

# User manual POWER SUPPLY TRS-09a

- Designed for TRS system



Read the user's manual carefully before starting to use the unit or software.  
Producer reserves the right to implement changes without prior notice.

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### **Explanation of symbols used in the manual:**



- This symbol denotes especially important guidelines concerning the installation and operation of the device. Not complying with the guidelines denoted by this symbol may cause an accident, damage or equipment destruction.

**IF THE DEVICE IS NOT USED ACCORDING TO THE MANUAL THE USER IS RESPONSIBLE FOR POSSIBLE DAMAGES.**



- This symbol denotes especially important characteristics of the unit. Read any information regarding this symbol carefully

## **1. BASIC REQUIREMENTS AND USER SAFETY**



- **The manufacturer is not responsible for any damages caused by inappropriate installation, not maintaining the proper technical condition and using the unit against its destination .**
- Installation should be conducted by qualified personnel . During installation all available safety requirements should be considered. The fitter is responsible for executing the installation according to this manual, local safety and EMC regulations.
- The unit must be properly set-up, according to the application. Incorrect configuration can cause defective operation, which can lead to unit damage or an accident.
- **If in the case of a defect of unit operation there is a risk of a serious threat to the safety of people or property additional, independent systems and solutions to prevent such a threat must be used.**
- **The unit uses dangerous voltage that can cause a lethal accident. The unit must be switched off and disconnected from the power supply prior to starting installation of troubleshooting (in the case of malfunction).**
- Neighbouring and mating equipment must meet the requirements of appropriate standards and regulations concerning safety and be equipped with adequate anti-overvoltage and anti-interference filters.
- **Do not attempt to disassemble, repair or modify the unit yourself. The unit has no user serviceable parts. Units, in which a defect was stated must be disconnected and submitted for repairs at an authorized service centre.**



- Do not use the unit in areas threatened with excessive shocks, vibrations, corrosive gasses and oils.
- Do not use the unit in explosion hazard areas.
- Do not use the unit in areas with significant temperature variations, exposed to icing.
- Do not use the unit in areas exposed to direct sunlight.
- Make sure that the ambient temperature (e.g. inside the control box) does not exceed the recommended values. In such cases forced cooling of the unit must be considered (e.g. by using a ventilator).



**The unit is designed for operation in an industrial environment and must not be used in a household environment or similar.**

## **2. GENERAL CHARACTERISTICS**

**TRS-09a** is a supporting power supply for the TRS System which supplies stabilized direct voltage 11.5V. It can work in two modes: as a controlled supply (switched on with external voltage  $7 \div 12V$ ) or a non-controlled supply. The configuration is selected by means of a link. Current efficiency is 200 mA. The supply is resistant to output voltage short circuit. The device is located in a casing that completely protects it against dust or low pressure streams of water.

## **3. TECHNICAL DATA**

Power supply voltage	230V AC +10%, -5%, 50 ÷ 60 Hz
External fuse (required)	T - type, max. 2 A
Power consumption	max. 6 VA
Output voltage	11.5 V ±5% DC
Current efficiency	max. 200 mA
Control voltage	7V ÷ 12V DC, max. 2mA
Protection level	IP 65 (ABS casing)
Housing type	wall mounted
Housing material	ABS
Housing dimensions (L x W x D)	
without glands	110 x 80 x 67 mm
with glands	133 x 130 x 67 mm
Operating temperature (depending on version)	0°C to +50°C or -20°C to +50°C
Storage temperature (depending on version)	-10°C to +70°C or -20°C to +70°C
Altitude	up to 2000 meters above sea level
Fastening	to wall, 2 M3 bolts
Connection cable	4 conductors (2 supply conductors + 2 data transmission conductors)
Screws tightening max. torque	0,5 Nm
Max. connection leads diameter	2,5 mm <sup>2</sup>
Safety requirements	according to: PN-EN 61010-1:1999 + PN-EN 61010-1/A2:1999 installation category: II pollution degree: 2 voltage in relation to ground: 300V AC  insulation resistance: >20MΩ insulation strength between power supply and input/output terminal: 1min. @ 2300V
EMC	PN-EN 61326:2003



This is a class A unit. In housing or a similar area it can cause radio frequency interference. In such cases the user can be requested to use appropriate preventive measures.



Detailed informations about installation of TRS system user can find in: "User manual for Temperature and Humidity Recording System".

## **4. DEVICE INSTALLATION**

The unit has been designed and manufactured in a way assuring a high level of user safety and resistance to interference occurring in a typical industrial environment. In order to take full advantage of these characteristics installation of the unit must be conducted correctly and according to the local regulations.



- Read the basic safety requirements on page 3 prior to starting the installation.
- Ensure that the power supply network voltage corresponds to the nominal voltage stated on the unit's identification label.
- The load must correspond to the requirements listed in the technical data.
- All installation works must be conducted with a disconnected power supply.
- Protecting the power supply clamps against unauthorized persons must be taken into consideration.

### **4.1. UNPACKING**

After removing the unit from the protective packaging, check for transportation damage. Any transportation damage must be immediately reported to the carrier. Also, write down the unit serial number on the housing and report the damage to the manufacturer.

Attached with the unit please find:

- warranty,
- user's manual for **TRS-09a** unit (device)

### **4.2. ASSEMBLY**



- Disconnect the power supply prior to starting assembly.
- Check the correctness of the performed connections prior to switching the unit on.



To install the device prepare pinholes accordingly to Figure 4.1. Back side of the case (with mounting holes) should be mounted to a wall using screws.

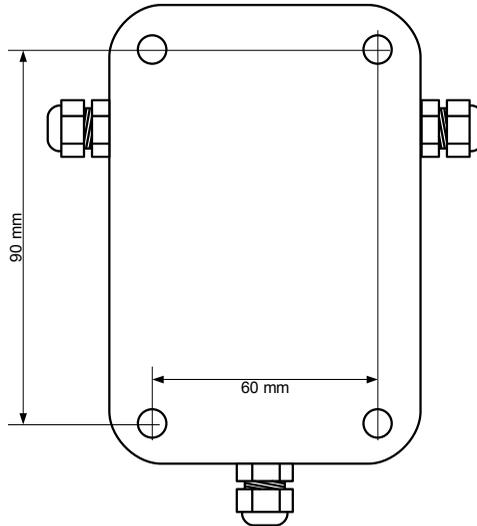


Figure 4.1. Distances between pinholes

### **4.3. CONNECTION METHOD**

#### **Caution**



- Installation should be conducted by qualified personnel . During installation all available safety requirements should be considered. The fitter is responsible for executing the installation according to this manual, local safety and EMC regulations.
- The unit is not equipped with an internal fuse or power supply circuit breaker. Because of this an external time-delay cut-out fuse with minimal possible nominal current value must be used (recommended bipolar, max. 2A) and a power supply circuit-breaker located near the unit. In the case of using a monopolar fuse it must be mounted on the phase cable (L).
- The power supply network cable diameter must be selected in such a way that in the case of a short circuit of the cable from the side of the unit the cable shall be protected against destruction with an electrical installation fuse.
- Wiring must meet appropriate standards and local regulations and laws.
- In order to secure against accidental short circuit the connection cables must be terminated with appropriate insulated cable tips.
- Tighten the clamping screws. The recommended tightening torque is 0.5 Nm. Loose screws can cause fire or defective operation. Over tightening can lead to damaging the connections inside the units and breaking the thread.

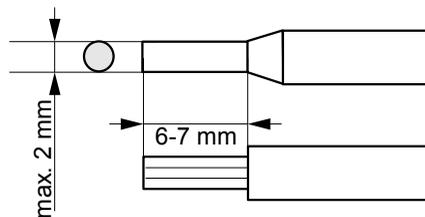


- In the case of the unit being fitted with separable clamps they should be inserted into appropriate connectors in the unit, even if they are not used for any connections.
- Unused clamps (marked as n.c.) must not be used for connecting any connecting cables (e.g. as bridges), because this can cause damage to the equipment or electric shock.
- If the unit is equipped with housing, covers and sealing packing, protecting against water intrusion, pay special attention to their correct tightening or clamping. In the case of any doubt consider using additional preventive measures (covers, roofing, seals, etc.). Carelessly executed assembly can increase the risk of electric shock.
- After the installation is completed do not touch the unit's connections when it is switched on, because it carries the risk of electrical shock.

**Due to possible significant interference in industrial installations appropriate measures assuring correct operation of the unit must be applied. To avoid the unit of improper indications keep recommendations listed below.**

- Avoid common (parallel) leading of signal cables and transmission cables together with power supply cables and cables controlling induction loads (e.g. contactors). Such cables should cross at a right angle.
- Contactor coils and induction loads should be equipped with anti-interference protection systems, e.g. RC-type.
- Use of screened signal cables is recommended. Signal cable screens should be connected to the earthing only at one of the ends of the screened cable.
- In the case of magnetically induced interference the use of twisted couples of signal cables (so-called "spirals") is recommended. The spiral (best if shielded) must be used with RS-485 serial transmission connections.
- In the case of interference from the power supply side the use of appropriate anti-interference filters is recommended. Bear in mind that the connection between the filter and the unit should be as short as possible and the metal housing of the filter must be connected to the earthing with largest possible surface. The cables connected to the filter output must not run in parallel with cables with interference (e.g. circuits controlling relays or contactors).

Connections of power supply voltage and measurement signals are executed using the screw connections inside of the unit's housing (Figure 4.2 - 4.4).



*Figure 4.2. Method of cable insulation replacing and cable terminals*

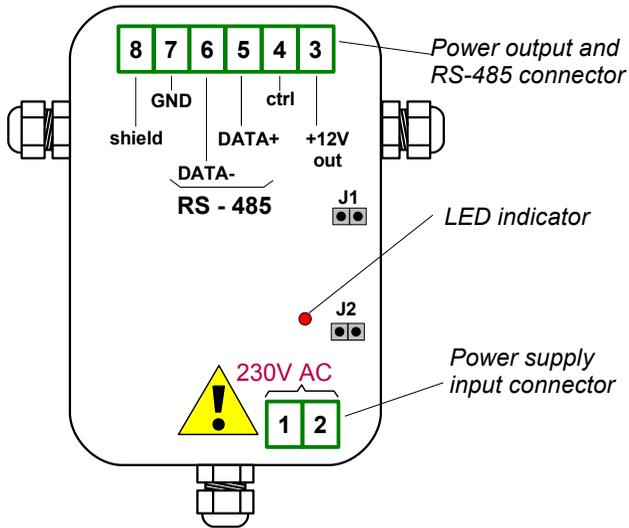


Figure 4.3. Location of elements inside the module case

### Connectors description

- { +12V out} - network supply voltage output (+)
- { ctrl } - control voltage input
- { DATA } - RS 485 lines connectors
- { GND } - GND of supply output and control input.

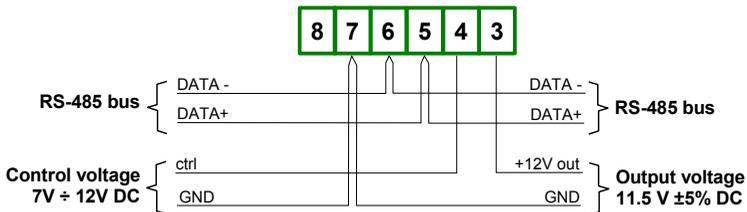


Figure 4.4. Connection of TRS-09a module to the network

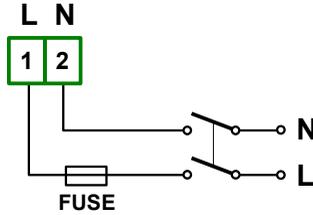


Figure 4.5. Connection of power supply

Serial connection of power supply modules TRS-09a (while power output of one module drives control input of the next one, Figure 4.6), allows turn off all modules connected to the network at the same time. When power supply of first TRS-09a module is turned off, then following power supply modules will be turned off sequentially.

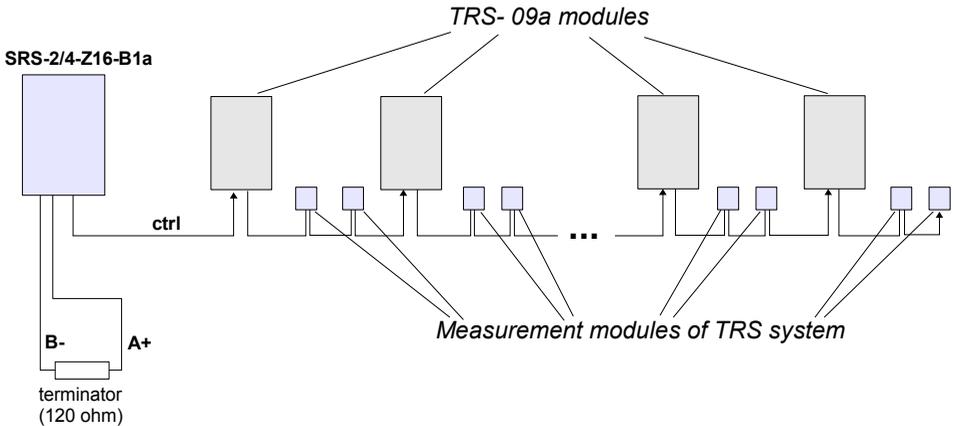


Figure 4.6. Cascade of power supply modules TRS-09a.



**RS-485 bus should be equipped with termination resistors (100-150 ohm) on both ends. The bus must not be ramified, and longer than 1 km.**

## **4.4. MAINTENANCE**

The unit does not have any internal replaceable or adjustable components available to the user. Pay attention to the ambient temperature in the room where the unit is operating. Excessively high temperatures cause faster ageing of the internal components and shorten the fault-free time of unit operation.

In cases where the unit gets dirty do not clean with solvents. For cleaning use warm water with small amount of detergent or in the case of more significant contamination ethyl or isopropyl alcohol.



Using any other agents can cause permanent damage to the housing.



Product marked with this symbol should not be placed in municipal waste. Please check local regulations for disposal and electronic products.

## **5. SELECTION OF OPERATION MODE**

The selection of operation mode can be done by proper jumper settings (see Figure 5.1):

- **externally controlled mode**: {J1} open , {J2} open or short

This configuration allows to remote control of the module using it's control input (voltage 7÷12V connected to { **ctrl** } terminal). If control input is not connected, or it's voltage is too low, module output voltage is turned off - voltage between terminals { **+12V out** } and { **GND** } will drop to 0V.

- **Stand alone mode**: {J1} short, {J2} open

This configuration allows stand alone mode of module operation. Module is independent of external signal { **ctrl** }. Power supply module is permanently turned on - voltage between terminals { **+12V out** } and { **GND** } is about 11.5 V.

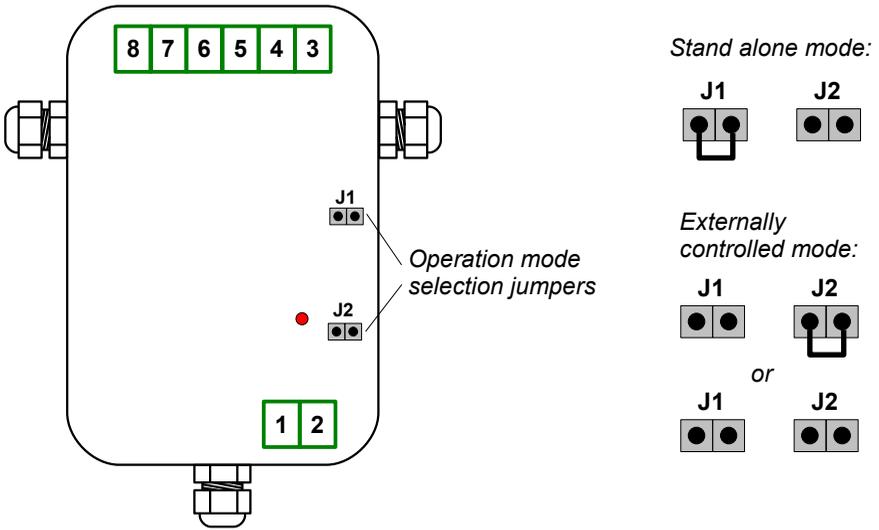
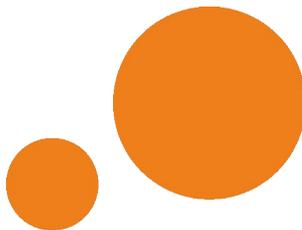


Figure 5.1. Selection of operation mode



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