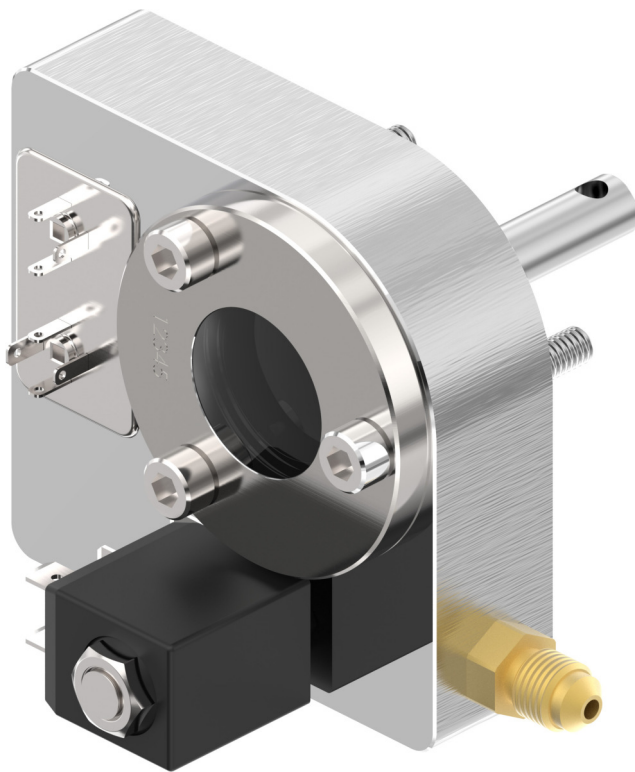


## Data Sheet

# Oil level Regulators **COM**



Danfoss COM oil level regulators are an integral part of oil management in refrigeration, air conditioning and heat pump systems. COM oil level regulators ensures an optimal oil level in scroll, semi-hermetic and reciprocating compressors. This in turn provides safe compressor operation and long compressor lifetime.

Danfoss COM oil level regulators use hall sensor and built in magnetic float for very precise oil level sensing. This design ensures a reliable performance even with foaming or dirty oil and ensures long life of the compressor even under different operating conditions such as defrost cycles and seasonal variations.

**Features**

- Higher resolution on the continuously.
- Hall sensor level sensing
- Lower energy consumption
- Lower weight
- Less complexity, only 2 models. 60 bar/130bar
- Adaptive functions
  - Power on logic
  - Emergency injection logic

## Functions

Maintaining an adequate oil level is a critical requirement for ensuring the long-term durability of a compressor. Depending on the system's design, such as in rack applications, achieving precise oil level control under various operating conditions necessitates the use of an active regulation system. Passive systems, on the other hand, pose challenges because they function effectively only when the operating conditions remain constant. However, due to seasonal variations, maintaining constant conditions is often impractical.

Active oil regulation systems are designed to adapt to fluctuations in operating conditions and defrost cycles, thereby ensuring reliable compressor operation. These active systems continuously monitor the oil level in compressors and generate alerts in the event of a low oil level. Even in cases where there is no built-in compressor oil pump and oil differential pressure switch (e.g., in scroll compressors), an active control system is essential for monitoring and maintaining the oil supply to the compressor.

A Hall sensor and a magnetic float system are integrated into the COM to gauge the oil level within the compressor. Depending on variations in the oil level and its impact on the magnetic field strength, a variable induced voltage is generated. This voltage is then assessed by the electronic system, triggering actions in the form of LED indicators, solenoid valve activations and relay.

Once the oil level reaches the predefined alarm threshold, COM activates an alarm condition. This signal can be employed for tasks such as disconnecting the compressor or data processing.

While the alarm condition persists, a continuous supply of oil is maintained to the compressor to restore the oil level to its normal range. Once this restoration is successful, the alarm is reset.

To promptly identify a compressor operating "without oil filling," a "Power on Logic" feature has been incorporated into the software. This feature eliminates the delay times associated with "Filling" and "Alarm." Consequently, it ensures that a compressor lacking oil filling does not run for alarm delay time before triggering an alarm but can be halted immediately.

The oil level indicator is divided into different ranges :

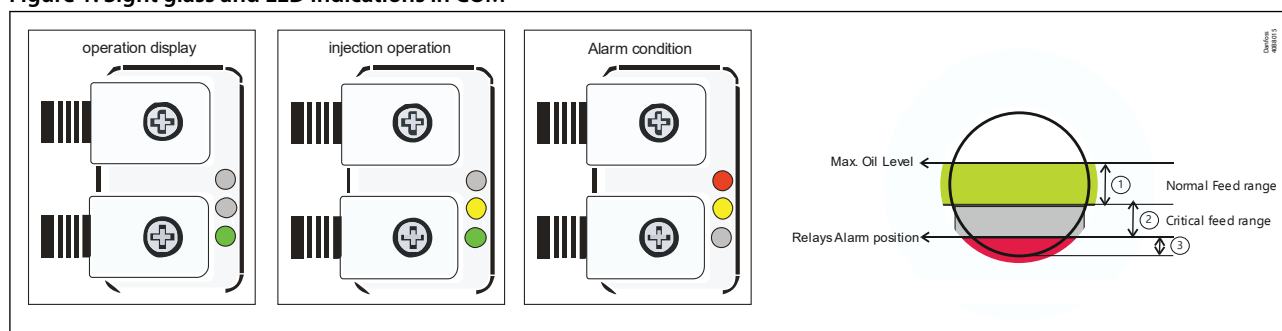
1. Normal oil level: 40-60% sight glass level.
2. Critical oil level: 25-40% sight glass level.
3. Alarm oil level: <25% sight glass level

When the green LED is illuminated, it indicates that the compressor is operational, and the oil level is within the normal range. During normal operation, if the oil level remains below the normal range for more than 10 seconds, the solenoid valve is activated, allowing oil to be replenished up to a maximum of 60% of the sight glass height. Subsequently, the solenoid valve closes. This 10-second delay serves a specific purpose, especially for certain compressor types and applications. During the compressor's startup phase, the oil level can fluctuate, and without this delay, the oil filling process might initiate even when there is sufficient oil present. The delay helps prevent overfilling of the compressor.

In low-pressure systems, if the oil level moves into the "critical area" despite active oil filling, it could be due to the compressor introducing more oil into the system than the COM can replenish. In such a scenario, the differential pressure (the difference between oil pressure and suction pressure) needs to be increased to allow sufficient oil flow back into the system. This can be accomplished by utilizing an ORD (Oil Return Valve) available with differential pressure options.

To prevent oil shortages, Danfoss oil management recommends keeping the COM operational even when the compressor is in the off condition. This ensures that the oil level is properly maintained, safeguarding against potential issues related to oil supply.

**Figure 1: Sight glass and LED indications in COM**



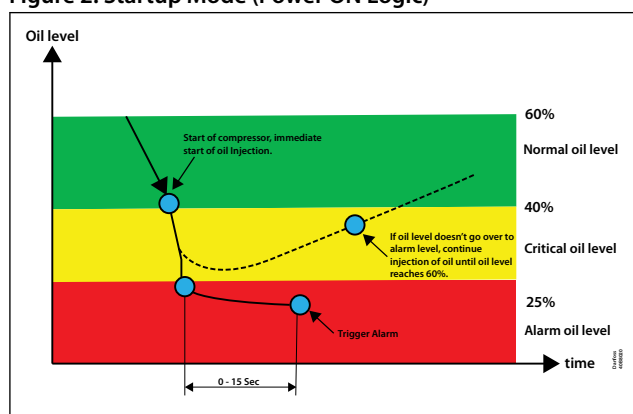
## **Startup Mode (Power ON Logic)**

The Power ON Logic becomes active when both the compressor and Danfoss COM are initially turned on. Startup mode(power On logic) suppresses all alarm and injection delay. Injection of oil starts immediately.

- If level is below 40%, injection function starts, and immediately activate the injection solenoid valve, injection continues until 60% level achieved again.
- If level is below 25%, Alarm function start, and depending how much below 0-25% level is measured, the alarm delay is suppressed to 0-15 sec. This is mitigating the risk of compressor running without oil during start up.

On the other hand, if the oil level does not decrease to the Alarm Level during the startup mode phase, the Power ON Logic is disabled, and the COM functions in the Normal Operation Mode.

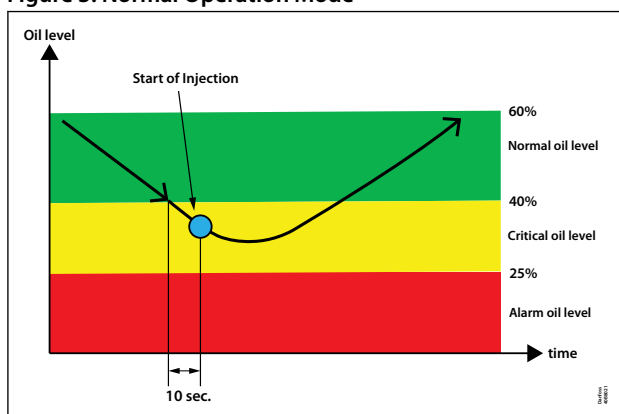
**Figure 2: Startup Mode (Power ON Logic)**



## **Normal Operation Mode**

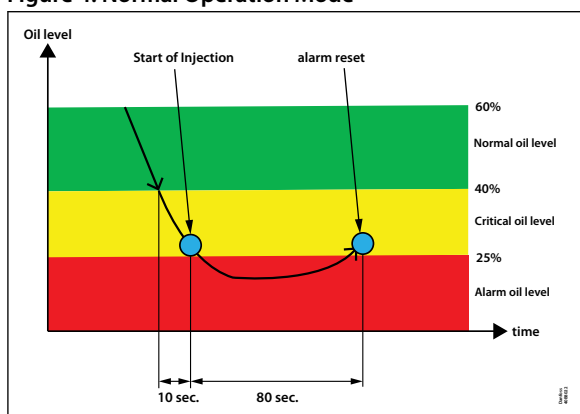
To ensure the compressor receives optimal lubrication, COM maintains the oil capacity within a range of 40-60%. If the oil level falls below the Normal Level, a delay counter comes into play. During the Normal Operation Mode, this counter prevents sudden fluctuations in the system and guards against overfilling the compressor. After a 10-second delay, the injection of oil commences. The electronic float's resistance to oil surges and foaming enables continuous monitoring of the oil level throughout the injection process until it reaches the Normal Level. This eliminates the need for breaks in the delay for intermediate measurements

**Figure 3: Normal Operation Mode**

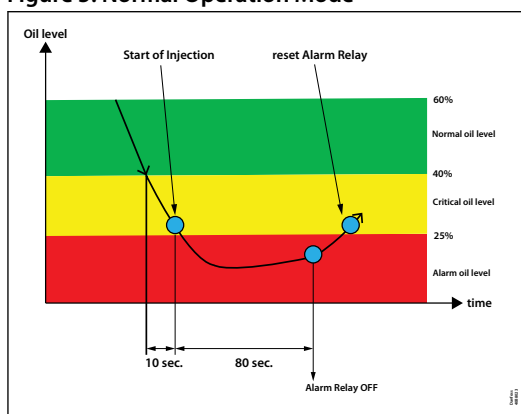


Should the oil level decrease even further, falling below the Critical Level (in the range of 40-25%), despite ongoing oil injection, an alarm counter is initiated. This counter runs for 80 seconds and subsequently triggers an alarm relay. This relay's contact can be monitored and employed for various purposes, such as shutting down the compressor or activating an alarm routine (this depends on how the alarm of COM has been used in the system). It's important to note that even when the alarm relay is activated, the oil injection process continues. Only when the oil level surpasses 25% does the alarm get deactivated, but the injection of oil persists until the Normal Level is reached

**Figure 4: Normal Operation Mode**



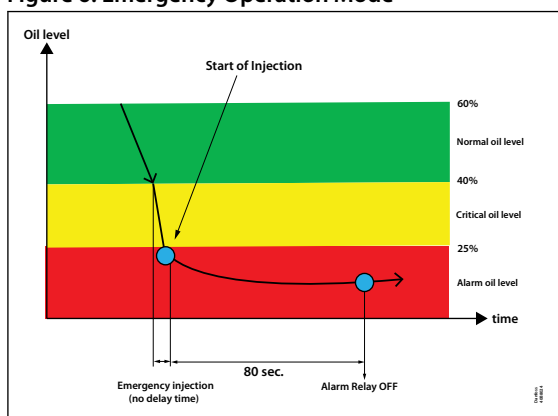
**Figure 5: Normal Operation Mode**



## **Emergency Operation Mode**

If there is a sudden increase in oil consumption, as might occur with a frequency-modulated compressor, the oil level can rapidly drop from the Normal Level to the Alarm Level. Danfoss COM detects this abrupt drop in oil level. In such instances, the delay that is normally beneficial in Normal Operation Mode is swiftly deactivated, and oil injection begins immediately to address the sudden oil level decrease. The alarm delay timer starts and if persists for 80secs, the alarm will be turned On. The alarm delay timer starts and if persists for 80secs, the alarm will be turned On. If level again reach 40% within the 80 sec delay time, alarm function timer is resets, and the alarm relay does not activate.

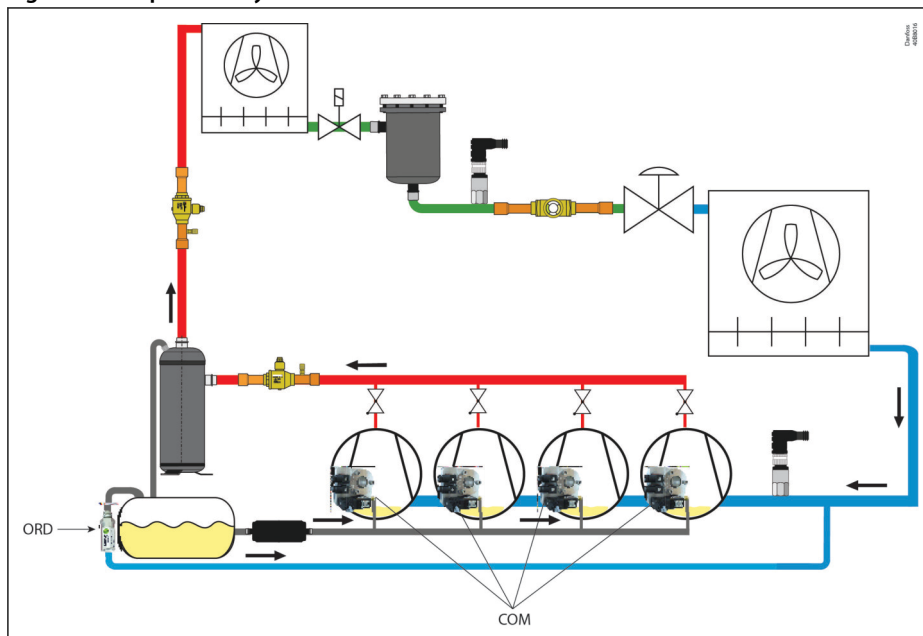
Figure 6: Emergency Operation Mode



## Applications

### Low pressure Oil system

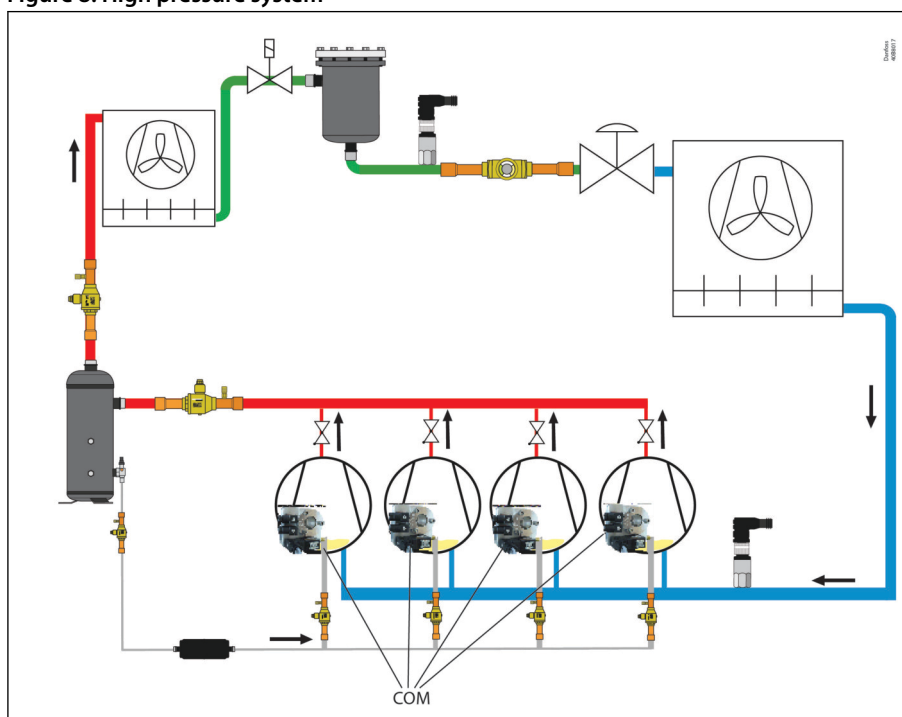
Figure 7: Low pressure system



The above shown is an example of low-pressure Oil system using Danfoss oil management. For such systems with oil pressure of 60 bar we use the 60bar oil level regulator, COM 10C. Each compressor must be fitted with one COM 10C. As needed, the ORD differential pressure valve can also be added.

### High pressure Oil system

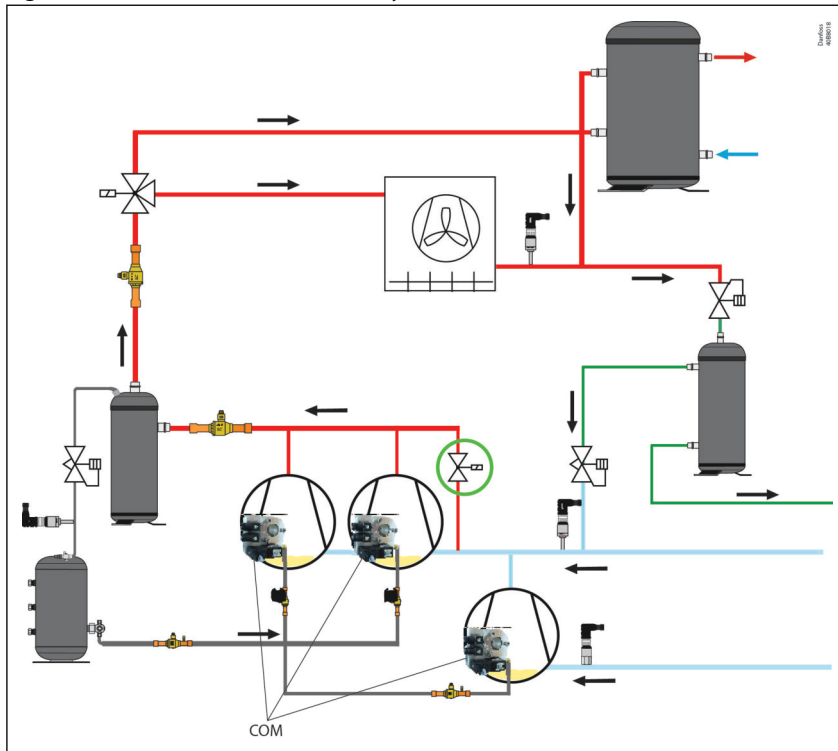
Figure 8: High pressure system



The above shown is an example of High-pressure Oil system using Danfoss oil Management. According to the pressure 60 bar or 130 bar in oil system, we can use COM 10C or COM 20 C respectively.

## **CO2 Booster/Trans-critical system**

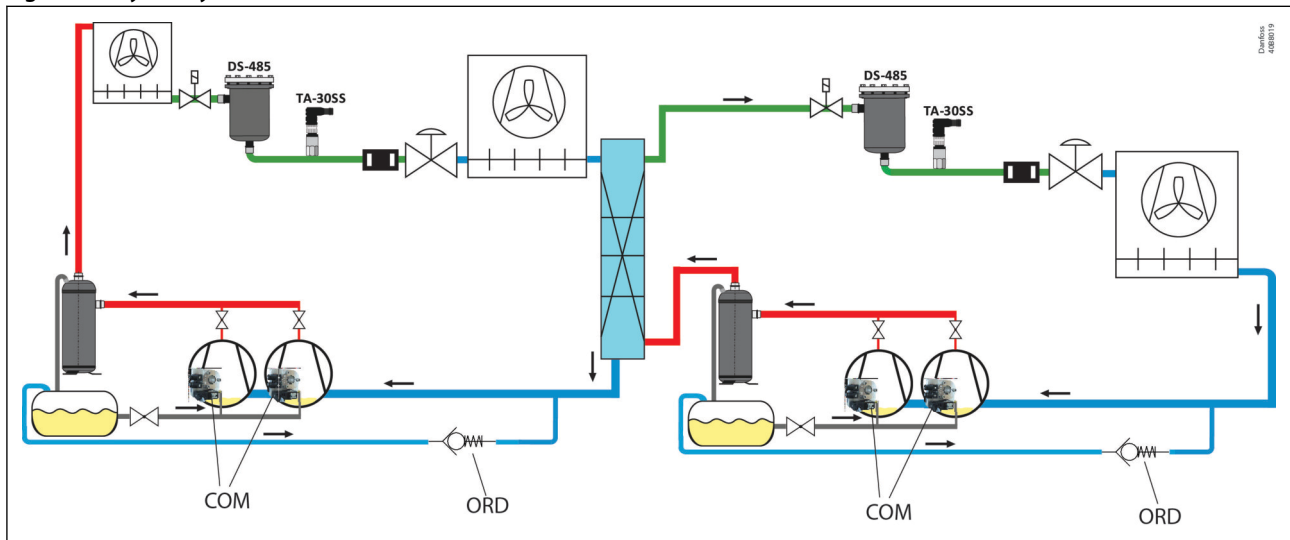
Figure 9: CO2 Booster / Trans-critical system



The above shown is an example of CO2 booster or trans-critical system using Danfoss oil Management.

## **Hybrid system with R134a and CO2**

Figure 10: Hybrid system with R134a and CO2



The above shown is an example of hybrid system with R134a and CO2 using Danfoss oil Management.

## Media

- Compatible Refrigerants: R404A, R134A, R448A, R449A, R450A, R513A, R744, R1234ze(E), R1234yf, R32, R455A, R454C, R1270, R290
- Compatible Oil: Mineral, Synthetic, Ester Oils

## Product specification

### Technical data

Table 1: Technical data

| Model                               | COM 10C                                                   | COM 20C                                                   |
|-------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|
| Max Operating pressure              | 60 bar / 870 psi                                          | 130 bar / 1885 psi                                        |
| Test Pressure                       | 66 bar / 957 psi                                          | 143 bar / 2074 psi                                        |
| Burst Pressure                      | 180 bar / 2610 psi                                        | 390 bar / 5656 psi                                        |
| Maximum Differential Pressure       | 40 bar / 580 psi                                          | 80 bar / 1160 psi (100 bar at nominal voltage)            |
| Supply Voltage                      | 24V AC 50Hz +10/-15%, 0,4A<br>230V AC 50Hz +10/-15% 0,04A | 24V AC 50Hz +10/-15%, 0,4A<br>230V AC 50Hz +10/-15% 0,04A |
| Alarm contact                       | Max 3A,230V AC dry contact                                | Max 3A,230V AC dry contact                                |
| Protection class                    | IP65                                                      | IP65                                                      |
| Filter                              | 100 micron mesh 80                                        | 100 micron mesh 80                                        |
| Vibration resistance (EN 60068-2-6) | max. 4g, 10... 250Hz                                      | max. 4g, 10... 250Hz                                      |

Table 2: Technical data

| Model                               | Adaptor set          |
|-------------------------------------|----------------------|
| Max Operating pressure              | 60 bar / 870 psi     |
| Test Pressure                       | 66 bar / 957 psi     |
| Burst Pressure                      | 180 bar / 2610 psi   |
| Vibration resistance (EN 60068-2-6) | max. 4g, 10... 250Hz |

Table 3: Technical data

| Model                  | ORD                |
|------------------------|--------------------|
| Max Working Pressure   | 60 bar / 870 psi   |
| Test Pressure          | 86 bar / 1247 psi  |
| Minimum Burst Pressure | 300 bar / 4351 psi |

### Identification

The below images are examples of labels on the product.



### Materials

Table 4: Materials

| COM 10C/20C                       | Material details                |
|-----------------------------------|---------------------------------|
| Housing and adaptor               | EN AW 6081, 6082                |
| Oil connector                     | Brass CW 617N 7/16"-20 UNF male |
| Sight glass                       | 11SMnPb37 Ni plated Pb< 0,035%  |
| Screws                            | Stainless steel                 |
| Valve seat                        | PTFE                            |
| O ring                            | CR                              |
| Plastic coil of electrical cables | PBT UL system                   |

Table 5: Materials

| Adaptor                           | Material details |
|-----------------------------------|------------------|
| Plastic coil of electrical cables | EN AW 6081, 6082 |

Table 6: Materials

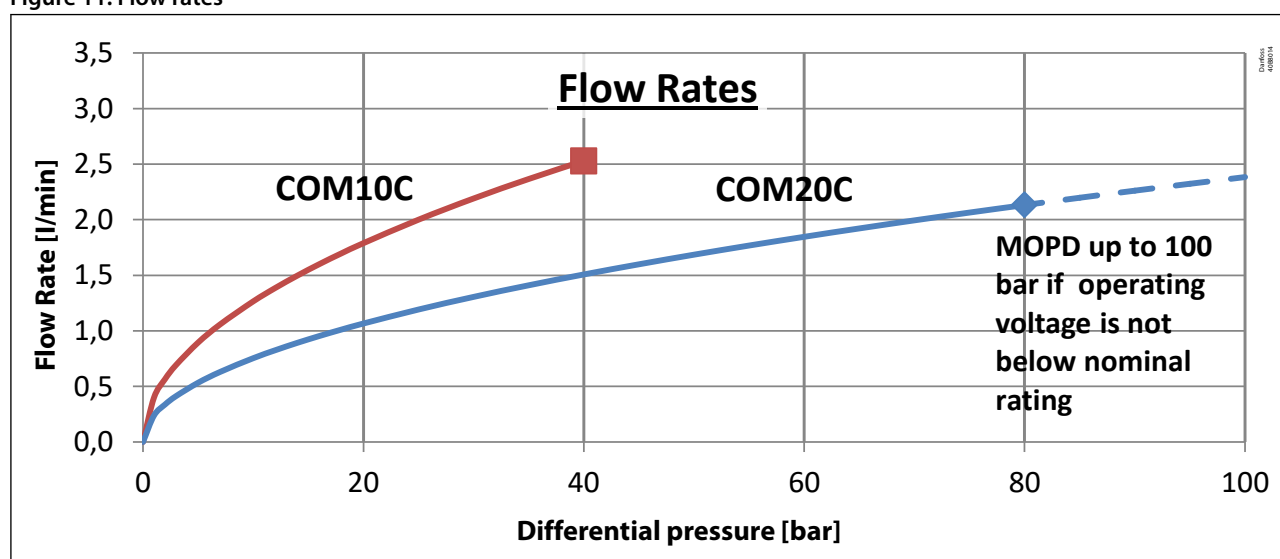
| ORD              | Material details |
|------------------|------------------|
| Housing          | EN AW 6082,6026  |
| Seat seal        | PTFE             |
| External sealing | O-Ring CR557-70  |

Table 7: Materials

| Cables                            | Material details |
|-----------------------------------|------------------|
| Plastic coil of electrical cables | PBT UL system    |

## Capacity tables

Figure 11: Flow rates



## Performance and environment conditions

Table 8: Performance and environment conditions

| Model                             | COM 10C                               | COM 20C                               |
|-----------------------------------|---------------------------------------|---------------------------------------|
| Media Temperature range           | -40 to +80°C / -40 to +176°F          | -40°C to +80°C / -40 to +176°F        |
| Ambient/Storage Temperature range | -40 to +50°C / -40 to +122°F (static) | -40 to +50°C / -40 to +122°F (static) |
| Humidity                          | 0-80% RH (non-condensing)             | 0-80% RH (non-condensing)             |

Table 9: Performance and environment conditions

| Model                             | Adaptors                                              |
|-----------------------------------|-------------------------------------------------------|
| Media Temperature range           | -40 to +80°C / -40 to +176°F                          |
| Ambient/Storage Temperature range | -40 to +50°C / -40 to +122°F (static)                 |
| Humidity                          | 0-80% RH (non-condensing) (up to 100% for T versions) |

Table 10: Performance and environment conditions

| Model                             | ORD                           |
|-----------------------------------|-------------------------------|
| Media Temperature range           | -40 to +80°C / -40 to +176°F  |
| Ambient/Storage Temperature range | -40 to +135°C / -40 to +275°F |

Table 11: Performance and environment conditions

| Model                             | Cables                                |
|-----------------------------------|---------------------------------------|
| Media Temperature range           | -40 to +80°C / -40 to +176°F          |
| Ambient/Storage Temperature range | -40 to +50°C / -40 to +122°F (static) |
| Humidity                          | 0-80% RH (non-condensing)             |

## Dimensions and weights

Table 12: Dimensions and weights

| Code no. | Type                        | Net Weight(Kg) |
|----------|-----------------------------|----------------|
| 040B0119 | COM 10C Oil level regulator | 0,580          |
| 040B0120 | COM 10C Oil level regulator | 0,575          |
| 040B0121 | COM 20C Oil level regulator | 0,635          |
| 040B0122 | COM 20C Oil level regulator | 0,630          |
| 040B0100 | COM 20C Oil level regulator | 0,635          |

Table 13: Dimensions and weights

| Code no. | Type                                    | Net Weight(Kg) |
|----------|-----------------------------------------|----------------|
| 040B0163 | ORD Differential pressure valve 1,5 bar | 0,045          |
| 040B0164 | ORD Differential pressure valve 3,5 bar | 0,045          |
| 040B0165 | ORD Differential pressure valve 5,0 bar | 0,045          |

Table 14: Dimensions and weights

| Code no. | Type                               | Depth   | Net Weight(Kg) |
|----------|------------------------------------|---------|----------------|
| 040B0123 | Adaptor set COM-AD-000             | 40,0 mm | 0,120          |
| 040B0124 | Adaptor set COM-AD-034-14          | 30,0 mm | 0,060          |
| 040B0125 | Adaptor set COM-AD-114             | 36,0 mm | 0,100          |
| 040B0126 | Adaptor set COM-AD-134             | 40,0 mm | 0,130          |
| 040B0127 | Adaptor set COM-AD-D06             | 40,0 mm | 0,120          |
| 040B0128 | Adaptor set COM-AD-118-18          | 22,5 mm | 0,075          |
| 040B0129 | Adaptor set COM-AD-118-18L         | 42,5 mm | 0,100          |
| 040B0130 | Mounting Adaptor set COM-AD-118-18 | 22,5 mm | 0,080          |
| 040B0131 | Mounting Adaptor set COM-AD-118-18 | 22,5 mm | 0,076          |
| 040B0145 | Adaptor set COM-AD-241             | 45,0 mm | 0,106          |
| 040B0146 | Adaptor set COM-AD-214             | 54,0 mm | 0,345          |

Table 15: Dimensions and weights

| Code no. | Type                           | Length  | Net Weight(Kg) |
|----------|--------------------------------|---------|----------------|
| 040B0153 | Power Cable set for Power 10 m | 10,00 m | 0,436          |
| 040B0155 | Power Cable set for Power 15 m | 15,00 m | 0,672          |
| 040B0157 | Power Cable set for Power 20 m | 20,00 m | 0,880          |
| 040B0147 | Power Cable set for Power 3 m  | 3,00 m  | 0,154          |
| 040B0151 | Power Cable set for Power 5 m  | 5,00 m  | 0,255          |
| 040B0149 | Power Cable set for Power 6 m  | 6,00 m  | 0,272          |
| 040B0101 | Power Cable set 5 m for Power  | 5,00 m  | 0,255          |
| 040B0102 | Power Cable set 10 m for Power | 10,00 m | 0,436          |
| 040B0103 | Power Cable set 15 m for Power | 15,00 m | 0,672          |
| 040B0104 | Power Cable set 20 m for Power | 20,00 m | 0,880          |

Table 16: Dimensions and weights

| Code no. | Type                            | Length  | Net Weight(Kg) |
|----------|---------------------------------|---------|----------------|
| 040B0148 | Relay Cable set for Relays 3 m  | 3,00 m  | 0,123 KG       |
| 040B0152 | Relay Cable set for Relays 5 m  | 5,00 m  | 0,197 KG       |
| 040B0150 | Relay Cable set for Relays 6 m  | 6,00 m  | 0,224 KG       |
| 040B0154 | Relay Cable set for Relays 10 m | 10,00 m | 0,386 KG       |
| 040B0156 | Relay Cable set for Relays 15 m | 15,00 m | 0,583 KG       |
| 040B0158 | Relay Cable set for Relays 20 m | 20,00 m | 0,767 KG       |
| 040B0111 | Relay Cable set 5 m for Relay   | 5,00 m  | 0,197 KG       |
| 040B0112 | Relay Cable set 10 m for Relay  | 10,00 m | 0,386 KG       |
| 040B0113 | Relay Cable set 15 m for Relay  | 15,00 m | 0,583 KG       |
| 040B0114 | Relay Cable set 20 m for Relay  | 20,00 m | 0,767 KG       |

Figure 12: ORD dimensions

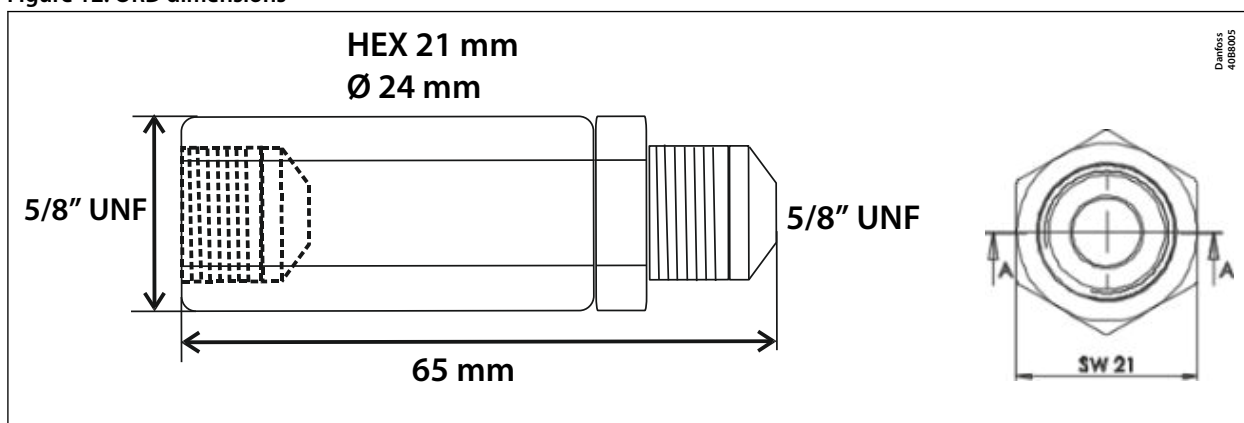


Figure 13: COM dimensions

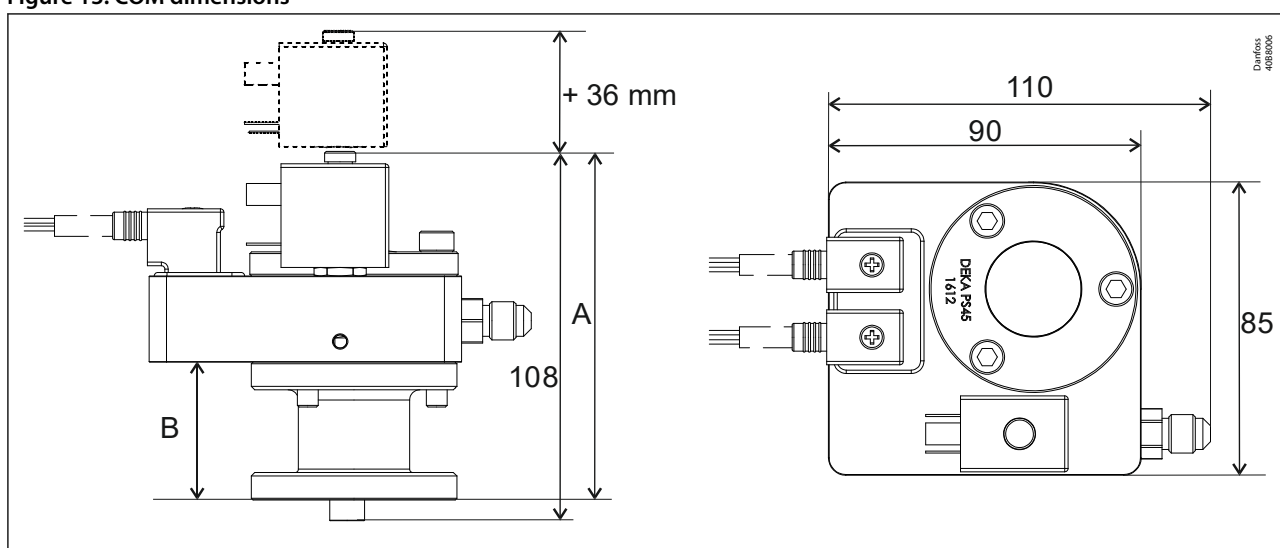


Table 17: COM dimensions

| Type                               | A(mm) installed | B (Adaptor depth) |
|------------------------------------|-----------------|-------------------|
| Adaptor set COM-AD-000             | 101,0 mm        | 40,0 mm           |
| Adaptor set COM-AD-034-14          | 91,0 mm         | 30,0 mm           |
| Adaptor set COM-AD-114             | 97,0 mm         | 36,0 mm           |
| Adaptor set COM-AD-134             | 101,0 mm        | 40,0 mm           |
| Adaptor set COM-AD-D06             | 101,0 mm        | 40,0 mm           |
| Adaptor set COM-AD-118-18          | 22,5 mm         | 22,5 mm           |
| Adaptor set COM-AD-118-18L         | 83,5 mm         | 42,5 mm           |
| Mounting Adaptor set COM-AD-118-18 | 83,5 mm         | 22,5 mm           |
| Mounting Adaptor set COM-AD-118-18 | 83,5 mm         | 22,5 mm           |
| Adaptor set COM-AD-241             | 106,0 mm        | 45,0 mm           |
| Adaptor set COM-AD-214             | 115,0 mm        | 54,0 mm           |

## Selection

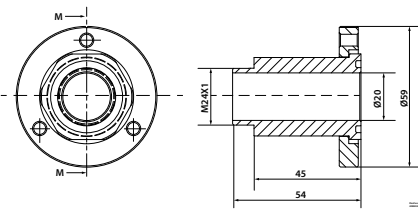
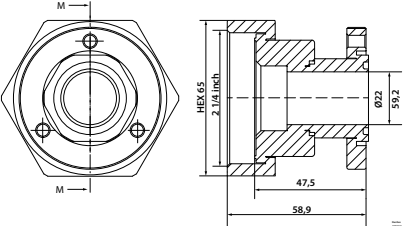
Table 18: selection of adaptor

| Adaptor type           | Dimension | Interface                                                      |
|------------------------|-----------|----------------------------------------------------------------|
| Adapter COM-AD-000     |           | Mounting Adapter 3-4 hole for compressor or vessel             |
| Adapter COM-AD-118-18  |           | Adapter 1-1/8"-18 UNEF for compressor or vessel                |
| Adapter COM-AD-118-18L |           | Adapter 1-1/8"-18 UNEF Long for compressor or vessel           |
| COM-AD-000             |           | Mounting Adapter 3-4 hole for compressor or vessel             |
| COM-AD-034-14          |           | Mounting adaptor set for compressor or vessel 3/4"-14 NPT      |
| COM-AD-114             |           | Mounting adaptor set for compressor or vessel Rota-lock 1-1/4" |

## Oil level Regulators, COM

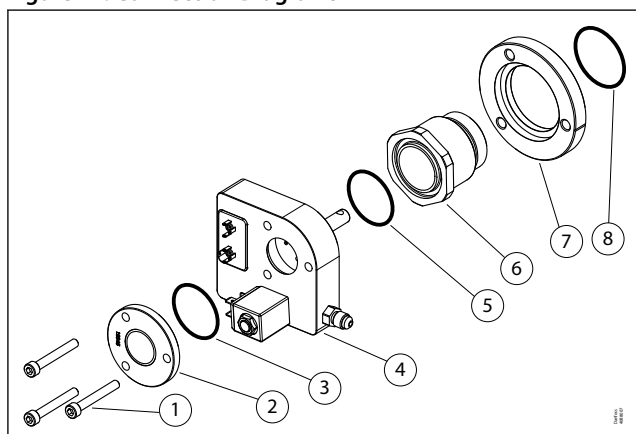
| Adapter type                                            | Dimension | Interface                                                                                 |
|---------------------------------------------------------|-----------|-------------------------------------------------------------------------------------------|
| COM-AD-134                                              |           | Mounting adaptor set for compressor or vessel Rota-lock 1-3/4"                            |
| COM-AD-D06                                              |           | Mounting adaptor set for compressor or vessel 6 hole                                      |
| COM-AD-118-18                                           |           | Mounting adaptor set for compressor or vessel 1-1/8"-18 UNEF                              |
| COM-AD-118-18L                                          |           | Mounting adaptor set for compressor or vessel 1-1/8"-18 UNEF                              |
| COM-AD-118-18 (Danfoss - mit zusätzlichem Adapter-Ring) |           | Mounting adaptor set for compressor or vessel 1-1/8"-18 UNEF With additional adapter ring |

## Oil level Regulators, COM

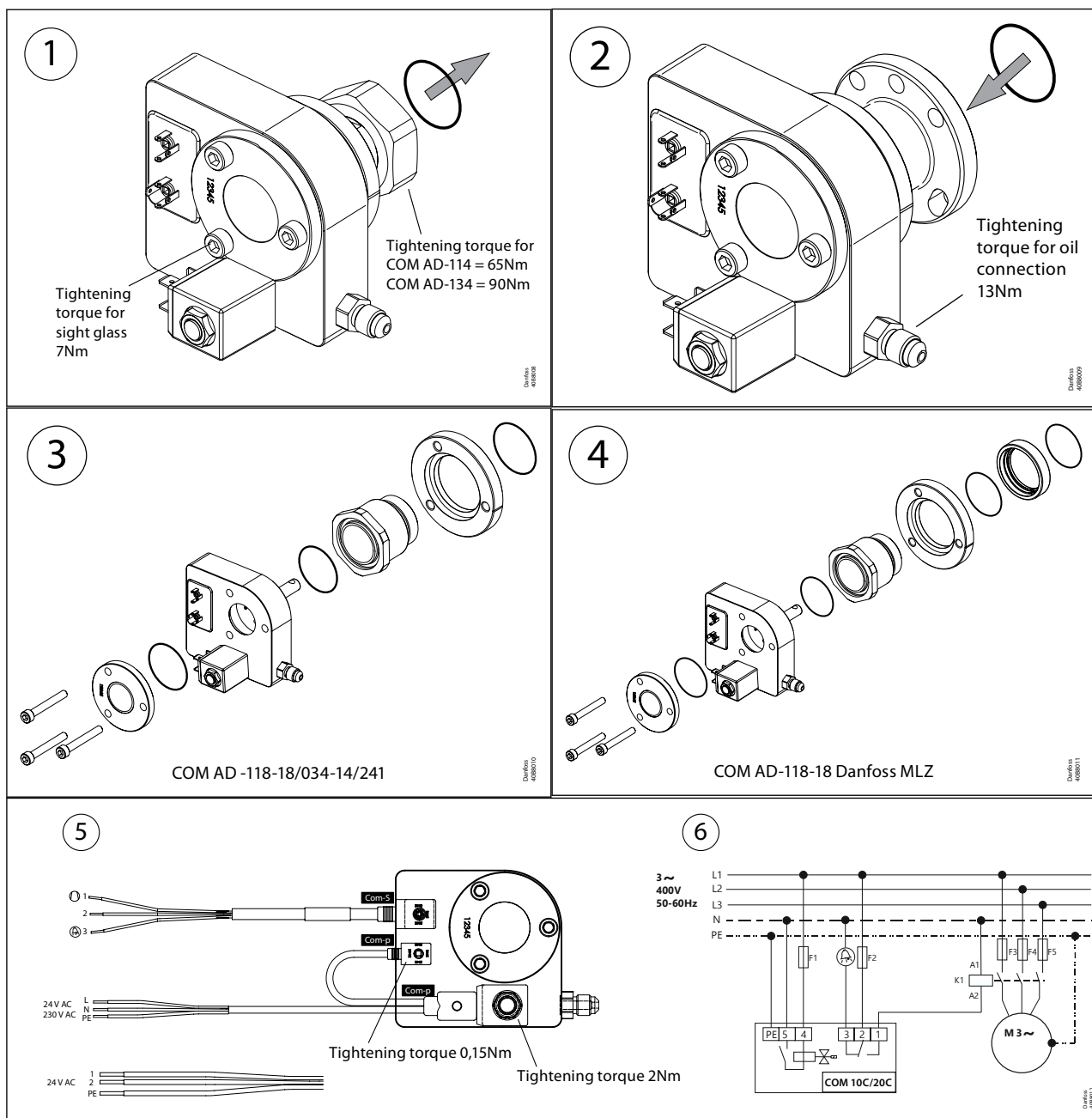
| Adapter type                                           | Dimension                                                                            | Interface                                                                               |
|--------------------------------------------------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| COM-AD-118-18 (Dorin - mit zusätzlichem Alu Dichtring) | Identical to 040B0106 + Aluminum gasket Dimension of alu gasket: 28,7 x 34 x 2. (mm) | Mounting adaptor set for compressor or vessel 1-1/8"-18 UNEF With additional alu gasket |
| COM-AD-241                                             |    | Mounting adaptor set for compressor or vessel M24x1                                     |
| COM-AD-214                                             |    | Mounting adaptor set for compressor or vessel Rota-lock 2-1/4"                          |

## Connection Diagrams

Figure 14: Connection Diagrams



- |   |               |
|---|---------------|
| 1 | Screw (3pcs.) |
| 2 | Sight glass   |
| 3 | O-ring        |
| 4 | Body          |
| 5 | O-ring        |
| 6 | Adapter       |
| 7 | Flange ring   |
| 8 | O-ring        |

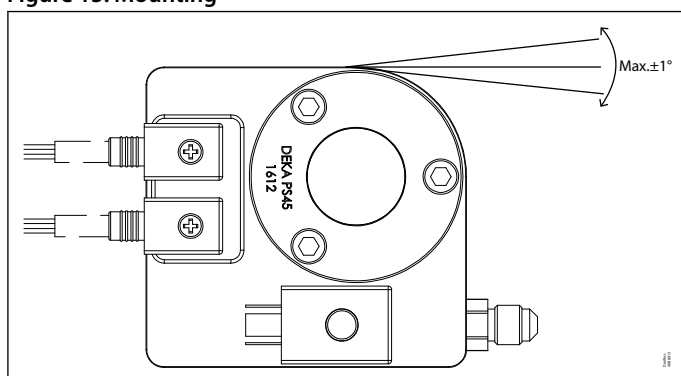


See product installation guide for more details.

## Mounting

Align the product horizontally (tol. +/- 1°).

Figure 15: Mounting



## Ordering

### Product part numbers

Table 19: COM Base Unit

| Description                 | Supply Voltage | Packaging Format | Quantity per packaging | Code No. |
|-----------------------------|----------------|------------------|------------------------|----------|
| COM 10C Oil level regulator | 230V           | Single pack      | 1                      | 040B0119 |
| COM 10C Oil level regulator | 24V            | Single pack      | 1                      | 040B0120 |
| COM 20C Oil level regulator | 230V           | Single pack      | 1                      | 040B0121 |
| COM 20C Oil level regulator | 24V            | Single pack      | 1                      | 040B0122 |
| COM 20C Oil level regulator | 230V           | Industrial pack  | 6                      | 040B0100 |

Table 20: ORD Differential Pressure Valve

| Description                             | Inlet Connection Type | Outlet Connection Type | Packaging Format | Quantity per packaging | Code No. |
|-----------------------------------------|-----------------------|------------------------|------------------|------------------------|----------|
| ORD Differential pressure valve 1,5 bar | 5/8-18-2B" UNF        | 5/8-18-2A" UNF         | Single pack      | 1                      | 040B0163 |
| ORD Differential pressure valve 3,5 bar | 5/8-18-2B" UNF        | 5/8-18-2A" UNF         | Single pack      | 1                      | 040B0164 |
| ORD Differential pressure valve 5,0 bar | 5/8-18-2B" UNF        | 5/8-18-2A" UNF         | Single pack      | 1                      | 040B0165 |

### Accessories part numbers

Table 21: Adaptor

| Description                        | Connection Type | Connection Length | Packaging Format | Quantity per packaging | Code No. |
|------------------------------------|-----------------|-------------------|------------------|------------------------|----------|
| Adaptor set COM-AD-000             | Flange          | 40,0 mm           | Single pack      | 1                      | 040B0123 |
| Adaptor set COM-AD-034-14          | 3/4 - 14" NPT   | 30,0 mm           | Single pack      | 1                      | 040B0124 |
| Adaptor set COM-AD-114             | 1 1/4-12-2B UNF | 36,0 mm           | Single pack      | 1                      | 040B0125 |
| Adaptor set COM-AD-134             | 1 3/4-12-2B UNF | 40,0 mm           | Single pack      | 1                      | 040B0126 |
| Adaptor set COM-AD-D06             | Flange          | 40,0 mm           | Single pack      | 1                      | 040B0127 |
| Adaptor set COM-AD-118-18          | 1 1/8" UNEF     | 22,5 mm           | Single pack      | 1                      | 040B0128 |
| Adaptor set COM-AD-118-18L         | 1 1/8" UNEF     | 42,5 mm           | Single pack      | 1                      | 040B0129 |
| Mounting Adaptor set COM-AD-118-18 | 1 1/8" UNEF     | 22,5 mm           | Single pack      | 1                      | 040B0130 |
| Mounting Adaptor set COM-AD-118-18 | 1 1/8" UNEF     | 22,5 mm           | Single pack      | 1                      | 040B0131 |
| Adaptor set COM-AD-241             | M 24mm          | 45,0 mm           | Single pack      | 1                      | 040B0145 |
| Adaptor set COM-AD-214             | 2 1/4-12-2B UNF | 54,0 mm           | Single pack      | 1                      | 040B0146 |

Table 22: Power cable

| Description                    | Voltage | Length  | Type      | Packaging Format | Quantity per packaging | Code No. |
|--------------------------------|---------|---------|-----------|------------------|------------------------|----------|
| Power Cable set for Power 10 m | 24 V    | 10,00 m | DIN 43650 | Single pack      | 1                      | 040B0153 |
| Power Cable set for Power 15 m | 24 V    | 15,00 m | DIN 43650 | Single pack      | 1                      | 040B0155 |
| Power Cable set for Power 20 m | 24 V    | 20,00 m | DIN 43650 | Single pack      | 1                      | 040B0157 |
| Power Cable set for Power 3 m  | 24 V    | 3,00 m  | DIN 43650 | Single pack      | 1                      | 040B0147 |
| Power Cable set for Power 5 m  | 24 V    | 5,00 m  | DIN 43650 | Single pack      | 1                      | 040B0151 |
| Power Cable set for Power 6 m  | 24 V    | 6,00 m  | DIN 43650 | Single pack      | 1                      | 040B0149 |
| Power Cable set 5 m for Power  | 24 V    | 5,00 m  | DIN 43650 | Industrial pack  | 50                     | 040B0101 |

## Oil level Regulators, COM

| Description                    | Voltage | Length  | Type      | Packaging Format | Quantity per packaging | Code No. |
|--------------------------------|---------|---------|-----------|------------------|------------------------|----------|
| Power Cable set 10 m for Power | 24 V    | 10,00 m | DIN 43650 | Industrial pack  | 35                     | 040B0102 |
| Power Cable set 15 m for Power | 24 V    | 15,00 m | DIN 43650 | Industrial pack  | 25                     | 040B0103 |
| Power Cable set 20 m for Power | 24 V    | 20,00 m | DIN 43650 | Industrial pack  | 20                     | 040B0104 |

**Table 23: Relay cable**

| Description                     | Voltage | Current | Length  | Type      | Packaging Format | Quantity per packaging | Code No. |
|---------------------------------|---------|---------|---------|-----------|------------------|------------------------|----------|
| Relay Cable set for Relays 3 m  | 230 V   | 3,0 A   | 3,00 m  | DIN 43650 | Single pack      | 1                      | 040B0148 |
| Relay Cable set for Relays 5 m  | 230 V   | 3,0 A   | 5,00 m  | DIN 43650 | Single pack      | 1                      | 040B0152 |
| Relay Cable set for Relays 6 m  | 230 V   | 3,0 A   | 6,00 m  | DIN 43650 | Single pack      | 1                      | 040B0150 |
| Relay Cable set for Relays 10 m | 230 V   | 3,0 A   | 10,00 m | DIN 43650 | Single pack      | 1                      | 040B0154 |
| Relay Cable set for Relays 15 m | 230 V   | 3,0 A   | 15,00 m | DIN 43650 | Single pack      | 1                      | 040B0156 |
| Relay Cable set for Relays 20 m | 230 V   | 3,0 A   | 20,00 m | DIN 43650 | Single pack      | 1                      | 040B0158 |
| Relay Cable set 5 m for Relay   | 230 V   | 3,0 A   | 5,00 m  | DIN 43650 | Industrial pack  | 50                     | 040B0111 |
| Relay Cable set 10 m for Relay  | 230 V   | 3,0 A   | 10,00 m | DIN 43650 | Industrial pack  | 35                     | 040B0112 |
| Relay Cable set 15 m for Relay  | 230 V   | 3,0 A   | 15,00 m | DIN 43650 | Industrial pack  | 25                     | 040B0113 |
| Relay Cable set 20 m for Relay  | 230 V   | 3,0 A   | 20,00 m | DIN 43650 | Industrial pack  | 20                     | 040B0114 |

## Spare part numbers

**Table 24: Spare part numbers**

| Description           | Packaging Format | Quantity per packaging | Code No. |
|-----------------------|------------------|------------------------|----------|
| Spare part set COM10C | Single pack      | 1                      | 040B0159 |
| Spare part set COM20C | Single pack      | 1                      | 040B0160 |
| Spare part 24V Coil   | Single pack      | 1                      | 040B0161 |
| Spare part 23V Coil   | Single pack      | 1                      | 040B0162 |

## Certificates, declarations, and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

Some approvals may change over time. You can check the most current status at [danfoss.com](https://danfoss.com) or contact your local Danfoss representative if you have any questions.

### Valid approvals

Table 25: Valid approvals

|                                                                                   |                                                                                   |                                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|

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