Addendum to the Operating Instructions

Gear Units
R..7, F..7, K..7, K..9, S..7, SPIROPLAN® W Series
Oil-Air Cooler for Splash Lubrication /OAC

Edition 08/2013
1 Important information

INFORMATION

This addendum provides important additional information to the operating instructions for the "R..7, F..7, K..7, K..9, S..7, Spiroplan® W Gear Unit Series". Please observe the information specified in this document.

This document does not replace the detailed operating instructions.
2 Oil-air cooler for splash lubrication /OAC

2.1 Design

If the thermal rating of the naturally cooled gear unit is not sufficient, an oil-air cooling system can be used.

**INFORMATION**

- The following information applies to gear units with splash lubrication.
- Also refer to the original operating instructions of the cooling system manufacturer.

SEW-EURODRIVE uses oil-air cooling systems for standard gear units in sizes OAC 005 and OAC 010.

The following figure shows an example of a standard parallel-shaft helical gear unit next to an oil-air cooler.

![Diagram of gear unit and oil-air cooler]

- [1] Motor for pump and fan
- [2] Oil-air heat exchanger
- [3] Temperature switch with two switching points
- [4] Suction pipe connections
- [5] Pressure pipe connections
- [6] Option: Oil expansion tank connection

The following figure shows the unit structure:

![Diagram of unit structure]
2.2 General information

The cooling system is delivered without electrical wiring and piping as a complete unit on a base frame for separate installation.

The standard scope of delivery of the cooling system includes:

- Pump with directly mounted asynchronous motor
- Oil-air heat exchanger
- Temperature switch with two switching points

The customer has to carry out the following electrical wiring:

- Wiring between the temperature switch and the motor for the pump and fan
- Wiring the motor for the pump and fan
2.3 **Function**

2.3.1 /TSM-2-55NO temperature switch

- At the first switching point (at 55 °C oil temperature), the motor for the pump and fan of the oil-air cooler is switched on.
- At the second switching point (at 90 °C oil temperature), either a warning signal is activated or the main drive is switched off.

2.3.2 Pump

When the pump is operated, a pressure control valve in the cooler limits the plant pressure to 5 bar.

**NOTICE**

An incorrectly set valve can damage the gear unit.
- Gear unit failure

Do not change the factory setting of the pressure control valve.

2.4 **Sizes, cooling capacity, selection**

The power data of the standardized cooling systems is summarized in the following table.

The specified cooling power ratings are valid under the following conditions:
- Air temperature 40 °C
- Oil temperature 70 °C
- Grid frequency 50 Hz

<table>
<thead>
<tr>
<th>Size of the cooling system</th>
<th>OAC 005</th>
<th>OAC 010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling power of the cooling system [kW]</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Oil flow rate of the cooling system [l/min]</td>
<td>16</td>
<td>29</td>
</tr>
<tr>
<td>Connected load of the motor for the pump and fan [kW]</td>
<td>0.75</td>
<td>0.75</td>
</tr>
<tr>
<td>Motor voltage 50 Hz [V]</td>
<td>230 / 400</td>
<td>230 / 400</td>
</tr>
<tr>
<td>Motor voltage 60 Hz [V]</td>
<td>276 / 480</td>
<td>276 / 480</td>
</tr>
<tr>
<td>Sound pressure level [dB]</td>
<td>71</td>
<td>71</td>
</tr>
<tr>
<td>Oil fill quantity of oil-air cooler [l]</td>
<td>1.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Weight [kg]</td>
<td>38</td>
<td>38</td>
</tr>
</tbody>
</table>
2.4.1 Wiring diagram of sizes OAC 005 / 010

Control circuit main motor

L1

F1
S0
Emergency off

S1
K3
Main contactor "On" for main motor control

K3

Control circuit temperature switch

F2
S0
Emergency off

T1
T2

Closes at \( \Theta_{oil} > 55^\circ C \)
Opens at \( \Theta_{oil} > 90^\circ C \)

Temp. signal to main motor control/warning: switch off

K1
K2

Main circuit main motor

L1
L2
L3

F3

K3

Main motor control

M1

Main motor

M

Motor for pump and fan

M2

L1

F4

K1

Switch on if \( \Theta_{oil} > 55^\circ C \)

Emergency off

S0

PE

Motor for pump and fan
2.5 Mechanical connection

Connect the heat exchanger to the cooling circuit according to the identifying markings observing local regulations.

In this respect, observe the following:

- Do not reduce the specified cable cross sections.
- It is important that you choose the correct wall thickness and material when selecting pipes, hoses and screw fittings.

2.6 Electrical connection

Make the electrical connections for the temperature switch and the motor for the pump and fan according to local regulations.

- Make sure that the pump rotates in the correct direction.
- The following responses have to be tripped at the switching points of the temperature switch:
  
  **Switching point 1**
  - Switch at switching point 1 closes if $T > 55 \, ^\circ\! C \rightarrow \text{COOLER ON}$
  - Switch at switching point 1 opens if $T < 55 \, ^\circ\! C \rightarrow \text{COOLER OFF}$

  **Switching point 2**
  - Switch at switching point 2 opens if $T > 90 \, ^\circ\! C \rightarrow \text{GEAR UNIT STOP or WARNING}$
  - Switch at switching point 2 closes if $T < 90 \, ^\circ\! C \rightarrow \text{GEAR UNIT ENABLED}$
2.7 Installation and connection information

NOTICE
Damage to the gear unit due to improper installation of the oil-air cooler.

Gear unit failure
• Install the oil-air cooler in such a way that input and output air can flow unobstructed.
• Ensure sufficient protection from dirt for the oil-air cooler.

Adhere to the following basic conditions when connecting the cooling system:
• Provide for a low-vibration installation site.
• The cooling system and the gear unit are set up separately as standard. The distance between the gear unit and the cooling system must not exceed 1 m.
• The cooling system must be installed at the same level as the gear unit or lower. If this is not possible, contact SEW-EURODRIVE.
• Do not reduce the specified cable cross sections.
• It is important that you choose the correct wall thickness and material when selecting pipes, hoses and screw fittings. Preferably use screw fittings with non-metallic gaskets.

SEW-EURODRIVE recommends the following cable cross sections for connecting the cooling system to the gear unit and the cooling circuit.

<table>
<thead>
<tr>
<th>Size of cooling system</th>
<th>Pump suction connection</th>
<th>Suction pipe(^1))</th>
<th>Cooler pressure connection</th>
<th>Pressure pipe(^2))</th>
</tr>
</thead>
<tbody>
<tr>
<td>OAC 005</td>
<td>G 1 1/4&quot;</td>
<td>DN32</td>
<td>G 1&quot;</td>
<td>DN25</td>
</tr>
<tr>
<td>OAC 010</td>
<td>G 1 1/4&quot;</td>
<td>DN32</td>
<td>G 1&quot;</td>
<td>DN25</td>
</tr>
</tbody>
</table>

1) max. length 1.5 m
2) max. length 2.5 m

INFORMATION
The dimensions of the oil-air cooler are specified in the original operating instructions of the respective cooling system manufacturer.

More detailed technical data of the several cooling systems are available from SEW-EURODRIVE on request.
2.8 Notes on checking the oil level

NOTICE
Incorrect oil fill damages the gear unit

Gear unit failure
- Note that the use of an oil-air cooler affects the oil level in the gear unit. The fill quantity on the nameplate of the gear unit must be increased by the oil fill quantities of the cooling system and the connection pipes.
- Fill the gear unit with the oil grade specified on the nameplate.

When the gear unit is connected to an oil cooling system, the oil fill quantity changes.

For the oil fill quantity of gear units with oil-air cooler applies:

Oil fill quantity of the system = oil fill quantity of the gear unit (see nameplate) + oil fill quantity of the cooling system (1.8 l) + volume of the pressure and suction pipes (depends on their length).

Check the oil level before startup. Observe the chapters "Checking the oil level" and "Checking the oil level and changing the oil in the " R..7, F..7, K..7, K..9, S..7, SPIROPLAN® W Gear Unit Series" operating instructions of the main drive.