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27.6VDC Power supply Series

EN54-4+A1+A2 Certified Power Supply Units Compliant with Fire Detection and Alarm systems

Overview

This power supply series is designed for installation with compliant fire alarm systems which require additional power for auxiliary devices connected to the system. The power supplies provide a voltage of 27.6 VDC with options of 1, 2 & 5 amp outputs and two different size enclosures depending on the battery size requirement.

In case of mains power failure, the PSU will switch to battery power, providing an uninterruptible power supply. The units are housed in a metal enclosure with space for two batteries. Maintenance free lead acid batteries are required to provide back up in the event of mains power loss.

Features

- Compliant to EN54-4:1997 +A1 +A2.
- 27.6VDC uninterruptible power supply for compliant Fire Systems
- 1A / 2A / 5A versions available in small mental enclosures for 7Ah batteries
- 2A / 5A versions available in large metal enclosures for 18Ah batteries
- Green LED indicating mains power (see Fault Outputs & Diagnostics table)
- Yellow LED indicating fault present (see Fault Outputs & Diagnostics table)
- Amber LED for engineer fault diagnostics (see Fault Outputs & Diagnostics table)
- GEN & EPS outputs for fault reporting (see Fault Outputs & Diagnostics table)
- Overload protection circuit to avoid damage to the PCB during short circuit or overload
- Battery charging supply between 500ma and 800ma depending on model (See Specification chart)
- Deep discharge protection will disconnect batteries to avoid battery damage if draining too low (Below 21VDC)
- Battery Monitoring checks status of batteries (low voltage, incorrect connection, short circuit)

Specification

		HAY-PSUEN54-1A	HAY-PSUEN54-2A	HAY-PSUEN54-5A	HAY-PSUEN54-2AL	HAY-PSUEN54-5AL
Mains Input	Rated Voltage/Frequency	110~240V AC ,47～63Hz				
	Input Current	0.3A	0.5A	1.2A	0.5A	1.2A
	Fuse Ratings	F3A				
Low Voltage Output	Voltage (Mains Power)	22.0 ~ 27.6 Vdc				
	Voltage (Battery Standby)	20.0 ~ 26.0Vdc				
	Ripple	<100 mV	<150 mV	<150 mV	<180 mV	<180 mV
	Output Fuse	F1A	F2A	F5A	F2A	F5A
	Battery Fuse	F1A	F2A	F5A	F2A	F5A
	Imax A（With Charging）	1A	2A	5A	2A	5A
	Imax B (No Charging)	1.5A	2.8A	5.8A	2.8A	5.8A
	Battery Capacity	2 x 7Ah			2 x 18Ah	
	Ri max	The maximum internal resistance of the battery and its associated circuitry is 5Ω				
	I min	0.1 Amp				
	Battery Charging	Two stage charging: Constant current bulk charging to 80% capacity within 24 hours. Float charging to 100% within 48 hours				
	Constant Current Charge	0.5A	0.8A			
	Temperature Compensation	Coefficient for charging voltage: -30mV/ ºC (0~50 ºC)				
	Low Battery Voltage Trigger	Threshold voltage – 23V				
	Deep Discharge Protection Cut Out	Threshold voltage – 21V				
Terminal connections	L ⏚ N	Mains Input				
	+OP -	Voltage output to load				
	+ BATT -	Connection to batteries using leads (supplied)				
	TEMP	Connection to battery temperature sensor (supplied)				
	GEN	GEN Fault output normally closed；0.50 A @ 60Vdc 0.9Ω solid state relay contacts, volt free；Open if Mains failed and battery voltage < 23V or fault PSU fault condition (see below)				
	EPS	EPS Fault output normally closed; 0.50 A @ 60V dc 0.9Ω solid state relay contacts, volt free; Open if loss of mains for > 10 seconds				
Environmental Conditions	Operating Temperature	- 20 to +45°C (operating), 20%~90% RH non-condensing				
	Storage Temperature	-25 to +85°C (storage),10%~90% RH non-condensing				
Enclosure	Material	1.2 mm steel white powder coated				
	Enclosure Dimensions w*h*d (mm)	275 x 330 x 80			420 x 400 x 80	
	Weight excluding batteries (KG)	3.1	3.1	3.3	5	5.2

Fault Outputs & Diagnostics

End User Basic Fault Finding Guide				
Fault LED (Yellow)	**Mains LED (Green)**	**Power Supply Status**	**Potential Issue**	**Investigation**
Off	On	Normal Operation	Mains & Battery Operating Correctly	No action required - PSU ok
Continual Flash	On Or Off	System Fault	Internal Power Fault	Call Service Provider
1 Flash	Off	System in battery mode	Mains Power is disconnected	Check mains power to PSU Call service provider where required

Service Engineer Fault Finding Guide					
Diagnostics LED (Amber)	**Fault LED (Yellow)**	**Mains LED (Green)**	**Power Supply Status**	**Potential Issue**	**Investigation Required by Engineer**
OFF	OFF	ON	Status normal	Mains & battery power ok	No action required - PSU ok
	1 Flash	OFF	Battery standby mode	Mains failure - batteries in use	Investigate mains power loss to PSU
Continual Flash	Continual Flash	ON/OFF	No 24v power at output	Overload Fuse blown Cable or auxiliary device short circuit	Check fuses, cable and auxiliary device for short circuit
1 Flash	OFF	ON	PSU charging batteries	PSU operating normally - batteries are charging but not fully charged	No action required - PSU ok and charging batteries
2 Flashes	Continual Flash	ON	PSU not seeing batteries	Batteries not fitted Batteries discharged too low Battery fuse blown	Test and replace discharged batteries - check battery fuse
		OFF	Battery power low	Mains power off and batteries running low (<23V)	Reinstate mains power and check battery charging
3 Flashes	Continual Flash	ON/OFF	PSU is registering a battery fault	Possible battery fault Poor battery connection	Replace batteries if required Check battery connections are tight and not corroded
4 Flashes	Continual Flash	ON/OFF	PSU is registering a battery charging fault	PSU charging circuit is faulty	Replace power supply unit
5 Flashes	Continual Flash	ON/OFF	PSU is registering battery temperature sensor fault	Battery temperature sensor either faulty or disconnected from input	Check TEMP input connections on PCB. If connected ok, replace battery and sensor leads.

LED Indicators	
LED Colours & Function	**LED Function**
Green LED	Mains power present
Yellow LED	Fault present (See Fault Finding Guide Above)
Amber LED	Fault diagnostics (See Fault Finding Guide Above)

Power Supply Fault Reporting Outputs				
GEN Fault	**EPS Fault**	**Status**	**Potential Issue**	**Investigation Required by Engineer**
Closed	Closed	Status normal	Mains & battery power ok	No action required - PSU ok
Closed	Open	Battery standby mode	Mains failure - batteries in use	Investigate mains power loss to PSU
Open	Closed	System Fault	General fault/Faulty batteries/Internal Fault	Fault - Use Fault finding guide above
Open	Open	Total power loss	Mains Power off and batteries too low	Restore mains power and replace batteries

Installation

This EN54 power supply range is for internal use only and designed for use with fire alarm systems and automatic fire detection. The PSU (Power Supply Unit) should be connected to a dedicated mains power circuit and have a Mains Isolation Switch fitted which is labelled FIRE ALARM – MAINS POWER ISOLATION SWITCH, this should be fused at a maximum rating for 5 amps. Suitable wall fixings should be used noting the overall weight of the PSU with batteries fitted. All cabling should meet the required fire alarm regulations, and the units should only be powered once all connections are double checked by the engineer.

System Wiring

Ensure that all cables meet the requirements and applicable regulations for the system installation. Use the knockouts provided to bring the mains & low voltage cables into the PSU and use cable ties to secure the cables to the cable anchors. Appropriate cable glands should be used for the cables entering the PSU. Ensure that the mains supply cable enters through a different entry point to the low voltage cables. The PSU should always be Earthed. You must ensure that when using the EPS & GEN Fault outputs, that any circuits they are connected to are less than 60 Vdc.

Enclosures

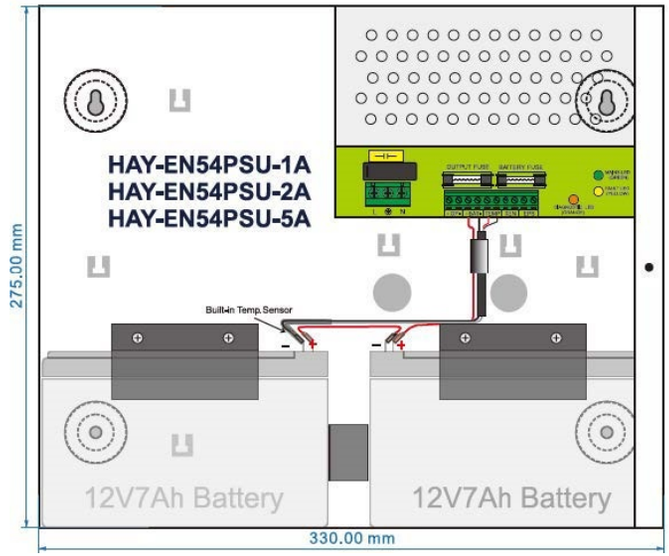
- HAY-PSUEN54-1A, HAY-PSUEN54-2A & HAY-PSUEN54-5A have an enclosure size of 275 x 330 x 80mm (H x W x D) and house 2 x 7Ah batteries. With batteries installed the unit weighs approximately 8 kg.
- HAY-PSUEN54-2AL & HAY-PSUEN54-5AL have an enclosure size of 400 x 420 x 80mm (H x W x D) and house 2 x 18Ah batteries. With batteries installed the unit weighs approximately 18.5 kg.
- Always ensure that the surface for mounting the PSUs is robust enough to hold the weight and that the correct fixings are used to support the unit.

Recommended Cable Requirements

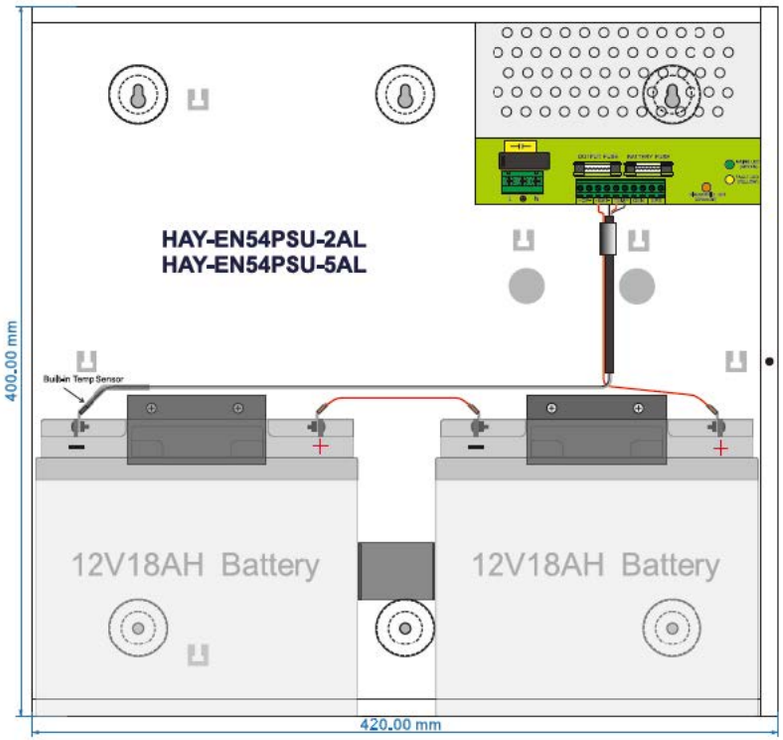
- Mains cable size - minimum 0.75mm^2 (Earth required)
- Output cable size for 5A output PSU - minimum 0.75mm^2 (Earth if required)
- Output cable size for 1A & 2A output PSU - minimum 0.5mm^2 (Earth if required)

Initial Power Up

- With only mains power connected to the PSU switch on the Mains Isolation Switch to ensure all LEDs are functioning correctly.
- All LEDs should flash momentarily and the green “Mains LED” should stay illuminated. The yellow “Fault LED” will continue to flash as this indicates no batteries & no temp. sensor are connected.
- Switch off Mains Isolation Switch and continue with load and fault reporting connections.

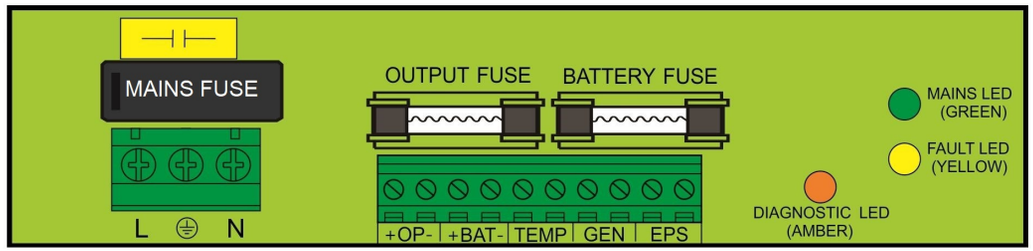


Wall Fixing Points Cable Tie Anchor Points



Commissioning

- Once all load and fault output connections are made the PSU can then be repowered by the mains supply. All connections are labeled in the below diagram.
- Check that LEDs are functioning correctly as per the Initial Power Up.
- Batteries can then be connected ensuring that they are connected in series using the short bridging wire provided. Note – the bridging wire should be connected to the positive of one battery and the negative of the other battery.
- The small white wires from the Temperature Sensor must be also connected to ensure the battery temperatures are being monitored. It does not matter which way round you connect these two wires.
- The engineer should now carry out a full test of the fire alarm system.
- Use the Specification chart for details on the operation of the fault outputs.
- In full healthy status only the green mains LED should be illuminated.
- When using the GEN and EPS outputs they should be showing closed circuit in healthy status.
- By disconnecting one of the battery leads, the yellow fault LED should within 1 minute start to flash and the amber LED will continue to repeat two flashes as per the Fault & Diagnostic chart.
- Reconnect the batteries and check that the yellow fault and amber diagnostic LEDs stop flashing after a few seconds.
- Fit the supplied brackets to secure the batteries as shown in the diagram.



COMPLIANCE:

This power supply unit meets the essential requirements of the following European Directives:

EMC: 2014/30/EU LVD: 2014/35/EU RoHS2.0: 2011/65/EU

Functional standard: EN54-4:1997 +A1 +A2 Environmental Class II

	**CAUTION!** The power supply unit is adapted for cooperation with the sealed lead-acid batteries (SLA). After the operation period they must not be thrown but recycled according to the applicable law.