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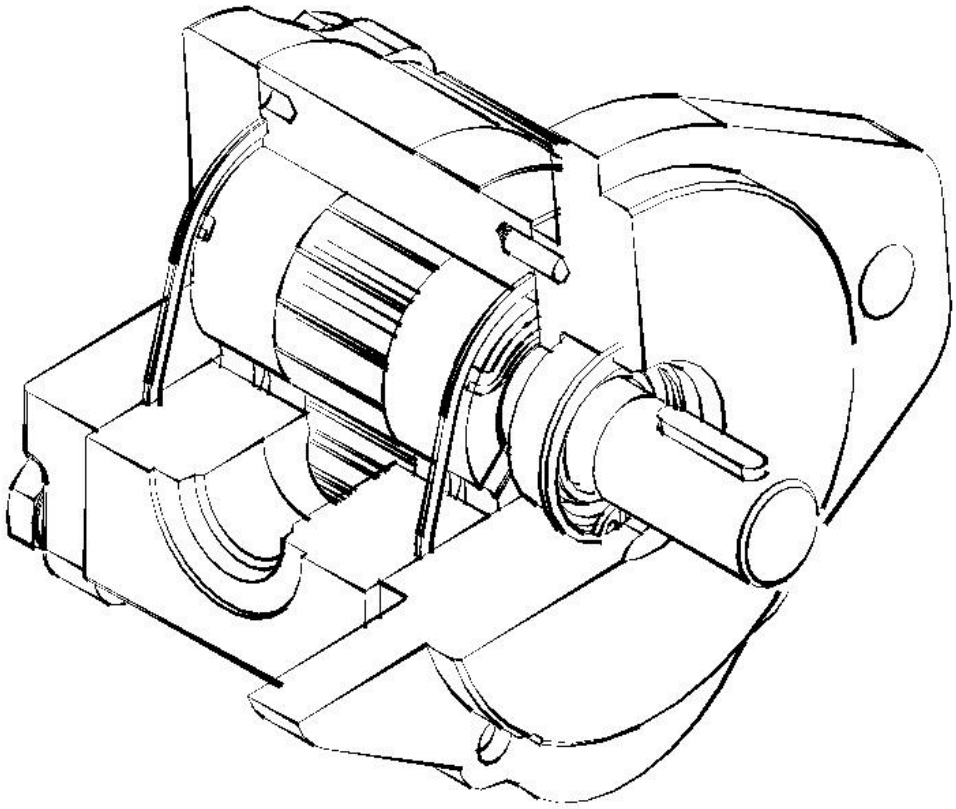
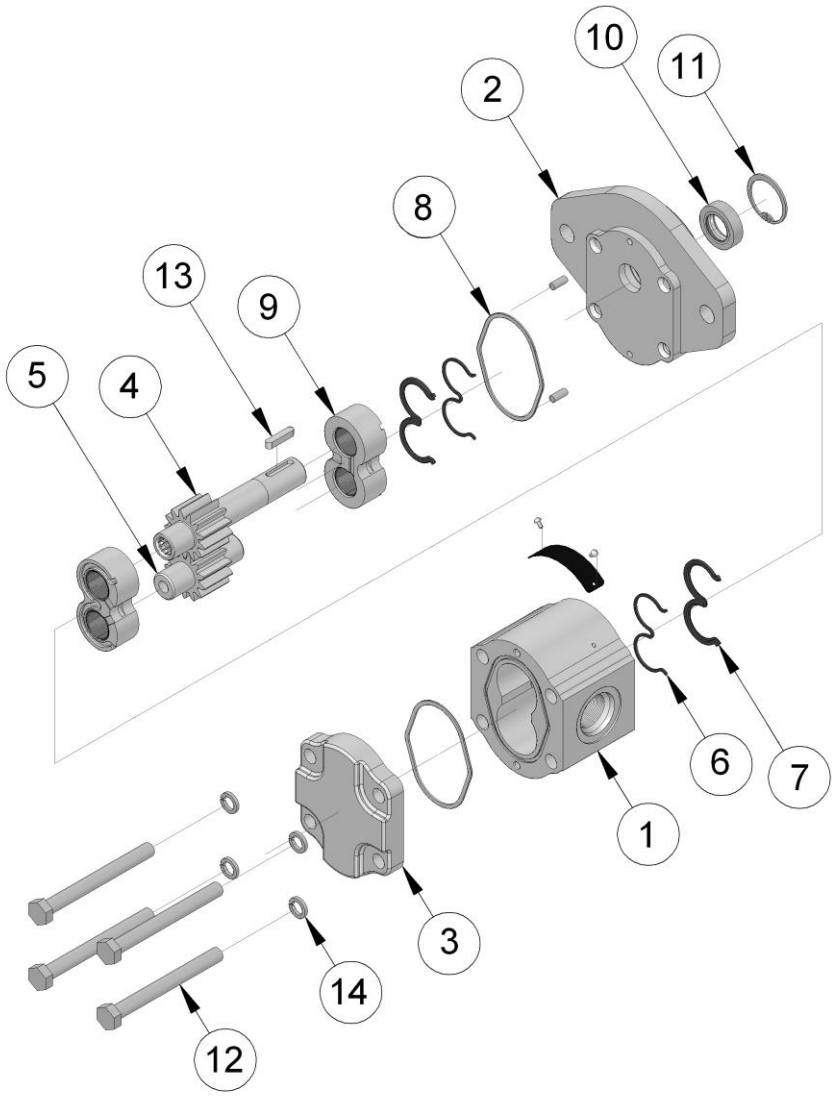


## BASIC DESCRIPTION

2 line pumps with external gearing can be used in advance hydraulic systems of measuring capacity (approx. up to 12 kW), with high serviceability and long service life. A wide range of types with various driving units, joint flanges, liquid inlets and outlets enable their application in varied hydraulic circuits of both stationary and mobile equipment and machinery. They are available in single-direction or reverse design with internal or external drainage. Furthermore, they are available in multiple versions (up to 5 sections) with separate inlets working liquid in individual sections or with one common inlet. On request, individual sections can be removed.

The basic version consists of several parts. The pump body is made of a heavy duty aluminium alloy. The cover and the flange are made of grey cast iron or aluminium alloy. The flange types used as well as the form inlets and outlets working liquid (located laterally - in the body or axially - in the cover) meet all worldwide standards. The gear wheels are optimized for low-noise applications. They show a high quality surface, are supported in aluminium bearing liners and continuously lubricated and cooled by working liquid.

## BASIC PARTS




**1.** Body
**2.** Flange
**3.** Cover
**4.** Driving gear
**5.** Driven gear
**6.** Balancing sealing
**7.** Sealing protective plate
**8.** Peripheral sealing
**9.** Bearing sleeves
**10.** Shaft seal
**11.** Safety ring
**12.** Connection bolts
**13.** Square key
**14.** Lock washer

## PARAMETER TABLE

| Nominal Size Parameters | | Sym. | Unit | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|
| Actual displacement | | $V_g$ | [$cm^3$] | 2.00 | 3.01 | 4.01 | 5.01 | 6.02 | 7.02 |
| Rotation speed | nominal | $n_n$ | [$min^{-1}$] | 1500 | | | | | |
| | minimum | $n_{min}$ | [$min^{-1}$] | 500 | | | | | |
| | maximum | $n_{max}$ | [$min^{-1}$] | 4000 | 4000 | 4000 | 4000 | 3600 | 3500 |
| Pressure at inlet * | minimum | $p_{1min}$ | [bar] | -0.30 | | | | | |
| | maximum | $p_{1max}$ | [bar] | 0.50 | | | | | |
| Pressure at outlet ** | max. continuous | $p_{2n}$ | [bar] | 280 | 280 | 280 | 280 | 280 | 280 |
| | maximum | $p_{2max}$ | [bar] | 300 | 300 | 300 | 300 | 300 | 300 |
| | peak | $p_3$ | [bar] | 310 | 310 | 310 | 310 | 310 | 310 |
| Nominal flow rate (min.) at $n_n$ and $p_{2n}$ | | $Q_n$ | [$dm^3.min^{-1}$] | 2.68 | 4.07 | 5.43 | 7.01 | 8.37 | 9.73 |
| Maximum flow rate at $n_{max}$ and $p_{2max}$ | | $Q_{max}$ | [$dm^3.min^{-1}$] | 7.95 | 10.85 | 14.48 | 18.69 | 20.09 | 24.25 |
| Nominal input power (max.) at $n_n$ and $p_{2n}$ | | $P_n$ | [kW] | 1.2 | 1.8 | 2.4 | 3.0 | 3.6 | 4.2 |
| Maximum input power at $n_{max}$ and $p_{2max}$ | | $P_{max}$ | [kW] | 3.3 | 4.9 | 6.6 | 8.2 | 8.9 | 9.5 |
| Weight | | m | [kg] | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 | 1.95 |

| Nominal Size Parameters | | Sym. | Unit | 8 | 10 | 11 | 12 | 15 | |
|---|---|---|---|---|---|---|---|---|---|
| Actual displacement | | $V_g$ | [$cm^3$] | 8.02 | 10.03 | 11.03 | 12.03 | 15.01 | |
| Rotation speed | nominal | $n_n$ | [$min^{-1}$] | 1500 | | | | | |
| | minimum | $n_{min}$ | [$min^{-1}$] | 500 | | | | | |
| | maximum | $n_{max}$ | [$min^{-1}$] | 3100 | 2800 | 2500 | 2400 | 2200 | |
| Pressure at inlet * | minimum | $p_{1min}$ | [bar] | -0.30 | | | | | |
| | maximum | $p_{1max}$ | [bar] | 0.50 | | | | | |
| Pressure at outlet ** | max. continuous | $p_{2n}$ | [bar] | 280 | 250 | 235 | 220 | 190 | |
| | maximum | $p_{2max}$ | [bar] | 300 | 270 | 255 | 240 | 210 | |
| | peak | $p_3$ | [bar] | 310 | 280 | 265 | 250 | 220 | |
| Nominal flow rate (min.) at $n_n$ and $p_{2n}$ | | $Q_n$ | [$dm^3.min^{-1}$] | 11.08 | 13.80 | 15.18 | 16.49 | 20.60 | |
| Maximum flow rate at $n_{max}$ and $p_{2max}$ | | $Q_{max}$ | [$dm^3.min^{-1}$] | 24.50 | 25.76 | 26.80 | 26.38 | 32.80 | |
| Nominal input power (max.) at $n_n$ and $p_{2n}$ | | $P_n$ | [kW] | 4.8 | 5.3 | 5.5 | 5.6 | 6.0 | |
| Maximum input power at $n_{max}$ and $p_{2max}$ | | $P_{max}$ | [kW] | 9.9 | 10.7 | 9.6 | 9.9 | 9.6 | |
| Weight | | m | [kg] | 2.00 | 2.10 | 2.10 | 2.20 | 2.45 | |

***** Inlet pressure in the reversible design can be up to **$p_1 = p_{2n}$-70 bar max.** External drainage must be used in case of the reversible design.

****** Outlet pressure in the reversible design is **10% lower** than shown in the table (depending on operating conditions - it is necessary to consult with the manufacturer).

## FORMULAS USED FOR CALCULATION

**Flow rate**

$$Q = \frac{V_g \cdot n}{1000} \cdot \eta_v \quad [dm^3\,min^{-1}]$$

| | | |
|---|---|---|
| $V_g$ | [$cm^3$] | pump displacement |
| n | [$min^{-1}$] | rotation speed |
| $\eta_v$ | [-] | volumetric efficiency |

**Displacement**

$$V_g = \frac{Q \cdot 1000}{n \cdot \eta_V} \quad [cm^3]$$

**Torque**

$$M_k = \frac{V_g \cdot p}{20 \cdot \pi \cdot \eta_m} \quad [Nm]$$

| | | |
|---|---|---|
| p | [bar] | required pressure at outlet |
| $\eta_m$ | [-] | mechanical efficiency |

**Input power**

$$P = \frac{V_g \cdot n \cdot p}{600 \cdot 1000 \cdot \eta_t} \quad [kW]$$

| | | |
|---|---|---|
| $\eta_t$ | [-] | total efficiency |

## PUMP EFFICIENCIES

**Volumetric efficiency $\eta_v$**

It determines the amount of flow losses. Its value is $\eta_v$ = 0.92 ÷ 0.98 (depending on rotation speed, viscosity of working liquid and outlet pressure). It can be expressed as follows:

$$\eta_v = \frac{Q_{act.}}{Q_{theor.}} \quad [-]$$

| | | |
|---|---|---|
| $Q_{act.}$ | [$dm^3min^{-1}$] | actual flow rate |
| $Q_{theor}$ | [$dm^3min^{-1}$] | theoretical flow rate |

**Mechanical efficiency $\eta_m$**

It determines mechanical losses. Its value is about $\eta_m$ = 0.85. It can be expressed as follows:

$$\eta_m = \frac{M_{theor}}{M_{act.}} \quad [-]$$

| | | |
|---|---|---|
| $M_{act.}$ | [Nm] | actual torque |
| $M_{theor}$ | [Nm] | theoretical torque |

**Total efficiency $\eta_t$**

It is defined as product of $\eta_v$ and $\eta_m$ and determines difference between theoretical and actual required input power:

$$\eta_t = \eta_v \cdot \pi_m = \frac{P_{theor}}{P_{act}} \quad [-]$$

| | | |
|---|---|---|
| $P_{act.}$ | [kW] | actual input power |
| $P_{theor}$ | [kW] | theoretical input power |

## WORKING LIQUID

- Mineral oils for hydraulic drives
- Hydraulic liquids based on plant oils suitable for hydraulic drives

**Liquid temperature**

t = -20 ÷ +80 [°C] when used with FKM (Viton) seal up to 120 [°C]

**Cinematic viscosity**

Recommended (during continuous operation): $\nu = 20 \div 80 \cdot 10^{-6}$ [$m^2 \cdot s^{-1}$]

Maximum (cold starting, at viscosity >1000, operating pressure <10 bar is permissible, speed <1500·$min^{-1}$): $\nu = 1200 \cdot 10^{-6}$ [$m^2 \cdot s^{-1}$]

Minimum (operating mode at $10 \cdot 10^{-6}$ up to $20 \cdot 10^{-6}$ should be consulted with manufacturer): $\nu = 10 \cdot 10^{-6}$ [$m^2 \cdot s^{-1}$]

**Filtration coefficient** $\beta_\alpha$

$\beta_{25}$ 75 ≥ (for pressure $p_2 < 200$ bar)
$\beta_{10}$ 75 ≥ (for pressure $p_2 > 200$ bar)

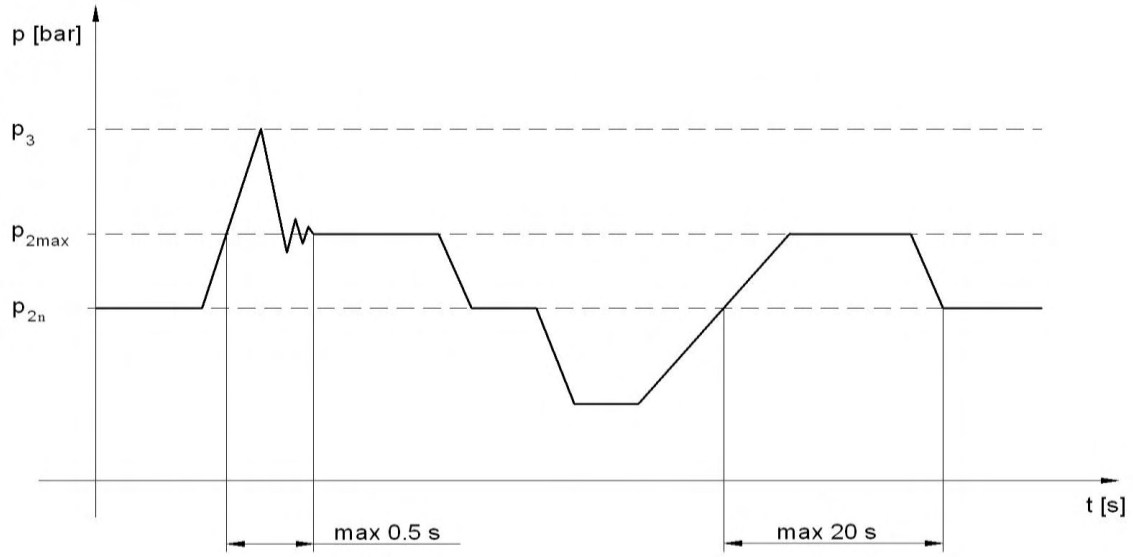
**Liquid contamination class according to ISO 4406**

21/18/15 (for pressure $p_2 < 200$ bar)
20/17/14 (for pressure $p_2 > 200$ bar)

**Liquid contamination class according to NAS 1638**

10 (for pressure $p_2 < 200$ bar)
8 (for pressure $p_2 > 200$ bar)

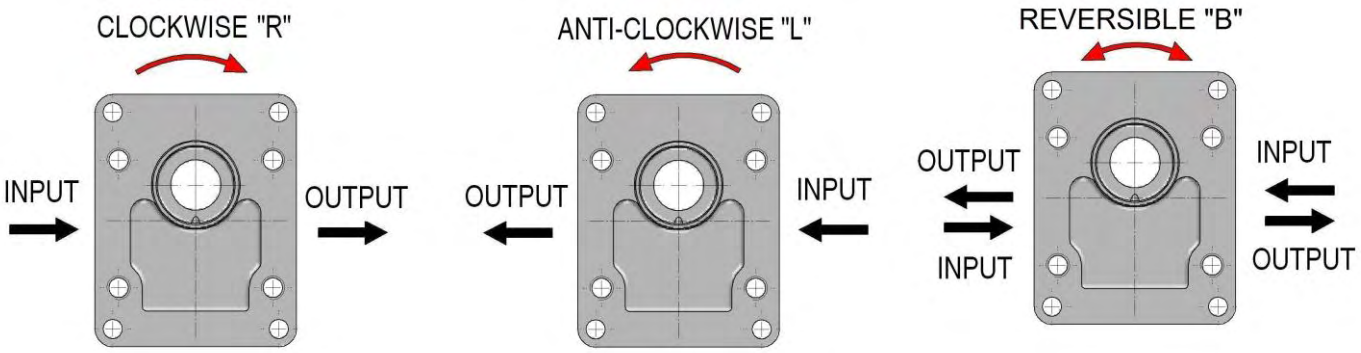
## PRESSURE LOAD




| | | |
|---|---|---|
| **$p_{2n}$** | **max. contin. pressure** | max. working pressure, at which the pump can be operated without time limitation. |
| **$p_{2max}$** | **max. pressure** | maximum pressure permissible for a short time, max. 20s. |
| **$p_3$** | **peak pressure** | short-time pressure (fractions of a second) arising in case of a sudden change of the operating mode; any excess of this pressure during operation is impermissible. |

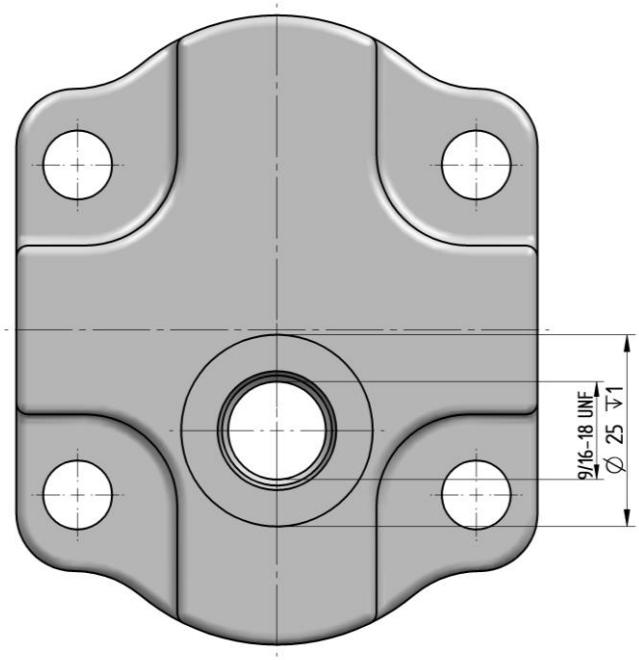
## DIRECTION OF ROTATION

Determine direction of rotation by looking at the drive shaft. The pump can only be used in the specified direction of rotation.

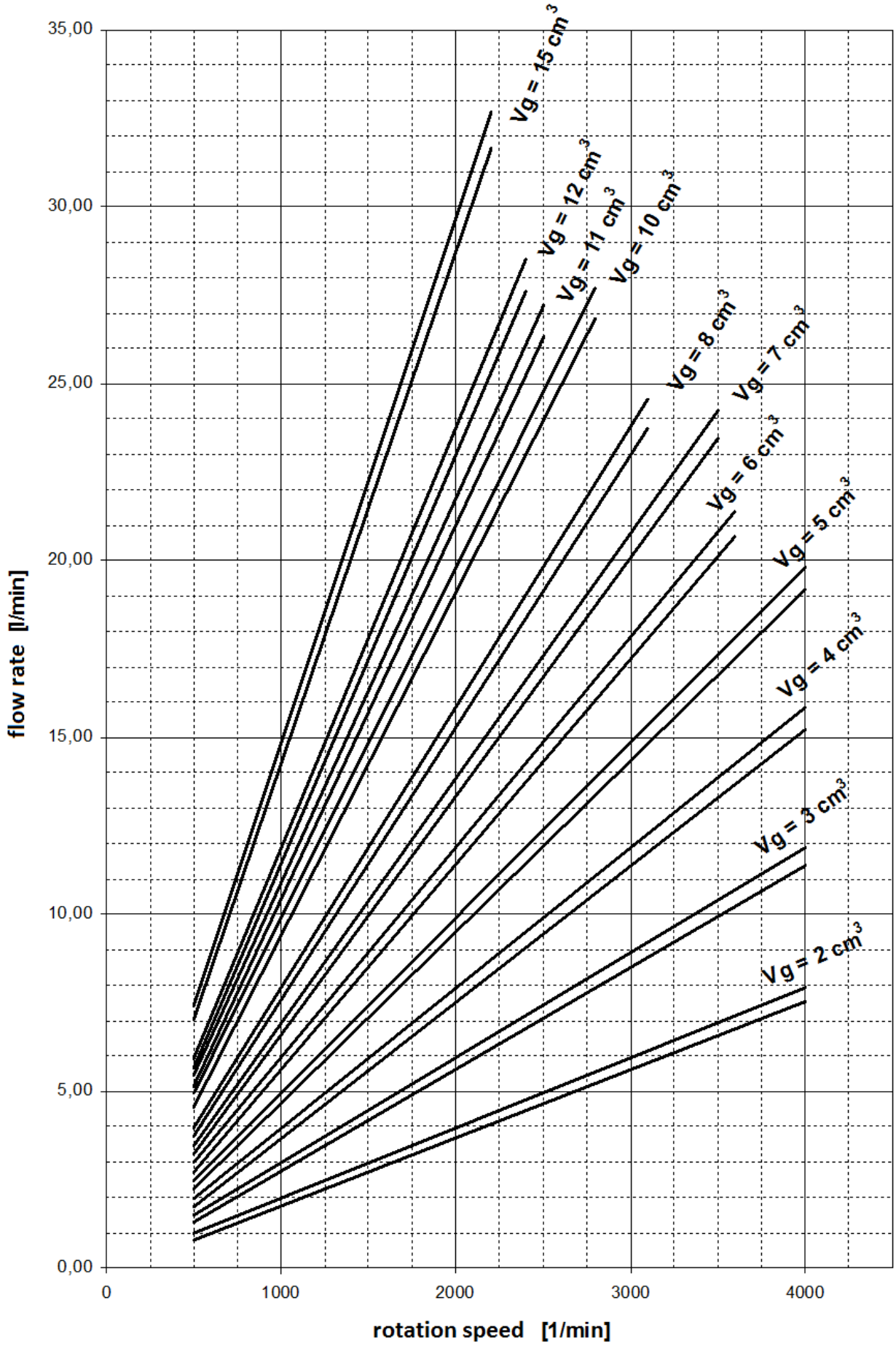



## REVERSIBLE DESIGN

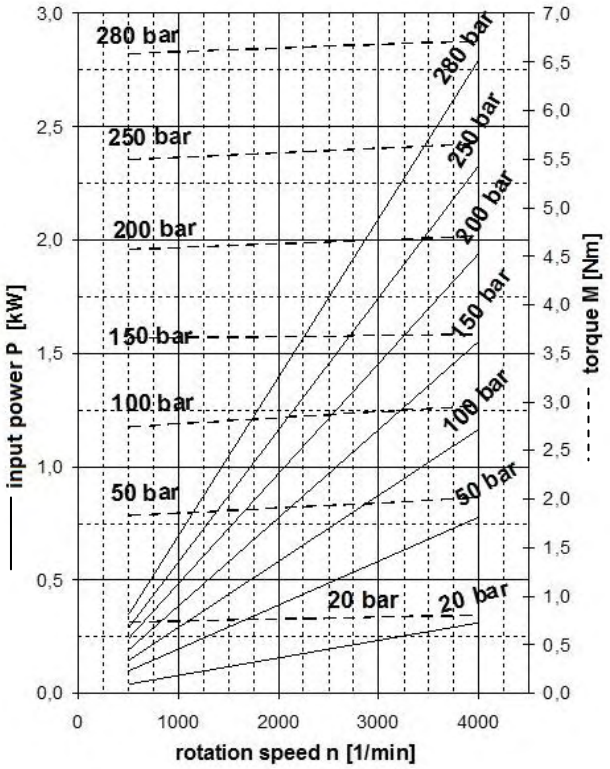
The pumps with the possibility of bidirectional rotation have a different internal arrangement requiring drainage. Two types of drain are used - internal and external. The internal drainage is always interconnected with the outlet by means of valves. The external drainage is solved by an orifice located in the cover opposite the driven gear.



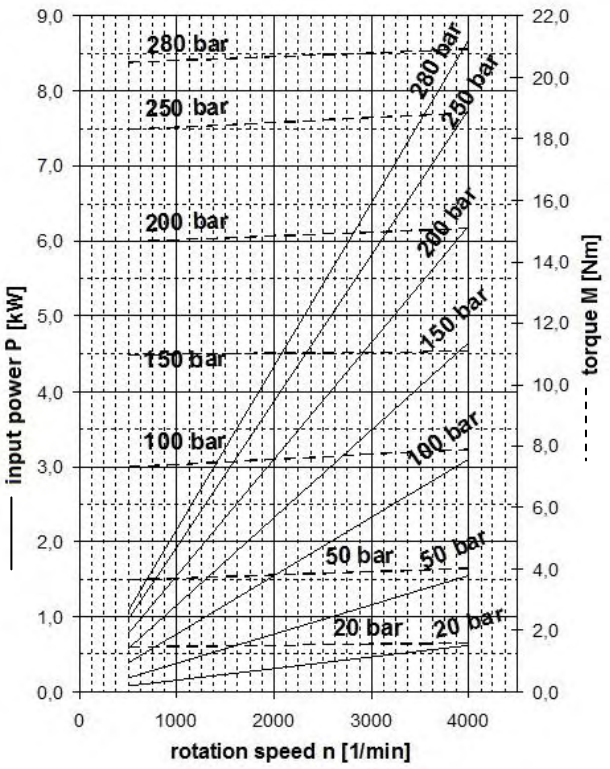
## FLOW RATE AND POWER CURVES



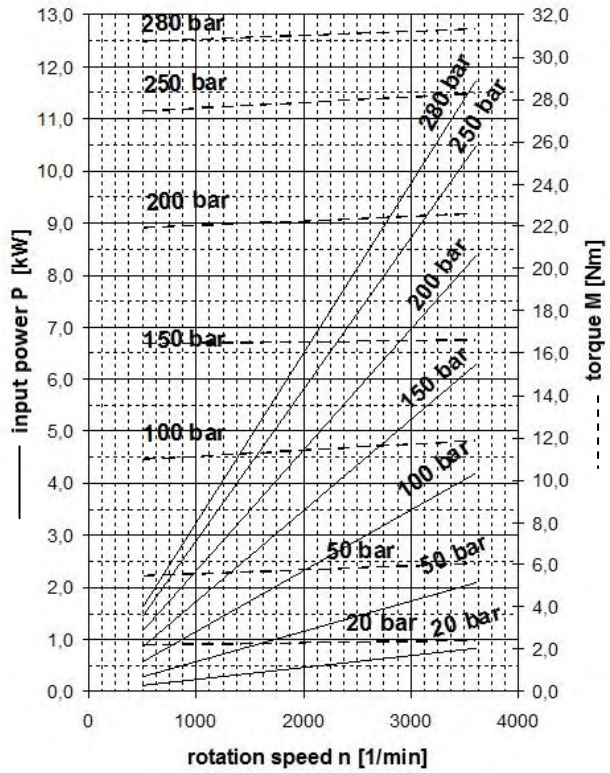
## 2 cm³



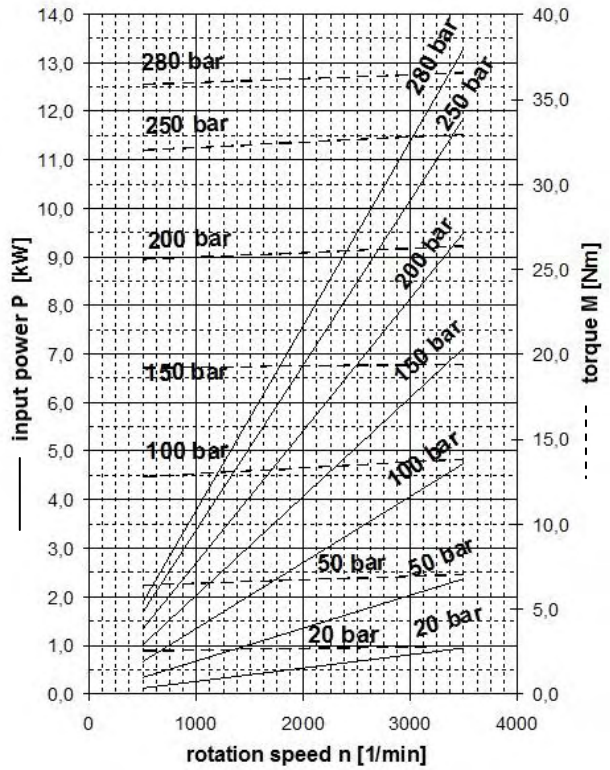

## 4 cm³



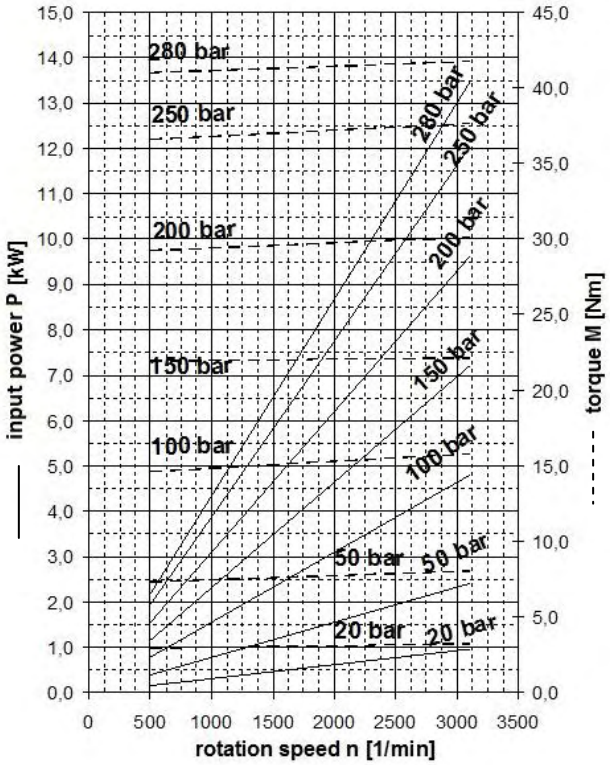

## 6 cm³



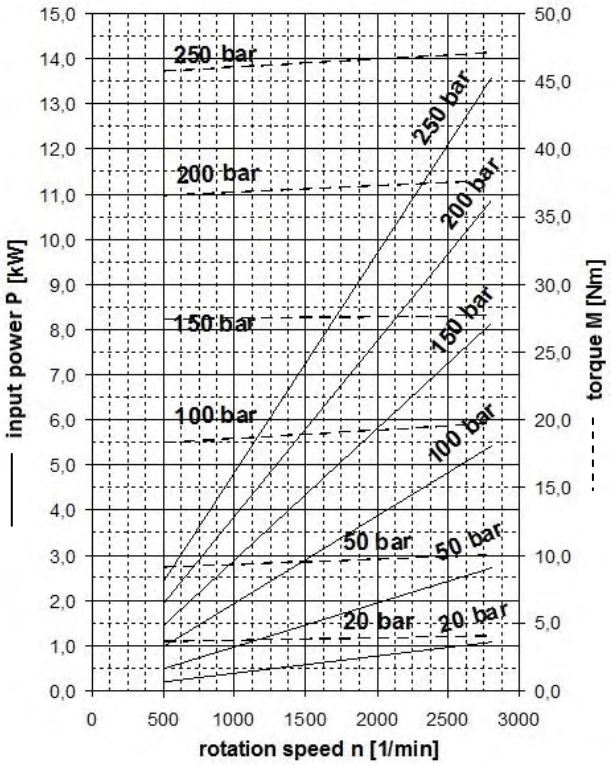

## 7 cm³



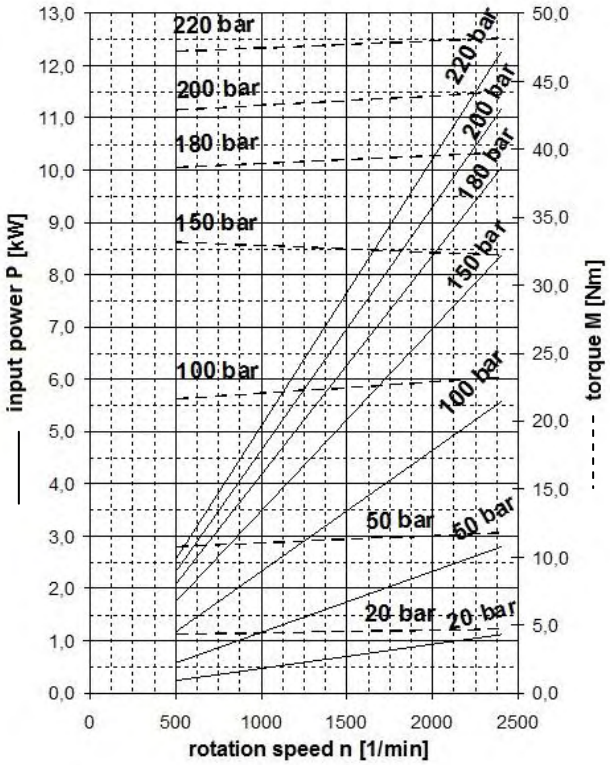
8 cm³



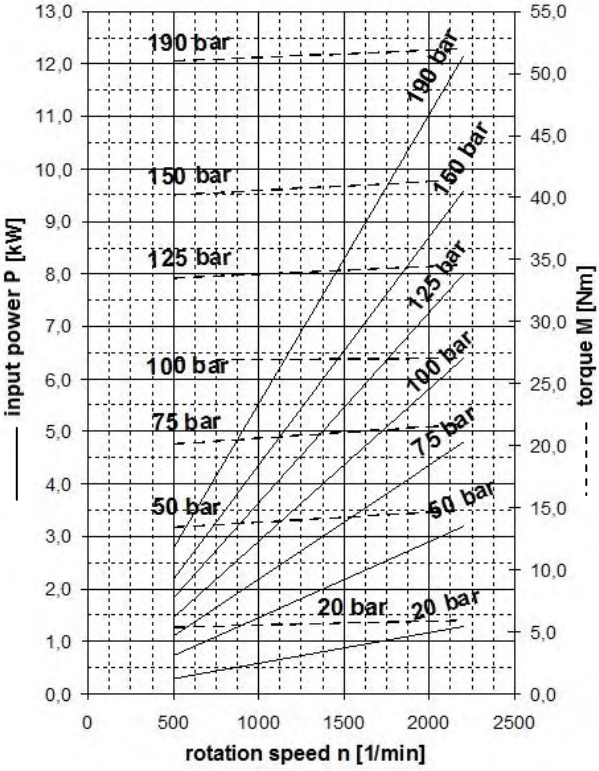

10 cm³




12 cm³




15 cm³



## ORDER KEY – SINGLE VERSION

2 - 12 R - S01 D03 - S G04 G03 - V . 001

| Code | Displacement [cm³] |
|---|---|
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |
| 8 | 8 |
| 9 | 9 |
| 10 | 10 |
| 11 | 11 |
| 12 | 12 |
| 13 | 13 |
| 14 | 14 |
| 15 | 15 |
| 18 | 18 |
| XX | Other displacements on request |

| Code | Direction of rotation |
|---|---|
| R | Clockwise rotation |
| L | Anti-clockwise rotation |
| B | Bi-directional rotation |

| Code | Type |
|---|---|
| 2 | Series Gear Pump |
| 2K | Series Gear Pump, short version |

| Code | Flange design |
|---|---|
| R03 | Rectangular flange, centre ring Ø 30 |
| R04 | Rectangular flange, centre ring Ø 36,5 |
| S01 | SAE AA, centre ring Ø 50,8 |
| S02 | SAE A, centre ring Ø 82,5 |
| F01 | ISO, centre ring Ø 45,25 |
| Z | Special design |

| Code | Location of inlets and outlets |
|---|---|
| S | Side (in the body) |
| R | Axial (in the cover) |
| C | Combination |

| Code | Drive shaft design |
|---|---|
| C05 | Cone 1:8 Key width 3 |
| C06 | Cone 1:8 Key width 2,4 |
| D02 | Spline 20/40 -30° SAE 9T, l = 9 |
| D03 | Spline 20/40 -30° SAE 9T, l = 27 |
| D04 | Spline 16/32 -30° SAE 9T, l = 32 |
| D05 | Spline 16/32 -30° SAE 8T, l = 32 |
| K05 | Cross coupling 4,37 |
| K06 | Cross coupling 5 |
| V06 | Cylindric Ø 12, Key 3, M10, l =31,5 |
| V07 | Cylindric Ø 12,7 Key 3,18, l = 27 |
| V08 | Cylindric Ø 12,7 Key 3,18, l = 38,2 |
| V09 | Cylindric Ø 15,88 Key 3,97, l = 32 |
| V10 | Cylindric Ø 16 1/4´´-20UNC THD |
| Z | Special design |

| Code | Liquid inlet and outlet connection shape |
|---|---|
| M03 | Thread M 14x1,5 |
| M05 | Thread M 18x1,5 |
| M07 | Thread M 22x1,5 |
| G01 | Thread BSP G1/4 |
| G02 | Thread BSP G3/8 |
| G03 | Thread BSP G1/2 |
| G04 | Thread BSP G3/4 |
| U02 | Thread 9/16–18 UNF-2B |
| U03 | Thread 3/4–16 UNF-2B |
| U04 | Thread 7/8–14 UNF-2B |
| R02 | Thread 3/8-18NPT |
| R03 | Thread 1/2-14NPT |
| H03 | Fitting Ø 8; Square 4xM6 Ø30 |
| H04 | Fitting Ø 12; Square 4xM6 Ø30 |
| H05 | Fitting Ø 15; Square 4xM6 Ø35 |
| H06 | Fitting Ø 20; Square 4xM6 Ø40 |
| S02 | Fitting Square 4xM8/25,15x25,15 |
| Z | Special design |

| Code | Special arrangements |
|---|---|
| - | No special arrangements |
| 001 | With front-end bearing |
| 004 | Without shaft seal |

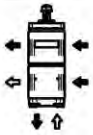
| Code | Sealing material |
|---|---|
| N | NBR |
| V | FKM (VITON) |
| H | HNBR |

An example of designation for the 2 clockwise pump with displacement of 2cm³, rectangular flange - centre ring Ø30, cylindrical shaft Ø12, BSP inlets sides, FKM seal and with front-end bearing:
2-**2R-R03V06-SG04G03-V.001**

## ORDER KEY – MULTIPLE VERSION

2 - 2 / 2 R – R03 V06 - S G04 G03 / G04 G03 - V . 001

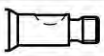
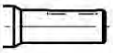
| Code | Displacement [cm³] |
|---|---|
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |
| 8 | 8 |
| 9 | 9 |
| 10 | 10 |
| 11 | 11 |
| 12 | 12 |
| 13 | 13 |
| 14 | 14 |
| 15 | 15 |
| 18 | 18 |
| XX | Other displacements on request |

| Code | Location of inlets and outlets | |
|---|---|---|
| S |  | Side (in the body) |
| C |  | Combination |

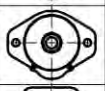
| Code | Special arrangements |
|---|---|
| - | No special arrangements |
| 001 | With front end bearing |
| 004 | Without shaft seal |

| Code | Sealing material |
|---|---|
| N | NBR |
| V | FKM (VITON) |
| H | HNBR |

| Code | Direction of rotation |
|---|---|
| R | Clockwise rotation |
| L | Anti-clockwise rotation |
| B | Bi-directional rotation |

| Code | Drive shaft design | |
|---|---|---|
| C05 |  | Cone 1:8 Key width 3 |
| C06 | | Cone 1:8 Key width 2,4 |
| D02 |  | Spline 20/40 -30° SAE 9T, l = 9 |
| D03 | | Spline 20/40 -30° SAE 9T, l = 27 |
| D04 | | Spline 16/32 -30° SAE 9T, l = 32 |
| D05 | | Spline 16/32 -30° SAE 8T, l = 32 |
| K05 |  | Cross coupling 4,37 |
| K06 | | Cross coupling 5 |
| V06 |  | Cylindric Ø 12, Key 3, M10, l =31,5 |
| V07 | | Cylindric Ø 12,7 Key 3,18, l = 27 |
| V08 |  | Cylindric Ø 12,7 Key 3,18, l = 38,2 |
| V09 | | Cylindric Ø 15,88 Key 3,97, l = 32 |
| V10 |  | Cylindric Ø 16 1/4''-20UNC THD |
| Z | | Special design |

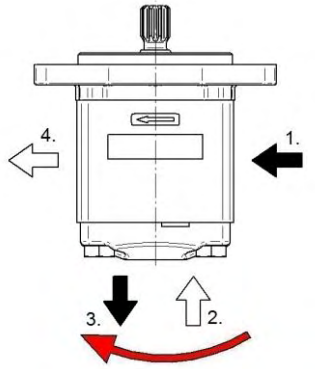
| Code | Type |
|---|---|
| 2 | Series Gear Pump |
| 2K | Series Gear Pump, short version |

| Code | Flange design | |
|---|---|---|
| R03 |  | Rectangular flange, centre ring Ø 30 |
| R04 |  | Rectangular flange, centre ring Ø 36,5 |
| S01 |  | SAE AA, centre ring Ø 50,8 |
| S02 |  | SAE A, centre ring Ø 82,5 |
| F01 |  | ISO, centre ring Ø 45,25 |
| Z | | Special design |

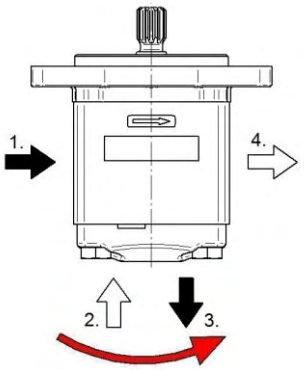
| Code | Liquid inlet and outlet connection shape | |
|---|---|---|
| M03 |  | Thread M 14x1,5 |
| M05 | | Thread M 18x1,5 |
| M07 | | Thread M 22x1,5 |
| G01 |  | Thread BSP G1/4 |
| G02 | | Thread BSP G3/8 |
| G03 | | Thread BSP G1/2 |
| G04 | | Thread BSP G3/4 |
| U02 |  | Thread 9/16–18 UNF-2B |
| U03 | | Thread 3/4–16 UNF-2B |
| U04 | | Thread 7/8–14 UNF-2B |
| R02 |  | Thread 3/8-18NPT |
| R03 | | Thread 1/2-14NPT |
| H03 |  | Fitting Ø 8; Square 4xM6 Ø30 |
| H04 | | Fitting Ø 12; Square 4xM6 Ø30 |
| H05 | | Fitting Ø 15; Square 4xM6 Ø35 |
| H06 | | Fitting Ø 20; Square 4xM6 Ø40 |
| S02 |  | Fitting Square 4xM8/25,15x25,15 |
| Z | | Special design |

An example of designation for the 2 two-section clockwise pump with displacements of 2 and 2 cm$^3$, rectangular flange centre ring Ø30, cylindrical shaft Ø12, BSP inlets sides, FKM seal and with front-end bearing:
**2-2/2R-R03V06-SG04G03/G04G03-V.001**

Note: In case of combination inlets, with the code "C" is respected following sequence of inlets and outlets:



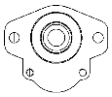
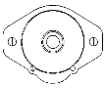
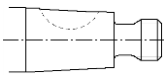
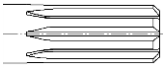
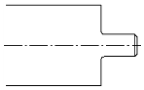
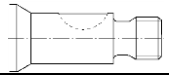

For clockwise and reverse gear pump,
in direction clockwise




For anti-clockwise gear pump,
in direction anti-clockwise

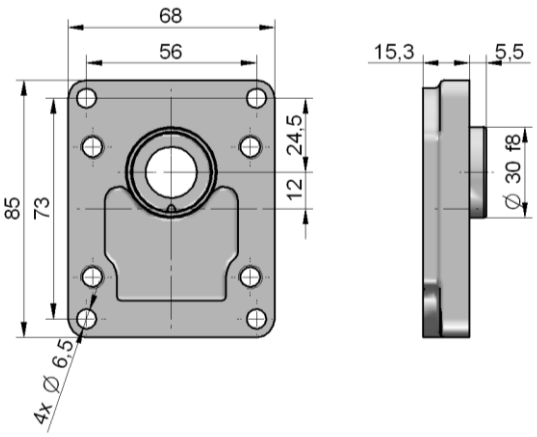
For. ex.: 2-12R-S01D03-C<u>G04</u><u>G04</u><u>G03</u><u>G03</u>-N
1. 2. 3. 4.

## COMBINATIONS OF FLANGES AND SHAFTS

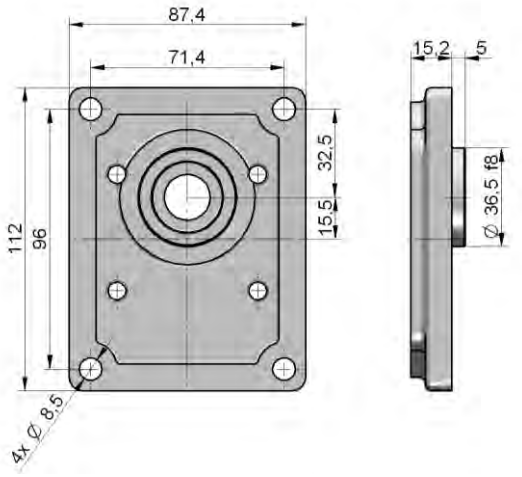
| DRIVE SHAFTS | | FLANGES DESIGN | | | | |
|---|---|---|---|---|---|---|
| | | R03 | R04 | S01 | S02 | F01 |
| | |  |  |  |  |  |
| C05 |  | ● | ● | ● | | |
| C06 | | ● | ● | | ● | |
| D02 |  | | | ● | | ● |
| D03 | | | | ● | ● | ● |
| D04 | | | | ● | ● | |
| D05 | | | | ● | ● | |
| K05 |  | | | | | ● |
| K06 | | | | ● | | |
| V06 |  | ● | | | | |
| V07 |  | | | ● | | |
| V08 | | ● | | ● | ● | ● |
| V09 | | | ● | | ● | ● |
| V10 |  | | | | | ● |

## FLANGES DESIGN

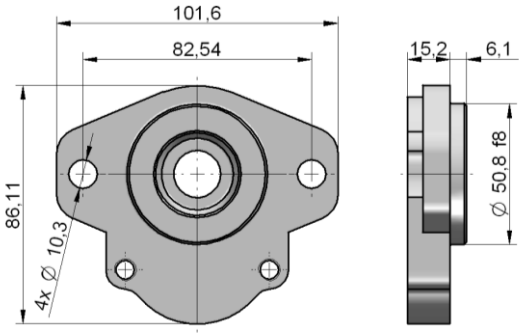
### R03:



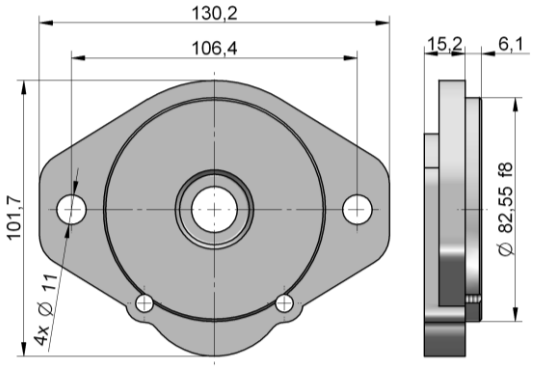

### R04:



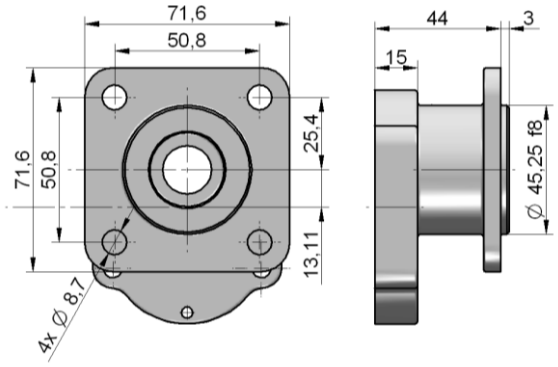

### S01:




### S02:

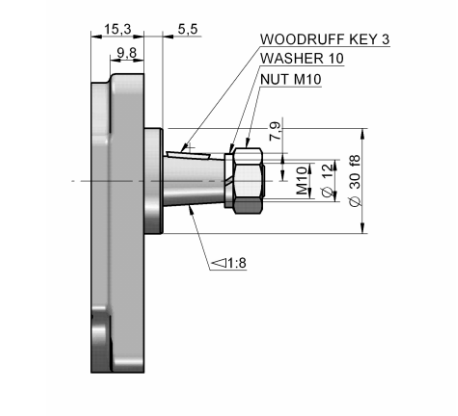



### F01:

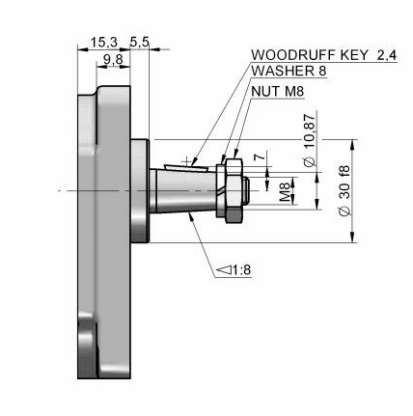


## DRIVE SHAFTS

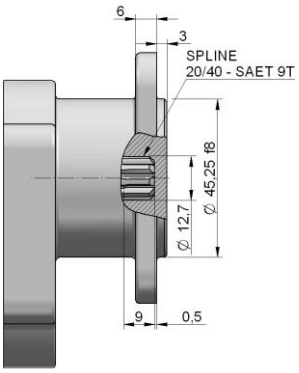
### C05:



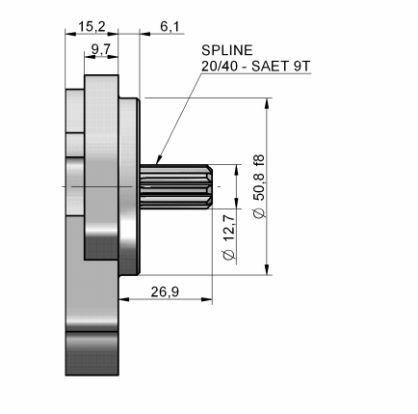

### C06:



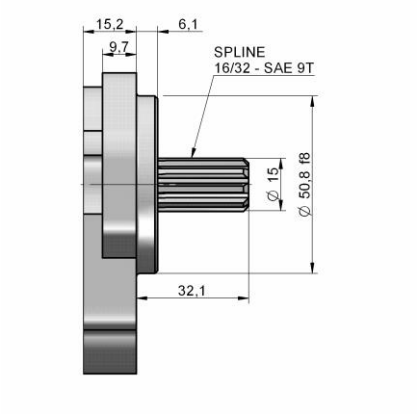

### D02:



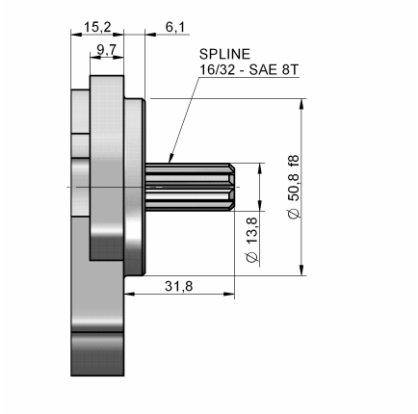

### D03:



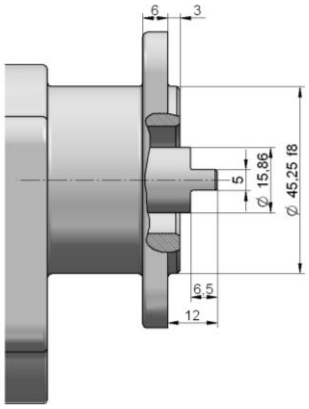

### D04:



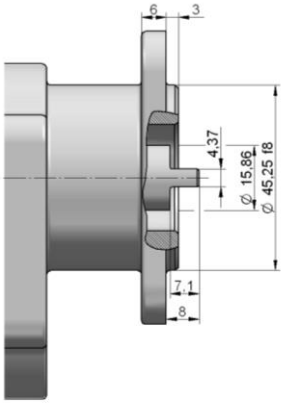

### D05:



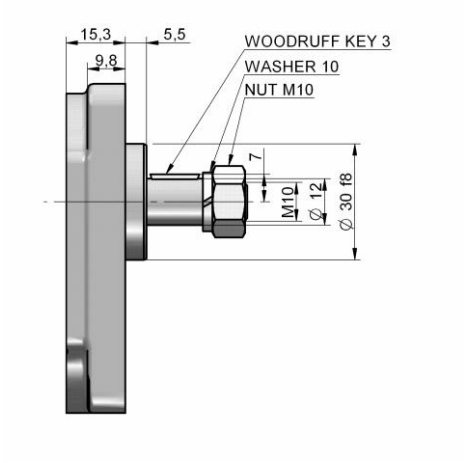

### K05:



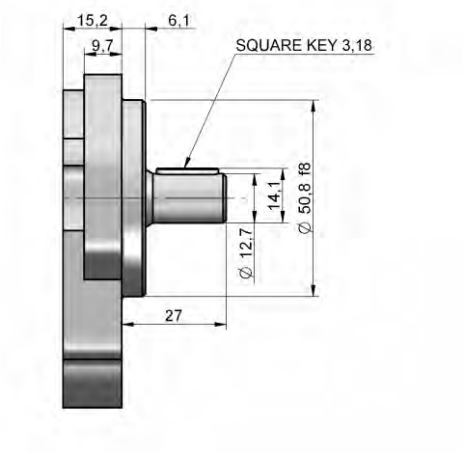

### K06:



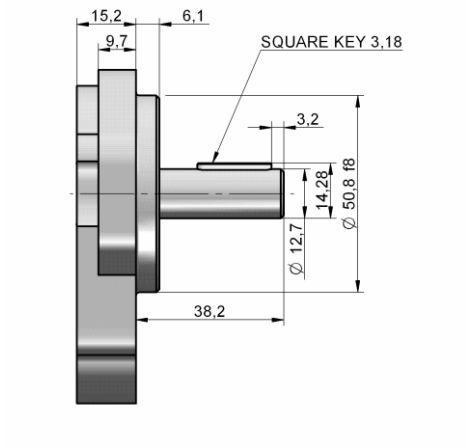
**V06:**



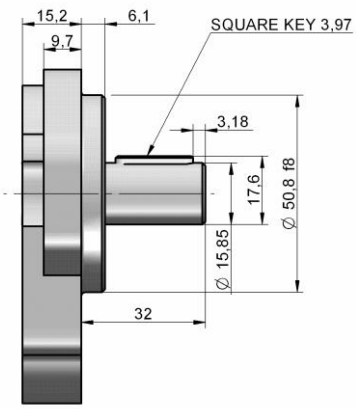

**V07:**



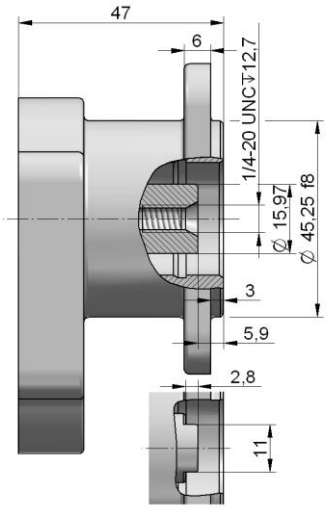

**V08:**




**V09:**

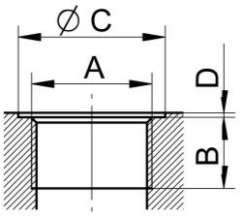



**V10:**



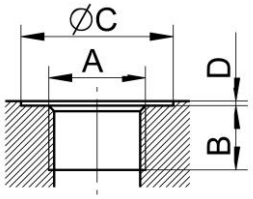
# LIQUID INLET AND OUTLET CONECTION

**Metric thread according to 6149**



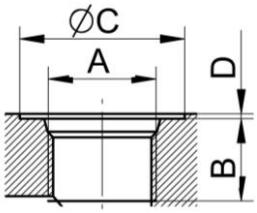

| Code | A | B | C | D |
|---|---|---|---|---|
| M03 | M 14x1.5 | 13 | 22 | 1 |
| M05 | M 18x1.5 | 13 | 24 | 1 |
| M07 | M 22x1.5 | 14 | 28 | 1 |

**BSPP pipe thread according ISO 228 - 1**



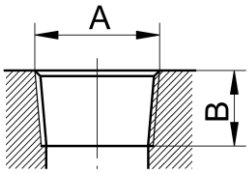

| Code | A | B | C | D |
|---|---|---|---|---|
| G01 | G 1/4 | 12 | 18 | 1 |
| G02 | G 3/8 | 13 | 24 | 1 |
| G03 | G1/2 | 14 | 33 | 1 |
| G04 | G3/4 | 16 | 39 | 1 |

**UNF thread according to SAE**



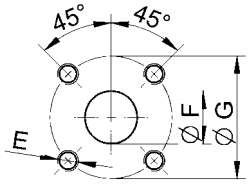

| Code | A | B | C | D |
|---|---|---|---|---|
| U02 | 9/16 – 18UNF | 13 | 25 | 1 |
| U03 | 3/4 – 16 UNF | 15 | 30 | 1 |
| U04 | 7/8 – 14 UNF | 17 | 34 | 1 |

**Tapered thread NPT**



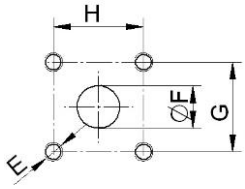

| Code | A | B |
|---|---|---|
| R02 | 3/8 – 18 NPT | 16 |
| R03 | 1/2 – 14 NPT | 20.8 |

**Flanged fittings according to DIN 8901/8902**




| Code | E | F | G |
|---|---|---|---|
| H03 | M6 | 8 | 30 |
| H04 | M6 | 12 | 30 |
| H05 | M6 | 15 | 35 |
| H06 | M6 | 20 | 40 |

**Flanged fittings ISO**

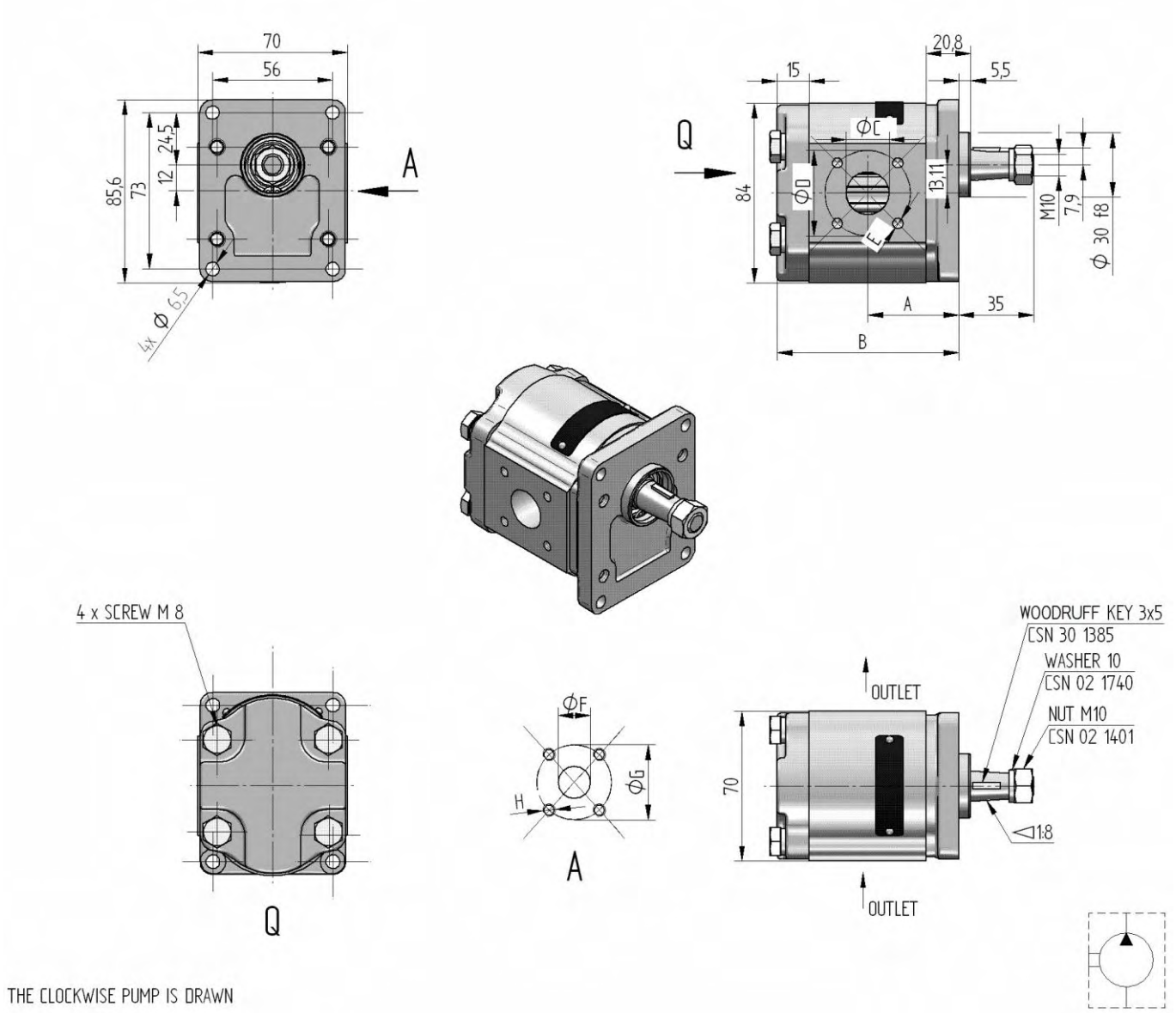



| Code | E | F | G | H |
|---|---|---|---|---|
| S02 | 1/4 UNC | 14.2 | 25.15 | 25.15 |
| S03 | M8 | 14.2 | 25.15 | 25.15 |

**Drains:**

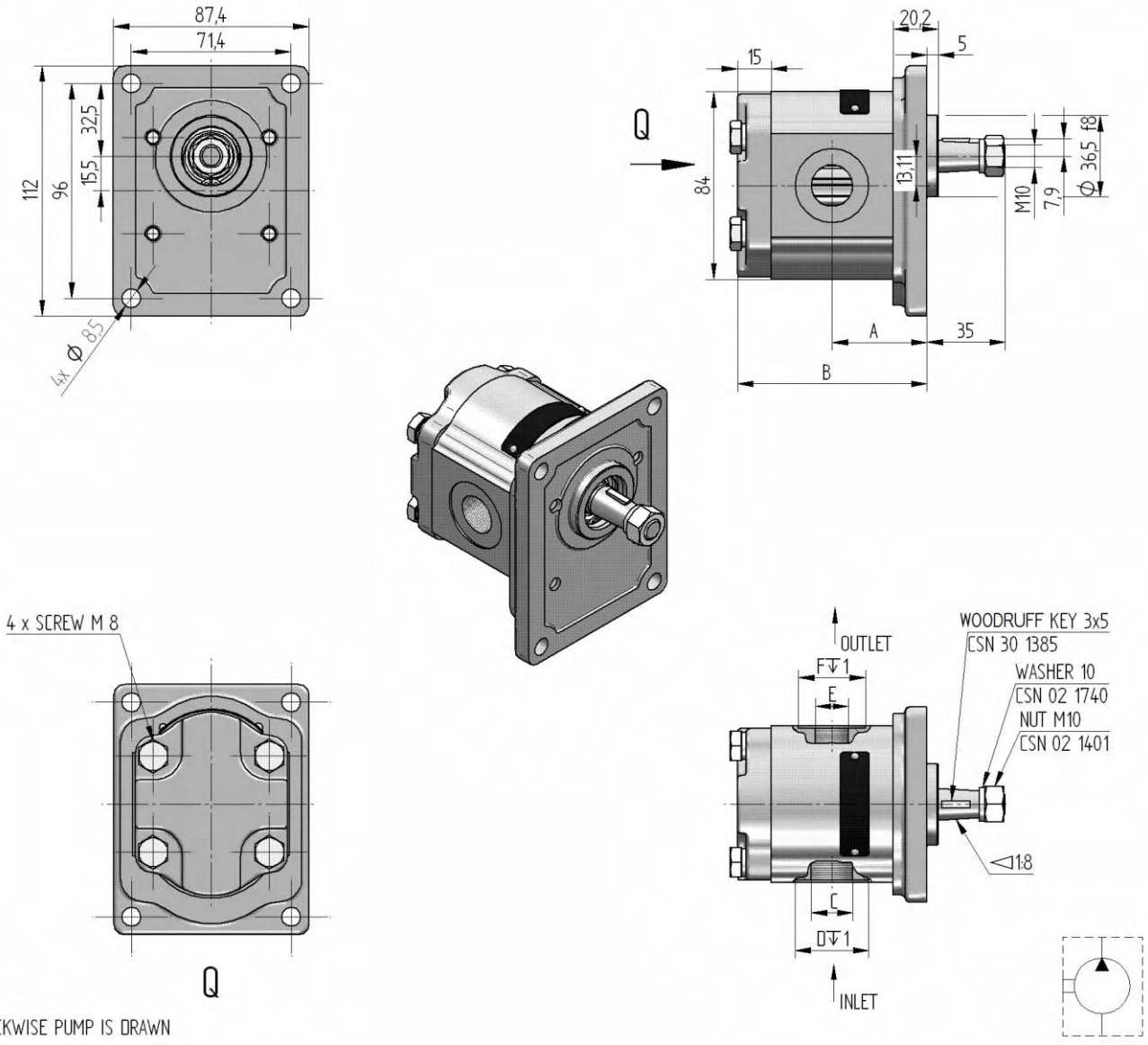
| Code | A | B | C | D |
|---|---|---|---|---|
| U01 | 7/16-20 UNF 2B | 13 | 21 | 1 |
| G01 | G 1/4 | 12 | 18 | 1 |

# CATALOGUE SHEETS OF 2 SERIES BASIC DESIGNS

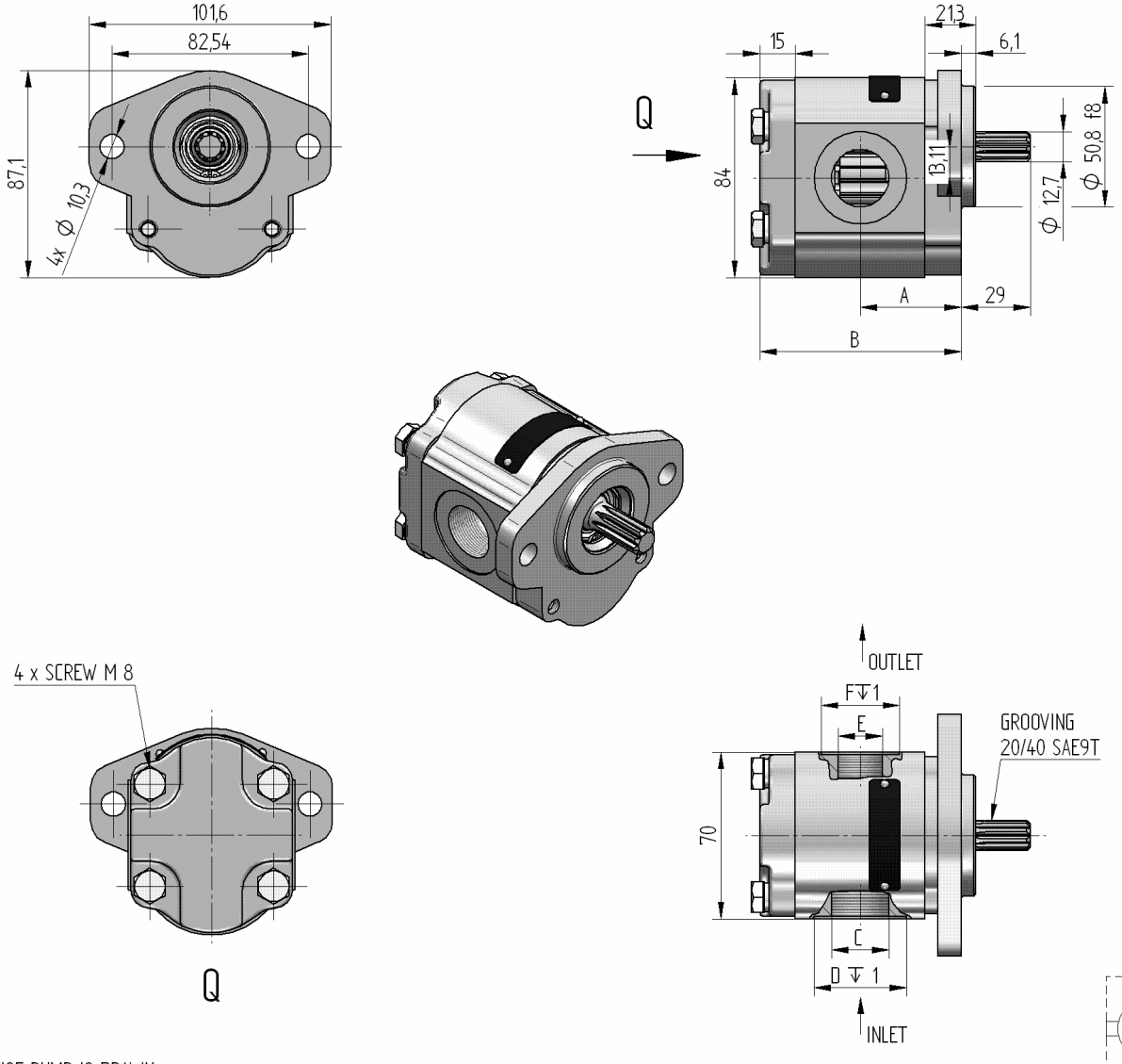



THE CLOCKWISE PUMP IS DRAWN

| ORDER KEY | PURCH. CODE | DIRECT. OF ROT. | DISPLA-CEMENT [cm³/rev] | CONT PRES [bar] | MIN. SPEED [min⁻¹] | MAX. SPEED [min⁻¹] | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | DIMENSION [mm] | | | | | | | |
| 2-15R-R03C05-S H06H05-N | | R | 15 | 190 | 500 | 2200 | 51.86 | 103.42 | 20 | 40 | M6x13 | 15 | 35 | M6x13 |
| 2-15L- R03C05-S H06H05-N | | L | | | | | | | | | | | | |
| 2-12R- R03C05-S H06H05-N | | R | 12 | 220 | 500 | 2400 | 47.88 | 95.46 | 20 | 40 | M6x13 | 15 | 35 | M6x13 |
| 2-12L- R03C05-S H06H05-N | | L | | | | | | | | | | | | |
| 2-11R- R03C05-S H06H05-N | | R | 11 | 235 | 500 | 2500 | 46.55 | 92.80 | 20 | 40 | M6x13 | 15 | 35 | M6x13 |
| 2-11L- R03C05-S H06H05-N | | L | | | | | | | | | | | | |
| 2-10R- R03C05-S H06H05-N | | R | 10 | 250 | 500 | 2800 | 45.21 | 90.12 | 20 | 40 | M6x13 | 15 | 35 | M6x13 |
| 2-10L- R03C05-S H06H05-N | | L | | | | | | | | | | | | |
| 2-8R- R03C05-S H06H05-N | | R | 8 | 280 | 500 | 3100 | 42.54 | 84.79 | 20 | 40 | M6x13 | 15 | 35 | M6x13 |
| 2-8L- R03C05-S H06H05-N | | L | | | | | | | | | | | | |
| 2-7R- R03C05-S H06H05-N | | R | 7 | 280 | 500 | 3500 | 41.21 | 82.12 | 20 | 40 | M6x13 | 15 | 35 | M6x13 |
| 2-7L- R03C05-S H06H05-N | | L | | | | | | | | | | | | |
| 2-6R- R03C05-S H06H05-N | | R | 6 | 280 | 500 | 3600 | 39.87 | 79.44 | 20 | 40 | M6x13 | 15 | 35 | M6x13 |
| 2-6L- R03C05-S H06H05-N | | L | | | | | | | | | | | | |
| 2-5R- R03C05-S H06H05-N | | R | 5 | 280 | 500 | 4000 | 38.54 | 76.78 | 20 | 40 | M6x13 | 15 | 35 | M6x13 |
| 2-5L- R03C05-S H06H05-N | | L | | | | | | | | | | | | |
| 2-4R- R03C05-S H06H05-N | | R | 4 | 280 | 500 | 4000 | 37.20 | 74.11 | 20 | 40 | M6x13 | 15 | 35 | M6x13 |
| 2-4L- R03C05-S H06H05-N | | L | | | | | | | | | | | | |
| 2-3R- R03C05-S H06H05-N | | R | 3 | 280 | 500 | 4000 | 35.87 | 71.44 | 20 | 40 | M6x13 | 15 | 35 | M6x13 |
| 2-3L- R03C05-S H06H05-N | | L | | | | | | | | | | | | |
| 2-2R- R03C05-S H06H05-N | | R | 2 | 280 | 500 | 4000 | 34.53 | 68.76 | 20 | 40 | M6x13 | 15 | 35 | M6x13 |
| 2-2L- R03C05-S H06H05-N | | L | | | | | | | | | | | | |

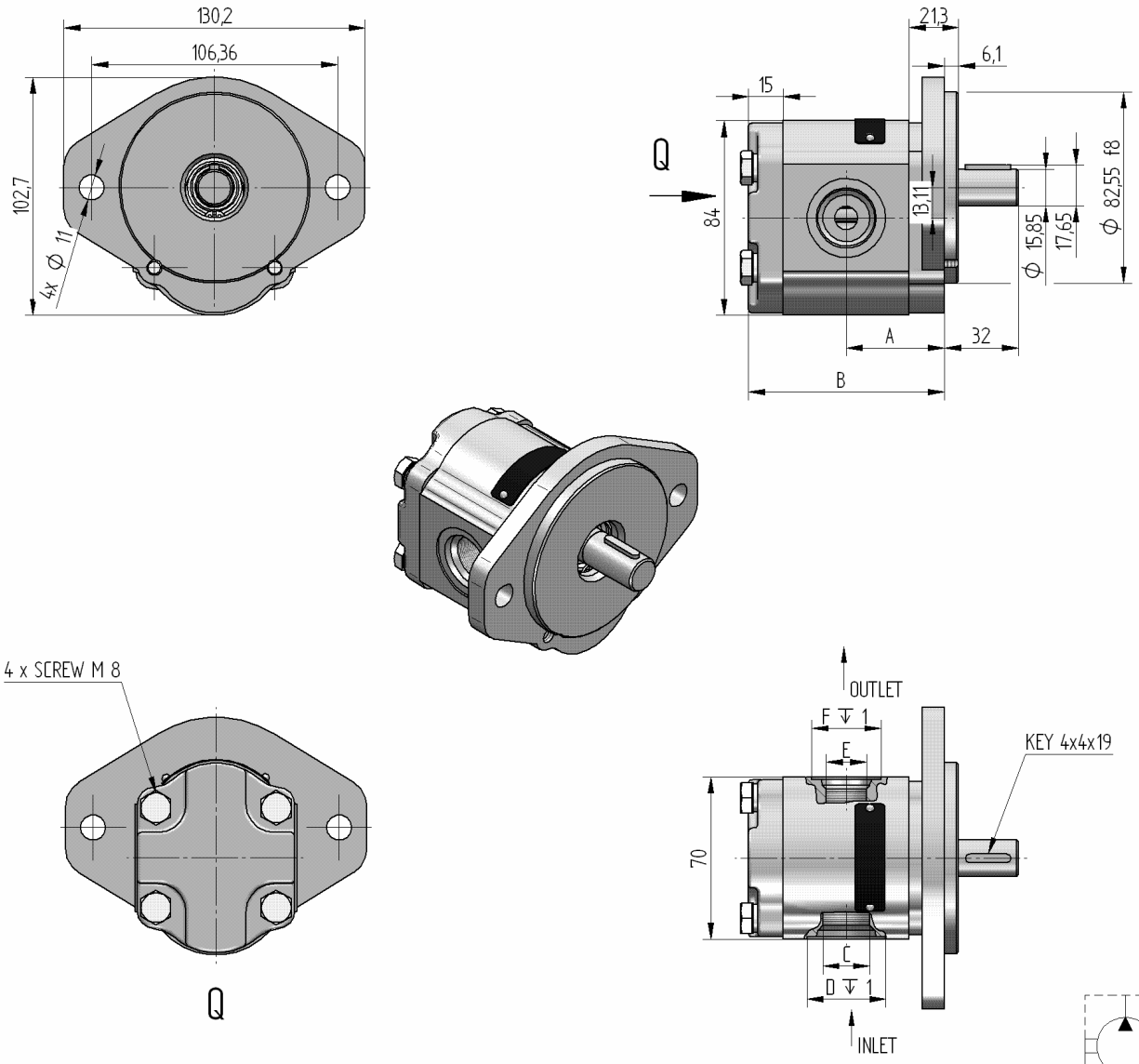



| ORDER KEY | PURCH. CODE | DIRECT. OF ROT. | DISPLA-CEMENT [cm³/rev] | CONT. PRESS. [bar] | SPEED MIN. [min⁻¹] | SPEED MAX. [min⁻¹] | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | DIMENSION [mm] | | | | | |
| 2-15R- R04C05-S G03G02-N | | R | 15 | 190 | 500 | 2200 | 51.76 | 103.32 | G 1/2 x 14 | ∅ 33 | G 3/8 x 13 | ∅ 24 |
| 2-15L- R04C05-S G03G02-N | | L | | | | | | | | | | |
| 2-12R- R04C05-S G03G02-N | | R | 12 | 220 | 500 | 2400 | 47.78 | 95.36 | G 1/2 x 14 | ∅ 33 | G 3/8 x 13 | ∅ 24 |
| 2-12L- R04C05-S G03G02-N | | L | | | | | | | | | | |
| 2-11R- R04C05-S G03G02-N | | R | 11 | 235 | 500 | 2500 | 46.45 | 92.70 | G 1/2 x 14 | ∅ 33 | G 3/8 x 13 | ∅ 24 |
| 2-11L- R04C05-S G03G02-N | | L | | | | | | | | | | |
| 2-10R- R04C05-S G03G02-N | | R | 10 | 250 | 500 | 2800 | 45.11 | 90.02 | G 1/2 x 14 | ∅ 33 | G 3/8 x 13 | ∅ 24 |
| 2-10L- R04C05-S G03G02-N | | L | | | | | | | | | | |
| 2-8R- R04C05-S G03G02-N | | R | 8 | 280 | 500 | 3100 | 42.45 | 84.69 | G 1/2 x 14 | ∅ 33 | G 3/8 x 13 | ∅ 24 |
| 2-8L- R04C05-S G03G02-N | | L | | | | | | | | | | |
| 2-7R- R04C05-S G03G02-N | | R | 7 | 280 | 500 | 3500 | 41.11 | 82.02 | G 1/2 x 14 | ∅ 33 | G 3/8 x 13 | ∅ 24 |
| 2-7L- R04C05-S G03G02-N | | L | | | | | | | | | | |
| 2-6R- R04C05-S G03G02-N | | R | 6 | 280 | 500 | 3600 | 39.77 | 79.34 | G 1/2 x 14 | ∅ 33 | G 3/8 x 13 | ∅ 24 |
| 2-6L- R04C05-S G03G02-N | | L | | | | | | | | | | |
| 2-5R- R04C05-S G03G02-N | | R | 5 | 280 | 500 | 4000 | 38.44 | 76.68 | G 1/2 x 14 | ∅ 33 | G 3/8 x 13 | ∅ 24 |
| 2-5L- R04C05-S G03G02-N | | L | | | | | | | | | | |
| 2-4R- R04C05-S G03G02-N | | R | 4 | 280 | 500 | 4000 | 37.10 | 74.01 | G 1/2 x 14 | ∅ 33 | G 3/8 x 13 | ∅ 24 |
| 2-4L- R04C05-S G03G02-N | | L | | | | | | | | | | |
| 2-3R- R04C05-S G03G02-N | | R | 3 | 280 | 500 | 4000 | 35.77 | 71.34 | G 1/2 x 14 | ∅ 33 | G 3/8 x 13 | ∅ 24 |
| 2-3L- R04C05-S G03G02-N | | L | | | | | | | | | | |
| 2-2R- R04C05-S G03G02-N | | R | 2 | 280 | 500 | 4000 | 34.43 | 68.55 | G 1/2 x 14 | ∅ 33 | G 3/8 x 13 | ∅ 24 |
| 2-2L- R04C05-S G03G02-N | | L | | | | | | | | | | |



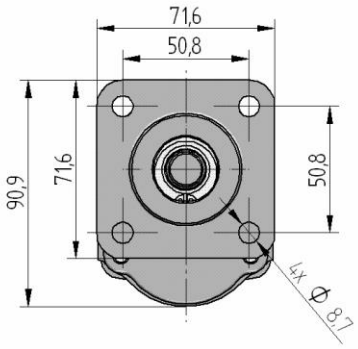

THE CLOCKWISE PUMP IS DRAWN

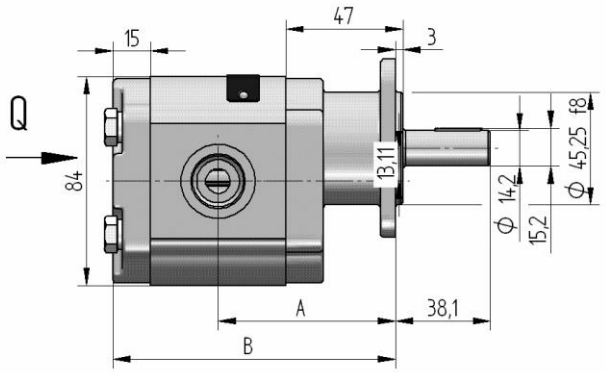
| ORDER KEY | PURCH. CODE | DIRECT. OF ROT. | DISPLA-CEMENT [cm³/rev] | CONT. PRESS. [bar] | MIN. SPEED [min⁻¹] | MAX. SPEED [min⁻¹] | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | DIMENSION [mm] | | | | | |
| 2-15R-S01D03-S G04G03-N | | R | 15 | 190 | 500 | 2200 | 51.76 | 103.32 | G 3/4 x 16 | ∅ 39 | G 1/2 x 14 | ∅ 33 |
| 2-15L- S01D03-S G04G03-N | | L | | | | | | | | | | |
| 2-12R- S01D03-S G04G03-N | | R | 12 | 220 | 500 | 2400 | 47.78 | 95.36 | G 3/4 x 16 | ∅ 39 | G 1/2 x 14 | ∅ 33 |
| 2-12L- S01D03-S G04G03-N | | L | | | | | | | | | | |
| 2-11R- S01D03-S G04G03-N | | R | 11 | 235 | 500 | 2500 | 46.45 | 92.70 | G 3/4 x 16 | ∅ 39 | G 1/2 x 14 | ∅ 33 |
| 2-11L- S01D03-S G04G03-N | | L | | | | | | | | | | |
| 2-10R- S01D03-S G04G03-N | | R | 10 | 250 | 500 | 2800 | 45.11 | 90.02 | G 3/4 x 16 | ∅ 39 | G 1/2 x 14 | ∅ 33 |
| 2-10L- S01D03-S G04G03-N | | L | | | | | | | | | | |
| 2-8R- S01D03-S G04G03-N | | R | 8 | 280 | 500 | 3100 | 42.44 | 84.69 | G 3/4 x 16 | ∅ 39 | G 1/2 x 14 | ∅ 33 |
| 2-8L- S01D03-S G04G03-N | | L | | | | | | | | | | |
| 2-7R- S01D03-S G04G03-N | | R | 7 | 280 | 500 | 3500 | 41.11 | 82.02 | G 3/4 x 16 | ∅ 39 | G 1/2 x 14 | ∅ 33 |
| 2-7L- S01D03-S G04G03-N | | L | | | | | | | | | | |
| 2-6R- S01D03-S G04G03-N | | R | 6 | 280 | 500 | 3600 | 39.77 | 79.34 | G 3/4 x 16 | ∅ 39 | G 1/2 x 14 | ∅ 33 |
| 2-6L- S01D03-S G04G03-N | | L | | | | | | | | | | |
| 2-5R- S01D03-S G04G03-N | | R | 5 | 280 | 500 | 4000 | 38.44 | 76.68 | G 3/4 x 16 | ∅ 39 | G 1/2 x 14 | ∅ 33 |
| 2-5L- S01D03-S G04G03-N | | L | | | | | | | | | | |
| 2-4R- S01D03-S G04G03-N | | R | 4 | 280 | 500 | 4000 | 37.10 | 74.01 | G 3/4 x 16 | ∅ 39 | G 1/2 x 14 | ∅ 33 |
| 2-4L- S01D03-S G04G03-N | | L | | | | | | | | | | |
| 2-3R- S01D03-S G04G03-N | | R | 3 | 280 | 500 | 4000 | 35.77 | 71.34 | G 3/4 x 16 | ∅ 39 | G 1/2 x 14 | ∅ 33 |
| 2-3L- S01D03-S G04G03-N | | L | | | | | | | | | | |
| 2-2R- S01D03-S G03G03-N | | R | 2 | 280 | 500 | 4000 | 34.43 | 68.66 | G 1/2 x 14 | ∅ 33 | G 1/2 x 14 | ∅ 33 |
| 2-2L- S01D03-S G03G03-N | | L | | | | | | | | | | |

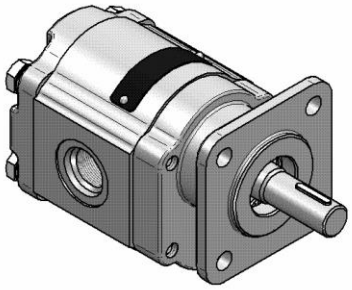


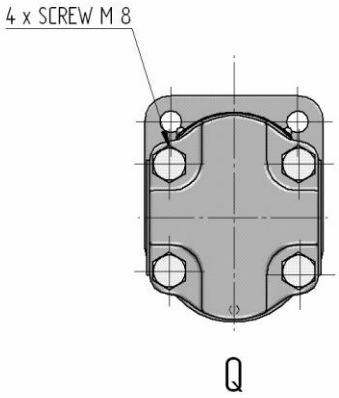

THE CLOCKWISE PUMP IS DRAWN

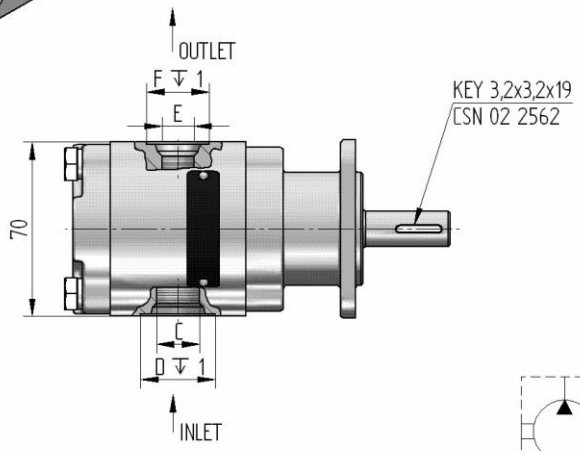
| ORDER KEY | PURCH. CODE | DIRECT. OF ROT. | DISPLA-CEMENT [cm³/rev] | CONT. PRESS. [bar] | MIN. SPEED [min⁻¹] | MAX. SPEED [min⁻¹] | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | DIMENSION [mm] | | | | | |
| 2-15R- S02V09-S U04U03-N | | R | 15 | 190 | 500 | 2200 | 51.76 | 103.32 | 7/8-14UNFx17 | ∅ 34 | 3/4-16UNFx15 | ∅ 30 |
| 2-15L- S02V09-S U04U03-N | | L | | | | | | | | | | |
| 2-12R- S02V09-S U04U03-N | | R | 12 | 220 | 500 | 2400 | 47.78 | 95.36 | 7/8-14UNFx17 | ∅ 34 | 3/4-16UNFx15 | ∅ 30 |
| 2-12L- S02V09-S U04U03-N | | L | | | | | | | | | | |
| 2-11R- S02V09-S U04U03-N | | R | 11 | 235 | 500 | 2500 | 46.45 | 92.70 | 7/8-14UNFx17 | ∅ 34 | 3/4-16UNFx15 | ∅ 30 |
| 2-11L- S02V09-S U04U03-N | | L | | | | | | | | | | |
| 2-10R- S02V09-S U04U03-N | | R | 10 | 250 | 500 | 2800 | 45.11 | 90.02 | 7/8-14UNFx17 | ∅ 34 | 3/4-16UNFx15 | ∅ 30 |
| 2-10L- S02V09-S U04U03-N | | L | | | | | | | | | | |
| 2-8R- S02V09-S U04U03-N | | R | 8 | 280 | 500 | 3100 | 42.44 | 84.69 | 7/8-14UNFx17 | ∅ 34 | 3/4-16UNFx15 | ∅ 30 |
| 2-8L- S02V09-S U04U03-N | | L | | | | | | | | | | |
| 2-7R- S02V09-S U04U03-N | | R | 7 | 280 | 500 | 3500 | 41.11 | 82.02 | 7/8-14UNFx17 | ∅ 34 | 3/4-16UNFx15 | ∅ 30 |
| 2-7L- S02V09-S U04U03-N | | L | | | | | | | | | | |
| 2-6R- S02V09-S U04U03-N | | R | 6 | 280 | 500 | 3600 | 39.77 | 79.34 | 7/8-14UNFx17 | ∅ 34 | 3/4-16UNFx15 | ∅ 30 |
| 2-6L- S02V09-S U04U03-N | | L | | | | | | | | | | |
| 2-5R- S02V09-S U04U03-N | | R | 5 | 280 | 500 | 4000 | 38.44 | 76.68 | 7/8-14UNFx17 | ∅ 34 | 3/4-16UNFx15 | ∅ 30 |
| 2-5L- S02V09-S U04U03-N | | L | | | | | | | | | | |
| 2-4R- S02V09-S U04U03-N | | R | 4 | 280 | 500 | 4000 | 37.10 | 74.01 | 7/8-14UNFx17 | ∅ 34 | 3/4-16UNFx15 | ∅ 30 |
| 2-4L- S02V09-S U04U03-N | | L | | | | | | | | | | |
| 2-3R- S02V09-S U04U03-N | | R | 3 | 280 | 500 | 4000 | 35.77 | 71.34 | 7/8-14UNFx17 | ∅ 34 | 3/4-16UNFx15 | ∅ 30 |
| 2-3L- S02V09-S U04U03-N | | L | | | | | | | | | | |
| 2-2R- S02V09-S U04U03-N | | R | 2 | 280 | 500 | 4000 | 34.43 | 68.66 | 7/8-14UNFx17 | ∅ 34 | 3/4-16UNFx15 | ∅ 30 |
| 2-2L- S02V09-S U04U03-N | | L | | | | | | | | | | |

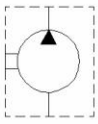


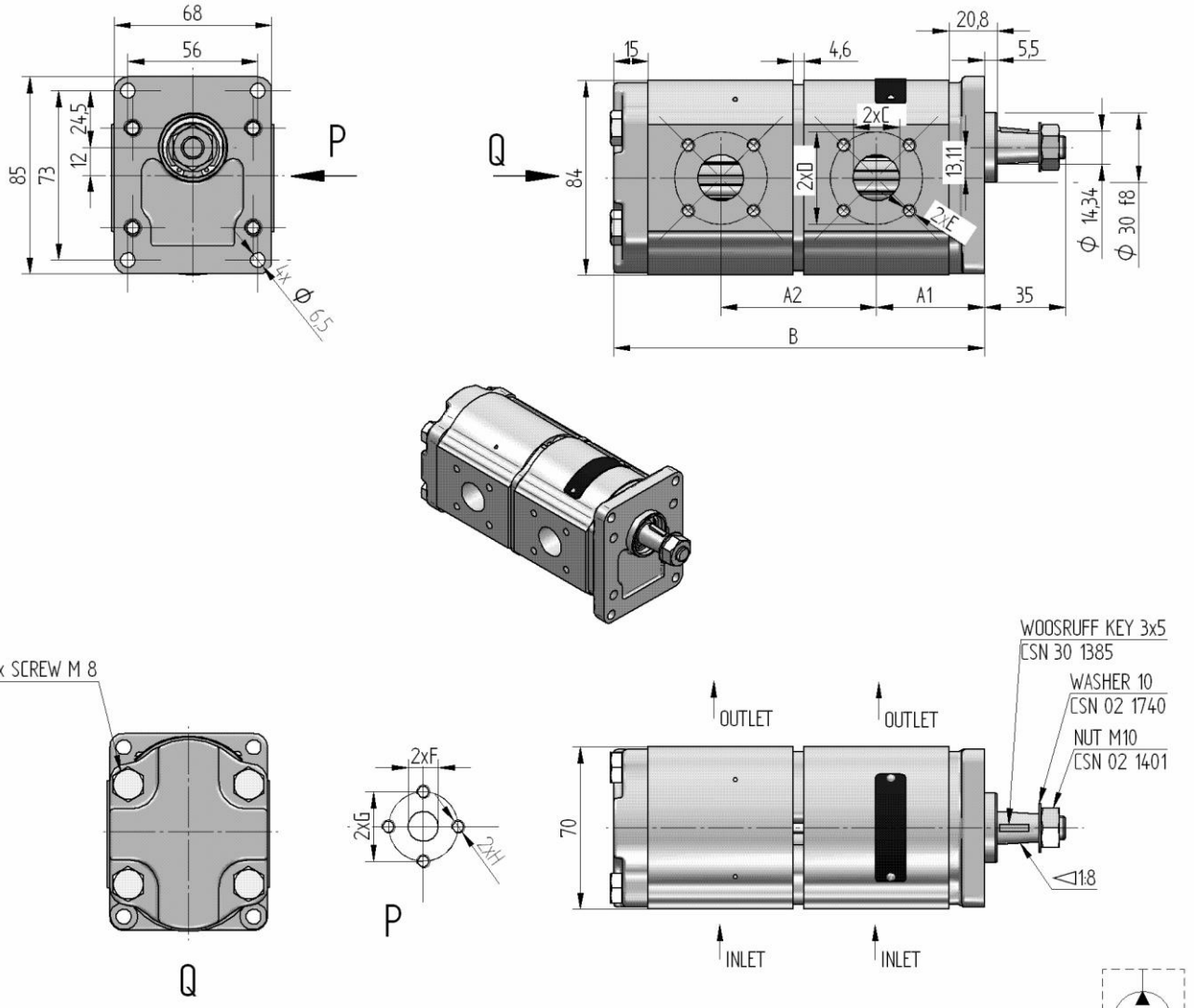


THE CLOCKWISE PUMP IS DRAWN

| ORDER KEY | PURCH. CODE | DIRECT. OF ROT. | DISPLA-CEMENT [cm³/rev] | CONT. PRESS. [bar] | MIN. SPEED [min⁻¹] | MAX. SPEED [min⁻¹] | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | DIMENSION [mm] | | | | | |
| 2-15R- F01V08-S U03U02-N | | R | 15 | 190 | 500 | 2200 | 80.56 | 132.12 | 3/4-16UNFx15 | ∅ 30 | 9/16-18UNFx13 | ∅ 25 |
| 2-15L- F01V08-S U03U02-N | | L | | | | | | | | | | |
| 2-12R- F01V08-S U03U02-N | | R | 12 | 220 | 500 | 2400 | 76.58 | 124.16 | 3/4-16UNFx15 | ∅ 30 | 9/16-18UNFx13 | ∅ 25 |
| 2-12L- F01V08-S U03U02-N | | L | | | | | | | | | | |
| 2-11R- F01V08-S U03U02-N | | R | 11 | 235 | 500 | 2500 | 75.25 | 121.50 | 3/4-16UNFx15 | ∅ 30 | 9/16-18UNFx13 | ∅ 25 |
| 2-11L- F01V08-S U03U02-N | | L | | | | | | | | | | |
| 2-10R- F01V08-S U03U02-N | | R | 10 | 250 | 500 | 2800 | 73.91 | 118.82 | 3/4-16UNFx15 | ∅ 30 | 9/16-18UNFx13 | ∅ 25 |
| 2-10L- F01V08-S U03U02-N | | L | | | | | | | | | | |
| 2-8R- F01V08-S U03U02-N | | R | 8 | 280 | 500 | 3100 | 71.24 | 113.49 | 3/4-16UNFx15 | ∅ 30 | 9/16-18UNFx13 | ∅ 25 |
| 2-8L- F01V08-S U03U02-N | | L | | | | | | | | | | |
| 2-7R- F01V08-S U03U02-N | | R | 7 | 280 | 500 | 3500 | 69.91 | 110.82 | 3/4-16UNFx15 | ∅ 30 | 9/16-18UNFx13 | ∅ 25 |
| 2-7L- F01V08-S U03U02-N | | L | | | | | | | | | | |
| 2-6R- F01V08-S U03U02-N | | R | 6 | 280 | 500 | 3600 | 68.57 | 108.14 | 3/4-16UNFx15 | ∅ 30 | 9/16-18UNFx13 | ∅ 25 |
| 2-6L- F01V08-S U03U02-N | | L | | | | | | | | | | |
| 2-5R- F01V08-S U03U02-N | | R | 5 | 280 | 500 | 4000 | 67.24 | 105.48 | 3/4-16UNFx15 | ∅ 30 | 9/16-18UNFx13 | ∅ 25 |
| 2-5L- F01V08-S U03U02-N | | L | | | | | | | | | | |
| 2-4R- F01V08-S U03U02-N | | R | 4 | 280 | 500 | 4000 | 65.90 | 102.81 | 3/4-16UNFx15 | ∅ 30 | 9/16-18UNFx13 | ∅ 25 |
| 2-4L- F01V08-S U03U02-N | | L | | | | | | | | | | |
| 2-3R- F01V08-S U03U02-N | | R | 3 | 280 | 500 | 4000 | 64.57 | 100.14 | 3/4-16UNFx15 | ∅ 30 | 9/16-18UNFx13 | ∅ 25 |
| 2-3L- F01V08-S U03U02-N | | L | | | | | | | | | | |
| 2-2R- F01V08-S U03U02-N | | R | 2 | 280 | 500 | 4000 | 63.23 | 97.46 | 3/4-16UNFx15 | ∅ 30 | 9/16-18UNFx13 | ∅ 25 |
| 2-2L- F01V08-S U03U02-N | | L | | | | | | | | | | |




THE CLOCKWISE PUMP IS DRAWN

| ORDER KEY | PURCH. CODE | DIRECT. OF ROT. | DISPLA-CEMENT [cm³/rev] | CONT. PRESS [bar] | MIN. SPEED [min⁻¹] | MAX. SPEED [min⁻¹] | A1 | A2 | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | DIMENSION [mm] | | | | | | | | |
| 2-15/15R-R03C05-S H06K01/H05K01-N | | R | 15 | 190 | 500 | 2200 | 51.86 | 129.58 | 181.14 | ∅ 20 | ∅ 40 | M6 | ∅ 13.5 | ∅30 | M6 |
| 2-15/15L- R03C05-S H06K01/H05K01-N | | L | | | | | | | | | | | | | |
| 2-12/12R- R03C05-S H06K01/H05K01-N | | R | 12 | 220 | 500 | 2400 | 47.88 | 117.64 | 165.22 | ∅ 20 | ∅ 40 | M6 | ∅ 13.5 | ∅30 | M6 |
| 2-12/12L- R03C05-S H06K01/H05K01-N | | L | | | | | | | | | | | | | |
| 2-11/11R- R03C05-S H06K01/H05K01-N | 189 9004 | R | 11 | 235 | 500 | 2500 | 46.55 | 113.65 | 159.90 | ∅ 20 | ∅ 40 | M6 | ∅ 13.5 | ∅30 | M6 |
| 2-11/11L- R03C05-S H06K01/H05K01-N | | L | | | | | | | | | | | | | |
| 2-10/10R- R03C05-S H06K01/H05K01-N | | R | 10 | 250 | 500 | 2800 | 45.21 | 109.63 | 154.54 | ∅ 20 | ∅ 40 | M6 | ∅ 13.5 | ∅30 | M6 |
| 2-10/10L- R03C05-S H06K01/H05K01-N | | L | | | | | | | | | | | | | |
| 2-8/8R- R03C05-S H06K01/H05K01-N | | R | 8 | 280 | 500 | 3100 | 42.54 | 101.63 | 143.88 | ∅ 20 | ∅ 40 | M6 | ∅ 13.5 | ∅30 | M6 |
| 2-8/8L- R03C05-S H06K01/H05K01-N | | L | | | | | | | | | | | | | |
| 2-7/7R- R03C05-S H06K01/H05K01-N | | R | 7 | 280 | 500 | 3500 | 41.21 | 97.63 | 138.54 | ∅ 20 | ∅ 40 | M6 | ∅ 13.5 | ∅30 | M6 |
| 2-7/7L- R03C05-S H06K01/H05K01-N | | L | | | | | | | | | | | | | |
| 2-6/6R- R03C05-S H06K01/H05K01-N | | R | 6 | 280 | 500 | 3600 | 39.87 | 93.61 | 113.18 | ∅ 20 | ∅ 40 | M6 | ∅ 13.5 | ∅30 | M6 |
| 2-6/6L- R03C05-S H06K01/H05K01-N | | L | | | | | | | | | | | | | |
| 2-5/5R- R03C05-S H06K01/H05K01-N | | R | 5 | 280 | 500 | 4000 | 38.54 | 89.62 | 127.86 | ∅ 20 | ∅ 40 | M6 | ∅ 13.5 | ∅30 | M6 |
| 2-5/5L- R03C05-S H06K01/H05K01-N | | L | | | | | | | | | | | | | |
| 2-4/4R- R03C05-S H06K01/H05K01-N | | R | 4 | 280 | 500 | 4000 | 37.10 | 85.61 | 122.52 | ∅ 20 | ∅ 40 | M6 | ∅ 13.5 | ∅30 | M6 |
| 2-4/4L- R03C05-S H06K01/H05K01-N | | L | | | | | | | | | | | | | |
| 2-3/3R- R03C05-S H06K01/H05K01-N | | R | 3 | 280 | 500 | 4000 | 35.87 | 81.62 | 117.19 | ∅ 20 | ∅ 40 | M6 | ∅ 13.5 | ∅30 | M6 |
| 2-3/3L- R03C05-S H06K01/H05K01-N | | L | | | | | | | | | | | | | |
| 2-2/2R- R03C05-S H06K01/H05K01-N | | R | 2 | 280 | 500 | 4000 | 34.53 | 77.59 | 111.82 | ∅ 20 | ∅ 40 | M6 | ∅ 13.5 | ∅30 | M6 |
| 2-2/2L- R03C05-S H06K01/H05K01-N | | L | | | | | | | | | | | | | |

**NOTES:**