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POWER SUPPLY 1-PHASE, 24 V DC DIMENSION Q SERIES

QS10.241
PSU 100-240V ac I/P 24V dc 10A 240W O/P



- Power supply unit for DIN rail. 100-240 V ac/110 V dc
- 60/82 mm wide
- Up to 93.9% efficiency
- 50% bonus power
- Maximum performance

PRODUCT DESCRIPTION

Puls Dimension Q is a new generation of power supply unit with very small construction dimensions and many technical benefits. The power supply unit has low inrush current (even with warm starts), active PFC, which provides a power factor close to one, expanded temperature range and active protection against line transients. (Not QS20) The power supply unit has high efficiency, which provides long lifetime both for the unit and adjacent products. Temperature increases in the cabinet are also kept at a low level. Furthermore, there is a relay output (DC OK) that is deactivated when the output voltage deviates more than 10 % from the set value. The bonus power provides an extra 50 % reserve with retained 24 V, which is an advantage when connected loads have high starting currents. The power supply unit has a high short-circuit current that simplifies tripping of secondary fuses. Both the bonus power and short-circuit current are time-limited to 4 seconds to avoid constant overloading of the power supply unit and wiring. **QS20.241** If a short circuit lasts longer than 4 seconds, the power supply unit will continue in so-called hick-up mode. The output power is reduced to nearly zero for about 17 seconds. The power supply unit then makes a new start-up attempt for 2-4 seconds. If the short circuit remains, a new pause of 17 seconds is taken. Once the short circuit is remedied, the power supply unit automatically returns to service.For more technical information, consult the **general information** at the beginning of the power supply section.

Bonus power
The power supply unit has bonus power that enables high power extraction with retained 24 V DC for 4 seconds, which is a major advantage when connected loads have high starting currents, such as the case with motors. How often bonus power can be utilised depends on the application. With the following diagram and formula, the repeat time can be calculated for each application. The bonus power is available as soon as the power supply unit is started and directly after a short circuit.

Bonus power	Operating cycle

Po	Nominal load current
Ppeak	Peak current
To	Time between bonus power
Tpeak	Peak current I time
Operating cycle	Tpeak / (Tpeak + To)
To	Tpeak - (operating cycle * Tpeak) / operating cycle

Example: Nominal load current (Po) is 7.5 A. Peak current (Ppeak) is 12 A
20 % of I_{nom}. The peak time is 3 seconds. 7.5 A = 75 % of I_{nom}. According to the diagram, the operating cycle is about 50 %. To = 3- (0.5 * 3) / 0.5 = 3
Maximum repeat time of the power boost is 3 seconds

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Output characteristics	
QS10.241	QS20.241

TECHNICAL DATA

INPUT DATA

Input voltage ac	100-240 V
Input voltage ac min	85 V AC
Input voltage ac max	276 V AC
Input voltage dc	110-150 V
Input voltage dc min	88 V DC
Input voltage dc max	187 V DC
Inrush current at 120 V ac typical	4 A
Inrush current at 230 V ac typical	7 A
Input voltage range	Wide-range
Power factor at 120 V ac, full load. Typical	0.98
Power factor at 230 V ac, full load. Typical	0.92
Number of phases	1

OUTPUT DATA

Output voltage	24 V DC
Output voltage min	24 V DC
Output voltage max	28 V DC
Output current	10 A
Power	240 W

EFFICIENCY / LIFETIME / MTBF

Efficiency at 120 V ac, full load, typical	92.6 %
Efficiency at 230 V ac, typical	92.4 %

Efficiency at 230 V ac, full load, typical	93.5 %
Lifetime at 120 V ac, full load and +40 ° C	68000 h
Lifetime at 230 V ac, full load and +40 ° C	71000 h
MTBF (IEC 61709) 230 V ac, max load, 40 ° C	581000 h

DIMENSIONS

Width	60 mm
Height	124 mm
Depth	117 mm
Weight	0.9 kg

OTHER

Approvals	ABS, CB, CE, CSA, GL, UL
Hold time at 120 V ac, typical full load	27 ms
Hold time at 230 V ac, typical full load	28 ms
IP class	IP20
Clamp type	Spring-clamp
Material protection	Aluminium
Supply frequency	50-60 ±6 %
Ripple max	50 mV pp
Series	Dimension Q
Power consumption 120 V ac	2.22 A
Power consumption 230 V ac	1.22 A
Power drop from +60 °C to + 70 °C	6 W/°C
Temperature min without derating	-25 °C
Temperature max without derating	60 °C

Type Power Supply	AC-DC
Active Transient	Yes
DC relay output	Yes

Fig. 6-1 Output voltage vs. output current, typ.

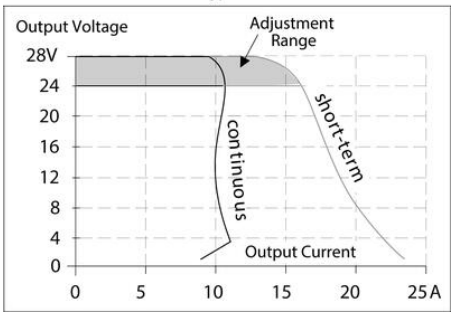


Fig. 15-1 Output current vs. ambient temp.

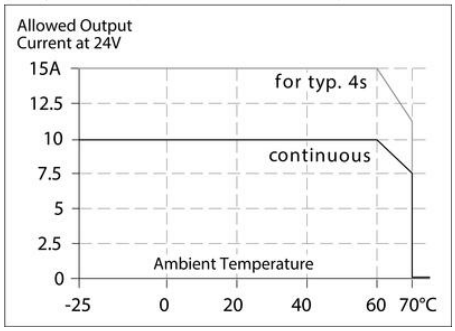


Fig. 9-2 Losses vs. output current at 24V, typ.

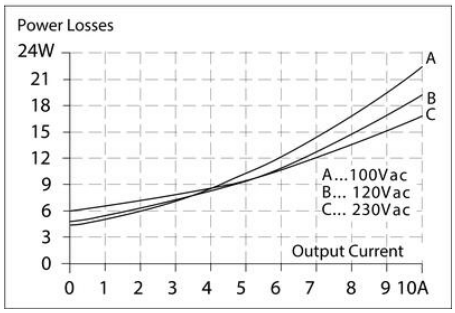


Fig. 9-1 Efficiency vs. output current at 24V, typ

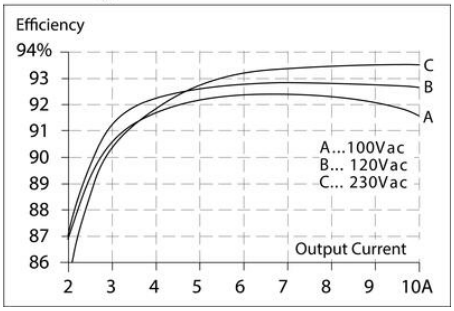
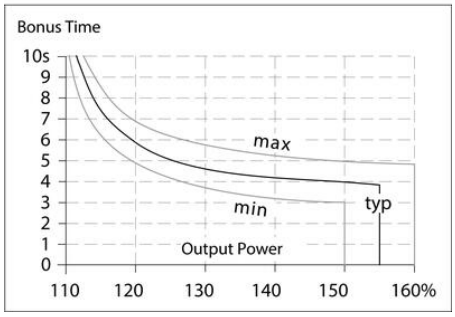


Fig. 6-2 Bonus time vs. output power



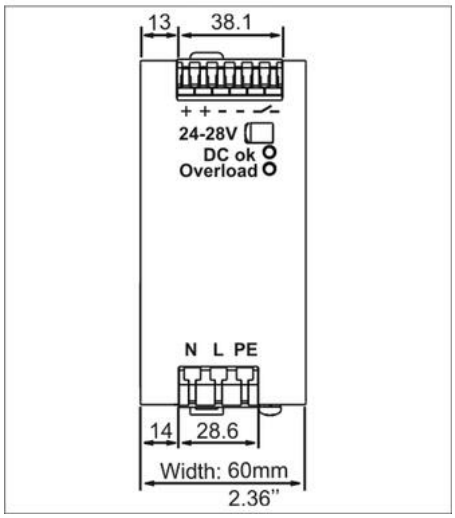
Maximal wire length *) for a fast (magnetic) tripping:

	0.75mm²	1.0mm²	1.5mm²	2.5mm²
C-2A	23m	29m	48m	69m
C-3A	20m	24m	38m	57m
C-4A	12m	16m	22m	33m
C-6A	5m	7m	9m	14m
C-8A	3m	4m	5m	7m
C-10A	2m	3m	4m	6m
C-13A	1m	1m	2m	2m
B-6A	11m	14m	24m	34m
B-10A	5m	8m	11m	18m
B-13A	4m	6m	8m	10m

*) Don't forget to consider twice the distance to the load (or cable length) when calculating the total wire length (+ and – wire).



Front view



Side view

