

OM3, OM4 and OM5 – TraxOil

Oil Management System

General information

The Copeland 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 are 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,

NOTE: Product types for safety class A3, please refer to separate documents.

A1 **A2L**



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 ESC-W... coil to achieve high pressure differential MOPD of 100 bar

Selection Table OM3 / 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	Illustration
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	Illustration
OM0-CUA	805037	Flange adapter 3- / 4-hole	See page Adapter overview
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. Cable Alarm Relay

Type	Part no.	Description	Illustration
OM3-N30	804910(M)*	Connection to Relay 3 m	
OM3-N60	804911(M)*	Connection to Relay 6 m	
OM3-N100	804912(M)*	Connection to Relay 10 m	
OM3-N150	804913(M)*	Connection to Relay 15 m	
OM3-N250	804914(M)*	Connection to Relay 25 m	

4. Solenoid Coil

Supply Voltage 24V			
Type	Part no.	Frequency	Illustration
ESC-24VAC	801033	50 Hz, 17 VA	

4. Solenoid Coil*

Supply Voltage 230V			
Type	Part no.	Frequency	Illustration
ESC-230VAC	801031	50 Hz, 17 VA	

5. Cable Assembly Power Supply and Solenoid

Type	Part no.	Description	Illustration
OM3-P30	804920(M)*	24 V, 3 m	
OM3-P60	804921(M)*	24 V, 6 m	
OM3-P100	804922(M)*	24 V, 10 m	
OM3-P150	804923(M)*	24 V, 15 m	
OM3-P250	804924(M)*	24 V, 25 m	

5. Cable assembly with 230V module*

Type	Part no.	Description	Illustration
OM-230V-3	804930(M)*	230 V, 3 m	
OM-230V-6	804931(M)*	230 V, 6 m	
OM-230V-10	804932(M)*	230 V, 10 m	
OM-230V-15	804933(M)*	230 V, 15 m	
OM-230V-25	804934(M)*	230 V, 25 m	

NOTE: *) Do not use with A2L refrigerant!

NOTE: * M = Multipack (20 pcs)

For assistance with selection, please contact your local Copeland Sales offices.

Selection Table 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	Illustration
OM5-020	805230	130 bar	20 sec.	
OM5-120	805231		120 sec.	

2. Adapter

Type	Part no.	Description	Illustration
OM0-CUA CO2	805337	Flange adapter 3- / 4-hole	See page Adapter overview
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. Cable Alarm Relay

Type	Part no.	Description	Illustration
OM3-N30	804910(M)*	Connection to Relay 3 m	
OM3-N60	804911(M)*	Connection to Relay 6 m	
OM3-N100	804912(M)*	Connection to Relay 10 m	
OM3-N150	804913(M)*	Connection to Relay 15 m	
OM3-N250	804914(M)*	Connection to Relay 25 m	

4. Solenoid Coil

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

4. Solenoid Coil

Supply Voltage 230V			
Type	Part no.	Frequency	Illustration
ESC-W230VAC	801029	50 Hz, 38 VA	

5. Cable Assembly Power Supply and Solenoid

Type	Part no.	Description	Illustration
OM3-P30	804920(M)*	24 V, 3 m	
OM3-P60	804921(M)*	24 V, 6 m	
OM3-P100	804922(M)*	24 V, 10 m	
OM3-P150	804923(M)*	24 V, 15 m	
OM3-P250	804924(M)*	24 V, 25 m	

5. Cable assembly with 230V module

Type	Part no.	Description	Illustration
OM-230V-3	804930(M)*	230 V, 3 m	
OM-230V-6	804931(M)*	230 V, 6 m	
OM-230V-10	804932(M)*	230 V, 10 m	
OM-230V-15	804933(M)*	230 V, 15 m	
OM-230V-25	804934(M)*	230 V, 25 m	

NOTE: * M = Multipack (20 pcs)

For assistance with selection, please contact your local Copeland Sales offices.

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

Kits incl. Adapter	Part no.
OM3-CUA	805301
OM3-CBB	805303
OM3-CCA	805304
OM3-CCB	805305
OM3-CCC	805306
OM3-CCD	805302
OM3-CCE	805300
OM3-CCL (A2L)	805126



Base Unit	Part no.	Adapter	Part no.	Coil	Part no.
OM3-020	805133	OM0-CUA	805037	ESC 24 VAC	801033
		OM0-CBB	805038		
		OM0-CCA	805039		
		OM0-CCB	805040		
		OM0-CCC	805041		
		OM0-CCD	805042		
		OM0-CCE	805043		
		OM0-CCL	805261		

OM4-CUA	805307
OM4-CBB	805309
OM4-CCA	805310
OM4-CCB	805311
OM4-CCC	805312
OM4-CCD	805308
OM4-CCE	805313
OM4-CCL (A2L)	805129



OM4-020	805135	OM0-CUA	805037	ESC 24 VAC	801033
		OM0-CBB	805038		
		OM0-CCA	805039		
		OM0-CCB	805040		
		OM0-CCC	805041		
		OM0-CCD	805042		
		OM0-CCE	805043		
		OM0-CCL	805261		

Accessories and Spare Parts

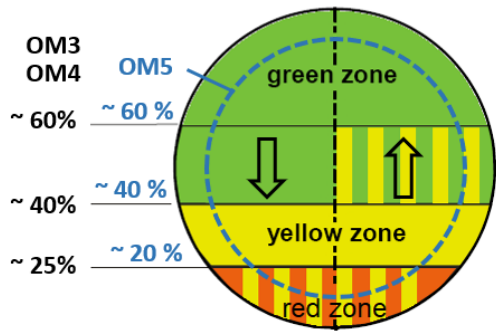
Type	Part no.	Description	Weight
ECT-623	804421	Transformer 230 VAC / 24 VAC, 60 VA (supply of 3 pieces Base unit)	1.20 kg
ESC-K01	801034	Screw cap (incl. 2x O-ring & fixing retainer)	0.01 kg
ODP-33A	800366	Differential Oil Check Valve 3.5 bar, PS: 46 bar (Inlet 5/8"-UNF female, outlet 5/8"-UNF male)	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)	0.01 kg
OM-HFC-K02	805083	Enclosing tube for OM3/OM4 (including O-ring), only for replacement of version with hexagonal nut!	0.11 kg
OM-CO2-K01	805079	Sealing Kit CO ₂ for OM5 (consists of all O-rings for OM5 and for all types of adapters)	0.01 kg
OM-CO2-K02	805082	Enclosing tube for OM5 (including O-ring), only for replacement of version with hexagonal nut!	0.11 kg

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

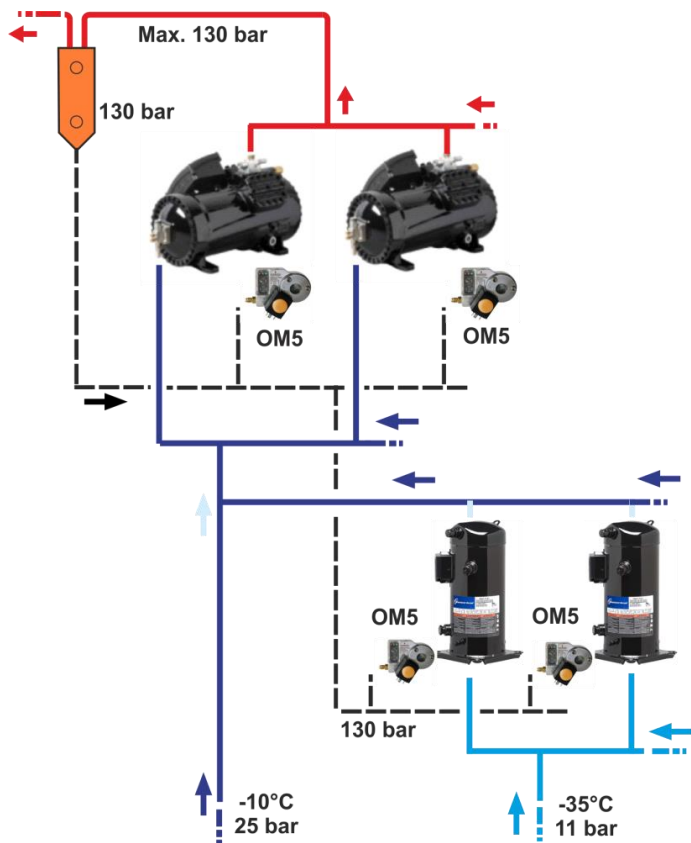
OM3/OM4/OM5 TraxOil generates an alarm signal and the alarm contact (SPDT) changes into alarm state. The latter may be used to shut down the compressor. In the Alarm status the TraxOil is still feeding oil into the compressor. If the oil level comes back to normal, the Alarm will be reset.

Sight-Glass Level Control Zones:

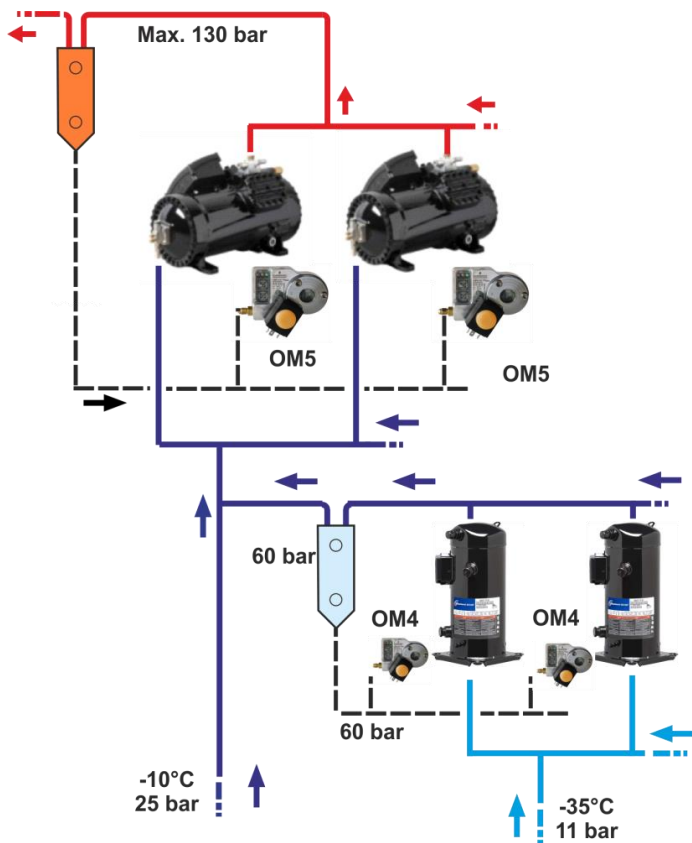


LEDs	Status	Function	Alarm
	Oil Level in green zone ↓ (60 - 40%, OM3/4)		
	Oil Level in green zone ↑ (60 - 40%, OM3/4)	Injection	
	Oil Level in yellow zone (40 - 25%, OM3/4)	Injection, delay 10 s	
	Oil Level in red zone (25 - 0%, OM3/4)	Injection	Yes, delay 20 s or 120 s

Typical transcritical/subcritical CO₂ Application with OM5



Typical transcritical/subcritical CO₂ application with OM4/OM5



Technical Data - OM3 / OM4 / OM5

Max. allowable Pressure PS	OM3 OM4 OM5	46 bar 60 bar HP side (inlet) 130 bar LP side (outlet) 100 bar
Max. Test Pressure PT	OM3 OM4 OM5	51 bar 66 bar 143 bar
Temperatures Storage/ Ambient/ Transport		-15...+50 °C
Medium		Oil inlet +5...+80 °C compressor side: -20...+80 °C (oil/refrigerant mixture)
Solenoid valve MOPD	OM3/4 OM5	30 bar 100 bar see Fig. 1
Protection Class (IEC 529, EN 60529)		IP65
Vibration Resistance		max. 4 g, 10....250 Hz
Enclosing tube		Replaceable for cleaning, hexagon wrench size 18
Oil connection		7/16"-20 UNF male, with strainer and O-ring (replaceable)
Supply voltage / Solenoid Coils	OM3/4 OM5	<u>ESC-24VAC</u> : 24 VAC±10 %, 50 Hz, 17 VA <u>ESC-230VAC*</u> : 230 VAC±10 % 50 Hz, 17 VA* <u>ESC-W24VAC</u> : 24 VAC ±10 %, 50 Hz, 38 VA

NOTE: *) not for A2L, with OM230V -x module **) OM3/4 only subcritical, OM5 transcritical with special CO₂ adapters

Weight	24 V System 230 V System	750...920 g incl. adapter 1100...1270 g incl. adapter
Materials	Body and Adapter Screws Sight Glass	Aluminum alloy, Brass, Steel galvanized steel nickel-plated steel (ISO 2081)
Released Refrigerants	<u>Fluid group II</u> <u>Fluid group I</u>	R134a, R404A, R407C, R450A, R452A, R448A, R449A, R507, R513A, R410A, R744** R32, R452B, R454B, R454A, R454C, R455A, R1234ze, R1234yf
Alarm contact		max. 3 A, 230 VAC, SPDT dry contact
Time Delay Alarm	OM...-020 & Kits OM...-120	20 sec. 120 sec.
Time Delay Filling		10 sec.
Level control		40%...60% of sight glass height
Applied Standards/ Directives		EN 61010-1, EN 378-2, EN 12178, EN 61326 (equipment group I, class B), RoHS 2011/65/EU
Markings		CE acc. EMC & LVD,  cULus (OM3/OM4)

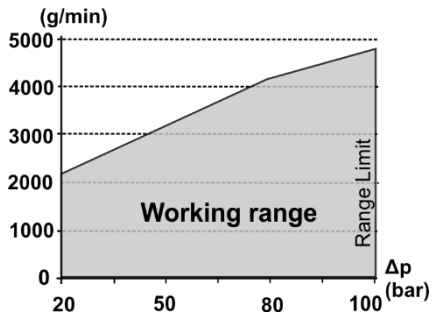
Technical Data - ESC Coil

Ambient Temperature	-40...+60 °C
Vibration resistance (EN60068-2-6)	0.7 g - 10...200 Hz
Protection class	IP65 (with assembled plug and cable)

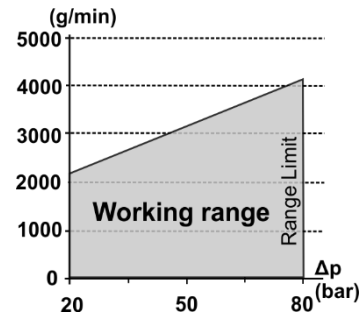
Supply Voltage variation	±10 %
Applied Standards/ Directives	EN 60947-1, EN 60947-5-1 RoHS 2011/65/EU
Markings:	
ESC-24VAC	
ESC-230VAC	
ESC-W24VAC	--
ESC-W230VAC	

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)

Supply Voltage 24 V / 230 V -0%
(only 50 Hz)



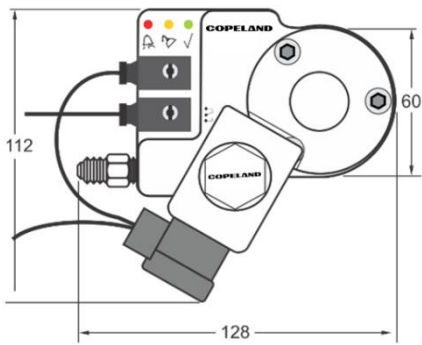
Supply Voltage 24 V / 230 V -10%
(only 50 Hz)



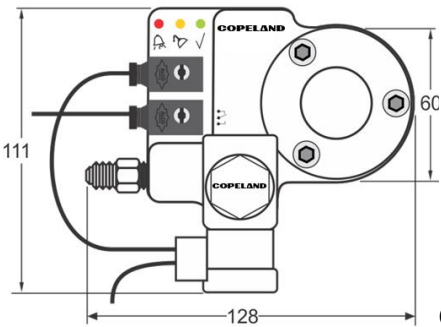
Adapter Selection for OM3 / OM4 / OM5

			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	Please refer to free program “Select” for selection of adapter matching to each compressor brand/ type		
	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			
	OM0-CCD 1-3/4“-12 UNF Part no. 805042	Copeland Bitzer			
Rotalock	OM0-CCE 1-1/4“-12UNF Part no. 805043	Copeland Bitzer			
	OM0-CCL Part no. 805261	Copeland YB..K1E			
Braze			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.		

Base Unit with coil

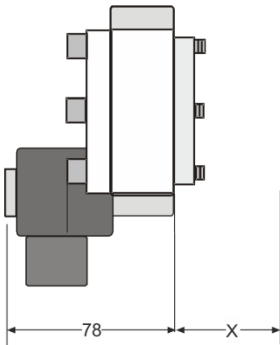


OM5 + ESC-W...

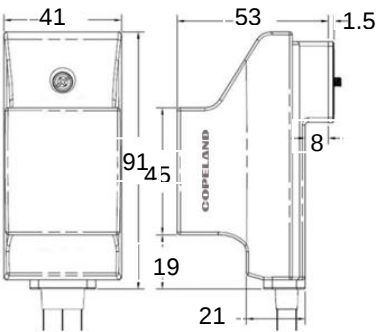


OM3/4 + ESC...

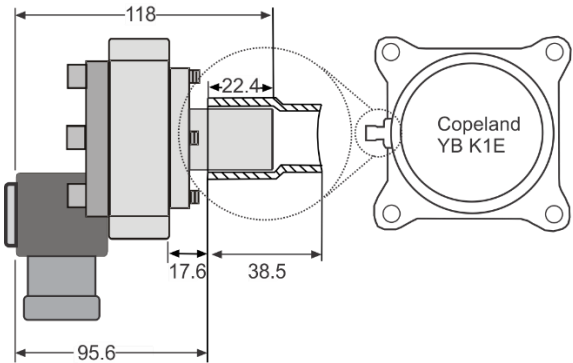
OM-230V-x Module:



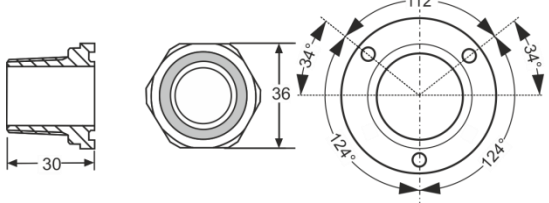
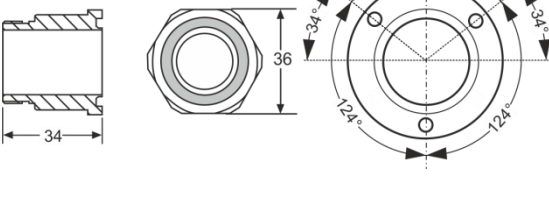
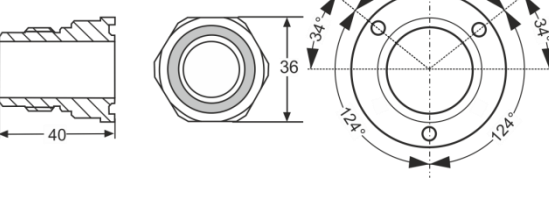
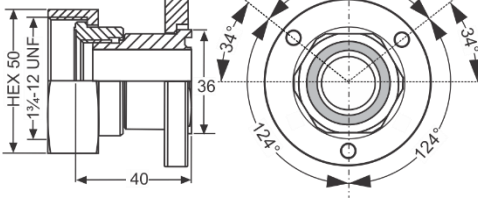
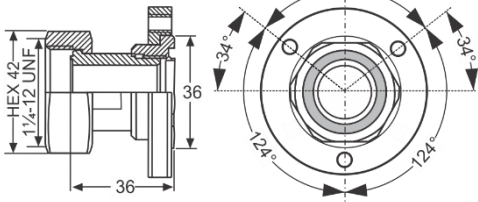
X: see table “Overview
Adapters”



Base Unit with braze adapter OM0-CCL
(for selected A2Lrefrigerants)



Adapters overview

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

Adapters overview (continued)

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

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

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