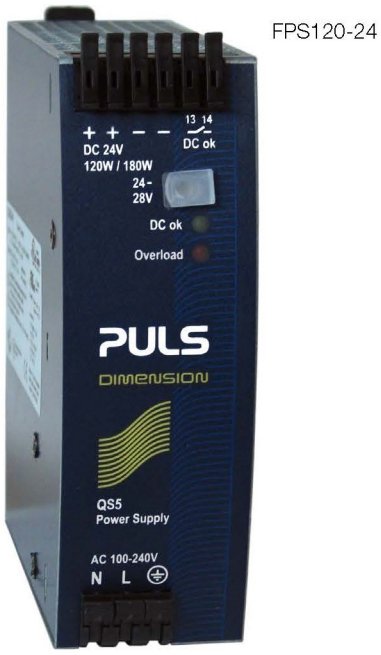
Foxboro™ DCS

200 Series Power Supplies - FPS240-24 and FPS120-24

PSS 41H-2FPS

Product Specification

August 2019



Legal Information

Overview

The 200 Series Power Supplies provide power at 24 V dc to 200 Series I/O Baseplates as well as separately to field control loops. These power supplies allow the user to select the size and power necessary to support each specific installation.

The Foxboro™ DCS Standard 200 Series power supplies provide 24 V dc to both the Standard and Compact 200 Series baseplates. These power supplies are agency certified for use in Class 1, Div. 2 and Zone 2 applications.

- FPS240-24 (P0924SM) Nominal input Range: 100-240 V ac and 110-150 V dc
- FPS120-24 (P0924SL) Nominal Input Range: 100-240 V ac and 110-300 V dc

These power supplies are recommended for use in sites where a lower-powered and/or smaller sized solution is desired. They provide bi-stable, quick-connect spring clamp terminals with IP20 finger safe construction for power input/output connections.

They have LED indicators for both power output and overload/short-circuit/over-temperature conditions.

The power supplies include a DIN rail mount earth terminal, which provides a ground point for the supplies' 24 V dc output cables.

Figure 1 - FPS240-24 Power Supply (P0924SM)

Figure 2 - FPS120-24 Power Supply (P0924SL)

Features

- Wide range of ac and dc input voltages
- High efficiency
- Power factor correction
- Dual stage current limiting
- Overvoltage shut down circuitry
- Transformer isolated 24 V dc output
- Class 1, DIV 2, Zone 2 applications
- UL® and UL-C Certifications
- Power for external field devices
- Relay contact output for externally powered alarm
- Convection cooling (no fans)
- Horizontal DIN rail mounting

Wide-Range Input Voltages

A high-efficiency input circuit in the power supplies automatically accepts a wide voltage range. See *Functional Specifications, page 7*.

Division 2, Zone 2 Application

The power supplies are UL and ULC listed (to UL 1950) as having a Safety Extra Low Voltage (SELV), and have IEC/EN 60950-1 certifications. They can be used in Division 2 and Zone 2 applications.

Power for External Field Devices

The actual amount of power required in a I/O subsystem depends on the number of modules being powered, the types of termination assemblies used, and whether internal or external powering is used for the individual field device(s). :

The FPS240-24 and FPS120-24 can also be used as a field power supply to power external field devices. However, for system integrity, field devices and I/O baseplates or conversion mounting structures should not be powered from the same FPS240-24 and FPS120-24.

Packaging

The conformal coated design provides protection for corrosive atmospheres such as hydrogen sulfides and chlorine, as found in many process control plants.The power supplies have DIN rail mounting clips for mounting on a horizontal DIN rail. Due to heat considerations, mounting on a vertical DIN rail is not supported.

Status Alarms

Visual LED indicators for power output and overload/short-circuit/over-temperature conditions are contained on the power supplies. To indicate when the 24 V dc output dips more than 10% for longer than 1 millisecond, a “DC ok” relay contact output is available to activate an externally powered alarm. A customer-supplied cable is required to connect the normally-open relay contact (with spring clamp terminals) to an external FBM or other monitoring device.

Safety Wiring

The power supply is designed to be used with special cables (ordered separately) to make installation easy and improve personal safety. See *Physical Specifications, page 10*.

Functional Specifications

<table>
<tr><td>Maximum Ratings</td><td>Output Voltage:
Factory set at 24.1 V dc
⚠⚠DANGER
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH
The output voltage of the FPS240-24 (P0924SM) and FPS120-24 (P0924SL) power supplies is set to 24.1 V by default. This voltage must not be changed. Do not expose or turn the output voltage potentiometer on these power supplies. Doing so will invalidate the warranty for these power supplies and any equipment connected to them and may result in faulty equipment operation. Foxboro provides no guarantee for any 200 Series subsystem equipment’s operation if this output voltage is changed.
Failure to follow these instructions will result in death or serious injury.</td></tr>
<tr><td>Input Specifications</td><td>FPS240-24 (P0924SM)
• Absolute Input Voltage Range:
85 to 276 V ac and 88 to 187 V dc
• Input Frequency:
47 to 63 Hz
• Nominal Input Current:
2.22/1.22 A at 120/230 V ac
• Efficiency (at Maximum Power, 10A, 24V):
90%+ typical
• Inrush Current:
4/7 A, at 120/230 V ac (peak at cold start)
• Input Transient Protection:
Included
FPS120-24 (P0924SL)
• Absolute Input Voltage Range:
85 to 264 V ac and 88 to 360 V dc
• Input Frequency:
47 to 63 Hz
• Nominal Input Current:
1.10/0.62 A at 120/230 V ac
• Efficiency (at Maximum Power, 10A, 24V):
90%+ typical
• Inrush Current:
9/11 A, at 120/230 V ac (peak at cold start)
• Input Transient Protection:
Included</td></tr>
</table>

Protection Features	• Overvoltage Protection: Factory set at 32-36 V dc • Isolation Resistance: 500 V ac input to output • Over Current Protection: Support loads with a higher short-term power requirement without damage or shutdown for up to four seconds
Vibration	2 g (17.8 to 500 Hz)
Regulatory Compliance: Electromagnetic Compatibility (EMC)	• *European EMC Directive 2014/30/EU* Meets the requirements of EN 61000-6-1:2007, EN 61000-6-2:2005/AC:2005, EN 61000-6-3:2007 + A1:2011/AC:2012, EN 61000-6-4:2007 + A1:2011
Regulatory Compliance: Product Safety	• *Underwriters Laboratories (UL) and CSA for U.S. and Canada* Certified as suitable for Class 1 Division 2 Groups A, B, C, D Hazardous Locations, Temperature Code T4 when connected to specified Foxboro processor modules as described in the *Standard and Compact 200 Series Subsystem User's Guide* (B0400FA). • *European Low Voltage Directive 2015/35/EU and Explosive Atmospheres (ATEX) Directive 2014/34/EU for use in Zone 2 Category 3G Hazardous Locations II 3G Ex nA nC II T4 Gc*
Calibration Requirements	Calibration of the module is not required.

Table 1 - Nominal Input and Output and Regulatory Compliance

Power Supply	Input			Maximum Rated Output (+), dc		
	V	A	Hz	V	W	A
FPS240-24 (P0924SM)	100-240 V ac	2.22/1.22	50 to 60	24	240	10
FPS240-24 (P0924SM)	110-150 V dc	2.37/0.87	-	24	240	10
FPS120-24 (P0924SL)	100-240 V ac	1.10/0.62	50 to 60	24	120	5
FPS120-24 (P0924SL)	110-300 V dc	1.19/0.44	-	24	120	5

Environmental Specifications

	Operating	Storage
Temperature[1]	–25 to 70°C (–13 to +158°F)	–40 to +85°C (–40 to +185°F)
Relative Humidity	5 to 95% (noncondensing)	5 to 95% (noncondensing)
Altitude	0 to +6,000 m (0 to +20,000 ft)	0 to +12,000 m (–1,000 to +40,000 ft)

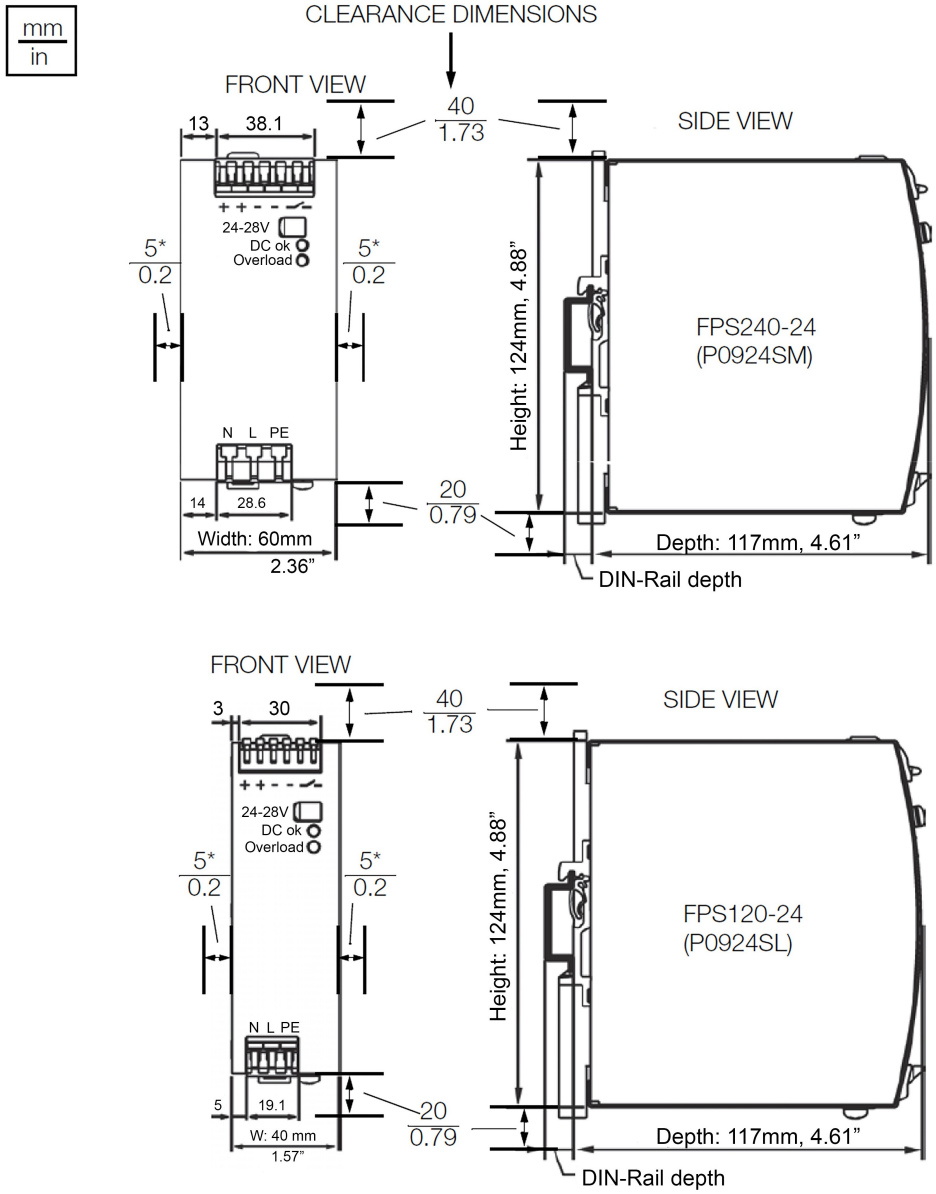
[1] Reduce output power or ambient temperature above 2,000 m (6,562 ft) sea level. For FPS240-24 (P0924SM), 7.5 W/1,000 m (3,280 ft) above 2,000 m (6,562 ft) sea level for temperatures > 50°C (122°F). For FPS120-24 (P0924SL), 15 W/1,000 m (3,280 ft) above 2,000 m (6,562 ft) sea level for temperatures > 50°C (122°F).

Physical Specifications

Mounting	Horizontal DIN-rail only.
Weight	• FPS240-24 (P0924SM): 0.9 kg (1.98 lb) • FPS120-24 (P0924SL): 0.62 kg (1.37 lb)
Dimensions	See *Dimensions - Nominal, page 12*.
Cooling	Convection cooled (no fans)
Indicators	Green LED (DC ok) indicates when output is within specified operating range (>23.5 V dc). Red LED (Overload) indicates output overload (V_{OUT} < 90%), short circuit (V_{OUT} = ca. 0V) or over-temperature condition (LED blinks).
Part Numbers	• Power Supply[1]: FPS240-24 (P0924SM) 24 V dc @ 240 W output FPS120-24 (P0924SL) 24 V dc @ 120 W output • AC Input Terminal Block Cable: Connects ac Input to Power Supplies - Qty 1 required - Must be ordered separately. ◦ P0170PA - 1.8 m (6 ft) ◦ (For IE16/32 and Molded Structural Foam FE8 enclosure upgrades) P0924SW - 1 m (3.3 ft) - for rear-mounted power supplies ◦ (For IE16/32 and Molded Structural Foam FE8 enclosure upgrades) P0924SX - 2 m (6.6 ft) - for front-mounted power supplies • Power Supply to Baseplates Cable: Connects power supply to baseplates. One or two cables can be used per power supply. The following cables support Modular Baseplates (P0926KE/HF/HJ/HM/HT/KH/HZ/JC/JF/JM). ◦ P0922XR - 1.0 m (3.3 ft) - Main Cable ◦ P0922XS - 3.0 m (9.8 ft) • Power Supply to Conversion Mounting Structures Cable: Connects power supply to conversion mounting structures. One or two cables can be used per power supply. The following cable supports conversion mounting structures (P0924JL/JM/JN/JP). ◦ P0922XR - 1.0 m (3.3 ft) - Main Cable

Alarm Status Relay (DC ok)	• Type: Normally Open (NO) • Alarm Status Contact Voltage: The DC-ok feature requires that the output voltage reaches 90% of the nominal (24 V) level. If this level cannot be achieved, the overload lamp will be on and the DC-ok contact will be open. The overload signal will shut off as soon as the 90% point is reached. • Contact Closes: As soon as the output voltage reaches 90% of the nominal 24 V output voltage. • Contact Opens: When the output voltage dips more than 10% below 24 V for >1 msec. Short dips will be extended to a signal length of 250 ms. Dips shorter than 1 ms will be ignored. • Contact Re-Closes: As soon as the output voltage exceeds 90% of the adjusted voltage • Contact Ratings ◦ Maximum: 60 V dc 0.3 A, 30 V dc 1 A, 30 V ac 0.5 A (resistive load) ◦ Minimum: 1 mA at 5 V dc (min. permissible load)
[1] Included with each power supply is a grounding terminal block (X0175WL).	

Dimensions - Nominal



* If the adjacent device is a heat source, we recommend 15 mm (0.59 in) clearance on the left and right sides of these power supplies.

Related Product Documents

Document Number	Description
PSS 41H-2SOV	*Standard 200 Series Subsystem Overview*
B0400FA	*Standard and Compact 200 Series Subsystem User's Guide*
PSS 41H-2W100	*100 Series Fieldbus Module Upgrade Subsystem Overview*
PSS 41H-2CERTS	*Standard and Compact 200 Series I/O - Agency Certifications*
PSS 31H-2W3	*Standard 200 Series Power Supply*
PSS 41H-2SBASPLT	*Standard 200 Series Baseplates*
PSS 41H-2W8	*100 Series Conversion Mounting Structures*
PSS 41H-2COV	*Compact 200 Series I/O Subsystem Overview*
PSS 41H-2C480	*Compact Power Supply - FPS480-24*
PSS 41H-2C200	*Compact 200 Series 16-Slot Horizontal Baseplate*

⚠ **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-2FPS, Rev A