
  - External power connection for device excitation
  - Main/expansion TA functionality

## Compact Design

The Compact FBM217's design is narrower than the standard 200 Series FBMs. It has a rugged acrylonitrile butadiene styrene (ABS) exterior for physical protection of the circuits. Enclosures specially designed for mounting the FBMs provide various levels of environmental protection, up to harsh environments, per ISA Standard S71.04.

## Visual Indicators

Red and green light-emitting diodes (LEDs) incorporated into the front of the modules provide visual module status indications of FBM functions. 32 blue LEDs provide the status of each input channel.

## Easy Removal/Replacement

The module mounts on a Compact 200 Series baseplate. Two screws on the FBM fix the module to the baseplate.

Redundant modules must be located in adjacent positions on the baseplate, with the first module located in an odd-numbered position (for example, the positions labelled "3" and "4"). To achieve redundancy, a redundant adapter module is placed on the two adjacent baseplate termination cable connectors to provide termination for a single cable (see *Figure 1, page 3*). A single termination cable connects from the redundant adapter to the associated termination assembly (TA).

When redundant, either module may be replaced without upsetting field input signals to the good module. Each module can be removed/replaced without removing field termination cabling, power, or communications cabling.

## Redundant Modules in Foxboro DCS HMI

The redundant pair of modules appear as two independent modules to system management software applications, such as Foxboro DCS System Manager and System Manager/Display Handler (SMDH). The functional redundancy for these modules is provided by their associated control blocks.

## Sequence of Events

The Sequence of Events (SOE) software package (for use with I/A Series® v8.x software and Control Core Services v9.0 or later) is used for acquisition, storage, display, and reporting of events associated with digital input points in a control system. SOE, using the optional GPS based time synchronization capability, supports data acquisition across control processors at intervals of up to one millisecond, depending on the signal source.

See *Sequence of Events* (PSS 31S-2SOE) to learn more about this package, and to *Time Synchronization Equipment* (PSS 41H-4TIMESNC), for a description of the optional time synchronization capability. Foxboro DCS with software earlier than V8.x can support SOE through ECB6 and EVENT blocks. However, these systems do not support GPS time synchronization and use a timestamp sent by the Control Processor which is accurate to the nearest second and does not provide synchronization between different Control Processors.

## Fieldbus Communication

A Fieldbus Communications Module or a Control Processor interfaces to the 2 Mbps module Fieldbus used by the FBMs. The Compact FBM217 accepts communication from either path (A or B) of the 2 Mbps Fieldbus. If one path is unsuccessful or is switched at the system level, the module continues communication over the active path.


## Modular Baseplate Mounting

The modules mount on a DIN rail mounted modular baseplate, which accommodates up to 16 compact FBMs. The baseplate is either DIN rail mounted or rack mounted, and includes signal connectors for redundant fieldbus, redundant independent DC power, and termination cables.

## Termination Assemblies

Field I/O signals connect to the FBM subsystem via DIN rail mounted TAs. The TAs used with the Compact FBM217 are described in *Termination Assemblies And Cables*, page 11.

# Functional Specifications

Compact FBM217 Module	<ul style="list-style-type: none"> <li>Input: 32 group isolated channels</li> <li>On-State Voltage: 15 to 30 V dc</li> <li>Off-State Voltage: 0 to 5 V dc</li> <li>Current: 2.2 mA (typical) at 30 V dc Input</li> <li>Source Resistance Limits (Applies to All TAs): <ul style="list-style-type: none"> <li>On-State: 1 k<math>\Omega</math> (maximum)</li> <li>Off-State: 100 k<math>\Omega</math> (minimum)</li> </ul> </li> </ul>
Filter/Debounce Time <sup>(1)</sup>	Configurable (No Filtering, 4, 8, 16, or 32 ms)
Maximum Pulse Count Rate	250 Hz
Isolation (Module/Passive TA Combination)	<p>For TAs that provide group isolation (RH916CA, RH916XZ, P0916CB, and P0916PX) input channels are group isolated from ground. For details, see <i>Standard and Compact 200 Series Subsystem User's Guide</i> (B0400FA). These module/TA combinations can withstand, without damage, a potential of 600 V ac applied for one minute between the group isolated channels and ground.</p> <div style="background-color: black; color: white; text-align: center; padding: 5px;">  <b>DANGER</b> </div> <p><b>HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH</b></p> <p>This does not imply that these channels are intended for permanent connection to voltages of these levels. Exceeding the limits for input voltages, as stated elsewhere in this specification, violates electrical safety codes and may expose users to electric shock.</p> <p><b>Failure to follow these instructions will result in death or serious injury.</b></p>
Isolation (Module/Signal Conditioning TA Combination) <sup>(2)</sup>	<p>High-voltage TAs P0916PY, P0916PZ, RH916YB, RH916QA, and P0916QB:</p> <ul style="list-style-type: none"> <li>Inputs are group-isolated.</li> <li>These TAs can withstand UL required dielectric potentials.</li> </ul> <p>High-voltage TAs P0916PS/PT/YA/PU/PV:</p> <ul style="list-style-type: none"> <li>Inputs are channel isolated.</li> <li>These TAs can withstand UL required dielectric potentials.</li> </ul>
Isolation (Remaining TAs)	<p>TAs RH924HA and RH924HB:</p> <ul style="list-style-type: none"> <li>Channels are isolated in pairs (1 and 2, 3 and 4, 5 and 6, and 7 and 8).</li> <li>Any pair will withstand 120 V ac between any other pair of channels and ground.</li> </ul>

	<p>TAs RH924HC, RH924HD, RH924HN, and RH924HR:</p> <ul style="list-style-type: none"> <li>Inputs are per-channel isolated, and will withstand 1250 V ac between any other channel and ground.</li> </ul> <p>TAs RH924HL and RH924HM:</p> <ul style="list-style-type: none"> <li>Inputs are per-channel isolated, and will withstand 1500 V ac between any other channel and ground.</li> </ul> <p>TAs RH924HP and RH924HS:</p> <ul style="list-style-type: none"> <li>Channels are isolated in two groups of eight (channels 1-8 and channels 9-16), and will withstand 1250 V ac between the two groups and ground.</li> </ul> <p>TAs RH924HQ and RH924HT:</p> <ul style="list-style-type: none"> <li>Channels are group isolated, and will withstand 1250 V ac between the group and ground.</li> </ul>
Communication	Communicates with its associated FCM or FCP via the module Fieldbus
Power Requirements	<ul style="list-style-type: none"> <li>Input Voltage Range: 24 V dc +5%, -10%</li> <li>Consumption: 3 W</li> <li>Heat Dissipation: 5 W</li> </ul>
Calibration Requirements	Calibration of the module and termination assembly is not required
Regulatory Compliance: Electromagnetic Compatibility (EMC)	<p><i>European EMC Directive 2004/108/EC (Prior to April 20, 2016) and 2014/30/EU (Beginning April 20, 2016)</i></p> <p>Meets: EN61326-1:2013 Class A Emissions and Industrial Immunity Levels</p>
Regulatory Compliance: Product Safety	<ul style="list-style-type: none"> <li><i>Underwriters Laboratories (UL) for U.S. and Canada:</i> UL/UL-C listed as suitable for use in UL/UL-C listed Class I, Groups A-D; Division 2; temperature code T4 enclosure based systems when connected to specified Foxboro DCS processor modules. Communications circuits also meet the requirements for Class 2 as defined in Article 725 of the National Electrical Code (NFPA No.70) and Section 16 of the Canadian Electrical Code (CSA C22.1). For more information, see <i>Standard and Compact 200 Series Subsystem User's Guide</i> (B0400FA).</li> <li><i>European Low Voltage Directive 2006/95/EC (Prior to April 20, 2016) and 2014/35/EU (Beginning April 20, 2016) and Explosive Atmospheres (ATEX) directive 94/9/EC (Prior to April 20, 2016) and 2014/34/EU (Beginning April 20, 2016):</i> DEMKO certified as Ex nA IIC T4 for use in certified Zone 2 enclosure when connected to specified I/A Series processor modules as described in the <i>Standard and Compact 200 Series Subsystem User's Guide</i> (B0400FA). For use in an enclosure suited for an ATEX Zone 2 classified area.</li> </ul>
RoHS Compliance	Complies with European RoHS Directive 2011/65/EU, including amending Directives 2015/863 and 2017/2102
Marine Certification	ABS Type Approved and Bureau Veritas Marine certified for Environmental Category EC31.
<p>(1) Digital filtering available for 200 Series FBM or competitive migration modules with version 1.25H or later firmware.</p> <p>(2) For input specifications for signal conditioning TAs, refer to Functional Specifications - Termination Assemblies.</p>	

## Environmental Specifications

	Operating	Storage
<b>Temperature</b>	<ul style="list-style-type: none"><li>Compact FBM217: -20 to +60°C (-4 to +140°F)</li><li>Termination Assembly - PA (Polyamide): -20 to +70°C (-4 to +158°F)</li></ul>	-40 to +70°C (-40 to +158°F)
<b>Relative Humidity</b>	5 to 95% (noncondensing)	5 to 95% (noncondensing)
<b>Altitude</b>	-300 to +3,000 m (-1,000 to +10,000 ft)	-300 to +12,000 m (-1,000 to +40,000 ft)
<b>Contamination</b>	Suitable for use in Class G3 (Harsh) environments as defined in ISA Standard S71.04, based on exposure testing according to EIA Standard 364-65, Class III.	
<b>Vibration</b>	7.5 m/s <sup>2</sup> from (5 to 500 Hz)	



# Physical Specifications

	Compact FBM217	Termination Assembly
Mounting	<p>The Compact FBM217 mounts on a Compact 200 Series 16-slot horizontal baseplate. The baseplate can be mounted on a horizontal DIN rail, or horizontally on a 19-inch rack using a mounting kit.</p> <p>Redundant modules must be located in odd and even adjacent positions on the baseplate (positions 1 and 2, 3 and 4, 5 and 6, 7 and 8, 9 and 10 (the second 1 and 2), 11 and 12 (the second 3 and 4), 13 and 14 (the second 5 and 6), or 15 and 16 (the second 7 and 8)). Refer to <i>Compact 200 Series 16-Slot Horizontal Baseplate</i> (PSS 41H-2C200) for details.</p>	<p>The TA mounts on a DIN rail and accommodates multiple DIN rail styles including 32 mm (1.26 in) and 35 mm (1.38 in)</p>
Weight	185 g (6.5 oz) approximate	<ul style="list-style-type: none"> <li>Compression:           <ul style="list-style-type: none"> <li>216 mm (8.51 in) – 420 g (0.93 lb, approximate)</li> <li>233 mm (9.15 in) – 454 g (1.0 lb, approximate)</li> </ul> </li> <li>Ring Lug:           <ul style="list-style-type: none"> <li>356 mm (14.02 in) – 908 g (2.0 lb, approximate)</li> <li>391 mm (15.38 in) – 950 g (2.1 lb, approximate)</li> </ul> </li> </ul>
Dimensions	<ul style="list-style-type: none"> <li>Height:           <ul style="list-style-type: none"> <li>130 mm (5.12 in)</li> </ul> </li> <li>Width:           <ul style="list-style-type: none"> <li>25 mm (0.98 in)</li> </ul> </li> <li>Depth:           <ul style="list-style-type: none"> <li>150 mm (5.9 in) - Including baseplate connectors, 139 mm (5.46 in)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Compression Screw:           <ul style="list-style-type: none"> <li>See <i>Dimensions - Nominal</i>, page 19</li> </ul> </li> <li>Ring Lug:           <ul style="list-style-type: none"> <li>See <i>Dimensions - Nominal</i>, page 19</li> </ul> </li> </ul>
Part Numbers	<ul style="list-style-type: none"> <li>Compact FBM217:           <ul style="list-style-type: none"> <li>RH101DF</li> </ul> </li> <li>Redundant Adapter:           <ul style="list-style-type: none"> <li>RH101AZ</li> </ul> </li> </ul>	See <i>Functional Specifications - Termination Assemblies</i> , page 13
Termination Cables	<ul style="list-style-type: none"> <li>Cable Lengths:           <ul style="list-style-type: none"> <li>Up to 30 m (98 ft)</li> </ul> </li> <li>Cable Materials:           <ul style="list-style-type: none"> <li>Polyurethane or Low Smoke Zero Halogen</li> </ul> </li> <li>Termination Cable Type:           <ul style="list-style-type: none"> <li>Baseplate to Main TA:               <ul style="list-style-type: none"> <li>Type 4 - See <i>Table 2</i>, page 18</li> </ul> </li> <li>Main TA to Expansion TA:               <ul style="list-style-type: none"> <li>Type 6 - See <i>Table 3</i>, page 18</li> </ul> </li> </ul> </li> </ul>	

Cable Connection	Type 4: <ul style="list-style-type: none"> <li>• FBM Baseplate End: 37-pin D-subminiature plug</li> <li>• Termination Assembly End: 37-pin D-subminiature receptacle</li> </ul>	Type 6: <ul style="list-style-type: none"> <li>• Main TA End: 25-pin D-subminiature receptacle</li> <li>• Expansion TA End: 37-pin D-subminiature receptacle</li> </ul>
Construction - Termination Assembly	<ul style="list-style-type: none"> <li>• Material: Polyamide (PA), compression</li> </ul>	
Field Termination Connections	<ul style="list-style-type: none"> <li>• Compression — Accepted Wiring Sizes:               <ul style="list-style-type: none"> <li>◦ Solid/Stranded/AWG: 0.2 to 4 mm<sup>2</sup>/0.2 to 2.5 mm<sup>2</sup>/24 to 12 AWG</li> <li>◦ Stranded with Ferrules: 0.2 to 2.5 mm<sup>2</sup> with or without plastic collar</li> </ul> </li> <li>• Ring-Lug — Accepted Wiring Sizes: #6 size screw connectors (0.375 in (9.5 mm)) 0.5 to 4 mm<sup>2</sup>/22 AWG to 12 AWG</li> </ul>	

# Termination Assemblies and Cables

Field I/O signals connect to the FBM subsystem via DIN rail mounted termination assemblies (TAs). Multiple types of TAs are available with Compact FBM217 to provide input signal connections, signal conditioning, optical isolation from signal surges and external power connections for field devices. 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 and power distribution).

The termination assembly can be used with a single Compact FBM217 or with a redundant pair (two Compact FBM217s).

The DIN rail mounted termination assemblies connect to the FBM subsystem baseplate by means of removable termination cables. When used with a redundant module pair, the termination assembly is connected to the baseplate using a Compact FBM217 redundant adapter (RH101AZ). The DIN rail mounted TAs connect to the redundant adapter by means of a removable termination cable.

The cables are available in a variety of lengths, up to 30 meters (98 feet), allowing the termination assemblies to be mounted as needed by plant design. Refer to Functional Specifications - Termination Assemblies for termination cable part numbers and specifications.

## Discrete Inputs

Various termination assemblies are available to support the interfacing of field signals to the low level FBM input circuits. Active termination assemblies support input signal conditioning for the FBM as well as channel isolation.

The signal conditioning circuits are located on daughter boards that are mounted under the component covers of the termination assemblies. To condition signals, these termination assemblies provide optical isolation, current limiting, voltage attenuation and optional terminal blocks to connect externally supplied excitation voltage.

## Low Voltage Discrete Inputs

The low voltage inputs (less than 60 V dc) use passive termination assemblies. Inputs are voltage monitor or contact sense types. Voltage monitor inputs require an external field voltage source. Contact sense inputs use the FBM auxiliary +24 V dc power supply to wet field contacts.

A load may be required for proper operation of the input channels.

## High Voltage Discrete Inputs

The high voltage input circuits support 125 V dc, 120 V ac, or 240 V ac. Voltage monitor inputs require a field voltage source.

Some versions of the termination assembly have a pair of external excitation voltage terminals, which distribute customer-supplied wetting voltage to all input channels on the assembly. These terminals allow the field power to be daisy chained between terminal assemblies.

## Main and Expansion Termination Assemblies

The Compact FBM217 supports 16 channel Main and Expansion termination assemblies. These types of termination assemblies were created originally to expand the functionality of the 100 Series FBMs, and equivalents were provided for the 200 Series subsystem as part of the 100 Series Fieldbus Module Upgrade Subsystem (as described in PSS 41H-2W100).

Any FBM217 main termination assembly can be matched with any FBM217 expansion termination assembly to provide system flexibility. When paired, the main and expansion termination assemblies are connected together using a Type 6 cable (P0928CQ).

In addition, the FBM217 can operate with only a single 16-channel main termination assembly.

## Functional Specifications - Termination Assemblies

FBM Type	Input Signal	TA Part Number PA <sup>(a)</sup>	Termination Type <sup>(b)</sup>	BP to TA Cable Type <sup>(c)</sup>	TA Cert. Type <sup>(d)</sup>
Compact FBM217	32 channel, voltage monitor 30 V dc Logic Zero – 0 to 5 V dc Logic One – 15 to 30 V dc Passive feedthrough with Compact FBM217 group isolation	RH916CA	C	4	1, 2, 4
Compact FBM217	32 channel, contact sense 24 V dc contact wetting from FBM Passive feedthrough with Compact FBM217 group isolation	RH916XZ <sup>(e)</sup>	C	4	1, 2, 4
Compact FBM217	32 channel, voltage monitor 132 V ac or 150 V dc maximum Logic Zero - 0 to 20 V ac; 0 to 20 V dc Logic One - 80 to 132 V ac; 75 to 150 V dc Input Current for Logic One; 1.6 mA maximum Channel isolation provided by termination assembly	RH916YA <sup>(e)</sup>	C	4	1, 4
Compact FBM217	32 channel, contact sense inputs, 132 V ac or 150 V dc maximum with external excitation Logic Zero - 0 to 20 V ac; 0 to 20 V dc Logic One - 80 to 132 V ac; 75 to 150 V dc Input Current for Logic One; 1.6 mA maximum Group isolation provided by termination assembly	RH916YB <sup>(e)</sup>	C	4	1, 4
Compact FBM217	32 channel, voltage monitor 240 V ac Logic Zero: 0 to 40 V ac Logic One: 164 to 264 V ac Input Current for Logic One; 1.6 mA maximum Channel isolation provided by termination assembly	RH916PU	C	4	1

Compact FBM217	<p>32 channel, contact sense inputs, 240 V ac with external excitation</p> <p>Logic Zero: 0 to 40 V ac</p> <p>Logic One: 164 to 264 V ac</p> <p>Input Current for Logic One; 1.6 mA maximum</p> <p>Group isolation provided by termination assembly</p>	RH916QA	C	4	1
Compact FBM217	<p>16 channel voltage monitor, external source, 130 V dc maximum voltage</p> <p>Logic Zero: 0 to 5 V dc</p> <p>Logic One: 15 to 130 V dc</p> <p>2.2 mA typical 5 to 130 V dc</p> <p>1 k<math>\Omega</math> Maximum On-state resistance</p> <p>100 k<math>\Omega</math> Minimum Off-state resistance</p> <p>OR</p> <p>Contact Sense, internal source 24 V dc <math>\pm</math>10% Open circuit voltage</p> <p>2.5 mA maximum short circuit current</p> <p>1 k<math>\Omega</math> Maximum On-state resistance</p> <p>100 k<math>\Omega</math> Minimum Off-state resistance</p> <p>Pairs isolation provided by termination assembly</p>	RH924HA	C	4	1, 2, 4
Compact FBM217	<p>16 channel voltage monitor, external source, 132 V ac or 150 V dc maximum voltage</p> <p>Logic Zero: 0 to 20 V ac; 0 to 20 V dc</p> <p>Logic One: 79 to 132 V ac; 75 to 150 V dc</p> <p>2.2 mA typical 20 to 132 V ac</p> <p>1 k<math>\Omega</math> Maximum On-state resistance</p> <p>100 k<math>\Omega</math> Minimum Off-state resistance</p> <p>Channel isolation provided by termination assembly</p>	RH924HC (Main)	C	4	1, 4

Compact FBM217	16 channel voltage monitor, external source, 264 V ac maximum voltage  Logic Zero: 0 to 40 V ac  Logic One: 164 to 264 V ac  2.2 mA typical 40 to 264 V ac  1 k $\Omega$ Maximum On-state resistance  100 k $\Omega$ Minimum Off-state resistance  Channel isolation provided by termination assembly	RH924HL (Main)	C	4	1
Compact FBM217	16 channel voltage monitor, external source, 150 V dc maximum voltage  Logic Zero: 0 to 10 V dc  Logic One: 33 to 150 V dc  2.5 mA typical 10 to 150 V dc  1 k $\Omega$ Maximum On-state resistance  100 k $\Omega$ Minimum Off-state resistance  Channel isolation provided by termination assembly	RH924HN (Main)	C	4	1, 2, 4
Compact FBM217	16 channel contact sense, internal source, 48 V dc nominal open circuit voltage  2.5 mA $\pm$ 20% short circuit current  1 k $\Omega$ Maximum On-state resistance  100 k $\Omega$ Minimum Off-state resistance  Two groups of eight isolation provided by termination assembly	RH924HP (Main)	C	4	1, 2, 4
Compact FBM217	16 channel contact sense, external source on Channel 1, 150 V dc maximum voltage  Logic Zero: 0 to 10 V dc  Logic One: 33 to 150 V dc  2.5 mA typical 10 to 150 V dc  Two groups of eight isolation provided by termination assembly	RH924HQ (Main)	C	4	1, 2, 4

(a) PA is polyamide rated from -20 to +70°C (-4 to +158°F).

(b) C = TA with compression terminals, RL = TA with ring lug terminals. Knife has compression terminals.

(c) See *Table 2, page 18* and *Table 3, page 18* for cable part numbers and specifications.

(d) See *Table 1, page 17* Termination Assembly certification definitions.

(e) Polyamide RL supersedes the PVC RL, note this is not a RoHS part.

## Functional Specifications - Expansion Termination Assemblies

FBM Type	Input Signal	TA Part Number PA <sup>(a)</sup>	Termination Type <sup>(b)</sup>	BP to TA Cable Type <sup>(c)</sup>	TA Cert. Type <sup>(d)</sup>
Compact FBM217	For 16 input voltage monitor/ contact sense:  Input/output specifications are the same as for TA RH924HA in <i>Functional Specifications - Termination Assemblies, page 13</i>  Pairs isolation provided by termination assembly	RH924HB (Expansion)	C	6	1, 2, 4
Compact FBM217	For 16 input voltage monitor:  Input/output specifications are the same as for TA RH924HC in <i>Functional Specifications - Termination Assemblies, page 13</i>  Channel isolation provided by termination assembly	RH924HD (Expansion)	C	6	1, 4
Compact FBM217	For 16 input voltage monitor:  Input/output specifications are the same as for TA RH924HL in <i>Functional Specifications - Termination Assemblies, page 13</i>  Channel isolation provided by termination assembly	RH924HM (Expansion)	C	6	1
Compact FBM217	For 16 input voltage monitor:  Input/output specifications are the same as for TA RH924HN in <i>Functional Specifications - Termination Assemblies, page 13</i>  Channel isolation provided by termination assembly	RH924HR (Expansion)	C	6	1, 2, 4
Compact FBM217	For 16 input contact sense:  Input/output specifications are the same as for TA RH924HP in <i>Functional Specifications - Termination Assemblies, page 13</i>  Two groups of eight isolation provided by termination assembly	RH924HS (Expansion)	C	6	1, 2, 4



Compact FBM217	For 15 input contact sense with external power supply:  Input/output specifications are the same as for TA RH924HQ in <i>Functional Specifications - Termination Assemblies, page 13</i>  Group isolation provided by termination assembly	RH924HT (Expansion)	C	6	1, 2, 4
<p>(a) PA is polyamide rated from -20 to +70°C (-4 to +158°F).</p> <p>(b) C = TA with compression terminals, RL = TA with ring lug terminals.</p> <p>(c) See <i>Table 2, page 18</i> and <i>Table 3, page 18</i> for cable part numbers and specifications.</p> <p>(d) See <i>Table 1, page 17</i> for Termination Assembly certification definitions.</p>					

**Table 1 - Certifications for Termination Assemblies**

Type	Certification
Type 1	TAs are UL/UL-C listed as suitable for use in Class I; Groups A-D; Division 2 temperature code T4 hazardous locations. They are DEMKO certified Ex nA IIC T4 for use in Zone 2 potentially explosive atmospheres.
Type 2	TAs are UL/UL-C listed as associated apparatus for supplying non-incendive field circuits Class I; Groups A-D; Division 2 hazardous locations when connected to specified 200 Series FBMs and field circuits meeting entity parameter constraints specified in <i>Standard and Compact 200 Series Subsystem User's Guide</i> (B0400FA). They are also DEMKO certified as associated apparatus 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.

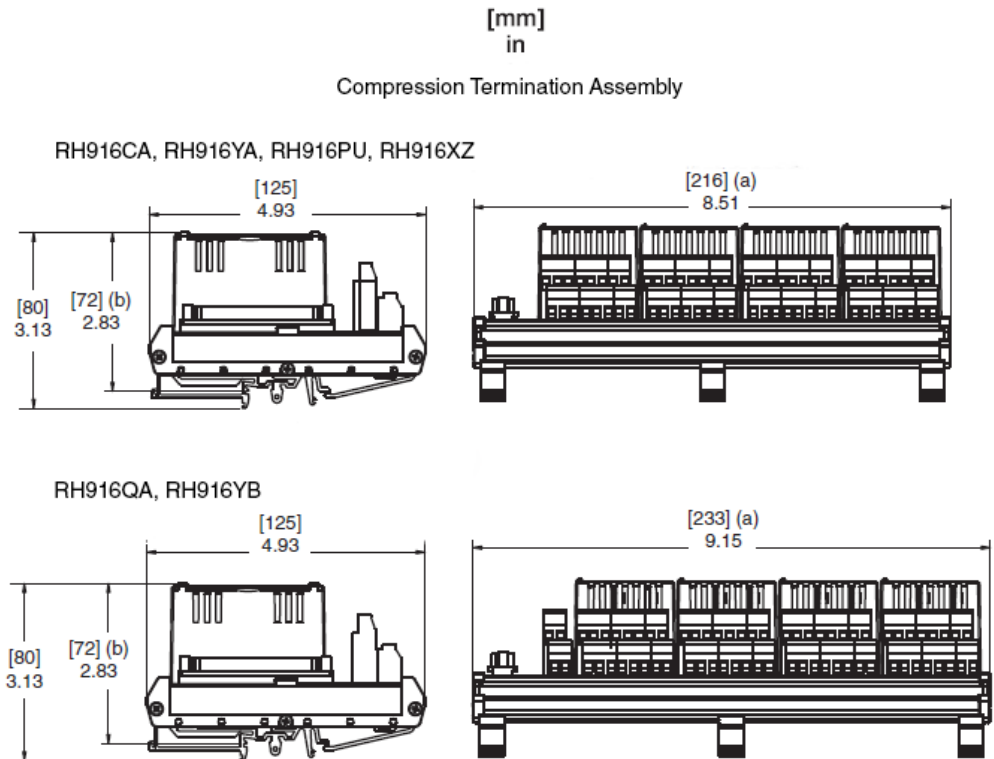
**Table 2 - Cables Types (Baseplate to Main TA Cables) and Part Numbers**

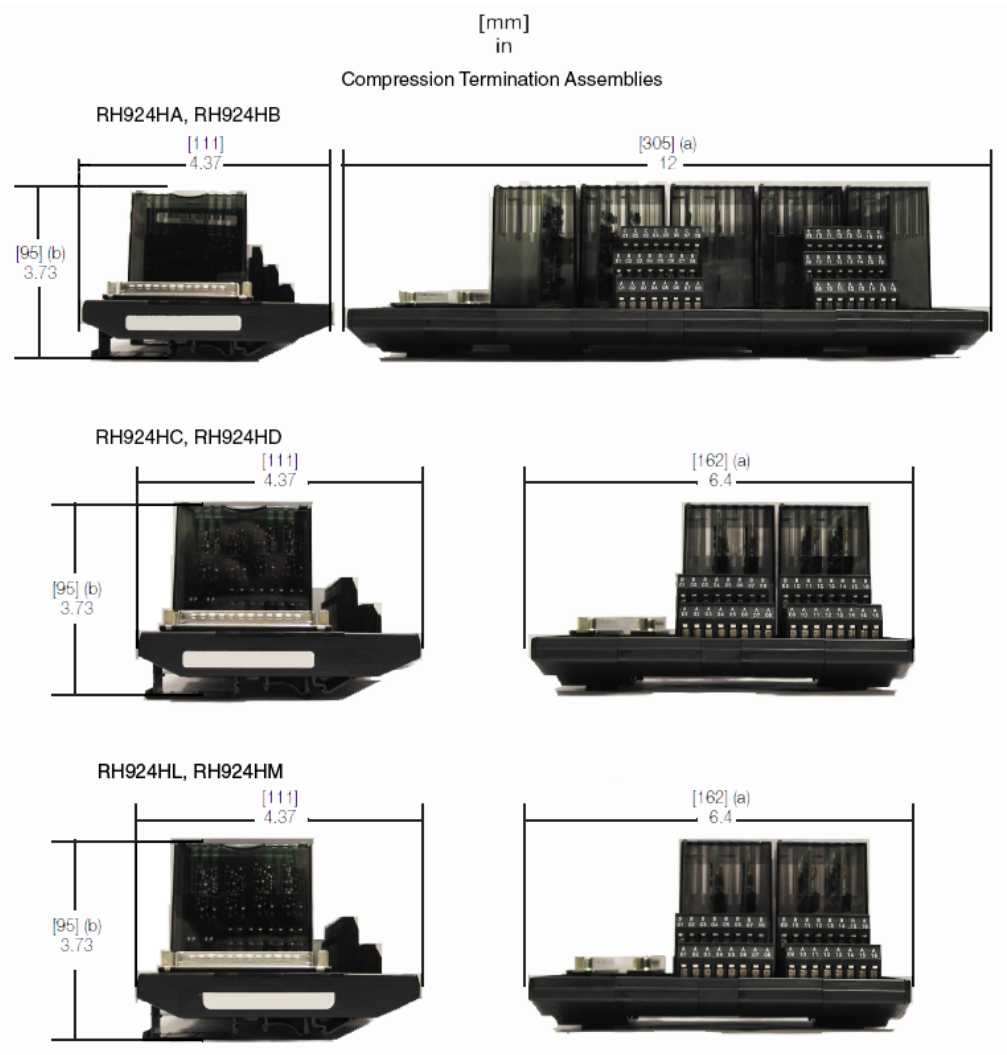
<b>Cable Length m (ft)</b>	<b>Type 4 P/PVC<sup>(a)</sup></b>	<b>Type 4 LSZH<sup>(b)</sup></b>
0.5 (1.6)	RH100CJ	RH100BN
1.0 (3.2)	RH100CK	RH100BP
1.5 (4.9)	RH100EQ	RH100EN
2.0 (6.6)	RH100CL	RH100BQ
3.0 (9.8)	RH100CM	RH100BR
5.0 (16.4)	RH100CN	RH100BS
10.0 (32.8)	RH100CP	RH100BT
15.0 (49.2)	RH100CQ	RH100BU
20.0 (65.6)	RH100CF	RH100BV
25.0 (82.0)	RH100CR	RH100BW
30.0 (98.4)	RH100CS	RH100BX
<p><sup>(a)</sup> P/PVC is polyurethane outer jacket and semi-rigid PVC primary conductor insulation. P/PVC cable is rated at -20 to +80°C (-4 to 176°F).</p> <p><sup>(b)</sup> Low smoke zero halogen or low smoke free of halogen (LSZH) is a material classification used for cable jacketing. LSZH is composed of thermoplastic or thermoset com-pounds that emit limited smoke and no halogen when exposed to high sources of heat. Temperature range: -40 to +105°C (-40 to +221°F).</p>		

**Table 3 - Cable Types (Main TA to Expansion TA Cables) and Part Numbers**

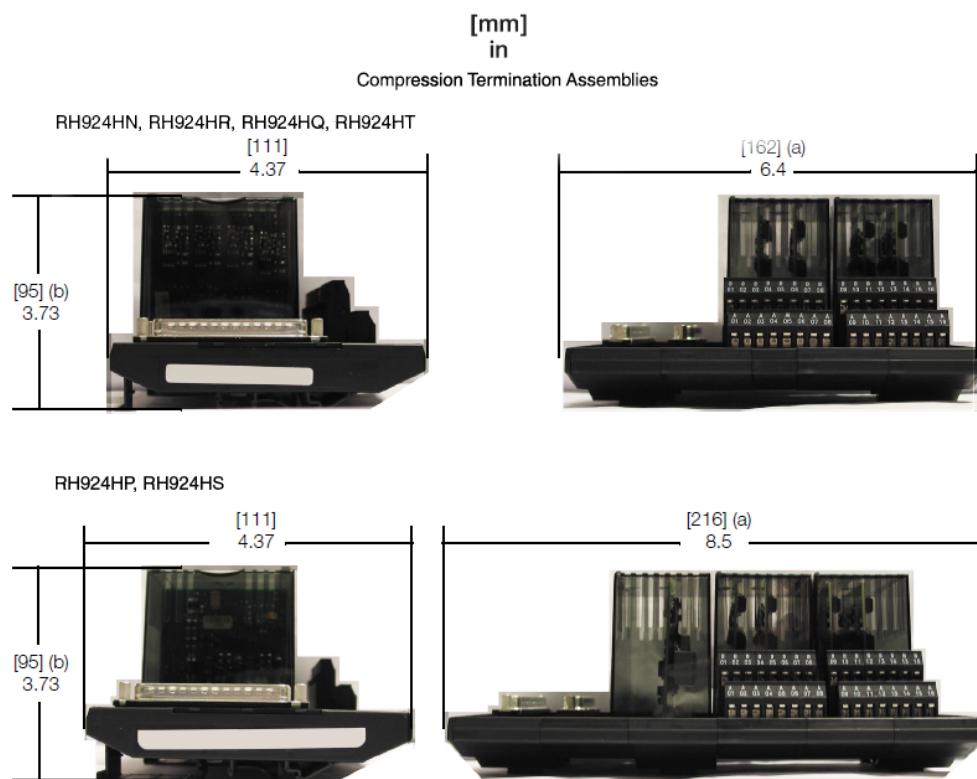
<b>Cable Length m (ft)</b>	<b>Type 6 LSZH<sup>(a)</sup></b>
0.75 (2.5)	P0928CQ
<p><sup>(a)</sup> Low smoke zero halogen or low smoke free of halogen (LSZH) is a material classification used for cable jacketing. LSZH is composed of thermoplastic or thermoset com-pounds that emit limited smoke and no halogen when exposed to high sources of heat. Temperature range: -40 to +105°C (-40 to +221°F.)</p>	

## Dimensions - Nominal





- (a) Overall width – for determining DIN rail loading.
- (b) Height above DIN rail (add to DIN rail height for total).



(a) Overall width – for determining DIN rail loading.

(b) Height above DIN rail (add to DIN rail height for total).

## Related Product Documents

Document Number	Description
PSS 41H-2COV	<i>Compact 200 Series I/O Subsystem Overview</i>
B0400FA	<i>Standard and Compact 200 Series Subsystem User's Guide</i>
PSS 41H-2C200	<i>Compact 200 Series 16-Slot Horizontal Baseplate</i>
PSS 31H-2S200	<i>Standard and Compact 200 Series Subsystem Overview</i>
PSS 41H-2CERTS	<i>Standard and Compact 200 Series I/O, Agency Certifications</i>
PSS 41H-2C480	<i>Compact Power Supply - FPS480-24</i>
PSS 41S-3FCPICS	<i>Field Control Processor 280 (FCP280) Integrated Control Software</i>