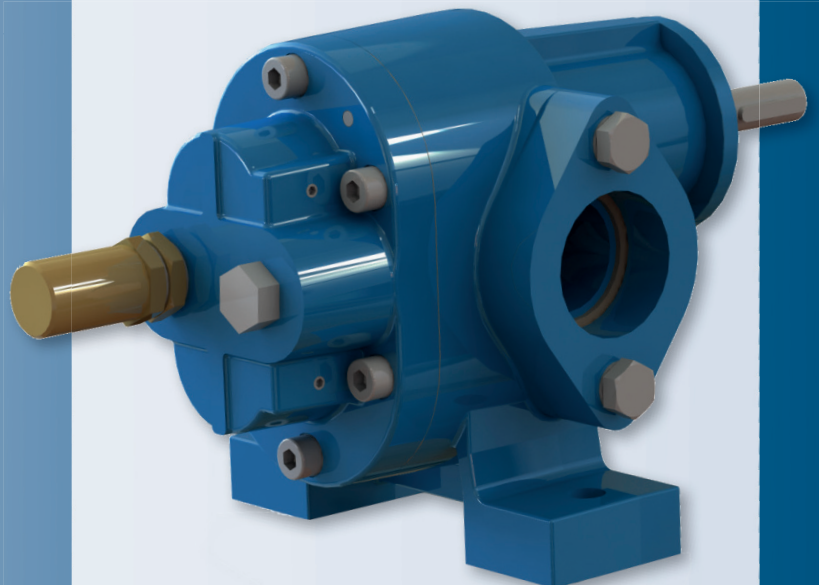


# 5

## B, BC, MBM, MBMC Series

Gear Pumps with Bare Shaft  
and Feet Mounting,  
Gear Pumps on Skid with Motor,  
Heating Chamber Version,  
ATEX version.



## 5.1 MAIN CHARACTERISTICS AND NOMINAL FLOW RATES

B, BC, MBM, MBMC pumps are volumetric gear pumps suitable for transferring lubricant viscous liquids without any suspended solids or abrasive substances. They are self-priming pumps used for a wide range of liquids with a viscosity from 1 to 20000 cSt. The speed of rotation is chosen according to the viscosity of the liquid. Flowrate range is from 5 to 800 L/min.

The standard construction consists of pump housing and cover in cast iron, shafts and gears in carbon steel, gaskets in Flexoid, sleeve bushings in Steel-Bronze-PTFE and a mechanical seal in ceramic-graphite-Viton. These pumps are supplied with a pressure relief valve in brass.

Nozzles in inlet and outlet are of the same diameter and positioned on the same axis.

A short and straight alignment of the flow channels provides for a good suction capability and a quiet running. The helical gears result in extremely low noise levels and reduced pressure pulsation.

B, BC pumps are typically installed on a skid and driven by an electric motor by means of an elastic coupling (MBM, MBMC series). The sizes from 10 to 400 are also available with a heating chamber integrated in the pump housing (BC, MBMC series).

**Fig. 501 – B pump, standard version**

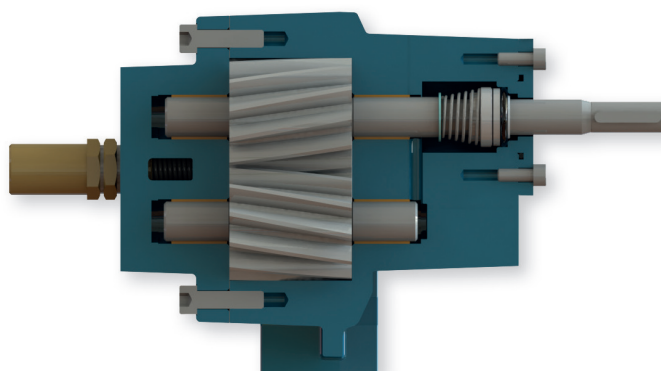


Table 501 shows the possible flow rates for non-pressurized pumping ( $\Delta p=0$ ) and a 46 cSt fluid.

The flow rate of gear pumps is virtually proportional to their

speed. The selected speeds are the most common speeds at rated power of industrial electric motors at 50 and 60Hz.

**Tab. 501 – Nominal flow rates**

| PUMP SIZE<br>(B, BC, MBM,<br>MBMC) | Geometrical<br>displacement<br>$V_{geo}$ [cm <sup>3</sup> /rev] | Nominal flow rate $Q_{teo}$ [L/min] at<br>Speed n [1/min] |       |       |       |       |       |
|------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------|-------|-------|-------|-------|-------|
|                                    |                                                                 | 690                                                       | 830   | 950   | 1150  | 1450  | 1750  |
| <b>5</b>                           | 4.6                                                             | 3.1                                                       | 3.8   | 4.3   | 5.2   | 6.6   | 8.0   |
| <b>10</b>                          | 9.1                                                             | 6.3                                                       | 7.5   | 8.6   | 10.5  | 13.2  | 15.9  |
| <b>15</b>                          | 13.6                                                            | 9.4                                                       | 11.3  | 12.9  | 15.7  | 19.8  | 23.9  |
| <b>25</b>                          | 18.2                                                            | 12.5                                                      | 15.1  | 17.3  | 20.9  | 26.4  | 31.8  |
| <b>40</b>                          | 28.1                                                            | 19.4                                                      | 23.3  | 26.7  | 32.3  | 40.7  | 49.1  |
| <b>50</b>                          | 41.2                                                            | 28.4                                                      | 34.2  | 39.1  | 47.3  | 59.7  | 72.0  |
| <b>70</b>                          | 50.3                                                            | 34.7                                                      | 41.8  | 47.8  | 57.9  | 73.0  | 88.1  |
| <b>100</b>                         | 81.4                                                            | 56.1                                                      | 67.5  | 77.3  | 93.6  | 118.0 | 142.4 |
| <b>150</b>                         | 117.5                                                           | 81.1                                                      | 97.5  | 111.7 | 135.2 | 170.4 | 205.7 |
| <b>200</b>                         | 149.5                                                           | 103.2                                                     | 124.1 | 142.1 | 172.0 | 216.8 |       |
| <b>250</b>                         | 185.4                                                           | 127.9                                                     | 153.9 | 176.1 | 213.2 | 268.8 |       |
| <b>300</b>                         | 221.3                                                           | 152.7                                                     | 183.7 | 210.2 | 254.5 | 320.9 |       |
| <b>350</b>                         | 257.2                                                           | 177.5                                                     | 213.5 | 244.3 | 295.8 | 372.9 |       |
| <b>400</b>                         | 299.1                                                           | 206.3                                                     | 248.2 | 284.1 | 343.9 | 433.6 |       |
| <b>500</b>                         | 369.6                                                           | 255.0                                                     | 306.8 | 351.1 | 425.1 | 535.9 |       |
| <b>550</b>                         | 407.9                                                           | 281.4                                                     | 338.5 | 387.5 | 469.0 | 591.4 |       |
| <b>600</b>                         | 446.1                                                           | 307.8                                                     | 370.3 | 423.8 | 513.0 | 646.8 |       |
| <b>1200</b>                        | 885.5                                                           | 611.0                                                     | 734.9 |       |       |       |       |
| <b>1600</b>                        | 1201.7                                                          | 829.2                                                     | 997.4 |       |       |       |       |

## 5.2 MAIN OPTIONS

The main options available are:

- Counter-clockwise rotation (see paragraph 5.3)
- Options on relief valve (see paragraph 5.4)
- Special seals according to liquids and temperatures (see paragraph 5.5)
- On skid with electric motor (see paragraph 5.6)
- Constructions for corrosive liquids and aggressive environments (see paragraph 5.7)
- Heating solutions (see paragraph 5.8)
- Atex (see paragraph 5.9)
- Accessories (see paragraph 5.10)

## 5.3 SENSE OF ROTATION AND FLOW DIRECTION

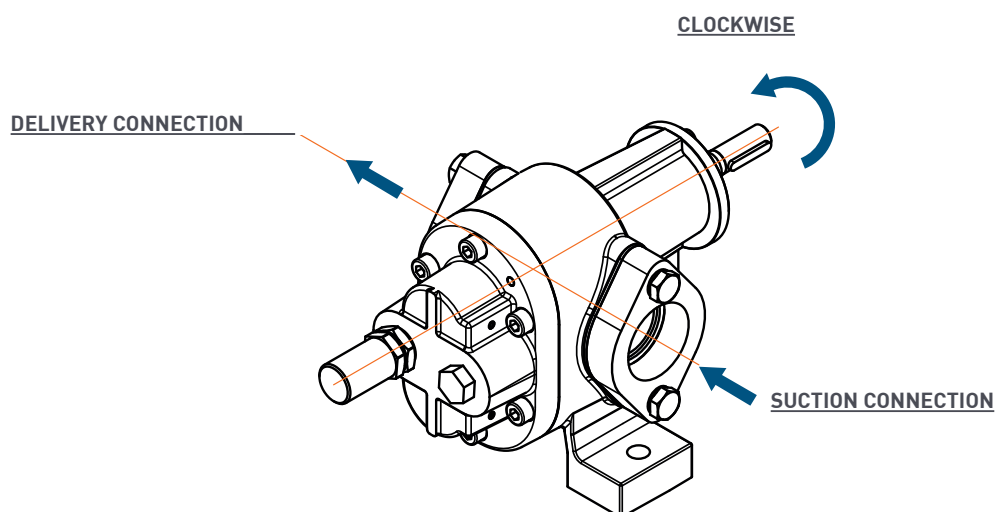
The standard version of B and BC pumps can operate only in one direction of rotation: clockwise watching the pump shaft-end.

The direction of the fluid flow is shown by an arrow placed nearby the piping connections.

A proper mounting will keep the nameplate on the top side. The flow direction will be from the left side to the right side watching the pump shaft-end and the pressure side (delivery) will be at the right side.

On request a counterclockwise version can be supplied.

**Fig. 502 – B, BC Series - Sense of rotation and flow direction**



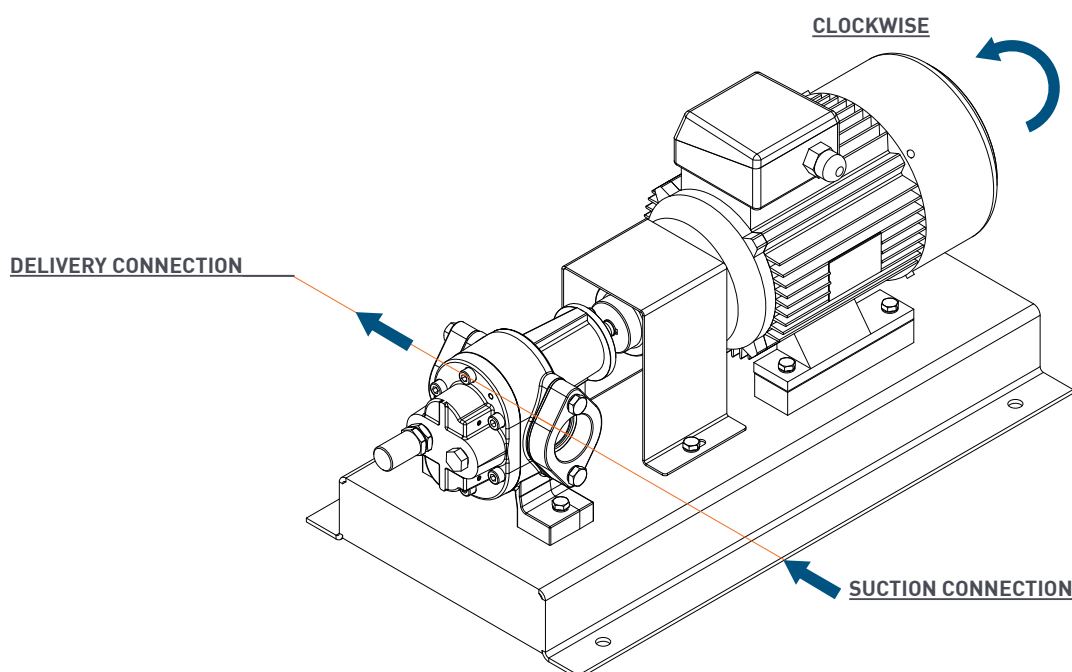
The standard version of MBM and MBMC pumps can operate only in one sense of rotation: clockwise watching the electric motor fan.

The sense of rotation of the motor, when properly connected to the mains, is shown by an arrow placed on

the fan cover. Watching the electric motor fan, the flow direction will be from the left side to the right side and the pressure side (delivery) will be at the right side.

On request a counterclockwise version can be supplied.

**Fig. 503 – MBM, MBMC Series - Sense of rotation and flow direction**



### 5.4 PRESSURE RELIEF VALVE

B, BC, MBM, MBMC pumps are supplied with a brass pressure relief valve as a standard. It works only on outlet, in one direction.

It may be used as a safety valve only for short-term operations. When a partial discharge flow has to be drained over a prolonged period of time, a separate by-pass valve with return to the suction tank has to be installed into the piping.

The pressure relief valve is designed as a spring-preloaded

piston valve. It is integrated into the pump's end cover.

The spring pretension and the relative opening pressure can be adjusted by means of a screw. Different springs are also available to reach the desired adjustment range.

The pressure relief valve is available on request in stainless steel construction.

As an option the pumps can be supplied without relief valve.

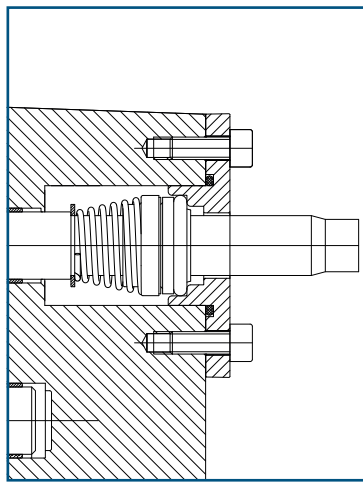
## 5.5 SHAFT-END SEALS

The standard version is fitted with mechanical seal in ceramic-graphite-FPM. A number of different seals materials can be supplied for different liquids and operating temperatures.

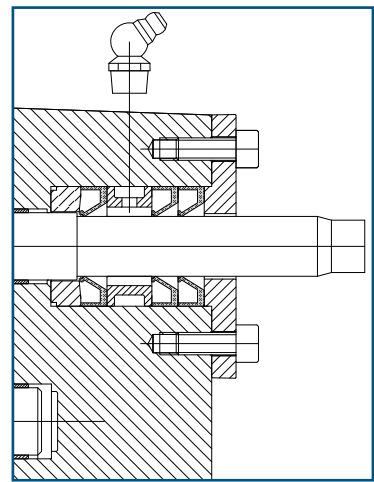
On request:

- Radial lip-type seal in FPM (Viton), NBR or PTFE (Teflon)
- Packing seal in Acrylic yarn-PTFE
- Seal for high temperatures up to 200°C
- Reversible mechanical seal
- Double mechanical seal; available also with flushing system or quench

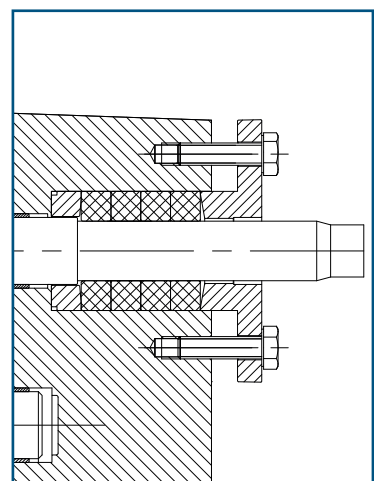
**Fig. 504 - Mechanical seal**



**Fig. 505 - Lip seal**



**Fig. 506 - Packing seal**



## 5.6 SKID VERSION WITH ELECTRIC MOTOR AND COUPLING (MBM, MBMC)

B, BC pumps can be mounted on a skid in galvanized steel and coupled to electric motors of different sizes through elastic coupling. Motors must be in frame B3.

The group is called MBM (B pump and motor on skid) and

MBMC (BC pump and motor on skid).

In table 502 the most common combinations of pumps and electric motors are listed.

**Tab. 502 - Combinations of pumps and electric motors**

| PUMP<br>SIZE<br>(MBM,<br>MBMC) | IEC Frame size                                            |      |      |     |     |     |     |     |     |     |
|--------------------------------|-----------------------------------------------------------|------|------|-----|-----|-----|-----|-----|-----|-----|
|                                | 71                                                        | 80   | 90   | 100 | 112 | 132 | 160 | 180 | 200 | 225 |
|                                | Maximum rated power for a 4 poles motor at 400V/50Hz [kW] |      |      |     |     |     |     |     |     |     |
|                                | 0.37                                                      | 0.75 | 1.50 | 3   | 4   | 7.5 | 15  | 22  | 22  | 30  |
| 5                              |                                                           |      |      |     |     |     |     |     |     |     |
| 10                             |                                                           |      |      |     |     |     |     |     |     |     |
| 15                             |                                                           |      |      |     |     |     |     |     |     |     |
| 25                             |                                                           |      |      |     |     |     |     |     |     |     |
| 40                             |                                                           |      |      |     |     |     |     |     |     |     |
| 50                             |                                                           |      |      |     |     |     |     |     |     |     |
| 70                             |                                                           |      |      |     |     |     |     |     |     |     |
| 100                            |                                                           |      |      |     |     |     |     |     |     |     |
| 150                            |                                                           |      |      |     |     |     |     |     |     |     |
| 200                            |                                                           |      |      |     |     |     |     |     |     |     |
| 250                            |                                                           |      |      |     |     |     |     |     |     |     |
| 300                            |                                                           |      |      |     |     |     |     |     |     |     |
| 350                            |                                                           |      |      |     |     |     |     |     |     |     |
| 400                            |                                                           |      |      |     |     |     |     |     |     |     |
| 500                            |                                                           |      |      |     |     |     |     |     |     |     |
| 550                            |                                                           |      |      |     |     |     |     |     |     |     |
| 600                            |                                                           |      |      |     |     |     |     |     |     |     |
| 1200*                          |                                                           |      |      |     |     |     |     |     |     |     |
| 1600*                          |                                                           |      |      |     |     |     |     |     |     |     |

(\*) 8 poles for pump models MBM1200 and MBM1600

The most common installed electric motors have the following characteristics:

- Standard motors in IP55, insulation class F available at 4, 6 and 8 poles
- Standard voltages for Three-phase motors  $\leq 4\text{kW}$  230/400V 50Hz - 265/460V 60Hz
- Standard voltages for Three-phase motors  $\geq 5,5\text{kW}$  400/690V 50Hz - 460/795V 60Hz
- Standard voltages for Single-phase motors 230V 50Hz

Special options on electric motors:

- Atex motors (see paragraph 5.9)
- Motors with built-in frequency converter
- Motors suitable for frequency converter connection
- Motor with forced ventilation

- Tropicalization
- Special voltages
- Protection IP56/IP65
- Protection IP67/IP68
- Thermistors PTC
- Special treatment for corrosive and saline environment
- Motors according to UL-CSA, NEMA, cURus and Marine regulations
- Insulation class H

Special motors available:

- Internal combustion engines
- Gearmotor
- Mechanical variator
- DC motors at 12V and 24V



### 5.7 VERSION FOR AGGRESSIVE LIQUIDS AND ENVIRONMENTS

B, BC, MBM, MBMC pumps can be supplied in a corrosion and acid-resistant construction.

*Stainless-steel version*

Pump housing, cover, shaft and gears in stainless steel and sleeve bushings in AISI 316-Bronze-PTFE.

*Bronze version*

Pump housing and cover in bronze, shaft and gears in stainless

steel and sleeve bushings in AISI 316-Bronze-PTFE.

Seals and gaskets materials are chosen according to the liquid pumped.

Many combinations suitable for corrosive liquids and aggressive environment can be supplied as follows:

- Gears in bronze
- Sleeve bushings in PTFE or Tecapeek

### 5.8 VERSION WITH HEATING CHAMBER (BC, MBMC)

BC pumps, available from size 10 to 400, have got a heating chamber integrated in the pump housing.

BC pumps are useful when the pumped liquid (such as bitumen or wax) needs to be heated in order to prevent the liquid from hardening. The heating chamber works with a circulation of diathermic oil, hot water or saturated vapor.

A different heating solution, as an alternative to the heating chamber, is to provide holes for glow-plug or electric resistances (not included).

MBMC serie consists in a BC pump mounted on a skid and coupled to electric motor by means elastic coupling.

## 5.9 VERSION FOR HAZARDOUS AREAS (ATEX)

### 5.9.1 The Atex Directives

ATEX is an abbreviation for "ATmosphere EXplosible" and refers to the following two European Union Directives:

- the Directive 2014/34/EU, for equipment and protective systems intended for use in potentially explosive atmospheres, is mandatory for manufacturers and states the classification criteria (ATEX CATEGORIES) and the manufacturing, marking and certification rules for such products;
- the Directive 99/92/EC, for the minimum requirements for improving the safety and health protection

of workers potentially at risk from explosive atmospheres, is mandatory for employers and states the classification criteria (ATEX ZONES) for working places where could happen a potentially explosive atmosphere. This Directive set also the connection between ATEX ZONES and ATEX CATEGORIES.

The Directive 2014/34/EU has replaced the former ATEX 94/9/EC and states that the electric products and the mechanical products, pumps included, intended to be used in hazardous areas, must be designed and manufactured in order to avoid being themselves a source of ignition.

**Tab. 503 – Atex Categories according to Directive 2014/34/EU**

| Protection level<br>(Guaranteed by the<br>equipment Category) | Mine             | Surface |                  |
|---------------------------------------------------------------|------------------|---------|------------------|
|                                                               |                  | Gas     | Combustible dust |
| Very High                                                     | M1               | 1G      | 1D               |
| High                                                          | M2               | 2G      | 2D               |
| Normal                                                        | not provided for | 3G      | 3D               |

**Tab. 504 - Atex Zones according to Directive 99/92/EC**

| Hazardous level of the perational Zone<br>Explosive atmosphere | Usage area in the presence of |                  |
|----------------------------------------------------------------|-------------------------------|------------------|
|                                                                | Gas                           | Combustible dust |
| Always present                                                 | Zone 0                        | Zone 20          |
| Probable                                                       | Zone 1                        | Zone 21          |
| Unlikely                                                       | Zone 2                        | Zone 22          |

**Tab. 505 - Association Zone and Category according to Atex 99/92/EC – gas**

| Explosive atmosphere | Danger zone | Protection guaranteed<br>by equipment | Equipment category |
|----------------------|-------------|---------------------------------------|--------------------|
| Always present       | 0           | Very High                             | 1G                 |
| Probable             | 1           | High                                  | 2G                 |
| Unlikely             | 2           | Normal                                | 3G                 |

**Tab. 506 - Association Zone and Category according to Atex 99/92/EC – dust**

| Explosive atmosphere            | Danger zone | Protection guaranteed<br>by equipment | Equipment category |
|---------------------------------|-------------|---------------------------------------|--------------------|
| Always present                  | 20          | Very High                             | 1D                 |
| Probable                        | 21          | High                                  | 2D                 |
| Unlikely (conductive dusts)     | 22          | Normal                                | 2D                 |
| Unlikely (non conductive dusts) | 22          | Normal                                | 3D                 |

### 5.9.2 The Atex pumps features

The Atex version of pumps B, BC on skid with Atex electric motor coupled with elastic coupling, (Atex electric pumps MBM, MBMC), is available for surface applications Group II (not for mines, Group I).

They belong to the Atex categories

- 2G, 3G for gases and vapours up to Group IIC (hydrogen, acetylene...)
- 2D, 3D for dusts up to Group IIIC (combustible metallic dust)

### 5.9.3 The Atex pumps conformity and marking

The Atex MBM, MBMC electric pumps comply with the Directive 2014/34/EU and the relevant technical assessment documentation has been filed at INERIS (Notified Body NB0080).

They are marked in conformity with the Directive 2014/34/EU and with ISO EN 80079-36 / 80079-37 standards as follows:

- II 2G Ex h IIC Tx Gb for usage in the presence of gases in Zone 1 and Zone 2
- II 2D Ex h IIIC Txxx°C Db for usage in the presence of dusts in Zone 21 and Zone 22.

The electric motor driving the pump, manufactured in compliance with IEC EN 60079-0, 60079-1, 60079-7 (for gases and vapours) or in compliance with IEC EN 60079-0, 60079-31 (for combustible dusts) matches the pump's protection mode and the customer's requirements.

The temperature class Tx (gases) or the maximum

The Atex MBM, MBMC electric pumps are available

- in all constructions (cast iron, bronze, stainless steel)
- with all shaft-end seals (mechanical, lip ring, packing)
- for ambient temperature between -20°C and 40°C
- for fluid viscosity up to 20.000 cSt
- for maximum fluid temperature of 180°C
- for maximum fluid conductivity of 1000 pS/m

surface temperature Txxx°C (dusts) are mainly linked to the maximum temperature of the pumped fluid. Therefore, the end user is responsible to limit the fluid temperature in order to keep Tx or Txxx°C below the maximum values defined by the Zone classification.

In addition to these electric pumps the Atex bare shaft pumps B, BC are available. They comply with the Directive 2014/34/EU and the relevant technical assessment documentation has been filed at INERIS (Notified Body NB0080).

They are marked in conformity with the Directive 2014/34/EU and with ISO EN 80079-36 / 80079-37 standards as follows:

- II 2G Ex h IIC Tx Gb for usage in the presence of gases in Zone 1 and Zone 2
- II 2D Ex h IIIC Txxx°C Db for usage in the presence of dusts in Zone 21 and Zone 22.

## 5.10 ACCESSORIES

- Pump on trolley
- Special tank for liquid container
- Control panel
- ON/OFF switches
- Reversing switches
- Piping
- Heated piping
- Valves
- Pressure gauge and pressure switch
- External cooling system
- Electric cables

## 5.11 SOUND LEVEL

The sound level has been measured in dB(A) at 1m distance, at 1450 1/min with gear oil (viscosity 46 cSt).

Tab. 507 – Sound level

| PUMP SIZE<br>(B, BC,<br>MBM,<br>MBMC) | Sound level dB(A) at pressure |       |        |        |
|---------------------------------------|-------------------------------|-------|--------|--------|
|                                       | 2 bar                         | 5 bar | 10 bar | 12 bar |
| 5                                     | 66.0                          | 66.0  | 68.0   | 68.0   |
| 10                                    | 66.0                          | 66.0  | 68.0   | 68.0   |
| 15                                    | 66.0                          | 66.0  | 68.0   | 68.0   |
| 25                                    | 66.0                          | 66.0  | 68.0   | 68.0   |
| 40                                    | 75.4                          | 77.0  | 77.5   | 77.5   |
| 50                                    | 75.4                          | 77.0  | 77.5   | 77.5   |
| 70                                    | 75.4                          | 77.0  | 77.5   | 77.5   |
| 100                                   | 77.0                          | 78.0  | 79.0   | 83.0   |
| 150                                   | 77.0                          | 78.0  | 79.0   | 83.0   |
| 200                                   | 82.0                          | 82.5  | 85.0   | 86.0   |
| 250                                   | 82.0                          | 82.5  | 85.0   | 86.0   |
| 300                                   | 82.0                          | 82.5  | 85.0   | 86.0   |
| 350                                   | 83.0                          | 83.0  | 86.0   | 86.0   |
| 400                                   | 83.0                          | 83.0  | 86.0   | 86.0   |
| 500                                   | 86.0                          | 87.0  | 89.0   | 90.0   |
| 550                                   | 86.0                          | 87.0  | 89.0   | 90.0   |
| 600                                   | 86.0                          | 87.0  | 89.0   | 90.0   |
| 1200                                  | 84.5                          | 85.5  | 86.0   | 86.5   |
| 1600                                  | 84.5                          | 85.5  | 86.0   | 86.5   |

## 5.12 PUMP SELECTION AND PERFORMANCE DATA

In table 508 are listed the actual delivery  $Q_{\text{eff}}$  and required power  $P_{\text{mec}}$  for each pump size at different speeds and pressures.

The data refer to a mineral oil ISO46 (Kinematic viscosity 46 cSt at 40°C).

The rated power for the the drive motor should be 20% higher than the required power  $P_{\text{mec}}$ .

For different viscosities please ask the performances (delivery and power) to our Technical department.

As a general rule the flow rate is approximately proportional to the speed.

A lower viscosity may lead to a loss of the net delivery and a higher viscosity may lead to an increase of the net delivery.

When dimensioning please consider the maximum viscosity, usually at the start-up phase.

Pump selection, delivery and required power at different speeds:

- 1) Given the project delivery  $Q_{\text{pro}}$  [L/min] and speed  $n_{\text{pro}}$  [1/min] calculate the project displacement  $V_{\text{pro}}$  [cm<sup>3</sup>/rev]:

$$V_{\text{pro}} = 1000 \times Q_{\text{pro}} / n_{\text{pro}}$$

- 2) Select the Pump Type with the geometrical displacement  $V_{\text{geo}}$  closer to  $V_{\text{pro}}$ ,

- 3) Read from the Performance Table the delivery at 1450 1/min and at the given pressure p:

$$Q_{1450, p} \text{ [L/min]}$$

- 4) Calculate the actual delivery  $Q$  [L/min] at  $n_{\text{pro}}$  and p:

$$Q = Q_{1450, p} + V_{\text{geo}} \times (n_{\text{pro}} - 1450) / 1000$$

- 5) Read from the Performance Table the required power and actual delivery of the selected Pump Type at the closer speed  $n_x$  to  $n_{\text{pro}}$  and at p:

$$P_{n_x, p} \text{ [kW]}, Q_{n_x, p} \text{ [L/min]}$$

- 6) Calculate the actual required power  $P$  at  $n_{\text{pro}}$  and p [kW]:

$$P = P_{n_x, p} \times Q / Q_{n_x, p}$$

Tab. 508 - Performance data at 690, 830, 950, 1150, 1450, 1750 1/min and 46 cSt

| PUMP<br>SIZE<br>(B, BC,<br>MBM,<br>MBMC) | Geometrical<br>displacement<br>$V_{geo}$<br>[cm <sup>3</sup> /rev] | Pressure<br>$p$<br>[bar] | Speed $n$ [1/min]    |                   |                      |                   |                      |                   |                      |                   |                      |                   |                      |                   |
|------------------------------------------|--------------------------------------------------------------------|--------------------------|----------------------|-------------------|----------------------|-------------------|----------------------|-------------------|----------------------|-------------------|----------------------|-------------------|----------------------|-------------------|
|                                          |                                                                    |                          | 690                  |                   | 830                  |                   | 950                  |                   | 1150                 |                   | 1450                 |                   | 1750                 |                   |
|                                          |                                                                    |                          | $Q_{eff}$<br>[L/min] | $P_{mec}$<br>[kW] | $Q_{eff}$<br>[L/min] | $P_{mec}$<br>[kW] | $Q_{eff}$<br>[L/min] | $P_{mec}$<br>[kW] | $Q_{eff}$<br>[L/min] | $P_{mec}$<br>[kW] | $Q_{eff}$<br>[L/min] | $P_{mec}$<br>[kW] | $Q_{eff}$<br>[L/min] | $P_{mec}$<br>[kW] |
| 5                                        | 4.6                                                                | 2                        | 3.0                  | 0.04              | 3.6                  | 0.05              | 4.2                  | 0.06              | 5.0                  | 0.08              | 6.4                  | 0.10              | 7.7                  | 0.13              |
|                                          |                                                                    | 5                        | 2.8                  | 0.10              | 3.4                  | 0.12              | 3.9                  | 0.14              | 4.8                  | 0.17              | 6.1                  | 0.21              | 7.4                  | 0.2               |
|                                          |                                                                    | 10                       | 2.5                  | 0.19              | 3.0                  | 0.22              | 3.5                  | 0.26              | 4.3                  | 0.31              | 5.6                  | 0.38              | 6.8                  | 0.5               |
|                                          |                                                                    | 12                       | 2.3                  | 0.22              | 2.9                  | 0.27              | 3.3                  | 0.31              | 4.1                  | 0.37              | 5.3                  | 0.45              | 6.6                  | 0.5               |
| 10                                       | 9.1                                                                | 2                        | 6.0                  | 0.05              | 7.3                  | 0.06              | 8.3                  | 0.08              | 10.1                 | 0.10              | 12.8                 | 0.13              | 15.5                 | 0.2               |
|                                          |                                                                    | 5                        | 5.6                  | 0.13              | 6.9                  | 0.15              | 7.9                  | 0.18              | 9.6                  | 0.2               | 12.3                 | 0.3               | 14.9                 | 0.3               |
|                                          |                                                                    | 10                       | 5.0                  | 0.25              | 6.2                  | 0.30              | 7.1                  | 0.34              | 8.8                  | 0.4               | 11.3                 | 0.5               | 13.9                 | 0.6               |
|                                          |                                                                    | 12                       | 4.8                  | 0.30              | 5.9                  | 0.36              | 6.8                  | 0.41              | 8.5                  | 0.5               | 11.0                 | 0.6               | 13.5                 | 0.7               |
| 15                                       | 13.6                                                               | 2                        | 9.0                  | 0.08              | 10.8                 | 0.10              | 12.4                 | 0.12              | 15.1                 | 0.2               | 19.1                 | 0.2               | 23.1                 | 0.3               |
|                                          |                                                                    | 5                        | 8.3                  | 0.19              | 10.1                 | 0.23              | 11.6                 | 0.27              | 14.2                 | 0.3               | 18.1                 | 0.4               | 22.0                 | 0.5               |
|                                          |                                                                    | 10                       | 7.1                  | 0.37              | 8.8                  | 0.45              | 10.2                 | 0.52              | 12.7                 | 0.6               | 16.4                 | 0.8               | 20.2                 | 1.0               |
|                                          |                                                                    | 12                       | 6.7                  | 0.44              | 8.3                  | 0.54              | 9.7                  | 0.62              | 12.1                 | 0.7               | 15.7                 | 0.9               | 19.5                 | 1.1               |
| 25                                       | 18.2                                                               | 2                        | 12.0                 | 0.08              | 14.4                 | 0.11              | 16.6                 | 0.13              | 20.1                 | 0.2               | 25.5                 | 0.2               | 30.9                 | 0.3               |
|                                          |                                                                    | 5                        | 11.1                 | 0.2               | 13.4                 | 0.2               | 15.5                 | 0.3               | 19.0                 | 0.4               | 24.2                 | 0.5               | 29.5                 | 0.6               |
|                                          |                                                                    | 10                       | 9.6                  | 0.4               | 11.8                 | 0.5               | 13.7                 | 0.6               | 17.0                 | 0.7               | 22.0                 | 0.9               | 27.2                 | 1.0               |
|                                          |                                                                    | 12                       | 9.0                  | 0.5               | 11.1                 | 0.6               | 13.0                 | 0.7               | 16.2                 | 0.8               | 21.2                 | 1.0               | 26.2                 | 1.2               |
| 40                                       | 28.1                                                               | 2                        | 18.4                 | 0.2               | 22.2                 | 0.2               | 25.5                 | 0.2               | 31.0                 | 0.3               | 39.3                 | 0.4               | 47.6                 | 0.5               |
|                                          |                                                                    | 5                        | 17.0                 | 0.4               | 20.6                 | 0.5               | 23.8                 | 0.5               | 29.1                 | 0.7               | 37.1                 | 0.9               | 45.2                 | 1.1               |
|                                          |                                                                    | 10                       | 14.6                 | 0.8               | 18.0                 | 0.9               | 20.9                 | 1.1               | 25.9                 | 1.3               | 33.5                 | 1.7               | 41.3                 | 2.0               |
|                                          |                                                                    | 12                       | 13.6                 | 0.9               | 16.9                 | 1.1               | 19.7                 | 1.3               | 24.6                 | 1.6               | 32.1                 | 2.0               | 39.8                 | 2.4               |
| 50                                       | 41.2                                                               | 2                        | 27.7                 | 0.3               | 33.4                 | 0.4               | 38.4                 | 0.4               | 46.5                 | 0.6               | 58.7                 | 0.8               | 70.9                 | 1.1               |
|                                          |                                                                    | 5                        | 26.7                 | 0.5               | 32.5                 | 0.6               | 37.5                 | 0.7               | 45.5                 | 0.9               | 57.5                 | 1.3               | 69.5                 | 1.7               |
|                                          |                                                                    | 10                       | 25.1                 | 0.8               | 30.9                 | 0.9               | 36.0                 | 1.1               | 43.8                 | 1.5               | 55.5                 | 2.1               | 67.3                 | 2.7               |
|                                          |                                                                    | 12                       | 24.5                 | 0.9               | 30.3                 | 1.1               | 35.4                 | 1.2               | 43.1                 | 1.8               | 54.7                 | 2.4               | 66.4                 | 3.0               |
| 70                                       | 50.3                                                               | 2                        | 33.6                 | 0.3               | 40.8                 | 0.4               | 46.8                 | 0.5               | 56.7                 | 0.7               | 71.5                 | 0.9               | 86.4                 | 1.2               |
|                                          |                                                                    | 5                        | 31.9                 | 0.5               | 39.4                 | 0.8               | 45.2                 | 0.9               | 54.9                 | 1.2               | 69.4                 | 1.6               | 83.9                 | 2.0               |
|                                          |                                                                    | 10                       | 29.2                 | 0.9               | 37.2                 | 1.3               | 42.7                 | 1.6               | 51.9                 | 2.0               | 65.8                 | 2.7               | 79.8                 | 3.4               |
|                                          |                                                                    | 12                       | 28.1                 | 1.0               | 36.2                 | 1.6               | 41.6                 | 1.9               | 50.7                 | 2.4               | 64.4                 | 3.2               | 78.2                 | 4.0               |
| 100                                      | 81.4                                                               | 2                        | 55.2                 | 0.4               | 66.7                 | 0.5               | 76.5                 | 0.5               | 92.9                 | 0.7               | 117.0                | 1.0               | 141.3                | 1.2               |
|                                          |                                                                    | 5                        | 53.8                 | 0.7               | 65.3                 | 0.9               | 75.2                 | 1.0               | 91.9                 | 1.2               | 115.6                | 1.7               | 139.7                | 2.2               |
|                                          |                                                                    | 10                       | 51.5                 | 1.3               | 63.1                 | 1.5               | 73.2                 | 1.8               | 90.2                 | 2.1               | 113.3                | 3.0               | 136.9                | 3.8               |
|                                          |                                                                    | 12                       | 50.6                 | 1.5               | 62.2                 | 1.8               | 72.4                 | 2.1               | 89.5                 | 2.5               | 112.3                | 3.5               | 135.8                | 4.4               |
| 150                                      | 117.5                                                              | 2                        | 79.2                 | 0.6               | 95.7                 | 0.7               | 110.0                | 0.9               | 133.3                | 1.1               | 168.1                | 1.6               | 203.0                | 2.0               |
|                                          |                                                                    | 5                        | 76.4                 | 1.0               | 92.9                 | 1.3               | 107.6                | 1.6               | 130.4                | 2.1               | 164.7                | 2.8               | 198.9                | 3.5               |
|                                          |                                                                    | 10                       | 71.7                 | 1.8               | 88.3                 | 2.2               | 103.6                | 2.9               | 125.7                | 3.6               | 158.9                | 4.8               | 192.2                | 6.1               |
|                                          |                                                                    | 12                       | 69.9                 | 2.1               | 86.5                 | 2.6               | 102.0                | 3.4               | 123.8                | 4.2               | 156.6                | 5.6               | 189.5                | 7.1               |
| 200                                      | 149.5                                                              | 2                        | 100.1                | 0.7               | 123.3                | 0.9               | 139.0                | 1.1               | 169.1                | 1.5               | 213.4                | 2.1               |                      |                   |
|                                          |                                                                    | 5                        | 95.4                 | 1.3               | 123.8                | 1.6               | 134.4                | 1.9               | 164.8                | 2.5               | 208.3                | 3.4               |                      |                   |
|                                          |                                                                    | 10                       | 87.7                 | 2.3               | 124.0                | 2.8               | 126.8                | 3.2               | 157.7                | 4.2               | 199.9                | 5.6               |                      |                   |
|                                          |                                                                    | 12                       | 84.6                 | 2.7               | 124.0                | 3.3               | 123.8                | 3.8               | 154.8                | 4.8               | 196.5                | 6.5               |                      |                   |

Different viscosities, working pressure, rotational speed and ambient conditions can change performance data shown in the table.

Tab. 508 - Performance data at 690, 830, 950, 1150, 1450, 1750 1/min and 46 cSt

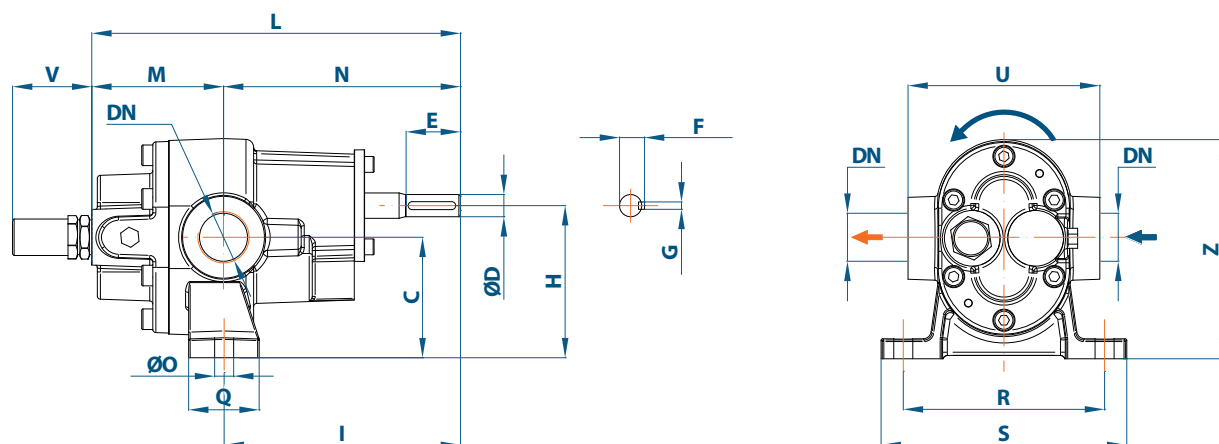
| PUMP<br>SIZE<br>(B, BC,<br>MBM,<br>MBMC) | Geometrical<br>displacement<br>$V_{geo}$<br>[cm <sup>3</sup> /rev] | Pressure<br>p<br>[bar] | Speed n [1/min]      |                   |                      |                   |                      |                   |                      |                   |                      |                   |                      |                   |
|------------------------------------------|--------------------------------------------------------------------|------------------------|----------------------|-------------------|----------------------|-------------------|----------------------|-------------------|----------------------|-------------------|----------------------|-------------------|----------------------|-------------------|
|                                          |                                                                    |                        | 690                  |                   | 830                  |                   | 950                  |                   | 1150                 |                   | 1450                 |                   | 1750                 |                   |
|                                          |                                                                    |                        | $Q_{eff}$<br>[L/min] | $P_{mec}$<br>[kW] | $Q_{eff}$<br>[L/min] | $P_{mec}$<br>[kW] | $Q_{eff}$<br>[L/min] | $P_{mec}$<br>[kW] | $Q_{eff}$<br>[L/min] | $P_{mec}$<br>[kW] | $Q_{eff}$<br>[L/min] | $P_{mec}$<br>[kW] | $Q_{eff}$<br>[L/min] | $P_{mec}$<br>[kW] |
| 250                                      | 185.4                                                              | 2                      | 124.5                | 0.9               | 150.5                | 1.2               | 173.1                | 1.5               | 209.8                | 1.9               | 264.7                | 2.7               |                      |                   |
|                                          |                                                                    | 5                      | 119.3                | 1.7               | 145.5                | 2.1               | 168.6                | 2.5               | 204.6                | 3.2               | 258.6                | 4.4               |                      |                   |
|                                          |                                                                    | 10                     | 110.7                | 3.0               | 137.1                | 3.7               | 161.1                | 4.2               | 195.9                | 5.4               | 248.3                | 7.3               |                      |                   |
|                                          |                                                                    | 12                     | 107.3                | 3.6               | 133.7                | 4.3               | 158.1                | 4.9               | 192.4                | 6.2               | 244.2                | 8.4               |                      |                   |
| 300                                      | 221.3                                                              | 2                      | 146.6                | 1.1               | 177.2                | 1.4               | 203.6                | 1.7               | 247.7                | 2.2               | 314.6                | 3.1               |                      |                   |
|                                          |                                                                    | 5                      | 137.5                | 2.0               | 167.5                | 2.5               | 193.6                | 3.0               | 237.4                | 3.7               | 305.2                | 5.1               |                      |                   |
|                                          |                                                                    | 10                     | 122.3                | 3.6               | 151.4                | 4.4               | 176.9                | 5.1               | 220.3                | 6.3               | 289.5                | 8.5               |                      |                   |
|                                          |                                                                    | 12                     | 116.2                | 4.2               | 144.9                | 5.2               | 170.2                | 6.0               | 213.4                | 7.3               | 283.3                | 9.8               |                      |                   |
| 350                                      | 257.2                                                              | 2                      | 169.6                | 1.1               | 204.9                | 1.4               | 238.1                | 1.7               | 288.5                | 2.2               | 364.3                | 2.9               |                      |                   |
|                                          |                                                                    | 5                      | 157.7                | 2.2               | 192.1                | 2.6               | 228.7                | 3.1               | 277.7                | 3.9               | 351.3                | 5.3               |                      |                   |
|                                          |                                                                    | 10                     | 137.9                | 4.1               | 170.8                | 4.7               | 213.1                | 5.5               | 259.5                | 6.9               | 329.7                | 9.2               |                      |                   |
|                                          |                                                                    | 12                     | 130.0                | 4.8               | 162.2                | 5.5               | 206.8                | 6.4               | 252.3                | 8.1               | 321.0                | 10.8              |                      |                   |
| 400                                      | 299.1                                                              | 2                      | 198.5                | 1.3               | 239.8                | 1.6               | 275.2                | 1.9               | 335.2                | 2.5               | 423.2                | 3.4               |                      |                   |
|                                          |                                                                    | 5                      | 186.9                | 2.6               | 227.1                | 3.2               | 261.9                | 3.6               | 322.1                | 4.5               | 407.5                | 6.1               |                      |                   |
|                                          |                                                                    | 10                     | 167.4                | 4.9               | 206.0                | 5.7               | 239.8                | 6.3               | 300.2                | 7.9               | 381.4                | 10.6              |                      |                   |
|                                          |                                                                    | 12                     | 159.6                | 5.8               | 197.6                | 6.7               | 230.9                | 7.4               | 291.5                | 9.3               | 371.0                | 12.4              |                      |                   |
| 500                                      | 369.6                                                              | 2                      | 248.7                | 1.8               | 302.4                | 2.3               | 346.3                | 2.7               | 419.4                | 3.5               | 529.1                | 4.8               |                      |                   |
|                                          |                                                                    | 5                      | 238.8                | 3.3               | 295.5                | 4.3               | 338.5                | 5.1               | 410.3                | 6.5               | 518.2                | 8.7               |                      |                   |
|                                          |                                                                    | 10                     | 222.4                | 5.8               | 284.0                | 7.6               | 325.6                | 9.0               | 395.2                | 11.3              | 500.0                | 15.1              |                      |                   |
|                                          |                                                                    | 12                     | 215.8                | 6.8               | 279.4                | 9.0               | 320.5                | 10.5              | 389.2                | 13.3              | 492.7                | 17.7              |                      |                   |
| 550                                      | 407.9                                                              | 2                      | 271.1                | 1.9               | 328.6                | 1.4               | 380.1                | 2.9               | 460.3                | 3.7               | 580.8                | 5.0               |                      |                   |
|                                          |                                                                    | 5                      | 255.6                | 3.6               | 313.8                | 1.2               | 368.9                | 5.4               | 447.2                | 6.8               | 564.9                | 9.2               |                      |                   |
|                                          |                                                                    | 10                     | 229.8                | 6.5               | 289.1                | 1.1               | 350.4                | 9.6               | 425.5                | 12.1              | 538.4                | 16.0              |                      |                   |
|                                          |                                                                    | 12                     | 219.4                | 7.7               | 279.2                | 1.1               | 343.0                | 11.3              | 416.7                | 14.2              | 527.8                | 18.8              |                      |                   |
| 600                                      | 446.1                                                              | 2                      | 299.8                | 1.8               | 361.1                | 2.3               | 413.8                | 2.7               | 501.6                | 3.4               | 633.5                | 4.7               |                      |                   |
|                                          |                                                                    | 5                      | 287.9                | 4.0               | 347.6                | 4.9               | 398.9                | 5.6               | 484.6                | 7.0               | 613.7                | 9.0               |                      |                   |
|                                          |                                                                    | 10                     | 268.1                | 7.6               | 325.0                | 9.2               | 374.0                | 10.5              | 456.3                | 12.8              | 580.8                | 16.2              |                      |                   |
|                                          |                                                                    | 12                     | 260.2                | 9.1               | 315.9                | 10.9              | 364.1                | 12.5              | 445.0                | 15.2              | 567.6                | 19.1              |                      |                   |
| 1200                                     | 885.5                                                              | 2                      | 595.4                | 6.3               | 720.2                | 8.2               |                      |                   |                      |                   |                      |                   |                      |                   |
|                                          |                                                                    | 5                      | 572.2                | 11.5              | 698.1                | 14.1              |                      |                   |                      |                   |                      |                   |                      |                   |
|                                          |                                                                    | 10                     | 533.4                | 20.0              | 661.2                | 24.0              |                      |                   |                      |                   |                      |                   |                      |                   |
|                                          |                                                                    | 12                     | 517.9                | 23.4              | 646.5                | 28.0              |                      |                   |                      |                   |                      |                   |                      |                   |
| 1600                                     | 1201.7                                                             | 2                      | 809.0                | 7.5               | 975.8                | 9.7               |                      |                   |                      |                   |                      |                   |                      |                   |
|                                          |                                                                    | 5                      | 778.9                | 14.9              | 943.4                | 18.4              |                      |                   |                      |                   |                      |                   |                      |                   |
|                                          |                                                                    | 10                     | 728.6                | 27.2              | 889.3                | 32.9              |                      |                   |                      |                   |                      |                   |                      |                   |
|                                          |                                                                    | 12                     | 708.5                | 32.1              | 867.7                | 38.7              |                      |                   |                      |                   |                      |                   |                      |                   |

Different viscosities, working pressure, rotational speed and ambient conditions can change performance data shown in the table.

## 5.13 OVERALL DIMENSIONS AND WEIGHTS

### 5.13.1 B

Fig. 507 - B5 to B40 dimensional drawing



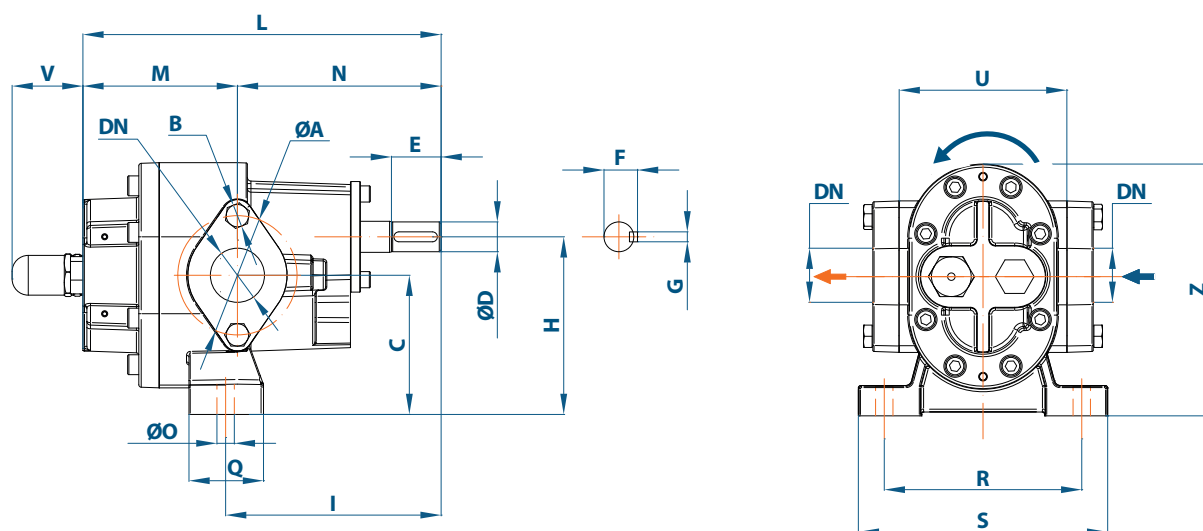
Tab. 509 - B5 to B40 overall dimensions and weights

| PUMP<br>SIZE<br>(B) | DN<br>ISO<br>228-1 | C  | D  | E  | F    | G | H  | I     | L     | M  | N     | O    | Q    | R   | S   | U   | V  | Z   | Weight<br>[kg] |
|---------------------|--------------------|----|----|----|------|---|----|-------|-------|----|-------|------|------|-----|-----|-----|----|-----|----------------|
| 5                   | G 1/2"             | 64 | 12 | 28 | 13.5 | 4 | 80 | 98.5  | 162   | 64 | 98    | 10.5 | 36   | 105 | 130 | 90  | 50 | 117 | 3.4            |
| 10                  | G 1/2"             | 64 | 12 | 28 | 13.5 | 4 | 80 | 98.5  | 172   | 74 | 98    | 10.5 | 36   | 105 | 130 | 90  | 50 | 117 | 3.8            |
| 15                  | G 3/4"             | 64 | 12 | 28 | 13.5 | 4 | 80 | 114.5 | 182.5 | 68 | 114.5 | 10.5 | 41.5 | 105 | 130 | 95  | 50 | 117 | 4.1            |
| 25                  | G 3/4"             | 64 | 12 | 30 | 13.5 | 4 | 80 | 114.5 | 192.5 | 78 | 114.5 | 10.5 | 41.5 | 105 | 130 | 95  | 50 | 117 | 4.5            |
| 40                  | G 1"               | 76 | 14 | 35 | 16   | 5 | 96 | 149.5 | 232.5 | 83 | 149.5 | 10.5 | 44.5 | 127 | 155 | 121 | 50 | 139 | 7.2            |

Dimensions in mm; tolerances allowed.



Fig. 508 - B50 to B70 dimensional drawing

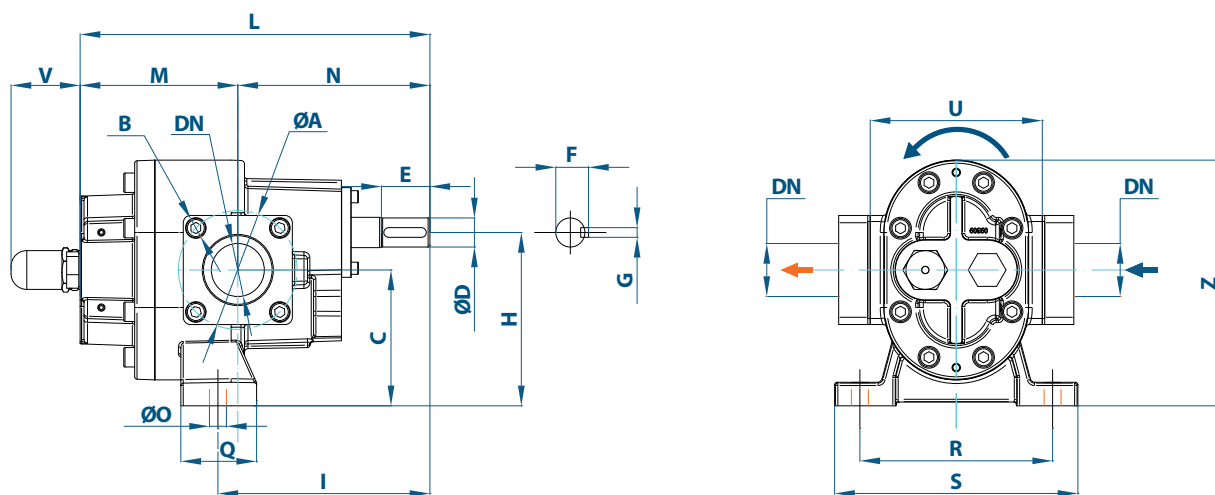


Tab. 510 - B50 to B70 overall dimensions and weights

| PUMP<br>SIZE<br>(B) | DN<br>ISO<br>228-1 | A  | B       | C    | D  | E  | F  | G | H   | I   | L   | M  | N   | O  | Q  | R   | S   | U  | V  | Z   | Weight<br>[kg] |
|---------------------|--------------------|----|---------|------|----|----|----|---|-----|-----|-----|----|-----|----|----|-----|-----|----|----|-----|----------------|
| 50                  | G1"1/2             | 75 | N°2-M10 | 91.5 | 14 | 35 | 16 | 5 | 114 | 156 | 236 | 87 | 149 | 12 | 53 | 127 | 157 | 98 | 50 | 162 | 9.8            |
| 70                  | G1"1/2             | 75 | N°2-M10 | 91.5 | 14 | 35 | 16 | 5 | 114 | 156 | 246 | 90 | 156 | 12 | 53 | 127 | 157 | 98 | 50 | 162 | 10.7           |

Dimensions in mm; tolerances allowed.

Fig. 509 - B100 to B150 dimensional drawing

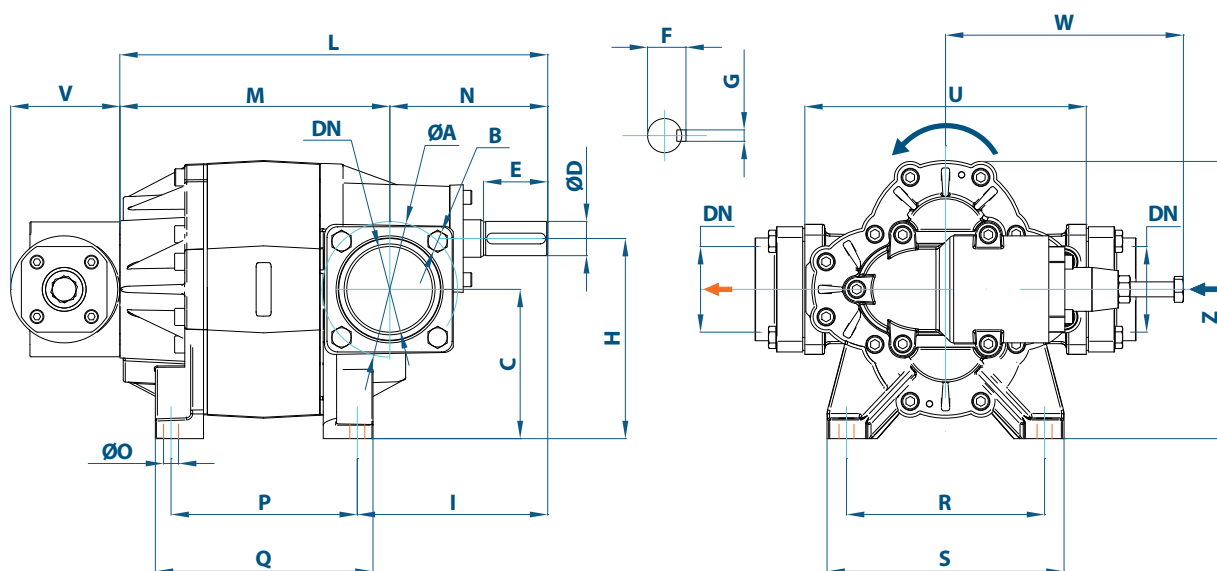


Tab. 511 - B100 to B150 overall dimensions and weights

| PUMP<br>SIZE<br>(B) | DN<br>ISO<br>228-1 | A  | B       | C   | D  | E  | F  | G | H   | I   | L     | M   | N     | O  | Q    | R   | S   | U   | V  | Z   | Weight<br>[kg] |
|---------------------|--------------------|----|---------|-----|----|----|----|---|-----|-----|-------|-----|-------|----|------|-----|-----|-----|----|-----|----------------|
| 100                 | G 2"               | 98 | N*4-M10 | 111 | 24 | 40 | 27 | 8 | 142 | 175 | 268.5 | 110 | 158.5 | 14 | 62.5 | 159 | 201 | 142 | 57 | 203 | 21.5           |
| 150                 | G 2"               | 98 | N*4-M10 | 111 | 24 | 40 | 27 | 8 | 142 | 175 | 288.5 | 130 | 158.5 | 14 | 62.5 | 159 | 201 | 142 | 57 | 203 | 24             |

Dimensions in mm; tolerances allowed.

Fig. 510 - B200 to B600 dimensional drawing

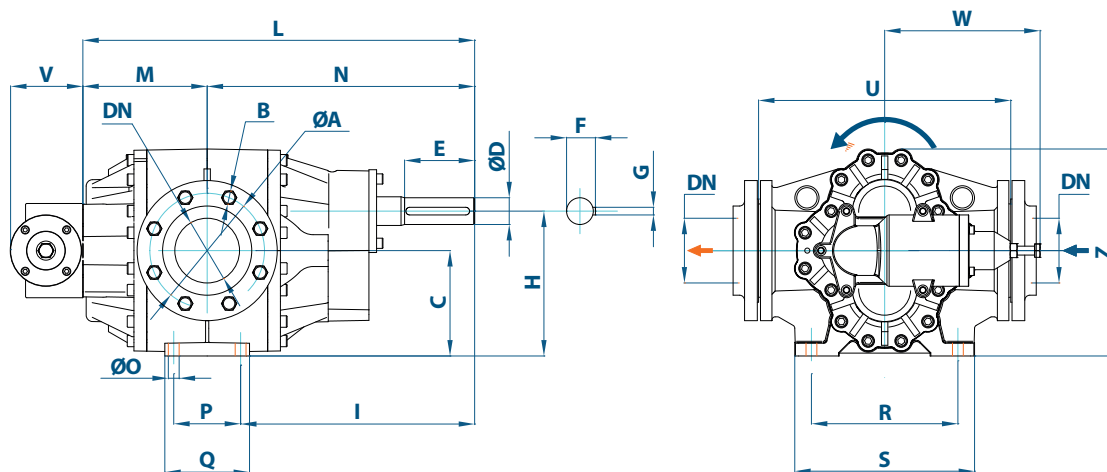


Tab. 512 - B200 to B600 overall dimensions and weights

| PUMP<br>SIZE<br>(B) | DN<br>ISO<br>228-1 | A   | B       | C     | D  | E  | F  | G  | H   | I   | L   | M   | N   | O  | P   | Q   | R   | S   | U   | V   | W   | Z   | Weight<br>[kg] |
|---------------------|--------------------|-----|---------|-------|----|----|----|----|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|----------------|
| 200                 | G 2"1/2            | 115 | N°4-M12 | 106   | 28 | 60 | 31 | 8  | 142 | 168 | 323 | 178 | 145 | 13 | 118 | 151 | 139 | 171 | 210 | 71  | 210 | 200 | 31.4           |
| 250                 | G 2"1/2            | 115 | N°4-M12 | 106   | 28 | 60 | 31 | 8  | 142 | 168 | 335 | 190 | 145 | 13 | 130 | 163 | 139 | 171 | 210 | 71  | 210 | 200 | 33             |
| 300                 | G 2"1/2            | 115 | N°4-M12 | 106   | 28 | 60 | 31 | 8  | 142 | 168 | 347 | 202 | 145 | 13 | 142 | 175 | 139 | 171 | 210 | 71  | 210 | 200 | 35             |
| 350                 | G 2"1/2            | 115 | N°4-M12 | 106   | 28 | 60 | 31 | 8  | 142 | 168 | 359 | 214 | 145 | 13 | 154 | 187 | 139 | 171 | 210 | 71  | 210 | 200 | 36             |
| 400                 | G 2"1/2            | 115 | N°4-M12 | 106   | 28 | 60 | 31 | 8  | 142 | 168 | 373 | 228 | 145 | 13 | 168 | 201 | 139 | 171 | 210 | 71  | 210 | 200 | 38             |
| 500                 | G 3"               | 127 | N°4-M12 | 139.5 | 32 | 60 | 35 | 10 | 187 | 181 | 382 | 234 | 148 | 13 | 151 | 169 | 185 | 222 | 263 | 102 | 222 | 260 | 60             |
| 550                 | G 3"               | 127 | N°4-M12 | 139.5 | 32 | 60 | 35 | 10 | 187 | 181 | 391 | 243 | 148 | 13 | 160 | 178 | 185 | 222 | 263 | 102 | 222 | 260 | 61             |
| 600                 | G 3"               | 127 | N°4-M12 | 139.5 | 32 | 60 | 35 | 10 | 187 | 181 | 400 | 252 | 148 | 13 | 169 | 187 | 185 | 222 | 263 | 102 | 222 | 260 | 63             |

Dimensions in mm; tolerances allowed.

Fig. 511 - B1200 to B1600 dimensional drawing



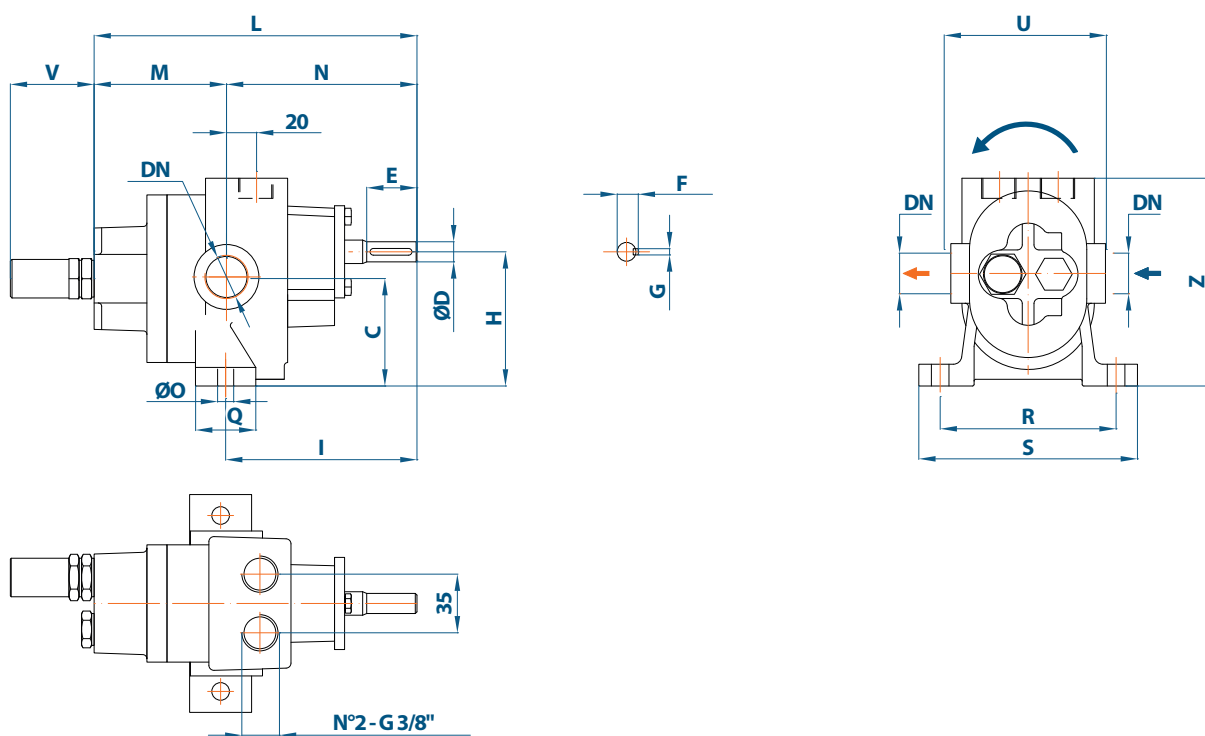
Tab. 513 - B1200 to B1600 overall dimensions and weights

| PUMP<br>SIZE<br>(B) | DN<br>UNI<br>2254 | A   | B       | C     | D  | E   | F  | G  | H     | I     | L   | M   | N   | O  | P   | Q   | R   | S   | U   | V     | W   | Z   | Weight<br>[kg] |
|---------------------|-------------------|-----|---------|-------|----|-----|----|----|-------|-------|-----|-----|-----|----|-----|-----|-----|-----|-----|-------|-----|-----|----------------|
| 1200                | G 4"              | 180 | N°8-M16 | 165.5 | 42 | 110 | 45 | 12 | 227.5 | 342.5 | 565 | 170 | 395 | 17 | 105 | 133 | 230 | 282 | 396 | 113.5 | 244 | 325 | 133            |
| 1600                | G 4"              | 180 | N°8-M16 | 165.5 | 42 | 110 | 45 | 12 | 227.5 | 367.5 | 615 | 195 | 420 | 17 | 105 | 133 | 230 | 282 | 396 | 113.5 | 244 | 325 | 158            |

Dimensions in mm; tolerances allowed.

## 5.13.2 BC

Fig. 512 - BC10 to BC25 dimensional drawing

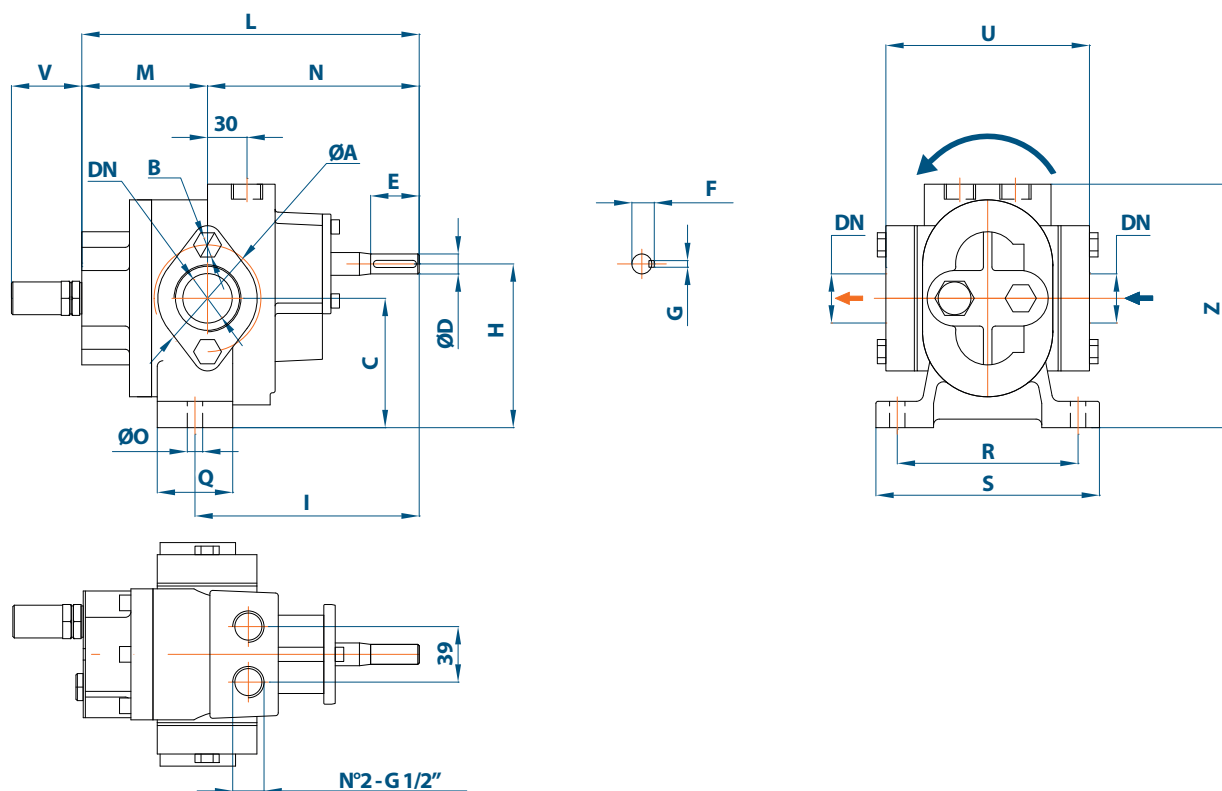


Tab. 514 - BC10 to BC25 overall dimensions and weights

| PUMP<br>SIZE<br>(BC) | DN<br>ISO<br>228-1 | C  | D  | E  | F    | G | H  | I     | L     | M  | N     | O    | Q    | R   | S   | U  | V  | Z   | Weight<br>[kg] |
|----------------------|--------------------|----|----|----|------|---|----|-------|-------|----|-------|------|------|-----|-----|----|----|-----|----------------|
| 10                   | G 1/2"             | 64 | 12 | 28 | 13.5 | 4 | 80 | 98.5  | 172   | 74 | 98    | 10.5 | 36   | 105 | 130 | 90 | 50 | 117 | 3.8            |
| 15                   | G 3/4"             | 64 | 12 | 28 | 13.5 | 4 | 80 | 114.5 | 182.5 | 68 | 114.5 | 10.5 | 41.5 | 105 | 130 | 95 | 50 | 117 | 4.1            |
| 25                   | G 3/4"             | 64 | 12 | 30 | 13.5 | 4 | 80 | 114.5 | 192.5 | 78 | 114.5 | 10.5 | 41.5 | 105 | 130 | 95 | 50 | 117 | 4.5            |

Dimensions in mm; tolerances allowed.

Fig. 513 - BC50 to BC70 dimensional drawing

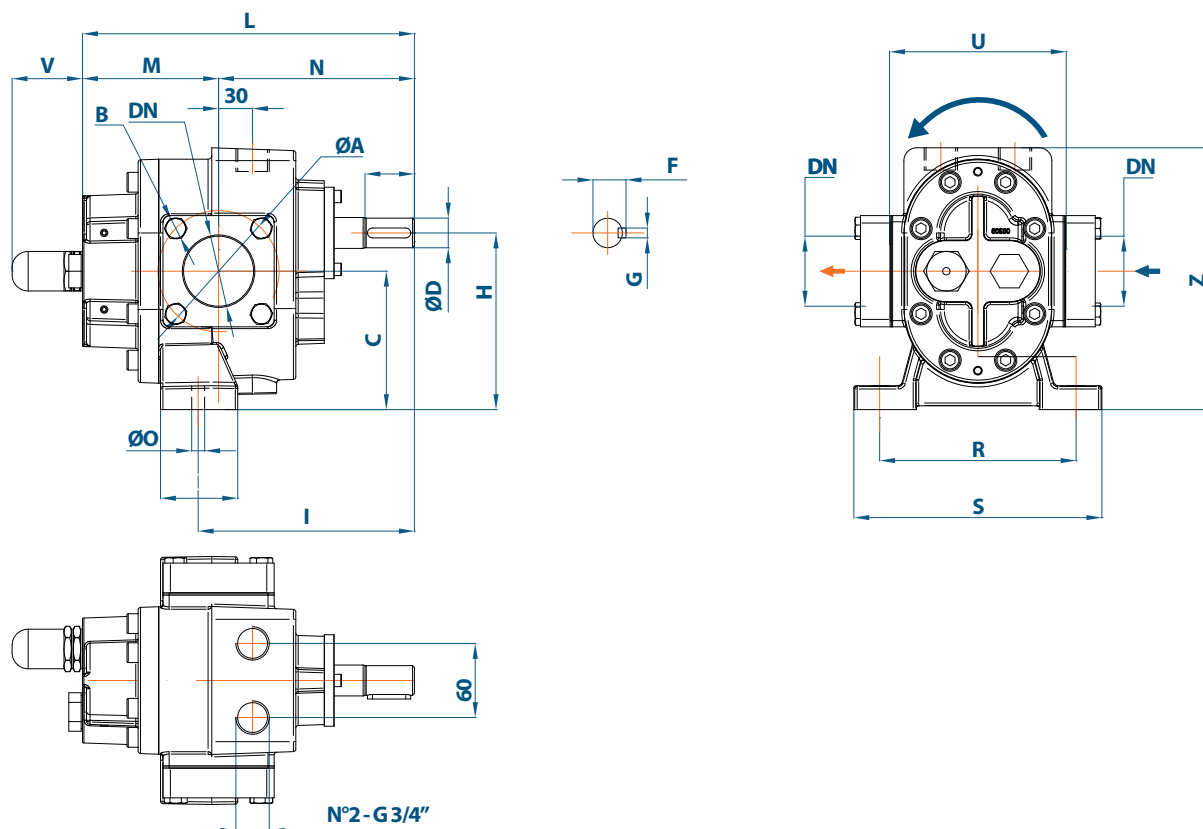


Tab. 515 - BC50 to BC70 overall dimensions and weights

| PUMP<br>SIZE<br>(BC) | DN<br>ISO<br>228-1 | A  | B       | C    | D  | E  | F  | G | H   | I   | L   | M  | N   | O  | Q  | R   | S   | U  | V  | Z   | Weight<br>[kg] |
|----------------------|--------------------|----|---------|------|----|----|----|---|-----|-----|-----|----|-----|----|----|-----|-----|----|----|-----|----------------|
| 50                   | G 1"1/2            | 75 | N°2-M10 | 91.5 | 14 | 35 | 16 | 5 | 114 | 156 | 236 | 87 | 149 | 12 | 53 | 127 | 157 | 98 | 50 | 162 | 9.8            |
| 70                   | G 1"1/2            | 75 | N°2-M10 | 91.5 | 14 | 35 | 16 | 5 | 114 | 156 | 246 | 90 | 156 | 12 | 53 | 127 | 157 | 98 | 50 | 162 | 10.7           |

Dimensions in mm; tolerances allowed.

Fig. 514 - BC100 to BC150 dimensional drawing

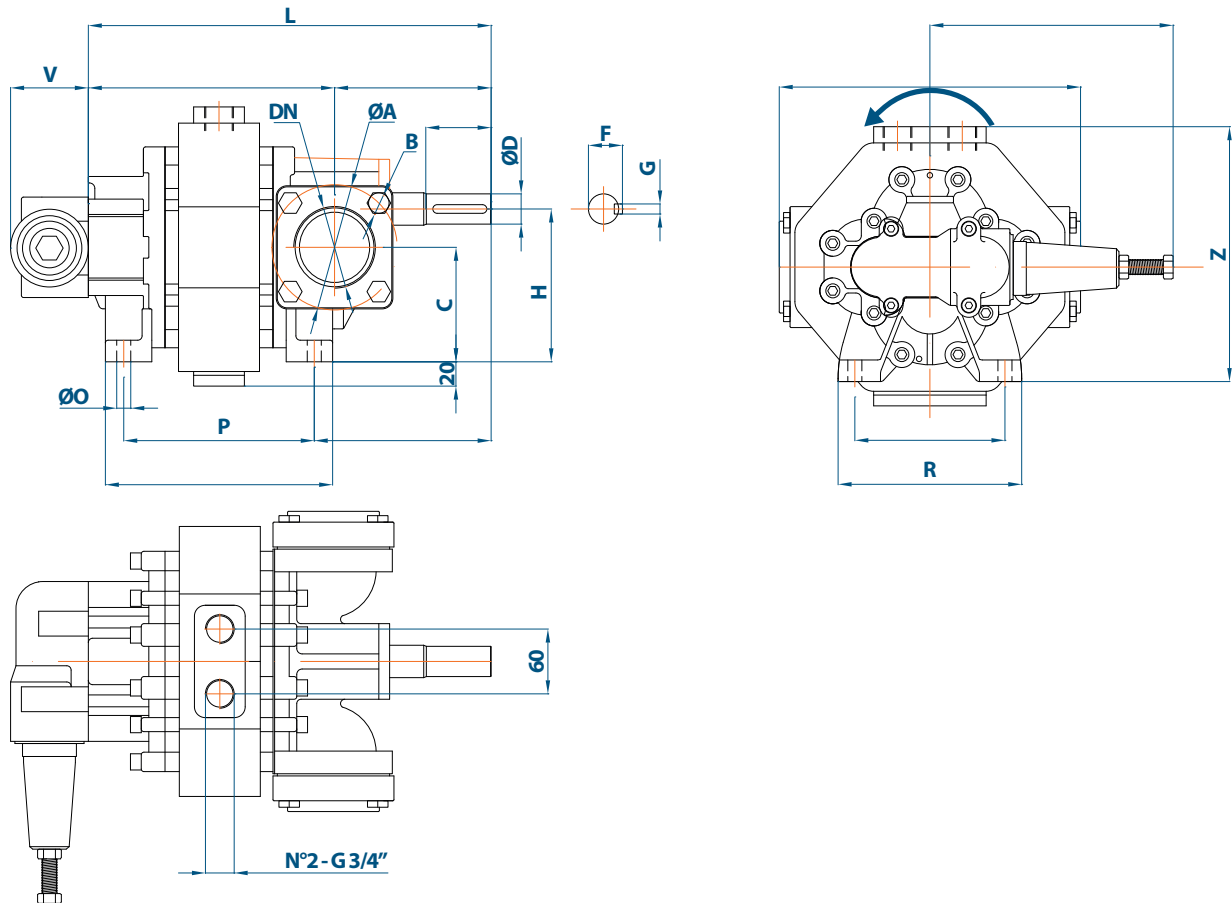


Tab. 516 - BC100 to BC150 overall dimensions and weights

| PUMP<br>SIZE<br>(BC) | DN<br>ISO<br>228-1 | A  | B       | C   | D  | E  | F  | G | H   | I   | L     | M   | N     | O  | Q    | R   | S   | U   | V  | Z   | Weight<br>[kg] |
|----------------------|--------------------|----|---------|-----|----|----|----|---|-----|-----|-------|-----|-------|----|------|-----|-----|-----|----|-----|----------------|
| 100                  | G 2"               | 98 | N°4-M10 | 111 | 24 | 40 | 27 | 8 | 142 | 175 | 268.5 | 110 | 158.5 | 14 | 62.5 | 159 | 201 | 142 | 57 | 203 | 21.5           |
| 150                  | G 2"               | 98 | N°4-M10 | 111 | 24 | 40 | 27 | 8 | 142 | 175 | 288.5 | 130 | 158.5 | 14 | 62.5 | 159 | 201 | 142 | 57 | 203 | 24             |

Dimensions in mm; tolerances allowed.

Fig. 515 - BC200 to BC400 dimensional drawing



Tab. 517 - BC200 to BC400 overall dimensions and weights

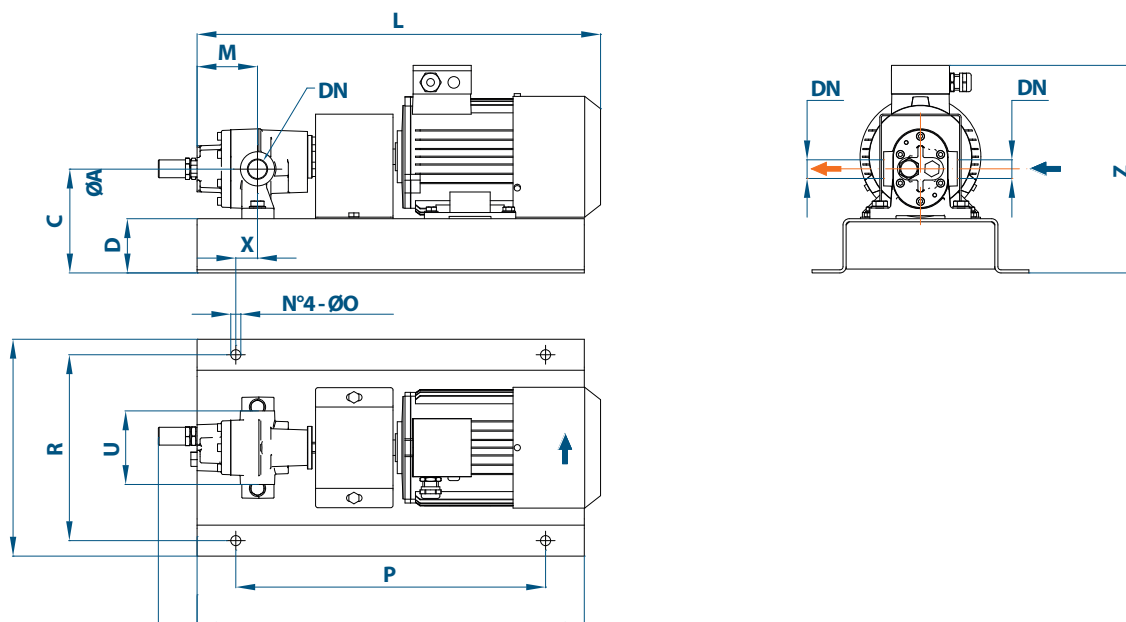
| PUMP<br>SIZE<br>(BC) | DN<br>ISO<br>228-1 | A   | B       | C   | D  | E  | F  | G | H   | I   | L   | M   | N   | O  | P   | Q   | R   | S   | U   | V  | W   | Z   | Weight<br>[kg] |
|----------------------|--------------------|-----|---------|-----|----|----|----|---|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|----|-----|-----|----------------|
| 200                  | G 2"1/2            | 115 | N°4-M12 | 106 | 28 | 60 | 31 | 8 | 142 | 168 | 323 | 178 | 145 | 13 | 118 | 151 | 139 | 171 | 210 | 71 | 210 | 200 | 31,4           |
| 250                  | G 2"1/2            | 115 | N°4-M12 | 106 | 28 | 60 | 31 | 8 | 142 | 168 | 335 | 190 | 145 | 13 | 130 | 163 | 139 | 171 | 210 | 71 | 210 | 200 | 33             |
| 300                  | G 2"1/2            | 115 | N°4-M12 | 106 | 28 | 60 | 31 | 8 | 142 | 168 | 347 | 202 | 145 | 13 | 142 | 175 | 139 | 171 | 210 | 71 | 210 | 200 | 35             |
| 350                  | G 2"1/2            | 115 | N°4-M12 | 106 | 28 | 60 | 31 | 8 | 142 | 168 | 359 | 214 | 145 | 13 | 154 | 187 | 139 | 171 | 210 | 71 | 210 | 200 | 36             |
| 400                  | G 2"1/2            | 115 | N°4-M12 | 106 | 28 | 60 | 31 | 8 | 142 | 168 | 373 | 228 | 145 | 13 | 168 | 201 | 139 | 171 | 210 | 71 | 210 | 200 | 38             |

Dimensions in mm; tolerances allowed.



## 5.13.3 MBM, MBMC

Fig. 516 - MBM5-40, MBMC10-25 dimensional drawing

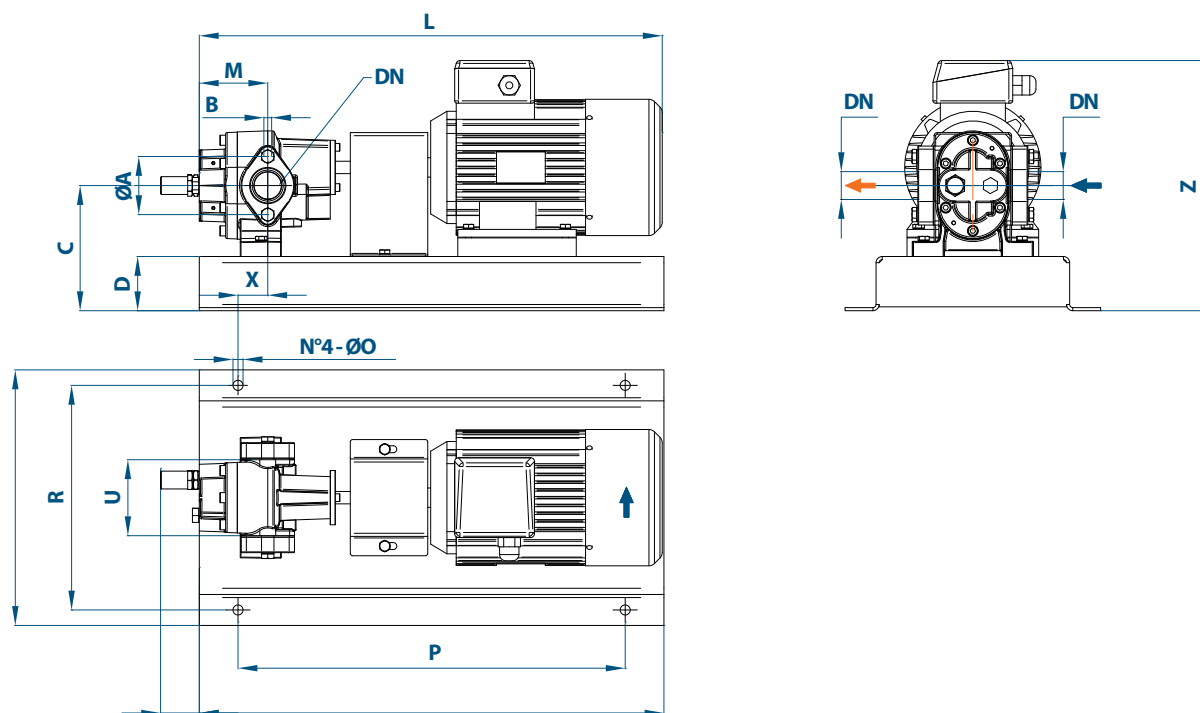


Tab. 518 - MBM5 to MBM40, MBMC10 to MBMC25 overall dimensions and weights

| PUMP SIZE |        | with IEC electric motor |    | DN<br>ISO<br>228-1 | C   | D  | L<br>(*) | M  | O  | P   | Q   | R   | S   | U   | V  | X  | Z<br>(*) | Weight<br>[kg] |
|-----------|--------|-------------------------|----|--------------------|-----|----|----------|----|----|-----|-----|-----|-----|-----|----|----|----------|----------------|
| (MBM)     | (MBMC) | Frame<br>size           | IM |                    |     |    |          |    |    |     |     |     |     |     |    |    |          |                |
| 5         |        | 71                      | B3 | G 1/2"             | 134 | 70 | 423      | 64 | 13 | 300 | 400 | 240 | 280 | 90  | 50 | 14 | 261      | 16             |
|           |        | 80                      | B3 | G 1/2"             | 134 | 70 | 484      | 64 | 13 | 400 | 500 | 240 | 280 | 90  | 50 | 14 | 270      | 23             |
|           |        | 90                      | B3 | G 1/2"             | 144 | 70 | 534      | 64 | 13 | 400 | 500 | 240 | 280 | 90  | 50 | 14 | 308      | 33             |
| 10        | 10     | 71                      | B3 | G 1/2"             | 134 | 70 | 433      | 74 | 13 | 300 | 400 | 240 | 280 | 90  | 50 | 24 | 261      | 16             |
|           |        | 80                      | B3 | G 1/2"             | 134 | 70 | 494      | 74 | 13 | 400 | 500 | 240 | 280 | 90  | 50 | 24 | 270      | 23             |
|           |        | 90                      | B3 | G 1/2"             | 144 | 70 | 544      | 74 | 13 | 400 | 500 | 240 | 280 | 90  | 50 | 24 | 308      | 33             |
| 15        | 15     | 71                      | B3 | G 3/4"             | 134 | 70 | 443.5    | 68 | 13 | 300 | 400 | 240 | 280 | 95  | 50 | 18 | 261      | 17             |
|           |        | 80                      | B3 | G 3/4"             | 134 | 70 | 504.5    | 68 | 13 | 400 | 500 | 240 | 280 | 95  | 50 | 18 | 270      | 23             |
|           |        | 90                      | B3 | G 3/4"             | 144 | 70 | 554.5    | 68 | 13 | 400 | 500 | 240 | 280 | 95  | 50 | 18 | 308      | 33             |
| 25        | 25     | 80                      | B3 | G 3/4"             | 134 | 70 | 514.5    | 78 | 13 | 400 | 500 | 240 | 280 | 95  | 50 | 28 | 270      | 24             |
|           |        | 90                      | B3 | G 3/4"             | 144 | 70 | 564.5    | 78 | 13 | 400 | 500 | 240 | 280 | 95  | 50 | 28 | 308      | 34             |
| 40        |        | 80                      | B3 | G 1"               | 146 | 70 | 554.5    | 83 | 13 | 400 | 500 | 240 | 280 | 121 | 50 | 33 | 286      | 26             |
|           |        | 90                      | B3 | G 1"               | 146 | 70 | 604.5    | 83 | 13 | 500 | 600 | 290 | 330 | 121 | 50 | 33 | 314      | 36             |
|           |        | 100                     | B3 | G 1"               | 150 | 70 | 667.5    | 83 | 13 | 500 | 600 | 290 | 330 | 121 | 50 | 33 | 327      | 50             |

Dimensions in mm; tolerances allowed; (\*) = depends on the motor manufacturer

Fig. 517 - MBM50-70, MBMC50-70 dimensional drawing

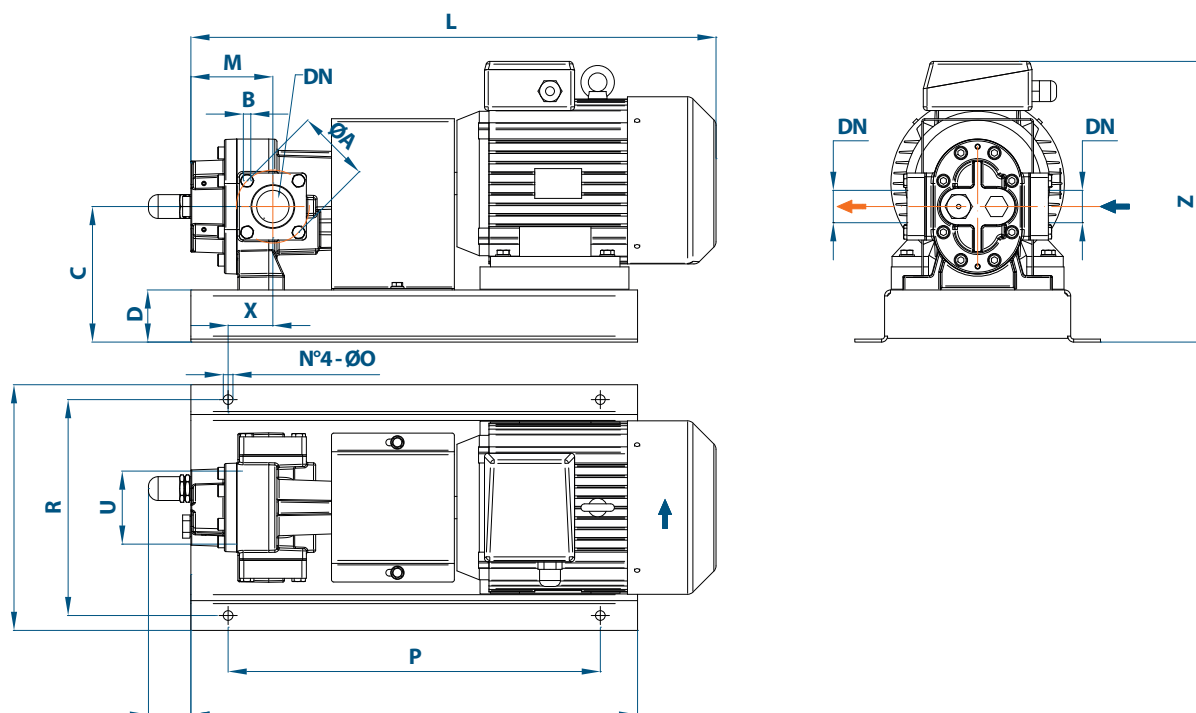


Tab. 519 - MBM50 to MBM70, MBMC50 to MBMC70 overall dimensions and weights

| PUMP SIZE |        | with IEC electric motor |    | DN<br>ISO<br>228-1 | A  | B       | C     | D  | L<br>(*) | M  | O  | P   | Q   | R   | S   | U  | V  | X  | Z<br>(*) | Weight<br>[kg] |
|-----------|--------|-------------------------|----|--------------------|----|---------|-------|----|----------|----|----|-----|-----|-----|-----|----|----|----|----------|----------------|
| (MBM)     | (MBMC) | Frame<br>size           | IM |                    |    |         |       |    |          |    |    |     |     |     |     |    |    |    |          |                |
| 50        | 50     | 90                      | B3 | G 1" 1/2           | 75 | N°2-M10 | 161.5 | 70 | 608      | 87 | 13 | 500 | 600 | 290 | 330 | 98 | 50 | 37 | 332      | 39             |
|           |        | 100                     | B3 | G 1" 1/2           | 75 | N°2-M10 | 161.5 | 70 | 671      | 87 | 13 | 500 | 600 | 290 | 330 | 98 | 50 | 37 | 341      | 52             |
|           |        | 112                     | B3 | G 1" 1/2           | 75 | N°2-M10 | 161.5 | 70 | 679      | 87 | 13 | 500 | 600 | 290 | 330 | 98 | 50 | 37 | 352      | 65             |
| 70        | 70     | 90                      | B3 | G 1" 1/2           | 75 | N°2-M10 | 161.5 | 70 | 618      | 90 | 13 | 500 | 600 | 290 | 330 | 98 | 50 | 40 | 332      | 40             |
|           |        | 100                     | B3 | G 1" 1/2           | 75 | N°2-M10 | 161.5 | 70 | 681      | 90 | 13 | 500 | 600 | 290 | 330 | 98 | 50 | 40 | 341      | 53             |
|           |        | 112                     | B3 | G 1" 1/2           | 75 | N°2-M10 | 161.5 | 70 | 689      | 90 | 13 | 500 | 600 | 290 | 330 | 98 | 50 | 40 | 352      | 65             |
|           |        | 132                     | B3 | G 1" 1/2           | 75 | N°2-M10 | 179.5 | 70 | 778      | 90 | 13 | 550 | 650 | 340 | 380 | 98 | 50 | 40 | 399      | 97             |

Dimensions in mm; tolerances allowed; (\*) = depends on the motor manufacturer

Fig. 518 - MBM100-150, MBMC100-150 dimensional drawing

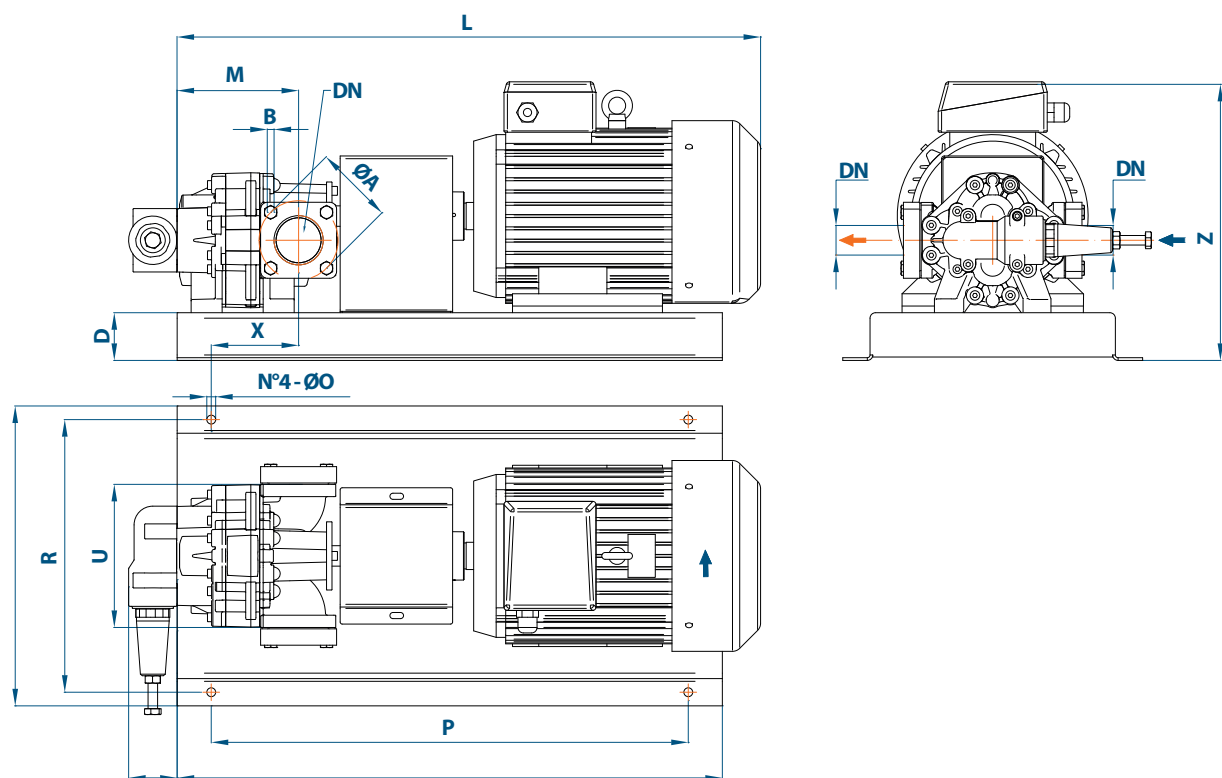


Tab. 520 - MBM100 to MBM150, MBMC100 to MBMC150 overall dimensions and weights

| PUMP SIZE |        | with IEC electric motor |    | DN<br>ISO<br>228-1 | A  | B       | C   | D  | L<br>(*) | M   | O  | P   | Q   | R   | S   | U   | V  | X  | Z<br>(*) | Weight<br>[kg] |
|-----------|--------|-------------------------|----|--------------------|----|---------|-----|----|----------|-----|----|-----|-----|-----|-----|-----|----|----|----------|----------------|
| (MBM)     | (MBMC) | Frame<br>size           | IM |                    |    |         |     |    |          |     |    |     |     |     |     |     |    |    |          |                |
| 100       | 100    | 90                      | B3 | G 2"               | 98 | N°4-M10 | 181 | 70 | 640.5    | 110 | 13 | 500 | 600 | 290 | 330 | 142 | 57 | 60 | 361      | 51             |
|           |        | 100                     | B3 | G 2"               | 98 | N°4-M10 | 181 | 70 | 703.5    | 110 | 13 | 500 | 600 | 290 | 330 | 142 | 57 | 60 | 370      | 64             |
|           |        | 112                     | B3 | G 2"               | 98 | N°4-M10 | 181 | 70 | 711.5    | 110 | 13 | 550 | 650 | 340 | 380 | 142 | 57 | 60 | 381      | 76             |
|           |        | 132                     | B3 | G 2"               | 98 | N°4-M10 | 181 | 70 | 800.5    | 110 | 13 | 550 | 650 | 340 | 380 | 142 | 57 | 60 | 410      | 108            |
| 150       | 150    | 100                     | B3 | G 2"               | 98 | N°4-M10 | 181 | 70 | 723.5    | 130 | 13 | 500 | 600 | 290 | 330 | 142 | 57 | 80 | 370      | 66             |
|           |        | 112                     | B3 | G 2"               | 98 | N°4-M10 | 181 | 70 | 731.5    | 130 | 13 | 550 | 650 | 340 | 380 | 142 | 57 | 80 | 381      | 79             |
|           |        | 132                     | B3 | G 2"               | 98 | N°4-M10 | 181 | 70 | 820.5    | 130 | 13 | 700 | 800 | 400 | 440 | 142 | 57 | 80 | 410      | 110            |

Dimensions in mm; tolerances allowed; (\*) = depends on the motor manufacturer

Fig. 519 - MBM200-600, MBMC200-400 dimensional drawing

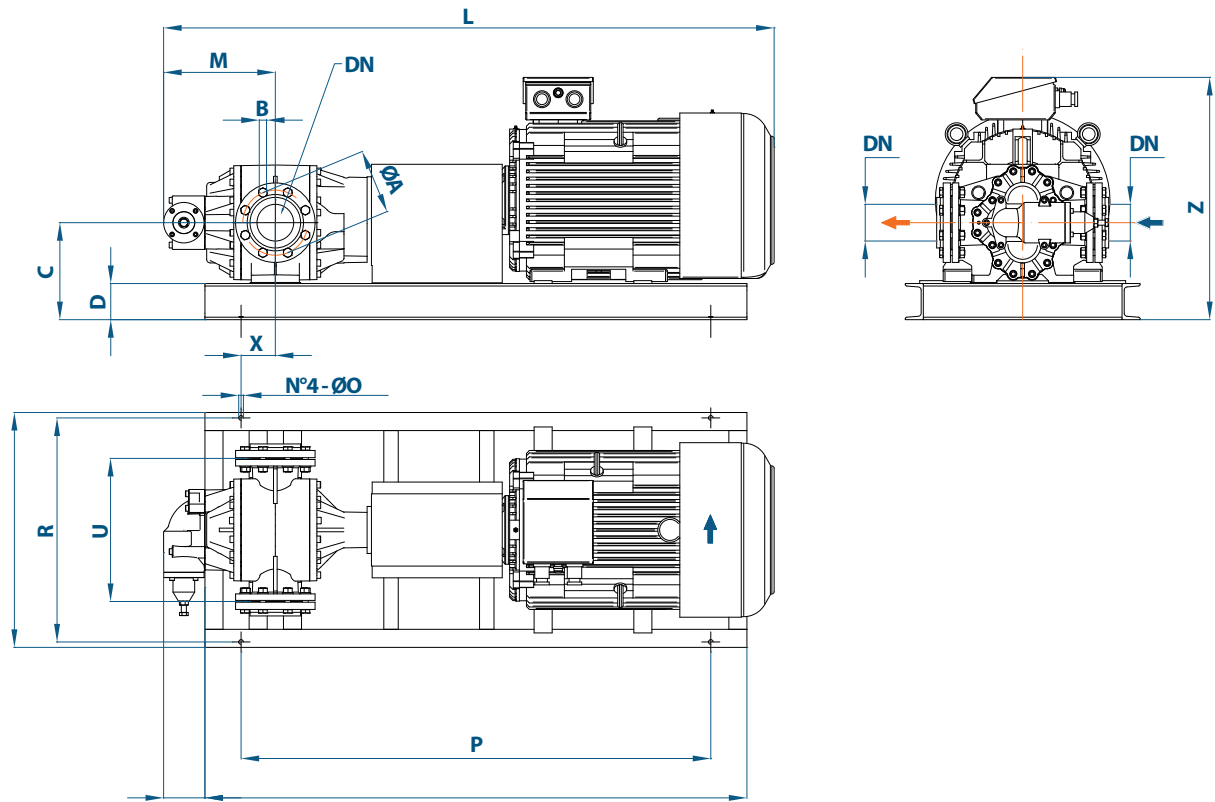


Tab. 521 – MBM200 to MBM600, MBMC200 to MBMC400 overall dimensions and weights

| PUMP SIZE |        | with IEC electric motor |    | DN ISO 228-1 | A   | B       | C     | D  | L (*) | M   | O  | P   | Q    | R   | S   | U   | V   | X   | Z (*) | Weight [kg] |
|-----------|--------|-------------------------|----|--------------|-----|---------|-------|----|-------|-----|----|-----|------|-----|-----|-----|-----|-----|-------|-------------|
| (MBM)     | (MBMC) | Frame size              | IM |              |     |         |       |    |       |     |    |     |      |     |     |     |     |     |       |             |
| 200       | 200    | 112                     | B3 | G 2"1/2      | 115 | N°4-M12 | 176   | 70 | 766   | 178 | 13 | 700 | 800  | 400 | 440 | 210 | 71  | 128 | 380   | 86          |
|           |        | 132                     | B3 | G 2"1/2      | 115 | N°4-M12 | 176   | 70 | 855   | 178 | 13 | 700 | 800  | 400 | 440 | 210 | 71  | 128 | 409   | 118         |
|           |        | 160                     | B3 | G 2"1/2      | 115 | N°4-M12 | 194   | 70 | 990   | 178 | 13 | 900 | 1000 | 400 | 440 | 210 | 71  | 128 | 453   | 209         |
| 250       | 250    | 112                     | B3 | G 2"1/2      | 115 | N°4-M12 | 176   | 70 | 778   | 190 | 13 | 700 | 800  | 400 | 440 | 210 | 71  | 140 | 380   | 88          |
|           |        | 132                     | B3 | G 2"1/2      | 115 | N°4-M12 | 176   | 70 | 867   | 190 | 13 | 700 | 800  | 400 | 440 | 210 | 71  | 140 | 409   | 119         |
|           |        | 160                     | B3 | G 2"1/2      | 115 | N°4-M12 | 194   | 70 | 1002  | 190 | 13 | 900 | 1000 | 400 | 440 | 210 | 71  | 140 | 453   | 211         |
| 300       | 300    | 132                     | B3 | G 2"1/2      | 115 | N°4-M12 | 176   | 70 | 879   | 202 | 13 | 700 | 800  | 400 | 440 | 210 | 71  | 152 | 409   | 121         |
|           |        | 160                     | B3 | G 2"1/2      | 115 | N°4-M12 | 194   | 70 | 1014  | 202 | 13 | 900 | 1000 | 400 | 440 | 210 | 71  | 152 | 453   | 213         |
| 350       | 350    | 132                     | B3 | G 2"1/2      | 115 | N°4-M12 | 176   | 70 | 891   | 214 | 13 | 700 | 800  | 400 | 440 | 210 | 71  | 164 | 409   | 122         |
|           |        | 160                     | B3 | G 2"1/2      | 115 | N°4-M12 | 194   | 70 | 1026  | 214 | 13 | 900 | 1000 | 400 | 440 | 210 | 71  | 164 | 453   | 214         |
| 400       | 400    | 132                     | B3 | G 2"1/2      | 115 | N°4-M12 | 176   | 70 | 905   | 228 | 13 | 700 | 800  | 400 | 440 | 210 | 71  | 178 | 409   | 124         |
|           |        | 160                     | B3 | G 2"1/2      | 115 | N°4-M12 | 194   | 70 | 1040  | 228 | 13 | 900 | 1000 | 400 | 440 | 210 | 71  | 178 | 453   | 216         |
|           |        | 180                     | B3 | G 2"1/2      | 115 | N°4-M12 | 214   | 70 | 1122  | 228 | 13 | 900 | 1000 | 400 | 440 | 210 | 71  | 178 | 484   | 263         |
| 500       |        | 132                     | B3 | G 3"         | 127 | N°4-M12 | 209.5 | 70 | 914   | 234 | 13 | 700 | 800  | 400 | 440 | 263 | 102 | 184 | 454   | 146         |
|           |        | 160                     | B3 | G 3"         | 127 | N°4-M12 | 209.5 | 70 | 1049  | 234 | 13 | 900 | 1000 | 400 | 440 | 263 | 102 | 184 | 480   | 238         |
|           |        | 180                     | B3 | G 3"         | 127 | N°4-M12 | 209.5 | 70 | 1131  | 234 | 13 | 900 | 1000 | 400 | 440 | 263 | 102 | 184 | 491   | 285         |
| 550       |        | 160                     | B3 | G 3"         | 127 | N°4-M12 | 209.5 | 70 | 1058  | 243 | 13 | 900 | 1000 | 400 | 440 | 263 | 102 | 193 | 480   | 239         |
|           |        | 180                     | B3 | G 3"         | 127 | N°4-M12 | 209.5 | 70 | 1140  | 243 | 13 | 900 | 1000 | 400 | 440 | 263 | 102 | 193 | 491   | 286         |
| 600       |        | 160                     | B3 | G 3"         | 127 | N°4-M12 | 209.5 | 70 | 1067  | 252 | 13 | 900 | 1000 | 400 | 440 | 263 | 102 | 202 | 480   | 241         |
|           |        | 180                     | B3 | G 3"         | 127 | N°4-M12 | 209.5 | 70 | 1149  | 252 | 13 | 900 | 1000 | 400 | 440 | 263 | 102 | 202 | 491   | 288         |

Dimensions in mm; tolerances allowed; (\*) = depends on the motor manufacturer

Fig. 520 - MBM1200-1600 dimensional drawing



Tab. 522 - MBM1200 to MBM1600 overall dimensions and weights

| PUMP<br>SIZE<br>(MBM) | with IEC<br>electric<br>motor |    | DN       | A   | B       | C     | D  | L<br>(*) | M   | O  | P    | Q    | R   | S   | U   | V   | X   | Z<br>(*) | Weight<br>[kg] |
|-----------------------|-------------------------------|----|----------|-----|---------|-------|----|----------|-----|----|------|------|-----|-----|-----|-----|-----|----------|----------------|
|                       | Frame<br>size                 | IM | UNI 2254 |     |         |       |    |          |     |    |      |      |     |     |     |     |     |          |                |
| 1200                  | 225                           | B3 | G 4"     | 180 | N°8-M16 | 235.5 | 70 | 1525     | 234 | 13 | 1400 | 1500 | 620 | 650 | 396 | 114 | 184 | 643      | 608            |
| 1600                  | 225                           | B3 | G 4"     | 180 | N°8-M16 | 235.5 | 70 | 1575     | 243 | 13 | 1400 | 1500 | 620 | 650 | 396 | 114 | 193 | 643      | 633            |

Dimensions in mm; tolerances allowed; (\*) = depend on the motor maker.

# 5.14 SPARE PARTS

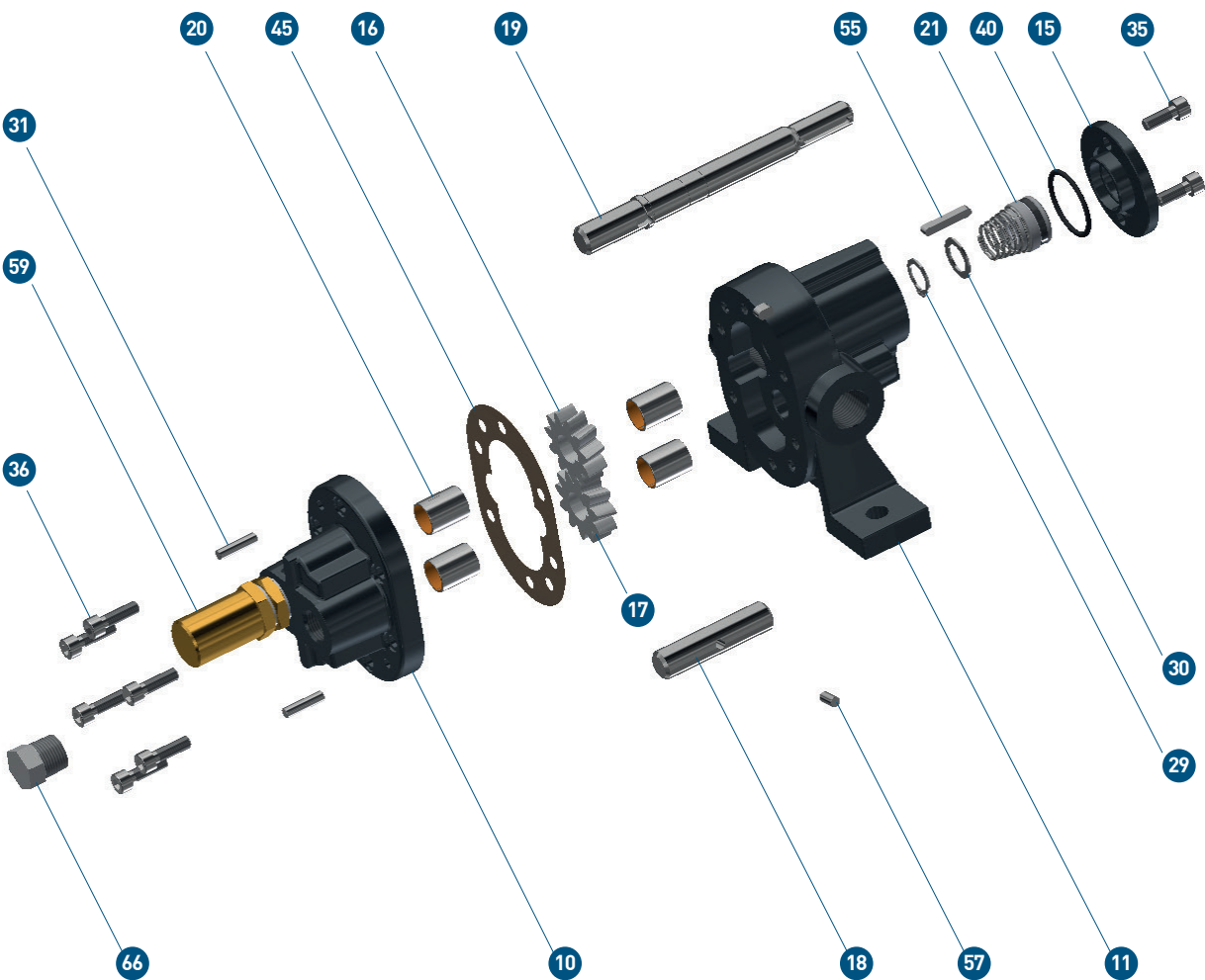


Fig. 521 - B3-40; BC10-25

Fig. 308 - Pressure relief valve details

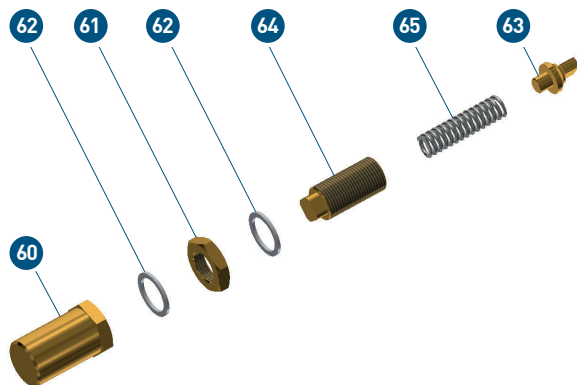




Fig. 522 - Packing seal details

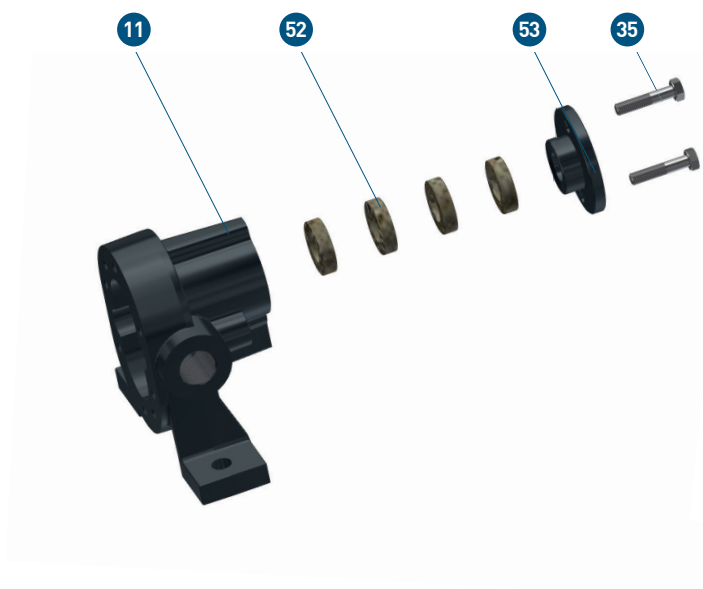
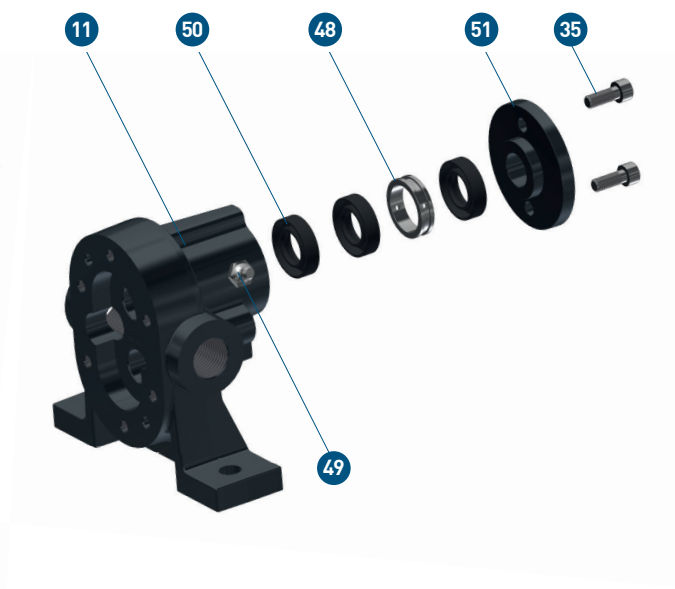


Fig. 523 - Lip seal details



Tab. 523 - B3-40, BC10-25 spare parts list

| Ref. | Description             | Ref. | Description       | Ref. | Description          | Ref. | Description           |
|------|-------------------------|------|-------------------|------|----------------------|------|-----------------------|
| 10   | Pump rear cover         | 21   | Mechanical seal   | 48   | Lantern ring         | 59   | Kit valve             |
| 11   | Pump housing            | 29   | Locking ring      | 49   | Greaser              | 60   | Valve cap             |
| 15   | Mechanical seal housing | 30   | Ring seal         | 50   | Lip seals            | 61   | Valve locknut         |
| 16   | Driving gear            | 31   | Dowel pin         | 51   | Lip seal housing     | 62   | Valve washer          |
| 17   | Driven gear             | 35   | Screw             | 52   | Packing              | 63   | Valve poppet          |
| 18   | Driven shaft            | 36   | Screw             | 53   | Packing seal housing | 64   | Valve adjusting screw |
| 19   | Driving shaft           | 40   | O-ring            | 55   | Feather key          | 65   | Valve spring          |
| 20   | Sleeve bushings         | 45   | Cover flat gasket | 57   | Feather key          | 66   | Threaded cap          |

Fig. 524 - B50-150; BC50-150

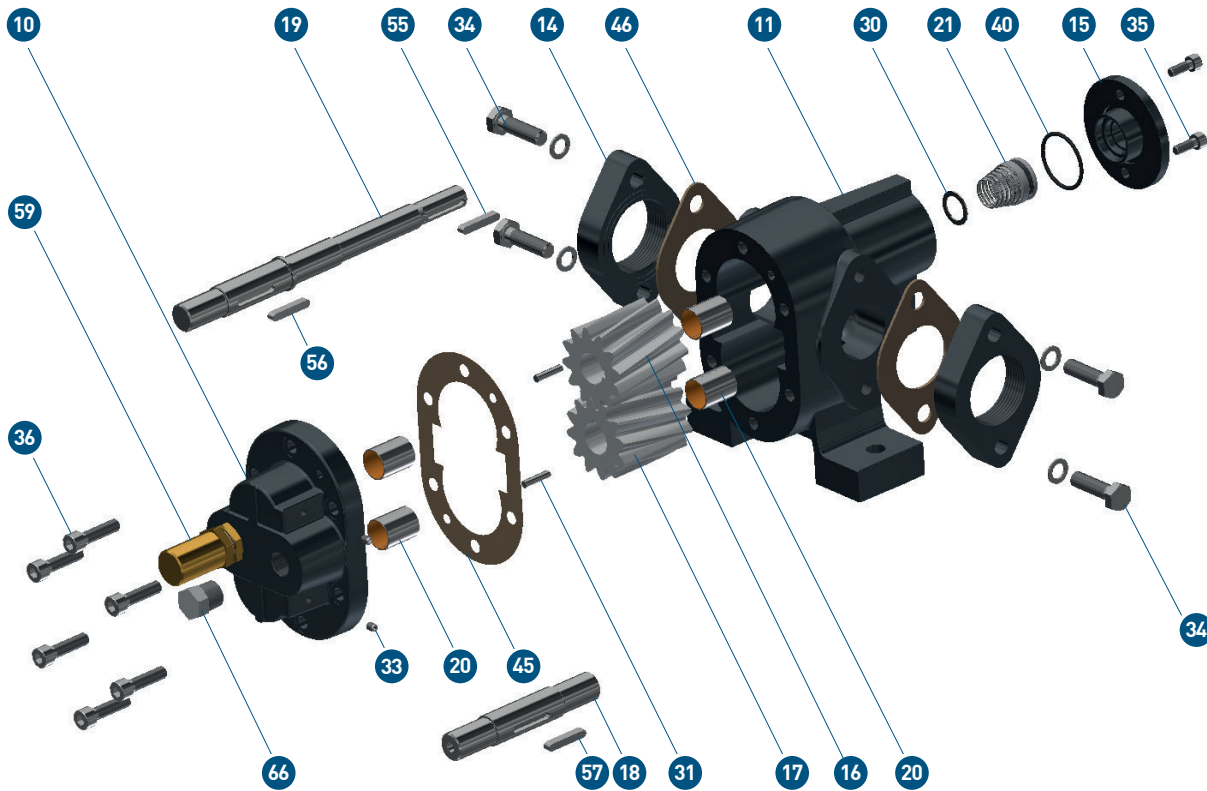


Fig. 308 - Pressure relief valve details

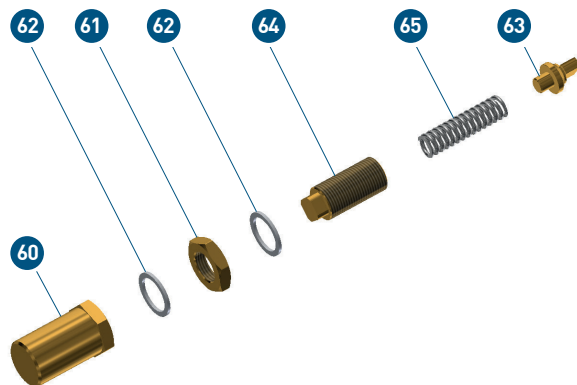
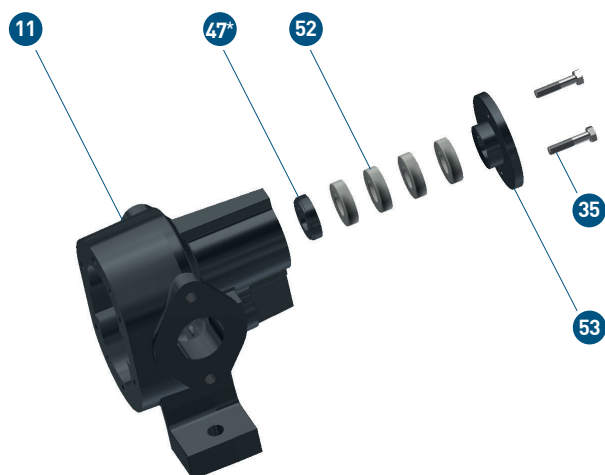
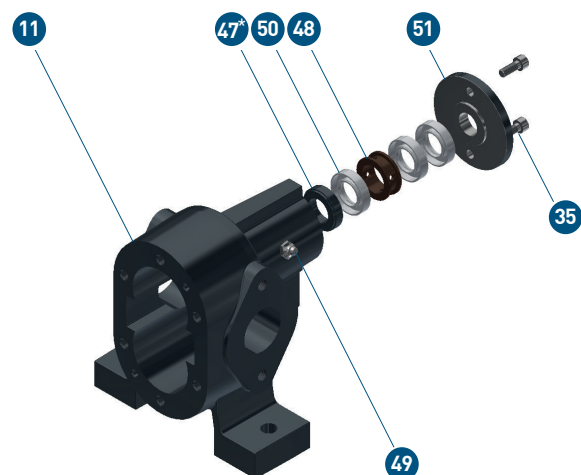


Fig. 525 – Packing seal details



(\*) Only on size B50 -B70

Fig. 526 – Lip seal details



(\*) Only on size B50-B70

Tab. 524 - B50-150, BC50-150 spare parts list

| Ref. | Description             | Ref. | Description        | Ref. | Description          | Ref. | Description           |
|------|-------------------------|------|--------------------|------|----------------------|------|-----------------------|
| 10   | Pump rear cover         | 30   | Ring seal          | 48   | Lantern ring         | 60   | Valve cap             |
| 11   | Pump housing            | 31   | Dowel pin          | 49   | Greaser              | 61   | Valve locknut         |
| 14   | Flange                  | 33   | Grub screw         | 50   | Lip seals            | 62   | Valve washer          |
| 15   | Mechanical seal housing | 34   | Bolt               | 51   | Lip seal housing     | 63   | Valve poppet          |
| 16   | Driving gear            | 35   | Screw              | 52   | Packing              | 64   | Valve adjusting screw |
| 17   | Driven gear             | 36   | Screw              | 53   | Packing seal housing | 65   | Valve spring          |
| 18   | Driven shaft            | 40   | O-ring             | 55   | Feather key          | 66   | Threaded cap          |
| 19   | Driving shaft           | 45   | Cover flat gasket  | 56   | Feather key          |      |                       |
| 20   | Sleeve bushings         | 46   | Flange flat gasket | 57   | Feather key          |      |                       |
| 21   | Mechanical seal         | 47*  | Seal bottom ring   | 59   | Kit valve            |      |                       |

(\*) Only on size B50-B70

Fig. 527 - B200-600; BC200-400

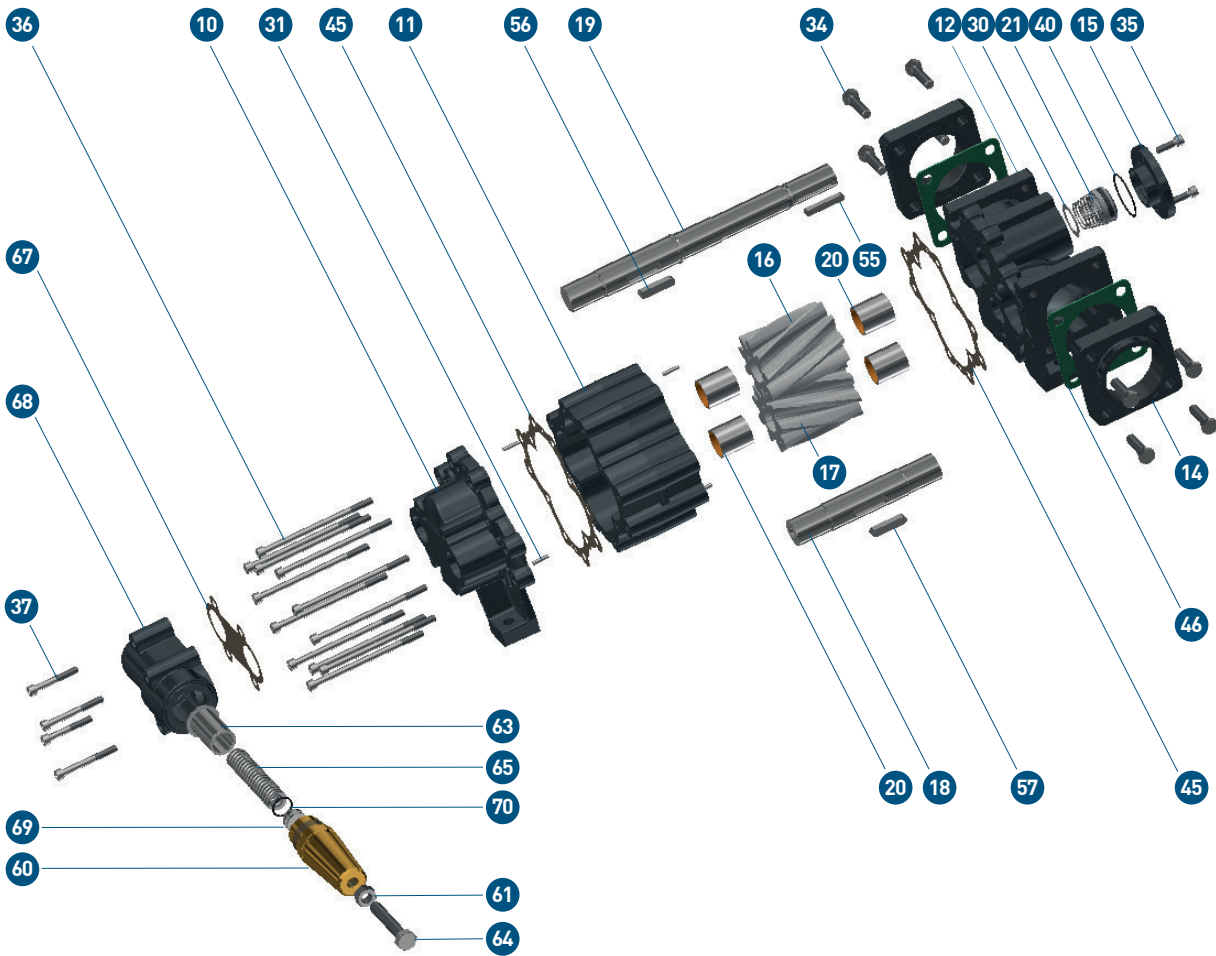


Fig. 528 - Packing seal details

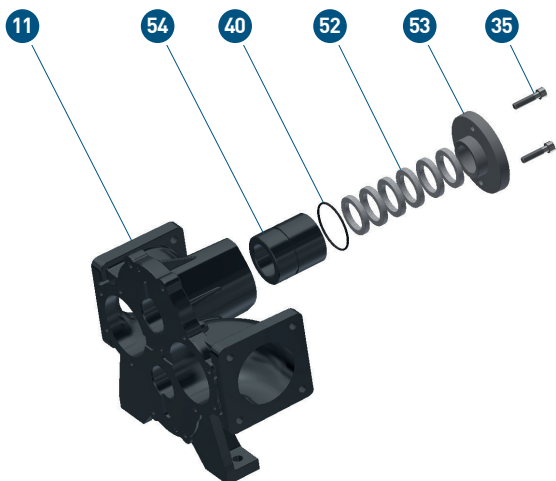


Fig. 529 - Lip seal details

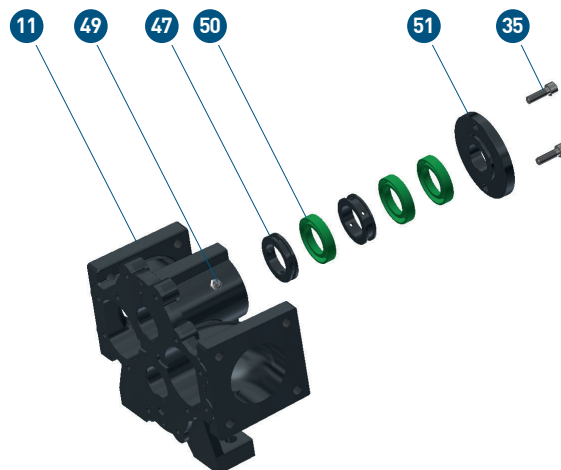
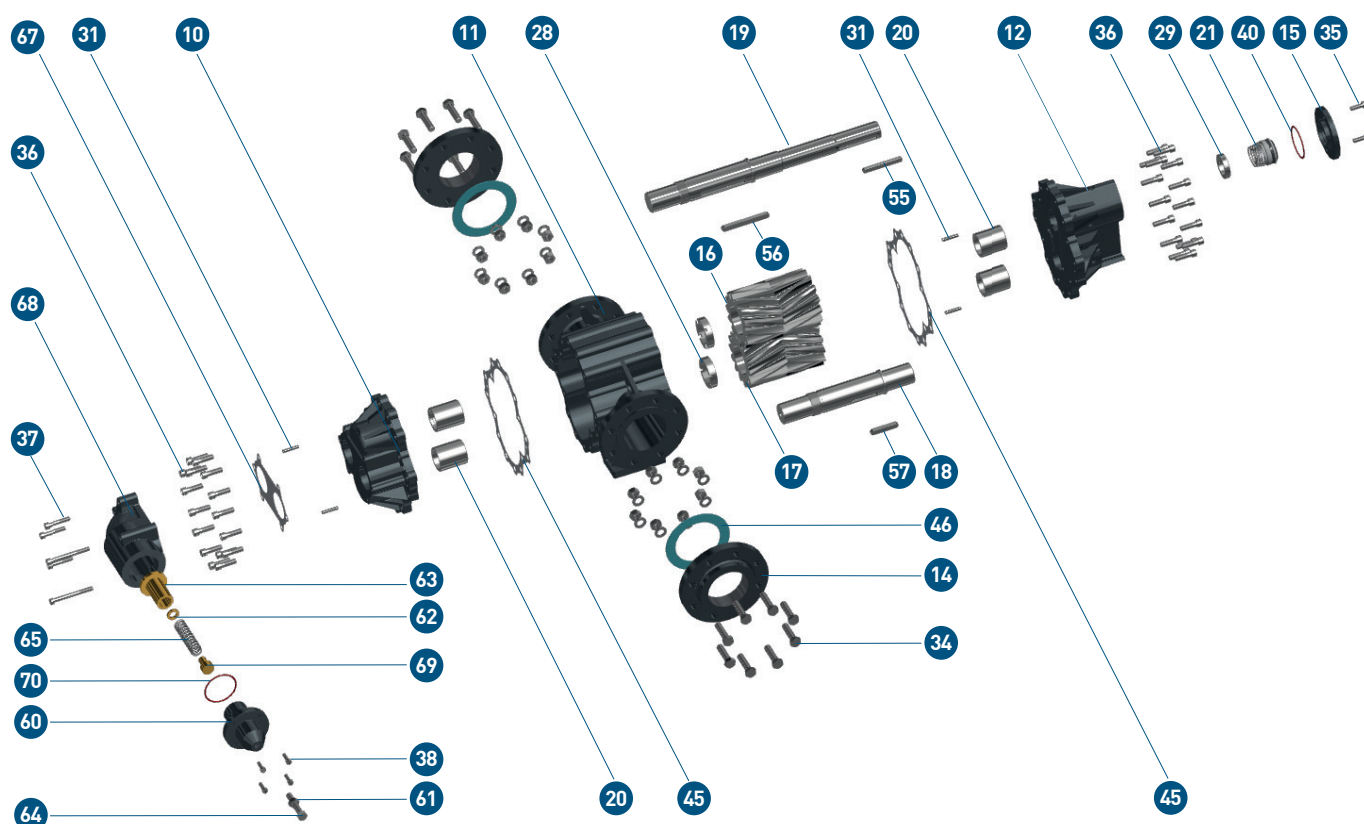


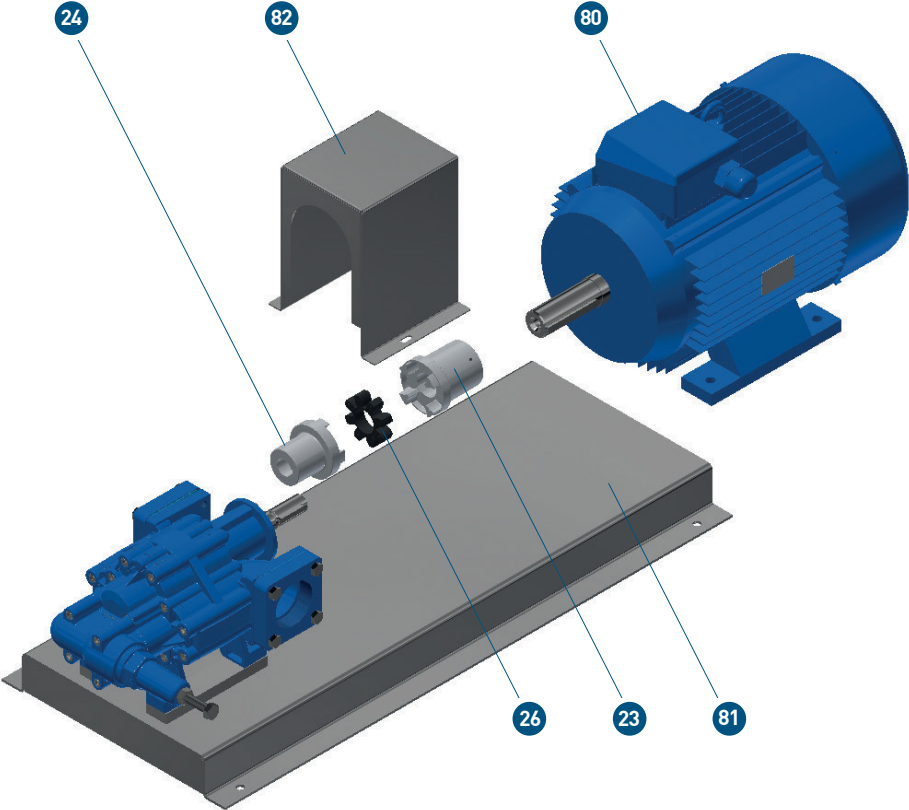
Fig. 530 - B1200-1600



Tab. 525 - B200-1600, BC200-400 spare parts list

| Ref. | Description             | Ref. | Description       | Ref. | Description          | Ref. | Description           |
|------|-------------------------|------|-------------------|------|----------------------|------|-----------------------|
| 10   | Pump rear cover         | 28   | Ring nut          | 46   | Flange flat gasket   | 60   | Valve cap             |
| 11   | Pump housing            | 29   | Locking ring      | 47   | Seal bottom ring     | 61   | Valve locknut         |
| 12   | Pump front cover        | 30   | Ring seal         | 49   | Greaser              | 62   | Valve washer          |
| 14   | Flange                  | 31   | Dowel pin         | 50   | Lip seals            | 63   | Valve poppet          |
| 15   | Mechanical seal housing | 34   | Bolt              | 51   | Lip seal housing     | 64   | Valve adjusting screw |
| 16   | Driving gear            | 35   | Screw             | 52   | Packing              | 65   | Valve spring          |
| 17   | Driven gear             | 36   | Screw             | 53   | Packing seal housing | 67   | Flat gasket           |
| 18   | Driven shaft            | 37   | Screw             | 54   | Packing seal case    | 68   | Valve housing         |
| 19   | Driving shaft           | 38   | Screw             | 55   | Feather key          | 69   | Spring cap            |
| 20   | Sleeve bushings         | 40   | O-ring            | 56   | Feather key          | 70   | O-ring                |
| 21   | Mechanical seal         | 45   | Cover flat gasket | 57   | Feather key          |      |                       |

Fig. 531 – MBM-MBMC



Tab. 526 - MBM, MBMC spare parts list

| Ref. | Description              |
|------|--------------------------|
| 23   | Half-coupling motor side |
| 24   | Half-coupling pump side  |
| 26   | Spider                   |
| 80   | Electric motor           |
| 81   | Skid                     |
| 82   | Coupling protection      |

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