Foxboro™ DCS

G10 System Enclosure

PSS 41H-2G10

Product Specification

January 2020

https://www.se.com

Legal Information

Overview

The EcoStruxure™ Foxboro™ DCS G10 System Enclosure provides environmental protection and housing for Standard 200 Series subsystem equipment.

The G10 enclosure is specifically designed for housing Standard 200 Series subsystem modules. The G10 enclosure is available as a vented enclosure or sealed enclosure.

The G10 vented enclosure can be configured with:

- Up to twelve 8-position vertically mounted Modular Baseplates, for mounting up to 96 Foxboro DCS Fieldbus Modules (FBMs)
- Up to three 2-position baseplates to support Field Control Processors (FCP280s)/ Fieldbus Communications Modules (FCMs)
- Up to six FPS400-24 power supplies (redundant power) to support the Modular Baseplates

The G10 sealed enclosure can be configured with:

- Up to four 8-position vertically mounted Modular Baseplates, for mounting up to 32 FBMs
- One 2-position baseplate to support FCPs (FCP280s)/FCMs
- Up to two FPS400-24 power supplies (redundant power) to support the baseplates

The G10 vented enclosure is a free-standing, floor-mounted unit with an IP 43/55 rating for location in mild (ordinary) environmental areas.

The G10 sealed enclosure is a free-standing, floor-mounted unit with options for either an IP 55 or IP 66 rating for location in harsh environments. Sealed enclosures with an IP 66 rating provide a higher level of protection from airborne contamination.

Multiple G10 enclosures can be installed connected to one another to maximize the use of floor space and ease of cabling. The enclosures can be bayed together using third-party kits.

This enclosure and its configurations have been tested and qualified by Foxboro for use with specified Standard 200 Series subsystem modules.

Features

- Vented enclosure accommodates up to 96 FBMs in up to twelve Modular Baseplates, sealed enclosure accommodates up to 32 FBMs
- Enclosure selection for use in ordinary (IP 43/55) or harsh (IP 55/66) rated environments
- Compact design to minimize use of floor space with both front and rear access that allow maximum density of enclosures in a control room environment
- Option for single or redundant power supplies
- Bottom or top cable entry for termination assembly (TA) cables and power wiring, but can be customer configured for simultaneous top and bottom cable entry
- Conveniently placed eyebolts for transporting and lifting the enclosures
- A 100 mm (4 in) plinth - total enclosure height of 2,160 mm (85.0 in)
- Optional handles with push button/keylocks
- Standard protective ground studs or optional isolated instrument ground rail

Ingress Protection

The metal enclosures provide the outer layer of protection for the control electronics. Other layers are provided by the module covers and built into the modules. This approach to protection means that a minimum of contaminants in the plant environment reaches the control components, thus greatly extending the life of the equipment.

For sealed IP 55/66 certified enclosures, heat is transferred from the interior surfaces of the enclosure and then dissipated by the enclosure's exterior surfaces into the plant environment. Air is not exchanged between the enclosure's interior and the outside environment. Therefore, contaminants are minimized inside the enclosure. Sealed IP 55/66 versions can be used outdoors in sheltered locations.

The enclosures support convenient top or bottom cable entry for TA cabling and power wiring. Vented enclosures with roof-mounted fans are not recommended with top cable entry.

Thermal Protection

Ventilation fans along with vented doors increase circulation for heat removal and can be used:

- At installations with only moderate levels of airborne contaminants, enclosure interiors can be exposed to allow plant air to circulate and remove the heat generated within the modules
- In areas where there are no requirements to filter the air to which the modules in the enclosure are exposed, such as office areas

Vented enclosures contain a dual fan assembly located at the top of the enclosure or single fan assemblies located on the enclosure front and rear door. Enclosures with vented doors can be located in main equipment areas or in an environment with office air quality.

Dual Thermostat

An optional dual (high/low) thermostat is available to monitor enclosure temperature extremes, with the exception of Zone II, Class I, Division 2 applications.

Modular Baseplate Mounting

The enclosure can contain various types of vertically mounted Modular Baseplates, which accommodate different quantities and types of modules (FCPs/FBMs/FCMs).

For the enclosure to accommodate a higher density of modules and maximize accessibility and space for TA cables, the baseplates are mounted in a vertical position. Vertical cable runs minimize the need to dress and route cables at ninety-degree angles while providing a direct path for cable access to the bottom or top of the enclosure. While improving layout, vertical orientation also reduces any horizontal obstructions, thus increasing airflow and improving overall thermal performance.

For more information on the various types of Modular Baseplates in a Foxboro DCS, see *Standard 200 Series Baseplates*(PSS 41H-2SBASPLT).

Vented Enclosure Design Options

The G10 vented enclosure is available with either roof-mounted or door-mounted fans.

Roof-mounted fans provide the best performance for cooling, and provide a lower noise-level than the door-mounted fans. However, roof-mounted fans can restrict top-entry cable access to the enclosure and reduce the overall ingress protection rating. For customers who plan to modify the swing direction of their enclosure doors, fans mounted on the roof allow the process to proceed more smoothly.

Door-mounted fans are desirable for top entry cable access configurations, and provide the highest level of ingress protection for vented enclosures.

Fieldbus I/O Groups

Vented Enclosures

The vented G10 system enclosure has four vertical DIN rails for mounting vertically mounted Modular Baseplates and their power supplies. Two of the DIN rails are accessible from the rear of the enclosure and two of the DIN rails are accessible from the front of the enclosure. Three of the DIN rails can mount up to four 8-position FBM Modular Baseplates, and the Baseplates on each rail are called a Fieldbus Input/Output (I/O) Group. Each Fieldbus I/O Group has an optionally redundant FPS400 power supply associated with the group and an optional 2-position vertically mounted Modular Baseplate for FCMs/FCPs. These power supplies and FCMs/FCP Baseplates are mounted on the fourth DIN rail (see *Figure 1, page 7* and *Figure 2, page 8*).

Sealed Enclosures

The sealed G10 enclosure uses two of its four vertical DIN rails for mounting vertically mounted Modular Baseplates. The DIN rails are accessible from the front of the enclosure.

Due to the thermal load and the reliance on conductive cooling, sealed enclosures have a limited loading capacity. One DIN rail can mount up to four 8-position Modular Baseplates and the other DIN rail mounts the redundant power supplies and one 2-position vertically mounted Modular Baseplate for FCMs/FCPs. Sealed enclosures use only the components in the Fieldbus Input/Output (I/O) Group 1 (see *Figure 1, page 7* and *Figure 2, page 8*). Fieldbus I/O Group 1 has an optionally redundant FPS400 power supply and an optional 2-position vertically mounted Modular Baseplate for FCMs/FCPs associated with the group.

Termination Assembly/Input Power Cabling

The enclosures can be ordered for bottom cable entry or top cable entry or modified by the customer for simultaneous top and bottom cable entry.

For the top cable entry version, the TA cables and/or customer power feeds enter through customer-configured cable glands. Any customizations made must follow the manufacturer's guidelines to preserve the enclosure's ingress protection rating. Vented enclosures with roof and door-mounted fans are not recommended for top cable entry.

For the vented bottom entry version, the TA cables and power cable enter through removable gland plates, located at the bottom (inside) of the enclosure. The plates can be removed, drilled, or punched for cable routing.

For the sealed bottom entry version, the TA cables and power cable enter through a solid bottom panel located at the bottom (inside) of the enclosure. The panel can be drilled or punched for cable routing. Users must provide their own cable glands (for top or bottom cable entry), in keeping with maintenance of the enclosure's ingress protection.

Cable straps are provided in the enclosure to dress and support the TA cables. Field I/O signals must be connected to a TA mounted in an adjoining Foxboro DCS termination enclosure.

Power and Grounding

The G10 enclosure supports an optional redundant power system, in which dual power distribution (two power supplies fed by independent entry sources) provides redundancy protection against power failures detected.

Power wiring to the enclosure is routed through the bottom or top of the enclosure. Optional dual power input feeds terminate at dedicated primary and secondary power distribution terminal blocks.

All enclosure structural elements are integrally grounded by the enclosure design to meet the appropriate industry regulations and standards.

The G10 enclosure uses a 200 Series power supply that provides 24 V DC to 200 Series baseplates. The power supply is agency certified for use in Zone II, Class I, Division 2 applications. For more information, see *Standard 200 Series Power Supply -FPS400-24* (PSS 41H-2FPS400).

Grounding

Two M8 studs (one for each enclosure side) provide a central ground point and dedicated grounding points when baying enclosures together.

An optional isolated instrument bus bar is available for additional ground points.

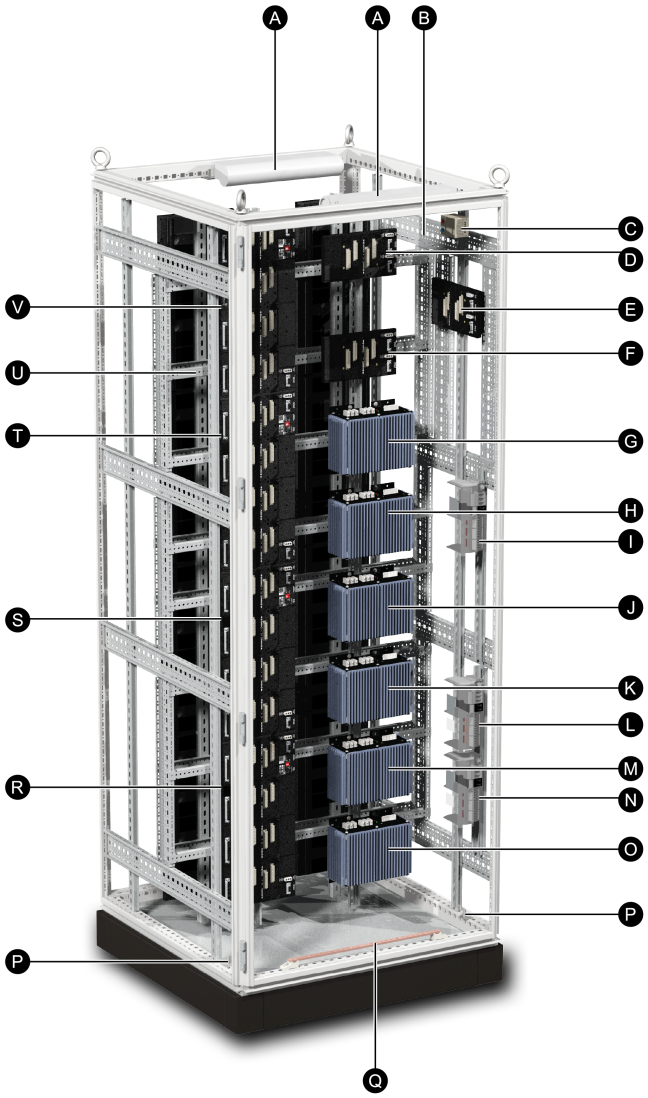
Power Distribution

Each power distribution terminal block assembly (primary, secondary or utility for powering fans and lights, see *Figure 1, page 7*) has dedicated ring lug assembly terminal blocks for customer main power. Each also has fused, knife disconnect terminal blocks for interrupting the main power, as well as independent knife disconnect terminal blocks for each device, for ease of service.

Additional blocks are provided for the customer to install utility outlets.

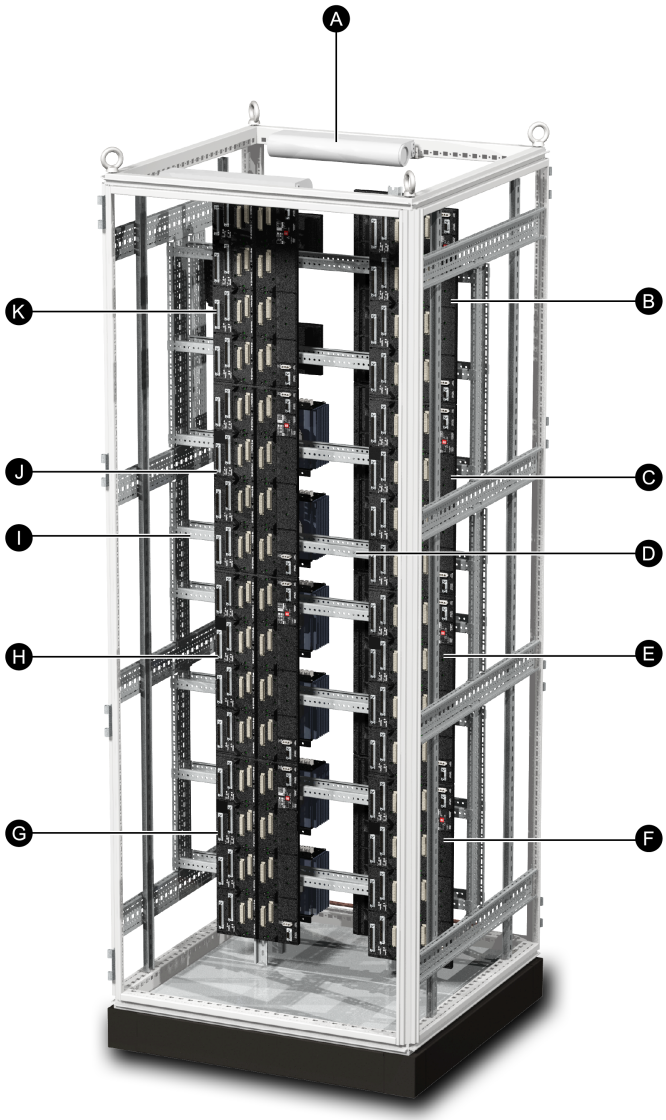
The enclosure is available without these power distribution terminal blocks when the customer has requirements for power distribution specific to regional electrical codes.

Figure 1 - G10 System Enclosure, Front View



Legend					
A	LED Light	**I**	ac Utility Power Terminal Blocks	**Q**	Optional Isolated Instrument Ground Rail
B	Expansion Baseplate Location	**J**	Fieldbus I/O Group 2 Power Supply (Primary)	**R**	Fieldbus I/O Group 1 Baseplate 4
C	High/Low Thermostat	**K**	Fieldbus I/O Group 2 Power Supply (Secondary)	**S**	Fieldbus I/O Group 1 Baseplate 3
D	Fieldbus I/O Group 1 2-Position Baseplate FCP or FCM	**L**	Power Distribution and Disconnects (Primary)	**T**	Fieldbus I/O Group 1 Baseplate 2
E	Fieldbus I/O Group 3 2-Position Baseplate FCP or FCM	**M**	Fieldbus I/O Group 1 Power Supply (Primary)	**U**	Location to Run TA Cable for Fieldbus I/O Group 1
F	Fieldbus I/O Group 2 2-Position Baseplate FCP or FCM	**N**	Power Distribution and Disconnects (Secondary)	**V**	Fieldbus I/O Group 1 Baseplate 1
G	Fieldbus I/O Group 3 Power Supply (Primary)	**O**	Fieldbus I/O Group 1 Power Supply (Secondary)		
H	Fieldbus I/O Group 3 Power Supply (Secondary)	**P**	Protective Ground Stud		
NOTE: Sealed enclosures contain only the equipment listed for Fieldbus I/O Group 1					

Figure 2 - G10 System Enclosure, Rear View



Legend			
A	LED Light (Front and Rear of Enclosure)	**G**	Fieldbus I/O Group 2 Baseplate 4
B	Fieldbus I/O Group 3 Baseplate 1	**H**	Fieldbus I/O Group 2 Baseplate 3
C	Fieldbus I/O Group 3 Baseplate 2	**I**	Location to Run TA Cable for Fieldbus I/O Group 2
D	Location to Run TA Cable for Fieldbus I/O Group 3	**J**	Fieldbus I/O Group 2 Baseplate 2
E	Fieldbus I/O Group 3 Baseplate 3	**K**	Fieldbus I/O Group 2 Baseplate 1
F	Fieldbus I/O Group 3 Baseplate 4		
NOTE: Sealed enclosures do not contain equipment listed for Fieldbus I/O Group 2 and 3 (Class I and Division 2 only).			

Enclosure Features and Options

Feature	Availability
Base Enclosure	• Vented IP 43/55 rated enclosure with single front and rear door-mounted fans (120 V AC or 240 V AC) or roof-mounted fans (120 V ACor 240 V AC dual fans), or • Sealed IP 55 rated enclosure, or • Sealed IP 66 rated enclosure
Enclosure Access	Front and rear access
Front Door	Solid front door with inlet vents
Cable Entry	Bottom cable entry or top cable entry (top entry not recommended for roof-mounted fans)
Sidewalls	Options configurable based on baying requirements
Door Handle	Optional comfort handle with push button or keylock
Door Mounting	Universal mounting for left- and right-hand door swing (left-hand is default)
Equipment Supported (Vented Enclosures)	• Up to 3 Fieldbus I/O Groups • Up to twelve 8-position Modular Baseplates for housing up to 96 FBMs (total of 96 FBMs per vented enclosure) • Up to three 2-position baseplate for FCMs/FCPs • Up to six FPS400-24 power supplies per Fieldbus I/O Group to support the Modular Baseplates (total of 6 power supplies per vented enclosure)
Equipment Supported (Sealed Enclosures)	• One Fieldbus I/O Group • Up to four 8-position Modular Baseplates for housing up to 32 FBMs (total of 32 FBMs per sealed enclosure) • One 2-position baseplate for FCMs/FCPs • Up to two FPS400-24 power supplies to support the Modular Baseplates
Enclosure Lighting[a]	Universal single and/or dual enclosure lights with motion activation
Thermostat[a]	Dual temperature thermostat
Fans[a]	Door-mounted or roof-mounted fans
Grounding[a]	• Two protective ground studs • Optional isolated instrument rail for additional connectors
Main Power[a]	• 100-250 V AC, 50-60 Hz, 125 V DC input primary only or primary and secondary power, or • 100-250 V AC, 50-60 Hz, 125 V DC input primary and 24 V DC secondary power, or • 24 V DC input primary only or primary and secondary power • Customer configured power entry (no terminal blocks supplied)
Utility Power	120 V AC or 240 V AC utility power terminal block

[a] If you are installing a G-series enclosure as part of a Zone 2 (IEC)/Class I, Division 2 application, see *Standard and Compact 200 Series I/O Agency Certifications* (PSS 41H-2CERTS) to determine 200 Series subsystem equipment hazardous location suitability. Also, be aware that optional enclosure electrical accessories, such as LED lights, roof or door-mounted fans, and thermostats, may not be used in hazardous (Zone 2 (IEC)/Class I, Division 2) environments.

Functional Specifications

Enclosure	The enclosures are free-standing, floor mounted, steel industrial enclosures containing: • Vertically mounted 8-position Modular Baseplates for mounting FBMs • Vertically mounted 2-position baseplates for FCPs/FCMs • FPS400-24 power supplies (single or redundant power)
Input Power (Optionally Redundant)	See *Standard 200 Series Power Supply - FPS400-24* (PSS 41H-2FPS400)

Environmental Specifications

	Operating	Storage
Temperature	• Vented (Thermal Loading): -20 to +60°C (-4 to +140°F) Up to 750 Watts (Average) -20 to +55°C (-4 to +131°F) 750 to 1,000 Watts (Maximum) • Sealed (Thermal Loading): -20 to +50°C (-4 to +122°F) Up to 400 Watts (Average) -20 to +45°C (-4 to +113°F) 400 to 500 Watts (Maximum)	-40 to 70°C (-40 to 158°F)
Relative Humidity	5 to 95% (noncondensing)	
Ingress Protection Ratings	• Vented: ◦ Door-Mounted Fans: IP 55 to EN 60 529 / NEMA 12 ◦ Roof-Mounted Fans: IP 43 to EN 60 529/10.9191 / NEMA 12 • Sealed: IP 55 to EN 60 529 / NEMA 12 IP 66 to EN 60 529 / NEMA 4	
Acoustic Noise Level[(a)]	• Roof-Mounted Fans: 61 dB (A) at 1 m/58 dB (A) at 3 m • Door-Mounted Fans: 64 dB (A) at 1 m/62 dB (A) at 3 m • Sealed Enclosure (No Fans): Ambient/Ambient	
Dual Thermostat	• High Alarm Setting: NC contact, Range: 0 to 60°C (32 to 140°F) • Low Alarm Setting: NO contact, Range: 0 to 60°C (32 to 140°F)	
Agency Certification	Empty enclosure is UL and UL-C approved. Enclosure meets all applicable European Union directives and is CE compliant. Final installed enclosures populated with your equipment should be inspected by your local UL/CSA committee, or other local safety governing organization if required. A complete listing of certifications is available from enclosure vendor. For installed Foxboro DCS equipment, see *Standard and Compact 200 Series I/O - Agency Certifications* (PSS 41H-2CERTS).	
Area Designation	Per customer order, vented for general purpose or sealed for hazardous area (Zone 2 (IEC)/ Class I, Division 2, (North America)	

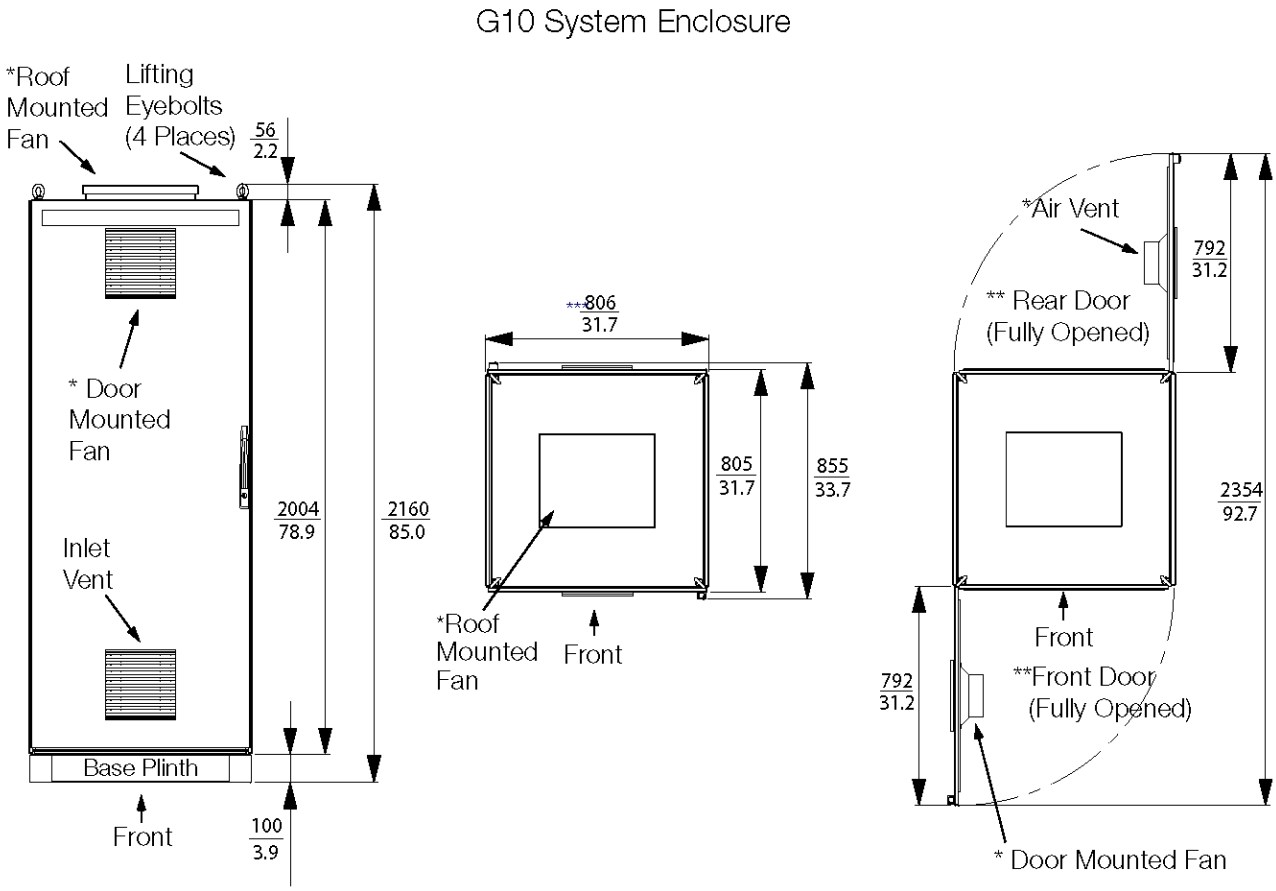
[(a)] Under normal operating conditions, with both fans running, at enclosure's mid-height at 46 dB (A) ambient noise level.

Physical Specifications

Weight	The weight of the enclosure is dependent upon the particular configuration. Consult with a Foxboro representative if precise weight figures are required. • Vented Enclosure (Max. Configuration): 800 mm (31.5 in) x 800 mm (31.5 in) - 261 kg (575 lb) • Side Panel: 800 mm (31.5 in) x 800 mm (31.5 in) - 8 kg (18 lb)
Mounting	Floor **⚠ CAUTION** **RISK OF INJURY** To prevent injury, this enclosure must be bolted down. See *Enclosures and Mounting Structures - Site Planning and Installation User's Guide* (B0700AS). **Failure to follow these instructions can result in injury or equipment damage.**
Construction	Sheet steel with textured, powder-coated finish
Color	• Side Panels, Roof, and Door: RAL 7035 - light gray - textured • Plinth: RAL 7022 - umbra gray smooth
Panel Thickness	• Doors: 2 mm (14 ga) • Side Panels, Roof: 1.5 mm (16 ga)
Construction	Material: • Doors: Sheet steel, 2.0 mm (14 ga) • Frame, Roof, Side Panels, Gland Plates: Sheet steel 1.5 mm (16 ga) • Base Plinth: Sheet steel and plastic Finish: • Frame: Dipcoat-primed, RAL 7044 smooth • Door, Roof, Side Panels: Dipcoat-primed, powder-coated, RAL 7035 (light gray) textured • Base/Plinth: Dipcoat-primed, RAL 7022 (umbra gray) smooth, plastic cover caps RAL 9005 (jet black) • Gland Plates and Internal Hardware: Zinc-plated, passivated

Cable Entry	• Vented Enclosure: Bottom through gland plate(s) Top through customer cutouts in enclosure top (For enclosure with roof-mounted fans, suggested entry is bottom) • Sealed Enclosure: Bottom through steel panel and customer cutouts in panel Top through customer cutouts in enclosure top
Grounding	• Roof, Sidewalls, Gland Plates: Automatic potential equalization built in • Doors: Dedicated 4 mm^2 (11 ga) ground strap to enclosure frame • Enclosure: Two M8 studs (one for each enclosure side) An optional isolated bus bar for additional ground points
Power Input Terminals	• Type: Ring Lug • Wire Size: Up to 6 mm^2 (10 AWG) • Ring Lug Size: M4 Maximum (DIN 46 234/46 237), 9.6 mm maximum O.D.
Termination Assembly Cabling	Universal mounting straps are supplied for attaching, routing, and strain relieving of TA cables. Each strap supports up to a 75 mm (3 in) diameter cable bundle.

Dimensions Nominal



* Vented Enclosures only — either roof- or door-mounted configurations can be ordered.

** Doors are factory-configured for left-hand swing, but can be reconfigured at site for right-hand swing.

*** With side panels, without side panels 800/31.5.

Related Product Documents

Document Number	Description
PSS 31H-2S200	*Standard 200 Series Subsystem Overview*
PSS 41H-2CERTS	*Standard and Compact 200 Series I/O - Agency Certifications*
PSS 41H-2FPS400	*Standard 200 Series Power Supply -FPS400-24*
PSS 41H-2SBASPLT	*Standard 200 Series Baseplates*
PSS 41H-2GOV	*G-Series Enclosures Overview*
B0700AS	*Enclosures and Mounting Structures - Site Planning and Installation User's Guide*
ISA-S71.04-1985 (not Foxboro-supplied)	*Environmental Conditions for Process Measurement and Control Systems: Airborne Contaminants*

WARNING: This product can expose you to chemicals including lead and lead compounds, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.p65warnings.ca.gov/.

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As standards, specifications, and design change from time to time, please ask for confirmation of the information given in this publication.

PSS 41H-2G10, Rev A