# 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 |

SPECIFICATIONS

| | |
|---|---|
| Active Transient | Yes |
| Approvals | ABS, CB, CE, CSA, GL, UL |
| DC relay output | Yes |
| Depth | 117 |
| Effect | 240 |
| Efficiency At 120 V AC, full load. Typical | 92.6 |
| Efficiency At 230 V AC, full load. Typical | 93.5 |
| Efficiency At 230 V AC. Typical | 92.4 |
| Height | 124 |
| Hold-up time at 120 V AC, full load. Typical. | 27 |
| Hold-up time at 230 V AC, full load. Typical. | 28 |
| Input voltage AC | 100-240 V |
| Input voltage ac max | 276 |
| Input voltage ac min | 85 |
| Input voltage DC | 110-150 V |
| Input voltage dc max | 187 |
| Input voltage dc min | 88 |
| Input voltage range | Wide-range |
| Inrush current at 120 V ac typical | 4 |
| Inrush current at 230 V ac typical | 7 |
| IP Class | IP20 |
| Lifetime at 120 V ac, full load and +40 ° C | 68000 |
| Lifetime at 230 V ac, full load and +40 ° C | 71000 |

| | |
|---|---|
| MTBF (IEC 61709) 230 V AC, Maximum Load, 40 ° C | 581000 |
| Number of phases | 1 |
| Output Current | 10 |
| Output voltage | 24 |
| Output voltage max | 28 |
| Output voltage min | 24 |
| Power Consumption At 120 V AC | 2.22 |
| Power Consumption At 230 V AC | 1.22 |
| Power Factor at 120 V AC, full load. Typical | 0.98 |
| Power Factor at 230 V AC, full load. Typical | 0.92 |
| Power Reduction Of 60 To 70 ° C | 6 |
| Ripple. max | 50 |
| Series | Dimension Q |
| Supply Frequency | 50-60 ±6 % |
| Temperature Range Without Derating From | -25 |
| Temperature Range Without Derating To | 60 |
| Weight | 0.9 |
| Width | 60 |

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

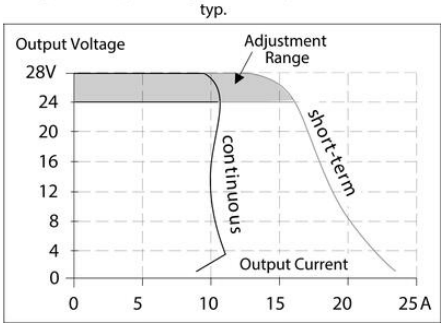



Fig. 15-1 Output current vs. ambient temp.

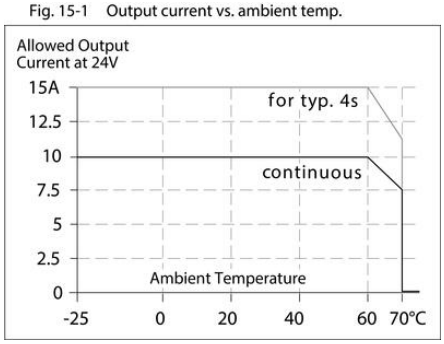



Fig. 9-2 Losses vs. output current at 24V, typ.

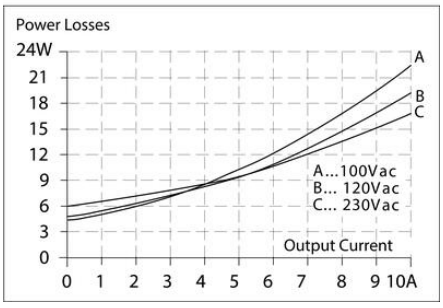



Fig. 9-1 Efficiency vs. output current at 24V, typ

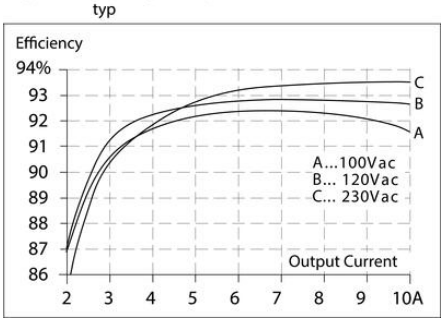
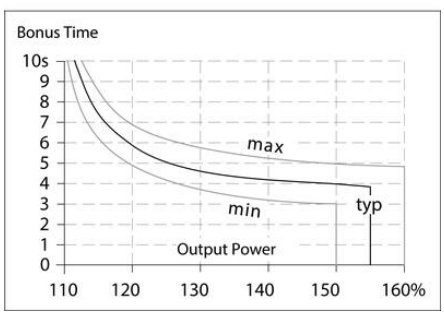



Fig. 6-2 Bonus time vs. output power

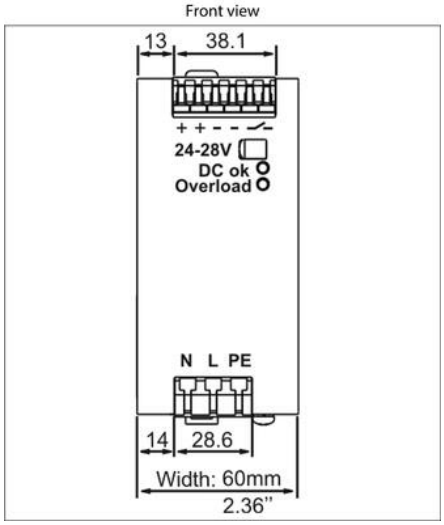


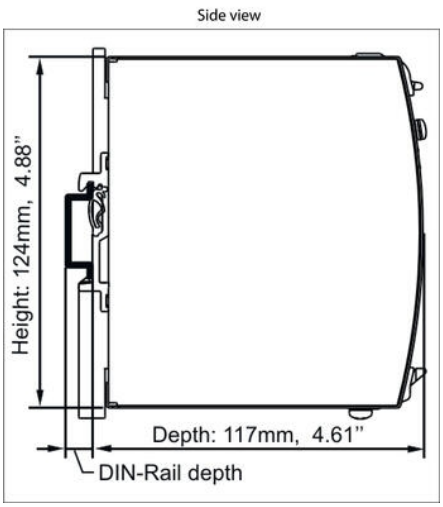

Maximal wire length *) for a fast (magnetic) tripping:

| | 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).


B
C
+ + − −
13 14
DC 24V
240W / 360W
DC ok
24 -
28V
D
DC ok
E
Overload
F
PULS
DIMENSION
QS10
Power Supply
AC 100-240V
N L
A


Front view
13
38.1
+ + - -
24-28V
DC ok
Overload
N L PE
14
28.6
Width: 60mm
2.36"


Side view
Height: 124mm, 4.88"
Depth: 117mm, 4.61"
DIN-Rail depth