Foxboro™ DCS

G12 System and Termination Enclosure

PSS 41H-2G12

Product Specification

January 2020

https://www.se.com

Legal Information

Overview

The EcoStruxure™ Foxboro™ DCS G12 enclosure is specifically designed for housing standard 200 Series subsystem modules and their associated termination assemblies (TAs) and customer-supplied terminal blocks for marshalling. The G12 enclosure is available as a vented enclosure or sealed enclosure.

The G12 vented and sealed enclosure can be configured with:

- Up to four 8-position vertically mounted Modular Baseplates, for mounting up to 32 Foxboro DCS Fieldbus Modules (FBMs)
- Up to four vertical DIN rails for mounting of TAs and terminal blocks for marshalling
- One 2-position baseplate to support Field Control Processors (FCP280s)/ Fieldbus Communications Modules (FCMs)
- Up to two FPS400-24 power supplies (redundant power) to support the Modular Baseplates

The G12 vented enclosure is a free-standing, floor mounted unit with an IP 43/55 rating for location in mild (ordinary) environmental areas.

The G12 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 G-series enclosures, including this enclosure and the G11 termination enclosure, 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 Foxboro or third-party kits, as discussed in *Enclosures and Mounting Structures - Site Planning and Installation User's Guide* (B0700AS).

The rear of the G12 enclosure can be set up in one of two basic configurations:

- Termination only – all DIN rails are allocated for the mounting of TAs only, where the customer terminates field signals directly to the TAs
- Marshalling – all DIN rails are set up in pairs of TAs and terminal blocks to provide additional functionality (such as fusing, disconnects, and lock-out validation) or where customers wish to terminate field cable bundles to dedicated terminal blocks and marshall signals to the appropriate TAs

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

Features

- Accommodates one 2-position baseplate to support FCPs (FCP280s)/FCMs
- (Enclosure front) Vented and sealed enclosures accommodate up to 32 FBMs in up to four Modular Baseplates
- (Enclosure rear) Up to four 1,800 mm (70.8 in) vertical DIN rails for mounting of TAs and terminal blocks for marshalling, to provide a total of 7.2 m (23.6 ft) of linear rail space
- Vented and sealed 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 environment
- Available PVC or non-PVC wireways for field I/O cabling, with optional signal segregation barrier plate for mixed signal field signal types
- Generous 76 mm x 102 mm (3 in x 4 in) wire ducts with adequate capacity for most wire management
- Option for single or redundant main power supplies and main/backup field I/O power supplies
- Bottom or top cable entry for field 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)
- Comfort door 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, so contaminants are minimized inside the enclosure.

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 2/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).

For more information on the various types of TAs in a Foxboro DCS, see *Standard 200 Series Subsystem Overview* (PSS 31H-2S200).

Vented Enclosure Design Options

The G12 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 they provide the highest level of ingress protection for vented enclosures.

Fieldbus I/O Groups

The vented and sealed G12 system and termination enclosures have two vertical DIN rails accessed from the front of the enclosure for mounting vertically mounted baseplates and their power supplies. The system and enclosures also have up to four vertical DIN rails accessed from the rear of the enclosures for TAs and customer-supplied terminal blocks for marshalling. One front-accessed DIN rail can mount up to four 8-position FBM Modular Baseplate. The baseplates on this rail are called a Fieldbus Input/Output (I/O) Group. This Fieldbus I/O Group has an optionally redundant FPS400 power supply associated with the group and an optional 2-position vertically mounted baseplate for FCMs/FCPs. These power supplies and FCMs/FCP baseplates are mounted on the second front-accessed DIN rail (see *Figure 2, page 9* and *Figure 3, page 10*).

The four rear DIN rails are designed for mounting TAs and the customer-supplied terminal blocks.

Termination Assembly Mounting

The G12 enclosure has up to four vertical DIN rails in the rear of the enclosure for mounting termination assemblies and customer-supplied terminal blocks for marshalling. Two are mounted in the center of the enclosure, and two are mounted on the sides.

Optional bus bars for field wiring shields and DIN rail isolation are available. These are used when customer field shields are terminated on dedicated terminal blocks that ground to the DIN rail. Isolation allows rails to be isolated from the enclosure ground.

An optionally redundant 100-250 V AC/125 V AC, 50-60 Hz field power supply is available for field power, and is mounted on side rails of the enclosure (see *Figure 2, page 9*). Both vented and sealed enclosures have a limited thermal load (see *Environmental Specifications, page 14*).

Termination Assembly/Input Power Cabling and Wireways

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 enclosure manufacturer’s guidelines to preserve the enclosure's ingress protection rating. Vented enclosures with roof-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, which can be removed, drilled, or punched for cable routing.

For the sealed bottom entry version, the TA cables and power cables enter through a solid bottom panel located at the bottom (inside) of the enclosure, which 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 the TA mounted in the same enclosure or an adjoining Foxboro DCS termination enclosure.

Optional bus bars for field wiring shields and DIN rail isolation are available. Isolation allows rails to be isolated from the enclosure ground. These are used when customer field shields are terminated on dedicated terminal blocks that ground to the DIN rail.

An optional signal segregation barrier plate provides isolation between the two interior adjacent wireways.

Wiring is restricted to preconfigured wireways, available in PVC or non-PVC versions.

Power and Grounding

The G12 enclosure supports an optional redundant power system, in which dual power distribution (two power supplies fed by independent entry sources) provides redundancy protection against detected power failures.

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 G12 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 2/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 bus bar is available for additional ground points.

Power Distribution

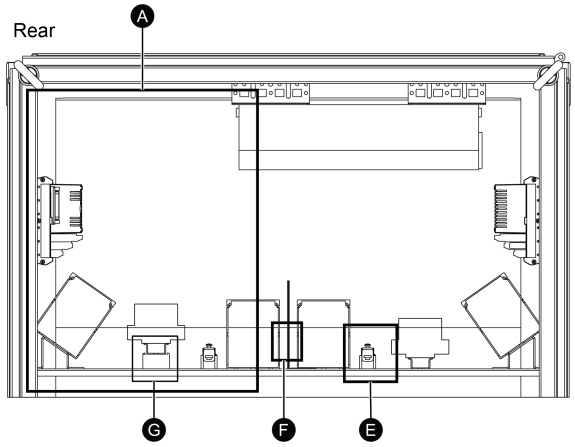
Each power distribution terminal block assembly (primary, secondary, or utility for powering fans and lights, see *Figure 2, page 9*) has dedicated ring lug assembly terminal blocks for customer main power. Each also has fused, knife disconnect terminal blocks for interrupting the main power, as well as independent knife disconnect terminal blocks for each device for ease of service.

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

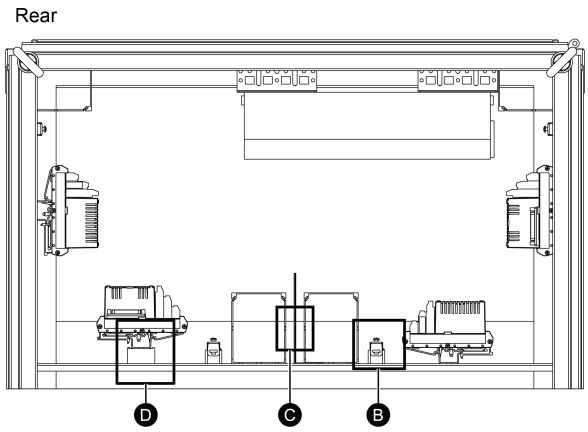
The enclosure is available without these power distribution terminal blocks when the customer has requirements for power distribution specific to regional electrical codes.

Figure 1 - G12 Enclosure Termination and Marshalling Layouts and DIN Rail Identification

G12 Marshalling Layout and DIN Rail Identification

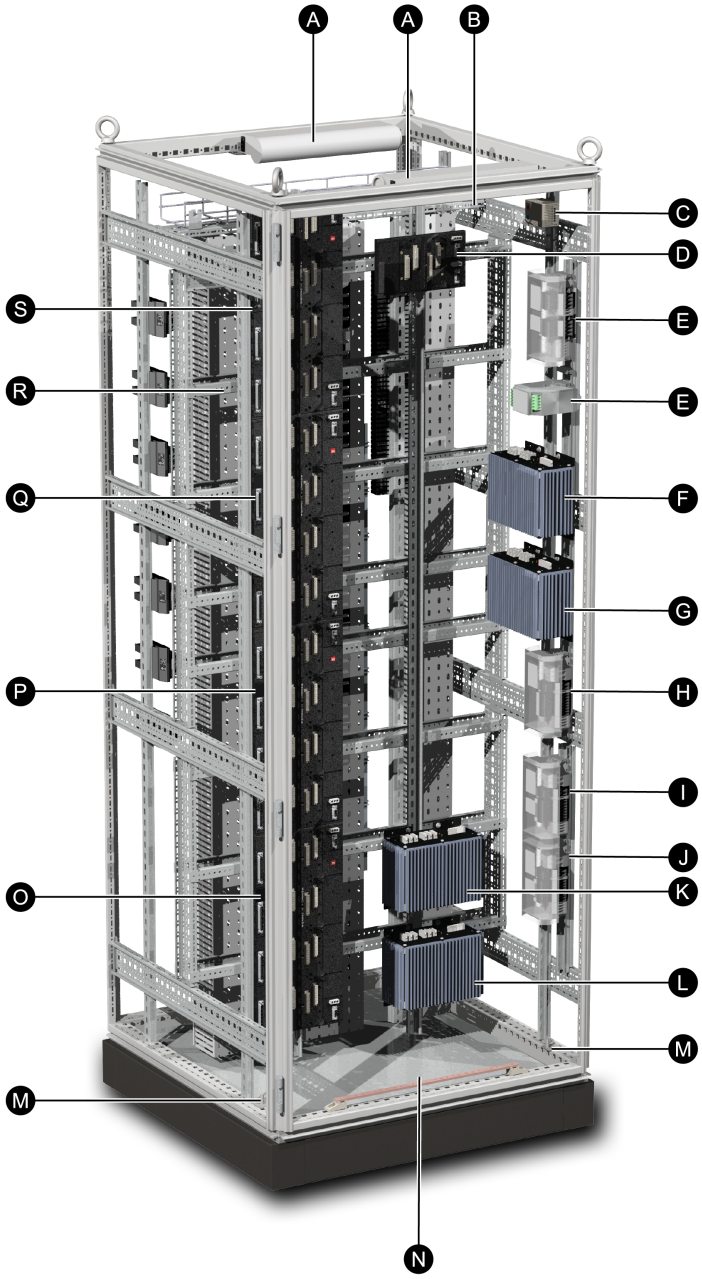


G12 Termination Layout and DIN Rail Identification



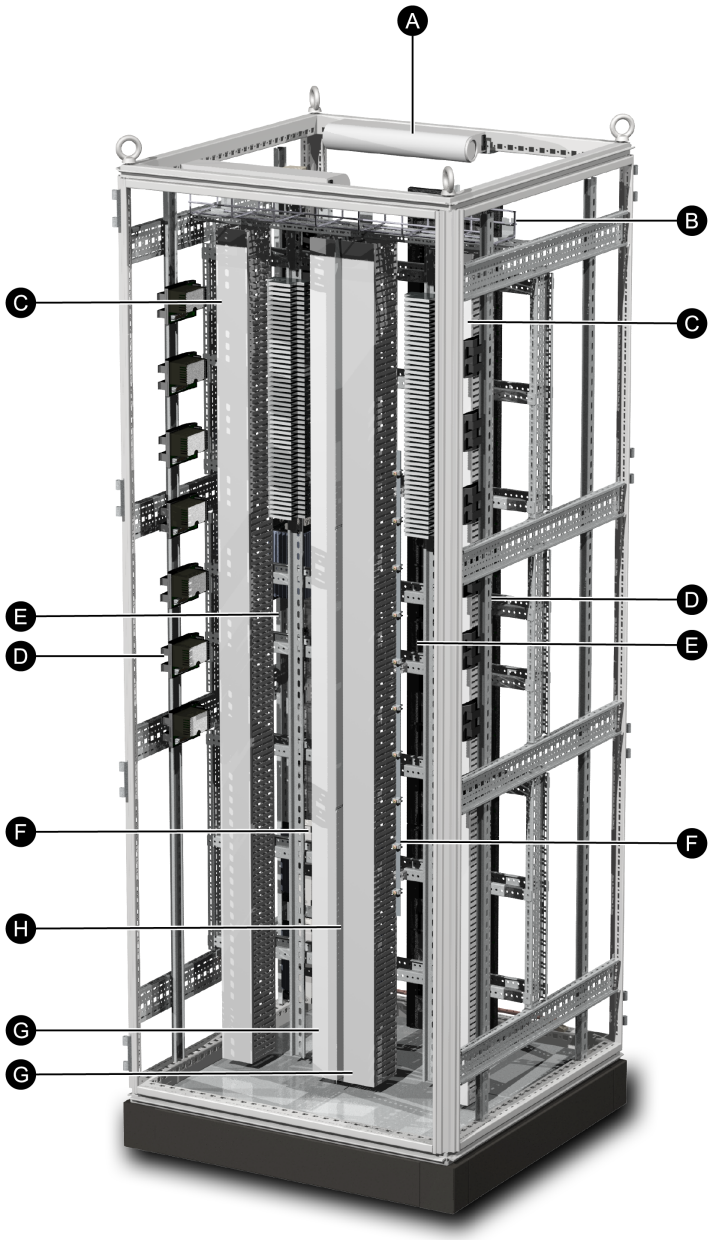
Legend			
A	Termination Assembly and Associated Terminal Blocks (per configuration)	**E**	Bus Bar for Field Wiring Shields (per configuration)
B	Bus Bar for Field Wiring Shields (per configuration)	**F**	Segregation Barrier for Varying Field Signals (per configuration)
C	Segregation Barrier for Varying Field Signals (per configuration)	**G**	DIN Rail Isolation (per configuration)
D	DIN Rail Isolation (per configuration)		
NOTE: For both setups, the front right DIN rail is reserved for terminal blocks and power supplies associated with single or redundant 24 V DC field power per configuration.			

Figure 2 - G12 System and Termination Enclosure, Front View



Legend					
A	LED Lights	**H**	ac Utility Power Terminal Blocks	**O**	Fieldbus I/O Group 1 Baseplate 4
B	Expansion Baseplate Location	**I**	Power Distribution and Disconnects, Primary	**P**	Fieldbus I/O Group 1 Baseplate 3
C	High/Low Thermostat	**J**	Power Distribution and Disconnects, Secondary	**Q**	Fieldbus I/O Group 1 Baseplate 2
D	2-Position Baseplate FCP or FCM	**K**	Fieldbus I/O Group 1 Power Supply (Primary)	**R**	Location for TA Cable for Fieldbus I/O Group 1
E	Redundant Field Power Distribution Terminal Blocks with Diode Assembly	**L**	Fieldbus I/O Group 1 Power Supply (Secondary)	**S**	Fieldbus I/O Group 1 Baseplate 1
F	Primary Redundant Field Power Supply	**M**	Protective Ground Stud		
G	Secondary Redundant Field Power Supply	**N**	Optional Isolated Instrument Ground Rail		

Figure 3 - G12 System and Termination Enclosure, Rear View



Legend			
A	LED Light (Front and Rear of Enclosure)	**E**	Terminal Block (Marshalling) DIN Rails
B	51 mm x 102 mm (3 in x 4 in) Cable Tray Wire Management for Marshalling Between DIN Rails (Mounted at Bottom in Top-Entry Option)	**F**	Bus Bar for Field Wiring Shield
C	76 mm x 102 mm (3 in x 4 in) Marshalling Wire Management	**G**	76 mm x 102 mm (3 in x 4 in) Field Wire Management Ducts
D	Termination Assembly DIN Rail	**H**	Signal Segregation Barrier Plates

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 AC or 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	Comfort handle with push-button/keylock
Door Mounting	Universal mounting for left and right-hand door swing (left-hand is default)
Equipment Supported	• Up to four 8-position Modular Baseplates for housing up to 32 FBMs • One 2-position baseplate for FCMs/FCPs • Single or redundant pair of FPS400-24 power supplies per Fieldbus I/O Group to support the baseplates • Up to four DIN rails per enclosure available for mounting TAs and customer-supplied terminal blocks for marshalling
Field Wiring	• PVC or non-PVC wireways for field I/O signal cabling • Optional signal segregation barrier plate for field signal isolation • Optional bus bars for field wiring shields and/or DIN rail isolation
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 field power entry is supported (no terminal blocks supplied)
Field Power	• Single or redundant field power supply, 100-250 V AC, 50-60 Hz, 125 V DC input, or • Single or redundant power distribution terminal block assemblies for customer configured power entry • No option available for 24 V DC field power — however, it can be directly sourced by the customer following local electrical guidelines. • Customer-configured field power entry is supported (no terminal blocks supplied)

Feature	Availability
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 • Vertically mounted DIN rail mounted termination assemblies and customer-supplied terminal blocks for marshalling • 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).	

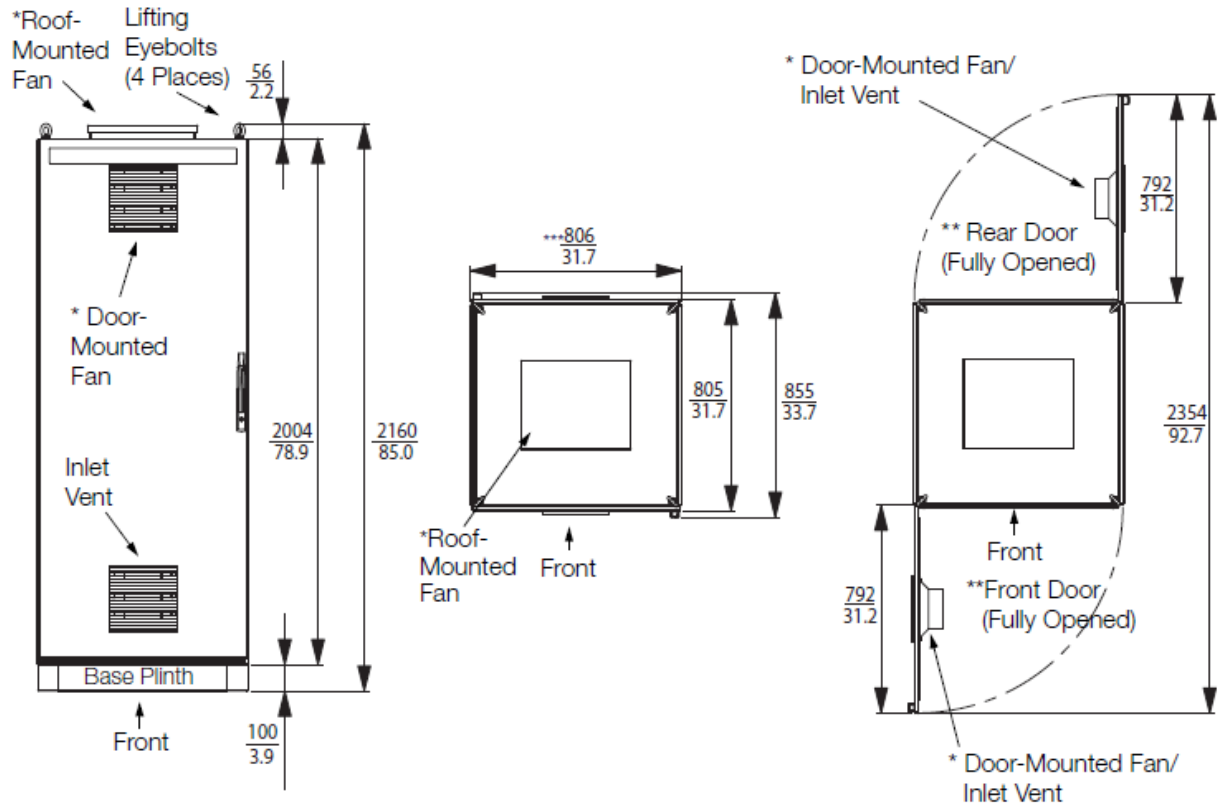
[(a)] Under normal operating conditions, with both fans running, at enclosure's mid-height at 46 dB (A) ambient noise level.

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 x 800 mm – 261 kg (575 lb) • Side Panel: 800 mm x 800 mm – 8 kg (18 lb)
Mounting	Floor **⚠CAUTION** **RISK OF EQUIPMENT DAMAGE OR INJURY** To prevent injury, this enclosure must be bolted down. Refer to the Installation Guide **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 Doors: 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 ◦ Doors, 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, Side Walls, 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.

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