



Korte Hei 3, 4714 RD Sprundel
The Netherlands

www.purewatergroup.com

PSSW

SWITCH MODE POWER SUPPLIES

USER INSTRUCTIONS AND SERVICE MANUAL

Manual covers:

PSSW07050

PSSW07050S

PSSW070503

PSSW070503S

PSSW14025

PSSW14025S

PSSW140253

PSSW140253S

PSSW30024

PSSW60012

LIST OF REVISIONS

Revision number	Date	Description	Page(s)	Signature
0	27-March-2017	First release	All	FS
1	14-Sept-2017	Dimensions 4,8kW PSSW added Added Control display	7 9	FS FS
2	6-April-2018	Reduced Power requirements VNX CEDI modules + new modules added + adjusted heat EU Declaration included	11-12 13	FS FS
3	16-August-2018	Reduced power requirements for LX modules	11-12	AU
4	17-Nov-2018	Adjusted power requirements	11-12	AU
5	11-March-2019	Adjusted power requirements	12	AU
6	02-April-2019	Update recommended PSSW for module	11	FS
7	28-Jan 2020	Update with DSPPSSW08 Display Better explanation of X4 and X3 Changed PSSW07050/14025 to PSSW07050(S)/14025S: including metal protection cap	4-6-9 8 4-5	
8	15-Dec-2020	Update in safety standards	5-7-13	HvB
9	15-Feb-2022	Removed obsolete DSPPSSW01	4, 6, 8, 9	AU
10	1-June-2022	Leakage current info	4, 6	AU
11	22-Jan-2025	Added 3 phase PSSW070503(S)/140253(S)	4, 5	FS
		Cooling update for PSSW070503(S)/140253(S)	9	FS
		EU declaration of conformity update	13	FS
		Added the versions without metal cap (without S)	All	FS
		Remark on installation orientation	6,8	FS

1. Introduction

The PSSW power supply units are high-frequency switching AC/DC converters, featuring function as digitally controlled supply units of DC voltage and current. They are of a modular design, and can be operated individually or arranged into parallel groups. To operate the unit, a CISW00108 communications expansion unit can be used. This also enables unit control of the RS485 series via external analogue signals, potentiometers, or internal trimmers. The device can be used as an industrial power supply source, for electrochemical processes such as electro deionization and electro dialysis.

The units are recommended to be used indoors and under normal environmental conditions (humidity, temperature, dust levels). When operating in an environment of above-average dustiness, the timeframe between service inspections must be reduced. The units are connected to either a single phase or three-phase power supply via three or four pin connectors. Prior to connection, appropriate unit fusing precautions must be followed – see Technical Data. The unit can function uninterrupted, with cooling ensured via internal ventilators.

PSSW power supply units of the same type can be connected in parallel if required current needed is higher than a single PSSW power supply can deliver.

2. Operational safety

The following requirements must be met when operating the power supplies:

- power supplies are for indoor use only
- proper cooling must be ensured
- power supplies can be connected only to a regular main supply
- power supplies must not be operated without the cover
- it is not allowed to disconnect the load during operation
- power supplies may be operated only by qualified staff
- changes of power supply parameters may be made only by a service engineer

3. Installation

The unit is intended to be installed into the mounting panel within the enclosure. Installation is undertaken using 4 M5 screws –see Layout Schematic. The unit can function both in a horizontal and vertical position; for optimal cooling, a vertical position is considered desirable. In locations surrounding unit ventilators and air exhausts, at least 100 mm of space should be ensured to permit unencumbered unit inflow and outflow of air. The unit must not be used in extremely dusty conditions, nor in conditions containing electrically conductive dust, nor in conditions containing above normal levels of aggressive chemical vapor. Such conditions could cause a decrease in the cooling of unit components, or lead to short circuits inside the unit. Damage or destruction of the power supply for any of these reasons during the warranty period is considered a breach of warranty terms and therefore negates free servicing and repair. Should the operating environment contain any of the aforementioned undesirable environmental variables, the enclosure case must be fitted with the required filters, or, if needed, an entirely independent cooling system must be engineered (for example by using an air conditioning system or HVAC). In units with an output voltage up to 96V, output terminals are not protected. If additional protection is sought, it is crucial to secure this via supplemental protection, for example via protective caps placed on screw heads.

4. Technical parameters

PSSW 2,9 kW

- Adjustable output voltage and current in a wide range
- Possibility of remote control by:
 - Analog signals from PLC via interface CISW00108
 - RS485 MODBUS protocol from PLC via CISW00108
 - Display DSPPSSW08 through RS485 MODBUS protocol via CISW00108 (up to 8x PSSW/CISW00108 with PLC monitoring/control functionality)
- Possibility of parallel arrangement of units
- Available with metal protection cap on DC connections (-S versions):
 - PSSW07050S
 - PSSW070503S
 - PSSW14025S
 - PSSW140253S
- Integrated overcurrent and overvoltage protection
- Galvanic input–output separation
- Available with 3 phase (L1, L2, L3) supply voltage and with single phase (L+N):
 - 1–phase 230V input power supply (PSSW07050(S)/14025(S)) or
 - 3–phase 400V input power supply (PSSW070503(S)/140253(S))



Type	DC voltage range	Max current*	Current @ max DC Voltage
PSSW14025(S) / PSSW140253(S)	0...140V DC	25A*	20,7A
PSSW07050(S) / PSSW070503(S)	0...70V DC	50A*	41,4A

* Maximum current: At higher voltages the current will be limited due to maximum rated output power of 2900W.

Description

Switched AC/DC converter, DC voltage and current supply unit, universal controllable module fed from a single phase system. The power supply unit can be operated separately or in parallel blocks. The units can be controlled by RS485 or by other analog signals include potentiometers. Units are usually used as an industrial power supply source for electrochemical processes such as electro deionization and electro dialysis.

INPUT	PSSW 2,9 kW	
	PSSW070503(S) / PSSW140253(S)	PSSW07050(S) / PSSW14025(S)
Rated supply voltage	3 ph 400 V, 50 / 60Hz	1 ph 230 V, 50 / 60Hz
Input power supply voltage range	3ph 360 ... 460V AC	1 ph 195 - 265V AC
Rated power input	3390 VA	3250 VA
Nominal input current	4,9A	14,2 A
Inrush current	< Inom	< Inom
Recommended input protection	3P 6A, characteristics C	1P 16 A , characteristics C
Leakage current	< 1,5 mA (Residual Current Device RCD 30 mA in front of the PSSW is suitable)	

OUTPUT	PSSW070503(S) / PSSW07050(S)		PSSW140253(S) / PSSW14025(S)	
	Rated power output	2900W		2900W
Rated output voltage	48V DC		96V DC	
Output voltage range adjustability	0 ... 70V DC		0 ... 140V DC	
Output voltage tolerance	± 1%		± 1%	
Output voltage ripple	< 0,25 V _{pp}		< 0,3 V _{pp}	
Rated output current	50A		25A	
Output current adjustability	0 ... 50A		0 ... 25A	
Output current tolerance	± 2%		± 2%	
Efficiency	93% / 90%		94% / 91%	
Power factor	0,92 / 0,99		0,92 / 0,99	

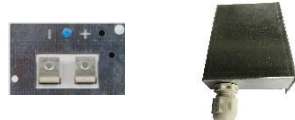
OUTPUT PROTECTION	PSSW070503(S) / PSSW07050(S)		PSSW140253(S) / PSSW14025(S)	
	Independent overvoltage protection	< 80V		< 160V
Overcurrent protection by fuse	✓		✓	
Electronic overcurrent protection	✓		✓	
Reversion of polarity protection	✓		✓	

SAFETY	PSSW 2,9 kW
LVD	EN 62368-1
Protection class	1
Contamination class	2
EMC	PSSW 2,9 kW
EMC emissions	EN 61000-6-4
EMC immunity	EN 61000-6-2
Harmonic current emissions	EN 61000-3-2

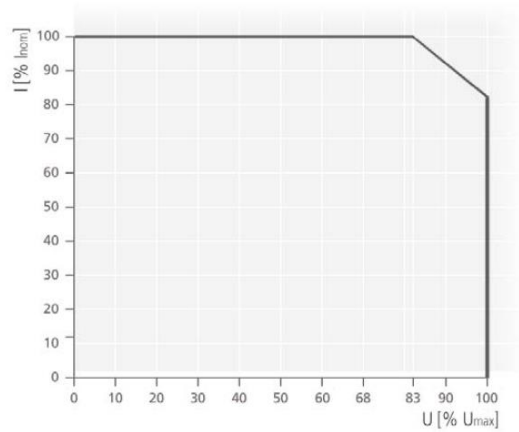
MARKING	Function of connecting terminals
PE	Protective conductor PE
L	2 Phase conductors (1ph)
+	Positive output terminal
-	Negative output terminal

CONNECTIVITY, IP PROTECTION	PSSW 2,9 kW
Weight	6 kg
Panel mounting	4x screw M6
Operating conditions	-10°C to + 40°C, max. relative humidity 80% non condensing
Storage	In dry rooms -25°C to + 80°C, max. relative humidity 80% non condensing
Protection	IP20, except output terminals
Input / output	0,5 – 2,5 mm ² / 2x screw M8

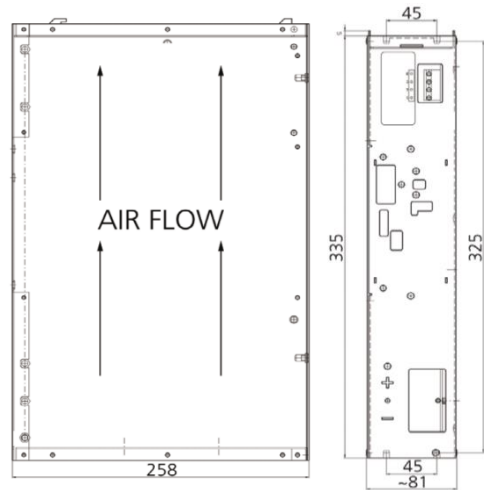
Output terminals including protection cap (-S versions only)



Output characteristics



Dimension chart (mm)



Please note cooling fans should be at the bottom.

PSSW 4,8 kW

- Adjustable output voltage and current in a wide range
- Possibility of remote control by:
 - Analog signals from PLC via interface CISW00108
 - RS485 MODBUS protocol from PLC via CISW00108
 - Display DSPPSSW08 through RS485 MODBUS protocol via CISW00108 (up to 8x PSSW/CISW00108 with PLC monitoring/control functionality)
- Possibility of parallel arrangement of units
- Integrated overcurrent and overvoltage protection
- Galvanic input–output separation
- 3–phase 400V input power supply
- Touch safe DC terminals



Type	DC voltage range	Max current*	Current @ max DC Voltage
PSSW30024	0...300V DC	24A*	16A
PSSW60012	0...600V DC	12A*	8A

* Maximum current: At higher voltages the current will be limited due to maximum rated output power of 4800W.

Description

Switched AC/DC converter, DC voltage and current supply unit, universal controllable module fed from a three-phase system. The power supply unit can be operated separately or in parallel blocks. Units are usually used as an industrial power supply source for electrochemical processes such as electrodeionization and electro dialysis.

INPUT	PSSW 4,8 kW
Rated supply voltage	3 ph 400 V, 50 / 60Hz
Input power supply voltage range	3ph 360 ... 460V AC
Rated power input	5550 VA
Nominal input current	8,0A
Inrush current	< Inom
Recommended input protection	3P 10A, characteristics C
Leakage current	< 1,5 mA (Residual Current Device RCD 30 mA in front of the PSSW is suitable)

OUTPUT	PSSW30024	PSSW60012
Rated power output	4800W	4800W
Rated output voltage	220V DC	400V DC
Output voltage range adjustability	0 ... 300V DC	0 ... 600V DC
Output voltage tolerance	± 1%	
Output voltage ripple	< 0,5 V _{pp}	< 1 V _{pp}
Rated output current	24A	12A
Output current adjustability	0 ... 24A	0 ... 12A
Output current tolerance	± 2%	
Efficiency	94%	
Power factor	0,94	

OUTPUT PROTECTION	PSSW30024	PSSW60012
Independent overvoltage protection	< 340V	< 670V
Overcurrent protection by fuse	✓	✓
Electronic overcurrent protection	✓	✓
Reversion of polarity protection	✓	✓

SAFETY PSSW 4,8 kW

LVD	EN 62368-1
Protection class	1
Contamination class	2

EMC PSSW 4,8 kW

EMC emissions	EN 61000-6-4
EMC immunity	EN 61000-6-2
Harmonic current emissions	EN 61000-3-2

MARKING Function of connecting terminals

PE	Protective conductor PE
L1, L2, L3	Phase conductors (3ph)
+	Positive output terminal
-	Negative output terminal

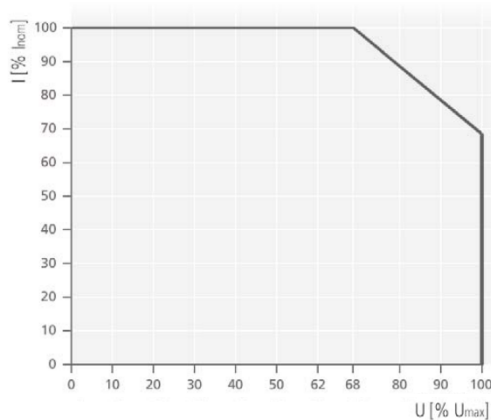
CONNECTIVITY, IP PROTECTION PSSW 4,8 kW

Weight	9 kg
Panel mounting	4x screw M5
Operating conditions	-10°C to + 40°C, max. relative humidity 80% non condensing
Storage	In dry rooms -25°C to + 80°C, max. relative humidity 80% non condensing
Protection	IP20
Input / output	Up to 16mm ²

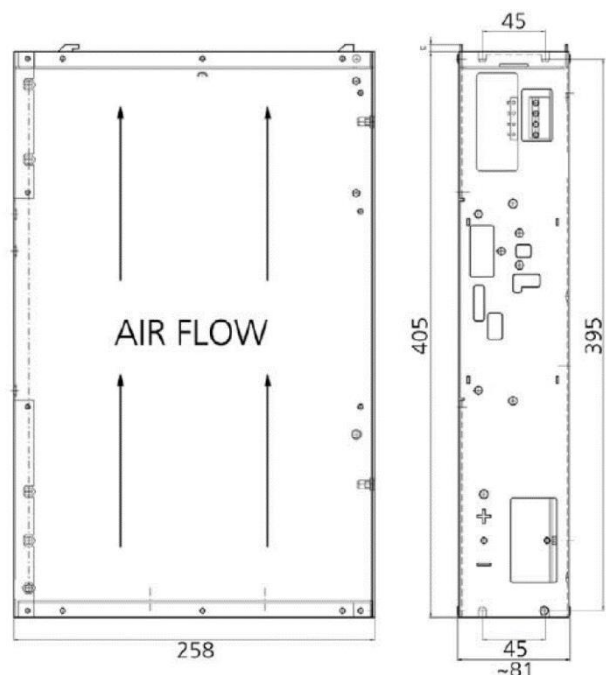
Output terminals



Output characteristics



Dimension chart (mm)



Please note cooling fans should be at the bottom.

5. Unit operation

X1 – configuration pin field

X2 – connector for programming

- only for service, please don't use it

X3 – CAN connector (Connection to CISW00108 or DSPSSW01)

- connector, type D-Sub 9 (Cannon 9)
- signals on connector are galvanic separated
- Flat cable to connect to CISW00108 included with control interface (1,5m) or display (2,5m)

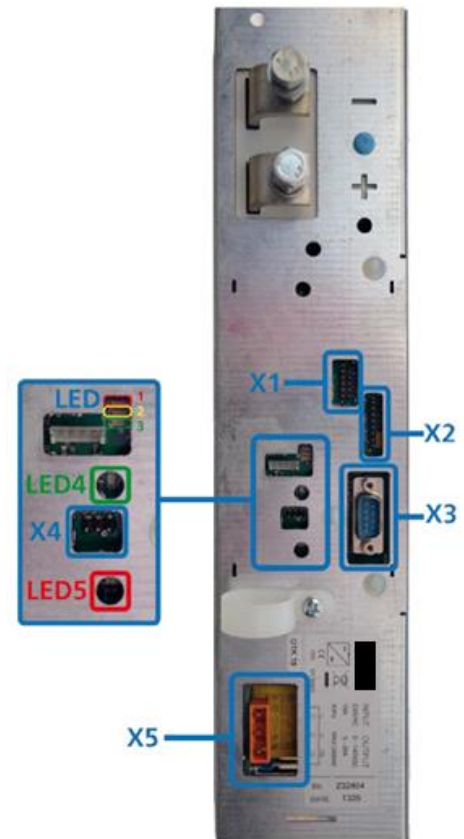
- pin 1 - offline
- pin 2 - CAN L
- pin 3 - GND
- pin 4 - offline
- pin 5 - GND
- pin 6 - GND
- pin 7 - CAN H
- pin 8 - offline
- pin 9 - external power supply +5V (ca 50 mA)

X4 – Optional connector for power to external control systems such as CISW00108 (not needed if external 24VDC power supply is available)

- use a cable with connector JST XH 3pin, cable is included with CISW00108
- output voltage of about $\pm 13V$, not stabilized, the maximum current consumption is 200 mA
- voltage is electrically connected with the output source
- In case of PLC control of Start DC (Enable), it is not recommended to use this connector to prevent mixture of DC voltages from different sources.

X5 – power supply connector WAGO, spacing 7,62 mm

- PSSW 4,8 kW
 - counterpart WAGO 231-704/026-000 - direct
 - or WAGO 732-124/026-000 - angular
- PSSW 2,9 kW
 - counterpart WAGO 231-703/026-000 - direct
 - or WAGO 732-123/026-000 – angular



LED	COLOUR	Signification
1	Red	<ul style="list-style-type: none"> • failure • if lights, module don't work properly • overheating • low voltage of inner power supply • overvoltage on output
2	Yellow	<ul style="list-style-type: none"> • failure • if blinking, communication with control system failed
3	Green	<ul style="list-style-type: none"> • OK • if lights, module works properly
4	Green	<ul style="list-style-type: none"> • function of inner power supply OK • if lights, inner power supply works properly
5	Red	<ul style="list-style-type: none"> • failure of power supply • if lights, module don't work properly • undervoltage on input • overvoltage on input • one phase missing, module works on 2 phases at power lower than 1000 W

Methods of operation

PLC control by CISW00108 control Interface:

With the aid of the CISW00108 Control Interface, connected between the power unit and the control system. Requested unit parameters can be determined via the following control signals:

- voltage 0-10V, internal resistor input is 13 kOhm
- current loop 0-20mA, internal resistor input is 47 Ohm
- PWM alternates 0-100%, frequency 200-1000 Hz, voltage 24V
- external potentiometers, recommended values 1 kOhm to 5 kOhm
- internal trimmers
- RS485 with MODBUS protocol



Please note that the CISW00108 Control Interface needs 24VDC, and that enabling of the DC will also be controlled by the CISW00108 Control Interface. If the start signal is done by PLC, it is recommended to use the same 24VDC power supply for this CISW00108 Control Interface (so not by X4).

Selection of control mode (voltage or current), control methods and analog output signals is done by dip switches S1 on the CISW00108 Control Interface.

Dipswitches S2 on CISW00108 Control Interface are used to control multiple parallel connected PSSW power supply units of the same model as one power supply. E.g. if two PSSW60012 power supply units are connected in Parallel (DC), you can control these 2 units as a single power supply capable of 0-600VDC and 0-24A (0-16A at max DC voltage).

An optional display to control up to 8 PSSW/CISW00108 power supply combinations is available as well. This display with touch screen is connected to the RS485 connections of the CISW00108 control interfaces (daisy chained). With this display the analog I/O's of the CISW00108 control interfaces are still available for external monitoring and/or control. This DSPSSW08 displayed is powered by 24VDC.



Cooling dimensioning

If the supply units are positioned inside an enclosure with increased protection, in most instances it is necessary to use external ventilators to secure sufficient cooling. If the units are utilized to their maximum output capabilities, the temperature of airflow into the unit must not exceed 40°C if Power supply is operated at full load. In order to ensure this, external ventilators are recommended, which will extract hot air away from the enclosure, or pump cool air into it.

Recommended air flow parameters are presented in the following table:

TYPE	Max. output	Efficiency	Power dissipation	Recommended air flow over one unit at max power draw
PSSW07050(S) / PSSW14025(S) 2,9 kW	2900 W	90%	320 W*	51-47 m ³ /h
PSSW070503(S) / PSSW140253(S) 2,9 kW	2900 W	93%	220 W*	36-47 m ³ /h
PSSW 4,8 kW	4800 W	92%	420 W*	68-90 m ³ /h

*Power dissipation at max. power. At lower power draw power dissipation will be less

7. Storage and delivery

The power supply is provided in a pre-assembled state and comes with an Instruction Manual. Each power supply is pre-tested for operability. Items are shipped wrapped in cardboard packaging. During transportation and storage, it is crucial to observe information contained in appended labels: protection against extreme weather conditions (rain, snow); protection against knocks and falls; which way up the package must face. During any kind of additional handling, the power supply must be transported in appropriate packaging. The power supply must be stored in a dry interior environment with temperatures ranging from -25°C to +80°C with relative humidity not in excess of 80% (non-condensing).

8. Service



In case of a defective power supply contact your dealer for assistance. Never try to repair the power supply yourself. Please contact Pure Water Group - Korte Hei 3, 4714 RD Sprundel, the Netherlands

Warranty

The power supply is covered by a standard two-year warranty from time of purchase. In the event the product develops a fault, please contact your supplier. Do not under any circumstances attempt to repair a faulty unit



Appendix A

EDI Module type	Maximum VDC required for EDI module	Maximum Amps required for EDI module	Power supply type	No of power supplies	Max. DC watt Power supply	DC Current range Power supply	Max analog signal for current control ¹			Recommended high VDC alarm setpoint VDC	Maximum Watts required (DC)	Estimated Power dissipation Watt
							Max setting of DC range	Max mA if 0-20mA is used	Max V if 0-10VDC is used			
MX60	53 VDC	2,5 A	PSSW14025(3)(S)	1	2900 W	25,0 A	10,0%	2,00 mA	1,00 VDC	53 VDC	133 W	50 W
MX125	106 VDC	2,5 A	PSSW14025(3)(S)	1	2900 W	25,0 A	10,0%	2,00 mA	1,00 VDC	106 VDC	265 W	50 W
MX250	213 VDC	2,5 A	PSSW30024	1	4800 W	24,0 A	10,4%	2,08 mA	1,04 VDC	213 VDC	533 W	70 W
MX500	426 VDC	2,5 A	PSSW60012	1	4800 W	12,0 A	20,8%	4,17 mA	2,08 VDC	426 VDC	1065 W	130W
LX04 X&Z&EU	27 VDC	6,0 A	PSSW07050(3)(S)	1	2900 W	50,0 A	12,0%	2,40 mA	1,20 VDC	27 VDC	162 W	50 W
LX10 X&Z&EU	67 VDC	6,0 A	PSSW14025(3)(S)	1	2900 W	25,0 A	24,0%	4,80 mA	2,40 VDC	67 VDC	402 W	60 W
LX18 X&Z&EU	120 VDC	6,0 A	PSSW14025(3)(S)	1	2900 W	25,0 A	24,0%	4,80 mA	2,40 VDC	120 VDC	720 W	110 W
LX24 X&Z&EU	160 VDC	6,0 A	PSSW30024	1	4800 W	24,0 A	25,0%	5,00 mA	2,50 VDC	160 VDC	960 W	120 W
LX30 X&Z&EU	200 VDC	6,0 A	PSSW30024	1	4800 W	24,0 A	25,0%	5,00 mA	2,50 VDC	200 VDC	1200 W	150 W
LX45 X&Z&EU	300 VDC	6,0 A	PSSW60012	1	4800 W	12,0 A	50,0%	10,00 mA	5,00 VDC	300 VDC	1800 W	210 W
LX04HI	50 VDC	10,0 A	PSSW07050(3)(S)	1	2900 W	50,0 A	20,0%	4,00 mA	2,00 VDC	50 VDC	500 W	80 W
LX10HI	125 VDC	10,0 A	PSSW14025(3)(S)	1	2900 W	25,0 A	40,0%	8,00 mA	4,00 VDC	125 VDC	1250 W	170 W
LX18HI	225 VDC	10,0 A	PSSW30024	1	4800 W	24,0 A	41,7%	8,33 mA	4,17 VDC	225 VDC	2250 W	240 W
LX24HI	300 VDC	10,0 A	PSSW60012	1	4800 W	12,0 A	83,3%	16,67 mA	8,33 VDC	300 VDC	3000 W	310 W
LX30HI	375 VDC	10,0 A	PSSW60012	1	4800 W	12,0 A	83,3%	16,67 mA	8,33 VDC	375 VDC	3750 W	370 W
LX45HI	562 VDC	10,0 A	PSSW60012	2	9600 W	24,0 A	41,7%	8,33 mA	4,17 VDC	563 VDC	5625 W	610 W
VNX15CDIT-2	600 VDC	6,6 A	PSSW60012	1	4800 W	12,0 A	55,0%	11,00 mA	5,50 VDC	600 VDC	3960 W	380 W
VNX28EP-2	300 VDC	6,6 A	PSSW60012	1	4800 W	12,0 A	55,0%	11,00 mA	5,50 VDC	300 VDC	1980 W	220 W

¹ Please note that in case of low maximum analog range, accuracy of analog signal is suitable for control in this range.



EDI Module type	Maximum VDC required for EDI module	Maximum Amps required for EDI module	Power supply type	No of power supplies	Max. DC watt Power supply	DC Current range Power supply	Max analog signal for current control			Recommended high VDC alarm setpoint VDC	Maximum Watts required (DC)	Estimated Power dissipation Watt
							Max setting of DC range	Max mA if 0-20mA is used	Max V if 0-10VDC is used			
VNX55-HH	600 VDC	8,0 A	PSSW60012	1	4800 W	12,0 A	66,7%	13,33 mA	6,67 VDC	600 VDC	4800 W	420 W
VNX55EP-2	300 VDC	13,2 A	PSSW30024	1	4800 W	24,0 A	55,0%	11,00 mA	5,50 VDC	300 VDC	3960 W	380 W
VNX55-E	300 VDC	13,2 A	PSSW30024	1	4800 W	24,0 A	55,0%	11,00 mA	5,50 VDC	300 VDC	3960 W	380 W
VNX55-EX	300 VDC	13,2 A	PSSW30024	1	4800 W	24,0 A	55,0%	11,00 mA	5,50 VDC	300 VDC	3960 W	380 W
VNX30CDIT-2 hardness <1,5ppm CaCO3	600 VDC	13,2 A	PSSW60012	2	9600 W	24,0 A	55,0%	11,00 mA	5,50 VDC	600 VDC	7920 W	760 W
VNX30CDIT-2 hardness >1,5ppm CaCO3	600 VDC	8,0 A	PSSW60012	1	4800 W	12,0 A	66,7%	13,33 mA	6,67 VDC	600 VDC	4800 W	420 W
VNX-MAX-1	600 VDC	7 A	PSSW60012	1	4800 W	12,0 A	58,3%	11,67 mA	5,83 VDC	600 VDC	4200 W	400 W
VNX-MINI-1	600 VDC	7 A	PSSW60012	1	4800 W	12,0 A	58,3%	11,67 mA	5,83 VDC	600 VDC	4200 W	400 W
EDIQubic036	300 VDC	16,0 A	PSSW30024	1	4800 W	24,0 A	66,7%	13,33 mA	6,67 VDC	300 VDC	4800 W	420 W

Appendix B



EU-DECLARATION OF CONFORMITY

Supplier: Pure Water Technologies bv
Korte Hei 3
NL-4714 RD Sprundel

Product(s): SWITCH MODE POWER SUPPLIES

Type(s): PSSW07050(S)
PSSW070503(S)
PSSW14025(S)
PSSW140253(S)
PSSW30024
PSSW60012

These products are determined for the industrial use.

The EU Directives covered by this Declaration are:

- ❖ Certain Voltage Electrical Equipment Directive (2014/35/EU)
- ❖ Electromagnetic Compatibility Directive.(2014/30/EU)

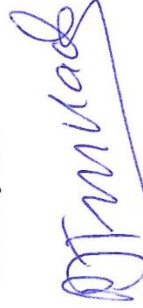
The products identified above comply with the requirements of the above EU directives by meeting the following standards:

EN IEC 62368-1 ed.2:2020,+A11:2020
EN 61000-6-4 ed.2:2007,+A1:2011,+Z1:2019
EN 61000-6-2 ed.3:2006,+Z1:2019

This declaration of conformity is issued under the sole responsibility of the supplier. The technical documentation required to demonstrate that the product meets the requirements of the Low Certain Voltage Electrical Equipment Directive and Electromagnetic Compatibility Directive has been compiled by the signatory below and is available for inspection by the relevant enforcement authorities.

Prepared: Sprundel
Date: 22 January 2025

Signature:



On behalf of: Pure Water Technologies bv
P.J.F.M. Hack
Director

