Watt&Well
CONVERTING POWER INTO CONFIDENCE

HIGH POWER SERIES

30 kW Modular Power Unit for EVSE

HIGH POWER | E-MOBILITY | EV CHARGERS

OVERVIEW

MPU-R2-DC is a 30kW modular power supply for EVSE systems compatible with DC grids.

It features a modular design capable of parallel and series operation for the output side.

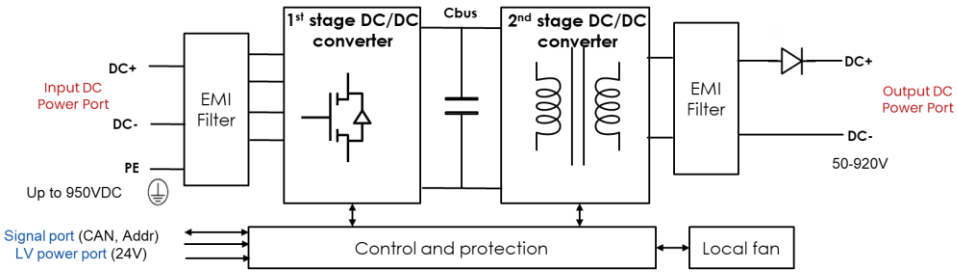
FEATURES

- Input DC connection with a range of 200VDC to 890VDC.
- Reinforced galvanic isolation between input and output.
- Compatible with all DC charging systems (CCS1, CCS2, NACS/J2400, CHAdeMO)
- Integrated forced air cooling with fan speed control.
- 19" rack, 2U.
- CANopen compatible digital bus with advanced control, monitoring, and logging capabilities.
- Integrated protections including charge switches, OCP, OTP and UVLO.
- Integrated output fuse and reverse diode.

VERSIONS

	EV SIDE			
	P	U	I	Output Protections
MPU-R2-DC	**30kW**	**920V**	**100A**	**Fuse, diode**

BLOCK DIAGRAM



Important note: this datasheet contains advanced information about an unreleased product. Values are susceptible to change in significant ways without prior notice

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Revision date: 03/2024

WARNING

This equipment operates at voltages and currents that can result in electrical shock, fire hazard and/or personal injury if not properly handled or applied. Equipment must be used with necessary caution and appropriate safeguards employed to avoid personal injury or property damage.

This board must be used only by qualified engineers and technicians familiar with risks associated with handling high voltage electrical and mechanical components, systems, and subsystems.

Table of Contents

1. Safety instructions

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS - This manual contains important instructions for Models **MPU-R2-920-100** that shall be followed during installation, operation and maintenance of the unit.

1.1. Caution

The following safety instruction must be observed during all phases of operation, service and repair of this equipment. Failure to comply with the safety precautions or warnings in this documentation violates safety standards of design, manufacture and intended use of this equipment and may impair the built-in protections within. WATT & WELL shall not be liable for users to comply with these requirements.

1.2. Installation

MPU-R2-DC device must be installed following installation chapter.
This product is a safety **Class 1** instrument. To minimize shock hazard, the instrument chassis must be connected to the EVSE frame which is in turn connected to earth ground.

The protective earth terminal must be connected to the safety electrical ground before another connection is made. Any interruption of the protective ground conductor, or disconnection of the protective earth terminal will cause a potential shock hazard that might cause personal injury.

MPU-R2-DC device is designed to be accessible only for trained staff operators in **restricted access locations.**

1.3. Input rating

CAUTION - To reduce the risk of fire, connect only to a circuit provided with 100 amperes maximum branch circuit overcurrent protection in accordance with the National Electrical Code, ANSI/NFPA 70.
Do not use power supplies which exceed the input voltage rating of this instrument. The electrical rating of this instrument is given into the chapter 3 of this document.

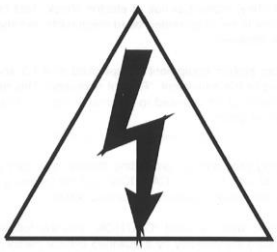
1.4. Live circuits

Operating personnel are not allowed to open the case of this equipment. Internal adjustment or component replacement is not allowed by non-WATT & WELL qualified personnel. Never replace components with cable connected to this instrument. To avoid injuries, always disconnect power and remove external voltage sources before touching components.

1.5. Hot surface

Surface of the product could be hot during and after operation.
To reduce the risk of burns - Use adequate protection before touching the device.

1.6. Marking

Symbol	English	French
	Input DC voltage	Tension d'entrée continue
	Grounding	Prise de Terre
	CAUTION - Risk of electric shocks	Attention - Risque de choc électrique

1.7. Maintenance

Capacitors inside the unit store hazardous energy. Do not remove the cover until 5 minutes after disconnecting all sources of supply.

1.8. Safety related functions

All safety related mechanisms and functions are implemented by hardware. The software does not provide or perform safety-related functions.

1.9. Parts substitution and modifications

Parts substitutions and modifications are allowed by authorized WATT & WELL service personnel only.
For repairs or modification, the unit must be returned to WATT & WELL's After Sale Service. Contact After Sale Service (aftersales@wattandwell.com) to obtain a return merchandise authorization (RMA) number.

WATT & WELL
After Sale Service
121 Rue Louis Lumière
84120 PERTUIS
France

1.10. Environmental condition

MPU-R2-DC device safety approval applies to the following operating conditions:

- Integrated into EVSE system (in a 19" cabinet or a custom build enclosure)
- Maximum relative humidity : 95% at 40°C non-condensing
- Altitude : up to 2000m
- Pollution degree : 3 [Note 1]
- Overvoltage category : III on the input side
- IP degree of enclosure : IP2X


Protective ground conductor terminal

The charging station where MPU-R2-DC will be installed should meet the requirements of environmental protection as defined in IEC 61851-1:2019.
The IP degree needs to reach IP44 or above for outdoor use or IP21 for indoor use.
Avoid using the charger in the offshore environment near the sea or near a pollution source or in a corrosive and damaging environment. If you need to use it in the above environment, the protection level of the station needs to reach IP65, otherwise it may lead to the failure of MPU-R2-DC. This damage caused will not be covered by the warranty.

[1] Attention should be paid to avoid ingress of water, metallic or conductive particles, dust or corrosive atmospheric that may cause early failures of equipment.

1.11. Normative compliance

MPU-R2-DC meets the intent of directives:

- Low Voltage: 2014/35/UE
- CEM 2014/30/UE
- RoHS: 2011/65/UE
- WEEE: 2012/19/EU

The compliance will be demonstrated to the normative reference:

Normative	Name	Note
NF EN IEC 61000-6-1	Electromagnetic compatibility (EMC) – Part 6-1: Generic standards – Immunity standard for residential, commercial and light-industrial environments	
NF EN IEC 61000-6-2	Electromagnetic compatibility (EMC) Part 6-2: Generic standards Immunity for industrial environments	
NF EN IEC 61000-6-3	Electromagnetic compatibility (EMC) Part 6-4: Generic standards Emission standard for residential, commercial and light-industrial environments	
NF EN IEC 61000-6-4	Electromagnetic compatibility (EMC) Part 6-4: Generic standards Emission standard for industrial environments	
IEC 61000-4-28	Electromagnetic compatibility (EMC) – Part 4-28: Testing and measurement techniques – Variation of power frequency, immunity test	Criterion A
IEC 61000-4-6:2013	Conducted RF Fields	
IEC 61000-4-4:2012	Electrical fast transient/burst immunity test Input power line	±2kV
IEC 61000-4-5:2014	Surge immunity test DC power line	±2kV common mode ±1kV differential mode
IEC 61000-4-3:2006 /AMD1:2007/AMD2:2010	Radiated, radiofrequency, electromagnetic field immunity test	Industrial Level
IEC 61000-4-2:2008	Electrostatic discharge immunity test	±4kV contact ±8kV air discharges
CISPR 16-2-1:2014/AMD1:2017	Conducted emission	Class B
CISPR 16-2-3:2016	Radiated emission	Class B

Please also note that **MPU-R2-DC** is designed to be compatible with the following norms:

Normative	Name	Note
IEC 61851-1:2019 (ed 3.0)	Electric vehicle conductive charging system Part 1: General requirements	
IEC 61851-23 (ed 1.0)	Electric vehicle conductive charging system Part 23: DC electric vehicle charging station	
IEC 61851-23/AC1 2016	Corrections of IEC 61861-23 ed1.0 (2014)	
IEC 61851-21-2	Electric vehicle conductive charging system - Part 21-2: Electric vehicle requirements for conductive connection to an AC/DC supply - EMC requirements for off board electric vehicle charging systems	Limits for DC power input and CPT ports

However, it is the user's responsibility to ensure that MPU-R2-DC is installed and used in compliance with all local country laws and regulations.

2. Absolute maximum ratings

Table 1: Absolute maximum ratings

Parameter	Condition	Min	Max	Units
LV Input Voltage		0	29	V
Output DC voltage		0	920	V
Input DC voltage			950	V
Operating Temperature		-30	70	°C
Long term storage Temperature		-30	70	°C
Temperature change rate			5	°C/min
DC output (DC+ or DC-) to PE			±1000	V

Recommended maximum ambient temperature is 50°C, beyond 50°C, linear derating on power output is applied.

3. Electrical Characteristics

All specifications are given for ambient temperature up to 50°C unless otherwise noted.

Table 2: Electrical characteristics

Parameter	Condition	Value			Units
		Min	Typ	Max	
DC gride side					
Input voltage		200	700	890[1]	V_{DC}
Input current		0		90	A_{DC}
Inrush current				60	A_{pk}
Current measurement accuracy	@90A			3	%
Voltage measurement accuracy	@700V			3	%
EV side					
Output voltage		200		920	V_{DC}
Power				30	kW
Maximum power variation (SW programmable)	Active power			30	kW/s
Current				100	A_{DC}
Voltage measurement accuracy	@920V			0.5	%
Current measurement accuracy	@50A			1.5	%
CAN communication					
CAN baud rate			500		kbps
CAN common mode range[2]		-7		7	V
Digital Inputs					
Positive going input current (Charge permission, Address, EMS)		2		10	mA
Negative going input current (Charge permission, Address, EMS)				0.1	mA
Maximum reverse voltage				5.5	V
LV input					
Supply voltage		19	24	29	V
Input current standby			0.2		A
Input current operation	Fan ON		4	6	A
Input current start-up (inrush)	@24V input during 1ms			20	A
Under Voltage Shutdown (programmable)				19	V
Over Voltage Shutdown (programmable)				27	V
Power consumption		5[3]		27.5[4]	W

[1] Power conversion is off when DC grid voltage is above 890V
[2] CAN common mode; CAN_H and CAN_L versus CAN_GND
[3] Standby mode operation

Insulation					
DC Input to DC output			4500		V
DC Input to case (PE)			4500		V
DC Output to case (PE)			4500		V
Y-capacitor input to PE				30	nF
Y-capacitor output to PE				35	nF

3.1. Safe Operating Area

MPU-R2_DC automatically adjusts its operation to the typical operating zone of an EV battery and can charge 400V nominal EV batteries with a voltage range of [250V; 550V] and 800V nominal EV batteries with a voltage range of [500V; 920V].
MPU-R2 can reconfigure between 400V and 800V configuration in less than 3sec.

The overall Safe Operating Area (SOA) is shown in Figure 1.

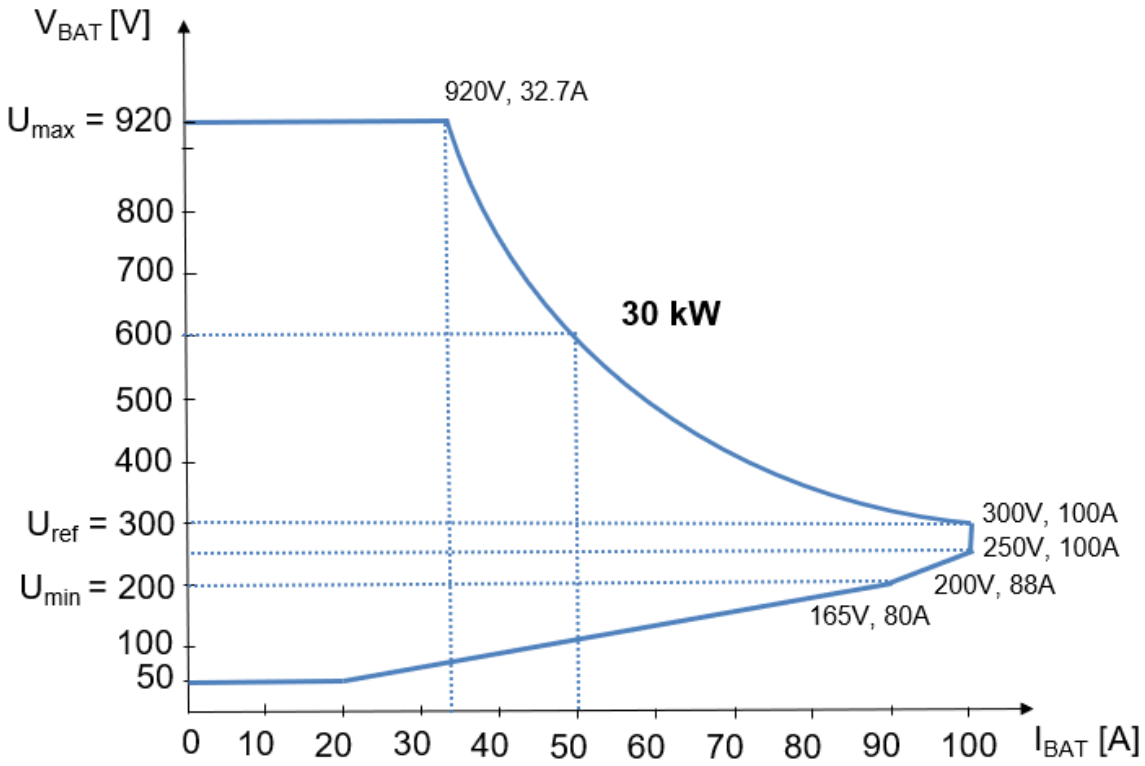


Figure 1: Battery Side Safe Operating Area @700V DC grid

3.2. Reliability

Table 3: Reliability characteristics

Parameter	Condition	Value			Units
		Min	Typ	Max	
Expected life of fan	L10 acc. to IPC 9591 at TU = 40 °C		105,000		hours
MTBF	Ambient temperature 40°C		500,000		hours

3.3. Typical efficiency

MPU-R2-DC is based on highly efficient full SiC (Silicon Carbide) technology. Peak efficiency reaches 96% and efficiency is consistently above 94% for a wide range of battery voltage and current.

3.4. Output power derating

MPU-R2-DC is sized for 31.5kW (Input side power) at 350V_{DC}

- Below 350V, power is limited by max current 90 A_{DC}
- Above 350V, power can be kept constant

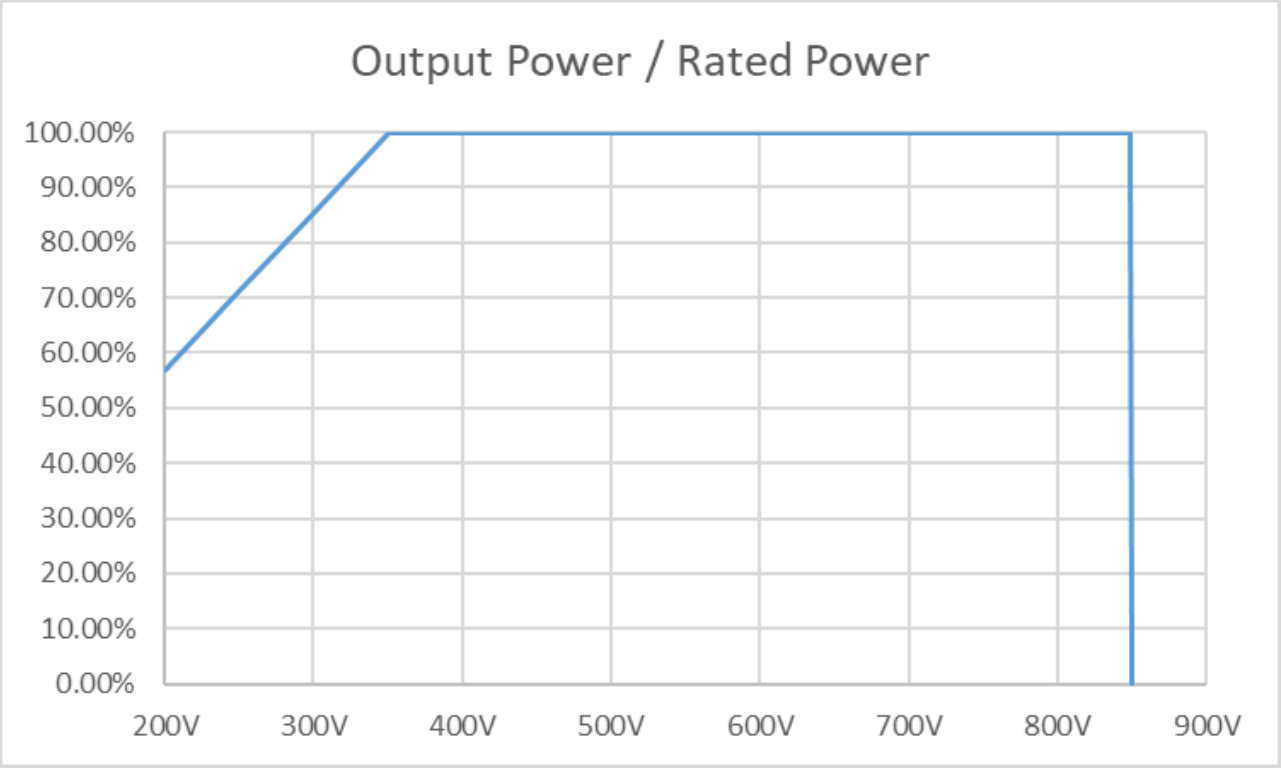


Figure 2: Output power vs DC input voltage

4. Installation

The unit must be properly assembled in accordance with the assembly instructions before it is used.
Do not use or install MPU-R2-DC product in case of visible physical damage.

4.1. Mechanical installation

4.1.1. Handling

MPU-R2-DC product has a weight of about 22 Kg. For correct handling, follow instruction below:

- The product must be handled flatly.
- For operator safety use personal protective equipment.
- Do not stack units (each unit should be self-supported and secured with the front and rear brackets)

4.1.2. Mounting

MPU-R2-DC can be mounted on standard 19" cabinets.
Note that the MPU-R2-DC is a heavy instrument and requires the cabinet to be equipped with slides or rails that support the chassis along the depth.
Minimum air flow required for air cooling is 3.4 m^3/min (120 CFM)
Recirculating of hot air should be minimized by ensuring fresh (cold) on the input (see Figure 3).
In addition, minimum distances for air cooling are:

- 15 cm for front side
- 9 cm for rear side

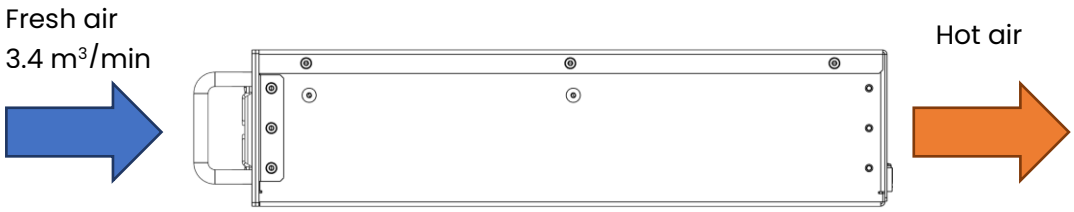


Figure 3: Air flow direction

4.2. Electrical installation

4.2.1. Legal installation

Electrical installation shall comply with international standards such as IEC or the requirements in national standards of each country.

4.2.2. Safety Notice

Never invert the polarity of the connector. Never force to place a connector. Use only approved manufacturer parts for electrical or mechanical connection.

It is strongly recommended to fix the cables to avoid any stress on the connection. All high-power connectors must be screwed up to avoid any disconnection.
Be careful if other devices are connected, there is a risk of electrical charge transfer.
It is forbidden to open the cover. Only W&W approved personnel are allowed to do maintenance operation. Waiting time after complete suppression of input voltage before opening the device should be respected.

4.2.3. Protective earth

MPU-R2-DC should be referenced to the EVSE frame which is in turn is connected to earth ground.
Any interruption of the protective ground conductor, or disconnection of the protective earth terminal will cause a potential shock hazard that might cause personal injury or death. Protective earth connection is made through input connector.

Use the protective earth terminal with minimal characteristics:
Wire section (minimal): 25 mm²
In addition, all parts of the chassis where MPU-R2-DC is to be installed (i.e., the 19" cabinet) need to be grounded. An electrical connection to "G" through mechanical parts must be done.

4.2.4. Input

DC grid is defined as input DC+ and DC-.
MPU-R2-DC product must be protected against short circuit, overload protection and earth leakage current protection with external devices.

4.2.5. LV DC input

LV input must be connected to 24Vdc bus. This input must be protected with a rapid fuse 20A rating.
This cable must be shorter than 3m.

4.2.6. DC Output

DC output is galvanically isolated from protective earth.
This cable must be shorter than 30 m.

4.2.7. EMI requirements

Converters are designed to be compliant with IEC 61000-6-1/2/3/4 standards.

- EMI emissions
  - Conducted emissions: class B
  - Radiated emissions class B
- EMI immunity
  - IEC EN 61000-6-2: Immunity standard for industrial environments
  - IEC EN 61000-6-1: Immunity standard for residential, commercial and light-industrial environments

However, Integrator is responsible to use best practice for final system to avoid high EMI emissions.

4.2.8. Series operation

- Grid side:
  - Series operations of MPU-R2-DC is not allowed.
- EV side:
  - Series operations of MPU-R2-DC is not allowed. Consult factory if series connection is required.

4.2.9. Disposal

- (Mandatory application within the European Union)
- Do not dispose of electronic tools tighter with household waste material. In accordance with WEEE European Directive (2012/19/UE), Electric material that has reached the end of their life must be collected separately and return to an environmentally compatible recycling facility. Please contact WATT & WELL for any questions about WEEE

5. Hardware specification

5.1. Theory of operation

MPU-R2 consist of 2 power converting stages:

- Boost converter that interfaces with the DC grid. This DC/DC converter uses a two-phases synchronous topology.
- DC/DC converter that performs galvanic isolation and DC side regulation. It is based on a full SiC resonant topology.

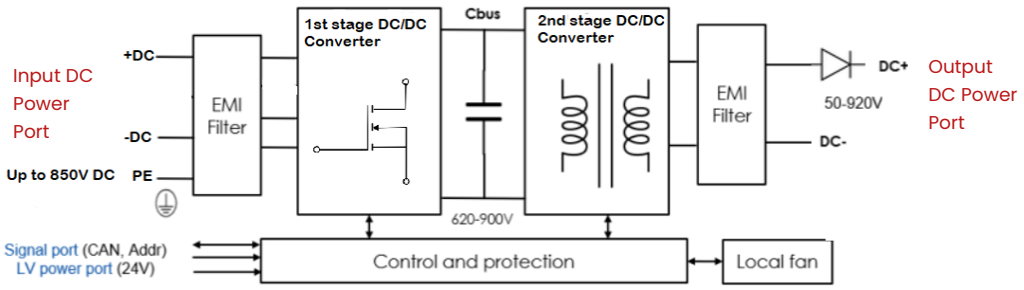


Figure 4 MPU-R2 30 kW high level synoptic

5.2. Interfaces and supply cables

Please note that the supply cables of the converter shall be chosen to have an ampacity based on Table 310-16 of the National Electrical Code, ANSI/NFPA 70 of no less than 125 percent of the maximum current that the circuit carries during rated conditions; and that a wiring terminal are provided with a pressure terminal connector that is securely held by a screw.

Please use an ordinary tool for securing all conductors.

5.2.1. Low voltage connector

Located on the front panel. Cable connected to these ports must be less than 3m long.
The LV connector is used to power the fans and control the converter independently.

Connector Reference (converter side):

- Phoenix Contact MSTB 2,5/ 2-GF-5,08 1776508 (UL approval 300V/15A)
- TIELEE: TLPHW-200R-02P-G12 (UL approval 300V/16A)

Recommended matting connectors (wire harness side):

Side	Connector	Manufacturer	Wire	Ferrule	Crimping tool
LV	MSTB 2,5/ 2-STF-5,08 – 1777989 (Screw terminal)	Phoenix contact	1 mm2	A 1 -6 Ref 3200247	Phoenix contact CRIMPFOX 6 Ref 1212034
	TLPSW-200V-02P-G12S	TIELEE	1 mm2	A 1 -6 Ref 3200247	

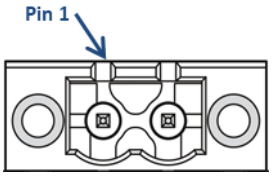


Figure 5: Low voltage connector

PIN	FUNCTION	DESCRIPTION	Preferred wiring color
1	LV_IN-	Low Voltage supply return (0V typ)	**Black**
2	LV_IN+	Low Voltage supply (24V typ)	**Red**

5.2.2. Grid side connector

Located on the front panel.
Connector Reference (converter side):

- Phoenix Contact: PC 35 HC/5-GF-15,00- 1762770 (UL approval 600V/115A)
- TIELEE: TLPHW-900R-05P-G17 (UL approval 600V/115A)

Recommended matting connectors (wire harness side):

Side	Connector	Manufacturer	Wire	Ferrule	Crimping tool
DC Grid	PC 35 HC/ 5-STF-15,00 Ref: 1762628	Phoenix contact	25 mm2	A 25 -20 Ref 3200386	Phoenix contact CRIMPFOX 25R Ref: 1212039
	TLPSW-900V-05P-G12C	TIELEE	25 mm2	CN160018	

PIN	FUNCTION	DESCRIPTION	Preferred wiring color
1	DC+	Positive voltage	**RED**
2	NC	Not connected	
3	DC-	Negative input	**BLUE**
4	NC	Not connected	
5	PE	Protective Earth	**Green/yellow striped**

5.2.3. Output DC side connectors

Located on the back panel. Cable connected to these ports must be less than 30m long.
Connector Reference (converter side):

- Phoenix Contact: PC 35 HC/ 3-GF-15,00 BK – 1762754 (UL approval 600V/115A: middle pin left NC)
- TIELEE: TLPHW-900R-03P-G17 (UL approval 600V/115A: middle pin left NC)

Recommended matting connectors (wire harness side):

Side	Connector	Manufacturer	Wire	Ferrule	Crimping tool
DC Out	PC 35 HC/ 3-STF-15,00 Ref: 1762602	Phoenix contact	35 mm2	Phoenix Contact A 35 -20 Ref 3200409	Phoenix Contact CRIMPFOX 50R Ref 1212041
	TLPSW-900V-03P-G12C	TIELEE	35 mm2	CN350018	

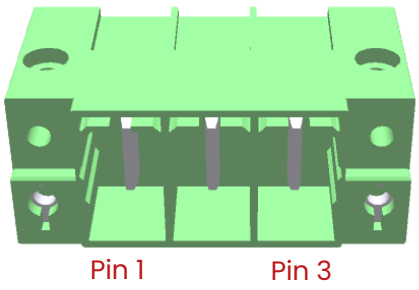


Figure 6: DC_OUT connector

PIN	FUNCTION	DESCRIPTION	Preferred wiring color
1	DC_OUT-	DC Output return (0)	**Black**
2	NC	Not connected	
3	DC_OUT+	DC Output (positive)	**Red**

5.2.4. COM connector

MPU-R2-DC features a galvanically isolated CAN bus for digital communications with other boards.
The COM connector is an RJ45 connector. Cable connected to these ports must be less than 3m long.

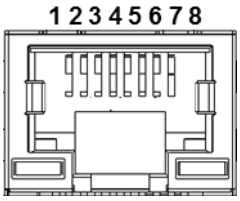


Figure 7 : COM connector front view

Table 4 – COM connector pinout

PIN	FUNCTION	DESCRIPTION
1	CAN H	CAN differential +
2	CAN L	CAN differential -
3	GND_ISO	Ground reference for CAN
4	EM_SHUT_RTN	Emergency Shutdown return line (negative)
5	EM_SHUT	Emergency Shutdown (positive)
6	NC	Not Connected
7	GND_ISO	Ground reference for CAN
8	ES_R/W	Read/write pin in case of daisy chained power units (Mandatory to keep floating)

Note on CAN bus termination: CAN bus is expected to be terminated at each bus end with a 120 Ω resistance. Wiring should be selected to have an intrinsic impedance of the twisted that match this 120 Ω.
By default, MPU-R2 does not include any 120 Ω resistor to avoid overloading the bus when multiple nodes are presents.

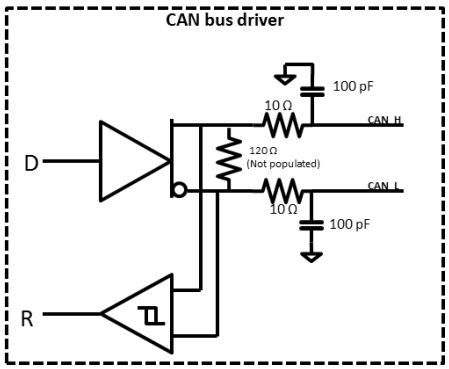


Figure 8: CAN transceiver simplified diagram

Note on CAN bus shield: Although ISO 11898-2 does not specify the wires type or the need for a shield, a shielded cable is recommended for electronically harsh environments. It is

recommended to ground the shield at a single point on the dedicated shield pin of the COM connector to avoid ground loops.
Also, remember that the CAN bus being isolated, the CAN_GND should be wired between nodes.

5.2.5. Emergency Shutdown

The COM connector also transmits an **Emergency Shutdown** (EM_SHUT) signal. This signal can be used to trigger an unconditional shutdown of the MPU-R2-DC operation. See Table 4 for the pinout of EM_SHUT within the COM connector.
In addition, a fast discharge circuit is enabled to discharge the internal output capacitors to a safe level (<<60V) in less than 1 second.

EM_SHUT logic is as follows:

- "floating": Emergency Shutdown triggered (EM_SHUT=1)
- 12V or 24V: normal operation (EM_SHUT=0)

The simplified circuit of the EM_SHUT is given in Figure 9.

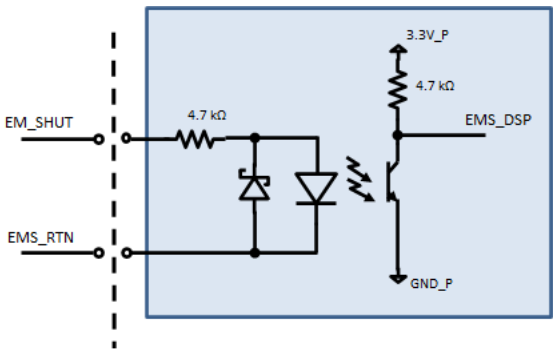


Figure 9 DSI input circuit

5.2.6. Address selector and Charge Permission.

Each MPU-R2 takes its CAN **address** at boot based on the Addressing connector on the front panel.

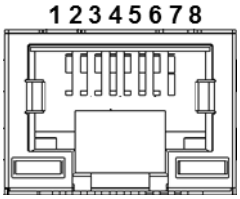


Figure 10: Addressing connector (RJ45) front view

Table 5: Addressing connector pinout

PIN	FUNCTION	DESCRIPTION
1	ADDR0	Address bit 0
2	ADDR3	Not used
3	ADDR1	Address bit 1
4	ADDR4	Not used

5	ADDR2	Address bit 2
6	GND_ISO	Return
7	CHARGE_P	Charge Permission
8	UNUSED	Not used

Default value of each unconnected line is logic '0'. An addressing line tied to GND_ISO is logic '1'.

Each MPU-R2 takes its CAN address at boot based on the Addressing connector on the front panel.
Recommended configuration is

a) In single unit configuration: use the default CAN ID 86 when no ADDR port is connected (or if all theirs lines are logic '0').
b) In multiple unit configuration with single output
   - Use addresses 80 (001) to 85 (110) for each unit
   - Avoid default address (000) to avoid confusion and declare it illegal to catch unconnected port issues
c) In multiple unit configuration with dual output (e.g. a CHAdeMO port and a COMBO port)
   - Use Addresses 80 to 82 for first output (can be done by the EV communication module[5])
   - Use Addresses 83 to 85 for second output ("channel B" in the EVI Module)
   - Avoid default address (000)

ADDR2	ADDR1	ADDR0	CAN ID
0	0	0	86
0	0	1	80
0	1	0	81
0	1	1	82
1	0	0	83
1	0	1	84
1	1	0	85
1	1	1	Illegal

However, up to 14 units can be addressed using PWM signals with EVIX-AD14 (check **Error! Reference source not found.**) as follows:

	CAN ID (dec)	CAN ID (hex)	ADDR2	ADDR1	ADDR0
Power Unit 0	80	0x50	0%	0%	100%
Power Unit 1	81	0x51	0%	100%	0%

[5] EV Interface module is a charging controller developed by Watt & Well. See **Error! Reference source not found.Error! Reference source not found.**

Power Unit 2	82	0x52	0%	100%	100%
Power Unit 3	83	0x53	100%	0%	0%
Power Unit 4	84	0x54	100%	0%	100%
Power Unit 5	85	0x55	100%	100%	0%
Power Unit 6	86	0x56	100%	100%	100%
Power Unit 7	87	0x57	0%	0%	50%
Power Unit 8	88	0x58	0%	50%	0%
Power Unit 9	89	0x59	0%	50%	50%
Power Unit 10	90	0x5A	50%	0%	0%
Power Unit 11	91	0x5B	50%	0%	50%
Power Unit 12	92	0x5C	50%	50%	0%
Power Unit 13	93	0x5D	50%	50%	50%

"**Charge Permission"** signal: CHARGE_P2. This signal can be used as a redundant stop signal in such way MPU-R2 stops operation when it receives a stop instruction by either "Charge Permission signal" or "CAN communication message". This functionality helps achieve compliance with safety features of some EV charging protocols like CHAdeMO. It is disabled by default.

When Charge Permission is enabled, logic levels are defined as

- '0' or floating: no output (forbidden operation). If a start message is received by CAN, a fault will be generated.
- '1' or shorted to GND_ISO: charge permission OK (system can start if a CAN message is received)

"ES_R/W" signal: should be kept floating by user on CAN connector side. It is used to disable the charging process of all units chained together in case of a fault on one unit.

LEDs

4 LEDs on front panel indicate the status of the system

Table 6: LED overview

LED	COLOR	FUNCTION	Description
1	Red	Fault	Indicates a fault in the system. System stops as a result
2	Green	DC output	**Continuous:** System in charge mode
3	Green	Safe C	**Blinking at 5Hz:** Safe C mode. Input DC voltage is out of range. Output power is set off and the charger remains waiting for input DC voltage to return within acceptable range
4	Yellow or Orange	Voltage presence	**Slow blink:** Auxiliary voltage only (24V) **Continuous**: Grid voltage and Auxiliary voltage

5.2.7. Protective Earth

Protective Earth is connected through the grid input connector in the rear panel to the rack chassis.

6. Mechanical specifications

MPU-R2-DC 30kW is packaged in a 2U (88.9 mm). standard 19" (482.6mm) rack. The total length from front to rear panel is 563.2mm (excluding handles).

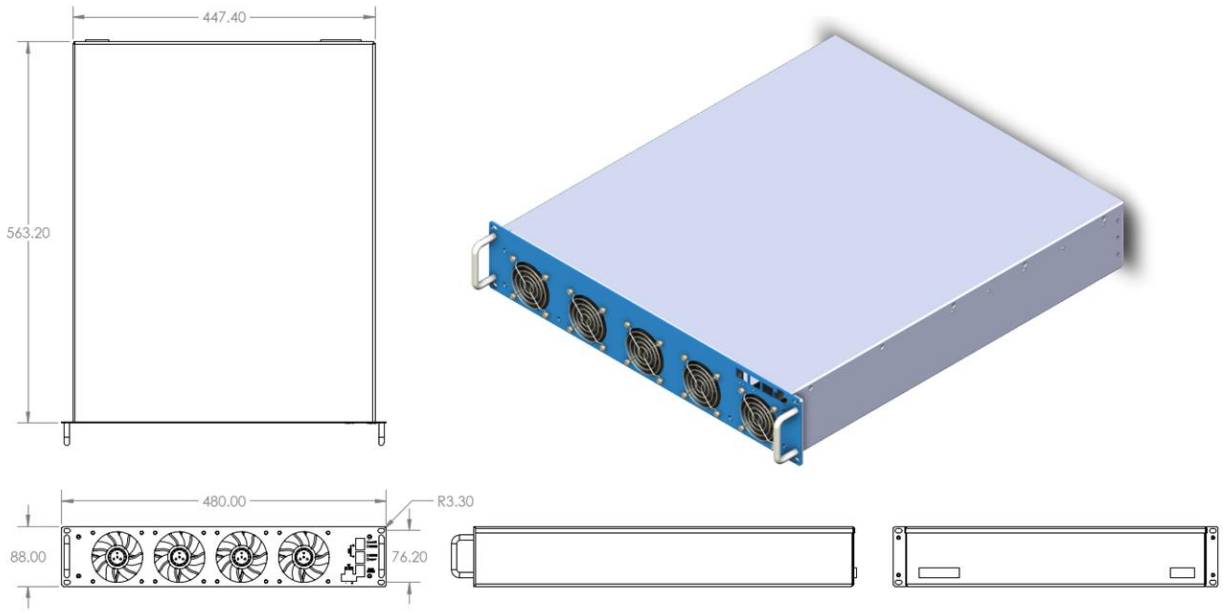


Figure 11: MPU-R2-DC assembly drawing

7. Maintenance

It is forbidden to open the product.

7.1. Cleaning

Use a soft cloth for cleaning the device. Do not use cleaning agent.
Internal dust could be removed with vacuum cleaner or dry air cleaning.

7.2. Cooling fan

Cooling fans are internally controlled. Do not obstruct apertures on the case side.

7.3. Fuse replacement

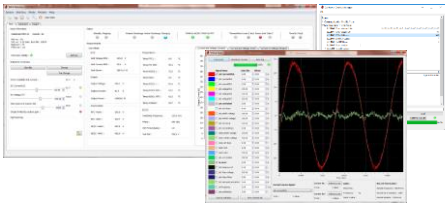
EV side is protected by an adequate fuse.
Fuse replacement is only allowed by WATT & WELL qualified personnel. Return product to factory for replacement.

8. Ordering information

8.1. Product Reference

	Status	P	Grid side	EV side	Other
MPU-R2-DC	Under development	30 kVA	2Φ	920V, 100A	x

8.2. Product accessories

WA051 – Pre-wired DC harness for MPU-R2 with 25mm² color-coded wire and M6 lug termination Cable length: 2.5m	
WA016 – Pre-wired LV harness With color-coded 4mm insulated banana plug Cable length: 2.5m	
WA007 – CAN bus adaptor from RJ45 to DB9 including 120 Ω termination resistance	
WA009 – USB to CAN transceiver (Kvaser) Compatible with MPU Monitor	
WA049 – MPU monitor license (USB license dongle) A Windows based GUI (Graphical User Interface) for easy access to measurements, monitoring and configuration parameters. It can be used to control MPU-R2 as a PC based master or to speed-up integration of a dedicated system master.	

8.3. Related products

EVI is a dual standard Supply Equipment Communication Controller (SECC) with all required signals for CCS2 /Combo and CHAdeMO communications.

Main features:

- CCS protocol compatible
  - ISO15118-2 and ISO15118-20
- CHAdeMO compatible (via Extension board)
  - Version 0.9 & 1.2
- Insulation Measurement Device according to IEC61557-8
- High voltage 920V charging.
- OCPP 1.6 and soon OCPP 2.0.1
- Smart Charging & V2G charging modes
- Cable temperature measurement
- Crypto ready with Secure Element embedded

EVIX – EVI Extension board:

An optional extension board (EVIX) can add additional functions such as:

- EVIX-AD6: Addressing of 6 power units
- EVIX-AD14: Addressing of 14 power units
- EVIX-AD6-CHA: CHAdeMO HW interface & Addressing 6 power units
- EVIX-IO: Peripheral extension board

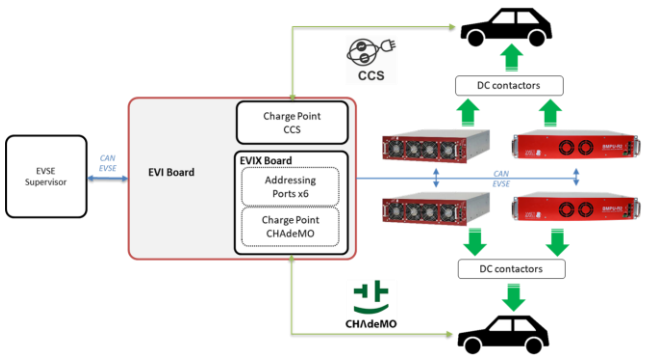


Figure 12: EVI & EVIX integration on EVSE environment

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