Foxboro Evo™ Process Automation System

Product Specifications

Foxboro® by Schneider Electric

PSS 31H-2K20

K20 System Enclosure

The Foxboro Evo™ K20 System Enclosure provides environmental protection and housing for Foxboro Evo standard 200 Series I/O subsystem modules.

OVERVIEW

The K20 enclosure is specifically designed for housing standard 200 Series I/O subsystem modules. The K20 enclosure is available as a vented enclosure or sealed enclosure.

The K20 vented enclosure can be configured with:

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

The K20 sealed enclosure can be configured with:

- Up to four 8-position vertically mounted Modular Baseplates, for mounting up to 32 Fieldbus Modules (FBMs)
- One 2-position baseplate to support Field Control Processors (FCP280s) or Fieldbus Communications Modules (FCMs)
- Up to two FPS400-24 power supplies (redundant power) to support the Modular Baseplates.

The K20 vented enclosure is a free-standing, floor mounted unit with an IP 43/55 rating for location in mild (ordinary) environmental areas.

The K20 sealed enclosure is a free-standing, floor mounted unit, with an IP 55 rating for locations in harsh environments.

Multiple K20 enclosures can be installed connected to one another to optimize the use of floor space. The enclosures can be bayed together using baying kits as discussed in the *K- Series Enclosures Site Planning and Installation User's Guide* (B0700GN).

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

FEATURES

The Foxboro Evo K20 system enclosure offers the following features:

- 800w x 600d x 2000mm high enclosure, available as vented or sealed; vented enclosure accommodates up to 96 Fieldbus Modules (FBMs) in up to twelve Modular Baseplates, and sealed enclosure accommodates up to 32 FBMs
- Vented enclosure accommodates up to three 2-position baseplates to support Field Control Processors (FCP280s) or Fieldbus Communications Modules
- Enclosure selection for use in ordinary (IP 43/55) or harsh (IP 55) 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 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 2156 mm (85.0 in)
- Comfort door handles with push-button or keylocks
- Standard protective earth (ground) studs or optional isolated instrument earth (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 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 versions can be used outdoors in sheltered locations.

The enclosures support convenient top or bottom cable entry for termination assembly 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 TEMPERATURE THERMOSTAT

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

MODULAR BASEPLATE MOUNTING

The enclosure can contain various types of vertically mounted 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 termination assembly 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 an Foxboro Evo system, refer to *Standard 200 Series Baseplates* (PSS 31H-2SBASPLT).

VENTED ENCLOSURE DESIGN OPTIONS

The K20 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, at the cost of restricting top-entry cable access to the enclosure and reducing 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 K20 system enclosure has four vertical DIN rails for mounting vertically mounted 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 baseplate for FCMs/FCPs. These power supplies and FCMs/FCP Baseplates are mounted on the fourth DIN rail (see Figure 1 and Figure 2).

Sealed Enclosures

The sealed K20 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 baseplate for FCMs/FCPs. Sealed enclosures use only the components in the Fieldbus Input/Output (I/O) Group 1 (see Figure 1 and Figure 2). Fieldbus I/O Group 1 has an optionally redundant FPS400 power supply and an optional 2-position vertically mounted 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 termination assembly 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 termination assembly 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 termination assembly 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. 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 termination assembly cables. Field I/O signals must be connected to the TA mounted in an adjoining Foxboro Evo termination enclosure.

POWER AND EARTHING (GROUNDING)

The K20 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.

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 earthed by the enclosure design to meet the appropriate industry regulations and standards.

The K20 enclosure uses a standard 200 Series power supply that provides 24 V dc to 200 Series baseplates. The power supply is agency certified for use in Class 1, Division / Zone 2 applications. For more information, refer to *Standard 200 Series Power Supply - FPS400-24* (PSS 31H-2W3).

Earthing (Grounding)

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

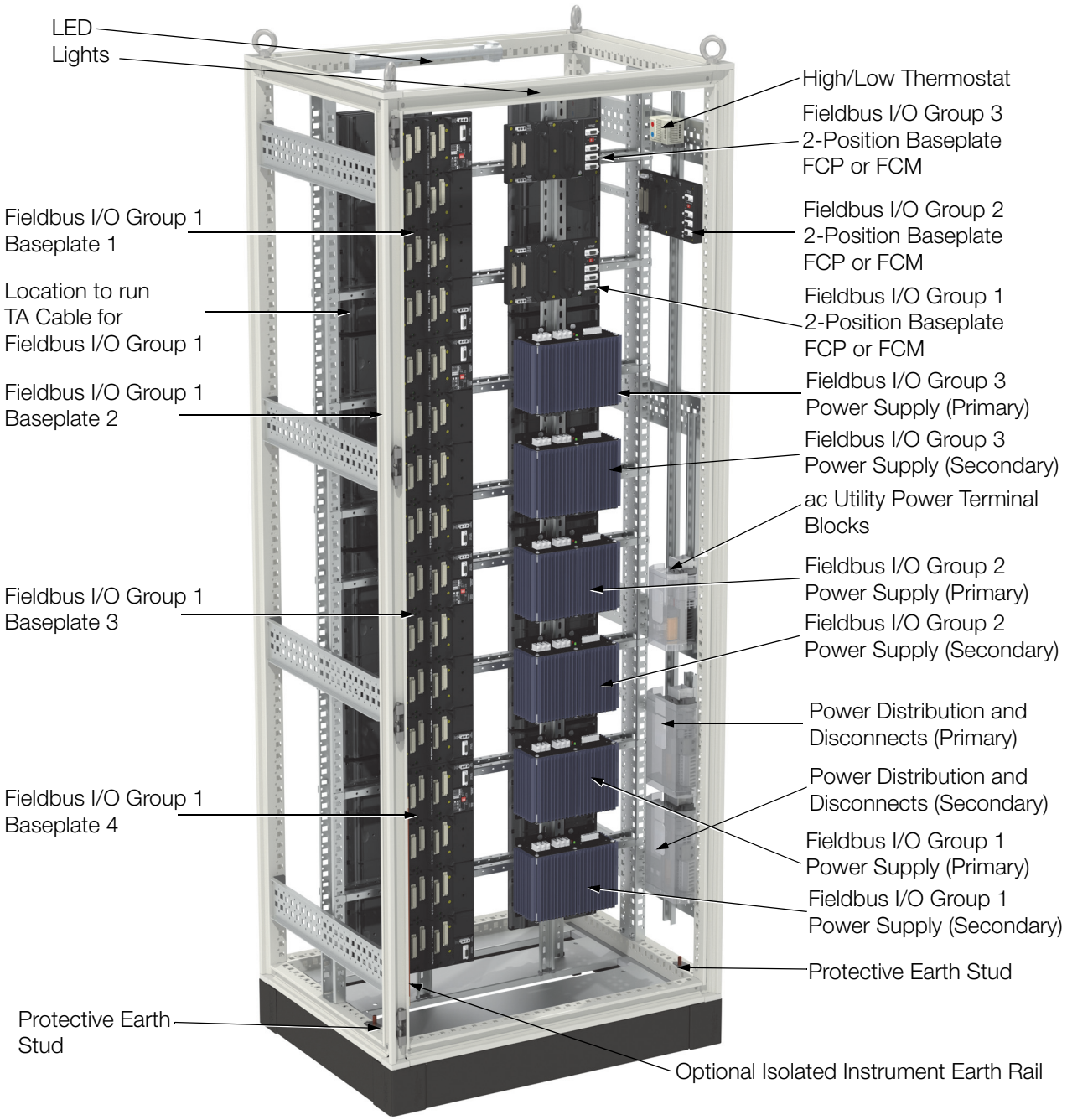
An optional isolated bus bar is available for additional earth (ground) points.

Power Distribution

Each power distribution terminal block assembly (primary, secondary or utility for powering fans and lights, see Figure 1) 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.

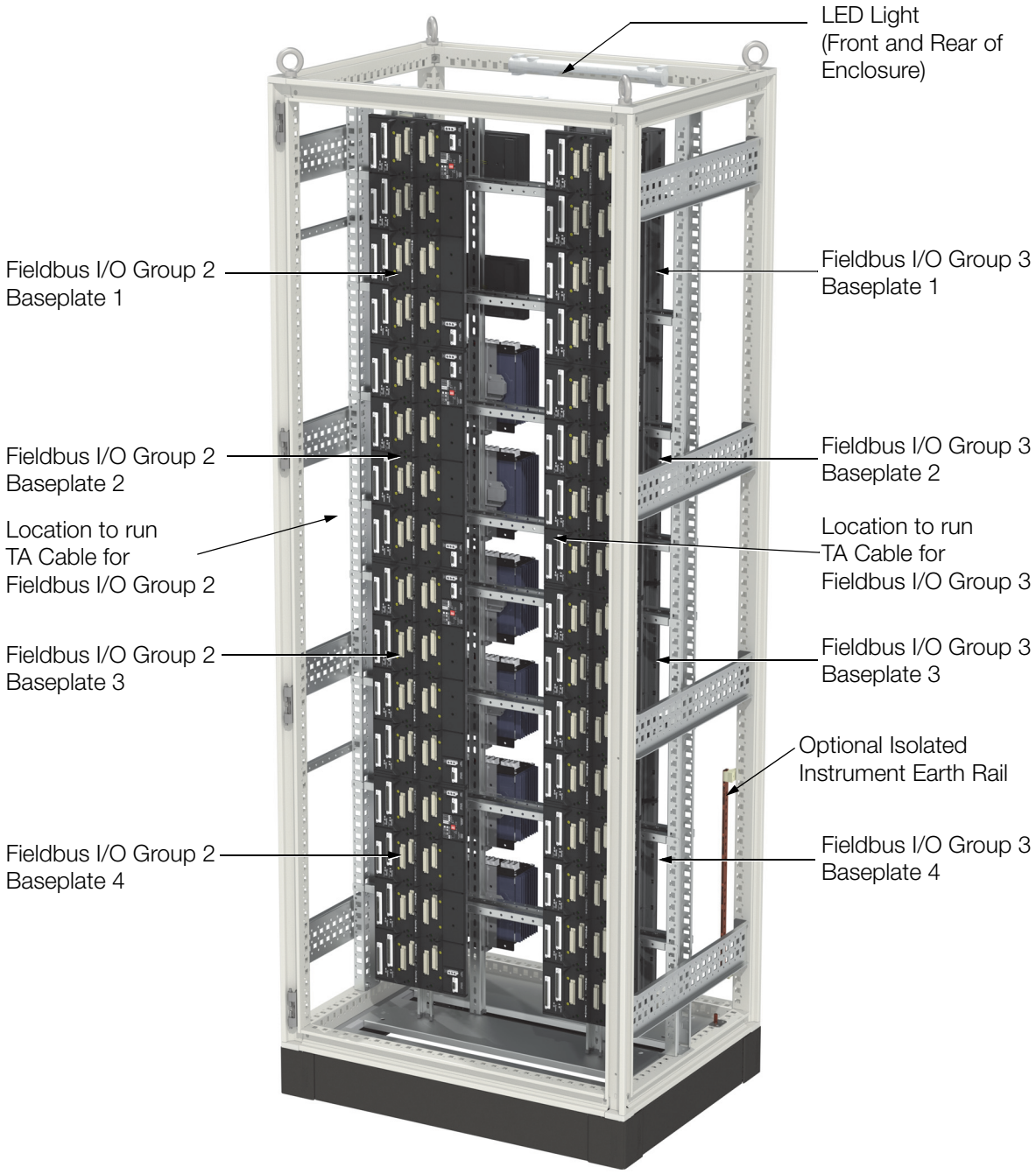
Additional blocks are provided for the customer to install utility outlets.

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



Note: Sealed enclosures contain only the equipment listed for Fieldbus I/O Group 1.

Figure 1. K20 System Enclosure, Front View



Note: Sealed enclosures do not contain equipment listed for Fieldbus I/O Group 2 and 3.

Figure 2. K20 System Enclosure, Rear View

ENCLOSURE FEATURES AND OPTIONS

The K20 enclosure is provided with the following features, some of which are optional.

Table 1. K20 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
Enclosure Access	Front and rear access
Front Door	Solid front door with inlet vents
Cable Entry	Top cable entry (top entry not recommended for roof-mounted fans)
Sidewalls	Options configurable based on baying requirements
Door Handle	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)]	Single and/or dual enclosure LED lights with motion activation
Thermostat[(a)]	Dual temperature thermostat
Fans[(a)]	Door-mounted or roof-mounted fans
Earthing (Grounding)[(a)]	Two protective earth (ground) studs Optional isolated instrument rail for additional connectors

Table 1. K20 Enclosure Features and Options (Continued)

Feature	Availability
Main Power[(a)]	100-250 V ac, 50-60Hz, 125 V dc input primary only or primary and secondary power, or 100-250 V ac, 50-60Hz, 125 V dc input primary and 24 V dc secondary power, or 24 V dc input primary only or primary and secondary power Additionally, 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 K-Series enclosure as part of a Class 1, Division / Zone 2 application, refer to *Standard and Compact 200 Series I/O - Agency Certifications* (PSS 31H-2CERTS) to determine 200 Series I/O 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 Class 1, Division / Zone 2 hazardous locations.

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)

Refer to PSS 31H-2W3.

ENVIRONMENTAL SPECIFICATIONS

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

Operating Temperatures

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 1000 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)

Storage Temperature
-40 to 70°C (-40 to 158°F)

Relative Humidity
5 to 95% (noncondensing)

Acoustic Noise Level(1)

ROOF-MOUNTED FANS
61 dB (A) at 1 m / 58 dB (A) at 3 m

DOOR-MOUNTED FANS
56 dB (A) at 1 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 Evo equipment, refer to PSS 31H-2CERTS.

Area Designation
Per customer order, vented and sealed are available for general purpose area; Class 1, Division / Zone 2 hazardous locations must use sealed enclosure only.

(1) 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 wide x 600 mm deep - 226 kg (498 lb)

SIDE PANEL
2000 mm high x 600 mm deep - 19 kg (42 lb)

Mounting
Floor

CAUTION

To prevent injury, this enclosure must be bolted down. Refer to the installation guide.

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
1.8 mm (15 ga)

SIDE PANELS, ROOF
1.5 mm (16 ga)

Construction
MATERIAL

Doors
Sheet steel, 1.8 mm (15 ga)

Frame, Roof, Side Panels, Gland Plates
Sheet steel, 1.5 mm (16 ga)

Base/Plinth
Sheet steel and plastic

FINISH

Frame
Epoxy-polyester resin paint, textured RAL 7035 gray

Doors, Roof, Side Panels
Epoxy-polyester resin paint, textured RAL 7035 gray

FINISH (CONT.)

Base/Plinth
Epoxy-polyester resin paint, textured RAL 7035 gray

Gland Plates and Internal Hardware
Zinc-plated, passivated

Cable Entry
Bottom through gland plate(s)
Top through customer cutouts in enclosure top (For enclosure with roof-mounted fans, suggested entry is bottom.)

Earthing (Grounding)
ROOF, SIDEWALLS, GLAND PLATES
Automatic potential equalization built in

DOORS
Dedicated 6 mm^2 (10 ga) ground strap to enclosure frame

ENCLOSURE
Two M8 studs (one for each enclosure side)
An optional isolated bus bar for additional earth (ground) points.

Power Input Terminals
TYPE
Ring Lug

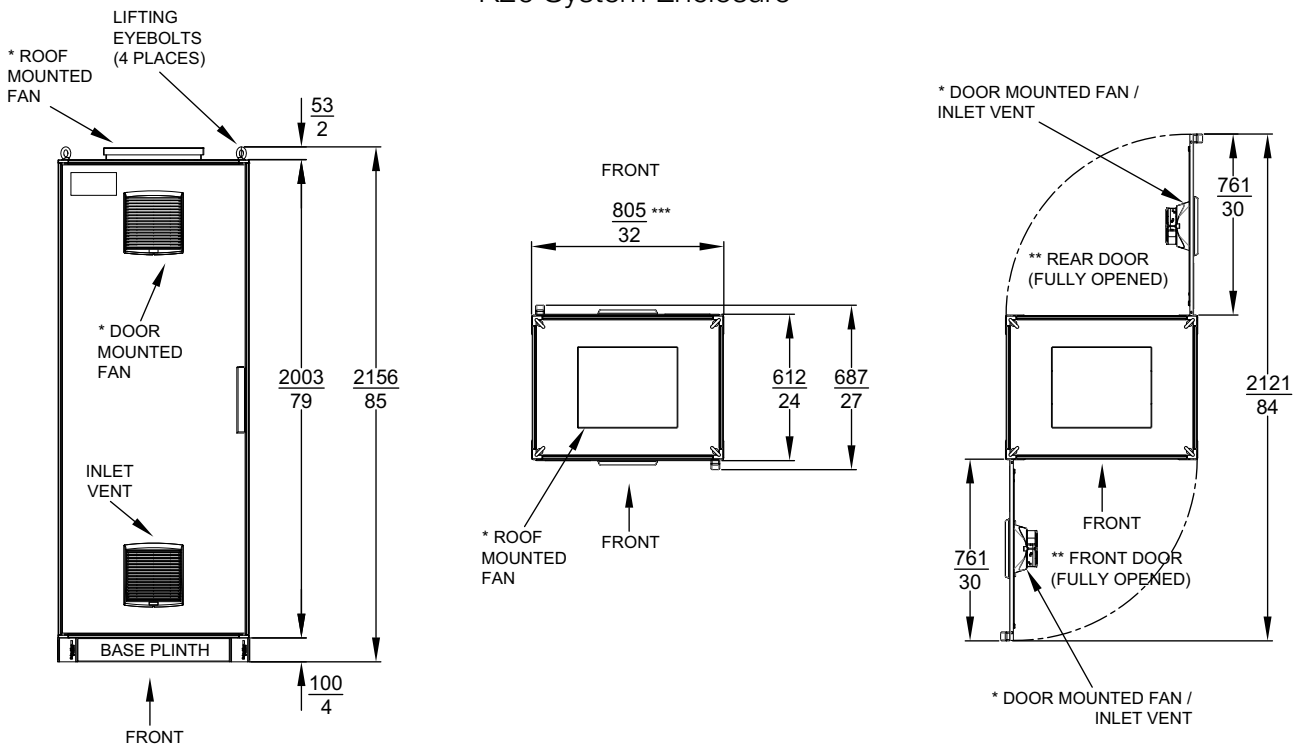
WIRE SIZE
Up to 6 mm^2 (10 AWG)

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 securing, routing and strain relieving of termination assembly cables. Each strap supports up to a 75 mm (3 in) diameter cable bundle.

DIMENSIONS - NOMINAL

K20 System Enclosure



* 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 / WITHOUT SIDE PANELS.

FOR MORE INFORMATION

For additional information describing Foxboro Evo enclosures for standard 200 Series I/O modules, refer to the following documentation:

Document Number	Description
PSS 31H-2SOV	Standard 200 Series Subsystem Overview
PSS 31H-2CERTS	Standard and Compact 200 Series I/O - Agency Certifications
PSS 31H-2W3	Standard 200 Series Power Supply - FPS400-24
PSS 31H-2SBASPLT	Standard 200 Series Baseplates
PSS 31H-2KOV	K-Series Enclosures Overview
ISA-S71.04-1985 (not Foxboro-supplied)	Environmental Conditions for Process Measurement and Control Systems: Airborne Contaminants

Foxboro®

by Schneider Electric

Invensys Systems, Inc
10900 Equity Drive
Houston, TX 77041
United States of America
http://www.invensys.com

Global Customer Support
Inside U.S.: 1-866-746-6477
Outside U.S.: 1-508-549-2424
Website: https://support.ips.invensys.com

MB 031 0815