Honeywell

Safety Manager
Release 162

Hardware Reference

EP-SM.MAN.6284

Issue 2.1 | December 2023

- Original Instructions -

6.2 PSUNI2424

The PSUNI2424 power supply is CE and UL approved for connection to industrial installations for use in process and safety controllers.

The power supply is a switched-mode AC to DC power supply with a high efficiency (87% with 230VAC input and 24A output) and supports a wide input voltage range between 100VAC and 240VAC. The output is SELV certified according the EN60950 standard.

The power supplies is certified for use in SIL3 applications where the output voltage needs to be guaranteed below 31VDC. This is done by using a dual independent over voltage protection supporting the IEC 61508 architectural constrains. In combination with an increase immunity for external EM-disturbances.

The power supplies can be connected in parallel up to eight power supplies to support higher output currents. The alarm outputs can be daisy-chained.

6.2.1 Main Features

Main features:

- Dual built-in over-voltage protection, supporting SIL3 applications (IEC 61508).
- ON/OFF switch on the power supply combined with isolated AC and DC power connectors enable on-line replacement of the unit in a live system.
- DC under-voltage alarm (<23.5V).
- AC under-voltage alarm (<80V).
- The power supplies can be connected in parallel up to eight power supplies to support higher output currents.
- Wide temperature range: -40°C to 70°C.
- Optimum protection against continuous overload and short-circuiting.
- >50ms holdup time.
- FAN alarm.
- Reduced FAN speed to reduce wear out in typical applications.
- Increased EMC immunity to support alarm systems (EN50130-4).
- 50A/200ms peak current for clearing fuses.
- Inrush current limited (<60A); Supports 10A type C circuit breakers.

The LEDs on the front panel indicate the following status:

"AC In" (Green LED)	on	AC input is within the specified range
	off	AC input is lost (for any reason)
"Status" (Green LED)	on	Power supply output is within specified voltage, temperature and current limits
	off	a. If DC output voltage is out of spec (on anode side of isolating ORing diode) b. If a greater current than specified is being pulled from the power supply and/or c. If the power supply has reached temperatures above specified limits d. OVP has activated or e. If AC input is under voltage
	flashing	One or both of the fans failed

6.2.2 Hardware control features

The PSUNI2424 power supply has the following hardware control features:

- Power switch
- An alarm contact

Each of these features is discussed in more detail below.

6.2.2.1 Power switch

It allows you to switch off the PSUNI2424 operation before you disconnect it.

Attention:
Cycling of the power switch can cause permanent damage to the power supply. After you switch the unit OFF, wait at least 30 seconds before you switch it ON again.

6.2.2.2 Alarm contact

The PSUNI2424 has an alarm contact used for monitoring the module health status.

The "Alarm contact state with output voltage above 23.5 V DC " below shows the alarm contact with the relay energized, which means that the PSU is powered and the output voltage is above 23.5 V DC.

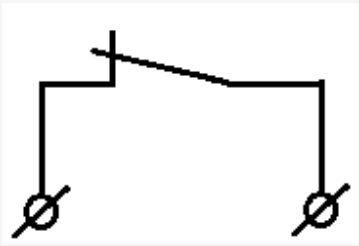

Figure 6-2: Alarm contact state with output voltage above 23.5 V DC

6.2.3 Installation

The unit can be mounted both vertically or horizontally.

Convection cooling works best when the unit is mounted vertically, with the power and fan input facing downwards (see "Vertical mounting of the PSUNI2424 power supply" on the facing page).

Note:
Vertical mounting is preferred for optimal cooling.

The absolute minimum spacing between two blade mounted units is 12.5 mm (0.5 in).

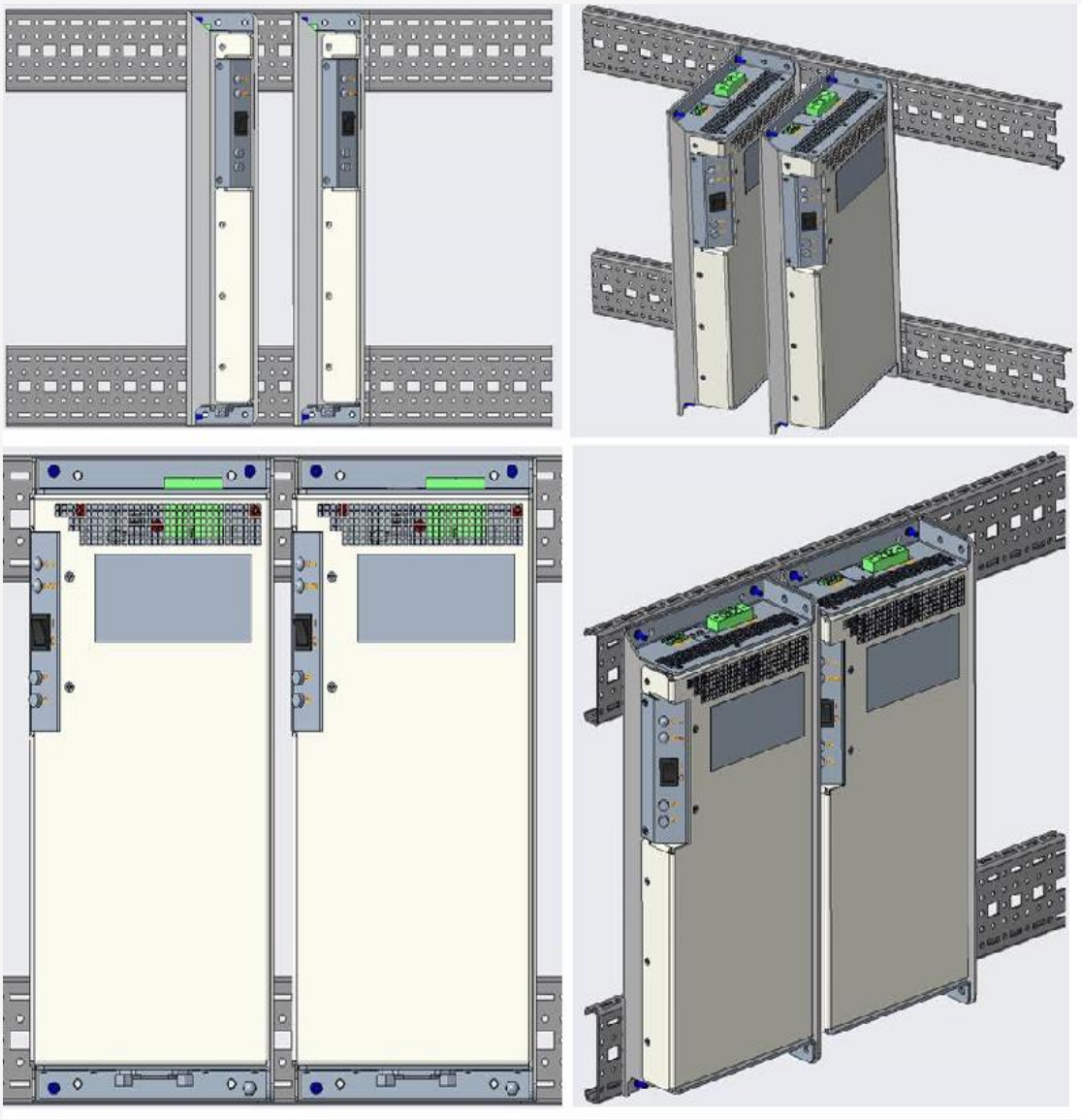

Figure 6-3: Vertical mounting of the PSUNI2424 power supply

6.2.3.1 Mounting holes

The below figure depicts the mounting details of PSUNI2424 power supply.

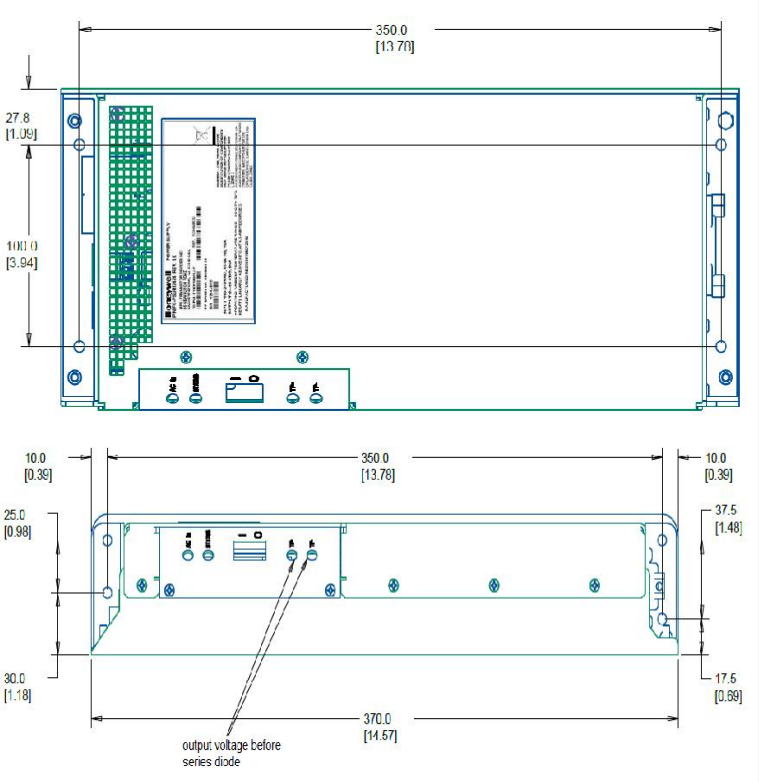

Figure 6-4: Mounting holes of the PSUNI2424 power supply

Note:
The dimensions are in mm / [inch].

6.2.3.2 AC Input

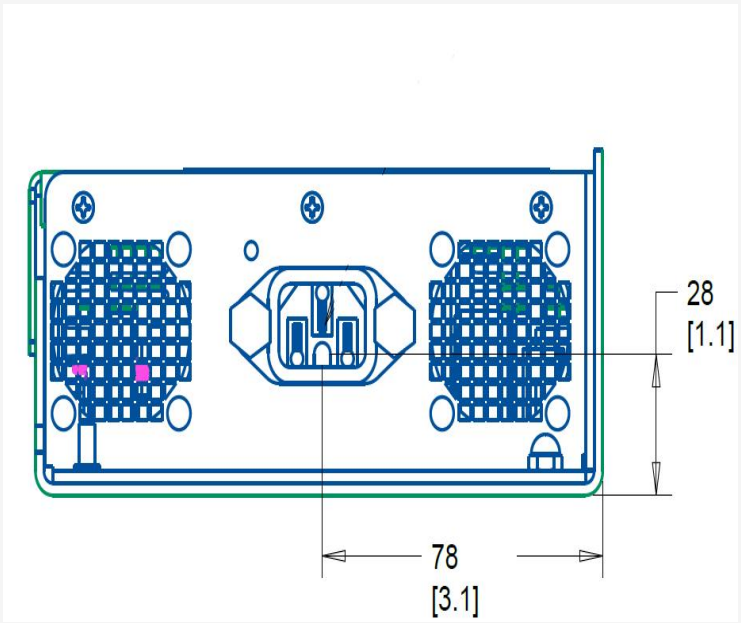

Figure 6-5: AC Input

Note:
The dimensions are in mm / [inch].

6.2.3.3 DC and alarm output

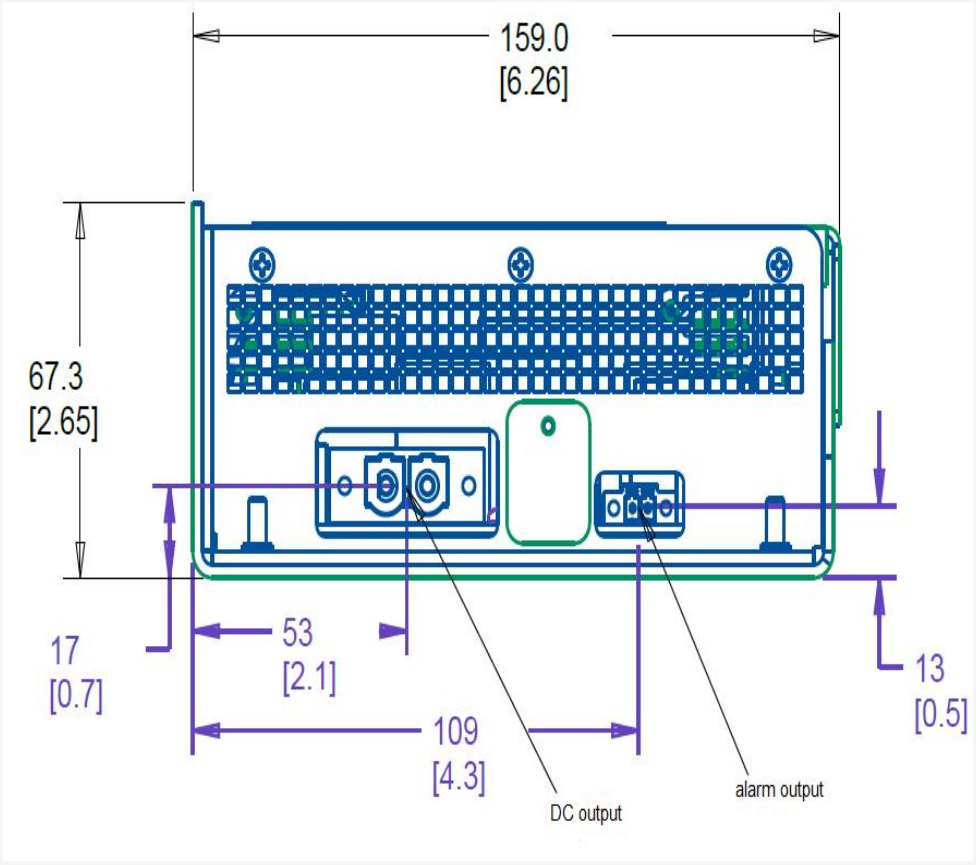

Figure 6-6: DC and alarm output

Note:
The dimensions are in mm / [inch].

6.2.3.4 Controller power supply configuration

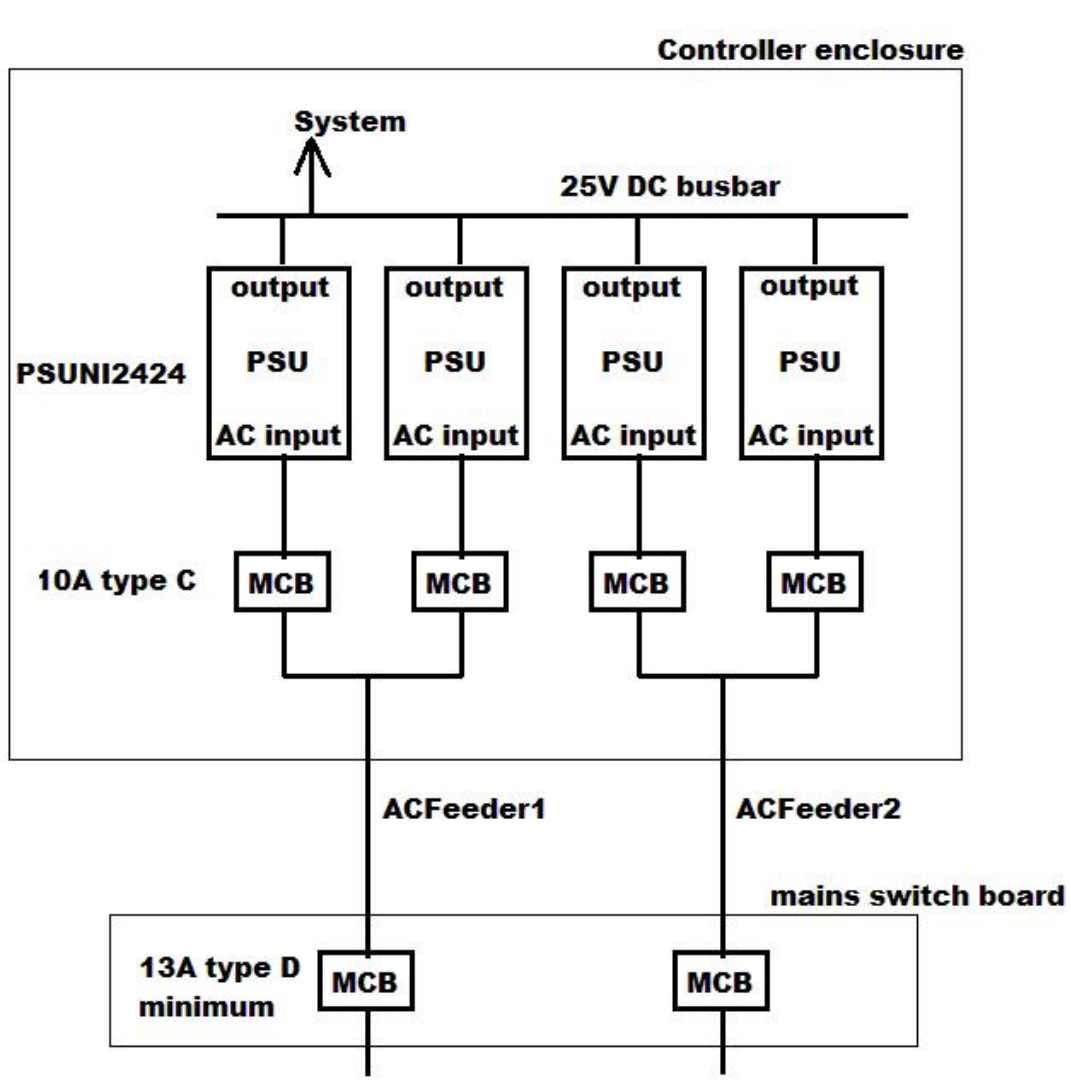

Figure 6-7: Controller power supply configuration

The mains switch board mini circuit breaker or fuse needs to support 120 A inrush current. It is supported with 13 A type D circuit breaker or higher.

6.2.3.5 Output derating curves

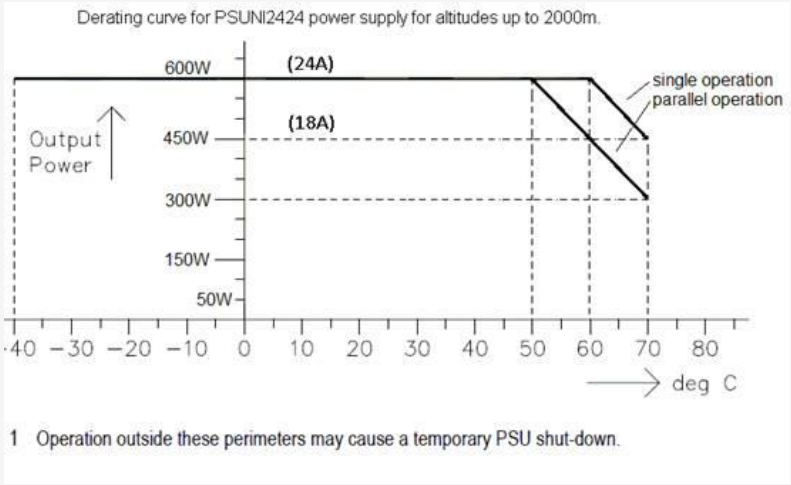

Figure 6-8: Output derating curve

Output derating should start 10°C earlier when DC outputs are connected in parallel to support higher currents.

6.2.4 Electrical connection

1. AC Mating Connector: PX0597, BULGIN C15 IEC
   AC Mating Cable: 80042 EcoFlex, 3x 16AWG
2. DC Mating Connector: 1967456 PC 16/2-stf-10,16, Phoenix, Contact
   DC Mating Cable: HV8-55-0 AND HV8-55-2, PowerFlex 1000, 8AWG
3. Alarm Mating Connector: 1827703 MC 1,5/2-STF-3,81
   20-24AWG Alarm wire
4. Each power supply unit AC input requires to have in series an external 10A circuit breaker type C or 10A class CC fuse.

Note:
The AC cable (2m in length - open end) and DC cable (1.8m in length with METHOD D-TAB-200-JCK-8-S DC bus bar connector) and alarm mating connector are included in the shipment box when

ordering the PSUNI2424 module.

6.2.5 Technical Data

The PSUNI2424 power supply unit has the following specifications:

General	Type number:	FC-PSUNI2424
	Approvals:	CE; cUL (60950). CID2 T4 and Zone2 (+61010-1) certifications are pending for the PSUNI2424. DC output is SELV certified. The OVP is SIL3 certified keeping DC output voltages below 31V (according IEC 61508). EMC standards: EN61131-2, EN50130-4 and EN61000-6-7.
Power	Output power:	600W
	Input power:	115VAC: 712W; 230VAC: 691W typical 85VAC: 750W; 220VAC: 720W maximum
	Power efficiency:	100VAC: 80% @ 6A and 84.5% @ 12-24A 230VAC: ; 82% @ 6A and 87% @ 12-24A
	Power factor:	100VAC: >0.99@6-24A 230VAC: >0.88 @ 6A and 0.98 @ 24A
	Input frequency range:	45-66Hz
Physical	Dimensions:	370 x 159 x 67.3mm (W × H × D)
	Weight:	2.9kg
Environment	Storage temperature:	-40°C to 85°C Keep below 40°C for long term storage.

	Operating temperature:	-40°C to 70°C
	Maximum temperature change:	3°C/minute
	Humidity:	5% to 95% RH non-condensing. Derating RH above 40°C
	Pollution degree:	PD2 maximum(IEC60664-1)
	Altitude:	0-2000m above sea level
Input	Input voltage:	100-120 / 220-240VAC nominal (Operational between 85 – 265VAC)
	Inrush and re-rush current:	<60A; supports using 10A type C circuit breaker EMI filter with 2uF between the input lines
	Input current:	• 115VAC: 6.2A • 230VAC: 3.1A At rated DC output load
	Internal fusing:	10A fuse for each AC leg line
	External Protection[1]:	Fuse: 10A class CC or MCB: 10-13A type C(EN60898-1)
	Installations	Industrial installations only. OVC II up to 2000m
Output	Output voltage:	25.7V no load and 25.1V with 24A static load;

		24.5-26.5V with 24A dynamic load.
	Ripple	20-40mV typical (HART compliant)
	Noise:	<100mV LL and <700mV LE
	Output current:	0-24A continuously; 50A for 200ms typical for clearing fuses
	Load sharing:	< 10% difference at full load
	Electronic current limiter:	34A typical (27A-42A) after 200ms
	Derating output current:	Single operation: 24A with -0.6A/°C above 60°C up to 2000m altitude Parallel operation: 24A with -0.6A/°C above 50°C upto 2000m altitude
	Hold-up time:	50ms; Rest EN61000-4-11 level 3
Alarm output	Type:	Solid-state output (Opto-FET) isolated up to 500VAC
		Activated when power supply status is okay (FAN speed okay and output voltage >23.5V)
	Nominal voltage:	31V maximum (33V TVS protected inside)
	Nominal Current:	40mA maximum non inductive
	Voltage drop:	<0.2V at 7mA
	Short circuit protection:	Yes (Trips within 1second at 0.5A – self restoring)
FAN speed:	0% below -10°C and	

	50% above -10°C and 100% above 80-85°C heatsink temperature	
Isolation	Input to output:	3750VAC/1min (8mm creepage)
	Input to case:	2210VAC/1min; Transient limited by 3000V spark gap and 300VAC varistor in series; 100% tested at 2300VDC
	Output to case:	1500VDC/1min; Transient limited by 320VAC varistor; <50M Ohm at 250VDC

Note:

1. One double pole external circuit breaker per power supply unit is mandatory, for electrical safety reasons.