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## Operating Instructions



## Energy Regulators 50.5; 50.6; 50.8; 50.9

90.60150.353-001-04-A

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# 1 About these operating instructions

## 1.1 Validity

These operating instructions are for the following material number ranges of energy regulators:

- 50.5xxxx.xxx
- 50.6xxxx.xxx
- 50.8xxxx.xxx
- 50.9xxxx.xxx

## 1.2 Handling of these operating instructions

These operating instructions are part of the product and describe the intended use of the product.

- ▶ Read these operating instructions, especially the safety instructions, carefully before use.
- ▶ Observe all other applicable documents.
- ▶ Keep these operating instructions during the product lifetime.
- ▶ Make sure that these operating instructions are available completely and legibly at all times.
- ▶ Pass these operating instructions to each subsequent owner or user of the product.

## 1.3 Revisions

Date	Version	What is new?
20 <sup>th</sup> September 2019	01	Initial version
04 <sup>th</sup> December 2019	02	Changes based on QS
29 <sup>th</sup> January 2021	03	Addition Chapter 4.2.4
13 <sup>th</sup> December 2021	03	Additions
21 <sup>st</sup> September 2022	03	Reformulation chapter 7
04 <sup>th</sup> October 2022	03	Addition of series 50.9
02 <sup>nd</sup> December 2022	03	Complementation chapter 2.3.5
23.02.2023	04	Additions in chapter 4.2

Tab. 1: Revisions

## 1.4 Other applicable documents

- Type drawing
- Technical delivery conditions
- Transmission curve
- Approved technical data

## 1.5 Symbols and markings

Symbols	Meaning
✓	Requirement of an action
▶	One-step action
▷	Measure to avoid a hazard in a warning
1.	<ul style="list-style-type: none"><li>• Step within a multi-step action list</li><li>• Keep order</li></ul>
↪	Final result of an action
	Tip for easier work
 <b>DANGER!</b>	Hazardous situation that will lead to death or serious injuries, if the safety measures are not followed.
 <b>WARNING!</b>	Hazardous situation that can lead to death or serious injuries, if the safety measures are not followed.
 <b>CAUTION!</b>	Hazardous situation that can lead to minor injuries, if the safety measures are not followed.
<b>NOTICE!</b>	Hazardous situation that can lead to property damage if the safety measures are not followed.

Tab. 2: Symbols and markings

## 2 Safety

### 2.1 Intended use

EGO Energy Regulators are intended for controlling surface heating elements on cookers or hobs in domestic and commercial areas in fixed buildings. Any other use requires the written consent of E.G.O.. EGO Energy Regulators are intended for supervised operation only.

Intended use also includes the following points:

- Compliance with the permissible operating conditions according to the type drawing.
- Observance of these operating instructions.

### 2.2 Staff qualification

These operating instructions are intended for following staff / staff groups:

Staff	Required qualification
Production staff of the kitchen appliances manufacturer	Has received instructions for the required activity from the kitchen appliance manufacturer.
Qualified electrician	<ul style="list-style-type: none"><li>• Knows the relevant standards and regulations for electrical installations.</li><li>• Has experience in using the relevant tools and equipment for electrical installations.</li><li>• Has knowledge of cooking appliances.</li><li>• Has received training from the kitchen appliance manufacturer.</li></ul>

Tab. 3: Staff qualification

### 2.3 Residual risks

#### 2.3.1 Installation with applied voltage

If there is voltage applied on the energy regulator by installation, electric shock hazard consists within the installation.

- ▶ Energy regulator has to be installed or replaced by qualified staff only.
- ▶ Power supply of the cooking appliance must be completely switched off before all installation or replacement work at an energy regulator.

#### 2.3.2 Insufficient grounding

People could suffer an electric shock by having insufficient grounding.

- ▶ Energy regulator has to be connected correctly and has to be integrated in the grounding of the application (e.g., via the housing of the appliance).
- ▶ Pay attention to the regional regulations.

### 2.3.3 Wrong connection

Insufficient electric contacts could lead to an excessive heating. This can cause fires.

Insufficient electric contacts have among others the following causes:

- Mixing up the insertion position of the connection wire.
- Unsuitable receptacles or wire material.
  
- ▶ Pay attention to the regional regulations.
- ▶ Energy regulator has to be connected according to these operating instructions and type drawing.
- ▶ All hints of these operating instructions about cables, receptacles and wire end ferrules have to be considered.

### 2.3.4 Incorrect cable routing

Improper cable routings, e.g., as directly behind the connectors of the energy regulator, could lead to a damage of the cable insulation.

These could lead to an electric shock hazard by having open wires.

- ▶ Never route cables directly behind the connectors of the energy regulator.

### 2.3.5 Humidity / parts inside

Energy regulators are not waterproof. Energy regulators are approved with pollution level 2 (no conductive pollution).

Admissible humidity: 95 % RH according to DIN IEC 60068-2-78.

Condensation during operation or storage isn't allowed to occur at any time. In case it does occur, the results can reach from short time malfunctions up to permanent failure of the energy regulator. The customer / device manufacturer must protect the energy regulator from condensation by providing a protected installation in the customer application as described in the product operating instruction 90.60150.353.

The energy regulator itself does not contain a protection from condensation.

E.g., if condensation is likely to occur due to large temperature differences during the transport, it is strongly recommended to wait for at least two hours in the new climate conditions before putting the energy regulator into operation (=applying mains voltage).

- ▶ In case of liquid entry, a hazard of electric shock consists.  
Make sure that the energy regulator cannot get in contact with liquids. This appears particularly within the vertical installation (e.g., in autarkic cooktops).
- ▶ Energy regulators in the cooking appliance have to be protected from humidity and accessibility to the electric connections.
- ▶ Pay attention to local regulations.

### 2.3.6 Insufficient air- and creepage distances

Insufficiently long air and creepage distances to conductive housing parts when connecting the energy regulators can cause shock to people.

- ▶ When connecting the energy regulator, keep the minimum air and creepage distances according to the specifications of EN 60730-1 and EN 60335-1.
- ▶ Pay attention to local regulations.

### 2.3.7 Use of the energy regulator outside its intended use

Within using the energy regulator outside the surface cooking area, there are hazards of burning and electric shocks. By doing a misuse (e.g., usage of the energy regulator as oven control), a hazard of fire consists.

- ▶ The energy regulator must be used in the intended area and in accordance with the operating instructions.
- ▶ E.G.O is not liable for the risks caused by improperly modified energy regulators.

### 2.3.8 Use of damaged energy regulator

If energy regulators are damaged (e.g., corrosion, housing damages), it is possible that live parts get accessible. This leads to hazard of electric shock by touching.

- ▶ Do not use damaged energy regulators.

### 2.3.9 Sharp edges

Packaging material and energy regulator parts like connection tabs or mounting parts may have sharp edges. People can cut themselves into hands or fingers.

- ▶ Wear safety gloves during transport and installation.

### 2.3.10 Live parts

Live parts suddenly become accessible due to mechanical damage. The sudden access to live parts creates the risk of electric shock.

- ▶ Do not use energy regulators that are damaged.

### 2.3.11 Deformation

Mechanical deformations can lead to malfunctions or even destruction of the energy regulator, e.g., when using fastening screws that are too long. If there is a deformation during assembly, e.g., breakage of the housing, the energy regulator must be sorted out. Note the maximum screw-in depth of the fastening screws (see type drawing).

- ▶ Please note the DIN EN 61210 regulation.
- ▶ Do not use energy regulators that are defective.

### 2.3.12 Too much force when attaching or removing the knob

Excessive force when attaching or removing the knob can damage the energy regulator and cause malfunctions. The use of knobs that do not correspond to the specifications in the type drawing can result in the base-insulated metal spindle axis being exposed. This creates the risk of electric shock.

- ▶ Knobs made of insulating material with a maximum push-on force of 100 N and a pull-off force of > 50 N for metal axles and use > 30 N for plastic axles.
- ▶ Please note the type drawing and the regulations DIN EN 61210 and EN 60335-1.

### 2.3.13 Overheating

Overheating can cause a fire. The following factors can lead to overheating:

- ▶ Unsuitable plug and screw connectors, conductor material or cross-section, wire end sleeves.
- ▶ Bad contact points. The contact points are to be examined in a type check for excessive heating and, if necessary, corrective measures are to be initiated.
- ▶ Increased contact resistance at the plug connection.
- ▶ Only use cables and connection material in accordance with DIN EN 61210 and make the connections properly. When inserting sleeves again, observe the manufacturer's specifications.
- ▶ Observe the applicable national guidelines.

### 2.3.14 Evaporation

Plastic parts and screw locking varnish can produce toxic fumes if the permissible temperatures are exceeded.

- ▶ Risk of poisoning from evaporation.
- ▶ Do not heat plastic parts above the specified maximum temperatures. These can be found in the approved technical data.

### 2.3.15 Electrochemical corrosion

Electrochemical corrosion due to different material pairings or aggressive media (acids, bases, etc.) can lead to malfunctions and even destruction of the energy regulator.

- ▶ Please therefore note the electrochemical voltage series of the materials used when selecting fastening parts.

### 2.3.16 Exceeding the maximum switching capacity

Exceeding the maximum switching capacity can lead to overheating of components and thus to a fire hazard.

- ▶ The switching capacities of the respective energy regulator series specified in the approved technical data must not be exceeded.

### 2.3.17 Falling below the minimum switching power

Falling below the minimum switching power can lead to malfunctions in the switching function.

- ▶ Make sure that the switching capacities that are specified in the technical data for the respective energy regulator series are not exceeded.

### 2.3.18 Exceeding the maximum number of switching cycles

Exceeding the maximum number of switching cycles can lead to malfunctions.

- ▶ Make sure that the number of switching cycles specified in the technical data for the respective energy regulator series specified is not exceeded.

### 2.3.19 Temperatures too high

Exceeding the maximum permissible ambient temperature both on the energy regulator and in the area of the housing can lead to malfunctions and destruction of the energy regulator.

- ▶ When designing the application, observe and adhere to the maximum ambient temperature specified in the type drawing and the approved technical data.
- ▶ Observe the corresponding required constructions.

### 2.3.20 Temperatures too low

Falling below the minimum permissible ambient temperature can lead to malfunctions and even destruction of the energy regulator.

- ▶ When designing the application, observe and maintain the minimum permissible ambient temperature specified in the type drawing.

### 2.3.21 Blocking of the switching mechanism

Blocking of the switching mechanism can lead to malfunctions.

- ▶ Never change the switching mechanism.  
Make sure that the moving parts of the energy regulator are not blocked by surrounding components or foreign bodies.

## 3 Transport and storage

### 3.1 Transport

- ▶ Use suitable packaging to prevent damage to the product.
- ▶ Do not stack heavy pallets on the energy regulator pallets.
- ▶ Have a transport temperature between  $-40\text{ °C}$  –  $+70\text{ °C}$ .
- ▶ Observe the regulations for the transport test for unpacked (IEC 68-2-31) and packaged components (IEC 68-2-32) as well as the vibration test for unpacked components (IEC 68-2-6) and regional guidelines.

### 3.2 Storage

- ▶ Comply with the following storage conditions:
  - Have a storage temperature between  $5\text{ °C}$  –  $70\text{ °C}$ .
  - Store dry in a closed room (hygroscopic insulation material).
  - Have a protection against corrosion and pollution.
  - For block storage: Stack a maximum of two energy regulator pallets on top of each other with the maximum of own weight.

## 4 Installation and commissioning

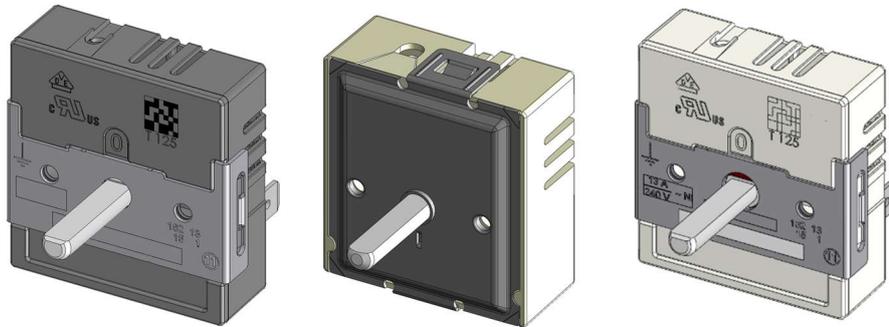
### 4.1 Assembly

The energy regulator must be installed in accordance with the specific instructions of the device manufacturer. The installation may only be carried out by qualified personnel. Use suitable screws during installation, taking into account, the maximum length of the screw. Do not overtighten the screw and observe the maximum permissible torque.

- 1 If the energy regulator is installed as a spare part for an energy regulator that has already been installed: replace the flat receptacles.

#### 4.1.1 2-hole fixing

1. Build in the energy regulator as follows:
  - ▷ Place the energy regulator in the panel with the heater position to the top (see pictures below).

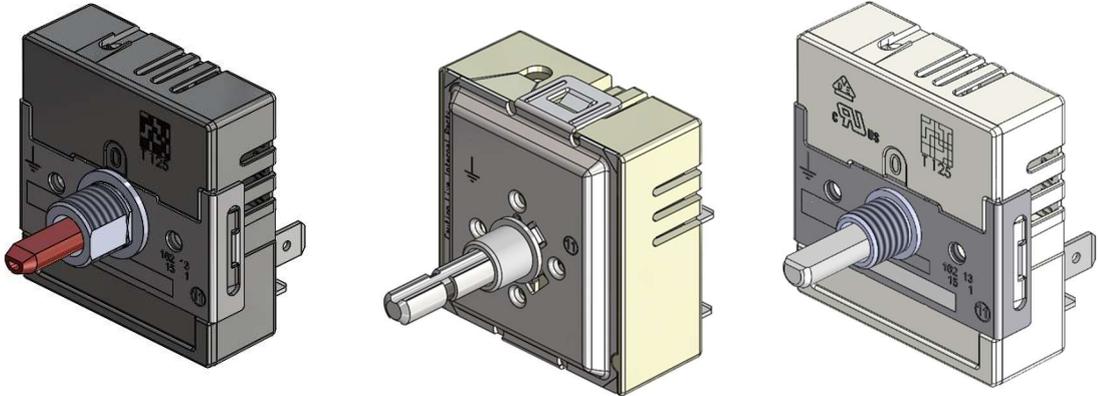


2. Assemble the energy regulator with the screws in the panel. Use suitable screws and respect the maximum length of the screw. The screw must not enter the energy regulator by more than 6 mm (measured from top cover of the energy regulator).
  - ▷ Do not overtighten the screws.
3. The metallic cover sheet can be used to integrate the energy regulator in the grounding of the appliance.
  - ▶ Pay attention to the regional regulations.

#### 4.1.2 Central fixing

1. Build in the energy regulator as follows:

- ▷ Place the energy regulator in the panel with the heater position to the top (see pictures below).



- ▷ Align the energy regulator with the support flap to assure the position of the energy regulator.
- ▷ Assemble the energy regulator over the middle bolt (support screws are not included).
- ▷ Do not exceed the maximum permissible torque.

#### 4.1.3 Ambient temperature

To ensure the functionality of the energy regulators in the system the ambient temperature is limited. The design of the application has to assure that the ambient temperature stated in the technical documents will not be exceeded.

- ▷ Make sure that the ambient temperature will not be exceeded under any circumstances.

#### 4.1.4 Installation of knobs

In order to protect the energy regulator from damages the forces for the knobs have to be limited.

- ▷ The push on forces to install a knob onto the axle shall not exceed 100 N.

#### 4.1.5 Deinstallation of knobs

The knob will be installed on the shaft of the energy regulator. The knob is meant to be firmly installed on the shaft of the energy regulator and shall not be removed.

In order to assure a permanent installation of the knob on the shaft the corresponding pull off forces are defined as follows:

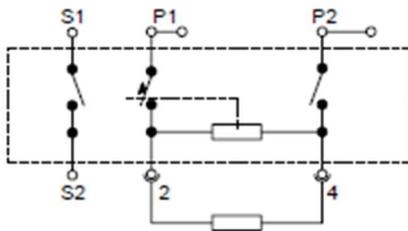
- ▷ For energy regulators with a metal shaft the pull off force has to be  $\geq 50$  N.
- ▷ For energy regulators with a plastic shaft the pull off force has to be  $\geq 30$  N.

## 4.2 Electrical connection

- ▶ Observe the corresponding type drawing and the approved technical data sheet before connecting the energy regulator.
- ▶ The electrical requirements of the IEE Wiring regulations must be observed when the appliance is connected to the electrical supply.
- ▶ The energy regulator is only intended for switching resistive loads on principle.
- ▶ The maximum forces to the tab connectors shall not extend  
Radial: 20 N  
Axial: 100 N

### 4.2.1 Wiring of a single circuit energy regulator

The control provides an all-pole disconnection of the load, which must be connected between the terminals 2 and 4.



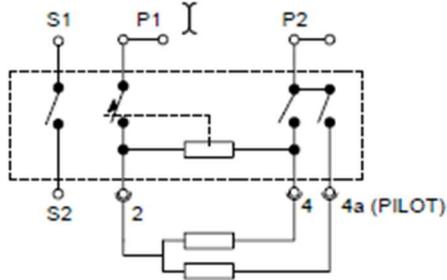
The different connectors provide different possibilities of connecting the heating elements. Please be aware of the following constellation of the individual contact paths:

- ▷ P1-2: This contact path provides a micro gap clearance.
- ▷ P2-4: This contact path provides a contact clearance of >3 mm.
- ▷ S1-S2: This contact path provides limited amperage for signal contact only.

Note: Please refer to the type drawing for correct wiring. The contact path S1-S2 must not be used for switching loads of a heating element.

#### 4.2.2 Wiring of a double circuit energy regulator

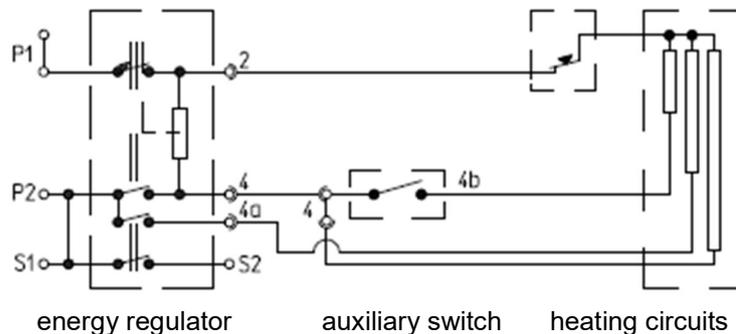
The control provides an all-pole disconnection of the load, which should be connected between the terminals 2 and 4.



- ▷ P1-2: This contact path provides a micro gap clearance.
  - ▷ P2-4: This contact path provides a contact clearance of >3 mm.
  - ▷ S1-S2: This contact path provides limited amperage for signal contact only.
  - ▷ P2-4a: This contact path provides a contact clearance of >3 mm.
- Max. total power of contact paths P2-4 and P2-4a are indicated in the type drawing.

Notice: Please refer to the type drawing for correct wiring. The contact path S1-S2 must not be used for switching loads of a heating element.

#### 4.2.3 Wiring of triple circuit energy regulator



- ▷ P1-2: This contact path provides a micro gap clearance.
  - ▷ P2-4: This contact path provides a contact clearance of >3 mm.
  - ▷ P2-4a: This contact path provides a contact clearance of >3 mm.
- Max. total power of contact paths P2-4 and P2-4a are indicated in the type drawing.
- ▷ 4-4b: This contact path provides a micro gap clearance.
  - ▷ In case of a bridge between the contacts S1-P2: The maximum load of the contact is limited to 8 A.
  - ▷ S1-S2: This contact path provides limited amperage for signal contact only.

Notice: Please refer to the type drawing for correct wiring. The contact path S1-S2 must not be used for switching loads of a heating element.

#### 4.2.4 Multi-circuit activation

There are two different types of multi-circuit activation:

- Multi-circuit function is activated by overwind the spindle. The multi circuit can be controlled by turning the spindle and will be active until the spindle is reset to zero position.
- The multi-circuit function is activated by turning the energy regulator counter clockwise out of the zero position (or vice versa). The multi circuit is active within 180° after activation and can be controlled within that range. As soon as the spindle of the energy regulator is turned outside the 180° of angle after activation the multi-circuit activation stops.

#### 4.2.5 Type of connection

- ▶ Use 6.3 mm x 0.8 mm or 4.8 mm x 0.8 mm receptacles for tabs of stainless steel depending on the used tab terminals.
- ▶ The receptacles have to be aligned to the tab terminals in terms of material and dimensions.
- ▶ If using single wires: connect each wire with the connection terminal of the energy regulator.
- ▶ Use suitable conductive and insulation material.
- ▶ When using stranded wires: only use with a temperature resistance of > 125 °C.

#### 4.2.6 Electromagnetic Compatibility

Energy regulators are electrical switching devices that may influence the electromagnetic compatibility.

- ▶ Energy regulator has to be installed or replaced by qualified staff only.
- ▶ Pay attention to the regional regulations.

## 5 Maintenance

EGO Energy Regulators cannot be repaired.

- ▶ A damaged energy regulator has to be replaced by a completely new energy regulator.

## 6 Disposal

- ▶ Do not dispose the energy regulator within the household rubbish.
- ▶ Dispose according to local regulations for disposal of electrical products.

## 7 Technical data

For further details please refer to the type drawing or the technical data.

## 8 Contact

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