



OM3 **TRAXOIL**  
Electronic Oil Level  
Management System  
Technical Data

Document no.: A3.5.054/E 00  
replacement for:  
Date: 01.10.2004

### Electronic oil level management system with alarm function and compressor shut down

#### Features

- IP 65 rating due to molded housing and new electrical connection with molded cable Assemblies
- 3 Zone 100% Level Control by using precise Hall-sensor measurement, not prone to errors by foaming or light like optical sensors
- CE marking under Low Voltage and EMC Directive
- SPDT output contact for compressor shut down or alarming, rating 230VAC/3A
- Easy installation by sight-glass replacement and front side mounting without nuts
- Self contained unit with oil level sensor and integral solenoid to manage oil level supply
- Alarm, status and 3 zone indication by LED's
- Supply 24 V AC, 50/60 Hz
- Adapters suitable for various types of compressors
- Sacrificial magnet for reliable operation
- Recommended by leading compressor manufacturers

#### Introduction

Maintaining proper oil level is of primary importance for a long compressor lifetime. Especially when paralleling compressors in compressor pack applications, maintaining sufficient oil in the compressor's crankcase becomes difficult. A simple way of balancing the oil level in parallel compressor arrangements is the use of oil equilibrium lines. These systems are also referred to as *passive systems*. However, passive systems require individual tailoring for each application and they only perform satisfactorily under more or less constant operating conditions. Particularly in refrigeration applications with varying operating conditions and defrost cycles an active means of oil level management is a must in order to ensure reliable compressor operation.

An additional benefit of active systems is that, apart from oil balancing, they normally also monitor the oil level and provide alarming capabilities. This is a particular benefit for scroll compressors which, due to the lack of an integral oil pump, do not have a differential oil pressure switch as conventional compressors have.

The OM3 TraxOil system is a self-contained system which provides both functions, oil level monitoring and oil level balancing, for active oil level management systems.

#### Description

OM3 TraxOil uses a Hall-Sensor to measure the oil level and its electronics controls an integrated solenoid valve which feeds missing oil directly into the compressor sump. If the oil level drops into the **red zone** (see page 2 for more details) OM3-TraxOil shows an alarm signal and the alarm contact changes into alarm state. The latter may be used to shut down the compressor. In the Alarm status the OM3 Traxoil is still feeding oil into the compressor. If the oil level comes back to normal, the Alarm will be reset.



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### Electronic Oil Level Management System

An indicator float inside the OM3 TraxOil system is equipped with a magnet and changes its position according to the oil level. Through the variation in the magnetic field the position of the float is monitored by the Hall Sensor. The integrated electronics takes care of the levels for alarming and solenoid control as described below.

#### Operation

The Level control is divided into 3 Zones. The green LED indicates that Oil level is within the normal limit (**green Zone, 40-60% sight glass height**) and only the green LED is on. On reaching the "Fill level" OM3 Traxoil is starting after 10 sec. delay to fill oil into the crankcase of the compressor and the yellow LED is switched on. The time delay of 10 sec. is for some applications/compressor types necessary to avoid overfilling of the compressor. During the start of a compressor the oil level can vary much and quickly and although there is enough oil in the compressor the fill level is reached and would lead to immediate oil injection. If this happens frequently the result could be overfilling.

Should the oil level reaching the yellow zone although oil is injected the green LED will go off and the yellow is now indicating Oil level in the **yellow Zone (25-40% sight glass height)**. The yellow Zone could be understood as a warning zone. Reason that oil level reaches the yellow Zone could be that the Oil separator is not working properly or the compressor is throwing more oil into the circuit than the OM3 can feed into the crankcase of the compressor for compensation. Alco recommends to have the OM3 TraxOil permanently under power supply also during stand-by and shut-off mode.

Should the system fail to reach oil level within **green or yellow zone**, OM3 TraxOil will interpret this as a fault in the oil supply system and the float reaches now the **red zone (<25% sight**



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glass height). Consequently, the alarm relay will open and the red LED will illuminate after a time delay of 20 sec. In this condition OM3-Traxoil is still feeding oil into the crankcase of the compressor and subsequently the yellow LED is on.

Depending on the external wiring of the cable OM3-N\_\_ the compressor may be shut down automatically. See Table 1 for complete functional explanation and LED configuration.

**Sight-Glass Level Control Zones**

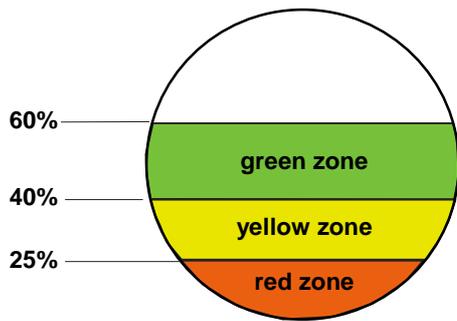


Table 1

LED	Status / Function
● Green	Oil Level in green zone (60 - 40%)
● Green ● Yellow	Oil Level in green zone (60 - 40%) & Injection
● Yellow	Oil Level in yellow zone (40 - 25%) & Injection
● Red ● Yellow	Oil Level in red zone (25 - 0%) & Injection

**Applications**

The OM3 TraxOil system is applicable to low and **high pressure oil management systems**. Traditional oil level management systems work with a low pressure oil reservoir. The oil is kept at a pressure slightly above suction pressure by a differential pressure valve. A possible configuration is shown below:

**High pressure systems** store the oil at compressor discharge pressure. The advantage of this is that these systems do not need a separate oil receiver but make use of a combined oil separator/reservoir arrangement. This normally results in a cost saving over traditional systems.

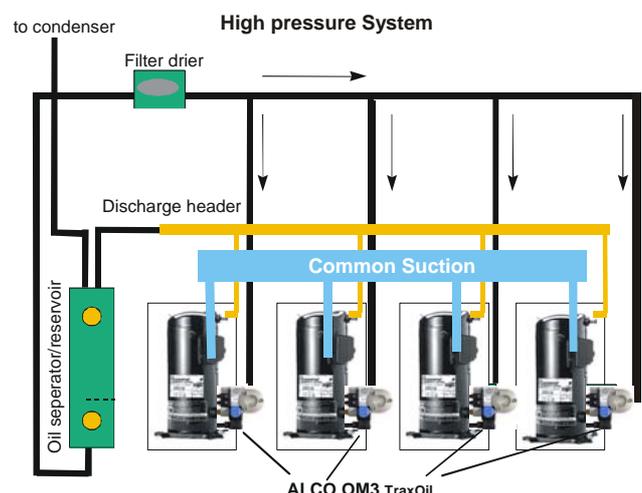
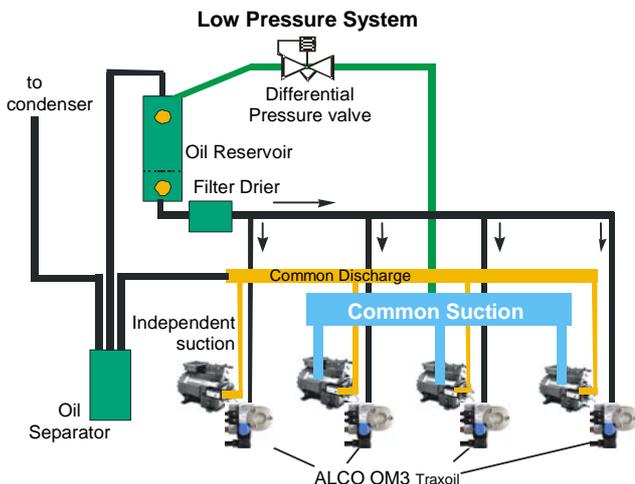
**Traditional low pressure oil level management system**

The oil separator is connected downstream of the discharge line. After separation, the refrigerant flows to the condenser while the oil flows to the oil receiver. The pressure inside the oil receiver is controlled by the differential pressure valve. When the integrated solenoid of OM3 TraxOil opens then oil will flow to the compressors crankcase. Note that OM3 TraxOil contains an own inbuilt strainer. However, an additional oil filter/filter-dryer (i.e. ADK Series) in the common oil supply line is recommended for reliable system operation. The differential pressure required for sufficient oil flow from the oil receiver to the compressor is system specific. For most applications, a value of 3.5 bar will give satisfactory results, whereas 1.4 bar can be regarded as a minimum required value. A suitable valve with a differential pressure of 3.5 bar is available from ALCO, refer to the Accessories Section for further details.

**High pressure oil level management system**

From an application point of view, high pressure systems are more critical than traditional low pressure systems. There must be a separator/reservoir installed with a sufficient size and Oil content that there is always Oil stored and thus avoiding discharge gas entering the crankcase of the compressor which could lead to some negative effects like higher discharge and oil temperatures, less of lubrication capability and the loss of efficiency due to hot-gas bypass.

OM3 TraxOil is designed for applications with low and high pressure systems.





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**Selection Chart**

**Complete systems**

Complete systems come as a packages consisting of OM3 TraxOil base unit, adapter flange, O-rings and with an ALCO ASC coil. Depending on the compressor type for which the OM3 is to be used different adapters are supplied with the system.

Cable Assemblies for Power Supply/Solenoid and Relay have to be ordered separately.

Type	PCN	Compressors	Weight
<b>OM3-CUA</b> flange adapter 3-/4-hole	<b>805 030</b>	<b>Arctic Circle</b> G2, G4, G6 <b>Bitzer</b> 4VC, 4TC, 4PC, 4NC, 4J, 4H, 4G, 6J, 6H, 6G, 6F, 8GC, 8FC <b>Bock</b> HA, HG (except HG/HA-12/22/34, see OM3-CBB), O-series <b>Copeland</b> D2, D3, D4, D6, D9, 4CC, 6CC <b>Dorin</b> all KP, K sizes (except those mentioned under OM3-CBB) <b>Frascold</b> Series A, B, D, F, S, V, Z	0,91 kg
<b>OM3-CBB</b> screw adapter 1-1/8"-18 UNEF	<b>805 032</b>	<b>Bitzer</b> 2KC, 2JC, 2HC, 2GC, 2FC, 2EC, 2DC, 2CC, 4FC, 4EC, 4DC, 4CC, <b>Bock</b> HA12/22/34, HG12/22/34 <b>Dorin</b> all H, K100CC/CS, K150CC/CS, K180CC/CS, K200CC, K230CS, K235CC, K240SB, K40CC, K50CS, K75CC/CS- <b>L'Unite Hermetique</b> TAH, TAG <b>Maneurop</b> LT, MT, SM, SZ	0,86 kg
<b>OM3-CCA</b> screw adapter 3/4"-14 NPTF	<b>805 033</b>	<b>Bitzer</b> ZL, ZM <b>Copeland</b> ZB, ZF, ZS	0,85 kg
<b>OM3-CCB</b> screw adapter 1-1/8"-12 UNF	<b>805 034</b>	<b>Copeland</b> DK, DL	0,87 kg
<b>OM3-CCD</b> Rotalock adapter 1-3/4"-12 UNF	<b>805 031</b>	<b>Copeland</b> ZR 90 to ZR19M ZR 250 to ZR 380 ZRT 180K to 760K, ZRU 280K-560K, ZRY480K-1140K	0,93 kg
<b>OM3-CCC</b> flange adapter 3-hole	<b>805 035</b>	<b>Copeland</b> D8D, D8S_ (except D8SJ and D8SK, installation only on one sight glass possible due to higher cylinder head)	0,92 kg

Other adapter types on request!

**Cable Assemblies for OM3**

Type	PCN	Connection to ..	Temperature Range °C	Cable length mtr.	Gewicht
<b>OM3-P30</b>	<b>805 151</b>	<b>Power Supply and Solenoid</b>	<b>-25/+80</b>	<b>3,0</b>	0,24 kg
<b>OM3-P60</b>	<b>805 152</b>			<b>6,0</b>	0,25 kg
<b>OM3-N30</b>	<b>805 141</b>	<b>Relay</b>		<b>3,0</b>	0,13 kg
<b>OM3-N60</b>	<b>805 142</b>			<b>6,0</b>	0,14 kg

**Accessories and Spare Parts**

Typ	Art.-Nr.		Gewicht
<b>ECT-523</b>	<b>804 332</b>	<b>Transformer 230 VAC / 24VAC, 20 VA</b> (supply of 1 pcs. OM3)	0,82 kg
<b>ECT-623</b>	<b>804 421</b>	<b>Transformer 230 VAC / 24VAC, 50 VA</b> (supply of 3 pcs. OM3)	1,20 kg
<b>ODP-33A</b>	<b>800 366</b>	<b>Differential Oil check valve 3.5 bar</b> (Inlet 5/8"-UNF female, outlet 5/8"-UNF male)	0,14 kg
<b>ASC 24VAC</b>	<b>801 052</b>	<b>Solenoid coil 24 VAC, 50/60 Hz, 15VA</b>	
<b>OM0-CUA</b>	<b>805 037</b>	<b>Flange adapter 3-/4-hole</b>	
<b>OM0-CBB</b>	<b>805 038</b>	<b>Screw adapter 1-1/8"-18 UNEF</b>	
<b>OM0-CCA</b>	<b>805 039</b>	<b>Screw adapter 3/4"-14 NPTF</b>	
<b>OM0-CCB</b>	<b>805 040</b>	<b>Screw adapter 1-1/8"-12 UNF</b>	
<b>OM0-CCC</b>	<b>805 041</b>	<b>Flange adapter 3-hole</b>	
<b>OM0-CCD</b>	<b>805 042</b>	<b>Rotalock adapter 1-3/4"-12UNF</b>	
<b>OM3-K01</b>	<b>805 036</b>	<b>Repair Kit for all types</b> (consists of all necessary gaskets, coil clip, oil adapter with screen, sightglas)	0,26 kg



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**Ordering Information (e.g. Copeland D6)**

For a complete system the following parts are needed:

1. OM3-CUA PCN 805 030 Oil Management System
2. OM3-P30 PCN 805 151 Cable Assembly Power Supply and Solenoid 3.0m
3. OM3-N30 PCN 805 141 Cable Assembly Relay 3.0m
4. ECT-523 PCN 804 332 Transformer 230 Vac / 24 VAC, 20 VA
5. ODP-33A PCN 800 366 Differential oil check valve 3.5 bar

**Electrical Wiring**

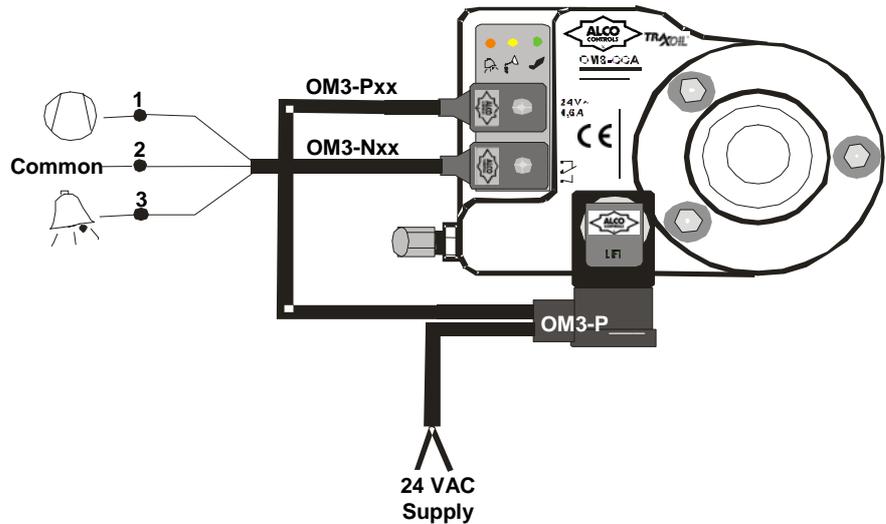
**Relay Connector OM3-Nxx connection**

- 1 = blue (open in Alarm)
  - 2 = black (common)
  - 3 = brown (closed in Alarm)
- (do not connect compressor directly to OM3 but via a separate conductor.)

**Power supply OM3-Pxx = 24 VAC**

**Note:**

Alco recommends to have the OM3 permanently under power supply also during stand-by and shut-off mode.



**Technical Data**

CE marked under: Low Voltage Directive	73/23EC-changed by 93/68EC
EMC Directive	89/336/EC changed by 91/263EC, 92/31EC, 93/68EC
Max. working pressure PS:	31 bar
Max. test pressure PT:	35 bar
Burst Pressure:	175 bar
Supply voltage / Current	24 VAC, 50/60 Hz, +10/-15%, 0,7A
ALCO ASC 24 VAC, 50/60 Hz	15 VA
Solenoid valve MOPD	20 bar
Vibration resistance (EN60068-2-6)	max. 4g, 10....250Hz
Medium temperature	-20 to 80°C
Ambient/Storage temperature	-20 to 50°C
Medium compatibility	HCFC, HFC, mineral, synthetic and ester lubricants
Protection class	IP 65 (IEC529/EN 60529)

Orientation of base unit:	Horizontal, +/- 1°
Level control:	40% to 60% Sight glass height
Applied Standards:	EN 12284 , EN 378, EN 61010 and EN 61326
Flow rate at ΔP=3,5 bar	0,9 ltr/min. water at 20°C ambient
Time Delay Alarm:	20 sec.
Time Delay Filling:	10 sec.
Weight	730 – 780 g
Alarm contact:	max. 3 A, 230 VAC SPDT dry contact
Body and Adapter material	Aluminum (EN AW 6060)
Screws	stainless Steel (ISO 4762)
Sight Glass	nickel-plated Steel (S235JR / DIN EN 10027)
Oil connection	7/16"-20 UNF male, with strainer and O-Ring (replaceable, see Acc.)

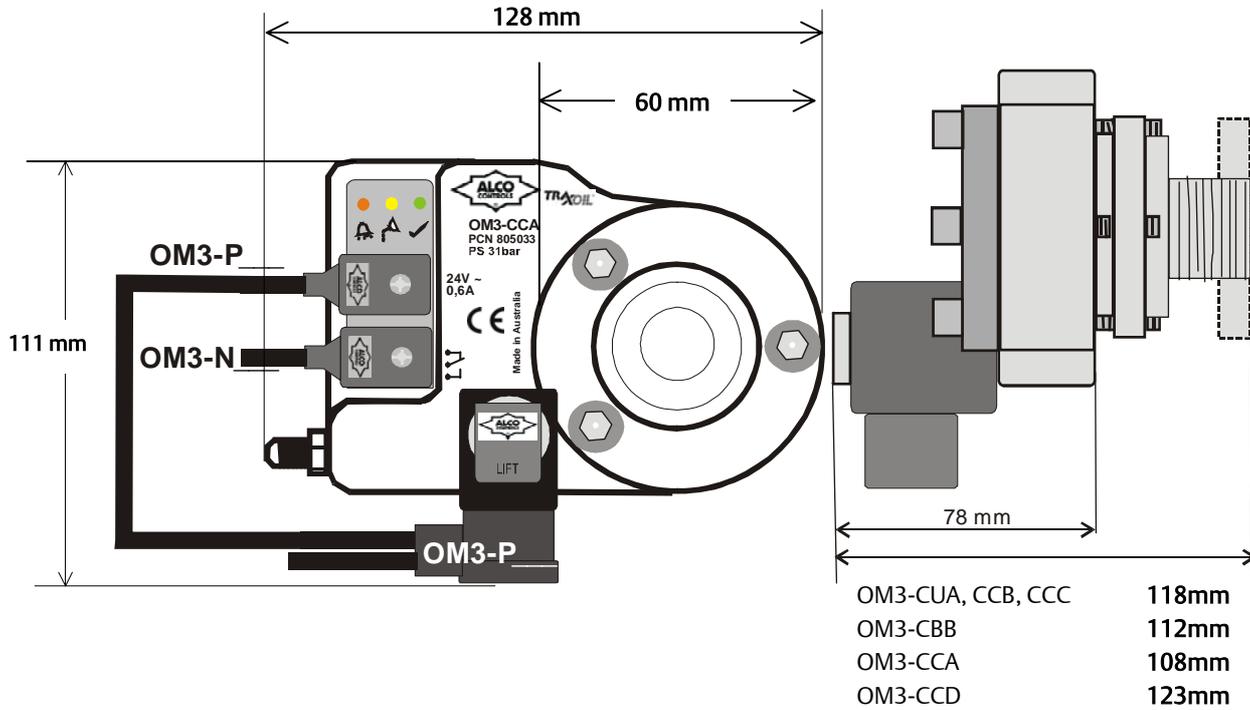


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**Dimensions in mm: (not to scale)**

➡ Base unit must be mounted horizontally for correct operation!  
 Max. Deviation +/- 1°





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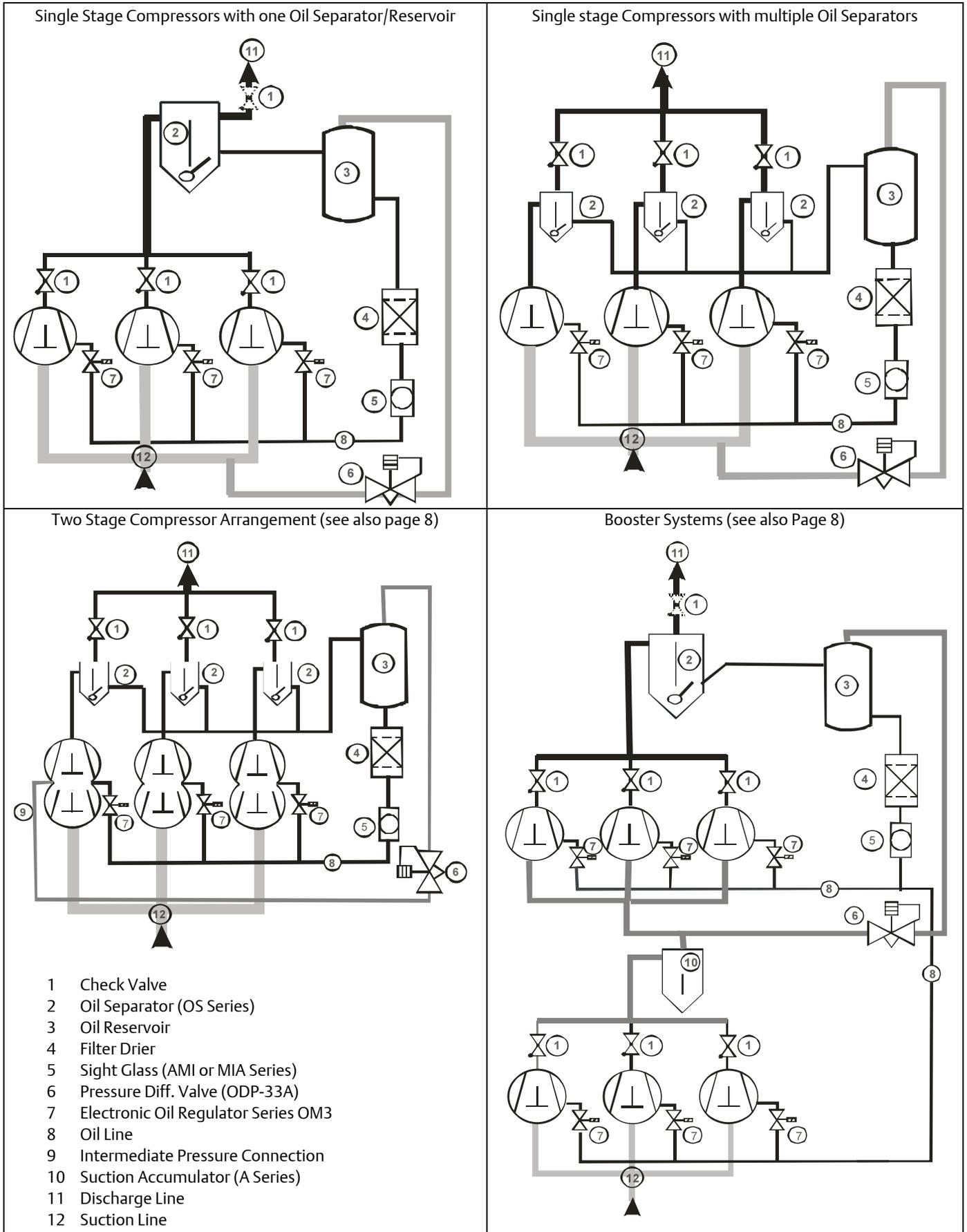
Adapters	Side view	Front view (facing compressor):
<p><b>OM0-CUA (805 037)</b> Flange adapter 3/4-hole  <i>as used in OM3-CUA (805 006)</i></p> <ul style="list-style-type: none"> <li>• Three holes <math>\varnothing</math> 6.9 mm, PCD 47.62</li> <li>• Four holes <math>\varnothing</math> 6.9 mm, PCD 50 mm</li> </ul>		
<p><b>OM0-CCA (805 039)</b> Screw adapter 3/4"-14 NPTF  <i>as used in OM3-CCA (805 008)</i></p> <ul style="list-style-type: none"> <li>• Additional flange ring for adapter / base unit connection (included)</li> </ul>		
<p><b>OM0-CCB (805 040)</b> Screw adapter 1 1/8"-12 UNF  <i>as used in OM3-CCB (805 016)</i></p> <ul style="list-style-type: none"> <li>• Additional flange ring for adapter / base unit connection (included)</li> </ul>		
<p><b>OM0-CBB (805 038)</b> screw adapter 1-1/8"-18 UNF  <i>as used in OM3-CBB (805 032)</i></p> <ul style="list-style-type: none"> <li>• Additional flange ring for adapter / base unit connection (included)</li> </ul>		
<p><b>OM0-CCD (805 042)</b> 1-3/4"-UNF</p> <ul style="list-style-type: none"> <li>• two piece Adapter consists of OM0-CCA and rotalock adapter 1-3/4"-12 UNF</li> </ul>		
<p><b>OM0-CCC (805 041)</b> 3 hole Flange Adapter</p>		
<p><b>ODP-33A (800 366)</b> Differential Pressure Valve</p> <ul style="list-style-type: none"> <li>• <math>\Delta p = 3,5</math> bar</li> </ul>		



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Typical Application Diagrams: (systems can have more devices installed which are not shown for simplicity reasons)





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**Two Stage Compressors**

On these type of Compressors the Oil in the Crankcase is exposed to the intermediate Pressure. For that reason the Differential pressure valve must be connected to this and not to the suction line.

**Booster systems**

These systems also require the installation of the Differential valve to the suction of the high pressure compressors (intermediate pressure). Oil separators will be installed on the high pressure stage only and then distributed to both the high and low pressure compressors.

**Installation**

For a very quick installation from front side all adapters have thread holes. Arrangement of adapter and OM3 body becomes very easily due to markings on body and adapter.

**Oil Reservoirs**

Oil reservoirs needs to have a minimum oil charge all the time to compensate any fluctuation in oil level. For high pressure systems it is imperative, otherwise OM3 Traxoil would feed discharge gas into the crankcase of the compressor with the according negative impacts to the system as described in the section for "High pressure oil management system".

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	Poland	+97 148 832 828	+97 148 832 848
	Russia & Cis	+48 (0)22 458 9205	+48 (0)22 458 9255
	España & Portugal	+7 095 232 94 72	+7 095 232 03 56
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UK & Ireland	+44 (0)1 635 876 161	+44 (0)1 635 877 111	
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