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POWER SUPPLY 1-PHASE, 24 V DC DIMENSION Q SERIES, 40A

QS40.241
PSU 100-240V ac I/P 24V dc 40A 960W O/P



- Output current 40 A
- Up to 94.6% efficiency
- High short-circuit currents
- Remote function
- Protective filters

PRODUCT DESCRIPTION

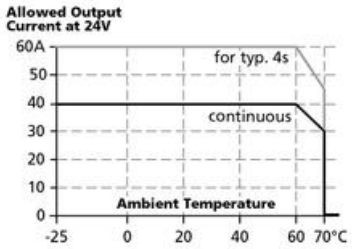
Pulse Dimension Q is a series power supply with very high performance. The efficiency is high over a wide load range, which results in reduced power consumption and longer life regardless of load current. An average efficiency is 93.8% with a peak value of 94.6%. The power loss at idle is only 12 W.

The bonus power provides 50% extra reserve with retained 24 V dc (60 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 (for a number of milliseconds) 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 21 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.

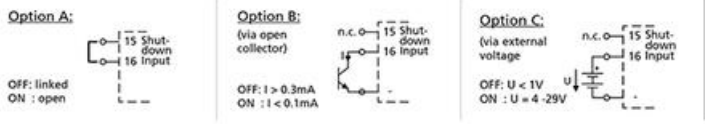
Heavy transient ensure operation also in very störrik electrical environment and also has QS40.244 active inrush current protection, which means a very low starting current, even if the unit has been in operation for a longer time. Especially useful for redundant / parallel-connected systems.

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, the red LED indicates overload.
The unit can also be remote controlled for on / off function, three different connection options available. Can be used instead of expensive DC contactors when you need to break up the 24 VDC side. Note. remote control function has no safety circuit and therefore should not be used in the security context.
Active PFC reduces power consumption and harmonics close to zero. Moreover, the current distribution in the phases were much more even at the voltage asymmetry.

Output characteristics

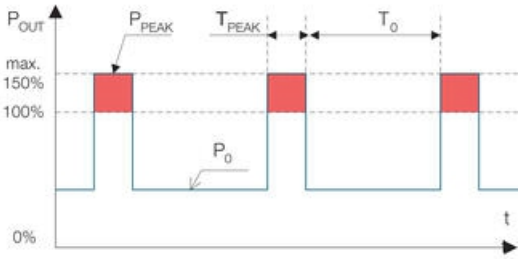
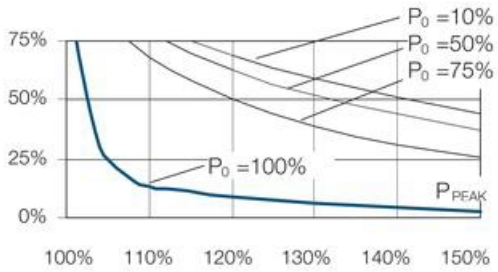
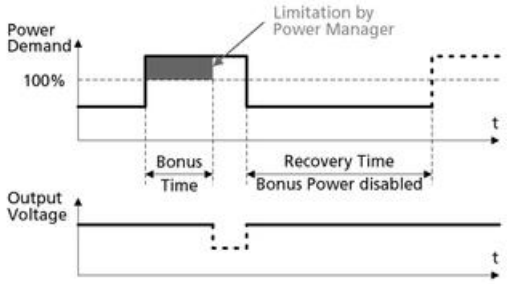
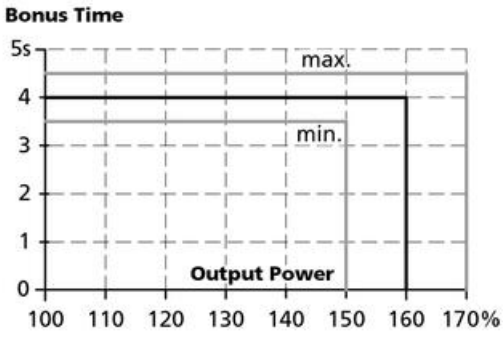


Remote function



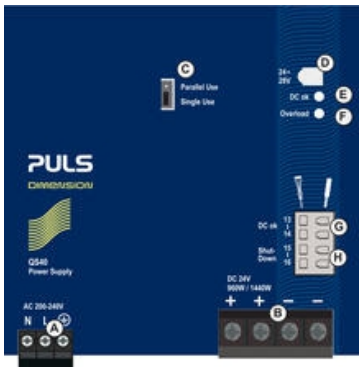
Bonus power

The power supply 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, for example. engines. How often you can use the bonus effect depends on the application. With the below chart and formula estimated the repeat time available for each individual application. The bonus power is available as soon as the power supply is started and after a short circuit

Bonus power	Work cycle
	
	

P_o	Nominal load current
P_{peak}	Peak current
T_o	Time between bonus effect
T_{peak}	Peak current time
Work cycle	$T_{peak}/(T_{peak}+T_o)$
T_o=	T_{peak}-(duty cycle)*T_{peak})/work cycle

Ex. Peak current (Ppeak) 50 A = 125%. Peak time is 3 seconds. Nominal load current (Po) is 30 A. 30 A = 75% of In. According to the diagram, the working cycle about 0.45. To = 3 - (0.45 * 3) / 0.45 = 3.6. Maximum repeat time of bonus power is 3.6 seconds.



Indicators	Overload LED	DC-OK LED	DC-OK contact
Normal operation	Off	On	Closed
During bonus poweroutput	Off	On	Closed
Overload (Hick-up)	Flashing	Off	Open
Short circuit	Flashing	Off	Open
Over temperature	Flashing	Off	Open
Remote shutdown	Flashing	Off	Open
No input voltage	Off	Off	Open

Ex. Peak current (Ppeak) 50 A = 125%. Peak time is 3 seconds. Nominal load current (Po) is 30 A. 30 A = 75% of In. According to the diagram, the working cycle about 0.45. To = 3 - (0.45 * 3) / 0.45 = 3.6. Maximum repeat time of bonus power is 3.6 seconds.

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	24 V DC
Output voltage min	24 V DC
Output voltage max	28 V DC
Output current	40 A
Power	960 W

EFFICIENCY / LIFETIME / MTBF

Efficiency at 120 V ac, full load, typical	93.6 %
Efficiency at 230 V ac, typical	93.9 %
Efficiency at 230 V ac, full load, typical	94.6 %
Lifetime at 120 V ac, full load and +40 ° C	64000 h
Lifetime at 230 V ac, full load and +40 ° C	84000 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, ATEX, CB, CE, CSA, 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 Hz +-6%
Ripple max	100 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.

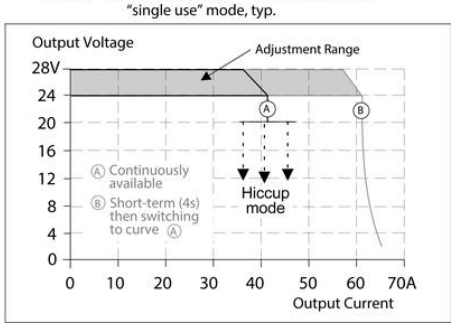
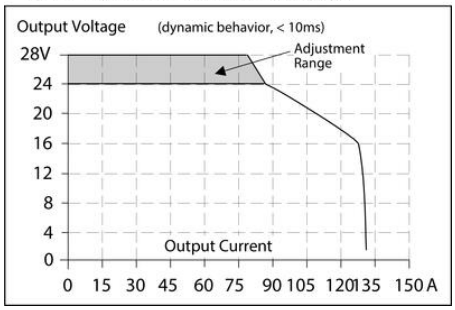


Fig. 6-4 Dynamic overcurrent capability, typ.



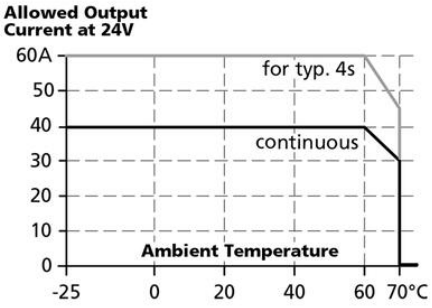


Fig. 12-2 Losses vs. output current at 24V, typ.

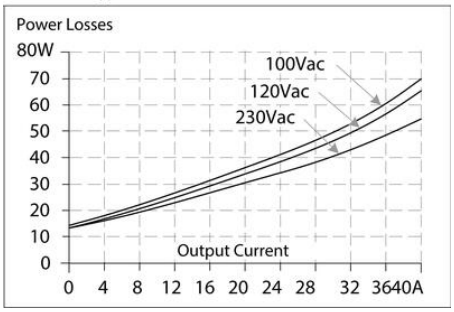
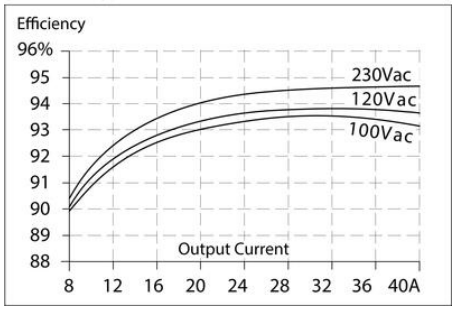


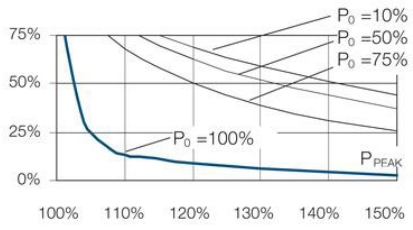
Fig. 12-1 Efficiency vs. output current at 24V, typ.

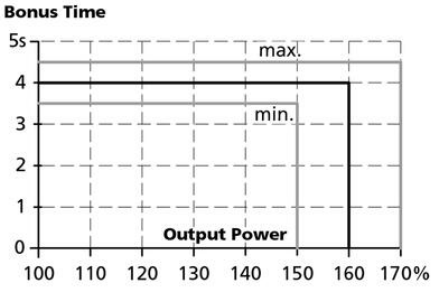


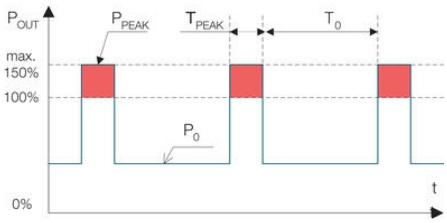
Maximal wire length*) for a fast (magnetic) tripping:

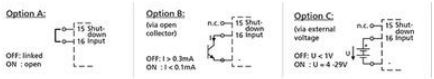
	0.75mm²	1.0mm²	1.5mm²	2.5mm²
C-2A	29m	38m	54m	86m
C-3A	27m	34m	48m	78m
C-4A	19m	26m	38m	58m
C-6A	10m	15m	21m	34m
C-8A	8m	12m	18m	28m
C-10A	7m	11m	16m	26m
C-13A	4m	6m	8m	13m
B-6A	19m	25m	35m	55m
B-10A	11m	17m	24m	40m
B-13A	10m	13m	21m	29m
B-16A	7m	11m	15m	24m
B-20A	5m	7m	9m	16m

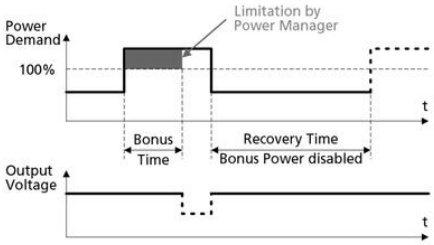
*) Don't forget to consider twice the distance to the load (or cable length) when calculating the total wire length (+ and – wire).

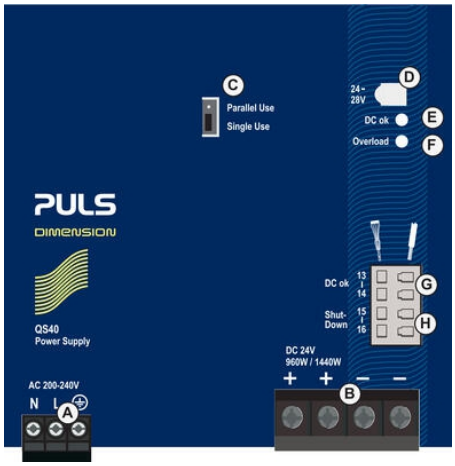


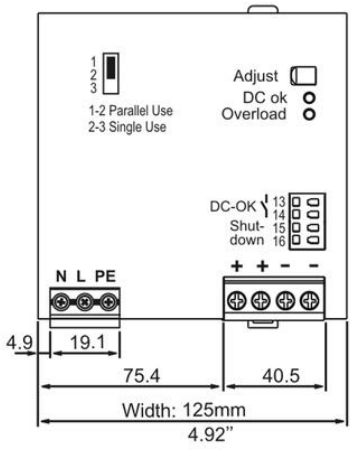


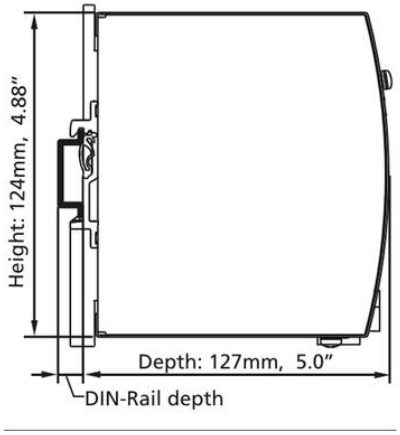





Power Demand
100%
Limitation by Power Manager
t
Bonus Time
Recovery Time
Bonus Power disabled
Output Voltage
t


C
Parallel Use
Single Use
24-28V
D
DC ok
E
Overload
F
PULS
DIMENSION
QS40
Power Supply
DC ok
13
14
Shut-Down
15
16
G
H
DC 24V
960W / 1440W
+ + − −
B
AC 200-240V
N L
A


1
2
3
1-2 Parallel Use
2-3 Single Use
Adjust
DC ok
Overload
DC-OK
Shut-down
13
14
15
16
N L PE
+ + − −
4.9
19.1
75.4
40.5
Width: 125mm
4.92”


Height: 124mm, 4.88”
Depth: 127mm, 5.0”
DIN-Rail depth