DIN-RAIL
POWER SUPPLIES

PULS

C
Q
U
X

DIMENSION

ML

MINI LINE

SL

SILVER LINE

PRODUCTS 2007

Success with Innovation and Quality

Everything starts with an idea! PULS is the only organisation solely focussed on DIN-rail power supplies which allows Bernhard Erdl and his experienced team to develop premium pioneer products. The outstanding performance of the SilverLine and MiniLine families of products has quickly made them a market standard and the DIMENSION series is poised to extend this success. In 2006 the innovative performance of PULS' new line was honoured with the prestigious Frost & Sullivan Technology Leadership Award.

DIMENSION products are unusually compact and many features were specifically developed with long service life and high reliability in mind. The compactness of the unit creates additional space, giving end users more design freedom. A well thought-out design with many unique strengths gives the DIMENSION its lead, making it a valuable component, and not restricted just to technology oriented systems integrators and suppliers.

We manufacture the product to a very high quality standard in our own factory in the Czech Republic. Its track record dates back to 1998 and in 2006 an innovative new building will be added. As many of our customers are increasingly using foreign operations to manufacture their products, PULS has established subsidiaries in the key economic regions of the world to provide local service and distribution.

CONTENT

Small Power-ful Easy

PULS power supplies are at the forefront in the market with the smallest and most powerful units. The dimensions are up to 50% smaller than other standard products which enables significant space reductions in control cabinets and machines. Be creative and take advantage of the new possibilities.

Up to now, the efficiency is unrivalled due to our low losses and state-of-the-art technology. This basic requirement is essential to achieve a small size without compromising in quality or reliability. We also guarantee precise MTBF and life expectancy figures as well as a 3 year warranty.

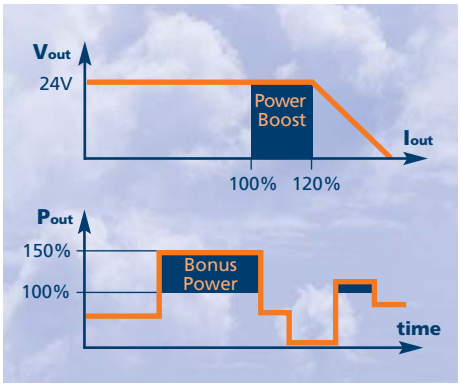
Large power reserves support the starting of heavy loads such as DC-motors or capacitive loads. With PULS, power supplies no longer have to be oversized to accommodate short-term peak loads of dynamic current demands.

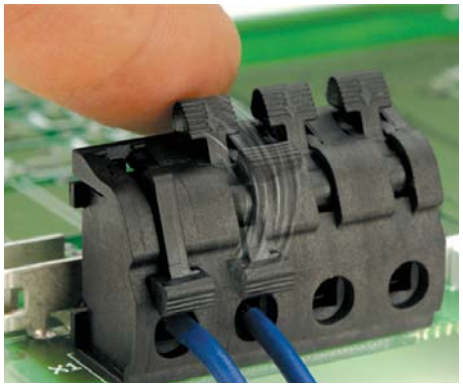
Dependent on the series, PULS guarantees BonusPower® of 50% or a Power Boost up to 25%. For the Dimension C-Series this extra current can be handled continuously when the ambient temerature remains below 45°C. With these power reserves, the user does not need to oversize but only has to choose a unit which will meet the operating requirements. In some cases, you can rely on the next smaller unit to save money and space.

All signals and control elements are straightforward, self explanatory and easily accessible. The patented DIN-rail system and spring clamp terminals do not require tools and make the installation effortless.

Wide range or auto-select input voltages avoid user errors. The wide operating temperature range and the extraordinary EMI immunity enables trouble free operation, even under harsh conditions.

With an extensive approval package, universal input voltages and the worldwide support makes choosing PULS easy around the globe.





CONTENT

SilverLine

SL-Series
Power supplies for general applications

- 1- or 3-phase units
- 40W to 960W output power
- Screw terminals
- Rugged metal housing

SLR-Series
The perfect units for building redundant power systems

- Redundant power supplies and redundancy modules
- Integrated decoupling diode
- Designed for parallel use
- DC-OK relay contact
- Plug connector

SLA-Series
Power supplies for use with AS-Interface® field bus

- 1- or 3-phase units
- Integrated data-decoupling unit
- Supports IR-adressing-mode

SL20.112	SL20.112	SL20.112	SL20.112	SL20.112
Series: SilverLine	**Size:** Ampacity at 24V$_{DC}$	**Input:** 1... 1-phase input 3... 3-phase input	**Generation:** 0... 1st Generation 1... 2nd Generation	**Options:** e.g. output voltage

MiniLine

ML-Series
The perfect and compact units for lower power demands.

Available in a variety of output voltages

- 1-phase or 320-550V$_{AC}$ input
- 25W to 100W output power
- 85V to 264V wide-range or auto-select-input voltage
- Wide DC-input voltage
- Output voltages from 5V to 56V
- Single use / parallel use selector
- Quick-connect spring-clamps terminals
- Rugged plastic housing
- Diode module MLY02.100 to build redundant systems or to isolate sensitive loads.

ML50.100	ML50.100	ML50.100	ML50.100
Series: MiniLine	**Size:** corresponds to the output power at 24V$_{DC}$	**Input:** 1... 1-phase input 2... 320-550V$_{AC}$ input	**Options:** e.g. output voltage

DIMENSION

C-Series

Power supplies for general applications with excellent value and the highest quality level. Cost-driven fewer featured series.

- 1-phase units
- 100-120/200-240V auto-select- or wide-range-input
- 20% reserves in output power, may be used continuously up to 45°C
- Low inrush current surge
- Full output power from -25°C to +60°C
- Large screw connection terminals

Q-Series

Premium class power supplies with maximum efficiency, countless features and state-of-the-art technology. The Q-Series is suitable for almost all applications.

- 1- or 3-phase units
- AC- and DC-wide-range input
- 50% reserves in output power
- DC-OK relay contact
- Lowest inrush current surge
- Efficiency up to 95%
- Active harmonic correction
- Active power factor correction
- Extensive approval package
- Full output power between -25°C and +60°C
- Quick-connect spring-clamp connection terminals

U-Series

Two variations of back-up systems which prevent equipment down-time in case of power outages or interruptions.

- 24V and 48V buffer units to bridge power failures up to several 100ms (utilises electrolytic capacitors)
- 24V DC-UPS to bridge longer power failures (utilises only one 12V battery)
- Comprehensive monitoring and signalling functions

X-Series

An alternative to fully regulated power supplies. Small size, maximum efficiency and a low price are the benefits with only a small compromises in the precision of the output voltage regulation and buffer time.

- 3-phase units
- Alternative to 50Hz transformer
- 25% reserves in output power
- No inrush current surge
- Efficiency up to 96%
- Shut-down in case of overload
- Simple diagnostics of errors
- Full output power between -25°C and +60°C
- Large screw connection terminals

QS10.241	QS10.241	QS10.241	QS10.241	QS10.241
Series: Q... Q-Series C... C-Series X... X-Series U... U-Series	**Input:** S... 1-phase input T... 3-phase input	**Size:** Ampacity at 24VDC	**Output:** Nominal output voltage	**Options**

PRODUCT PORTFOLIO

1-PHASE-UNITS

	25 – 40 W	50 W	60 W	72 – 85 W	90 – 100 W
5 – 5.5 V	ML30.101				
10 – 12 V	ML30.102				
12 – 15 V		ML50.102			ML100.102
±12 – ±15 V	ML30.106				
24 – 28 V	ML30.100	ML50.100 ML50.101 ML50.111	SL2.100	QS3.241 CS3.241* ML70.100	ML95.100 ML100.100
28 – 32 V					
36 – 43 V					
48 – 56 V		ML50.105			ML100.105

3-PHASE-UNITS

24 – 28 V					ML90.200 ML100.200
36 – 43 V					
48 – 56 V					
72 V					

REDUNDANCY AND BACK-UP SYSTEMS

Redundant power supplies			SLR2.100		
Redundancy and decoupling modules	MLY02.100				
DC/DC converter	SLD2.100				
Buffer module	UF20.241 (24V), UF20.481 (48V)				
	SLV20.200 (24V)				
DC-UPS	UB10.241				
Battery modules	UZK12.071 (12V 7Ah), UZK12.261 (12V 26Ah)				

AS-INTERFACE®

30.5V				SLA3.100	

*DEVICE*NET®

24 V					QS5.DNET

120 W	180 W	240 W	480 W	720 W	960 W	> 960 W
	QS10.121					
QS5.241 CS5.241/243/244 SL5.100		QS10.241 CS10.241/2/3/4 SL10.100	QS20.241* SL20.100 SL20.110 SL20.111	SL30.100		**Parallel use** *(detailed information can be found in the product tables on the following pages)*
		QS10.301				
			QS20.361* SL20.112			
		QS10.481 CS10.481	QS20.481* SL20.113			

SL5.300		SL10.300	QT20.241 SL20.310	SL30.300	XT40.241/242 SL40.300	**Parallel use** *(detailed information can be found in the product tables on the following pages)*
			QT20.361		XT40.361/362	
		SL10.305	QT20.481		XT40.481/482	
					XT40.721/722	

SLR5.100		SLR10.100				
YR2.Diode, YRM2.DIODE						
SLR02					SLR01	
			QTD20.241			

SLA4.100		SLA8.100 /300				

	QS10.DNET					

* available Q1/07

DIMENSION | SilverLine | MiniLine

MiniLine 25-100W

MiniLine power supplies are very compact, can be installed in seconds and are extremely reliable. PULS has reduced the number of critical components such as electrolytic capacitors and only uses the highest quality materials. The plastic housed MiniLine is available in a 25-100W range and with input voltages between 85-550VAC

		5V 5A	12V 2.5A	24V 1.3A	±12V 2A	12V 4.2A	24V 2.1A
Output Voltage	nom.	**5-5.5V**	**10-12V**	**24-28V**	**±12 - ±15V**	**12-15V**	**24-28V**
Output Current	nom.	5.0A	3.0-2.5A	1.3-1.1A	2.0A	4.2-3.3A	2.1-1.8A
Output Power	nom.	25W	30W	30W	36W	50W	50W
Factory Setting [1]	typ.	5.1V	12.0V [A]	24.5V	±15.0V [A]	15.0V [A]	24.5V
Ripple & Noise [2]	max.	50mVpp	10mVpp	50mVpp	50mVpp	100mVpp	50mVpp
Overload Behaviour		cont. current	cont. current	cont. current	cont. current	cont. current	cont. current
AC Input Voltage	nom.	**AC100-240V** (Wide-Range Input)				**AC100-240V** (Wide-Range Input)	
Tolerance		-15% +10%	-15% +10%	-15% +10%	-15% +10%	-15% +10%	-15% +10%
Input Current [3]	max.	0.5A	0.6A	0.6A	0.7A	1.0A	1.0A
Power Factor 120/230Vac [4]	typ.	0.55/0.46	0.55/0.47	0.56/0.47	0.56/0.47	0.56/0.48	0.56/0.48
Hold-up Time 120/230Vac [4]	typ.	43/220ms	38/200ms	40/210ms	50/245ms	35/190ms	35/190ms
DC Input Voltage		85-375Vdc	85-375Vdc	85-375Vdc	85-375Vdc	85-375Vdc	85-375Vdc
Limitation of Inrush Current		NTC	NTC	NTC	NTC	NTC	NTC
Inrush Current 120Vac [5]	typ.	17A; 0.3A²s	17A; 0.3A²s	17A; 0.3A²s	17A; 0.4A²s	17A; 0.4A²s	17A; 0.4A²s
Inrush Current 230Vac [5]	typ.	35A; 1.1A²s	35A; 1.1A²s	35A; 1.1A²s	35A; 1.5A²s	35A; 1.5A²s	35A; 1.5A²s
Efficiency 120/230Vac [4]	typ.	79.0/80.0%	82.6/84.0%	87.0/87.5%	84.0/86.0%	87.5/90.0%	87.7/89.0%
Power Losses 120/230Vac [4]	typ.	6.6/6.3W	6.3/5.7W	4.5/4.3W	6.9/5.9W	7.1/5.6W	7.0/6.2W
MTBF [6]		600 000h	650 000h	650 000h	600 000h	600 000h	600 000h
Operational Temperature Range	min.	-10°C ... +70°C	-10°C ... +70°C	-10°C ...+70°C	-10°C ... +70°C	-10°C ...+70°C	-10°C ...+70°C
Derating +60...+70°C	min.	0.8W/°C	0.8W/°C	0.8W/°C	1.0W/°C	1.3W/°C	1.3W/°C
Dimensions WxHxD [7]	nom.	45x75x91mm	45x75x91mm	45x75x98mm	45x75x91mm	45x75x91mm	45x75x91mm
Weight	max.	240g	250g	230g	240g	260g	240g
DC-OK Signal		no	no	no	no	no	yes [O]
Parallel Use		yes	yes	yes	no	yes	yes
Serial Use [9]		yes	yes	yes	no	no	yes
Order Number		**ML30.101**	**ML30.102**	**ML30.100**	**ML30.106**	**ML50.102**	**ML50.100** **ML50.101**** **ML50.111*****

*) manual selector **) with passive load share ***) with plug screw connector (depth 98mm)
Fold out the back page to find the footnotes

Spring-clamp versus screw terminals

As standard the units are equipped with spring clamp terminals
Optional: ML50.111 offers plug screw terminals
Both options allow the same size wires.

Solid wire	0.3–2.5mm²
Stranded wire	0.3–2.5mm²
AWG	24–12 AWG

Diode Module MLY02.100

With the decoupling module redundant systems can be built for voltages between 10 and 56V.
Read more on page 25.

Easy Adjustment

With the help of a jumper on the output terminals, the output voltage range can be set without the need of a volt meter.

	jumper	no jumper
ML30.102	12V	10V
ML30.106	±15V	±12V
ML50.102	15V	12V

48V 1.05A	24V 3A	24V 3.95A NEC Class 2	12V 7.5A	24V 4.2A	48V 2.1A	24V 3.75A 380-480V	24V 4.2A 380-480V
48-56V	**24-28V**	**24-28V**	**12-15V**	**24-28V**	**48-56V**	**24-28V**	**24-28V**
1.05-0.9A	3.0-2.6A	3.95-3.4A	7.5-6.0A	4.2-3.6A	2.1-1.8A	3.75-3.2A	4.2-3.6A
50W	72W	95W	90W	100W	100W	90W	100W
48.0V	24.5V	24.5V	12.0V	24.5V	48.0V	24.5V	24.5V
100mVpp	50mVpp	50mVpp	50mVpp	50mVpp	100mVpp	50mVpp	50mVpp
cont. current	cont. current	cont. current	cont. current	cont. current	cont. current	cont. current	cont. current
	AC115/230V*	**AC100-120/220-240V** (Auto-Select Input)				**2AC 380-480V**	**2AC 380-480V**
-15% +10%	-25% +15%	-15% +10%	-15% +10%	-15% +10%	-15% +10%	±15%	±15%
1.0A	1.6A/0.8A	2.1A/1.0A	1.9A/0.9A	2.1A/1.0A	2.1A/1.0A	0.5A	0.6A
0.56/0.48	0.56/0.49	0.56/0.5	0.56/0.5	0.56/0.5	0.56/0.5	0.6/0.55	0.6/0.55
35/190ms	47/48ms	41/46ms	41/46ms	38/44ms	38/44ms	52/93ms	48/85ms
85-375Vdc	220-375Vdc	220-375Vdc	220-375Vdc	220-375Vdc	220-375Vdc	T)	T)
NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC
17A; 0.4A²s	30A; 1.1A²s	22A; 0.4A²s	22A; 0.4A²s	22A; 0.4A²s	22A; 0.4A²s	36A; 0.7A²s	36A; 0.7A²s
35A; 1.5A²s	36A; 0.9A²s	42A; 1.4A²s	42A; 1.4A²s	42A; 1.4A²s	42A; 1.4A²s	45A; 1A²s	45A; 1A²s
88.9/90.3%	90.6/91.5%	88.5/90.0%	87.7/88.5%	88.5/90.0%	90.4/91.8%	89.5/89.0%	89.5/89.0%
6.2/5.4W	7.5/6.7W	11.6/9.9W	12.6/11.7W	13.0/11.1W	10.6/8.9W	10.5/11.1W	11.7/12.3W
600 000h	600 000h	500 000h	500 000h	500 000h	500 000h	650 000h	650 000h
-10°C ...+70°C	-10°C ...+70°C	-10°C ...+70°C	-10°C ...+70°C	-10°C ...+70°C	-10°C ...+70°C	-10°C ...+70°C	-10°C ...+70°C
1.3W/°C	1.8W/°C	2W/°C	2.5W/°C	2.5W/°C	2.5W/°C	2.0W/°C	2.5W/°C
45x75x91mm	45x75x91mm	73x75x103mm	73x75x103mm	73x75x103 mm	73x75x103mm	73x75x103mm	73x75x103mm
240g	260g	360g	360g	360g	360g	360g	360g
no	no	no	no	no	no	no	no
yes	yes	no	yes N)	yes N)	yes N)	no	yes
yes	yes	no	no	yes	yes	yes	yes
ML50.105	**ML70.100**	**ML95.100**	**ML100.102**	**ML100.100**	**ML100.105**	**ML90.200**	**ML100.200**

1-Phase-Power Supplies 60-120W

			24V 2.5A	24V 3A available Q1/07	24V 3.4A	24V 5A	24V 5A
Output Voltage		nom.	**24V**	**24-28V**	**24-28V**	**24-28V**	**24-28V**
Output Current	continuous	nom.	2.5A	3.0-2.6A	3.4-3.0A	5.0-4.5A	5.0-4.3A
	short-term		–	3.6-3.1A	5.0-4.5A	7.5-6.7A	6.0-5.1A
Output Power	continuous	nom.	60W	72W	80W	120W	120W
	short-term		–	86.4W	120W	180W	144W
Power Reserves		min.	–	20%	50%	50%	20%
			–	Power Boost G) L)	BonusPower K)	BonusPower K)	Power Boost L) U)
Factory Setting 1)		typ.	24.5V	24.1V	24.1V	24.1V	24.1V
Ripple & Noise 2)			25mVpp	50mVpp	50mVpp	50mVpp	50mVpp
Overload Behaviour			cont. current	cont. current	cont. current	cont. current	cont. current
AC Input Voltage			**AC115/230V**	**AC100-240V**	**AC100-240V**	**AC100-240V**	**AC115/230V**
Tolerance			-25% +15%	±10%	±15%	-15% +10%	-22% +15%
Input			manual switch	wide-range	wide-range	wide-range	auto-select
Input Current 3)			1.3/0.7A	1.4-0.95A	1.8-1.0A	1.4-0.65A	2.6/1.3A
Harmonic Correction 8)			no	no	active	active	no
EN 61000-3-2 (PFC-Norm)			yes	no	yes	yes	no
Power Factor 120/230Vac 4)		typ.	0.6/0.51	0.53/0.47	0.53/0.47	0.99/0.91	0.56/0.47
Hold-up Time120/230Vac 4)		typ.	53/54ms	35/176ms	41/174ms	34/65ms	80/78ms
DC Input Voltage			160-375Vdc	88-375Vdc	88-375Vdc	88-350Vdc	–
Limitation of Inrush Current			NTC	active	active	active	active
Inrush Current 120Vac 5)			15A; 1.1A²s	16A; 1.0A²s	7A; 2A²s	9A; 0.5A²s	3A; 1A²s
Inrush Current 230Vac 5)			28A; 1.6A²s	31A; 1.6A²s	13A; 2A²s	11A; 0.5A²s	3A; 1A²s
Efficiency 120/230Vac 4)		typ.	87.8/89.1%	90.2/91.6%	88.7/90.0%	91.6/92.7%	89.4/90.2%
Power Losses 120/230Vac 4)			8.3/7.3W	7.8/6.6W	10.4/9.1W	11.0/9.4W	14.5/13.2W
MTBF 6)			740 000h	> 700 000h	1450 000h	830 000h	869 000h
Operational Temperature Range		min.	-10°C ... +70°C	-25°C ... +70°C	-25°C ... +70°C	-25°C ...+70°C	-25°C ...+70°C
Derating +60...+70°C		min.	1.5W/°C	1.8W/°C	2W/°C	3W/°C	3W/°C
Dimensions WxHxD 7)		nom.	49x124x102mm	32x124x102mm	32x124x102mm	40x124x117mm	32x124x117mm
Connection Terminals			screw terminals	screw terminals	spring terminals	spring terminals	screw terminals
Weight		max.	460g	430g	440g	620g	500g
DC-Ok Signal			no	no	no	relay contact P)	no
Parallel Use			yes	no J)	yes	yes	no J)
Serial Use 9)			no	T)	yes	yes	yes
Order Number			**SL2.100**	**CS3.241**	**QS3.241**	**QS5.241**	**CS5.241** **CS5.241-S1***

*) with quick-connect spring-clamp terminals

Fold out the back page to find the footnotes

CS5.241 CS5.244 SL5.100

24V 5A	24V 5A	24V 5A
24-28V	**24-28V**	**24V**
5.0-4.3A	5.0-4.3A	5.0A
6.0-5.1A	6.0-5.1A	6.0A
120W	120W	120W
144W	144W	144W
20% Power Boost L) U)	20% Power Boost L)	20% Power Boost G))
24.1V	24.1V	24.5V
50mVpp	50mVpp	50mVpp
cont. current	cont. current	cont. current
AC100-120V	**AC200-240V**	**AC115/230V**
±10%	±10%	-25% +15%
–	–	manual switch
2.5A/–	–/1.25A	2.6/1.4A
no	no	no
not applicable	yes	yes
0.59/–	–/0.50	0.56/0.49
80ms/–	–/78ms	57/58ms
–	210-375Vdc	210-375Vdc
NTC	NTC	NTC
45A; 3A²s	–	16A; 1.6A²s
–	30A; 1A²s	18A; 1.1A²s
90.0%/–	–/90.2%	88.7/89.3%
13.5W/–	–/13.2W	15.3/14.4W
740 000h	940 000h	520 000h
-10°C ...+70°C	-10°C ...+70°C	-10°C ...+70°C
3W/°C	3W/°C	3W/°C
32x124x117mm	32x124x117mm	64x124x102mm
screw terminals	screw terminals	screw terminals
500g	500g	620g
no	no	no
no J)	no J)	yes M)
yes	yes	yes
CS5.243	**CS5.244**	**SL5.100**

1-Phase-Power Supplies 180-240W

QS10.121 QS10.241 CS10.241 SL10.100

			12V 15A	24V 10A	24V 10A	24V 10A PFC	24V 10A
Output Voltage		**nom.**	**12-15V**	**24-28V**	**24-28V**	**24-28V**	**24-28V**
Output Current	continuous	nom.	15.0-13.5A	10.0-9A	10.0-8.6A	10.0-8.6A	10.0-8.6A
	short-term		22.5-20.3A	15.0-13.5A	12.0-10.3A	12.0-10.3A	12.0-10.3A
Output Power	continuous	nom.	180W	240W	240W	240W	240W
	short-term		270W	360W	288W	288W	288W
Power Reserves		min.	50% BonusPower K)	50% BonusPower K)	20% Power Boost G) L)	20% Power Boost G)	20% Power Boost G) L)
Factory Setting 1)		typ.	12.0V	24.1V	24.1V	24.1V	24.1V
Ripple & Noise 2)		max.	50mVpp	50mVpp	50mVpp	50mVpp	50mVpp
Overload Behaviour			cont. current	cont. current	cont. current	cont. current	cont. current
AC Input Voltage		**nom.**	**AC100-240V**	**AC100-240V**	**AC115/230V**	**AC115/230V**	**AC100-120V**
Tolerance			±15%	±15%	-22% +15%	-22% +15%	±10%
Input			wide-range	wide-range	auto-select	auto-select	–
Input Current 3)		max.	2.2-1.0A	2.8-1.2A	5.0/2.5A	5.0/2.3A	5.0A/–
Harmonic Correction 8)			active	active	none	passive	none
EN 61000-3-2 (PFC-Norm)			yes	yes	no	yes	not applicable
Power Factor 120/230Vac 4)		typ.	0.98/0.92	0.98/0.92	0.59/0.51	0.59/0.57	0.57/–
Hold-up Time 120/230Vac 4)		typ.	32/32ms	27/28ms	46/47ms	46/42ms	46ms/–
DC Input Voltage			88-375Vdc	88-375Vdc	–	–	–
Limitation of Inrush Current			active	active	active	active	NTC
Inrush Current 120Vac 5)		typ.	4A; 0.6A²s	4A; 0.6A²s	3A; 1A²s	3A; 1A²s	85A; 8.5A²s
Inrush Current 230Vac 5)		typ.	7A; 0.6A²s	7A; 0.6A²s	3A; 1A²s	3A; 1A²s	–
Efficiency 120/230Vac 4)		typ.	91.5/91.8%	92.3/93.0%	91.0/91.6%	91.0/91.2%	91.3%/–
Power Losses 120/230Vac 4)		typ.	16.7/16.1W	20.0/18.1W	24.1/22.4W	24.1/23.6W	23.4W/–
MTBF 6)			631 000h	581 000h	821 000h	810 000h	710 000h
Operational Temperature Range		min.	-25°C ... +70°C	-25°C ... +70°C	-25°C ... +70°C	-25°C ... +70°C	0°C ... +70°C
Derating +60...+70°C		min.	5W/°C	6W/°C	6W/°C	6W/°C	6W/°C
Dimensions WxHxD 7)		nom.	60x124x117mm	60x124x117mm	60x124x117mm	60x124x117mm	60x124x117mm
Connection Terminals			spring terminals	spring terminals	screw terminals	screw terminals	screw terminals
Weight		max.	930g	900g	700g	800g	700g
DC-OK-Signal			relay contact P)	relay contact P)	no	no	no
Parallel Use			yes	yes	no J)	no J)	no J)
Serial Use 9)			yes	yes	T)	T)	T)
Order Number			**QS10.121**	**QS10.241**	**CS10.241 CS10.241-S1***	**CS10.242**	**CS10.243**

*) with quick-connect spring-clamp terminals
Fold out the back page to find the footnotes

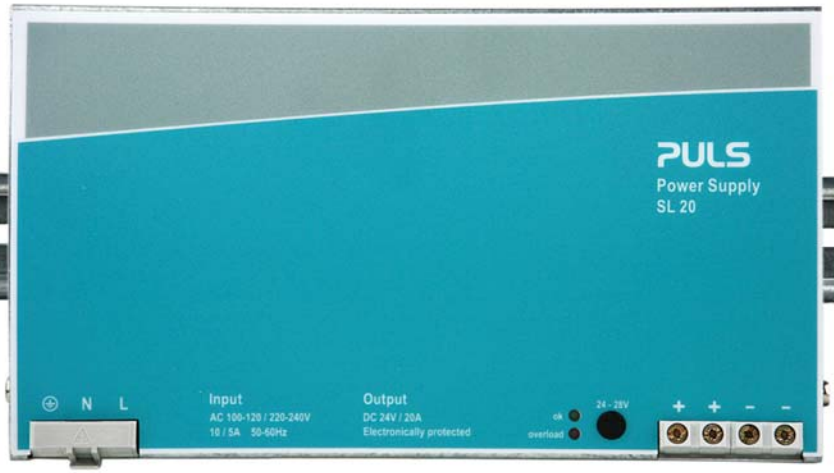
QS10.301 QS10.481 CS10.481

24V 10A	24V 10A	30V 8A	48V 5A	48V 5A
24-28V	**24-28V**	**28-32V**	**48-56V**	**48-52V**
10.0-8.6A	10.0-8.6A	8.6-7.5A	5.0-4.3A	5-4.6A
12.0-10.3A	12.0-10.3A	12.8-11.3A	7.5-6.5A	6.0-5.5A
240W	240W	240W	240W	240W
288W	288W	360W	360W	288W
20% Power Boost G) L)	20% Power Boost G)	50% BonusPower K)	50% BonusPower K)	20% Power Boost G) L)
24.1V	24.5V	30.0V	48.0V	48.0V
50mVpp	30mVpp	50mVpp	100mVpp	100mVpp
cont. current	cont. current	cont. current	cont. current	cont. current
AC200-240V	**AC115/230V**	**AC100-240V**	**AC100-240V**	**AC115/230V**
±10%	-25% +15%	±15%	±15%	-22% +15%
–	manual switch	wide-range	wide-range	auto-select
–/2.5A	6.0/2.8A	2.8-1.2A	2.8-1.2A	5.0/2.5A
none	none	active	active	no
no	no	yes	yes	no
–/0.52	0.56/0.5	0.98/0.92	0.98/0.92	0.59/0.51
–/45ms	61/60ms	27/28ms	27/28ms	46/47ms
210-375Vdc	240-375Vdc	88-375Vdc	88-375Vdc	–
NTC	NTC	active	active	active
–	45A; 6.8A²s	4A; 0.6A²s	4A; 0.6A²s	3A; 1A²s
48A; 3A²s	51A; 4.2A²s	7A; 0.6A²s	7A; 0.6A²s	3A; 1A²s
–/91.3%	89.1/90.0%	92.3/93.0%	91.2/92.0%	91.0/91.6%
–/23.4W	30.0/27.2W	20.0/18.1W	23.2/20.9W	24.1/22.4W
910 000h	425 000h	581 000h	606 000h	830 000h
0°C ... +70°C	0°C ... +70°C	-25°C ... +70°C	-25°C ... +70°C	-25°C ... +70°C
6W/°C	6W/°C	6W/°C	6W/°C	6W/°C
60x124x117mm	120x124x102mm	60x124x117mm	60x124x117mm	60x124x117mm
screw terminals	screw terminals	spring terminals	spring terminals	screw terminals
700g	980g	900g	900g	700g
no	no	relay contact P)	relay contact P)	no
no J)	yes M)	yes	yes	no J)
T)	no	yes	yes	T)
CS10.244	**SL10.100**	**QS10.301**	**QS10.481**	**CS10.481**

1-Phase-Power Supplies 480-720W

QS20.241

SL20.111



			24V 20A available Q1/07	24V 20A	24V 20A	24V 20A PFC	36V 13A available Q1/07
Output Voltage		**nom.**	**24-28V**	**24-28V**	**24-28V**	**24-28V**	**36-42V**
Output Current	continuous	nom.	20.0-17.1A	20.0-17.1A	20.0-17.1A	20.0-17.1A	13.3-11.4A
	short-term		30.0-25.7A	25.0-21.5A	25.0-21.5A	25.0-21.5A	20.0-17.1A
Output Power	continuous	nom.	480W	480W	480W	480W	480W
	short-term		720W	600W	600W	600W	720W
Power Reserves		min.	50% BonusPower K)	25% Power Boost G)	25% Power Boost G)	25% Power Boost G)	50% BonusPower K)
Factory Setting 1)		typ.	24.1V	24.0V	24.0V	24.0V	36.0V
Ripple & Noise 2)		max.	100mVpp	40mVpp	40mVpp	40mVpp	100mVpp
Overload Behaviour			Hiccup	Hiccup	selectable B)	selectable B)	Hiccup
AC Input Voltage		**nom.**	**AC100-240V**	**AC200-240V**	**AC115/230V**	**AC115/230V**	**AC100-240V**
Tolerance			±15%	±10%	-22% +15%	-22% +15%	±15%
Input			wide-range	–	auto-select	auto-select	wide-range
Input Current 3)		max.	5-2.6A	–/5A	10/5A	10/5A	5-2.6A
Harmonic Correction 8)			active	none	none	passive	active
EN 61000-3-2 (PFC-Norm)			yes	no	no	yes	yes
Power Factor 120/230Vac 4)		typ.	0.95/0.95	–/0.60	0.71/0.61	0.71/0.73	0.95/0.95
Hold-up Time 120/230Vac 4)		typ.	27/37ms	–/25ms	36/36ms	36/34ms	27/37ms
DC Input Voltage			88-375Vdc	270-370Vdc	–	–	88-375Vdc
Limitation of Inrush Current			active	passive R)	passive R)	passive R)	active
Inrush Current 120Vac 5)		typ.	15A; 2A²s	–	12A; 4.2A²s	12A; 4.2A²s	15A; 2A²s
Inrush Current 230Vac 5)		typ.	15A; 2A²s	30A; 10A²s	22A; 4.2A²s	22A; 4.2A²s	15A; 2A²s
Efficiency 120/230Vac 4)		typ.	92.3/93.0%	–/91.4%	90.1/91.3%	90.1/90.8%	92.3/93.0%
Power Losses 120/230Vac 4)		typ.	40.0/36.1W	–/54.2W	52.7/45.7W	52.7/48.6W	40.0/36.1W
MTBF 6)			> 500 000h	310 000h	270 000h	270 000h	> 500 000h
Operational Temperature Range		min.	-25°C ... +70°C	0°C ... +70°C	0°C ... +70°C	0°C ... +70°C	-25°C ... +70°C
Derating +60...+70°C		min.	12W/°C	12W/°C	12W/°C	12W/°C	12W/°C
Dimensions WxHxD 7)		nom.	82x124x127mm	220x124x102mm	220x124x102mm	220x124x102mm	82x124x127mm
Connection Terminals			spring terminals	screw terminals	screw terminals	screw terminals	spring terminals
Weight		max.	1400g	1800g	1800g	2500g	1400g
DC-OK-Signal			relay contact P)	no	no	no	relay contact P)
Parallel Use			yes	yes N)	yes N)	yes N)	yes
Serial Use 9)			T)	yes	yes	yes	T)
Order Number			**QS20.241**	**SL20.100**	**SL20.110**	**SL20.111**	**QS20.361**

Fold out the back page to find the footnotes

QS20.481

SL30.100

36V 13A	48V 10A available Q1/07	48V 10A	24V 30A
36-43V	**48-55V**	**48-56V**	**24-48V**
13.3-11.4A	10.0-8.7A	10.0-8.6A	30.0-25.7A
16.6-14.3A	15.0-13.1A	12.5-10.7A	–
480W	480W	480W	720W
600W	720W	600W	–
25% Power Boost G)	50% BonusPower K)	25% Power Boost G)	– –
36.0V	48.0V	48.0V	24.0V
80mVpp	150mVpp	80mVpp	50mVpp
cont. current	Hiccup	cont. current	Hiccup
AC115/230V	**AC100-240V**	**AC115/230V**	**AC208-240V**
-22% +15%	±15%	-22% +15%	-13% +15%
auto-select	wide-range	auto-select	–
10/5A	5-2.6A	10/5A	–/10A
passive	active	none	none
yes	yes	no	no
0.71/0.73	0.95/0.95	0.71/0.61	–/0.67
36/34ms	27/37ms	36/36ms	–/30ms
–	88-375Vdc	–	–
passive R)	active	passive R)	passive R)
12A; 4.2A²s	15A; 2A²s	12A; 4.2A²s	–
22A; 4.2A²s	15A; 2A²s	22A; 4.2A²s	30A; 10A²s
91.2/92.0%	92.3/93.0%	92.1/92.8%	–/92.5%
46.3/41.7W	40.0/36.1W	41.2/37.2W	–/58.4W
270 000h	> 500 000h	270 000h	240 000h
0°C ... +70°C	-25°C ... +70°C	0°C ... +70°C	0°C ... +70°C
12W/°C	12W/°C	12W/°C	18W/°C
220x124x102mm	82x124x127mm	220x124x102mm	240x124x112mm
screw terminals	spring terminals	screw terminals	screw terminals
2500g	1400g	1800g	2000g
no	relay contact P)	no	no
yes N)	yes	yes N)	yes N)
yes	T)	yes	yes
SL20.112	**QS20.481**	**SL20.113**	**SL30.100**

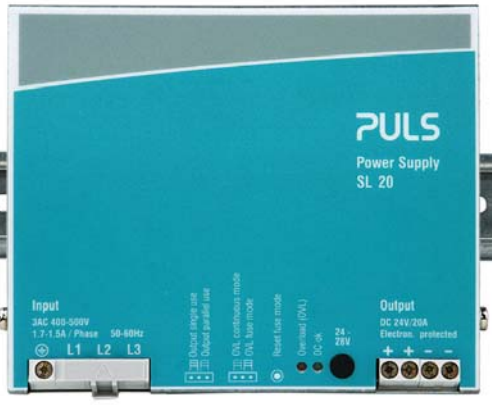
3-Phase-Power Supplies 90-960W

ML100.200

SL5.300

SL10.300

SL20.310



			24V 4.2A	24V 5A	24V 10A	48V 5A	24V 20A
Output Voltage		**nom.**	**24-28V**	**24-28V**	**24-28V**	**48-52V**	**24-28V**
Output Current	continuous	nom.	4.2-3.6A	5.0-4.3A	10.0-8.6A	5-4.6A	20.0-17.5A
	short-term		–	6.0-5.2A	12.0-10.3A	6.0-5.5A	30.0-26A
Output Power	continuous	nom.	100W	120W	240W	240W	480W
	short-term		–	144W	288W	288W	720W
Power Reserves		min.	–	20%	20%	20%	50%
			–	Power Boost G)	Power Boost G)	Power Boost G)	BonusPower K)
Factory Setting 1)		typ.	24.5V	24.5V	24.5V	48.0V	24.1V
Ripple & Noise 2)		max.	50mV	25mVpp	30mVpp	30mVpp	100mVpp
Overload Behaviour			cont. current	cont. current	selectable C)	selectable C)	cont. current
AC Input Voltage		**nom.**	**2AC 380-480V**	**3AC 400-500V**	**3AC 400-500V**	**3AC 400-500V**	**3AC 380-480V**
Tolerance			±15%	±15%	±15%	±15%	±15%
Input Current / Phase 3)		max.	0.6A	0.5A	0.8A	0.8A	0.9A
Harmonic Correction 8)			none	passive	passive	passive	active
EN 61000-3-2 (PFC-Norm)			yes	yes	yes	yes	yes
Power Factor 400/480Vac 4)		typ.	0.6/0.55	0.52/0.49	0.5/0.47	0.5/0.47	0.94/0.95
Hold-up Time 400/480Vac 4)		typ.	48/85ms	30/45ms	34/55ms	34/55ms	22/22ms
DC Input Voltage			T)	450-820Vdc	450-820Vdc	450-820Vdc	–> QTD20.241
Limitation of Inrush Current			NTC	NTC	passive R)	passive R)	active
Inrush Current 400Vac 5)		typ.	36A; 0.7A²s	16A; 1.1A²s	15A; 0.3A²s	15A; 0.3A²s	3A; 1A²s
Inrush Current 480Vac 5)		typ.	45A; 1A²s	19A; 1.3A²s	15A; 0.4A²s	15A; 0.4A²s	3A; 1A²s
Efficiency 400/480Vac 4)		typ.	89.5/89.0%	88.8/88.9%	91.9/92.1%	93.8/93.9%	95.0/94.8%
Power Losses 400/480Vac 4)		typ.	11.7/12.3W	15.1/15.0W	24.2/23.7W	16.0/15.7W	25.3/26.6W
MTBF 6)			650 000h	410 000h	543 000h	543 000h	605 000h
Operational Temperature Range		min.	-10°C ... +70°C	-10°C ... +70°C	0°C ... +70°C	0°C ... +70°C	-25°C ... +70°C
Derating +60...+70°C		min.	2.5W/°C	3W/°C	6W/°C	6W/°C	12W/°C
Dimensions WxHxD 7)		nom.	73x75x103mm	73x124x117mm	89x124x117mm	89x124x117mm	65x124x127mm
Connection Terminals			spring terminals	screw terminals	screw terminals	screw terminals	spring terminals
Weight		max.	360g	730g	980g	980g	870g
DC-OK-Signal			no	no	no	no	relay contact P)
Parallel Use			yes	yes M)	yes N)	yes N)	yes
Serial Use 9)			yes	no	yes	yes	yes
Order Number			**ML100.200 ML90.200***	**SL5.300**	**SL10.300**	**SL10.305**	**QT20.241**

*) ML90.200 is the NEC Class 2 version of the ML100.200. See details page 8/9.

Fold out the back page to find the footnotes

QT20.241 QT20.481 SL40.300

24V 20A	36V 13A	48V 10A	24V 30A	24V 40A
24-28V	**36-42V**	**48-55V**	**24-28V**	**24-28V**
20.0-17.1A	13.3-11.4A	10.0-8.7A	30.0-25.7A	40.0-34.3A
25.0-21.5A	20.0-17.1A	15.0-13A	–	45.0-38.6A
480W	480W	480W	720W	960W
600W	720W	720W	–	1080W
25%	50%	50%	–	12.5%
Power Boost G)	BonusPower K)	BonusPower K)	–	Power Boost G)
24.5V	36.0V	48.0V	24.0V	24.0V
30mVpp	150mVpp	100mVpp	40mVpp	50mVpp
selectable C)	cont. current	cont. current	Hiccup	cont. current
3AC 400-500V	**3AC 380-480V**	**3AC 380-480V**	**3AC 400-500V**	**3AC 400-500V**
±15%	±15%	±15%	±15%	±15%
1.7A	0.9A	0.9A	2A	3A
passive	active	active	passive	passive
yes	yes	yes	yes	yes
0.5/0.47	0.94/0.95	0.94/0.95	0.5/0.47	0.5/0.47
12.5/23ms	22/22ms	22/22ms	12.6/23.5ms	16/30ms
450-820Vdc	–	–	450-820Vdc	–
passive R)	active	active	passive R)	passive R)
6A; 1A²s	3A; 1A²s	3A; 1A²s	12A; 2A²s	23A; 3A²s
6A; 1A²s	3A; 1A²s	3A; 1A²s	15A; 2A²s	27A; 3A²s
92.2/92.2%	94.8/94.6%	95.4/95.0%	92.5/92.5%	92.6/92.8%
41.3/41.3W	26.3/27.4W	23.1/25.3W	58.4/58.4W	77.4/74.5W
504 000h	605 000h	605 000h	425 000h	305 000h
0°C ... +70°C	-25°C ... +70°C	-25°C ... +70°C	0°C ... +70°C	0°C ... +70°C
12W/°C	12W/°C	12W/°C	18W/°C	24W/°C
150x124x121mm	65x124x127mm	65x124x127mm	240x124x112mm	275x124x117mm
screw terminals	spring terminals	spring terminals	screw terminals	screw terminals
1800g	870g	870g	2000g	3300g
no	relay contact P)	relay contact P)	no	no
yes N)	yes	yes	yes N)	yes N)
yes	yes	yes	yes	yes
SL20.310	**QT20.361**	**QT20.481**	**SL30.300**	**SL40.300**

2-phase operation

3-phase units can also be used on only 2 legs of a 3-phase system. At higher ambient temperatures a reduction in output power has to be considered which is noted below.

SL5.300, SL10.300, SL10.305
allowed without de-rating

SL20.310
at 400V: 6W/°C above 40°C,
at 480V: 6W/°C above 50°C

QT20.241, QT20.361, QT20.481
at 400V: 6W/°C above 40°C,
at 480V: 6W/°C above 50°C

SL30.300
at 400V: 10W/°C above 40°C,
at 480V: 10W/°C above 45°C

SL40.300
at 400V: 18W/°C above 40°C,
at 480V: 18W/°C above 45°C

Semi-Regulated 3-Phase Power Supplies 960W

Power supplies in the Dimension X series include a new and innovative concept for generating a DC voltage from a three-phase input. A semi-regulated resonant converter enables a very compact design, maximum efficiency and extremely competitive pricing, with only a small compromise in the output voltage regulation, output ripple and hold-up time.
Weighing just 1.4 kg, the device provides 960 watts of continuous output power with an additional 25% power reserve for dynamic loads. The light weight and compact dimensions facilitate straightforward mounting on DIN-rail.
Principal uses are applications involving supplies to motors, valves and other load circuits with a high power consumption, where an accurate output voltage regulation (standard on switch mode power supplies) is not required.

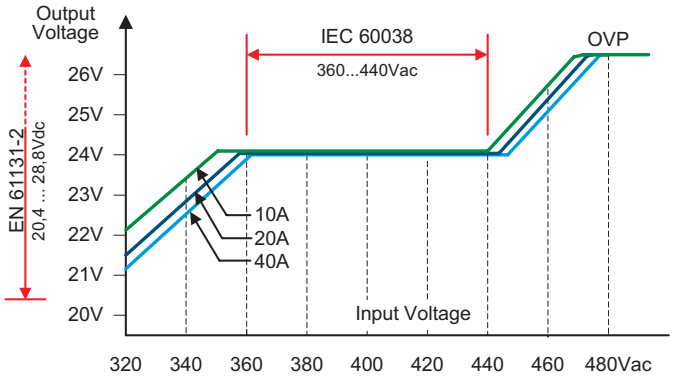
Exploit potential cost savings
The advantages of the X-Series over its competitors include its lower puchase price, and smaller enclosures allowing further savings on the total system cost. In addition transport and installation costs are significantly reduced, energy costs are lower and the cooling and ventilation requirements are simplified. These are all factors that have not been available in this form until now.

Comparison of the various topologies
XT40 (semi-regulated) SL40 (fully regulated) and transformer

	XT40	SL40	Transformer
Input voltage range	+	++	–
Inrush current surge	++	+	–
Hold-up time	–	+	–
Phase-loss operation	–	+	–
Efficiency	++	+	–
Output voltage regulation	+	++	–
Output adjustment range	–	++	–
Ripple & Noise	+	++	–
Error diagnostics	++	++	–
Harmonic distortion (PFC)	+	+	–
EMC	++	++	+
Ease of installation	++	++	–
Weight	++	+	–

++ very good + good – poor

What does semi-regulated mean?
Transformer power supplies are normally unregulated, i.e. when the input voltage varies, the output voltage follows this change proportionally. IEC 60038 specifies a ±10% tolerance for the input voltage. At 400V, this gives a range from 360V to 440V AC. On the 24V side, this means 21.6V to 26.4V DC. The typical load regulation of ±5% must be added to this range giving a voltage window from 20.4V to 27.6V. Unfortunately, the quality of mains supply worldwide does not always meet the requirements of this standard and in addition fuses and cables produce additional voltage drops, which widen the limits of the input voltage.
This is precisely where the semi-regulated concept comes in. PULS has found a way to regulate a resonant converter within certain limits. This control range is used to accurately stabilise the output voltage to within ±1% over the core range of the input voltage and the load changes. The output voltage only starts to change proportionally with the input voltage with extreme under-voltage or over-voltage condition.



XT40.481

XT40.721

			24V 40A	36V 26A	48V 20A	72V 13A
Output Voltage		**nom.**	**24V**	**36V**	**48V**	**72V**
Output Current	continuous	nom.	40A	26.6A	20A	13.3A
	short-term		50A	33.3A	25A	16.7A
Output Power	continuous	nom.	960W	960W	960W	960W
	short-term		1200W	1200W	1200W	1200W
Power Reserves		min.	25% BonusPower H)	25% BonusPower H)	25% BonusPower H)	25% BonusPower H)
Ripple & Noise 2)			1000mVpp	1500mVpp	2000mVpp	3000mVpp
Overload Behaviour			Shut-down D)	Shut-down D)	Shut-down D)	Shut-down D)
AC Input 400V-Unit		**nom.**	**3AC 400V**	**3AC 400V**	**3AC 400V**	**3AC 400V**
AC Input 480V-Unit		**nom.**	**3AC 480V**	**3AC 480V**	**3AC 480V**	**3AC 480V**
Tolerance			±15%	±15%	±15%	±15%
Input Current 400V-Unit		max.	1.65A	1.65A	1.65A	1.65A
Input Current 480V-Unit		max.	1.4A	1.4A	1.4A	1.4A
Harmonic Correction 8)			active	active	active	active
EN 61000-3-2 (PFC-Norm)			yes	yes	yes	yes
Power Factor 4)		typ.	0.93	0.93	0.93	0.93
Hold-up Time 4)		typ.	3ms F)	3ms F)	3ms F)	3ms F)
DC Input Voltage			–	–	–	–
Limitation of Inrush Current			active E)	active E)	active E)	active E)
Efficiency 4)		typ.	95.5%	95.5%	96.0%	95.5%
Power Losses 4)		typ.	45.2W	45.2W	40.0W	45.2W
MTBF 6)			> 500 000h	> 500 000h	> 500 000h	> 500 000h
Operational Temperature Range		min.	-25°C ... +70°C	-25°C ... +70°C	-25°C ... +70°C	-25°C ... +70°C
Derating +60...+70°C		min.	24W/°C	24W/°C	24W/°C	24W/°C
Dimensions WxHxD 7)		nom.	96x124x157mm	96x124x157mm	96x124x157mm	96x124x157mm
Weight		max.	1400g	1400g	1400g	1400g
Parallel Use			no	no	no	no
Serial Use 9)			T)	T)	T)	T)
Order Number	**400V-Unit**		**XT40.241**	**XT40.361**	**XT40.481**	**XT40.721**
	480V-Unit		**XT40.242**	**XT40.362**	**XT40.482**	**XT40.722**

Fold out the back page to find the footnotes

QS5.DNET and QS10.DNET

QS5.DNET QS10.DNET

			24V 3.8A	24V 8A
Output Voltage		**nom.**	**24V**	**24-24.5V**
Output Current	continuous	nom.	3.8A	8.0A
	after turn-on	nom.	5.7A	12.0A
Current Limitation	continuous	max.	4.15A	9.5A
Output Voltage Rise Time *)		typ.	100ms	85ms
Output Power		nom.	91W	196W
Factory Setting 1)			24V ±0.2%	24V ±0.2%
AC Input Voltage		**nom.**	**AC 100-240V**	**AC 100-240V**
Tolerance			-15% +10%	±15%
Input Current 3)		max.	1.1-0.5A	2.3-1.0A
Harmonic Correction 8)			active	active
EN 61000-3-2 (PFC-Norm)			yes	yes
Power Factor 120/230Vac 4)		typ.	0.99/0.91	0.99/0.92
Hold-up Time 120/230Vac 4)		typ.	44/85ms	33/34ms
DC Input Voltage			88-350Vdc	88-375Vdc
Limitation of Inrush Current			active	active
Inrush Current 120Vac 5)		typ.	9A; 0.5A²s	4A; 0.6A²s
Inrush Current 230Vac 5)		typ.	11A; 0.5A²s	7A; 0.6A²s
Efficiency 120/230Vac 4)		typ.	91.9/92.4%	92.3/92.7%
Power Losses 120/230Vac 4)		typ.	8.0/7.5W	16.0/15.1W
MTBF 6)			830 000h	621 000h
Operational Temperature Range		min.	-25°C ... +70°C	-25°C ... +70°C
Derating +60...+70°C		min.	2W/°C	5W/°C
Dimensions WxHxD 7)		nom.	40x124x117mm	60x124x117mm
Weight		max.	620g	900g
NEC-Classification			NEC Class 2	NEC Class 1
*Device*Net® Conformance Tested			yes	yes
DC-OK-Signal			relay contact P)	relay contact P)
Order Number			**QS5.DNET**	**QS10.DNET**

*) Period of time until the output voltage increases from 5% to 95% of its nominal value.
Measured with nominal load and an external capacitor of 7000µF.
Fold out the back page to find the footnotes

DeviceNet® CONFORMANCE TESTED is a bus system which is used worldwide. There is a user organisation called the Open ***Device*Net®** Vendor Association (ODVA) which specifies the requirements and performs the testing.

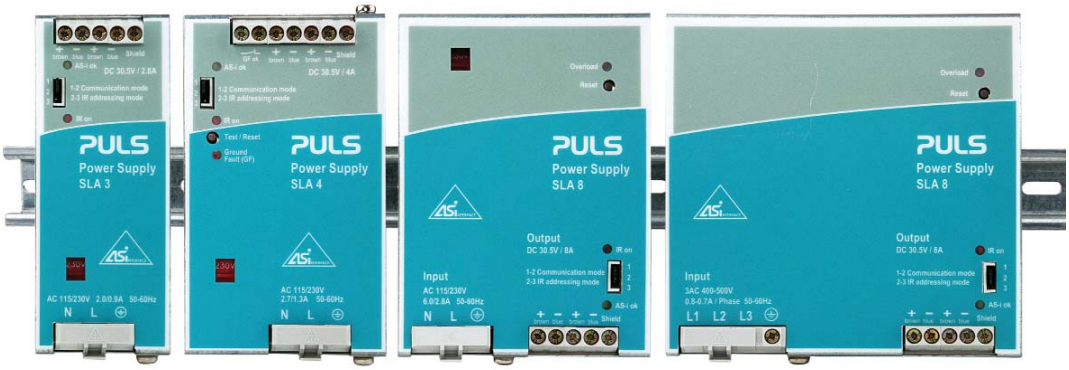
ODVA PULS is a member of this association and supports this system with two special power supplies which are tested according to the ODVA requirements. The two units QS5.DNET and QS10.DNET meet this standard and carry the approval mark "***Device*Net®** Conformance Tested".

The special features of ***Device*Net®** units:

- The nominal and overload currents are sized for the ratings of the ***Device*Net®** cables.
- Large load capacitors can be charged in a very short period of time.
- After turn on, the output voltage increases according to the ***Device*Net®** timing specification.
- The output voltage is modified for the ***Device*Net®** level.

SLA-Units

SLA3.100 SLA4.100 SLA8.100 SLA8.300



The AS-Interface® power supplies feed an AS-Interface® fieldbus. This network technology permits the controlling of slaves such as actuators and sensors and provides them with power using the same single two-conductor wire. An AS-Interface® power supply provides the required voltage of 30.55V and is equipped with a data decoupling unit which prevents the modulated signal voltage from being destroyed. The output of an AS-Interface® power supply is inductive and cannot be used for other purposes.

Fast addressing of slaves

The 'IR addressing mode' is selectable via jumper and interrupts the data comminucation on the yellow AS-i cable. During this process, the slaves are still supplied with voltage and can be programmed locally with the infrared interface. This saves a lot of time during installation and service work.

Protections

To protect the relatively thin AS-Interface cable the 8A units are equiped with an electronic fuse which switches off the output in an overload situation. The output of the 4A power supply has a integrated ground fault monitor and reports unsafe communication. In addition to all standard features the 2.8A unit fulfils the NEC Class 2 requirement which is important for application within the United States of America.

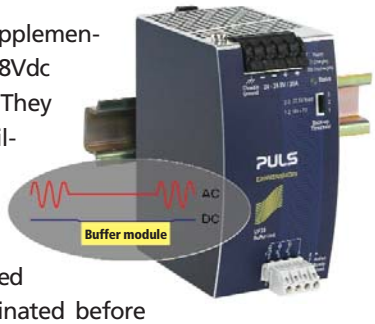
		30.5V 2.8A	30.5V 4A	30.5V 8A	30.5V 8A
Output Voltage	**nom.**	**30.5V**	**30.5V**	**30.5V**	**30.5V**
Output Current	nom.	2.8A	4.0A	8.0A	8.0A
Output Power	nom.	85W	120W	240W	240W
AC Input Voltage	**nom.**	**AC 100-120/200-240V (-15% +10%), manual selector**			**3AC 400-500V (±15%)**
Input Current [3]	max.	2.0/0.9A	2.7/1.3A	6.0/2.8A	0.8A
Harmonic Correction [8]		no	no	no	passive
EN 61000-3-2 (PFC-Norm)		yes	yes	no	yes
Power Factor 120/230Vac [4]	typ.	0.58/0.52	0.58/0.52	0.53/0.48	0.5/0.47 (400/480V)
Hold-up Time 120/230Vac [4]	typ.	55/58ms	56/60ms	26/28ms	30/50ms
DC Input Voltage		230-375Vdc	240-375Vdc	230-375Vdc	450-820Vdc
Limitation of Inrush Current		NTC	NTC	passive [R]	NTC
Inrush Current 120Vac [5]	typ.	18A; 1.4A²s	45A; 3.7A²s	14A; 1.5A²s	45A; 1.4A²s (400V)
Inrush Current 230Vac [5]	typ.	32A; 1.6A²s	50A; 2.5A²s	26A; 1.5A²s	54A; 2.3A²s (480V)
Efficiency 120/230Vac [4]	typ.	89.5/90.5%	89.0/90.0%	91.0/92.0%	91.5/91.6%
Power Losses 120/230Vac [4]	typ.	10.5/9.1W	10.0/13.5W	23.7/21.2W	22.5/22.0W
MTBF [6]		505 000h	400 000h	330 000h	510 000h
Operational Temperature Range	min.	-10°C ... +70°C	-10°C ... +70°C	-10°C ... +70°C	-10°C ... +70°C
Derating +60...+70°C	min.	2W/°C	3W/°C	6W/°C	6W/°C
Dimensions WxHxD [7]	nom.	49x124x102mm	73x124x102mm	91x124x102mm	129x124x117mm
Weight	max.	500g	650g	890g	1160g
IR-Mode-Jumper		yes	yes	yes	yes
Shut-down at Overload		no	no	yes	yes
Ground Fault Monitor		no	yes	no	no
Order Number		**SLA3.100**	**SLA4.100**	**SLA8.100**	**SLA8.300**

Fold out the back page to find the footnotes

SLV20, UF20 and UB10

Power failures, voltage fluctuations or power faults can cause downtime and loss of data, which usually costs a lot of time and money. A Buffer module or a DC-UPS provides a reliable and economical solution to protect against the consequences of mains failures. Short term power failures up to several 100ms can be bridged with the 24V or 48V buffer units. For longer power failures, the DC-UPS is more suitable.

Buffer Modules



The buffer modules are supplementary devices for 24Vdc or 48Vdc regulated power supplies. They deliver power to bridge failures on the DC voltage or to extend the hold-up time after turn-off of the AC power. Data can be saved and processes can be terminated before the DC Voltage turns off which allows for a controlled restart. Buffer modules can also be used to avoid voltage dips during peak current demands of the load. Suitable power supplies can be found in the accessory list on page 30 and 31.

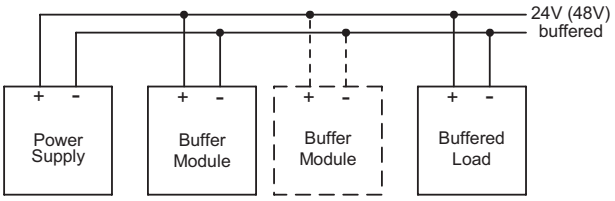
Working principle:
The power supply provides a suitable voltage to the load and at the same time energy is stored in the capacitors within the buffer module. When there is a DC voltage failure, this energy is then released in a regulated process to the load. The buffer modules are maintenance free, easy to operate and do not require any control wiring. Buffer modules are connected with two wires paralleled to the load circuit. To gain longer hold up time or to increase the buffer current, multiple units can be used in parallel.

- Buffering with service-free electrolytic capacitors
- 24V or 48V models available
- Constant output voltage in buffer mode
- Easy installation by simply connecting the buffer module in parallel to the load.
- Comprehensive monitoring and signalling functions.

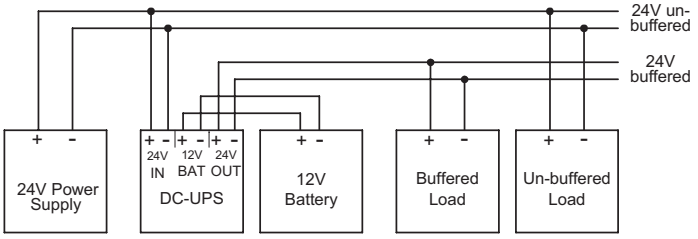
DC-UPS

Using an external battery module, the DC UPS delivers 24V in case of power outages. There is one DC-UPS and two different battery modules available. A unique feature of this system is that only one 12V battery is required and the UPS module boosts the 12V to a 24V level. This makes matching batteries unnecessary while still allowing constant buffering. The integrated active battery management with charging function guarantees the longest service life possible. Detailed diagnostic indicators and signal outputs facilitate simple integration and user friendly operation.
The output is decoupled from the input allowing load circuits to be easily split into buffered and non buffered sections. The energy of the battery can then be used in the circuit which requires buffering. Due to the light weight the pre-assembled 7Ah battery module can be mounted on a DIN-rail. For longer hold up times there is a larger 26Ah battery module available.

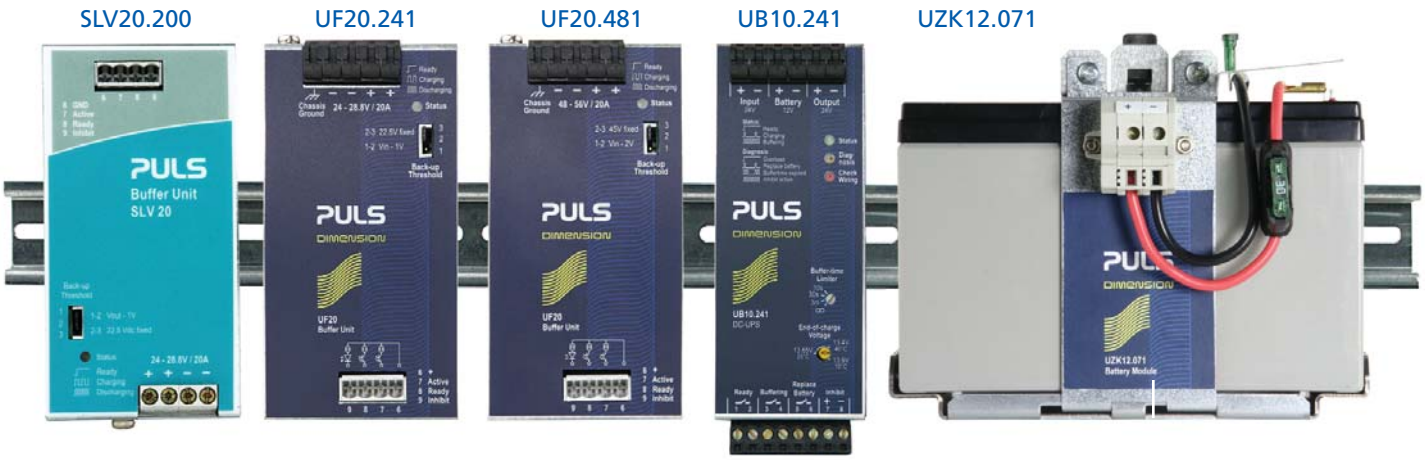
- Requires only one 12V battery (Batteries between 3.9 and 27Ah only)
- Constant output voltage in buffer mode
- Low voltage drop between input and output
- Electronically protected against output overloads
- Extensive battery management
- Extensive and smart diagnostic and monitoring functions



Wiring diagram buffer module



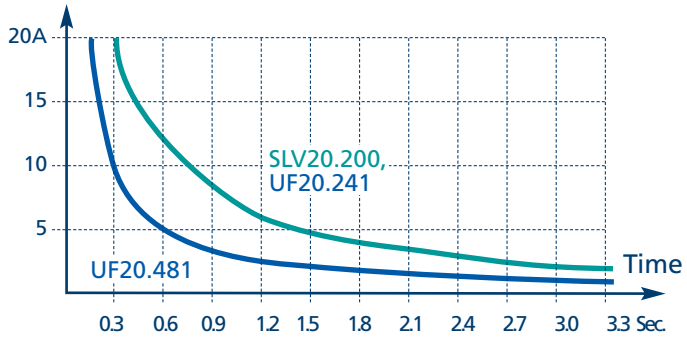
Wiring diagram DC-UPS



			Buffer Module			DC-UPS
			24-28.8V	24-28.8V	48-56V	24-28.8V
Output Voltage	Buffer Mode	nom.	22.5V*)	22.5V*)	45V *)	22.3V
Output Current	Buffer Mode	nom.	20A	20A	20A	10A (15A for 4s)
	Normal Mode	nom.	–	–	–	15A
Current Dissipation	fully charged	typ.	80mA	80mA	40mA	0.12A
	Charging Mode	max.	600mA	600mA	500mA	1.1A
Power Losses	Stand-by	typ.	1.9W	1.9W	1.9W	2.7W
Voltage Drop	Input-Output	max.	–	–	–	0.3V at 10A
Transition Threshold	Buffer Mode	typ.	22.5V *)	22.5V *)	45V *)	22.3V
Charging Time		typ.	18s	18s	21s	5 / 17h (7 / 26Ah)
Hold-up Time		min.	200ms at 20A	200ms at 20A	100ms at 20A	5'42" / 39' (7 / 26Ah) at 10A
		typ.	310ms at 20A	310ms at 20A	150ms at 20A	6'15" / 55' (7 / 26Ah) at 10A
MTBF			2 334 500h	2 327 000h	2 348 000h	T)
Operational Temperature Range		min.	-10°C ... +70°C	-25°C ... +70°C	-25°C ... +70°C	-25°C ... +60°C
Dimensions WxHxD 7)			64x124x102mm	64x124x102mm	64x124x102mm	49x124x117mm
Connection Terminals			screw terminals	spring terminals	spring terminals	spring terminals
Weight		max.	740g	740g	740g	530g
Input / Output Decoupling			no	no	no	yes
Signals			Inhibit	Inhibit	Inhibit	Inhibit
			Ready, Buffering	Ready, Buffering	Ready, Buffering	Ready, Buffering, Replace Battery
Order Number			**SLV20.200**	**UF20.241**	**UF20.481**	**UB10.241**
Battery Modules 12V 7Ah / 12V 26Ah						UZK12.071 / UZK12.261
Battery Replacement 12V 7Ah / 12V 26Ah						UZB12.071 / UZB12.261
Battery Modules without Battery Assembly						UZO12.07 / UZO12.26

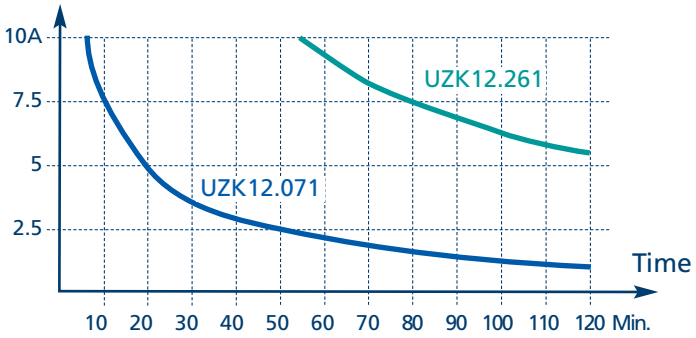
*) Option: The buffer units can be set in a variable mode where the unit starts buffering as soon as the voltage decreases by 1V/2V (24V/48V-unit).
The output voltage in buffer mode corresponds to this value. Fold out the back page to find the footnotes

Buffer Current



Typ. hold-up time of 24V- and 48V-buffer-module

Buffer Current



Typ. hold-up time of the DC-UPS for various battery modules

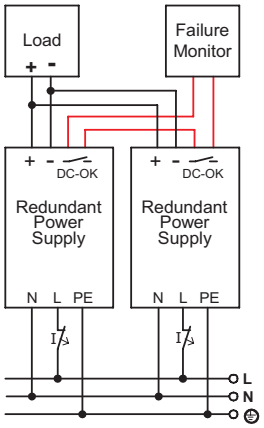
SLR2, SLR5, SLR10

To increase the reliability and availability of the DC voltage two or more power supplies can be used in parallel to obtain a redundant system. This type of system requires one additional power supply as a reserve, so that in a situation where one may fail, the output current can still be delivered from the remaining units.

SLR2.100 SLR5.100 SLR10.100

The special features of redundant power supplies:

Integrated decoupling diode
This prevents a non-functioning unit from becoming a load to the remaining units.
DC-OK relay contact
Signals when DC output voltage is not in range.
Plug connectors
Allows a quick and easy replacement of a non-functioning unit.
Passive current share
Longer lifetimes are gained from lower internal temperatures due to the load sharing of currents between the individual power supplies.



Wiring diagram for a redundant system

			24V 2.5A	24V 5A	24V 10A
Output Voltage			**24V**	**24V**	
Output Current	continuous	nom.	2.5A	5.0A	10.0A
	short-term		–	6.0A	12.0A
Output Power	continuous	nom.	60W	120W	240W
	short-term		–	144W	288W
Power Reserves		min.	–	20% Power Boost G)	20% Power Boost G)
Ripple & Noise 2)		max.	30mVpp	30mVpp	30mVpp
Overload Behaviour			cont. current	cont. current	cont. current
AC Input Voltage		nom.	AC 115/230V (-25% +15%), manual selector		
Input Current 3)		max.	1.3/0.7A	2.6/1.4A	6.0/2.8A
Harmonic Correction 8)			none	none	none
EN 61000-3-2 (PFC-Norm)			yes	yes	no
Power Factor 120/230Vac 4)		typ.	0.6/0.51	0.56/0.49	0.56/0.5
Hold-up Time 120/230Vac 4)		typ.	53/54ms	57/58ms	61/60ms
DC Input Voltage			160-375Vdc	210-375Vdc	240-375Vdc
Limitation of Inrush Current			NTC	NTC	NTC
Inrush Current 120Vac 5)		typ.	15A; 1.1A²s	16A; 1.6A²s	45A; 6.8A²s
Inrush Current 230Vac 5)		typ.	28A; 0.9A²s	18A; 1.1A²s	51A; 4.2A²s
Efficiency 120/230Vac 4)		typ.	86.1/87.2%	87.7/88.3%	87.7/88.5%
Power Losses 120/230Vac 4)		typ.	9.7/8.8W	16.8/15.9W	33.7/31.2W
MTBF 6)			700 000h	480 000h	390 000h
Operational Temperature Range		min.	-10 °C ... +70°C	-10 °C ... +70°C	0 °C ... +70°C
Derating +60...+70°C		min.	1.5W/°C	3W/°C	6W/°C
Dimensions WxHxD 7)			49x124x102mm	64x124x102mm	120x124x102mm
Weight		max.	470g	620g	980g
Order Number			**SLR2.100**	**SLR5.100**	**SLR10.100**

Fold out the back page to find the footnotes

MLY02, YR2.DIODE, SLR01, SLR02

Due to redundancy modules, redundant systems can also be built with standard power supplies without built in decoupling diodes.

Redundancy modules

Contain decoupling diodes as well as a monitoring circuitry. LEDs and relay contacts signals when the DC output voltage is not in range due to a non-functioning unit.

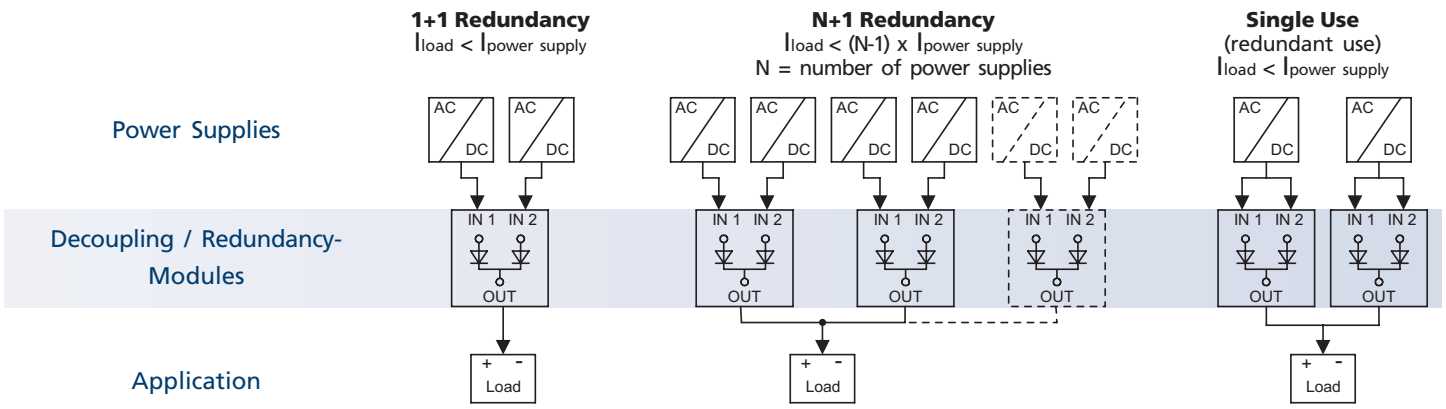
Decoupling modules

Contain only decoupling diodes and no monitoring is included. Decoupling modules are the perfect solution to use in a redundant systems if the power supply itself is equipped with a DC-OK signal.

MLY02.100 YR2.DIODE YRM2.DIODE SLR01 SLR02

			Redundancy Modules 1x40A	2x30A	2x10A	Decoupling Modules 2x10A	2x5A
Voltage Range			**DC 24–28V**	**DC 24–28V**	**DC 24–60V**	**DC 10–60V**	**DC 10–60V**
Inputs			1	2	2	2	2
Outputs			1	1	1	1	1
Input Current	1+1-Mode	nom.	40A	2x 30A	2x 12.5A	2x 12.5A	2x 10A
	N+1-Mode	nom.	40A	2x 15A	2x 10A	2x 10A	2x 5A
	Single Use	nom.	40A	30A	20A	20A	10A
Output Current	Full Load	nom.	40A	30A	20A	20A	10A
	Overload	max.	54A	64A*)	25A	25A	16A
Voltage Drop	Input / Output	typ.	0.5V	0.5V	0.85V	0.85V	0.9V
Power Losses	No Load	typ.	1.1W	1.6W	1W	0W	0W
	Full Load	typ.	19.2W at 40A	13.2W at 30A	18W at 20A	17W at 20A	9W at 10A
MTBF 6)			5 200 000h	4 700 000h	6 200 000h	10 100 000h	9 300 000h
Operational Temperature Range		min.	-10°C ... +70°C	-10°C ... +70°C	-25°C ... +70°C	-25°C ... +70°C	-40°C ... +70°C
Derating +60...+70°C		min.	1A/°C	0.7A/°C	0.5A/°C	0.5A/°C	0.25A/°C
Dimensions WxHxD 7)		nom.	48x124x117mm	48x124x102mm	32x124x117mm	32x124x102mm	45x75x91mm
Connection Terminals			screw terminals	screw terminals	screw terminals	spring terminals	spring terminals
Weight		max.	650g	640g	350g	290g	140g
Under-Voltage Monitor			adjustable between16V and 27V		21.5V	–	–
Over-Voltage Monitor			30.7V±5%	30.7V±5%	–	–	–
Alarm Contact			relay contact P)	relay contact P)	relay contact P)	–	–
Order Number			**SLR01**	**SLR02**	**YRM2.DIODE**	**YR2.DIODE**	**MLY02.100**

Fold out the back page to find the footnotes

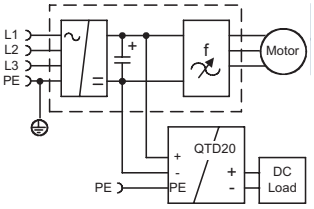


QTD20.241 and SLD2.100

QTD20.241			24V 20A
Output Voltage		**nom.**	**24-28V**
Output Current	continuous	nom.	20-17.5A
Output Power	continuous	nom.	480W
Factory Setting [1]		typ.	24.1V
Ripple & Noise [2]		max.	100mVpp
Overload Behaviour			cont. current
Input Voltage		**nom.**	**360-900Vdc***)
Input Current [3]		max.	1.0A
Hold-up Time [4]		typ.	22ms
Limitation of Inrush Current			active
Inrush Current [5]		typ.	3A; 1A²s
Efficiency/Power Losses [4]		typ.	94.5%/25.2W
MTBF [6]			615 000h
Operational Temperature Range		min	-25°C ... +70°C
Derating +60...+70°C		min.	12W/°C
Dimensions WxHxD [7]			65x124x127mm
Weight		max.	870g
DC-OK-Signal			relay contact [P]
Parallel Use			yes
Serial Use [9]			yes
Order Number			**QTD20.241**

*) please check details in data sheet
Fold out the back page to find the footnotes

The perfect power supply for drive systems.
This units utilises the kinetic energy from the motor to keep the controls and brakes operational until the motor is in a complete stop position.



Intermediate busses are not usually filtered and have high superimposed EMI noise and generate huge leakage currents. The PULS QTD20 has a robust input stage and an appropriate input filter to handle these conditions.
Additionally, the QTD20 is equipped with input fuses which are rated for 600VDC. The unit is also UL and IEC approved.

SLD2.100			5V 8A
Output Voltage		**nom.**	**5-5.5V**
Output Current	continuous	nom.	8A
Output Power	continuous	nom.	40W
Factory Setting [1]		typ.	5.1V
Ripple & Noise [2]		max.	50mVpp
Overload Behaviour			cont. current
Input Voltage		**nom.**	**DC 24V -25%/+50%**
Input Current [3]		max.	2.7A
Hold-up Time [4]		typ.	12ms
Limitation of Inrush Current			active
Inrush Current [5]		typ.	5A; 1.5A²s
Efficiency/Power Losses [4]		typ.	82.0%/8.8W
MTBF [6]			510 000h
Operational Temperature Range		min.	0°C ... +70°C
Derating +60...+70°C		min.	1.5W/°C
Dimensions WxHxD [7]		nom.	49x124x102mm
Weight		max.	470g
Parallel Use			yes
Serial Use [9]			no
Order Number			**SLD2.100**

Fold out the back page to find the footnotes

24V to 5V Converter
- Input 18... 36Vdc
- Output 5V, 8A
- Active limitation of inrush current
- Reverse polarity protection on the input

Overview and Short Description of Standards

IEC/EN/UL 60950-1	Safety of Information Technology Equipment
IEC/EN/UL 60601-1	Safety of Medical Equipment
UL 1604	Electrical equipment for use in Class I and II, Division 2, and Class III hazardous locations
UL 508	Industrial control equipment
EN 61000-3-2	Electromagnetic compatibility (EMC) Limits for harmonic current emission
EN 61000-3-3	Electromagnetic compatibility (EMC) Limitation of voltage changes, voltage fluctuations and flicker
EN 61000-6-1	Electromagnetic compatibility – Generic immunity standard – Residential and commercial environment
EN 61000-6-2	Electromagnetic compatibility – Generic immunity standard – Industrial environment
EN 61000-6-3	Electromagnetic compatibility – Generic emission standard – Residential and commercial environment
EN 61000-6-4	Electromagnetic compatibility – Generic emission standard – Industrial environment
EN 55011	Industrial, scientific and medical (I.S.M.) radio frequency equipment – Radio disturbance characteristics
EN 55022	Information technology equipment (I.T.E.) Radio disturbance characteristics
FCC Part 15	Federal Communications Commission, EMC Requirements for Radio Frequency Devices
IEC/EN 60204-1	Safety of Electrical Equipment of Machines
EN 50178	Electronic Equipment in Power Installations
IEC/EN 61131-2	Programmable Controllers
EN 61558-2-17	Safety of Power Transformers
SEMI F47-200	Ride-through compliance for semiconductor industry
NEC Class 2	Approval according to the North American National Electrical Code. NEC Class 2 defines limited power circuits with power sources <8A and <100VA.
Class I Div 2 (HazLoc)	Approval for the use in Class I Division 2 Groups A, B, C, D hazardous locations.

„PFC-Standard"

When does a power supply have to comply with the EN 61000-3-2 (harmonic input current) ?

In typical industrial environments, complying with EN61000-3-2 is only necessary under special conditions. Complying to this standard can have some technical drawbacks, such as lower efficiency as well as some commercial aspects such as higher purchasing costs. Frequently, the user does not profit from fulfilling this standard, therefore, it is important to know whether it is mandatory to meet this standard for a specific application.

The EN 61000-3-2 is not mandatory when:

- The input power of the power supply is below 75W. The measurement of the harmonic input current allows averaging of the total load cycle including all brakes.
- The input power of the power supply is above 1000W
- The power supply is connected to a mains below 220V
- The power supply is used outside the European Union
- The power supply is connected to a mains supply with its own transformer. Such mains are considered to be non-public.

Where individual self-contained items are installed in a rack or a case (e.g. power supplies, drive system) as an assembled piece of equipment, they are regarded to be individually connected to the mains. Alternatively, it is also permitted to assess the whole rack.

This short interpretation allows a rough orientation for machine builder and system integrators. It is not a consultation and can not replace studying the standard and the individual decision.

	CE	UL 508	UL 60950-1	UL 1604 Class I Div 2	NEC Class 2	CB-Scheme IEC 60950, I.T.E.	CB-Scheme IEC 60601-1, medical	GL Germanischer Lloyd	CCC Mark (China)	Device Net, ODVA approval	SEMI F47-0200, PQ-Star	AS-Interface approval	EN 61000-3-2 (PFC)	EN 61000-3-3 (Flicker)	EN 61000-6-1 (EMC-Immunity)	EN 61000-6-2 (EMC-Immunity)	EN 61000-6-3 (EMC-Emission)	EN 61000-6-4 (EMC-Emission)	EN 55011 / EN 55022 Class B	FCC Part 15 Class B
CS3.241	x	x	x	–	x	x	–	x	–	–	–	–	–	x	x	x	–	x	x	x
CS5.241	x	x	x	–	–	x	–	x	–	–	–	–	–	x	x	x	–	x	x	x
CS5.243	x	x	x	–	–	x	–	x	–	–	–	–	n.a.	x	x	x	x	x	x	x
CS5.244	x	x	x	–	–	x	–	x	–	–	–	–	x	x	x	x	x	x	x	x
CS10.241	x	x	x	–	–	x	–	x	–	–	–	–	–	x	x	x	–	x	x	x
CS10.242	x	x	x	–	–	x	–	x	–	–	–	–	x	x	x	x	x	x	x	x
CS10.243	x	x	x	–	–	x	–	x	–	–	–	–	n.a.	x	x	x	x	x	x	x
CS10.244	x	x	x	–	–	x	–	x	–	–	–	–	–	x	x	x	–	x	x	x
CS10.481	x	x	x	–	–	x	–	x	–	–	–	–	–	x	x	x	–	x	x	x
ML30.100	x	x	x	x	x	x	x	x	–	–	–	–	x	x	x	x	x	x	x	x
ML30.101	x	x	x	x	x	x	–	x	–	–	–	–	x	x	x	x	x	x	x	x
ML30.102	x	x	x	x	x	x	–	–	–	–	–	–	x	x	x	x	x	x	x	x
ML30.106	x	x	x	–	x	x	–	x	–	–	–	–	x	x	x	x	x	x	x	x
ML50.100	x	x	x	x	x	x	x	x	–	–	–	–	x	x	x	x	x	x	x	x
ML50.101	x	x	x	x	x	x	–	–	–	–	–	–	x	x	x	x	x	x	x	x
ML50.102	x	x	x	x	x	x	–	–	–	–	–	–	x	x	x	x	x	x	x	x
ML50.105	x	x	x	–	x	x	–	–	–	–	–	–	x	x	x	x	x	x	x	x
ML50.111	x	x	x	–	x	x	x	x	–	–	–	–	x	x	x	x	x	x	x	x
ML70.100	x	x	x	–	x	x	–	x	–	–	–	–	x	x	x	x	x	x	x	x
ML90.200	x	x	x	–	x	x	–	x	–	–	–	–	x	x	x	x	x	x	x	x
ML95.100	x	x	x	x	x	–	–	–	–	–	–	–	x	x	x	x	x	x	x	x
ML100.100	x	x	x	x	–	x	–	x	–	–	–	–	x	x	x	x	x	x	x	x
ML100.102	x	x	x	x	–	x	–	x	–	–	–	–	x	x	x	x	x	x	x	x
ML100.105	x	x	x	–	–	x	–	x	–	–	–	–	x	x	x	x	x	x	x	x
ML100.200	x	x	x	–	–	x	–	x	–	–	–	–	x	x	x	x	x	x	x	x
MLY02.100	x	x	x	x	–	x	–	x	–	–	–	–	x	x	x	x	x	x	x	x
QS3.241	x	x	x	x	–	x	–	x	–	–	x	–	x	x	x	x	x	x	x	x
QS5.241	x	x	x	x	–	x	–	x	–	–	x	–	x	x	x	x	x	x	x	x
QS5.DNET	x	x	x	x	x	x	–	x	–	x	x	–	x	x	x	x	x	x	x	x
QS10.121	x	x	x	x	–	x	–	x	–	–	–	–	x	x	x	x	x	x	x	x
QS10.241	x	x	x	x	–	x	–	x	–	–	x	–	x	x	x	x	x	x	x	x
QS10.301	x	x	x	–	–	–	–	–	–	–	–	–	x	x	x	x	x	x	x	x
QS10.481	x	x	x	x	–	x	–	x	–	–	–	–	x	x	x	x	x	x	x	x
QS10.DNET	x	x	x	x	–	x	–	x	–	x	x	–	x	x	x	x	x	x	x	x
QS20.241	x	x	x	x	–	x	–	x	–	–	–	–	x	x	x	x	x	x	x	x
QS20.361	x	x	x	x	–	x	–	x	–	–	–	–	x	x	x	x	x	x	x	x
QS20.481	x	x	x	x	–	x	–	x	–	–	–	–	x	x	x	x	x	x	x	x
QT20.241	x	x	x	x	–	x	–	x	–	–	x	–	x	x	x	x	x	x	x	x
QT20.361	x	x	x	x	–	x	–	x	–	–	–	–	x	x	x	x	x	x	x	x
QT20.481	x	x	x	x	–	x	–	x	–	–	–	–	x	x	x	x	x	x	x	x
QTD20.241	x	x	x	–	–	x	–	–	–	–	–	–	n.a.	n.a.	x	x	x	x	x	x

n.a.: not applicable; Approvals may be pending on new products, please contact PULS for additional information.

CE mark
EMC, LVD

c UL us
LISTED
UL 508

c UL us
UL 60950-1
UL 1604

IECEE
CB SCHEME
IEC 60950-1
IEC 60601

GL
Germanischer
Lloyd, Marine

CCC S&E
China Compulsory
Certification

DeviceNet
ODVA-approval

SEMI F47 PQ EPRI PEAC
Power Quality Star

AS-Interface

	CE	UL 508	UL 60950-1	UL 1604 Class I Div 2	NEC Class 2	CB-Scheme IEC 60950, I.T.E.	CB-Scheme IEC 60601-1, medical	GL Germanischer Lloyd	CCC Mark (China)	Device Net, ODVA approval	SEMI F47-0200, PQ-Star	AS-Interface approval	EN 61000-3-2 (PFC)	EN 61000-3-3 (Flicker)	EN 61000-6-1 (EMC-Immunity)	EN 61000-6-2 (EMC-Immunity)	EN 61000-6-3 (EMC-Emission)	EN 61000-6-4 (EMC-Emission)	EN 55011 / EN 55022 Class B	FCC Part 15 Class B
SL2.100	x	x	x	–	x	x	–	–	x	–	–	–	x	x	x	x	x	x	x	x
SL4.100	x	x	x	–	x	x	–	–	–	–	–	–	x	x	x	x	x	x	x	x
SL5.100	x	x	x	–	–	x	x	–	–	–	–	–	x	x	x	x	x	x	x	x
SL5.300	x	x	x	–	–	x	–	x	–	–	–	–	x	x	x	x	x	x	x	x
SL10.100	x	x	x	x	–	x	–	–	–	–	–	–	–	x	x	x	–	x	x	x
SL10.300	x	x	x	–	–	x	–	x	–	–	–	–	x	x	x	x	x	x	x	x
SL10.305	x	x	x	–	–	–	–	–	–	–	–	–	x	x	x	x	x	x	x	x
SL20.100	x	x	x	–	–	x	–	–	–	–	–	–	–	x	x	x	–	x	x	x
SL20.110	x	x	x	–	–	x	–	–	–	–	–	–	–	x	x	x	–	x	x	x
SL20.111	x	x	x	–	–	x	–	–	–	–	–	–	x	x	x	x	x	x	x	x
SL20.112	x	x	x	–	–	x	–	–	–	–	–	–	x	x	x	x	x	x	x	x
SL20.113	x	x	x	–	–	x	–	–	–	–	–	–	–	x	x	x	–	x	x	x
SL20.310	x	x	x	–	–	x	–	x	–	–	–	–	x	x	x	x	x	x	x	x
SL30.100	x	x	x	–	–	x	–	–	–	–	–	–	–	x	x	x	–	x	x	x
SL30.300	x	x	x	–	–	x	–	–	–	–	–	–	x	x	x	x	–	x	–	x
SL40.300	x	x	x	–	–	x	–	–	–	–	–	–	x	x	x	x	x	x	x	x
SLA3.100	x	x	x	–	x	x	–	–	–	–	–	x	x	x	x	x	x	x	x	x
SLA4.100	x	x	x	–	–	x	–	–	–	–	–	x	x	x	x	x	x	x	x	x
SLA8.100	x	x	x	–	–	x	–	–	–	–	–	x	–	x	x	x	–	x	x	x
SLA8.300	x	–	–	–	–	–	–	–	–	–	–	x	x	x	x	x	–	x	–	x
SLD2.100	x	–	–	–	–	–	–	–	–	–	–	–	n.a.	n.a.	x	x	x	x	x	x
SLR01	x	x	x	–	–	–	–	–	–	–	–	–	n.a.	n.a.	x	x	x	x	x	x
SLR02	x	x	x	–	–	–	–	–	–	–	–	–	n.a.	n.a.	x	x	x	x	x	x
SLR10.100	x	x	x	–	–	x	–	–	–	–	–	–	–	x	x	x	–	x	x	x
SLR2.100	x	x	x	–	x	x	–	–	–	–	–	–	x	x	x	x	x	x	x	x
SLR5.100	x	x	x	–	–	x	x	–	–	–	–	–	x	x	x	x	x	x	x	x
SLV20.200	x	x	x	–	–	x	–	–	–	–	–	–	n.a.	n.a.	x	x	x	x	x	x
UB10.241	x	x	x	–	–	–	–	x	–	–	–	–	n.a.	n.a.	x	x	x	x	x	x
UF20.241	x	x	x	–	–	x	–	–	–	–	–	–	n.a.	n.a.	x	x	x	x	x	x
UF20.481	x	x	x	–	–	x	–	–	–	–	–	–	n.a.	n.a.	x	x	x	x	x	x
XT40.241	x	x	x	–	–	–	–	–	–	–	–	–	x	x	x	x	x	x	x	x
XT40.242	x	x	x	–	–	–	–	–	–	–	–	–	x	x	x	x	x	x	x	x
XT40.361	x	x	x	–	–	–	–	–	–	–	–	–	x	x	x	x	x	x	x	x
XT40.362	x	x	x	–	–	–	–	–	–	–	–	–	x	x	x	x	x	x	x	x
XT40.481	x	x	x	–	–	–	–	–	–	–	–	–	x	x	x	x	x	x	x	x
XT40.482	x	x	x	–	–	–	–	–	–	–	–	–	x	x	x	x	x	x	x	x
XT40.721	x	x	x	–	–	–	–	–	–	–	–	–	x	x	x	x	x	x	x	x
XT40.722	x	x	x	–	–	–	–	–	–	–	–	–	x	x	x	x	x	x	x	x
YR2.DIODE	x	x	x	x	–	–	–	x	–	–	–	–	n.a.	n.a.	x	x	x	x	x	x
YRM2.DIODE	x	x	x	–	–	–	–	x	–	–	–	–	n.a.	n.a.	x	x	x	x	x	x

n.a.: not applicable; Approvals may be pending on new products, please contact PULS for additional information.

CE mark
EMC, LVD

c UL us
LISTED
UL 508

c UL us
UL 60950-1
UL 1604

IECEE
CB SCHEME
IEC 60950-1
IEC 60601

GL
Germanischer
Lloyd, Marine

China Compulsory
Certification

DeviceNet
ODVA-approval

SEMI F47 PQ
Power Quality Star

AS-Interface

	Decoupling / Redundancy Module	Buffer Unit	Wall/Panel Mount Bracket	Side Mount Bracket
CS3.241	YRM2.DIODE	UF20.241	ZM1.WALL	ZM11.SIDE
CS5.241	YRM2.DIODE	–	ZM1.WALL	ZM11.SIDE
CS5.243	YRM2.DIODE	UF20.241	ZM1.WALL	ZM11.SIDE
CS5.244	YRM2.DIODE	UF20.241	ZM1.WALL	ZM11.SIDE
CS10.241	YRM2.DIODE	–	ZM1.WALL	ZM13.SIDE
CS10.242	YRM2.DIODE	–	ZM1.WALL	ZM13.SIDE
CS10.243	YRM2.DIODE	UF20.241	ZM1.WALL	ZM13.SIDE
CS10.244	YRM2.DIODE	UF20.241	ZM1.WALL	ZM13.SIDE
CS10.481	YRM2.DIODE	–	ZM1.WALL	ZM13.SIDE
ML30.100	MLY02.100	UF20.241	*)	–
ML30.101	–	–	*)	–
ML30.102	MLY02.100	–	*)	–
ML30.106	–	–	*)	–
ML50.100	MLY02.100	UF20.241	*)	–
ML50.101	MLY02.100	UF20.241	*)	–
ML50.102	MLY02.100	–	*)	–
ML50.105	MLY02.100	UF20.481	*)	–
ML50.111	MLY02.100	UF20.241	*)	–
ML70.100	MLY02.100	UF20.241	*)	–
ML90.200	–	UF20.241	–	–
ML95.100	–	UF20.241	–	–
ML100.100	MLY02.100	UF20.241	–	–
ML100.102	YR2.DIODE	–	–	–
ML100.105	MLY02.100	UF20.481	–	–
ML100.200	MLY02.100	UF20.241	–	–
QS3.241	YR2.DIODE	UF20.241	ZM1.WALL	ZM11.SIDE
QS5.241	YR2.DIODE	UF20.241	ZM1.WALL	ZM12.SIDE
QS5.DNET	YR2.DIODE	UF20.241	ZM1.WALL	ZM12.SIDE
QS10.121	2x YR2.DIODE	–	ZM1.WALL	ZM13.SIDE
QS10.241	YR2.DIODE	UF20.241	ZM1.WALL	ZM13.SIDE
QS10.301	YR2.DIODE	–	ZM1.WALL	ZM13.SIDE
QS10.481	YR2.DIODE	UF20.481	ZM1.WALL	ZM13.SIDE
QS10.DNET	YR2.DIODE	UF20.241	ZM1.WALL	ZM13.SIDE
QS20.241	2x YR2.DIODE	UF20.241	ZM1.WALL	–
QS20.361	2x YR2.DIODE	–	ZM1.WALL	–
QS20.481	YR2.DIODE	UF20.481	ZM1.WALL	–
QT20.241	2x YR2.DIODE	UF20.241	ZM1.WALL	ZM14.SIDE
QT20.361	2x YR2.DIODE	–	ZM1.WALL	ZM14.SIDE
QT20.481	YR2.DIODE	UF20.481	ZM1.WALL	ZM14.SIDE
QTD20.241	2x YR2.DIODE	UF20.241	ZM1.WALL	ZM14.SIDE
SL2.100	SLR02	SLV20.200	SLZ02	–
SL5.100	SLR02	SLV20.200	SLZ02	–
SL5.300	SLR02	SLV20.200	SLZ02	–
SL10.100	SLR02	SLV20.200	SLZ02	–
SL10.300	SLR02	SLV20.200	SLZ02	–
SL10.305	YR2.DIODE	UF20.481	SLZ02	–

*) A plastic wall mount bracket is included with this item.

Wall/Panel mount bracket for the 45mm wide MiniLine

SLZ02
Wall/Panel mount bracket for SilverLine

SLZ11-SLZ14
Mounting bracket for S7-300 rail

	max. width of unit
SLZ11	51mm
SLZ12	66mm
SLZ13	90mm
SLZ14	121mm

	Decoupling / Redundancy Module	Buffer Unit	Wall/Panel Mount Bracket	Side Mount Bracket
SL20.100	SLR02	SLV20.200	SLZ02	–
SL20.110	SLR02	SLV20.200	SLZ02	–
SL20.111	SLR02	SLV20.200	SLZ02	–
SL20.112	–	–	SLZ02	–
SL20.113	–	UF20.481	SLZ02	–
SL20.310	SLR02	SLV20.200	SLZ02	–
SL30.100	SLR01, SLR02	–	SLZ02	–
SL30.300	SLR01, SLR02	–	SLZ02	–
SL40.300	SLR01	–	SLZ02	–
SLA3.100	–	–	SLZ02	–
SLA4.100	–	–	SLZ02	–
SLA8.100	–	–	SLZ02	–
SLA8.300	–	–	SLZ02	–
SLD2.100	–	–	SLZ02	–
SLR10.100	–	SLV20.200	SLZ02	–
SLR2.100	–	SLV20.200	SLZ02	–
SLR5.100	–	SLV20.200	SLZ02	–
UB10.241	–	–	ZM1.WALL	
UF20.241	–	–	ZM1.WALL	ZM14.SIDE
UF20.481	–	–	ZM1.WALL	ZM14.SIDE
XT40.241	SLR01	UF20.241	–	–
XT40.242	SLR01	UF20.241	–	–
XT40.361	–	–	–	–
XT40.362	–	–	–	–
XT40.481	2xYRM2.DIODE	UF20.481	–	–
XT40.482	2xYRM2.DIODE	UF20.481	–	–
XT40.721	–	–	–	–
XT40.722	–	–	–	–
YR2.DIODE	–	–	ZM1.WALL	ZM11.SIDE
YRM2.DIODE	–	–	ZM1.WALL	ZM11.SIDE

ZM1.WALL
Wall/Panel mount bracket for DIMENSION

ZM11.SIDE ... ZM14.SIDE:
Side mount bracket for DIMENSION

Conformal Coated Power Supplies

In environments where dust, contaminants, occasional high humidity, vibration or thermal shock can be expected, devices with conformal coated PC-boards are recommended: A significantly higher operational safety can be achieved with conformal coating by avoiding short circuits and corrosion of conductors and solder joints.

The following power supplies are available with conformal coated PC-boards:

ML50.109	24-28V	2.1A	50W	100-240Vac	corresponds to ML50.100
ML100.109	24-28V	4.2A	100W	100-120/220-240Vac	corresponds to ML100.100
CS5.241-C1	24-28V	5A	120W	100-120/200-240Vac	corresponds to CS5.241
QS10.241-C1	24-28V	10A	240W	100-240Vac	corresponds to QS10.241
SL10.309	24-28V	10A	240W	3AC 400-500V	corresponds to SL10.300
QT20.241-C1	24-28V	20A	480W	3AC 380-480V	corresponds to QT20.241

FOOTNOTES

1) At full load
2) 50 Ohm measurement, bandwidth 20MHz
3) At full load and the lower end of the input voltage range
4) At full load and nominal input voltage
5) Peak value and inrush energy at an ambient temperature of 40°C and cold start
6) According to SN29500 (IEC 61709) and 230Vac (or 3x400Vac), nominal load and 40°C ambient temperature
7) Without DIN-rail
8) Harmonic correction describes whether the input current waveform is filtered in order to reduce the amount of harmonic current. The fulfillment of the EN 61000-3-2 does not necessarily require a corrected unit.
9) Valid only for the same units up to a total maximum voltage of 150Vdc.

A) Missing jumper adjusts the unit to 12V (ML30.102), ±12V (ML30.106) or 10V (ML30.102).
B) Selectable between hiccup mode or continuous output current.
C) Selectable between continuous output current and FUSE Mode® (shut-down)
D) During overload, unit shuts down after the following time periods:
   - 15s for output currents between 100 and 125%
   - 6s for output currents between 125% and 200%
   - 100ms for output currents > 200%
   To restart, press the reset button or cycle the input power.
E) No inrush current surge
F) After an input power failure, the output voltage decreases continuously. After 3ms and full load, 80% of the nominal output voltage is available.
G) Do not use the short term current / power longer than a duty cycle of 10% and/or not longer than 1 minute every 10 minutes.
H) Once the short term power is exceeded, the power supply responds with a time-delayed shut-down.
J) The power supply should not be used in parallel in order to increase the output power. However, units can be paralleled for building 1+1 redundancy systems or to deliver short-term peak currents to the load when the average current is smaller than the current of one power supply.
K) The output power will be automatically reduced to the continuous output power level, in case the BonusPower® will be obtained for longer than 4s.
L) The short-term power / current is continuously allowed up to an ambient of 45°C. Above this temperature, do not use the short term power longer than a duty cycle of 10% and/or not longer than 1 minute every 10 minutes.
M) No passive current share. One or more units can be permanently overloaded, which shortens the life time expectancy and reduces the MTBF. The overloaded unit can respond with thermal shut-down at ambient temperatures above 45°C.
N) Set unit into parallel mode by changing the jumper position. The regulation of the output voltage is then load dependent. The output voltage is approximately 5% higher at no load compared to full load. This allows a current share between paralleled units.
O) Open collector transistor output, 30mA max.
P) Relay contact: 60Vdc 0.3A; 30Vdc 1A; 30Vac 0.5A
R) Resistor with automatic bypass
T) Consult PULS
U) The unit can respond with a thermal shut-down when continuously loaded with more than 120W and operated with a mains voltage of 100V or below.

For further Information about our products visit **www.pulspower.com** and download the individual datasheets.

The information presented in this document is believed to be accurate and reliable and may change without notice.

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