



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.



OM3 TRAXOIL[®]

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**

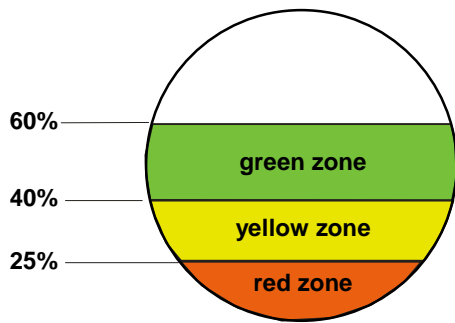


OM3 TRAXOIL[®]
Electronic Oil Level
Management System

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

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.

Sight-Glass Level Control Zones



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.

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:

Traditional low pressure oil level management system

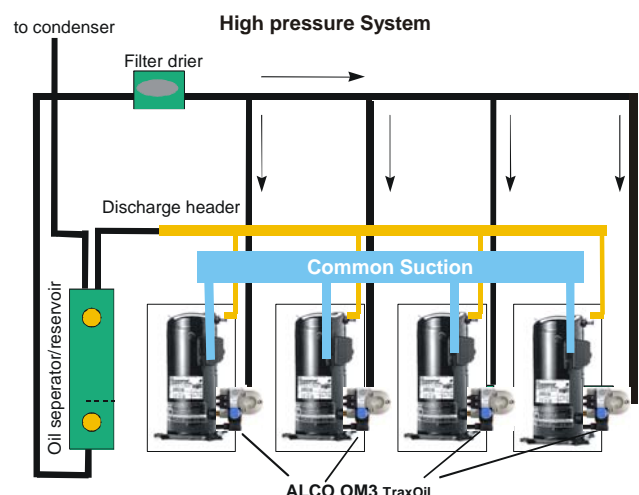
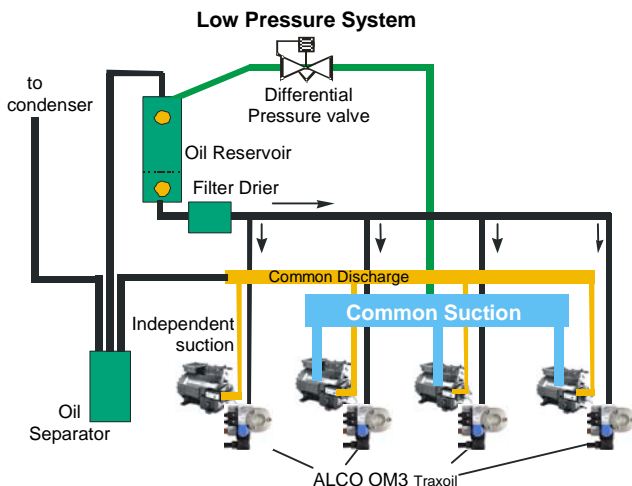
The oil separator is connected downstream of the discharge line. After separation, the refrigerant flows to the condenser while the oil flows to the oil receiver. The pressure inside the oil receiver is controlled by the differential pressure valve. When the integrated solenoid of OM3 TraxOil opens then 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 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.

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.





OM3 TRAXOIL®
**Electronic Oil Level
 Management System**

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

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
OM3-CUA flange adapter 3-/4-hole	805 030	Arctic Circle G2, G4, G6 Bitzer 4VC, 4TC, 4PC, 4NC, 4J, 4H, 4G, 6J, 6H, 6G, 6F, 8GC, 8FC Bock HA, HG (except HG/HA-12/22/34, see OM3-CBB), O-series Copeland D2, D3, D4, D6, D9, 4CC, 6CC Dorin all KP, K sizes (except those mentioned under OM3-CBB) Frascold Series A, B, D, F, S, V, Z	0,91 kg
OM3-CBB screw adapter 1-1/8"-18 UNEF	805 032	Bitzer 2KC, 2JC, 2HC, 2GC, 2FC, 2EC, 2DC, 2CC, 4FC, 4EC, 4DC, 4CC, Bock HA12/22/34, HG12/22/34 Dorin all H, K100CC/CS, K150CC/CS, K180CC/CS, K200CC, K230CS, K235CC, K240SB, K40CC, K50CS, K75CC/CS- L'Unite Hermetique TAH, TAG Maneurop LT, MT, SM, SZ	0,86 kg
OM3-CCA screw adapter 3/4"-14 NPTF	805 033	Bitzer ZL, ZM Copeland ZB, ZF, ZS	0,85 kg
OM3-CCB screw adapter 1-1/8"-12 UNF	805 034	Copeland DK, DL	0,87 kg
OM3-CCD Rotalock adapter 1-3/4"-12 UNF	805 031	Copeland ZR 90 to ZR19M ZR 250 to ZR 380 ZRT 180K to 760K, ZRU 280K-560K, ZRY480K-1140K	0,93 kg
OM3-CCC flange adapter 3-hole	805 035	Copeland 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
OM3-P30	805 151	Power Supply and Solenoid	-25/+80	3,0	0,24 kg
OM3-P60	805 152			6,0	0,25 kg
OM3-N30	805 141	Relay		3,0	0,13 kg
OM3-N60	805 142			6,0	0,14 kg

Accessories and Spare Parts

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



OM3 TRAXOIL[®]
Electronic Oil Level
Management System

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

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

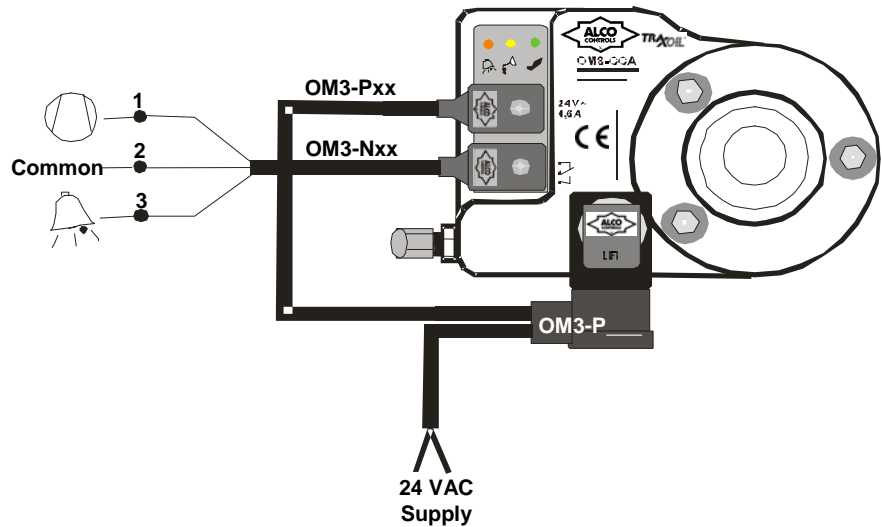
Relay Connector OM3-Nxx connection

- 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.)

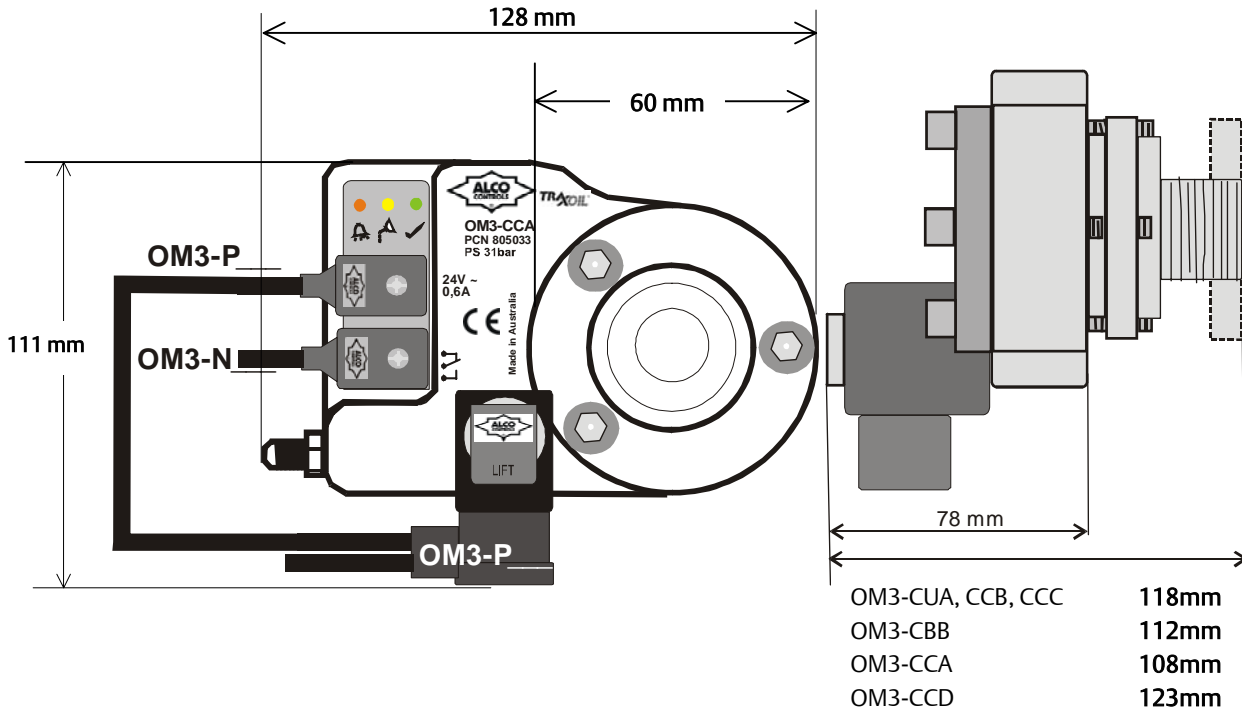


OM3 TRAXOIL[®]
Electronic Oil Level
Management System

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

Dimensions in mm: (not to scale)

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





OM3 TRAXOIL[®]
Electronic Oil Level
Management System

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

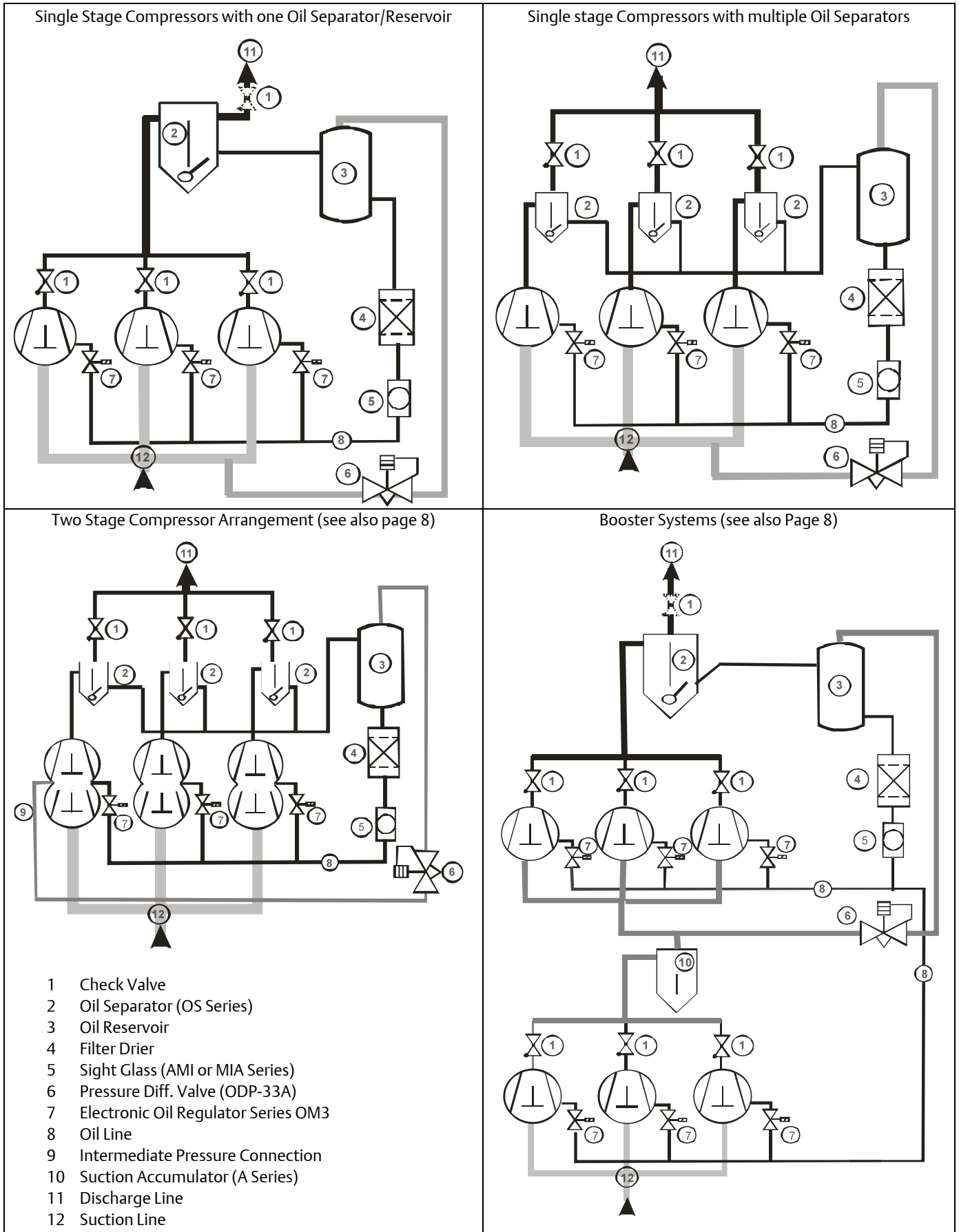
Adapters	Side view	Front view (facing compressor):
<p>OM0-CUA (805 037) Flange adapter 3/4-hole <i>as used in OM3-CUA (805 006)</i></p> <ul style="list-style-type: none"> • Three holes \varnothing 6.9 mm, PCD 47.62 • Four holes \varnothing 6.9 mm, PCD 50 mm 		
<p>OM0-CCA (805 039) Screw adapter 3/4"-14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



OM3 TRAXOIL[®]
Electronic Oil Level
Management System

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

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





OM3 TRAXOIL[®]
**Electronic Oil Level
Management System**

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

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".

ALCO CONTROLS is not to be held responsible for erroneous literature regarding capacities, dimensions, applications, etc. stated herein. Products, specifications and data in this literature are subject to change without notice. The information given herein is based on technical data and tests which ALCO CONTROLS believes to be reliable and which are in

compliance with technical knowledge of today. It is intended only for use by persons having the appropriate technical knowledge and skills, at their own discretion and risk. Since conditions of use are outside of ALCO'S control we can not assume any liability for results obtained or damages occurred due to improper application.

		Phone.:	Fax:
ALCO CONTROLS	Benelux	+31 (0)773 240 234	+31 (0)773 240 235
Emerson Electric GmbH & Co OHG	Denmark & Finland	+44 (0)1 635 876 161	+44 (0)1 635 877 111
Postfach 1251	Eastern Europe, Turkey & Iran	+32 (0)87 305 061	+32 (0)87 305 506
Heerstraße 111	France/Greece, Maghreb	+33 (0)478 668 570	+33 (0)478 668 571
D-71332 Waiblingen	Deutschland, Österreich, Schweiz	+49 (0)6109 6059 0	+49 (0)6109 6059 40
Germany	Italia	+39 02 961 78 1	+39 02 961 78 888
Phone ...49-7151-509-0	Middle East & Afrika	+97 148 832 828	+97 148 832 848
Fax ...49-7151-509-200	Poland	+48 (0)22 458 9205	+48 (0)22 458 9255
	Russia & Cis	+7 095 232 94 72	+7 095 232 03 56
	España & Portugal	+34 93 4 123 752	+34 93 4 124 215
	Sweden & Norway	+44 (0)1 635 876 161	+44 (0)1 635 877 111
www.alco-controls.com	UK & Ireland	+44 (0)1 635 876 161	+44 (0)1 635 877 111