

# Eaton 91PS 8-10 kW (3:1) UPS Technical Specification

Manufacturer's declaration in accordance with IEC 62040-3

IEC 62040-3 Subclause	MODEL RATING (1.0 p.f.)	8 kW	10 kW
	Model catalogue reference	91PS-8(10)	91PS-10(10)
	Number of internal batteries	0 to 1 x 32 blocks	0 to 1 x 32 blocks
	UPS options	Long life batteries External maintenance bypass switch External battery cabinets	
	Upgradability	Yes, to 10 kW	No
	External paralleling	Up to 4 units with HotSync technology	
5.1.1	UPS topology	Double conversion	
5.3.4	UPS performance classification	VFI-SS-111	

## MECHANICAL

	UPS dimensions (width x depth x height)	335 x 750 x 950 mm
	Weight, UPS and internal batteries UPS + 0 BAT UPS + 1 BAT	73 kg 163 kg
	External Battery Cabinet (EBC-H) dimensions (width x depth x height)	335 x 750 x 950 mm
	UPS Cable entry	Rear
	UPS Degree of protection	IP 20
	UPS colour	Black; RAL 9005
	Mean Time To Repair (MTTR)	< 25 minutes

## ENVIRONMENTAL

6.5.5	Acoustic noise at 1 m, in 25 °C ambient temperature	< 54 dBA in double conversion < 47 dBA in ESS
4.1.4	Ambient UPS storage temperature range	- 25 °C to + 55 °C without batteries, 0 °C to + 25 °C with batteries, indoors in the protective package
4.2.1.1 and 5.4.2.2 h	Ambient service temperature range UPS Internal battery	0 °C to + 40 °C without output power derating + 20 °C to + 25 °C recommended for optimized battery life time
4.2.1.1	Relative humidity range	5 to 95%, no condensation allowed
4.2.1.2	Maximum service altitude	1000 m (3300 ft) above sea level at 40 °C Maximum 2000 m (6600 ft) with 1% derating per each add. 100 m
	RoHS/WEEE compliancy	Yes

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## EFFICIENCY

5.3.2 r and 6.4.1.6	Efficiency in double-conversion, rated linear load	100% load	95.8%	95.8%
		75% load	95.6%	95.8%
		50% load	95.0%	95.5%
		25% load	92.7%	93.7%
	Heat dissipation in double conversion	100% load	351 W	438 W
		75% load	276 W	329 W
		50% load	211 W	236 W
		25% load	157 W	168 W
	Efficiency in ESS, rated linear load	100% load	98.4%	98.6%
		75% load	98.2%	98.4%
		50% load	97.6%	98.0%
		25% load	95.9%	96.6%

## ELECTRICAL CHARACTERISTICS

### INPUT

5.2.1.a and 5.2.1 b	Rated input voltage Voltage tolerance	Rectifier input Bypass input	220/380 V; 230/400 V; 240/415 V 187 to 276 V rated voltage -15% / +10%	
5.2.1 c and 5.2.1 d	Rated input frequency Frequency tolerance		50 or 60 Hz, user configurable 40 to 72 Hz	
5.2.2 a and 5.2.2 b	Number of input phases	Rectifier input Bypass input	3 phases + neutral 1 phase + neutral	
5.2.2 d	Input power factor, double conversion	100% load 75% load 50% load 25% load	0.99 0.99 0.98 0.94	0.99 0.99 0.99 0.96
5.2.2 c	Rated input r.m.s. current	380V 400V 415V	13 A 12 A 12 A	16 A 15 A 15 A
5.2.2 f	Maximum input r.m.s. current		15 A	19 A
5.2.2 h and 5.2.2. i	Input current distortion at rated input current	Resistive load Non-linear load	< 4.0% < 6.5%	< 3.5% < 5.5%
5.2.2 e	In-rush current		< Rated input current (input filter components only)	

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5.2.2 k	AC power distribution system compatibility	TN, TT, IT (4-wire)	
	Rectifier ramp-up, rectifier start and load step	4 A/s (default), configurable. Minimum 1 A/s.	
	Back feed protection	Yes, for rectifier and bypass lines	

## ELECTRICAL CHARACTERISTICS

### OUTPUT

5.3.2 f	Number of output phases	1 phase + neutral	
	Crest factor	3	
5.3.2 b	Rated output voltage	220 V; 230 V; 240 V, configurable	
5.3.2 b	Output voltage variation, steady state	< 1%	
5.3.2 i	Total voltage harmonic distortion		
	100% linear load	< 1.5%	
	100% non-linear load	< 2.5%	
5.3.2 q	Voltage unbalance at reference unbalanced load	N/A	
5.3.2 j	Voltage transient (r.m.s) at 100% step load	4%	
	Recovery time to steady state at 100% step load	100 ms	
5.3.2 c	Rated output frequency	50 or 60 Hz, configurable	
	Output frequency variation	± 0.1 Hz	
	Slew rate	0.8 - 1 Hz/s	
5.3.2 d and 5.3.2 e	Maximum frequency range for synchronization with bypass	± 4 Hz as default. User settable 0.5 to 5 Hz.	
	Maximum synchronized phase error	< 2° with static balanced load	
	Maximum slew-rate when synchronizing	1 Hz/s	
5.3.2 k	Rated output power	8 kW / 8 kVA	10 kW / 10 kVA
5.3.2 l	Overload capability	10 min 102-110% load 60 sec 111-125% load 10 sec 126-150% load 300 ms >150% load	
	On inverter		
	Overload capability	10 min 102-110% load 60 sec 111-125% load 10 sec 126-150% load 300 ms >150% load	
	On inverter, stored energy mode		

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	Overload capability ESS mode	Continuous < 110% load 20 ms 1000% load	
	Overload capability On bypass	Continuous < 125% load 20 ms 1000% load	
5.3.2 m	Output current limitation, short-circuit capability	109 A, 300 ms	
6.4.2.10.3 and 6.4.2.10.4	Fault clearing capability	Circuit breaker B20 / C10	
5.3.2 o and 5.3.2 p	Load power factor Rated Permitted range	1.0 0.8 lagging to 0.8 leading	

## ESS MODE CHARACTERISTICS

	Transfer time to double-conversion Mains available Mains failure	No break Typically 2 ms
	Output voltage variation setting	± 10% of nominal voltage, default
	Output frequency variation setting	± 4 Hz, default
	Storm detection	UPS locks into double-conversion mode when three power line disturbances have forced the unit to double-conversion three times (user adjustable) within a one-hour period (user adjustable).
	High Alert mode	UPS will stay on double-conversion for one hour (user adjustable), after which the unit will automatically return to operate on ESS.

## BYPASS

	Type of bypass	Static
	Bypass rating	10 kW
	Bypass voltage range	220 V; 230 V; 240 V tolerance -15% / +10% of rated voltage
	Transfer time break	No break
	Maintenance bypass	Internal as standard
	Bypass fuse $i^2t$ value, Pre-arc $i^2t$ Total clearing $i^2t$	2592 A <sup>2</sup> s 15480 A <sup>2</sup> s (at 240 V)
	Required external bypass protective fuse, recommended rating	63 A gG
	Rated conditional short-circuit current, $I_{cc}$	50 kA (with recommended protective fusing)

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## BATTERY CHARACTERISTICS

5.4.2.2 d	Battery technology		12 V, VRLA
5.4.2.2 a	Battery design life		5 or 10 years
5.4.2.2 b	Battery quantity	Internal External	32 blocks, 192 cells per battery string 28-40 blocks per string
5.4.2.2 c	Battery voltage	Internal External	384 V 336 V – 480 V
5.4.2.2 e	Nominal Ah capacity (C10)		9 Ah
5.4.2.2 f	Stored energy time		See separate declaration
5.4.2.2 o	Recharge profile		ABM or float
5.4.2.2 q	End of discharge voltage		1.67 VPC to 1.75 VPC Configurable or automatic (load adaptive)
5.4.2.2 r	Charge current limit	Default Load ≤80% Load >80%	5 A, configurable 1...12.5 A 1...3.5 A
	Battery start option		Yes

## COMMUNICATION CIRCUITS

5.6	Standard connectivity ports	Mini-slot ports for optional cards, Device USB and Host USB, RS-232 service port, relay output, 5 building alarm inputs and a dedicated EPO, Web and SNMP card
	Complete list of indications and interface devices	See User's and Installation Guide

## COMPLIANCE WITH STANDARDS

IEC 62040-1	Safety Degree of protection	Access Restricted access IP 20; protection against medium sized foreign matter (incl. finger), no protection against vertically dripping water.
IEC 62040-2	Electromagnetic Compatibility Immunity Emissions	EMC Category C3 EMC Category C2
IEC 62040-4 EN 50581	Environmental Aspects - Requirements and Reporting	Yes

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