PULS

DIMENSION **Q-Series**

QT20.241, QT20.241-C1

24V, 20A, THREE PHASE INPUT

POWER SUPPLY

- 3AC 380-480V Wide-range Input
- Also Specified for 2-Phase Operation
- Extra Long Lifetime
- 95% Full Load and Excellent Partial Load Efficiencies
- Width only 65mm, Weight only 870g
- 50% BonusPower®, 720W for up to 4s
- Active Power Factor Correction PFC
- Active Filtering of Input Transients
- Full Power Between -25°C and +60°C
- Extremely Low Input Inrush Current Surge
- DC-OK Relay Contact
- Quick-connect Spring-clamp Terminals
- 3 Year Warranty

GENERAL DESCRIPTION

The most outstanding features of the DIMENSION Q-Series DIN-rail power supplies are the extremely high efficiencies and the compact sizes which are achieved by a synchronous rectification and other unique design details.

Large power reserves of 150% support the starting of heavy loads such as DC-motors or capacitive loads. In many cases this allows the use of a unit from a lower wattage class which saves space and money.

High immunity to transients and power surges as well as low electromagnetic emission makes usage in nearly every environment possible.

The integrated output power manager and virtually no input inrush current make installation and usage simple with no jumper and switches necessary. Diagnostics are easy due to the DC-ok relay, a green DC-OK LED and the red overload LED.

Unique quick-connect spring-clamp terminals allow a safe and fast installation and a large international approval package for a variety of applications makes this unit suitable for nearly every application.

SHORT-FORM DATA

Output voltage Adjustment range	DC 24V 24 - 28V	nominal
Output current	20 – 17.5A 30 – 26A	continuous short term (4s)
Output power	480W 720W	continuous short term (4s)
Output ripple	< 100mVpp	20Hz to 20MHz
Input voltage Mains frequency AC Input current Power factor AC Inrush current	3AC 380-480V 50-60Hz 0.79 / 0.65A 0.94 / 0.95 3A peak	±15% ±6% at 3x400 / 480Vac at 3x400 / 480Vac
Efficiency Losses	95.0 / 94.8% 25.3 / 26.4W	at 3x400 / 480Vac at 3x400 / 480Vac
Temperature range Derating	-25°C to +70°C 12W/°C	operational +60 to +70°C
Hold-up time	22 / 22ms	at 3x400 / 480Vac
Dimensions Weight	65x124x127mm 870g / 1.92lb	WxHxD

ORDER NUMBERS

Power Supply	**QT20.241**	24-28V Standard unit
	QT20.241-C1	24-28V Unit with conformal coated pc board
Accessory	ZM1.WALL	Wall mount bracket
	ZM14.SIDE	Side mount bracket
	UF20.241	Buffer unit
	YR40.241	Redundancy module

MARKINGS

c UL US LISTED IND. CONT. EQ.
UL 508

c US
UL 60950-1

c SP US
Class I Div 2

Power Standards Lab PSL SEMI F47

GL
Marine

CE
EMC, LVD

Apr. 2017 / Rev. 2.1 DS-QT20.241-EN
All parameters are typical values specified at 24V, 20A, 3x 400Vac, 50Hz, symmetrical mains voltages, 25°C ambient and after a 5 minutes run-in time unless otherwise noted.

INDEX

TERMINOLOGY AND ABREVIATIONS

PE and ⏚ symbol	PE is the abbreviation for **P**rotective **E**arth and has the same meaning as the symbol ⏚.
Earth, Ground	This document uses the term "earth" which is the same as the U.S. term "ground".
T.B.D.	To be defined, value or description will follow later.
AC 400V	A figure displayed with the AC or DC before the value represents a nominal voltage with standard tolerances included. E.g.: DC 12V describes a 12V battery disregarding whether it is full (13.7V) or flat (10V)
400Vac	A figure with the unit (Vac) at the end is a momentary figure without any additional tolerances included.
50Hz vs. 60Hz	As long as not otherwise stated, AC 230V parameters are valid at 50Hz mains frequency.
may	A key word indicating flexibility of choice with no implied preference.
shall	A key word indicating a mandatory requirement.
should	A key word indicating flexibility of choice with a strongly preferred implementation.

1. INTENDED USE

This device is designed for installation in an enclosure and is intended for the general professional use such as in industrial control, office, communication, and instrumentation equipment.

Do not use this power supply in equipment, where malfunction may cause severe personal injury or threaten human life.

2. INSTALLATION REQUIREMENTS

This device may only be installed and put into operation by qualified personnel.

This device does not contain serviceable parts.

The tripping of an internal fuse is caused by an internal defect.

If damage or malfunction should occur during installation or operation, immediately turn power off and send unit to the factory for inspection.

Mount the unit on a DIN-rail so that the input terminals are located on the bottom of the unit. For other mounting orientations see de-rating requirements in this document. See chapter 22.13.

This device is designed for convection cooling and does not require an external fan. Do not obstruct airflow and do not cover ventilation grid (e.g. cable conduits) by more than 15%!

Keep the following installation clearances:
40mm on top,
20mm on the bottom,
5mm on the left and right sides are recommended when the device is loaded permanently with more than 50% of the rated power. Increase this clearance to 15mm in case the adjacent device is a heat source (e.g. another power supply).

Caution: For use in a controlled environment according to CSA 22.2 No 107.1-01.

⚠ WARNING Risk of electrical shock, fire, personal injury or death.

- Do not use the power supply without proper grounding (Protective Earth). Use the terminal on the input block for earth connection and not one of the screws on the housing.
- Turn power off before working on the device. Protect against inadvertent re-powering.
- Make sure that the wiring is correct by following all local and national codes.
- Do not modify or repair the unit.
- Do not open the unit as high voltages are present inside.
- Use caution to prevent any foreign objects from entering the housing.
- Do not use in wet locations or in areas where moisture or condensation can be expected.
- Do not touch during power-on, and immediately after power-off. Hot surfaces may cause burns.

Notes for use in hazardous location areas:

The QT20.241 is suitable for use in Class I Division 2 Groups A, B, C, D locations.

WARNING EXPLOSION HAZARDS!

Substitution of components may impair suitability for this environment. Do not disconnect the unit or operate the voltage adjustment unless power has been switched off or the area is known to be non-hazardous.

A suitable enclosure must be provided for the end product which has a minimum protection of IP54 and fulfils the requirements of the EN 60079-15:2010.

3. AC-INPUT

The unit is optimized to operate on a three phase system. An operation on only two legs of a three-phase system is possible with slightly different parameters. See chapter 22.4 for details.

AC input	nom.	3AC 380-480V	Wide-range input
AC input range	min.	3x 323-552Vac	Continuous operation
Suitable mains systems		TN, TT, IT	Line (L) must not be earthed (grounded)
Allowed voltage L to Earth	max.	400Vac	Continuous, IEC 60664-1
Input frequency	nom.	50–60Hz	±6%
Turn-on voltage	typ.	3x 263Vac	Steady-state value, load independent, see Fig. 3-1
Shut-down voltage	typ.	3x 242Vac	Steady-state value, load independent, see Fig. 3-1

		3AC 400V	3AC 480V	
Input current	typ.	0.79A	0.65A	At 24V, 20A, see Fig. 3-3
Power factor*)	typ.	0.94	0.95	At 24V, 20A, see Fig. 3-4
Start-up delay	typ.	350ms	290ms	See Fig. 3-2
Rise time	typ.	30ms	30ms	At 24V, 20A, only resistive load see Fig. 3-2
	typ.	40ms	40ms	At 24V, 20A, resistive load with an additional 20mF capacitor
Turn-on overshoot	max.	500mV	500mV	See Fig. 3-2

*) The power factor is the ratio of the true (or real) power to the apparent power in an AC circuit.

Fig. 3-1 **Input voltage range**

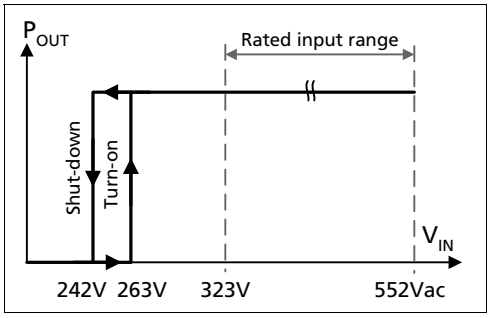

Fig. 3-2 **Turn-on behavior, definitions**

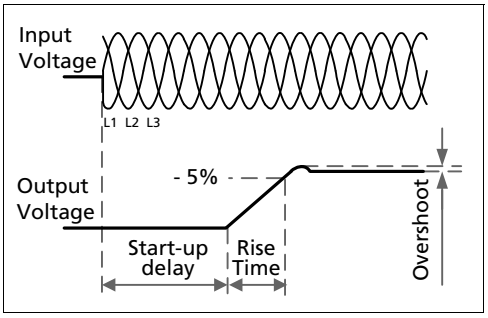

Fig. 3-3 **Input current vs. output load at 24V**

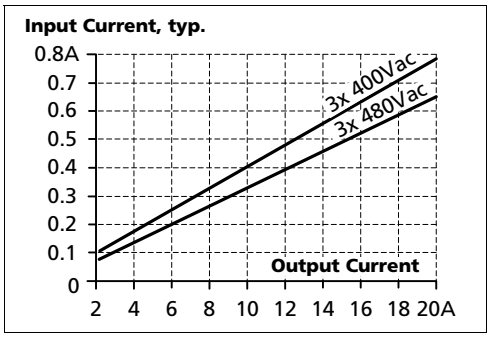

Fig. 3-4 **Power factor vs. output load at 24V**