SEW EURODRIVE

Addendum to the Operating Instructions

Gear Unit Series R..7, F..7, K..7

Gear Unit Heating

Edition 03/2020

26611783/EN

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1 Important information

INFORMATION

This information complements the "SPIROPLAN® W Gear Units, R..7, F..7, K..7, K..9, S..7 Series" operating instructions.

A requirement of fault-free operation and fulfillment of any rights to claim under guarantee is that you adhere to the information in the operating instructions.

⚠ WARNING

Danger of electric shock.

Severe or fatal injuries.

- De-energize the oil heater before you start working on the unit.
- Secure the oil heater against unintended power-up.

⚠ CAUTION

Improper installation of the oil heater may result in damage to the gear unit.

Possible damage to property.

- Make sure that all the heating elements are fully immersed in the oil bath in order to avoid any damage.

⚠ CAUTION

The voltage at the heater and the thermostat must not exceed 230 V.

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2 Structure

An oil heater is required to allow for a smooth start-up in the event of a cold start at low ambient temperatures. The oil heater is available with an external or an integrated thermostat depending on the gear unit design.

However, a gear unit heater is only possible for mounting positions where the thermostat and the screw-in heater are sufficiently covered with oil. This is why the position of the heater and the thermostat varies depending on the type and the mounting position of the gear unit. The following table shows for which mounting positions you can use a gear unit heater:

Gear unit type	Mounting position					
	M1	M2	M3	M4	M5	M6
R..	–	–	X	X	–	–
F..	X	X	–	–	X	X
K..	X	–	X[1)]	X	X[2)]	X[2)]

1) possible as of size K..97

2) possible as of size K..167

Depending on the type and size of the gear unit, the gear unit heater can be equipped with an external or an integrated thermostat:

Gear unit type	Gear unit size									
	77	87	97	107	127	137	147	157	167	187
R..	I	I	I	I	–	E	E	–	E	–
F..	I	I	E	E	E	–	–	E	–	–
K..	I	I	E	E	E	–	–	E	E	E

I Heater with integrated thermostat

E Heater with external thermostat

– Size not available

2.1 Operating principle

The heater is screwed into the gear unit housing and is controlled via a thermostat. The trip temperature of the heater is set depending on the respective lubricant.

The thermostat built in via a special cover has an adjustable temperature range in which the oil is heated. The temperature range is preset by SEW-EURODRIVE and can be changed manually by the customer.

In order to prevent the oil from burning, the heating elements of the heater have a maximum surface load. This is why the heating process for cold gear unit oil can take between one and several hours. The duration of the heating process before the start depends on the following factors:

- Gear unit size
- Mounting position
- Oil quantity
- Ambient temperature

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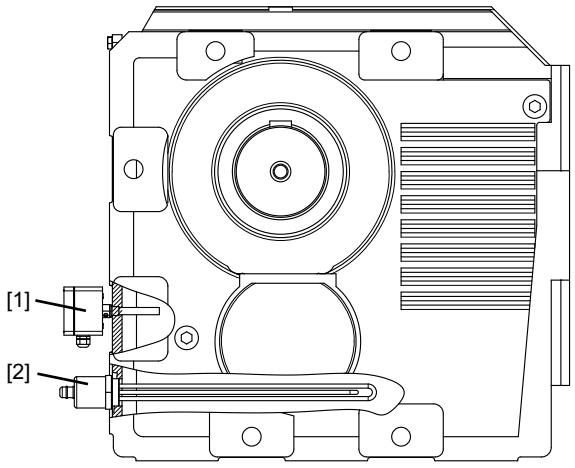
The thermostat has to be energized continuously, even if the drive is at a brief standstill. If the drive is at standstill over a longer period, for example during holidays, and the thermostat is not energized, you have to make sure that the thermostat is energized in due time before the drive is started up.

2.2 External thermostat

The following figure shows a gear unit with heater and external thermostat:



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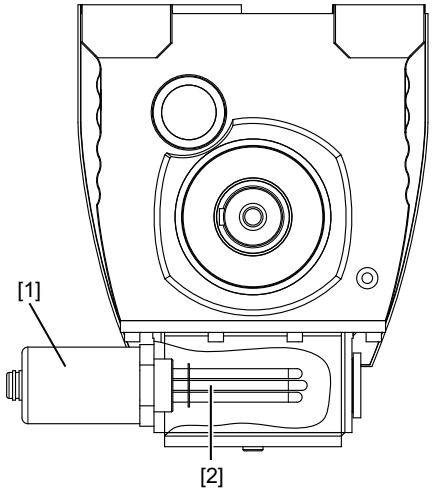
[1] Thermostat

[2] Heater

2.3 Integrated thermostat

The following figure shows the gear unit with integrated thermostat:



2060555403

[1] Thermostat

[2] Heater

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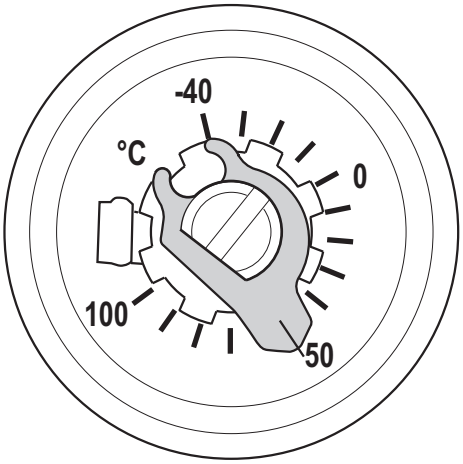
3 Thermostat

3.1 External thermostat

Depending on the lubricant, the AMTH-SW-2 thermostat with part number 19141238 is preset by SEW-EURODRIVE to one of the two temperature values:

Lubricant	Temperature value
CLP HC 220	0 °C
CLP HC 150	-5° C
CLP HC 68	-10° C
CLP HC 32	-15° C

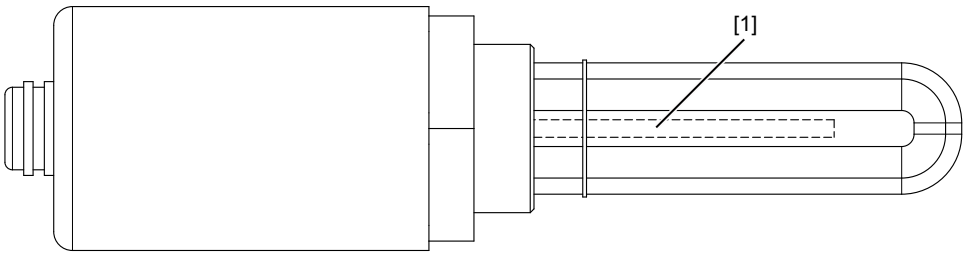
The following figure shows the possible setting range of the thermostat. In this example, the pointer is on 50 °C.



16834938379

3.2 Integrated thermostat

The C/Th/RE/3/G1½ heater is equipped with an integrated thermostat:



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[1] Heater

The temperature value is preset by the supplier. Irrespective of the lubricant, the value is 10 °C.

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The following table shows the integrated screw-in heaters:

Gear unit type			Screw-in heater						
			Heater	Thread	Connection voltage	Connection type	Power W	Cable gland	Wiring diagram
R77	F77	K77	C/Th/RE/3/G 1 1/2	G1 1/2	AC 230 V or AC 115 V/ 120 V	Series connection	180	Pg 16	A (→ 🖹 11)
R87	F87	K87							
R97	–	–	C/Th/RE/3/G 1 1/2	G1 1/2			270		
R107									
R137	F97	K97	C/RE/3/G1 1/2	G1 1/2			320		B (→ 🖹 12)
-	F107	K107	C/RE/3/G1 1/2	G1 1/2			400		
R147	F127	K127	C/RE/3/G1 1/2	G1 1/2			520		
R167	F157	K157	C/RE/3/G1 1/2	G1 1/2			700		
–	–	K167	C/RE/4/G2	G2		Parallel connection	1000		C (→ 🖹 13)
		K187	C/RE/4/G2	G2			1300		

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4 Thermostat – electrical connection

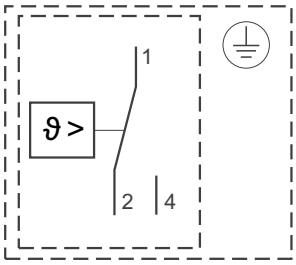
⚠ WARNING

Risk of injury due to electric shock.

Severe or fatal injuries.

- Disconnect the unit from the supply system if live parts can be touched during work on the unit.

The following figure shows the electrical connection.



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- Connect to terminals (1, 2 and 4) as shown in the wiring diagram
- Connect the protective earth to terminal "PE"

INFORMATION

- Observe the manufacturer's documentation.

5 Startup/operation

The gear unit heater comes equipped with cable glands and jumpers. These are included in the delivery of the screw-in heaters and are already preassembled. The gear unit heater is connected to the current supply via terminal studs. They do not depend on the size of the heater and always have an M4 thread. We recommend using RKS4 ring cable lugs with small grommets.

⚠ CAUTION

Malfunction of the gear unit heater due to change of the mounting position.

Possible damage to property.

- Do not change the mounting position without prior consultation with SEW-EURODRIVE, otherwise proper functioning of the gear unit heater is no longer ensured.

Notes on the function of the oil heater

- The thermostat is preset to the temperature specified in chapter "Thermostat" (→ 🗎 7). The thermostat turns off the oil heater at this temperature. The thermostat activates the oil heater again once the temperature is about 3 K below the limit temperature. The gear unit may only be taken into operation when the temperatures set in the thermostat have been reached or when the gear unit oil has been heated by the oil heater for at least 3 hours. Contact SEW-EURODRIVE for detailed project planning.
- Thermostat and oil heater are installed in the gear unit and are ready for operation. Before taking the thermostat and oil heater into operation, wire and connect them to the power supply.
- Contact SEW-EURODRIVE if a differing oil viscosity class is used or if ambient temperatures fall below the specified limit temperature.

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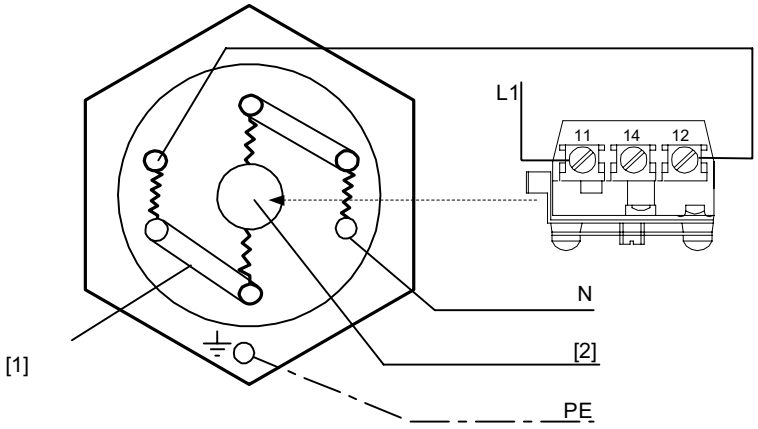
6 Technical data

6.1 A: C/Th/RE/3/G 1 1/2 screw-in heater

6.1.1 Connection diagram

AC voltage, single-phase, AC 230 V, series connection (view of the connection surface)



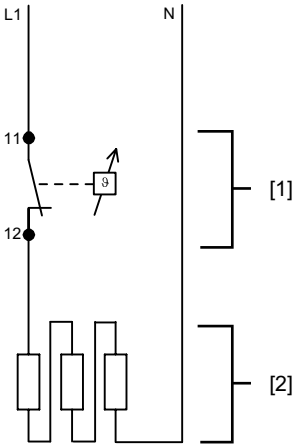
2060547723

[1] Jumpers

[2] Thermostat pipe

6.1.2 Wiring diagram

Observe the electrical characteristics of the control area.



2060549643

[1] Thermostat

[2] Heater

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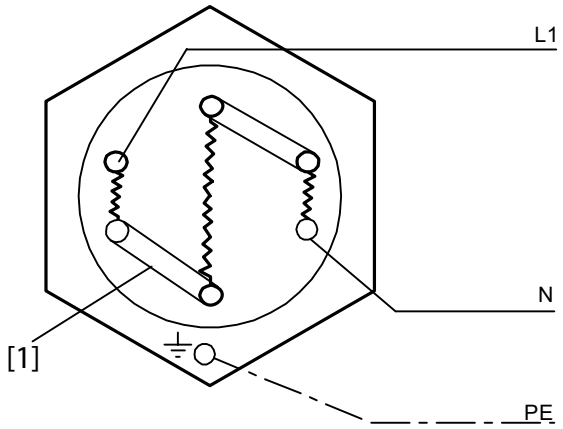
6.2 B: C/RE/3/G1 1/2 screw-in heater

6.2.1 Connection diagram

AC voltage, single-phase, AC 230 V, series connection (view of the connection surface)

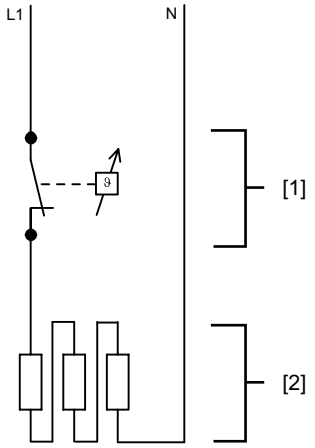


2060538123

[1] Jumpers

6.2.2 Wiring diagram

Observe the electrical characteristics of the control area.



2060540043

[1] Thermostat

[2] Heater

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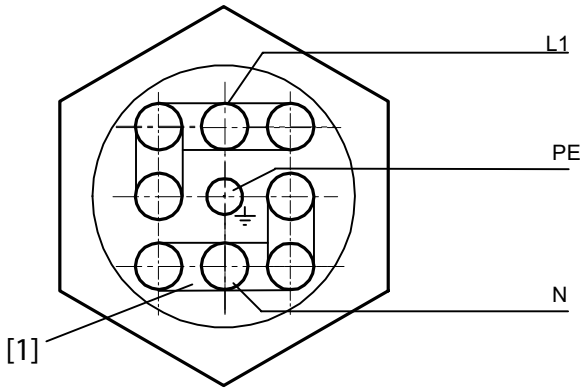
6.3 C: C/RE/4/G2 screw-in heater

6.3.1 Connection diagram

AC voltage, single-phase, AC 230 V, parallel connection (view of the connection surface)



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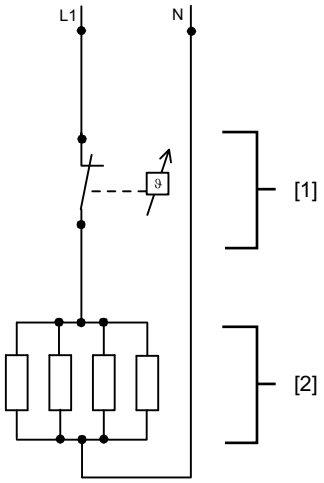
[1] Jumpers

6.3.2 Wiring diagram

Observe the electrical characteristics of the control area.



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[1] Thermostat

[2] Heater

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6.4 Thermostat

<table>
<tr><td colspan="4">Maximum switching capacity:</td></tr>
<tr><td rowspan="3">AMTHs-SW-2</td><td colspan="2">Current</td><td rowspan="2">Voltage</td></tr>
<tr><td>Terminal 2</td><td>Terminal 4</td></tr>
<tr><td>10 A</td><td>10 A</td><td>AC 230 + 10% cosφ = 1 (0.6)</td></tr>
<tr><td>0.25 A</td><td>0.25 A</td><td>DC 230 + 10%</td></tr>
<tr><td colspan="4">Contact reliability:
To ensure the greatest contact reliability possible, the manufacturer recommends a minimum load of AC/DC 24 V, 100 mA for silver terminals.</td></tr>
<tr><td colspan="2">Nominal impulse voltage:
Overvoltage category II</td><td colspan="2">2500 V
(via the switching contacts 400 V)</td></tr>
<tr><td colspan="2">Required fusing:</td><td colspan="2">See maximum switching current</td></tr>
</table>

- Permitted ambient temperature: -40˚ C to +80° C
- Permitted storage temperature: min. -50° C, max. +50° C
- Scale range: -40˚ C to +100° C
- Cable entry: M20x1.5 for a cable diameter of 6 to 13 mm
- IP65 degree of protection according to EN 60529

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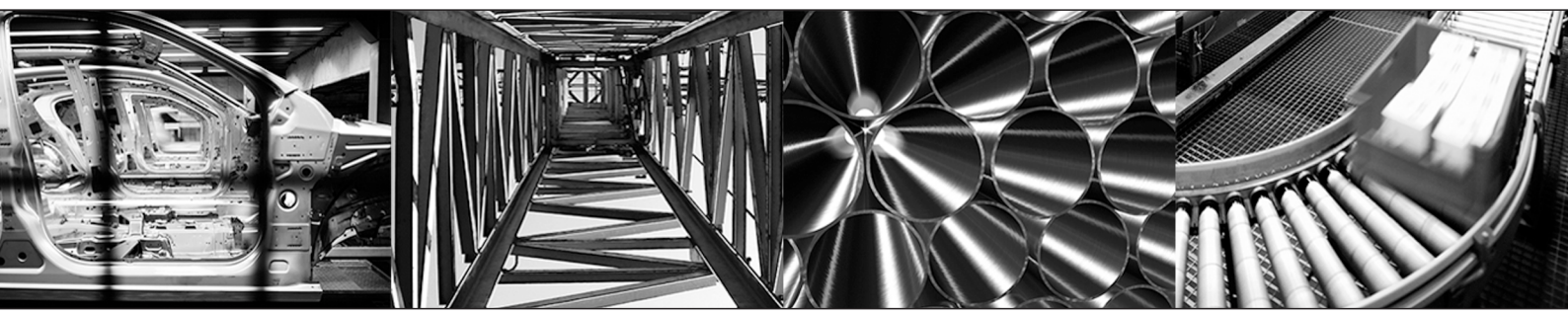

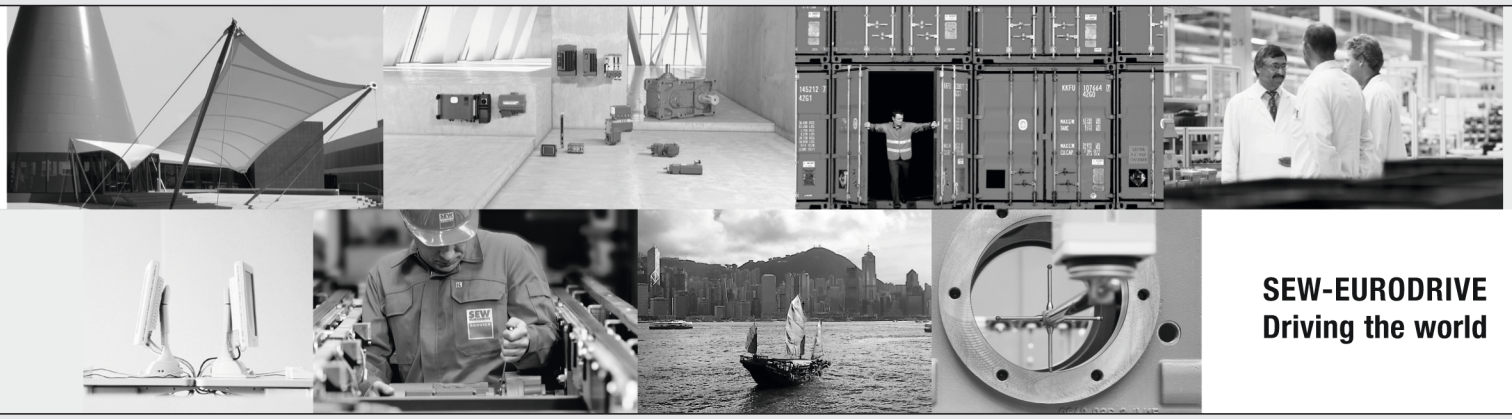

SEW-EURODRIVE
Driving the world

SEW-EURODRIVE GmbH & Co KG
Ernst-Blickle-Str. 42
76646 BRUCHSAL
GERMANY
Tel. +49 7251 75-0
Fax +49 7251 75-1970
sew@sew-eurodrive.com
➞ **www.sew-eurodrive.com**