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# POWER SUPPLY 1-PHASE, 48 V DC DIMENSION Q SERIES

QS40.481
PSU 100-240V ac I/P 48V dc 20A 960W O/P




- Output current of 20 A
- Up to 95% efficiency
- High short-circuit currents
- Maximum performance
- Remote Function

## PRODUCT DESCRIPTION

Pulse Dimension Q is a series power supply with very high performance. The efficiency is high over a wide load range, which results in reduced power consumption and longer life regardless of load current. The average efficiency is 94.2% with a peak of 95%. The power loss at idle is only 12 W.

The bonus power provides 50% extra reserve with retained 48 V DC (30 A) which is an advantage when connected loads have high starting currents and to bridge temporary current peaks. The bonus power is limited to 4 seconds to avoid constant overloading of the power supply and wiring. In addition to the bonus effect leave the unit a very high short-circuit current (ms) that helps to secondary fuses. If the overload remains after 4 sec. Ports end in the so called, hiccup mode. When the output voltage drops below 40 V dc shut the unit by the end of the 18's. And then make a new start attempt. If the overload / short connection is gone restarts the power supply automatically. If the overload / short circuit persists, the unit output current of approx. 2 sec and then again turn off.

Heavy transient assure operation even at very störrik electrical environment and also has QS40.484 active inrush current protection, which means a very low starting current, even if the unit has been in operation for a longer time. Especially useful for redundant / parallel-connected systems.

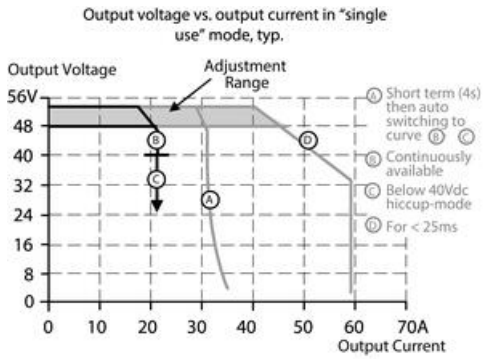
Simple diagnostics via DC-OK relay that falls on the output voltage deviates more than 10% from the set value, a green LED indicates DC-OK, Red LED indicates overload.

The unit can also be remote controlled for on/off function. Three different installation options available, see the "Technical data". Can be used instead of expensive DC contactors when you need to break up the 48 V side (NB. The remote control function has no safety circuit and therefore should not be used in the security context).

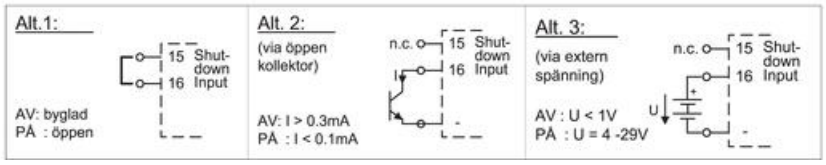
Active PFC reduces power consumption, harmonics close to zero and in addition, the power distribution in phases much smoother at power asymmetry.

We recommend free space of 40 mm over 20 mm below the unit, as well as 15 mm on the sides.

Output charcteristic

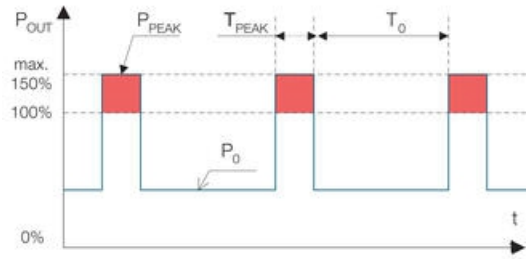
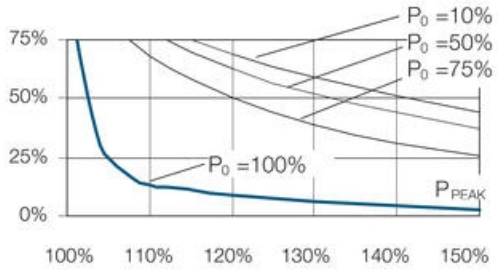
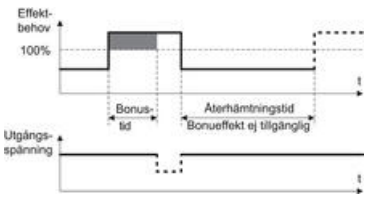
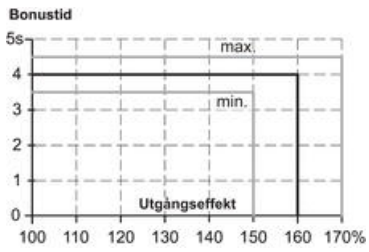



Remote control function




Bonus power

The power supply has a bonus power that enables high power output with maintained 48 V DC for 4 seconds, which is a big advantage when connected loads have high starting current, e.g. motors. How often you can use the bonus power depends on the application. With the diagram and formula below you can calculate the available repeat time for each application. Bonus power is available as soon as the power supply starts and immediately 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 |

E.g. Peak current (Ppeak) is 25A =125 %. Peak time is 3 seconds. Nominal load current (Po) is 15A. 15A =75 % of $I_{nom}$. According to the diagram the operating cycle is about 0.45. To=3 - (0.45*3) / 0.45=3.6. Maximal repeat time of the bonus power is 3.6 seconds

Switching




| Function | Overload LED | DC OK LED | DC OK relay contact |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Normal operation | Off | On | Closed |
| During bonus power output | Off | On | Closed |
| Overload (Hick-up) | Blinks | Off | Open |
| Short circuit | Blinks | Off | Open |
| Over temperature | Blinks | Off | Open |
| Remote shutdown | Blinks | Off | Open |
| No input voltage | Off | Off | Open |

# TECHNICAL DATA

## INPUT DATA

| | |
|---|---|
| **Input voltage ac** | 100-240 V |
| **Input voltage ac min** | 90 V AC |
| **Input voltage ac max** | 264 V AC |
| **Inrush current at 120 V ac typical** | 17 A |
| **Inrush current at 230 V ac typical** | 11 A |
| **Input voltage range** | Wide-range |
| **Power factor at 120 V ac, full load. Typical** | 0.99 |
| **Power factor at 230 V ac, full load. Typical** | 0.99 |
| **Number of phases** | 1 |

## OUTPUT DATA

| | |
|---|---|
| **Output voltage** | 48 V DC |
| **Output voltage min** | 48 V DC |
| **Output voltage max** | 54 V DC |
| **Output current** | 20 A |
| **Power** | 960 W |

## EFFICIENCY / LIFETIME / MTBF

| | |
|---|---|
| **Efficiency at 120 V ac, full load, typical** | 93.9 % |
| **Efficiency at 230 V ac, typical** | 93.9 % |
| **Efficiency at 230 V ac, full load, typical** | 95 % |
| **Lifetime at 120 V ac, full load and +40 ° C** | 68000 h |
| **Lifetime at 230 V ac, full load and +40 ° C** | 90000 h |
| **MTBF (IEC 61709) 230 V ac, max load, 40 ° C** | 300000 h |

## DIMENSIONS

| | |
|---|---|
| **Width** | 125 mm |
| **Height** | 124 mm |
| **Depth** | 127 mm |
| **Weight** | 1.9 kg |

## OTHER

| | |
|---|---|
| **Approvals** | ABS, CB, CE, CSA, EX, GL, IECEx, UL |
| **Hold time at 120 V ac, typical full load** | 27 ms |
| **Hold time at 230 V ac, typical full load** | 27 ms |
| **IP class** | IP20 |
| **Clamp type** | Spring-clamp |
| **Material protection** | Aluminium |
| **Supply frequency** | 50-60 ±6 % |
| **Ripple max** | 150 mV pp |
| **Series** | Dimension Q |
| **Power consumption 120 V ac** | 8.6 A |
| **Power consumption 230 V ac** | 4.5 A |
| **Power drop from +60 °C to + 70 °C** | 24 W/°C |
| **Temperature min without derating** | -25 °C |
| **Temperature max without derating** | 60 °C |

| | |
|---|---|
| **Type Power Supply** | AC-DC |
| **DC relay output** | Yes |

Fig. 6-1 **Output voltage vs. output current in "single use" mode, typ.**

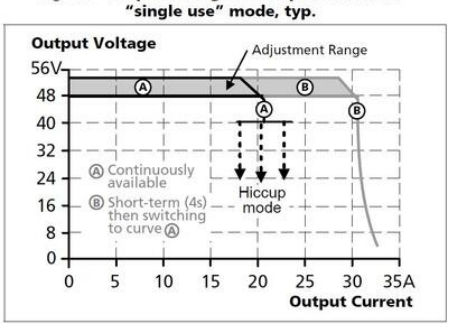



Fig. 6-4 **Dynamic overcurrent capability, typ.**

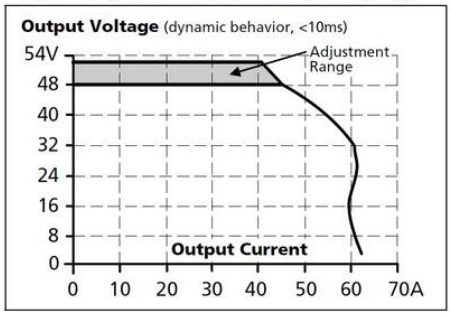



Fig. 12-1 **Efficiency vs. output current at 48V, typ.**

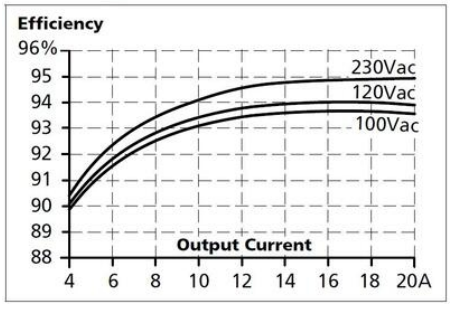


Fig. 12-2 **Losses vs. output current at 48V, typ.**

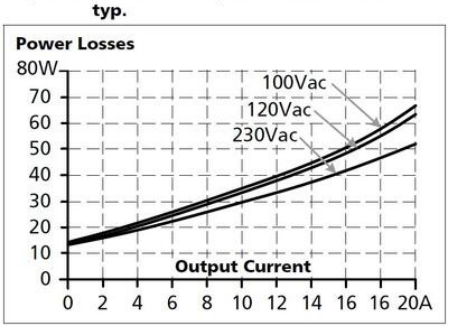



Fig. 18-1 **Output current vs. ambient temp.**

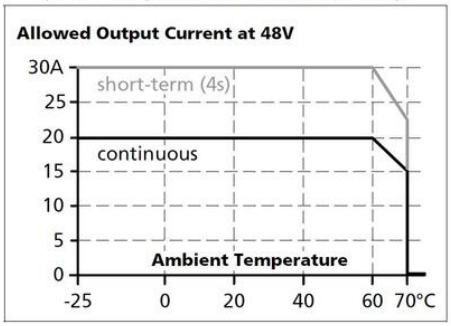
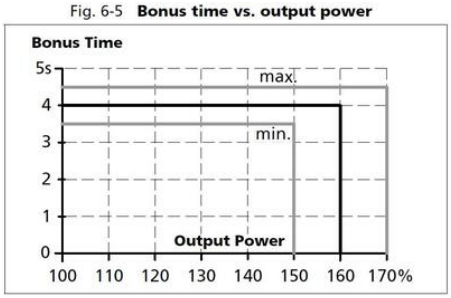



Fig. 6-5 **Bonus time vs. output power**




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

| | 0.75mm² | 1.0mm² | 1.5mm² | 2.5mm² |
|---|---|---|---|---|
| **C-2A** | 68m | 89m | >100m | >100m |
| **C-3A** | 53m | 75m | >100m | >100m |
| **C-4A** | 44m | 57m | 88m | >100m |
| **C-6A** | 18m | 25m | 38m | 58m |
| **C-8A** | 9m | 12m | 18m | 24m |
| **C-10A** | 8m | 11m | 16m | 23m |
| **C-13A** | 4m | 5m | 8m | 12m |
| **B-6A** | 39m | 50m | 74m | >100m |
| **B-10A** | 21m | 29m | 44m | 68m |
| **B-13A** | 13m | 21m | 34m | 52m |
| **B-16A** | 7m | 9m | 13m | 17m |
| **B-20A** | 2m | 3m | 4m | 5m |

Fig. 6-3 **Short-circuit on output, Hiccup$^{PLUS}$ mode, typ.**

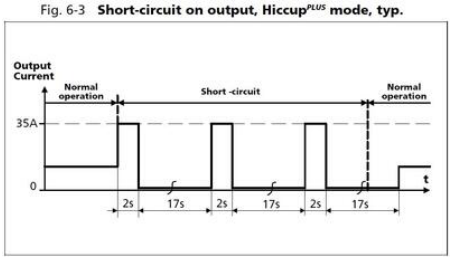



Fig. 16-1 **Front side**

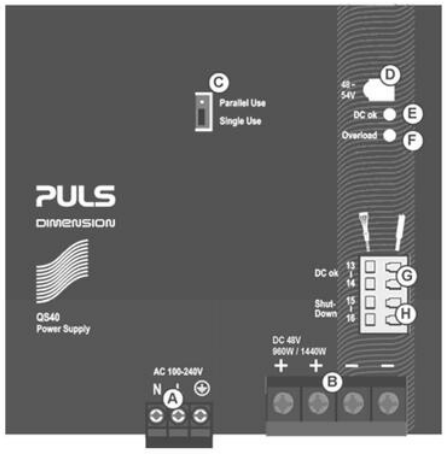



Fig. 23-1 **Front view**

