# POWER SUPPLY 3-PHASE, 48 V DC DIMENSION Q SERIES 20A

QT40.481 PSU 3PH 380-480V ac I/P 48V dc 20A 960W O/P

- . Output current of 20 A
- Up to 95.3% efficiency
- · Integrated primary fuses
- · High short-circuit currents
- Maximum performance





### Product description

Pulse Dimension Q is a series power supply with very high performance. QT40.481 have built primary fuses that make it possible to connect the unit without the need for intermediate fuses up to 32 A (UL) which saves space and money. 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 94.7% with a peak value of 95.4%.

The power loss at idle is very low, 9.5 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. See technical data for example.

Active transient ensure operation also in very störrik electrical environment, also have QT40.481 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 (remote control function has no safety circuit and therefore should not be used in the security context).

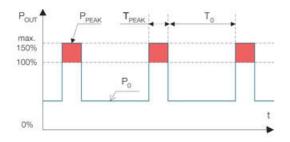
Active PFC reduces power consumption, harmonics close to zero, in addition, the power distribution in phases much smoother at power asymmetry. In parallel, the output voltage to be adjusted to the same value on both units (± 100 mV) in single mode or let the factory settings on the unit apply to all units. After possible, adjustment of the output voltage, the switch in the front moved to the "parallel use". The units are now ready to work in parallel.

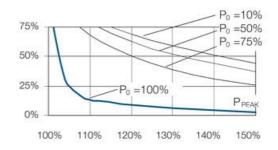
We recommend clearance of 40 mm, 20 mm below the unit and 5 mm on the sides.

#### 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 characteristics

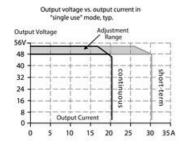




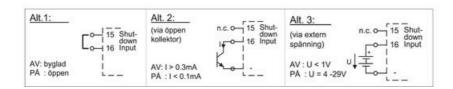
Po	Nominal load current
Ppeak	Peak current
То	Time between bonus power
Tpeak	Peak current I time
Operating cycle	Tpeak/ (Tpeak+To)
To=	Tpeak- (operating cycle*Tpeak) / operating cycle

E.g. Peak current (Ppeak) is 25A = 125 %. Peak time is 3 seconds. Nominal load current (Po) is 15A. 15 A = 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.

### Output characteristics



Remote control function This function permits outputs to be shut down by means of an external signals from e.g. a control system or button. Shutdown occurs immediately and to restart has a delay of about 350 ms. In a shutdown state the output voltage is below 2 V DC and the power is less than 0.5 W.



## Specifications

Active Transient	Yes
Approvals	CB, CE, CSA, GL, UL

DC rolay output         Yes           Depth         127           Effect         960           Efficiency At 400 V AC, full load. Typical         95.4           Efficiency At 400 V AC, full load. Typical         124           Height         124           Hold-up time at 400 V AC, full load. Typical.         25           Input voltage AC         300.480 V           Input voltage ac max         576           Input voltage range         Wride-range           Invus voltage range         Wride-range           Invus voltage range         1920           Invus voltage range         8000           If Class         1920           Iffettime at 400 V ac, full load and +0° C         80000           Material Protection         Available of phases           Output voltage         375000           Number of phases         3           Output voltage         48           Output voltage min         48           Power Consumption at 400 V ac, full load. Typical         3.8           Power Reduction Of 60 To 70° C         24           Ripple. max         15           Series         Dimension Q           Supply Frequency         5-6-0-4-6           Fro	Clamp type	Spring-clamp
Effect         960           Efficiency At 400 V AC, full load. Typical         95.4           Efficiency At 400 V AC, Typical         94.7           Height         124           Hold-up time at 400 V AC, full load. Typical.         25           Input voltage AC         380-480 V           Input voltage a max         576           Input voltage a cmin         323           Input voltage range         Wide-range           Inrush current at 400 V ac typical         5           IP Class         1P20           Lifetime at 400 V ac, full load and +40 ° C         86000           Material Protection         Aluminum           MTBF (IEC 61709) 400 V ac, max loan, +40 °C         375000           Number of phases         3           Output Current         20           Output voltage max         54           Output voltage min         48           Power Factor at 400 V AC, full load. Typical         8.8           Power Reduction Of 60 To 70 ° C         24           Ripple, max         10           Series         Dimension Q           Supply Frequency         50.60 ±6 %           Temperature Range Without Derating From         25           Temperature Range Without Derating Fr	DC relay output	Yes
Efficiency At 400 V AC, Tujl load. Typical         95.4           Efficiency At 400 V AC. Typical         94.7           Height         124           Hold-up time at 400 V AC, full load. Typical.         25           Input voltage AC         380-480 V           Input voltage ac max         576           Input voltage ac min         323           Input voltage range         Wide-range           Inrush current at 400 V ac typical         5           IP Class         IP20           Material Protection         Aluminium           MTBF (IEC 61709) 400 V ac, max loan, +40 °C         375000           Number of phases         3           Output Voltage         48           Output voltage max         54           Output voltage max         54           Output voltage max         54           Over consumption at 400 V ac         1.65           Power Factor at 400 V AC, full load. Typical         0.88           Power Reduction Of 60 To 70 ° C         24           Ripple. max         150           Series         Dimension Q           Supply Frequency         50-60 ±6 %           Temperature Range Without Derating From         25           Temperature Range Without Derating Fro	Depth	127
Efficiency At 400 V AC. Typical         94.7           Height         124           Hold-up time at 400 V AC, full load. Typical.         25           Input voltage AC         380-480 V           Input voltage ac max         576           Input voltage ac min         323           Input voltage ange         Wide-range           Inrush current at 400 V ac typical         5           IP Class         IP20           Lifetime at 400 V ac, full load and +40 ° C         86000           Material Protection         Aluminium           MTBF (IEC 61708) 400 V ac, max loan, +40 °C         375000           Number of phases         3           Output Current         20           Output voltage         48           Output voltage max         54           Output voltage min         48           Power Factor at 400 V Ac, full load. Typical         0.88           Power Reduction Of 60 To 70 ° C         24           Ripple. max         150           Series         Dimension Q           Supply Frequency         50-80 ±6 %           Temperature Range Without Derating From         -25           Temperature Range Without Derating To         60           Type Power Supply <t< th=""><th>Effect</th><th>960</th></t<>	Effect	960
Height         124           Hold-up time at 400 V AC, full load. Typical.         25           Input voltage AC         380-480 V           Input voltage ac max         576           Input voltage ac min         323           Input voltage range         Wide-range           Invash current at 400 V ac typical         5           IP Class         IP20           Lifetime at 400 V ac, full load and +40 ° C         86000           Material Protection         Aluminium           MTBF (IEC 61709) 400 V ac, max loan, +40 °C         375000           Number of phases         3           Output Voltage         48           Output voltage max         54           Output voltage max         54           Power Consumption at 400 V ac, full load. Typical         0.88           Power Factor at 400 V AC, full load. Typical         0.88           Power Reduction Of 60 To 70 ° C         24           Ripple, max         150           Series         Dimension Q           Supply Frequency         50-60-26 %           Temperature Range Without Derating From         -25           Temperature Range Without Derating To         60           Type Power Supply         AC-DC           Weight </th <th>Efficiency At 400 V AC, full load. Typical</th> <th>95.4</th>	Efficiency At 400 V AC, full load. Typical	95.4
Hold-up time at 400 V AC, full load. Typical.         25           Input voltage AC         380-480 V           Input voltage ac max         576           Input voltage ac min         323           Input voltage range         Wide-range           Inrush current at 400 V ac typical         5           IP Class         IP20           Lifetime at 400 V ac, full load and +40 °C         86000           Material Protection         Aluminium           MTBF (IEC 61709) 400 V ac, max loan, +40 °C         375000           Number of phases         3           Output Current         20           Output voltage         48           Output voltage max         54           Output voltage min         48           Power Consumption at 400 V ac         1.65           Power Reduction Of 60 To 70 ° C         24           Ripple, max         150           Series         Dimension Q           Supply Frequency         50-60 ±6 %           Temperature Range Without Derating From         -25           Temperature Range Without Derating To         60           Weight         1.5	Efficiency At 400 V AC. Typical	94.7
Input voltage AC         380-480 V           Input voltage ac max         576           Input voltage ac min         323           Input voltage range         Wide-range           Inrush current at 400 V ac typical         5           IP Class         IP20           Lifetime at 400 V ac, full load and +40 ° C         86000           Material Protection         Aluminium           MTBF (IEC 61799) 400 V ac, max loan, +40 ° C         375000           Number of phases         3           Output Current         20           Output voltage         48           Output voltage max         54           Output voltage min         48           Power Consumption at 400 V ac         1.65           Power Reduction Of 60 To 70 ° C         24           Ripple. max         150           Series         Dimension Q           Supply Frequency         50-60 ±6 %           Temperature Range Without Derating From         -25           Temperature Range Without Derating From         -25           Type Power Supply         AC-DC           Weight         1.5	Height	124
Input voltage ac max Input voltage ac min Input voltage range Inrush current at 400 V ac typical IP20 Ilfetime at 400 V ac, full load and +40 ° C Material Protection MtBF (IEC 61709) 400 V ac, max loan, +40 °C Input voltage of phases Input voltage Inrush current Intush curren	Hold-up time at 400 V AC, full load. Typical.	25
Input voltage ac min         323           Input voltage range         Wide-range           Inrush current at 400 V ac typical         5           IP Class         IP20           Lifetime at 400 V ac, full load and +40 ° C         86000           Material Protection         Aluminium           MTBF (IEC 61709) 400 V ac, max loan, +40 °C         375000           Number of phases         3           Output Current         20           Output voltage         48           Output voltage max         54           Output voltage min         48           Power consumption at 400 V ac         1.65           Power Reduction Of 60 To 70 ° C         24           Ripple. max         150           Series         Dimension Q           Supply Frequency         50-60 ±6 %           Temperature Range Without Derating From         -25           Temperature Range Without Derating To         60           Type Power Supply         AC-DC           Weight         1.5	Input voltage AC	380-480 V
Input voltage range         Wide-range           Inrush current at 400 V ac typical         5           IP Class         IP20           Lifetime at 400 V ac, full load and +40 °C         86000           Material Protection         Aluminium           MTBF (IEC 61709) 400 V ac, max loan, +40 °C         375000           Number of phases         3           Output Current         20           Output voltage         48           Output voltage max         54           Output voltage min         48           Power consumption at 400 V ac         1.65           Power Factor at 400 V AC, full load. Typical         0.88           Power Reduction Of 60 To 70 ° C         24           Ripple. max         150           Series         Dimension Q           Supply Frequency         50-60 ±6 %           Temperature Range Without Derating From         -25           Temperature Range Without Derating To         60           Type Power Supply         AC-DC           Weight         1.5	Input voltage ac max	576
Inrush current at 400 V ac typical         5           IP Class         IP20           Lifetime at 400 V ac, full load and +40 ° C         86000           Material Protection         Aluminium           MTBF (IEC 61709) 400 V ac, max loan, +40 °C         375000           Number of phases         3           Output Current         20           Output voltage         48           Output voltage max         54           Output voltage min         48           Power consumption at 400 V ac         1.65           Power Reduction Of 60 To 70 ° C         24           Ripple. max         150           Series         Dimension Q           Supply Frequency         50-60 ±6 %           Temperature Range Without Derating From         -25           Temperature Range Without Derating To         60           Type Power Supply         AC-DC           Weight         1.5	Input voltage ac min	323
IP Class Lifetime at 400 V ac, full load and +40 ° C Material Protection Aluminium MTBF (IEC 61709) 400 V ac, max loan, +40 °C Number of phases 3 Output Current 20 Output voltage AB Output voltage max 54 Output voltage min 48 Power consumption at 400 V ac 1.85 Power Factor at 400 V AC, full load. Typical Bries Power Reduction Of 60 To 70 ° C Ripple. max 150 Series Dimension Q Supply Frequency 50-60 ±6 % Temperature Range Without Derating From Type Power Supply AC-DC Weight 1.5	Input voltage range	Wide-range
Lifetime at 400 V ac, full load and +40 ° C         86000           Material Protection         Aluminium           MTBF (IEC 61709) 400 V ac, max loan, +40 °C         375000           Number of phases         3           Output Current         20           Output voltage         48           Output voltage max         54           Output voltage min         48           Power consumption at 400 V ac         1.65           Power Factor at 400 V AC, full load. Typical         0.88           Power Reduction Of 60 To 70 ° C         24           Ripple. max         150           Series         Dimension Q           Supply Frequency         50-60 ±6 %           Temperature Range Without Derating From -25         -25           Temperature Range Without Derating To         60           Type Power Supply         AC-DC           Weight         1.5	Inrush current at 400 V ac typical	5
Material ProtectionAluminiumMTBF (IEC 61709) 400 V ac, max loan, +40 °C375000Number of phases3Output Current20Output voltage48Output voltage max54Output voltage min48Power consumption at 400 V ac1.65Power Factor at 400 V AC, full load. Typical0.88Power Reduction Of 60 To 70 ° C24Ripple. max150SeriesDimension QSupply Frequency50-60 ±6 %Temperature Range Without Derating From-25Temperature Range Without Derating To60Type Power SupplyAC-DCWeight1.5	IP Class	IP20
MTBF (IEC 61709) 400 V ac, max loan, +40 °C375000Number of phases3Output Current20Output voltage48Output voltage max54Output voltage min48Power consumption at 400 V ac1.65Power Factor at 400 V AC, full load. Typical0.88Power Reduction Of 60 To 70 ° C24Ripple. max150SeriesDimension QSupply Frequency50-60 ±6 %Temperature Range Without Derating From-25Temperature Range Without Derating To60Type Power SupplyAC-DCWeight1.5	Lifetime at 400 V ac, full load and +40 ° C	86000
Number of phases  Output Current  Output voltage  48  Output voltage max  54  Output voltage min  48  Power consumption at 400 V ac  1.65  Power Factor at 400 V AC, full load. Typical  Power Reduction Of 60 To 70 ° C  Ripple. max  150  Series  Dimension Q  Supply Frequency  50-60 ±6 %  Temperature Range Without Derating From  725  Temperature Range Without Derating To  60  Type Power Supply  AC-DC  Weight	Material Protection	Aluminium
Output Current20Output voltage48Output voltage max54Output voltage min48Power consumption at 400 V ac1.65Power Factor at 400 V AC, full load. Typical0.88Power Reduction Of 60 To 70 ° C24Ripple. max150SeriesDimension QSupply Frequency50-60 ±6 %Temperature Range Without Derating From-25Temperature Range Without Derating To60Type Power SupplyAC-DCWeight1.5	MTBF (IEC 61709) 400 V ac, max loan, +40 °C	375000
Output voltage48Output voltage max54Output voltage min48Power consumption at 400 V ac1.65Power Factor at 400 V AC, full load. Typical0.88Power Reduction Of 60 To 70 ° C24Ripple. max150SeriesDimension QSupply Frequency50-60 ±6 %Temperature Range Without Derating From-25Temperature Range Without Derating To60Type Power SupplyAC-DCWeight1.5	Number of phases	3
Output voltage max  Output voltage min  48  Power consumption at 400 V ac  1.65  Power Factor at 400 V AC, full load. Typical  O.88  Power Reduction Of 60 To 70 ° C  Ripple. max  150  Series  Dimension Q  Supply Frequency  50-60 ±6 %  Temperature Range Without Derating From  Type Power Supply  AC-DC  Weight  54  48  60  1.65  D.88  C.88  C.	Output Current	20
Output voltage min 48  Power consumption at 400 V ac 1.65  Power Factor at 400 V AC, full load. Typical 0.88  Power Reduction Of 60 To 70 ° C 24  Ripple. max 150  Series Dimension Q  Supply Frequency 50-60 ±6 %  Temperature Range Without Derating From -25  Temperature Range Without Derating To 60  Type Power Supply AC-DC  Weight 1.5	Output voltage	48
Power Consumption at 400 V ac  1.65  Power Factor at 400 V AC, full load. Typical  0.88  Power Reduction Of 60 To 70 ° C  24  Ripple. max  150  Series  Dimension Q  Supply Frequency  50-60 ±6 %  Temperature Range Without Derating From  -25  Temperature Range Without Derating To  60  Type Power Supply  AC-DC  Weight	Output voltage max	54
Power Factor at 400 V AC, full load. Typical  Power Reduction Of 60 To 70 ° C  Ripple. max  150  Series  Dimension Q  Supply Frequency  50-60 ±6 %  Temperature Range Without Derating From  -25  Temperature Range Without Derating To  60  Type Power Supply  AC-DC  Weight	Output voltage min	48
Power Reduction Of 60 To 70 ° C  Ripple. max  150  Series  Dimension Q  Supply Frequency  50-60 ±6 %  Temperature Range Without Derating From  -25  Temperature Range Without Derating To  60  Type Power Supply  AC-DC  Weight  1.5	Power consumption at 400 V ac	1.65
Ripple. max  Series  Dimension Q  Supply Frequency  50-60 ±6 %  Temperature Range Without Derating From -25  Temperature Range Without Derating To  60  Type Power Supply  AC-DC  Weight  1.5	Power Factor at 400 V AC, full load. Typical	0.88
Series Dimension Q  Supply Frequency 50-60 ±6 %  Temperature Range Without Derating From -25  Temperature Range Without Derating To 60  Type Power Supply AC-DC  Weight 1.5	Power Reduction Of 60 To 70 ° C	24
Supply Frequency50-60 ±6 %Temperature Range Without Derating From-25Temperature Range Without Derating To60Type Power SupplyAC-DCWeight1.5	Ripple. max	150
Temperature Range Without Derating From -25  Temperature Range Without Derating To 60  Type Power Supply AC-DC  Weight 1.5	Series	Dimension Q
Temperature Range Without Derating To 60  Type Power Supply AC-DC  Weight 1.5	Supply Frequency	50-60 ±6 %
Type Power Supply AC-DC Weight 1.5	Temperature Range Without Derating From	-25
Weight 1.5	Temperature Range Without Derating To	60
	Type Power Supply	AC-DC
Width 110	Weight	1.5
	Width	110

#### Output voltage vs. output current in "single use" mode, typ.

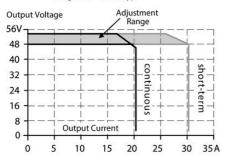


Fig. 6-4 Dynamic overcurrent capability, typ.

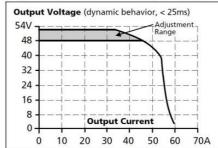


Fig. 17-1 Output current vs. ambient temp.

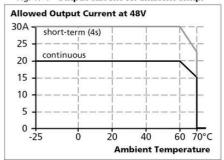


Fig. 6-3 Bonus time vs. output power

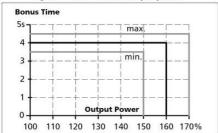


Fig. 11-1 Efficiency vs. output current at 48V,

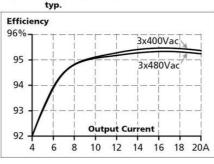
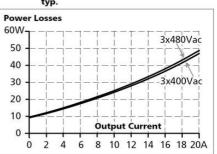


Fig. 11-2 Losses vs. output current at 48V, typ.



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

	0.75mm <sup>2</sup>	1.0mm <sup>2</sup>	1.5mm <sup>2</sup>	2.5mm <sup>2</sup>
C-2A	74m	89m	146m	190m
C-3A	57m	79m	128m	163m
C-4A	43m	52m	73m	116m
C-6A	19m	25m	27m	57m
C-8A	8m	12m	17m	25m
C-10A	6m	9m	13m	19m
C-13A	3m	5m	7m	10m
B-6A	38m	52m	76m	113m
B-10A	18m	26m	38m	55m
B-13A	12m	19m	29m	42m
B-16A	6m	8m	12m	20m
B-20A	1m	2m	4m	5m



Fig. 15-1 Front side

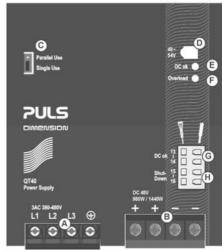
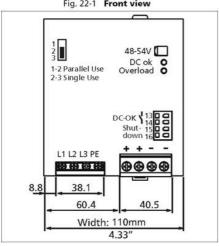
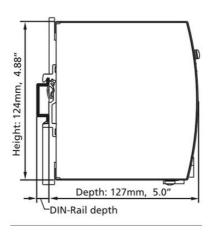


Fig. 22-1 Front view





Output voltage vs. output current in "single use" mode, typ.

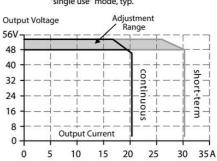


Fig. 6-4 Dynamic overcurrent capability, typ.

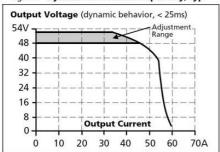


Fig. 17-1 Output current vs. ambient temp.

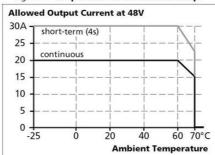


Fig. 6-3 Bonus time vs. output power

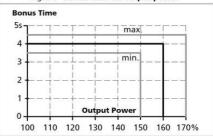


Fig. 11-1 Efficiency vs. output current at 48V, typ.

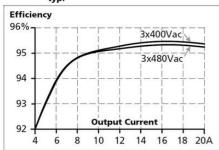
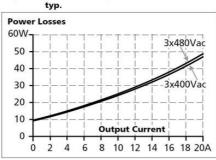


Fig. 11-2 Losses vs. output current at 48V,



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

	0.75mm <sup>2</sup>	1.0mm <sup>2</sup>	1.5mm <sup>2</sup>	2.5mm <sup>2</sup>
C-2A	74m	89m	146m	190m
C-3A	57m	79m	128m	163m
C-4A	43m	52m	73m	116m
C-6A	19m	25m	27m	57m
C-8A	8m	12m	17m	25m
C-10A	6m	9m	13m	19m
C-13A	3m	5m	7m	10m
B-6A	38m	52m	76m	113m
B-10A	18m	26m	38m	55m
B-13A	12m	19m	29m	42m
B-16A	6m	8m	12m	20m
B-20A	1m	2m	4m	5m



Fig. 15-1 Front side

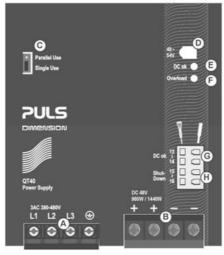


Fig. 22-1 Front view

