

Switching Mode Power Supply for Magnetron use

Single – Power-Supply

PPS-MWS-2000-4000-CAN1

PPS-MWS-2000-4000-CAN1H

TECHNICAL DATA

PPS-MWS-2000-4000-CAN1
PPS-MWS-2000-4000-CAN1H

SINGLE pulsed Magnetron Power Supply
SINGLE pulsed Magnetron Power Supply with Heat-Regulation

1x 2000W/4000W (continous / pulse-peak)

MicroWave-/HF-Power

Magnetron-Type: **2.0 kW / 2450 MHz**

Adjustable Power from 10 % - 100 %

Standard Ripple

Dimensions: 19" rack (plug-in-case)
3 units height
508 mm depth (incl. Fan's)

CAN-Bus controlled (CAN01 or CanPH02c)

CAN01 -Protocol

or CanPH02c-Protocol (coming soon)

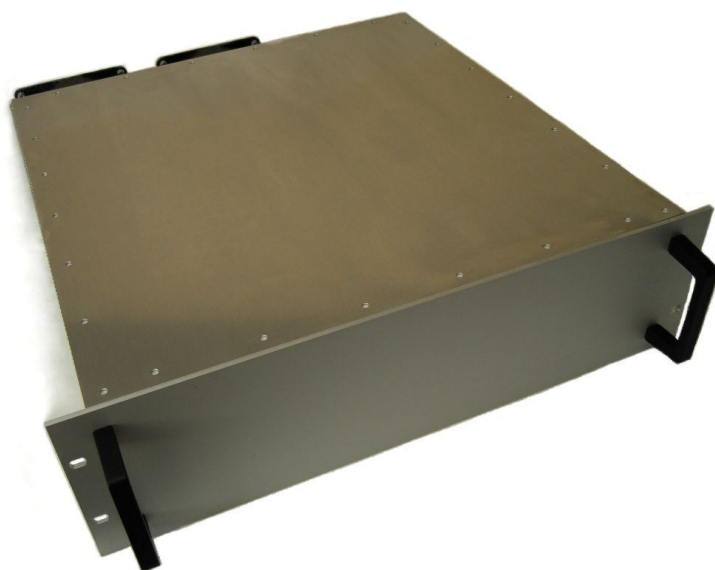
Air- and water-cooled: water-cooled (5 l/min; 4 bar)

Input POWER: **3-ph 400V~** 47-63 Hz (max 5 A/ph)

Input-AUX-PWR: **230V~** 47-63 Hz

1x Magnetron – Heater – Regulation (optional)

Leading edge phase controlled heat-regulation



Delivered with all needed device connectors:

- Interlock	- connector	1x
- 3x 400 V~ / 3 phase	- connector	1x
- 1x 230 V~	- connector	1x

- MW-Head	- connector	1x
- HV -LEMO (10 kV)	- connector	1x
- Reflected-Power	- connector	1x

Not included:

- Water-IN /-OUT	- flexible tube	
	(e.g.: FESTO ,PUN 10 x 1.5')	
- CAN-Bus	- connector	



Attention: -- Microwaves and High-Voltage are dangerous --

Very important to avoid any injury :

Use INTERLOCK -Switch(es) to prevent any microwave output, if microwave-system is not complete closed. Responsible for the correct interruption of the microwave energy production is the constructor of the complete microwave-system.

1 General Description / Block Diagramm

The PPS-MWS-2000-4000-CAN1 power supply could be controlled over CAN-Bus

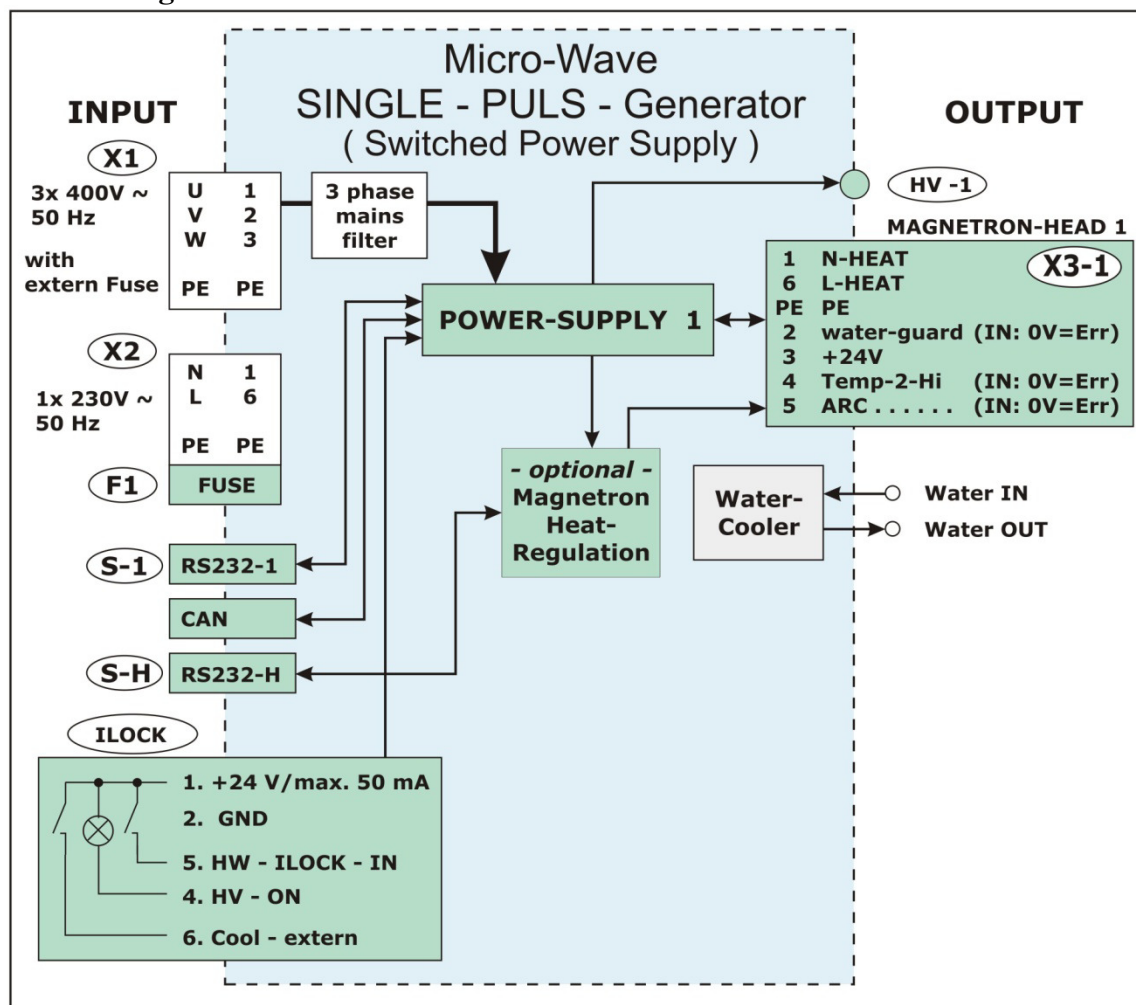
Either with the
or with the

CAN01 – Protocol
CanPH02c – Protocol (*coming soon*)

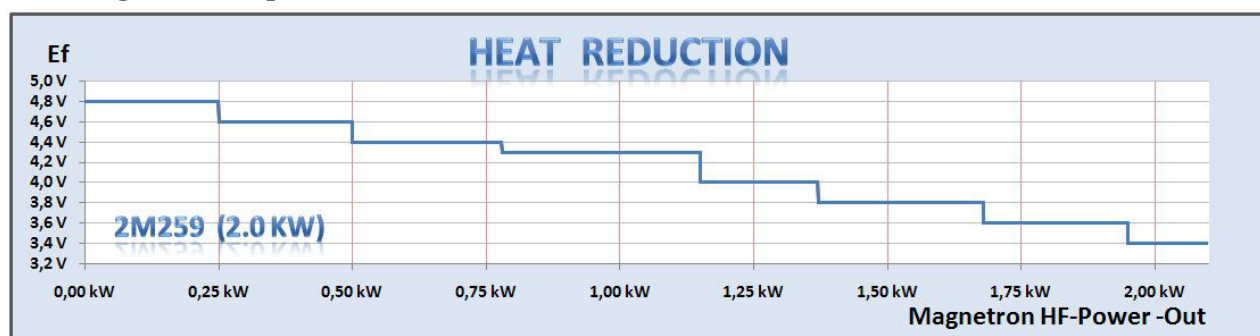
→ CAN-Bus-Protocol about the
placed in the

CAN01 (and CanPH02c) - Protocol
CAN01 / CanPH02c – **Manual**

Block – Diagram



Heat Regulation (optional)



2 Technical Data

Suggested Magnetron Type.....	Waveguide R26 / WR340 --- 2M259 or NL10250 (2.0 kW)
Preheating Time.....	Magnetron heating-time included
Input Voltage.....	3x 400V~ +/- 10 % (359 V~ ... 438 V~) / 47 – 63 Hz, 3 phase
Input current.....	< 5 A rms / phase @ full load
Input Protection.....	3-phase-Fuse <u>must be provided externally</u> : → 3-ph Fuse 10A T (time lag), 400V~
Input (auxiliary) Voltage.....	1x 230V~ +/- 10 % (200V~ ... 265 V~) / 47 – 63 Hz, 1 phase
Input current.....	< 2 A rms @ 230 Vac @ full load
Input Protection.....	1-ph-Fuse/automatic circuit breaker implemented in device – positioned on back-side: → 1-ph Fuse 2A T (time lag), 230 V~
Auxiliary Power.....	24 V_{DC} , 50 mA – Output Magnetron-Head-1 -Connector 24 V _{DC} , 50 mA – Output ILOCK/HV-ON -Connector
Output Power.....	1x 3.000 W 1x 2.000 W HF-Power continuous
Output current.....	output current regulation 1x 50 mA to 725 mA (725 mA @ continuous 2.000 W HF-Power) , 1x 50 mA to 1.450 mA (1.450 mA @ pulse-peak 4.000 W HF-Power)
Output current ripple.....	Standard Ripple
Output polarity.....	– 3.800 V to – 4.200 V, negative in respect to ground potential
Harmonic Distortion.....	Meets EN 61000-3-2 for class A
Transient overvoltage.....	Meets EN 61000-4-4 for class B
EMI Filtering.....	Meets EN 55022 for class B
Output current signal.....	POWER-OUT over CAN-Status - message
Output voltage signal.....	POWER-OUT over CAN Status – message

CONTROL – Signals → from extern into device

CAN-Bus .. COMMAND – Messages

ILOCK-Connector – INPUT - signal's:

INTERLOCK . . 0V /not connected = error/ Ilock opened , 24V = okay / Ilock closed
COOL-Extern . 0V /not connected = error/ NO cooling , 24V = okay / cooling

MAG-HEAD-Connector – INPUT - signal's:

WATER-Guard . 0V /not connected = error/ no cooling , 24V = okay / water cooling
Temp-2-High . 0V /not connected = error/ Temp-2-High , 24V = okay / Temp okay
ARC-detect . 0V /not connected = error/ ARC detected , 24V = okay / NO ARC

STATUS – Signals → from device to extern

CAN-Bus .. STATUS – Messages

ILOCK-Connector – OUTPUT – signal's:

HV-ON connection of lamp/LED (24 V) possible
If HV = ON → HV-ON-Pin connected to ground

CAN-01 - Pulse - Timing

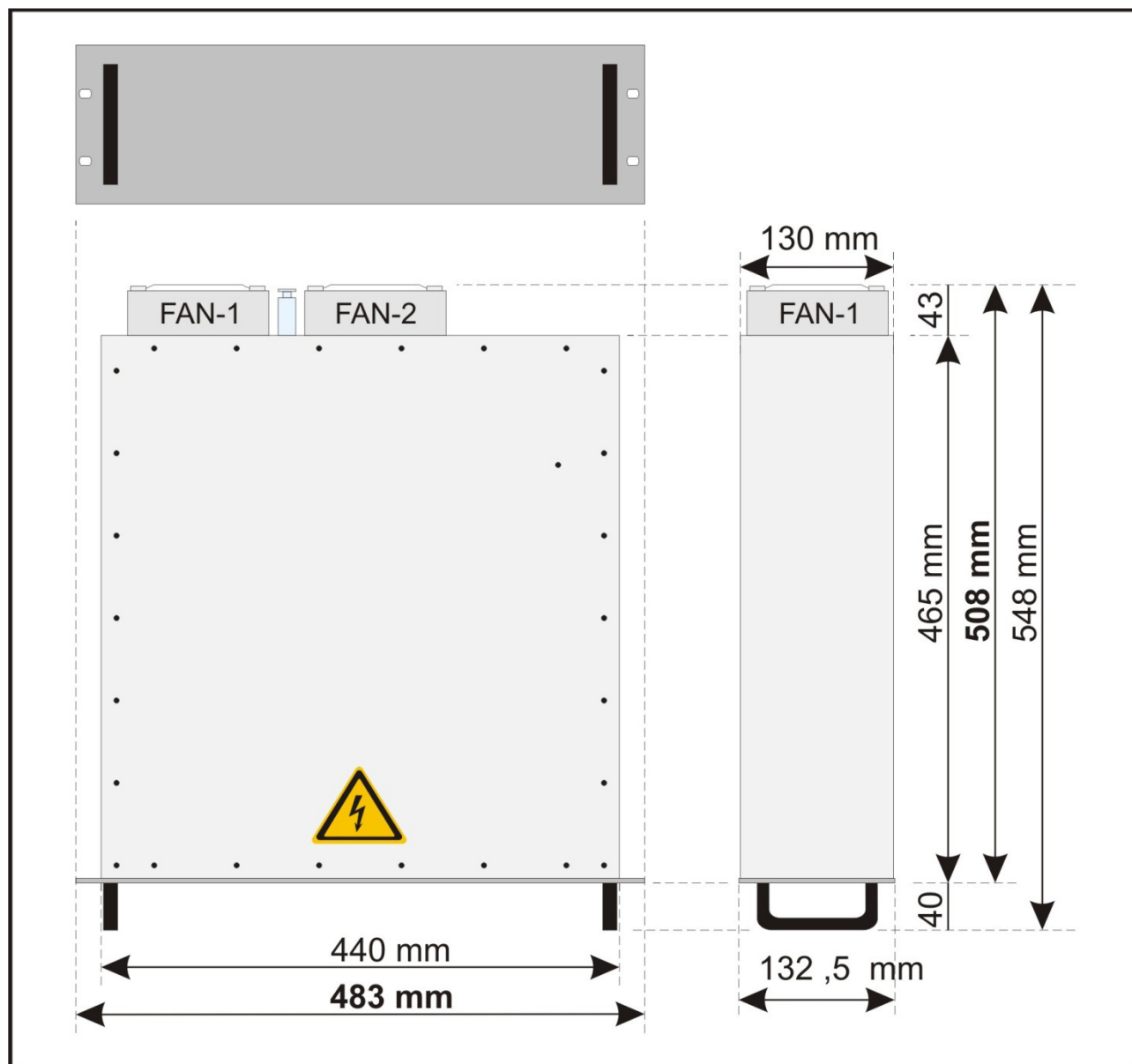
ON_TIME (Pulse-Hi -Duration) 1 ms . . 24 ms
OFF_TIME (Pulse-Low-Duration) 1 ms . . 250 ms Max. Pulse-Frequency f= 500 Hz

3 Environment Conditions

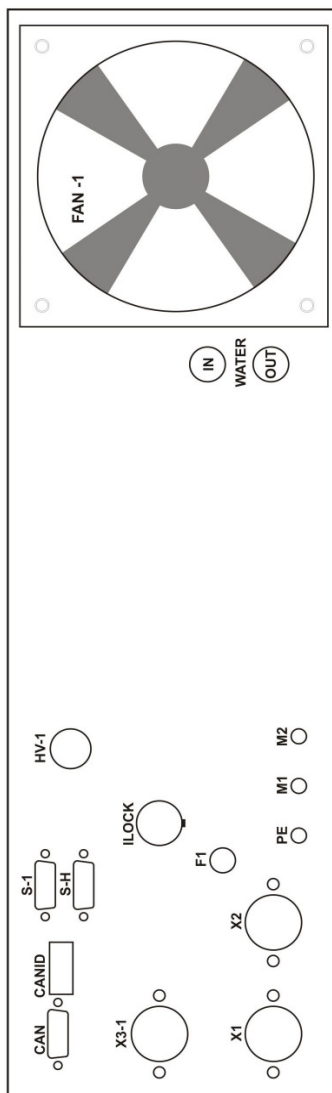
USE	INDOOR USE only
Temperature Air (controlled per firmware: error if out-of-limits)	8 ° C .. to .. 46 ° C
Temperature Water (controlled per firmware: error if out-of-limits)	5 ° C .. to .. 48 ° C

4 Mechanical Data

Dimension without handhold L x W x H	508 x 483 x 132.5 mm³ (length x width x height)
Dimension with handhold L x W x H	548 x 483 x 132.5 mm ³
	19'' rack (plug-in-case)
	3 rack-units height
Weight (approximately)	13 kg



5 Back-Side of Device / Connectors



>> Connectors <<

Abbreviations:

PS-1 ... Power-Supply-1

HV-1 > High-Voltage PS-1

X1 > INPUT_: 3 phase ... 400 V~

X2 > INPUT_: 1 phase AUX 230 V~

X3-1 > OUTPUT: MW-Head-Output PS-1

PE > protective earth

M1 > Ground-1

M2 > Ground-2

ILOCK > Interlock - Connector

F1 .. > Fuse 230 V~ (AUX-Voltage)

WATER-IN > water-cooling IN

WATER-OUT > water-cooling OUT

FAN-1 > air-cooling PS-1

Communication-Ports:

CAN > CAN-Bus-Port (SUBD9)

CANID > Can-Start-ID (Dip-Switches)

S-1 > Serial PS-1 (Firmware-Update)

S-H > Serial Heat-Regulation

*Back-Side: - NOTE -
X4 – Reflected Power
not on picture (new)*



6 Connectors Details & Pinning

6.1 Connectors Details

Needed Cable-Connectors included in delivery of new device:

Qty	Name	Definition	male	/female	Producer	Factory-Nr
1x	X1	3x 400V~ 3x 400V~ /50Hz (47-63Hz) 3 Phase		female	Binder	693.99-4222-00-04
1x	X2	1x 230V~ 1x 230V~ /50Hz (47-63Hz) 1 Phase		female	Binder	693.99-4226-00-07
1x	X3-1	MW-Head-1 MW-Head-1 Power-Supply-1	male		Binder	693.99-4225-00-07
1x	X4	Refl-Pwr Reflected-Power + Meas-Power-Ext.		female	Binder	581.99-2022-02-06
1x	ILOCK	Interlock ILOCK for both Power-Supplies	male		Binder	678.99-0617-00-06
1x	HV-1	Hi-Volt-1 HV-1 from Power-Supply-1	male		LEMO	FFA.1Y.410.CLAC47 (-10kV)

Connectors NOT included in delivery of new device:

Qty	Name	Definition	male	/female	Producer	Factory-Nr
1x	CAN	Can-Bus To control Power-Supply-1 And Power-Supply-2		female		
2x	S-1 S-H	Serial-1 RS232 of Power-Supply-1 ... Ser-Heat RS232 of MW-Heat-Control ... for Firmware-Update	male			
2x	WATER	Water-IN Cooling of Power-Supply-1 Water-OUT and Power-Supply-2			FESTO	PUN10x1.5

6.2 Connectors Pinning

1.	X1	400V~/50 Hz -- 3 Phase	1,5 mm ²
Pin	Name	Definition	
1	U	400V~ / 50Hz (47-63Hz) ... Phase-1	
2	V	400V~ / 50Hz (47-63Hz) ... Phase-2	
3	W	400V~ / 50Hz (47-63Hz) ... Phase-3	
4	PE	Protective Earth	
2.	X2	230V~/50 Hz -- 1 Phase	1,0 mm ²
1	N	N - 230V~ / 50Hz (47-63Hz)	
2		./.	
3		./.	
4		./.	
5		./.	
6	L	L - 230V~ / 50Hz (47-63Hz)	
PE	PE	Protective Earth	
3.	X3-1	MW-Head-1 230V~ 1,0 mm ² 24V 0,75 mm ²	
1	N-HEAT	N - 230V~ / 50Hz (47-63Hz)	
2	Water-guard	IN: 0V=Err 24V=No Error	
3	+24V	Intern 24V power-supply	
4	Temp-2-Hi	IN: 0V=Err 24V=No Error	
5	ARC	IN: 0V=Err 24V=No Error	
6	L-HEAT	L - 230V~ / 50Hz (47-63Hz)	
PE	PE	Protective Earth	
4.	X4	Reflected-Power 0,75 mm ²	
1	Forward Power 1	NOT connected at moment	
2	Reflected Power 1	INPUT: 0 .. 10 V	
3		./.	
4	--- Refl. Power 2	./.. not used in Single-Dev.	
5	--- Forw. Power 2	NOT connected at moment	
6	GND	Ground	
5.	ILOCK	Interlock 0,75 mm ²	
1	+24V/max 50mA	Intern 24V power-supply	
2	GND	Intern GND power-supply	
3			
4	HV-ON	Indicates HV-ON	
5	HW-ILOCK-IN	Hardware-ILOCK extern connected	
6	Cool-extern	Cool-Extern input for detection	

