

Oil Management System Series OM3, OM4 and OM5 - TraxOil

Technical Bulletin

The Emerson TraxOil oil management is a self-contained and reliable electronically controlled system with an integrated solenoid valve, which feeds missing oil directly into the compressor sump. The sight glass function remains fully available, status and level information is indicated by LED's. The integrated alarm function with compressor shut down completes the overall proven solution for compressor protection.

While OM3 is the well-proven solution for HFC & HFO blended refrigerants, OM4 can also be used for subcritical CO₂ systems.

OM5 TraxOil has been specially developed for trans-critical CO₂ applications; the new adapters are equipped with special types of O-rings to guarantee safe long-term and reliable operation.

For selected A2L applications with Copeland scroll there is a braze adapter available (see table 2, page 2).

Features

- Self-contained unit with oil level sensor and integral solenoid to manage oil level supply
- 3 Zone Level Control by using precise Hall-Sensor measurement, not prone to errors by foaming or light like optical sensors
- Alarm, status and level indication by LED's
- Supply 24 VAC or 230 VAC
- SPDT output contact for compressor shut down or alarming, rating 230 VAC / 3 A
- Easy installation by sight-glass replacement and front side mounting without nuts
- Adapters suitable for various types of compressors
- Recommended by leading compressor manufacturers
- **CE** marking under LVD and EMC Directive,



OM3 / OM4

OM3 and OM4 for selected HFC & HFO/HFO blended refrigerants

- OM3: max. allowable pressure PS: 46 bar
- OM4: max. allowable pressure PS: 60 bar

Note: for A2L refrigerant applications...

- Shall be positioned out of the potentially flammable zone where any leaked refrigerant could flow or stagnate or shall be sufficiently ventilated, so the concentration of any leaked refrigerant never reaches 50% of Lowest Flammable Limit.
- After installation and before charging the system with the refrigerants, a leak test must be performed, and the acceptance criteria shall be according to the relevant standard as per the EN 378.
- The power supply must be 24 VAC only.
- The voltage of alarm contact is max. 24 VAC.

OM4 for R744 (CO₂) subcritical,

- max. allowable pressure PS: 60 bar



OM5


OM5 for R744 (CO₂) transcritical,

- Max. allowable pressure PS:
Inlet: 130 bar; Outlet to compressor: 100 bar
- CO₂ optimized gasket material
- Adapters with CO₂ optimized gasket material
- High wattage ESC3-W coil to achieve high pressure differential MOPD of 100 bar

Oil Management System Series OM3, OM4 and OM5 - TraxOil

Product Selection OM3 and OM4 (select one item of each group)

1. Base Units (supplied without adapter and coil)


Type	Part No.	Max. allowable pressure PS	Time delay alarm	Picture
OM3-020	805133	46 bar	20 sec.	
OM3-120	805134		120 sec.	
OM4-020	805135	60 bar	20 sec.	
OM4-120	805136		120 sec.	

2. Adapter


Type	Part No.	Description	Picture
OM0-CUA	805037	Flange adapter 3- / 4-hole	<p>Please see page Adapter overview</p>
OM0-CCC	805041	Flange adapter 3-hole	
OM0-CBB	805038	Screw adapter 1-1/8"-18 UNEF	
OM0-CCA	805039	Screw adapter 3/4"-14 NPTF	
OM0-CCB	805040	Screw adapter 1-1/8"-12 UNF	
OM0-CCD	805042	Rotalock adapter 1-3/4"-12UNF	
OM0-CCE	805043	Rotalock adapter 1-1/4"-12UNF	
OM0-CCL	805261	Braze adapter Ø22.5 mm	

Note: For use with A2L refrigerants only the OM0-CCL can be used!


3. Cables Alarm Relay

Type	Part No.	Description	Picture
OM3-N30	805141	Connection to Relay 3 m	
OM3-N60	805142	Connection to Relay 6 m	
OM3-N100	805146	Connection to Relay 10 m	


4. Solenoid Coil

Supply Voltage 24V			
Type	Part No.	Frequency	Picture
ESC 24 VAC	801033	50 Hz, 17 VA	


4. Solenoid Coil*

Supply Voltage 230V			
Type	Part No.	Frequency	Picture
ESC 230 VAC	801031	50 Hz, 17 VA	

5. Cable Assembly Power Supply and Solenoid

Type	Part No.	Description	Picture
OM3-P30	805151	24 V, 3 m	
OM3-P60	805152	24 V, 6 m	
OM3-P100	805153	24 V, 10 m	

5. Cable assembly with 230V module*


Type	Part No.	Description	Picture
OM-230V-3	805163	230 V, 3 m	
OM-230V-6	805164	230 V, 6 m	

Note: *) Do not use with A2L refrigerant!

Oil Management System Series OM3, OM4 and OM5 - TraxOil

Product Selection OM5 (select one item of each group)


1. Base Units (supplied without adapter and coil)

Type	Part No.	Max. allowable pressure PS	Time delay alarm	Picture
OM5-020	805230	130 bar	20 sec.	
OM5-120	805231		120 sec.	


2. Adapter

Type	Part No.	Description	Picture
OM0-CUA CO2	805337	Flange adapter 3- / 4-hole	<p>Please see page Adapter overview</p>
OM0-CCC CO2	805341	Flange adapter 3-hole	
OM0-CUD CO2	805049	Flange adapter 6- / 6-hole	
OM0-CBB CO2	805338	Screw adapter 1-1/8"-18 UNEF	
OM0-CCA CO2	805339	Screw adapter 3/4"-14 NPTF	
OM0-CCB CO2	805340	Screw adapter 1-1/8"-12 UNF	
OM0-CCD CO2	805342	Rotalock adapter 1-3/4"-12UNF	
OM0-CCE CO2	805343	Rotalock adapter 1-1/4"-12UNF	


3. Cables Alarm Relay

Type	Part No.	Description	Picture
OM3-N30	805141	Connection to Relay 3 m	
OM3-N60	805142	Connection to Relay 6 m	
OM3-N100	805146	Connection to Relay 10 m	

4. Solenoid Coil

Supply Voltage 24V			
Type	Part No.	Frequency	Picture
ESC-W24VAC	801028	50 Hz, 38 VA	

5. Cable Assembly Power Supply and Solenoid

Type	Part No.	Description	Picture
OM3-P30	805151	24 V, 3 m	
OM3-P60	805152	24 V, 6 m	
OM3-P100	805153	24 V, 10 m	

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Oil Management Kits including Base Unit, Adapter and 24V ESC Coil:

Kits incl. Adapter	Part No.		Base Unit	Part No.	Adapter	Part No.	Coil	Part No.
OM3-CUA	805301	➔	OM3-020	805133	OM0-CUA	805037	ESC 24 VAC	801033
OM3-CBB	805303				OM0-CBB	805038		
OM3-CCA	805304				OM0-CCA	805039		
OM3-CCB	805305				OM0-CCB	805040		
OM3-CCC	805306				OM0-CCC	805041		
OM3-CCD	805302				OM0-CCD	805042		
OM3-CCE	805300				OM0-CCE	805043		
OM3-CCL (A2L)	805126				OM0-CCL	805261		
OM4-CUA	805307				➔	OM4-020		
OM4-CBB	805309	OM0-CBB	805038					
OM4-CCA	805310	OM0-CCA	805039					
OM4-CCB	805311	OM0-CCB	805040					
OM4-CCC	805312	OM0-CCC	805041					
OM4-CCD	805308	OM0-CCD	805042					
OM4-CCE	805313	OM0-CCE	805043					
OM4-CCL (A2L)	805129	OM0-CCL	805261					

Accessories and Spare Parts

Type	Part No.	Description	Weight
ECT-623	804421	Transformer 230 VAC / 24 VAC, 60 VA (supply of 3 pieces Base unit)	1.20 kg
ESC-K01	801034	Screw cap (incl. 2x O-ring & fixing retainer)	
ODP-33A	800366	Differential Oil Check Valve 3.5 bar, PS: 46 bar (Inlet 5/8"-UNF female, outlet 5/8"-UNF male)	0.14 kg
OM3-K01	805036	Repair Kit OM3/OM4 (consists of sight glass with O-ring and screws, oil adapter with strainer, O-ring back side)	0.26 kg
OM5-K01	805067	Repair Kit OM5 for CO ₂ (consists of sight glass with O-ring and screws, oil adapter with strainer, O-ring back side)	0.26 kg
OM-HFC-K01	805081	Sealing Kit OM3/OM4 (consists of all O-rings for OM3/OM4 and for all types of adapters)	
OM-HFC-K02	805083	Enclosing tube for OM3/OM4 (including O-ring), only for replacement of new version with hexagonal nut!	
OM-CO2-K01	805079	Sealing Kit CO ₂ for OM5 (consists of all O-rings for OM5 and for all types of adapters)	
OM-CO2-K02	805082	Enclosing tube for OM5 (including O-ring), only for replacement of new version with hexagonal nut!	

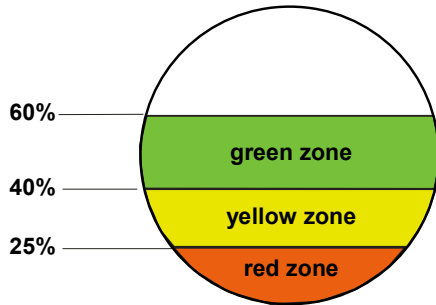
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Function

OM3/OM4/OM5 TraxOil use a Hall-Sensor to measure the oil level. A magnetic float changes its position according to the oil level, not prone to errors by foaming or light. The hall sensor converts these magnetic field changes into an equivalent signal, which is used by the electronic controller to open or close an integrated solenoid valve which feeds missing oil directly into the compressor sump. If the oil level drops into the red zone

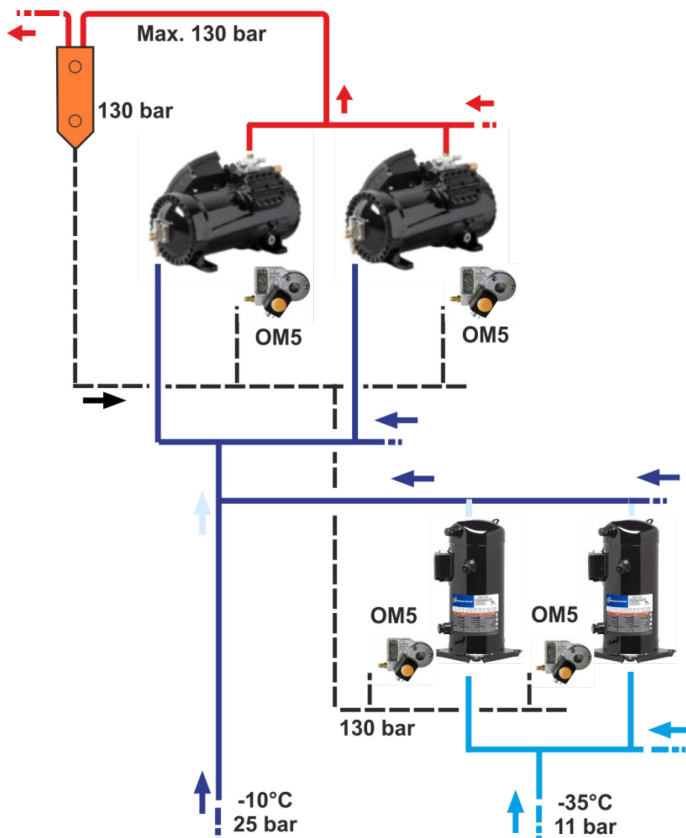
OM3/OM4/OM5 TraxOil generates an alarm signal and the alarm contact (SPDT) changes into alarm state. The latter may be used to shut down the compressor. In the Alarm status the TraxOil is still feeding oil into the compressor. If the oil level comes back to normal, the Alarm will be reset.

Sight-Glass Level Control Zones:

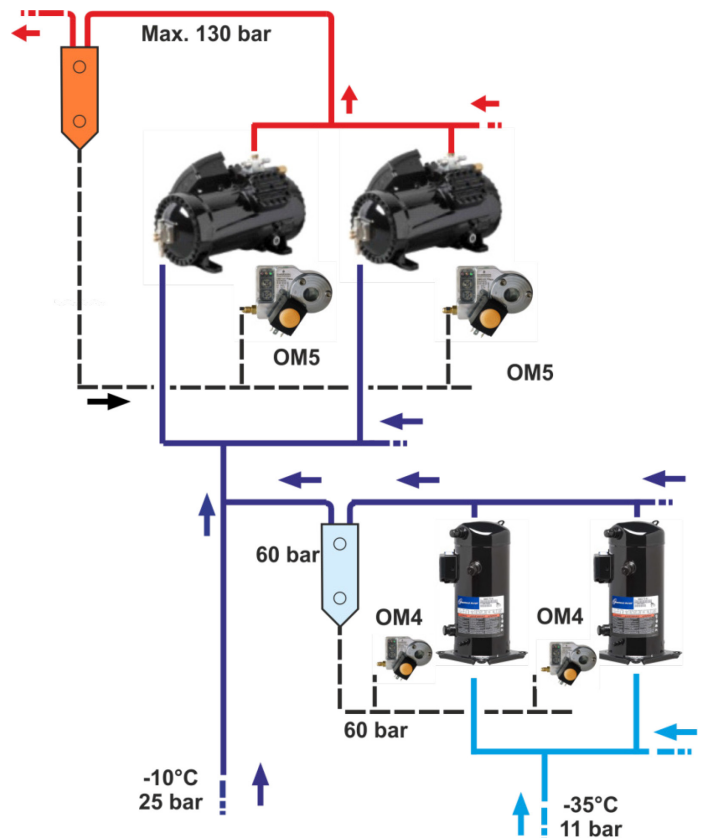


LEDs	Status	Function	Alarm
●	Oil Level in green zone (60 - 40%)		
● ●	Oil Level in green zone (close 40%)	Injection, delay 10 s	
●	Oil Level in yellow zone (40 - 25%)	Injection	
● ●	Oil Level in red zone (25 - 0%)	Injection	Yes, delay 20 s or 120 s

Typical transcritical/subcritical CO₂ Application with OM5






Typical transcritical/subcritical CO₂ application with OM4/OM5






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Technical Data OM3, OM4 and OM5

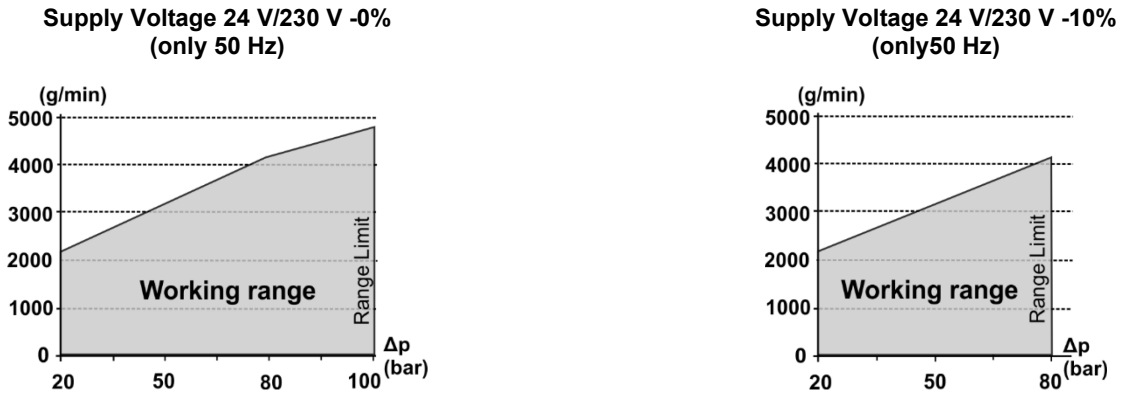
Markings	 under: Low Voltage Directive 14/35/EU, EMC Directive 2014/30/EU   (OM3/OM4)	Selected Oil / refrigerant combinations <u>OM3/OM4:</u> A1: R134a, R404A, R407C, R450A, R452A, R448A, R449A, R507, R513A, R410A, A2L: R32, R452B, R454B, R454A, R454C, R455A, R1234ze, R1234yf, Note: A2L only with oil: Emkarate RL-3MAF, R32 only with SP32 oil type <u>OM4/OM5:</u> CO ₂	
Applied Standards/ Directives	EN 12284, EN 378-1, EN 378-2, EN 61010-1, EN 50081-1, EN 50082-1, IEC 60335-2-40 Clause 22.116 RoHS 2011/65/EU	Vibration resistance (EN 60068-2-6)	max. 4 g, 10...250 Hz
Max. allowable pressure PS	<u>OM3:</u> 46 bar <u>OM4:</u> 60 bar <u>OM5:</u> HP side (inlet): 130 bar LP side (outlet): 100 bar	Materials Body and Adapter Screws Sight Glass	Aluminum alloy, Brass, Steel galvanized steel nickel-plated steel (ISO 2081)
Max. Test pressure PT	<u>OM3:</u> 51 bar <u>OM4:</u> 66 bar <u>OM5:</u> 143 bar	Level control	40%...60% of sight glass height
Supply voltage / total power - with ESC-24VAC coil - with ESC-230VAC coil and OM-230V-x module - with ESC-W24VAC coil	<u>OM3/OM4:</u> max. 24 VAC for A2L 24 VAC±10%, 50 Hz, 17 VA 230 VAC±10%, 50 Hz, 17 VA <u>only OM5:</u> 24 VAC ±10%, 50 Hz, 38 VA	Alarm contact	max. 3 A, 230 VAC, (max. 24 VAC for A2L) SPDT dry contact
Solenoid valve MOPD	<u>OM3/OM4:</u> 30 bar <u>OM5:</u> 100 bar see Fig. 1	Time Delay Alarm	20 sec.: OM3/4/5-020, all OM3/4 Kits 120 sec.: OM3/4/5-120
Temperatures Ambient/Storage	-15...+50 °C	Time Delay Filling	10 sec.
Medium temperature Oil Inlet	+5...+80 °C	Protection class	IP65 (IEC 529 / EN 60529)
Oil/refrigerant mixture compressor side	-20...+80 °C	Weight 24 V System 230 V System	750...920 g incl. adapter 1100...1270 g incl. adapter
		Oil connection	7/16"-20 UNF male, with strainer and O-ring (replaceable, see acc. Accessories)
		Enclosing tube	Replaceable for cleaning, hexagon wrench size 18, see spare parts

Technical Data ESC Coil

Markings	 under: Low Voltage Directive 14/35/EU, EMC Directive 2014/30/EU   (ESC-24VAC/ ESC-230VAC)	Applied Standards	EN 60947-1, EN 60947-5-1 RoHS 2011/65/EU
		Ambient Temperature	-40...+60 °C
		Protection class	IP65 (properly installed on enclosing tube with EMERSON offered Cables and plugs)
		Vibration resistance (EN60068-2-6)	0.7 g 10...200 Hz

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Fig. 1: OM5: Performance related to supply voltage: Flow Rate and Differential Pressure between inlet and outlet
(Oil type Reniso C85E, oil temperature 54 °C)



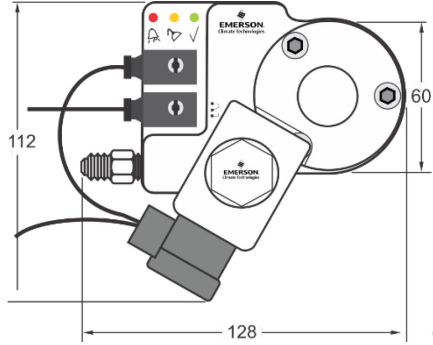
Adapter Selection for OM3/4/5

			Compressor Series with OM3	Compressor series with OM4	Compressor series with OM5			
			for applications up to 46 bar	OM4 can be incorporated in compressors designed for CO ₂ transcritical in conjunction with oil receivers/reservoirs up to 60 bar	for transcritical CO ₂ applications			
Flange	OM0-CUA 3- / 4-hole Part No. 805037	Bitzer Bock Copeland Dorin Frascold	<p>Please refer to free program "Controls Navigator" revision 2019 for selection of adapter matching to each compressor brand/ type</p>					
	OM0-CCC 3-hole Part No. 805041	Copeland						
	OM0-CUD CO2 6- / 6-hole Part No. 805049	Dorin						
Thread	OM0-CBB 1-1/8"-18 UNEF Part No. 805038	Bitzer Bock Dorin L'Unite Herm. Maneurop						
	OM0-CBB CO2 1-1/8"-18 UNEF Part No. 805338	Bitzer Bock Copeland						
	OM0-CCA 3/4"-14 NPTF Part No. 805039	Bitzer Copeland						
	OM0-CCB 1-1/8"-12 UNF Part No. 805040	Copeland						
Rotolock	OM0-CCD 1-3/4"-12 UNF Part No. 805042	Copeland Bitzer						
	OM0-CCE 1-1/4"-12UNF Part No. 805043	Copeland Bitzer						
	OM0-CCL Part No. 805261	Copeland YB..K1E						
Brize						<p>Note: Other adapter types on request! Our applications engineering advice and the information contained in this guideline are based on experience and are made to the best of our knowledge and belief, they must be regarded however as non-binding advice without guarantee.</p>		

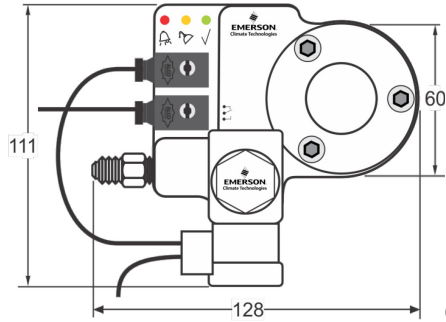
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Dimensions (mm)

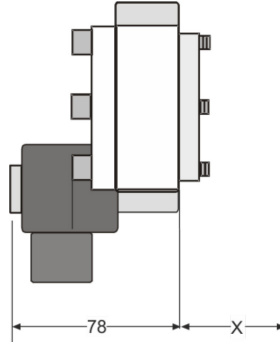
Base Unit with coil



OM5 + ESC-W...

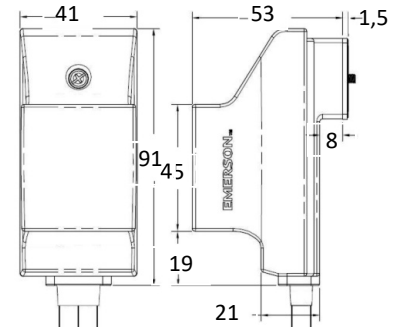


OM3/4 + ESC...

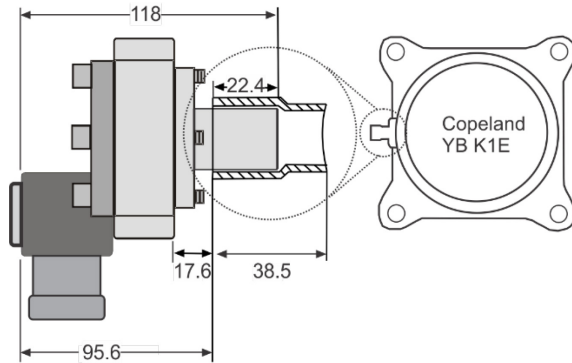


X: see table "Overview Adapters"

OM-230V-x Module:

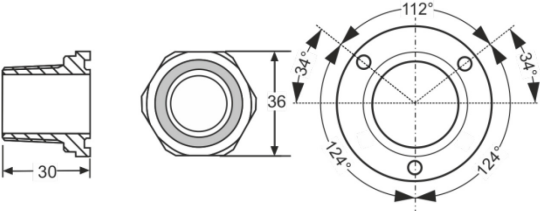
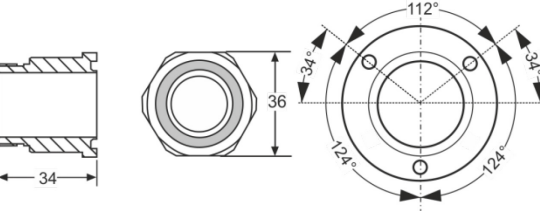
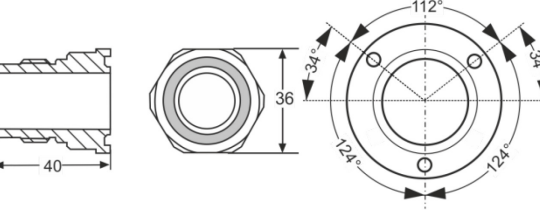
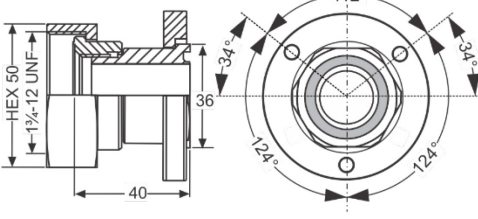
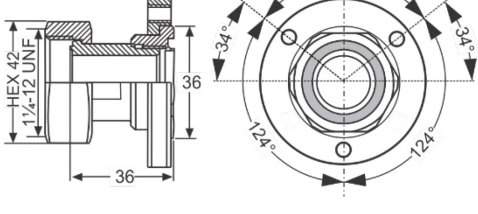


Base Unit with braze adapter OM0-CCL (for selected A2L refrigerants)



Oil Management System Series OM3, OM4 and OM5 - TraxOil

Overview Adapters

Connection type		Connection size / Dimensions (mm)	Base Unit	Refrigerants	Material	
					Adapter	Flange
Thread	OM0-CCA Part No. 805039	3/4"-14 NPTF 	OM3 / OM4	listed HFC & HFO/ HFO blends (page 6) CO ₂	Aluminum	Aluminum
	OM0-CCA CO2 Part No. 805339		OM5	CO ₂	Aluminum	Steel
	OM0-CBB Part No. 805038	1-1/8"-18 UNEF 	OM3 / OM4	listed HFC & HFO/ HFO blends (page 6) CO ₂	Aluminum	Aluminum
	OM0-CBB CO2 Part No. 805338		OM5	CO ₂	Aluminum	Steel
	OM0-CCB Part No. 805040	1-1/8"-12 UNF 	OM3 / OM4	listed HFC & HFO/ HFO blends (page 6) CO ₂	Aluminum	Aluminum
	OM0-CCB CO2 Part No. 805340		OM5	CO ₂	Aluminum	Steel
Rotalock	OM0-CCD Part No. 805042	1-3/4"-12 UNF 	OM3 / OM4	listed HFC & HFO/ HFO blends (page 6) CO ₂	Aluminum	Aluminum
	OM0-CCD CO2 Part No. 805342		OM5	CO ₂	Aluminum	Steel
	OM0-CCE Part No. 805043	1-1/4"-12 UNF 	OM3 / OM4	listed HFC & HFO/ HFO blends (page 6) CO ₂	Aluminum	Aluminum
	OM0-CCE CO2 Part No. 805343		OM5	CO ₂	Aluminum	Steel

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Overview Adapters

Connection type		Connection size / Dimensions (mm)	Base Unit	Refrigerants	Material	
					Adapter	Flange
Flange ¹	OM0-CUA Part No. 805037	3 / 4-holes 	OM3 / OM4	listed HFC & HFO/ HFO blends (page 6) CO ₂	Aluminum	
	OM0-CUA CO2 Part No. 805337		OM5	CO ₂	Aluminum	
	OM0-CCC Part No. 805041	3 holes 	OM3 / OM4	listed HFC & HFO/ HFO blends (page 6) CO ₂	Aluminum	
	OM0-CCC CO2 Part No. 805341		OM5	CO ₂	Aluminum	
	OM0-CUD CO2 Part No. 805049	6-/6 holes 	OM5	CO ₂	Aluminum	
Braze	OM0-CCL Part No. 805261		OM3 / OM4	listed A2L refrigerant	Brass	Steel

Note: ¹) M6 screws for fastening are not part of delivery.