Foxboro Evo™ Process Automation System

Product Specifications

Foxboro® by Schneider Electric

PSS 31H-2K45

K45 19-Inch Rack Enclosure

The Foxboro Evo™ K45 19-Inch Rack Enclosure with front access only provides environmental protection and housing for compatible Foxboro Evo equipment, such as the Foxboro Evo Control Network switches.

OVERVIEW

The Foxboro Evo K45 enclosure with front access only is a general purpose unit designed for housing compatible equipment on its four 19-inch racks, in areas where front access only to the enclosure's equipment is desired, such as when an enclosure must be placed against a wall. The K45 enclosure is available as a vented enclosure or sealed enclosure.

Equipment may be installed directly on the 19-inch racks, or on shelves. Separate equipment configurations are available for the upper and lower halves of the enclosure.

Each half may be empty, or accommodate one of the following configurations:

- One or three fixed or sliding shelves, each with an optional ac Transfer Switch; shelves can support equipment such as the Windows® based workstations, depending on the size and ventilation requirements of the workstation. The ac Transfer Switch provides the capability for two separate and independent sources of ac input power to feed enclosure equipment which supports single sources of power, such as the switches, workstations, and so forth.The shelf option also includes additional power strips,

which are connected to the ac Transfer Switch. All strips provide IEC plug connections to support universal ac sourcing.

- Equipment secured directly to the rails, such as the Foxboro Evo Control Network switches - depending on the sizing, power, cabling and ventilation requirements of the equipment.

The K45 vented enclosure is a free-standing, floor mounted unit with an IP 43/55 rating for location in mild (ordinary) environmental areas.

The K45 sealed enclosure is a free-standing, floor mounted unit, with an IP 55 rating for locations in harsh environments. Sealed enclosures are designed for embedded equipment, rather than for equipment such as workstations which require ambient temperatures to dissipate their heat.

CAUTION

Be aware that equipment in a sealed enclosure may exceed its thermal load.

Multiple K45 enclosures can be installed connected to one another to optimize the use of floor space. As well, adjoined enclosures reduce the total number of watts per enclosure that can be dissipated relative to standalone enclosures. The enclosures can be bayed together using baying kits as discussed in the *K-Series Enclosures Site Planning and Installation User's Guide* (B0700GN).

NOTE

Also be sure to secure the enclosure to the floor as discussed in the *K-Series Enclosures Site Planning and Installation User's Guide* (B0700GN).

FEATURES

The K45 19-inch rack enclosure with front access only offers the following features:

- 800w x 800d x 2000mm high enclosure, available as vented or sealed
- Front accessible 19-inch system rails, with 42 U of available mounting space (1U = 44mm (1.75 in))
- Front access with left- or right-side mounted door
- Enclosure selection for use in ordinary (IP 43/55) or harsh (IP 55) rated environments
- Upper and lower halves of the enclosure each accommodate:
  - One or three fixed or sliding shelves with optional ac Transfer Switch.
  - Equipment secured directly to the 19-inch rails, such as the control network switches, depending on sizing, power, cabling and ventilation requirements.
- Compact design to minimize use of floor space with front access only that allows maximum density of enclosures in a control environment
- Bottom or top cable entry for 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)
- 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 equipment contained within. When the equipment includes covers or layers built into the equipment itself, a minimum of contaminants in the plant environment reaches the equipment, thus greatly extending its life.

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 power wiring. Vented enclosures with roof-mounted fans are not recommended with top cable entry.

THERMAL PROTECTION

Ventilation fans along with a vented door 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 two fan assemblies located on the enclosure front door. Enclosures with a vented door 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.

EQUIPMENT MOUNTING

All equipment installed in this enclosure must be attached to the 19-inch rails directly or indirectly via a platform or mounting structure. As well, all equipment must be able to fit within the physical constraints of the enclosure with sufficient space for air flow and associated cabling, including cable routes, sufficient bend radius and dressing.

VENTED ENCLOSURE DESIGN OPTIONS

The K45 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’s door, 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.

INPUT POWER CABLING

The enclosures can be configured 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, 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 power cables 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 power cables 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.

POWER AND EARTHING (GROUNDING)

Power wiring to the enclosure is routed through the bottom or top of the enclosure. Customer-supplied 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 enclosure shelves support the optional ac Transfer Switch. For more information, refer to *ac Transfer Switch* (PSS 21H-5F1 B4).

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 instrument bus bar is available for additional earth (ground) points.

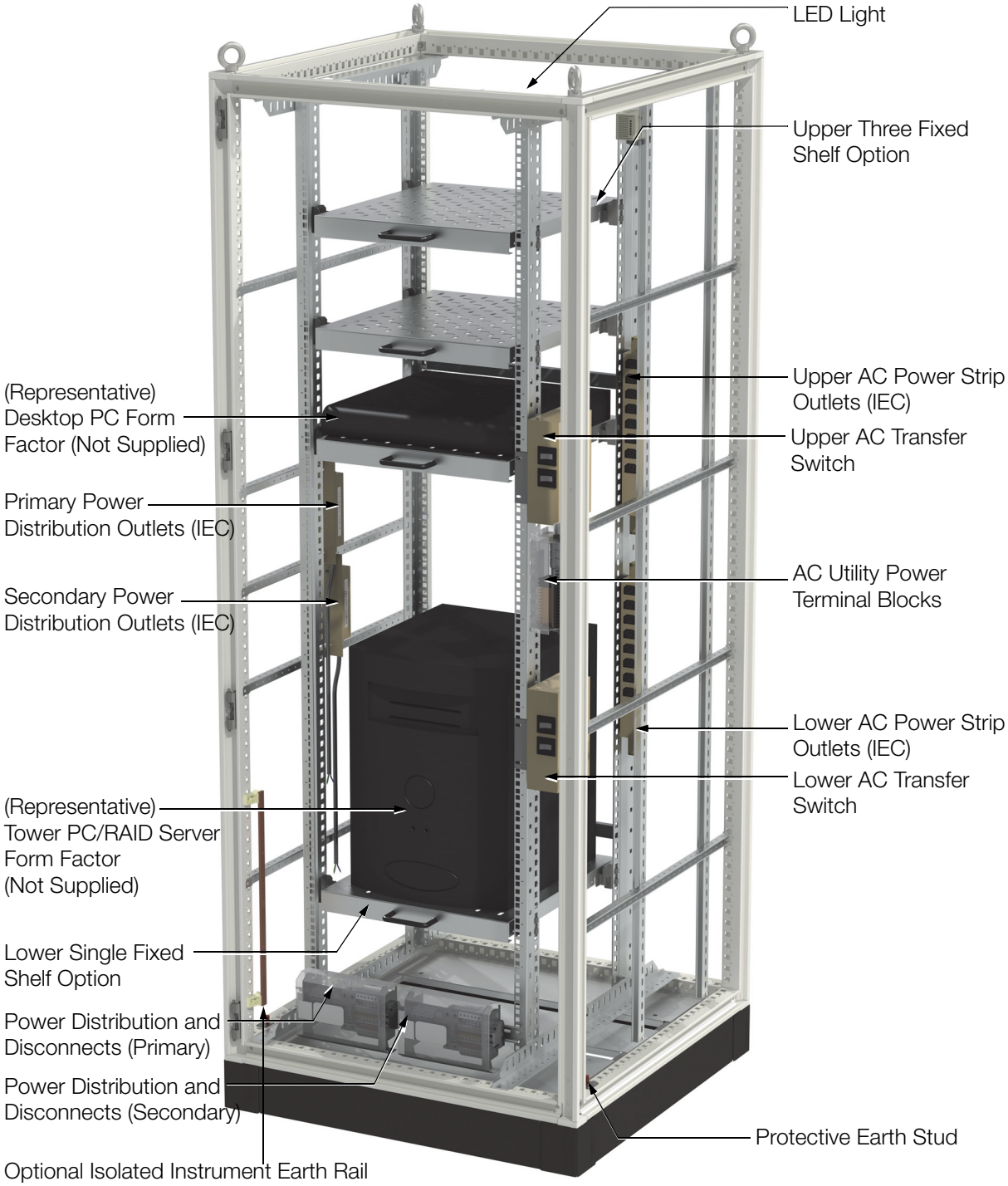


Figure 1. K45 19-Inch Rack Enclosure, Front View with Shelf Options

ENCLOSURE FEATURES AND OPTIONS

The K45 enclosure is provided with the following features, some of which are optional.

Table 1. K45 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 access only
Front Door	Solid front door with or without 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	Handle with push-button or keylock
Door Mounting	Universal mounting for left and right-hand door swing (left-hand is default)
Equipment Support (In Upper Half of Enclosure)	One or three fixed or sliding shelves, each with an optional ac Transfer Switch and additional power strips Equipment secured directly to the rails (no support provided)
Equipment Support (In Lower Half of Enclosure)	One or three fixed or sliding shelves, each with an optional ac Transfer Switch and additional power strips Equipment secured directly to the rails (no support provided)
Enclosure Lighting[a]	Single LED light 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
Additional Enclosure Electrical Accessories	(With shelving option only) Optional ac Transfer Switches, power strips and/or multi-outlet distribution plug
Power Options[a]	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 DIN rail mounted compatible equipment, as discussed in this document.

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

Dependent on equipment loaded in the enclosure. Refer to the specifications listed in the equipment's Product Specification Sheet or other documentation.

THERMAL WATTAGE LIMITS (FOR NON-ADJOINED ENCLOSURES)(1)

Sealed
Dissipation of 314 W generates a +10°C (18°F) heat rise
Dissipation of 628 W generates a +20°C (36°F) heat rise

Vented
Dissipation of 1000 W generates a +5°C (9°F) heat rise

Storage Temperature

-40 to 70°C (-40 to 158°F)

Relative Humidity

5 to 95% (noncondensing)

Acoustic Noise Level(2)

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 Temperature 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 RoHS, 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.

NOTE

For the ZCP270 and ATS to meet CE certifications required in European installations, shielded enclosures are required as described in *Power, Earthing (Grounding), EMC and CE Compliance* (B0700AU).

Area Designation

Per customer order, vented and sealed are available for general purpose areas only.

(1) The effective heat rise should be added to the planned ambient temperature and the result should be lower than the rated maximum ambient temperature of the equipment to be installed.
(2) 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 800 mm deep - 253 kg (558 lb)

SIDE PANEL
2000 mm high x 800 mm deep - 19 kg (42 lb)

Mounting
Floor

WARNING

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 DOOR
RAL 7035 - light gray - textured

PLINTH
RAL 7022 - umbra gray smooth

Panel Thickness
DOOR
1.8 mm (15 ga)

SIDE PANELS, ROOF
1.5 mm (16 ga)

Construction
MATERIAL

Door
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
Door, Roof, Side Panels
Epoxy-polyester resin paint, textured RAL 7035 gray
Base/Plinth
Epoxy-polyester resin paint, textured RAL 7022 gray
Gland Plates and Internal Hardware
Zinc-plated, passivated

Weight Load Supported Per Optional Shelf
100 kg (220 lb) (maximum)

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

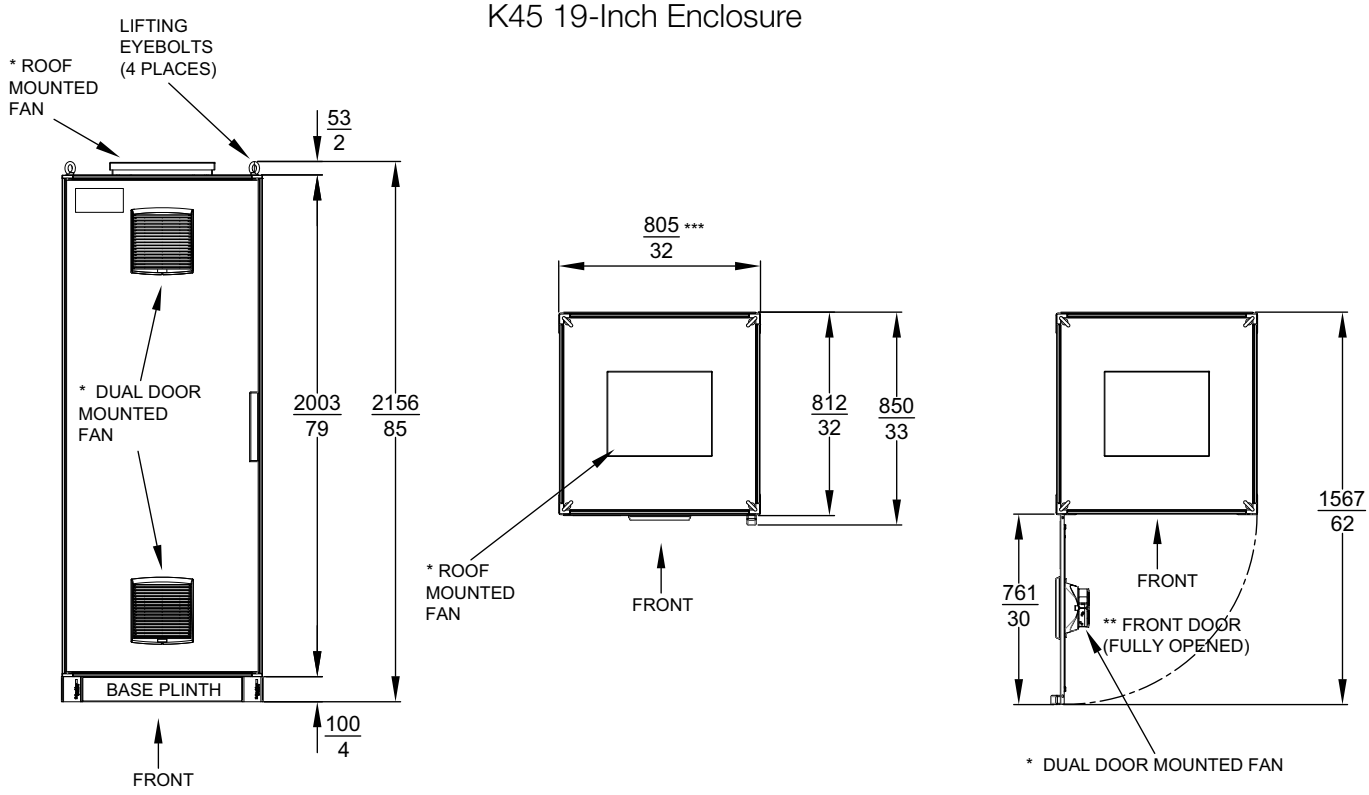
DOOR
Dedicated 6 mm^2 (10 ga) ground strap to enclosure frame

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

Enclosure Equipment Cabling
Universal mounting straps are supplied for securing, routing and strain relieving of enclosure equipment cables. Each strap supports up to a 75 mm (3 in) diameter cable bundle.

DIMENSIONS - NOMINAL

K45 19-Inch 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 with 200 Series I/O mounted equipment, refer to the following documentation:

Document Number	Description
PSS 21H-1B10	Z-Module Control Processor 270 (ZCP270)
PSS 31H-1ATS	Address Translation Station Communications
PSS 31H-2KOV	K-Series Enclosures Overview
PSS 21H-5B9 B4	1 x 8 Mounting Structure and 1 x 8 FBM Mounting Structure
PSS 21H-5F1 B3	ac Transfer Switch
PSS 31H-7NwEquip	The Foxboro Evo Control Network Ethernet Equipment
ISA-S71.04-1985 (not Foxboro-supplied)	Environmental Conditions for Process Measurement and Control Systems: Airborne Contaminants

Foxboro®

by Schneider Electric

Invensys Systems, Inc.
38 Neponset Avenue
Foxborough, MA 02035-2037
United States of America
www.schneider-electric.com

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

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