Foxboro™ DCS

Equipment Room Intelligent Enclosure

PSS 41H-2I30

Product Specification

March 2024

Legal Information

The information provided in this document contains general descriptions, technical characteristics and/or recommendations related to products/solutions.

This document is not intended as a substitute for a detailed study or operational and site-specific development or schematic plan. It is not to be used for determining suitability or reliability of the products/solutions for specific user applications. It is the duty of any such user to perform or have any professional expert of its choice (integrator, specifier or the like) perform the appropriate and comprehensive risk analysis, evaluation and testing of the products/solutions with respect to the relevant specific application or use thereof.

Overview

The EcoStruxure™ Foxboro™ DCS Equipment Room Intelligent Enclosure provides an integrated solution that is designed to be highly space efficient. The Equipment Room Enclosure includes Universal Input/Output (UIO) modules, power supplies, and Termination Assemblies (TAs) that are pre-installed and tested and can be connected to a wide range of field devices. The enclosure supports Schneider Electric's Flexible Lean Execution strategy, which shortens project schedules and reduces the risk of startup delays.

The Equipment Room Intelligent Enclosure is designed to be installed in air-conditioned non hazardous equipment room environments. The enclosure requires front and rear access, with system components mounted in the front and field wiring in the rear.

The enclosure supports up to 448 Universal I/O channels in simplex and redundant combinations, and can be connected to a second Equipment Room Intelligent Enclosure or with other Field Mounted Intelligent Enclosures (PSS 41H-2I20). The enclosure optionally supports a Field Control Processor for regulatory control and a Field Device Controller for integration to third party PLCs.

Field cables, communication cables, and power cables enter the enclosure through cable glands located at the bottom of the enclosure.

The channel-to-channel isolated Universal I/O Module supports DI, DO, AI, AO, HART, NAMUR, Pulse, and 1 ms SOE signal types.

Field Cables terminate directly on Termination Assemblies (TAs) with Signal Conditioners for optional field signal processing. See Termination Assemblies and Signal Conditioners, page 9.

Terminals are provided to terminate spare field cable cores and screens.

Features

- NEMA® 12/IP43 rating for installation in indoor non hazardous locations
- System components are mounted in the front and field wiring TAs in the rear. The enclosure front is separated from the rear by a metal dividing plate
- Universal I/O and TAs support any one of these options:
  - 448 Simplex I/O
  - 256 Redundant I/O
  - 384 Simplex and 64 Redundant I/O
- Optional Foxboro™ DCS Field Control Processor (FCP280 FT) that provides regulatory control through the Universal I/O modules:
  - FCP280 can connect to a second Equipment Room Enclosure using copper communication cable or optionally connect using Field Communication Modules (FCM2F10) to a Field Mounted Intelligent Enclosure(s) using single mode fiber communication cable
- Optional Field Device Controller (FDC280 FT) for integration to third party PLCs using Ethernet based communication protocols such as Modbus TCP
- Mounting point for a customer supplied High Sensitivity Smoke Detector
- Utility power socket
- Door handles with keylocks
- Document pocket inside front door
- 120 VAC or 230 VAC system supply
- Supports the Intelligent Commissioning Wizard, which significantly reduces commissioning effort and shortens the time to plant start-up (see *Field Device Expert for HART Devices* (PSS 41S-10FDMHRT))

Environmental Protection

The enclosure is designed for installation in indoor air-conditioned equipment rooms with air quality in line with ISA-S71.04-1985, Environmental Conditions for Process Measurement and Control Systems: Airborne Contaminants. Severity Level G1 (Mild).

The metal enclosures provide an outer layer of protection for the control electronics. Other layers are provided by the module covers and conformal coated electronics. This allows only a minimum of contaminants in the plant environment to reach the control components.

Thermal Protection

The enclosure has a fan tray for air circulation within the enclosure and fans in the front and rear doors to expel air.

The fans and temperature within the enclosure are monitored by the Enclosure Monitoring Unit (EMU) that provides a diagnostic alarm on fan deterioration or enclosure over temperature.

Cable Entry

Bottom cable entry for power, communication, and field cables is through cable gland plates. Cable glands must be sealed to maintain the enclosure ingress protection classification.

Modular Baseplate Mounting

The enclosure contains baseplates for mounting system components.

For more information on the Compact 200 Series 16-slot baseplate, see *Compact 200 Series 16-Slot Horizontal Baseplate* (PSS 41H-2C200).

For more information on the FCP280 baseplate (RH924YA) and the FDC280 baseplate (RH101KF), see *Standard 200 Series Baseplates* (PSS 41H-2SBASPLT).

Field Termination Assemblies

Termination Assemblies (TAs) are installed on the DIN rails mounted at the sides of the FBM baseplates. The Universal I/O modules are connected to the TAs with pre-installed system cables.

The TAs are supplied with redundant 24 VDC, protected by fuses that are monitored by the Fuse Monitoring Unit (FMU).

The enclosure is shipped with TAs fitted with passive feed-through signal conditioners, which you can replace with the signal conditioners listed in the section Termination Assemblies and Signal Conditioners, page 9.

Power Distribution Architecture

The enclosure provides a redundant 24 V power system using six FPS480-24 power supplies fed by independent sources. Power wiring is routed through the bottom of the enclosure. Dual power input feeds terminate at dedicated primary and secondary power distribution terminal blocks.

Three power distribution terminal block assemblies (primary, secondary, and utility for powering fans and lights) have dedicated screw clamp terminal blocks for customer main power. Each terminal block has a circuit breaker for protection and isolation of the main power, as well as independent secondary circuit breakers for the protection and isolation of each device.

Electrical fuses are monitored by the Fuse Monitoring Unit (FMU) and an open fuse indication from the FMU is wired into the Enclosure Monitoring Unit (EMU) through the Alarm Distribution Assembly.

The enclosure is provided with either North American or European utility power socket depending on the configuration selected.

Grounding

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

Two studs (M8 size, one for each enclosure side) provide a protective ground connection point for single enclosures and when baying enclosures together.

Field wiring shields are terminated either to the Terminal Assemblies, or to the Instrument Earth Bus bar.

Enclosure Diagnostic Alarms

The EMU provides an alarm for power supply failure detection, fuse failure detection via the FMU, fan deterioration, and enclosure over temperature. The EMU provides a composite diagnostic alarm from a graduated analog signal that indicates individual alarms and is prewired to a Universal I/O module channel for indication and alarm.

Enclosure Security

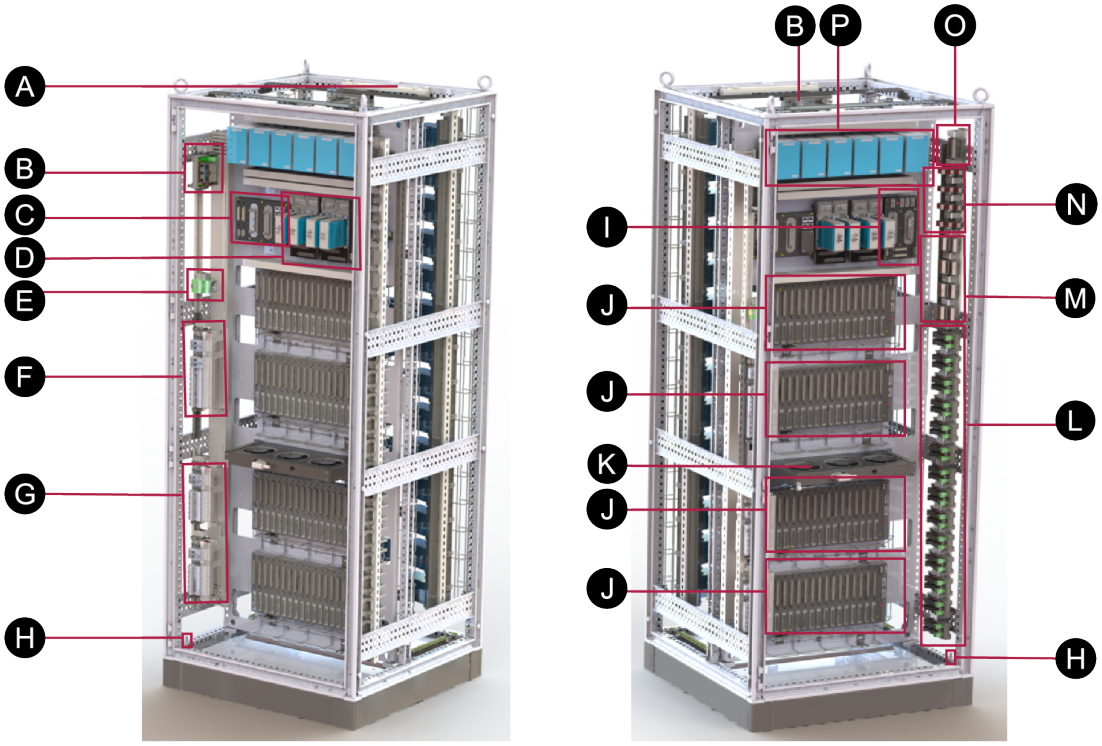
The enclosure is supplied with front and rear doors fitted with key locks.

Enclosure Options

The enclosure can be configured with these options:

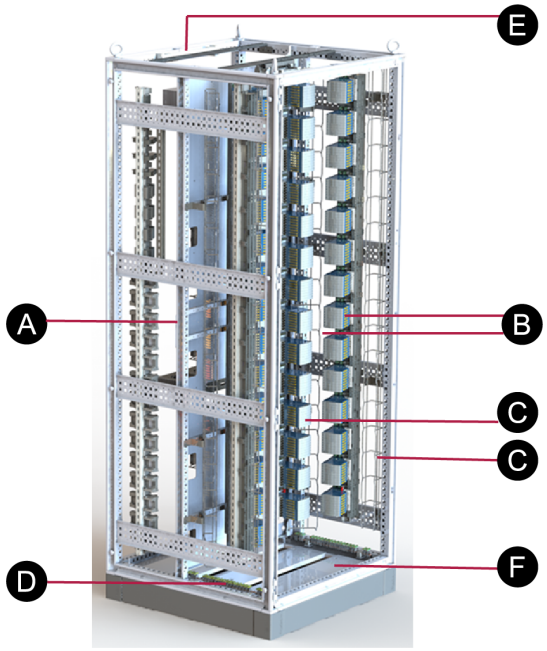
- 120 VAC, or 230 VAC system supply and 120 VAC, or 230 VAC utility power
- Bottom entry, customer supplied cable glands
- Utility socket selection for Europe or North America
- TA selection for IS, Non-IS, and manufacturer
- 448 simplex UIO points, 256 redundant UIO points, or 384 simplex and 64 redundant UIO points
- Third party communications to PLCs using FDC280
- Controllers and Foxboro Fieldbus options

Figure 1 - Front Interior Views of Left and Right Side Panel of the Enclosure



A	LED Light
B	Enclosure Monitoring Unit
C	FDC280 Baseplate
D	FCM Baseplate
E	Utility Socket
F	Utility (Incoming) Power Distribution Assembly
G	Main (Incoming) Power Distribution Assembly
H	Ground Studs
I	FCP280 Baseplate
J	Foxboro™ DCS Compact Fieldbus Module (FBM) Baseplates
K	Fan Tray
L	Fuse Monitoring Unit
M	24 VDC Field Distribution Assembly
N	24 VDC System Distribution Assembly
O	Alarm Distribution Assembly Terminals
P	Power Supply Units (Primary and Secondary)

Figure 2 - Rear Interior View of the Enclosure



A	Cabinet Dividing Plate (with Cutouts for Front to Rear Cable Routing)
B	Termination Assemblies (Phoenix Contact shown)
C	Wire Tray for Field Cables
D	Instrument Ground Bar
E	LED Light
F	Gland Plate for Cable Entry

Termination Assemblies and Signal Conditioners

These tables list the Termination Assemblies and Signal Conditioners supported. You can select them as required at the time of ordering the enclosure.

Table 1 - Supported Phoenix Termination Assemblies and Signal Conditioners

Part	Phoenix Part Number	Description
Base Module - VIP/S/D25M/ BASE 1-8/L/C/EX	2906595	VIPER base module (Termination Assembly), screw connection (p/n – 2906595) • Shipped with IOA FEED-THRU/ EX (p/n –2906598) • Replace with the IOAs below, as required
IOA AI/AO/BFI/DS/0.5A/EX	2906599	IOA, analog protection with disconnects and test points
IOA DI/DO/BFI/DS/1.0A/EX	2906600	IOA, digital protection with disconnects and test points

Table 1 - Supported Phoenix Termination Assemblies and Signal Conditioners (Continued)

Part	Phoenix Part Number	Description
IOA REL 24V DO/BFI/3.0A/EX	2910153	IOA, 24 V DO relay
IOA REL 120V DO/BFI/3.0A/EX	2910154	IOA, 120 V DO relay
IOA REL 24V DI/BFI/1.0A/EX	2910155	IOA, 24 V DO relay
IOA REL 120V DI/1.0A/EX	2910157	IOA, 120 V DI relay
IOA REL 230V DO/BFI/NO/3.0A/EX	2910421	IOA, 230 V DO relay NO contact
IOA REL 230V DO/BFI/NC/3.0A/EX	2910422	IOA, 230 V DO relay NC contact
IOA REL 230V DI/1.0A/EX	2910423	IOA, 230 V DI relay

Functional Specifications

Enclosure	Powder coated steel
Input Power (Redundant)	• Supply Voltage: ◦ 120 VAC and 240 VAC Options: See *Compact Power Supply - FPS480-24* (PSS 41H-2C480) ◦ 24 VDC Option: 24 +/- 0.2 VDC • Main Power: ◦ PSU Group 1: 480 W ◦ PSU Group 2: 480 W ◦ PSU Group 3: 480 W • Utility Power: ◦ Door Fans: 2 * 42 W ◦ Tray Fan: 26 W ◦ Light: 2 * 5 W ◦ Utility socket, 6A@240 V: 1,440 W • Total Input Power: 3,000 W (maximum)
Maximum Dissipated Power	767 W
Enclosure Over Temperature Alarm Setting	60°C (140°F)
Regulatory Compliance, Electromagnetic Compatibility (EMC)	• *EMC Directive 2014/30/EU*: Meets: EN 61326-1:2013 and EN 61000-6-2:2005
Regulatory Compliance, Product Safety	• *Underwriters Laboratories (UL) for U.S. and Canada*: UL/UL-C listed as suitable for use in ordinary locations when installed as described in *I-Series Intelligent Enclosures Planning and Installation Guide* (B0700GX). Communications circuits also meet the requirements for Class 2 as defined in Article 725 of the National Electrical Code (NFPA No.70) and Section 16 of the Canadian Electrical Code (CSA C22.1). Conditions for use are as specified in *I-Series Intelligent Enclosures Planning and Installation Guide* (B0700GX). • *European Low Voltage Directive 2014/35/EU*: Certified when installed as described in *I-Series Intelligent Enclosures Planning and Installation Guide* (B0700GX).
RoHS Compliance	Complies with European RoHS Directive 2011/65/EU

Environmental Specifications

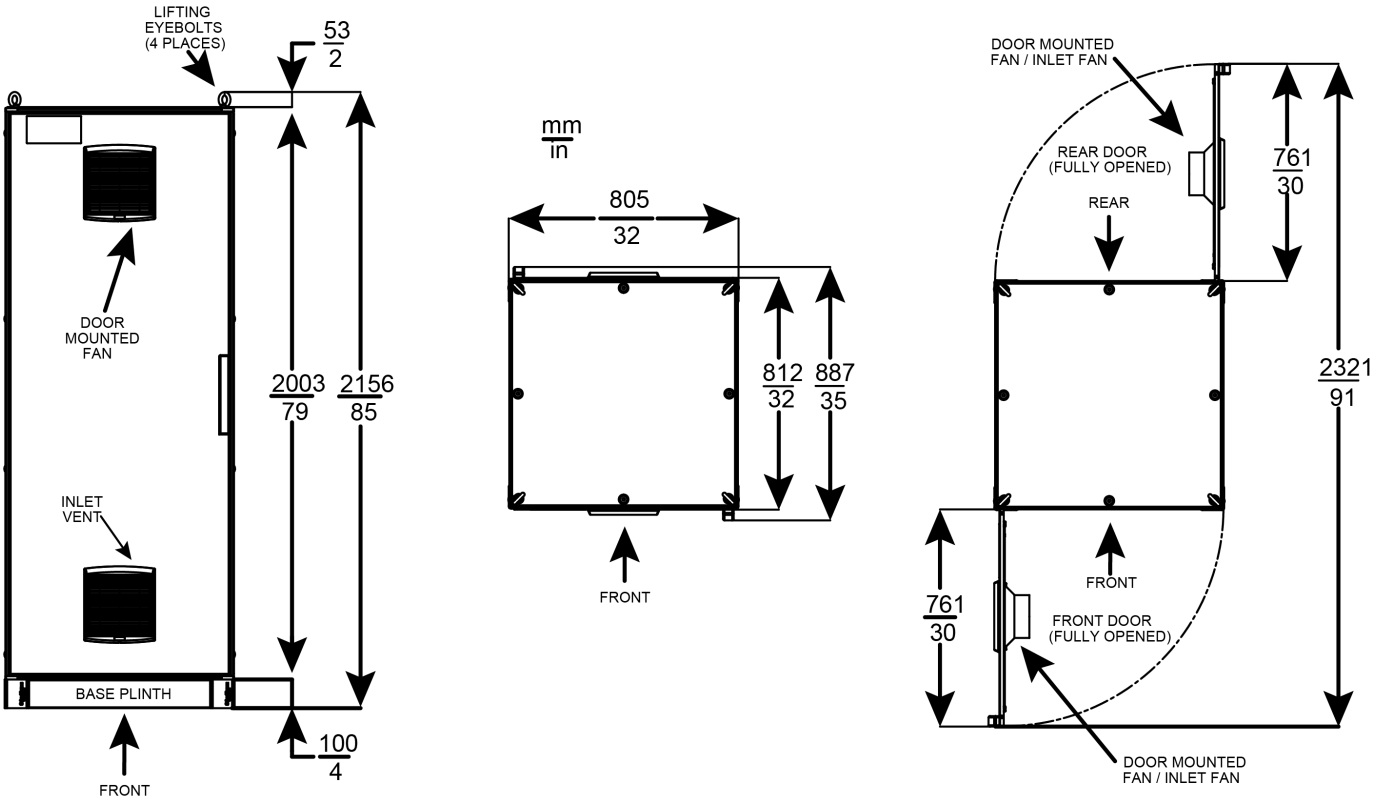
	Operating	Storage
Temperature	-20° to +40°C (-4° to +104° F) (External Ambient)	-40 to 70°C (-40 to 158°F)
Altitude	-300 to +3,000 m (-1,000 to +10,000 ft)	-300 to +12,000 m (-1,000 to +40,000 ft)
Relative Humidity	5 to 95% (noncondensing)	
Ingress Protection Ratings	IP 43 to EN 60 529/10.9191/NEMA® 12 Vented for non-hazardous environments	
Contamination Class	Non-corrosive	
Enclosure Over Temperature Alarm	60° C (140° F)	
Vibration	• 2.0 to 13.2 Hz, 1.0 mm • 13.2 to 100 Hz, 0.7 g	
Sound Power Level (SWL)	66.8 dB	

Physical Specifications

Mounting	Floor mounted **⚠WARNING** **POTENTIAL RISK OF INJURY** The enclosure must be securely mounted. See *I-Series Intelligent Enclosures Planning and Installation Guide* (B0700GX) for instructions to mount the enclosure. **Failure to follow these instructions can result in death, serious injury, or equipment damage.**
Weight	The weight of the enclosure is dependent upon the configuration: up to 296 kg (up to 652 lbs).
Construction	Sheet steel with textured, powder-coated finish.
Panel Thickness	• Door Materials: Sheet steel, 15 Gauge (1.7 mm) • Frame, Roof, Side Panels, Gland Plates Materials: Sheet steel, 16 Gauge (1.5 mm) • Base/Plinth Materials: Sheet steel and plastic • Frame Finish: Epoxy-polyester resin paint, textured RAL 7035 gray • Doors, Roof, Side Panels Finish: Epoxy-polyester resin paint, textured RAL 7035 gray • Base/Plinth Finish: Epoxy-polyester resin paint, textured RAL 7022 gray • Gland Plates and Internal Hardware Finish: Passivated
Field Termination Connections	See *I-Series Intelligent Enclosures Planning and Installation Guide* (B0700GX).
Field-Wire Termination	• Termination Assemblies: TAs with screw-clamp field connections that support up to 14 Gauge (2.5 mm^2) • Wire Tray: Two wire trays 50 mm x 50 mm (2 in x 2 in) and three wire trays 38 mm x 102 mm (1.5 in x 4 in) for routing of system cables and field wires respectively
Ground Bus Bar	• Two bus bars for instrument earth • Separate connection point (stud) for protective earth

Protective Earth	• Roof, Sidewalls, Gland Plates: Built in automatic potential equalization • Doors: Dedicated 10 Gauge (6 mm^2) ground strap to enclosure frame • Protective Earth Connection: Two M8 size studs (one for each enclosure side)
Power Input Terminals	• Type: Screw Clamp • Wire Size: Up to 10 AWG (6 mm^2)

Dimensions-Nominal



• DOORS ARE FACTORY-CONFIGURED FOR LEFT-HAND SWING. BUT CAN BE RECONFIGURED AT SITE FOR RIGHT-HAND SWING

Related Documents

- *Compact 200 Series 16-Slot Horizontal Baseplate* (PSS 41H-2C200)
- *Compact 200 Series Subsystem Overview* (PSS 41H-2COV)
- *Compact Power Supply - FPS480-24* (PSS 41H-2C480)
- *Environmental Conditions for Process Measurement and Control Systems: Airborne Contaminants*, ISA-S71.04-1985 (not Foxboro-supplied)
- *FBM247, Current/Voltage Analog/Digital/Pulse I/O Configurable Module* (PSS 41H-2S247)
- *FBM248, Current/Voltage Analog/Digital/Pulse I/O Configurable Module (Redundant)* (PSS 41H-2S248)
- *Field Control Processor 280 (FCP280)* (PSS 41H-1FCP280)
- *Field Device Controller 280 (FDC280)* (PSS 41H-2FDC280)
- *Field Mounted Intelligent Enclosure* (PSS 41H-2I20)
- *Fieldbus Communications Module, FCM2F2/FCM2F4/FCM2F1* (PSS 41H-2FCM)
- *I-Series Intelligent Enclosures Planning and Installation Guide* (B0700GX)
- *Standard 200 Series Baseplates* (PSS 41H-2SBASPLT)
- *Standard and Compact 200 Series I/O - Agency Certifications* (PSS 41H-2CERTS)

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-2I30, Rev B