

Bent axis fixed displacement axial piston pumps

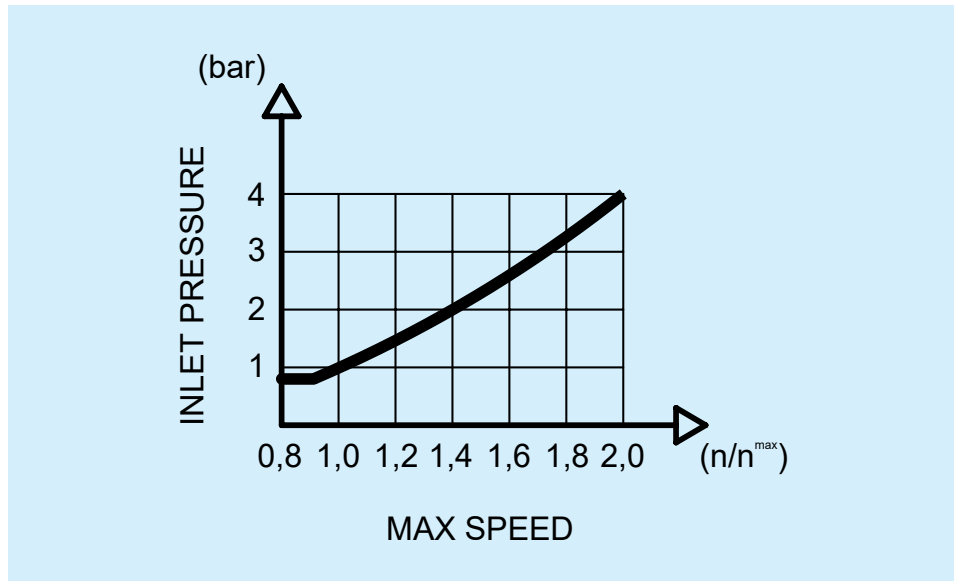


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Introduction The HMPFA series bent axis axial piston pumps have a fixed displacement and were designed to work in open circuits. The system has been designed to obtain a 40° angle of inclination of the pumps to the output shaft axis. This geometry allows:

- high starting torque;
- high volumetric and mechanical efficiency;
- high maximum pressures.

The maximum allowable speed can be increased by increasing the feed pressure (see graph).

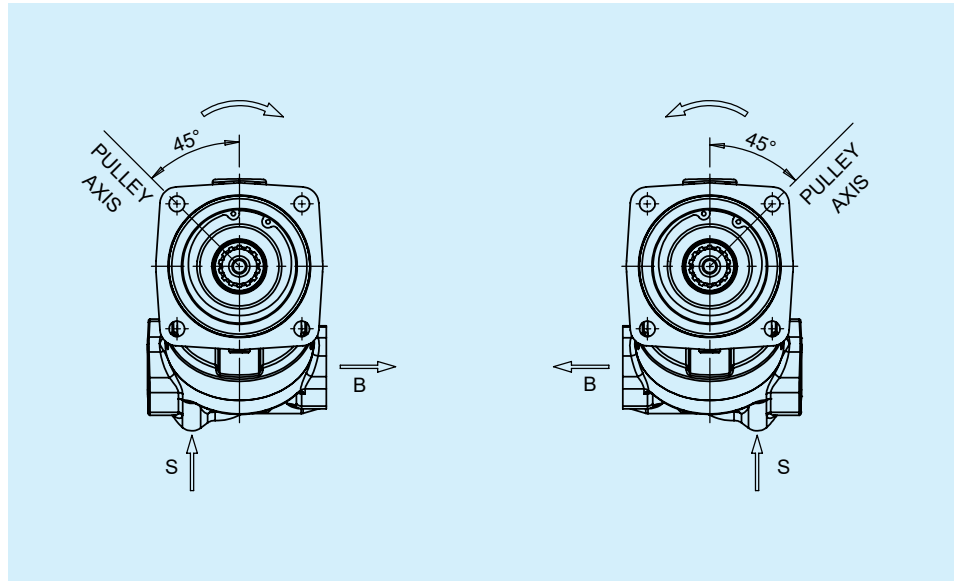


Optimization of service life of bearings in applications with radial load

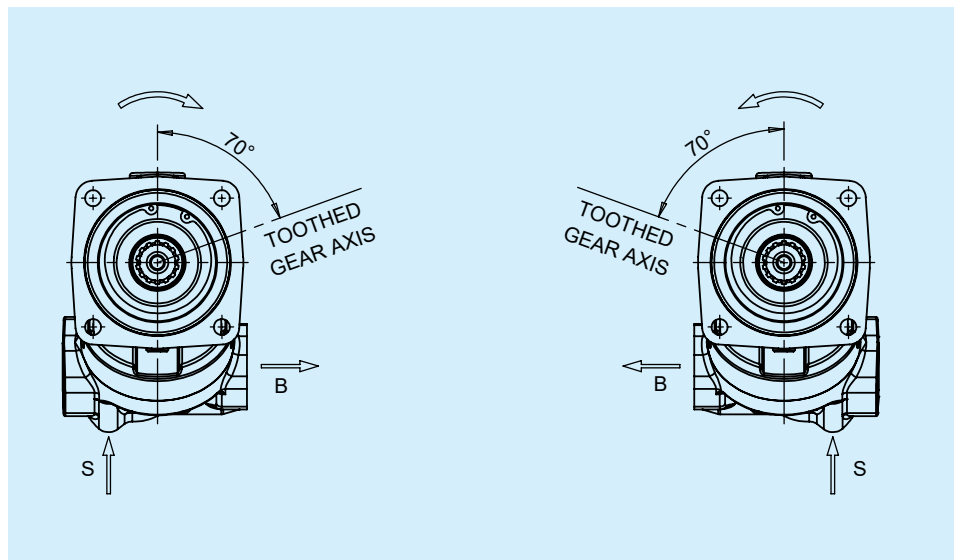
The direction of application of the radial load affects the service life of the motor bearings.

An optimal direction of the force reduce the stress on the bearings and gives them a longer service life. The recommended angle of load application depends on the direction of rotation and the type of application.

Pulley axis



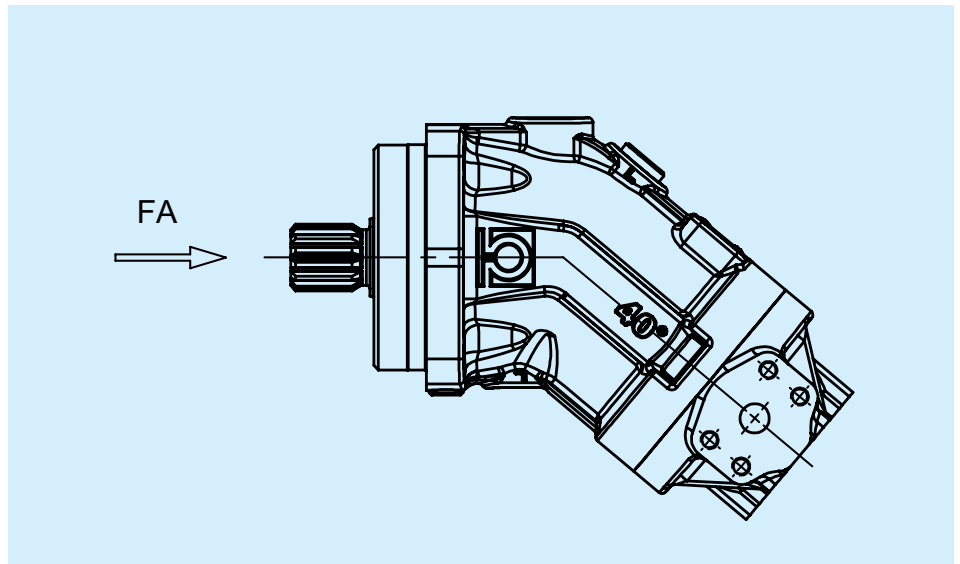
Toothed gear axis



Axis for any application (alternating direction of rotation)

Axial force application

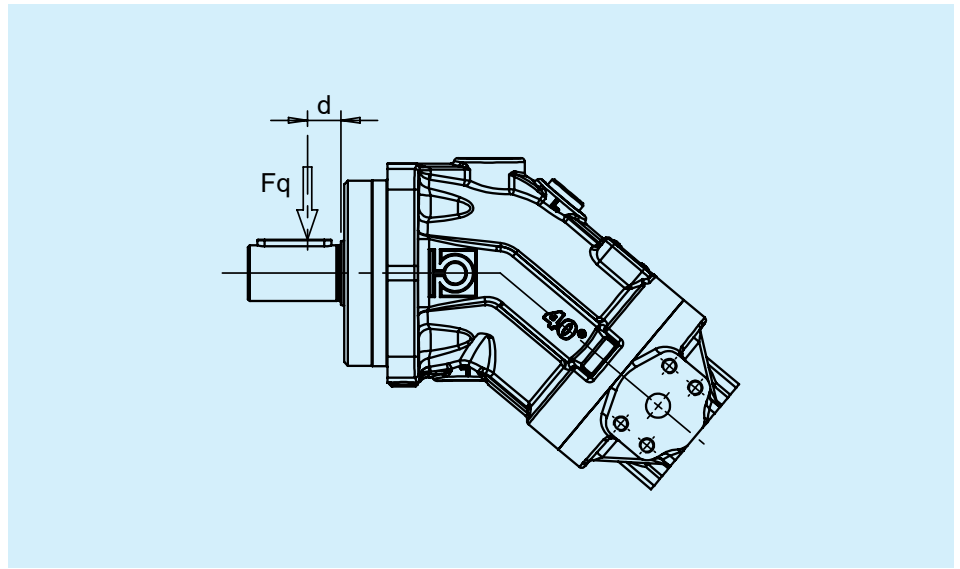
Axial compressive forces can be applied to the shaft (see table). Axial tensile loads, on the other hand, which can reduce the service life of the main bearing, should be avoided.



Nominal displacement		MAX axial load without pressure (*)	MAX axial load at working pressure
cm ³	in ³		
10	0.61	320	3
12	0.73	320	3
16	0.98	320	3
23	1.4	500	5.2
28	1.71	500	5.2
32	1.95	500	5.2
45	2.75	630	7
56	3.42	800	8.7
63	3.84	800	8.7
80	4.88	1000	10.6
90	5.49	1000	10.6
107	6.53	1250	12.9
125	7.63	1250	12.9

(*) The values indicated are maximum values and should not be applied during continuous operation.

Radial force application Radial loads allowed



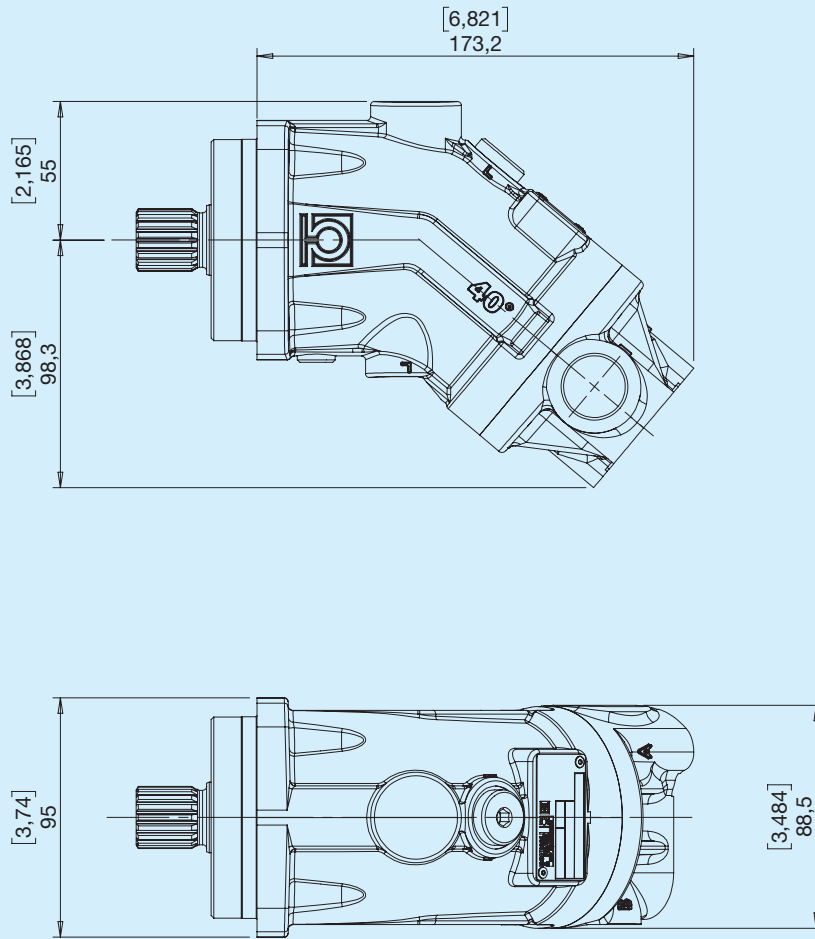
Nominal displacement		Ø Shaft (mm)	MAX axial load without pressure (*) N	Distance d (mm)
cm ³	in ³			
10	0,61	20 Y	3000	16
		25 C	3200	
12	0,73	20 Y	3000	16
		25 C	3500	
16	0,98	25 Y	3200	16
23	1,4	25 Y	5700	16
		30 C	5400	
28	1,71	25 Y	5700	16
		30 C	5400	
32	1,95	30 C	5400	16
45	2,75	30 C	7600	18
56	3,42	30 Y	9500	18
		30 X	7800	
		35 C	9100	
63	3,84	35 C	9100	18
80	4,88	35 Y	11600	20
		35 X	11100	
		40 C	11400	
90	5,49	40 C	11400	20
107	6,53	40 Y	13600	20
		45 C	14100	
125	7,63	45 C	14100	20

(*) The values indicated are maximum values and should not be applied during continuous operation.

Fixed displacement pumps HPPF 10-12-16

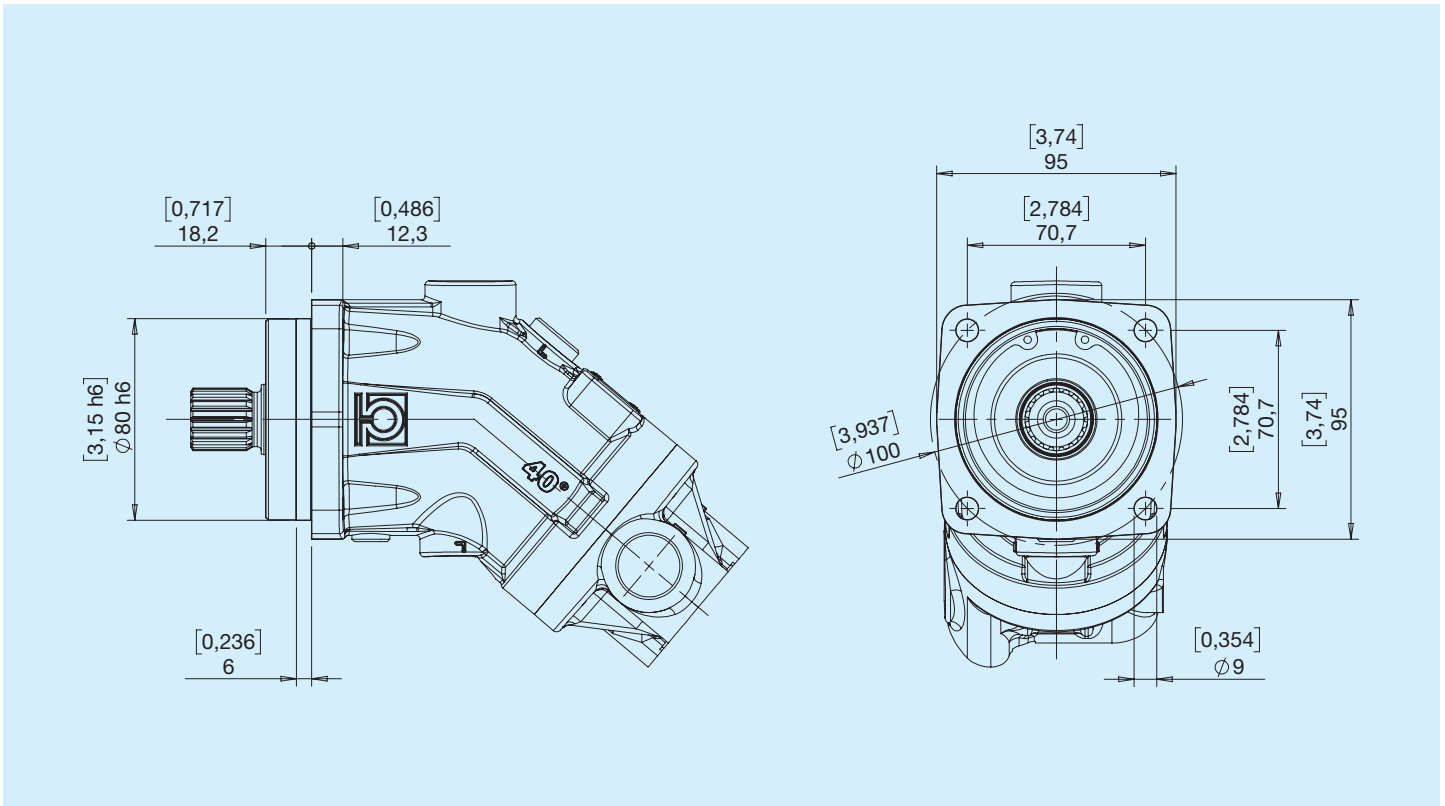


Before use, carefully read the GENERAL INSTRUCTIONS FOR USE OF OPEN CIRCUIT AXIAL PISTON PUMPS AND MOTORS.

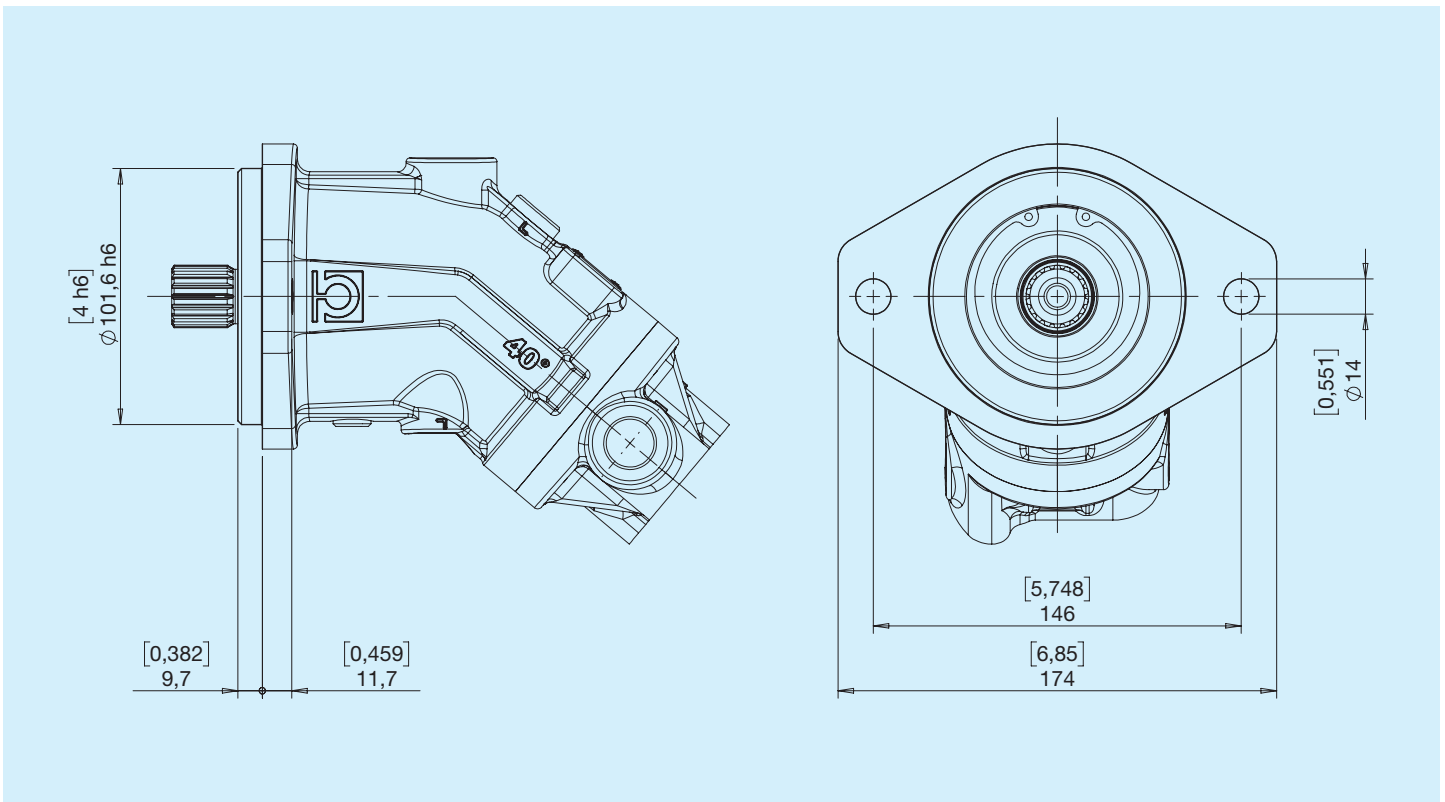


HPPF	Nominal displacement		Continuous pressure		Intermittent pressure		Peak pressure		Rotation speed nmax MAX min ⁻¹	Torque @350 bar MIN min ⁻¹	Weight		Polar moment of inertia kg • m ²
	cm ³	in ³	bar	psi	bar	psi	bar	psi			kg	lbs	
10	10	0.61	350	5076	400	5801	450	6527	3600	500	6.6	14.5	0,0004
12	12	0.73	350	5076	400	5801	450	6527	3600	500	6.6	14.5	0,0004
16	16	0.98	350	5076	400	5801	450	6527	3600	500	6.6	14.5	0,0004

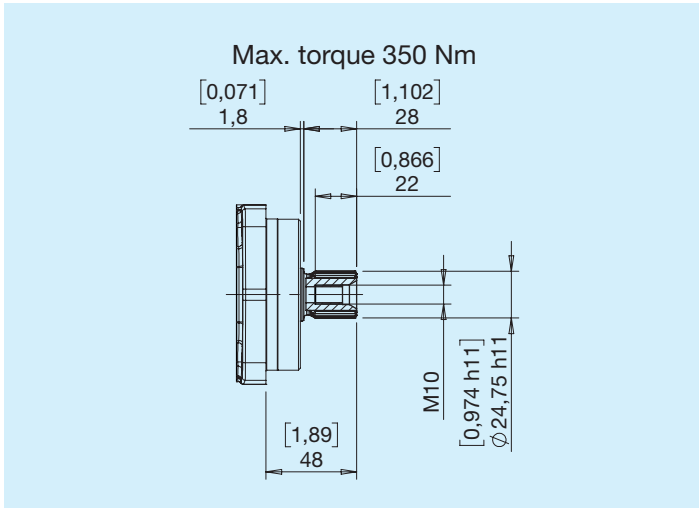
I ISO 4 holes



S SAE B

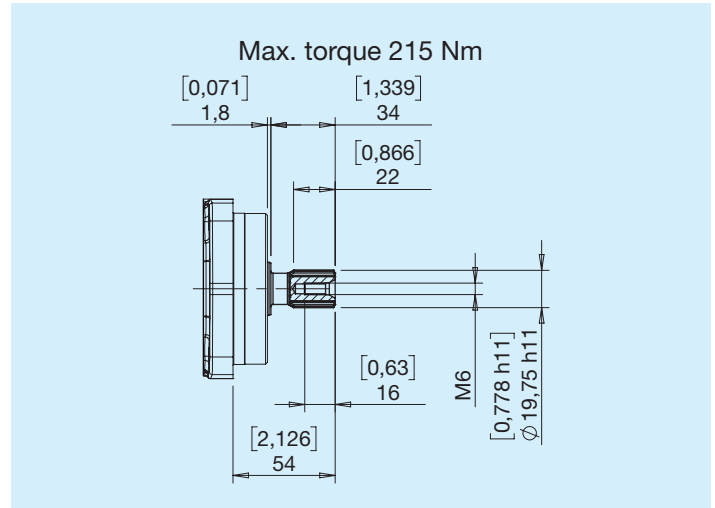


Z DIN 5480 W25x1.25x30x18



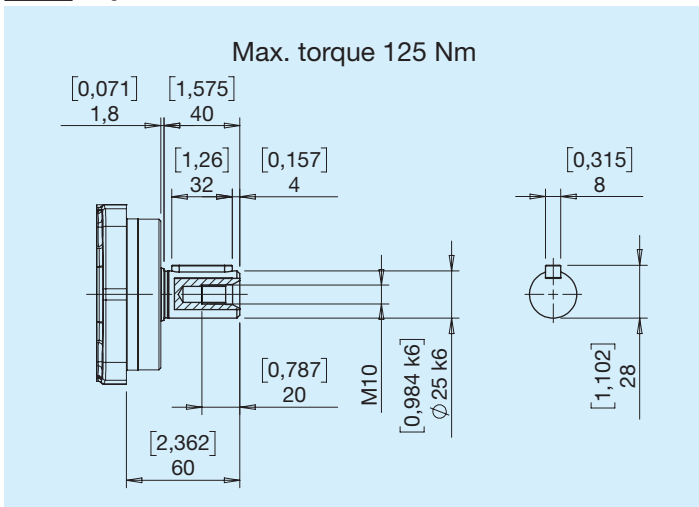
Continuous pressure 350 bar/5076 psi
Peak pressure 400 bar/5801 psi

X DIN 5480 W20x1.25x30x14



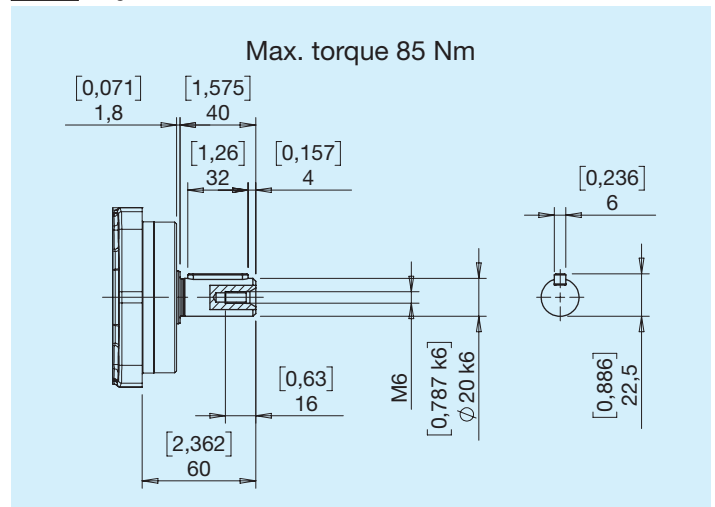
Continuous pressure 350 bar/5076 psi
Peak pressure 400 bar/5801 psi

C Cylindrical Ø25



Continuous pressure 350 bar/5076 psi
Peak pressure 400 bar/5801 psi

Y Cylindrical Ø20

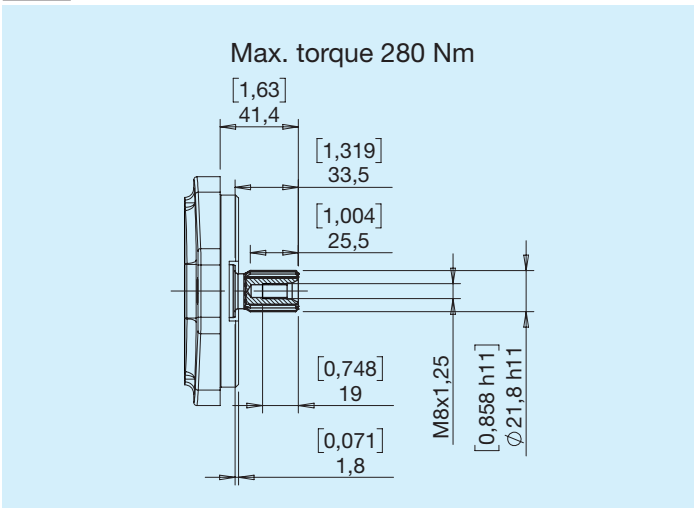


Continuous pressure 350 bar/5076 psi
Peak pressure 400 bar/5801 psi

For applications with radial load on the drive shaft (pinions, V-belts), with X and Y type shaft, the allowed pressure is 315 bar / 4569 psi ($P_{max} = 350 \text{ bar} / 5076 \text{ psi}$).

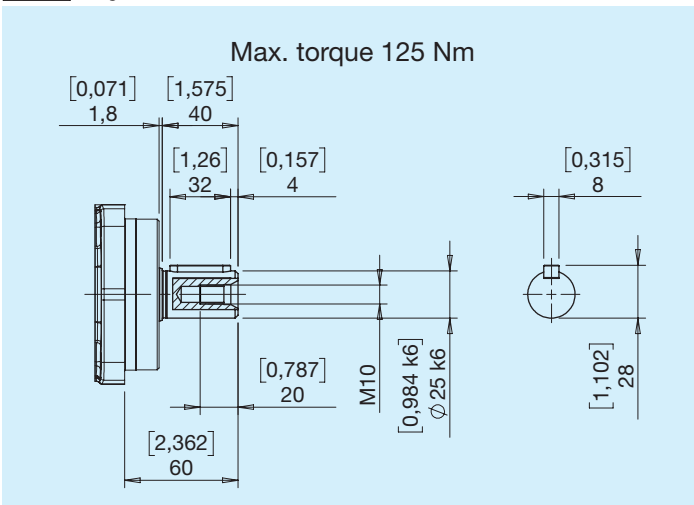
For pulsating load greater than 315 bar / 4569 psi, use the version with male splined shaft Z.

S SAE 13T 16/32 DP



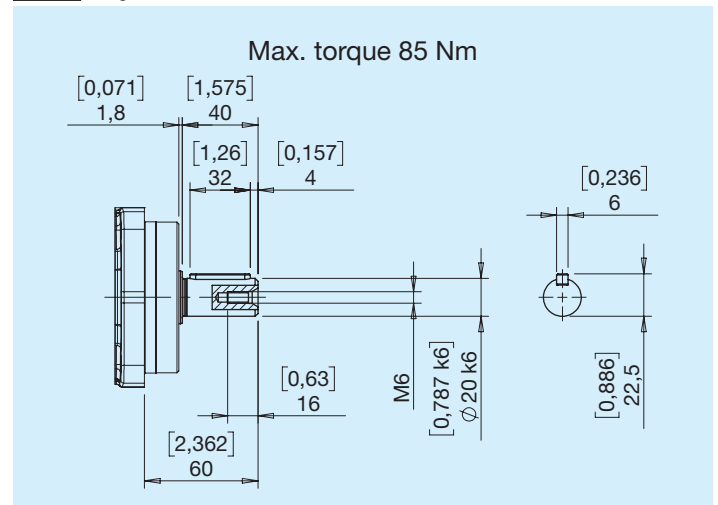
Continuous pressure 350 bar/5076 psi
Peak pressure 400 bar/5801 psi

C Cylindrical Ø25



Continuous pressure 350 bar/5076 psi
Peak pressure 400 bar/5801 psi

Y Cylindrical Ø20

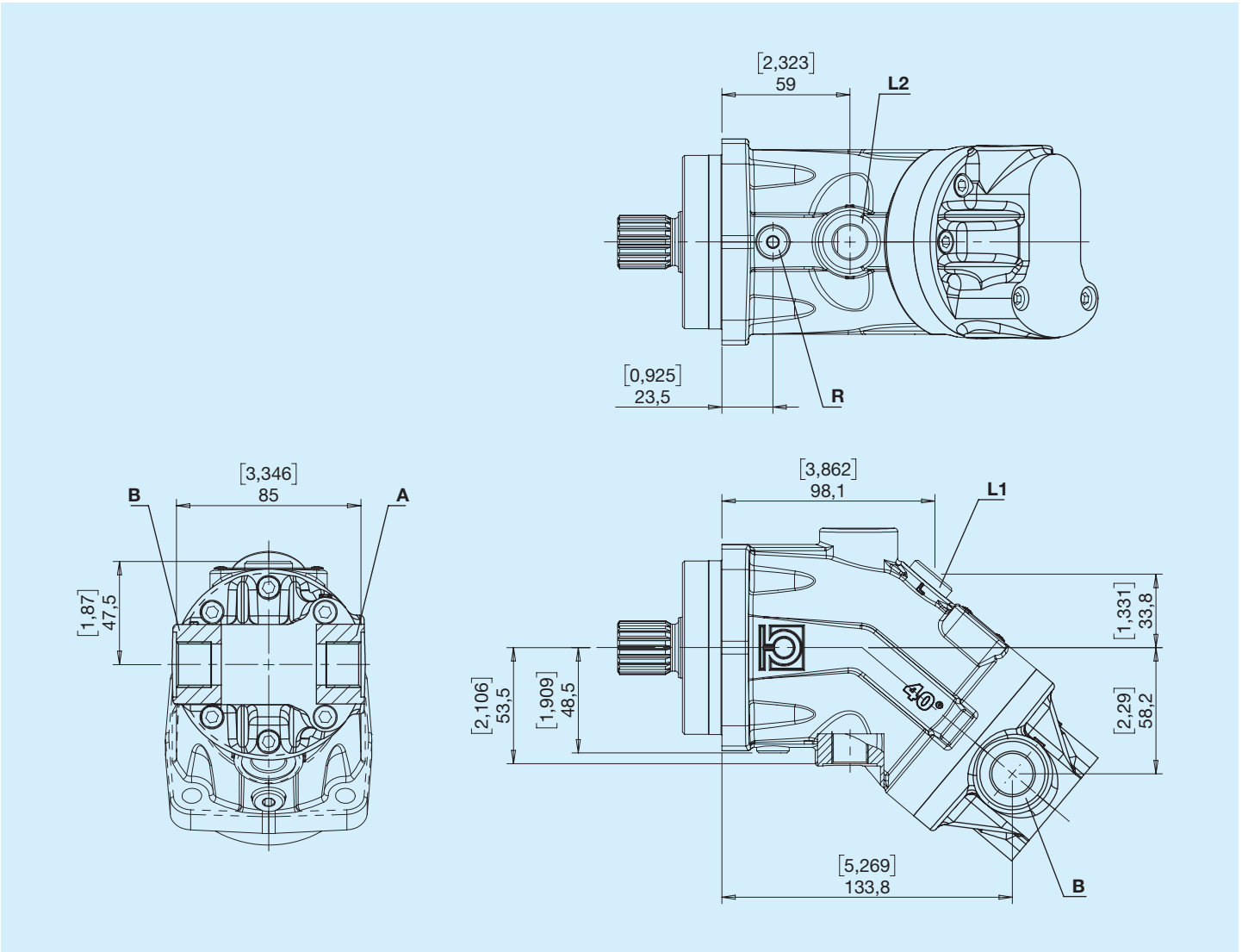


Continuous pressure 350 bar/5076 psi
Peak pressure 400 bar/5801 psi

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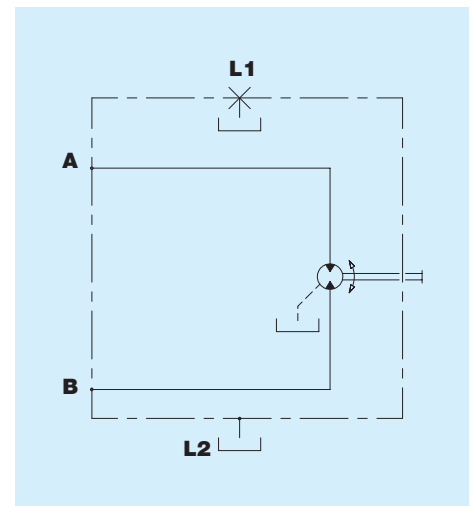
For pulsating load greater than 315 bar / 4569 psi, use the version with male splined shaft Z.

FL Lateral threaded

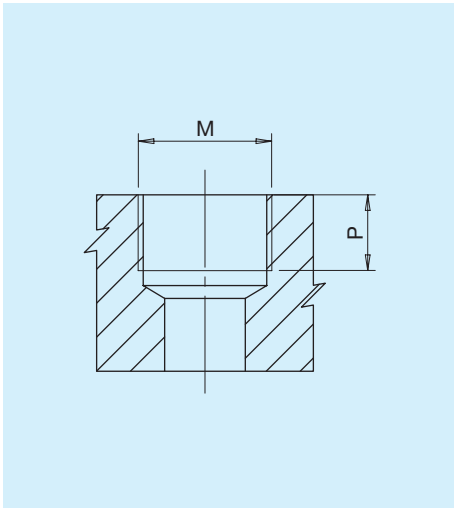


A,B - Use
L1, L2 - Drain port
S - Inlet
R - Spurgo

Hydraulic diagram



Type G - Gas



Type	M	Nm	P	
			mm	in
G1	Port ISO 1179-1 - G 1/8	8	8	0.31
G3	Port ISO 1179-1 - G 3/8	38	12	0.47
G6	Port ISO 1179-1 - G 3/4	90	18	0.71
G7	Port ISO 1179-1 - G 1	160	22	0.87

Combinations

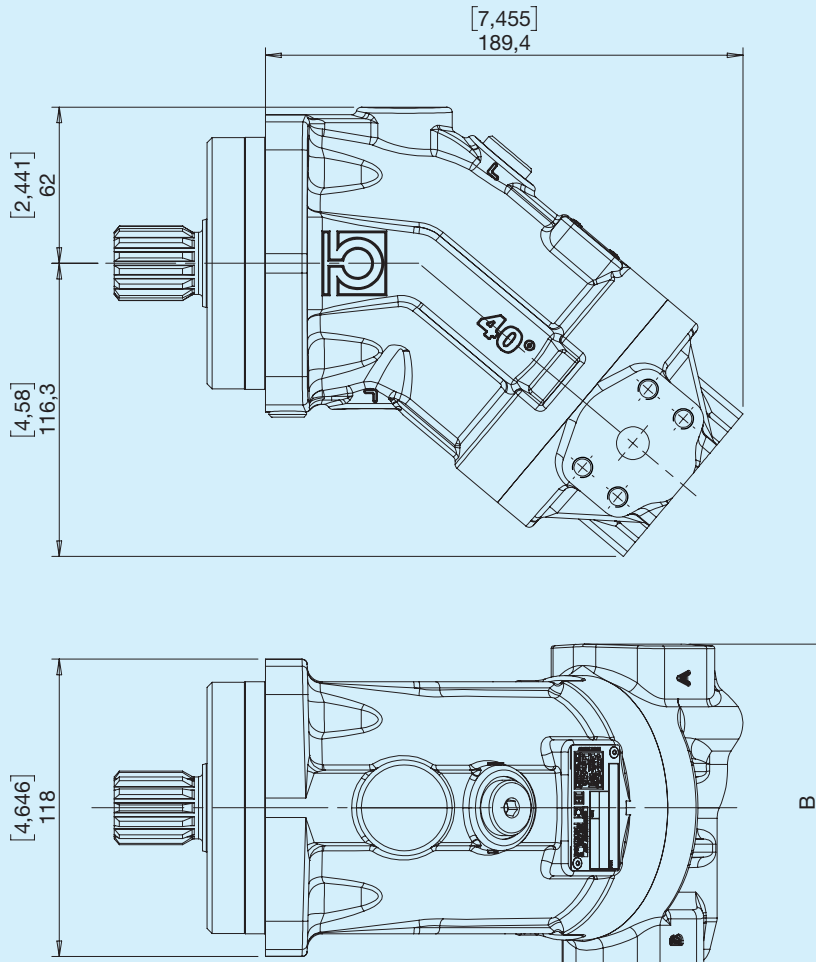
Position of ports	Drain port L1-L2	Delivery B	Inlet S	Purge R
G	G3	G4	G7	G1

HPPF	1	2	3	4	5	6	7	8	9	10	11	12
Displacement												
1	2	3										
010			012				016					
Flanges												
4	I ISO 4 holes S SAE B											
Shafts												
5	Z DIN 5480 W25x1.25x30x18			C Cylindrical Ø25			S SAE 13T 16/32 DP					
	X DIN 5480 W20x1.25x30x14			Y Cylindrical Ø20								
Position of ports												
6	7	FL Lateral threaded										
Direction of rotation												
8	R Right					L Left						
Seals												
9	O NBR -30°C ÷ +100°C				F FKM (VITON) -20 °C ÷ +200 °C							
Accessories												
10	O No option					C Painting						
Special versions												
11	12	...										

Fixed displacement pumps HPPF 23-28-32



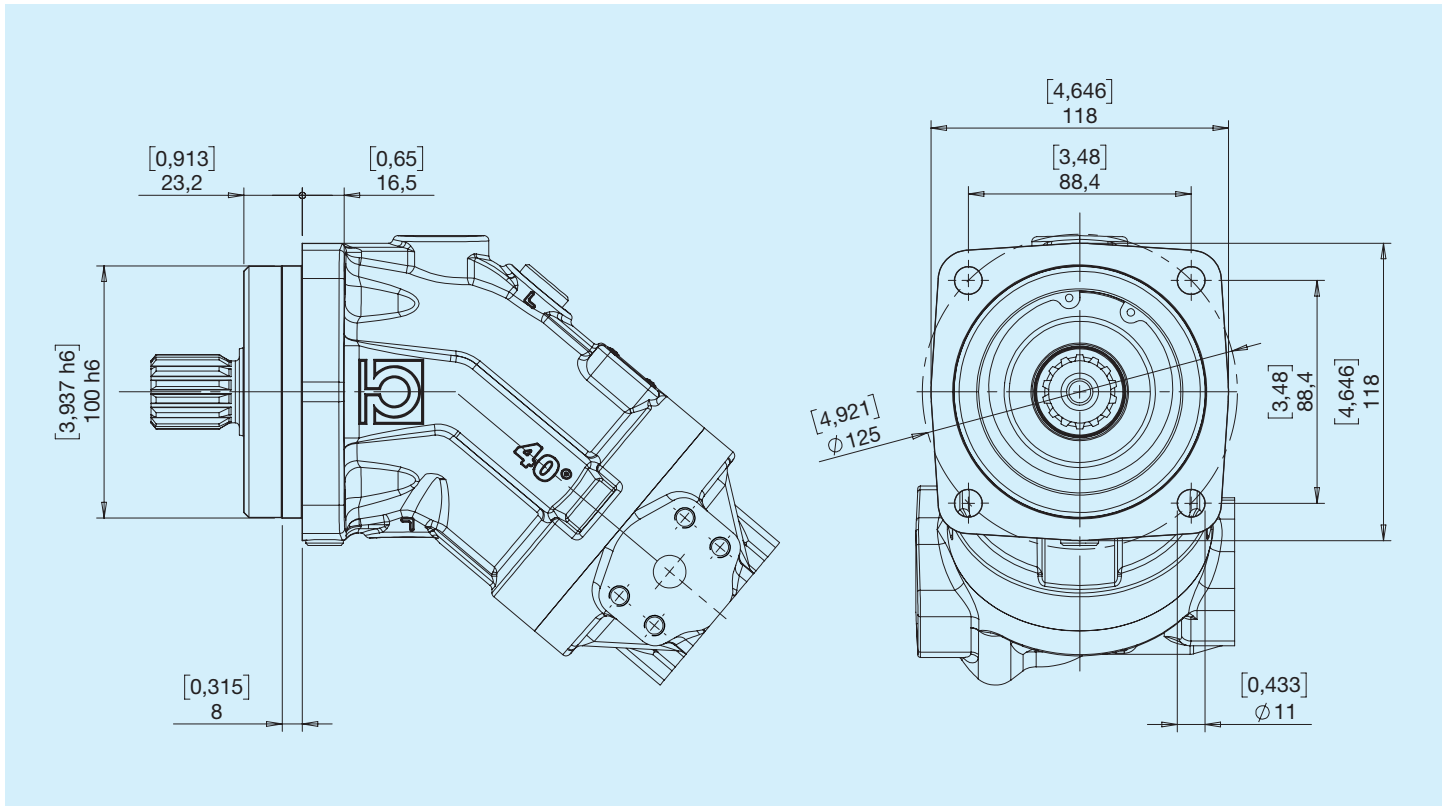
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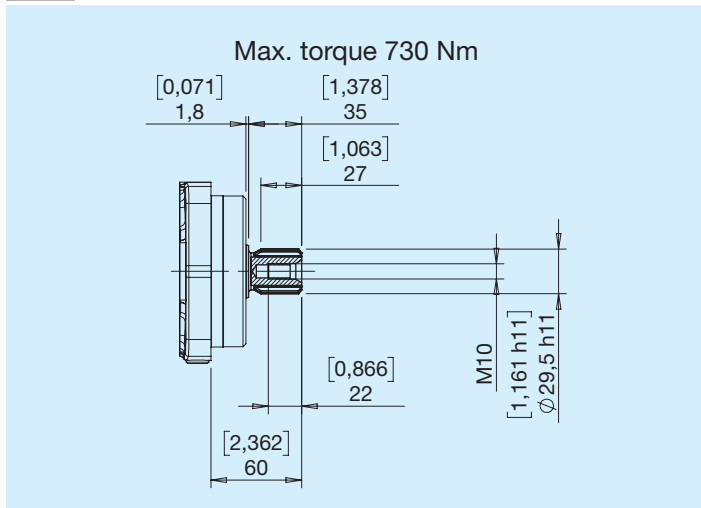
B - See port position section

HPPF	Nominal displacement		Continuous pressure		Intermittent pressure		Peak pressure		Rotation speed nmax MAX min ⁻¹	Torque @350 bar MIN min ⁻¹	Weight		Polar moment of inertia kg • m ²
	cm ³	in ³	bar	psi	bar	psi	bar	psi			kg	lbs	
23	23	1.40	350	5076	400	5801	450	6527	3600	500	10.9	24	0,0012
28	28	1.71	350	5076	400	5801	450	6527	3600	500	10.9	24	0,0012
32	32	1.95	350	5076	400	5801	450	6527	3600	500	10.9	24	0,0012

I ISO 4 holes

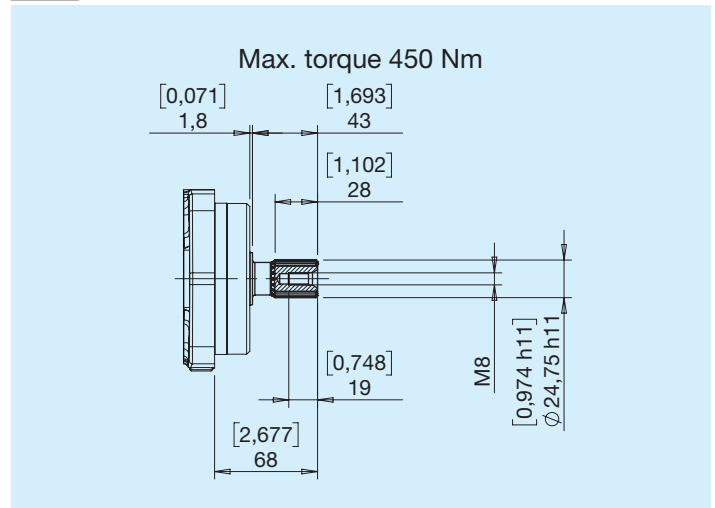


Z DIN 5480 W30x2x30x14



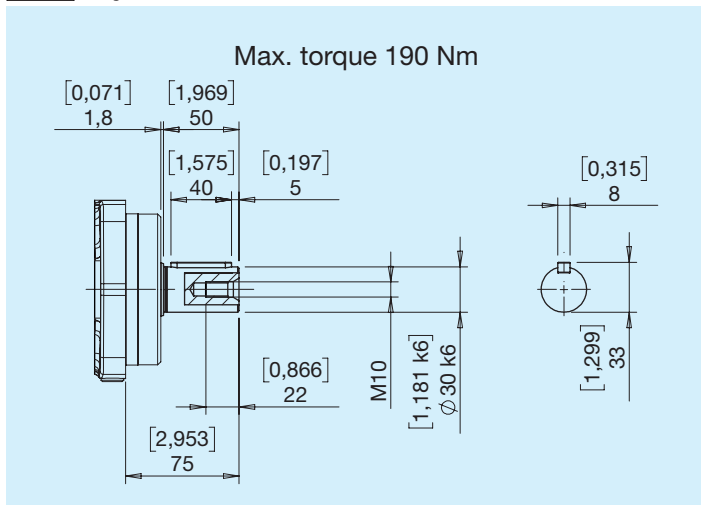
Continuous pressure 400 bar/5801 psi
Peak pressure 450 bar/6527 psi

X DIN 5480 W25x1.25x30x18



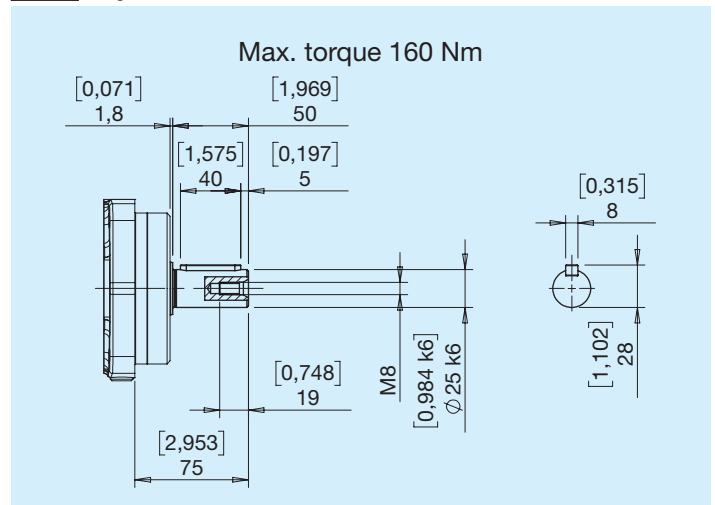
Continuous pressure 400 bar/5801 psi
Peak pressure 450 bar/6527 psi

C Cylindrical Ø30



Continuous pressure 350 bar/5076 psi
Peak pressure 400 bar/5801 psi

Y Cylindrical Ø25

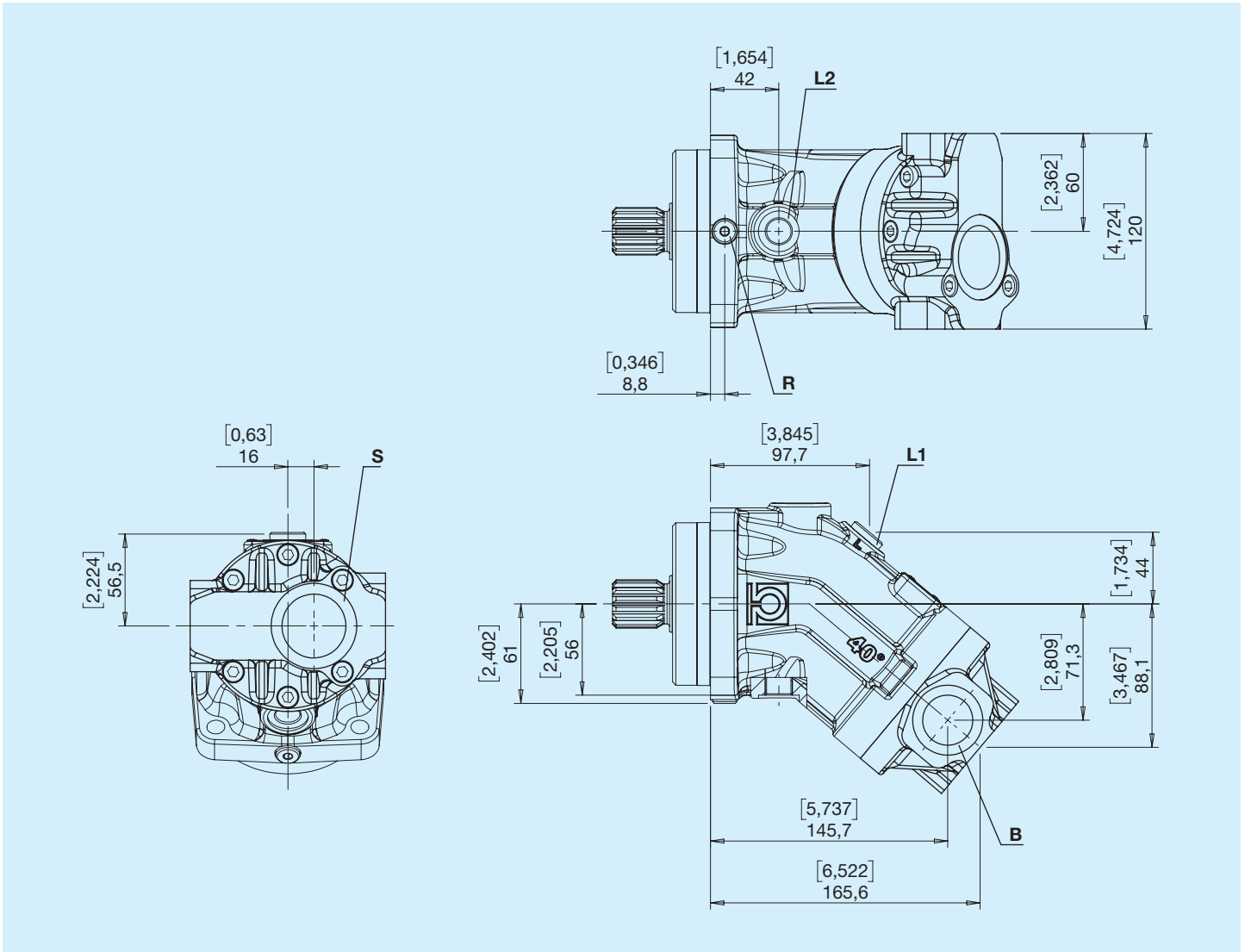


Continuous pressure 350 bar/5076 psi
Peak pressure 400 bar/5801 psi

For applications with radial load on the drive shaft (pinions, V-belts), with X and Y type shaft, the allowed pressure is 315 bar / 4569 psi ($P_{max} = 350 \text{ bar} / 5076 \text{ psi}$).

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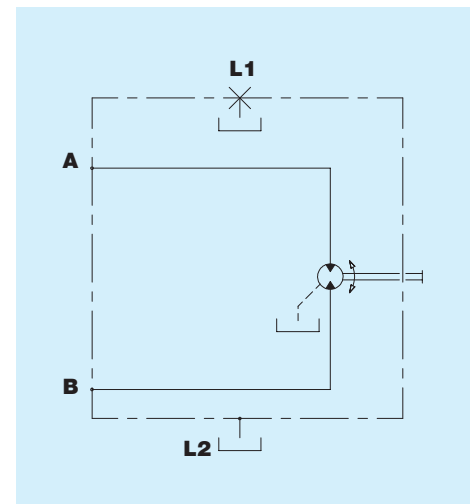
FS Threaded GAS



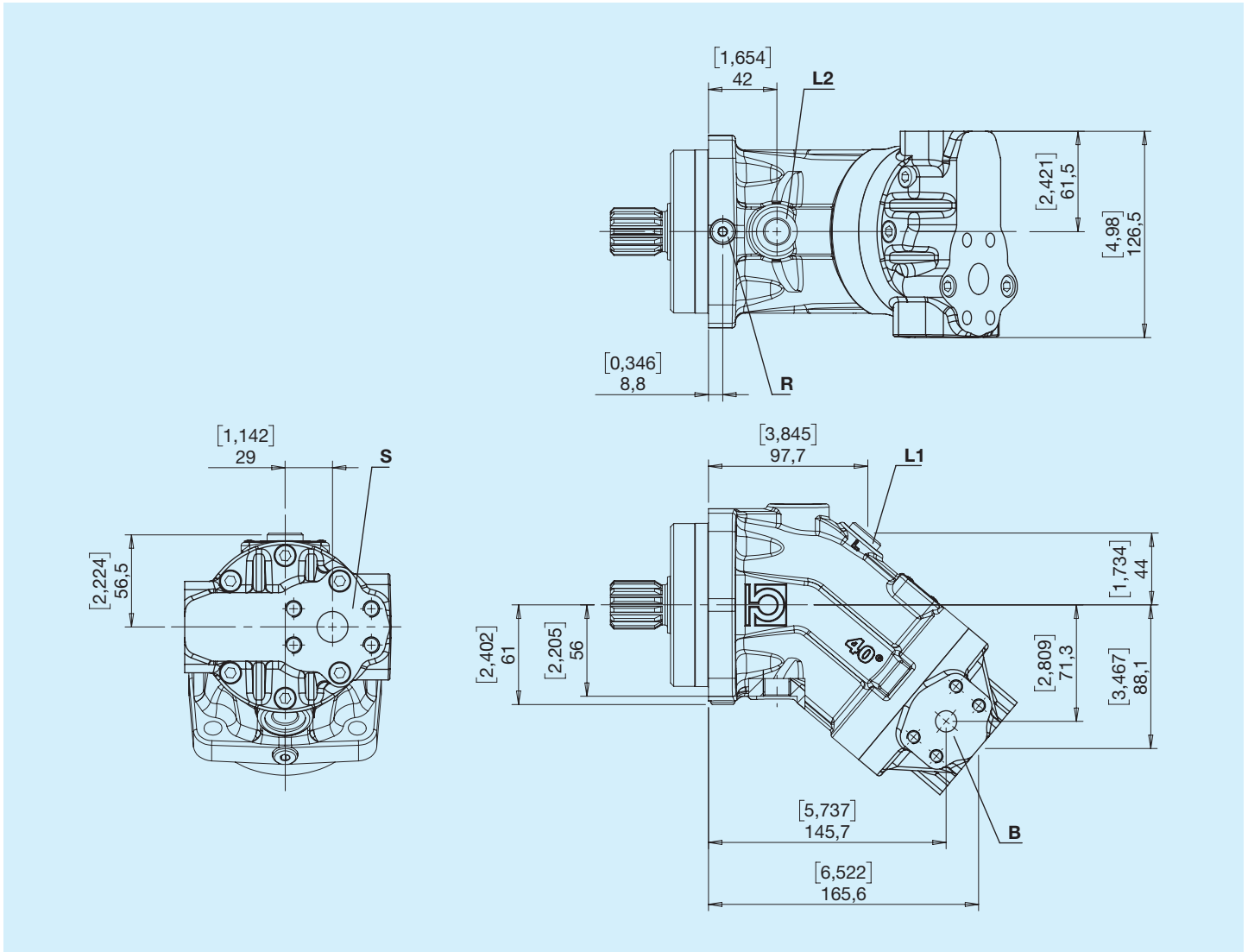
A,B - Use
L1, L2 - Drain port
S - Inlet
R - Spurgo

In the left version, the valve is rotated by 180°.

Hydraulic diagram



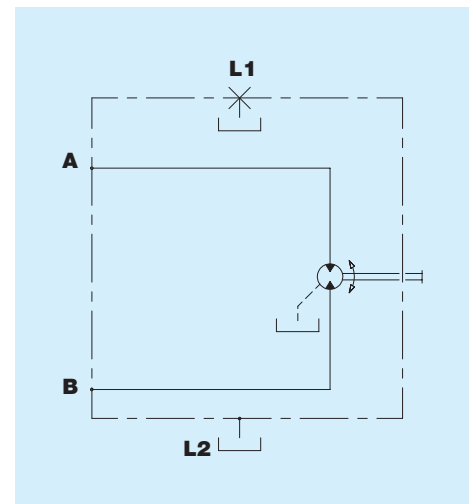
SS SAE flange



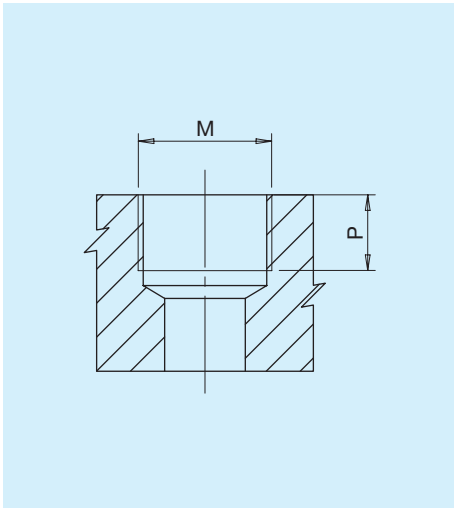
A,B - Use
L1, L2 - Drain port
S - Inlet
R - Spurgo

In the left version, the valve is rotated by 180°.

Hydraulic diagram

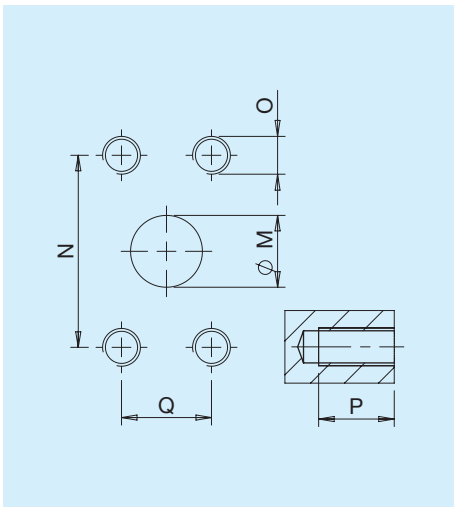


Type G - Gas



Type	M		P	
		Nm	mm	in
G1	Port ISO 1179-1 - G 1/8	8	8	0.31
G3	Port ISO 1179-1 - G 3/8	38	12	0.47
G7	Port ISO 1179-1 - G 1	160	19	0.75
G8	Port ISO 1179-1 - G 1 1/4	200	20	0.79

Type N - SAE



Type	M		N		Q		P		O	
	mm	in	mm	in	mm	in	mm	in		Nm
N4	13	0.51	40.5	1.59	18.2	0.72	15	0.59	M8	17
N6	19	0.75	47.6	1.87	22.2	0.87	17	0.67	M10	38

Combinations

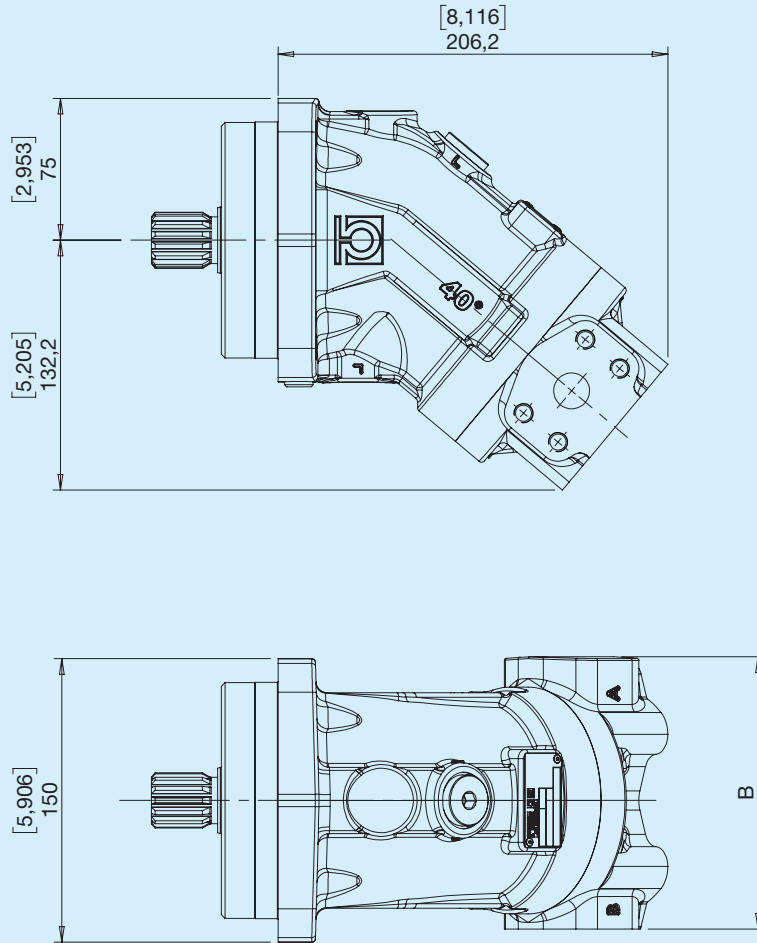
Position of ports	Drain port L1-L2	Delivery B	Inlet S	Purge R
G	G3	G4	G8	G1
SS	G3	N4	N6	G1

HPPF	1	2	3	4	5	6	7	8	9	10	11	12	
<hr/>													
1	2	3	Displacement										
			023				028			032			
<hr/>													
4	Flanges												
I ISO 4 holes													
<hr/>													
5	Shafts												
Z DIN 5480 W30x2x30x14				X DIN 5480 W25x1.25x30x18				C Cylindrical Ø30			Y Cylindrical Ø25		
<hr/>													
6	7	Position of ports											
FS Threaded GAS					SS SAE flange								
<hr/>													
8	Direction of rotation												
R Right						L Left							
<hr/>													
9	Seals												
0 NBR -30°C ÷ +100°C						F FKM (VITON) -20 °C ÷ +200 °C							
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10	Accessories												
0 No option						C Painting							
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11	12	Special versions											
...													

Fixed displacement pumps HPPF 45



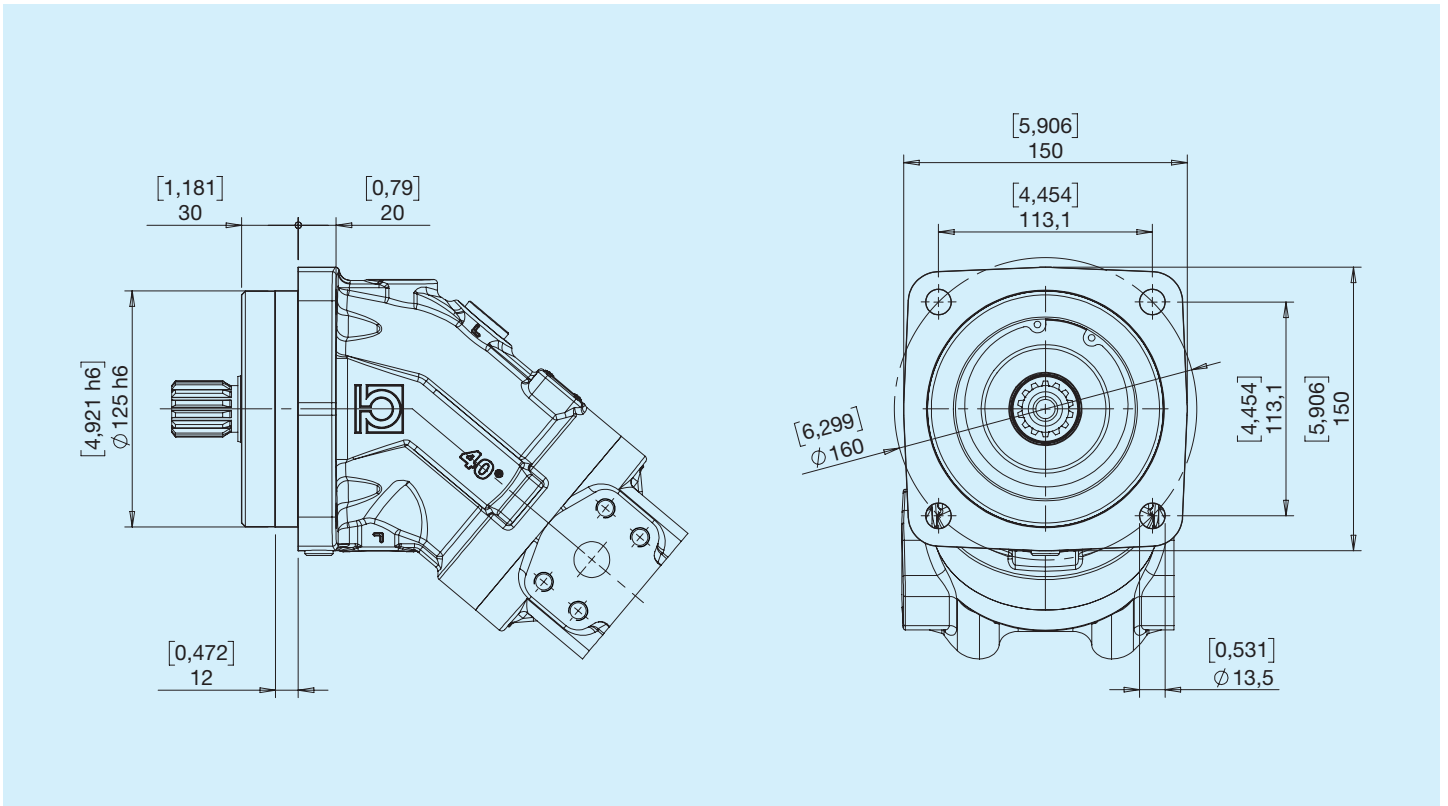
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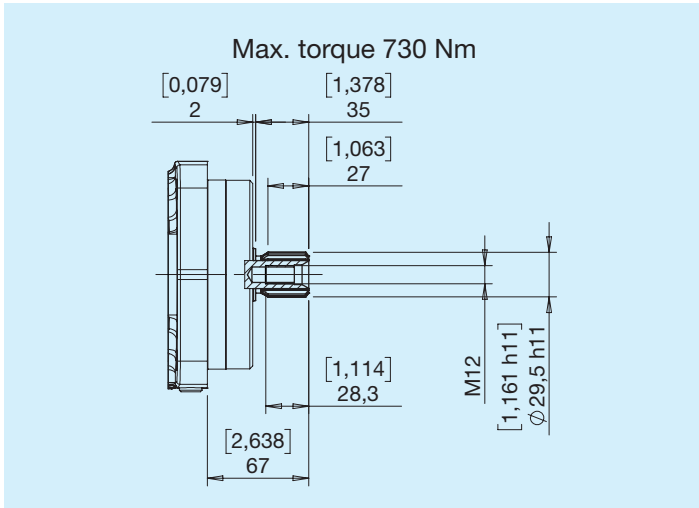
B - See port position section

HPPF	Nominal displacement		Continuous pressure		Intermittent pressure		Peak pressure		Rotation speed nmax MAX min ⁻¹	Torque @350 bar MIN min ⁻¹	Weight		Polar moment of inertia kg • m ²
	cm ³	in ³	bar	psi	bar	psi	bar	psi			kg	lbs	
45	45	2.75	350	5076	400	5801	450	6527	3600	500	17.2	37.9	0,0024

I ISO 4 holes

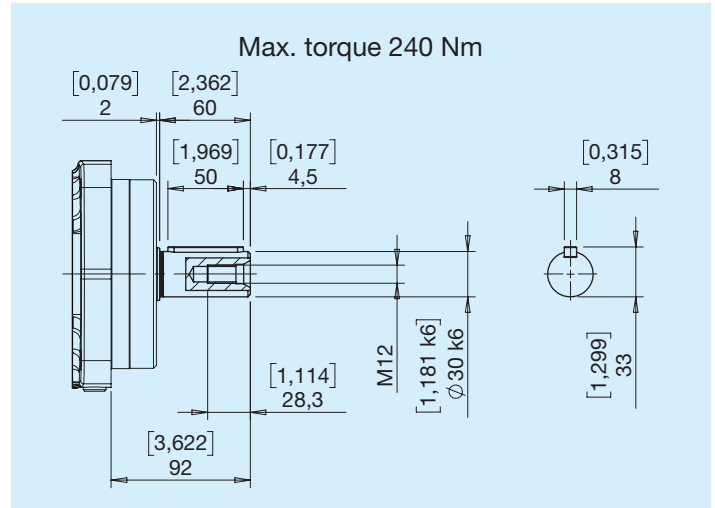


Z DIN 5480 W30x2x30x14



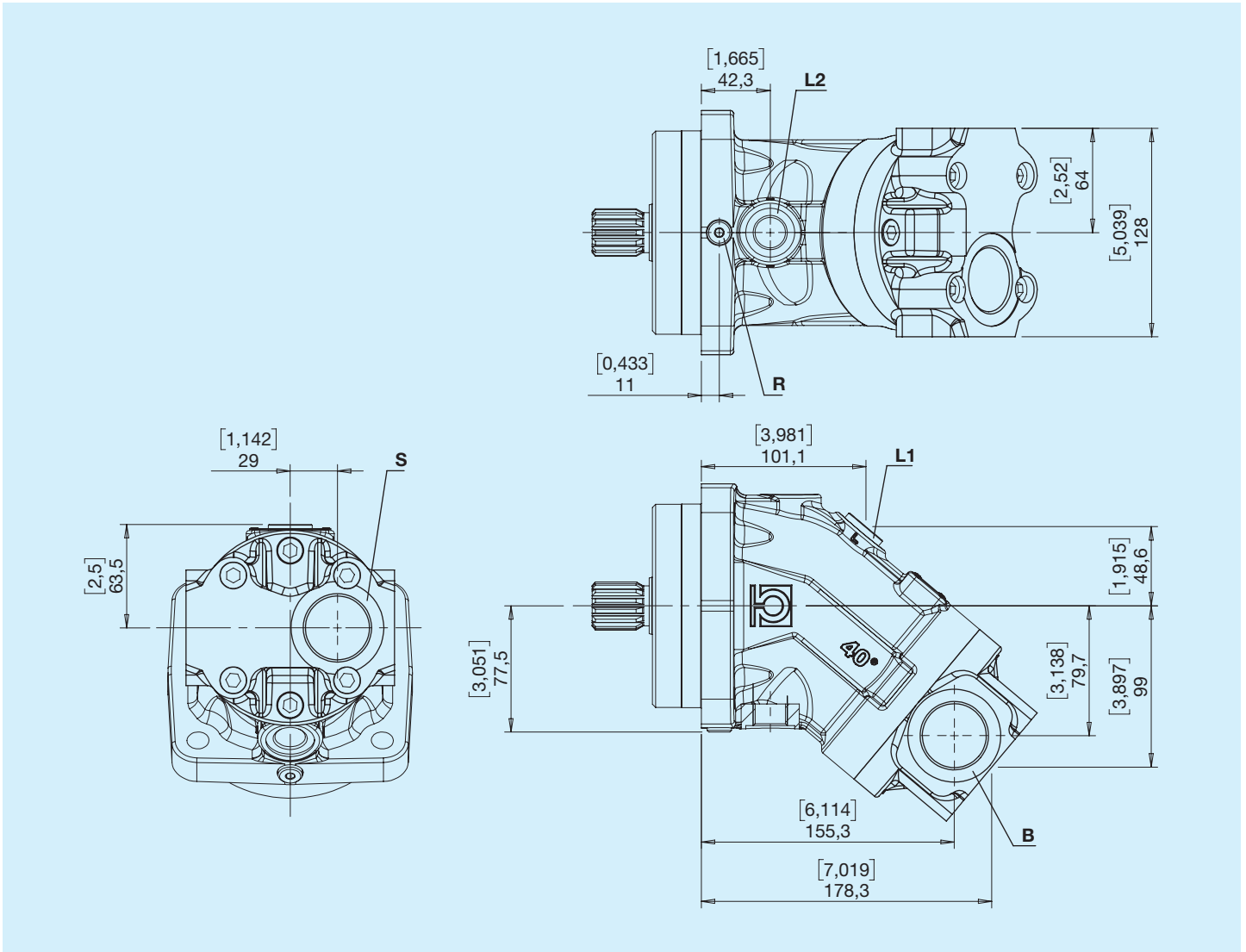
Continuous pressure 400 bar/5801 psi
Peak pressure 450 bar/6527 psi

C Cylindrical \varnothing 30



Continuous pressure 350 bar/5076 psi
Peak pressure 400 bar/5801 psi

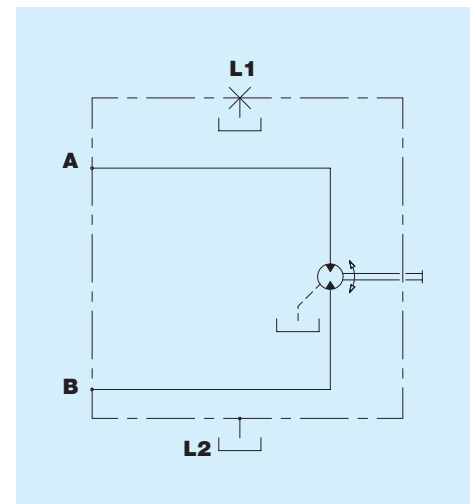
FS Threaded GAS



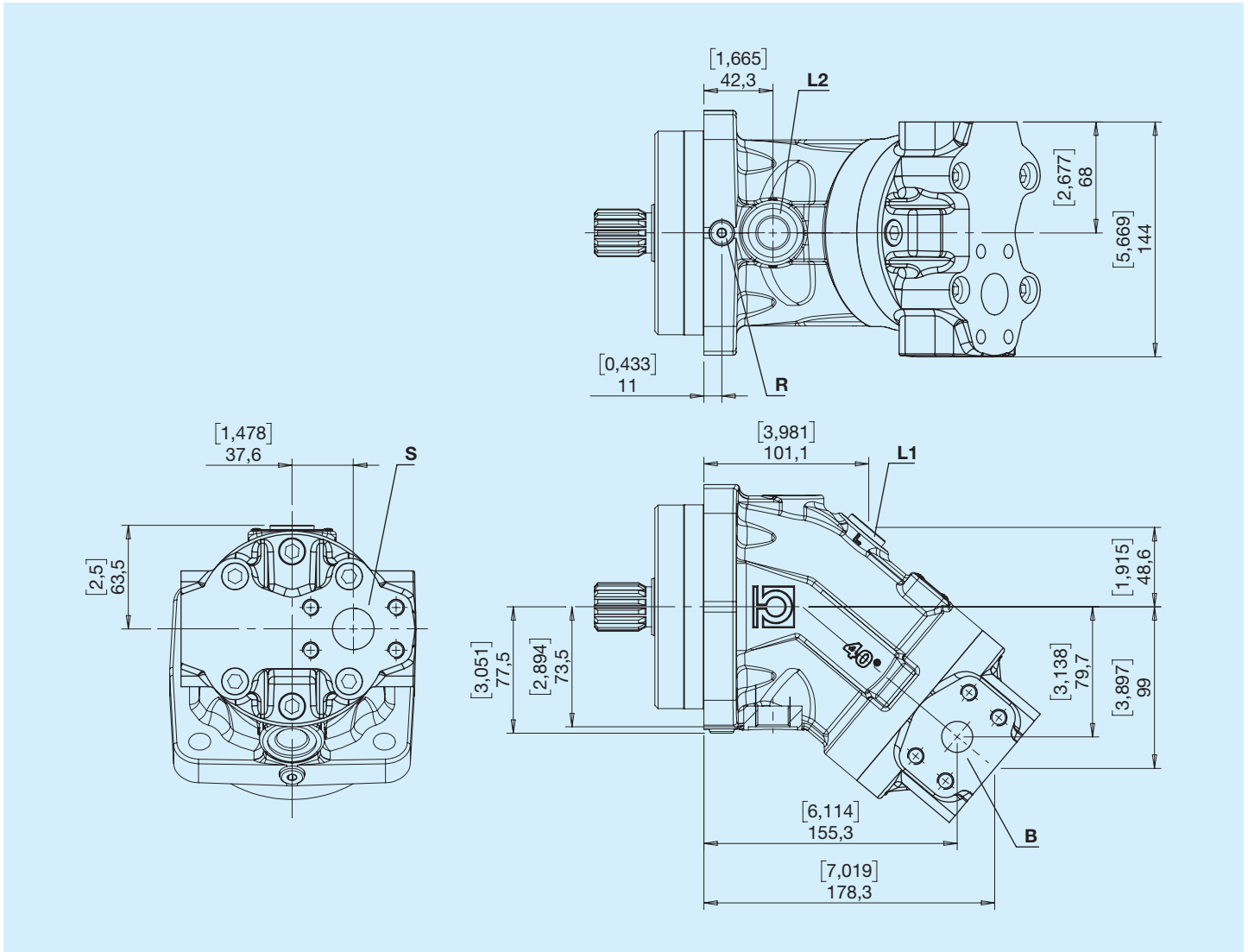
A,B - Use
 L1, L2 - Drain port
 S - Inlet
 R - Spurgo

In the left version, the valve is rotated by 180°.

Hydraulic diagram



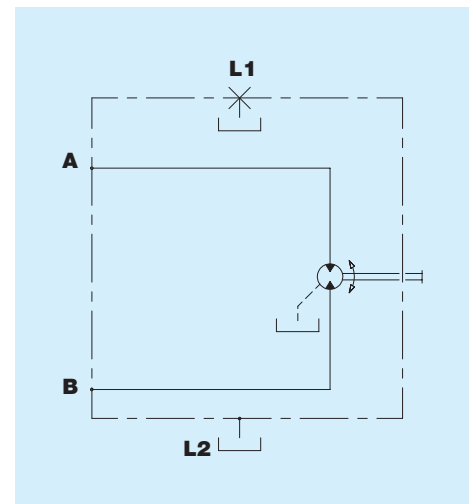
SS SAE flange



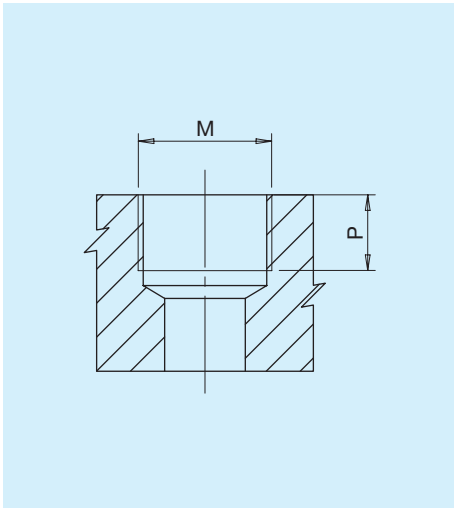
A,B - Use
L1, L2 - Drain port
S - Inlet
R - Spurgo

In the left version, the valve is rotated by 180°.

Hydraulic diagram

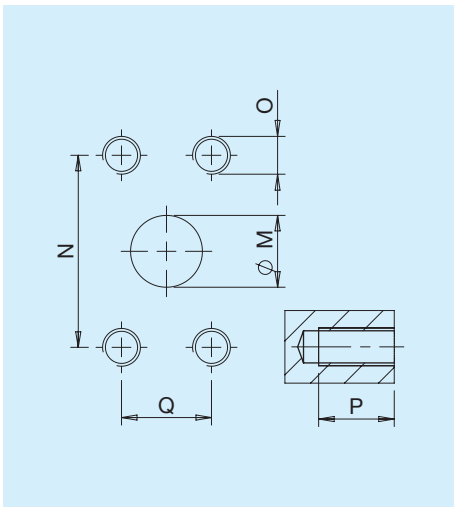


Type G - Gas



Type	M		P	
		Nm	mm	in
G1	Port ISO 1179-1 - G 1/8	8	15	0.59
G4	Port ISO 1179-1 - G 1/2	70	16	0.63
G8	Port ISO 1179-1 - G 1 1/4	200	22	0.87

Type N - SAE



Type	M		N		Q		P		O
	mm	in	mm	in	mm	in	mm	in	Nm
N7	19	0.75	50.8	2	23.8	0.94	20	0.79	M10 38
N8	25.5	1	52.4	2.06	26.2	1.03	20	0.79	M10 38

Combinations

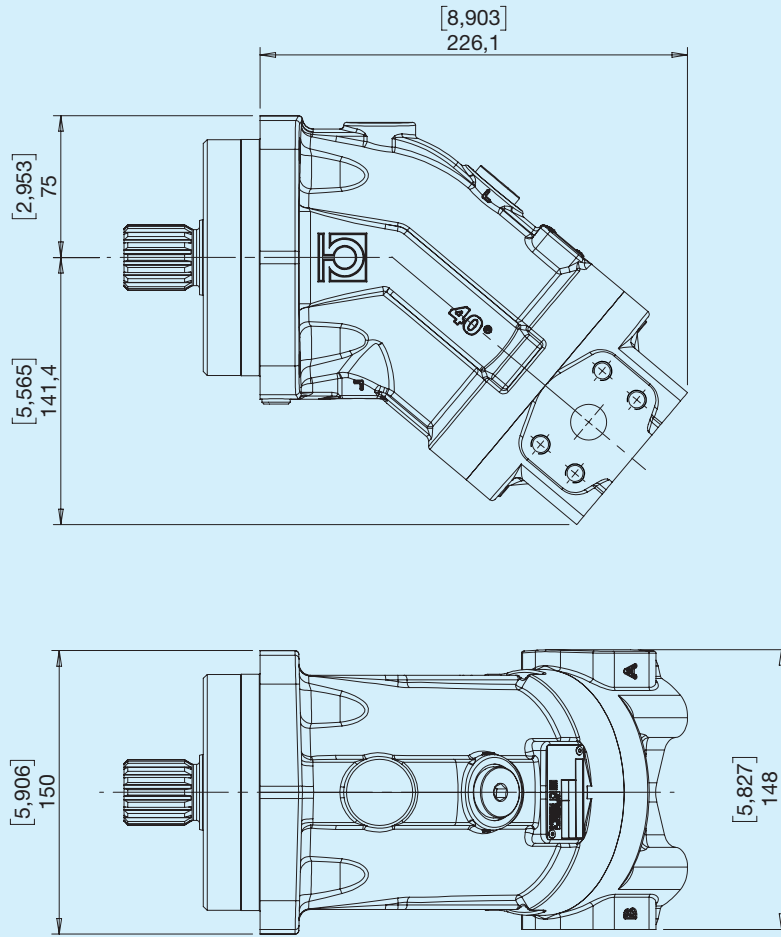
Position of ports	Drain port L1-L2	Delivery B	Inlet S	Purge R
G	G4	G4	G8	G1
SS	G4	N7	N8	G1

HPPF	1	2	3	4	5	6	7	8	9	10	11	12
<hr/>												
1	2	3	Displacement									
<hr/>			045									
4	Flanges											
<hr/>												
I ISO 4 holes												
5	Shafts											
<hr/>												
Z DIN 5480 W30x2x30x14				C Cylindrical Ø30								
6	7	Position of ports										
<hr/>		FS Threaded GAS				SS SAE flange						
8	Direction of rotation											
<hr/>												
R Right				L Left								
9	Seals											
<hr/>												
0 NBR -30°C ÷ +100°C				F FKM (VITON) -20 °C ÷ +200 °C								
10	Accessories											
<hr/>												
0 No option				C Painting								
11	12	Special versions										
<hr/>		...										

Fixed displacement pumps HPPF 56-63

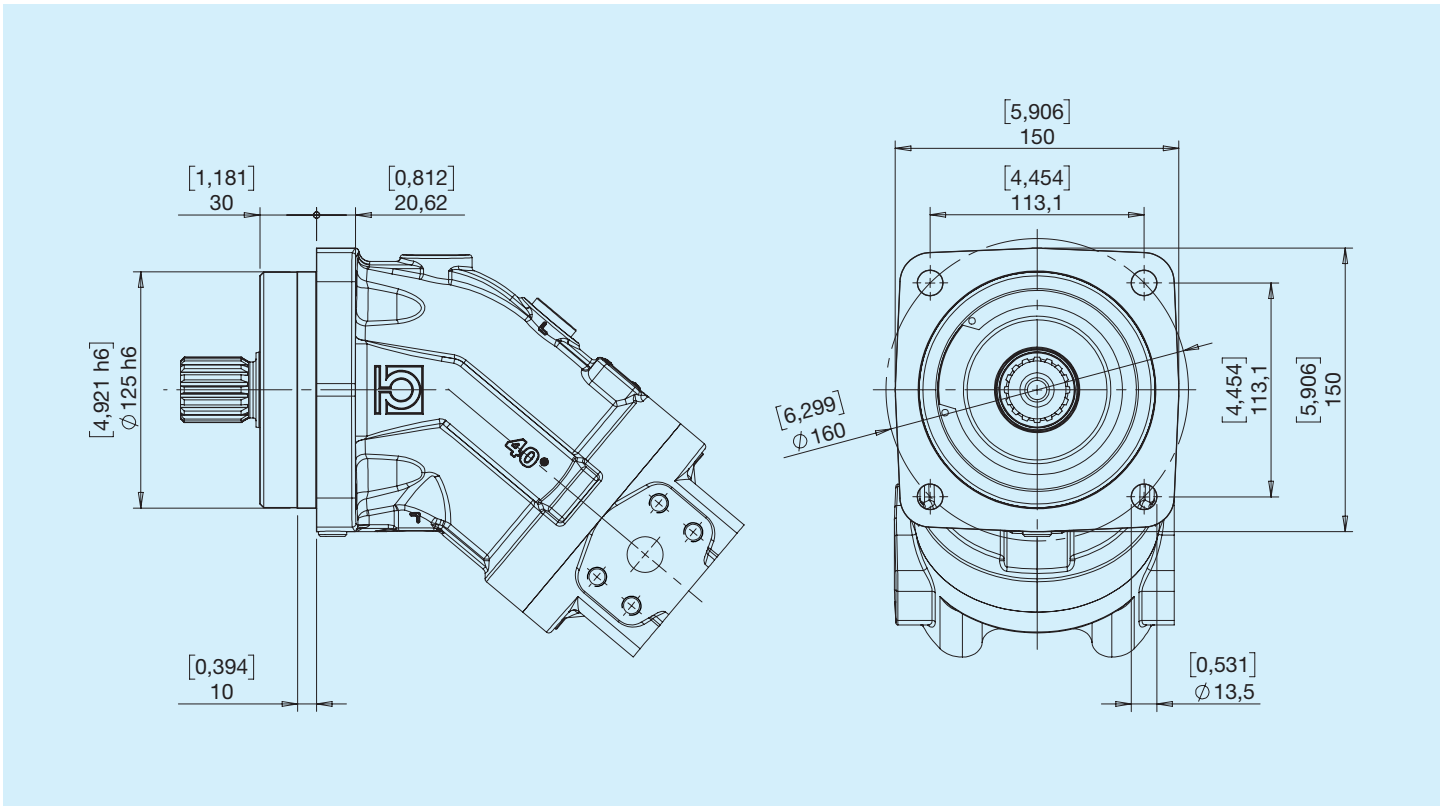


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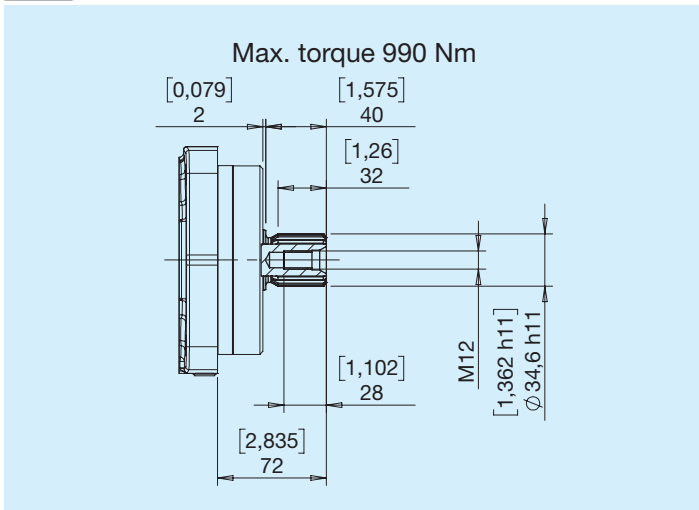


HPPF	Nominal displacement		Continuous pressure		Intermittent pressure		Peak pressure		Rotation speed nmax MAX min ⁻¹	Torque @350 bar MIN min ⁻¹	Weight		Polar moment of inertia kg • m ²
	cm ³	in ³	bar	psi	bar	psi	bar	psi			kg	lbs	
56	56	3.42	350	5076	400	5801	450	6527	3600	500	19.9	43.9	0,0042
63	63	3.84	350	5076	400	5801	450	6527	2000	350	19.9	43.9	0,0042

I ISO 4 holes

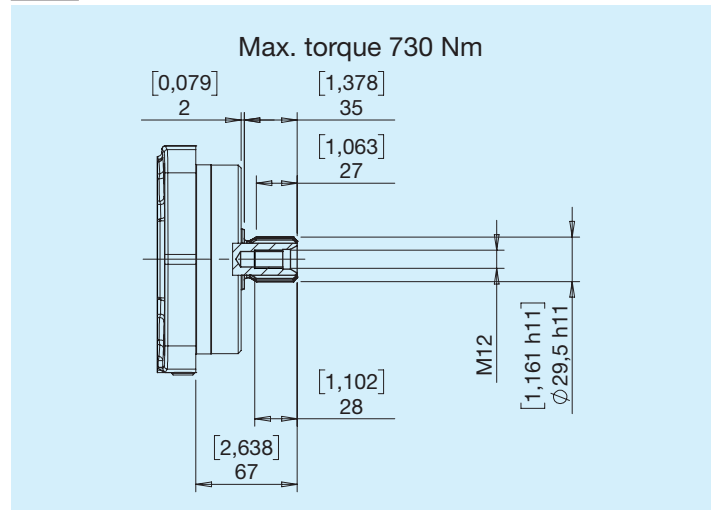


Z DIN 5480 W35x2x30x16



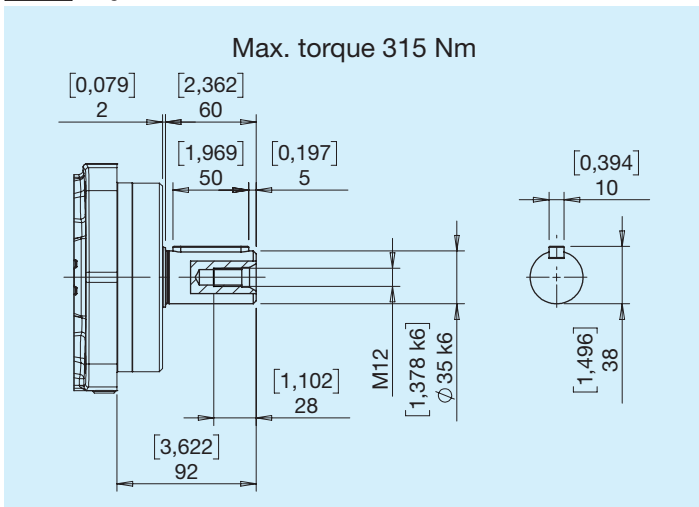
Continuous pressure 400 bar/5801 psi
Peak pressure 450 bar/6527 psi

X DIN 5480 W30x2x30x14



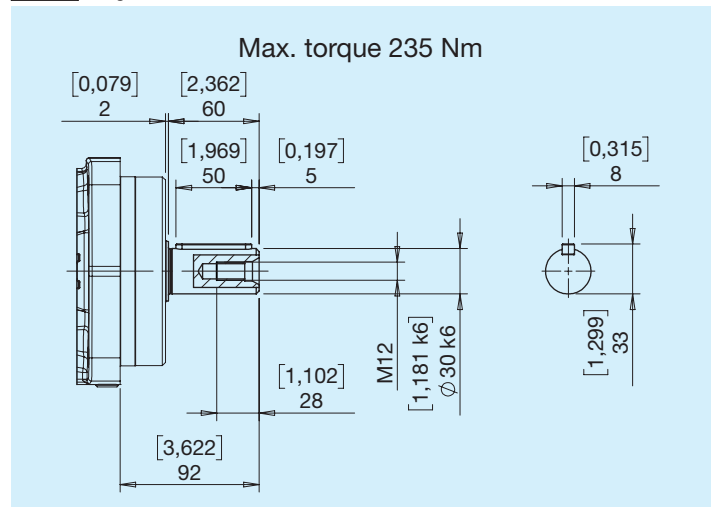
Continuous pressure 350 bar/5076 psi
Peak pressure 400 bar/5801 psi

C Cylindrical Ø35



Continuous pressure 350 bar/5076 psi
Peak pressure 400 bar/5801 psi

Y Cylindrical Ø30

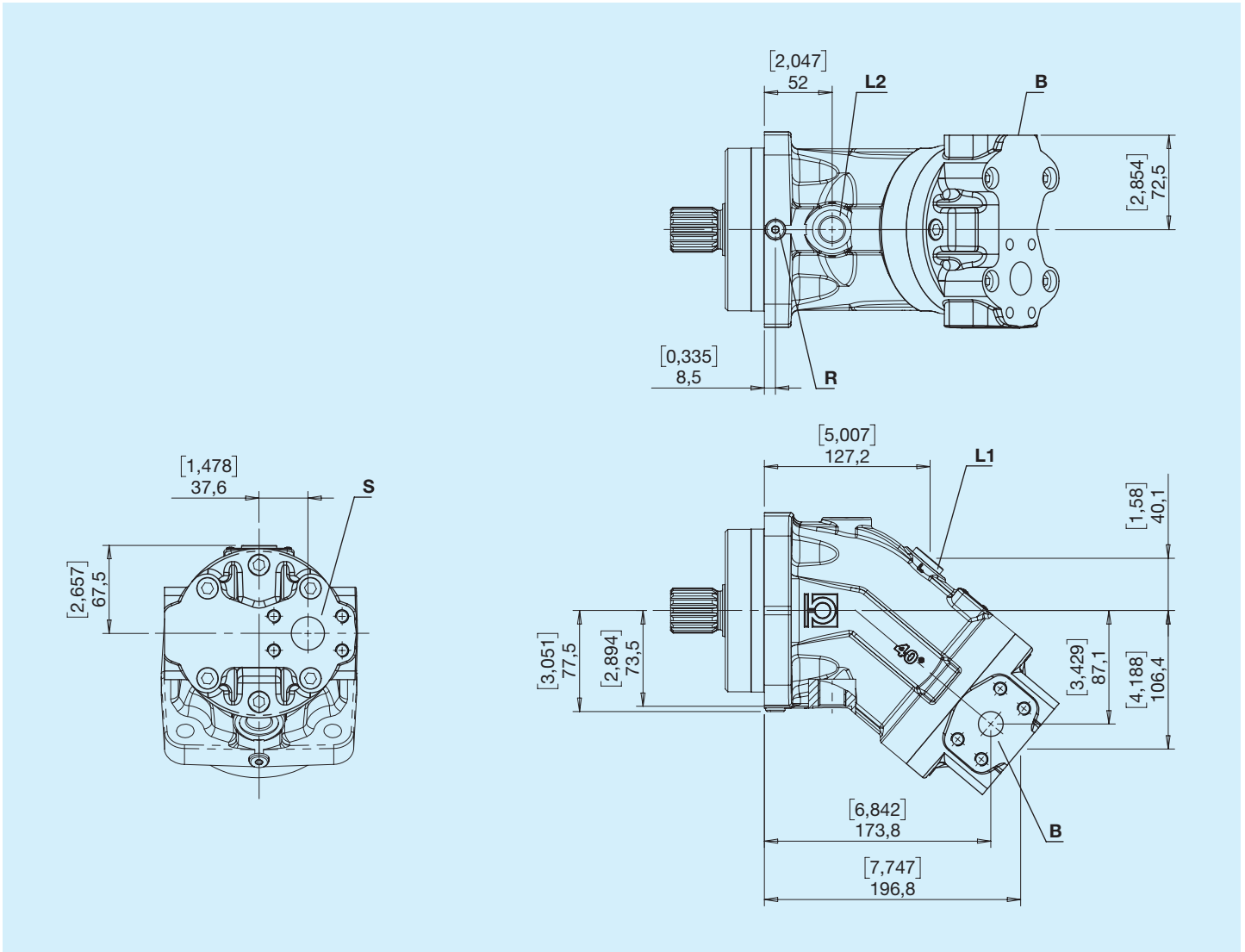


Continuous pressure 350 bar/5076 psi
Peak pressure 400 bar/5801 psi

For applications with radial load on the drive shaft (pinions, V-belts), with X and Y type shaft, the allowed pressure is 315 bar / 4569 psi ($P_{max} = 350 \text{ bar} / 5076 \text{ psi}$).

For pulsating load greater than 315 bar / 4569 psi, use the version with male splined shaft Z.

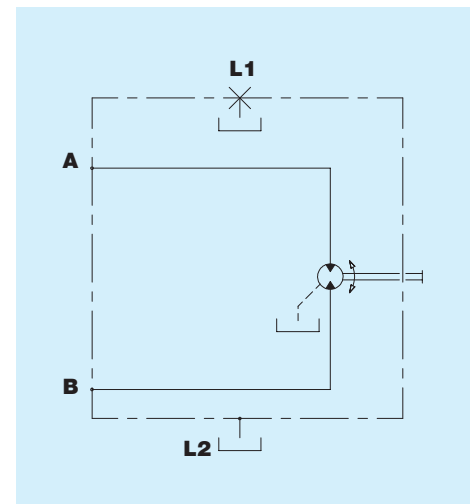
SS SAE flange



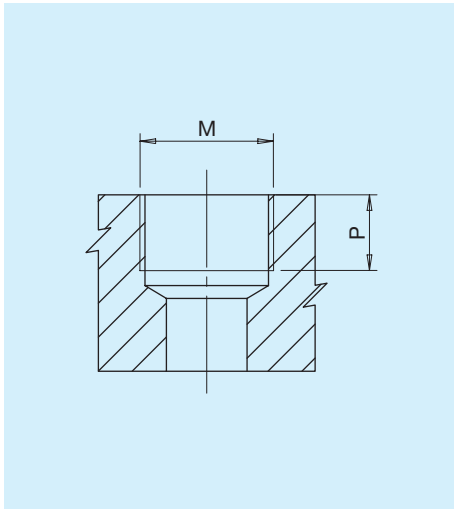
- A,B - Use
- L1, L2 - Drain port
- S - Inlet
- R - Spurgo

In the left version, the valve is rotated by 180°.

Hydraulic diagram

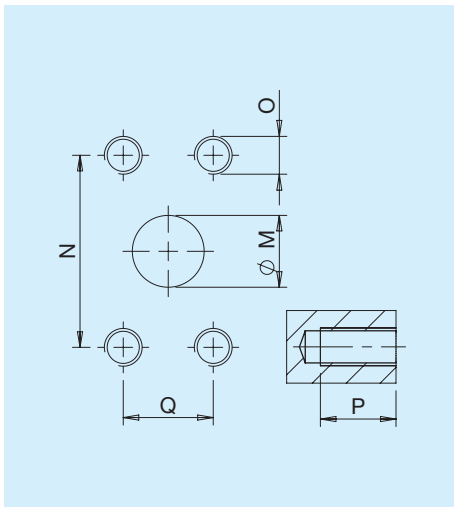


Type G - Gas



Type	M		P	
		Nm	mm	in
G1	Port ISO 1179-1 - G 1/8	8	15	0.59
G4	Port ISO 1179-1 - G 1/2	70	16	0.63

Type N - SAE



Type	M		N		Q		P		O
	mm	in	mm	in	mm	in	mm	in	Nm
N7	19	0.75	50.8	2	23.8	0.94	17	0.67	M10 38
N8	25.5	1	52.4	2.06	26.2	1.03	17	0.67	M10 38

Combinations

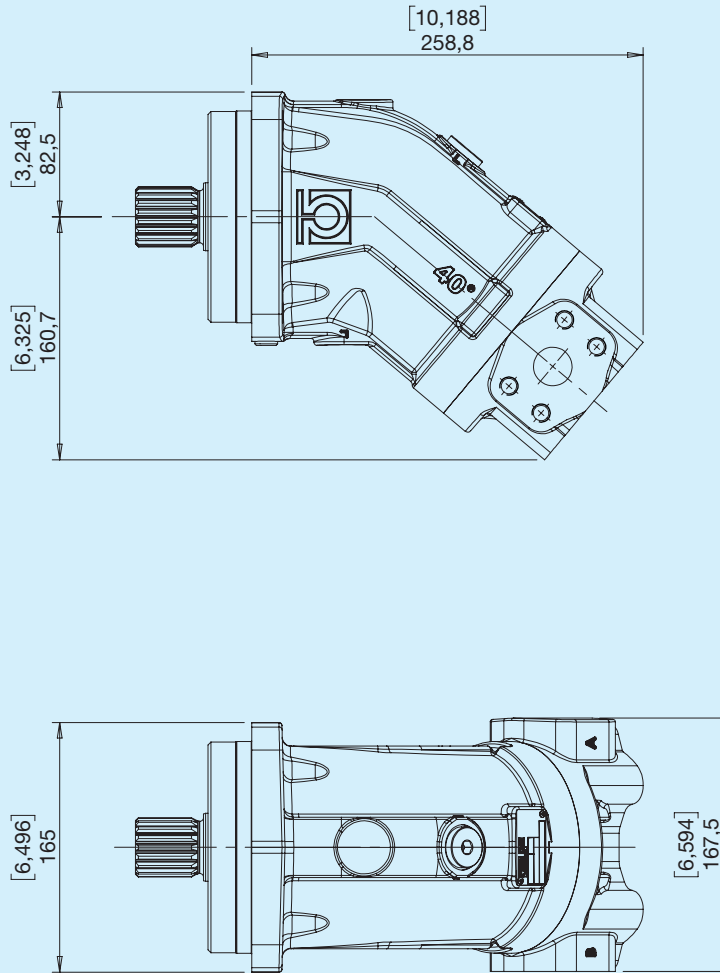
Position of ports	Drain port L1-L2	Delivery B	Inlet S	Purge R
G	G4	G4	N8	G1

HPPF	1	2	3	4	5	6	7	8	9	10	11	12
Displacement												
1	2	3						063				
056												
Flanges												
4	I ISO 4 holes											
Shafts												
5	Z DIN 5480 W35x2x30x16			X DIN 5480 W30x2x30x14			C Cylindrical Ø35			Y Cylindrical Ø30		
Position of ports												
6	7	SS SAE flange										
Direction of rotation												
8	R Right					L Left						
Seals												
9	0 NBR -30°C ÷ +100°C					F FKM (VITON) -20 °C ÷ +200 °C						
Accessories												
10	0 No option					C Painting						
Special versions												
11	12	...										

Fixed displacement pumps HPPF 80-90

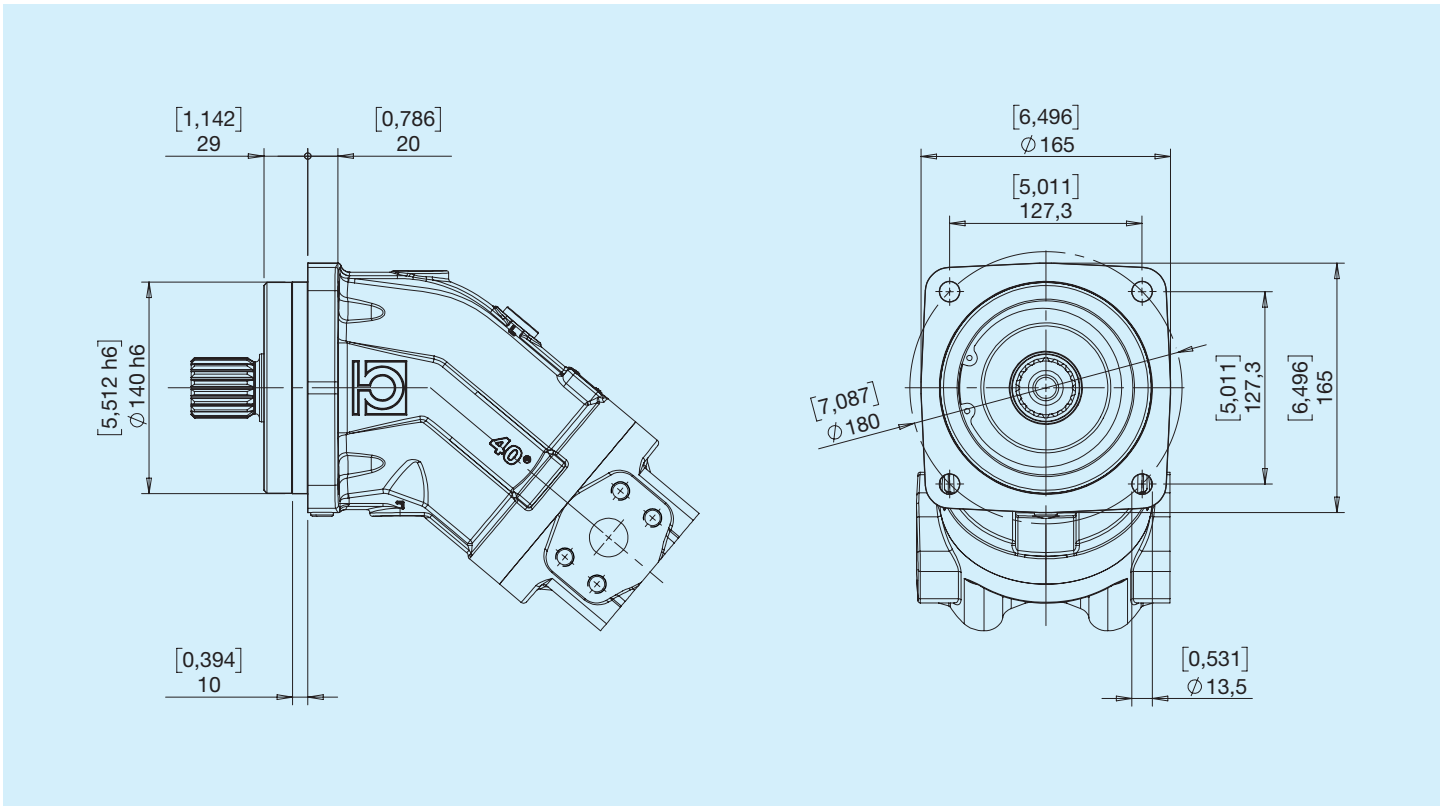


Before use, carefully read the GENERAL INSTRUCTIONS FOR USE OF OPEN CIRCUIT AXIAL PISTON PUMPS AND MOTORS.

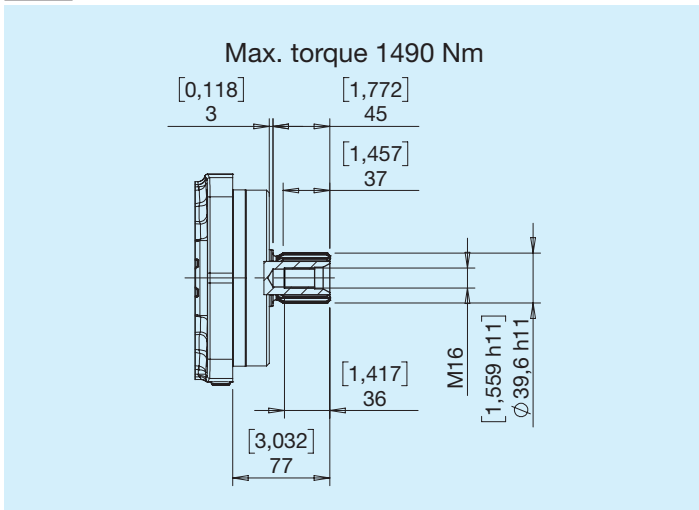


HPPF	Nominal displacement		Continuous pressure		Intermittent pressure		Peak pressure		Rotation speed nmax MAX min ⁻¹	Torque @350 bar		Weight		Polar moment of inertia kg • m ²
	cm ³	in ³	bar	psi	bar	psi	bar	psi		MIN min ⁻¹	kg	lbs		
80	80	4.88	350	5076	400	5801	450	6527	3600	500	27.7	61.1	0,0027	
90	90	5.49	350	5076	400	5801	450	6527	1800	501	27.7	61.1	0,0027	

I ISO 4 holes

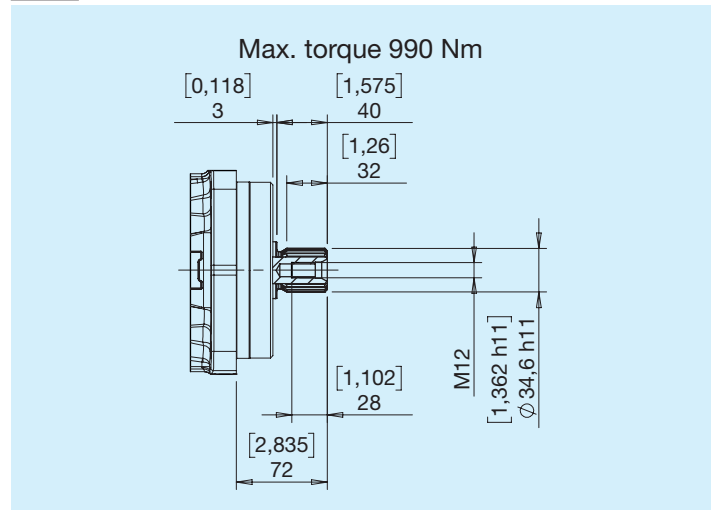


Z DIN 5480 W40x2x30x18



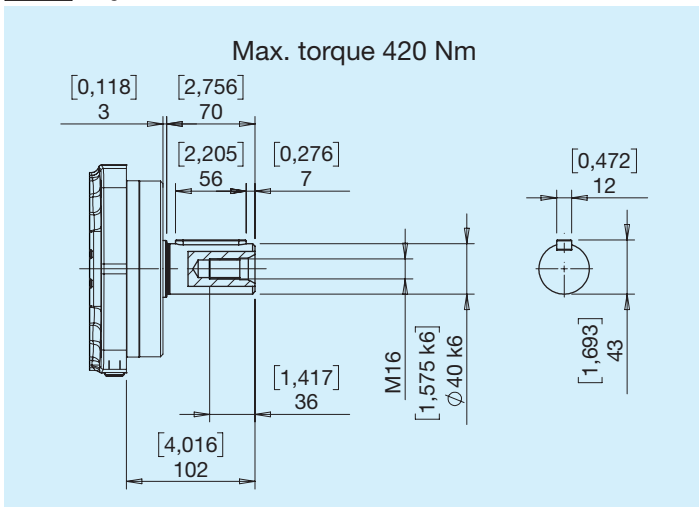
Continuous pressure 400 bar/5801 psi
Peak pressure 450 bar/6527 psi

X DIN 5480 W35x2x30x16



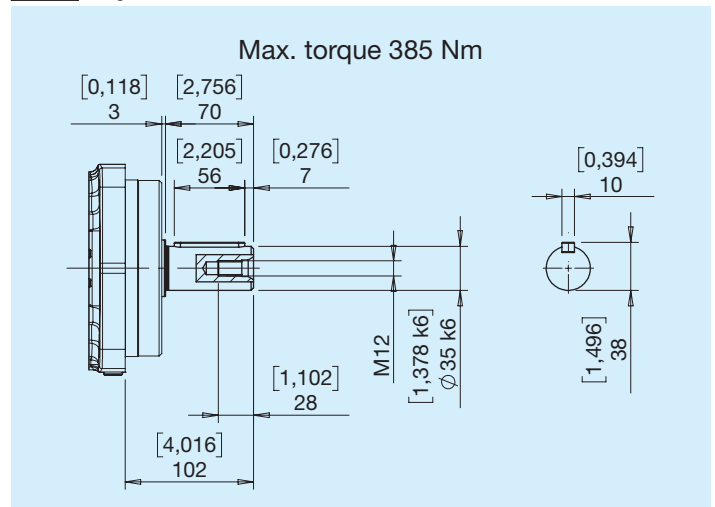
Continuous pressure 350 bar/5076 psi
Peak pressure 400 bar/5801 psi

C Cylindrical Ø40



Continuous pressure 350 bar/5076 psi
Peak pressure 400 bar/5801 psi

Y Cylindrical Ø35

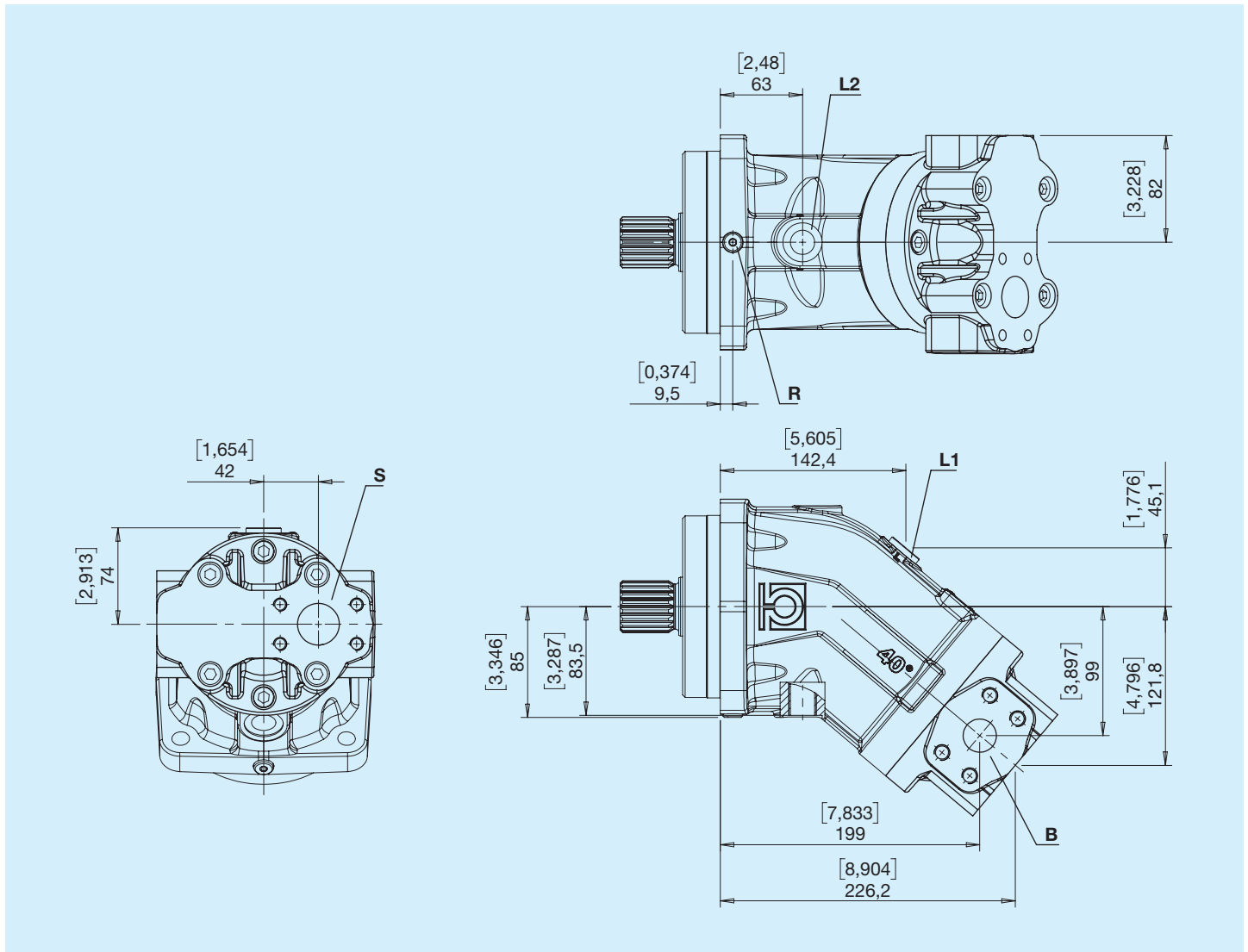


Continuous pressure 350 bar/5076 psi
Peak pressure 400 bar/5801 psi

For applications with radial load on the drive shaft (pinions, V-belts), with X and Y type shaft, the allowed pressure is 315 bar / 4569 psi ($P_{max} = 350 \text{ bar} / 5076 \text{ psi}$).

For pulsating load greater than 315 bar / 4569 psi, use the version with male splined shaft Z.

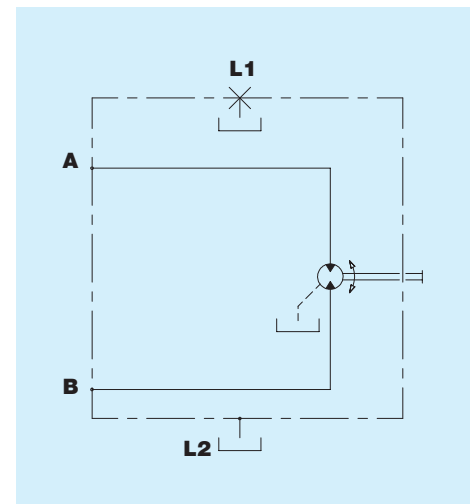
SS SAE flange



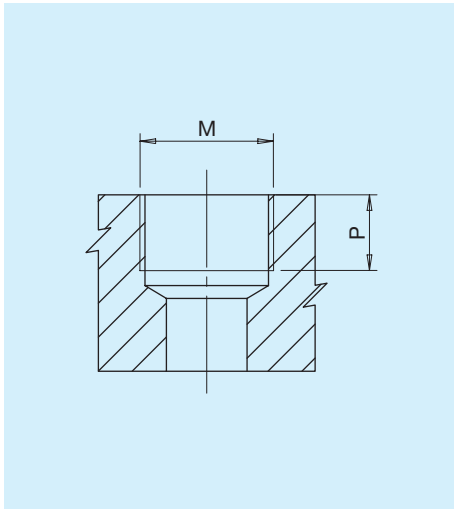
A,B - Use
L1, L2 - Drain port
S - Inlet
R - Spurgo

In the left version, the valve is rotated by 180°.

Hydraulic diagram

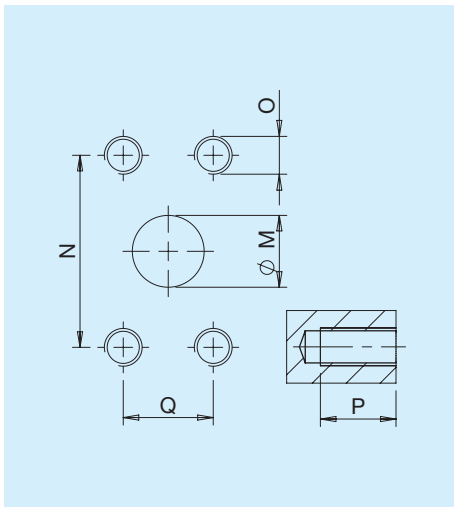


Type G - Gas



Type	M		P	
		Nm	mm	in
G1	Port ISO 1179-1 - G 1/8	8	15	0.59
G4	Port ISO 1179-1 - G 1/2	70	16	0.63

Type N - SAE



Type	M		N		Q		P		O
	mm	in	mm	in	mm	in	mm	in	Nm
N7	25	0.98	57.2	2.25	27.76	1.09	17	0.67	M10 38
N8	32	1.26	58.7	2.31	30.2	1.19	17	0.67	M12 70

Combinations

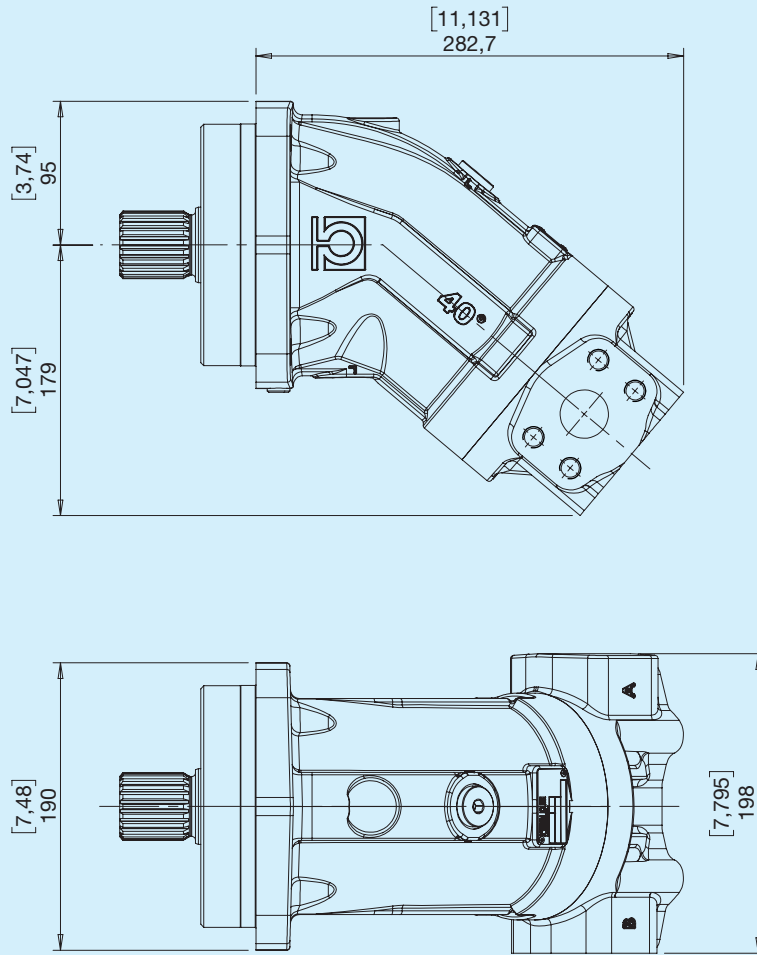
Position of ports	Drain port L1-L2	Delivery B	Inlet S	Purge R
G	G4	G4	N8	G1

HPPF	1	2	3	4	5	6	7	8	9	10	11	12
1	2	3										
Displacement												
080			090									
Flanges												
I ISO 4 holes												
Shafts												
Z DIN 5480 W40x2x30x18			X DIN 5480 W35x2x30x16				C Cylindrical Ø40			Y Cylindrical Ø35		
Position of ports												
SS SAE flange												
Direction of rotation												
R Right					L Left							
Seals												
O NBR -30°C ÷ +100°C					F FKM (VITON) -20 °C ÷ +200 °C							
Accessories												
O No option					C Painting							
Special versions												
...												

Fixed displacement pumps HPPF 107-125

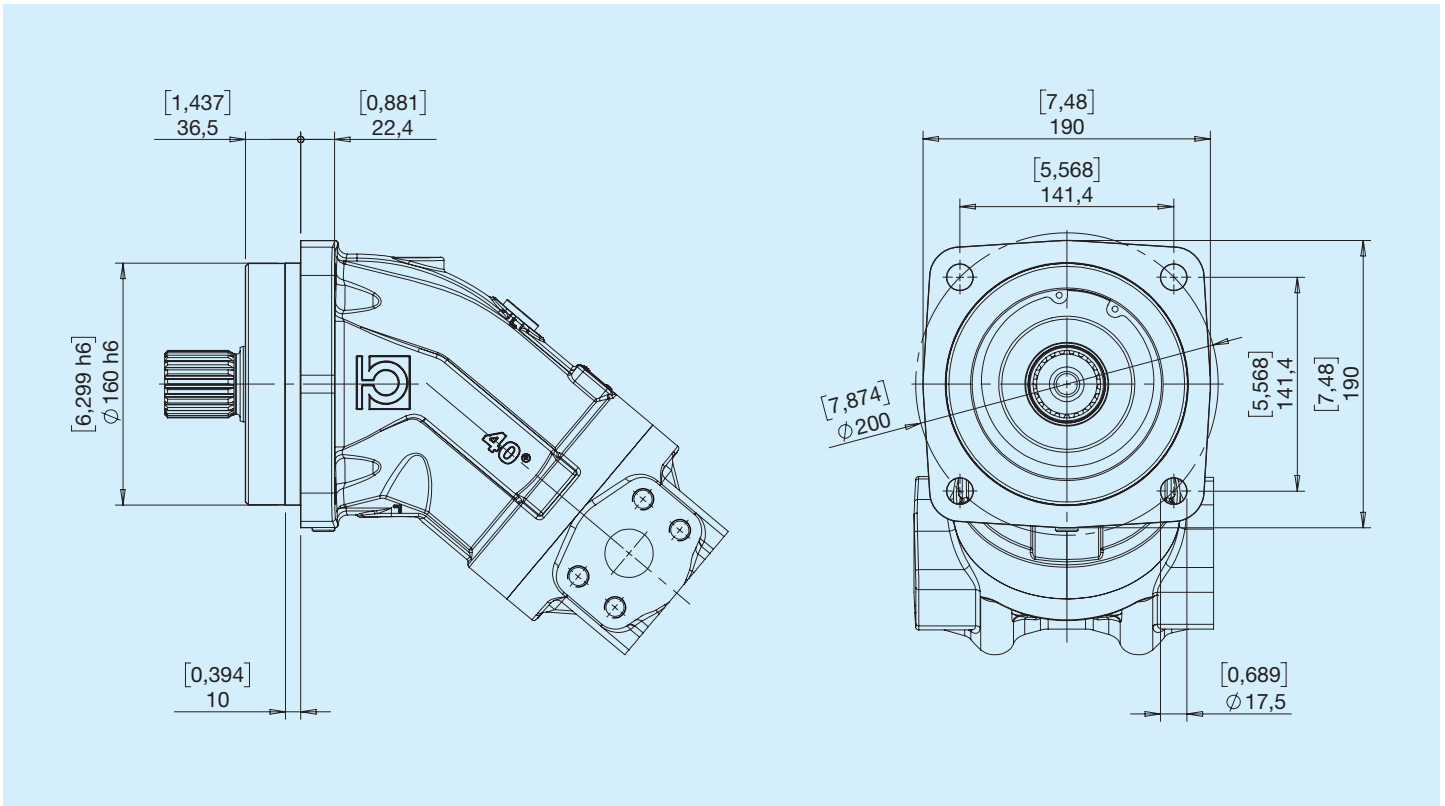


Before use, carefully read the GENERAL INSTRUCTIONS FOR USE OF OPEN CIRCUIT AXIAL PISTON PUMPS AND MOTORS.

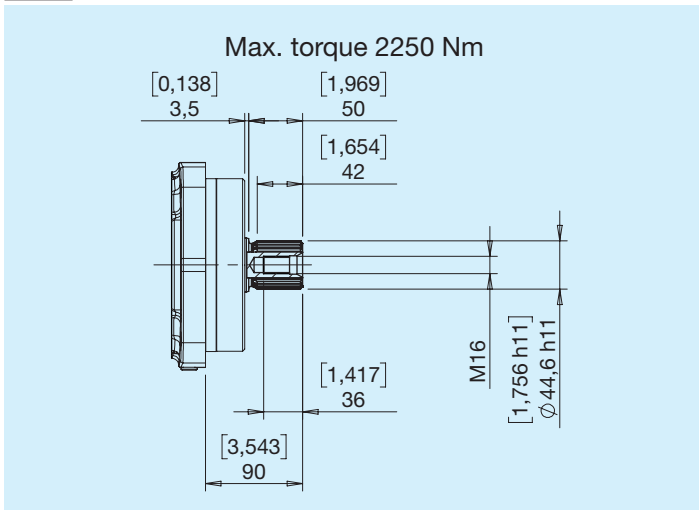


HPPF	Nominal displacement		Continuous pressure		Intermittent pressure		Peak pressure		Rotation speed nmax MAX min ⁻¹	Torque @350 bar		Weight		Polar moment of inertia kg • m ²
	cm ³	in ³	bar	psi	bar	psi	bar	psi		MIN min ⁻¹	kg	lbs		
107	107	6.53	350	5076	400	5801	450	6527	3600	500	37.8	83.3	0,0116	
125	125	7.63	350	5076	400	5801	450	6527	1600	697	37.8	83.3	0,0116	

I ISO 4 holes

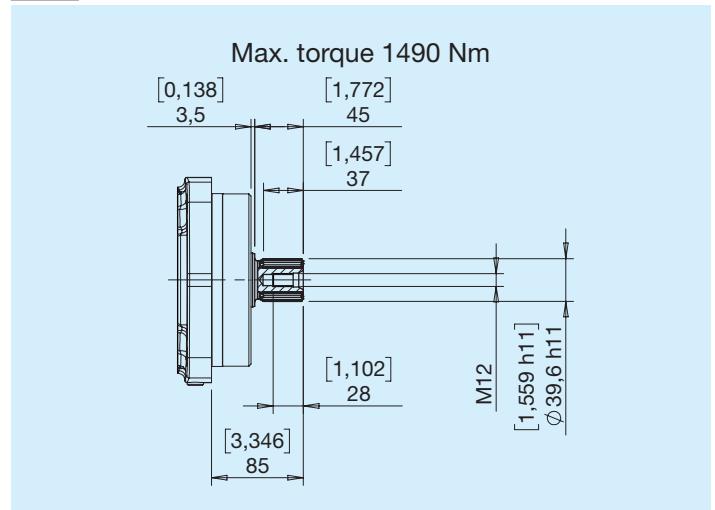


Z DIN 5480 W45x2x30x21



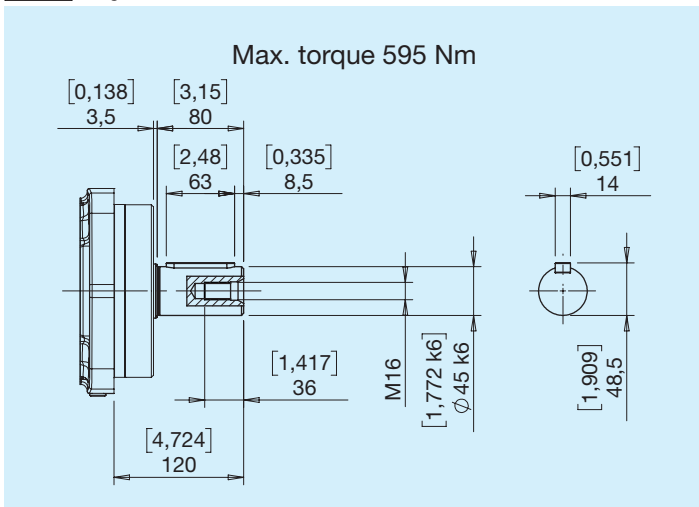
Continuous pressure 400 bar/5801 psi
Peak pressure 450 bar/6527 psi

X DIN 5480 W40x2x30x18



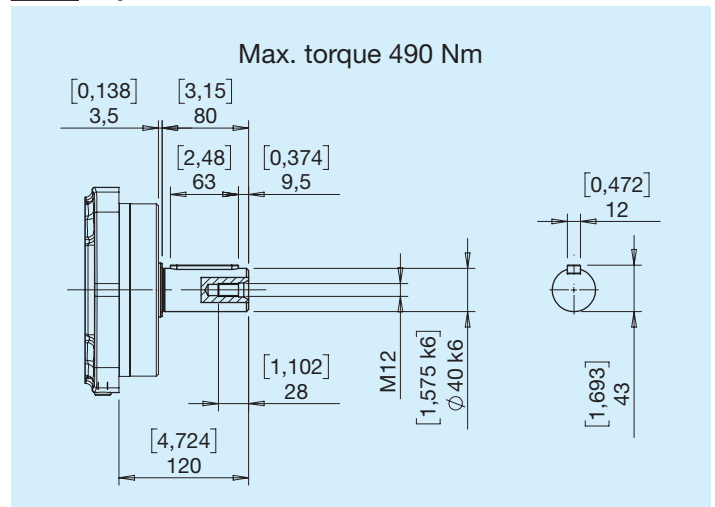
Continuous pressure 400 bar/5801 psi
Peak pressure 450 bar/6527 psi

C Cylindrical \varnothing 45



Continuous pressure 350 bar/5076 psi
Peak pressure 400 bar/5801 psi

Y Cylindrical \varnothing 40

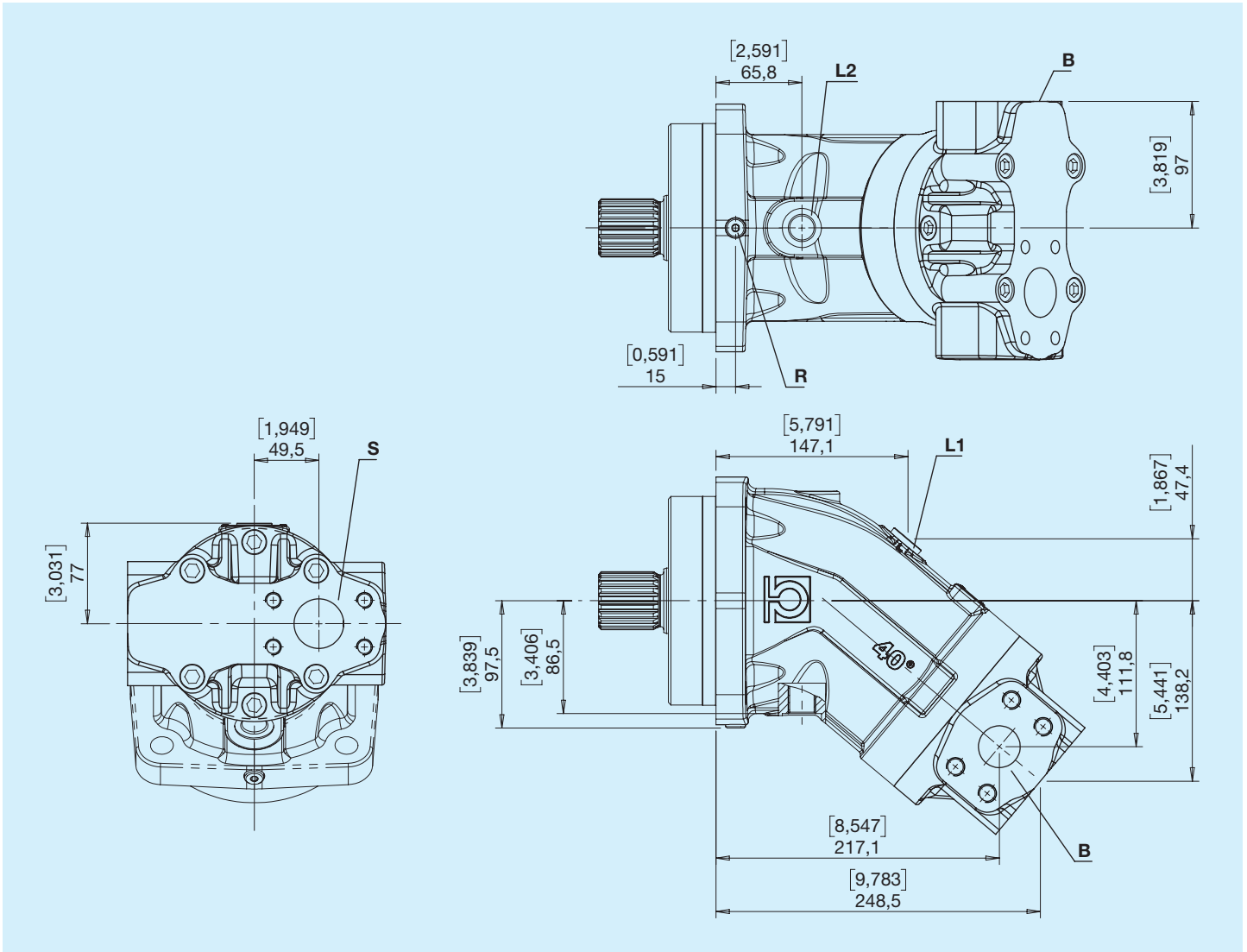


Continuous pressure 350 bar/5076 psi
Peak pressure 400 bar/5801 psi

For applications with radial load on the drive shaft (pinions, V-belts), with X and Y type shaft, the allowed pressure is 315 bar / 4569 psi ($P_{max} = 350 \text{ bar} / 5076 \text{ psi}$).

For pulsating load greater than 315 bar / 4569 psi, use the version with male splined shaft Z.

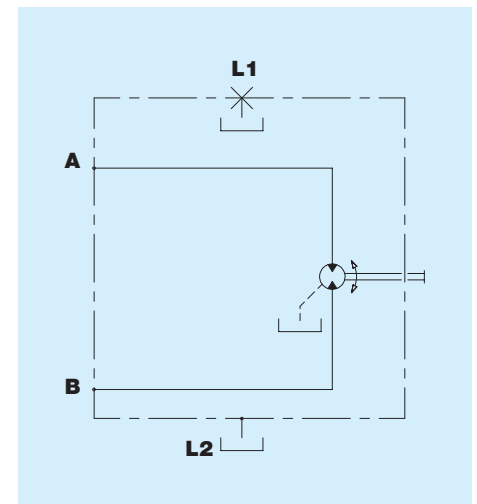
SS SAE flange



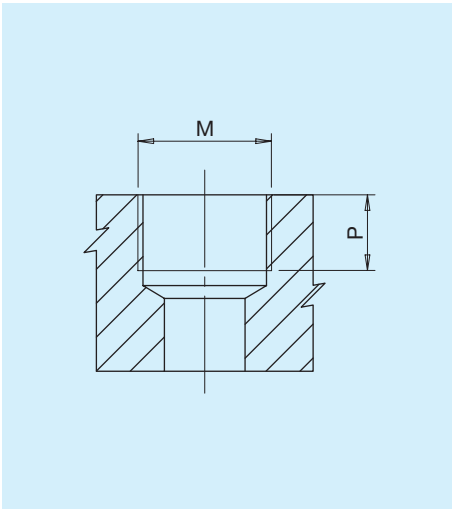
A,B - Use
L1, L2 - Drain port
S - Inlet
R - Spurgo

In the left version, the valve is rotated by 180°.

Hydraulic diagram

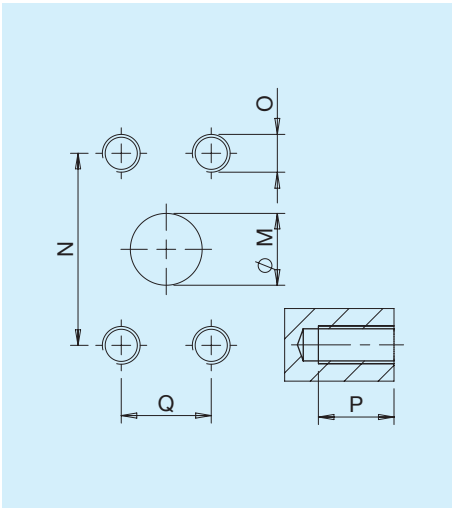


Type G - Gas



Type	M		P	
		Nm	mm	in
G1	Port ISO 1179-1 - G 1/8	8	15	0.59
G4	Port ISO 1179-1 - G 1/2	70	16	0.63

Type N - SAE



Type	M		N		Q		P		O
	mm	in	mm	in	mm	in	mm	in	Nm
N7	25	0.98	57.2	2.25	27.76	1.09	17	0.67	M12 70
N8	32	1.26	66.7	2.63	31.8	1.25	19	0.75	M14 120
N9	38	1.5	69.9	2.75	35.7	1.41	20	0.79	M12 70

Combinations

Position of ports	Drain port L1-L2	Delivery B	Inlet S	Purge R
G	G4	G4	N9	G1
SS 125	G4	N8	N9	G1

HPPF												
	1	2	3	4	5	6	7	8	9	10	11	12
1	2	3										
			Displacement									
			107					125				
4	Flanges											
I ISO 4 holes												
5	Shafts											
Z DIN 5480 W45x2x30x21			X DIN 5480 W40x2x30x18			C Cylindrical Ø45			Y Cylindrical Ø40			
6	7	Position of ports										
		SS SAE flange										
8	Direction of rotation											
R Right					L Left							
9	Seals											
0 NBR -30°C ÷ +100°C					F FKM (VITON) -20 °C ÷ +200 °C							
10	Accessories											
0 No option					C Painting							
11	12	Special versions										
		...										