

Installation and Operating Manual



**Extension Module for
Additional Inputs and Outputs**

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1 Security instructions and restriction of liability

1.1 Sign for security instructions



Security instructions for personal safety are marked with this sign and are printed in bold letters.

Instructions that refer to the functioning safety of the system are also printed in bold letters.

1.2 General safety instructions



For your own safety please note the following for installation:

Please see that fire safety cable systems and similar things are not impaired!

The extension module may not be installed and operated in rooms where highly flammable mixtures may be present, such as gas bottles, paint, lacquer, solvents etc.!

Do not store any of the mentioned mixtures in rooms in which the extension module is installed!

The extension module must not be installed on a conductive base!

Use well-isolated tools only!

Do not use technical equipment that is defective or broken!

The construction safety measures can deteriorate if the extension module is used in a way other than the one determined by the manufacturer.

The preset signs and marks must not be changed, removed or made illegible.

All operations must be conducted in accordance with the national electricity regulations and local rules!

For installation in foreign countries please see your corresponding institutions for information on regulations and safety measures.

Keep children away from electronics!



Observe the following when performing any electrical work on the extension module:

The extension module has been designed for providing pumps and valves with an alternating voltage of 110V - 230V ($\pm 15\%$) with a frequency of 50/60Hz. Using this regulator for other voltage values is not allowed. Please also note that the admissible nominal currents must not be exceeded.

If there is a grounded conductor planed or laid down for pump or reversing valve it **MUST** also be connected. There are corresponding supply terminals. Please make sure that the earthing contact is led to the extension module's also on the power supply side.

The extension module is only for the prescribed applications. No liability is taken over for other utilization.

All operations on an open module are only to be conducted cleared from the power supply. All safety regulations for working on the power supply are valid. Connecting and/or all operations that require opening the extension module (e.g. changing the fuse) are only to be conducted by specialists.

The extension module is protected against overload and short circuit.

1.3 *Regarding these instructions*

This manual describes the installation and commissioning of an extension module for additional inputs and outputs. The corresponding manufacturer's installation manual must be observed when installing the remaining components, e.g. the pump group.

Before beginning work, carefully read the "Installation" section of the extension module in chapter 2 and ensure all preliminary measures have been met before installing. Only begin with the installation when you have understood this instruction and proceed in sequence!

These instructions must be handed out to all persons that work with this system.

This manual is a component of the extension module and must be included with the extension module when sold to a third party.

1.4 *Restriction of liability*

The manufacturer can monitor neither the compliance to this manual nor the methods used during the installation, operation, usage and maintenance of the extension module.

Improper installation can cause damages to material and persons.

This is the reason why we do not take over responsibility and liability for losses, damages or cost that might arise due to improper installation, operation or wrong utilization and maintenance or that occur in some connection with the afore-mentioned.

Moreover we do not take over liability for patent infringements or infringements - occurring in connection with the use of this extension module - on third parties' rights.

The manufacturer preserves the right to put changes to product, technical data or installation and operation instructions without prior notice.

NOTE: Opening the device – connecting case excluded – as well as other use than determined by the manufacturer leads to a loss of warranty.

2 Installation

2.1 *Installation Site*

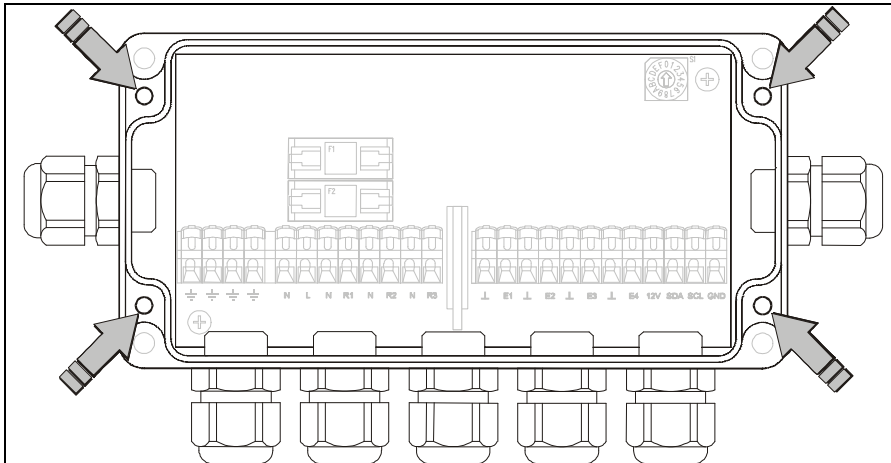
The extension module is designed for vertical wall installation. The extension module may not be installed or operated in rooms where highly flammable liquids or gases are located or highly flammable mixtures may be liberated, such as through gas bottles, paint, lacquer, solvents etc. Installing the extension module is only permitted in areas where the module is adequately protected (see technical specifications). The temperature at the installation site may never fall below or exceed the maximal permitted ambient temperature.

2.2 Installation

Wall installation

Four mounting holes are provided in the housing for mounting (see section 1). Once the housing cover is removed, the module can be used as a template for marking the mounting holes.

(Attention: Only use the extension module as a marking template; never use it as a drilling template).

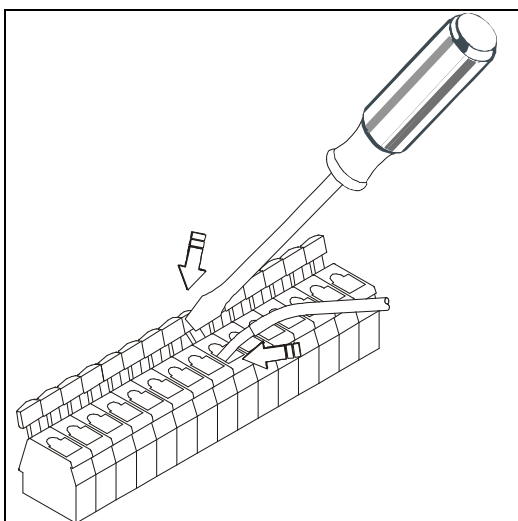


Section 1: Installation diagram

2.3 Connecting the extension module



The connecting work described here is only possible when the cover of the extension modules is open. Before doing so, disconnect the mains supply! Comply with all valid regulations for working on mains! The mains may only be switched on when the housing is closed. The installer must also ensure that the extension module's IP protection is not damaged during installation.



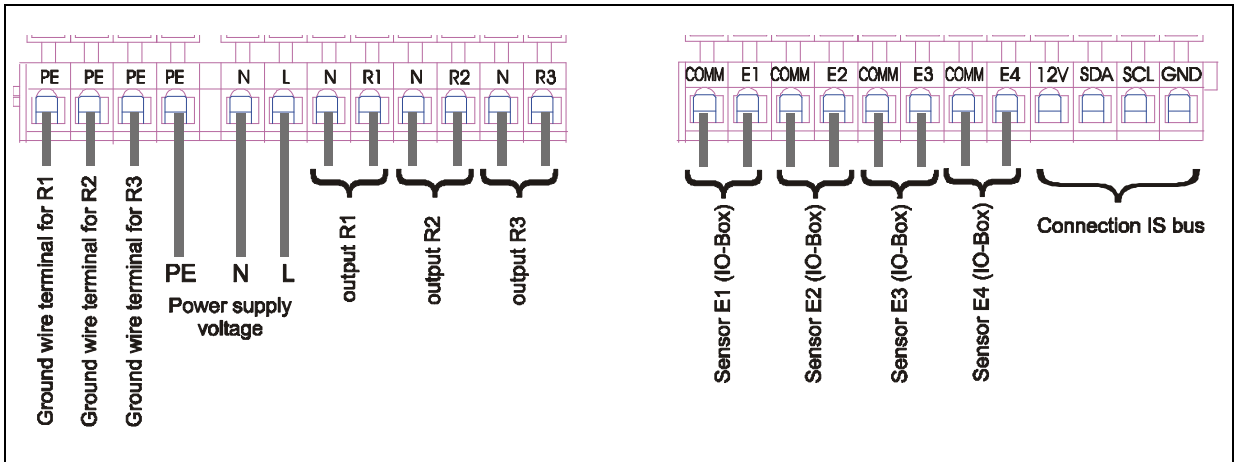
Section 2: Actuating the terminal clamps

The connection of individual pumps, valves and sensors depends on the function programming of the superordinated regulator.

If an earth connection is provided or prescribed for pumps or switch valves, it must be connected. The corresponding connecting terminal clamps are provided. Ensure that the earthing contact is also connected to the extension module's mains supply side.

Each terminal may only be allocated one connecting wire (up to 2.5mm²).

Wire end sleeves must be used for finely stranded wires.

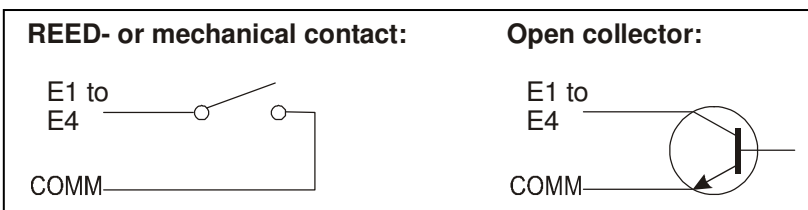


Section 3: Terminal diagram

Temperature sensor:

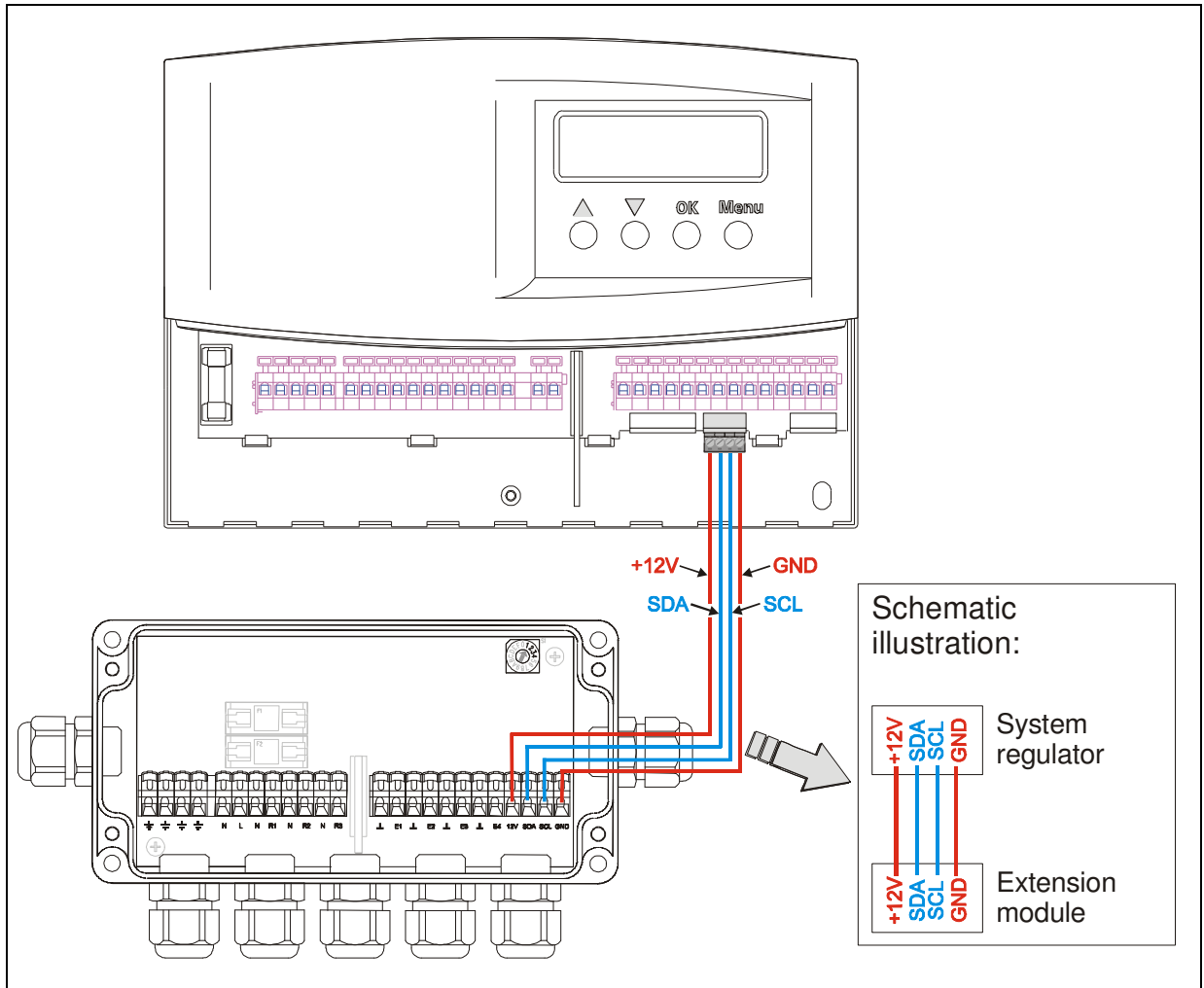
Attention: Only original sensors authorized for the extension module may be used. These sensors are type PT1000. These types of temperature sensors are precision platinum temperature sensors and are equipped with a 1.5m long weather and temperature resistant silicon cable. The temperature sensor and silicon cable are temperature resistant up to +180°C. The polarity of the sensor contacts is irrelevant. All sensor leads are low voltage and must be installed separately from the wires carrying 230V or 430V to prevent any inductive interference (minimum distance 100mm). If external inductive interference is to be expected, e.g. by heavy current cables, contact wires, transformer stations, radios and television sets, amateur radio stations, microwave devices or similar devices, the conducting cables carrying the measuring signal must be shielded. The sensor cable can be extended to a length around 100m. To do this, use a cross section of the extension cable from 1.5mm² to 100m and 0.75mm² to 50m.

Impulse generator:



If an impulse generator is used with a reed switch, the connection's polarity is irrelevant. Ensure the correct polarity when using an open collector circuit.

Section 4: Connecting a volume flow meter

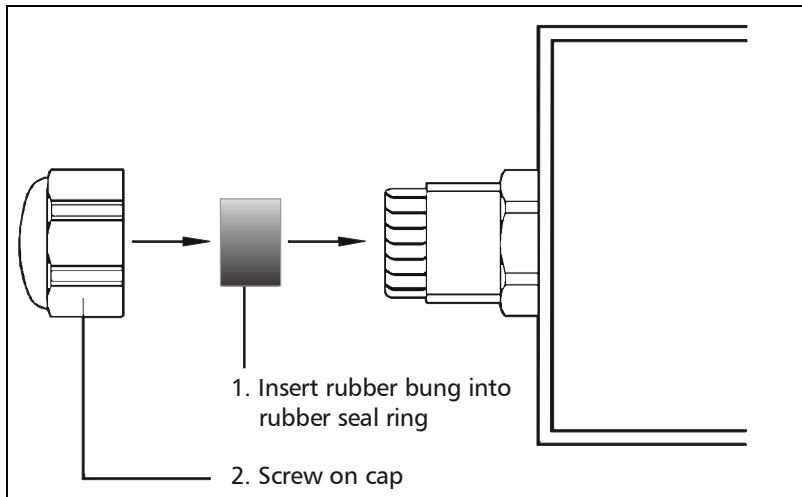


Section 5: Connecting the IS bus

2.4 IP protection during installation

The extension module was designed for protection class IP 65. Observe the following points during installation to comply with this protection class.

- use only round connection wires with a cladding diameter of 4.5 – 10mm
- attach the rubber bungs provided in place of the wire for connection screws not in use.

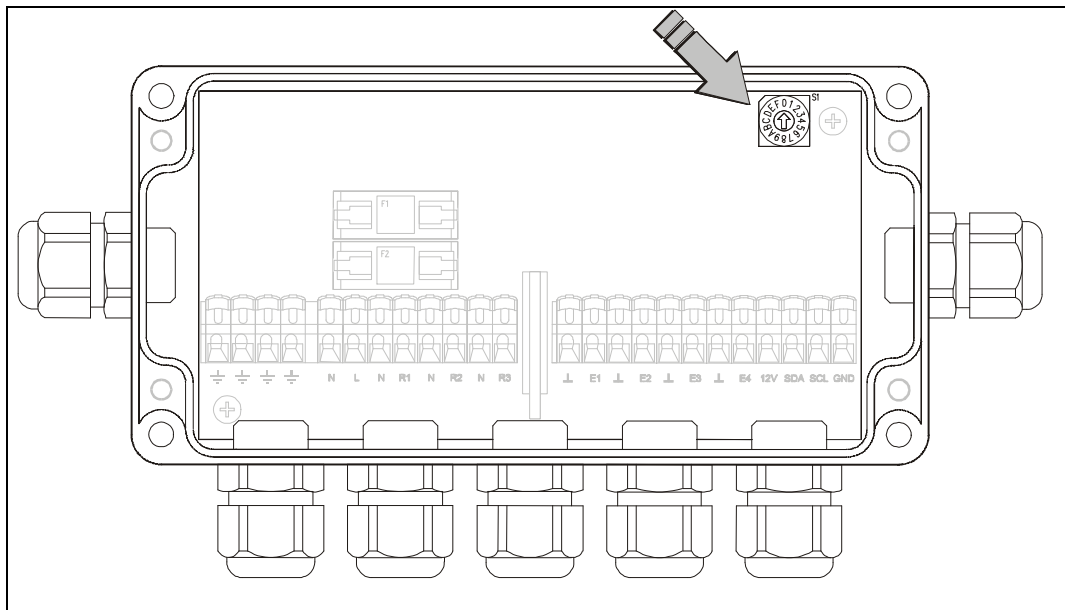


Section 6: Inserting a rubber bung

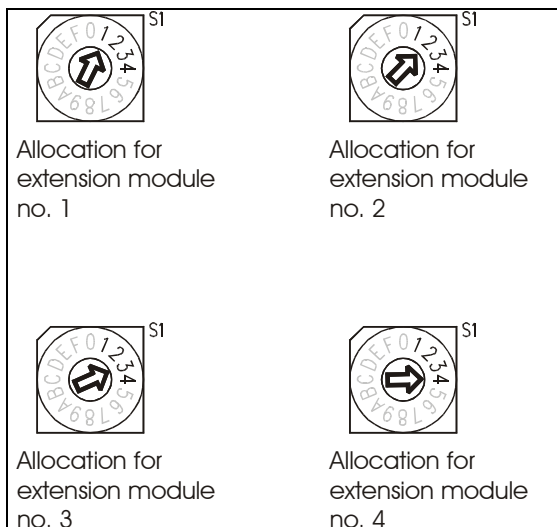
3 Commissioning



Since the extension module can also only be commissioned when the cover is open, the mains must also be switched off! Comply with all valid regulations for working on mains! The mains may only be switched on after commissioning the extension module when the housing is closed.



Section 7: Selector switch for unique allocation



Section 8: Selector switch settings

Since up to four extension modules can be connected to a system regulator, a unique allocation of the individual modules is necessary. This allocation is performed using a selector switch (see section 7 and 8).

Depending on the extension module (IO Box 1, IO Box 2, IO Box 3 or IO Box 4), the selector switch must be set accordingly using a small screw driver (setting 1, 2, 3 or 4).

All remaining switch settings are intended for factory purposes and may not be used!

Each allocation must be **unique**, this means multiple extension modules may never have the same allocation number!

4 Notes for troubleshooting



Warning! Before opening the housing, the power must be disconnected from the device!

The extension module was designed for several years of continuous use. Nevertheless, faults may occur. In most cases, however, the cause of the fault is not to be sought in the module but rather in the peripheral system elements. The following description of a few common faults should help the installer and the operator to isolate the fault and activate the system as quickly as possible to avoid unnecessary costs. Naturally, not all possible faults can be listed. However, here you will find the most common causes of faults that cover the majority of the fault conditions related to the extension module. Send the regulator in after you have first ensured that none of the described malfunctions have occurred.

One/several pumps connected to the extension module is/are not running although the activation conditions are met.

<u>Secondary condition:</u>	<u>Possible cause:</u>
According to the regulator display (“Operating mode..”) the pump is running	No power supply (230V) present for IO box, a fuse or feeder may be defective. Pump connecting wire is defective or related fuse is burned out.
“Manual operation” submenu selected	Manually switch pump(s) to OFF mode
Fault displayed in “Operating mode” menu (for example, short circuit, disruption)	Sensor lead or sensor is defective or disrupted For safety reasons, the affected control-system outputs are switched off during sensor faults.
The audible click of the R2 or R3 relay can be heard, but the output remains free of voltage	No power supply (230V) present for IO box, a fuse or feeder may be defective.

3 way valve does not react although the activation conditions are met.

<u>Secondary condition:</u>	<u>Possible cause:</u>
The audible click of the relay can be heard, but the output remains free of voltage	No power supply (230V) present for IO box, a fuse or feeder may be defective.
When using a 3 way switch valve	Switch valve is not connected correctly (not only N and Rx must be connected, but also a permanent phase L)

Fault display in the regulator's LCD display:

The pending fault messages of the extension module can be read on the "Operating mode" submenu on the system regulator.

Short circuits and disconnections of the individual temperature sensors are then displayed only when the corresponding sensors are actually really used on account of the selected layout plan and the activated functions. The regulator automatically detects the following errors and shows these in the display. If, despite the error display, a malfunction is not rectified but is still acknowledged, there will be another error display after a few seconds. When several errors occur at the same time the error with the lowest value (e.g. first T1 then T2 etc.) is displayed.

Attention: If the regulator detects a sensor fault, all affected control-system outputs of the regulator or the extension module are switched off for safety reasons until the fault is remedied or automatically disappears. When the affected outputs can be switched back on therefore depends on the error itself and not on acknowledgement of the error message. This means unnecessary downtime of the system is reduced to a minimum.

Meaning of individual display examples:

Short circuit I1 (IOBox1) Temperature sensor lead on I1 of the IO Box 1 is short circuited

...

Disrupt. I1 (IOBox1) Temperature sensor lead on I1 of the IO Box 1 is disrupted

...

I1 (IOBox1) absent IO box 1 not/incorrectly connected or allocation for selector switch is incorrectly set (see chapter 3)

If there is an error (short circuit or interruption) on one of the temperature sensor lines or if the input of a not (or incorrectly) connected IO box is selected, the error message '**Err°C**' will be displayed in the '*Measured data*' menu instead of the measured value.

Temperature sensor troubleshooting

The temperature is determined by so-called resistance sensors. These are PT1000 type sensors. The resistance value also changes depending on the temperature. An ohmmeter can be used to check if there is a sensor defect. Disconnect the corresponding temperature sensor from the extension module and measure the resistance value. The following table contains the typical resistance values depending on the temperature. Please note that slight deviations are allowed.

Resistance values of the temperature sensor **Pt1000**

Temperature [°C]	-30	-20	-10	0	10	20	30	40	50	60	70
Resistance [Ω]	882	922	961	1000	1039	1078	1117	1155	1194	1232	1271

Temperature [°C]	80	90	100	110	120	130	140	150	160	170	180
Resistance [Ω]	1309	1347	1385	1423	1461	1498	1536	1573	1611	1648	1685

5 Guarantee

The manufacturer undertakes the following guaranteed obligations:

The manufacturer will remove all manufacturing and material faults that appear in the extension module and affect the correct functioning of the device during the guarantee period. The usual tear and wear is not a fault. After conclusion of the sales contract guarantee is not granted for any mistakes that have been caused by improper use of the end user or third parties, particularly by improper installation and operation, faulty or careless use, extremely heavy use, inappropriate operating material, inadequate construction, unsuitable construction ground or similar things. Guarantee is only granted when the mistake has - immediately after notice - been reprehended to your dealer who, in turn, informs the manufacturer about the reprehension. In this case a copy of the receipt must be enclosed.

For a fast and smooth settlement a detailed error description is necessary. Any guarantee obligations expire after 24 months after date of purchase, except for the fact that the manufacturer agrees by written confirmation to prolongue the expiration period.

The authorized dealer's guarantee on the basis of the purchase contract with the end user is not applicable for this guarantee obligation. Guarantee is effected by either rectification or replacement. This does not include the costs involved in exchanging, dispatching or re-installing. If rectification or replacement is not possible or are not effected within a certain period of time (despite written respite by the customer) the manufacturer comes up for all losses in value caused by the malfunction or – if this is not sufficient in the interest of the end user - accepts the buyer's right of conversion.

Any further claims against the manufacturer arising from this obligation, particularly compensation claims due to losses in sales, reimbursement payments as well as indirect damages are excluded if not forced by law.

6 Specifications

Power supply	12V DC (supplied by the IS bus)
Voltage for pumps/valves	110/230 Volt ($\pm 15\%$), 50/60Hz
Self consumption	$\leq 1,5$ W
7 Inputs	
Can be used as a temperature - (Pt1000) or impulse input for metering the heat quantity	
3 Outputs	
R1 as switch output	Triac for regulating speed, switch capacity max. 200W at 230V
R2	Switch relay, total switch capacity max. 800W at 230V
R3	
Outputs are protected against overcharge and short circuit.	
Interfaces	IS bus for connecting to the system regulator
Protection class	when using the rubber bungs provided: IP 65 according to DIN 40050/EN 60529
Ambient temperature allowed	0 to + 45° C
Installation	Wall-mounted
Weight	570 g
Housing	Recyclable, 3-part plastic housing
Dimensions LxWxH (mm)	150 x 215 x 43 mm
Temperature sensors	
Pt1000 (2 x included in delivery)	1.5 m silicon cable, temperature range up to 180° C

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