
Operating Instructions



Thermostats 55.xxxxx.xxx / 56.xxxxx.xxx

90.60145.653-001-02-A

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1 About these operating instructions

1.1 Validity

These operating instructions are for the following material number range of thermostats:

- 55.xxxxx.xxx
- 56.xxxxx.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? |
|------------|---------|------------------------------|
| 27.11.2020 | 01 | Initial version |
| 22.03.2021 | 02 | Complement chapter no. 5 |
| 26.03.2021 | 03 | Complement chapter 2.1 + 3.1 |

Tab. 1: Revisions

1.4 Other applicable documents

- Type drawing
- 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">Step within a multi-step action listKeep order |
| ↪ | Final result of an action |
|  | Tip for easier work |
|  DANGER! | Hazardous situation that will lead to death or serious injuries, if the safety measures are not followed. |
|  WARNING! | Hazardous situation that can lead to death or serious injuries, if the safety measures are not followed. |
|  CAUTION! | Hazardous situation that can lead to minor injuries, if the safety measures are not followed. |
| NOTICE! | 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 Thermostats are intended for the following applications, depending on the type (temperature regulator, thermal cut-out, temperature limiter):

- Temperature regulator: regulates the operating temperature of a medium.
- Temperature limiter: For safety reasons, limits the operating temperature of a medium to an adjustable maximum temperature.
- Thermal cut-out: For safety reasons, limits the operating temperature of a medium to a fixed maximum temperature.

Any other use requires the written consent of E.G.O..

EGO Thermostats and Temperature Limiters are not dangerous substances in the sense of the EC Dangerous Preparations Directive (1999/45/EG) or the German Hazardous Substances Ordinance (GefStoffV) and thus are not subject to labeling requirements.

Exception: Diastates that are filled with a metal alloy with a low melting point are marked with a separate warning sign: "Attention. Filler reacts with water. Danger of fire and etching".

EGO thermostats that are filled with a metal alloy with a low melting point are treated separately. The working area must be arranged to prevent any contact between the metal alloy and water, as this leads to a chemical reaction. The thermostats must be protected against mechanical factors such as shock and impacts.

Proper use also includes the following points:

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

2.2 Staff qualification

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

| Staff | Required qualification |
|---|--|
| Production staff of the electrical appliance manufacturer | Has received instruction for the required activity from the electrical appliance manufacturer. |
| Qualified electrician | <ul style="list-style-type: none">• Knows the relevant standards and regulations for electrical installation.• Has experience in using the relevant tools and aids for electrical installation.• Has knowledge of electrical appliances.• Has received training from the electrical appliance manufacturer. |

Tab. 3: Staff qualification

2.3 Residual risks

Unless otherwise indicated, the following residual risks apply to all types:

2.3.1 Sharp edges

Packaging boxes and mechanical parts of the thermostats (e.g. housing, sensor or tab terminal) can have sharp edges. People can cut themselves into hands or fingers.

- ▶ Wear safety gloves.

2.3.2 Sensor tip

People can stab themselves at the sensor tip. In particular, there is a risk that the sensor tip deflects unexpectedly due to the force of a spring and injures the eyes.

- ▶ Handle the sensor carefully.
- ▶ Wear safety glasses.

2.3.3 Live parts

The following factors can cause an electric shock:

Live parts suddenly become accessible due to mechanical damage.

- ▶ Do not use thermostats that are damaged (e.g. cracks).

The protective earthing of the thermostat housing, sensor and capillary tube of thermostats with protection class I is missing or insufficient.

- ▶ Observe valid standards and national guidelines.
- ▶ Make sure that the thermostat housing and capillary tube are properly and permanently connected to earth potential (e.g. with a capillary tube grounding clamp)
 - or –
 - install sensor insulated.

Voltage is carried over from external voltage-carrying components via the capillary tube to the touchable sensor.

- ▶ Use thermostats with an insulated capillary tube or ensure that there is sufficient distance to live components.

The thermostat is installed without being de-energized beforehand.

- ▶ Installation should only be carried out by qualified staff.
- ▶ Make sure that all supply voltages are switched off before installation.

Clearances and creepage distances are disregarded when installing in the housing.

- ▶ Observe valid standards and national guidelines.

Thermostats do not have an IP protection class.

- ▶ Install the thermostat in a suitable housing protected from dust and moisture.

With temperature regulators and temperature limiters: The basic insulated metal axis is exposed. There is a risk of an electric shock if touched.

- Knob made of insulating material: Select at least 50 N pull-off forces in accordance with IEC 60335 part 1 ff.

2.3.4 Deformation

Mechanical deformations may lead to malfunctions or even destruction of the thermostat. The risk exists particularly in the following cases:

- Too long fastening screws
 - Crushing of the sensor
 - Kinking the capillary tube
 - Pull on the capillary tube
 - Effect of force and bending stress on the solder joint between sensor and capillary tube.
 - With adjustable thermostats: Deformation of the mechanics by exceeding the maximum stop torque of 150 Ncm.
-
- ▶ Observe the maximum screw-in depth of the fastening screws in the fastening bracket of the thermostat (see type drawing).
 - ▶ Avoid mechanical effects on the sensor.
 - ▶ Never kink the capillary tube during assembly and operation (observe the minimum bending radius according to the type drawing).
 - ▶ Do not exceed the tensile load of the capillary tube on the housing of 50 N.
 - ▶ With adjustable thermostats: Observe the maximum stop torque of 150 Ncm.

2.3.5 Ingress of foreign parts

Ingressing foreign parts can lead to malfunctions.

- ▶ Install thermostats in a suitable housing protected from dust and moisture.

2.3.6 Too high force when attaching or removing the receptacle

The thermostat can be damaged due to excessive force when attaching or removing the socket.

- ▶ When attaching and removing observe the instructions in accordance with the IEC 61210 standard (axial forces for attaching and removing the blade terminal).

2.3.7 Too high force when putting on the knob

The thermostat can be damaged due to excessive force when attaching the knob.

- ▶ Use a knob with a maximum push-on force of 50 N.

2.3.8 Incorrectly selected, assembled or reused stuffing box sets

Incorrectly selected, assembled or reused stuffing box sets can lead to leaks.

- ▶ Select stuffing box sets according to the application. Pay particular attention to the temperature resistance and maximum pressure resistance of the stuffing box seal.
- ▶ Adhere to the specified tightening torque and the order of the individual parts during assembly so that the capillary tube is not damaged.
- ▶ Once installed, do not reuse the stuffing box sets after dismantling.
- ▶ Test the tightness of the system through experiments.

2.3.9 Leaking substances

Filling medium can escape from leaked sensors or capillary tubes. The filling medium can mix with food (e.g. deep fryer oil). As a result, people can suffer from adverse health effects.

- ▶ Lay the sensor and capillary tube protected when used in the food industry.
- ▶ With medium contact:
 - Completely change the medium (e.g. deep fryer oil).
 - Ensure by cleaning that there are no more residues of the filling medium.

The NaK filler for high temperature applications may cause chemical burns.

- ▶ Wear protective gloves and safety glasses during installation and replacement.
- ▶ Observe additional warning in the type drawing.

If the temperature is too high, toxic fumes can escape from plastic parts and screw locking varnish (e.g. from hood and insulating hoses).

- ▶ Never heat plastic parts above the following specified maximum temperatures:
 - Teflon insulating hose: 260 °C
 - Fiberglass: 230 °C
 - OWF: 140 °C
 - PVC: 105 °C
 - Housing: according to type drawing

2.3.10 Unsuitable material pairings and aggressive substances

Unsuitable material pairings and aggressive media may cause corrosion. This may lead to malfunctions or even destruction of the thermostat.

- ▶ When selecting fastening parts for the sensor and capillary tube, note the electrochemical series of the materials used. Use a suitable protective tube if necessary.

2.3.11 Overheating

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

- Unsuitable plug and screw connectors, cable end sleeve, conductor material, conductor cross-section
 - Insufficient contact points
 - Increased contact resistance at the plug connection
 - Exceeding the permissible switching power
-
- ▶ When inserting the sleeves again, observe the manufacturer's specifications.
 - ▶ Make sure that the switching capacities specified in the technical data are not exceeded.
 - ▶ Only use cables, receptacles and connection material in accordance with the IEC 61210 standard.
 - ▶ Establish connections properly.
 - ▶ Check the contact points in a type test for excessive overheating and initiate remedial measures if necessary.

2.3.12 Failing below the minimum switching power

Failing below the minimum switching power may lead to faults in the switching function.

- ▶ Make sure that the switching capacities are not falling below the value noted in the specified technical data.

2.3.13 Exceeding the maximum number of switching cycles

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

- ▶ Make sure that the number of switching cycles specified in the technical data is not exceeded.

2.3.14 Aging (thermal cut-outs and temperature limiters)

Thermal cut-outs and temperature limiters age in normal operation even with regular cycle loads. Aging may lead to malfunctions.

- ▶ Change thermal cut-outs and temperature limiters prophylactically in the following cases:
 - The temperature controller fails
 - Exceeding the maximum sensor temperature
 - After 10 years at the latest

2.3.15 Deviating switching temperatures and hysteresis

Switching temperatures and hysteresis specified in the type drawing apply in accordance with E.G.O. measuring method (at room temperature of 23 °C, temperature change 1K / min in the E.G.O. factory standard bath). In the case of deviating room temperatures and temperature changes, the actual switching temperatures and hysteresis may differ from the information in the type drawing.

- ▶ When designing the application, note the correction factors in the type drawing.
- ▶ Carry out a series of tests with thermostats in the respective application and compensate for the measured temperature differences if necessary.

2.3.16 Uneven heat distribution on the sensor

Uneven heat distribution on the sensor may lead to malfunctions or even destruction of the thermostat.

- ▶ Note the following points when designing the application:
 - The heat distribution on the sensor should be as even as possible.
 - The sensor must be surrounded by the measuring medium over its entire length.
- ▶ Carry out a series of tests with thermostats in the respective application and compensate for the measured temperature differences if necessary.

2.3.17 Temperatures too high or too low

Exceeding the maximum permissible sensor temperature according to the type drawing may lead to malfunctions and even destruction of the thermostat.

- ▶ When designing the application, note and adhere to the maximum sensor temperature specified in the type drawing. Pay particular attention to post heat.

Exceeding the maximum permissible ambient temperature in the area of the housing may lead to malfunctions and even destruction of the thermostat.

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

The following dangers exist if the temperature falls below the minimum permissible according to the type drawing:

- If the sensor is suddenly heated up from being undercooled, the sensor can burst.
- The break protection can be triggered unintentionally.

- ▶ When designing the application, observe and adhere to the minimum ambient and sensor temperature specified in the type drawing.

2.3.18 Too high pressure on the sensor

Exceeding the maximum permissible pressure at the sensor may lead to malfunctions and even destruction of the thermostat.

- ▶ Note the maximum permissible sensor pressure:
 - Boiler sensor: 20 bar
 - Tube sensor: 30 bar
 - High pressure sensor: 250 bar

2.3.19 Changes and readjustments on the thermostat

Changes and readjustments to the thermostat may lead to malfunctions.

- ▶ Never change the E.G.O. factory setting.

2.3.20 Blocking of the switching mechanism

Blocking of the switching mechanism, in particular through manipulation of the reset mechanism, may lead to malfunctions.

- ▶ Never change the switching mechanism or the reset mechanism.
- ▶ Make sure that the reset button always moves freely and is 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 pallets.
- ▶ Maintain a temperature range of -40 °C – +70 °C.

Transport regulations

IEC 68-2-31 Transport test for unpackaged components

IEC 68-2-32 Transport test for packaged components

IEC 68-2-6 Vibration test for unpackaged components

Thermostats filled with metal alloys with a low melting point

ADR/RID (Transport Road / Rail):

UN 3543

Technical name: Articles containing a substance which emits flammable gas in contact with water, n.o.s. (Sodium-Potassium-Mixture)

Hazard Class: 4.3

Packaging group: --

Tunnel restriction code: (E)

Transport category: 4

Transitional provision:

Following chapter 1.6.1.46 ADR the usage of UN 3543 on the road is planned to be mandatory from 01.01.2023. Until the 31st of December 2022 the UN 3543 is released from the regulations of ADR if actions have been taken that under normal circumstances of transport prevent the substances from release.

IMDG-Code (Transport Sea):

UN 3543

Proper shipping name: Articles containing a substance which emits flammable gas in contact with water, n.o.s. (Sodium-Potassium-Mixture)

Hazard class: 4.3

Packing group: --

ICAO/IATA (Transport Air):

Forbidden

Product approvals

The product approvals for EGO Thermostats and Temperature Limiters are stored in the approved technical specifications.

3.2 Storage

- ▶ Observe the following storage conditions:
 - Temperature from 5 – 70 °C
 - Dry and closed room
 - Storage in a container that is suitable for electrical switchgear

4 Installation and Commissioning

4.1 Mechanical installation

4.1.1 Basic information on installation

You can freely choose the order of assembly depending on the application. Note the following points:

- ▶ If the adjustment facial expressions are inaccessible: set the switch-off temperature before installation.
- ▶ For thermostats with 2 sensors: note the correct position of the sensor according to the type drawing.

4.1.2 Sensor mounting

1. Position the sensor at the measuring point and fix it. Unwind the capillary tube if necessary.
2. Lay the capillary tube securely. Note the following points:
 - Avoid sharp turns or kinks.
 - Possibly position and fix sliding insulating hoses.
 - Possibly complete and assemble the stuffing box screw connections. Ensure that there is sufficient permanent tightness.

4.1.3 Fasten thermostat inside the housing

1. With 2-point fastening: select the screw so that the following conditions are met:
 - Sufficient fixation is guaranteed.
 - The screw does **not** touch the housing.
2. With central fastening:
 - Choose fastening materials, such as nut or cap nut according to the type drawing.
 - Make sure there is sufficient torque and avoid „over-turning“.
3. For temperature limiter and thermal cut-out: ensure that the reset mechanism can move freely.
4. If applicable put on a suitable knob.

4.2 Regulation

4.2.1 With adjustable thermostats: set the switch-off temperature

- ▶ Adjust facial expressions with a suitable tool, e.g. knob, turn until the intended storage temperature is reached. Note the following points:
 - Temperature-characteristic according to the type drawing
 - Installation position of the thermostat (correct alignment of the spindle surface)

4.3 Electrical connection

4.3.1 Basic information on the electrical connection

- ▶ Observe the cross-section, insulation material and circuit diagram according to the type drawing.
- ▶ Observe national standard information on electrical connection, such as EN 60730.
- ▶ Make sure that the shape and position of the electrical connection are not changed (e.g. bending).
- ▶ Ensure permanent low-resistance connection.

4.3.2 Information on the various connection types

Observe the following instructions for electrical connection and earthing of the thermostat:

- ▶ Screw-connection: Pay attention to the tightening torque and secure fit of the cable.
- ▶ Connection with clamping bracket (U-shape):
 - Only use clamping brackets according to the type drawing.
 - Pay attention to the tightening torque and the tight fit of the cable.
- ▶ Plug connection:
 - Ensure that the flat receptacle on the flat plug is firmly seated.
 - Do not bend the connection when plugging it in.

4.3.3 Ground the thermostat

1. Depending on the application, assess whether and which components need to be integrated into the earthing concept.
2. Establish electrical connection.

5 Maintenance

- ▶ EGO Thermostats cannot be repaired.
A damaged thermostat has to be replaced by a completely new thermostat.

6 Disposal

- ▶ Do not dispose of the thermostat with household waste.
- ▶ Dispose of the thermostat in accordance with locally applicable regulations.

7 Technical data

For all data see type drawing and document “approved technical data”.

8 Contact

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