Technical Data Sheet

RMD75-UW Series ◊ Plug & Play Railway

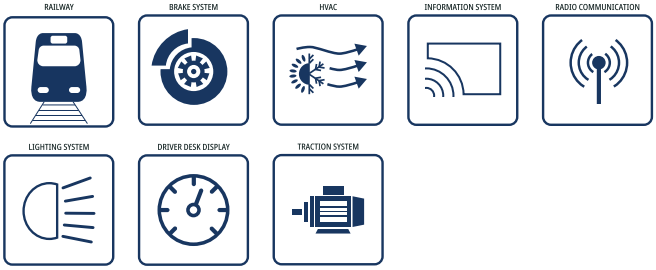
75W ◊ Ultra-Wide Input 16.8V-137.5VDC

RECOM DC/DC Converter

FEATURES

- Fully EN50155 compliant, no external circuits
- Ultra-wide input range 11:1 reduces product variety
- Excellent efficiency, lowest power loss, full lifetime
- Active input reverse polarity protection
- Active inrush current limitation - network protection
- 10ms hold-up time over the entire input range
- Reinforced insulation, 5mm air/creepage distances
- Trim-output for long cable runs or battery charging
- Parallel and redundant operation
- 120% Peak load capability to 90W for 10s
- Remote (on/off) and DC OK signal
- 2 years warranty

APPLICATIONS



SAFETY & EMC

RoHS² compliant 10 from 10 | Reach compliant | CE

DESCRIPTION

The chassis mountable RMD75-UW series DC/DC converter is designed for railway and transportation applications and is compliant with all relevant standards: EN50155, EN50121-3-2, DB-EMV06, EN50124-1, EN50125-1, EN61373 1B, EN62368-1, EN45545-2. The unit is designed with 11:1 input voltage range to cover the input voltages from 14.4VDC up to 154VDC for nominal 24, 36, 48, 72 and 110V in one range for all applications - on every vehicle worldwide. Isolated and fully regulated outputs feature reinforced isolation. Due to the base plate mounting the unit operates with full power within the wide temperature for OT4+ST1&ST2 class from -40°C to +85°C and no additional cooling systems are necessary. Input reverse polarity protection, inrush current limitation, 10ms hold-up time, remote control, output OR-ing diode and efficiency of up to 92% round up the functionality of this fully railway compliant Plug&Play unit.

SELECTION GUIDE

Part Number	Input Voltage Range [VDC]	Output Voltage nom. [VDC]	Output Current max. (1) [A]	Efficiency typ. [%]	continuous Output Power [W]
RMD75-110-12SUW *coming soon	16.8-137.5	12	7.5	91	75
RMD75-110-24SUW	16.8-137.5	24	3.75	92.5	75

Note1: Refer to **„Peak load Capability“**

Note2: Efficiency is tested at input voltage 110VDC and full load at +25°C ambient.

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RECOM DC/DC Converter

MODEL NUMBERING

RMD75-110-__ SUW/PT/DR

- RMD75-110-__ SUW/PT/DR
  - cont. Output Power
  - nom. Input Voltage
  - nom. Output Voltage
  - **S**ingle Output
  - Push-in terminal connector (3)
  - with pre-mounted **D**in-**R**ail clip (4)

Note3: add suffix **"/PT"** for push-in terminal connector and relay changeover contacts instead of open collector PG function, no output voltage trimming function; without suffix = standard connector, open collector PG and output voltage trimming function. Refer to **„Dimension Drawing "/PT" Version (mm)"**

Note4: add suffix **"/DR"** for module with pre-mounted din-rail clip on backside. Refer to **„Dimension Drawing "/DR" Version (mm)"**

Note5: Add suffix **"/PT/DR"** for version with push-in terminal connector and pre-mounted DIN-rail clip on the backside

ORDERING INFORMATION

Model	Nom. Output Voltage	Power Good	Connector	Trimming function	Peak Power
RMD75-110-24SUW	24VDC	open collector	standard connector	yes (21.6-26.4VDC)	90W/10sec max.
RMD75-110-24SUW/PT	24VDC	changeover contact	WAGO cage clamp	no	90W/10sec max.
RMD75-110-24SUW/DR	24VDC	open collector	standard connector	yes (21.6-26.4VDC)	no
RMD75-110-24SUW/PT/DR	24VDC	changeover contact	WAGO cage clamp	no	no

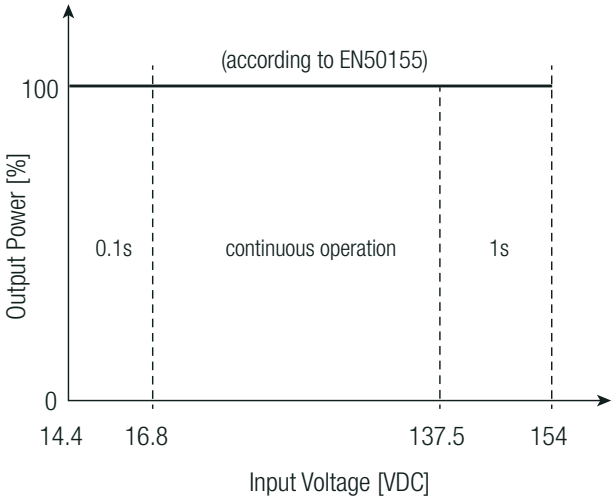
BASIC CHARACTERISTICS (measured @ T_{AMB}= 25°C, nom. V_{IN}, full load and after warm-up unless otherwise stated)

Parameter	Conditions			Min.	Typ.	Max.
Input Voltage Range	refer to **„Input Voltage Range"**	nom. V_{IN}= 24, 36, 48, 72, 110VDC		16.8VDC		137.5VDC
		according to EN 50155	100ms max	14.4VDC		16.8VDC
			1s max.	137.5VDC		154VDC
Input Capacitance	internal				4µF	
Under Voltage Lockout	rising edge			15VDC		16VDC
	falling edge					14.4VDC
	hysteresis				1VDC	
Input Current	V_{IN}=16.8VDC			5.1A	5.45A	7A
	V_{IN}=24VDC				3.5A	4.7A
	V_{IN}= 110VDC				0.75A	1A
	V_{IN}= 137.5VDC					0.8A
Inrush Current	active inrush current limitation (<3.5 x Inom)					14A
No Load Power Consumption	V_{IN}= 16.8VDC				1.9W	
	V_{IN}= 110VDC				1.4W	
Standby Power (shutdown by remote)						1W
Output Current Range	continuous operation		RMD75-110-12SUW	0A		6.25A
			RMD75-110-24SUW	0A		3.125A
	10s max., refer to **„Peak load Capability"** T_{AMB}= 70°C max.		RMD75-110-12SUW			7.5A
			RMD75-110-24SUW			3.75A
Nominal Output Voltage (factory set)	RMD75-110-12SUW				12VDC	
	RMD75-110-24SUW				24VDC	
Output Voltage Trimming (not available for /PT option)	RMD75-110-12SUW			10.8VDC		13.2VDC
	RMD75-110-24SUW			21.6VDC		26.4VDC
Minimum Load				0%		
Start-up time	V_{IN}= 24VDC					1s
	V_{IN}= 110VDC					1s
	by using CTRL ON/OFF function					0.2s
Rise time	V_{IN}= 24VDC, 110VDC					100ms

BASIC CHARACTERISTICS (measured @ T_{AMB}= 25°C, nom. V_{IN}, full load and after warm-up unless otherwise stated)

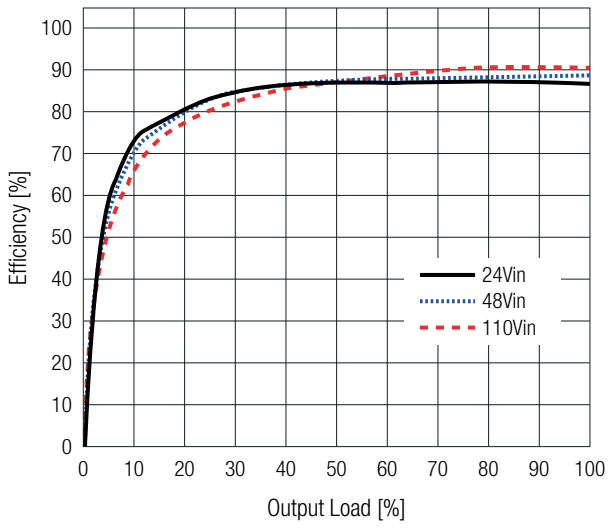
Parameter	Condition		Min.	Typ.	Max.
Hold-up time	V_{IN}= 16.8VDC		10ms		
	V_{IN}= 110VDC		30ms		
ON/OFF CTRL	DC-DC ON		open or connected to +V_{IN}		
	DC-DC OFF		connected to -V_{IN}		
Input Current of CTRL pin	DC-DC ON				10mA
Internal Operating Frequency				88kHz	
Output Ripple and Noise	10µF electrolytic capacitor in parallel across the output (low ESR)	ripple		1% of V_{OUT}	
		noise		2% of V_{OUT}	
Maximum Capacitive Load	RMD75-110-24SUW			4000µF	

Input Voltage Range

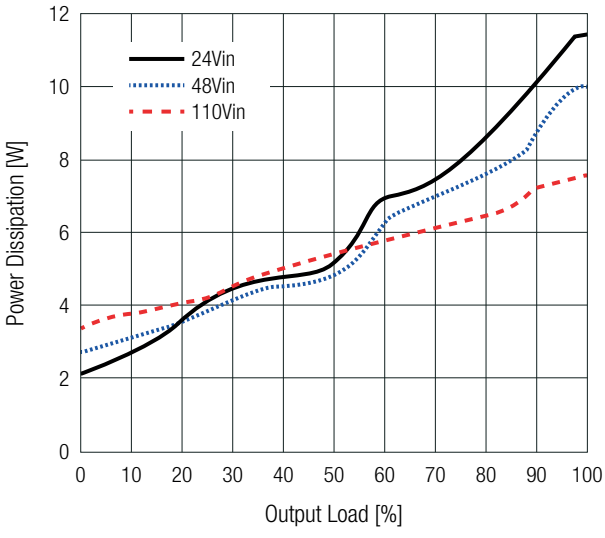


RMD75-110-24SUW

Efficiency vs Load

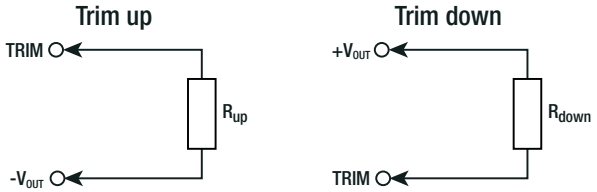


Power Dissipation vs Load



OUTPUT VOLTAGE TRIMMING

The output voltage of the RMD40-UW can be trimmed between ±10% by using an external trim resistor. The /PT version does not support this feature. The values for the trim resistor are according to standard E96 values; therefore, the specified voltage may slightly vary. Resistor values may be calculated with the following equation:



$Vout_{nom}$	= nominal output voltage	[VDC]
$Vout_{set}$	= trimmed output voltage	[VDC]
V_{ref}	= reference voltage	[VDC]
R_{up}	= trim up resistor	[Ω]
R_{down}	= trim down resistor	[Ω]
k_u	= trim up factor	[ ]
k_d	= trim down factor	[ ]

Model	R_1 [Ω]	R_2 [Ω]	R_3 [Ω]	V_{ref} [VDC]
RMD75-110-12SUW	16k	4k2	7k8	2.5
RMD75-110-24SUW	35k3	4k1		

Calculations:

$$k_u \cong \left[\frac{V_{REF}}{V_{OUTset} - V_{REF}}\right] \times R_1 \qquad R_{up} \cong \left[\frac{k_u \times R_2}{R_2 - k_u}\right] - R_3$$

$$k_d \cong \left[\frac{V_{OUTset} - V_{REF}}{V_{REF}}\right] \times R_2 \qquad R_{down} \cong \left[\frac{k_d \times R_1}{(R_1 - k_d}\right] - R_3$$

Practical Example trim up +10% for RMD75-110-24SUW

$Vout_{set}$ = 26.4VDC; $Vout_{nom}$ = 24VDC

$$k_u = \left[\frac{2.5V}{26.4V - 2.5V}\right] \text{ x } 35k3 = \mathbf{3692.47}$$

$$R_{up} = \left[\frac{3692.47 \text{ x } 4k1\Omega}{4k1\Omega - 3692.47}\right] - 7k8\Omega = \mathbf{29348.49\Omega}$$

R_{up} according to E96 ≈ **29k4Ω**

Practical Example trim down -10% for RMD75-110-24SUW

$Vout_{set}$ = 21.6VDC; $Vout_{nom}$ = 24VDC

$$k_d = \left[\frac{21.6V - 2.5V}{2.5V}\right] \text{ x } 4k1 = \mathbf{31324}$$

$$R_{down} = \left[\frac{31324 \text{ x } 35k3\Omega}{35k3\Omega - 31324}\right] - 7k8\Omega = \mathbf{270302.92\Omega}$$

R_{down} **according to E96 ≈ 267kΩ**

RMD75-110-12SUW

Trim up	1	2	3	4	5	6	7	8	9	10	[%]
$Vout_{set}$ =	12.12	12.24	12.36	12.48	12.6	12.72	12.84	12.96	13.08	13.2	[VDC]
R_{up} (E96) ≈	287k	150k	100k	73k2	57k6	46k4	39k2	33k2	28k7	24k9	[Ω]

Trim down	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	[%]
$Vout_{set}$ =	11.88	11.76	11.64	11.52	11.4	11.28	11.16	11.04	10.92	10.8	[VDC]
R_{down} (E96) ≈	1M43	649k	412k	301k	237k	191k	162k	137k	118k	105k	[Ω]

RMD75-110-24SUW

Trim up	1	2	3	4	5	6	7	8	9	10	[%]
$Vout_{set}$ =	24.24	24.48	24.72	24.96	25.2	25.44	25.68	25.92	26.16	26.4	[VDC]
R_{up} (E96) ≈	412k	187k	121k	86k6	68k1	54k9	45k3	39k2	34k	29k4	[Ω]

Trim down	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	[%]
$Vout_{set}$ =	23.76	23.52	23.28	23.04	22.8	22.56	22.32	22.08	21.84	21.6	[VDC]
R_{down} (E96) ≈	2M74	1M43	976k	732k	576k	475k	402k	348k	301k	267k	[Ω]

REGULATIONS (measured @ T_{AMB}= 25°C, nom. V_{IN}, full load and after warm-up unless otherwise stated)

Parameter	Conditions	Value
Output Accuracy		±3.0% max.
Line Regulation	low line to high line, full load	±0.5% max.
Load Regulation	0%-100% load	2.0% max.
Transient Response	10-90% load, V_{IN}= 16.8-137VDC	1.2VDC
	recovery time	5ms max.

PROTECTIONS (measured @ T_{AMB}= 25°C, nom. V_{IN}, full load and after warm-up unless otherwise stated)

Parameter	Type		Value
Internal Input Fuse			T20A, slow blow type
Short Circuit Protection (SCP)			constant current mode, auto recovery
Short Circuit Input Current	V_{IN}= 24VDC		3.4A
	V_{IN}= 110VDC		0.7A
Input Reverse Polarity Protection	active protected		-137.5VDC
Over Voltage Protection (OVP)	clamping		120% - 140% of nom. V_{OUT}
Over Voltage Category (OVC)	short term and continuous		OVC II (5000m)
Over Current Protection (OCP)	auto recovery		120% - 250% of rated I_{OUT}
Class of Equipment			Class I
Isolation Coordination	according to EN 50124-1:2018		V_{NOM}= 250VDC
Isolation Voltage [6]	1 minute	I/P to O/P	4.2kVDC
		I/P to case, OK contact to I/P, O/P and case	2.2kVDC
		O/P to case	1.5kVDC
Isolation Resistance			300MΩ min.
Isolation Capacitance			1200pF typ.
Insulation Grade			reinforced
Internal Clearance	I/P to O/P		5mm
	I/P to PE / O/P to PE		2.5mm

Note6: For repeat Hi-Pot testing, reduce the time and/or the test voltage

POWER GOOD STANDARD VERSION

Parameter	Type		Value
Power OK LED	RMD75-110-24SUW	V_{OUT}= >21.6VDC	green
		V_{OUT}= <21.6VDC	light off
Open Collector	RMD75-110-24SUW	V_{OUT}= >21.6VDC	OK= 5V/1mA
		V_{OUT}= <21.6VDC	NOK= 0V

POWER GOOD /PT VERSION

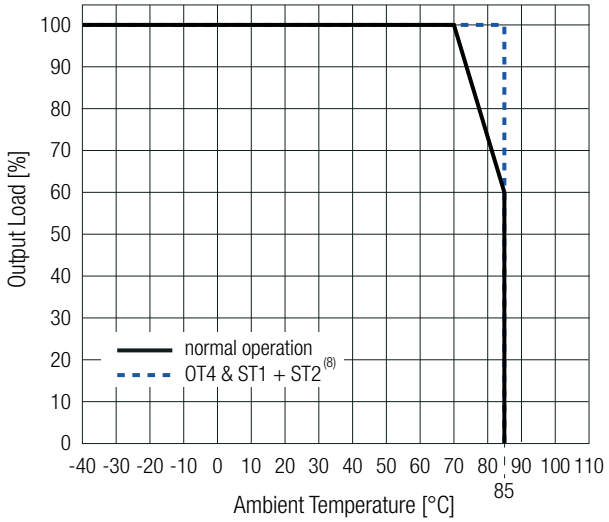
Parameter	Type		Value
Power OK LED	RMD75-110-24SUW	V_{OUT}= >21.6VDC	green
		V_{OUT}= <21.6VDC	light off
Power Good			0.9Vout
Changeover Contact	RMD75-110-24SUW	V_{OUT}= >21.6VDC	OK: OK2 connected OK or OK1 not connected OK
		V_{OUT}= <21.6VDC	NOK: OK1 connected to OK or OK2 not connected OK

ENVIRONMENTAL (measured @ T_{AMB}= 25°C, nom. V_{IN}, full load and after warm-up unless otherwise stated)

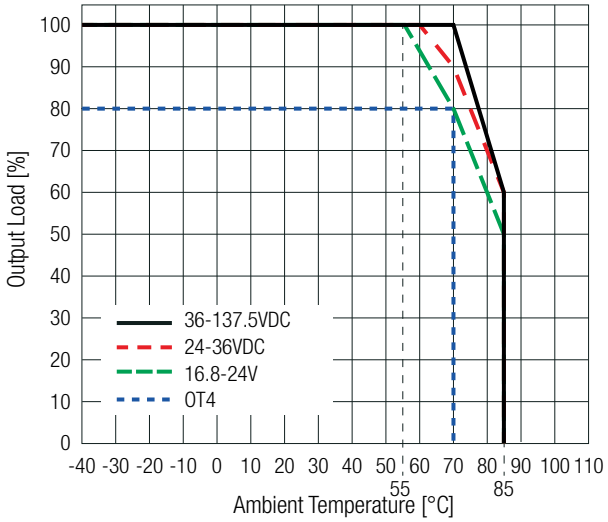
Parameter	Conditions		Value
Operating Ambient Temperature Range	without derating, normal operation		-40°C to +70°C
	according to EN 50155 class OT4 and extended operating temperature class ST1 & ST2	without derating for 15 minutes max.	-40°C to +85°C
Maximum Baseplate Temperature			+95°C
Temperature Coefficient			0.2%/K
Operating Altitude	according to EN 50124-1:2018		5000m
Operating Humidity	non-condensing		95% RH max.
Conformal Coating (7)	according to EN 50155		Class PC2
Pollution Degree			PD2
IP Rating			IP20
Design Lifetime			20 years
MTBF	according to IEC 61709/ UTE C80-810	T_{AMB}= +40°C	1950 x 10³ hours
		T_{AMB}= +50°C	1400 x 10³ hours
Useful Life Class	according to EN50155:2018 (S1)		L4

Note7: The board is protected on both sides with a protective / transparent / fluorescent / coating. The coating is compliant with class 2, according to IPC-A-610G: 2017

Derating Graph (Standard and "/PT" version)



Derating Graph "/DR"-Version



Note8: The specified operating temperature range -40°C to +85°C (covering OT4, ST1 and ST2) is valid only with conduction cooling to a thermally suitable baseplate (e.g. aluminum or equivalent) of at least 300 × 300 mm and 2.5mm thickness.

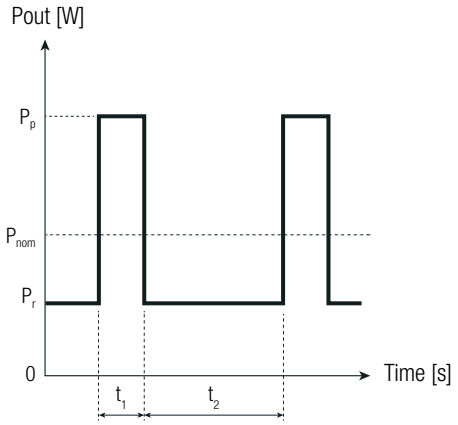
PEAK LOAD CAPABILITY

Peak power capability supports short power peaks of dynamic loads like motors, relays, storage devices or computer booting sequences. In addition allowing faster charge of load sided capacitors and reliable circuit breaker operation. The peak power rating applies only up to a maximum ambient temperature of +70°C. For Din-rail mounted version no peak power allowed, 75W max. continuous power!

P_{nom} = nominal output power [W]
P_p = peak output power (90W max) [W]
P_r = recovery power (≤60W) [W]
t_1 = peak time (10s max) [s]
t_2 = recovery time (3 x t_1) [s]

Calculation:

$$t_2 = \frac{(P_{nom} - P_P) \times t_1}{P_r - P_{nom}}$$



Practical Example:

P_{nom} = 75W
P_p = 90W
P_r = 60W
t_1 = 10s

$$t_2 = \frac{(75W - 90W) \times 30s}{60W - 75W} = \underline{\mathbf{30s}}$$

ENVIRONMENTAL (RAILWAY STANDARDS)

Parameter	Conditions	Value
Low Temperature start-up test	Temperature: -40°C; Stabilization time 2h	EN 60068-2-1 (Ad)
Dry heat test	Temperature: +70°C; Continuous operational checks time 6h	EN 60068-2-2 (Be) – Cycle A
Low temperature storage test	Temperature: -40°C; Low temperature exposition time 16h	EN 60068-2-1 (Ab)
Cyclic damp heat test	Temperature: +70°C/+25°C; Number of cycles: 2; Time 2x 24h	EN 60068-2-30 (Db)
Simulated long-life testing (Test performed at maximum level for each axis.)	Random Vibration, unit not powered during test Frequency range 5-150Hz with -6db/oct from 20 to 150Hz Vertical axis 5.72m/s² for 5h [ASD 0.964(m/s²)²/Hz] Transverse axis 2.55m/s² for 5h [ASD 0.192(m/s²)²/Hz] Longitudinal axis 3.96m/s² for 5h [ASD 0.461(m/s²)²/Hz]	EN 61373 clause 9, class B Body mounted
Shock testing (Test performed at maximum level for each axis.)	Half-sine shock, unit powered during test; Vertical axis 30m/s² for 30ms Transverse axis 30m/s² for 30ms; Longitudinal axis 50m/s² for 50ms Number of shocks: 18 (3x polarity for each axis)	EN 61373 clause 10, class B Body mounted
Functional random vibration test (Test performed at maximum level for each axis.)	Random Vibration, unit powered during test Frequency range 5-150Hz with -6db/oct from 20 to 150Hz Vertical axis 1.01m/s² for 10min [ASD 0.0301(m/s²)²/Hz] Transverse axis 0.45m/s² 10min [ASD 0.006(m/s²)²/Hz] Longitudinal axis 0.7m/s² 10min [ASD 0.0144(m/s²)²/Hz]	EN 61373 clause 8, class B Body mounted
Railway applications - Fire protection on railway vehicles - Part 2: Requirements for fire behavior of materials and components	R24 & R25	EN45545-2 Hazard Level HL1 - HL3

SAFETY & CERTIFICATIONS

Certificate Type (Safety)	Report Number	Standard
Audio/video, information and communication technology equipment. Safety requirements	80235804-00	IEC62368-1:2018 3rd Edition EN IEC 62368-1:2020+A11:2020
Railway applications - Insulation coordination - Part 1: Basic requirements - Clearances and creepage distances for all electrical and electronic equipment	RMD40&RMD75_V1.0	EN50124-1
Railway Applications - Electrical Equipment used on rolling stock		EN50155
RoHS2		RoHS 2011/65/EU + AM2015/863

EMC Compliance	Conditions		Standard / Criterion
Railway applications - Electromagnetic compatibility			EN50121-3-2:2016
Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments			EN IEC 61000-6-2:2019
Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments	V_{IN}= 24VDC & 110VDC		EN61000-6-4:2007+A1:2011
ESD Electrostatic discharge immunity test	V_{IN}= 24VDC & 110VDC	Air: ±2, 4, 8kV Contact: ±2, 4, 8kV	IEC61000-4-2:2008, Criteria A EN61000-4-2:2009, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	V_{IN}= 24VDC & 110VDC	20V/m (80-1000MHz) 10V/m (1000-6000MHz)	IEC/EN61000-4-3:2010, Criteria A
Fast Transient and Burst Immunity	DC Power Port: ±2kV DC Output Port: ±2kV		IEC/EN61000-4-4:2012, Criteria A
Surge Immunity	V_{IN}= 24VDC & 110VDC	DC Power Port sym.: ±0.5, 1kV DC Power Port unsym.: ±0.5, 1, 2kV	IEC/EN61000-4-5:2014, Criteria A
Immunity to conducted disturbances, induced by radio-frequency fields	V_{IN}= 24VDC & 110VDC	DC Power Port: 10Vr.m.s. (0.15-80MHz)	IEC61000-4-6: 2013, Criteria A EN61000-4-6:2014, Criteria A
Power Magnetic Field Immunity	V_{IN}= 24VDC & 110VDC	30A/m, 50/60Hz	IEC61000-4-8:2009, Criteria A EN61000-4-8:2010, Criteria A
Railway applications - Electromagnetic compatibility	V_{IN}= 24VDC & 110VDC		EN50121-3-2:2016+A1:2019
Technische Regeln zur Elektromagnetischen Verträglichkeit: Nachweis der Funkverträglichkeit von Schienenfahrzeugen mit Bahnfunkdiensten	V_{IN}= 24VDC & 110VDC		Regelung Nr. EMV 06:2019

RMD75-UW Series ◊ Plug & Play Railway

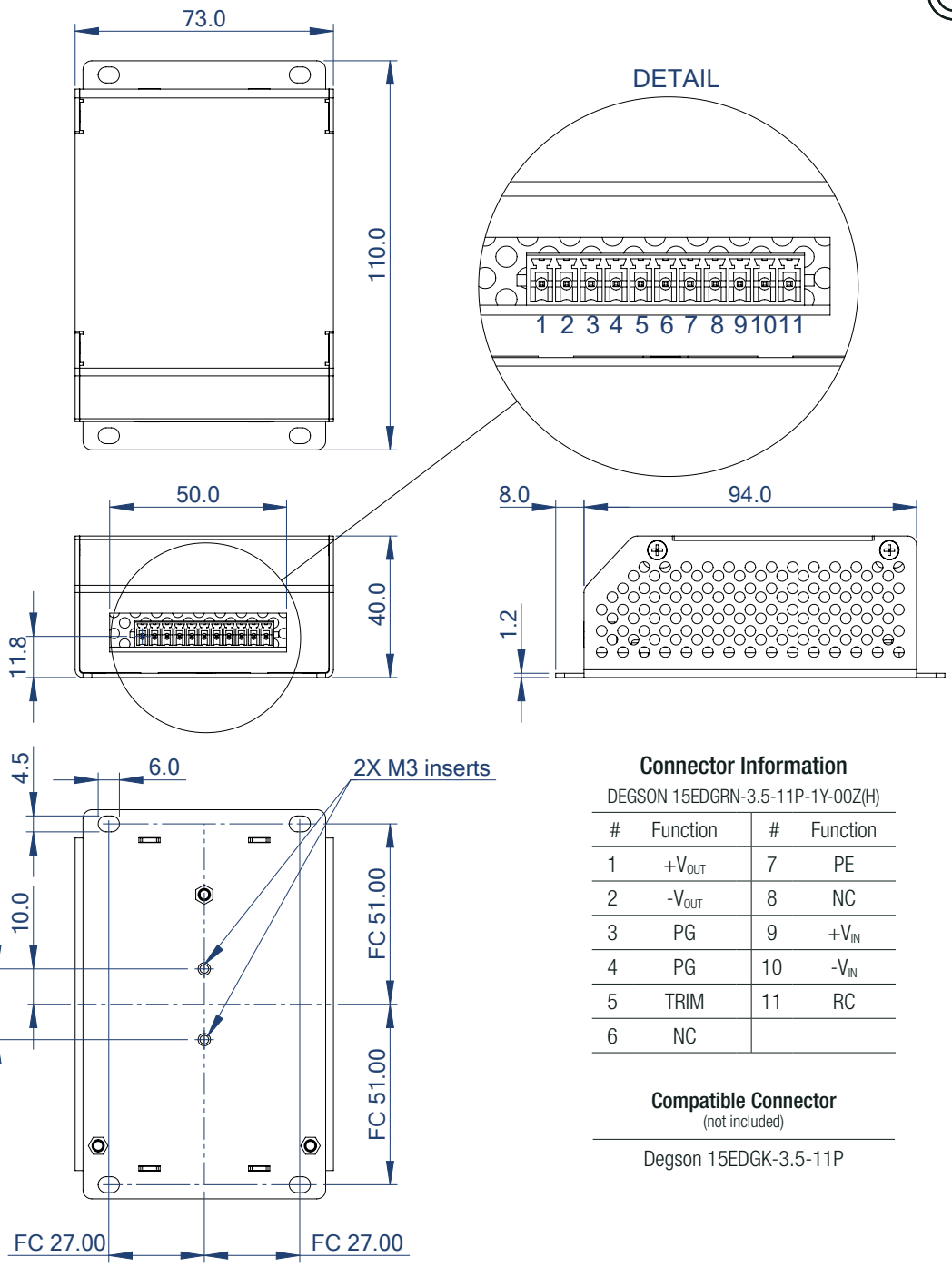
75W ◊ Ultra-Wide Input 16.8V-137.5VDC

RECOM DC/DC Converter

DIMENSION & PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	case	aluminum
Dimension (LxWxH)	standard version	110.0 x 73.0 x 40.0mm (4.33 x 2.87 x 1.57 inch)
	/PT version	112.0 x 73.0 x 40.0mm (4.40 x 2.87 x 1.57 inch)
	/DR version	110.0 x 73.0 x 49.0mm (4.33 x 2.87 x 1.92 inch)
	/PT/DR version	112.0 x 73.0 x 49.0mm (4.40 x 2.87 x 1.92 inch)
Weight	standard version	320g typ. (0.71 lbs)
	/PT version	328g typ. (0.72 lbs)
	/DR version	331g typ. (0.73 lbs)
	/PT/DR version	339g typ. (0.75 lbs)

Dimension Drawing Standard Version (mm)



Connector Information

DEGSON 15EDGRN-3.5-11P-1Y-00Z(H)

#	Function	#	Function
1	$+V_{OUT}$	7	PE
2	$-V_{OUT}$	8	NC
3	PG	9	$+V_{IN}$
4	PG	10	$-V_{IN}$
5	TRIM	11	RC
6	NC		

Compatible Connector

(not included)

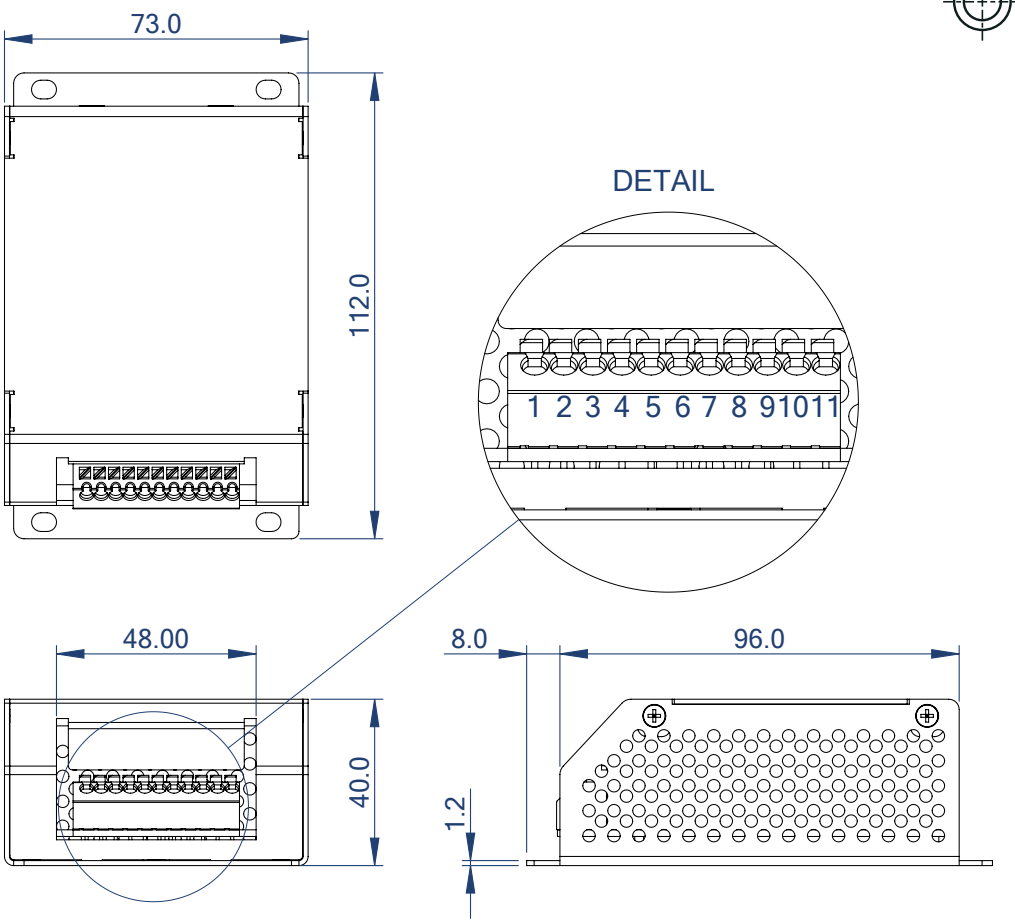
Degson 15EDGK-3.5-11P

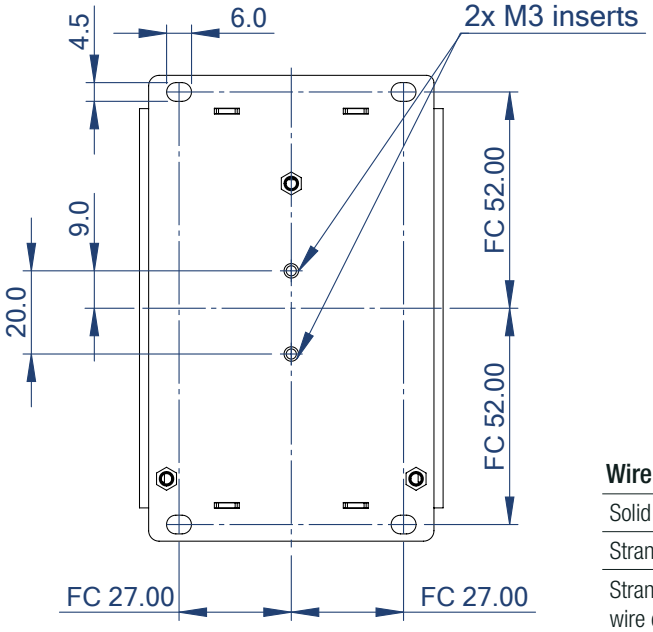
Tolerances:
xx.x= ±0.5mm
xx.xx= ±0.25mm
FC = fixing centers

Note9: The M3 inserts can be used for DIN-rail clip (max. penetration= 2.5mm)

DIMENSION & PHYSICAL CHARACTERISTICS

Dimension Drawing "/PT" Version (mm)





CAGE CLAMP®
(Wago 250-211)

#	Function	#	Function
1	$+V_{OUT}$	7	PE
2	$-V_{OUT}$	8	NC
3	OK	9	$+V_{IN}$
4	OK1	10	$-V_{IN}$
5	OK2	11	RC
6	NC		

Wire cross section

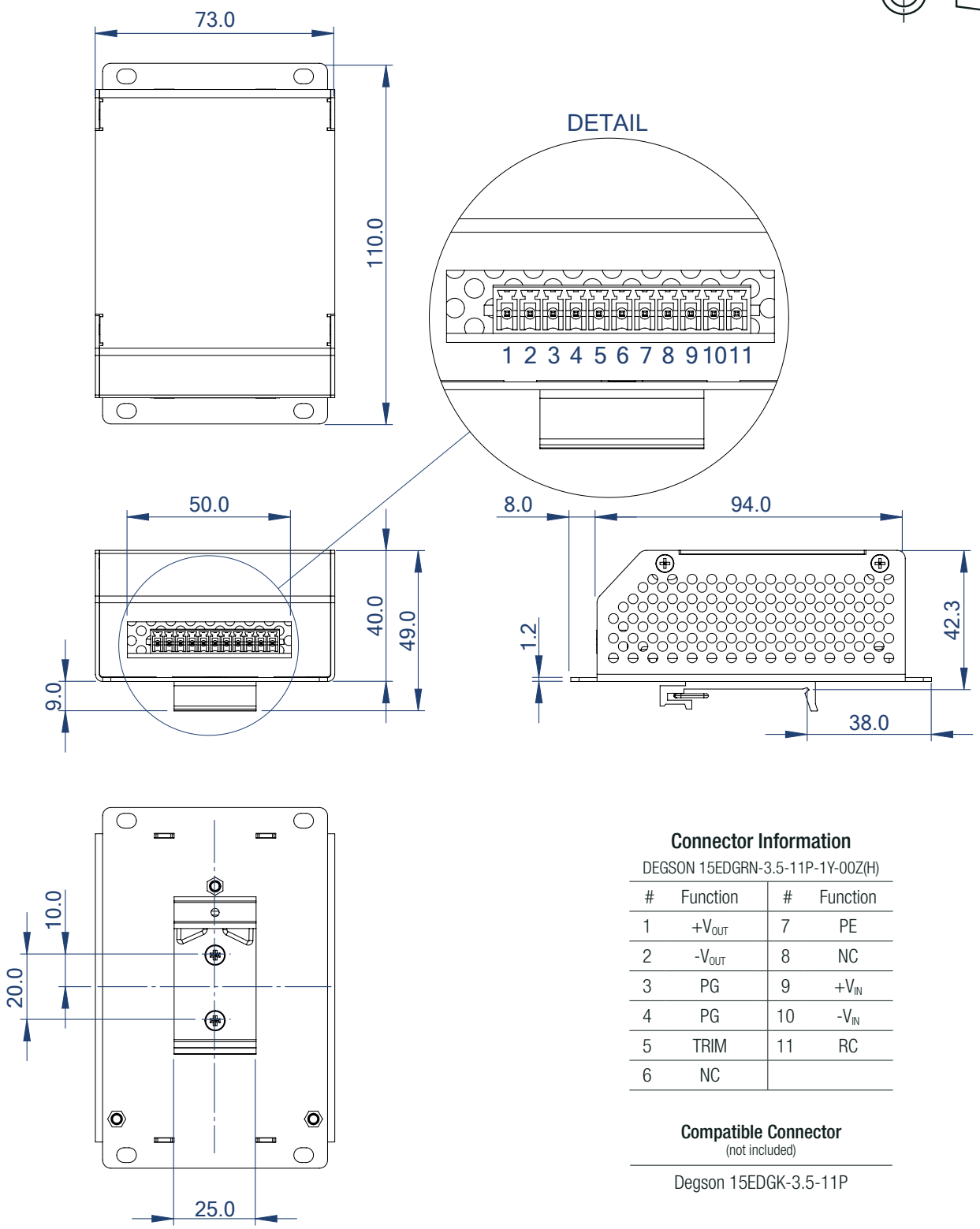
Solid conductor	0.2-1.5mm² / 24-16 AWG
Stranded conductor	0.2-1.5mm² / 24-16 AWG
Stranded conductor: wire end ferrule with plastic collar wire end ferrule without plastic collar	 0.25-1.0mm² 0.25-1.0mm²
Stripping length	8.5-9.5mm / 0.33-0.37 inch

Note10: The M3 inserts can be used for DIN-rail clip (max. penetration= 2.5mm)

Tolerances:
xx.x= ±0.5mm
xx.xx= ±0.25mm
FC = fixing centers

DIMENSION & PHYSICAL CHARACTERISTICS

Dimension Drawing "/DR" Version (mm)



Connector Information

DEGSON 15EDGRN-3.5-11P-1Y-00Z(H)

#	Function	#	Function
1	$+V_{OUT}$	7	PE
2	$-V_{OUT}$	8	NC
3	PG	9	$+V_{IN}$
4	PG	10	$-V_{IN}$
5	TRIM	11	RC
6	NC		

Compatible Connector

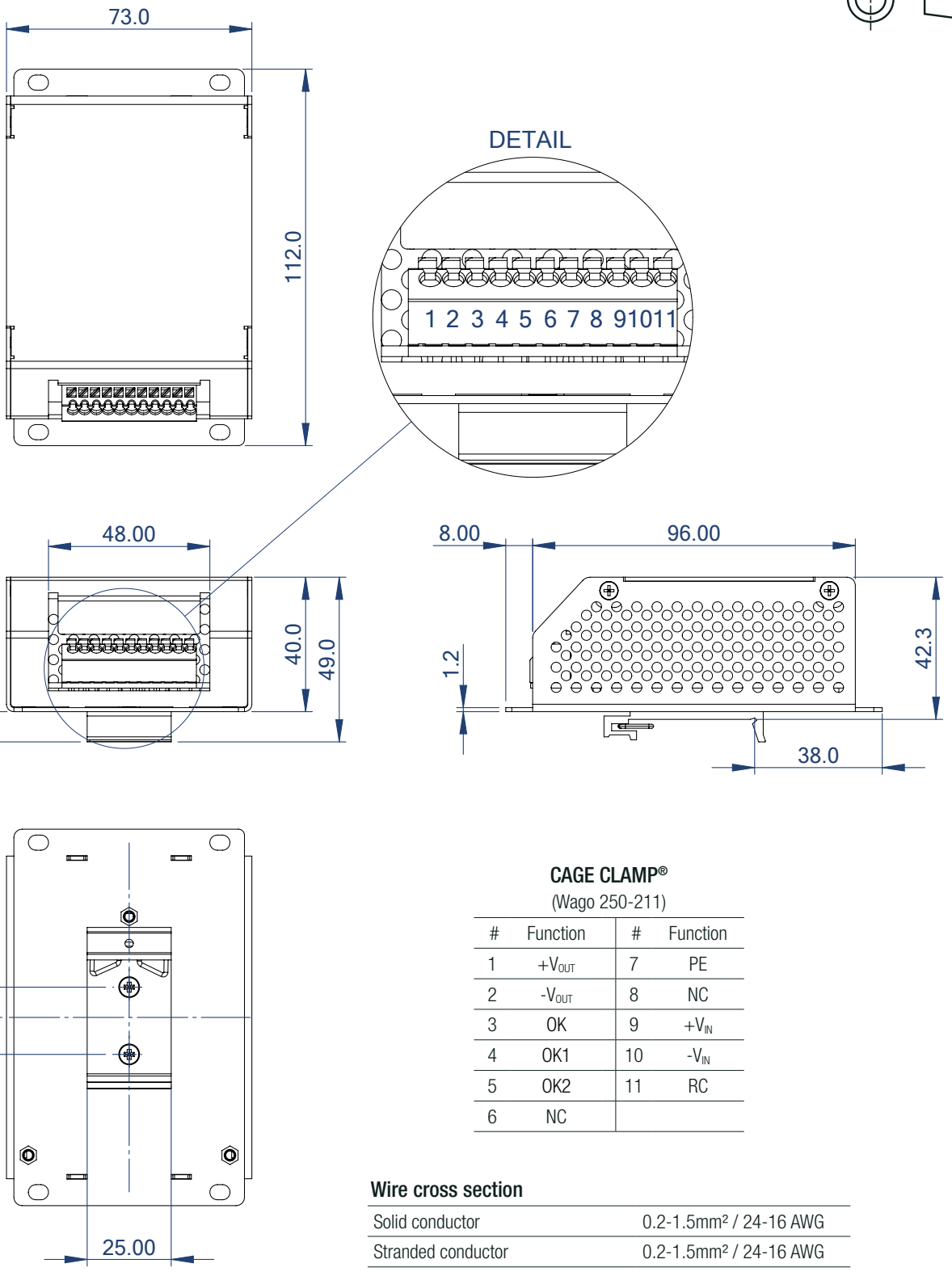
(not included)

Degson 15EDGK-3.5-11P

Tolerances:
xx.x= ±0.5mm
xx.xx= ±0.25mm
FC = fixing centers

DIMENSION & PHYSICAL CHARACTERISTICS

Dimension Drawing "/PT/DR" Version (mm)



CAGE CLAMP®
(Wago 250-211)

#	Function	#	Function
1	$+V_{OUT}$	7	PE
2	$-V_{OUT}$	8	NC
3	OK	9	$+V_{IN}$
4	OK1	10	$-V_{IN}$
5	OK2	11	RC
6	NC		

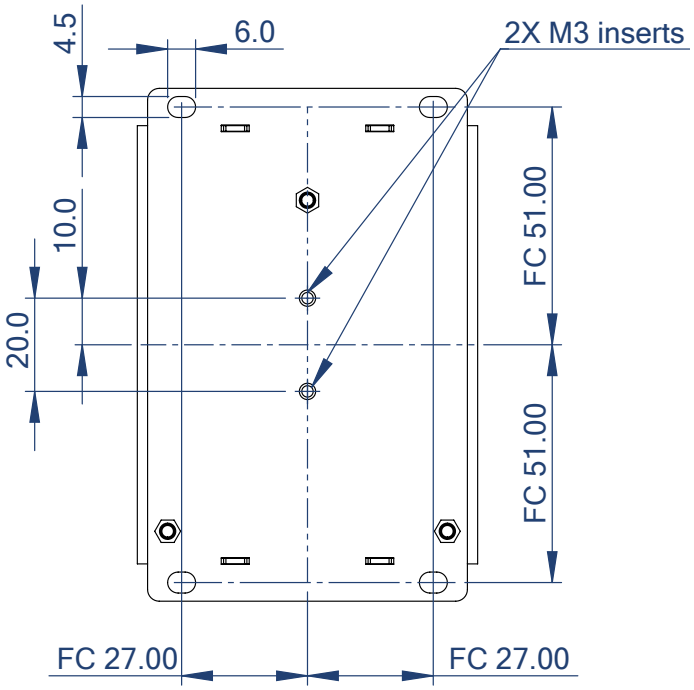
Wire cross section

Solid conductor	0.2-1.5mm² / 24-16 AWG
Stranded conductor	0.2-1.5mm² / 24-16 AWG
Stranded conductor: wire end ferrule with plastic collar wire end ferrule without plastic collar	 0.25-1.0mm² 0.25-1.0mm²
Stripping length	8.5-9.5mm / 0.33-0.37 inch

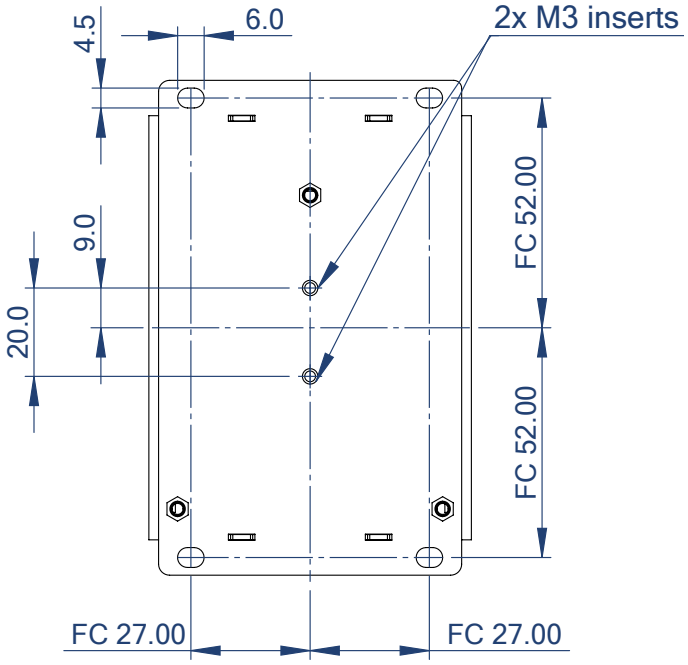
Tolerances:
xx.x= ±0.5mm
xx.xx= ±0.25mm
FC = fixing centers

INSTALLATION & APPLICATION

Mounting Instructions Standard Version



Mounting Instructions /PT Version



Natural air convection around the unit must be possible at any time and the temperature shall not be exceeded.

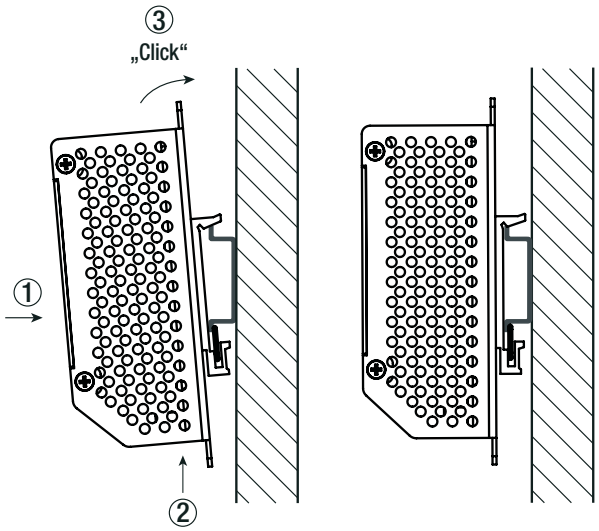
The RMD converter has to be installed with 4 x M4 screws and can be mounted in any mounting direction.

All control and signal terminals have been tested and have passed the requirements according to the EN50121-3-2 regulations, nevertheless for installation conditions with cable lengths above 30m, maybe additional protection against disturbances will be necessary.

Mounting Instructions "/DR"-Versions

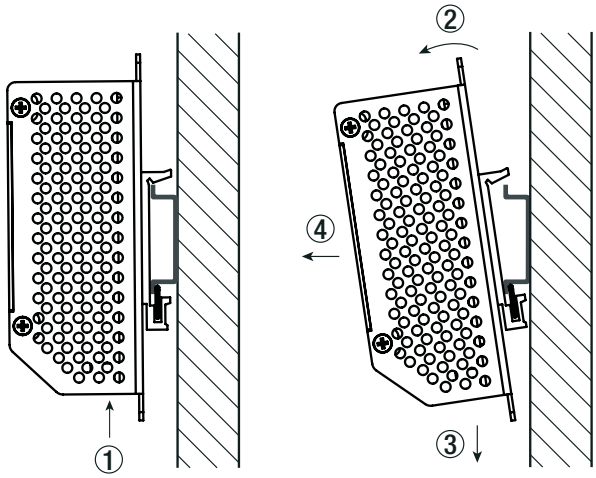
Mounting Rail: Standard TS35 DIN Rail in accordance with EN 60715.

Mounting



1. Tilt the device slightly forward.
2. Place the device on the rail and slide it upward until it reaches the stop.
3. Press the device toward the rail at the top until you hear a “click.” The device is now locked in place.
4. To ensure that it is secure, shake the device gently.

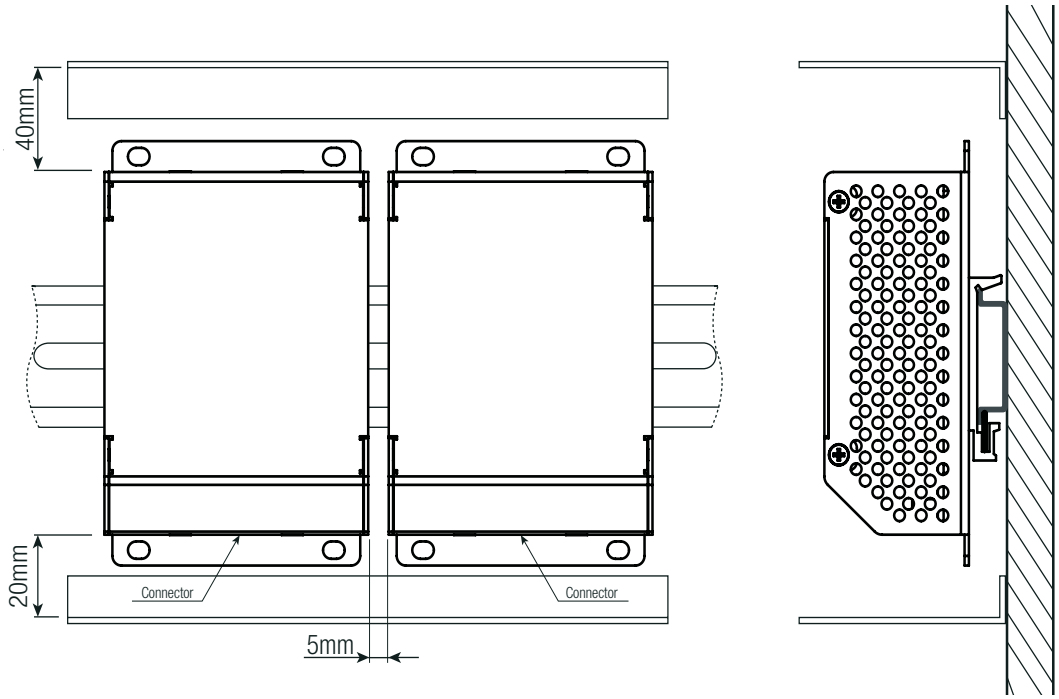
Release



1. Push the device upwards.
2. While pushing the device upwards, tilt the top of the device away from the DIN rail.
3. Pull the device downward from the DIN rail.
4. Remove the device completely from the DIN rail.

INSTALLATION & APPLICATION

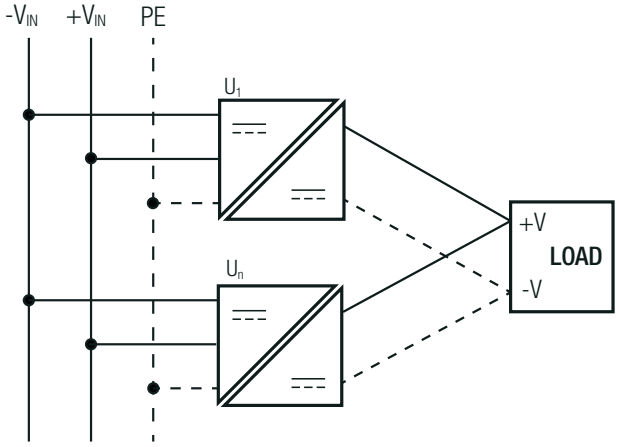
Installation Guidelines DR-Version



Note11: To guarantee sufficient convection cooling, keep a distance of 40mm above and 20mm below the device as well a gap of 5mm between 2 units.

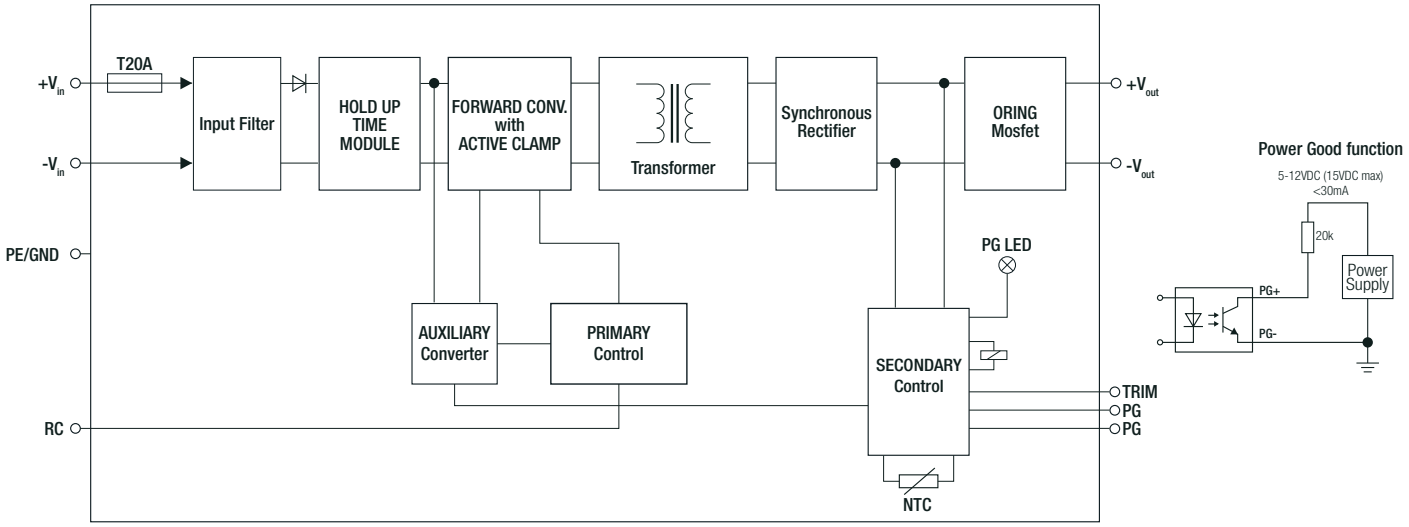
Parallel Operation

1) Adjust each unit to the exact same output voltage with same load and cooling conditions. (More than 3 units connected in parallel are not recommended)
2) Use the same wire length and cable cross-section for each unit (star connection) and energize all units at the same time to avoid triggering overload protection.
3) A 10% safety margin may be recommended because the power distribution may be slightly asymmetrical depending on the cabling.
4) **ATTENTION:**
   Leakage current, EMI, inrush current, harmonics will increase when using multiple power supplies.

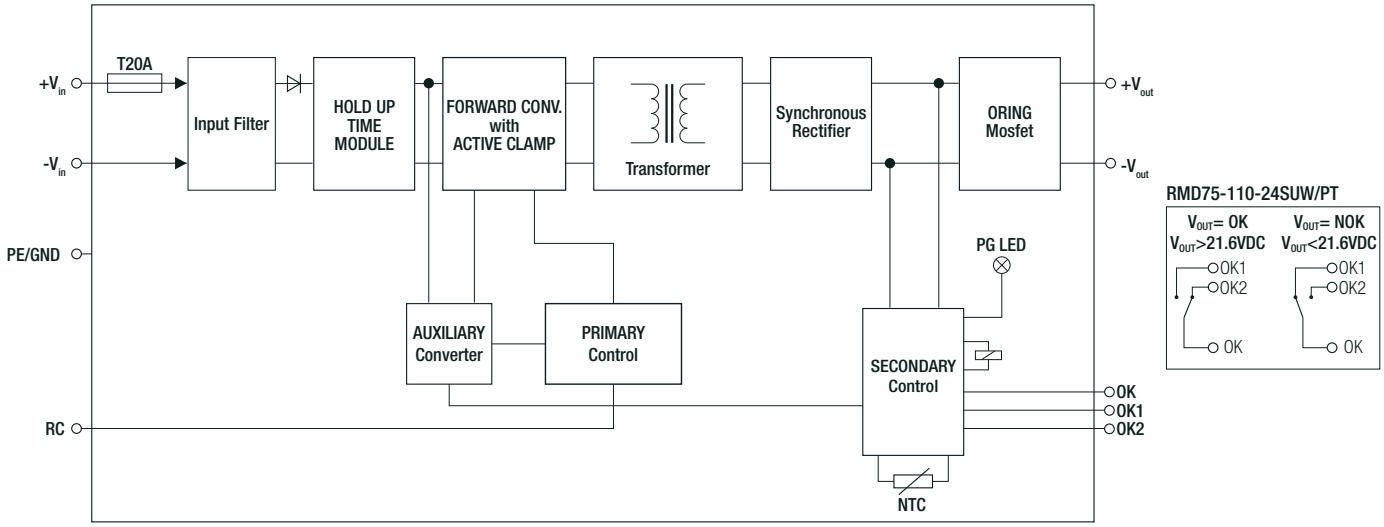


BLOCK DIAGRAM

Standard Version



/PT Version



PACKAGING INFORMATION

Parameter	Type	Value
Packaging Dimension (LxWxH)	cardboard box	340.0 x 255.0 x 110.0mm
Packaging Quantity		10pcs
Storage Temperature Range		-55°C to +85°C
Storage Humidity	non-condensing	85% RH max.