OVUR-type oil separator
2110, 3211, 4113
OVUR-type oil separator

Installation, operation and maintenance manual

Design
In principle, the oil separator consists of a shell with an end cover. Nozzles are welded in the shell. On delivery, the nozzles are blanked off with seal caps, which protect against moisture and dirt during transport and storage.

Application
The oil used in the compressor for lubrication, sealing and cooling of compressor block is mixed with the refrigerant gas and together they are transferred to the oil separator.

In the oil separator, oil and gas are separated and the now almost oil-free gas leaves the compressor unit through discharge branch.

Product description
In the separator, filter elements separate the oil from the gas, of which the major part is separated in the demisters and drained to the bottom of the oil separators. The separated oil is returned to the compressor through a special oil return system.

If ordered, there is a fine separator element. The remaining oil in the gas is separated in the fine separator element and returned to the compressor through the oil return. Normally, it is superfluous to remove or replace the fine separator element but at increasing oil consumption, it is possible to inspect the filter or extract it through the flange.
<table>
<thead>
<tr>
<th>OVUR-type</th>
<th>OD</th>
<th>A</th>
<th>C</th>
<th>D</th>
<th>F</th>
<th>I</th>
<th>K</th>
<th>Y</th>
<th>N1 DN Outlet</th>
<th>N2 DN Outlet</th>
<th>M</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>2110</td>
<td>Ø 219.1</td>
<td>1073</td>
<td>407</td>
<td>49</td>
<td>50</td>
<td>70</td>
<td>120</td>
<td>528</td>
<td>50</td>
<td>50</td>
<td>M12x40</td>
<td>50 Nm</td>
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<tr>
<td>3211</td>
<td>Ø 323.9</td>
<td>1148</td>
<td>435</td>
<td>71</td>
<td>46</td>
<td>102</td>
<td>160</td>
<td>557</td>
<td>65</td>
<td>65</td>
<td>M16x50</td>
<td>120 Nm</td>
</tr>
<tr>
<td>4113</td>
<td>Ø 419.0</td>
<td>1360</td>
<td>510</td>
<td>95</td>
<td>70</td>
<td>150</td>
<td>120</td>
<td>665</td>
<td>100</td>
<td>100</td>
<td>M20x55</td>
<td>240 Nm</td>
</tr>
</tbody>
</table>

Diagram showing dimensions and features of the OVUR-type oil separator, including:
- **1/4" NPT**: For installation.
- **1/2" R.G**: Drain line.
- **Oil drain**.
- **3/4" R.G**: Safety valve.
### Shipping

The oil separator must be blanked off and primed on delivery. The primer is not intended for outdoor storage. If the oil separator is not put into immediate service, take precautions against corrosion or contamination.

Only lift the oil separator when it is empty, and make sure it is not subjected to strokes or bumps during transport. When lifting the oil separator before it is built into the unit, always use straps around the shell.

The weight is stated in the technical data.

A shipping description can be made when the oil separator is built together with the unit.

### Installation

The site and personal protection must be in accordance with EN 378-3 or national requirements.

Check the oil separator immediately upon receipt for any damage occurred during transport. If the oil separator is damaged, it must not be installed and started.

When placing the oil separator, make sure there is enough space for inspection, maintenance, escape and emergency.

Foundations must be sufficiently robust, as their purpose is to provide permanent support without settling and to absorb any normal vibrations from outside causes.

The OVUR oil separator type is for vertical installation.

Blanked off branches must be cut off at the cutting groove depending on metal thickness on adjoining tubes. Make sure that no dirt or other unknown elements enter the oil separator during installation.

### Connection possibilities

<table>
<thead>
<tr>
<th>Connection nominal diameter</th>
<th>Connection external diameter OD</th>
<th>Standard connection thickness DIN 2448</th>
<th>Connection possibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN</td>
<td>inch</td>
<td>60.3</td>
<td>2.9</td>
</tr>
<tr>
<td>50</td>
<td>2</td>
<td></td>
<td>2.9</td>
</tr>
<tr>
<td>65</td>
<td>2½</td>
<td>76.1</td>
<td>2.9</td>
</tr>
<tr>
<td>100</td>
<td>4</td>
<td>114.3</td>
<td>3.6</td>
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</table>

### Description

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>ST 45.8 DIN 17175</td>
<td>Shell</td>
</tr>
<tr>
<td>ST 45.8 DIN 17175</td>
<td>Nozzle</td>
</tr>
<tr>
<td>P265 GH</td>
<td>End cover</td>
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</tbody>
</table>
Do not remove protective plugs and covers until immediately before installation.

The entire system must be clean before starting the operation. When fitting the tube connections, make sure that stress in the oil separator during test, operation and standstill does not exceed the allowable values. Vibrations must be minimised, possibly by means of vibration dampers.

Apart from branch connections, welding must not be carried out on the oil separator.

The oil separator must be secured against exceeding the allowable pressures and temperatures.

All outer surfaces must have a corrosion resistant surface coating to allow the oil separator to be installed in certain environments without it causing corrosion.

**Safety equipment**

Before the oil separator is put into operation, it must be provided with safety equipment. The manufacturer of the refrigeration plant is responsible for the safety equipment as it is not included in the oil separator delivery.

**Start-up and operation**

Before start-up, make sure that all connections are tight.

To avoid accidents or personal injury, the person responsible for the plant must make sure that the operating staff is duly trained and instructed before the refrigeration plant is started. The instruction should be based on the unit instruction manuals and should include instructions in construction, supervision, operation and maintenance of the system as well as the handling of used refrigerant.

Evacuation and charging with refrigerant must be carried out in accordance with the description in the unit instruction manual.

Before operation, the refrigeration plant must be leak tested and inspected by an authorised person.

Local safety and health regulations must be observed.

The authorised person makes a certificate which must be kept by the user.

**Bolted connections**

Normal relaxing of the gasketed joints may occur in the interval between testing at the manufacturer’s and installation on site. Therefore, all external bolted joints may require retightening after installation and, if necessary, after the vessel has reached operating temperature.

It is important that all bolted joints are tightened evenly and in a diametrically staggered pattern. All bolts must be tightened to the same torque using a torque wrench.
**Maintenance**

The oil separator should be inspected at the inspection intervals stated in the compressor specification. Only qualified personnel must carry out inspection.

Operating experience will determine how often inspection of the oil separator is needed. It depends on the operating conditions. Johnson Controls Denmark recommends inspection to be carried out in monthly intervals during the running-in period. After a running-in period of six months, a maintenance plan must be made. Johnson Controls Denmark recommends inspection to be carried out every third month as a minimum.

Do not disconnect or tighten connections when the equipment is under pressure.

Periodic inspection during the service life of the oil separator must meet the requirements of national legislation or EN 378-2. Correspondingly, a visual inspection of connections, outer surfaces, bases, the vibration damper and safety equipment must be carried out.

If corrosion, erosion or other weaknesses in the oil separator are found, the oil separator must be inspected by a qualified authorised third party, who will provide the necessary permission to continue using the oil separator. If repair is requested, approved personnel together with a qualified third party and Johnson Controls Denmark will carry this out. If permission to continue using the oil separator is not granted, the oil separator must be scrapped.

**Disassembly for inspection or cleaning**

Before disassembly, the user must make sure that the oil separator has been depressurised, vented and drained, neutralised and/or purged of hazardous material.

**Gasket connections**

Gasket and gasket surface should be thoroughly cleaned and free of scratches and other defects. The gasket should be properly positioned before attempting to retighten bolts. When an oil separator is dismantled for any cause, it must be reassembled with new gaskets. This will prevent further leaks and/or damage to the gasket-seating surface of the oil separator.

**Spare parts and replacement parts**

Spare parts and replacement parts can be ordered directly from Johnson Controls Denmark. When ordering parts, please provide the name of the needed part as well as the oil separator serial number, type, size and other information from the name plate.

**Environmentally correct removal**

The oil separator does not contain environmentally damaging material such as asbestos, mercury or heavy metals.

All parts of the oil separator can be re-used after being scrapped.

- Refrigerant and oil must be drained off before destruction
- All steel materials can be used again after remelting
- During the re-melting process, coating will disappear without damaging the environment