Foxboro Evo™ Process Automation System

Product Specifications

Foxboro® by Schneider Electric

PSS 31H-2K80

K80 Trident Enclosure

SEALED ENCLOSURE

VENTED ENCLOSURE
DOOR-MOUNTED FANS

The K80 Trident Enclosure provides environmental protection and housing for Triconex™ Trident controllers and I/O system.

OVERVIEW

The K80 enclosure is specifically designed for housing Triconex Trident controllers and I/O system. It is available as a vented or sealed enclosure.

The K80 vented enclosure can be configured with up to twenty Trident I/O baseplates, one Main Processor (MP) baseplate, and one Communication Module (CM) baseplate. It is a free-standing, floor mounted unit with an IP 43/55 rating for location in mild (ordinary) environmental areas.

The K80 sealed enclosure can be configured with up to ten Trident I/O baseplates, one Main Processor (MP) baseplate, and one Communication Module (CM) baseplate. It is a free-standing, floor mounted unit, with an IP 55 rating for locations in harsh environments.

Multiple K80/K85 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 baying kits as discussed in the *K-Series Enclosures Site Planning and Installation User's Guide* (B0700GN).

These enclosures and their configurations have been tested and qualified by Foxboro® for use with the Trident controllers and I/O baseplates specified in the *Technical Product Guide for Trident vX*[1] *Systems*.

NOTE

The end-user is responsible for locating adequate inlet ventilation to maintain proper operation of the enclosure's equipment, through ventilation on the rear door or a side wall, or from an adjoined cabinet.

FEATURES

The K80 Trident enclosure offers the following features:

- Vented enclosure accommodates up to twenty Trident I/O baseplates, sealed enclosure accommodates up to ten Trident I/O baseplates; in addition, both enclosure types accommodate one Main Processor (MP) baseplate, and one Communication Module (CM) baseplate
- Main power entry includes disconnect terminal blocks for 120/240 V ac or 125 V dc systems, or 10 A, Type D, double pole circuit breakers for 120/240 V ac systems
- Enclosure front and rear access
- Standard redundant 24 V dc field and logic power - 480W (two field I/O power supplies) or 960W (four field I/O power supplies)
- Enclosure selection for use in ordinary (IP 43/55) or harsh (IP 55) rated environments
- Optional door intrusion monitoring switches
- Alarm contact terminal block assembly for Trident MP baseplate alarming, door intrusion monitoring switches, enclosure temperature switch and field and logic power supply status
- 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 controller Ethernet and serial cabling
- Generous 76 mm x 102 mm (3 in x 4 in) wire ducts with adequate capacity for most wire management
- Conveniently placed eyebolts for transporting and lifting the enclosures
- A 100 mm (3.9 in) plinth - total enclosure height of 2156 mm (85.0 in)
- Handles with push-button or keylocks
- Three earth (ground) points; two protective earth (ground) studs, one isolated protective earth (ground) rail and one 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 bottom cable entry for termination assembly cabling and power wiring.

(1) Request latest revision from Triconex. Document title changes with each product revision.

DUAL TEMPERATURE THERMOSTAT

An optional dual (high/low) thermostat is available to monitor enclosure temperature extremes, with the exception of Class 1, Division / Zone 2 applications.

DOOR INTRUSION MONITORING

An optional door intrusion monitoring switch is available for each door on the enclosures. Each switch is prewired to a set of alarm status terminal blocks.

TRIDENT BASEPLATE MOUNTING

The enclosure can contain various types of vertically mounted Trident I/O baseplates, which accommodate different quantities and types of Triconex I/O and communication modules listed in the *Technical Product Guide for Trident vX Systems* manual.

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 of the enclosure. While improving layout, vertical orientation also reduces any horizontal obstructions, thus increasing airflow and improving overall thermal performance.

POWER AND EARTHING (GROUNDING)

Power wiring to the enclosure is routed through the bottom (through removable gland plates) of the enclosure. Dual power input feeds terminate at dedicated primary and secondary power distribution terminal blocks or circuit breaker assemblies.

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 isolated protective earth (ground) rail and an isolated instrument earth (ground) rail are available for additional earth (ground) points and may be used for cable shields.

Power Distribution

These enclosures are available with a dedicated assembly for customer main power. Two types of power distribution are available with:

- Disconnect terminal blocks for 120/240 V ac or 125 V dc systems. This method of power entry also has fused, knife disconnect terminal blocks for isolating the main power, as well as independent knife disconnect terminal blocks for each device, for ease of service.
- 10 A, Type D, double pole circuit breakers for 120/240 V ac systems.

The standard 24 V dc field power supplies include a distribution terminal block assembly for distribution of 24 V dc power. Each point includes a serviceable knife disconnect.

Utility power is supported through a dedicated terminal block or circuit breaker assembly which provides independent disconnects for light and fan circuits as well as additional blocks for the customer to install utility outlets.

The enclosures may be ordered without these power distribution terminal blocks when the customer has requirements for power distribution specific to regional electrical codes.

Optional bus bars for field wiring shields are available.

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

Figure 1. K80 Trident Enclosure, Front Left View

Figure 2. K80 Trident Enclosure, Front Right View

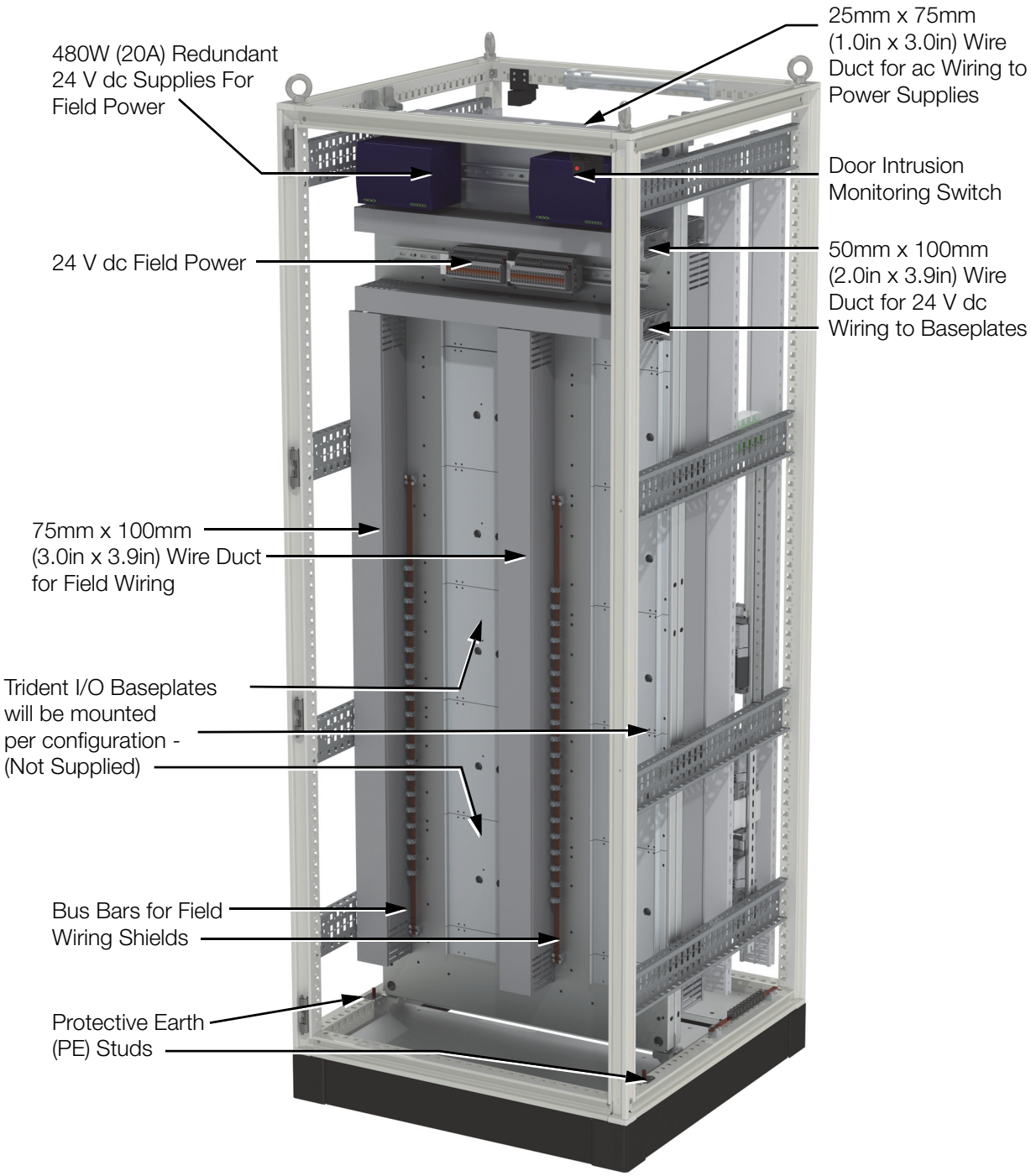


Figure 3. K80 Trident Enclosure, Rear Right View

Figure 4. K80 Trident Enclosure, Rear Left View

ENCLOSURE FEATURES AND OPTIONS

The K80 enclosure is provided with the following features, some of which are optional.

Table 1. K80 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- Sealed IP 55 rated enclosure
Enclosure Access	Front and rear access
Front Door	Solid front door with inlet vents
Cable Entry	Bottom cable entry
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)
Wireways	PVC -OR- non-PVC wireways
Equipment Supported	Up to twenty Trident I/O baseplates (vented enclosure) or up to ten I/O baseplates (sealed enclosure) In addition, both enclosure types support one Main Processor (MP) baseplate, and one Communication Module (CM) baseplate
Enclosure Lighting	Enclosure LED light with motion activation
Thermostat	Dual temperature thermostat
Security	Optional door intrusion monitoring switch - one per door
Fans	Door-mounted fans
Earthing (Grounding)	Two protective earth (ground) studs One isolated protective earth (ground) rail One isolated instrument earth (ground) rail
Main Power	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 Additionally, customer configured power entry (no terminal blocks supplied)

Table 1. K80 Enclosure Features and Options (Continued)

Feature	Availability
Field Power	Standard redundant 24 V dc field power - 480W (two field I/O power supplies) with dedicated terminal block or circuit breaker assemblies Redundant power distribution terminal block assemblies for customer configured power entry
Alarm Contact	Alarm contact terminal block assembly for Trident MP baseplate alarming, door intrusion monitoring switches, enclosure temperature switch and field and logic power supply status
Utility Power	120 V ac or 240 V ac utility power with disconnect terminal blocks or 10 A, Type D, double pole circuit breakers

FUNCTIONAL SPECIFICATIONS

Enclosure

The enclosures are free-standing, floor mounted, steel industrial enclosures containing:

- Up to twenty Triconex™ Trident I/O baseplates (vented enclosure) or up to ten I/O baseplates (sealed enclosure); in addition, both enclosure types support one Main Processor (MP) baseplate, and one Communication Module (CM) baseplate
- 24 V dc field and logic power supplies (redundant power).

ENVIRONMENTAL SPECIFICATIONS

Ingress Protection Ratings

VENTED

Door-Mounted Fans
IP 55 to EN 60 529 / NEMA 12

SEALED
IP 55 to EN 60 529 / NEMA 12

Operating Temperatures (Ambient)

Thermal performance of the K80 enclosure meets the convection cooling requirements described in the *Planning and Installation Guide for Trident vX Systems*(2).

VENTED (THERMAL LOADING LIMIT)
-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 LIMIT)
-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(3)

DOOR-MOUNTED FANS
56 dB (A) at 1 m

SEALED ENCLOSURE (NO FANS)
Ambient / Ambient

Dual Thermostat

HIGH ALARM SETTING
Opens on alarm, Range - 0 to 60°C (32 to 140°F)

LOW ALARM SETTING
Opens on alarm, 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 and RoHS 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.

Area Designation

Per customer order, vented for general purpose or sealed for Class 1, Division / Zone 2 hazardous locations

(2) Document title changes with each product revision. To obtain the latest version of the *Planning and Installation Guide for Trident vX Systems* document, contact Invensys Global Client Support.
(3) 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 and Triconex equipment selected. Consult with a Foxboro representative if precise weight figures are required.

VENTED ENCLOSURE (MAX. CONFIGURATION)
800 mm x 800 mm - 253 kg (558 lb)

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

Mounting
Floor

CAUTION

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

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
Roof, Side Panels, Doors
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

Cable Entry
Bottom through gland plate(s)

Earthing (Grounding)
FRONT AND REAR DOORS
Dedicated 6 mm^2 (10 ga) ground strap to enclosure frame

ENCLOSURE
Two protective earth (ground) M8 studs (one for each enclosure side)
An isolated protective earth (ground) rail and an isolated instrument earth (ground) rail are provided for additional earth (ground) points.

Power Input Terminals
DISCONNECT TERMINAL BLOCKS

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.

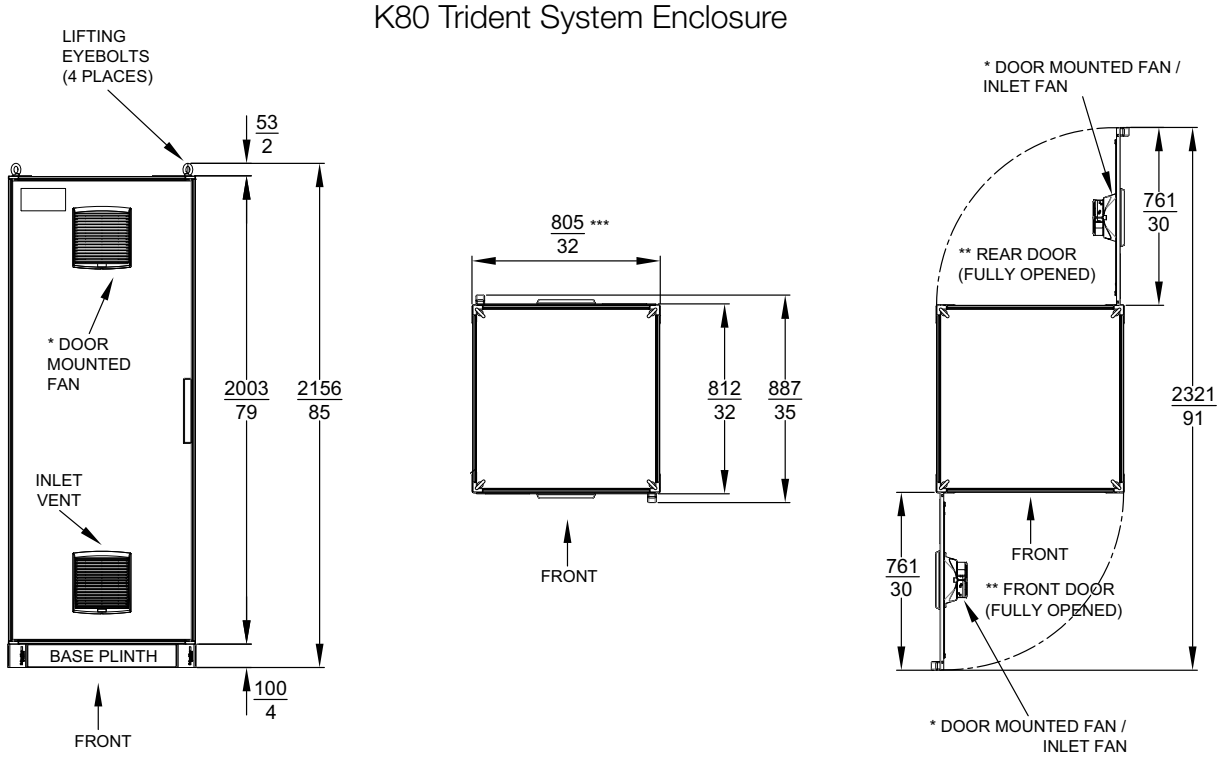
CIRCUIT BREAKERS

Type
Compression
Wire Size
Solid: Up to 6 mm^2 (3 AWG)
Stranded: Up to 4 mm^2 (8 AWG)

Termination Assembly Cabling
Universal mounting straps are supplied for securing, routing and strain relieving of Triconex termination cables. Each strap supports up to a 75 mm (3 in) diameter cable bundle.

DIMENSIONS - NOMINAL

K80 Trident System Enclosure



* VENTED ENCLOSURES ONLY·
** 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 these enclosures, refer to the following documentation.

Document Number	Description
PSS 31H-2K85	K85 Trident Enclosure
ISA-S71.04-1985 (not Foxboro-supplied)	Environmental Conditions for Process Measurement and Control Systems: Airborne Contaminants
9791034-XXX[a]	Technical Product Guide for Trident vX Systems
9720110-XXX[a]	Planning and Installation Guide for Trident vX Systems
9720111-XXX[a]	Communication Guide for Trident vX Systems
9720112-XXX[a]	Safety Considerations Guide for Trident vX Systems

(a) Document title and document part number changes with each product revision. Request latest revision from Triconex.

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