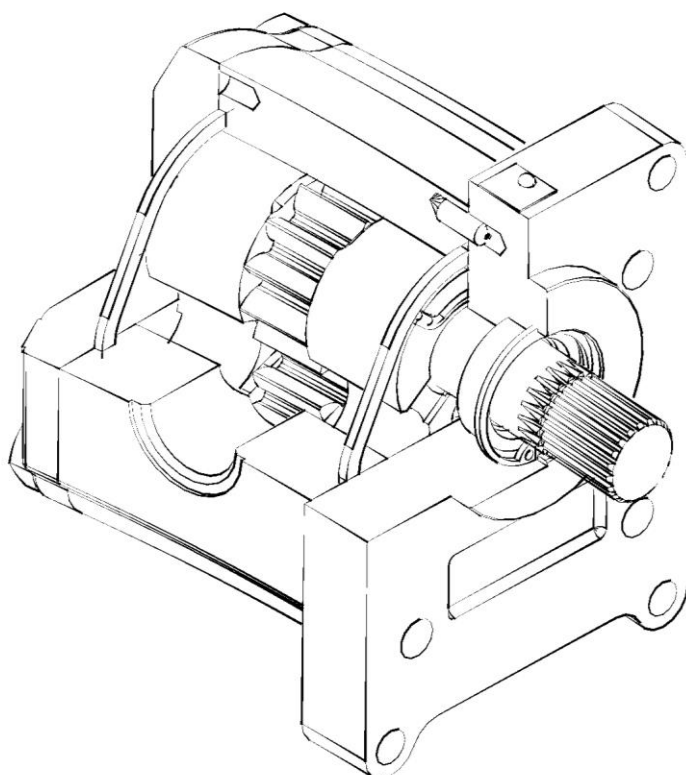


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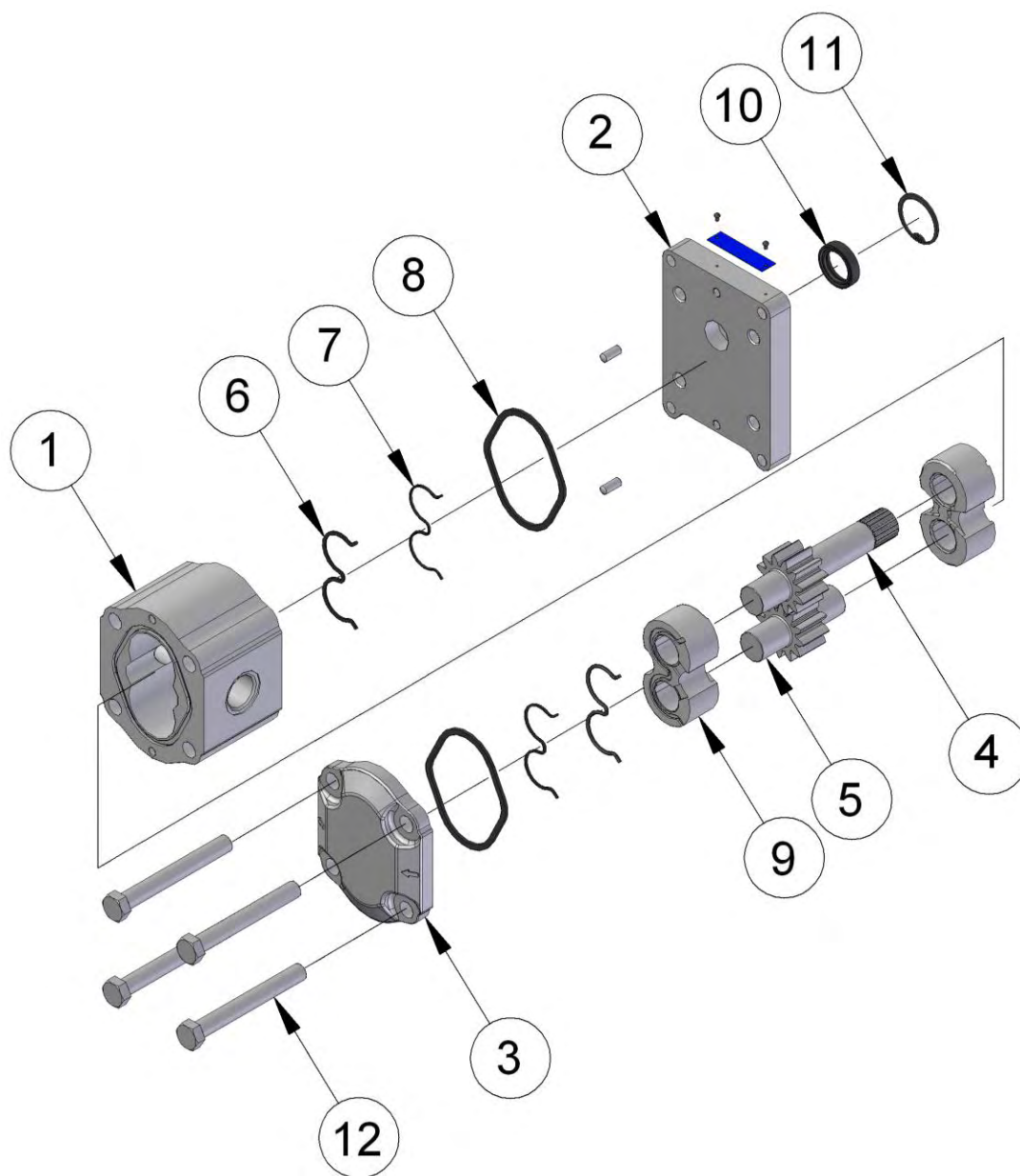


DESCRIPTION

3 series pumps based construct and the displacement range of 3 series pumps is based on the proven U3 (UN) series. The cover and flange are manufactured from grey iron. The body is designed from aluminum alloy shaped profile bars. Pumps are connected with four through-bolts made of M12 high strength steel. They are equipped with a hydraulic pressure compensation axial-clearance which is executed by means of a balancing sealing directly in the bearing sleeves. Compared to the previous design of U3 (UN), the 3 series pumps have better noise, maximum pressure and flow efficiency within the entire speed range, whereas the favorable price has been maintained. 3 series offers a possibility large range displacement $V_g = 5$ to $39 \text{ cm}^3/\text{rev}$, at achieve nominal pressure up to 300 Bar. They are produced in unidirectional and in multiple versions.

Pumps of 3 series can be equipped with flow regulation and a relief valve (see. page 9 - 12), both in the unidirectional and multiple version (see. page 24).

BASIC PARTS OF PUMP



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. Connecting bolts

A reinforced version (3D), or a shortened version (3K) can be used for special purposes

3D pumps are a reinforced version that is about 10 mm longer. The Pump has increased the pressure from displacement $>16 \text{ cm}^3/\text{rev}$. The position of the inlets and outlets is shifted by about 5 mm on body and about 10 mm on the cover compared with the standard version.

3K pumps are about 11.4 mm shorter. The position of the inlets and outlets is shifted by about 5.7 mm on body and 11.4 mm on the cover compared with the standard version.

PARAMETER TABLE

Basic design

Nominal Size Parameters		Sym.	Unit	8	10	12.5	16	20	25	28	31
Actual displacement		V_g	$[\text{cm}^3]$	7.93	10.02	12.10	16.28	20.45	25.46	28.38	32.14
Rotation speed	Nominal	n_n	$[\text{min}^{-1}]$	1500							
	Minimum	$n_{\min}$	$[\text{min}^{-1}]$	600	450	450	450	450	450	450	450
	Maximum	$n_{\max}$	$[\text{min}^{-1}]$	3200	3200	3200	3200	3200	3200	3000	2800
Pressure at inlet *	Minimum	$p_{1\min}$	$[\text{bar}]$	0.50							
	Maximum	$p_{1\max}$	$[\text{bar}]$	-0.30							
Pressure at outlet **	max. continuous	p_{2n}	$[\text{bar}]$	250	250	250	250	230	200	200	160
	Maximum	$p_{2\max}$	$[\text{bar}]$	300	300	300	290	270	250	230	200
	Peak	p_3	$[\text{bar}]$	310	310	310	300	280	260	240	210
Nominal flow rate (min.) at n_n and p_{2n}		Q_n	$[\text{dm}^3 \cdot \text{min}^{-1}]$	10.70	13.60	16.40	22.00	28.00	35.10	39.10	44.40
Maximum flow rate at $n_{\max}$ and $p_{2\max}$		$Q_{\max}$	$[\text{dm}^3 \cdot \text{min}^{-1}]$	25.12	31.74	38.33	51.58	64.79	80.66	84.29	89.09
Nominal input power (max.) at n_n and p_{2n}		P_n	$[\text{kW}]$	5.83	7.37	8.90	11.97	13.83	14.98	16.69	15.12
Maximum input power at $n_{\max}$ and $p_{2\max}$		$P_{\max}$	$[\text{kW}]$	15.42	19.49	23.54	30.64	35.93	41.53	40.07	37.06
Weight		M	$[\text{kg}]$	5.15	5.30	5.40	5.55	5.70	5.85	6.00	6.20

Additional design

Nominal Size Parameters		Sym.	Unit	5	39	3D 17	3D 22	3D 25	3D 28	3D 34	3D 39
Actual displacement		V_g	$[\text{cm}^3]$	5.01	40.07	17.12	22.54	25.46	28.38	34.23	40.07
Rotation speed	nominal	n_n	$[\text{min}^{-1}]$	1500	1200	1500					1200
	minimum	$n_{\min}$	$[\text{min}^{-1}]$	600	400	450	450	450	450	450	400
	maximum	$n_{\max}$	$[\text{min}^{-1}]$	3200	1800	3200	3200	3200	3000	2500	1800
Pressure at inlet *	minimum	$p_{1\min}$	$[\text{bar}]$	0.50							
	maximum	$p_{1\max}$	$[\text{bar}]$	-0.30							
Pressure at outlet **	max. continuous	p_{2n}	$[\text{bar}]$	250	120	250	250	250	240	190	160
	maximum	$p_{2\max}$	$[\text{bar}]$	300	160	280	270	260	260	200	170
	peak	p_3	$[\text{bar}]$	310	170	290	280	270	270	210	180
Nominal flow rate (min.) at n_n and p_{2n}		Q_n	$[\text{dm}^3 \cdot \text{min}^{-1}]$	6.60	44.20	23.1	32.4	35.1	39.1	46.5	43.50
Maximum flow rate at $n_{\max}$ and $p_{2\max}$		$Q_{\max}$	$[\text{dm}^3 \cdot \text{min}^{-1}]$	15.84	71.40	52.29	69.24	78.21	81.73	82.15	69.24
Nominal input power (max.) at n_n and p_{2n}		P_n	$[\text{kW}]$	3.68	14.14	12.59	16.57	18.72	20.03	19.13	18.86
Maximum input power at $n_{\max}$ and $p_{2\max}$		$P_{\max}$	$[\text{kW}]$	9.73	24.04	30.08	38.19	41.53	43.40	33.56	24.04
Weight		m	$[\text{kg}]$	5.00	6.55	5.70	6.00	6.1	6.25	6.50	6.9

* Inlet pressure in the reversible design can be up to $p_1 = p_{2n} - 70 \text{ bar max.}$ 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

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

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

Displacement

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

Torque

$$M_k = \frac{V_g \cdot p}{20 \cdot \pi \cdot \eta_m} \quad [\text{N.m}]$$

p	$[\text{bar}]$	required pressure at outlet
η_m	$[-]$	mechanical efficiency

Input power

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

η_t	$[-]$	total efficiency
----------	-------	------------------

PUMP EFFICIENCIES

Volumetric efficiency η_v

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

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

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

Mechanical efficiency η_m

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

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

$M_{act.}$	$[\text{N.m}]$	actual torque
$M_{theor.}$	$[\text{N.m}]$	theoretical torque

Total efficiency η_t

It is defined as product of η_v and η_m and determines the difference between theoretical and actual required input power:

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

$P_{act.}$	$[\text{kW}]$	actual input power
$P_{theor.}$	$[\text{kW}]$	theoretical input power

WORKING LIQUID

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

Liquid temperature

$$t = -20 \div +80 [^{\circ}\text{C}] \quad \text{when used with FKM (Viton) seal up to } 120 [^{\circ}\text{C}]$$

Cinematic viscosity

Recommended (during continuous operation):

$$\nu = 20 \div 80 \cdot 10^{-6} [\text{m}^2 \cdot \text{s}^{-1}]$$

Maximum (cold starting, at viscosity >1000 , operating pressure <10 bar is permissible, speed $<1500 \cdot \text{min}^{-1}$):

$$\nu = 1200 \cdot 10^{-6} [\text{m}^2 \cdot \text{s}^{-1}]$$

Minimum (operating mode at $10 \cdot 10^{-6}$ up to $20 \cdot 10^{-6}$ should be consulted with manufacturer):

$$\nu = 10 \cdot 10^{-6} [\text{m}^2 \cdot \text{s}^{-1}]$$

Filtration coefficient β_{α}

$\beta_{25} 75 \geq$ (for pressure $p_2 < 200$ bar)

$\beta_{10} 75 \geq$ (for pressure $p_2 > 200$ bar)

Liquid contamination class according to ISO 4406

21/18/15 (for pressure $p_2 < 200$ bar)

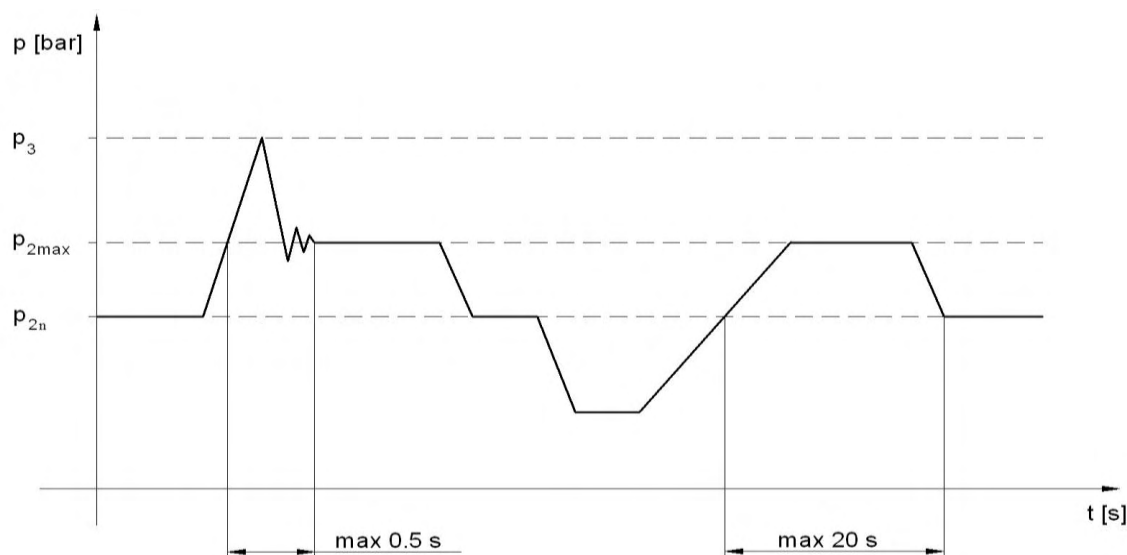
20/17/14 (for pressure $p_2 > 200$ bar)

Liquid contamination class according to NAS 1638

10 (for pressure $p_2 < 200$ bar)

8 (for pressure $p_2 > 200$ bar)

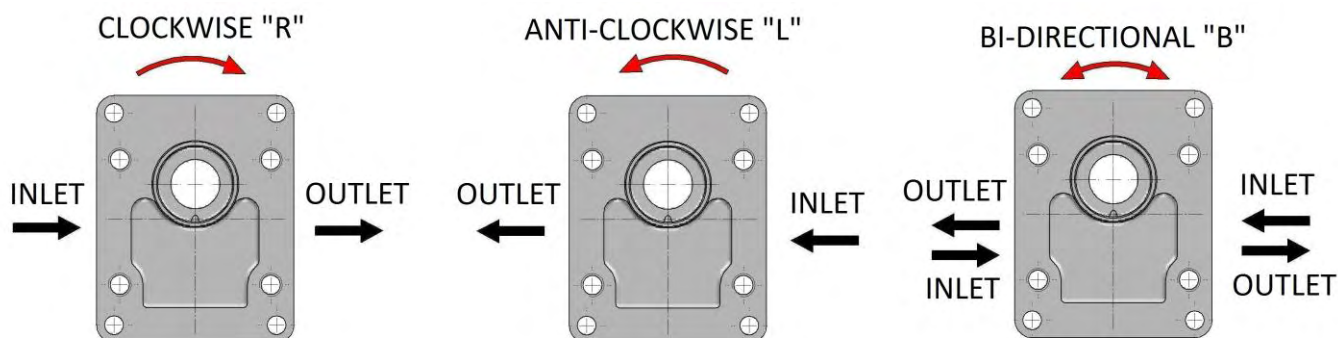
PRESSURE LOAD



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

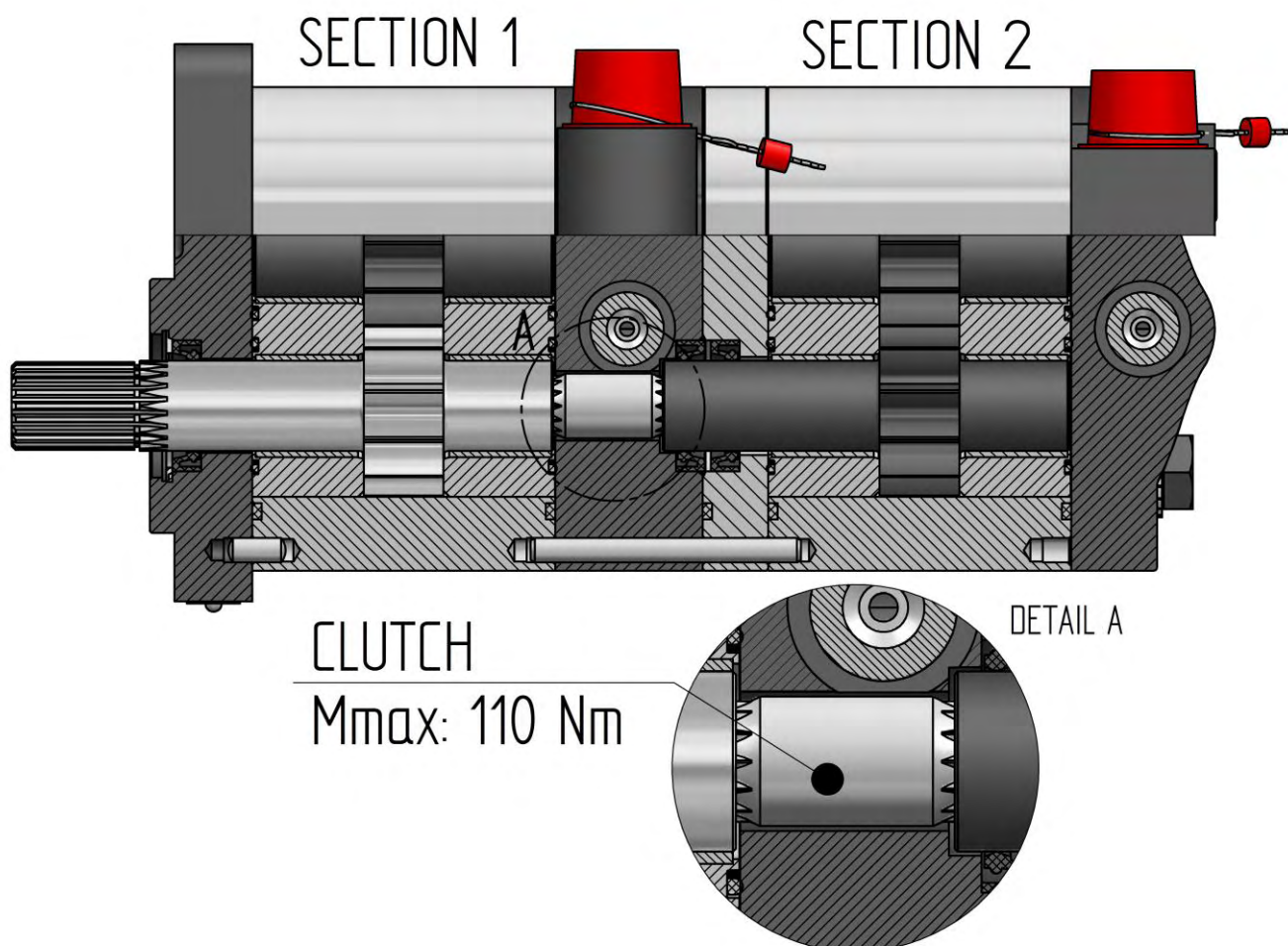
Determine direction of rotation by looking at the drive shaft. The pump can only be used in the specified direction of rotation.



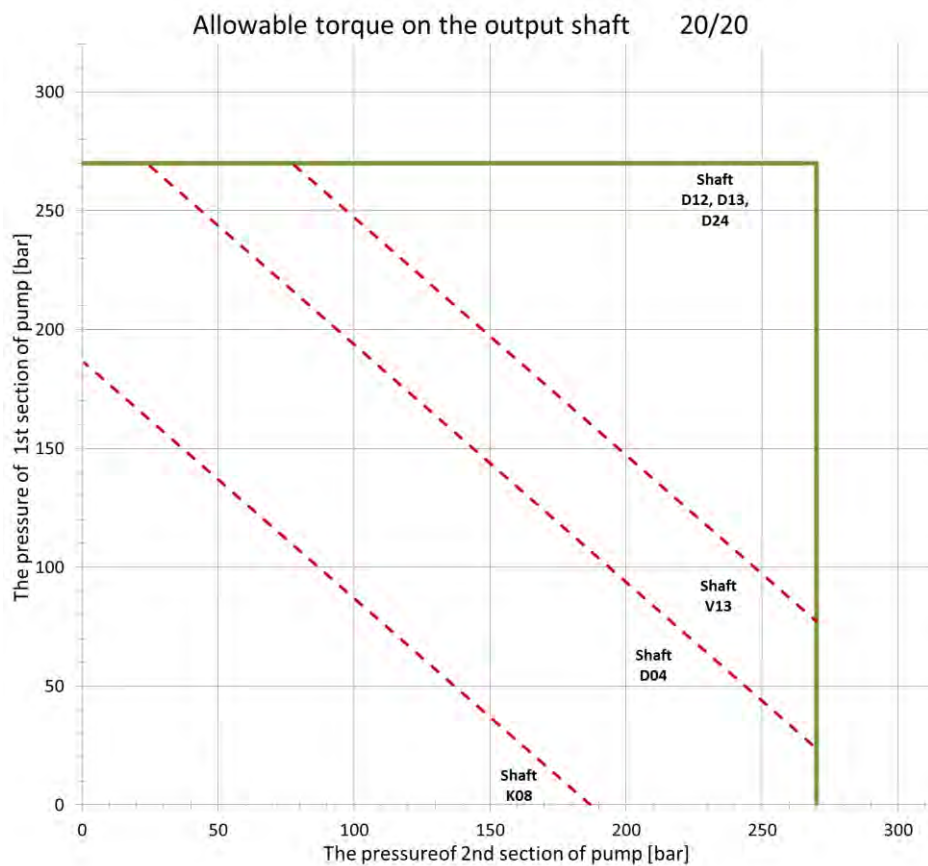
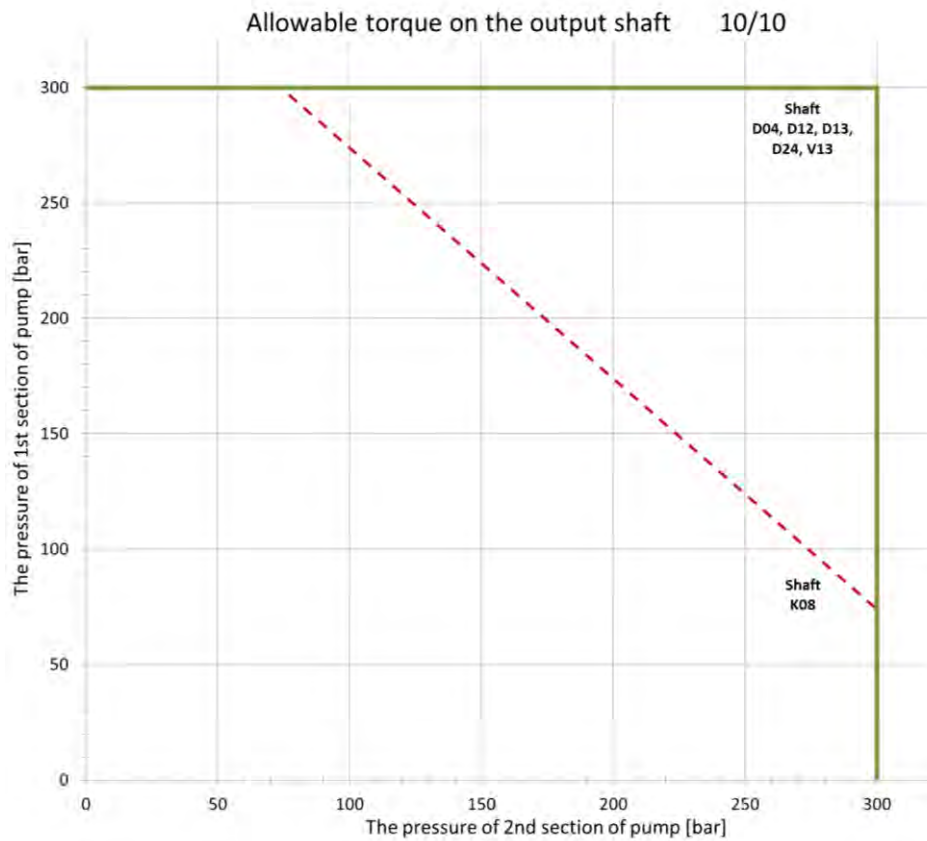
OTHER REQUIREMENTS

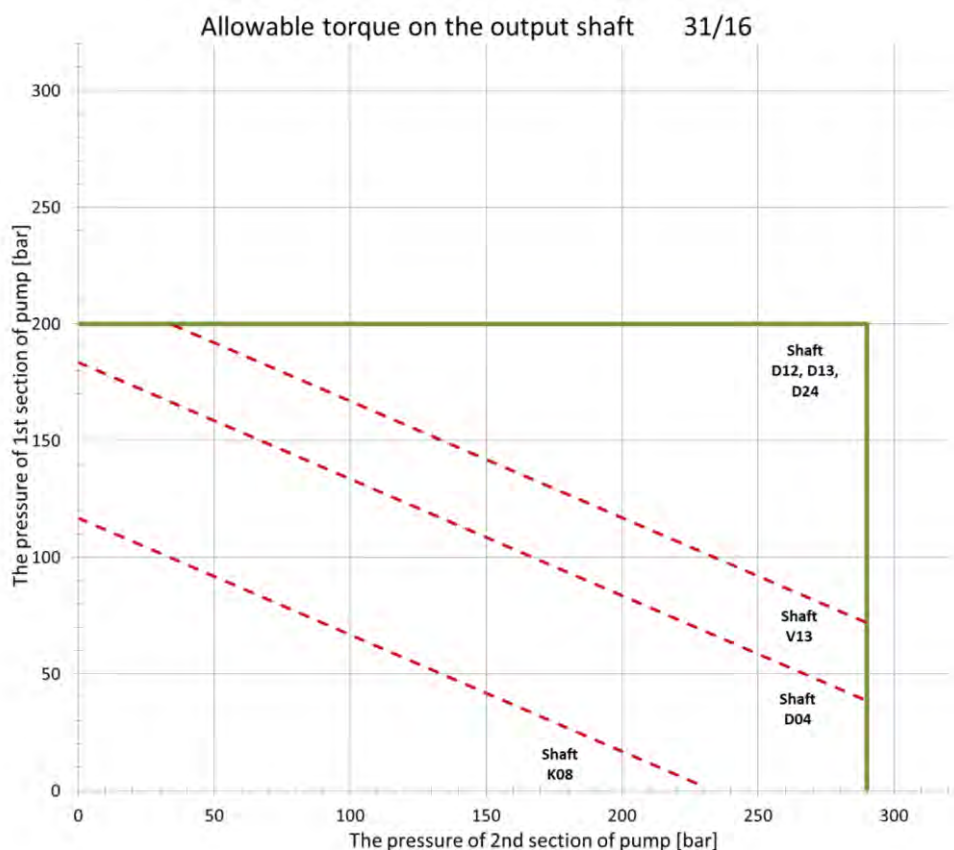
Technical requirements for multiple pumps are the same as for single version pumps.

- In case of multiple pumps the maximum torque, which transfer clutch between each sections, is 110 Nm. Therefore, caution should be used while burdening more sections at once (see allowable torques on the output shaft and the clutch).
- Section 1 should be burdened by the product of pressure and flow more than section 2



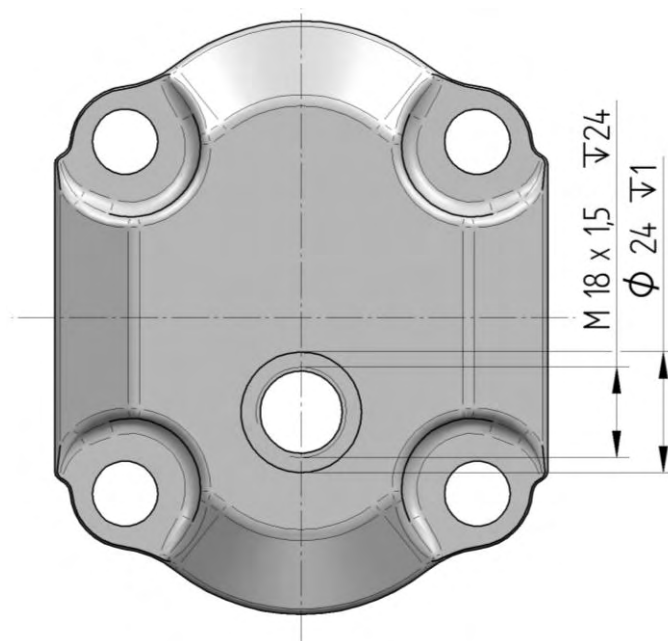
ALLOWABLE TORQUE ON THE OUTPUT SHAFT DEPENDENT ON PRESSURE



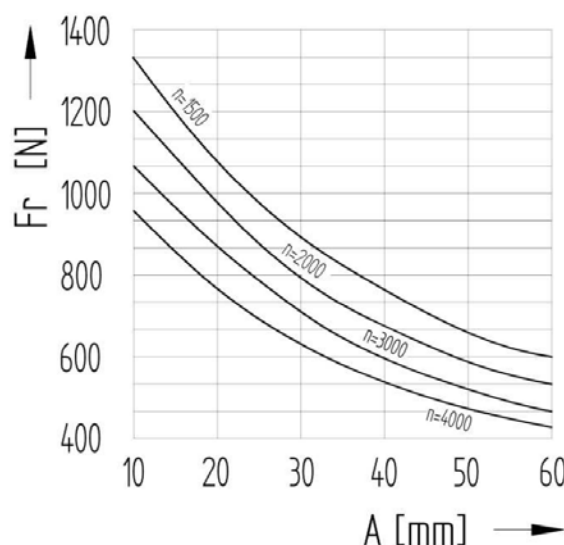
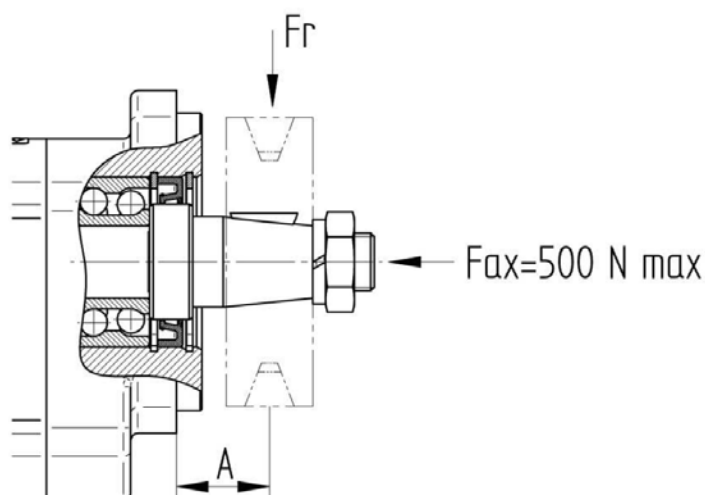


REVERSIBLE DESIGN

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. (see fig.). Maximum pressure in the drainage of the serial version (standard seal shaft) is 0.5 bar.



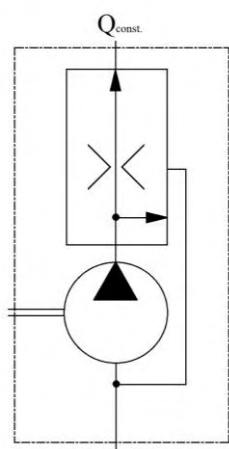
PUMP WITH FRONT-END BEARING



Without front-end bearing the driven unit must not impart axial or radial load of the driven shaft once the engine has been connected to it!

FLOW REGULATOR FOR UNIDIRECTIONAL PUMP

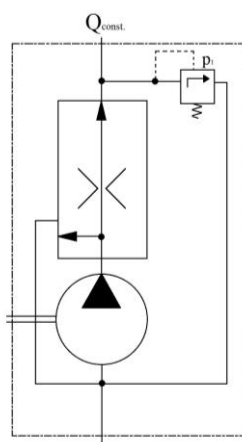
The pump may be equipped with liquid flow regulator, which is designed to maintain constant flow rate regardless of the pump RPM. This principle can be used everywhere, where there is a requirement for motion control at constant speed regardless of RPM. The value of flow rate is determined by type of aperture (see the following figures).



Three way flow control valve

Excess flow returned to suction line

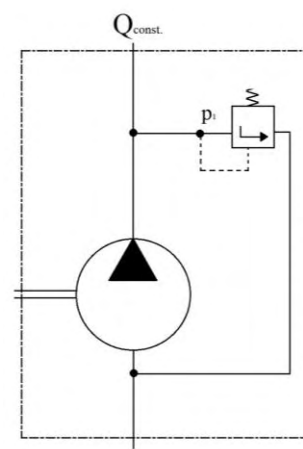
$Q_{const}=2 - 30\text{l/min}$



Three way flow control valve
with pressure-relief valve

Excess flow returned to suction line

$Q_{const}=2 - 30\text{l/min}$, $p_1=5 - 250\text{bar}$



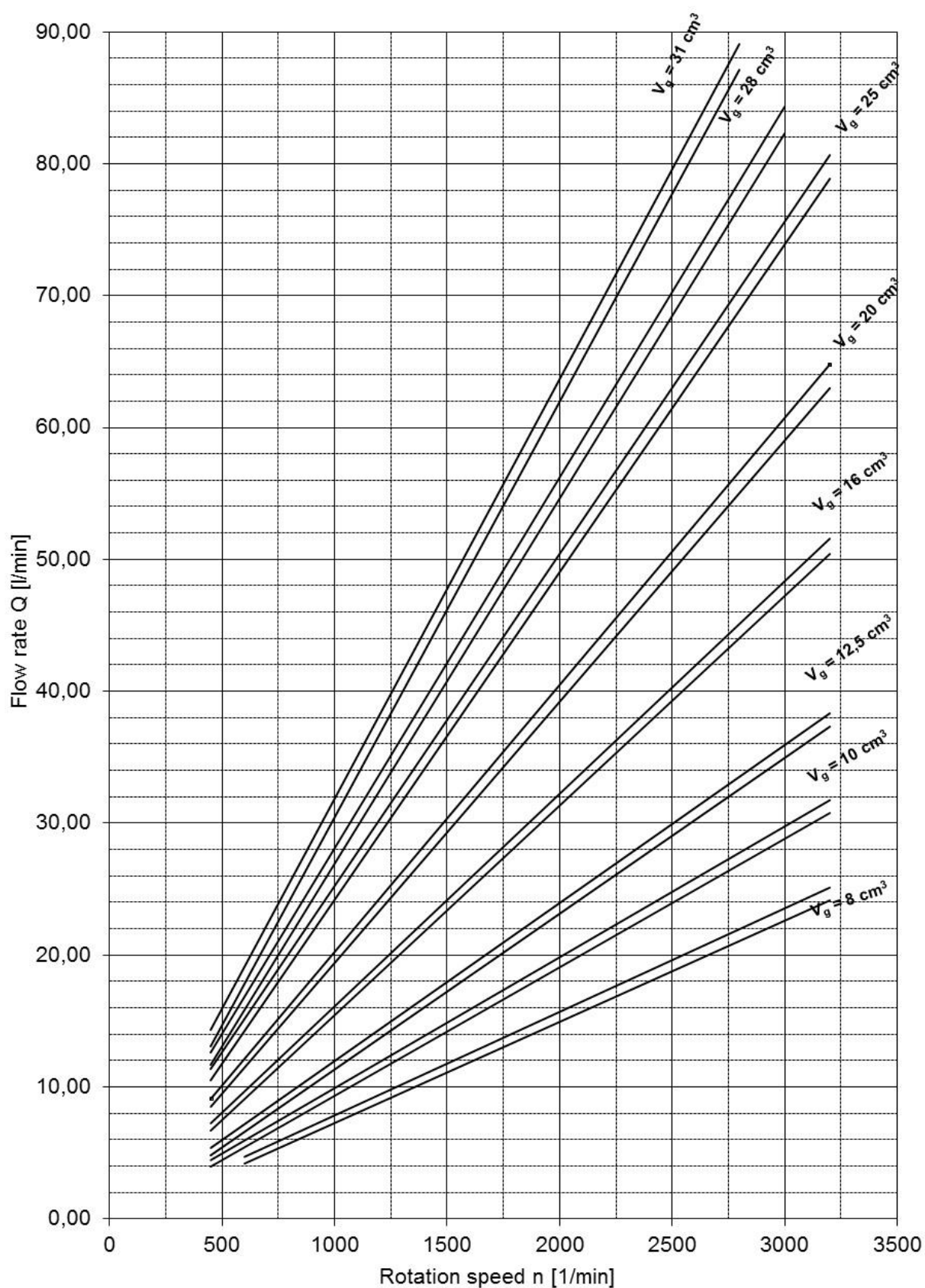
Pressure-relief valve

Discharge returned to suction line

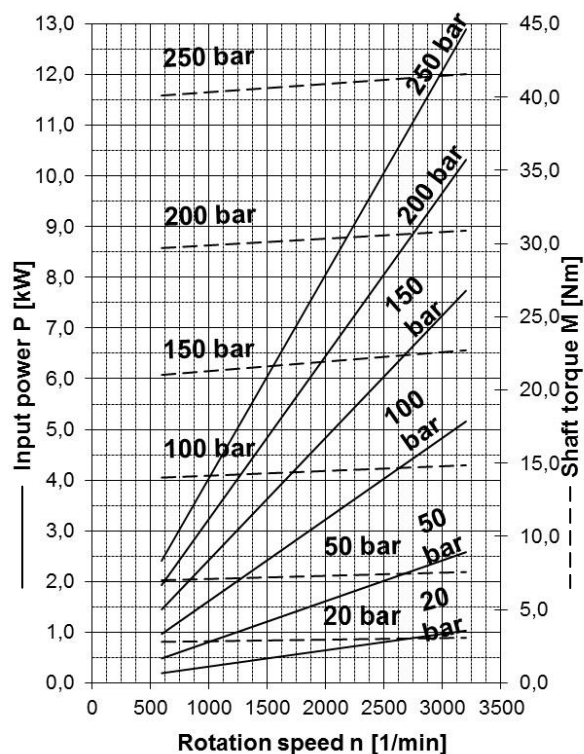
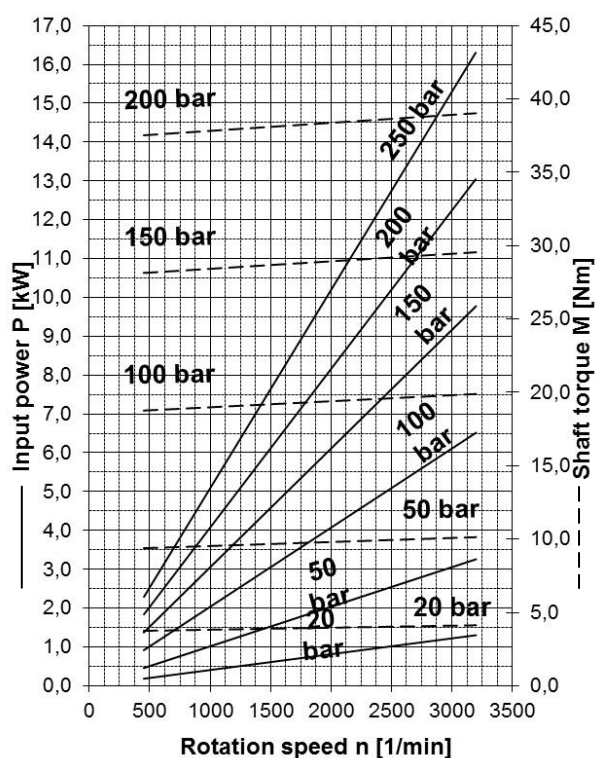
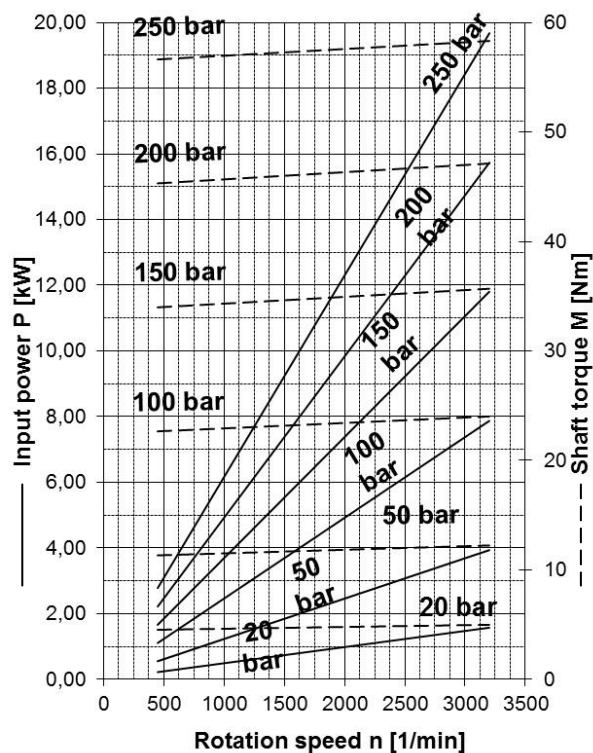
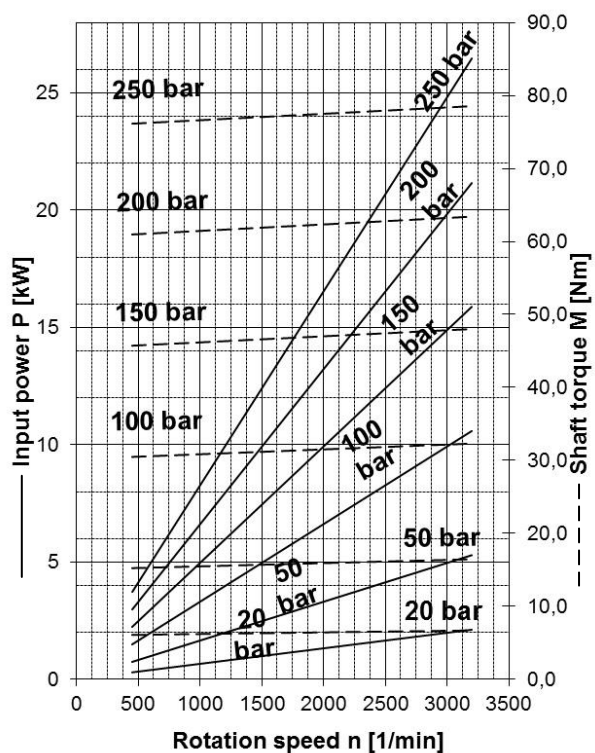
$p_1=5 - 250\text{bar}$

Note: The setting values of the safety valve must be consulted with the producer

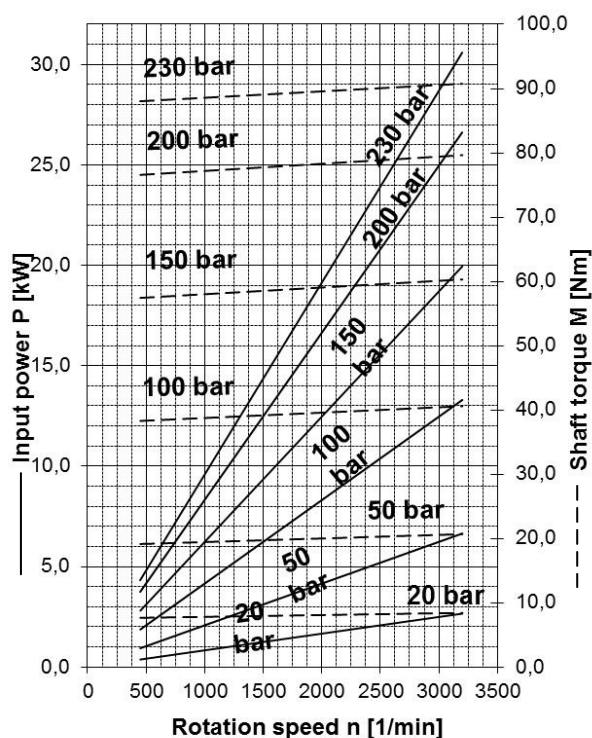
3 FLOW RATE AND POWER CURVES



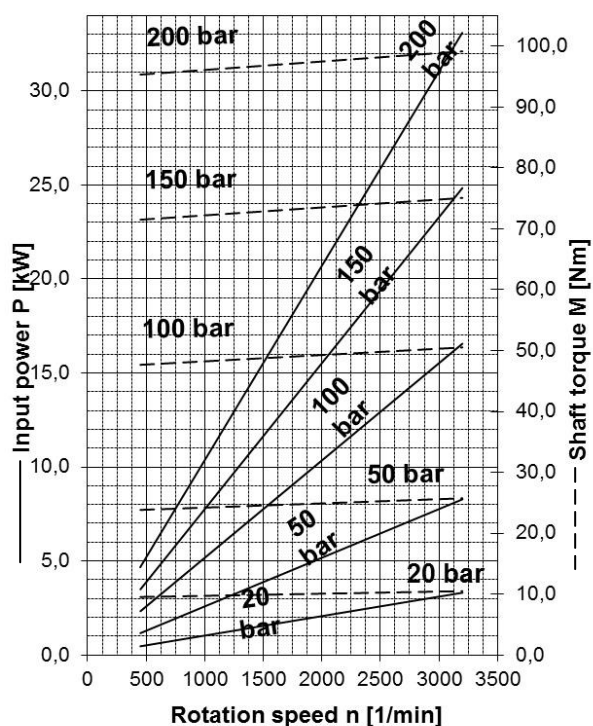
The above characteristics apply for oil ISO Vg 46 at a temperature $t=45^\circ\text{C}$.

8 cm³10 cm³12,5 cm³16 cm³

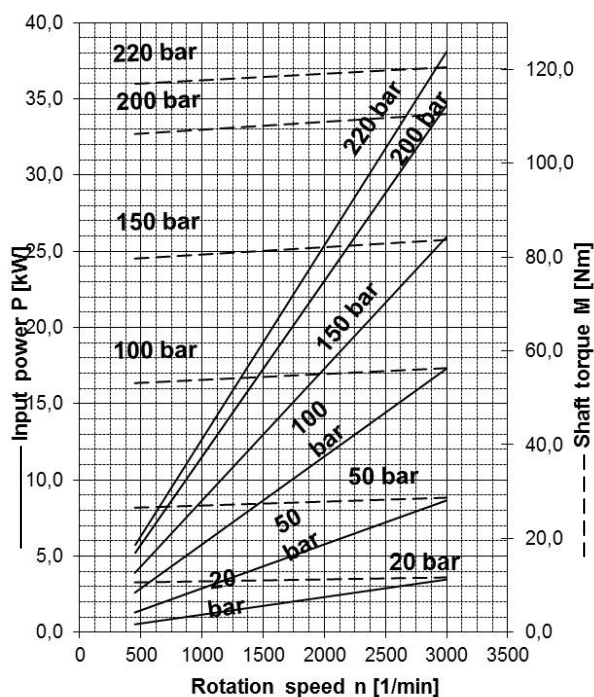
20 cm³



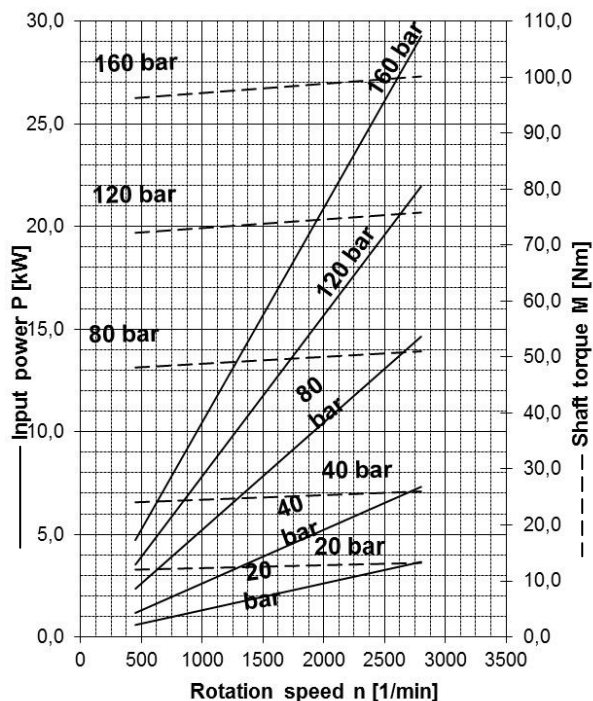
25 cm³



28 cm³



31 cm³



ORDER KEY – SIMPLE VERSION

3D - 16 R - R08 D12 - S M09 M07 - V . 000

Code	Displacement [cm ³]
5,0	5,01
8,0	7,93
10,0	10,02
12,5	12,10
16,0	16,28
20,0	20,45
25,0	25,46
28,0	28,38
31,0	32,14
39,0	40,07
XX	Other displacements on request

Code	Direction of rotation
R	Clockwise rotation
L	Anti-clockwise rotation
B	Reversible rotation

Code	Type
3	3 Series Gear Pump
3K	3 Series Gear Pump, shortened version
3D	3 Series Gear Pump, reinforced version

Code	Flange design
R08	 Rectangular flange, centre ring Ø62, spacing 86x120, with O-ring
R09	 Rectangular flange, centre ring Ø62, spacing 86x120
R10	 Rectangular flange, centre ring Ø63, spacing 76x96
S02	 SAE A, centre ring Ø82,55, 2 aperture, spacing 106,4
S03	 SAE B, centre ring Ø101,6, 2 aperture, spacing 146
K01	 Centre ring Ø62, 2 bolts, spacing 115
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
D04	 Spline 5/8"
D12	 Spline 22x1
D13	 Spline SAE 7/8"
D24	 Spline 6x18x22
K08	 Cross coupling
V13	 Cylindric
Z	Special design

Code	Special arrangements
-	Without special arrangements
001	Rectangular flange, 2 holes
080	Double-edged seal FPN
200	With front-end bearing

Code	Sealing material
V	FPN (VITON)
N	NBR

Code	Liquid inlet and outlet connection shape
M03	Thread M 14x1,5
M05	Thread M 18x1,5
M06	 Thread M 20x1,5
M07	Thread M 22x1,5
M09	Thread M 27x2
M12	Thread M 33x2
G03	Thread BSP G1/2
G04	 Thread BSP G3/4
G05	Thread BSP G1
G06	Thread BSP G1 1/4
H05	Flange fitting 4xM6/Ø35; Ø15
H06	 Flange fitting 4xM6/Ø40; Ø20
H08	Flange fitting 4xM6/Ø30; Ø13,5
H11	Flange fitting 4xM10/Ø51; Ø26
K03	 Flange fitting 4xM8/Ø40; Ø18
E02	Flange fitting 3/4
E03	 Flange fitting 1
E04	Flange fitting 1 1/4
Z	Special design

An example of designation for the pump 3 anti-clockwise pump with displacement 16 cm³, rectangular flange with center ring Ø62 without O-ring, spline 22x1, input and output in body with metric thread and standard seal NBR without special arrangements: **3-16L-R09D12-SM09M07-N**

3D - 16 / 16 R - R08 D12 - S M09 M07 / M09 M07 - V . 000

Code	Displacement [cm ³]
5,0	5,01
8,0	7,93
10,0	10,02
12,5	12,10
16,0	16,28
20,0	20,45
25,0	25,46
28,0	28,38
31,0	32,14
39,0	40,07
XX	Other displacements on request

Code	Direction of rotation
R	Clockwise rotation
L	Anti-clockwise rotation
B	Reversible rotation

Code	Type
3	3 Series Gear Pump
3K	3 Series Gear Pump, shortened version
3D	3 Series Gear Pump, reinforced version

Code	Location of inlets and outlets
S	 Side (In the body)
C	 Combination

Code	Drive shaft design
D04	Spline 5/8"
D12	Spline 22x1
D13	Spline SAE 7/8"
D24	Spline 6x18x22
K08	Cross coupling
V13	Cylindric
Z	Special design

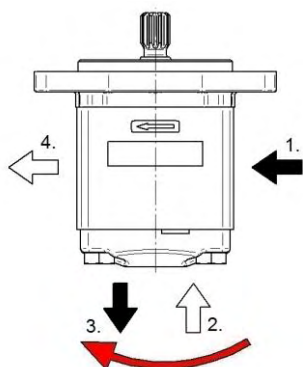
Code	Special arrangements
-	Without special arrangements
001	Rectangular flange, 2 holes
080	Double-edged seal FPN
200	With front-end bearing

Code	Sealing material
V	FPN (VITON)
N	NBR

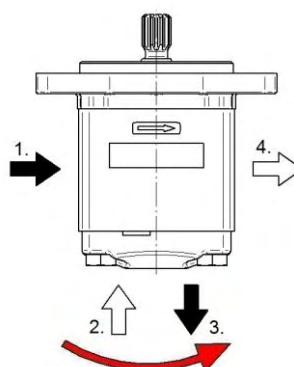
Code	Liquid inlet and outlet connection shape
M03	Thread M 14x1,5
M05	Thread M 18x1,5
M06	Thread M 20x1,5
M07	Thread M 22x1,5
M09	Thread M 27x2
M12	Thread M 33x2
G03	Thread BSP G1/2
G04	Thread BSP G3/4
G05	Thread BSP G1
G06	Thread BSP G1 1/4
H05	Flange fitting 4xM6/Ø35; Ø15
H06	Flange fitting 4xM6/Ø40; Ø20
H08	Flange fitting 4xM6/Ø30; Ø13,5
H11	Flange fitting 4xM10/Ø51; Ø26
K03	Flange fitting 4xM8/Ø40; Ø18
E02	Flange fitting 3/4
E03	Flange fitting 1
E04	Flange fitting 1 1/4
Z	Special design

version 01/2015

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

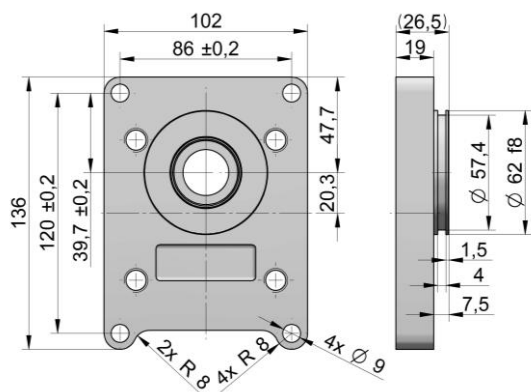
3D-16R-S02D04-CG04G04G03G03-N
1. 2. 3. 4.

COMBINATIONS OF FLANGES AND SHAFTS

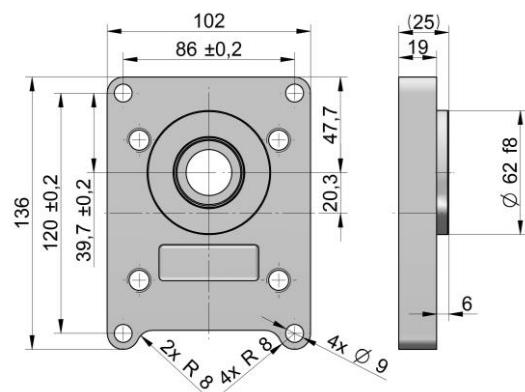
		FLANGES DESIGN					
		R08	R09	R10	S02	S03	K01
DRIVE SHAFTS							
D04					●		
D12		●	●				
D13						●	●
D24				●			
K08		●	●				
V13		●	●				

FLANGES DESIGN

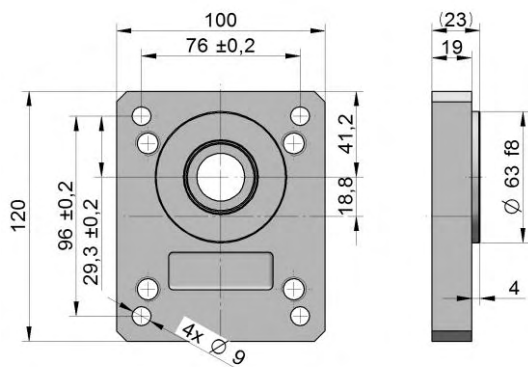
R08:



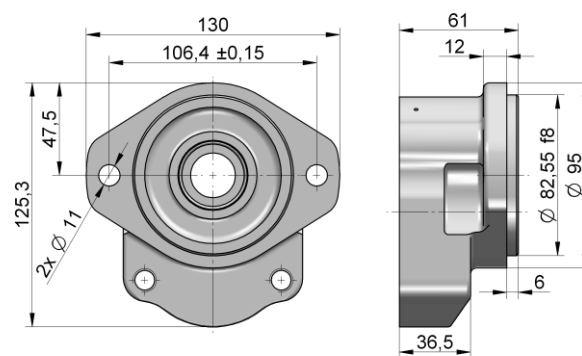
R09:



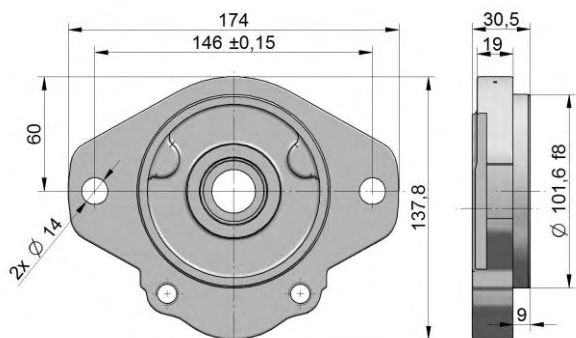
R10:



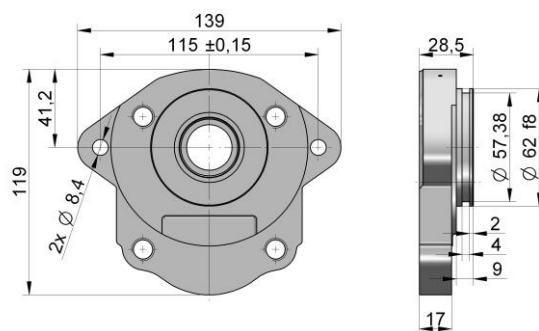
S02:



S03:

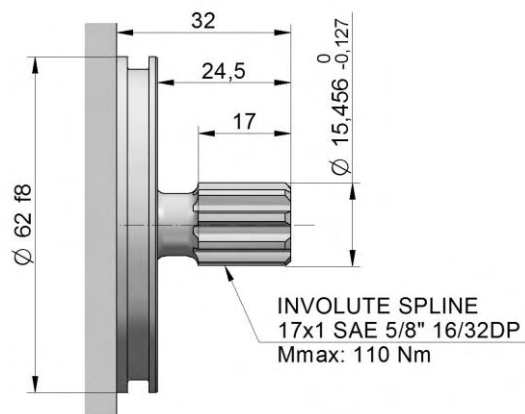


K01:

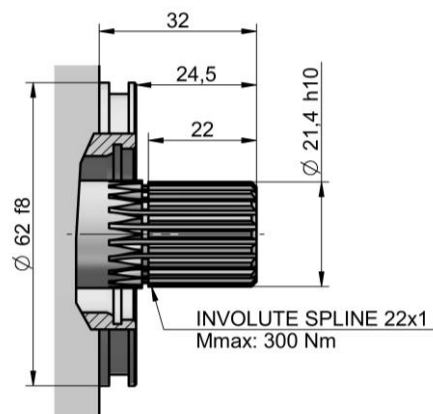


DRIVE SHAFTS

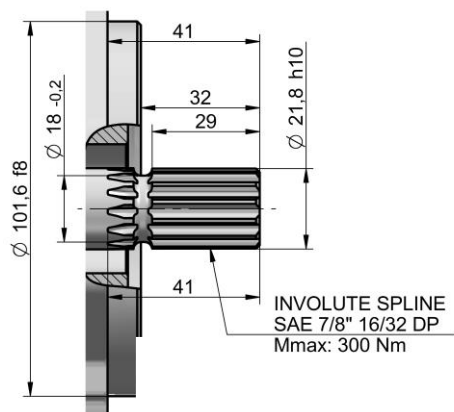
D04:



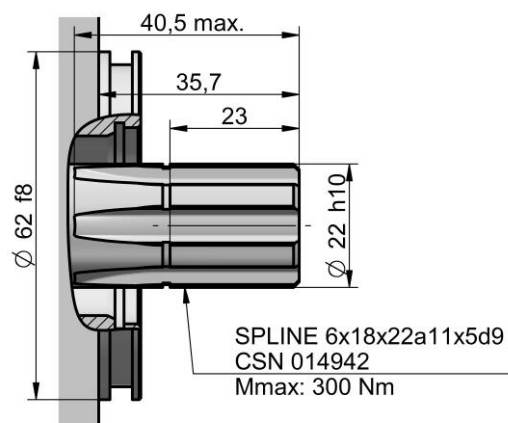
D12:



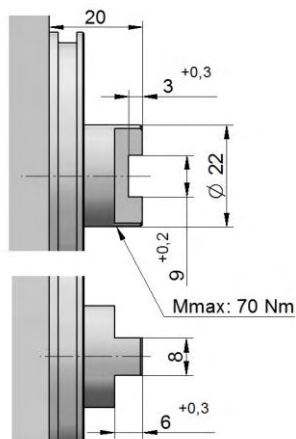
D13:



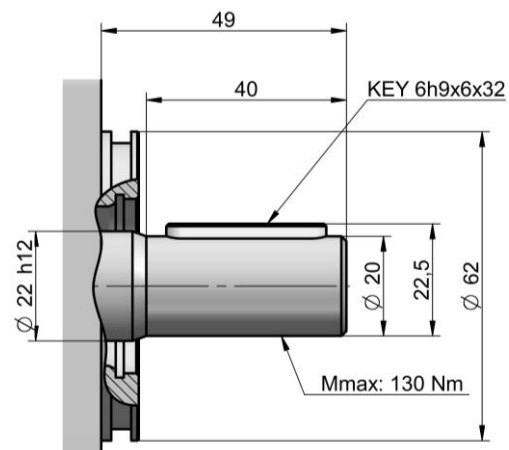
D24



K08:

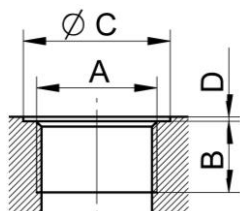


V13:



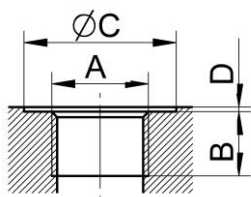
LIQUID INLET AND OUTLET CONNECTION

Metric thread according to ISO 6149:



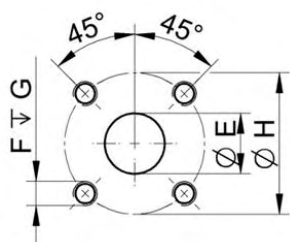
Code	A	B	C	D
M03	M 14x1.5	13	22	1
M05	M 18x1.5	14	24	
M06	M 20x1.5	14	26	
M07	M 22x1.5	14	28	
M09	M 27x2	16	33	
M12	M 33x2	18	40	

BSPP pipe thread according to ISO 228 - 1 :



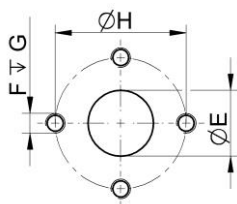
Code	A	B	C	D
G03	G 1/2	14	33	1
G04	G 3/4	16	39	
G05	G 1"	18	45	
G06	G 1 1/4"	18	57	

Flanged fittings according to DIN 8901/8902



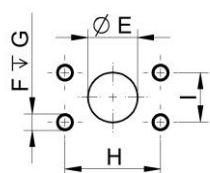
Code	E	F	G	H
H05	15	M6	13	35
H06	20	M6	13	40
H07	13.5	M6	13	30
H11	26	M10	16	51

Flanged fittings – “cross”



Code	E	F	G	H
K03	18	M8	16	40

Flanged fittings according to SAE, metric thread

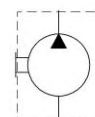
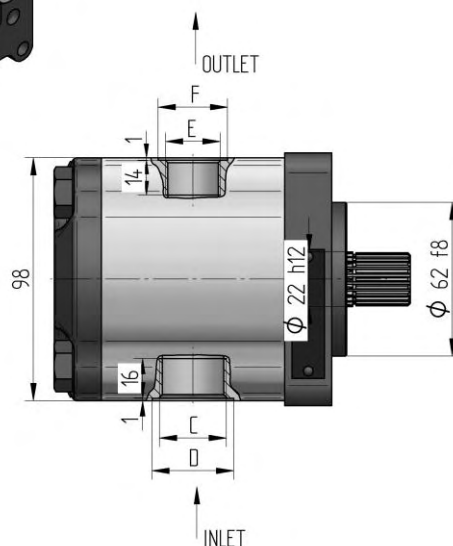
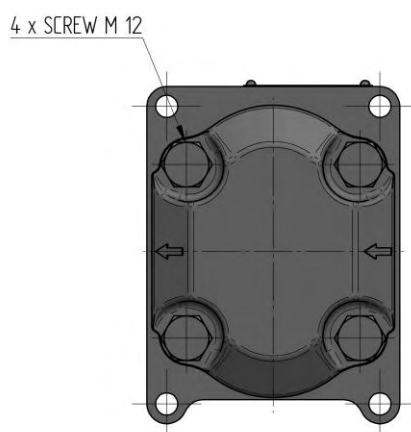
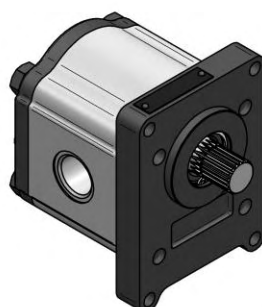
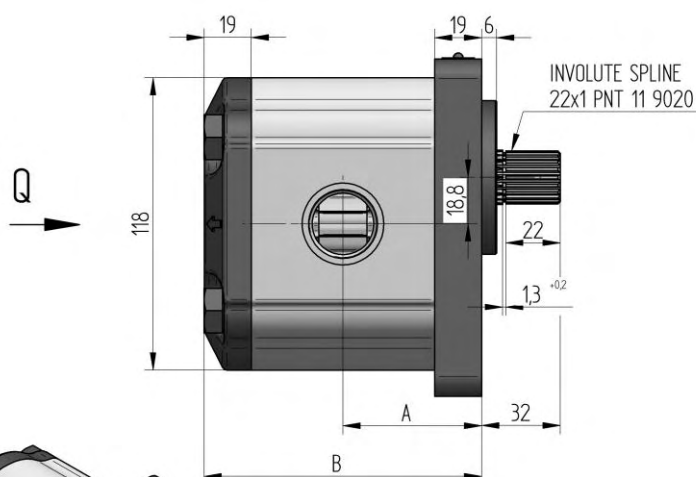
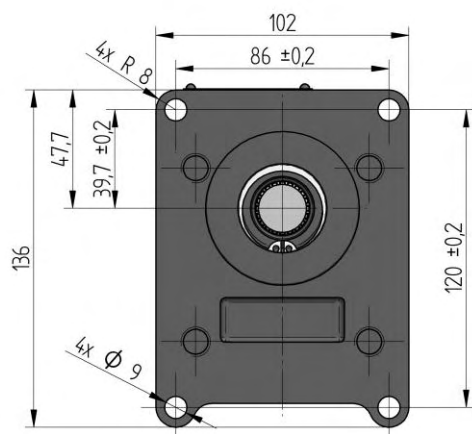


Code	E	F	G	H	I
E02	19	M10	18	47.6	22.2
E03	25.4	M10	18	52.4	26.2
E04	30.5	M10	18	58.7	30.2

Drains:

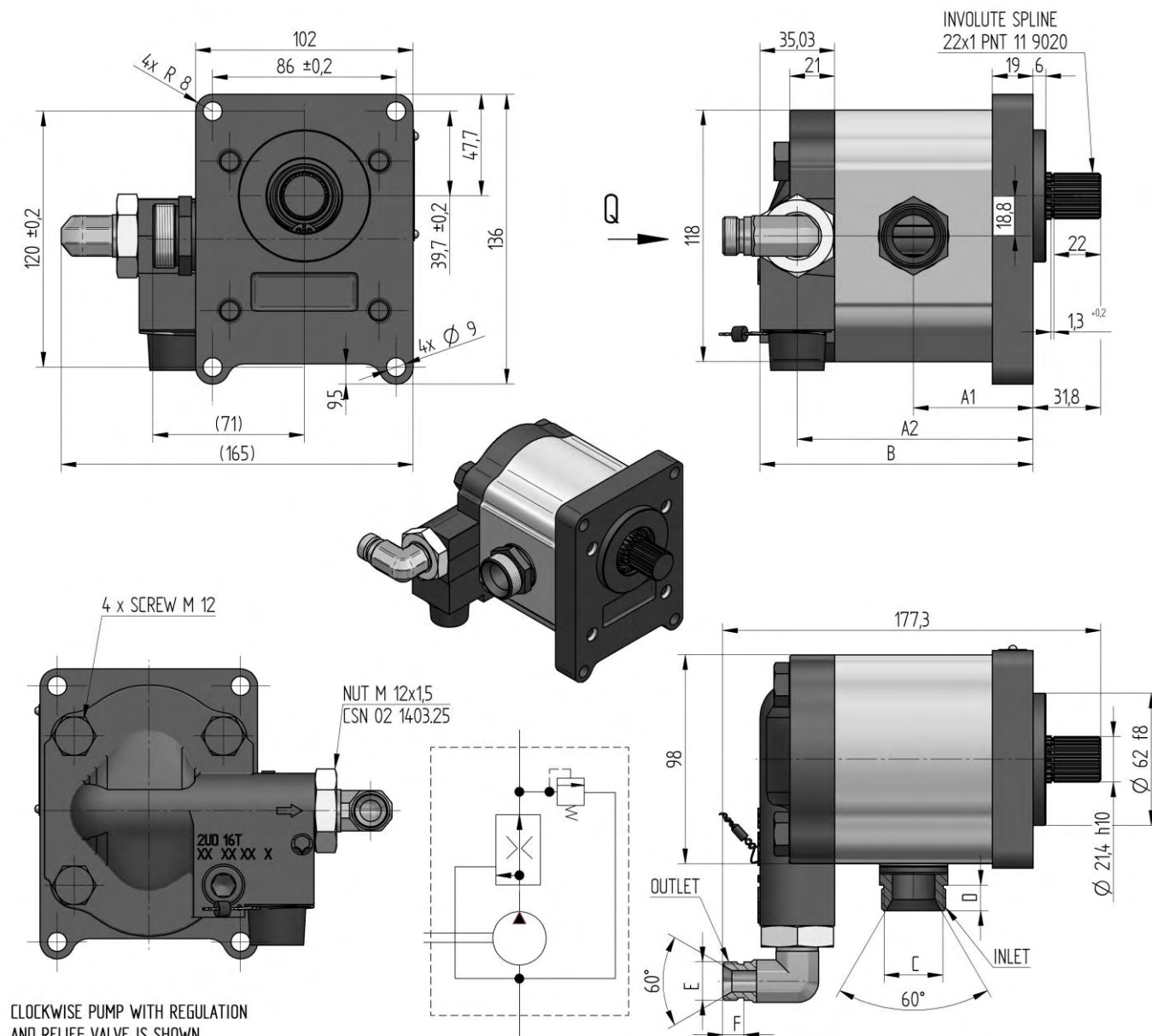
Code	A	B	C	D
M05	M18x1,5	14	24	1

CATALOGUE SHEETS OF 3 SERIES BASIC DESIGNS

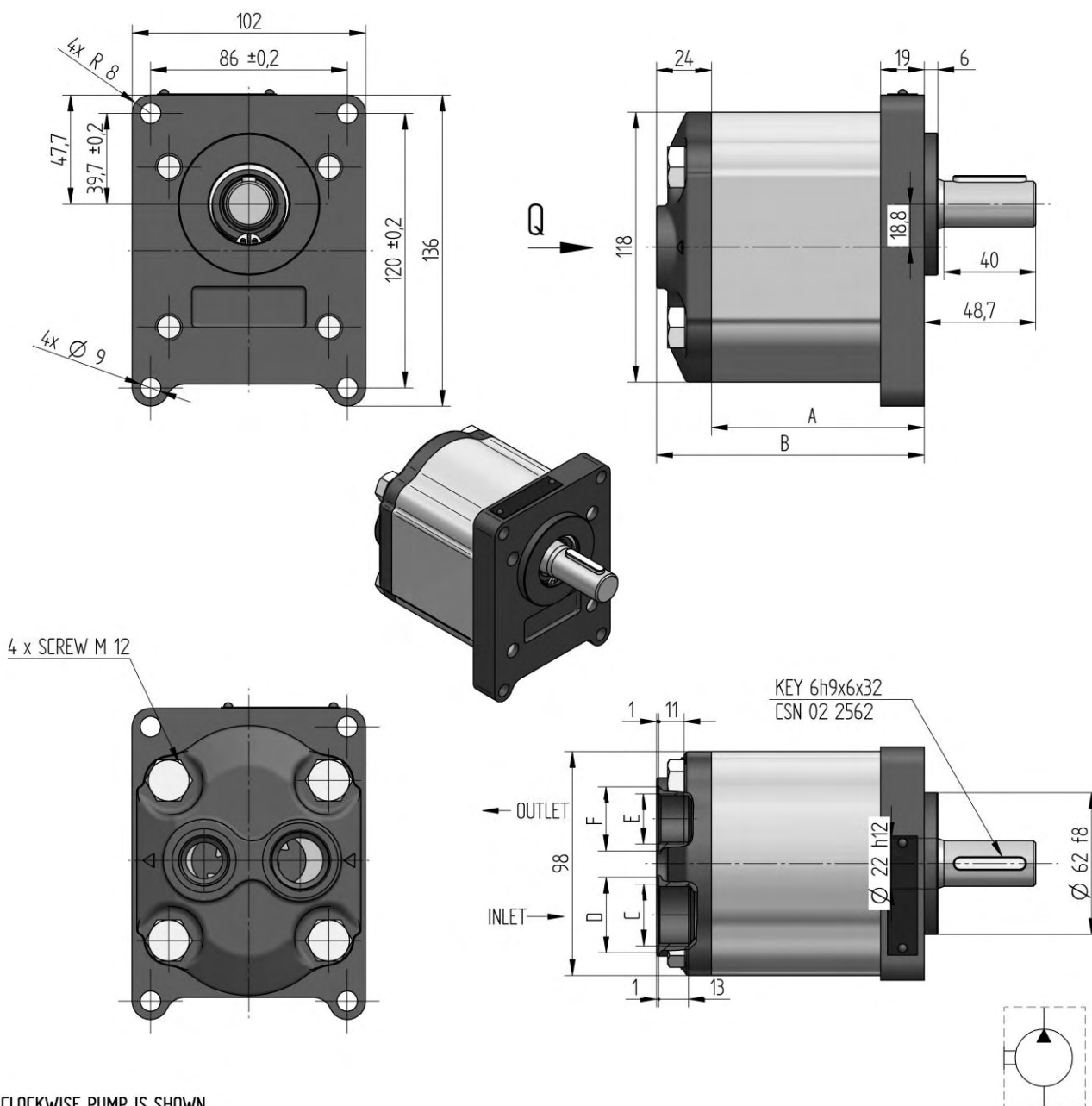


CLOCKWISE PUMP IS SHOWN

3-31R- R08D12-SM09M07-N	1183 9476	R	31	200	450	2800	65.50	131.0	M27x2	Ø 33	M22x1.5	Ø 28	
3-31L- R08D12-SM09M07-N	1183 9047	L											
3-28R- R08D12-SM09M07-N		R	28	230	450	3000	63.25	126.5	M27x2	Ø 33	M22x1.5	Ø 28	
3-28L- R08D12-SM09M07-N		L											
3-25R- R08D12-SM09M07-N	1183 9475	R	25	250	450	3200	61.50	123.0	M27x2	Ø 33	M22x1.5	Ø 28	
3-25L- R08D12-SM09M07-N	1183 9046	L											
3-20R- R08D12-SM09M07-N	1183 9412	R	20	270	450	3200	58.50	117.0	M27x2	Ø 33	M22x1.5	Ø 28	
3-20L- R08D12-SM09M07-N	1183 9413	L											
3-16R- R08D12-SM09M07-N	1183 9406	R	16	290	450	3200	56.00	112.0	M27x2	Ø 33	M22x1.5	Ø 28	
3-16L- R08D12-SM09M07-N	1183 9407	L											
3-12,5R- R08D12-SM09M07-N		R	12.5	300	450	3200	53.50	107.0	M27x2	Ø 33	M22x1.5	Ø 28	
3-12,5L- R08D12-SM09M07-N		L											
3-10R- R08D12-SM09M07-N	1183 9400	R	10	300	450	3200	52.25	104.5	M27x2	Ø 33	M22x1.5	Ø 28	
3-10L- R08D12-SM09M07-N	1183 9401	L											
3-8R- R08D12-SM09M07-N		R	8	300	600	3200	51.00	102.0	M27x2	Ø 33	M22x1.5	Ø 28	
3-8L- R08D12-SM09M07-N		L											
ORDER KEY	PURCH. CODE	DIRECT. OF ROT.	DISPLACEMENT [cm³/rev]	NOM. PRESS. [bar]	MIN. SPEED [min⁻¹]	MAX.	A	B	C	D	E	F	

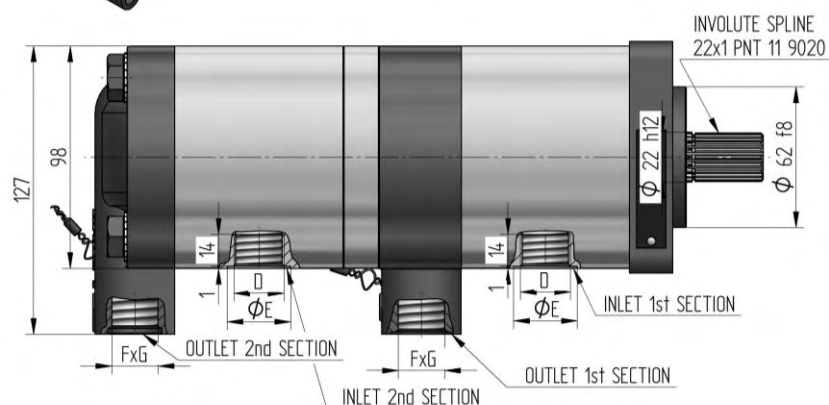
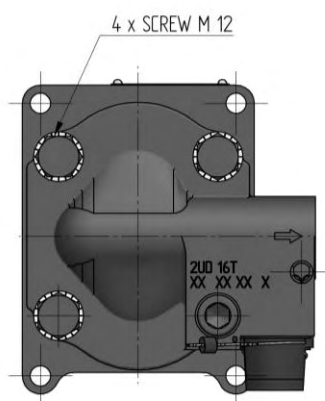
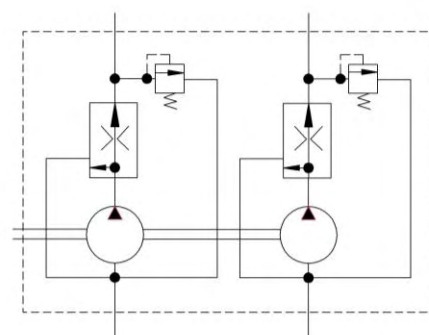
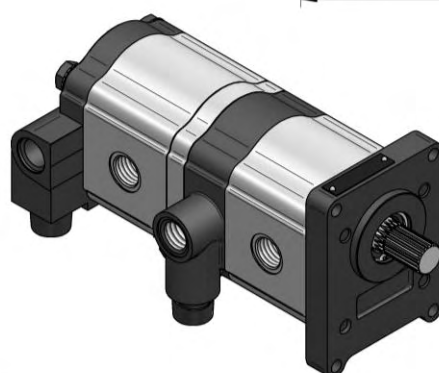
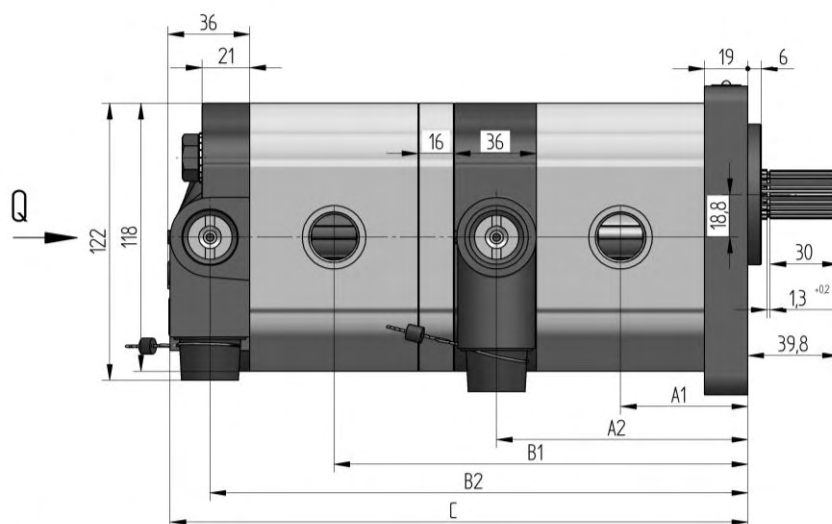
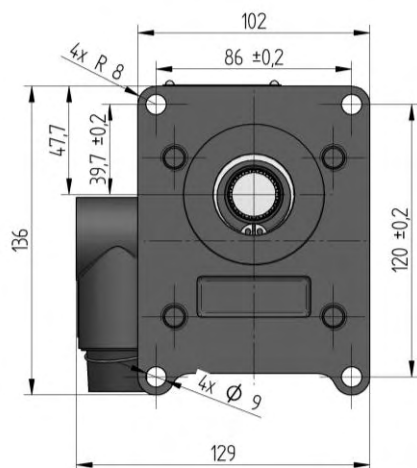


3-31R- R09D12-SZZ-V		R	31	450	2800	65.50	129.5	147.0	M30x2	14	M18x1.5	10
3-31L- R09D12-SZZ-V		L	28	450	3000	63.25	125.0	142.5	M30x2	14	M18x1.5	10
3-28R- R09D12-SZZ-V		R	25	450	3200	61.50	121.5	139.0	M30x2	14	M18x1.5	10
3-28L- R09D12-SZZ-V		L	20	450	3200	58.50	115.5	133.0	M30x2	14	M18x1.5	10
3-25R- R09D12-SZZ-V		R	16	450	3200	56.00	110.5	128.0	M30x2	14	M18x1.5	10
3-25L- R09D12-SZZ-V		L	12.5	450	3200	53.50	105.5	123.0	M30x2	14	M18x1.5	10
3-20R- R09D12-SZZ-V		R	10	450	3200	52.25	103.0	120.5	M30x2	14	M18x1.5	10
3-20L- R09D12-SZZ-V		L	8	600	3200	51.00	100.5	118.0	M30x2	14	M18x1.5	10
3-16R- R09D12-SZZ-V	1183 9633	R										
3-16L- R09D12-SZZ-V		L										
3-12.5R- R09D12-SZZ-V		R										
3-12.5L- R09D12-SZZ-V		L										
3-10R- R09D12-SZZ-V		R										
3-10L- R09D12-SZZ-V		L										
3-8R- R09D12-SZZ-V		R										
3-8L- R09D12-SZZ-V		L										
ORDER KEY	PURCH. CODE	DIRECT. OF ROT.	DISPLACEMENT [cm³/rev]	MIN. SPEED [min⁻¹]	MAX. SPEED [min⁻¹]	A1	A2	B	C	D	E	F



CLOCKWISE PUMP IS SHOWN

3-31R- R09V13-RM09M07-N		R	31	200	450	2800	112.0	136.0	M27x2	Ø 33	M22x1.5	Ø 28		
3-31L- R09V13-R M09M07-N		L												
3-28R- R09V13-RM09M07-N		R	28	230	450	3000	107.5	131.5	M27x2	Ø 33	M22x1.5	Ø 28		
3-28L- R09V13-RM09M07-N		L												
3-25R- R09V13-RM09M07-N		R	25	250	450	3200	104.0	128.0	M27x2	Ø 33	M22x1.5	Ø 28		
3-25L- R09V13-RM09M07-N		L												
3-20R- R09V13-RM09M07-N		R	20	270	450	3200	98.0	122.0	M27x2	Ø 33	M22x1.5	Ø 28		
3-20L- R09V13-RM09M07-N		L												
3-16R- R09V13-RM09M07-N		R	16	290	450	3200	93.0	117.0	M27x2	Ø 33	M22x1.5	Ø 28		
3-16L- R09V13-RM09M07-N		L												
3-12.5R- R09V13-RM09M07-N		R	12.5	300	450	3200	88.0	112.0	M27x2	Ø 33	M22x1.5	Ø 28		
3-12.5L- R09V13-RM09M07-N		L												
3-10R- R09V13-RM09M07-N	1183 9404	R	10	300	450	3200	85.5	109.5	M27x2	Ø 33	M22x1.5	Ø 28		
3-10L- R09V13-RM09M07-N		L												
3-8R- R09V13-RM09M07-N		R	8	300	600	3200	83.0	107.0	M27x2	Ø 33	M22x1.5	Ø 28		
3-8L- R09V13-RM09M07-N		L												
ORDER KEY	PURCH. CODE	DIRECT. OF ROT.	DISPLA- CEMENT [cm³ /rev]	NOM. PRESS. [bar]	SPEED [min ⁻¹]		A	B	C	DIMENSION [mm]			F	



CLOCKWISE PUMP IS SHOWN

3-31/31R- R09D12-SM07M07/ M07M07-N		R	31	450	2800	65.50	129.5	210.50	274.5	293.0	M22x1.5	28	M22x1.5	28
3-31/31L- R09D12-SM07M07/ M07M07-N		L												
3-28/28R- R09D12-SM07M07/ M07M07-N		R	28	450	3000	63.25	125.0	203.75	265.5	284.0	M22x1.5	28	M22x1.5	28
3-28/28L- R09D12-SM07M07/ M07M07-N		L												
3-25/25R- R09D12-SM07M07/ M07M07-N		R	25	450	3200	61.50	121.5	198.50	258.5	277.0	M22x1.5	28	M22x1.5	28
3-25/25L- R09D12-SM07M07/ M07M07-N		L												
3-20/20R- R09D12-SM07M07/ M07M07-N		R	20	450	3200	58.50	115.5	189.50	246.5	265.0	M22x1.5	28	M22x1.5	28
3-20/20L- R09D12-SM07M07/ M07M07-N		L												
3-16/16R- R09D12-SM07M07/ M07M07-N	1183 9645	R	16	450	3200	56.00	110.5	182.00	236.5	255.0	M22x1.5	28	M22x1.5	28
3-16/16L- R09D12-SM07M07/ M07M07-N		L												
3-12.5/12.5R- R09D12-SM07M07/M07M07-N		R	12.5	450	3200	53.50	105.5	174.50	226.5	245.0	M22x1.5	28	M22x1.5	28
3-12.5/12.5L- R09D12-SM07M07/M07M07-N		L												
3-10/10R- R09D12-SM07M07/ M07M07-N		R	10	450	3200	52.25	103.0	170.75	221.5	240.0	M22x1.5	28	M22x1.5	28
3-10/10L- R09D12-SM07M07/ M07M07-N		L												
3-8/8R- R09D12-SM07M07/ M07M07-N		R	8	600	3200	51.00	100.5	167.00	216.5	265.0	M22x1.5	28	M22x1.5	28
3-8/8L- R09D12-SM07M07/ M07M07-N		L												
ORDER KEY	PURCH. CODE	DIRECT. OF ROT.	DISPLACEMENT [cm³/rev]	MIN. SPEED [min⁻¹]	MAX SPEED [min⁻¹]	A1	A2	B1	B2	C	D	E	F	G
DIMENSION [mm]														

[illegible]