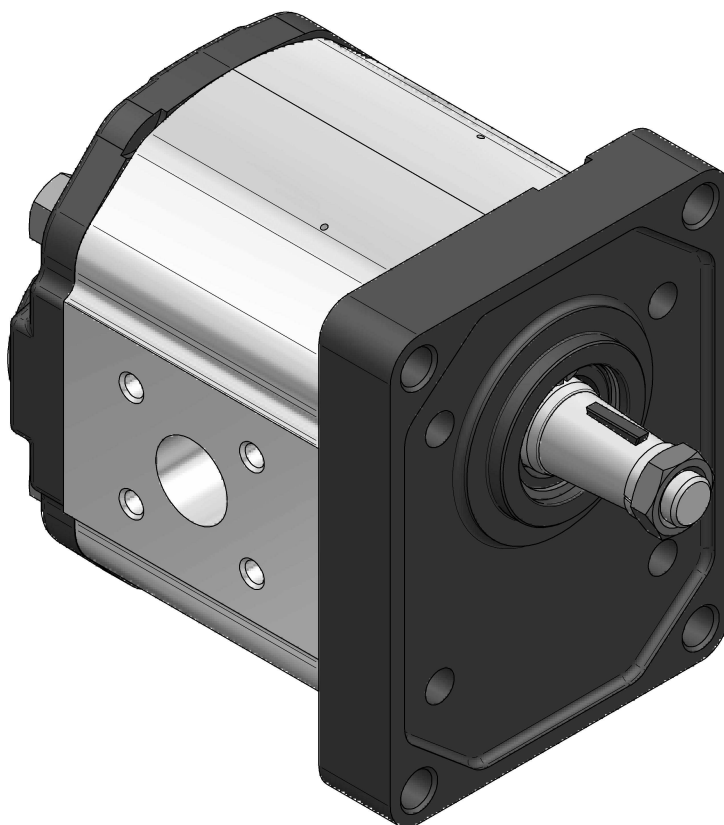


BASIC DESCRIPTION

Q und QLS line pumps are particularly designed to be used in mobile hydraulic systems of agricultural and road building machines as well as in advanced hydraulic systems of material handling devices. The geometric volume size range of this line is $V_g = 10$ to $100 \text{ cm}^3/\text{rev}$.

The pumps are characterized by simple construction with a hydraulic pressure balance, compact dimensions and a wide range of types and connections. The flange and the pump cover are made of grey cast iron, the body of a section bar made of a heavy duty aluminum alloy. The gear wheels with 12 teeth made of heavy duty steel are optimized for low-noise applications. QLS construction enables the pumps to be used at low revolutions at high pressure.

Q and QLS pumps are produced in various designs with diverse drives, connecting flanges, fluid inlets and outlets. They comply with the ISO, SAE, UNI as well as other worldwide standards. They can be delivered in one-way or multiple designs. Furthermore, the pumps are also available in reversible version with internal or external drainage.

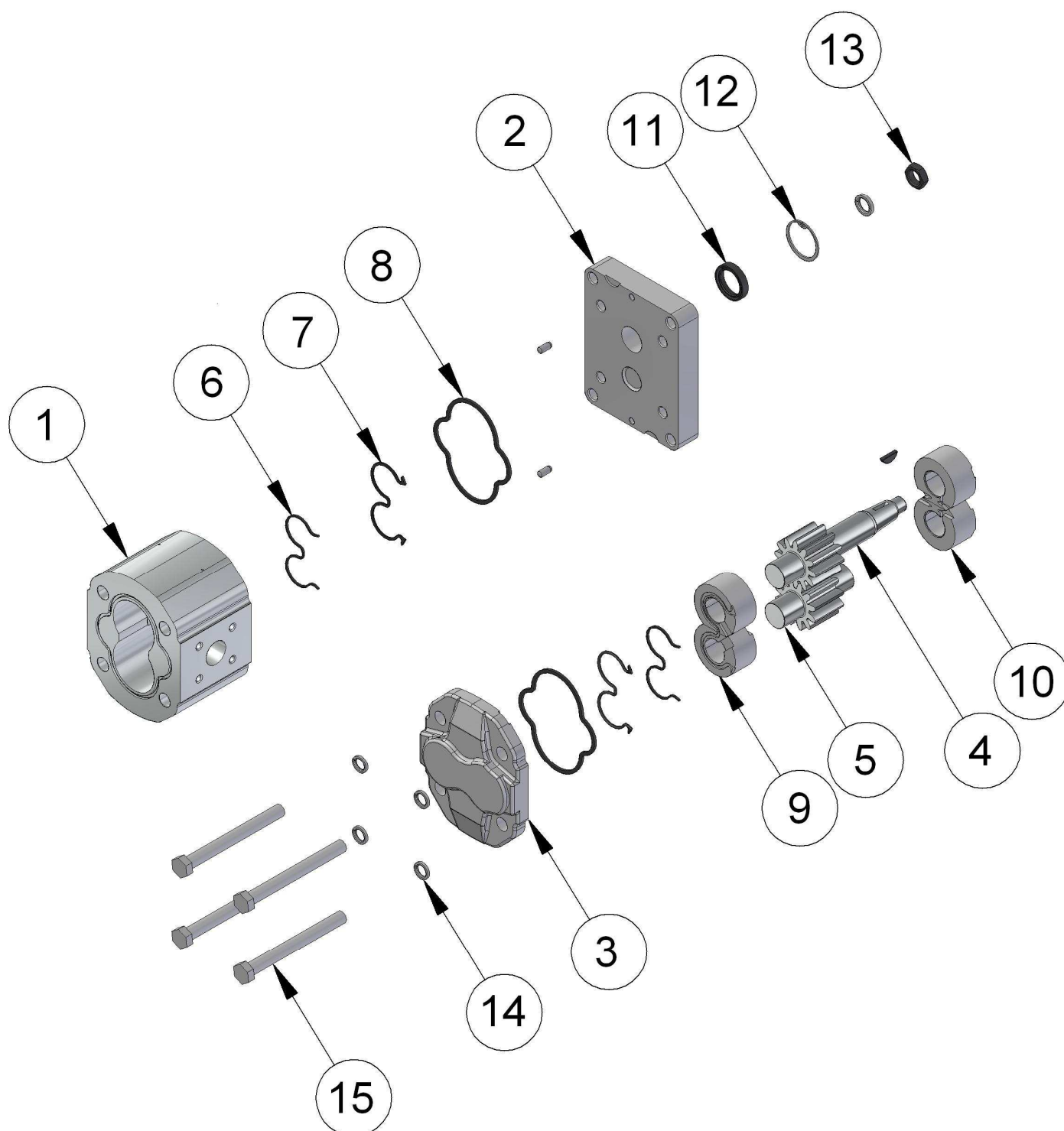


PARAMETER TABLE

Nominal Size Parameters		Symb.	Unit	Q – 10	Q – 13,5	Q – 17	Q – 22,5	Q – 27	Q – 34
Nominal displacement		V_g	[cm ³]	10	13,5	17	22,5	27	34
Rotation speed	nominal	n_n	[min ⁻¹]	1500					
	min.	n_{min}	[min ⁻¹]	500					
	max.	n_{max}	[min ⁻¹]	3000	3000	3000	3000	3000	2800
Pressure at the inlet port	max.	p_{1min}	[bar]	-0,3					
	min.	p_{1max}	[bar]	0,5					
Pressure at the outlet port	max. continuous pressure	p_{2n}	[bar]	270	290	290	290	290	280
	max. pressure	p_{2max}	[bar]	290	310	310	310	310	300
	peak pressure	p_3	[bar]	310	330	330	330	330	320
Nominal flow rate (min.) at n_n and p_{2n}		Q_n	[dm ³ .min ⁻¹]	13,5	18,2	23,0	30,5	36,0	46,0
Maximum flow rate at n_{max} and p_{2max}		Q_{max}	[dm ³ .min ⁻¹]	30,0	40,6	51,2	67,1	81,2	93,9
Nominal input power (max.) at n_n and p_{2n}		P_n	[kW]	8,0	11,7	14,7	19,3	23,3	27,9
Max. input power at n_{max} and p_{2max}		P_{max}	[kW]	17,2	24,9	31,4	41,2	49,9	55,8
Weight		m	[Kg]	7,9	8,0	8,1	8,3	8,5	8,8

Nominal Size Parameters		Symb.	Unit	Q – 43	Q – 51	Q – 61	Q – 71	Q – 82	Q – 100
Nominal displacement		V_g	[cm ³]	43	51	61	71	82	100
Rotation speed	nominal	n_n	[min ⁻¹]	1500					
	min.	n_{min}	[min ⁻¹]	500					
	max.	n_{max}	[min ⁻¹]	2500	2500	2000	1800	1800	1800
Pressure at the inlet port	max.	p_{1min}	[bar]	-0,3					
	min.	p_{1max}	[bar]	0,5					
Pressure at the outlet port	max. continuous pressure	p_{2n}	[bar]	270	250	230	210	180	180
	max. pressure	p_{2max}	[bar]	290	270	250	230	200	200
	peak pressure	p_3	[bar]	310	290	270	250	220	220
Nominal flow rate (min.) at n_n and p_{2n}		Q_n	[dm ³ .min ⁻¹]	58,0	69,0	82,0	96,0	110,0	135,0
Maximum flow rate at n_{max} and p_{2max}		Q_{max}	[dm ³ .min ⁻¹]	106,0	126,5	121,3	127,1	146,2	178,2
Nominal input power (max.) at n_n and p_{2n}		P_n	[kW]	34,0	37,6	41,4	44,1	43,4	52,9
Max. input power at n_{max} and p_{2max}		P_{max}	[kW]	60,9	67,7	60,0	57,9	57,9	70,6
Weight		m	[Kg]	9,2	9,5	9,9	10,2	10,6	11,8

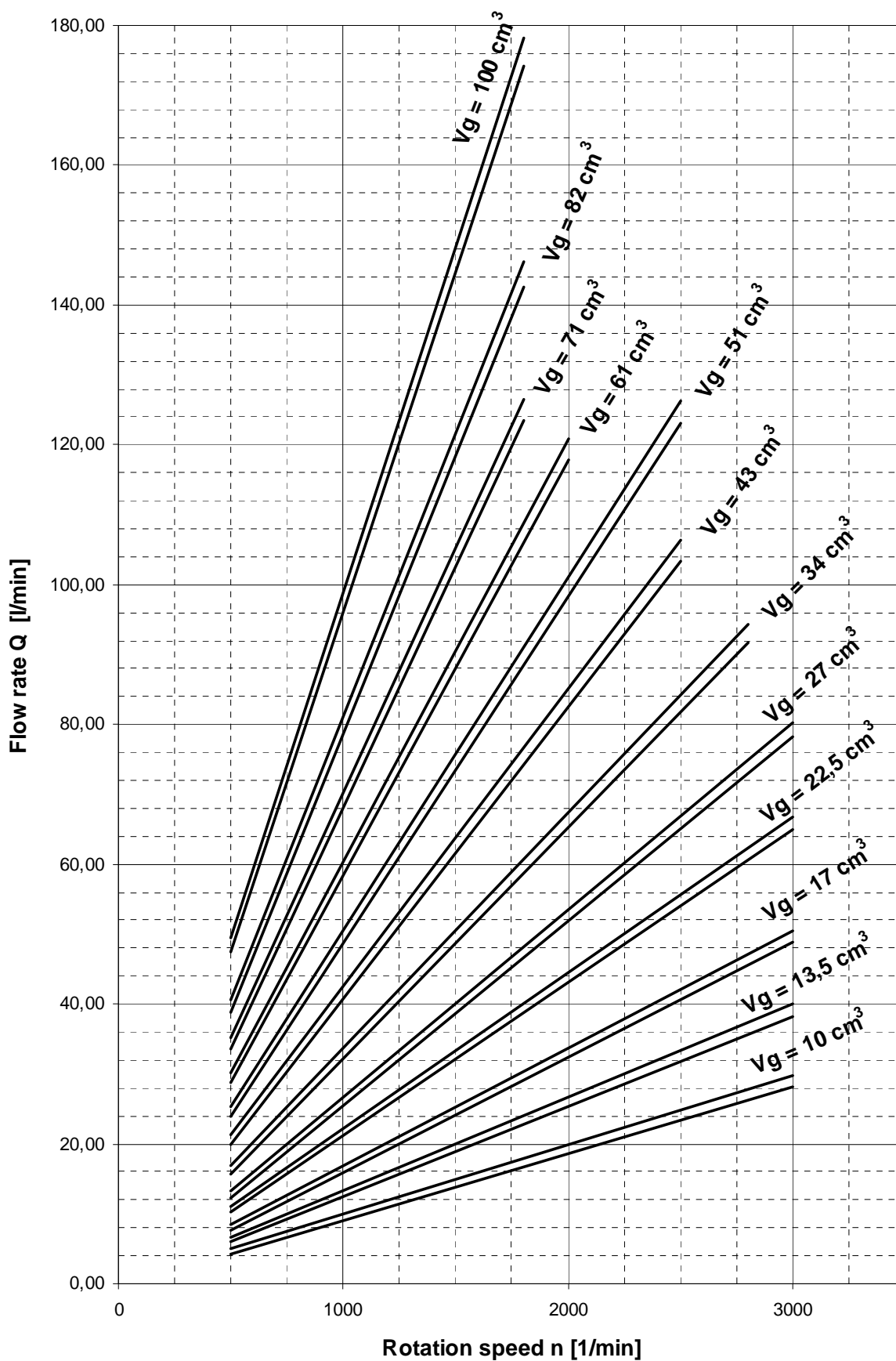
BASIC PARTS



1. Body
2. Flange
3. Cover
4. Driving gear
5. Driven gear
6. Sealing protective plate
7. Thrust pressure seal
8. Peripheral sealing

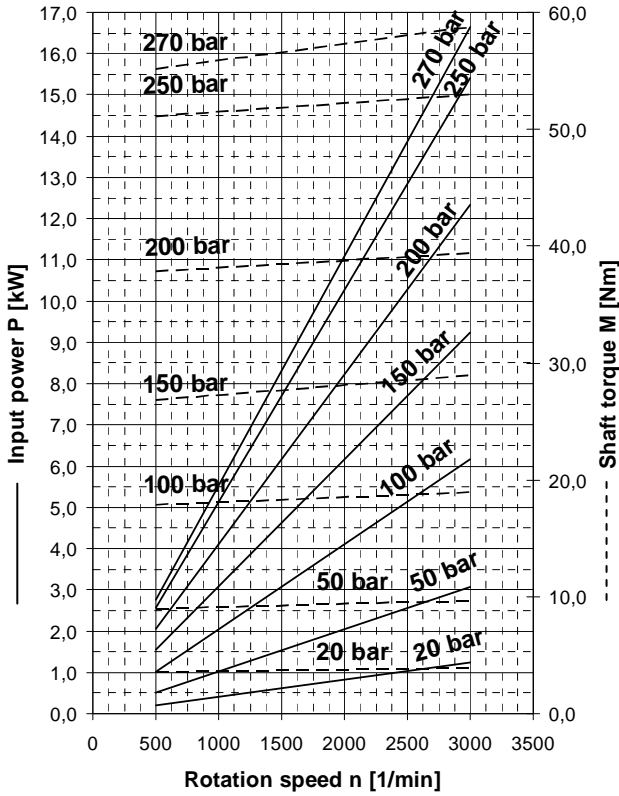
9. Bearing left
10. Bearing right
11. Shaft seal
12. Safety ring
13. Nut
14. Lock washer
15. Connection bolts

FLOW RATE AND INPUT POWER CURVES

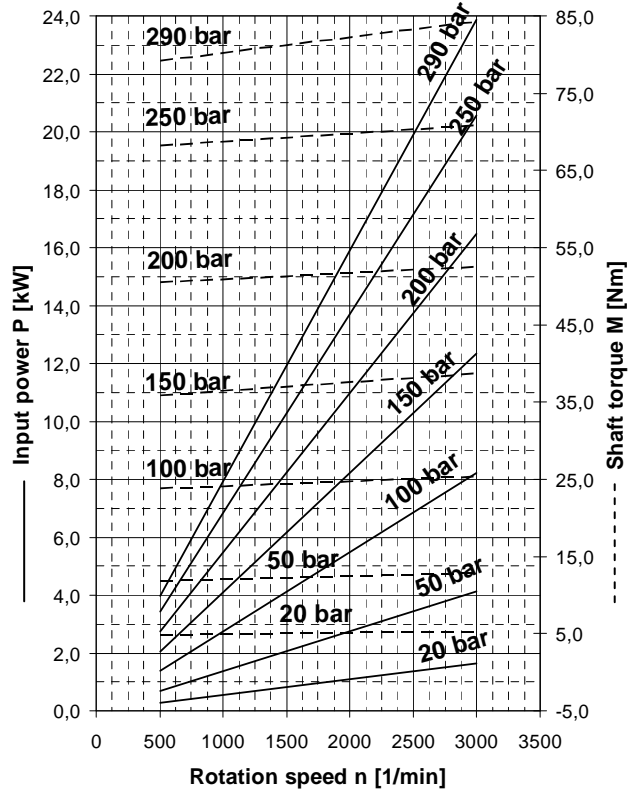


The curves above are valid for the ISO Vg 46 oil at temperature $t = 45^{\circ}\text{C}$.

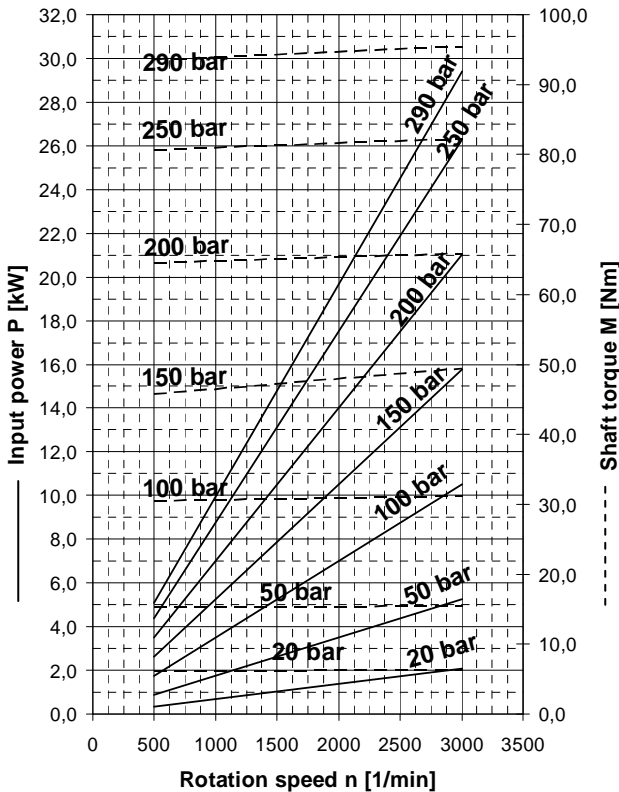
10 cm³



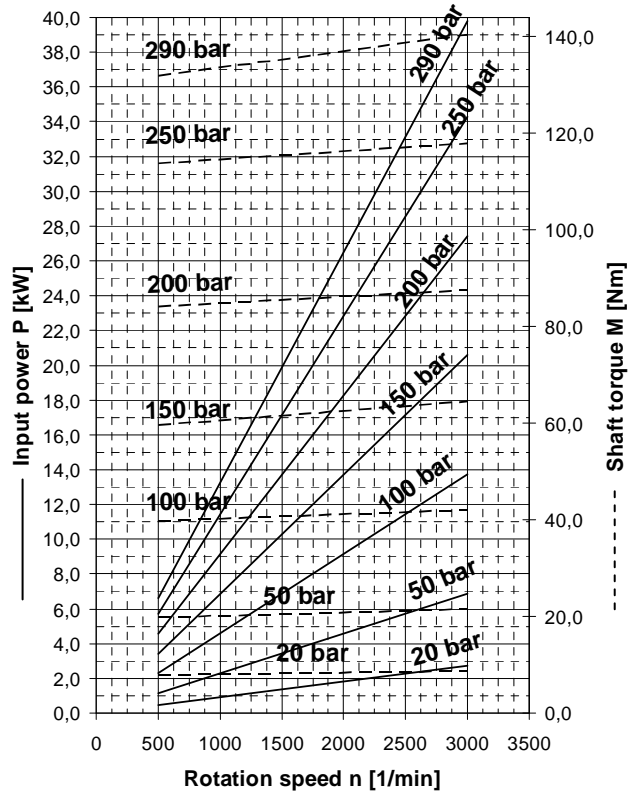
13,5 cm³



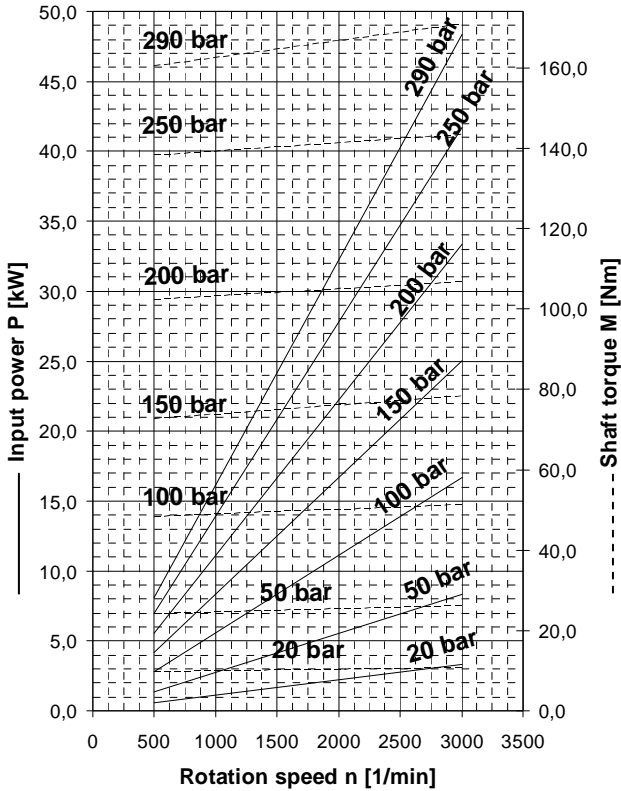
17 cm³



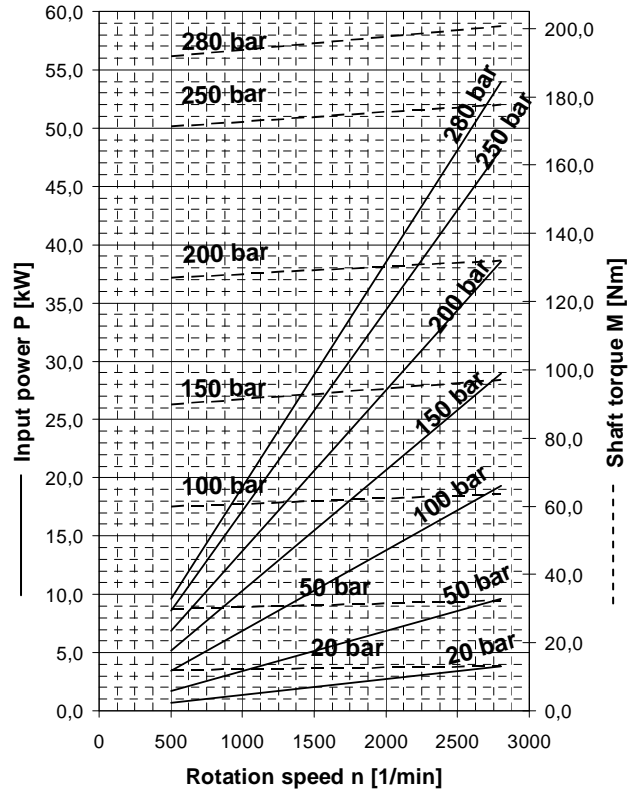
22,5 cm³



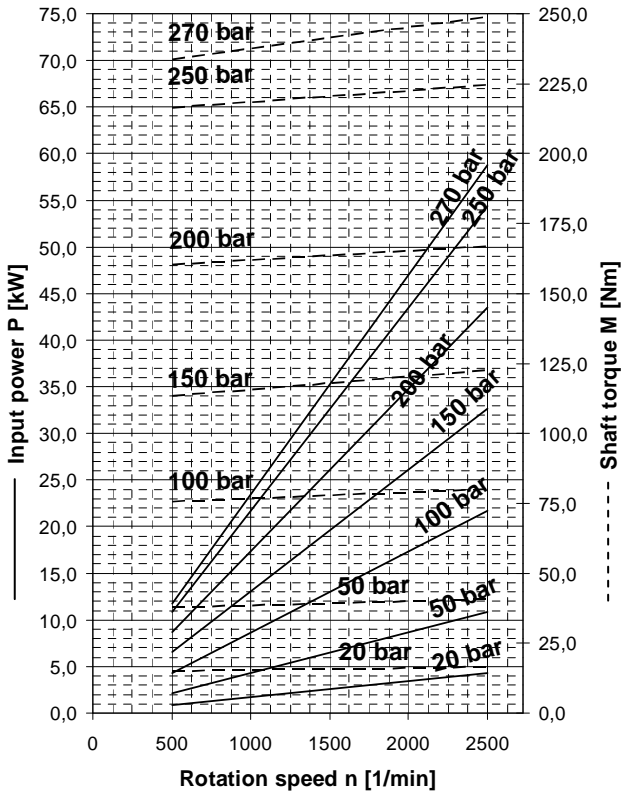
27 cm³



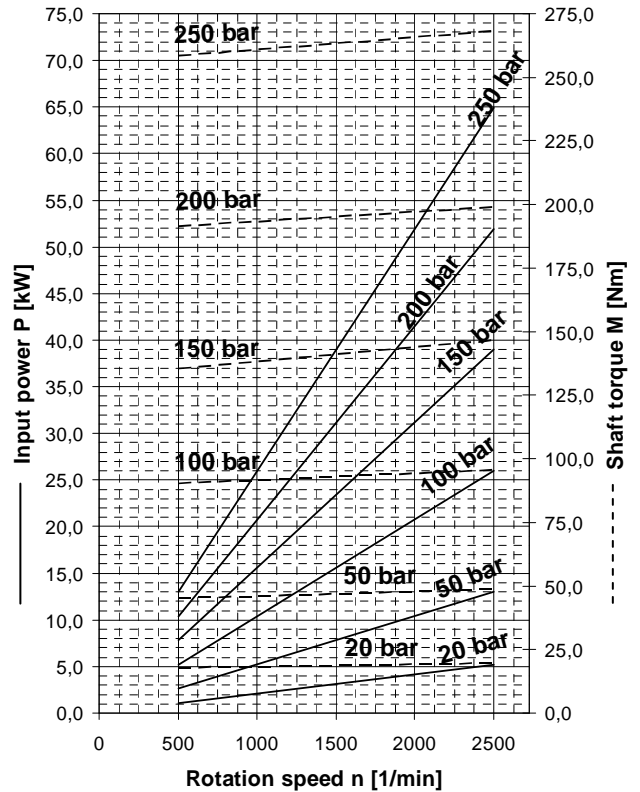
34 cm³



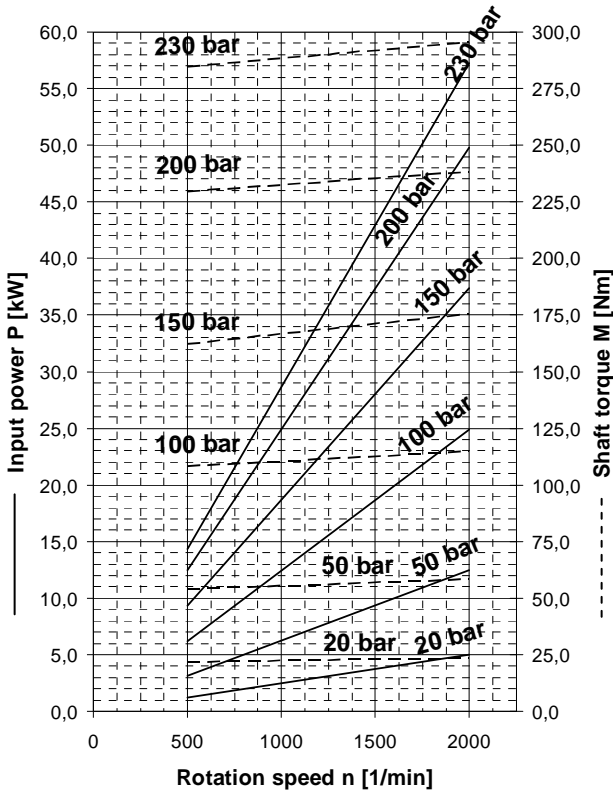
43 cm³



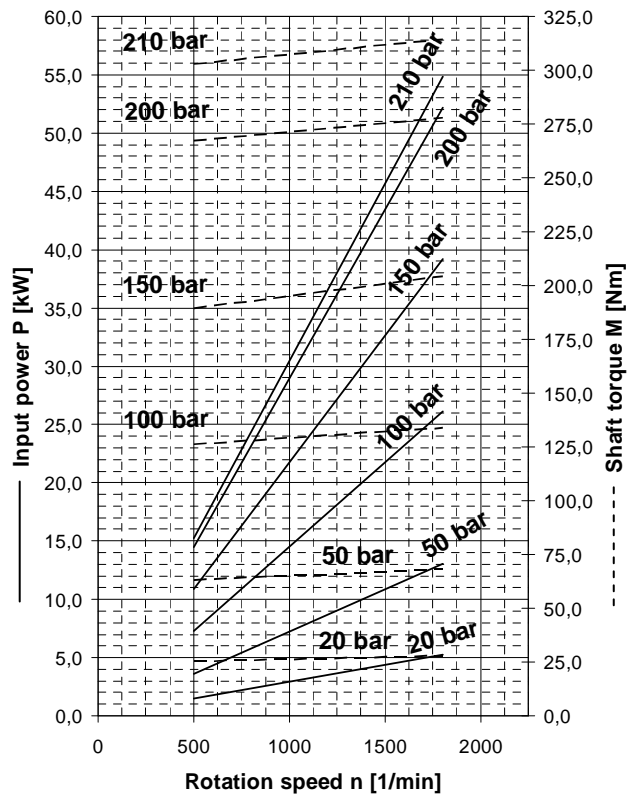
51 cm³



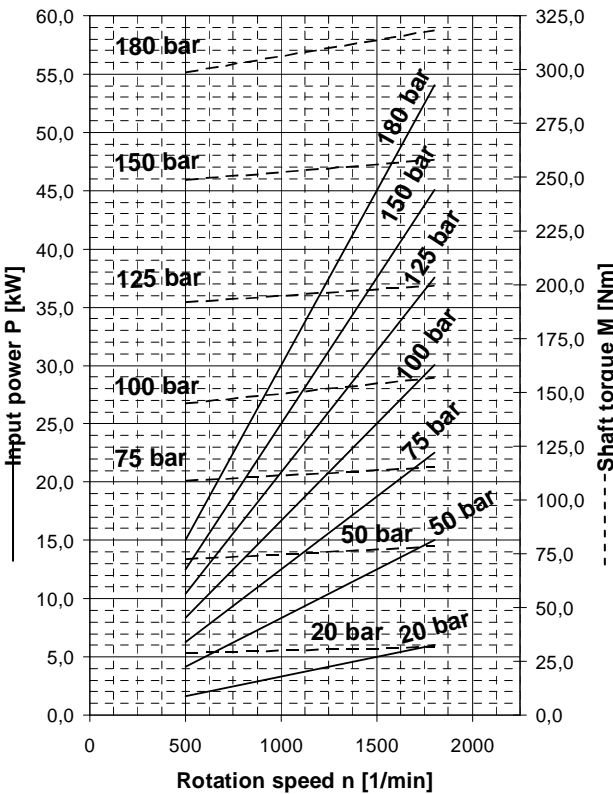
61 cm³



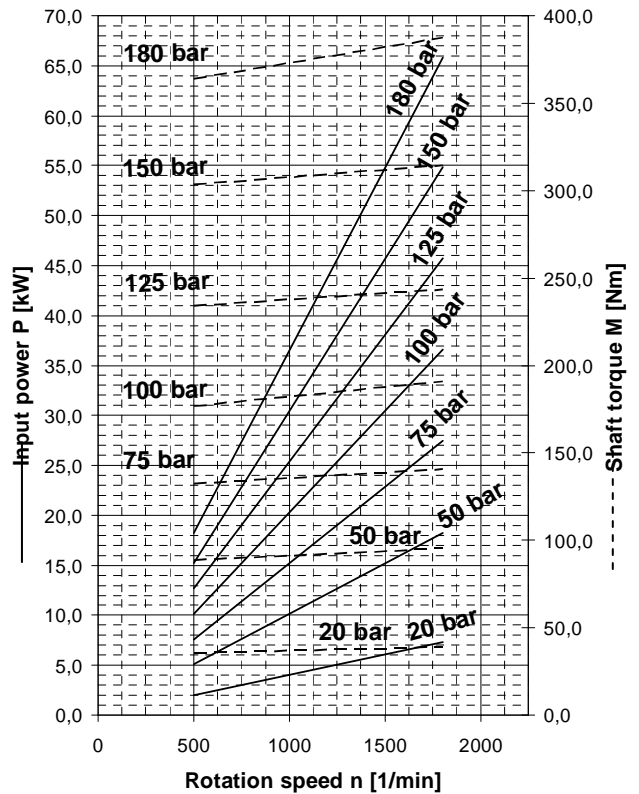
71 cm³



82 cm³



100 cm³



CALCULATION FORMULAS

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

V_g	[cm ³]	geometric pump volume
n	[min ⁻¹]	rotation speed
η_v	[-]	volumetric efficiency

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

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

p	[bar]	required pressure at the outlet port
η_v	[-]	mechanic efficiency

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

η_t	[-]	total efficiency
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PUMP EFFICIENCY

Volumetric efficiency η_v

Volumetric efficiency determines the amount of flow losses. Its value varies: $\eta_v = 0,92 \div 0,98$ (depending on the speed and the pressure at the pressure port). Volumetric efficiency can be expressed as follows:

$$\eta_v = \frac{Q_{\text{skut}}}{Q_{\text{teor}}} \quad [-]$$

Q_{skut}	[dm ³ ·min ⁻¹]	actual flow rate
Q_{teor}	[dm ³ ·min ⁻¹]	theoretical flow rate

Mechanical efficiency η_m

Mechanical efficiency determines the hydraulic-mechanical losses. Its value varies at about $\eta_m = 0,85$. Mechanical efficiency can be expressed as follows:

$$\eta_m = \frac{M_{\text{teor}}}{M_{\text{skut}}} \quad [-]$$

M_{skut}	[N.m]	actual shaft torque
M_{teor}	[N.m]	theoretical shaft torque

Total efficiency η_t

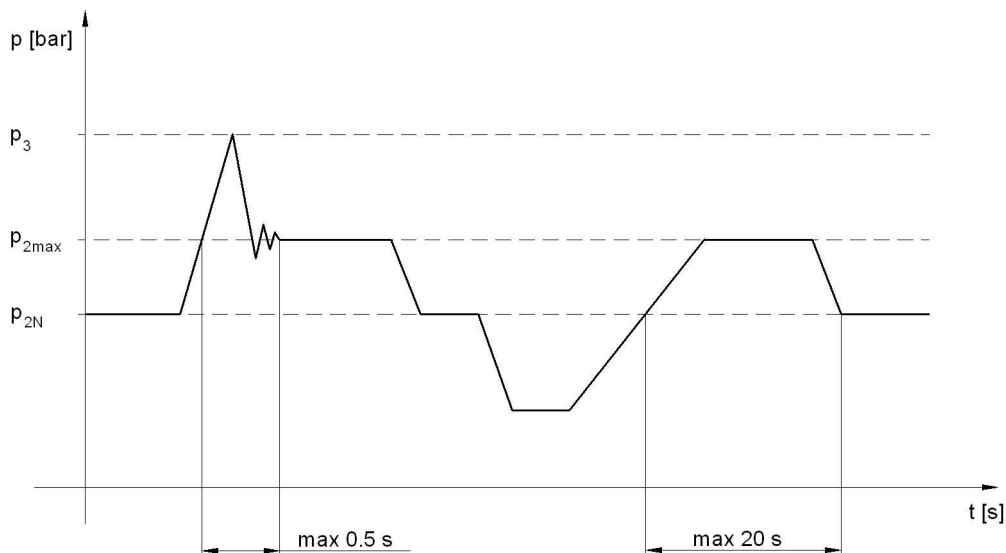
Total efficiency is defined as the arithmetic product of η_v and η_m and expresses the difference between the theoretical and the required actual input power:

$$\eta_t = \eta_v \cdot \eta_m = \frac{P_{\text{teor}}}{P_{\text{skut}}} \quad [-]$$

P_{skut}	[kW]	actual input power
P_{teor}	[kW]	theoretical input power

COMPRESSION LOAD

p_{2N}	max. continuous pressure	maximum working pressure at which the pump can be operated without time-limitation
p_{2max}	maximum pressure	maximum short-term (max. 20s) design pressure
p₃	peak pressure	short-term pressure (split second) arising in case of a sudden change of the operating mode; any excess of this pressure during operation is inadmissible.



WORKING LIQUID

- Mineral oils for hydraulic drives
- Hydraulic liquids based on vegetable oils, suitable for hydrostatic drives

Liquid temperature

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

Cinematic viscosity

during continuous operation: $v = 20 \div 80$ [mm² · s⁻¹]
 max.: $v = 1200$ [mm² · s⁻¹]
 min.: $v = 10$ [mm² · 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)

Contamination class ISO 4406

19/16 (for pressure $p_2 < 200$ bar)
 17/14 (for pressure $p_2 > 200$ bar)

Contamination class NAS 1638

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

DIRECTION OF ROTATION

When determining the direction of rotation, always look at the drive shaft. The pump is allowed to be operated in the defined direction of rotation only.

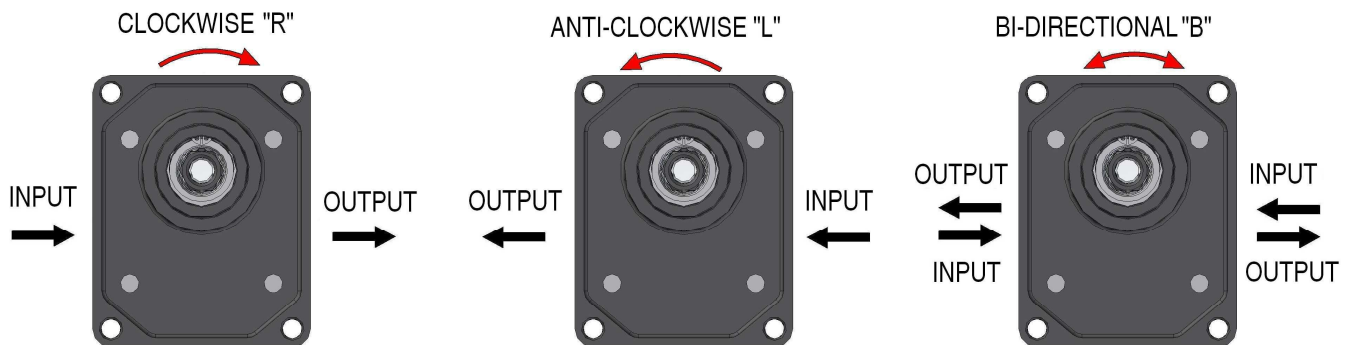
FURTHER REQUIREMENTS

The drive mechanism is not allowed to produce axial or radial load of the pump shaft, unless this is expressly allowed for pumps with a front end bearing.

All requirements influencing the pump's technical parameters and properties are referred to in the respective service instructions, technical conditions as well as the test specification of the manufacturer.

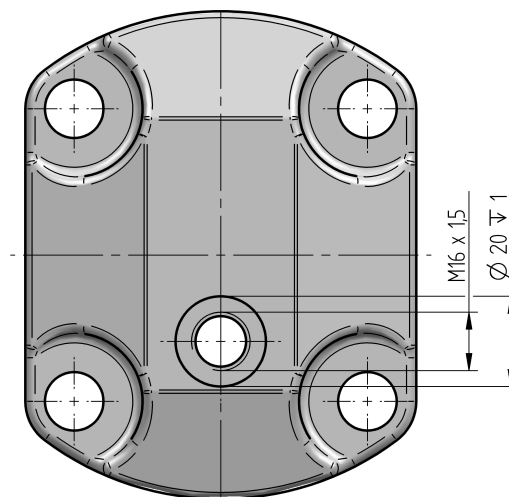
DIRECTION OF ROTATION

When determining the direction of rotation, always look at the drive shaft. The pump is allowed to be operated in the defined direction of rotation only.



BI-DIRECTIONAL VERSION

Pumps, which can optionally rotate clockwise or anti-clockwise, have a different internal arrangement requiring drainage. There are two types of drainage - internal drainage and external drainage. The internal drainage is always connected with the discharge port by means of valves. The external drainage is solved by means of an orifice located in the cover opposite the driven gear (see image below).



ORDER KEY – SIMPLE VERSION

Q - 51 R - R1 C1 - S G0 G4 - N . 001

Code	Displacement [cm ³]
10	10,11
13,5	13,67
17	17,24
22,5	22,59
27	27,35
34	33,89
43	42,81
51	51,13
61	61,24
71	71,35
82	82,05
100	99,98
XX	Other displacements on request

Code	Rotation
R	Clockwise rotation
L	Anti-clockwise rotation
B	Bi-directional rotation

Code	Type
Q	Q Series Gear Pump
QLS	Q Series Gear Pump, short version

Code	Flange design
R1	Rectangular flange, centre ring \varnothing 50,8 spacing 98,5 x 128
R2	Rectangular flange UN II
R3	Rectangular flange UN III
R4	Rectangular flange, centre ring \varnothing 105 spacing 102,5 x 145
S2	SAE B – 2 aperture
S3	SAE C – 2 aperture
S4	SAE B – 4 aperture
I1	ISO, centre ring \varnothing 80 front end bearing
I2	ISO, centre ring \varnothing 80
U1	UNI
A1	trough - bolts
A2	trough - bolts
B1	Flange 4 aperture centre ring \varnothing 90 spacing 110 x 86
Z	Special design

Code	Location of suction and pressure port	
S		Side (in the body)
R		Rear (in the cover)
C		Combination

Code	Drive shaft design	
C1		Taper 1:8
C2		Taper 1:5
D1		Grooving 25x1,5 CSN 014950
D2		Grooving SAE 13T
D3		Grooving SAE 15T
D4		Grooving UNI 221
D5		Straight-flanked grooving DIN 5462 A8x32x36x6
D6		Straight-flanked grooving 6 grooves, \varnothing 20
D7		Straight-flanked grooving 6 grooves, \varnothing 19
D8		Grooving B 22x19 DIN 5482
K1		Cross coupling
V1		Cylindric SAE \varnothing 22,225
V2		Cylindric \varnothing 20h7
V3		Cylindric \varnothing 25
Z		Special design

Code	Special arrangements
-	No special arrangements
001	Two-edged shaft seal
004	Without shaft seal
007	Slew flange ocket
008	With front end bearing light design
050	Built-in bleeder

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

Code	Design of suction and pressure port	
M08		Thread M 27x1,5
M09		Thread M 27x2
M11		Thread M 33x1,5
M12		Thread M 33x2
M15		Thread M 48x2
G03		Thread BSP G1/2
G04		Thread BSP G3/4
G05		Thread BSP G1*
G06		Thread BSP G1 1/4
G07		Thread BSP G1 1/2
U03		Thread 3/4 - 16 UNF
U04		Thread 7/8 - 14 UNF
U05		Thread 1-1/16 - 12 UN
U07		Thread 1-5/16 - 12 UN
U08		Thread 1-5/8 - 12 UN
H08		Flanged fitting 4xM8/40
H09		Flanged fitting 4xM8/55 ; \varnothing 18
H10		Flanged fitting 4xM8/55 ; \varnothing 25
H11		Flanged fitting 4xM10/51
A02		Flanged fitting SAE 3/4
A03		Flanged fitting SAE 1
A04		Flanged fitting SAE 1 1/4
A05		Flanged fitting SAE 1 1/2
A06		Flanged fitting SAE 2
E02		Flanged fitting 3/4
E03		Flanged fitting 1
E04		Flanged fitting 1 1/4
E05		Flanged fitting 1 1/2
E06		Flanged fitting 2
K03		Flanged fitting 4xM8/40; \varnothing 18
K04		Flanged fitting 4xM10/51; \varnothing 26
K05		Flanged fitting 4xM8/55; \varnothing 18
K06		Flanged fitting 4xM8/55; \varnothing 25
S01		Flanged fitting, square 4xM8/46x46
Z		Special design











ORDER KEY – MULTIPLE VERSION



Q - 43 / 43 R - R1 D1 - S G03 G04 / G03 G04 - V . 001















Code	Displacement [cm ³]
10	10,11
13,5	13,67
17	17,24
22,5	22,59
27	27,35
34	33,89
43	42,81
51	51,13
61	61,24
71	71,35
82	82,05
100	99,98
XX	Other displacements on request

Code	Rotation
R	Clockwise rotation
L	Anti-clockwise rotation
B	Bi-directional rotation

Code	Type
Q	Q Series Gear Pump
QLS	Q Series Gear Pump, short version













Code	Flange design
R1	Rectangular flange, centre ring \varnothing 50,8 spacing 98,5 x 128
R2	 Rectangular flange UN II
R3	 Rectangular flange UN III
R4	Rectangular flange, centre ring \varnothing 105 spacing 102,5 x 145
S2	 SAE B – 2 aperture
S3	 SAE C – 2 aperture
S4	 SAE B – 4 aperture
I1	 ISO, centre ring \varnothing 80 front end bearing
I2	 ISO, centre ring \varnothing 80
U1	 UNI
A1	 trough - bolts
A2	 trough - bolts
B1	Flange 4 aperture centre ring \varnothing 90 spacing 110 x 86
Z	Special design

Code	Location of suction and pressure port	
S		Side (in the body)
C		Combination

Code	Drive shaft design
C1	 Taper 1:8
C2	 Taper 1:5
D1	 Grooving 25x1,5 ČSN 014950
D2	 Grooving SAE 13T
D3	 Grooving SAE 15T
D4	 Grooving UNI 221
D5	 Straight-flanked grooving DIN 5462 A8x32x36x6
D6	 Straight-flanked grooving 6 grooves, \varnothing 20
D7	 Straight-flanked grooving 6 grooves, \varnothing 19
D8	 Grooving B 22x19 DIN 5482
K1	 Cross coupling
V1	 Cylindric SAE \varnothing 22,225
V2	 Cylindric \varnothing 20h7
V3	 Cylindric \varnothing 25
Z	Special design

Code	Special arrangements
-	No special arrangements
001	Two-edged shaft seal
004	Without shaft seal
007	Slew flange ocket
008	With front end bearing light design
050	Built-in bleeder

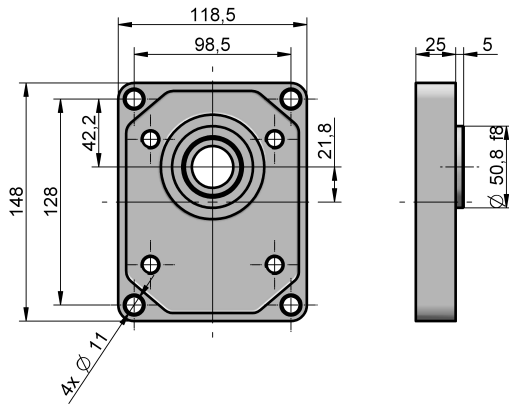
Code	Sealing material
N	NBR
V	FKM (VITON)
H	HNBR

Code	Design of suction and pressure port	
M08		Thread M 27x1,5
M09		Thread M 27x2
M11		Thread M 33x1,5
M12		Thread M 33x2
M15		Thread M 48x2
G03		Thread BSP G1/2
G04		Thread BSP G3/4
G05		Thread BSP G1"
G06		Thread BSP G1 1/4
G07		Thread BSP G1 1/2
U03		Thread 3/4 - 16 UNF
U04		Thread 7/8 - 14 UNF
U05		Thread 1-1/16 - 12 UN
U07		Thread 1-5/16 - 12 UN
U08		Thread 1-5/8 - 12 UN
H08		Flanged fitting 4xM8/ \varnothing 40
H09		Flanged fitting 4xM8/ \varnothing 55 ; \varnothing 18
H10		Flanged fitting 4xM8/ \varnothing 55 ; \varnothing 25
H11		Flanged fitting 4xM10/ \varnothing 51
A02		Flanged fitting SAE 3/4
A03		Flanged fitting SAE 1
A04		Flanged fitting SAE 1 1/4
A05		Flanged fitting SAE 1 1/2
A06		Flanged fitting SAE 2
E02		Flanged fitting 3/4
E03		Flanged fitting 1
E04		Flanged fitting 1 1/4
E05		Flanged fitting 1 1/2
E06		Flanged fitting 2
K03		Flanged fitting 4xM8/ \varnothing 40 ; \varnothing 18
K04		Flanged fitting 4xM10/ \varnothing 51 ; \varnothing 26
K05		Flanged fitting 4xM8/ \varnothing 55 ; \varnothing 18
K06		Flanged fitting 4xM8/ \varnothing 55 ; \varnothing 25
S01		Flanged fitting, square 4xM8/46x46
Z		Special design

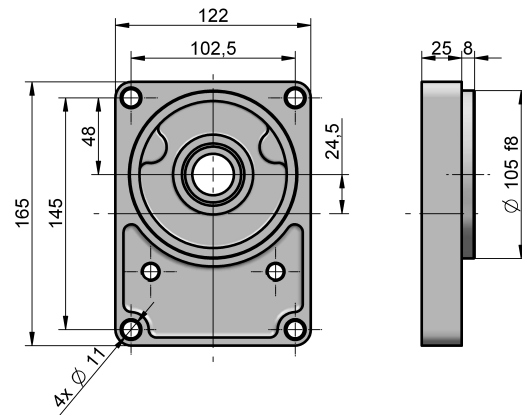
DESIGN OF FLANGES, DRIVE SHAFTS AND INLET PORTS

Flanges

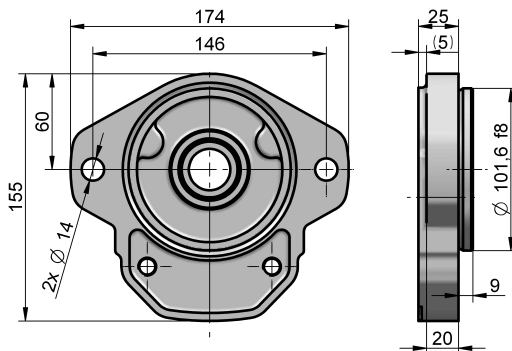
R1:



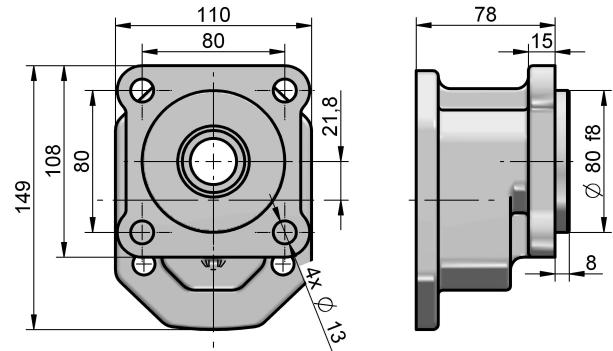
R4:



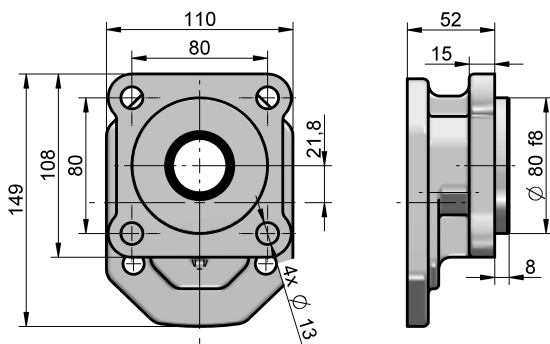
S2:



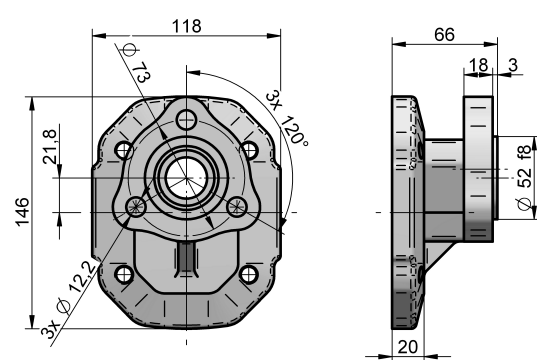
I1:



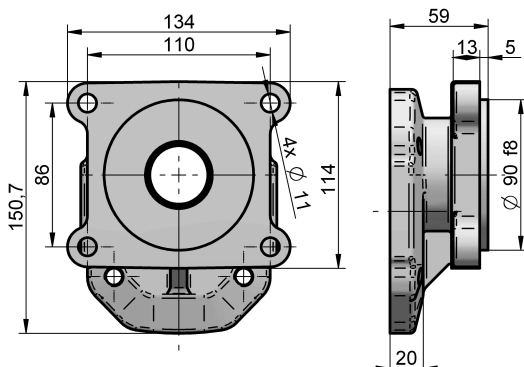
I2:



U1:

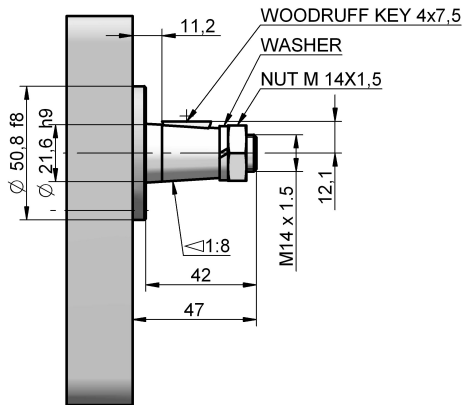


B1:

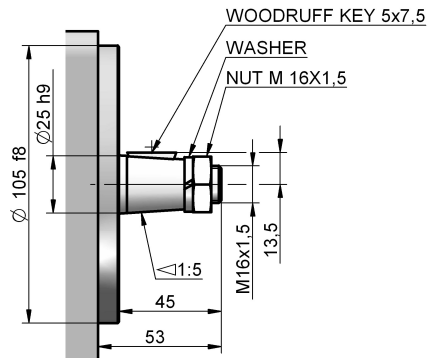


Drive shafts:

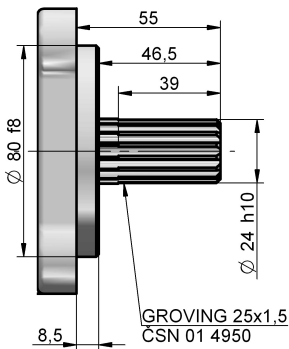
C1:



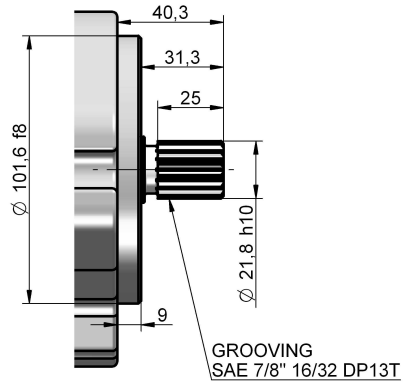
C2:



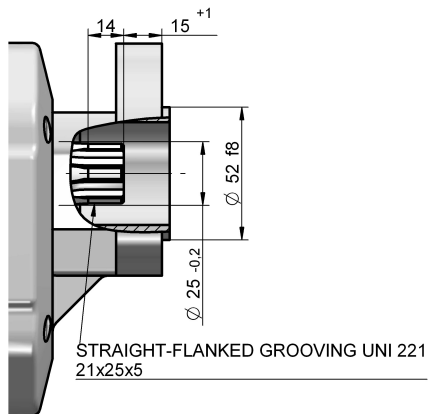
D1:



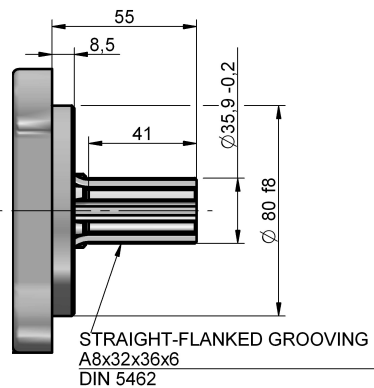
D2:



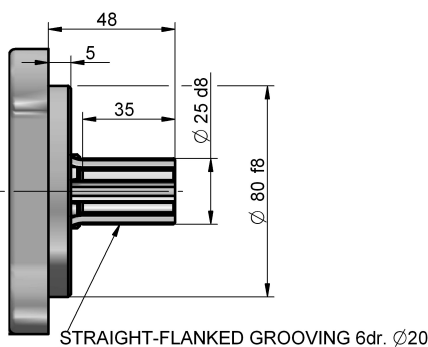
D4:



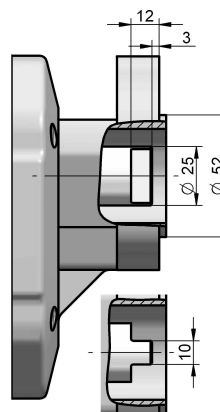
D5:



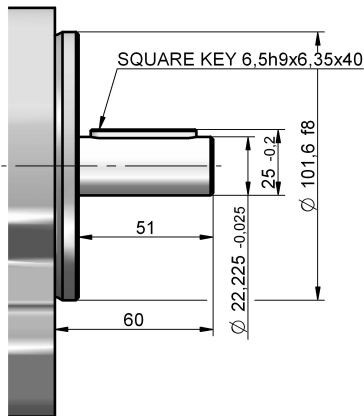
D6:



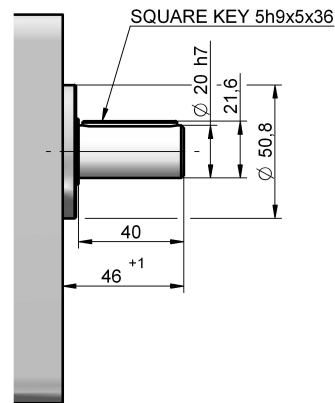
K1:



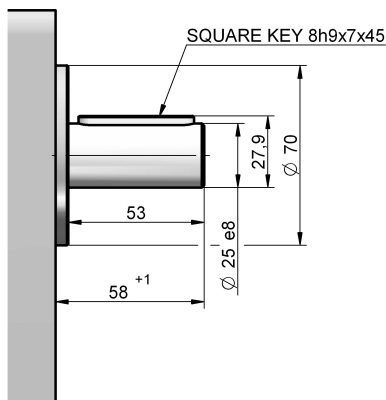
V1:



V2:

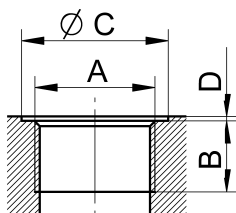


V3:



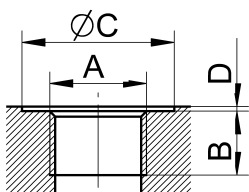
INLET AND OUTLET PORTS

Metric thread ISO 6149



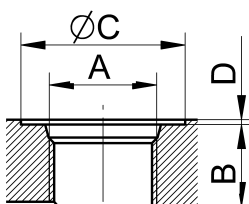
Code	A	B	C	D
M08	M 27x1,5	16	33	1
M09	M 27x2	16	33	1
M11	M 33x1,5	18	40	1
M12	M 33x2	18	40	1
M15	M 48x2	16	56	1

BSP pipe thread ISO 228 - 1



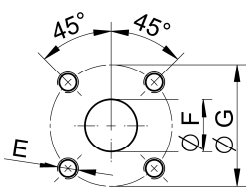
Code	A	B	C	D
G03	G1/2	18	33	1
G04	G3/4	16	39	1
G05	G1	18	45	1
G06	G1 1/4	18	57	1
G07	G1 1/2			1

UNF thread SAE



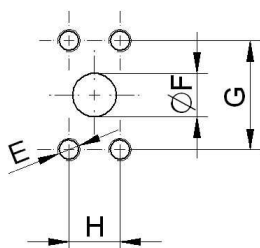
Code	A	B	C	D
U03	3/4 - 16 UNF	15	30	1
U04	7/8 - 14 UNF	17	34	1
U05	1-1/16-12UNF	19	41	1
U07	1-5/16-12UNF	23	49	1
U08	1-5/8-12UNF	23	58	1

Flanged fittings DIN 8901/8902



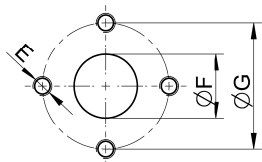
Code	E	F	G
H08	M8	20	40
H09	M8	18	55
H10	M8	25	55
H11	M10	26	51

Flanged fittings ISO 6163, „rectsngle“



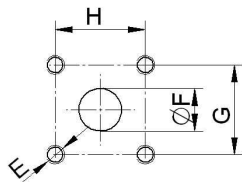
Code	E	F	G	H
A02	3/8-16UNC-2B	19	47,6	22,2
A03	3/8-16UNC-2B	25,4	52,4	26,2
A04	7/16-14UNC-2B	30,5	58,7	30,2
A05	1/2-13UNC-2B	39,3	69,8	35,7
A06	1/2-13UNC-2B	51	77,8	42,9
E02	M10	19	47,6	22,2
E03	M10	25,4	52,4	26,2
E04	M10	30,5	58,7	30,2
E05	M12	39,3	69,8	35,7
E06	M12	51	77,8	42,9

Flanged fittings ISO 6163, „cross“

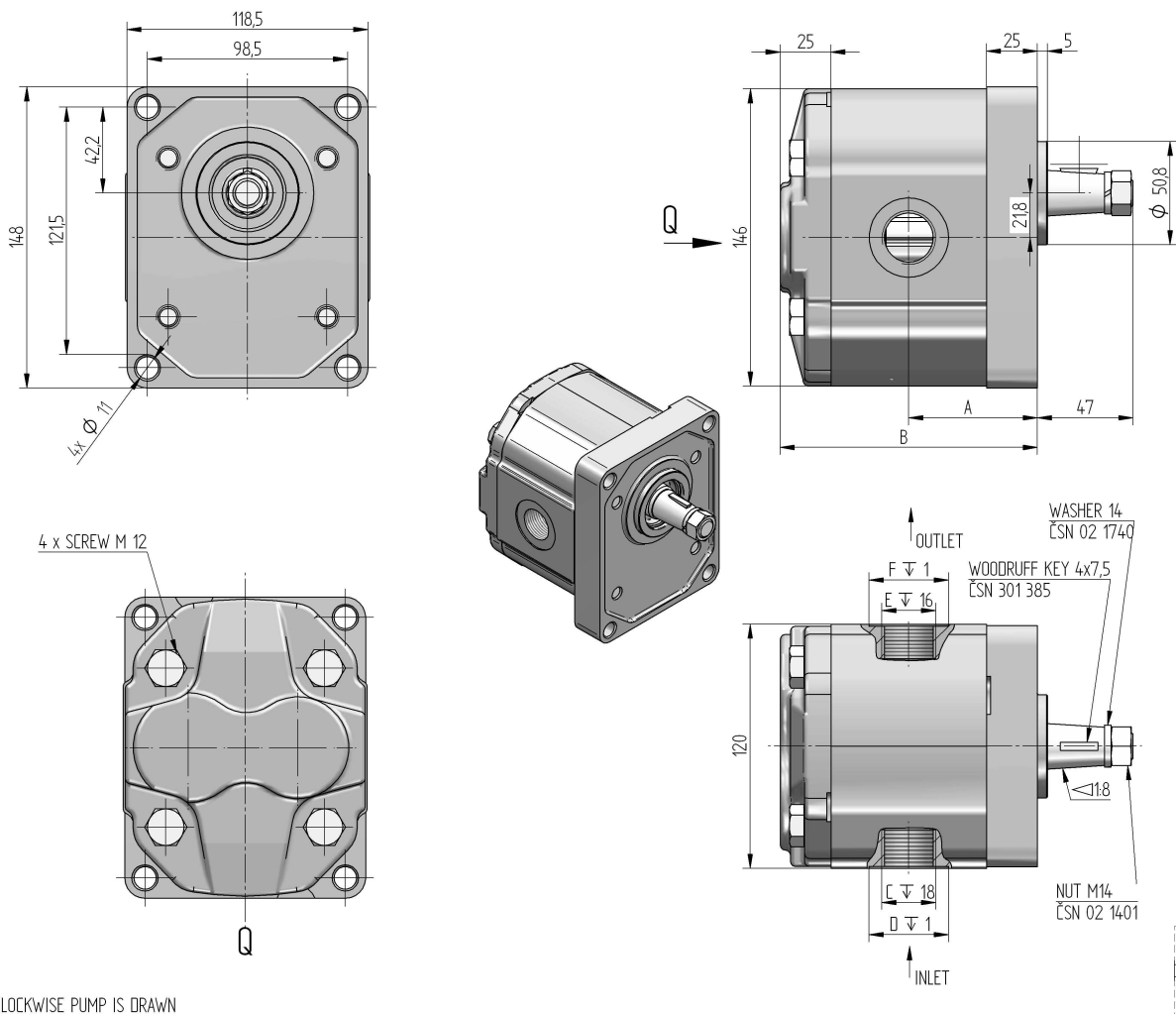


Code	E	F	G
K03	M8	18	40
K04	M10	26	51
K05	M8	18	55
K06	M8	25	55

Flanged fittings ISO

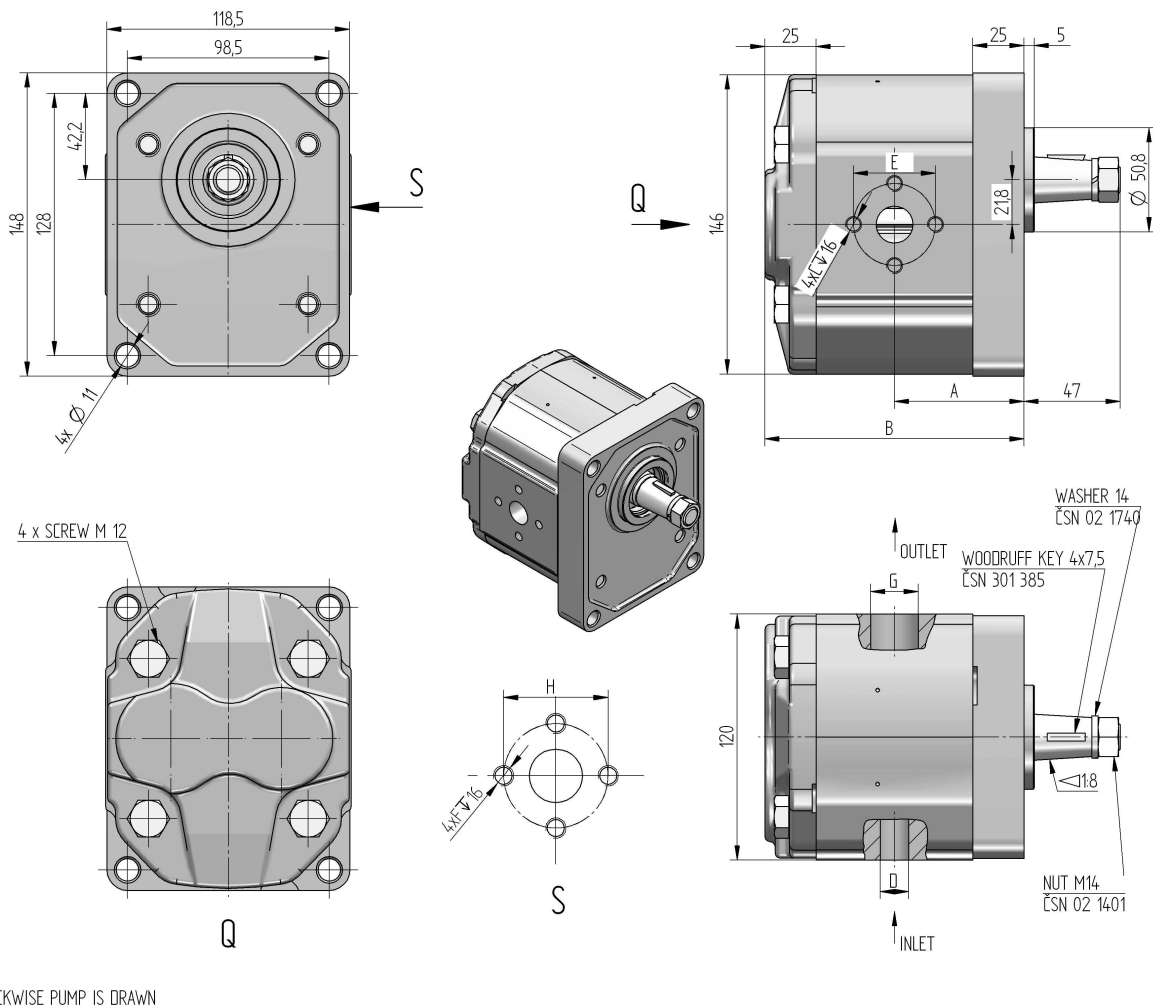


Code	E	F	G	H
S01	M8	28	46	46



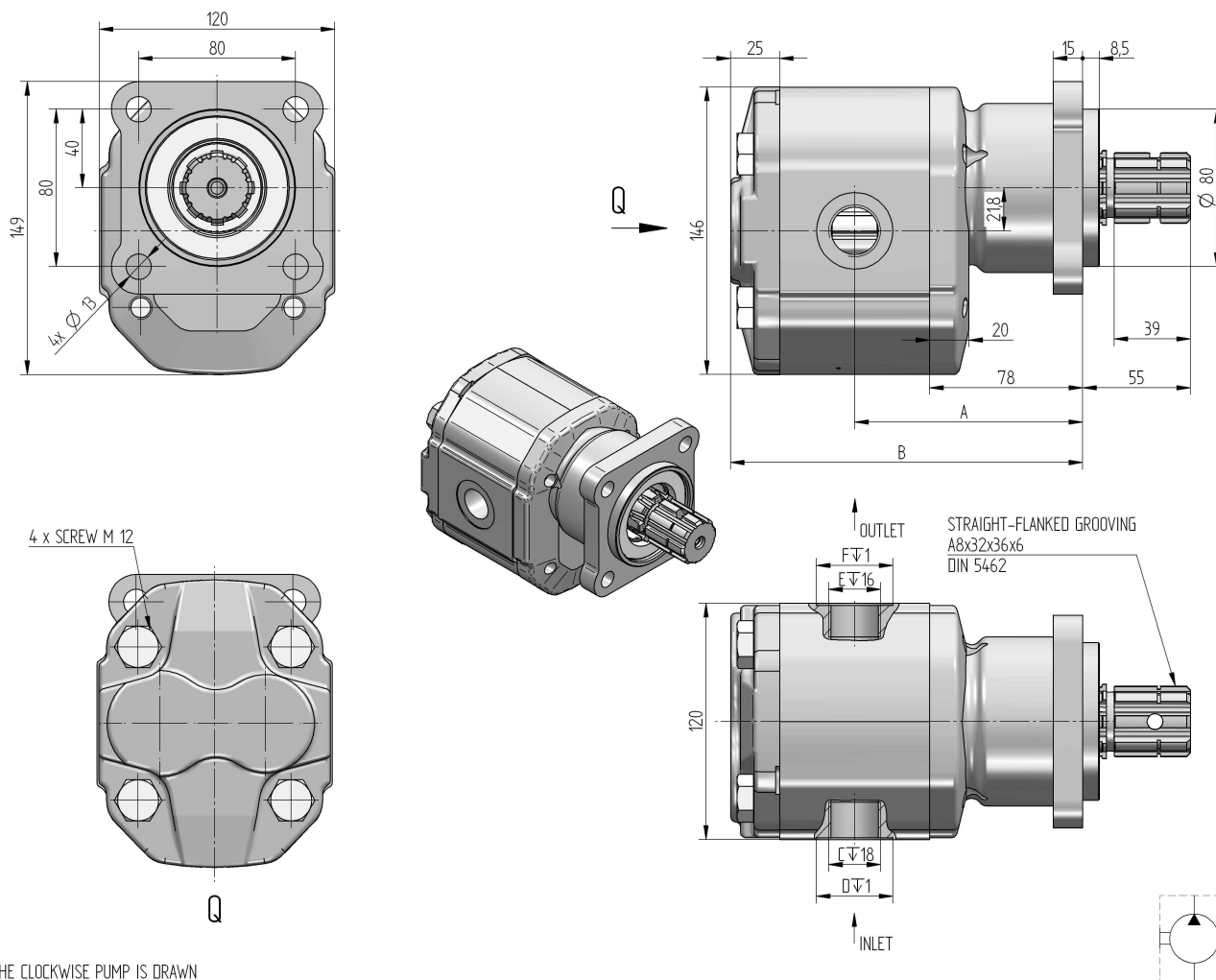
THE CLOCKWISE PUMP IS DRAWN

ORDER KEY	PURCH. CODE	DIRECT. OF ROT.	DISPLACEMENT [cm ³ /1]	CONT. PRESS. [bar]	MIN. SPEED [min ⁻¹]	MAX. SPEED [min ⁻¹]	A	B	C	D	E	F	DIMENSION [mm]	
Q-100-R1C1-S G06 G05-N		R	100	180	500	1800	97,75	195,5	G 1 1/4"	Ø 57	G 1"	Ø 45		
Q-100L-R1C1-S G06 G05-N		L												
Q-82R-R1C1-S G06 G05-N		R	82	180	500	1800	86,25	172,5	G 1 1/4"	Ø 57	G 1"	Ø 45		
Q-82L-R1C1-S G06 G05-N		L												
Q-71R-R1C1-S G06 G05-N		R	71	210	500	1800	81,75	163,5	G 1 1/4"	Ø 57	G 1"	Ø 45		
Q-71L-R1C1-S G06 G05-N	185 9031	L												
Q-61R-R1C1-S G06 G05-N	185 9059	R	61	230	500	2000	77,5	155	G 1 1/4"	Ø 57	G 1"	Ø 45		
Q-61L-R1C1-S G06 G05-N	185 9043	L												
Q-51R-R1C1-S G05 G04-N	180 9923	R	51	250	500	2500	73,25	146,5	G 1"	Ø 45	G 3/4"	Ø 39		
Q-51L-R1C1-S G05 G04-N		L												
Q-43R-R1C1-S G05 G04-N	180 9810	R	43	270	500	2500	69,75	139,5	G 1"	Ø 45	G 3/4"	Ø 39		
Q-43L-R1C1-S G05 G04-N		L												
Q-34R-R1C1-S G04 G04-N	180 9809	R	34	280	500	2800	66	132	G 3/4"	Ø 39	G 3/4"	Ø 39		
Q-34L-R1C1-S G04 G04-N		L												
Q-27R-R1C1-S G04 G04-N	180 9808	R	27	290	500	3000	63,25	126,5	G 3/4"	Ø 39	G 3/4"	Ø 39		
Q-27L-R1C1-S G04 G04-N		L												
Q-22,5R-R1C1-S G04 G04-N		R	22,5	290	500	3000	61,25	122,5	G 3/4"	Ø 39	G 3/4"	Ø 39		
Q-22,5L-R1C1-S G04 G04-N		L												
Q-17R-R1C1-S G03 G03-N	180 9876	R	17	290	500	3000	59	118	G 1/2"	Ø 33	G 1/2"	Ø 33		
Q-17L-R1C1-S G03 G03-N		L												
Q-13,5R-R1C1-S G03 G03-N		R	13,5	290	500	3000	57,5	115	G 1/2"	Ø 33	G 1/2"	Ø 33		
Q-13,5L-R1C1-S G03 G03-N		L												
Q-10R-R1C1-S G03 G03-N		R	10	270	500	3000	56	112	G 1/2"	Ø 33	G 1/2"	Ø 33		
Q-10L-R1C1-S G03 G03-N		L												



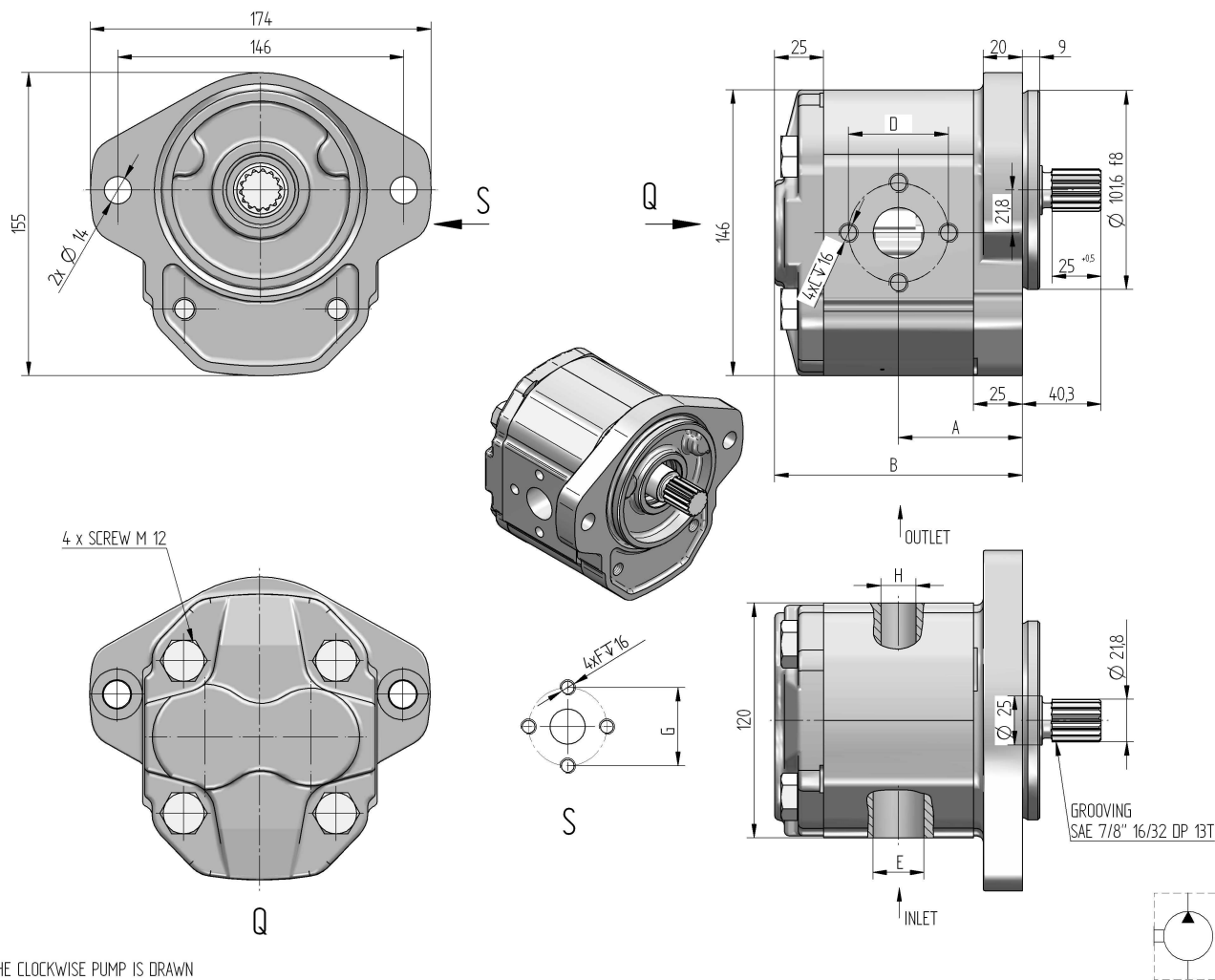
THE CLOCKWISE PUMP IS DRAWN

Q-100R-R1C1-S K03 K04-N		R	100	180	500	1800	97,75	195,5	M 8	Ø 18	Ø 40	M10	Ø 26	Ø 51
Q-100L-R1C1-S K03 K04-N		L	100	180	500	1800	97,75	195,5	M 8	Ø 18	Ø 40	M10	Ø 26	Ø 51
Q-82R-R1C1 S K03 K04-N	185 9042	R	82	180	500	1800	86,25	172,5	M 8	Ø 18	Ø 40	M10	Ø 26	Ø 51
Q-82L-R1C1-S K03 K04-N		L	82	180	500	1800	86,25	172,5	M 8	Ø 18	Ø 40	M10	Ø 26	Ø 51
Q-71R-R1C1-S K03 K04-N	185 9035	R	71	210	500	1800	81,75	163,5	M 8	Ø 18	Ø 40	M10	Ø 26	Ø 51
Q-71L-R1C1-S K03 K04-N	185 9044	L	71	210	500	1800	81,75	163,5	M 8	Ø 18	Ø 40	M10	Ø 26	Ø 51
Q-61R-R1C1-S K03 K04-N	185 9001	R	61	230	500	2000	77,5	155	M 8	Ø 18	Ø 40	M10	Ø 26	Ø 51
Q-61L-R1C1-S K03 K04-N	185 9004	L	61	230	500	2000	77,5	155	M 8	Ø 18	Ø 40	M10	Ø 26	Ø 51
Q-51R-R1C1-S K03 K04-N	185 9000	R	51	250	500	2500	73,25	146,5	M 8	Ø 18	Ø 40	M10	Ø 26	Ø 51
Q-51L-R1C1-S K03 K04-N	185 9003	L	51	250	500	2500	73,25	146,5	M 8	Ø 18	Ø 40	M10	Ø 26	Ø 51
Q-43R-R1C1-S K03 K04-N	180 9937	R	43	270	500	2500	69,75	139,5	M 8	Ø 18	Ø 40	M10	Ø 26	Ø 51
Q-43L-R1C1-S K03 K04-N	180 9939	L	43	270	500	2500	69,75	139,5	M 8	Ø 18	Ø 40	M10	Ø 26	Ø 51
Q-34R-R1C1-S K03 K04-N	180 9936	R	34	280	500	2800	66	132	M 8	Ø 18	Ø 40	M10	Ø 26	Ø 51
Q-34L-R1C1-S K03 K04-N	180 9938	L	34	280	500	2800	66	132	M 8	Ø 18	Ø 40	M10	Ø 26	Ø 51
Q-27R-R1C1-S K03 K04-N	180 9935	R	27	290	500	3000	63,25	126,5	M 8	Ø 18	Ø 40	M10	Ø 26	Ø 51
Q-27L-R1C1-S K03 K04-N	185 9002	L	27	290	500	3000	63,25	126,5	M 8	Ø 18	Ø 40	M10	Ø 26	Ø 51
Q-22,5R-R1C1-S K03 K04-N	185 9022	R	22,5	290	500	3000	61,25	122,5	M 8	Ø 18	Ø 40	M10	Ø 26	Ø 51
Q-22,5L-R1C1-S K03 K04-N	185 9038	L	22,5	290	500	3000	61,25	122,5	M 8	Ø 18	Ø 40	M10	Ø 26	Ø 51
Q-17R-R1C1-S K03 K03-N		R	17	290	500	3000	59	118	M 8	Ø 18	Ø 40	M 8	Ø 18	Ø 40
Q-17L-R1C1-S K03 K03-N		L	17	290	500	3000	59	118	M 8	Ø 18	Ø 40	M 8	Ø 18	Ø 40
Q-13,5R-R1C1-S K03 K03-N		R	13,5	290	500	3000	57,5	115	M 8	Ø 18	Ø 40	M 8	Ø 18	Ø 40
Q-13,5L-R1C1-S K03 K03-N		L	13,5	290	500	3000	57,5	115	M 8	Ø 18	Ø 40	M 8	Ø 18	Ø 40
Q-10R-R1C1-S K03 K03-N		R	10	270	500	3000	56	112	M 8	Ø 18	Ø 40	M 8	Ø 18	Ø 40
Q-10L-R1C1-S K03 K03-N		L	10	270	500	3000	56	112	M 8	Ø 18	Ø 40	M 8	Ø 18	Ø 40
ORDER KEY	PURCH. CODE	DIRECT. OF ROT.	DISPLACEMENT [cm ³ /1]	CONT. PRESS. [bar]	MIN. SPEED [min ⁻¹]	MAX. SPEED [min ⁻¹]	A	B	C	DIMENSION [mm]				



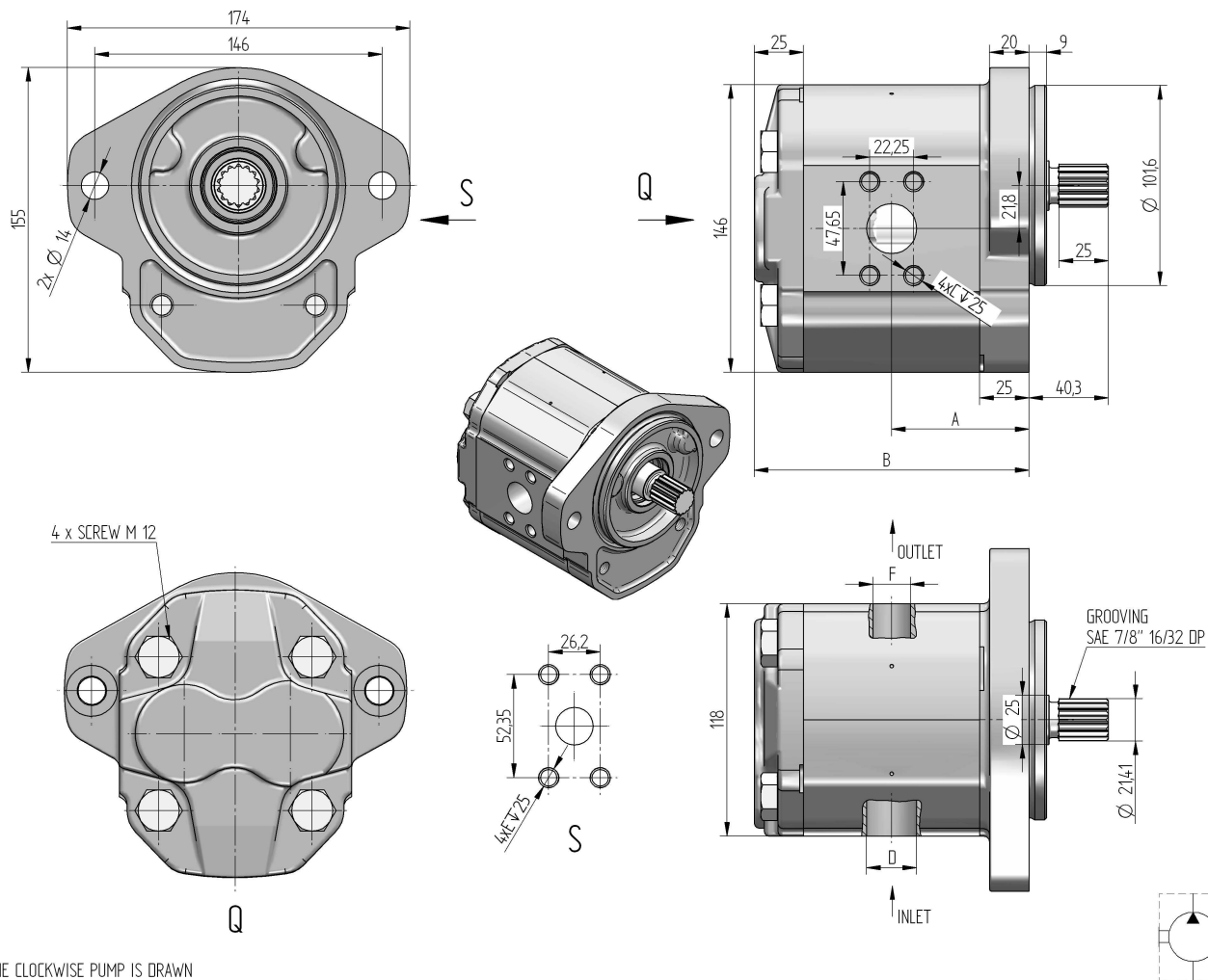
THE CLOCKWISE PUMP IS DRAWN

Q-100R-I1D5-S G05 G06-N		R	100	180	500	1800	150,75	248,5	G 1"	Ø 45	G 1 1/4	Ø 57		
Q-100L-I1D5-S G05 G06-N		L												
Q-82R-I1D5-S G05 G06-N	185 9021	R	82	180	500	1800	139,26	225,5	G 1"	Ø 45	G 1 1/4	Ø 57		
Q-82L-I1D5-S G05 G06-N	185 9016	L												
Q-71R-I1D5-S G05 G06-N	185 9064	R	71	210	500	1800	134,75	216,5	G 1"	Ø 45	G 1 1/4	Ø 57		
Q-71L-I1D5-S G05 G06-N	185 9065	L												
Q-61R-I1D5-S G05 G06-N	185 9020	R	61	230	500	2000	130,5	208	G 1"	Ø 45	G 1 1/4	Ø 57		
Q-61L-I1D5-S G05 G06-N	185 9015	L												
Q-51R-I1D5-S G04 G05-N	185 9019	R	51	250	500	2500	126,25	199,5	G 3/4	Ø 39	G 1"	Ø 45		
Q-51L-I1D5-S G04 G05-N	185 9014	L												
Q-43R-I1D5-S G04 G05-N		R	43	270	500	2500	122,75	192,5	G 3/4	Ø 39	G 1"	Ø 45		
Q-43L-I1D5-S G04 G05-N	185 9013	L												
Q-34R-I1D5-S G04 G04-N		R	34	280	500	2800	119	185	G 3/4	Ø 39	G 3/4	Ø 39		
Q-34L-I1D5-S G04 G04-N	185 9012	L												
Q-27R-I1D5-S G04 G04-N	185 9018	R	27	290	500	3000	116,25	179,5	G 3/4	Ø 39	G 3/4	Ø 39		
Q-27L-I1D5-S G04 G04-N	185 9010	L												
Q-22,5R-I1D5-S G04 G04-N		R	22,5	290	500	3000	114,25	175,5	G 3/4	Ø 39	G 3/4	Ø 39		
Q-22,5L-I1D5-S G04 G04-N		L												
Q-17R-I1D5-S G03 G03-N	185 9017	R	17	290	500	3000	112	171	G 1/2	Ø 33	G 1/2	Ø 33		
Q-17L-I1D5-S G03 G03-N	185 9010	L												
Q-13,5R-I1D5-S G03 G03-N		R	13,5	290	500	3000	110,5	168	G 1/2	Ø 33	G 1/2	Ø 33		
Q-13,5L-I1D5-S G03 G03-N		L												
Q-10R-I1D5-S G03 G03-N		R	10	270	500	3000	109	165	G 1/2	Ø 33	G 1/2	Ø 33		
Q-10L-I1D5-S G03 G03-N		L												
ORDER KEY	PURCH. CODE	DIRECT. OF ROT.	DISPLACEMENT [cm ³ /1]	CONT. PRESS. [bar]	MIN. SPEED [min ⁻¹]	MAX. SPEED [min ⁻¹]	A	B	C	DIMENSION [mm]				



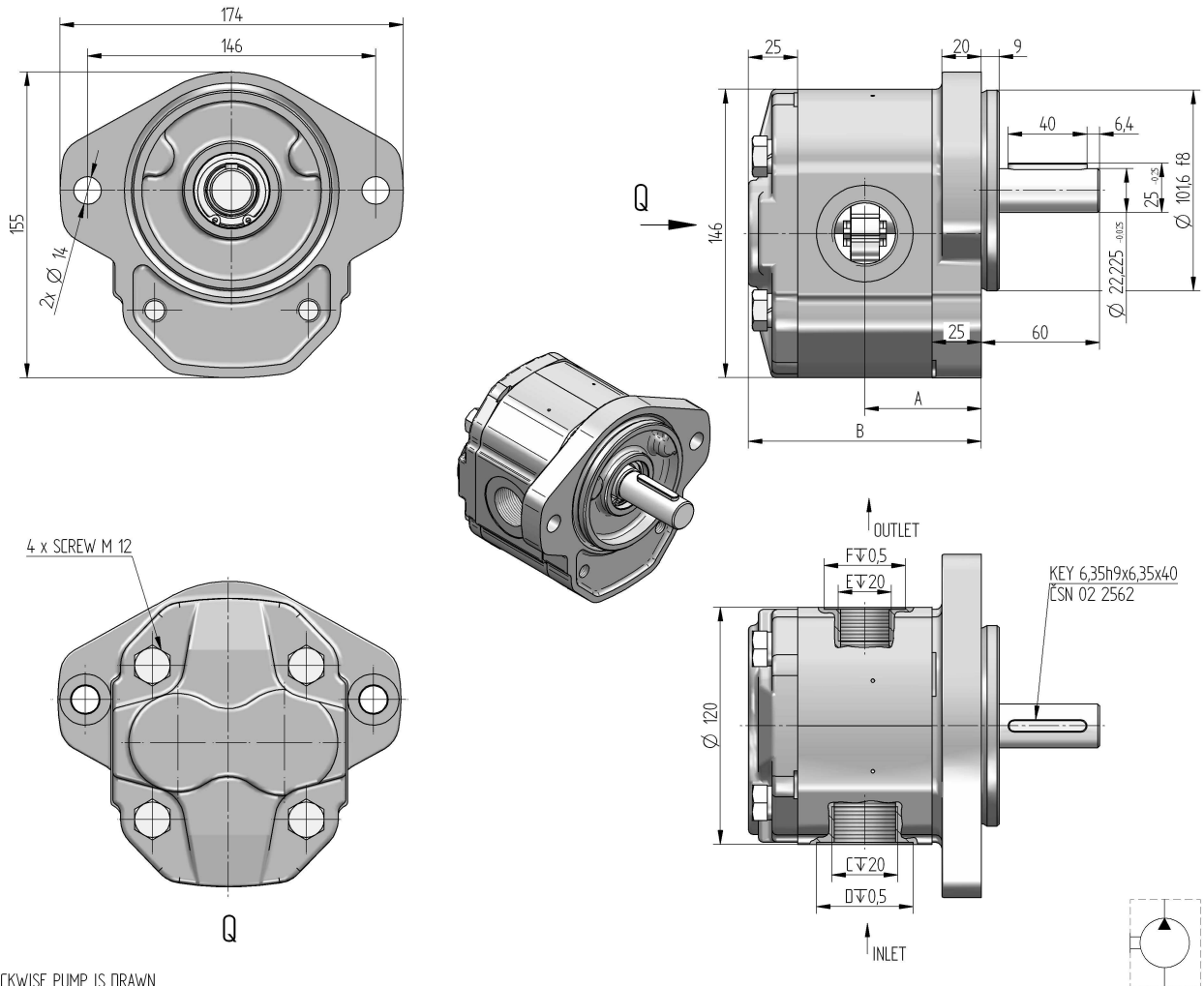
THE CLOCKWISE PUMP IS DRAWN

Q-100R-S2D2-S K03 K04-N		R	100	180	500	1800	97,75	195,5	M 10	Ø 51	Ø 28	M 8	Ø 40	Ø 18
Q-100L-S2D2-S K03 K04-N		L												
Q-82R-S2D2-S K03 K04-N		R	82	180	500	1800	86,25	172,5	M 10	Ø 51	Ø 28	M 8	Ø 40	Ø 18
Q-82L-S2D2-S K03 K04-N		L												
Q-71R-S2D2-S K03 K04-N		R	71	210	500	1800	81,75	163,5	M 10	Ø 51	Ø 28	M 8	Ø 40	Ø 18
Q-71L-S2D2-S K03 K04-N		L												
Q-61R-S2D2-S K03 K04-N		R	61	230	500	2000	77,5	155	M 10	Ø 51	Ø 28	M 8	Ø 40	Ø 18
Q-61L-S2D2-S K03 K04-N		L												
Q-51R-S2D2-S K03 K04-N	185 9039	R	51	250	500	2500	73,25	146,5	M 10	Ø 51	Ø 28	M 8	Ø 40	Ø 18
Q-51L-S2D2-S K03 K04-N		L												
Q-43R-S2D2-S K03 K04-N	185 9028	R	43	270	500	2500	69,75	139,5	M 10	Ø 51	Ø 28	M 8	Ø 40	Ø 18
Q-43L-S2D2-S K03 K04-N		L												
Q-34R-S2D2-S K03 K04-N	185 9024	R	34	280	500	2800	66	132	M 10	Ø 51	Ø 28	M 8	Ø 40	Ø 18
Q-34L-S2D2-S K03 K04-N		L												
Q-27R-S2D2-S K03 K04-N	185 9027	R	27	290	500	3000	63,25	126,5	M 10	Ø 51	Ø 28	M 8	Ø 40	Ø 18
Q-27L-S2D2-S K03 K04-N		L												
Q-22,5R-S2D2-S K03 K04-N	185 9034	R	22,5	290	500	3000	61,25	122,5	M 10	Ø 51	Ø 28	M 8	Ø 40	Ø 18
Q-22,5L-S2D2-S K03 K04-N		L												
Q-17R-S2D2-S K03 K03-N		R	17	290	500	3000	59	118	M 8	Ø 40	Ø 18	M 8	Ø 40	Ø 18
Q-17L-S2D2-S K03 K03-N		L												
Q-13,5R-S2D2-S K03 K03-N		R	13,5	290	500	3000	57,5	115	M 8	Ø 40	Ø 18	M 8	Ø 40	Ø 18
Q-13,5L-S2D2-S K03 K03-N		L												
Q-10R-S2D2-S K03 K03-N		R	10	270	500	3000	56	112	M 8	Ø 40	Ø 18	M 8	Ø 40	Ø 18
Q-10L-S2D2-S K03 K03-N		L												
ORDER KEY	PURCH. CODE	DIRECT. OF ROT.	DISPLACEMENT [cm ³ /1]	CONT. PRESS. [bar]	MIN. SPEED [min ⁻¹]	MAX. SPEED [min ⁻¹]	A	B	C	D	E	F	G	H
DIMENSION														
[mm]														



THE CLOCKWISE PUMP IS DRAWN

Q-100R-S2D2-S E03 E02-N		R	100	180	500	1800	97,75	195,5	M10	Ø 25,4	M10	Ø 19,1		
Q-100L-S2D2-S E03 E02-N		L	100	180	500	1800	97,75	195,5	M10	Ø 25,4	M10	Ø 19,1		
Q-82R-S2D2-S E03 E02-N		R	82	180	500	1800	86,25	172,5	M10	Ø 25,4	M10	Ø 19,1		
Q-82L-S2D2-S E03 E02-N		L	82	180	500	1800	86,25	172,5	M10	Ø 25,4	M10	Ø 19,1		
Q-71R-S2D2-S E03 E02-N		R	71	210	500	1800	81,75	163,5	M10	Ø 25,4	M10	Ø 19,1		
Q-71L-S2D2-S E03 E02-N		L	71	210	500	1800	81,75	163,5	M10	Ø 25,4	M10	Ø 19,1		
Q-61R-S2D2-S E03 E02-N		R	61	230	500	2000	77,5	155	M10	Ø 25,4	M10	Ø 19,1		
Q-61L-S2D2-S E03 E02-N		L	61	230	500	2000	77,5	155	M10	Ø 25,4	M10	Ø 19,1		
Q-51R-S2D2-S E03 E02-N		R	51	250	500	2500	73,25	146,5	M10	Ø 25,4	M10	Ø 19,1		
Q-51L-S2D2-S E03 E02-N		L	51	250	500	2500	73,25	146,5	M10	Ø 25,4	M10	Ø 19,1		
Q-43R-S2D2-S E03 E02-N	185 9041	R	43	270	500	2500	69,75	139,5	M10	Ø 25,4	M10	Ø 19,1		
Q-43L-S2D2-S E03 E02-N		L	43	270	500	2500	69,75	139,5	M10	Ø 25,4	M10	Ø 19,1		
Q-34R-S2D2-S E03 E02-N		R	34	280	500	2800	66	132	M10	Ø 25,4	M10	Ø 19,1		
Q-34L-S2D2-S E03 E02-N		L	34	280	500	2800	66	132	M10	Ø 25,4	M10	Ø 19,1		
Q-27R-S2D2-S E03 E02-N	180 9732	R	27	290	500	3000	63,25	126,5	M10	Ø 25,4	M10	Ø 19,1		
Q-27L-S2D2-S E03 E02-N		L	27	290	500	3000	63,25	126,5	M10	Ø 25,4	M10	Ø 19,1		
Q-22,5R-S2D2-S E03 E02-N		R	22,5	290	500	3000	61,25	122,5	M10	Ø 25,4	M10	Ø 19,1		
Q-22,5L-S2D2-S E03 E02-N		L	22,5	290	500	3000	61,25	122,5	M10	Ø 25,4	M10	Ø 19,1		
Q-17R-S2D2-S E03 E02-N	180 9749	R	17	290	500	3000	59	118	M10	Ø 25,4	M10	Ø 19,1		
Q-17L-S2D2-S E03 E02-N		L	17	290	500	3000	59	118	M10	Ø 25,4	M10	Ø 19,1		
Q-13,5R-S2D2-S E03 E02-N		R	13,5	290	500	3000	57,5	115	M10	Ø 25,4	M10	Ø 19,1		
Q-13,5L-S2D2-S E03 E02-N		L	13,5	290	500	3000	57,5	115	M10	Ø 25,4	M10	Ø 19,1		
Q-10R-S2D2-S E03 E02-N	180 9744	R	10	270	500	3000	56	112	M10	Ø 25,4	M10	Ø 19,1		
Q-10L-S2D2-S E03 E02-N		L	10	270	500	3000	56	112	M10	Ø 25,4	M10	Ø 19,1		
ORDER KEY	PURCH. CODE	DIRECT. OF ROT.	DISPLA-CEMENT [cm ³ /1]	CONT. PRESS. [bar]	MIN. SPEED [min ⁻¹]	MAX. SPEED [min ⁻¹]	A	B	C	D	E	F	DIMENSION [mm]	



THE CLOCKWISE PUMP IS DRAWN

Q-100R-S2D2-S U08 U07-N		R	100	180	500	1800	97,75	195,5	1-5/8-12 UN	Ø 58	1-5/16-12 UN	Ø 49		
Q-100L-S2D2-S U08 U07-N		L	100	180	500	1800	97,75	195,5	1-5/8-12 UN	Ø 58	1-5/16-12 UN	Ø 49		
Q-82R-S2D2-S U08 U07-N		R	82	180	500	1800	86,25	172,5	1-5/8-12 UN	Ø 58	1-5/16-12 UN	Ø 49		
Q-82L-S2D2-S U08 U07-N		L	82	180	500	1800	86,25	172,5	1-5/8-12 UN	Ø 58	1-5/16-12 UN	Ø 49		
Q-71R-S2D2-S U08 U07-N		R	71	210	500	1800	81,75	163,5	1-5/8-12 UN	Ø 58	1-5/16-12 UN	Ø 49		
Q-71L-S2D2-S U08 U07-N	180 9891	L	71	210	500	1800	81,75	163,5	1-5/8-12 UN	Ø 58	1-5/16-12 UN	Ø 49		
Q-61R-S2D2-S U08 U07-N		R	61	230	500	2000	77,5	155	1-5/8-12 UN	Ø 58	1-5/16-12 UN	Ø 49		
Q-61L-S2D2-S U08 U07-N	180 9890	L	61	230	500	2000	77,5	155	1-5/8-12 UN	Ø 58	1-5/16-12 UN	Ø 49		
Q-51R-S2D2-S U08 U07-N		R	51	250	500	2500	73,25	146,5	1-5/8-12 UN	Ø 58	1-5/16-12 UN	Ø 49		
Q-51L-S2D2-S U08 U07-N	180 9889	L	51	250	500	2500	73,25	146,5	1-5/8-12 UN	Ø 58	1-5/16-12 UN	Ø 49		
Q-43R-S2D2-S U08 U07-N		R	43	270	500	2500	69,75	139,5	1-5/8-12 UN	Ø 58	1-5/16-12 UN	Ø 49		
Q-43L-S2D2-S U08 U07-N	180 9888	L	43	270	500	2500	69,75	139,5	1-5/8-12 UN	Ø 58	1-5/16-12 UN	Ø 49		
Q-34R-S2D2-S U07 U05-N		R	34	280	500	2800	66	132	1-5/16-12 UN	Ø 49	1-1/16-12 UN	Ø 41,2		
Q-34L-S2D2-S U07 U05-N	180 9887	L	34	280	500	2800	66	132	1-5/16-12 UN	Ø 49	1-1/16-12 UN	Ø 41,2		
Q-27R-S2D2-S U07 U05-N		R	27	290	500	3000	63,25	126,5	1-5/16-12 UN	Ø 49	1-1/16-12 UN	Ø 41,2		
Q-27L-S2D2-S U07 U05-N	180 9886	L	27	290	500	3000	63,25	126,5	1-5/16-12 UN	Ø 49	1-1/16-12 UN	Ø 41,2		
Q-22,5R-S2D2-S U07 U05-N		R	22,5	290	500	3000	61,25	122,5	1-5/16-12 UN	Ø 49	1-1/16-12 UN	Ø 41,2		
Q-22,5L-S2D2-S U07 U05-N		L	22,5	290	500	3000	61,25	122,5	1-5/16-12 UN	Ø 49	1-1/16-12 UN	Ø 41,2		
Q-17R-S2D2-S U07 U05-N		R	17	290	500	3000	59	118	1-5/16-12 UN	Ø 49	1-1/16-12 UN	Ø 41,2		
Q-17L-S2D2-S U07 U05-N	180 9885	L	17	290	500	3000	59	118	1-5/16-12 UN	Ø 49	1-1/16-12 UN	Ø 41,2		
Q-13,5R-S2D2-S U07 U05-N		R	13,5	290	500	3000	57,5	115	1-5/16-12 UN	Ø 49	1-1/16-12 UN	Ø 41,2		
Q-13,5L-S2D2-S U07 U05-N		L	13,5	290	500	3000	57,5	115	1-5/16-12 UN	Ø 49	1-1/16-12 UN	Ø 41,2		
Q-10R-S2D2-S U07 U05-N		R	10	270	500	3000	56	112	1-5/16-12 UN	Ø 49	1-1/16-12 UN	Ø 41,2		
Q-10L-S2D2-S U07 U05-N		L	10	270	500	3000	56	112	1-5/16-12 UN	Ø 49	1-1/16-12 UN	Ø 41,2		
ORDER KEY	PURCH. CODE	DIRECT. OF ROT.	DISPLACEMENT [cm³/1]	CONT. PRESS. [bar]	MIN. SPEED [min⁻¹]	MAX. SPEED [min⁻¹]	A	B	C	D	E	F	DIMENSION [mm]	