



Operating Guide **Cabinet**

Technical specifications

Type: Rittal TS8 42U

Dimensions (WxHxD): 600mm x 2150mm x 800mm

Version: no front door, no backdoor, on wheels

AC input: 3-phase terminal (L1+L2+L3+PE)

AC input voltage: 340...460V AC

Features:

- For up to 8 units of PS/PSI 81500-30 3U
- Analog interface wired between all each for parallel operation of all units as one 120kW block
- Isolation amplifiers installed for analog interface remote control (4 channel: VMON, CMON, VSEL, CSEL)
- 3-phase circuit breakers (one for each unit)
- 1x DC output on copper bars



Important notes

- *Do not change the internal wiring or replace wires with ones with less cross section!*
- *Series operation of the power supplies not allowed!*
- *The power grid connection has to be fused externally.*

Installation of the cabinet

In order to ensure sufficient airflow, it is required to leave at least 30cm space behind the cabinet.

The AC supply connection is done on the input terminal inside the cabinet, which is located in the lower part. A three-phase supply with PE (earth) is required. The AC input terminal can be accessed when removing the lower 12U dummy panel (see cabinet layout drawing below). For the assignment of the phases see the labelling on the input terminal.

Equipping the units

The cabinet is prepared for up to eight units of 3U power supplies (PSI 81500-30 3U or similar).



Danger!

Because of the DC output wiring being preconfigured for 30A per unit (6mm² cables), it is not allowed to equip models with higher output current.

In order to equip the devices, they're simply inserted or removed while sliding on top of the mounting rails. Before mounting the units finally, by tightening the mounting screws on the front, make sure the AC input and DC output connection has been made properly, as described below. After the units have been equipped, connected and mounted correctly, you can reconnect the analog interface connection (only if used) between the units and any other connection, for example to a PC.

AC input connection of the units

In case of first installation or adding additional units, the AC input should be wired first. When adding a unit, first disconnect the cabinet from the power grid. For safety reasons, it is not sufficient to just switch off the circuit breakers.

Details about AC input connection can be found in the power supply operating guide.

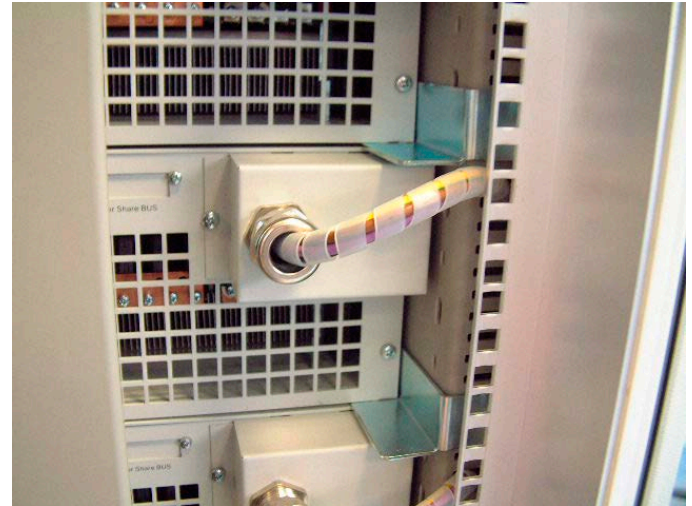


Figure 1: AC input connection of the single units

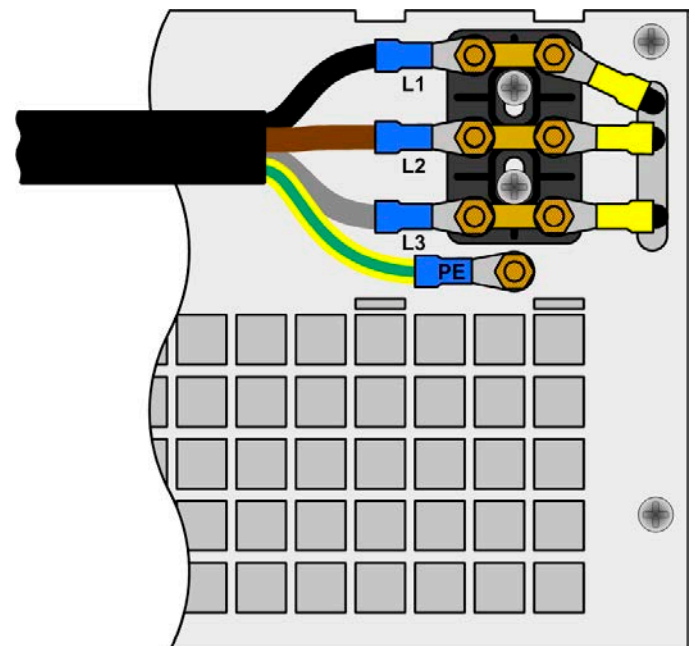


Figure 2: Unit AC input terminal

Grid connection

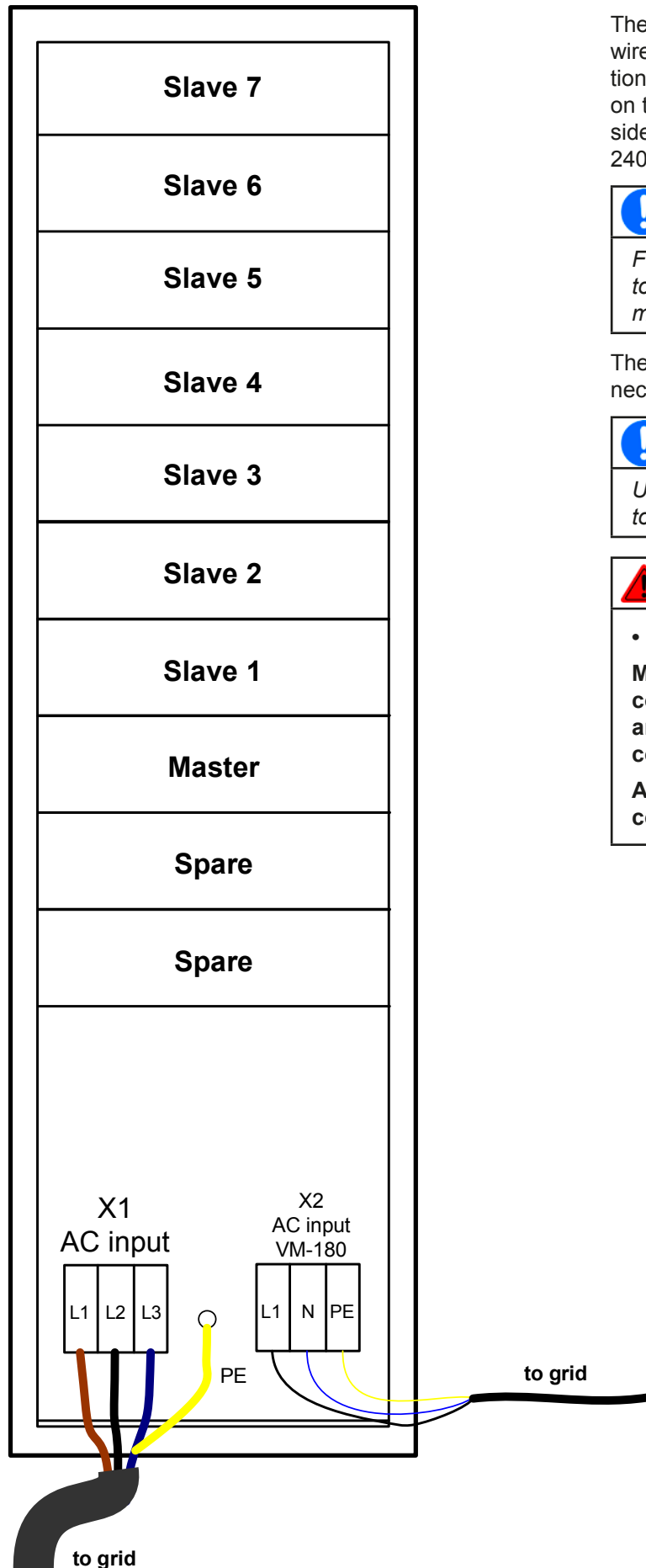


Figure 3

DC output

The DC outputs of the power supplies are already internally wired to copper bars (see scheme below). The DC connection to the outside is done on the DC connection terminal on the lower part of the cabinet, accessible from the rear side. The DC output can deliver up to 1500V and up to 240A, while providing max. 120kW total power.



Note

For the DC connection to any outside sink, make sure to use cables with proper cross section, according to max. current.

The DC load cables are directly screwed to the M8 connection terminals on the DC copper bars.



Note

Use 8mm ring lugs on the load cable ends to connect to the DC terminal.



Danger!

- Risk of electric shock

Make sure to switch off the devices or even disconnect them from AC supply before connecting any DC sink. Remove the plastic cover on the DC copper bars cautiously!

After the DC connection is done, mount the plastic cover again!

Analog interface wiring

All units can be connected with their analog interfaces and DC outputs in order to have them working in parallel. The analog interface connection creates a master-slave system where the user accesses the master unit for analog remote control and monitoring. The analog signals (VMOM, CMON, VSEL, CSEL, see device manual) are led out via isolation amplifiers to have a galvanic isolation. The digital signals Remote, DGND and Rem-SB are led out normally, but in case they're also used in remote control, they need to be galvanically isolated too, for example by using the dry contacts of relays.

Operation

Manual control

As long as the analog interfaces of the units are connected in master-slave operation, manual control of the cabinet can only be done on the master unit. All other unit's displays are lit, showing their actual voltage and current, but the control panels are locked, except LOCAL and PRESET buttons.

The master unit controls the slave by putting out the monitor signals VMON (voltage) and CMON (current). It means, the slaves will follow the master regarding voltage and current as soon as the master's DC output is switched on and starting to provide power.



Note

Any parameter other than output voltage, current and power on all units is not controlled by the master. It means, you have to set up all units (OVP etc.) separately before starting to use the cabinet as a system.

Remote control via analog interface

The cabinet is preconfigured to be used for analog remote control. All required signals have to be galvanically isolated. While this is already installed for the analog control and monitoring signals, the digital signals - as far as they are going to be used in remote control - have to be galvanically isolated, too.

Remote control via analog interface of the whole cabinet has following characteristics:

- The master unit is the one with the analog interface plug labeled „Master“. This is assigned to the lowermost units because of the connection to the isolation amplifiers.
- In case a unit fails due to overheating or defect, the remaining unit(s) in the parallel connection will continue to provide power, but the total power will be less.
- Like when remotely controlling a single unit, the analog remote control on the master can only be used if there is no other type of remote control active, i.e. digitally

Remote control via digital interface

Digital remote control or at least remote monitoring is possible for either the master only or some or all units. However, it is recommended only to equip the master unit with a digital interface of your choice. In this case, the slave units are controlled via their analog interfaces, like before. The difference is, that the master is not control on its analog interface, leaving control signals like Remote and Rem-SB unused.

Remote control via digital interface of the whole cabinet has following characteristics:

- The master unit is the one with the digital interface plugged.
- There will be no totals formation on any actual value. It means, the master returns its own actual values of current and power, which then have to be multiplied in the PC software by the number of active units in the cabinet
- In case a unit fails due to overheating or defect, the remaining unit(s) in the parallel connection will continue to provide power, but the total power will be less.
- Like when remotely controlling a single unit, the digital remote control on the master can only be used if there is no other type of remote control active, i.e. via analog interface

Views

Front View

3U

Slave 7
PS 81500-30

3U

Slave 6
PS 81500-30

3U

Slave 5
PS 81500-30

3U

Slave 4
PS 81500-30

3U

Slave 3
PS 81500-30

3U

Slave 2
PS 81500-30

3U

Slave 1
PS 81500-30

3U

Master
PS 81500-30

3U

Spare

3U

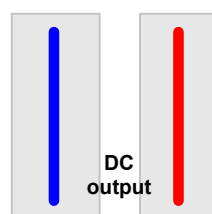
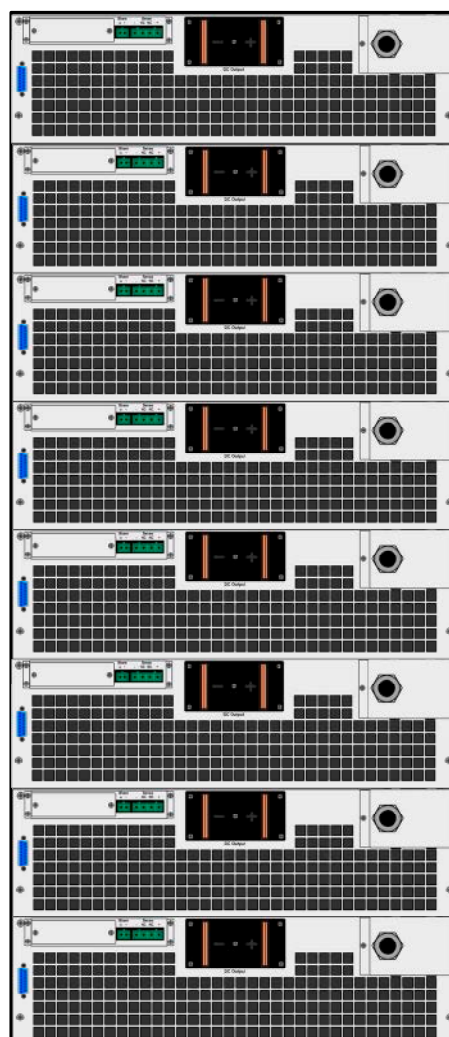
Spare

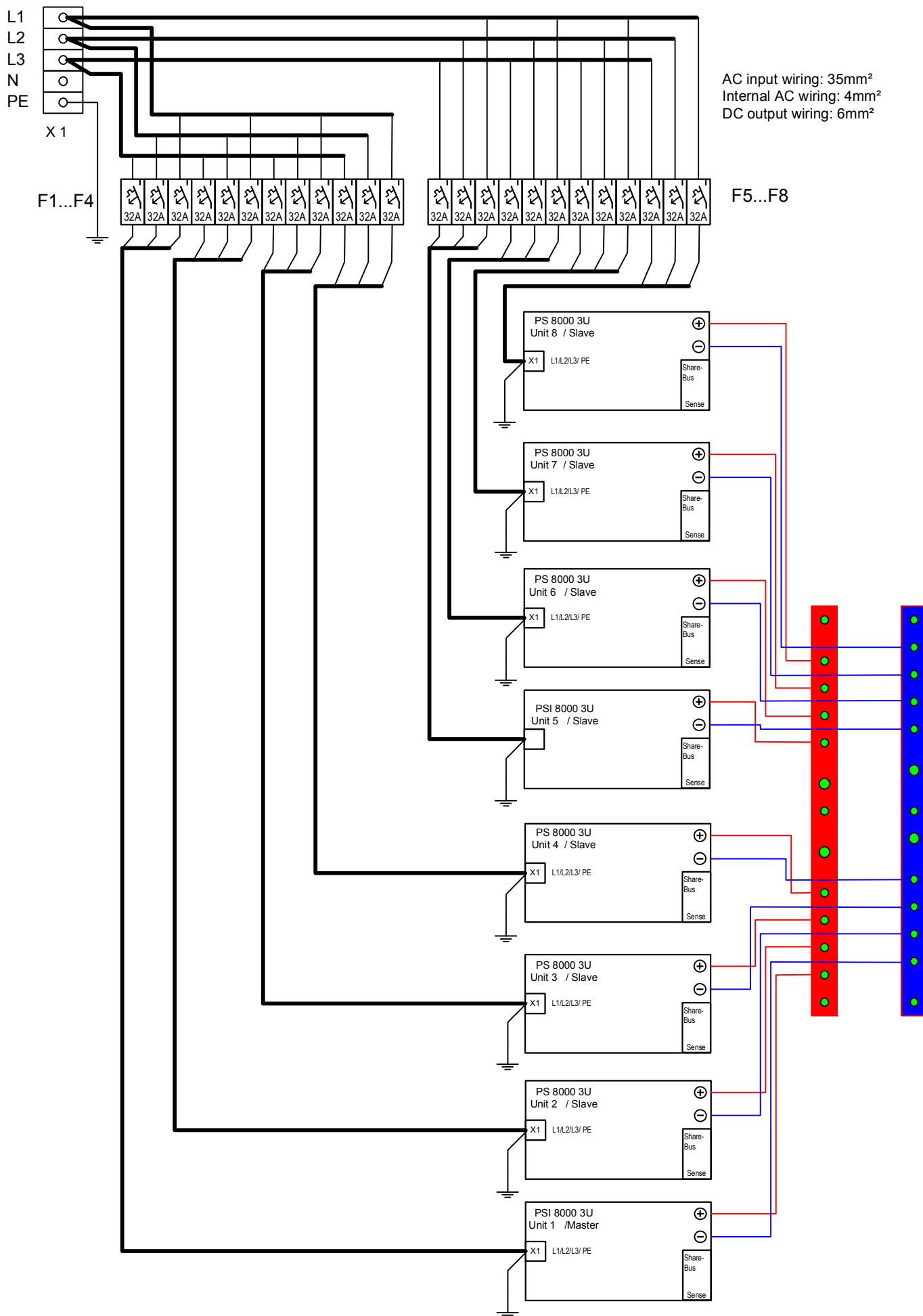
Circuit breakers
(behind front plate)

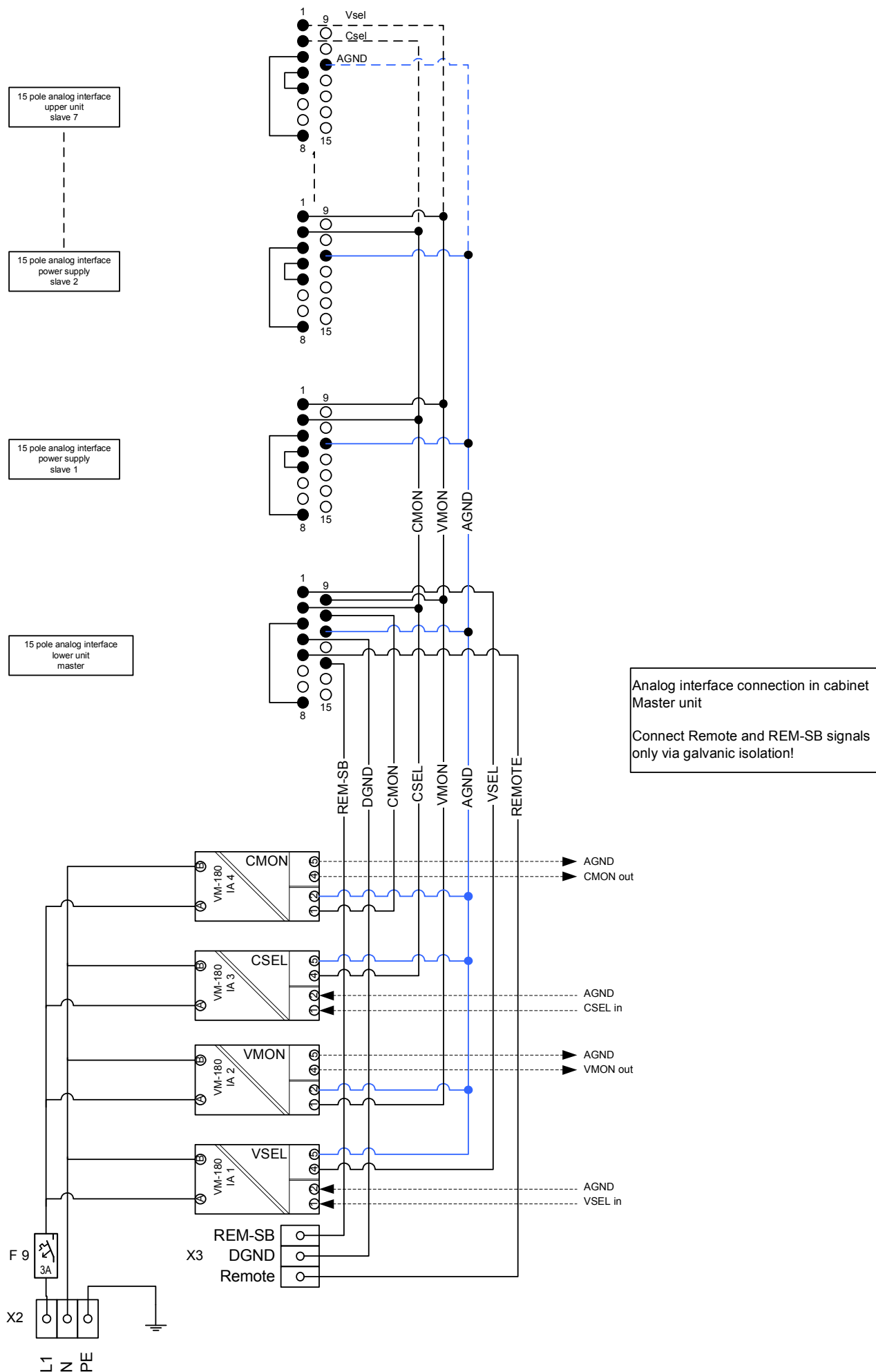
F1...F4
F5...F8
F9

6U

Rear View







Potential-Trennverstärker (mit Weitspannungsnetzteil)

Die Trennverstärkerreihe VM180-VM188 arbeiten nach dem Prinzip der optoelektronischen Potentialtrennung. Sie zeichnet sich durch ihre hohe Qualität und ein überlegendes Preis-/ Leistungsverhältnis aus.

Die Geräte besitzen ein Weitspannungsnetzteil was den Anschluss an alle üblichen AC und DC Versorgungsspannungen ermöglicht. Sie arbeiten unipolar und weisen eine Dreiwege-Trennung der Potentiale zwischen Eingang, Ausgang und Versorgung auf.

Elf Gerätetypen ermöglichen die galvanisch getrennte Übertragung bzw. Umsetzung von Normsignalen.

Typenübersicht:

Typ Type	Eingang Input	Ausgang Output	Hilfsenergie Auxiliary energy
VM 180	0 ... 10 V	0 ... 10 V	19 ... 255 Vac/dc
VM 181	0 ... 20 mA	0 ... 10 V	19 ... 255 Vac/dc
VM 182	4 ... 20 mA	0 ... 10 V	19 ... 255 Vac/dc
VM 183	0 ... 10 V	0 ... 20 mA	19 ... 255 Vac/dc
VM 184	0 ... 10 V	4 ... 20 mA	19 ... 255 Vac/dc
VM 185*	0 ... 20 mA	0 ... 20 mA	19 ... 255 Vac/dc
VM 186	0 ... 20 mA	4 ... 20 mA	19 ... 255 Vac/dc
VM 187	4 ... 20 mA	0 ... 20 mA	19 ... 255 Vac/dc
VM 188/1	0 ... 60 mV	0 ... 10 V	19 ... 255 Vac/dc
VM 188/2	0 ... 60 mV	0 ... 20 mA	19 ... 255 Vac/dc
VM 188/3	0 ... 60 mV	4 ... 20 mA	19 ... 255 Vac/dc

*Der Gerätetyp VM185 eignet sich auch zur Übertragung von 4...20mA nach 4...20mA !

Die Geräte sind montagefreundlich auf Tragschienen TS35 aufzurasten.

Potential Separation Amplifiers (with wide-range power supplies)

The separation amplifier series VM180-VM188 operates according to the principle of optoelectronic potential separation. It is distinguished by its high quality and an excellent price/performance ratio.

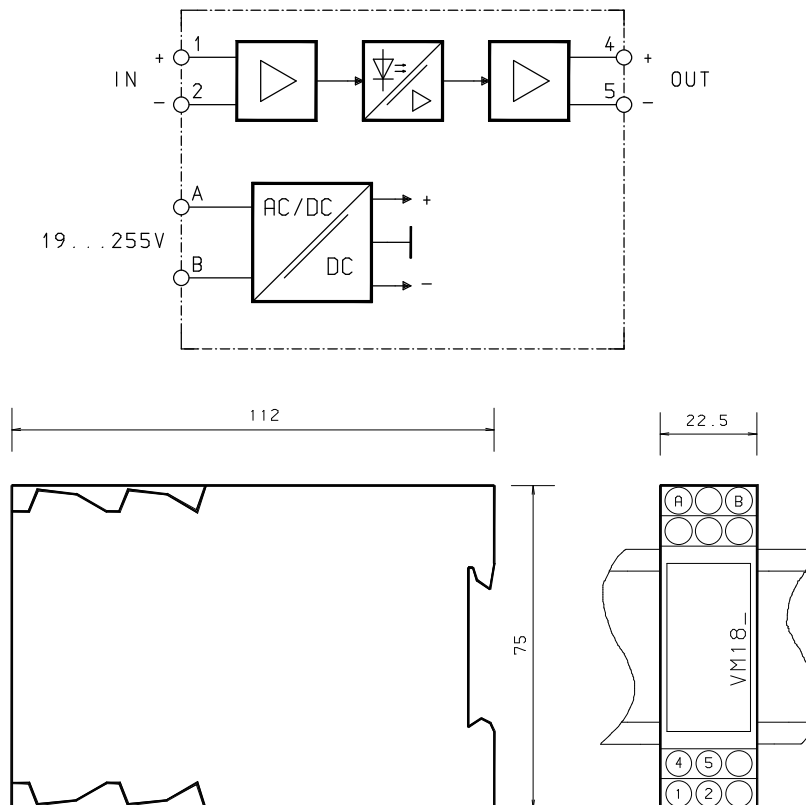
The devices have a wide-range power supply, that allows a connection at all usual ac and dc supply voltages. They work unipolarly and have three-way separation of the potentials between input, output, and supply.

Eleven types of devices allow electrical insulation transmission respectively conversion of standard signals.

Type summary:

*The type VM185 is also suitable for transmission of 4...20mA to 4...20mA !

The devices can be easily snap-mounted onto mounting rails TS35.



Technische Daten VM 180 - VM 188

Versorgungsspannung	DC	: 19...255 Vdc
Versorgungsspannung	AC	: 30...255 V / 48...62 Hz
Leistungsaufnahme	AC/DC	: 1,5 VA / 1,5 W
Spannungseingang (10V)		: 0...10 V / $R_{IN} = 100\text{ k}\Omega$
Spannungseingang (60mV)		: 0...60 mV / $R_{IN} = 20\text{ k}\Omega$
Überlastbarkeit (U-Eingang)		: max. 50 V
Stromeingang / Bürde		: 0(4)...20 mA / $100\text{ }\Omega$
Überlastbarkeit (Stromeingang)		: max. 50 mA
Spannungsausgang / Last		: 0...10 V / max. 5 mA
Stromausgang / Bürde		: 0(4)...20 mA / max. $500\text{ }\Omega$
Trennungsspannung		: 2,5 kV
Übertragungsfrequenz		: 25 Hz / 5kHz*
Linearitätsfehler		: 0,1%
Bürdenfehler		: max. 0,02%
Temperaturdrift		: 50 ppm/K
Umgebungstemperatur		: 0...50°C
Anschlüsse		: Schraubklemmen 2,5 mm ²
Gehäusematerial		: Isolierstoff grau
Gehäusebefestigung		: Schnappbefestigung für TS35
Gehäusemaße		: siehe Zeichnung
Gewicht		: 110 g

* Option

Technical Data VM 180 - VM 188

Supply voltage	DC	: 19...255 Vdc
Supply voltage	AC	: 30...255 V / 48...62 Hz
Power consumption	AC/DC	: 1.5 VA / 1.5 W
Voltage input (10 V)		: 0...10 V / $R_{IN} = 100\text{ k}\Omega$
Voltage input (60 mV)		: 0...60 mV / $R_{IN} = 20\text{ k}\Omega$
Overload capacity (Voltage inputs)		: max. 50 V
Current input / Burden		: 0(4)...20 mA / $100\text{ }\Omega$
Overload capacity (Current inputs)		: max. 50 mA
Voltage output / Load		: 0...10 V / max. 5 mA
Current output / Burden		: 0(4)...20 mA / max. $500\text{ }\Omega$
Isolation voltage		: 2.5 kV
Transmission frequency		: 25 Hz / 5 kHz*
Linearity error		: 0.1%
Burden error		: max. 0.02%
Temperature drift		: 50 ppm/K
Ambient temperature		: 0...50°C
Connections		: Screw-type terminals 2.5 mm ²
Housing material		: Insulating material grey
Fastening of housing		: Snap-on for TS35
Dimensions of housing		: cf. drawing
Weight		: 110 g

* option



Elektro-Automatik

EA-Elektro-Automatik GmbH & Co. KG

Development - Production - Sales

Helmholtzstraße 31-33

41747 Viersen

Germany

Telefon: +49 2162 / 37 85-0

Telefax: +49 2162 / 16 230

ea1974@elektroautomatik.de

www.elektroautomatik.cn