

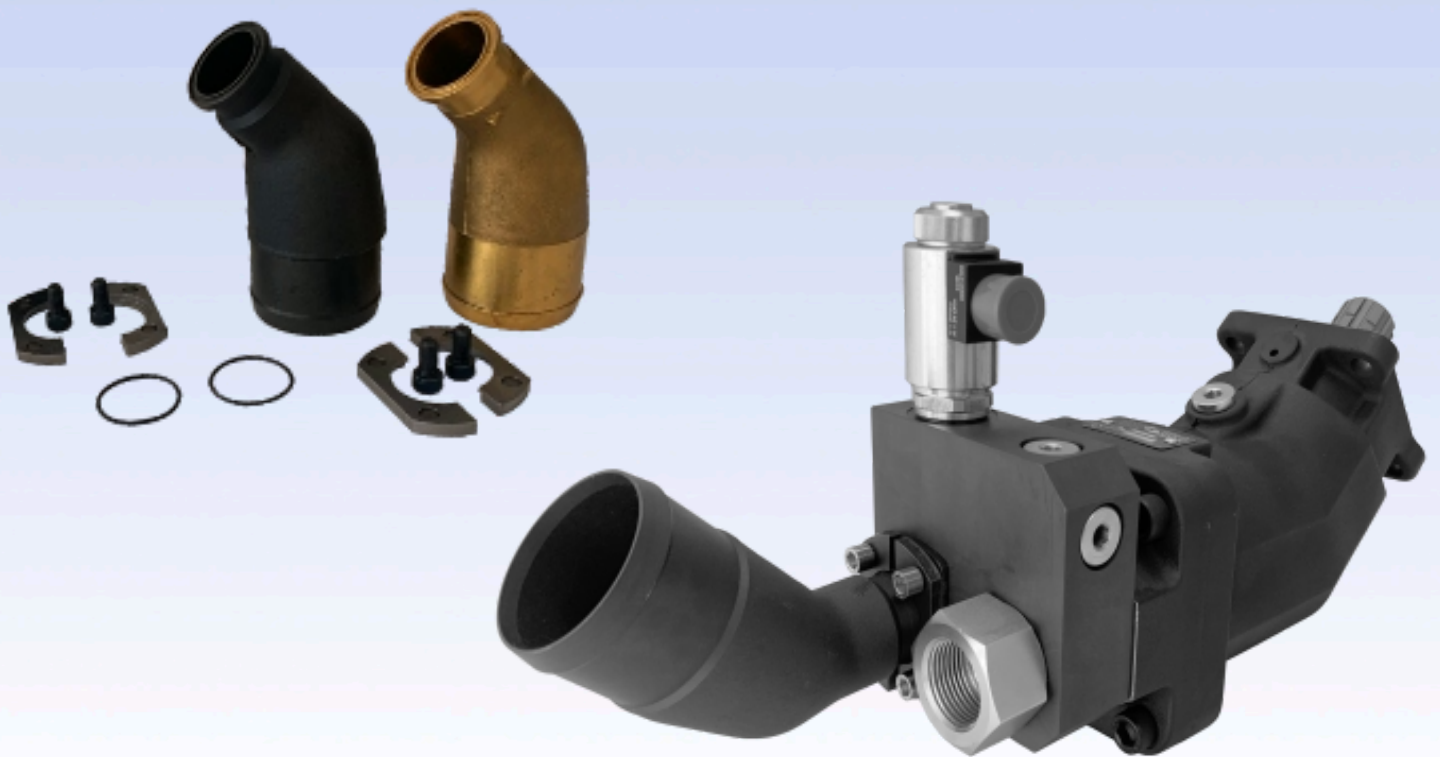
ByPass Valve for Bent Ax s Pumps

ByPass Valve for Hydraulic Bent Ax s P ston Pumps 12V ByPass Valve
24V ByPass Valve

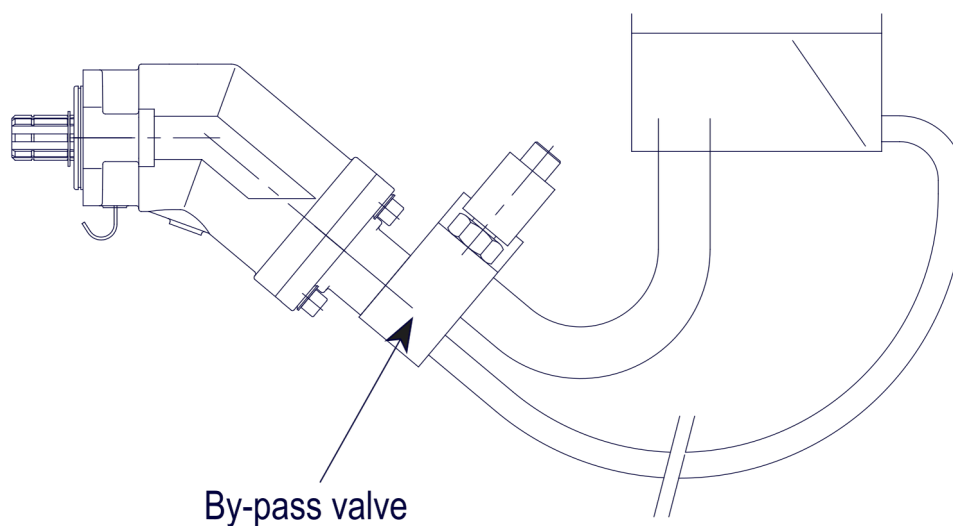
Des gnat on;

12V ByPass Valve

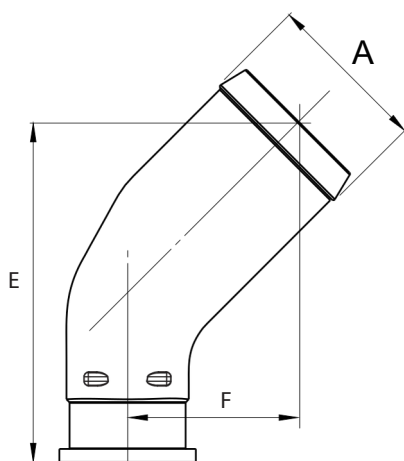
24V ByPass Valve



ByPass Valve for Bent Axes Pumps

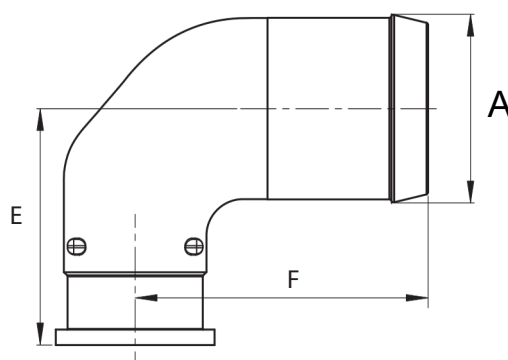


45° elbow fittings



Ø hose	Ø A	E	F
1 1/2"	39.1	91.7	46.7
42	43	91.7	46.7
1 3/4"	46	91.7	46.7
2"	51.8	108.4	54.4
2 1/2"	64.5	125.2	62.2

90° elbow fittings



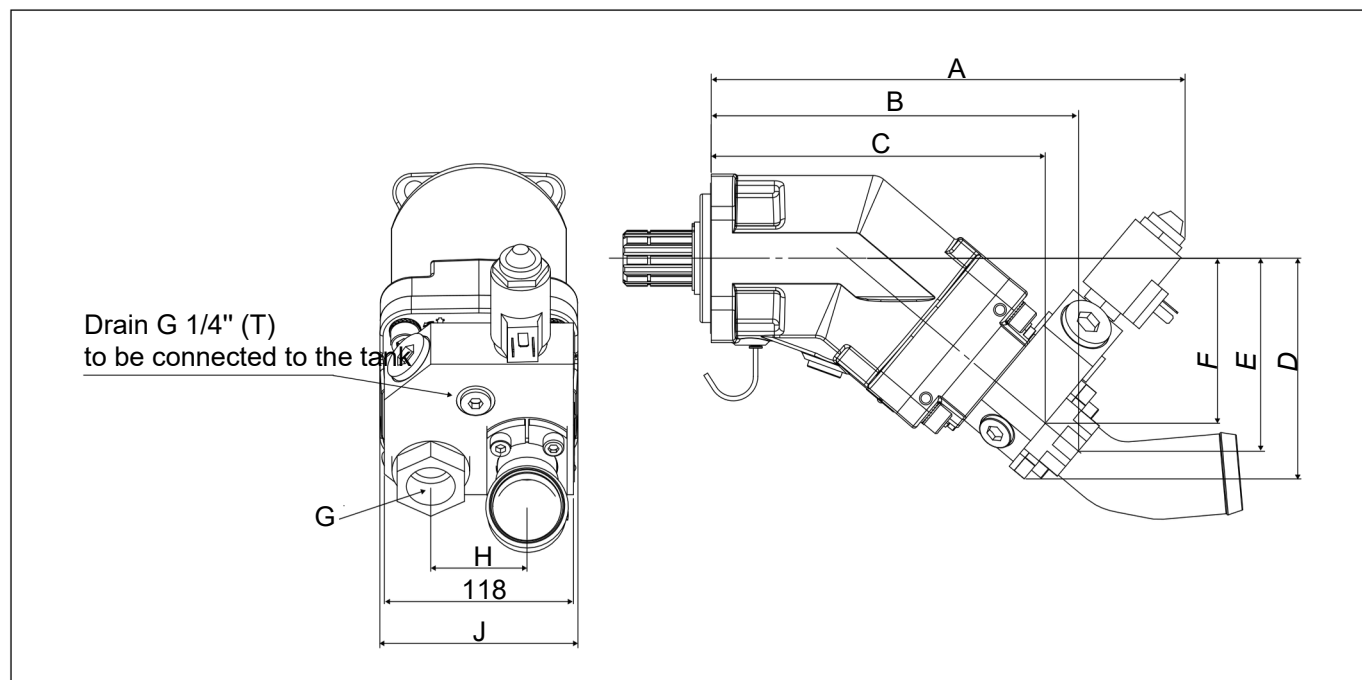
Ø hose	Ø A	E	F
1 1/2"	39.	58.6	79.5
2"	1	64.9	80.2
2 1/2"	51.	71.3	87.5

8

64.

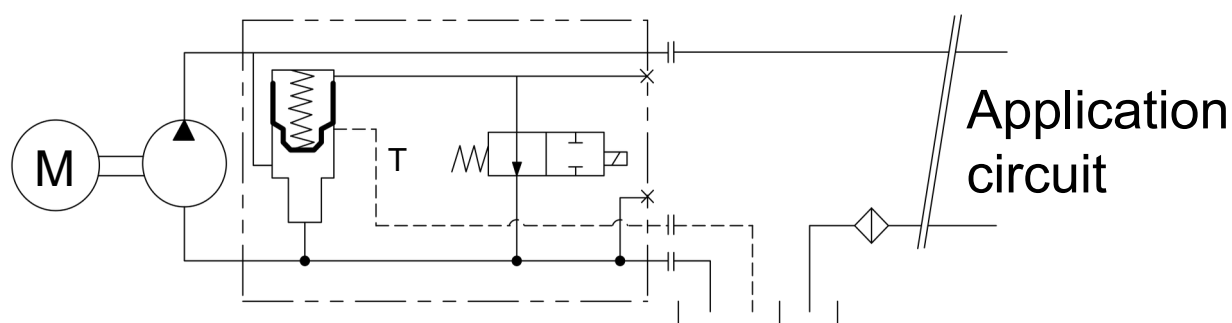
5

ByPass Valve for Bent Ax s Pumps



Pump MODEL	DISPL. (cc)	A	B	C	D	E	F	G	H	J
5 cc	5.1	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
10 cc	10.2	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
12 cc	12.0	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
18 cc	18.0	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
25 cc	25.0	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
32 cc	32.0	295.50	229.00	208.30	137.30	120.10	102.70	G 3/4"	54	108
41 cc	41.0	295.50	229.00	208.30	137.30	120.10	102.70	G 3/4"	54	108
50 cc	50,3	307.10	240.40	220.00	147.10	129.70	112.50	G 3/4"	54	108
56 cc	56,0	307.10	240.40	220.00	147.10	129.70	112.50	G 3/4"	54	108
63 cc	63.0	307.10	240.40	220.00	147.10	129.70	112.50	G 3/4"	54	108
80 cc	80,4	334.00	269.00	246.70	157.80	143.90	124.80	G 1"	60	123
108 cc	108	334.00	269.00	246.70	157.80	143.90	124.80	G 1"	60	123
130 cc	130	336.30	271.3	249.00	159.70	145.80	126.70	G 1"	60	123

ByPass Valve for Bent Ax s Pumps



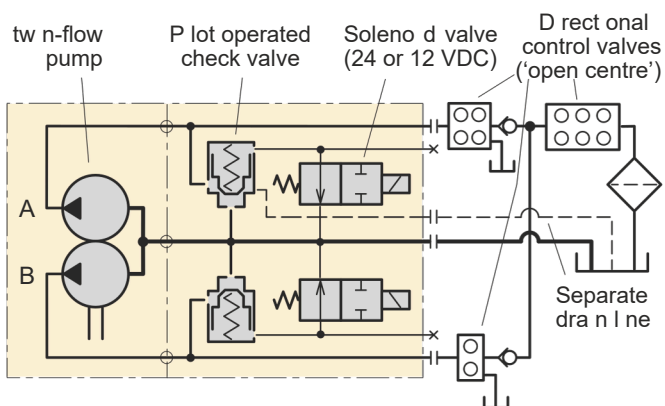
Pump MODEL	DISPL. (cc)	WEIGHT WITHOUT INLET FITTING (kg)	WEIGHT WITH INLET FITTING (kg)	TORQUE WITHOUT FITTING (N.m)	TORQUE WITH FITTING (N.m)
5 cc	5.1	9.00	9.40	8.20	8.60
10 cc	10.2	9.00	9.40	8.65	9.05
12 cc	12.0	9.20	9.60	8.74	9.14
18 cc	18.0	9.30	9.70	8.79	9.19
25 cc	25.0	11.00	11.40	8.89	9.29
32 cc	32.0	11.10	11.50	11.10	11.50
41 cc	41.0	11.20	11.60	11.15	11.55
50 cc	50,3	11.30	11.70	11.75	12.15
56 cc	56,0	11.35	11.75	11.80	12.20
63 cc	63.0	11.45	11.85	11.85	12.25
80 cc	80,4	14.80	15.20	17.80	18.30
108 cc	108	14.90	15.30	17.92	18.42
130 cc	130	15.30	15.70	18.70	19.50

DUAL FLOW PUMP bypass valve

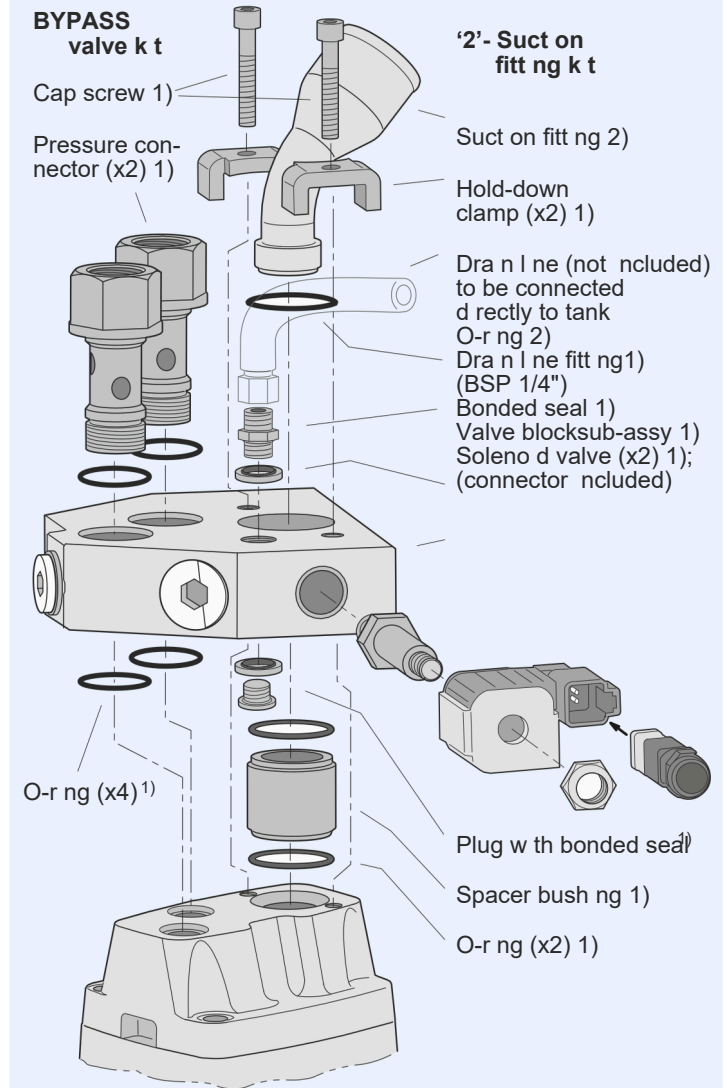
- A dual/twin pump fitted with a bypass valve can be utilised in applications where the pump is operating constantly i.e. when the pump is driven from the crankshaft through a cardan shaft, or when it is installed on an engine-PTO. In addition, it can be used when, temporarily, one of the two circuits is not required; the power losses are thus reduced as the non-required flows are not forced through lines and 'open centre' valves.
- The DUAL bypass valve should be disengaged during transport when the pump is operating constantly and the engine is running at max rpm; the hydraulic system is not sized for the large flow that would otherwise go through it.
- The DUAL valve connects the outlet and inlet ports of the pump, and only a small oil flow goes through the system and to the reservoir.
- The valve is installed directly on top of the pump port surface with 'banjo' fittings and two cap screws (refer to the split view to the right).
- As the DUAL valve is symmetrical it can be 'turned 180°' so as not to interfere with chassis components. The valve can accommodate left hand as well as right hand rotating pumps.
- The valve can only be engaged or disengaged (through the 24 or 12 VDC solenoid) at low system pressures (below 20 bar).

IMPORTANT INFORMATION

- In order to secure a cooling flow through the system, a separate drain line **must** be connected from the BPV-pump drain line fitting (shown in the split view) directly to tank; refer also to the schematic.
- The pressure connectors must be tightened (to 50 Nm) before the suction fitting clamp screws are tightened.



Bypass valve circuit schematic (example).



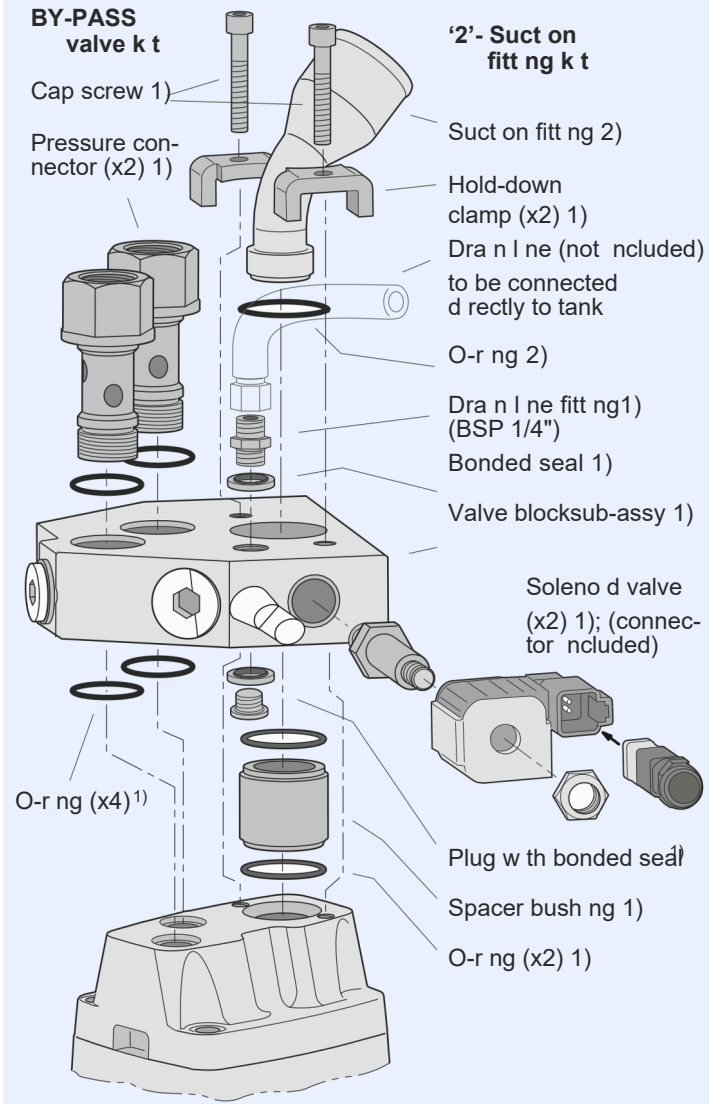
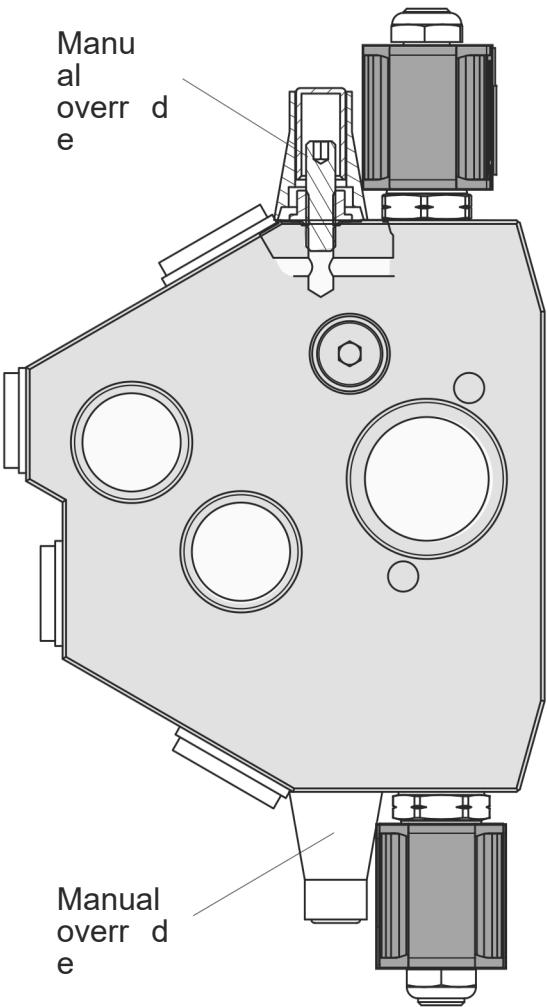
Bypass valve split view without manual override (with dual flow pump end cap).

NOTE: A suction fitting kit (parts designated '2' in the split view) is **not** included with the pump; it must be ordered separately.

Bypass valve (Dual Flow Pump) **Without manual override**

Bypass valve, type	Dual Flow Pump
Max pressure, continuous	350 bar 400 bar 24
Intermittent	VDC, (12 VDC) 14 W
Solenoid voltage (optional)	(each solenoid)
Power requirement	Activated solenoid:
Operating mode	Check valve closed

Bypass valve1	Voltage	Ordering number	Dual Flow	Torque ³⁾
ByPass	24 VDC	2400 565	42/42,	50 Nm
	12 VDC	1200 565	53/53,	
			55/28,	
			70/35,	
			70/70	



Bypass valve split view with manual override (with pump end cap).

NOTE: A suction fitting kit (parts designated '2' in the split view) is **not** included with the pump; it must be ordered separately

A11 (ISO2) Eksenel P stonlu Pompa

ISO2 Mount ng Flange H gh Pressure Bent Ax s Pump

H gh Pressure Hydraul c Bent Ax s P ston Pumps, H gh Pressure, 400/450 BAR Work ng Pressure. H gh Rotat onal Speed, H gh Effic ency, SI m Des gn, Cast Iron Pump Body, Re-Des gned n 2025.

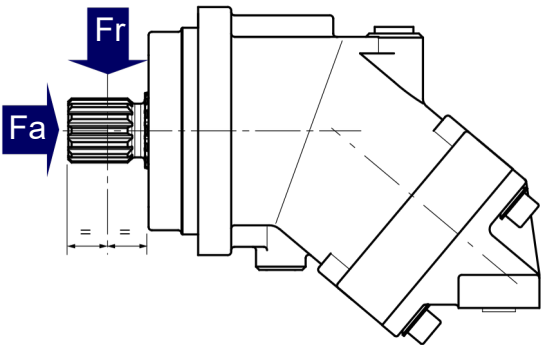
Des gnaton;

5cc, 10cc, 12cc, 18cc, 25cc, 32cc, 41cc, 50cc,
56cc, 63cc,



Characteristics of the A11 - ISO2 Flange Bent Axis Pumps

Pump MODEL	DISPL. (cc)	CONTINUOUS MAX. SPEED (rpm)	INTERMITTENT MAX. SPEED (rpm)	MAX. FLOW ABSORBED (l/min)	TORQUE BAR (m.N/bar)	TORQUE AT 350 BAR (m.N)	THEORETICAL MAX. POWER AT 400 BAR (HP / kW)	MAX. ALLOW PRESSURE CONTN./PEAK (bar)	WEIGHT (kg)
5 cc	5.1	8800	9600	45	0.09	46	64.1 / 48.2	400 / 450	5.2
10 cc	10.2	8600	9400	88	0.14	58	72.9 / 54.4	400 / 450	5.5
12 cc	12.0	8000	8800	96	0.19	67	85.5 / 64.4	400 / 450	5.5
18 cc	18.0	8000	8800	144	0.28	99	128.5 / 95.9	400 / 450	5.5
25 cc	25.0	6300	6900	158	0.40	139	140.0 / 104.4	400 / 450	11.4
32 cc	32.0	6300	6900	202	0.50	178	180.5 / 134.4	400 / 450	11.5
41 cc	41.0	5600	6200	230	0.65	228	205.2 / 153.1	400 / 450	11.6
45 cc	45.0	5600	6200	252	0.72	253	202.4 / 151.8	400 / 450	17.9
50 cc	50.3	5000	5500	252	0.80	280	224.1 / 167.5	400 / 450	18.1
56 cc	56.0	5000	5500	280	0.90	320	244.5 / 187.1	400 / 450	18.1
63 cc	63.0	5000	5500	315	1.00	351	281.6 / 209.1	400 / 450	18.2



Pump model	5, 10, 12	18 cc	25 cc	32 cc	41. 45	50 cc	56, 63cc
Fr (lbf)	630	900	1350	1462.5	1462.5	1686	2023
Fr (N/bar)	2800	4000	6000	6500	6500	7500	9000
Fa (lbf)	0.23	0.31	0.42	0.46	0.62	0.62	0.77
Fa (N/bar)	(15)	(20)	(27)	(30)	(40)	(40)	(50)

Ordering Code; A11 - ISO2 Flange Bent Axis Pumps

Model Code

A11

Bent Axis Hydraulic Piston Pump
(ISO2) Mounting Flange

Displacement

63

5

10

12

18

25

32

41

45

50

56

63

Flange Type
4 bolts ISO2 3019-2

4B

4B

4B

4B

4B

4B

4B

4B

4B

4B

4B

Shaft Type
Keyed or Splined

S14

S18

S18

S18

S18

S18

S18

S18

S16

S16

S16

S16

K25

K25

K25

K25

S14

S14

S14

S14

S14

S14

S14

K20

K20

K20

K20

K25

K25

K25

K30

K30

K30

K30

K30

K30

K30

K35

K35

K35

K35

Rear Cover Type

RD1

RS1

RS1

RS1

RS1

RD1

RD1

RD1

RD1

RD1

RD1

RD1

RD1

RS2

RS2

RS2

RS2

RD2

RD2

RD2

RD2

RD2

RD2

RD2

RD2

SD2

SD2

SD2

SD2

SD2

SD2

SD2

SD2

Direction of Rotation

W

W

B - Directional Rotation - New Design

Seal Options

V

V

Viton Seals

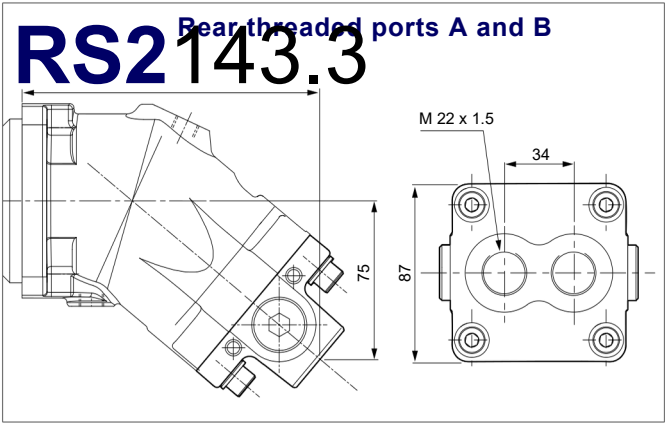
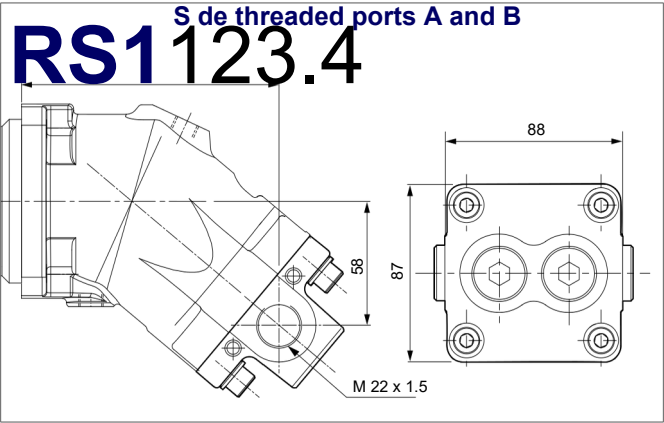
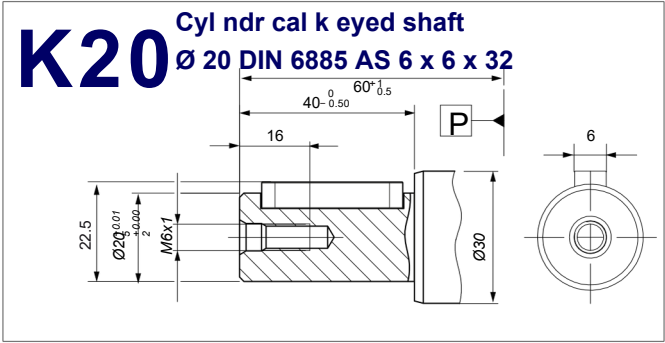
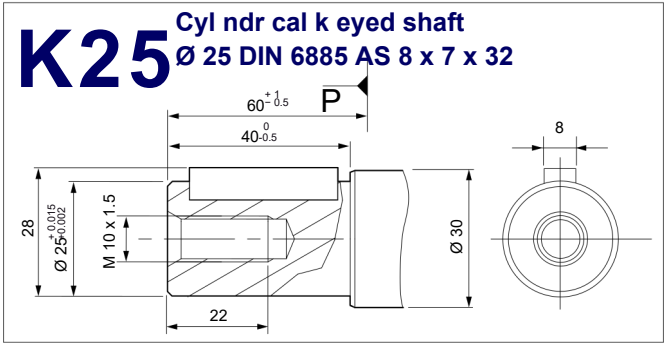
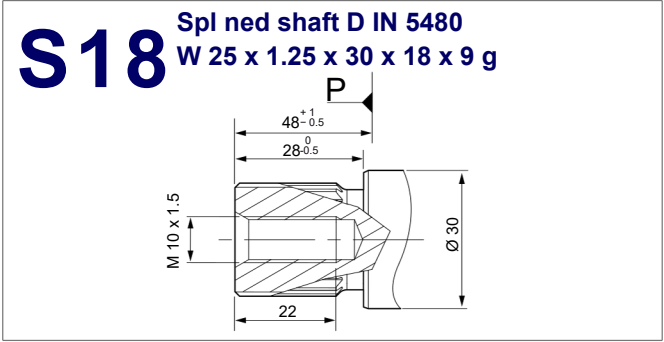
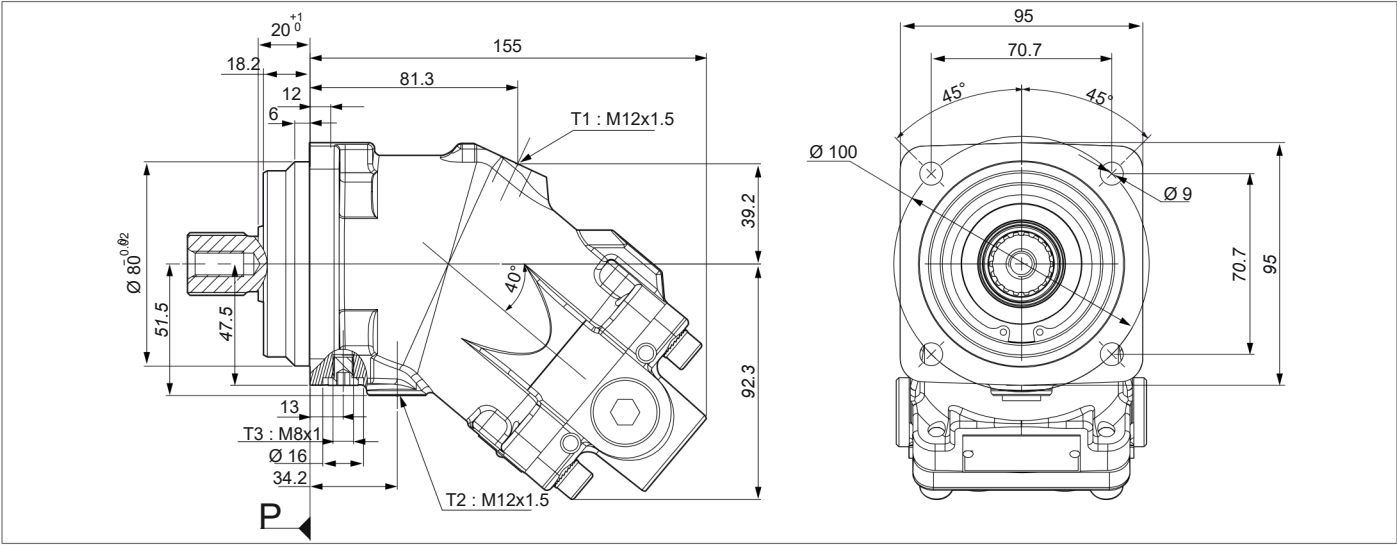
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Nitrile Seals

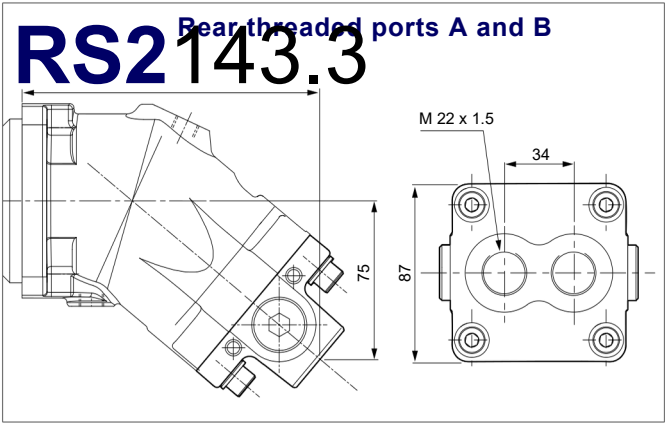
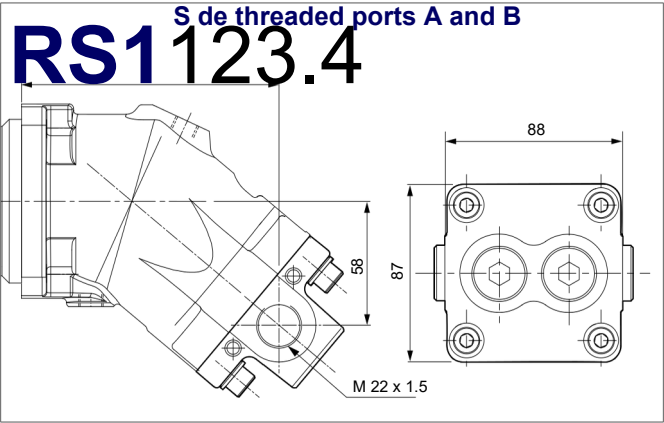
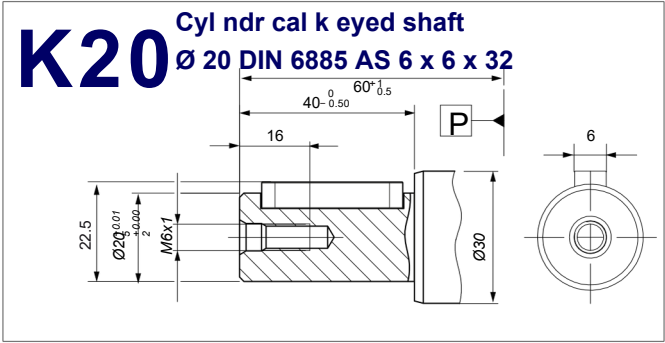
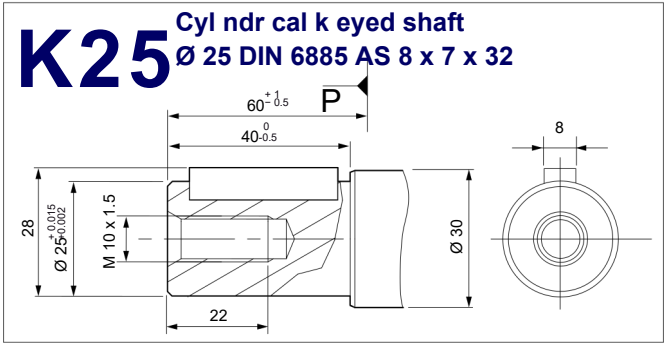
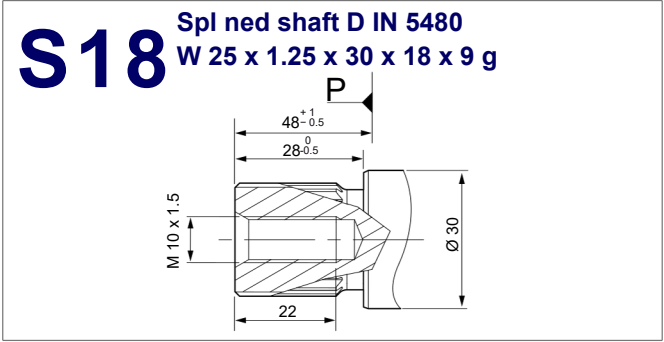
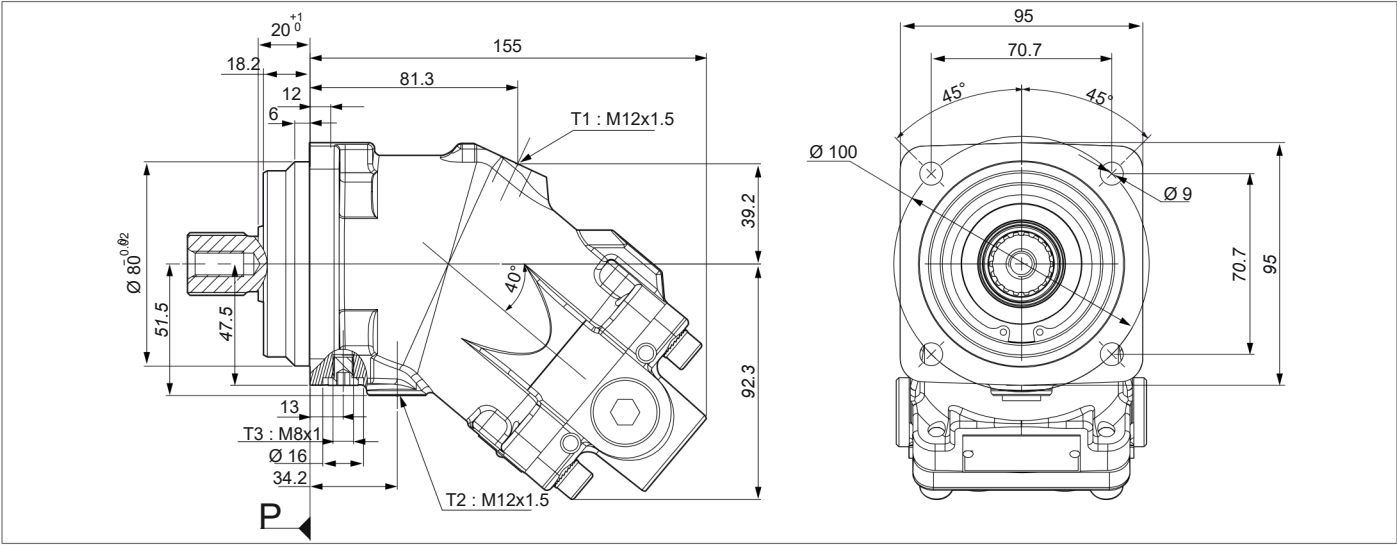
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High Pressure Seals

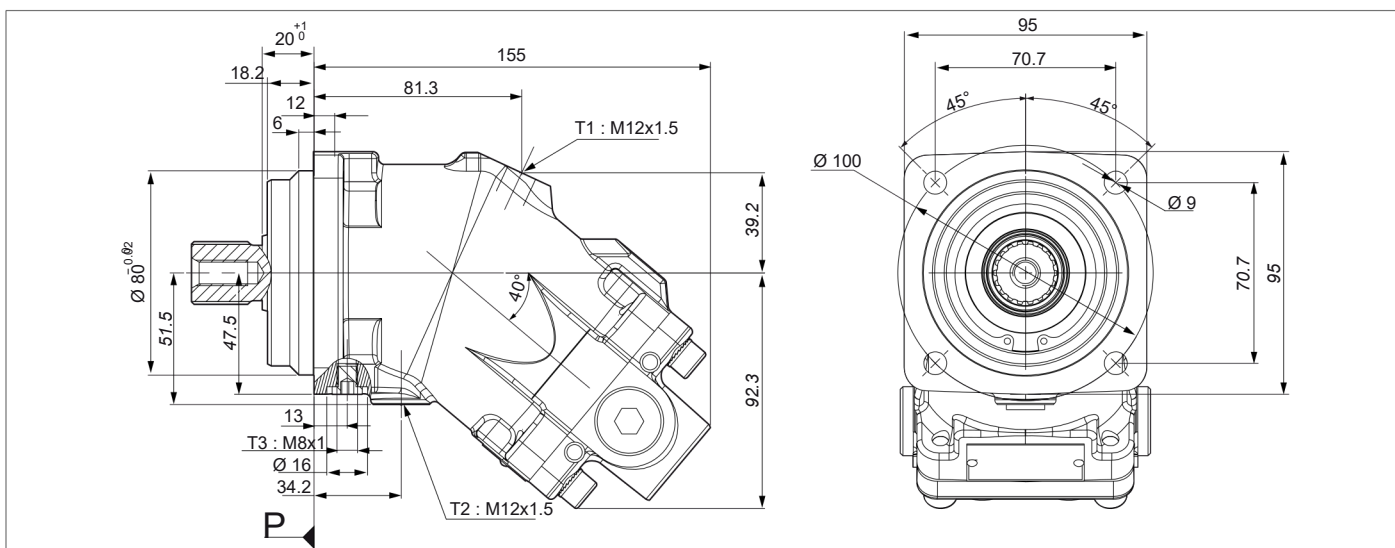
A11 - 5 cc (ISO2) Bent Axis Pump



A11 - 10 cc (ISO2) Bent Ax s Pump

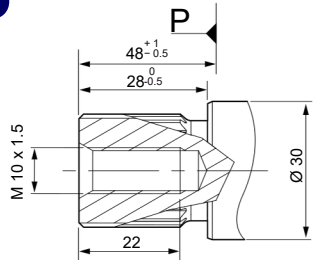


A11 - 12 cc (ISO2) Bent Axis Pump



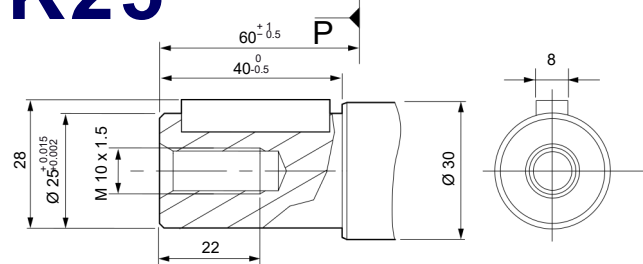
S18

Spl ned shaft D IN 5480
W 25 x 1.25 x 30 x 18 x 9 g



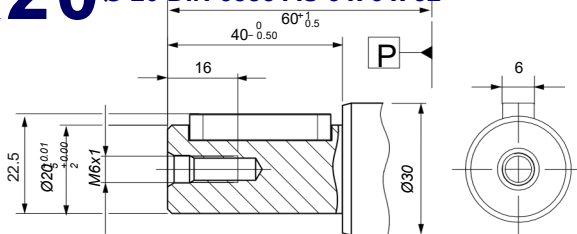
K25

Cylindralkylskåp
Ø 25 DIN 6885 AS 8 x 7 x 32



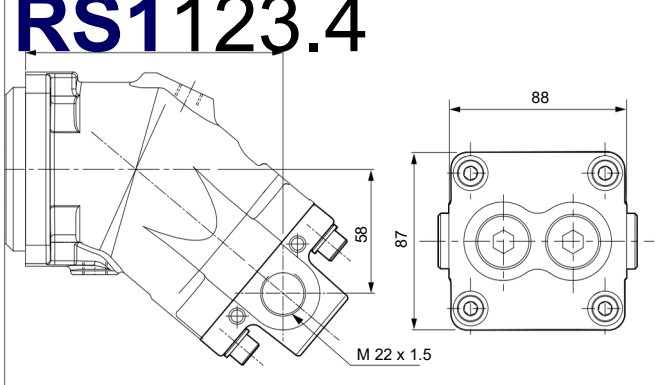
K20

Cylindralk-eyed shaft
Ø 20 DIN 6885 AS 6 x 6 x 32



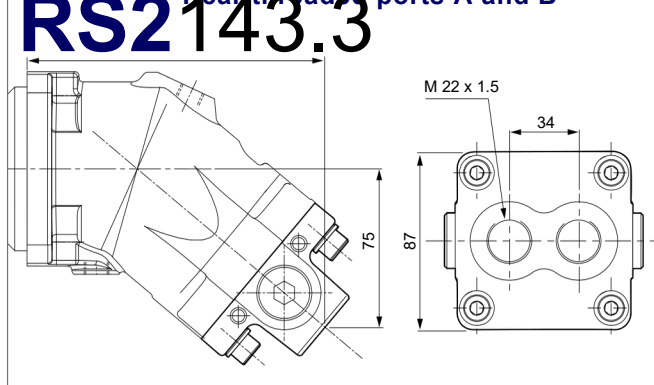
RS1123.4

Serial threaded ports A and B

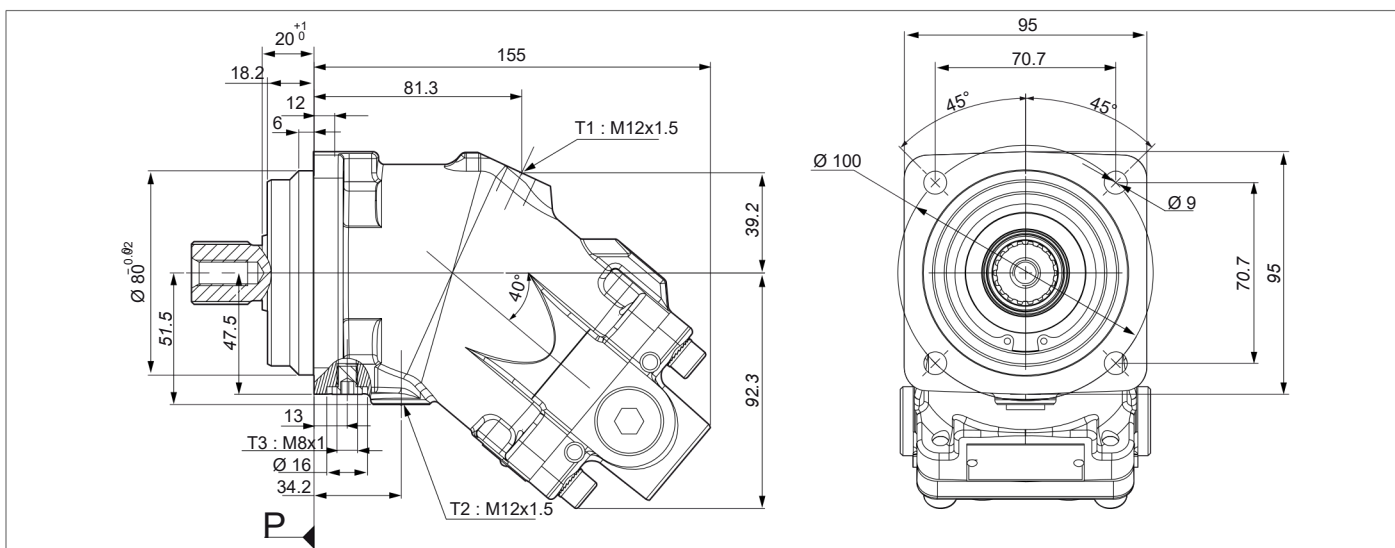


RS2 143.3

Rear threaded ports A and B

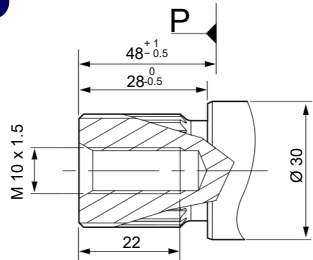


A11 - 18 cc (ISO2) Bent Axis Pump



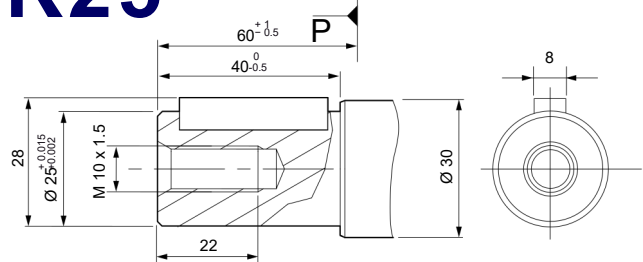
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Spl ned shaft D IN 5480
W 25 x 1.25 x 30 x 18 x 9 g



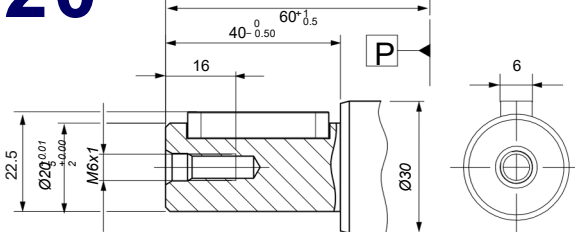
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Cylindralkylskåp
Ø 25 DIN 6885 AS 8 x 7 x 32



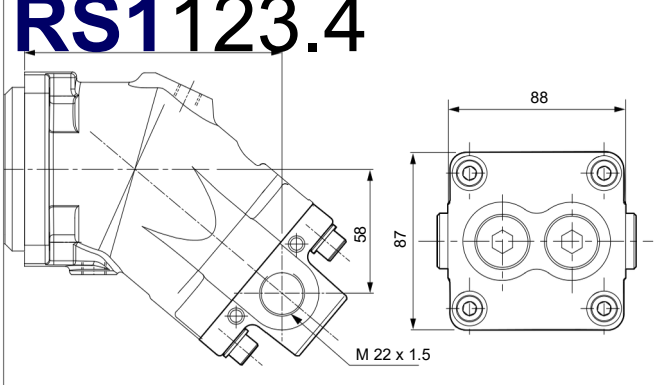
K20

Cylindralkylskift
Ø 20 DIN 6885 AS 6 x 6 x 32



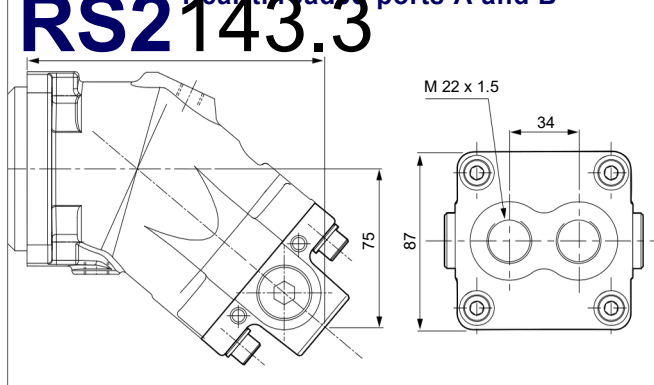
RS1123.4

Single threaded ports A and B

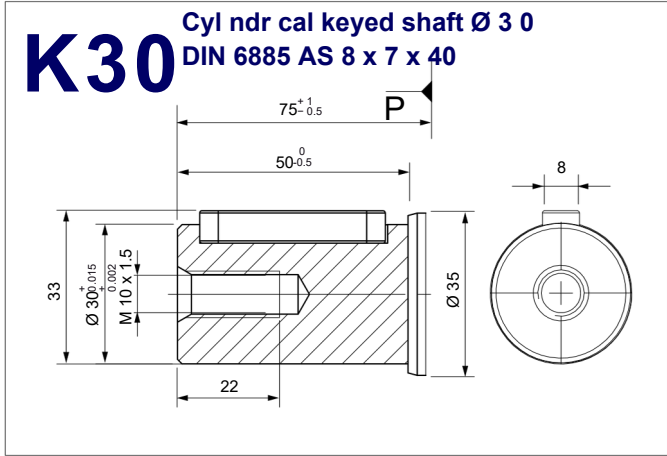
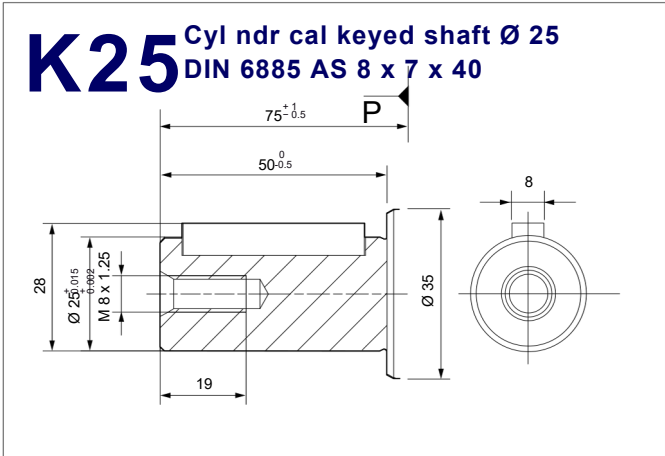
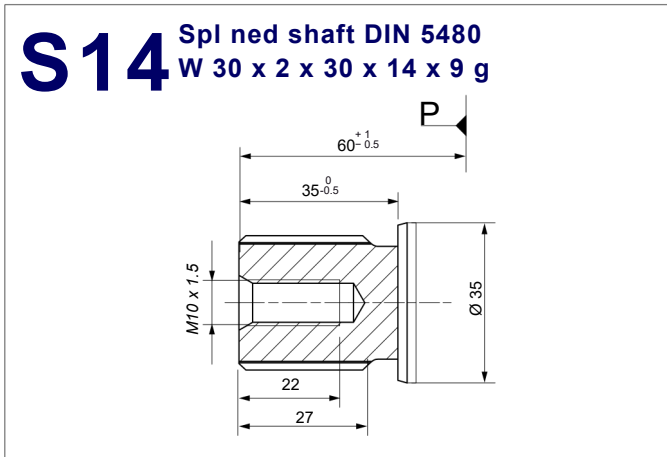
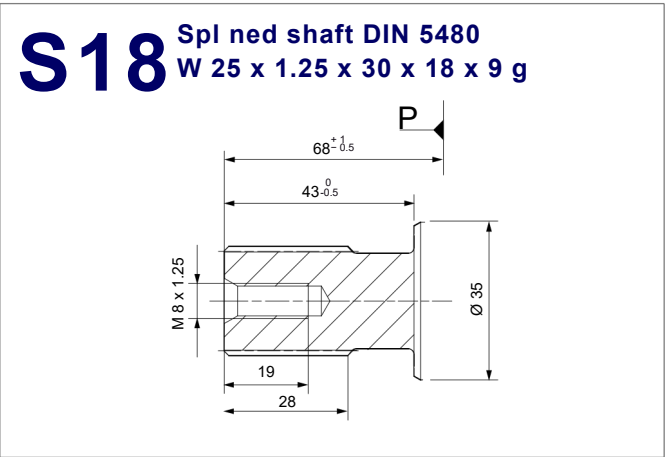
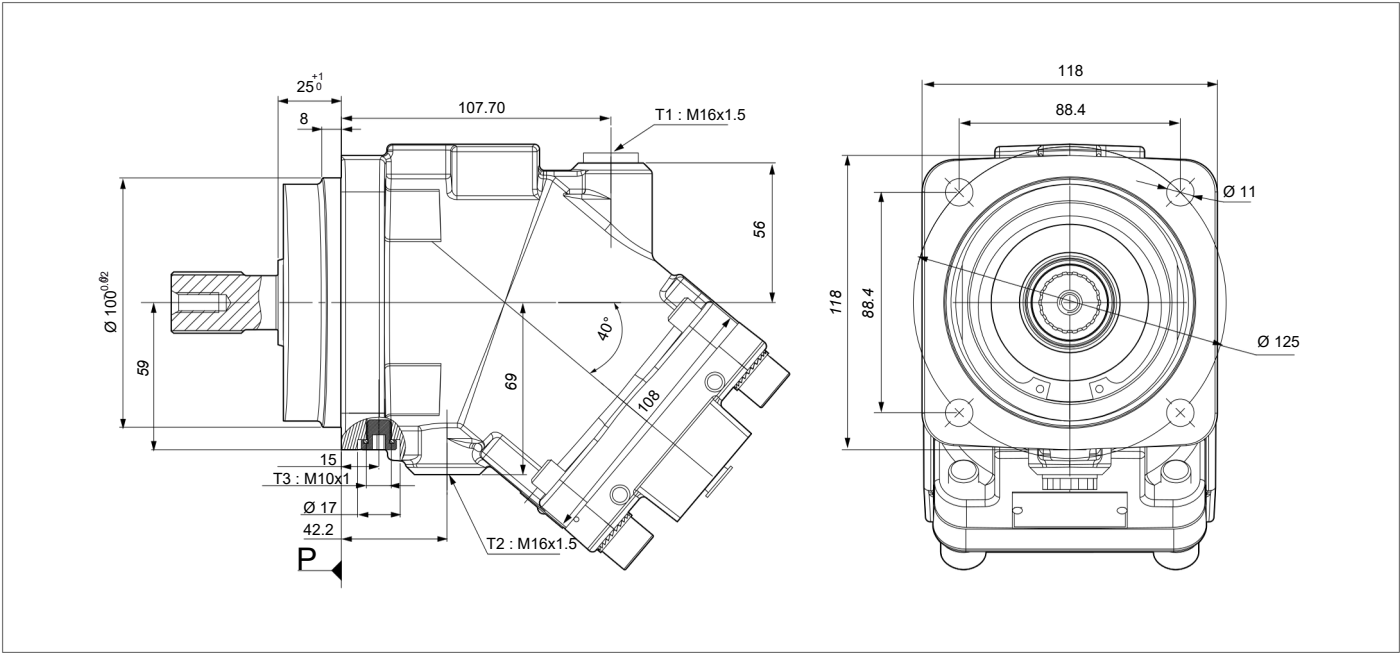


RS2143.3

Rear threaded ports A and B

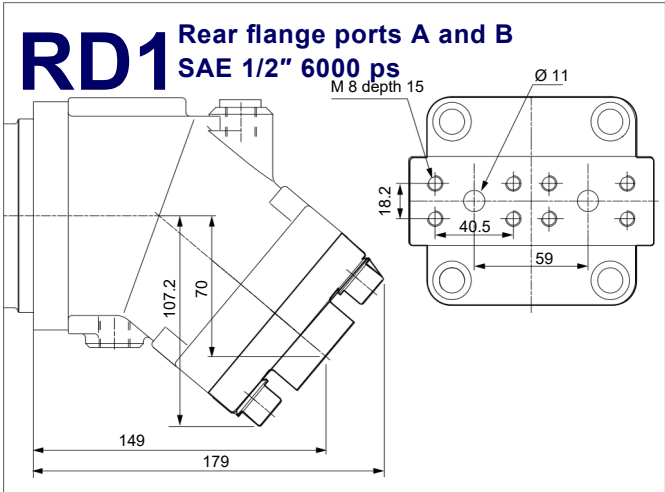
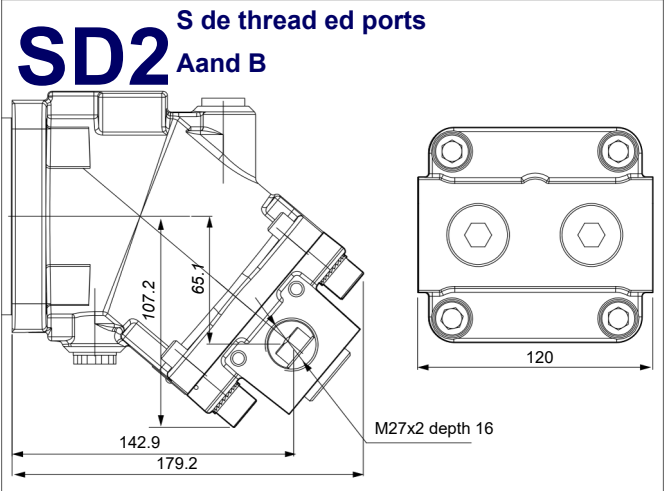
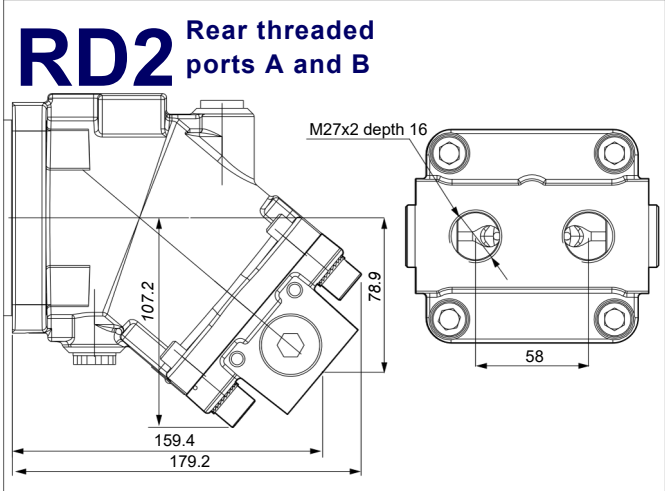
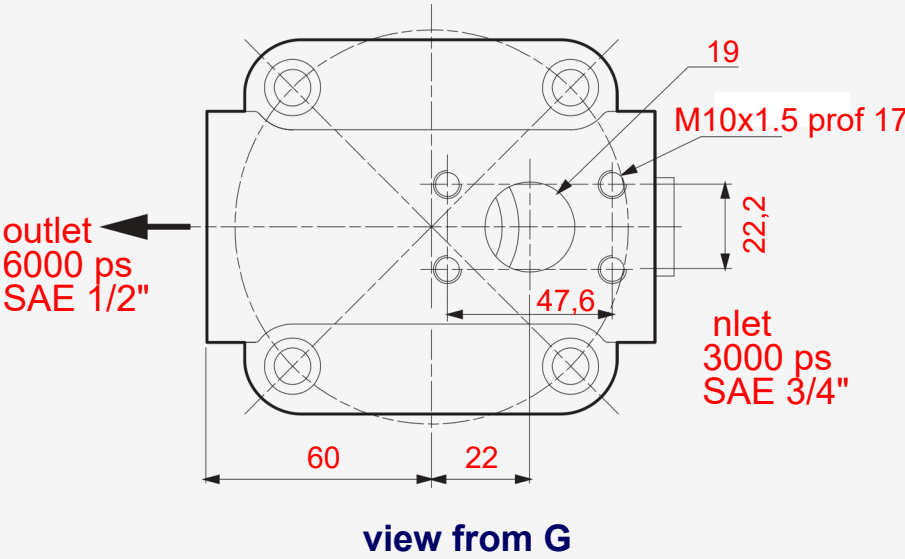


A11 - 25 cc (ISO2) Bent Ax s Pump

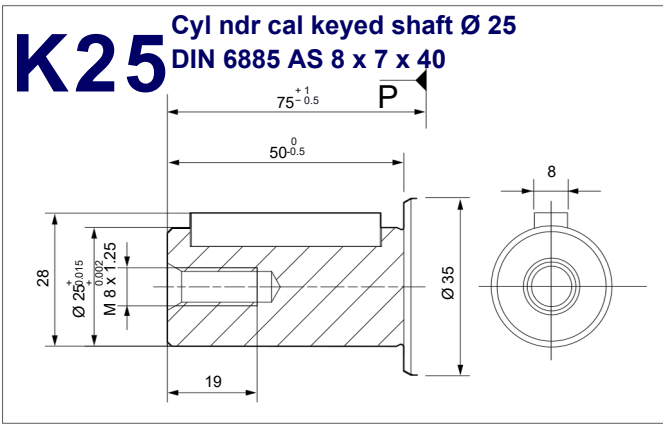
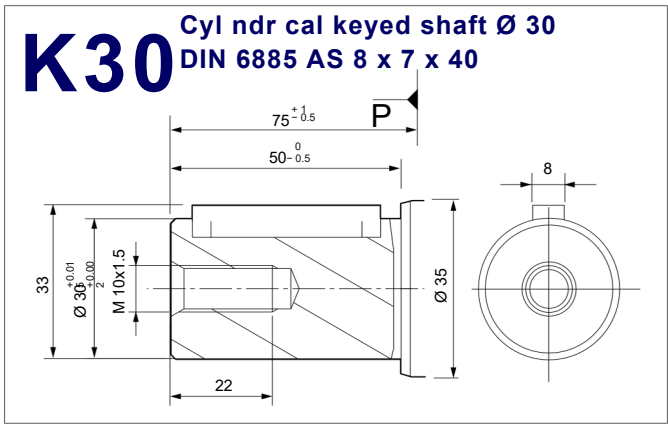
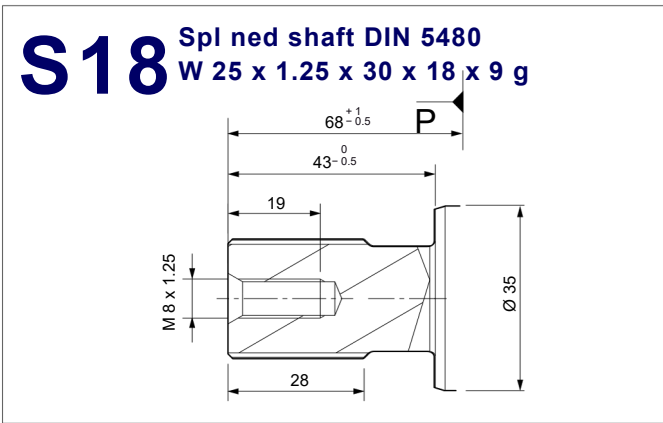
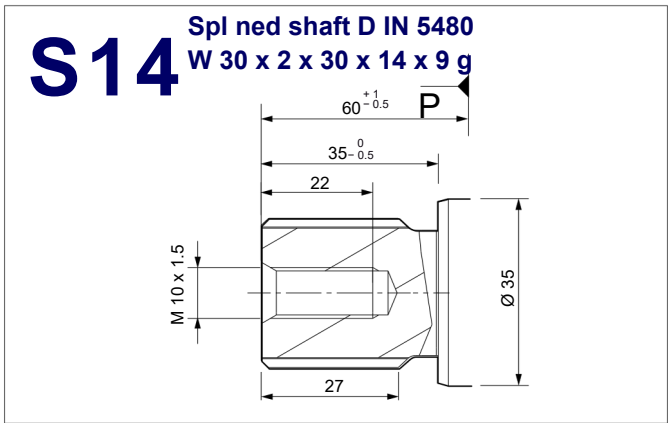
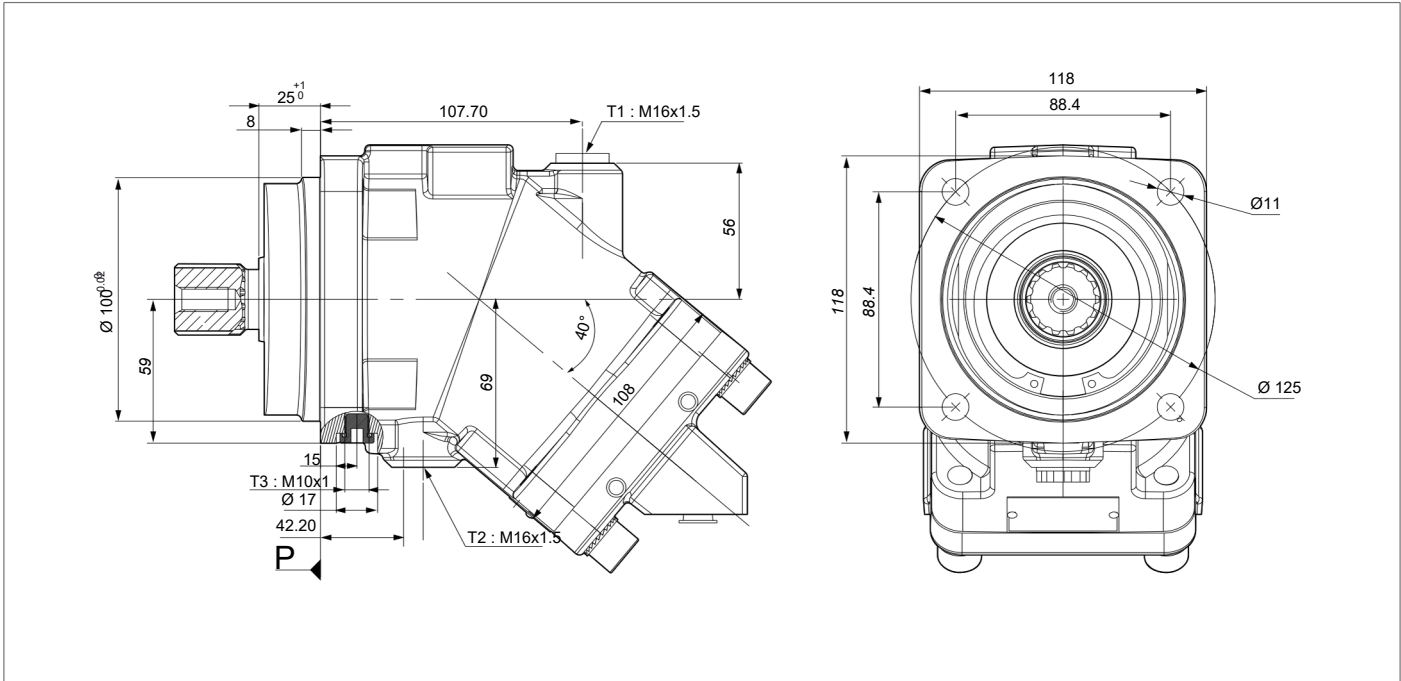


A11 - 25 cc (ISO2) Bent Axis Pump

SLR



A11 - 32 cc (ISO2) Bent Axis Pump



A11 - 32 cc (ISO2) Bent Axis Pump

SLR

outlet
6000 ps
SAE 1/2"

19
M10x1.5 prof 17

22,2
nlet
3000 ps
SAE 3/4"

47,6

60 22

view from G

RD2 Rear threaded
ports
M27x2 depth 16

RD1 Rear flange ports
SAE 1/2" 6000 ps
Ø 11

59

18.2

58

75.4

112

40.5

M8 depth 15
drilling depth 18

84
112.3

155.2
185

165.6
185.3

SD2 S de threaded ports
Aand B

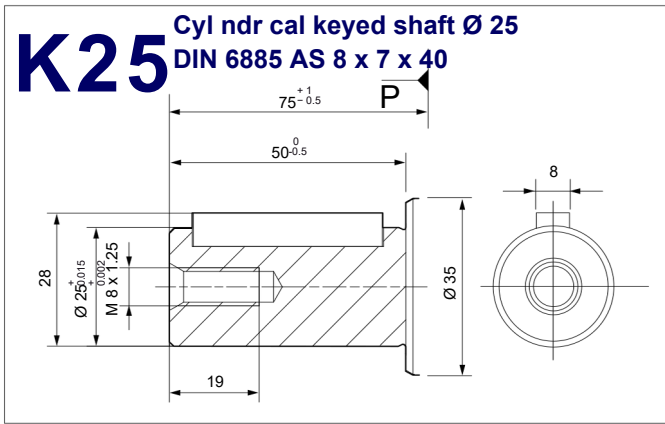
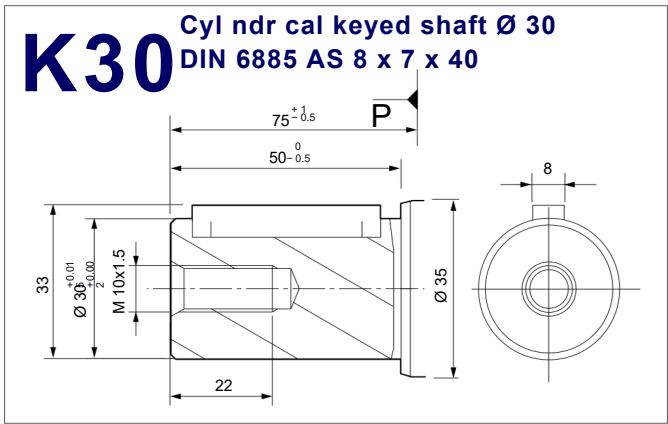
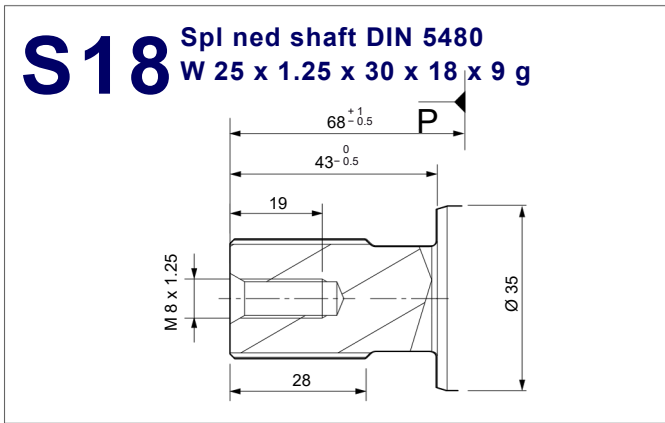
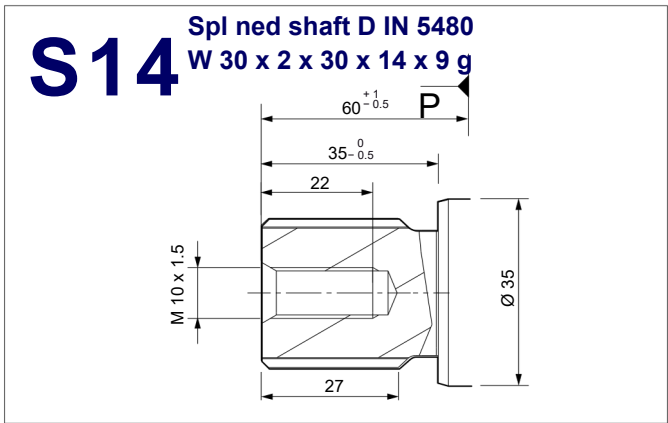
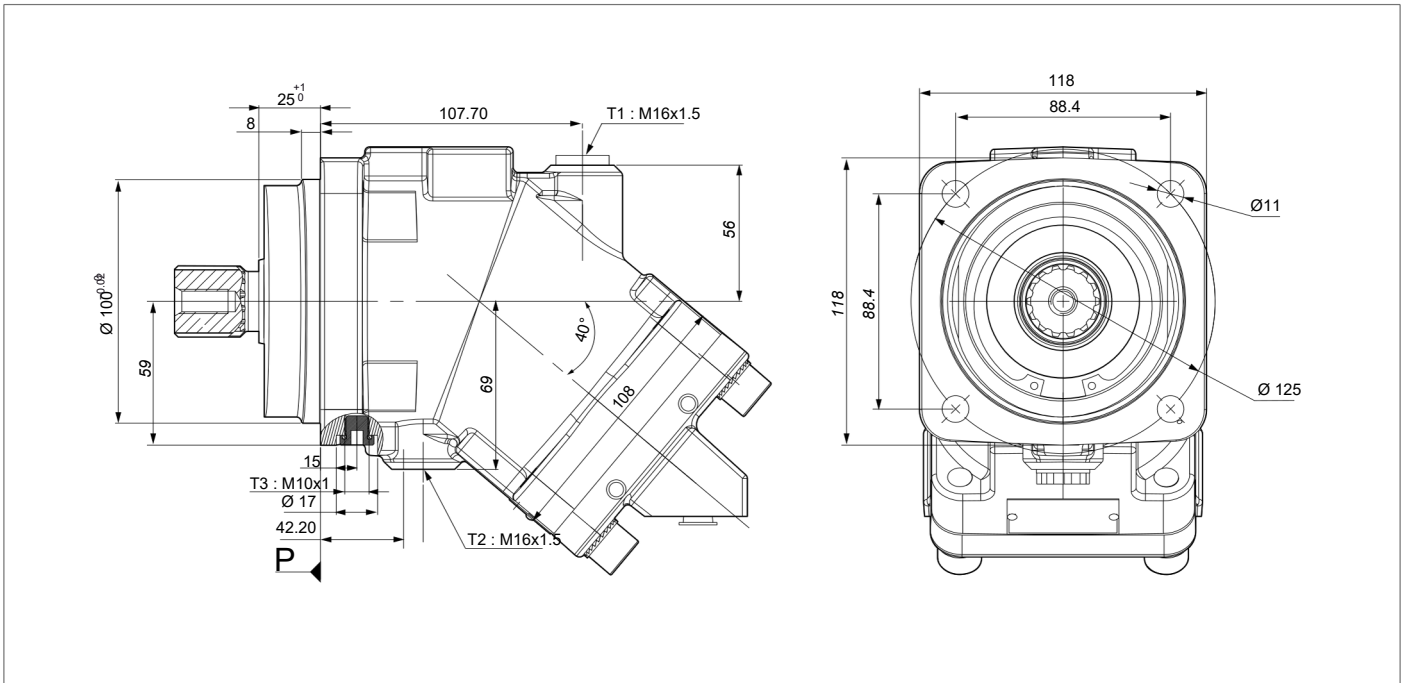
120

112.3
70.3

M27x2 depth 16

149
185.3

A11 - 41 cc (ISO2) Bent Ax s Pump



A11 - 41 cc (ISO2) Bent Axis Pump

SLR

outlet
6000 ps
SAE 1/2"

19
M10x1.5 prof 17

22,2
inlet
3000 ps
SAE 3/4"

47,6

60 22

view from G

RD2 Rear threaded ports
M27x2 depth 16

RD1 Rear flange ports
SAE 1/2" 6000 ps
Ø 11

59

18,2

58

75,4

112

40,5

M8 depth 15
drilling depth 18

84
112,3

155,2
185

165,6
185,3

SD2 Side threaded ports
A and B

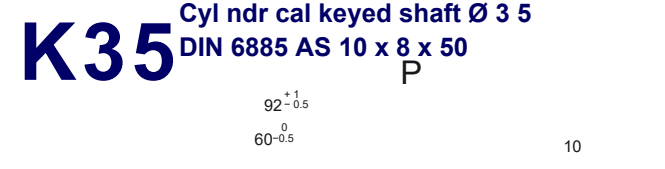
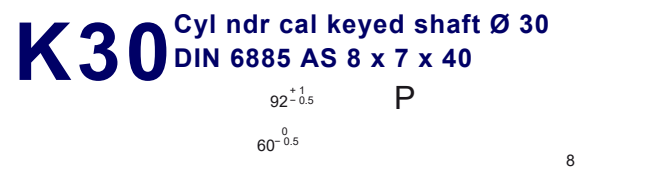
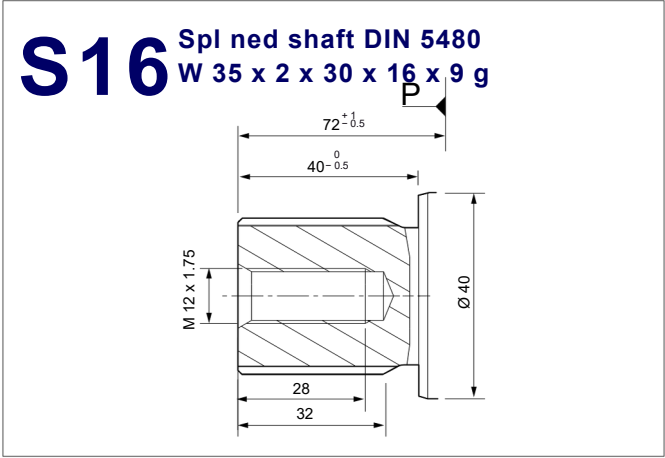
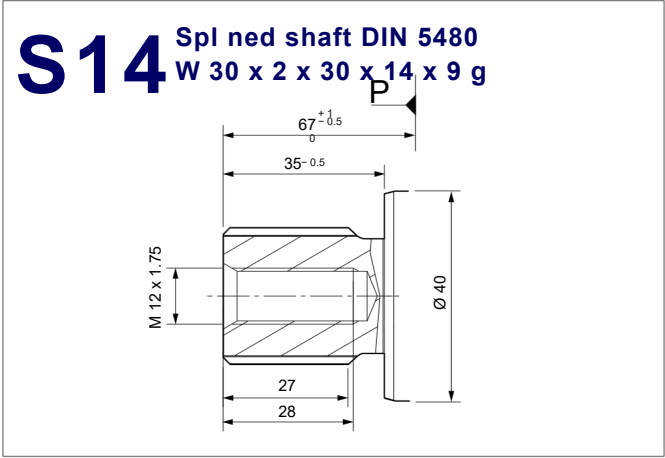
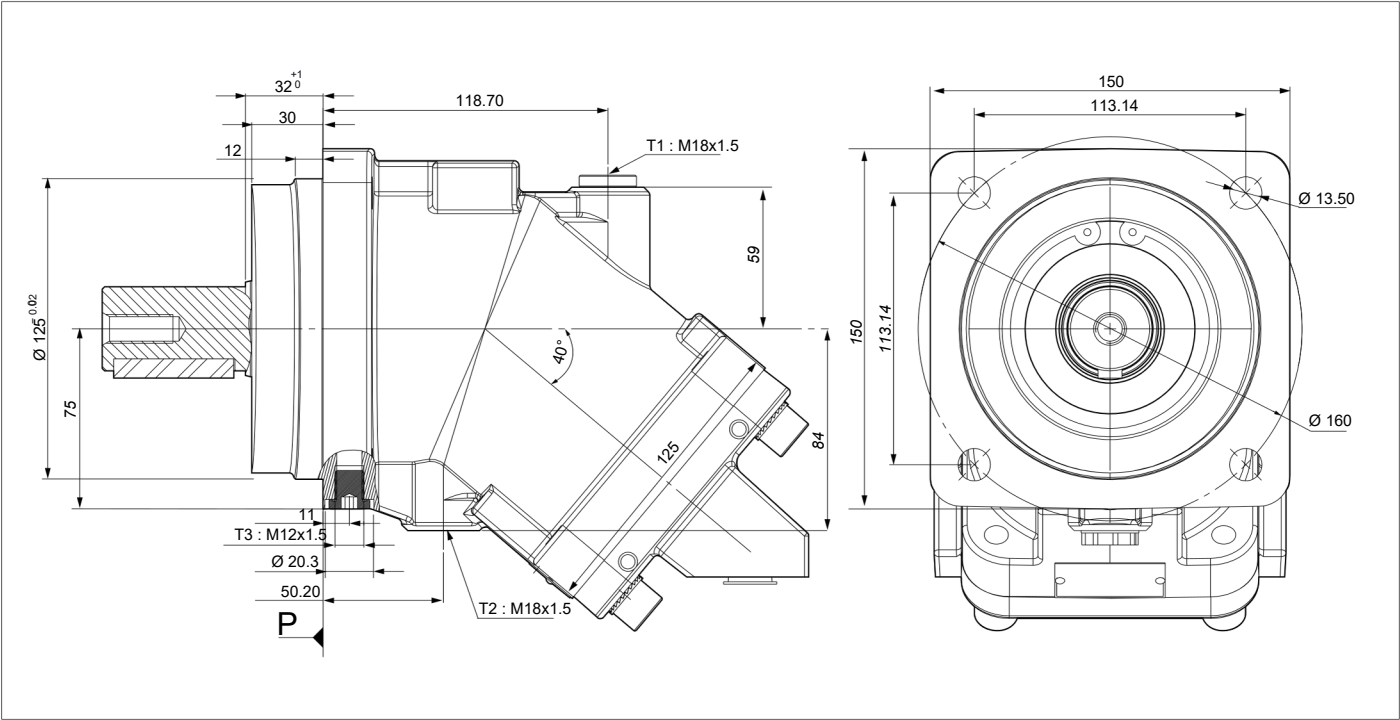
120

112,3
70,3

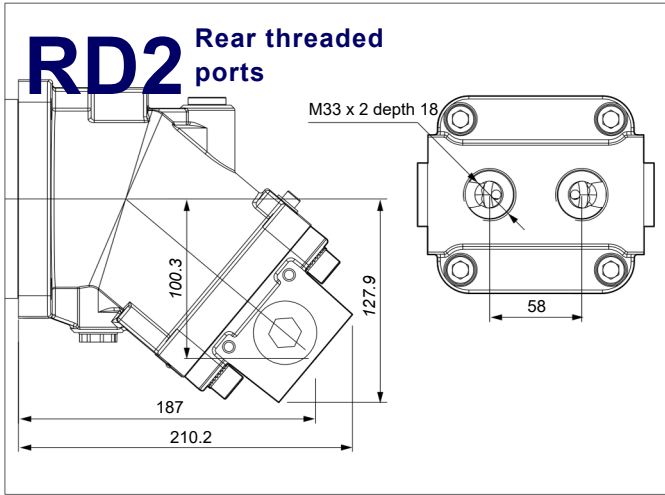
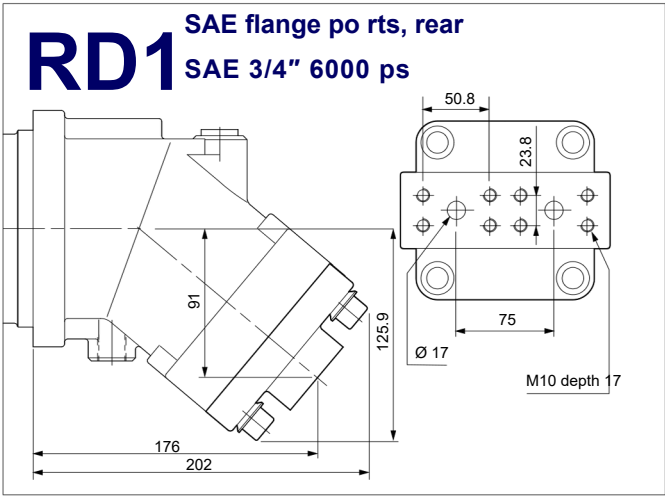
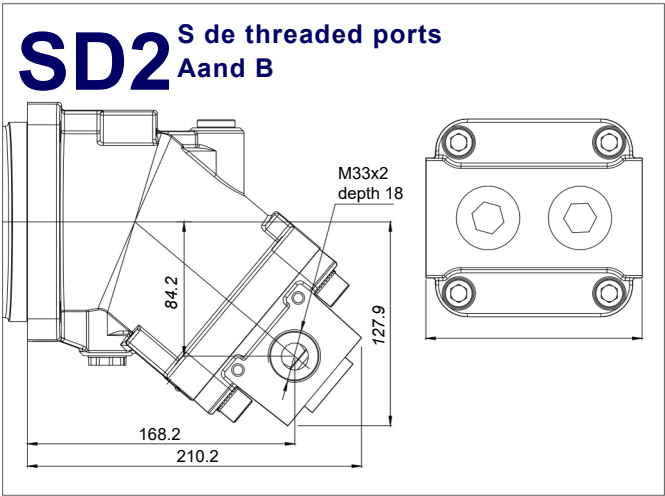
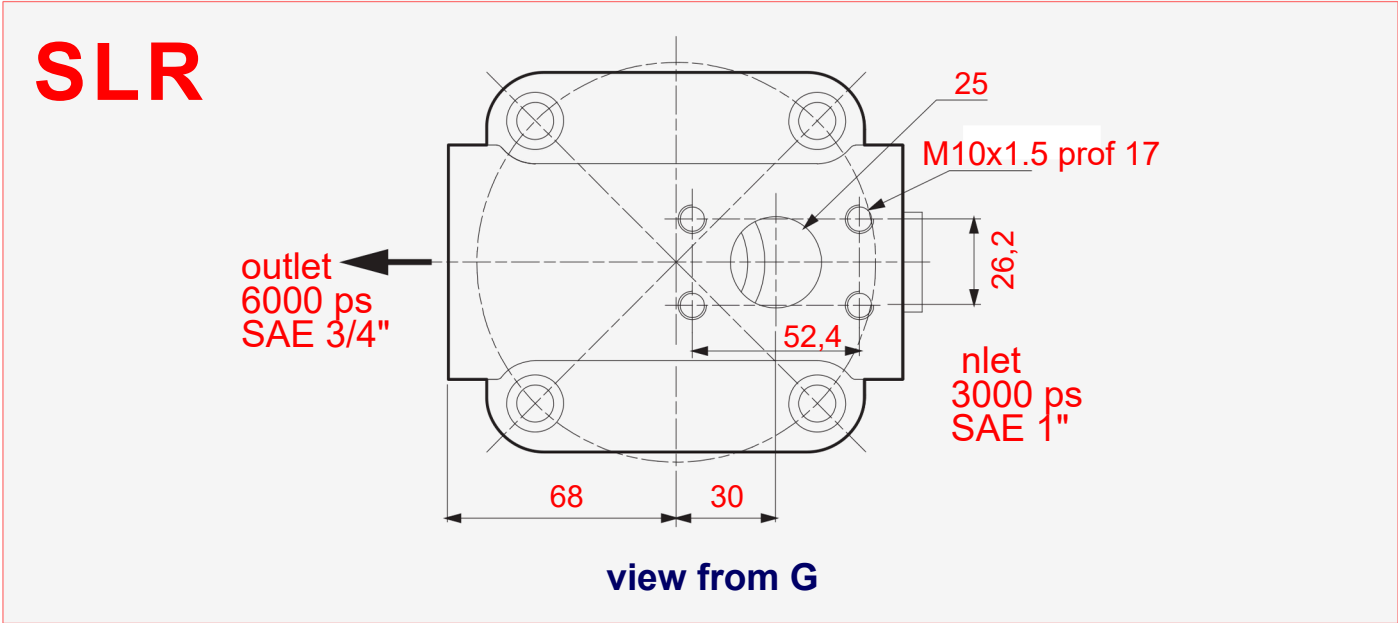
M27x2 depth 16

149
185,3

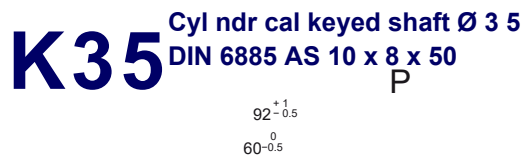
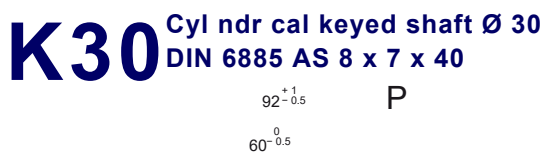
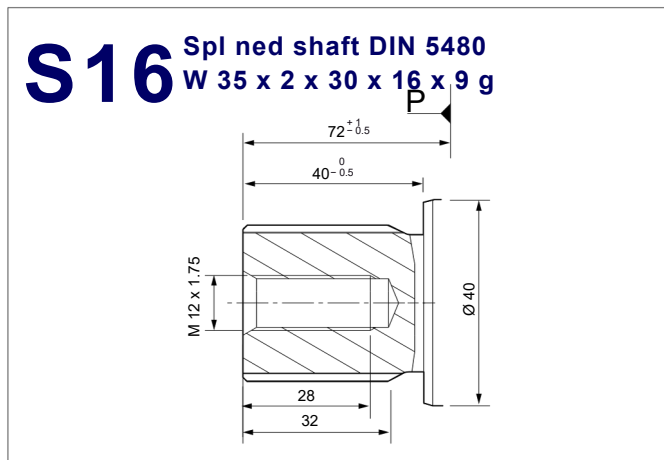
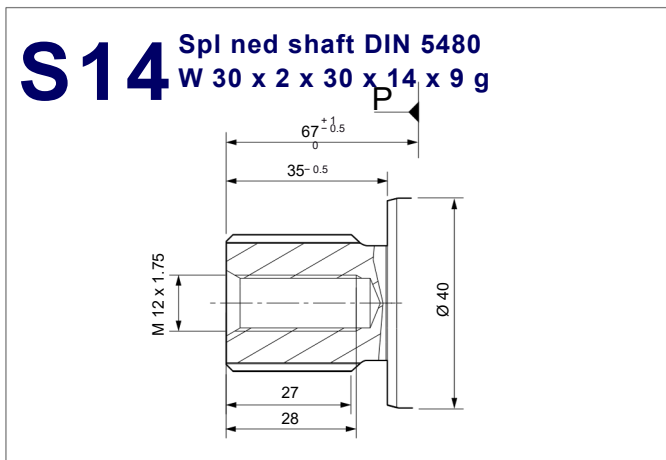
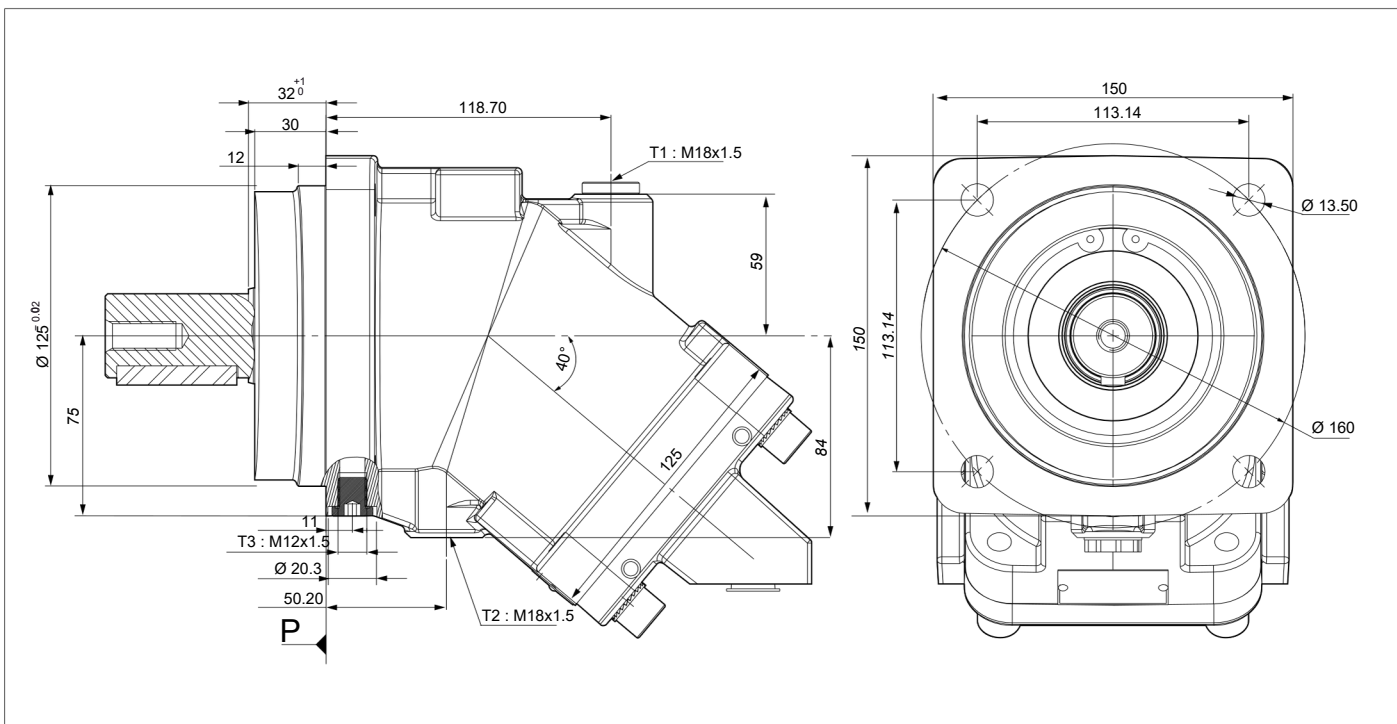
A11 - 45 cc (ISO2) Bent Axis Pump



A11 - 45 cc (ISO2) Bent Ax s Pump

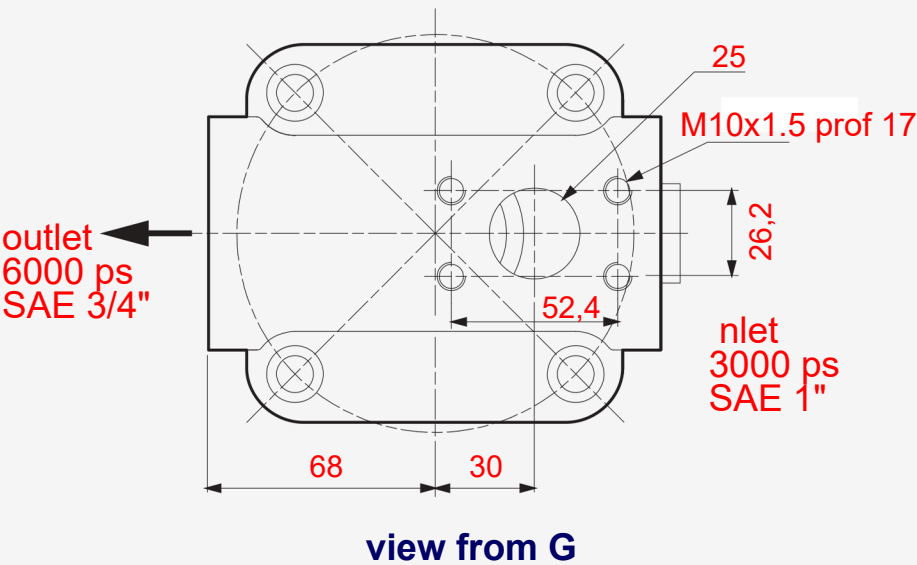


A11 - 50 cc (ISO2) Bent Axis Pump

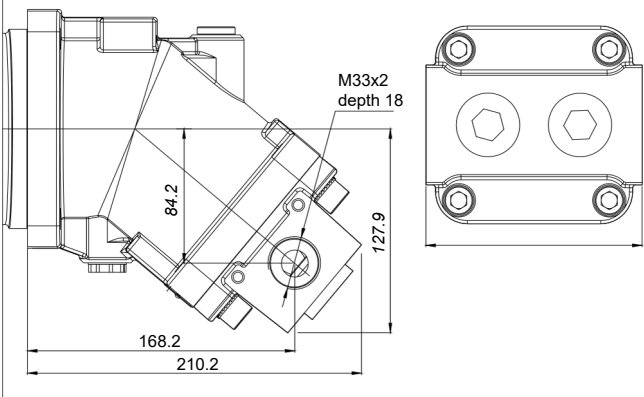


A11 - 50 cc (ISO2) Bent Axis Pump

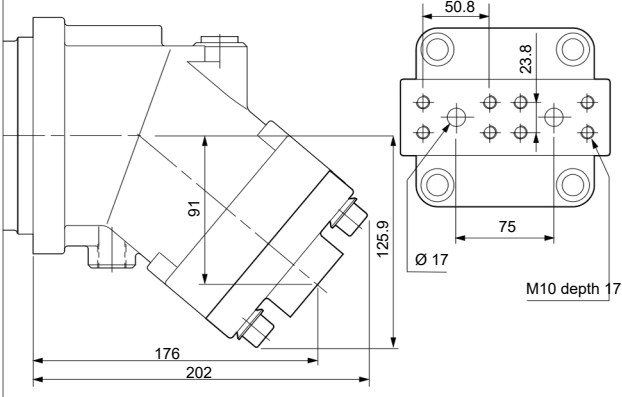
SLR



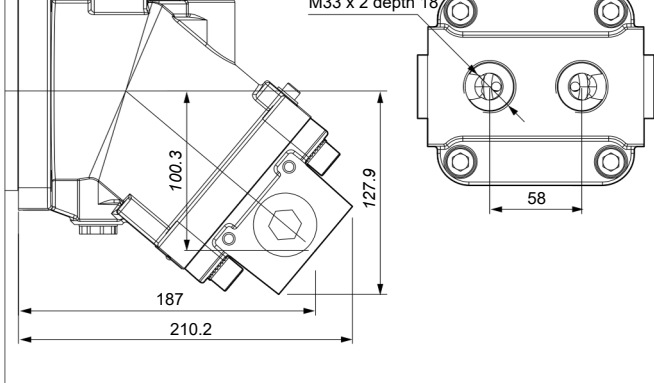
SD2 Side threaded ports
A and B



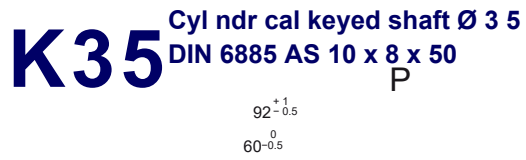
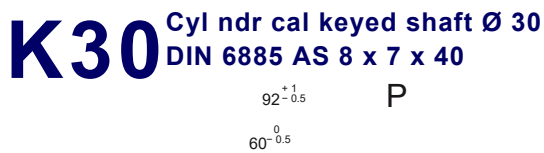
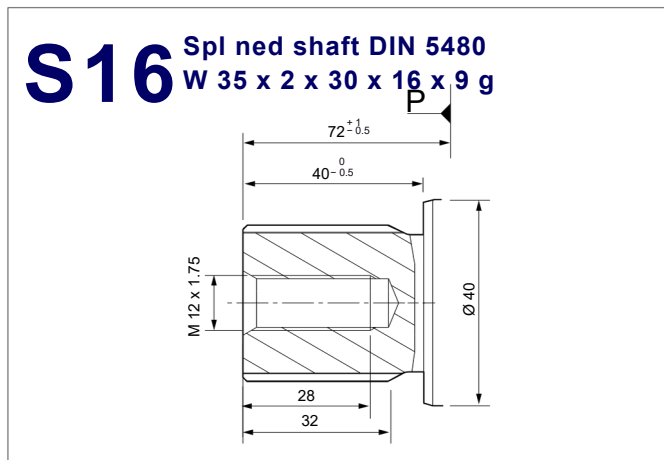
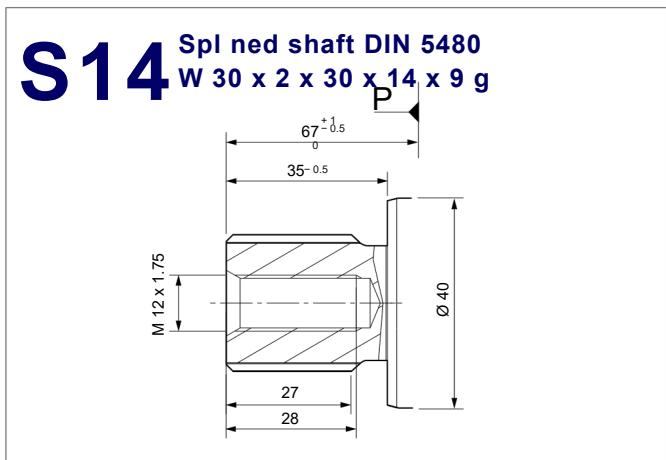
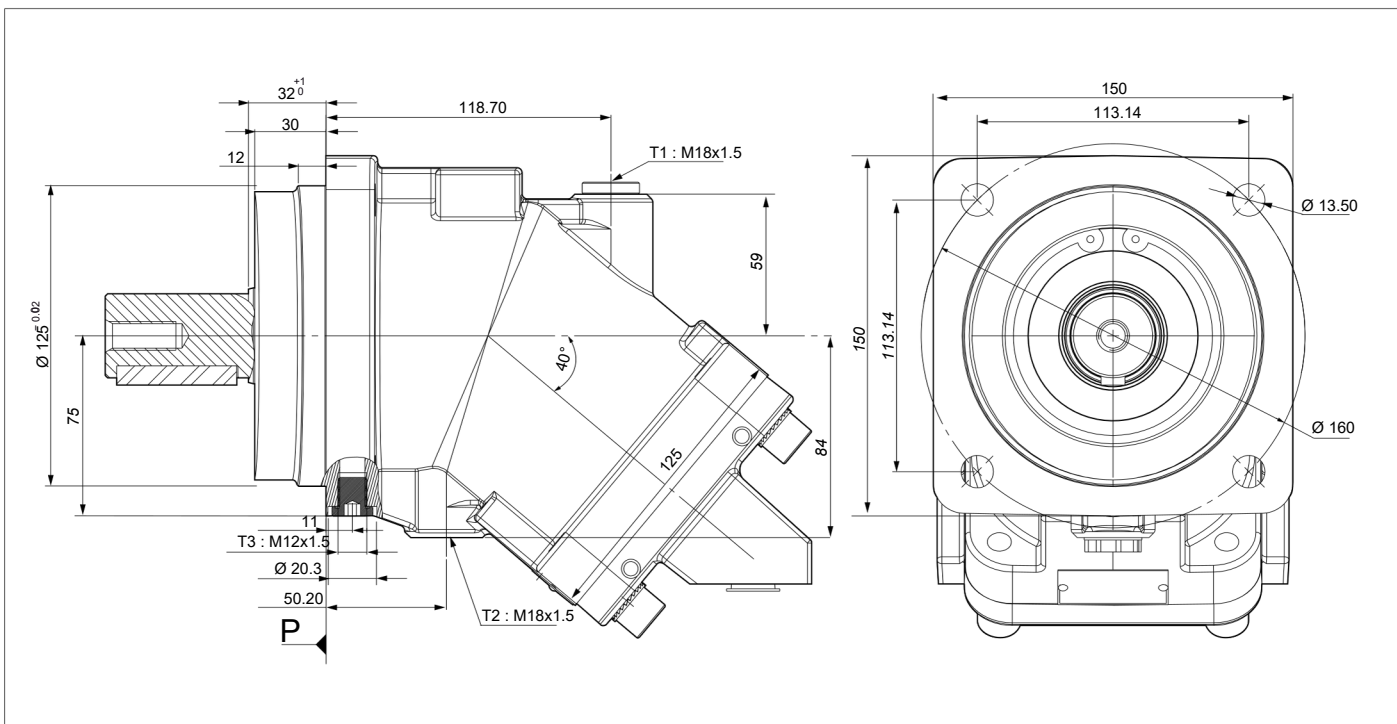
RD1 SAE flange ports, rear
SAE 3/4\" 6000 ps



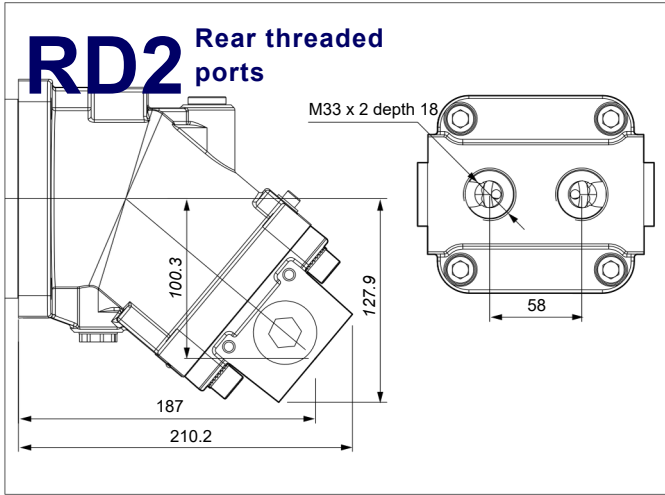
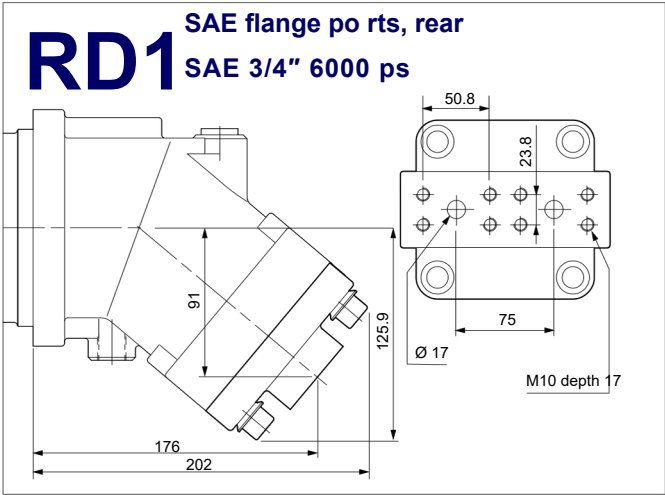
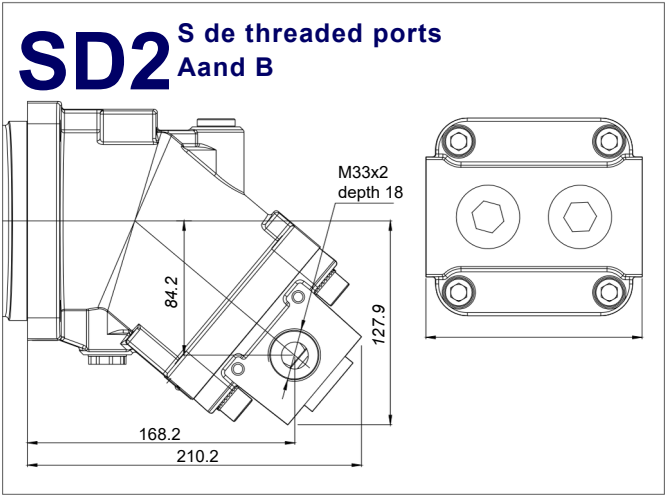
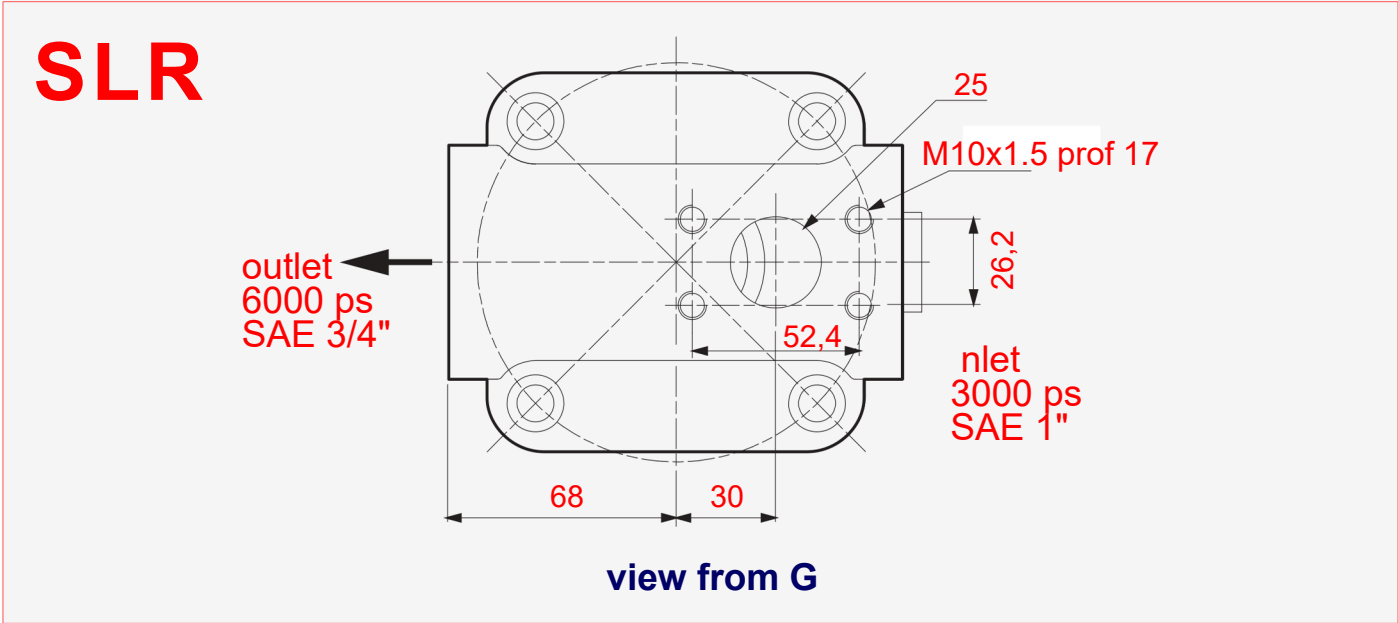
RD2 Rear threaded
ports



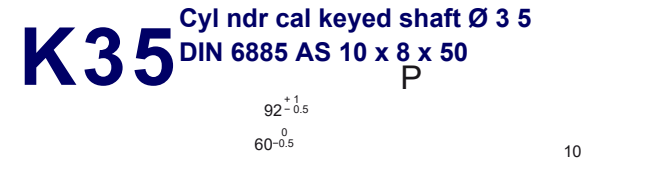
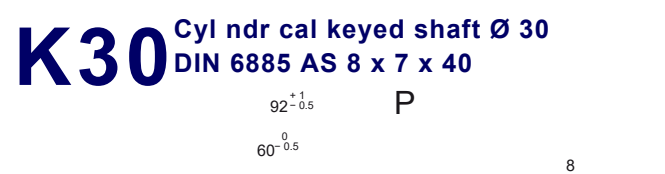
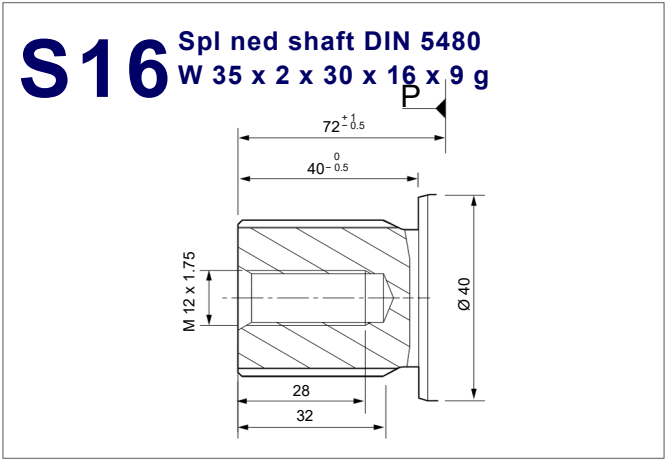
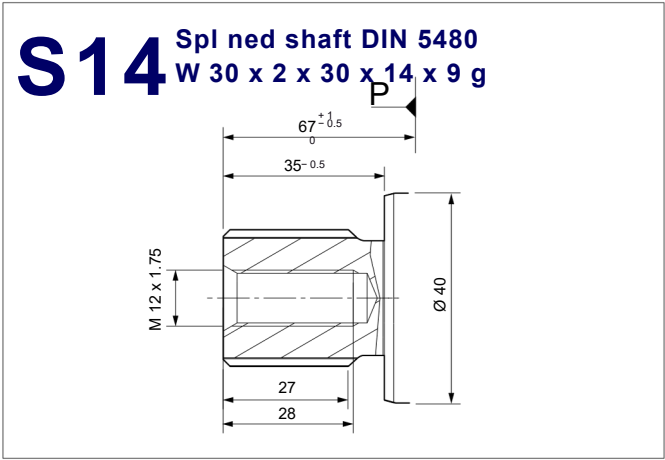
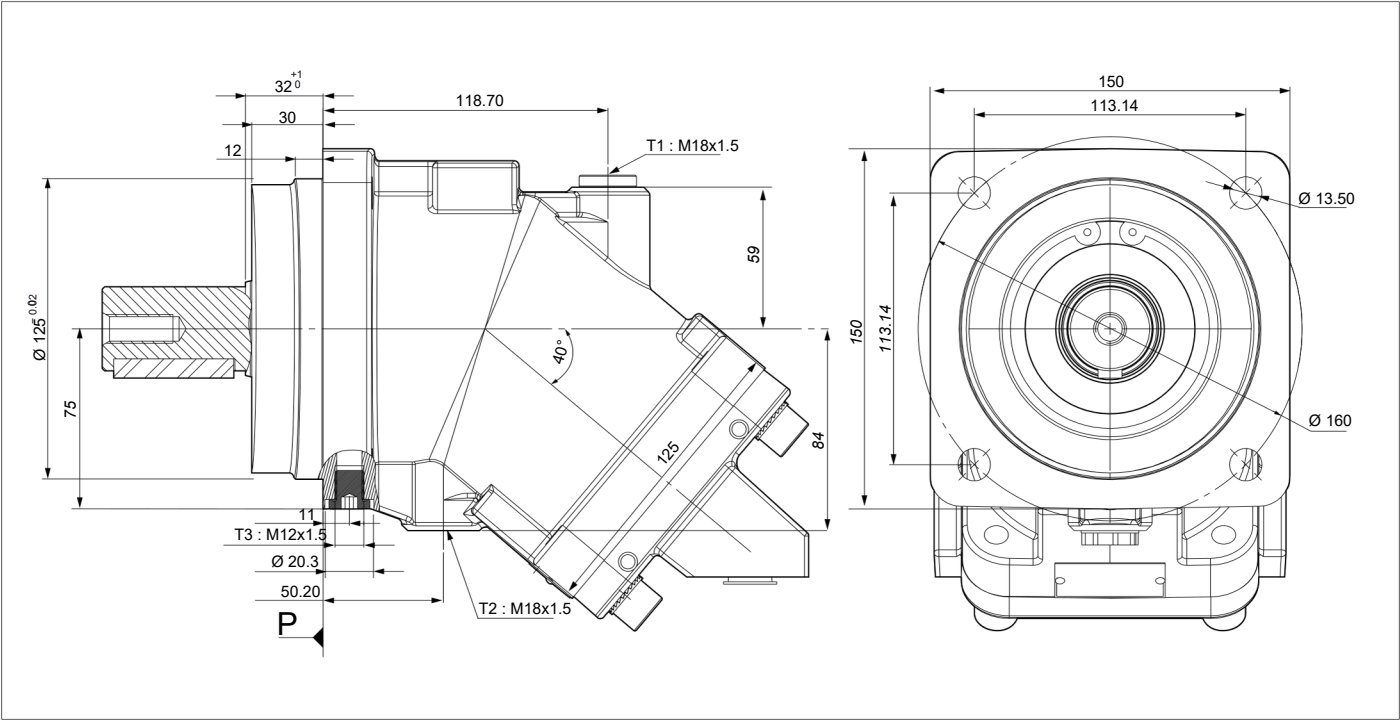
A11 - 56 cc (ISO2) Bent Axis Pump



A11 - 56 cc (ISO2) Bent Axis Pump

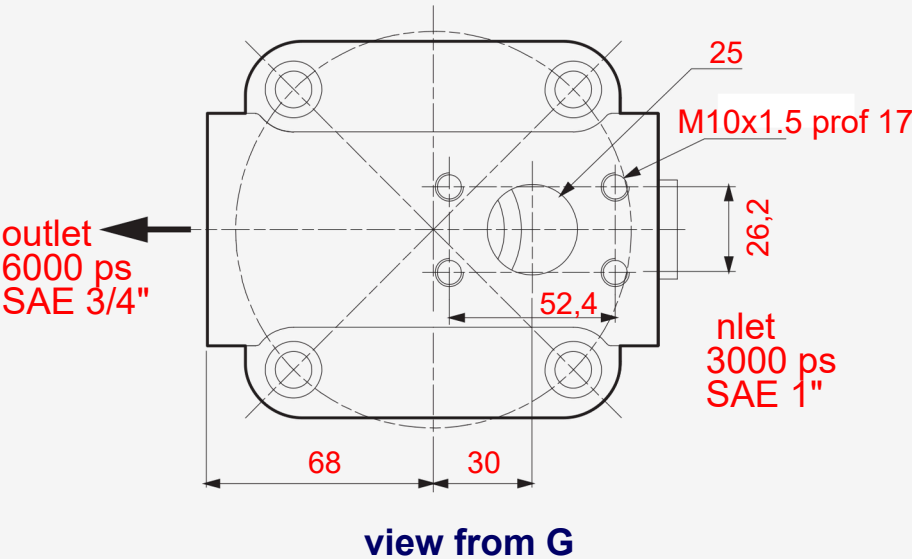


A11 - 63 cc (ISO2) Bent Axis Pump

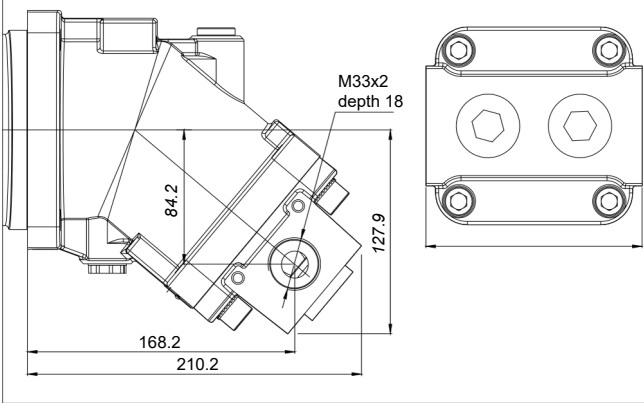


A11 - 63 cc (ISO2) Bent Axis Pump

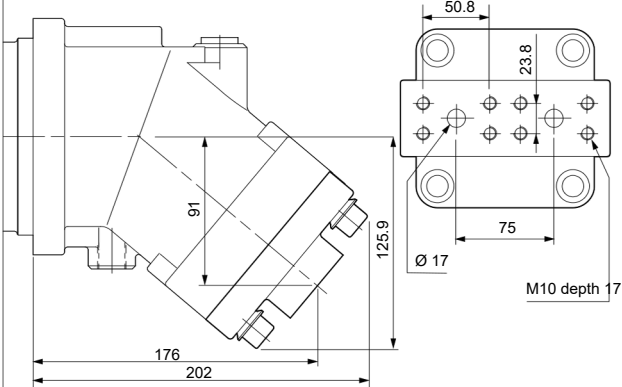
SLR



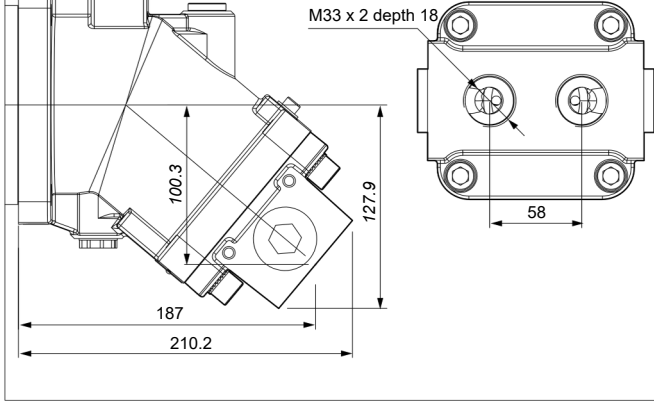
SD2 Side threaded ports A and B



RD1 SAE flange ports, rear SAE 3/4" 6000 ps

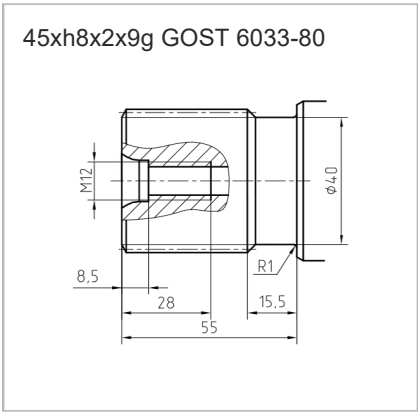
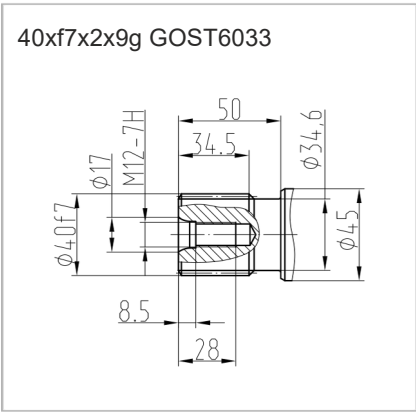
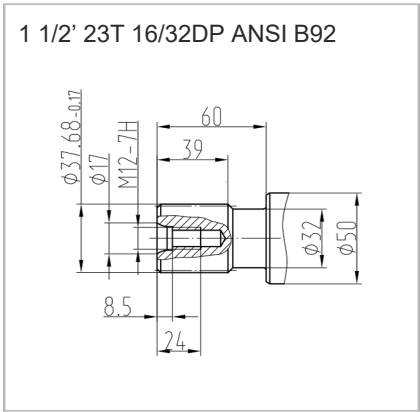
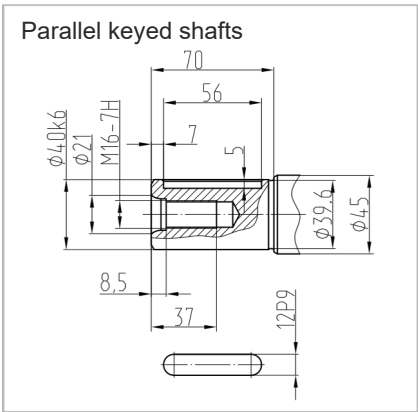
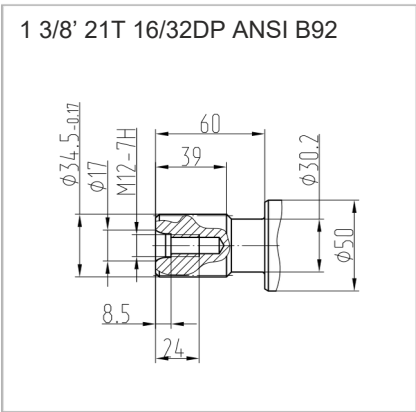
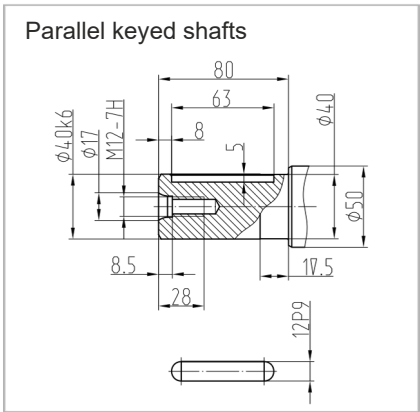
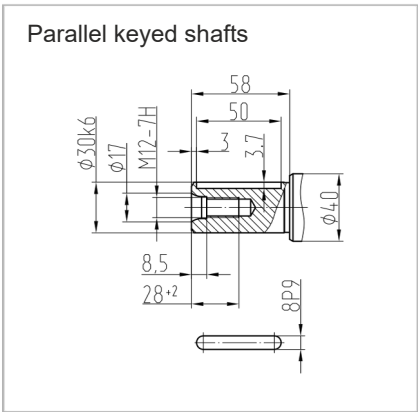
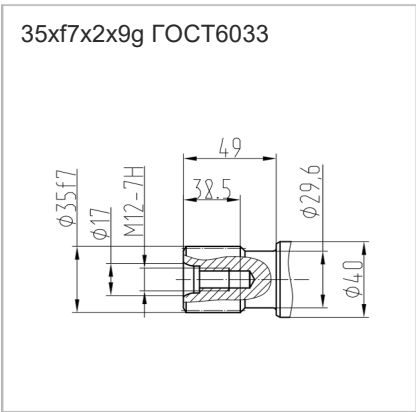
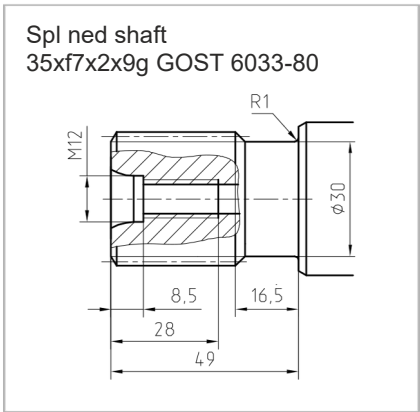


RD2 Rear threaded ports



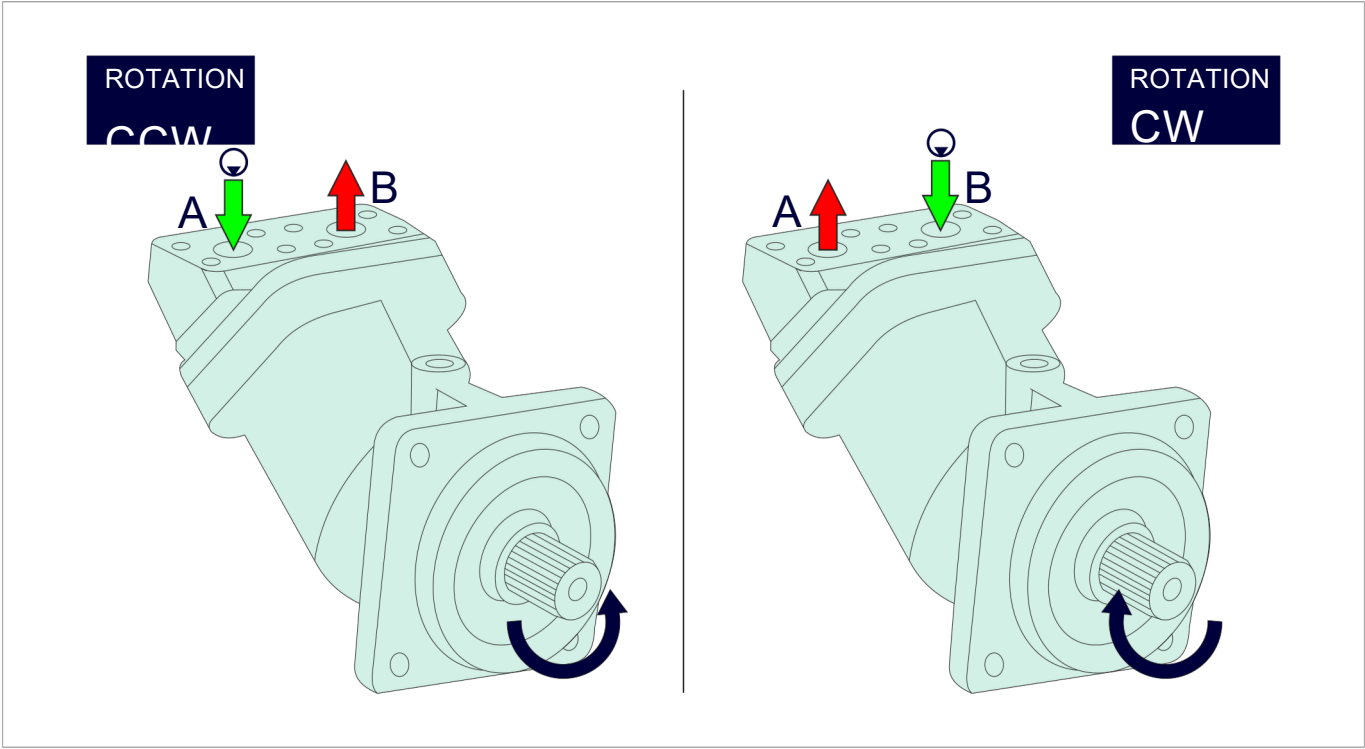
Special Shaft Drive Options for A11 Pumps

For the Special applications, we produce Special Shaft Drive for the A11 Pumps.
Details are listed in below.



Direction of Rotation; Reversible

The Pumps rotate clockwise or counter-clockwise depending on the direction of hydraulic flow entering the Pump.



Formulas			
Pump Output Flow	GPM	$GPM = (Speed\ (rpm) \times d\ sp.\ (cu.\ in.)) / 231$	$GPM = (n \times d) / 231$
Pump Input Horsepower	HP	$HP = GPM \times Pressure\ (ps) / 1714 \times Efficiency$	$HP = (Q \times P) / 1714 \times E$
Pump Efficiency	E	Overall Efficiency = Output HP / Input HP	$E_{overall} = HP_{out} / HP_{in} \times 100$
		Overall Efficiency = Volumetric Eff. $\times$ Mechanical Eff.	$E_{overall} = Eff_{Vol.} \times Eff_{Mech.}$
Pump Volumetric Efficiency	E	Volumetric Efficiency = Actual Flow Rate Output (GPM) / Theoretical Flow Rate Output (GPM) $\times 100$	$Eff_{Vol.} = Q_{act.} / Q_{theo.} \times 100$
Pump Mechanical Efficiency	E	Mechanical Efficiency = Theoretical Torque to Drive / Actual Torque to Drive $\times 100$	$Eff_{Mech} = T_{theo.} / T_{act.} \times 100$
Pump Displacement	CIPR	$Displacement\ (in.^3 / rev.) = Flow\ Rate\ (GPM) \times 231 / Pump\ RPM$	$CIPR = GPM \times 231 / RPM$
Pump Torque	T	Torque = Horsepower $\times 63025 / RPM$	$T = 63025 \times HP / RPM$
		Torque = Pressure (PSIG) $\times$ Pump Displacement (CIPR) / 2π	$T = P \times CIPR / 6.28$

- Horsepower for driving a pump

: For every 1 hp of drive, the equivalent of 1 gpm @ 1500 psi can be produced.
- Horsepower for idling a pump

: To idle a pump when it's unloaded will require about 5% of its full rated power
- Wattage for heating hydraulic oil

: Each watt will raise the temperature of 1 gallon of oil by 1° F. per hour.
- Flow velocity in hydraulic lines

: Pump suction lines 2 to 4 feet per second, pressure lines up to 500 psi - 10 to 15 ft./sec., pressure lines 500 to 3000 psi - 15 / 20 ft./sec.; all oil lines in a run-over-oil systems; 4 ft./sec.

Installation & Assembly Informations for Bent Axis Pumps

POSITION

ISO2FlangeBent Axis Pumps can be operate any position.

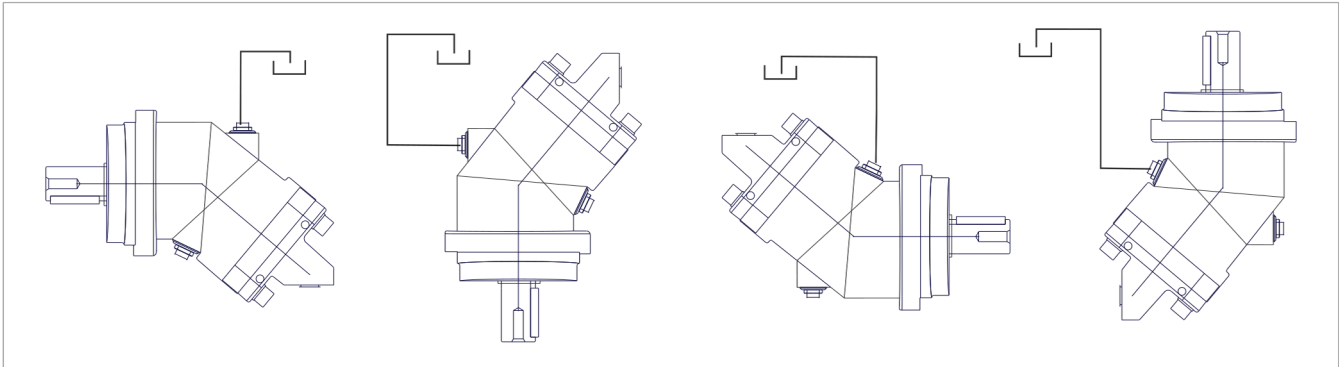
DIRECTION OF ROTATION

ISO2FlangeBent Axis Pumps can be operate in both directions of rotation.

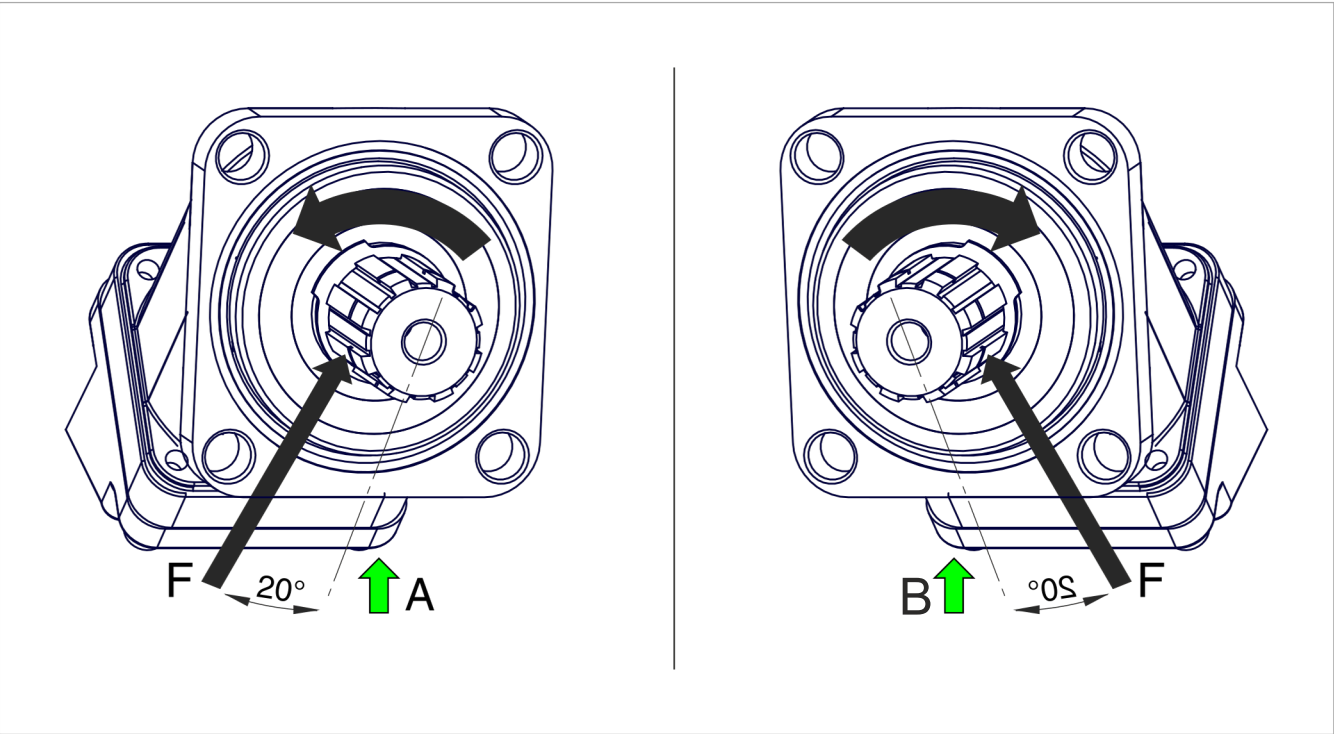
Before of Installation operation, the Pump must be filled with hydraulic fluid and a r bled.

INSTALLATION POSITION

See following examples.



HYDRAULIC FLUID
Recommended ; Generally :
between 15 and 200 cSt.
Maximum : between 5 and 1600
cSt.



FOR USE;
Available a e-mail on request or each Pump is supplied v a Starting datasheet.

Formulas, Calculations, Installation Guide

Quick Calculation

Flow rate

$$Q = \frac{VS \times n}{1000} \text{ (lpm)}$$

Torque

$$M = \frac{V_s \times DP \times \eta_{mh}}{63} \text{ (Nm)}$$

Power

$$P = \frac{2p \times M \times n}{60000} = \frac{M \times n}{9549} = \frac{Q \times DP \times \eta_t}{600} \text{ (kw)}$$

Speed

$$n = \frac{1000 \times Q_v \times \eta_v}{VS} \text{ (rpm)}$$

New frame sizes to meet market requirements.

Optional by-pass valve.

For use in mobile & industrial and stationary applications areas.

The pump drive shaft bearings are designed to give the service life expected in these areas of operation. Interchangeable with other bent axis pumps & Pumps

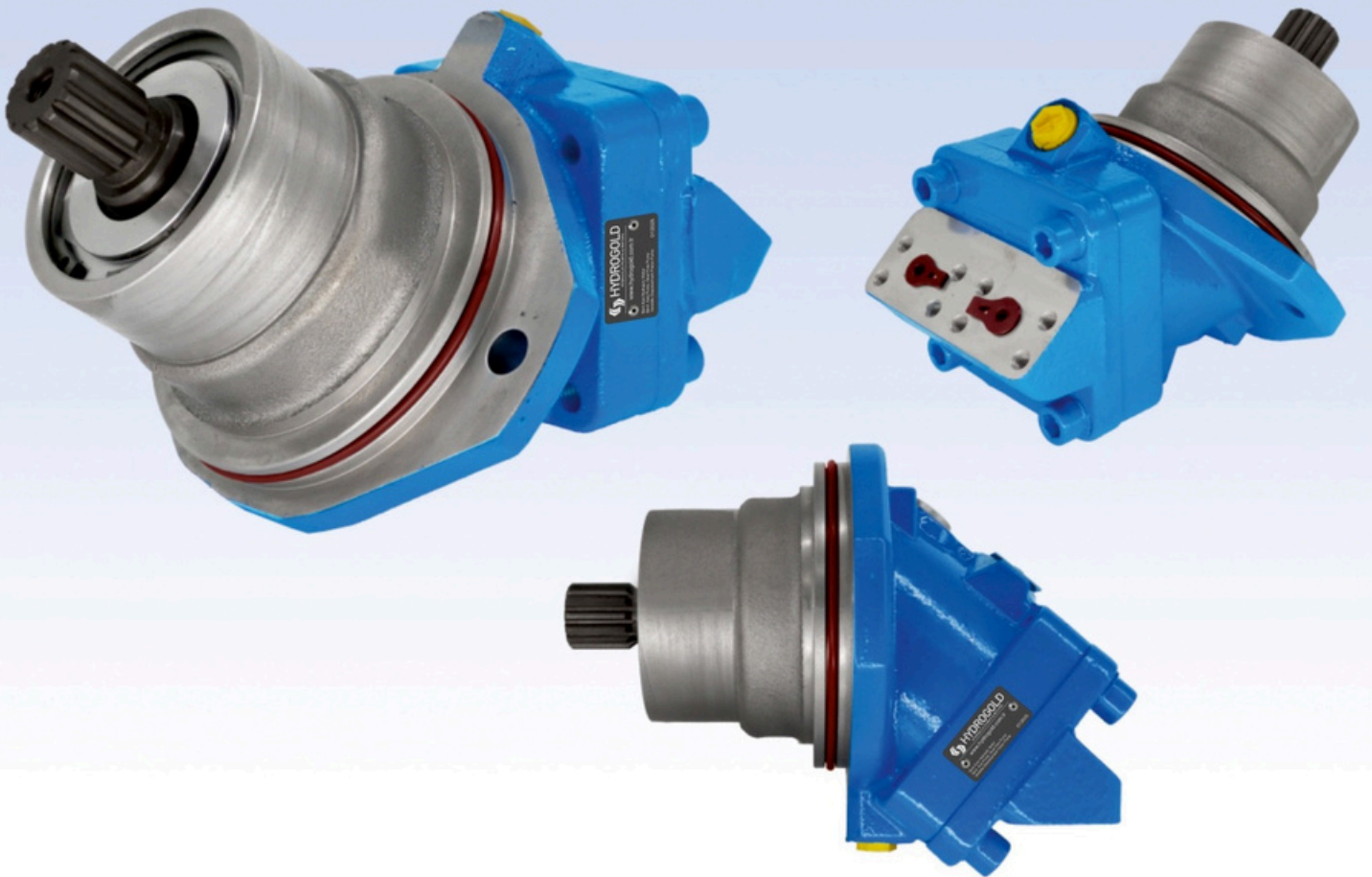
V	= Displacement (ccm/rev.)
S	= Diff. pressure (bar)
p	= Speed (rpm)
n	= Flow (lpm)
Q _v	= Volumetric efficiency
η _{mh}	= Mechanical-hydraulic efficiency
η _t	= Total efficiency (η _t =η _v ×η _{mh})

A8PF (Fixed Plug n) Eksenel P stonlu Pompa

High Pressure Hydraulic Bent Axis Piston Pumps, High Pressure,
450/500 BAR Working Pressure. High Rotational Speed, High Efficiency,
Simple Design, Cast Iron Pump Body, Re-Designed in 2025.

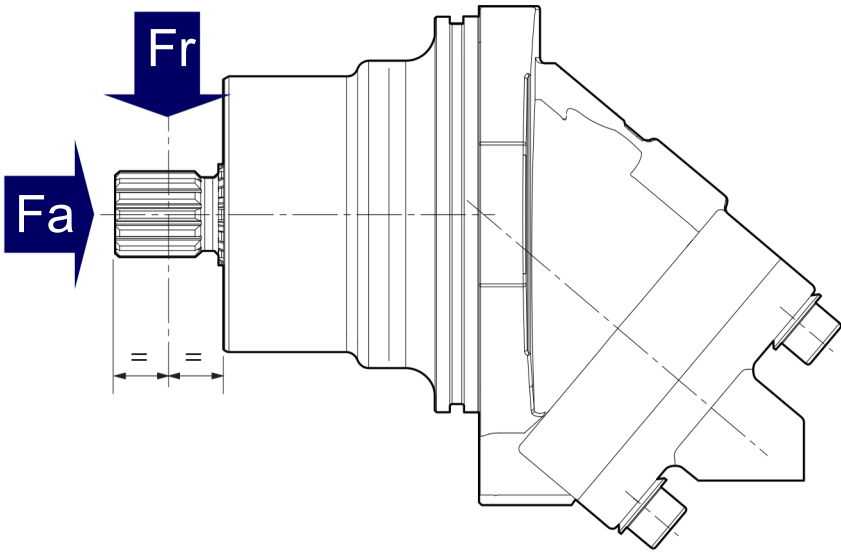
Designation;

28cc, 32cc, 41cc, 50cc, 56cc,
63cc, 80cc, 90cc, 108cc, 125cc



Characteristics of the A8PF (Fixed Plug n) Flange Bent Axis Pumps

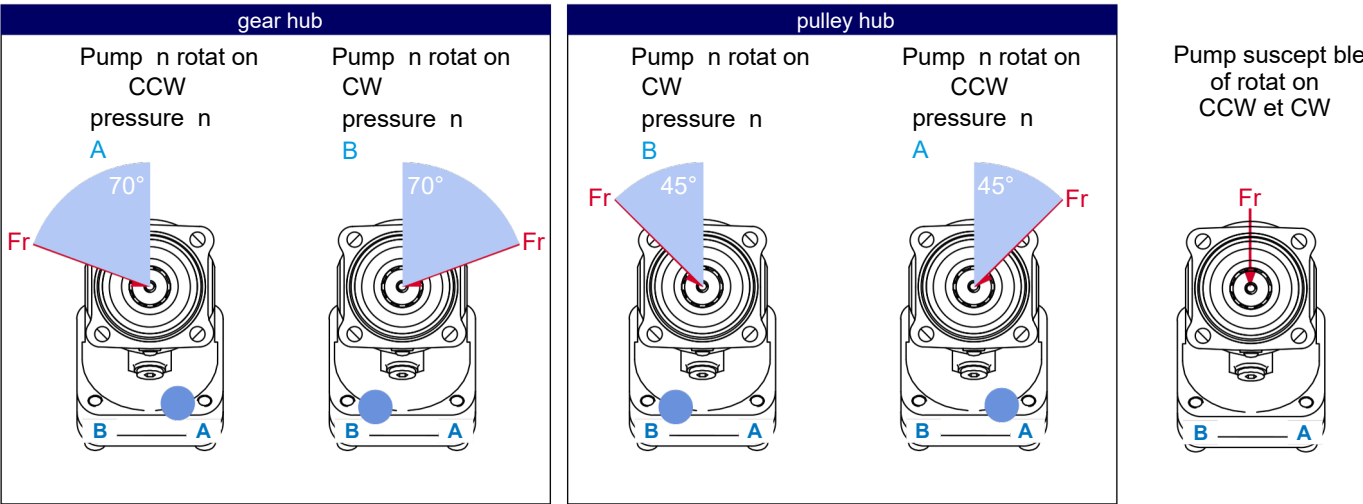
Pump MODEL	DISPL. (cc)	CONTINUOUS MAX. SPEED (rpm)	INTERMITTENT MAX. SPEED (rpm)	MAX. FLOW ABSORBED (l/min)	TORQUE BAR (m.N/bar)	TORQUE AT 350 BAR (m.N)	THEORETICAL MAX. POWER AT 400 BAR (HP / kW)	MAX. ALLOWED PRESSURE CONTN./PEAK (bar)	WEIGHT (kg)
28 cc	28.0	6300	6900	158	0.40	139	140.0 / 104.4	400 / 450	11.4
32 cc	32.0	6300	6900	202	0.50	178	180.5 / 134.4	400 / 450	11.5
41 cc	41.0	5600	6200	230	0.65	228	205.2 / 153.1	400 / 450	11.6
50 cc	50,3	5000	5500	252	0.80	280	224.1 / 167.5	400 / 450	18.1
56 cc	56,0	5000	5500	280	0.90	320	244.5 / 187.1	400 / 450	18.1
63 cc	63.0	5000	5500	315	1.00	351	281.6 / 209.1	400 / 450	18.2
80 cc	80,4	4500	5000	362	1.27	447	323.6 / 241.5	400 / 450	26.1
90 cc	90,1	4500	5000	405	1.43	500	361.5 / 269.9	400 / 450	26.2
108 cc	108	4000	4400	435	1.70	598	328.8 / 245.6	400 / 450	33.2
125 cc	125	3400	4400	428	2.00	698	382.6 / 284.6	400 / 450	33.8



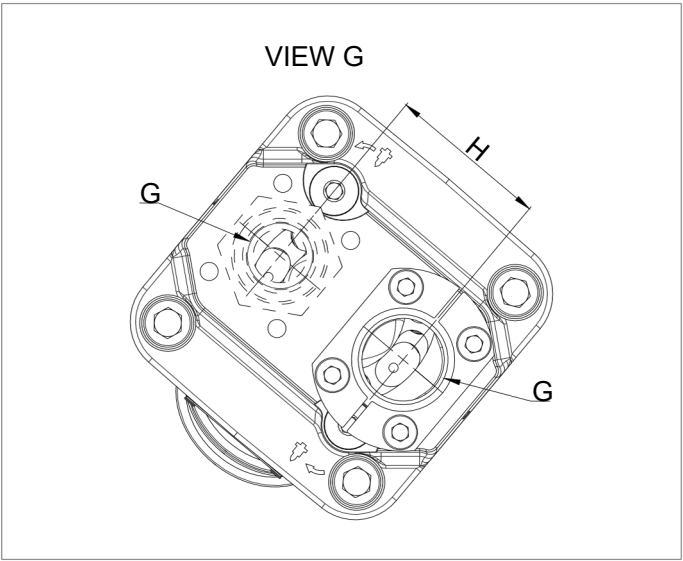
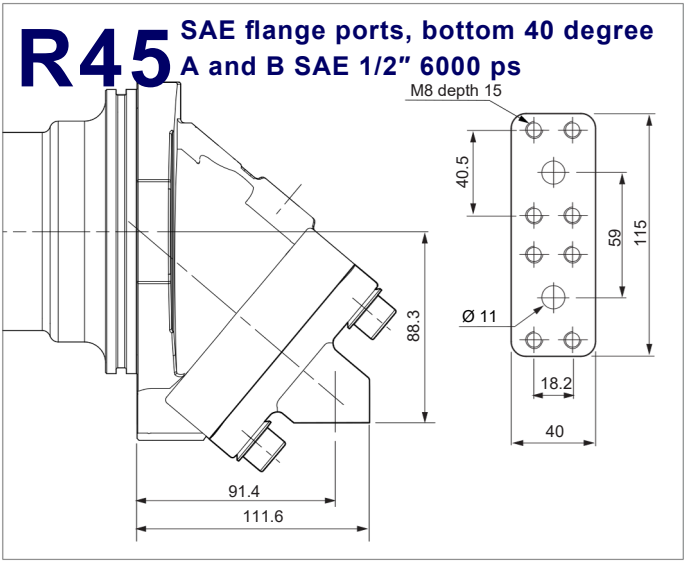
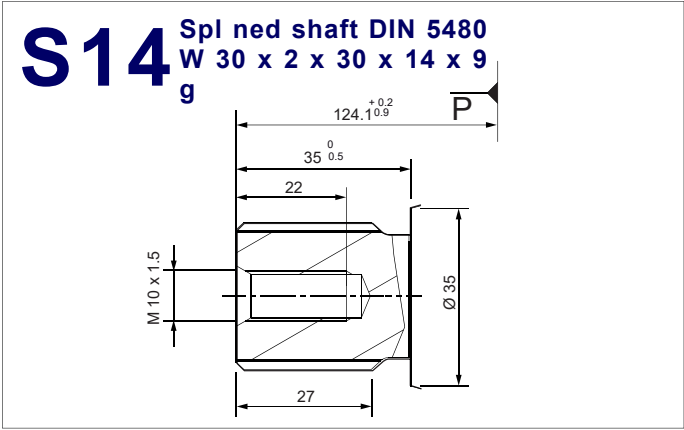
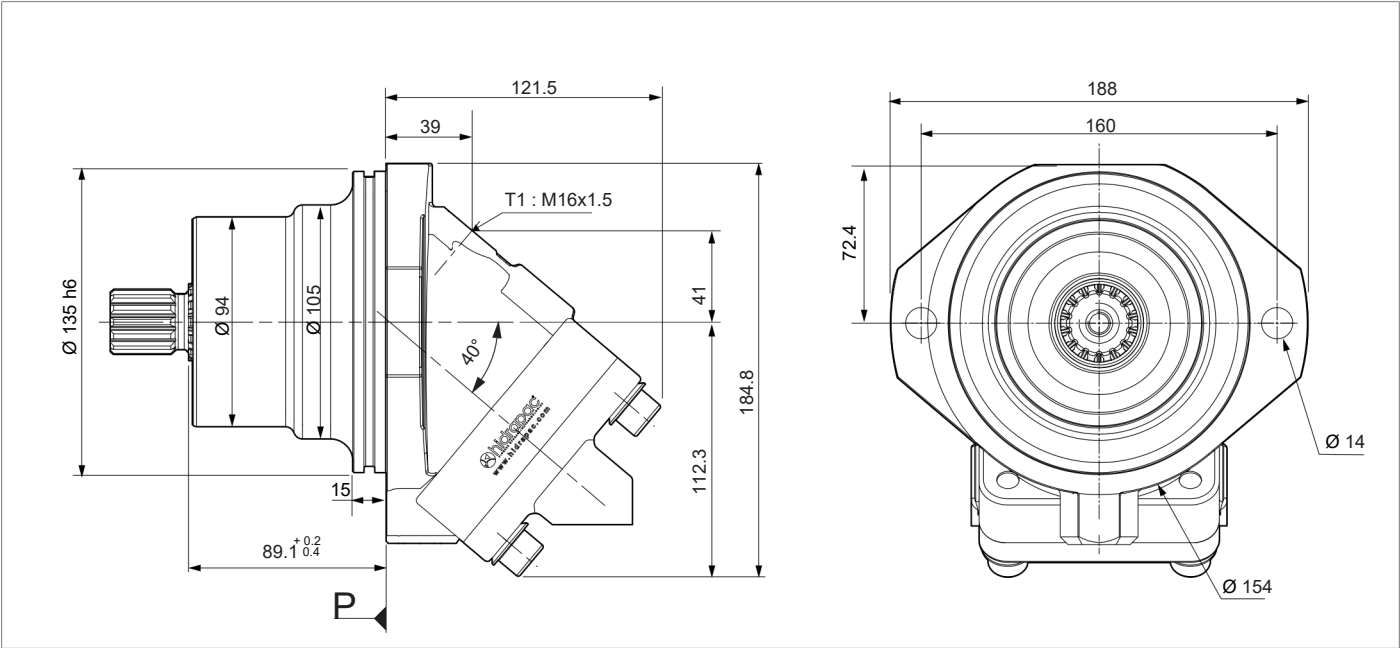
Pump model	28 cc	32 cc	41. 45	50 cc	56, 63cc	80,90,108	125 cc
Fr (lbf)	1350	1462.5	1462.5	1686	2023	2812	3262
Fr (N/bar)	6000	6500	6500	7500	9000	12500	14500
Fa (lbf)	0.42	0.46	0.62	0.62	0.77	1.24	1.33
Fa (N/bar)	(27)	(30)	(40)	(40)	(50)	(80)	(86)

Order ng Code; A8PF (F xed Plug n) Bent Ax s Pumps

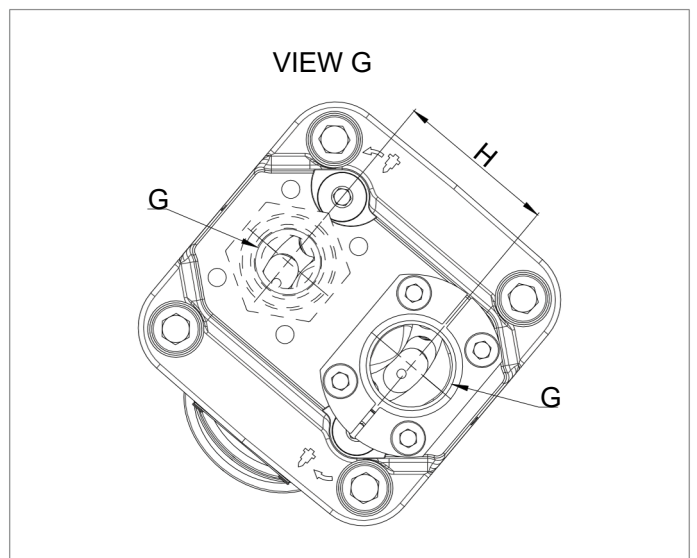
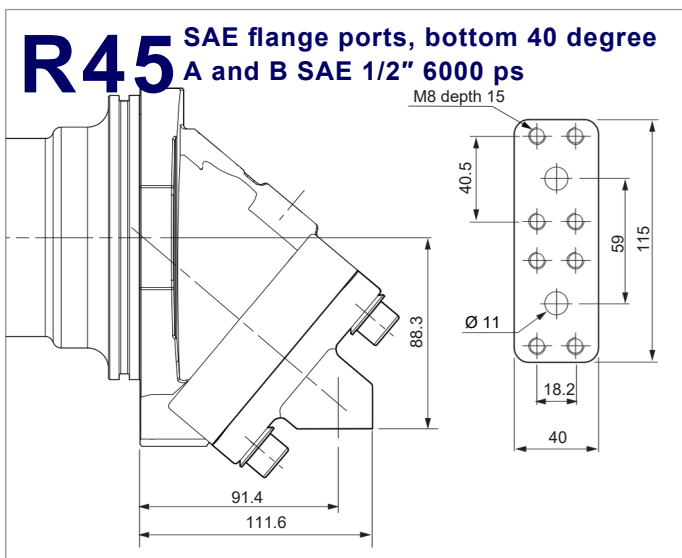
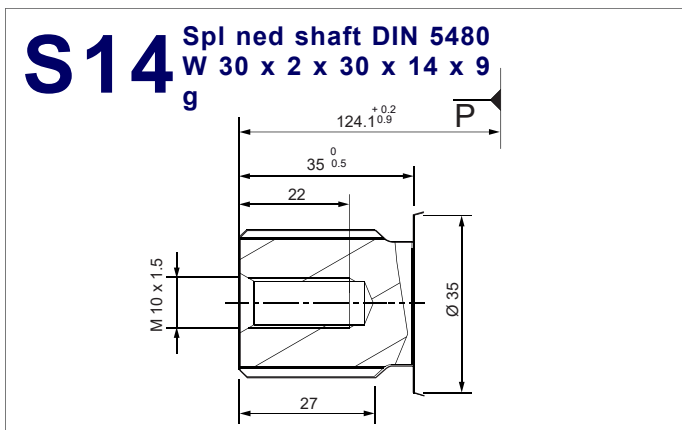
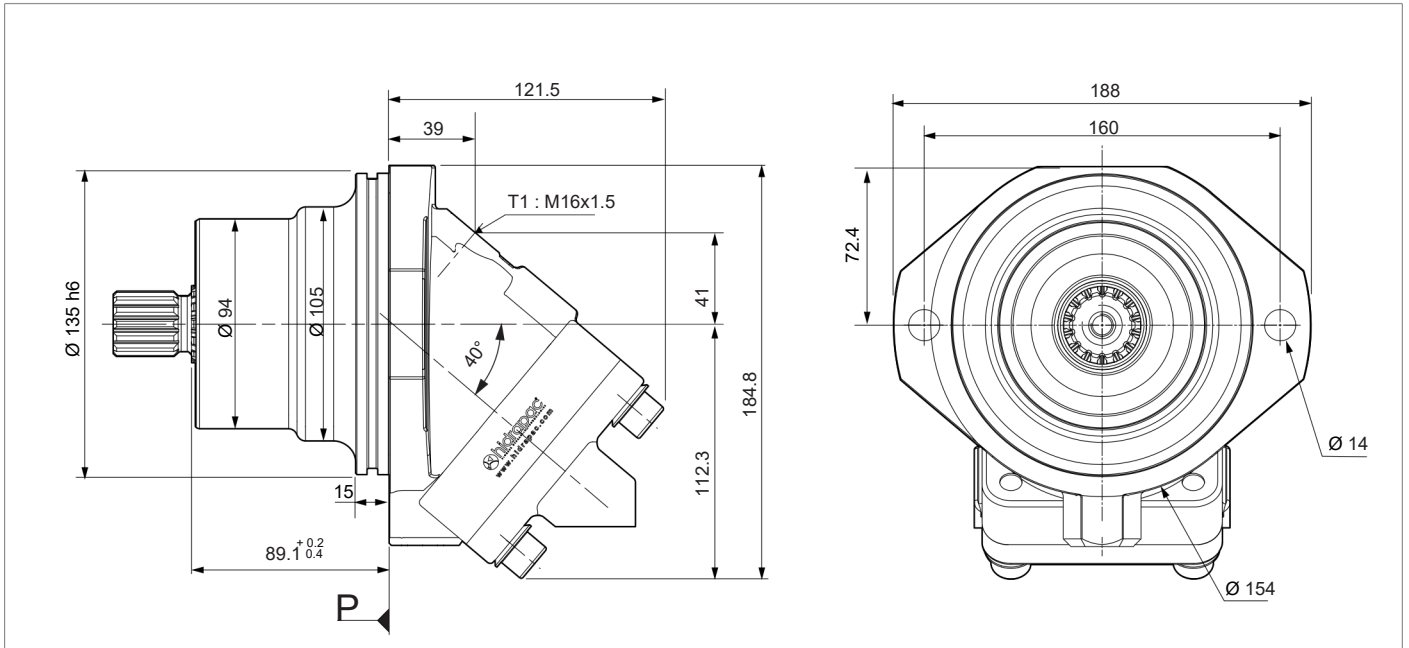
Model Code	D splacement	Shaft Type	Flange Type	Rotat on	Seal ng
A8PF	28	S14	B2	CW	V
A8PF	28	S14	B2	CW	V
Bent Ax s Hydraul c Pump	32	Spl ned Shaft W30x2x30x14x9g	2 Bolt ISO 3019-2	R ght D rect on of Rotat on	V ton H gh Pressure Seal
F xed Plug n	41				
	50				
	56				
	63	S16			
	80	Spl ned Shaft W35x2x30x16x9g		CCW	N
	90			Left D rect on of Rotat on	N tr le Seal 5/10 Bar
	108	S18			
	125	Spl ned Shaft W40x2x30x18x9g			
		S21			
		Spl ned Shaft W45x2x30x21x9g			



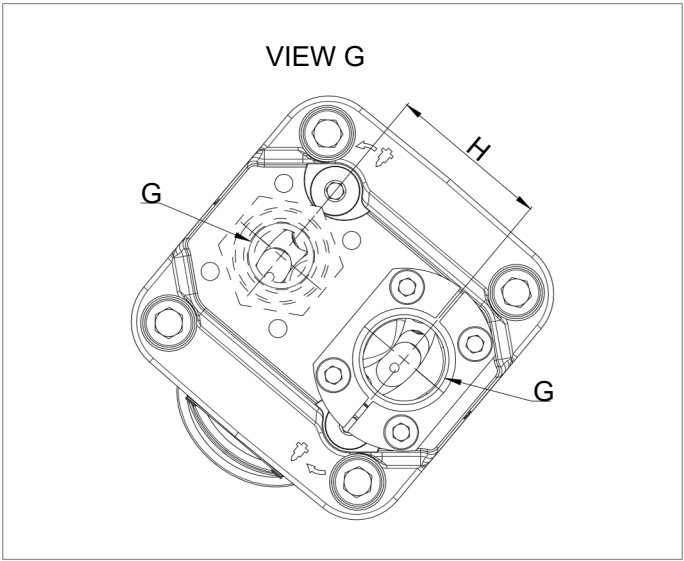
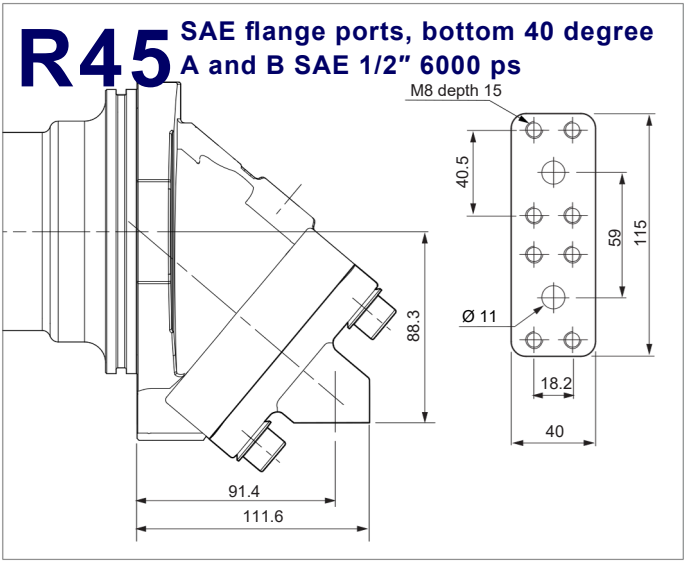
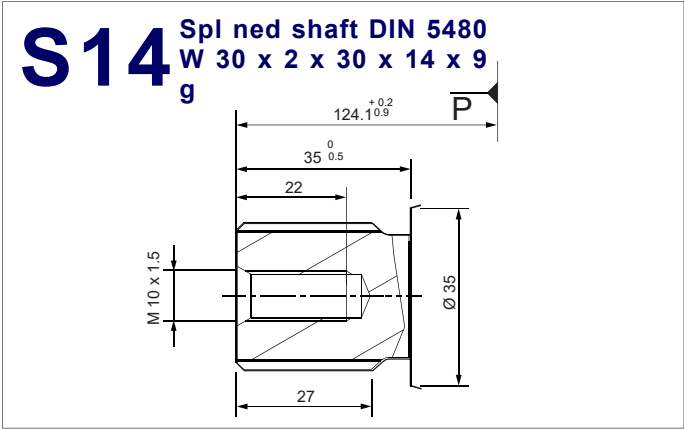
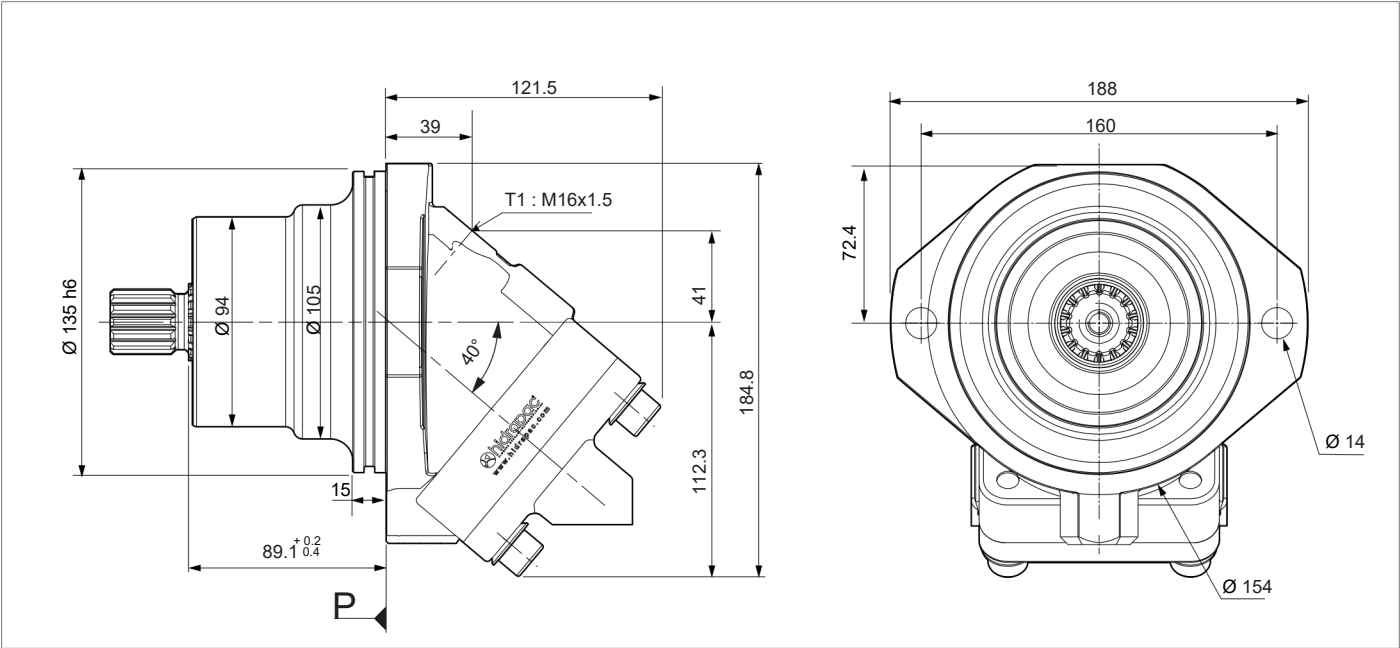
A8PF - 28 cc (F xed Plug n) - 2 Bolt



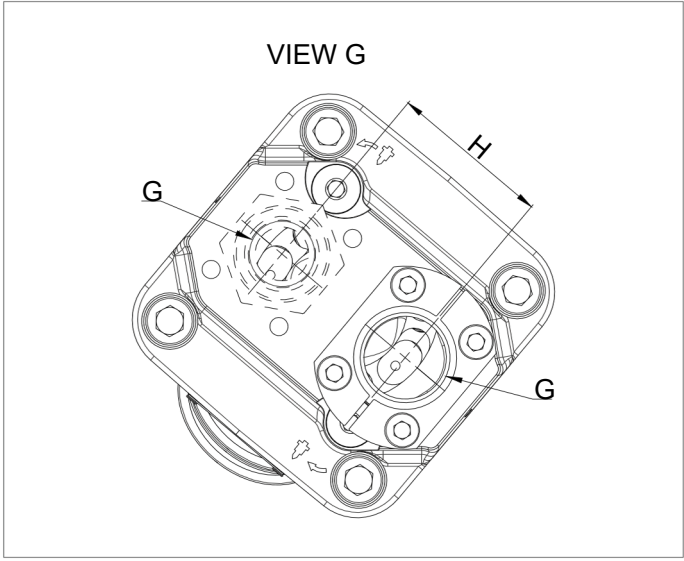
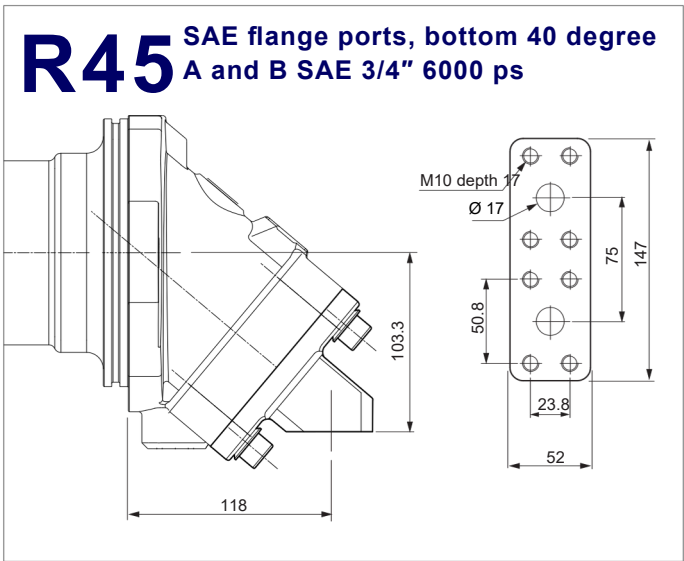
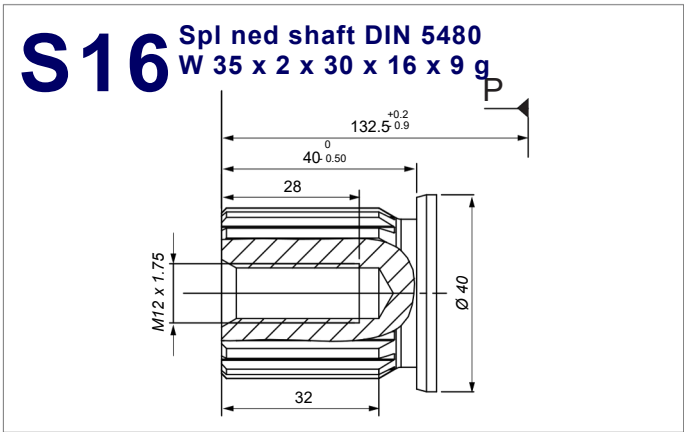
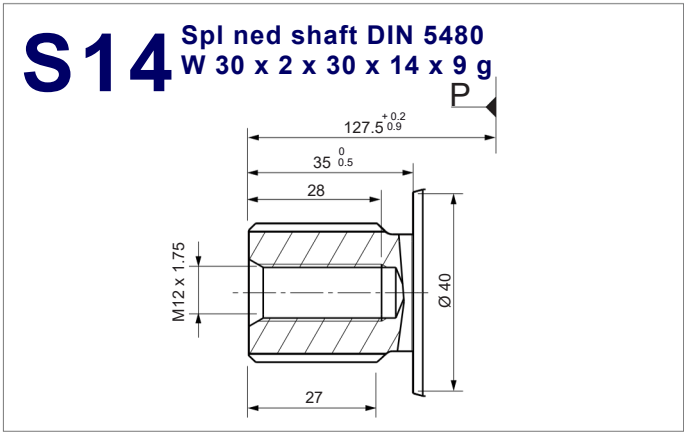
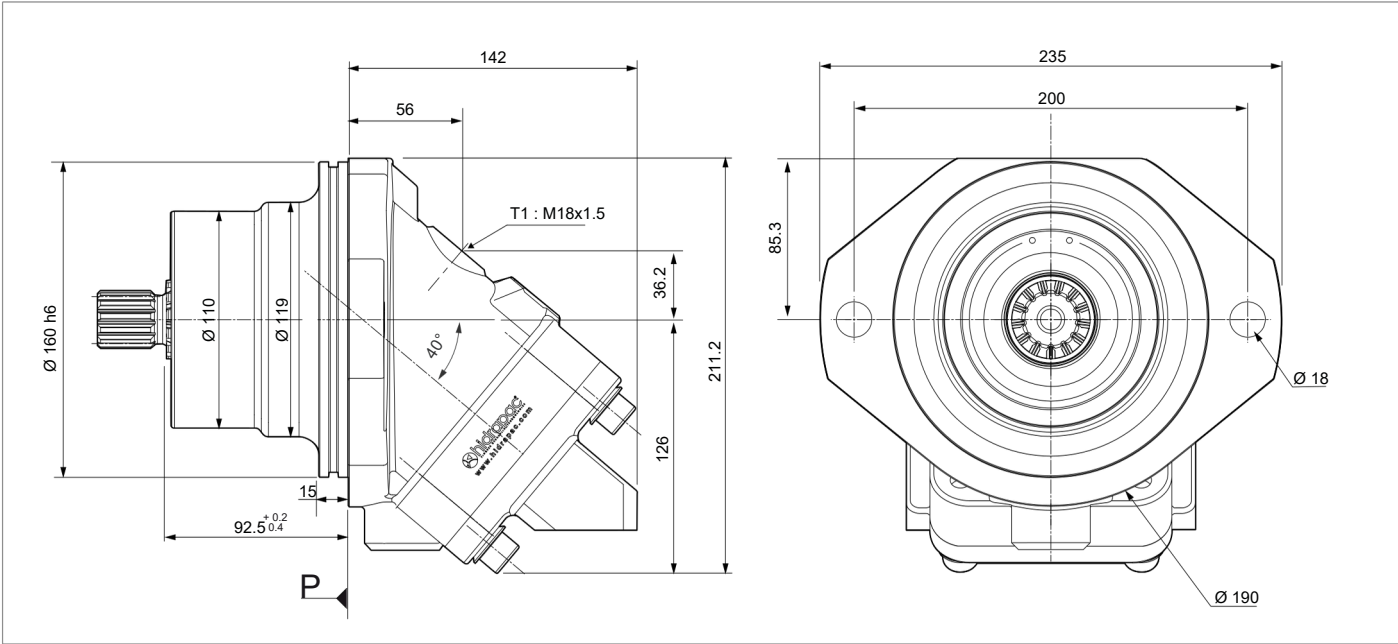
A8PF - 32 cc (Fixed Plug n) - 2 Bolt



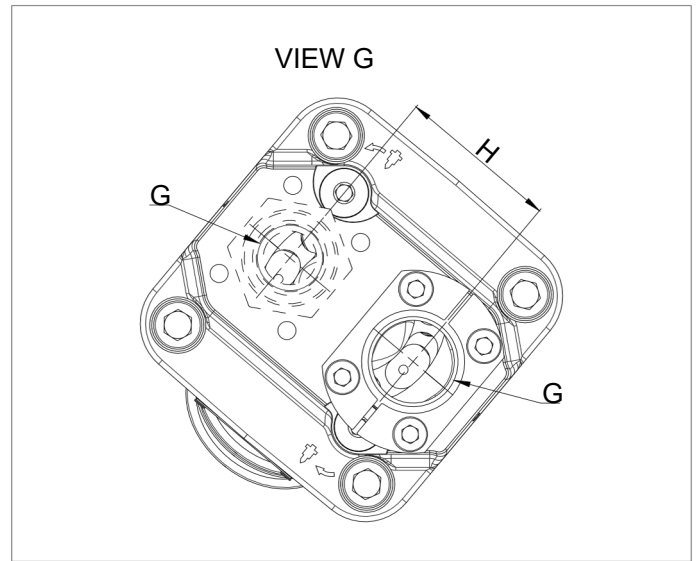
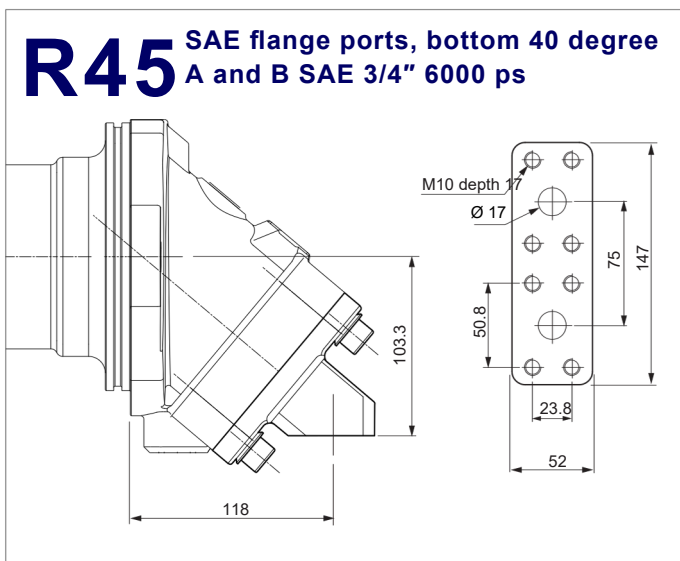
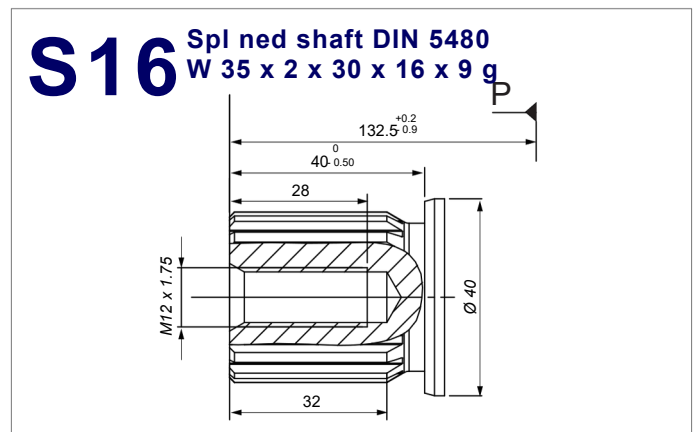
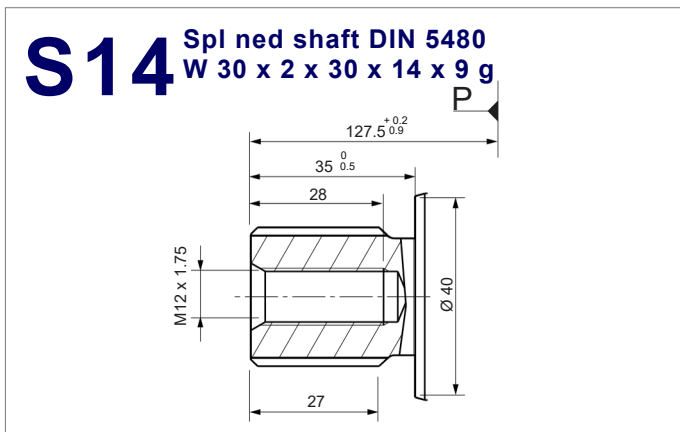
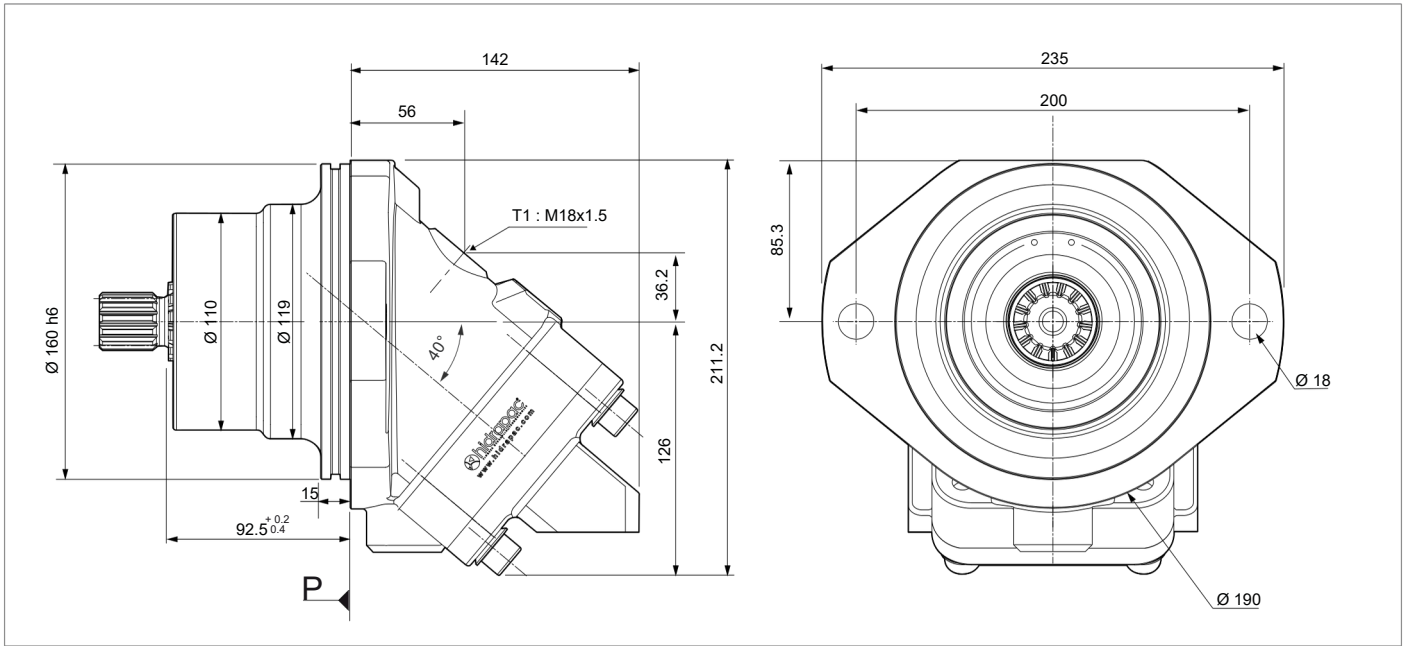
A8PF - 41 cc (F xed Plug n) - 2 Bolt



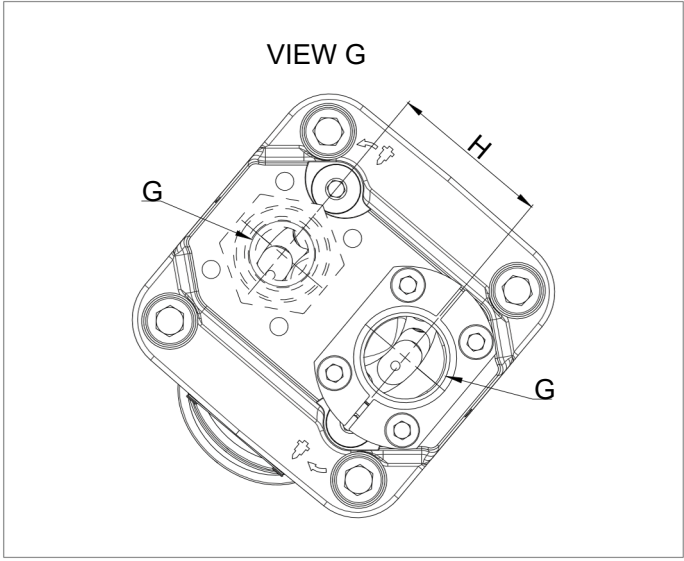
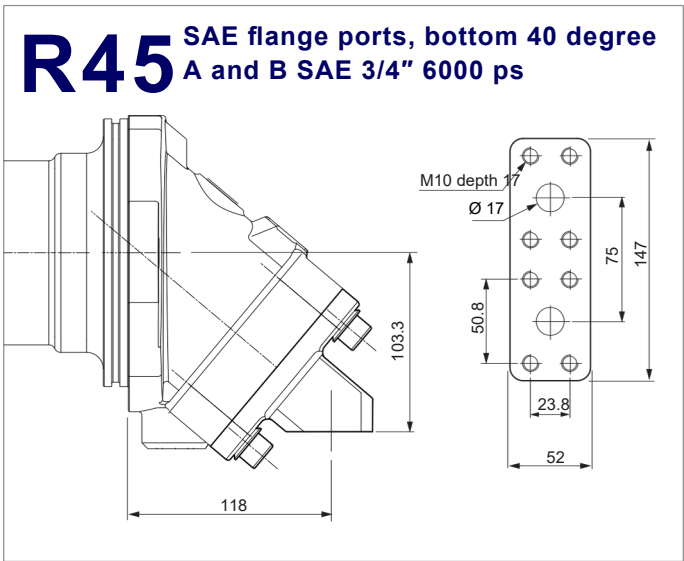
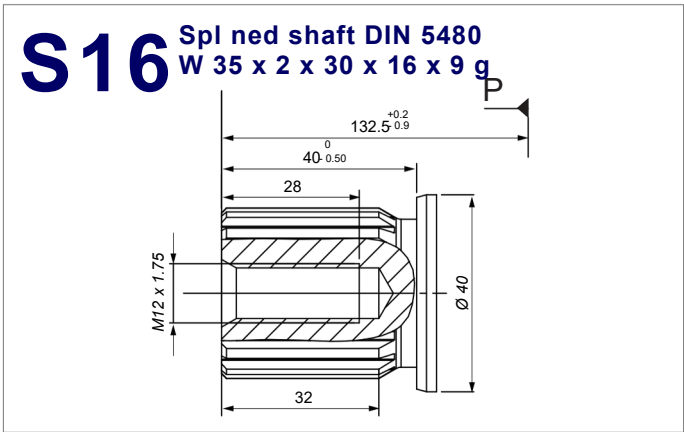
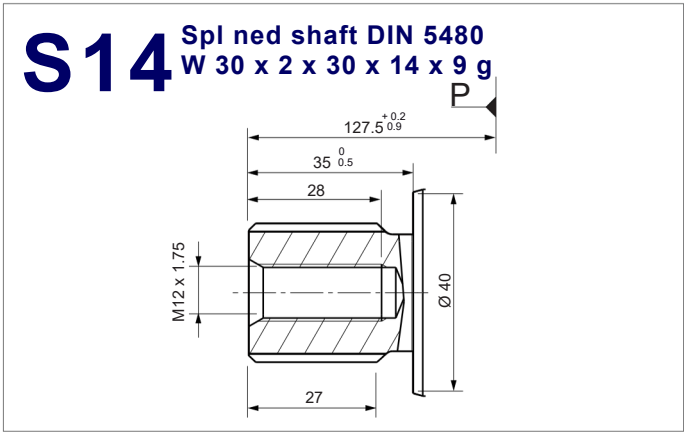
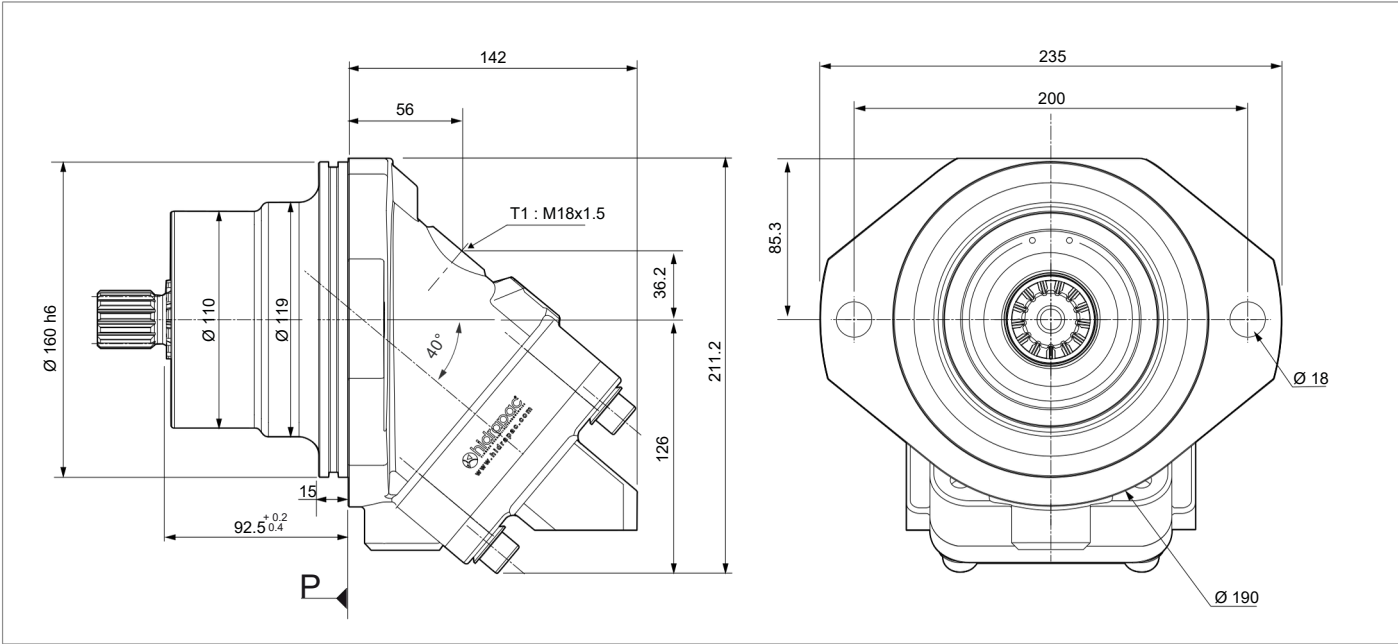
A8PF - 50 cc (Fixed Plug n) - 2 Bolt



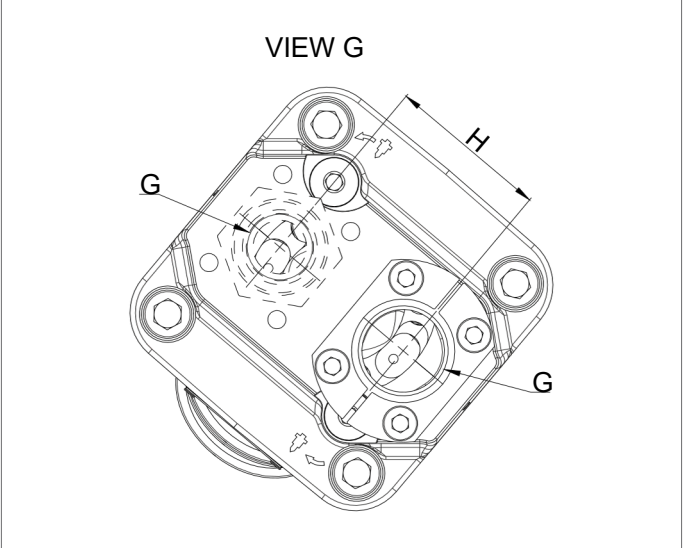
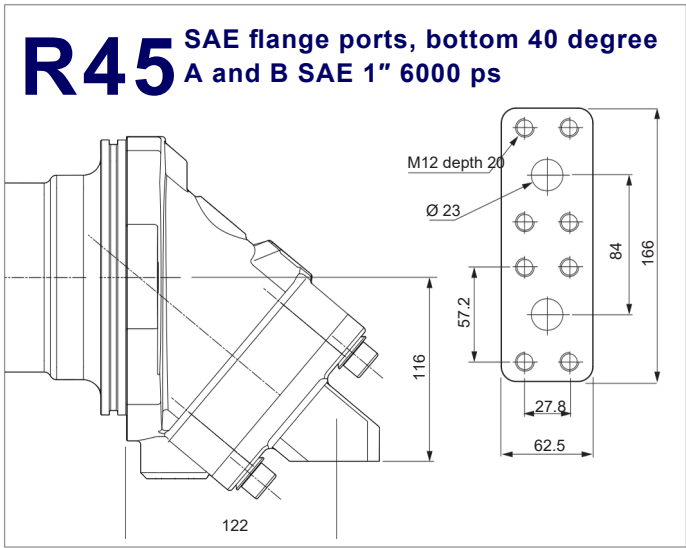
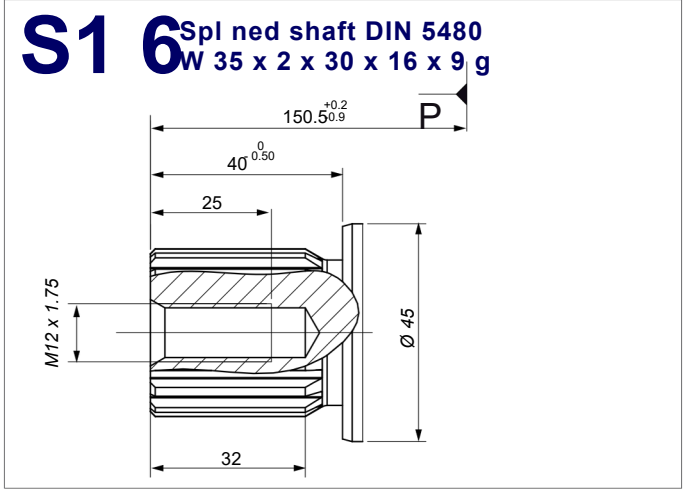
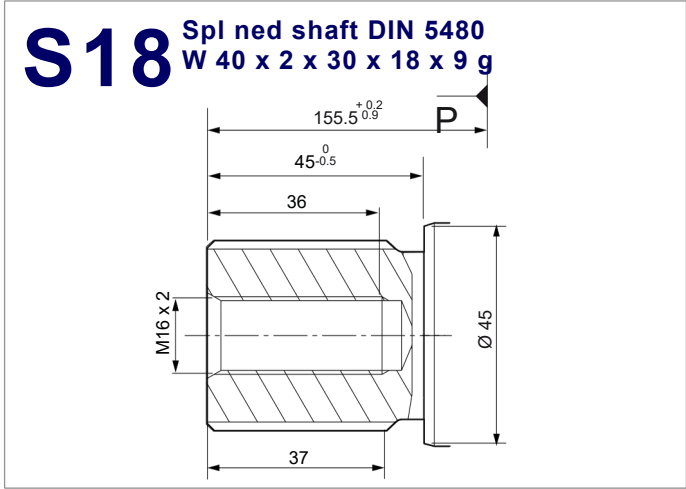
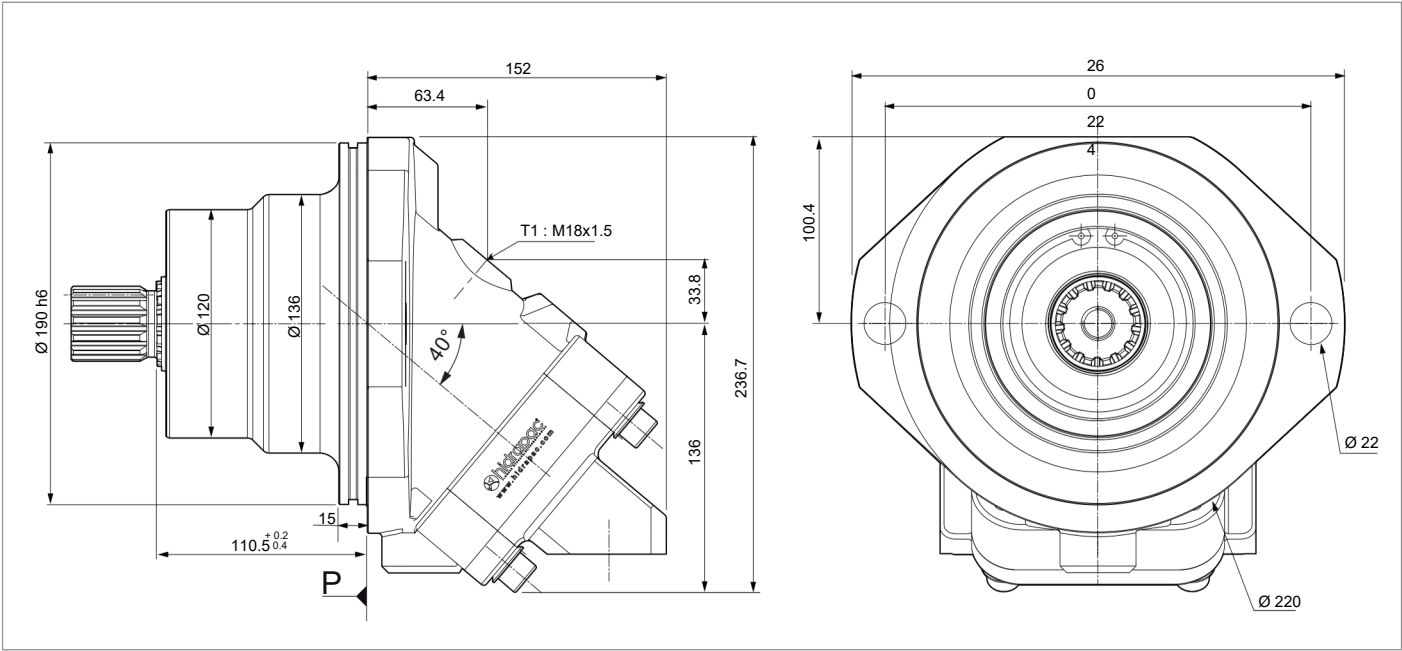
A8PF - 56 cc (Fixed Plug n) - 2 Bolt



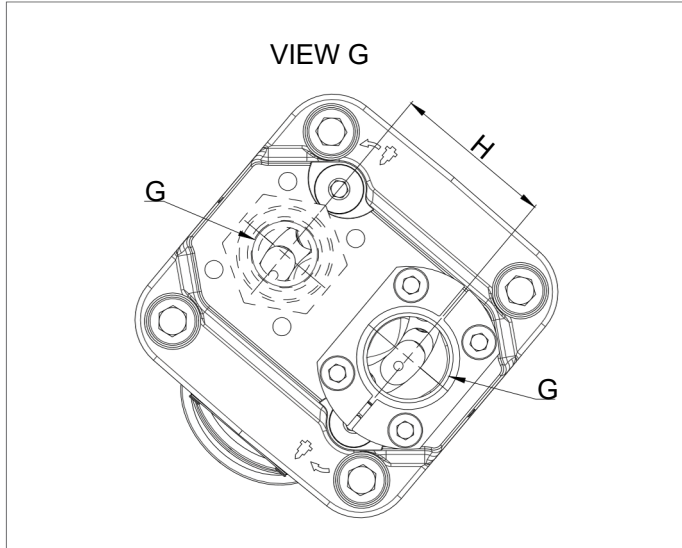
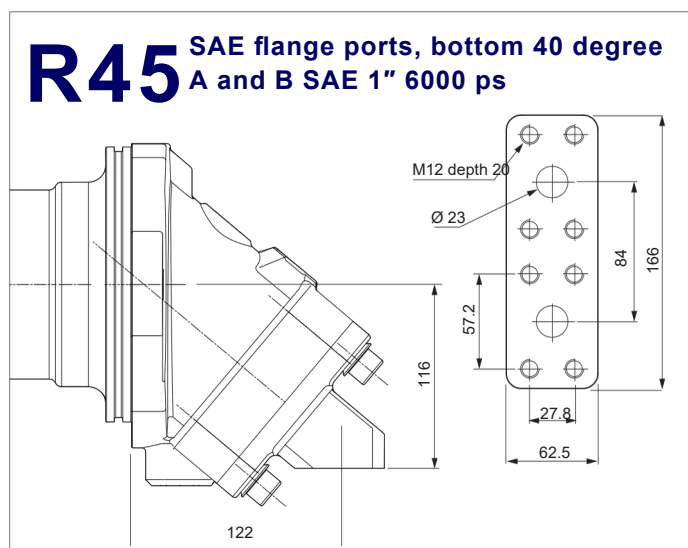
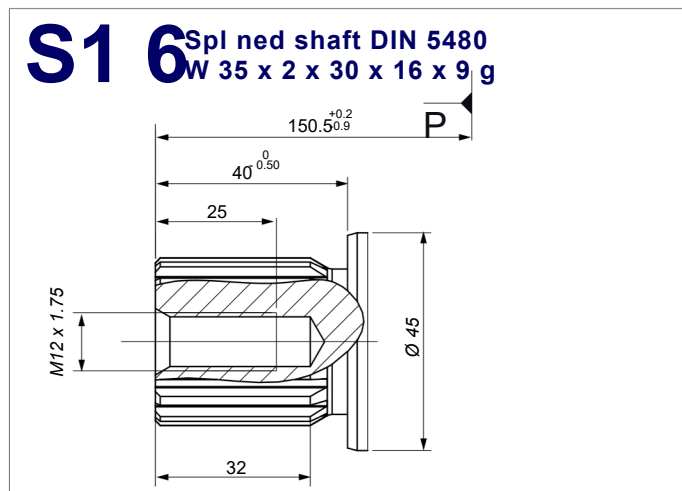
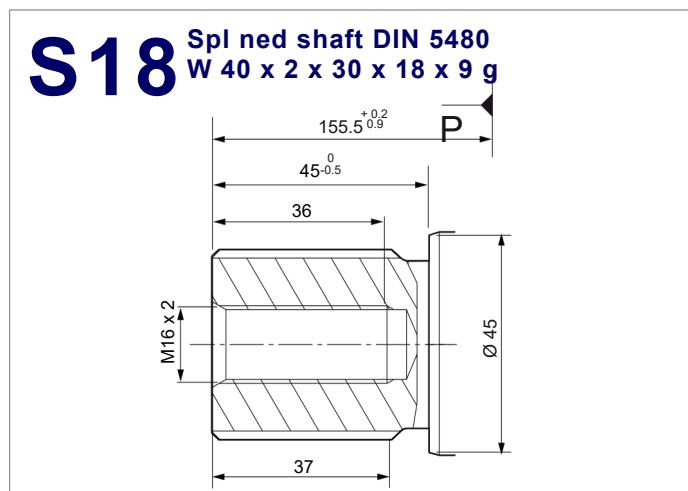
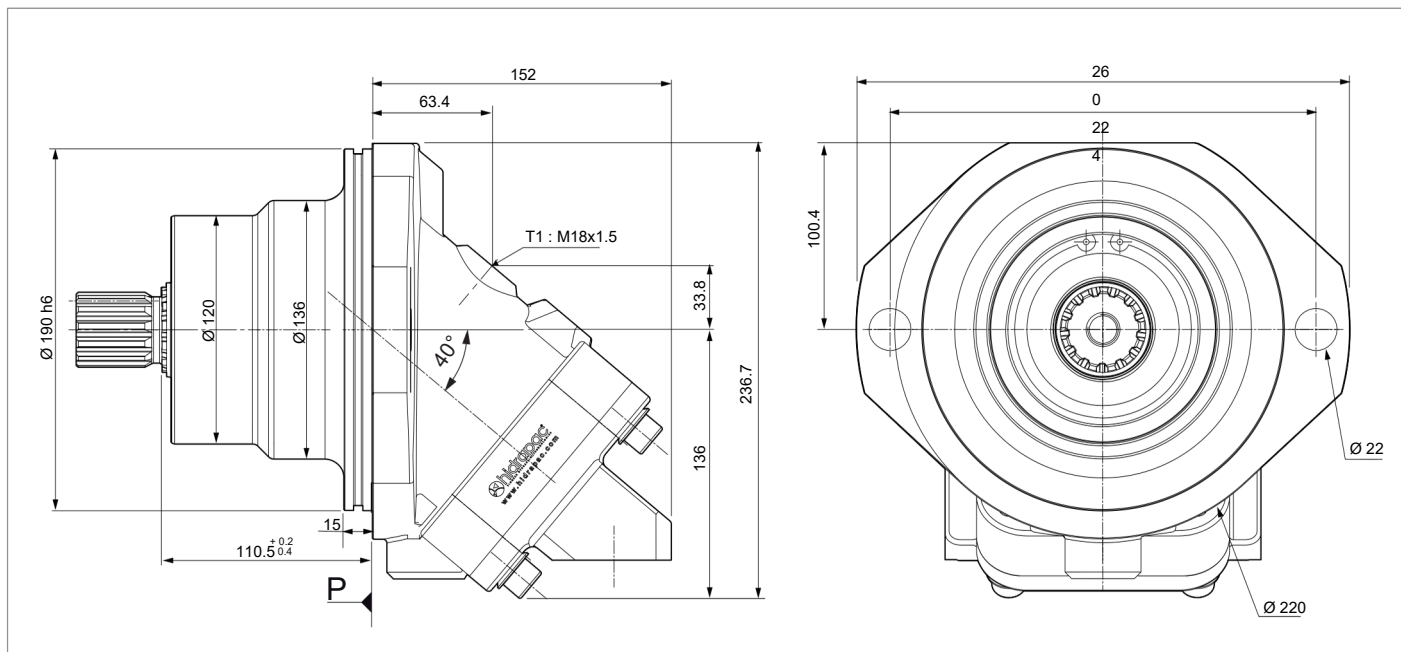
A8PF - 63 cc (Fixed Plug n) - 2 Bolt



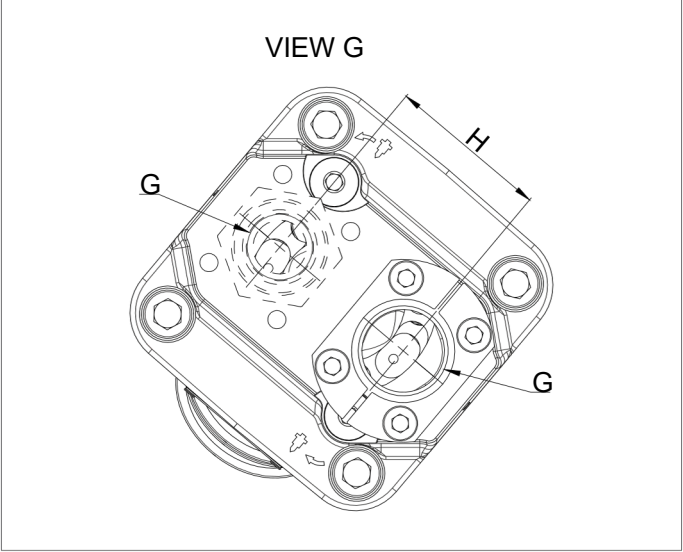
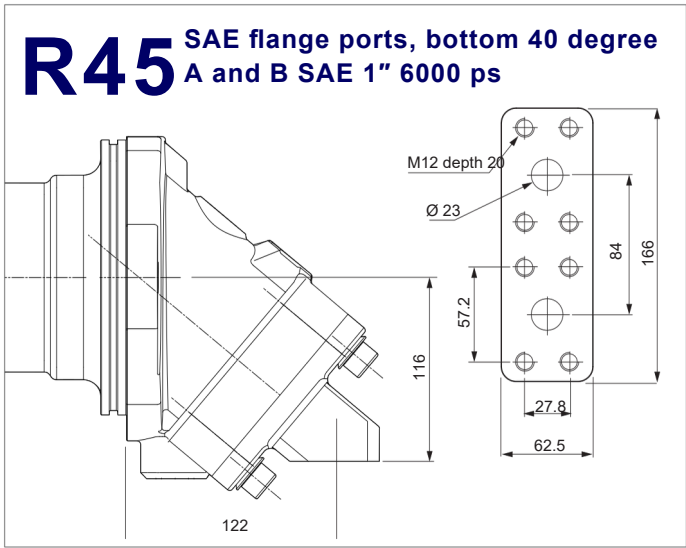
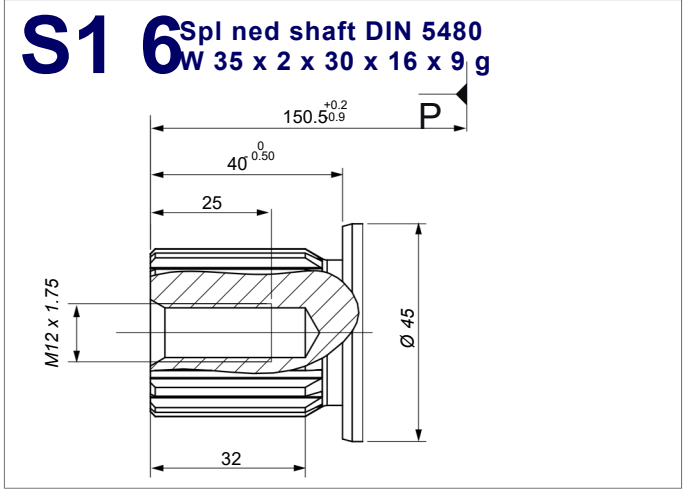
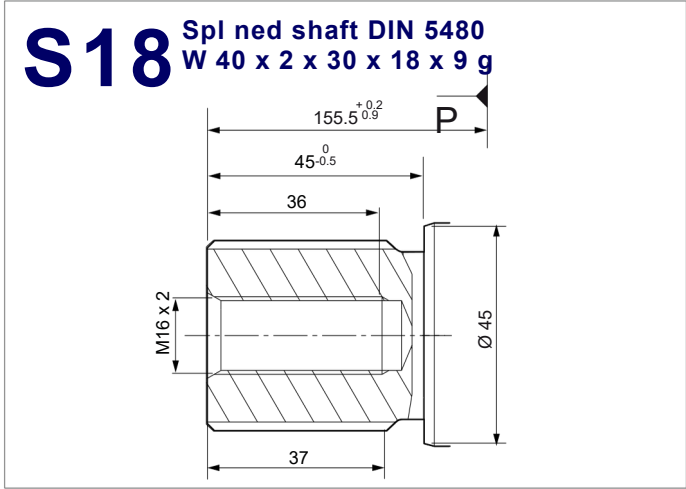
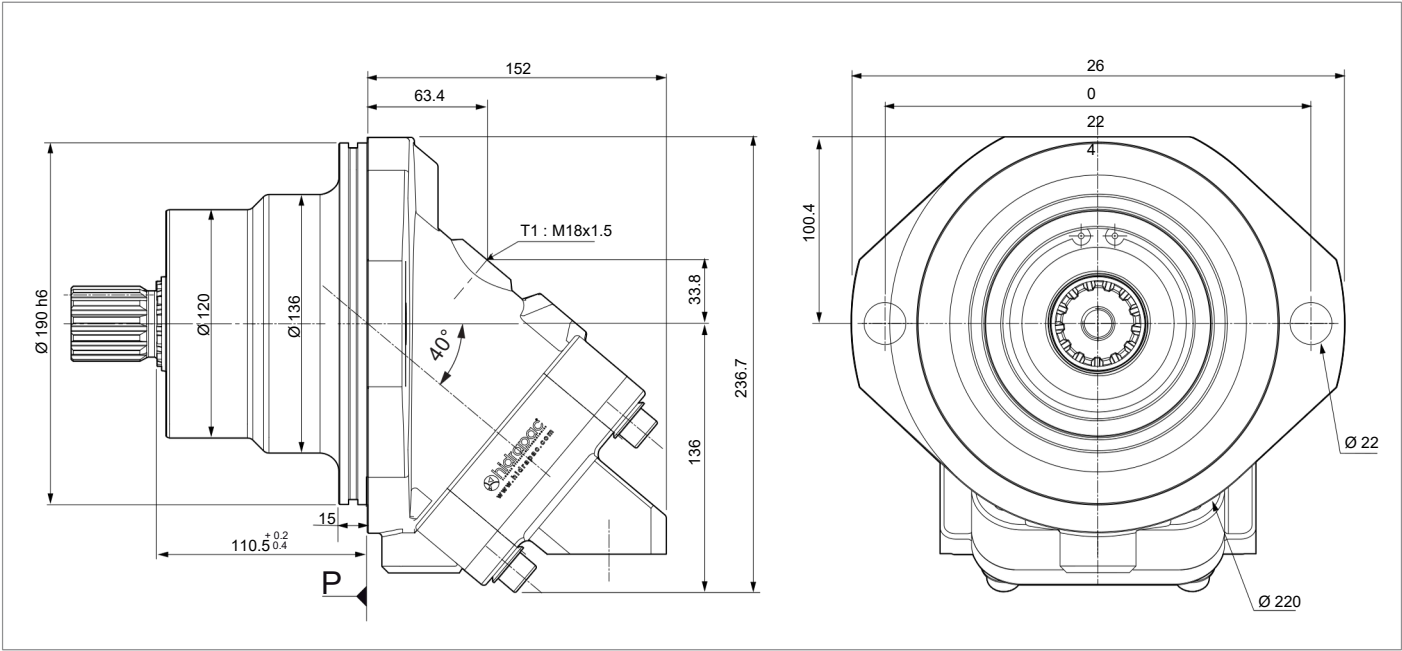
A8PF - 80 cc (Fixed Plug n) - 2 Bolt



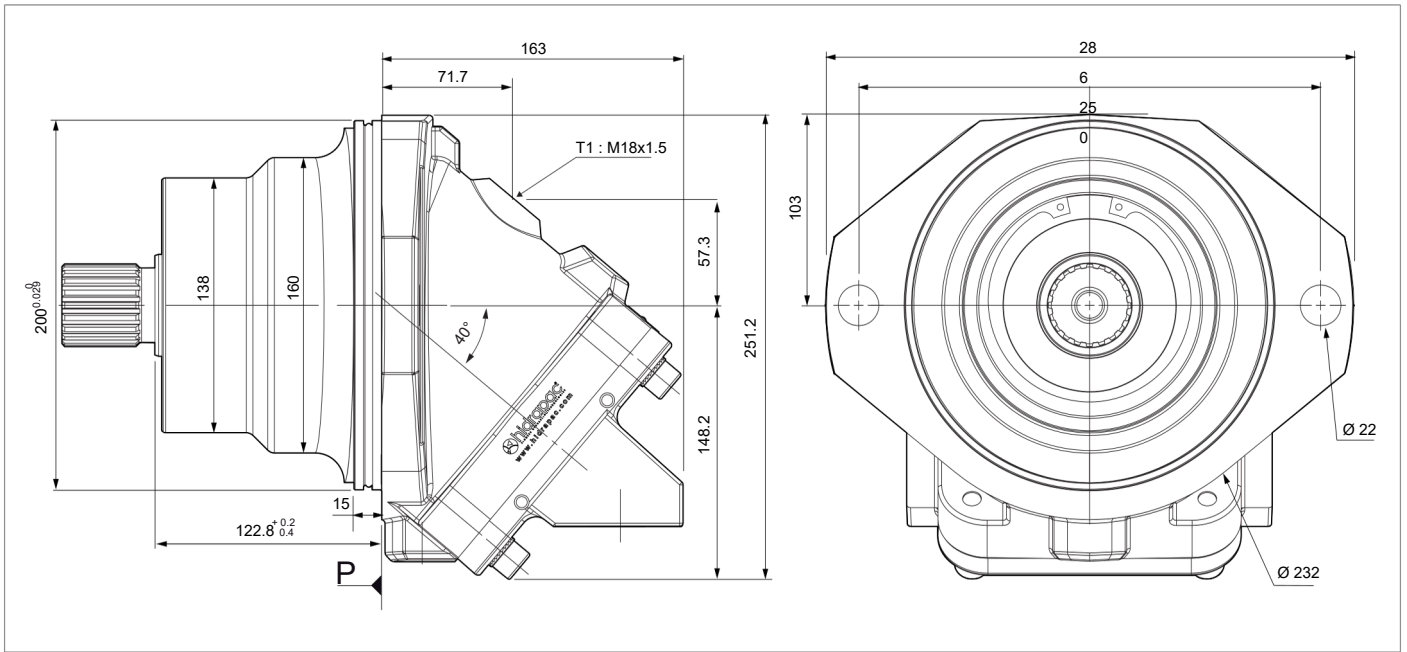
A8PF - 90 cc (F xed Plug n) - 2 Bolt



A8PF - 108 cc (F xed Plug n) - 2 Bolt



A8PF - 125 cc (Fixed Plug n) - 2 Bolt



S21 Spl ned shaft DIN 5480
W 45 x 2 x 30 x 21 x 9 g

P

$$172.8^{+0.2}_{-0.9}$$
$$50^{-0.5}$$

36

M16 x 2

Ø 55

40

R45 SAE flange ports, bottom 40 degree
A and B SAE 1" 1/4 6000 ps

M14 depth 20

Ø 30

99 198

119.7

66.7

31.8

69.2

129

S18 Spl ned shaft DIN 5480
W 40 x 2 x 30 x 18 x 9 g

P

+0.2
167.8^{0.9}

$$45^{-0.50}$$

25

M12 x 1.75

Ø 55

36

VIEW G

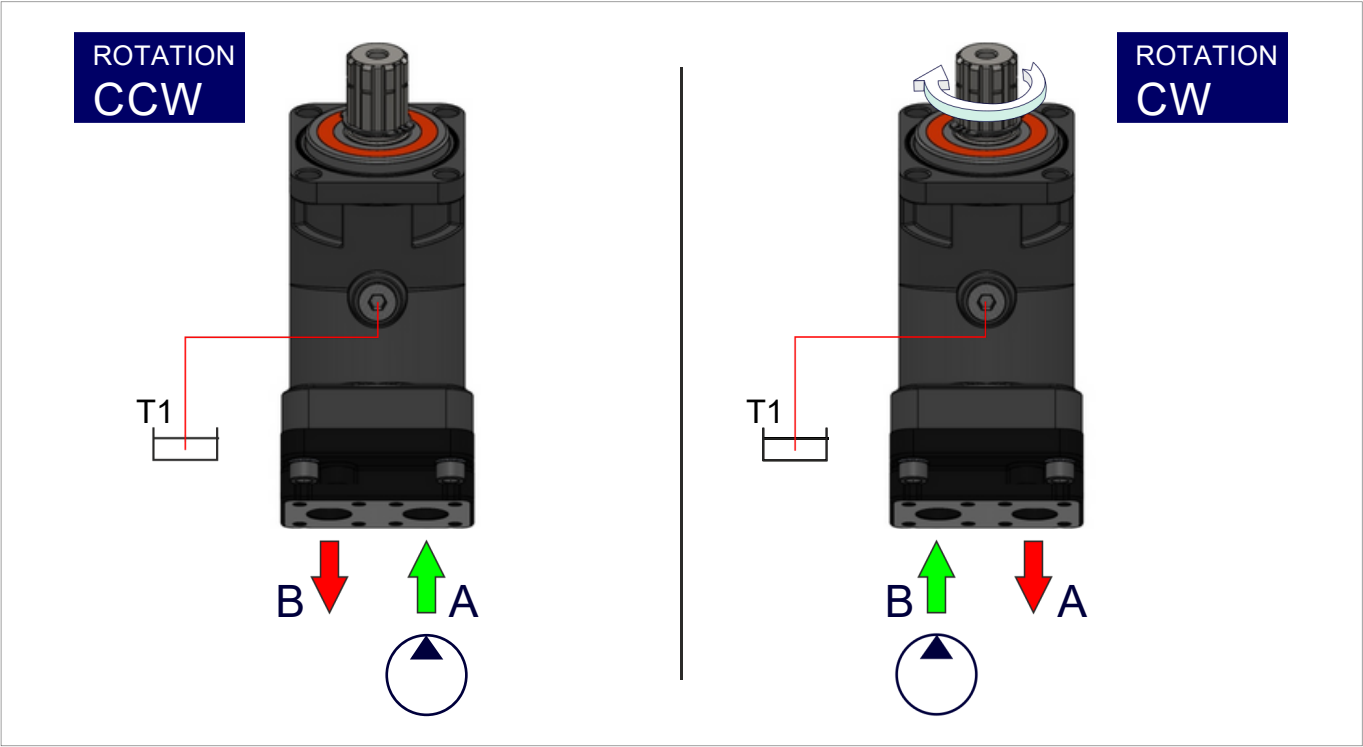
G

4

G

Direction of Rotation; CW/CCW

The Pumps rotate clockwise or counter-clockwise depending on the direction of hydraulic flow entering the Pump.



Formulas			
Pump Output Flow	GPM	$GPM = (Speed\ (rpm) \times d\ sp.\ (cu.\ in.)) / 231$	$GPM = (n \times d) / 231$
Pump Input Horsepower	HP	$HP = GPM \times Pressure\ (ps) / 1714 \times Efficiency$	$HP = (Q \times P) / 1714 \times E$
Pump Efficiency	E	Overall Efficiency = Output HP / Input HP	$E_{overall} = HP_{out} / HP_{in} \times 100$
		Overall Efficiency = Volumetric Eff. $\times$ Mechanical Eff.	$E_{overall} = Eff_{Vol.} \times Eff_{Mech.}$
Pump Volumetric Efficiency	E	Volumetric Efficiency = Actual Flow Rate Output (GPM) / Theoretical Flow Rate Output (GPM) $\times 100$	$Eff_{Vol.} = Q_{act.} / Q_{theo.} \times 100$
Pump Mechanical Efficiency	E	Mechanical Efficiency = Theoretical Torque to Drive / Actual Torque to Drive $\times 100$	$Eff_{Mech} = T_{theo.} / T_{act.} \times 100$
Pump Displacement	CIPR	$Displacement\ (in.^3 / rev.) = Flow\ Rate\ (GPM) \times 231 / Pump\ RPM$	$CIPR = GPM \times 231 / RPM$
Pump Torque	T	Torque = Horsepower $\times 63025 / RPM$	$T = 63025 \times HP / RPM$
		Torque = Pressure (PSIG) $\times Pump\ Displacement\ (CIPR) / 2\pi$	$T = P \times CIPR / 6.28$

- Horsepower for driving a pump

: For every 1 hp of drive, the equivalent of 1 gpm @ 1500 psi can be produced.
- Horsepower for idling a pump

: To idle a pump when it's unloaded will require about 5% of its full rated power
- Wattage for heating hydraulic oil

: Each watt will raise the temperature of 1 gallon of oil by 1° F. per hour.
- Flow velocity in hydraulic lines

: Pump suction lines 2 to 4 feet per second, pressure lines up to 500 psi - 10 to 15 ft./sec., pressure lines 500 to 3000 psi - 15 / 20 ft./sec.; all oil lines in a r-over-o systems; 4 ft./sec.

A8PF (Fixed Plug n)
Bent Axis Pumps A8PF

Installation & Assembly Informations for Bent Axis Pumps

POSITION

Fixed Flange Bent Axis Pumps can be operate any position.

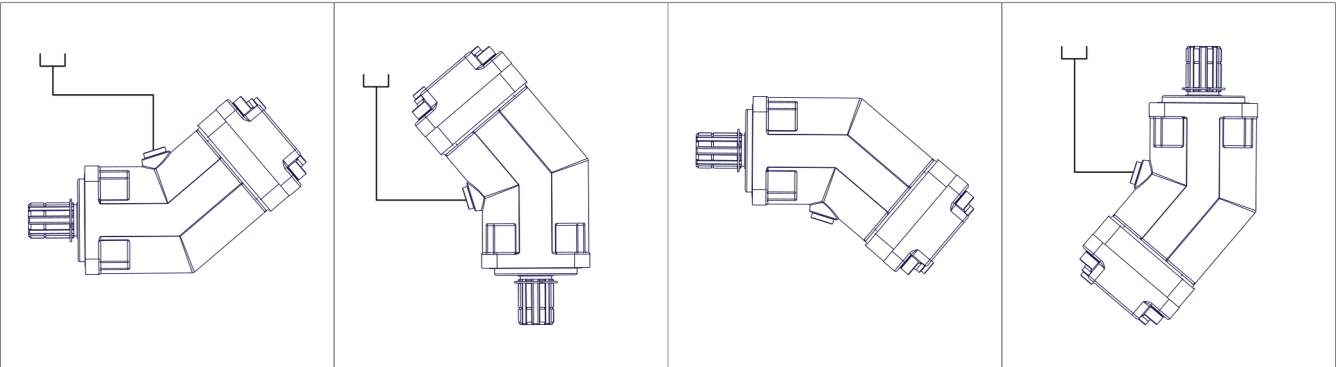
DIRECTION OF ROTATION

Fixed Flange Bent Axis Pumps can be operate in both directions of rotation.

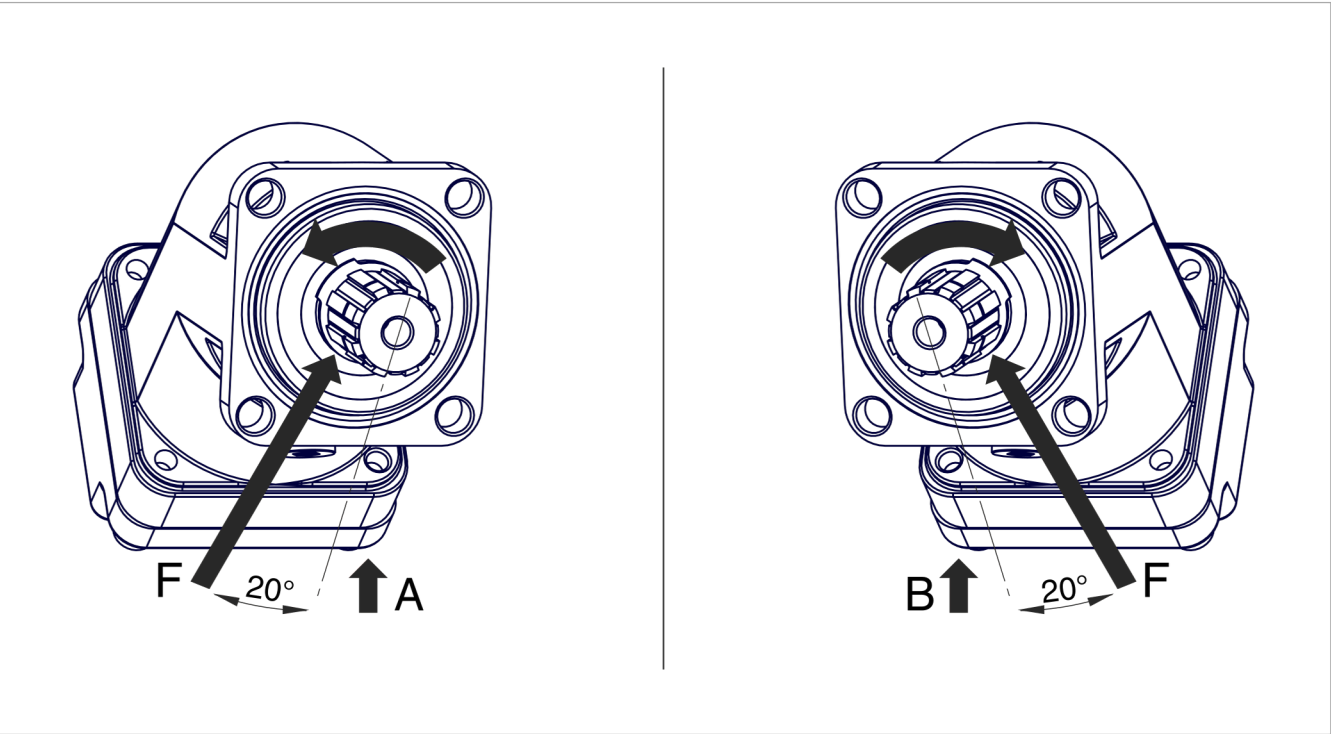
Before of Installation operation, the Pump must be filled with hydraulic fluid and a r bled.

INSTALLATION POSITION

See following examples.



HYDRAULIC FLUID
Recommended ; Generally :
between 15 and 200 cSt.
Maximum : between 5 and 1600 cSt.



FOR USE;
Available a e-mail on request or each Pump is supplied with a Starting datasheet.

Formulas, Calculations, Installation Guide

Quick Calculations

Flow rate

$$Q = \frac{VS \times n}{1000h_v} \text{ (lpm)}$$

Torque

$$M = \frac{V_s \times D_p \times \eta_{mh}}{63} \text{ (Nm)}$$

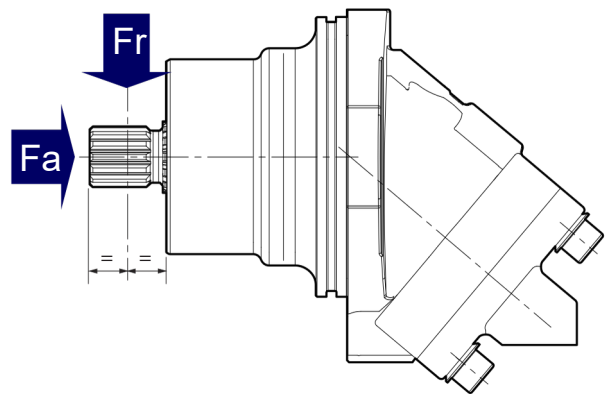
Power

$$P = \frac{2p \times M \times n}{60000} = \frac{M \times n}{9549} = \frac{Q \times D_p \times h_t}{600} \text{ (kw)}$$

Speed

$$n = \frac{1000 \times Q \times h_v}{VS} \text{ (lpm)}$$

V = Displacement (ccm/rev.)
S = Diff. pressure (bar)
lp = Speed (rpm)
n = Flow (lpm)
Q_v = Volumetric efficiency
η_{mh} = Mechanical-hydraulic efficiency
η_t = Total efficiency (η_t = η_v × η_{mh})



Pump model	28 cc	32 cc	41.45	50 cc	56, 63cc	80,90,108	125 cc
Fr (lbf)	1350	1462.5	1462.5	1686	2023	2812	3262
Fr (N/bar)	6000	6500	6500	7500	9000	12500	14500
Fa (lbf)	0.42	0.46	0.62	0.62	0.77	1.24	1.33
Fa (N/bar)	(27)	(30)	(40)	(40)	(50)	(80)	(86)

Other Advantages of Flange Bent Axis Pumps

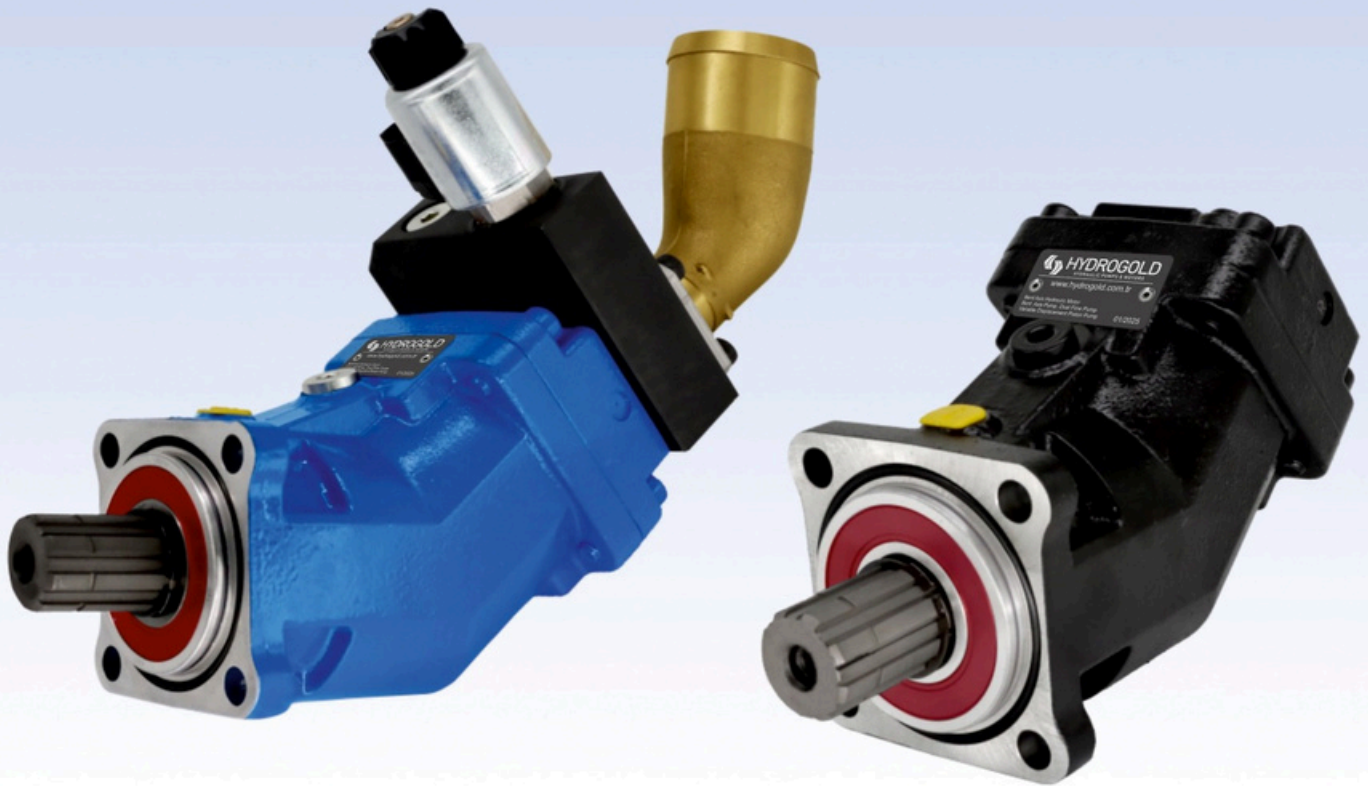
Interchangeable and Compatible with other Bent Axis Pumps,
Special Designed Positions,
One-Piece Position with Position Rings,
For use in stationary and mobile applications,
Compact Pump design and extra durable parts,
High Operational Reliability and High Starting Torque
Extra Warranty with Worldwide Service

A8PD (DIN) Eksenel P stonlu Pompa

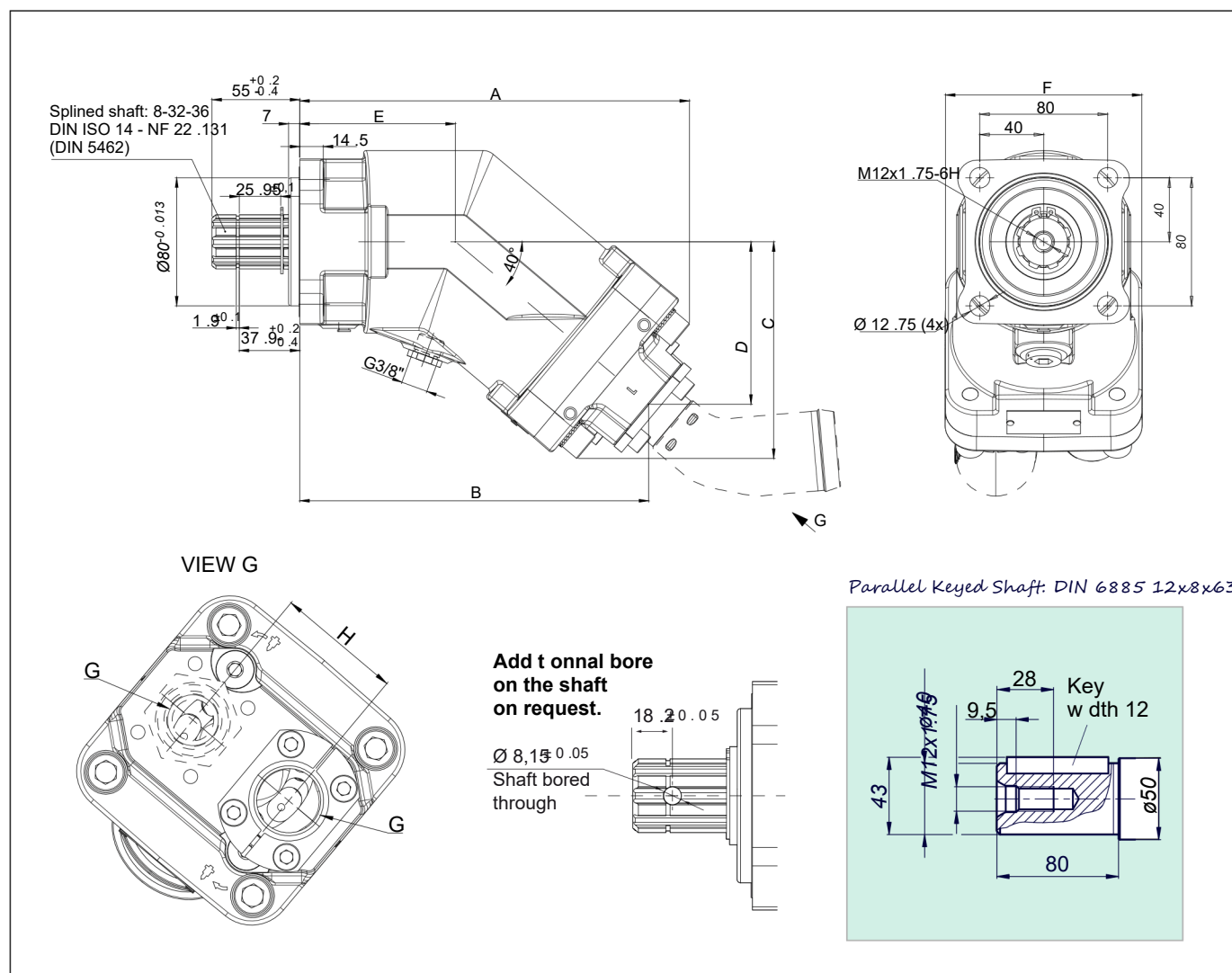
New Design- B-D rect onal Rotat on, H gh Pressure Hydraulic Bent Ax s P ston Pumps,
380/420 BAR Work ng Pressure. H gh Rotat onal Speed, H gh Effic ency,
SI m Design, Cast Iron Pump Body, Re-Des gned n 2025.

Des gnat on;

5cc, 10cc, 12cc, 18cc, 25cc, 32cc, 41cc, 50cc,
56cc, 63cc, 80cc, 108cc, 130cc



A8PD (DIN) Ser es Bent Ax s Pumps



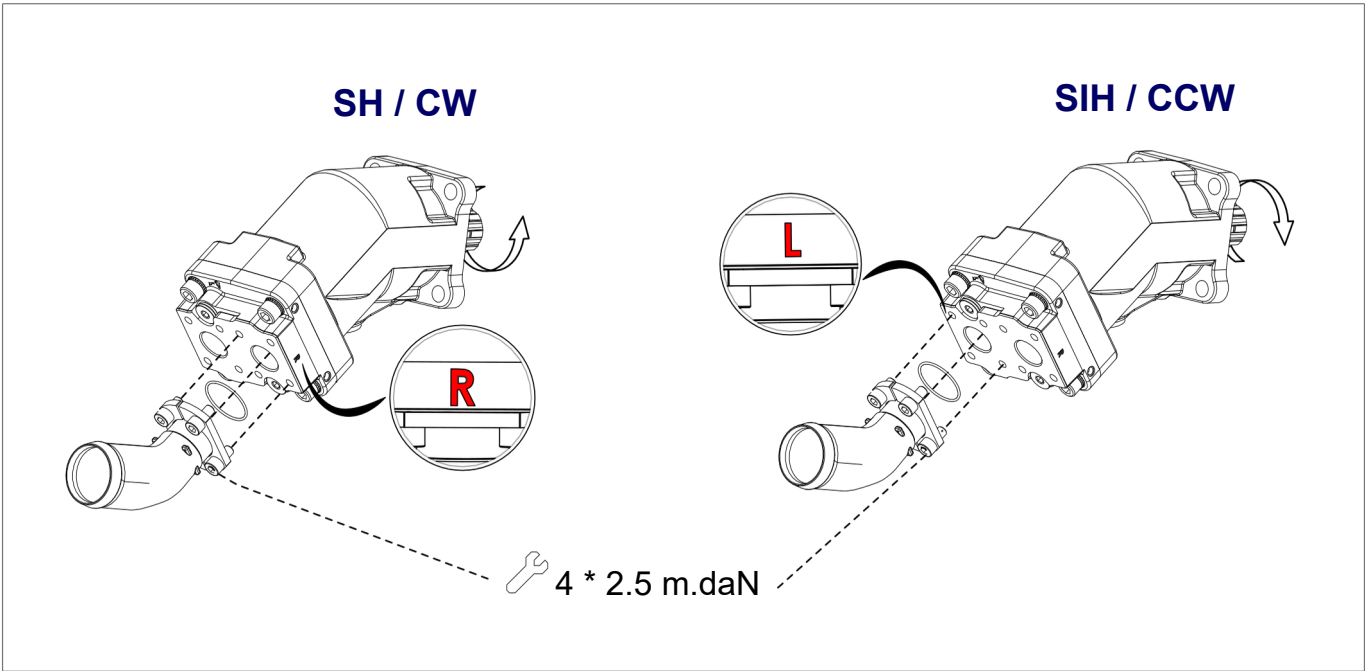
Pump MODEL	DISPL. (cc)	A	B	C	D	E	F	G	H
5 cc	5.1	196.7	177.8	77.1	103.9	85.7	108	G 3/4"	54
10 cc	10.2	196.7	177.8	77.1	103.9	85.7	108	G 3/4"	54
12 cc	12.0	196.7	177.8	77.1	103.9	85.7	108	G 3/4"	54
18 cc	18.0	196.7	177.8	77.1	103.9	85.7	108	G 3/4"	54
25 cc	25.0	196.7	177.8	77.1	103.9	85.7	108	G 3/4"	54
32 cc	32.0	202.8	184.0	82.3	109.1	85.7	108	G 3/4"	54
41 cc	41.0	202.8	184.0	82.3	109.1	85.7	108	G 3/4"	54
50 cc	50,3	214.4	195.5	92.0	118.9	85.7	108	G 3/4"	54
56 cc	56,0	214.4	195.5	92.0	118.9	85.7	108	G 3/4"	54
63 cc	63.0	214.4	195.5	92.0	118.9	85.7	108	G 3/4"	54
80 cc	80,4	241.7	220.9	103.5	133.3	97.4	123	G 1"	60
108 cc	108	241.7	222.5	104.8	133.3	97.4	123	G 1"	60
130 cc	130	244.0	224.8	106.7	135.2	97.4	123	G 1"	60

Characteristics of the A8PD - DIN Flange Bent Axis Pumps

Pump MODEL	DISPL. (cc)	MAX. PEAK/ CONTINUOUS PRESSURE (bar)	MAXIMUM SPEED (rpm)	MAX.TORQUE ABSORBED AT 380 BAR (N.m)	WEIGHT WITHOUT INLET FITTING (kg)	WEIGHT WITH INLET FITTING (kg)	TORQUE WITHOUT FITTING (N.m)	TORQUE WITH FITTING (N.m)
5 cc	5.1	420 / 380	3300	60	9.00	9.40	8.20	8.60
10 cc	10.2	420 / 380	3200	68	9.00	9.40	8.65	9.05
12 cc	12.0	420 / 380	3150	76	9.20	9.60	8.74	9.14
18 cc	18.0	420 / 380	2900	114	9.30	9.70	8.79	9.19
25 cc	25.0	420 / 380	2750	159	11.00	11.40	8.89	9.29
32 cc	32.0	420 / 380	2700	204	11.10	11.50	11.10	11.50
41 cc	41.0	420 / 380	2550	261	11.20	11.60	11.15	11.55
50 cc	50,3	420 / 380	2450	318	11.30	11.70	11.75	12.15
56 cc	56,0	420 / 380	2400	375	11.35	11.75	11.80	12.20
63 cc	63.0	420 / 380	2300	401	11.45	11.85	11.85	12.25
80 cc	80,4	420 / 380	2150	509	14.80	15.20	17.80	18.30
108 cc	108	420 / 380	1900	687	14.90	15.30	17.92	18.42
130 cc	130	420 / 380	1750	827	15.30	15.70	18.70	19.50

Direction of Rotation; Bore Direction

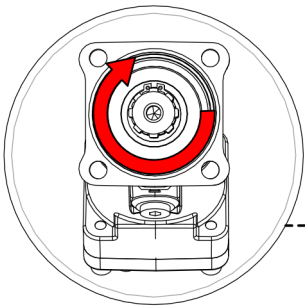
The Pumps rotate clockwise or counter-clockwise depending on the direction of hydraulic flow entering the Pump.



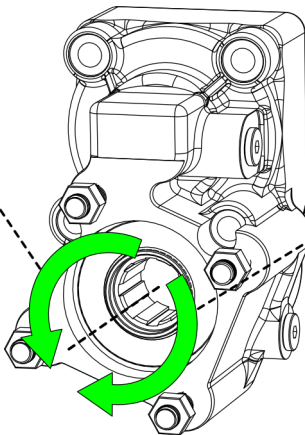
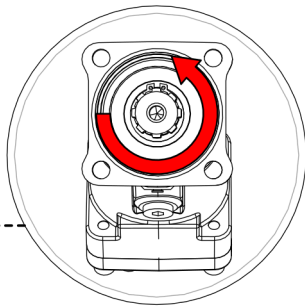
Ordering Code; A8PD - DIN Flange Bent Axis Pumps

Model Code	D splacement	Shaft Type	Flange Type	Rotat on	Seal ng
A8PD	108	S	H4	BD	V
A8PD Bent Ax s Hydraul c Pump DIN Flange	5	S Spl ned Shaft (default) 8x32x36 DIN ISO 14NF	H4 ISO 7653 Ø80 4 Bolt Flange	BD D rect on of Rotat on B -D rect onal	V V ton H gh Pressure Seal
	10				N N tr le Seal 5/10 Bar
	12				
	18				
	25				
	32	K Parallel Keyed Shaft (spec al) DIN 6885			
	41				
	50				
	56				
	63				
	80				
	108				
	130				

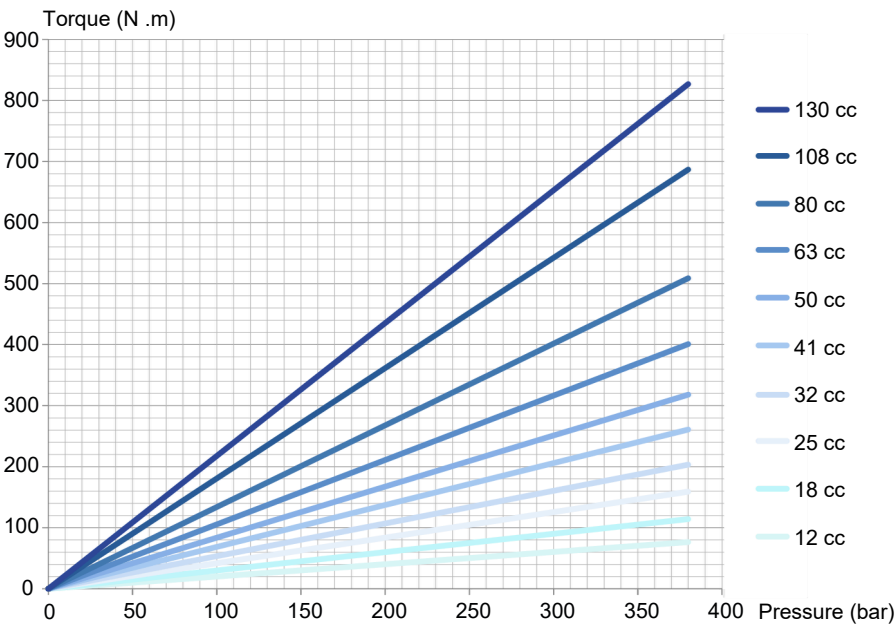
SH / CW



SIH / CCW



Performance, Torque, Speed and Pressure Charts

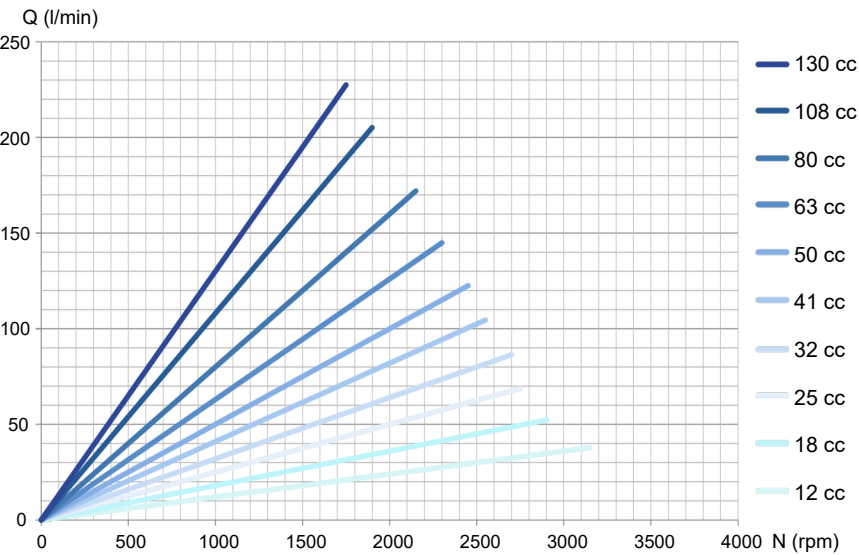


$$C = \frac{\Delta P \times Cyl \times P}{62.8 \times \eta_{meca}}$$

With:

- C = Torque in N.m.
- Cyl = Displacement in cc/rev
- ΔP = Differential pressure in bar
- η_{meca} = Mechanical efficiency

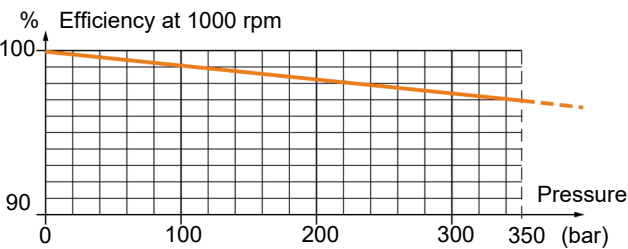
► Flow as a function of rotating speed



$$Q = \frac{N \times Cyl \times \eta_{vol}}{1000}$$

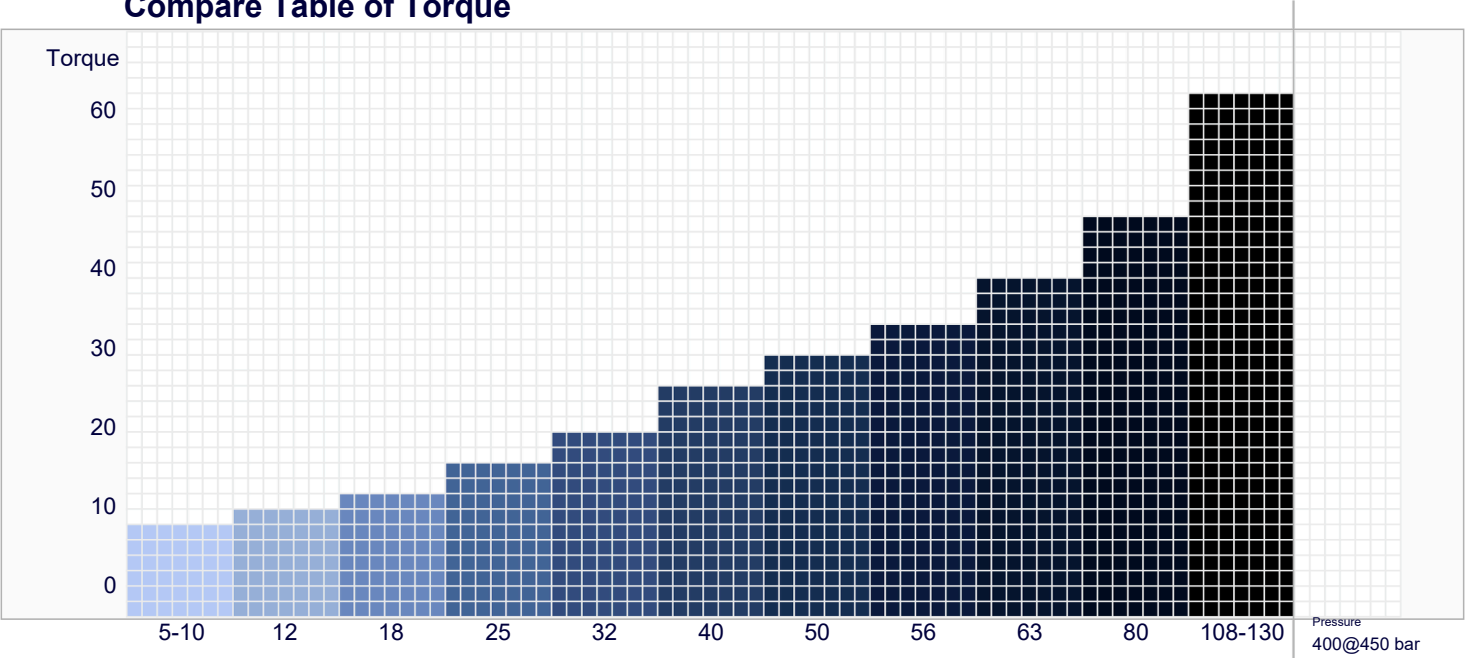
With:

- Q = Flow in l/min
- N = Speed in rpm
- η_{vol} = Volumetric efficiency
- Cyl = Displacement in cc/rev

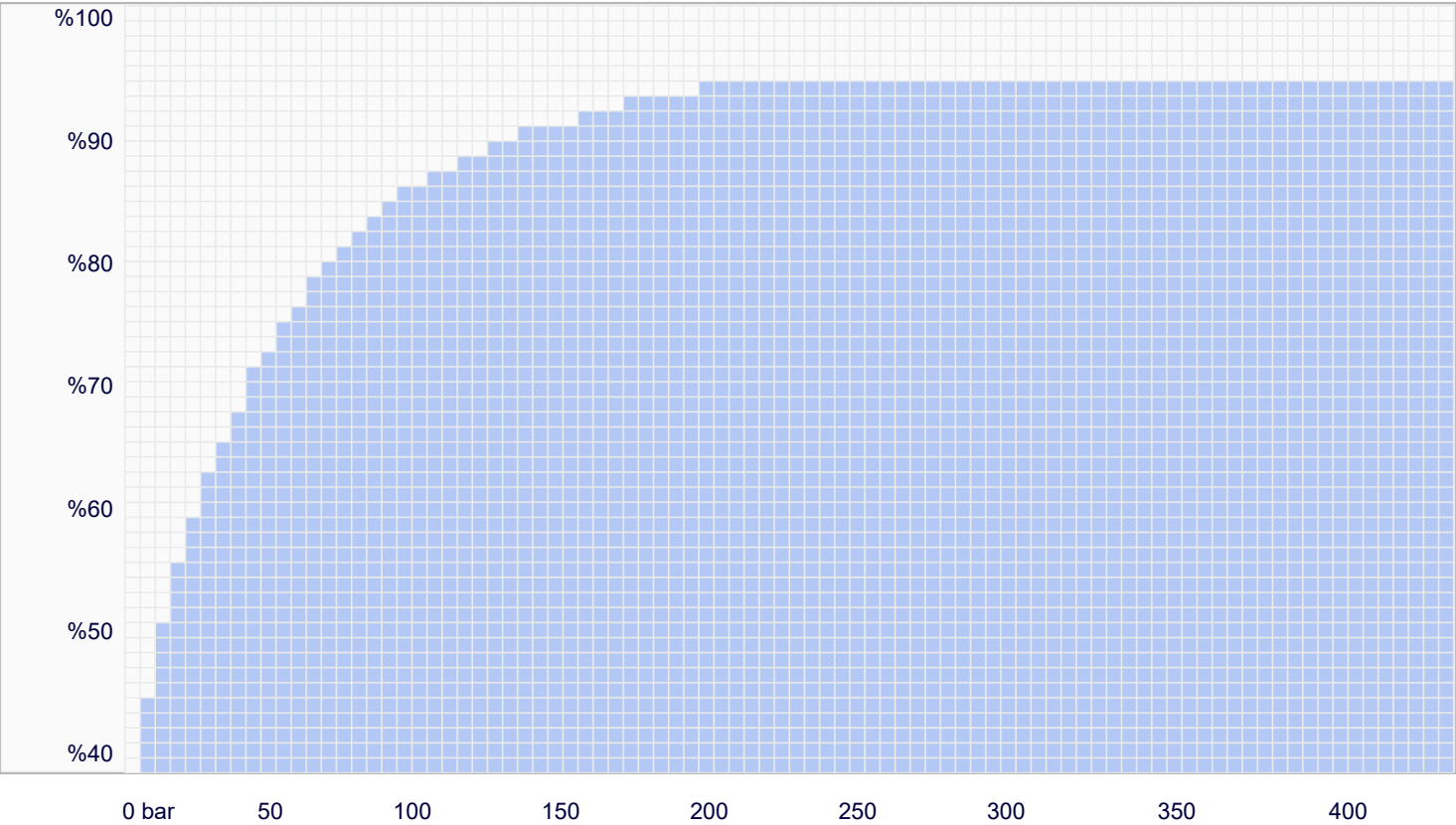


Performance, Torque, Speed and Pressure Charts

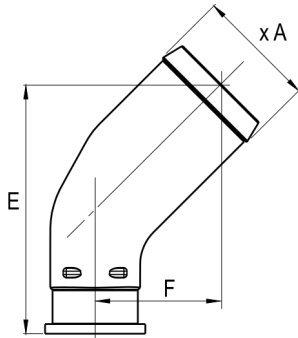
Compare Table of Torque



Efficiency of Bent Axis Pumps (1000 rpm)

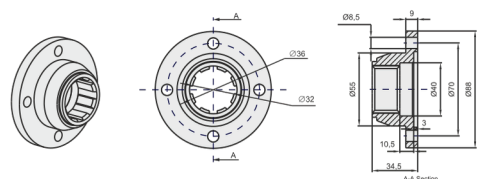
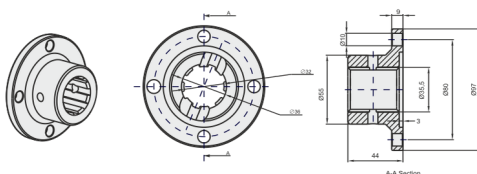
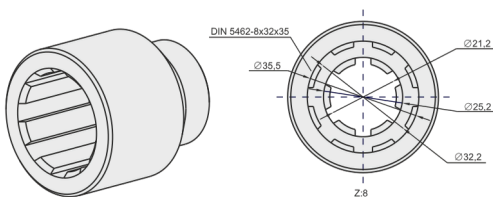
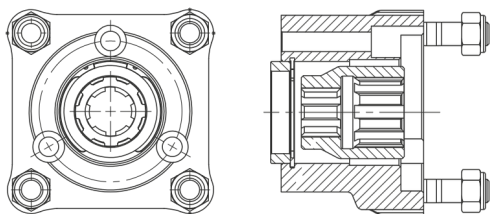


45° elbow fittings kit



Reference	Ø hose	Ø A	E	F
450039	1 1/2"	39.1	91.7	46.7
450043	42	43	91.7	46.7
450046	1 3/4"	46	91.7	46.7
450051	2"	51.8	108.4	54.4
450064	2 1/2"	64.5	125.2	62.2

Reference	Ø hose	Ø A	E	F
900039	1 1/2"	39.1	58.6	79.5
900051	2"	51.8	64.9	80.2
900064	2 1/2"	64.5	71.3	87.5



- Spl t Flange
- Seal
- Screw



-12 V
-24 V



- PTO P ston Pump Adapter
- PTO Gear Pump Adapter
- Long / Short Adapter

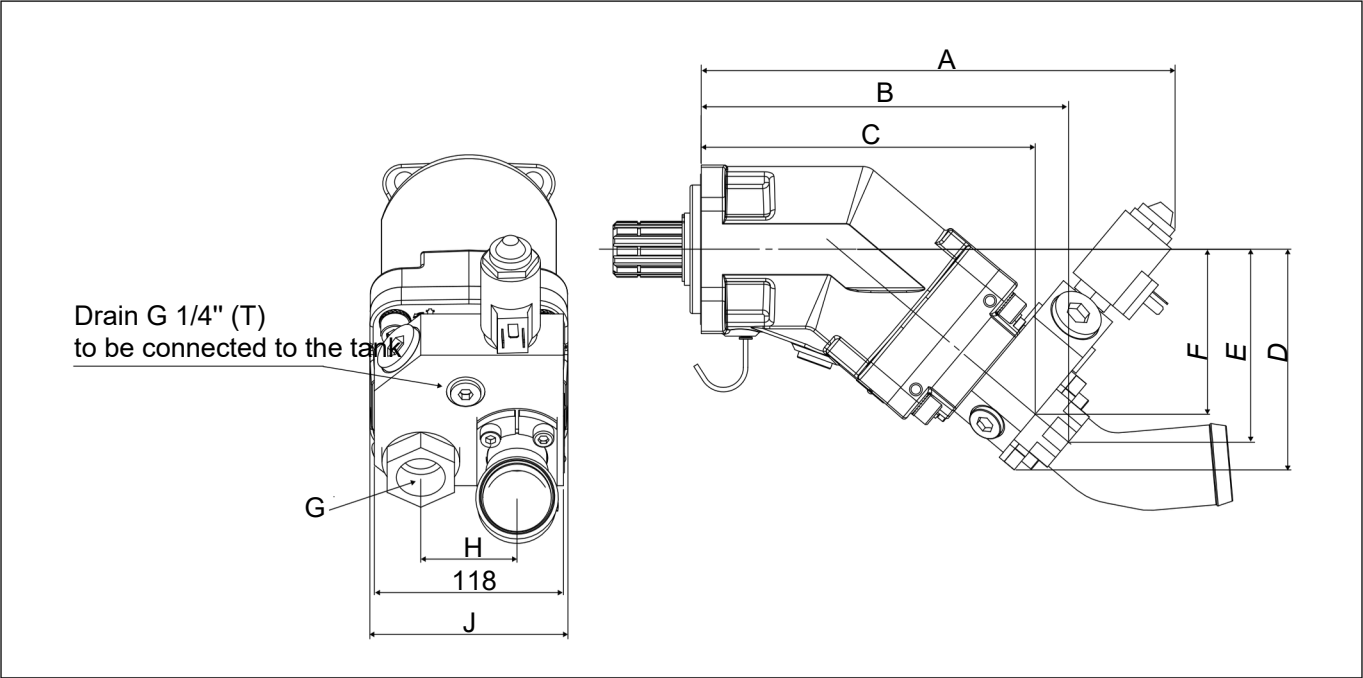


- 1120 (6 Spl ne)
- 1120 (8 Spl ne)
- 1300 (6 Spl ne)
- 1300 (8 Spl ne)



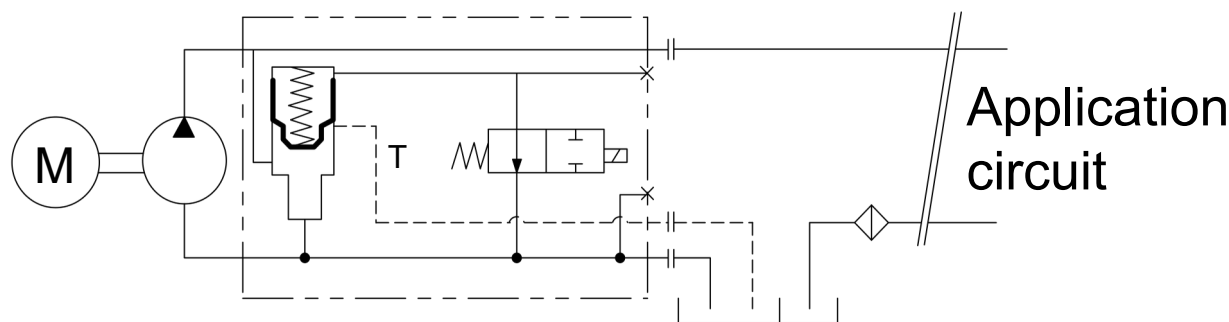
- 6 x 8 Couplar
- 6 x 8 Couplar (Long)
- 8 x 8 Couplar
- 8 x 8 Couplar (Long)

ByPass Valve for A8PD (DIN) Bent Axis Pumps



Pump MODEL	DISPL. (cc)	A	B	C	D	E	F	G	H	J
5 cc	5.1	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
10 cc	10.2	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
12 cc	12.0	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
18 cc	18.0	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
25 cc	25.0	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
32 cc	32.0	295.50	229.00	208.30	137.30	120.10	102.70	G 3/4"	54	108
41 cc	41.0	295.50	229.00	208.30	137.30	120.10	102.70	G 3/4"	54	108
50 cc	50,3	307.10	240.40	220.00	147.10	129.70	112.50	G 3/4"	54	108
56 cc	56,0	307.10	240.40	220.00	147.10	129.70	112.50	G 3/4"	54	108
63 cc	63.0	307.10	240.40	220.00	147.10	129.70	112.50	G 3/4"	54	108
80 cc	80,4	334.00	269.00	246.70	157.80	143.90	124.80	G 1"	60	123
108 cc	108	334.00	269.00	246.70	157.80	143.90	124.80	G 1"	60	123
130 cc	130	336.30	271.3	249.00	159.70	145.80	126.70	G 1"	60	123

ByPass Valve for A8PD (DIN) Bent Axis Pumps



Pump MODEL	DISPL. (cc)	WEIGHT WITHOUT INLET FITTING (kg)	WEIGHT WITH INLET FITTING (kg)	TORQUE WITHOUT FITTING (N.m)	TORQUE WITH FITTING (N.m)
5 cc	5.1	9.00	9.40	8.20	8.60
10 cc	10.2	9.00	9.40	8.65	9.05
12 cc	12.0	9.20	9.60	8.74	9.14
18 cc	18.0	9.30	9.70	8.79	9.19
25 cc	25.0	11.00	11.40	8.89	9.29
32 cc	32.0	11.10	11.50	11.10	11.50
41 cc	41.0	11.20	11.60	11.15	11.55
50 cc	50,3	11.30	11.70	11.75	12.15
56 cc	56,0	11.35	11.75	11.80	12.20
63 cc	63.0	11.45	11.85	11.85	12.25
80 cc	80,4	14.80	15.20	17.80	18.30
108 cc	108	14.90	15.30	17.92	18.42
130 cc	130	15.30	15.70	18.70	19.50

A8PD (DIN) Series Bent Axis Pumps

40° bent axis design giving high power, small overall dimensions, optimum efficiency and economic design. Flange and shaft designed for direct mounting on truck gearbox PTO's. The fixed displacement bent axis pumps generates a hydraulic fluid flow. It is designed for use in trucks, commercial vehicles and all stationary hydraulic applications. The Pump a fixed pump with rotary group in bent-axis design open circuits. Flow is proportional to drive speed and displacement.

For axial piston units with bent-axis design, the Pistons are arranged diagonally with respect to the drive shaft. The pump covers the whole displacement range 5 to 130 cm³/rev. The pump has been developed with modern styling and design to satisfy market demand as to designed new generation plate and pistons with very high flow performance, high pressures with high efficiency and very small dimensions.

The pump is available both to DIN and SAE world standards and can be mounted either directly at the gearbox or via a drive shaft. If necessary it can also be augmented with a by-pass valve. Other brand bent axis pumps compatible and interchangeable with DIN bent axis pumps. Refer to the data sheet and order confirmation for the technical data, operating conditions and operating limits of the bent axis piston pumps.

Formulas			
Pump Output Flow	GPM	$GPM = (Speed (rpm) \times d.s.p. (cu. in.)) / 231$	$GPM = (n \times d) / 231$
Pump Input Horsepower	HP	$HP = GPM \times Pressure (ps) / 1714 \times Efficiency$	$HP = (Q \times P) / 1714 \times E$
Pump Efficiency	E	Overall Efficiency = Output HP / Input HP	$E_{overall} = HP_{out} / HP_{in} \times 100$
		Overall Efficiency = Volumetric Eff. $\times$ Mechanical Eff.	$E_{overall} = EffVol. \times EffMech.$
Pump Volumetric Efficiency	E	Volumetric Efficiency = Actual Flow Rate Output (GPM) / Theoretical Flow Rate Output (GPM) $\times 100$	$EffVol. = Q_{act.} / Q_{theo.} \times 100$
Pump Mechanical Efficiency	E	Mechanical Efficiency = Theoretical Torque to Drive / Actual Torque to Drive $\times 100$	$EffMech = T_{theo.} / T_{act.} \times 100$
Pump Displacement	CIPR	$Displmnt (in. 3/ rev.) = Flow Rate (GPM) \times 231 / Pump RPM$	$CIPR = GPM \times 231 / RPM$
Pump Torque	T	Torque = Horsepower $\times 63025 / RPM$	$T = 63025 \times HP / RPM$
		Torque = Pressure (PSIG) $\times$ Pump Displacement (CIPR) / 2π	$T = P \times CIPR / 6.28$

- Horsepower for driving a pump** : For every 1 hp of drive, the equivalent of 1 gpm @ 1500 psi can be produced.
- Horsepower for idling a pump** : To idle a pump when it is unloaded will require about 5% of its full rated power
- Wattage for heating hydraulic oil** : Each watt will raise the temperature of 1 gallon of oil by 1° F. per hour.
- Flow velocity in hydraulic lines** : Pump suction lines 2 to 4 feet per second, pressure lines up to 500 psi - 10 to 15 ft./sec., pressure lines 500 to 3000 psi - 15 to 20 ft./sec.; all oil lines in a re-over-oil systems; 4 ft./sec.

A8PO (ISO) Bent Ax s Pumps

ISO Mount ng Flange H gh Pressure Bent Ax s Pump

H gh Pressure Hydraul c Bent Ax s P ston Pumps, H gh Pressure, 350/400 BAR Work ng Pressure. H gh Rotat onal Speed, H gh Effic ency, SI m Des gn, Cast Iron Pump Body, Re-Des gned n 2025.

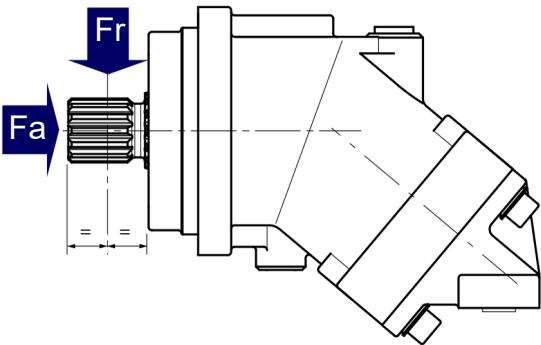
Des gnation;

5cc, 10cc, 12cc, 18cc, 25cc, 32cc, 41cc, 50cc,
56cc, 63cc, 80cc, 108cc, 125cc, 160cc, 180cc



Characteristics of the A8PO - ISO Flange Bent Axis Pumps

Pump MODEL	DISPL. (cc)	CONTINUOUS MAX. SPEED (rpm)	INTERMITTENT MAX. SPEED (rpm)	MAX. FLOW ABSORBED (l/min)	TORQUE BAR (m.N/bar)	TORQUE AT 350 BAR (m.N)	THEORETICAL MAX. POWER AT 400 BAR (HP / kW)	MAX. ALLOW PRESSURE CONTN./PEAK (bar)	WEIGHT (kg)
5 cc	5.1	8800	9600	45	0.09	46	64.1 / 48.2	400 / 450	5.2
10 cc	10.2	8600	9400	88	0.14	58	72.9 / 54.4	400 / 450	5.5
12 cc	12.0	8000	8800	96	0.19	67	85.5 / 64.4	400 / 450	5.5
18 cc	18.0	8000	8800	144	0.28	99	128.5 / 95.9	400 / 450	5.5
25 cc	25.0	6300	6900	158	0.40	139	140.0 / 104.4	400 / 450	11.4
32 cc	32.0	6300	6900	202	0.50	178	180.5 / 134.4	400 / 450	11.5
41 cc	41.0	5600	6200	230	0.65	228	205.2 / 153.1	400 / 450	11.6
45 cc	45.0	5600	6200	252	0.72	253	202.4 / 151.8	400 / 450	17.9
50 cc	50,3	5000	5500	252	0.80	280	224.1 / 167.5	400 / 450	18.1
56 cc	56,0	5000	5500	280	0.90	320	244.5 / 187.1	400 / 450	18.1
63 cc	63.0	5000	5500	315	1.00	351	281.6 / 209.1	400 / 450	18.2
80 cc	80,4	4500	5000	362	1.27	447	323.6 / 241.5	400 / 450	23.1
90 cc	90,1	4500	5000	405	1.43	500	361.5 / 269.9	400 / 450	23.2
108 cc	108	4000	4400	435	1.70	598	328.8 / 245.6	400 / 450	35.2
125 cc	125	3400	4400	428	2.00	698	382.6 / 284.6	400 / 450	38.8
160 cc	160	3400	4000	486	2.55	890	514.6 / 383.9	400 / 450	48.6
180 cc	180	3400	4000	612	2.86	1004	581.2 / 433.6	400 / 450	52.6

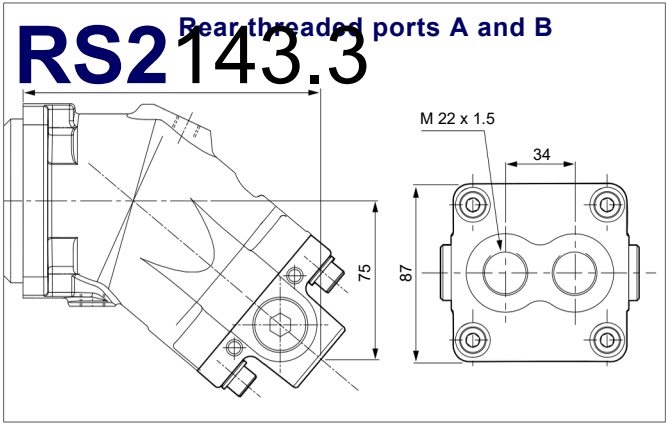
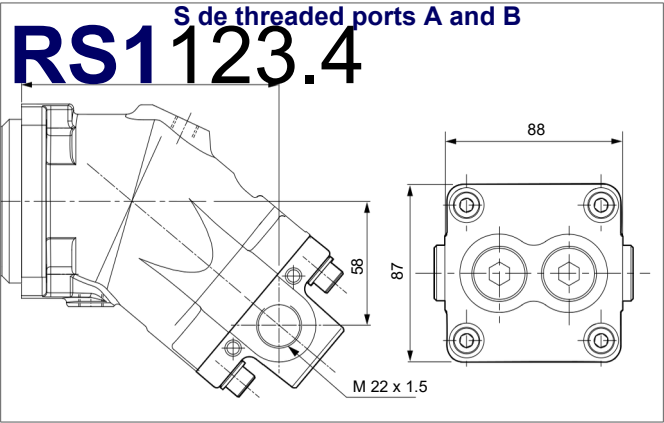
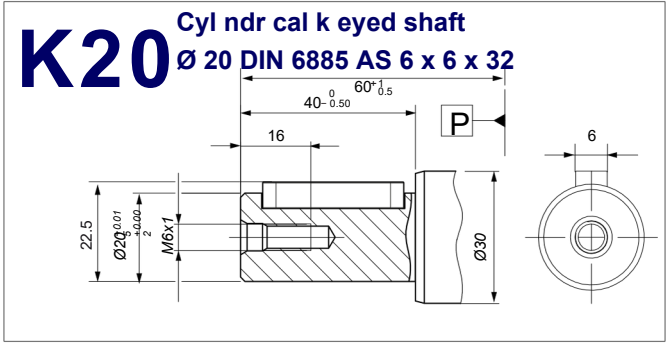
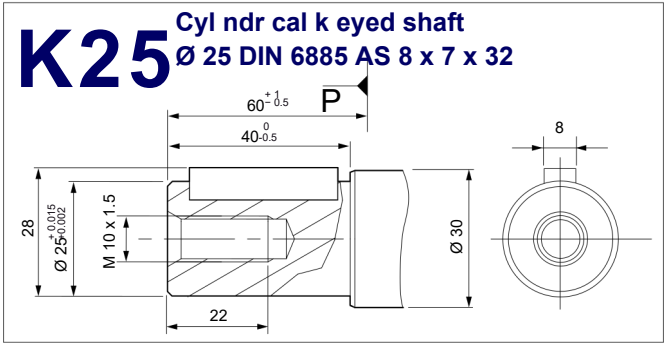
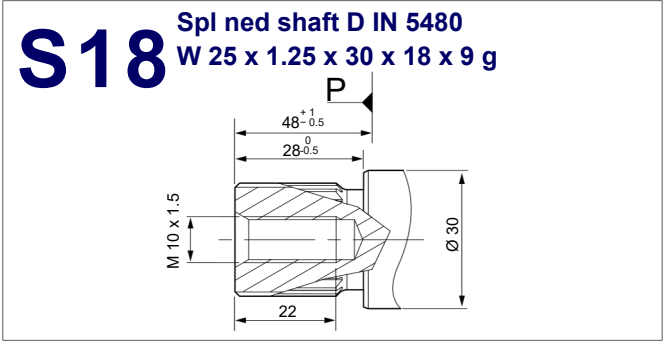
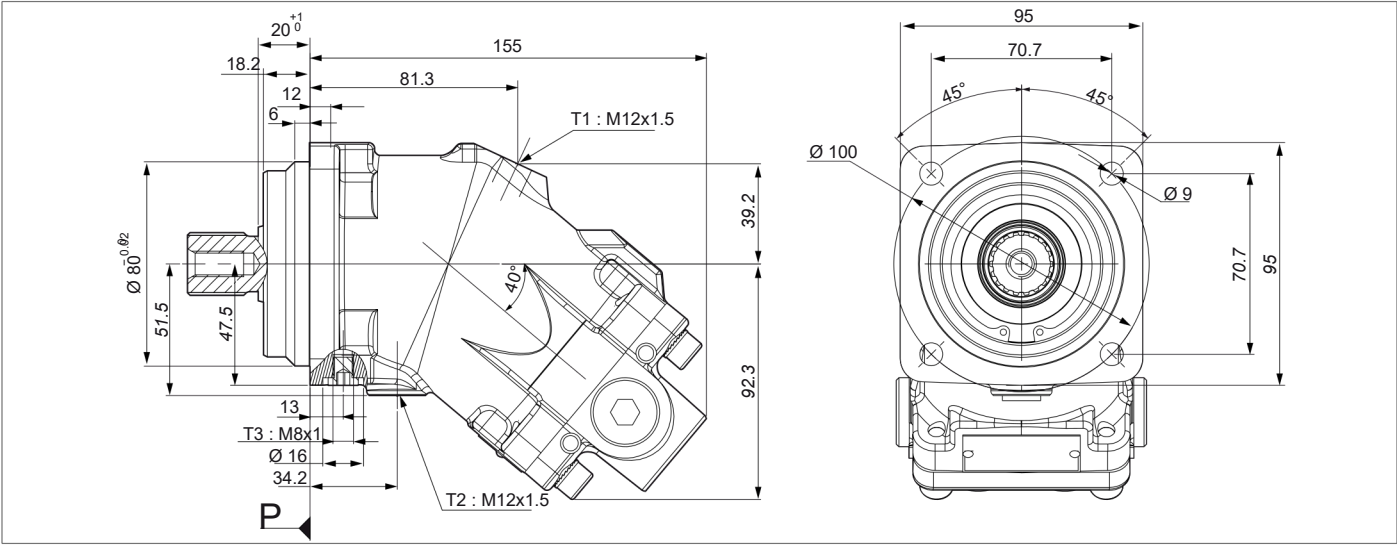


Pump model	5, 10, 12	18 cc	25 cc	32 cc	41. 45	50 cc	56, 63cc	80,90,108	125 cc	160, 180
Fr (lbf)	630	900	1350	1462.5	1462.5	1686	2023	2812	3262	4500
Fr (N/bar)	2800	4000	6000	6500	6500	7500	9000	12500	14500	20000
Fa (lbf)	0.23	0.31	0.42	0.46	0.62	0.62	0.77	1.24	1.33	1.47
Fa (N/bar)	(15)	(20)	(27)	(30)	(40)	(40)	(50)	(80)	(86)	(95)

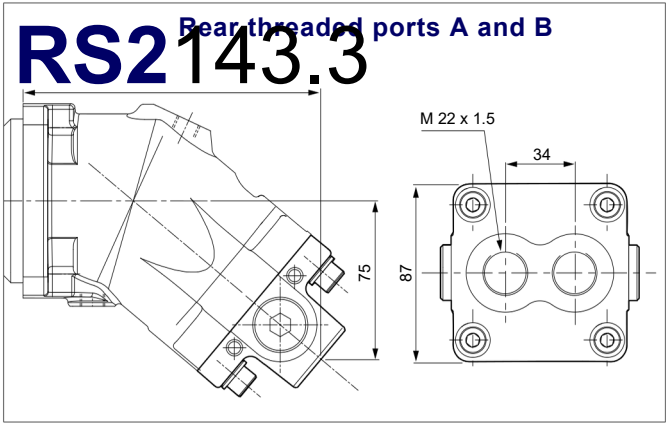
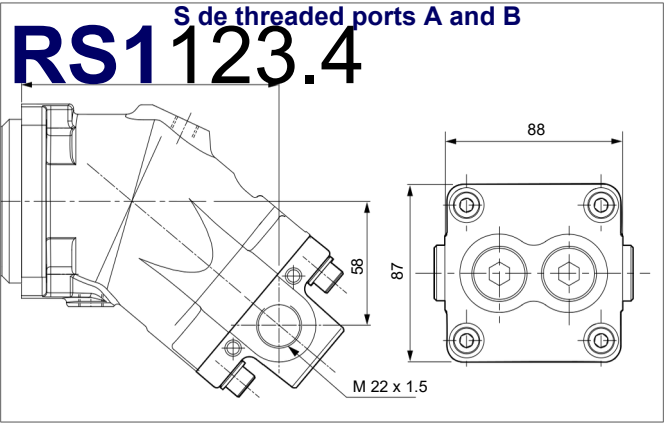
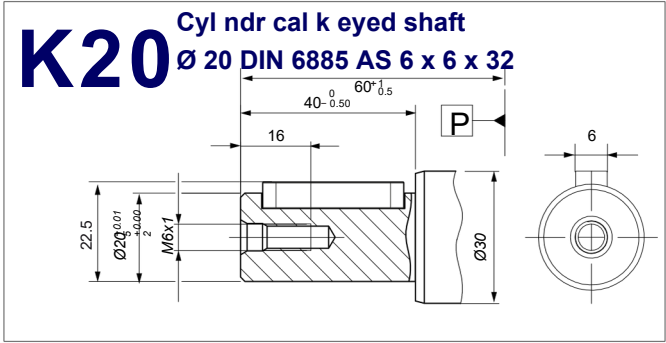
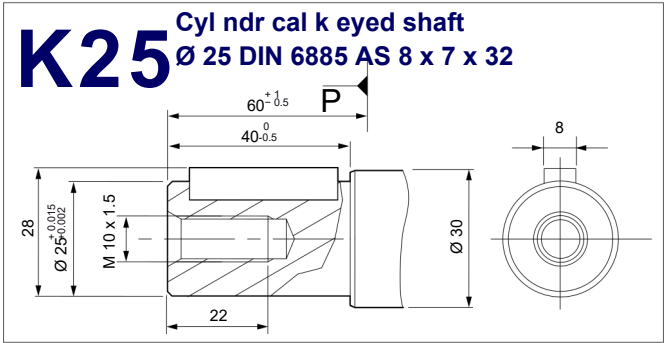
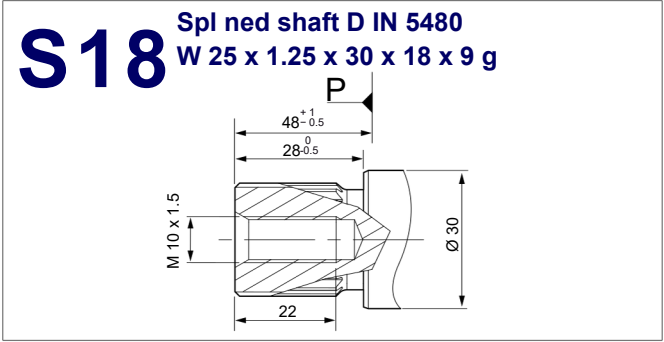
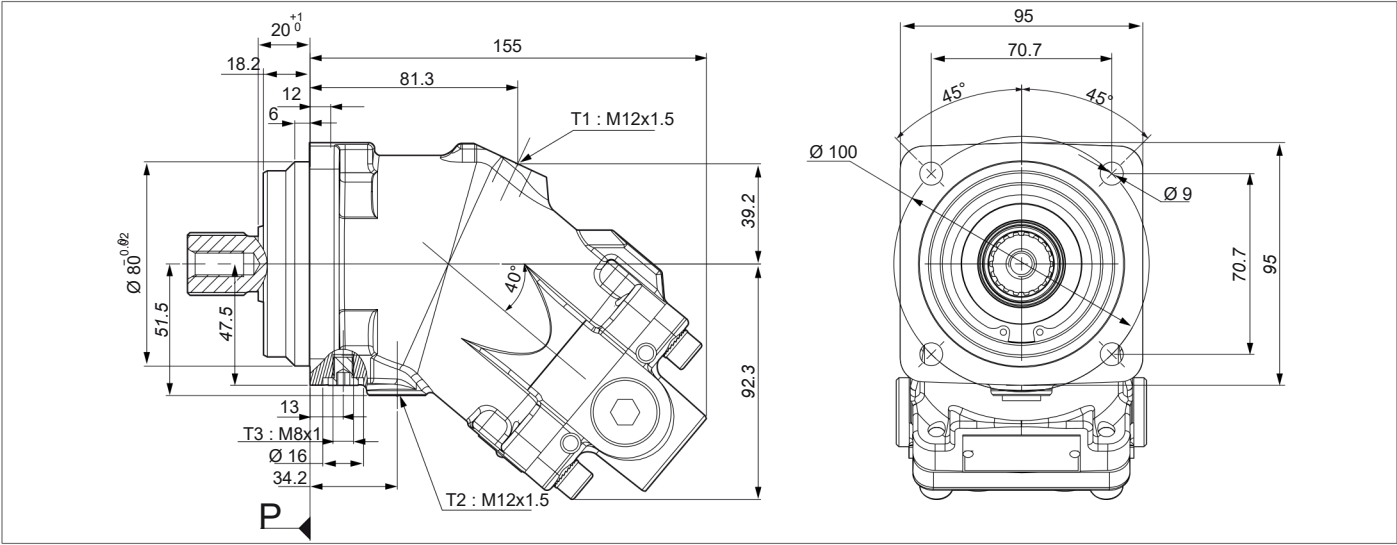
Ordering Code; A8PO - ISO Flange Bent Axes Pumps

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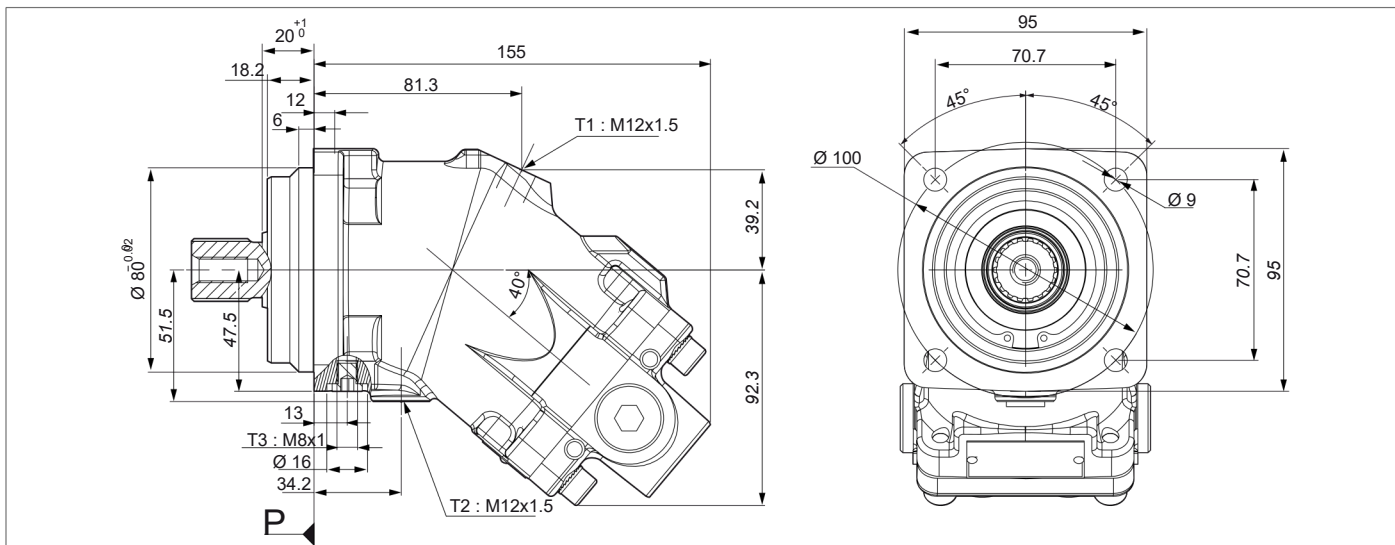
A8PO - 5 cc (ISO) Bent Axes Pump



A8PO - 10 cc (ISO) Bent Axis Pump

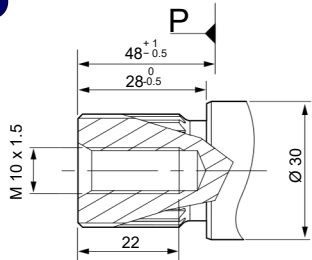


A8PO - 12 cc (ISO) Bent Axis Pump



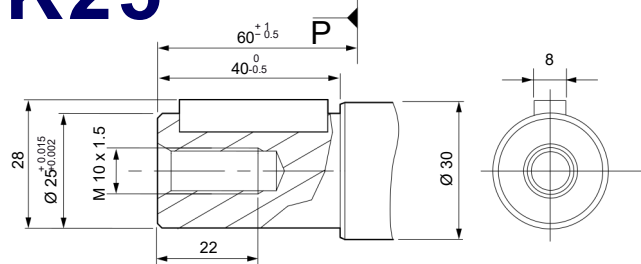
S18

Spl ned shaft D IN 5480
W 25 x 1.25 x 30 x 18 x 9 g



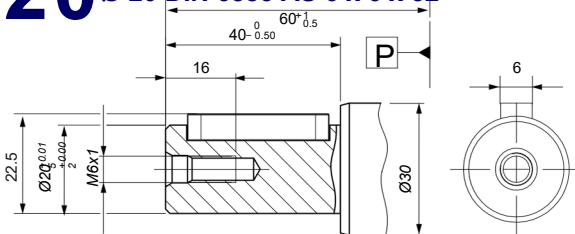
K25

Cylindralkylskåp
Ø 25 DIN 6885 AS 8 x 7 x 32



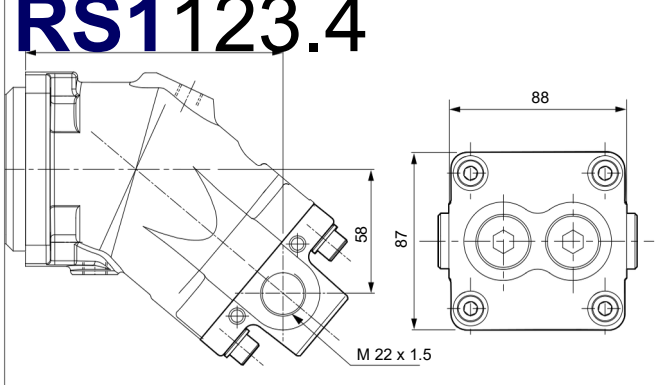
K20

Cylindralk-eyed shaft
Ø 20 DIN 6885 AS 6 x 6 x 32



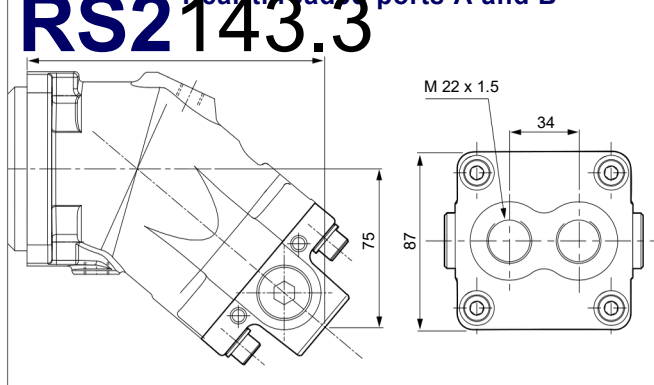
RS1123.4

Serial threaded ports A and B

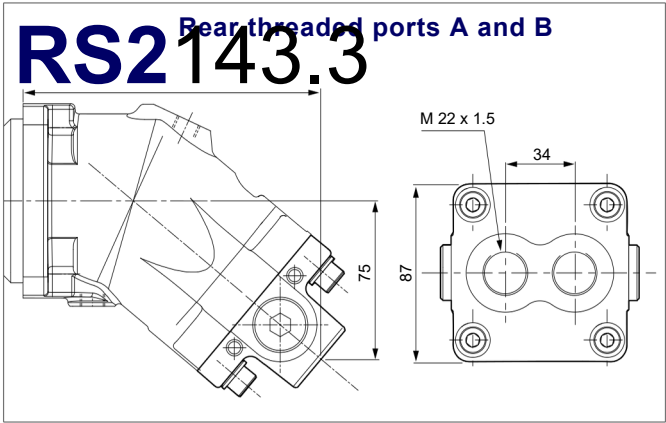
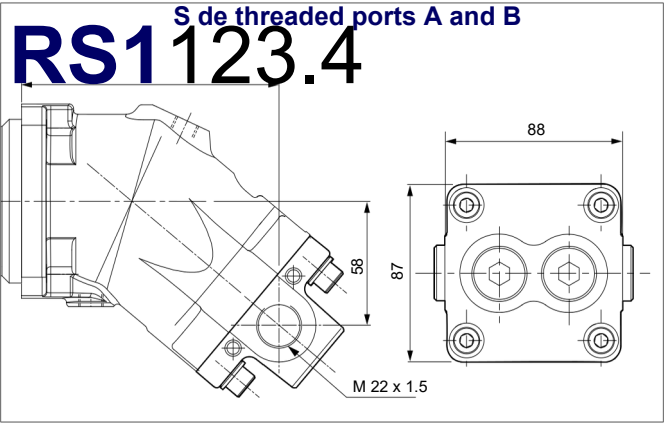
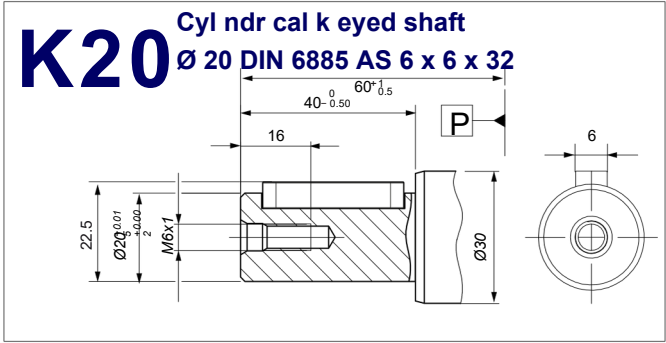
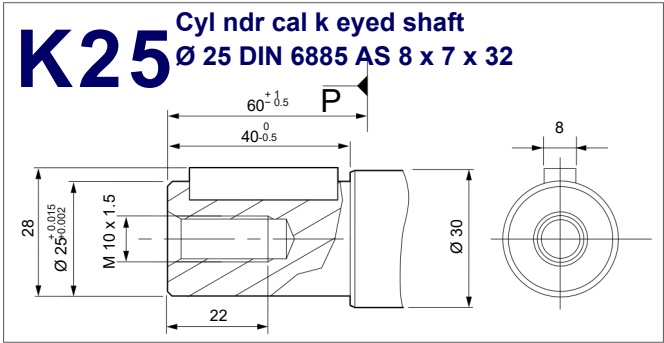
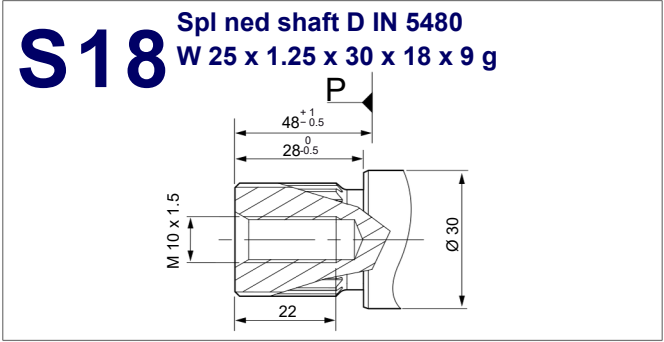
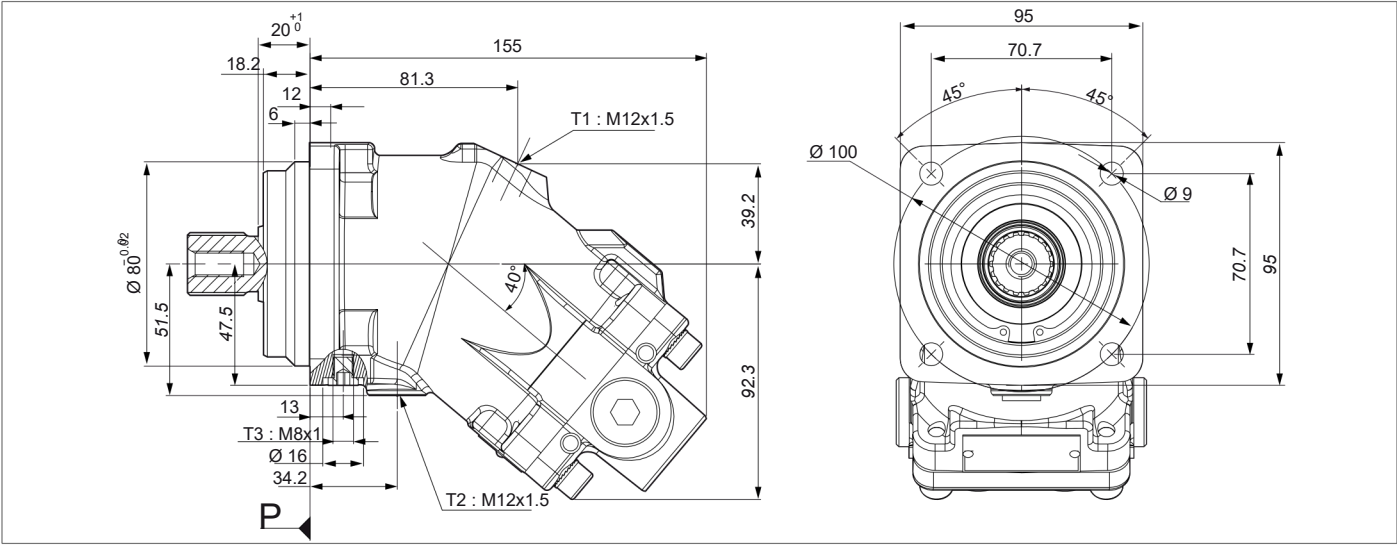


RS2143.3

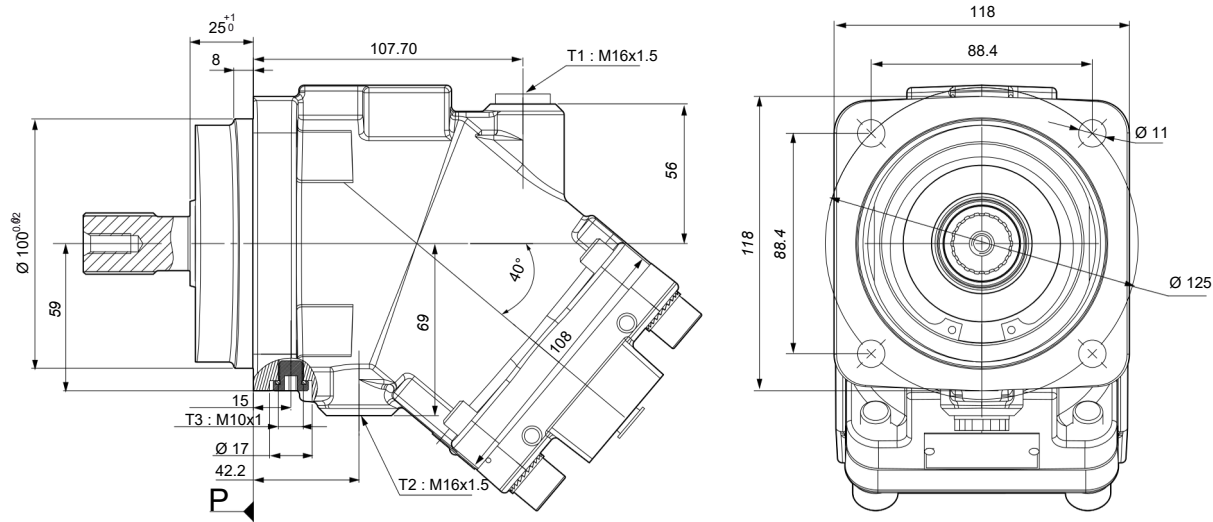
Rear threaded ports A and B



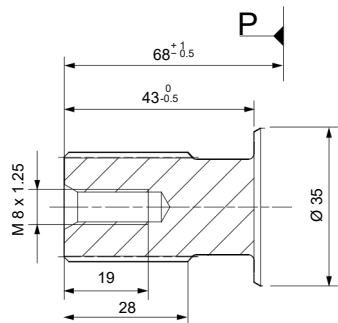
A8PO - 18 cc (ISO) Bent Ax s Pump



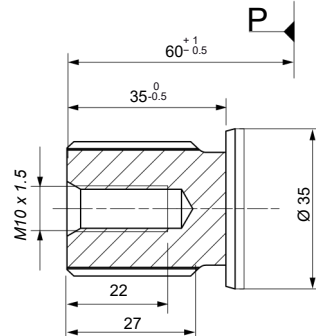
A8PO - 25 cc (ISO) Bent Axis Pump



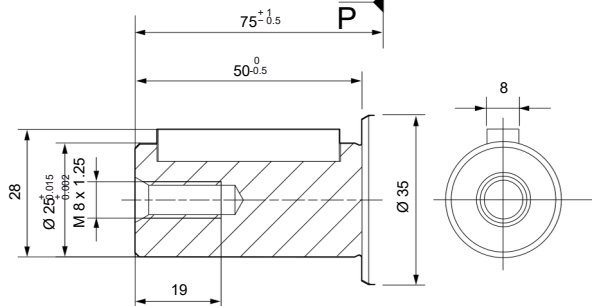
S18 Spl ned shaft DIN 5480
W 25 x 1.25 x 30 x 18 x 9 g



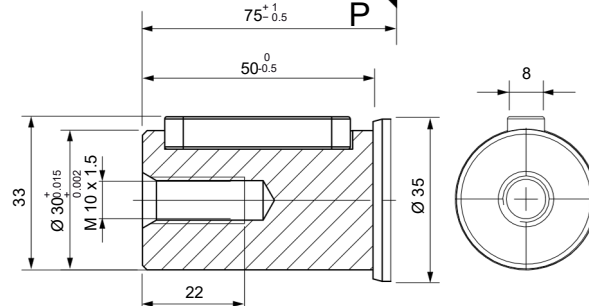
S14 Spl ned shaft DIN 5480
W 30 x 2 x 30 x 14 x 9 g



K25 Cyl ndr cal keyed shaft Ø 25
DIN 6885 AS 8 x 7 x 40

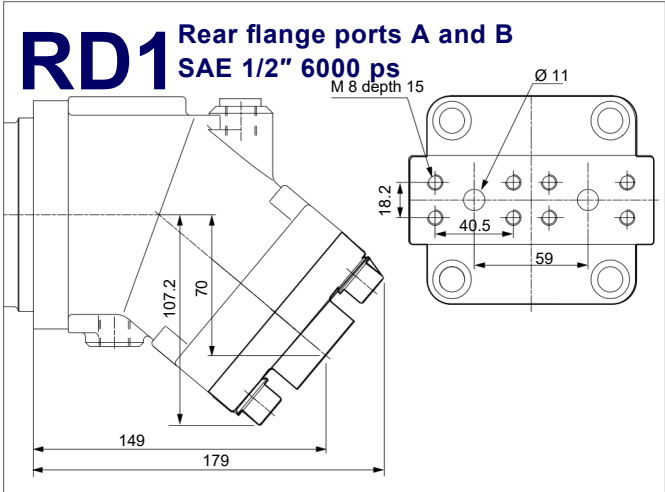
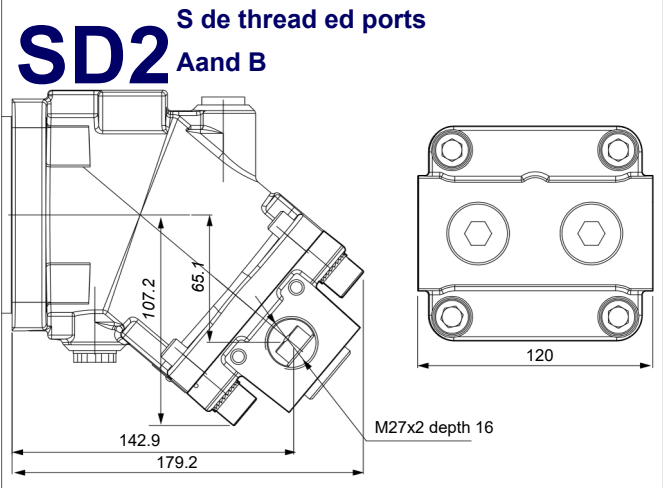
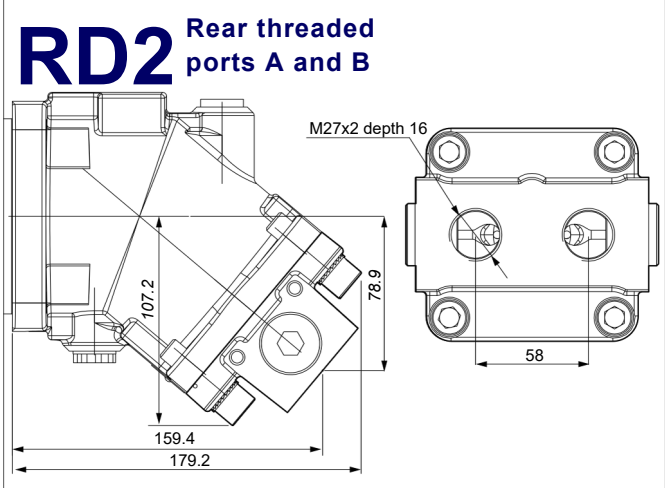
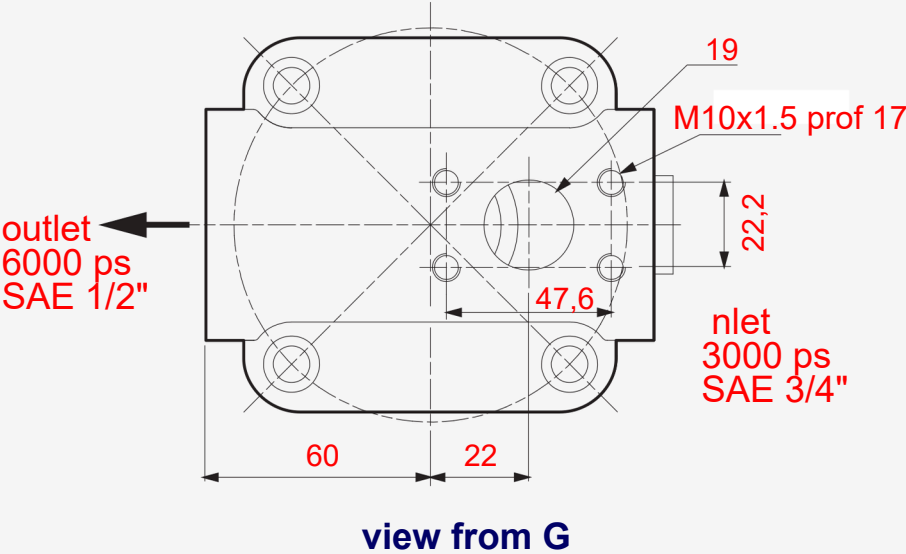


K30 Cyl ndr cal keyed shaft Ø 30
DIN 6885 AS 8 x 7 x 40

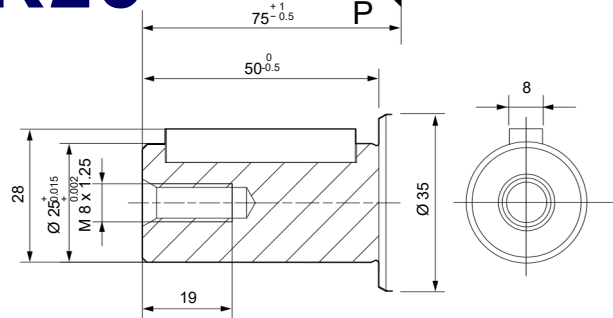
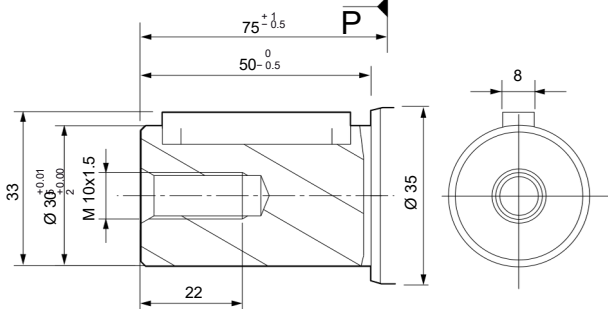
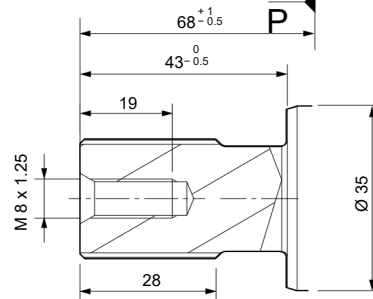
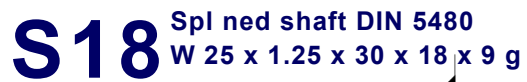
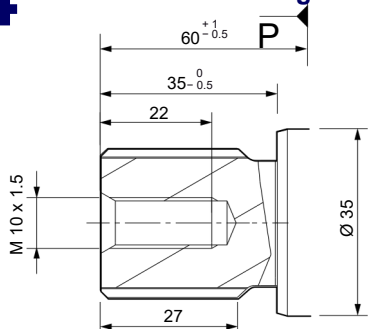
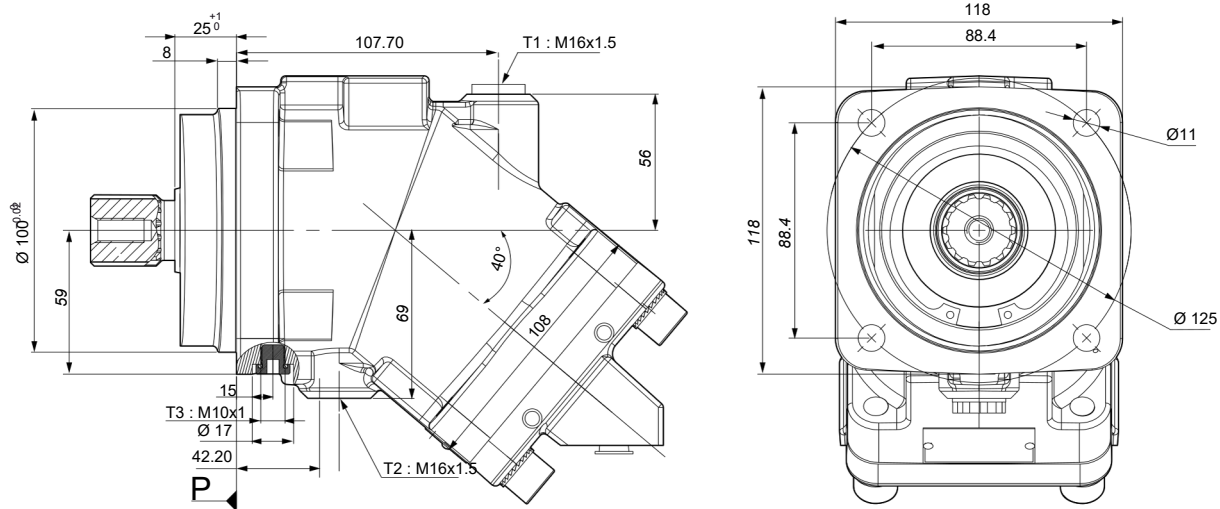


A8PO - 25 cc (ISO) Bent Ax s Pump

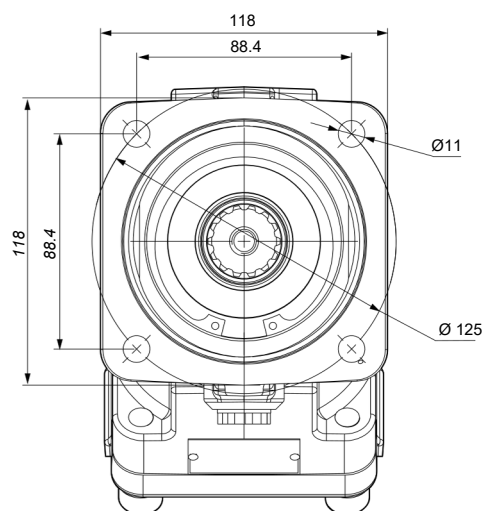
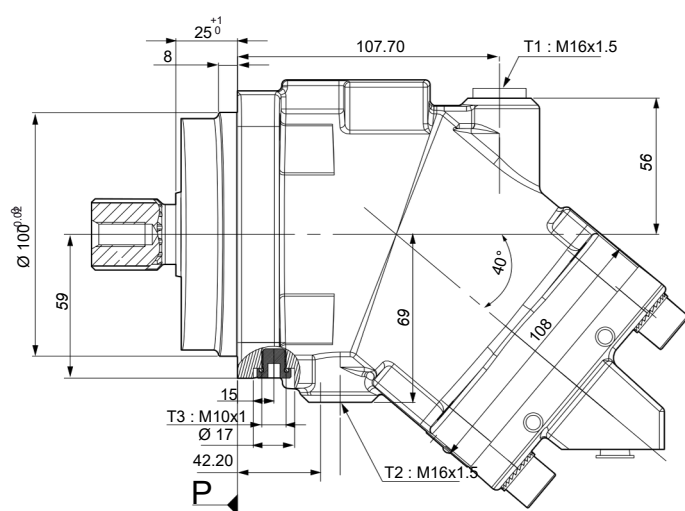
SLR



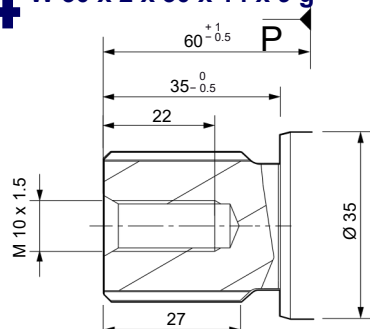
A8PO - 32 cc (ISO) Bent Axis Pump



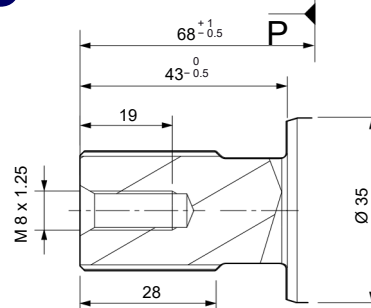
A8PO - 41 cc (ISO) Bent Axis Pump



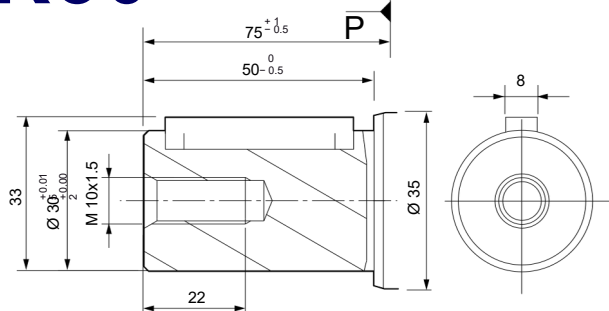
S14 Spl ned shaft D IN 5480
W 30 x 2 x 30 x 14 x 9 g



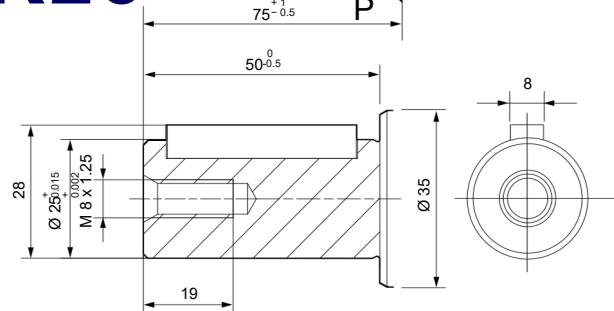
S18 Spl ned shaft DIN 5480
W 25 x 1.25 x 30 x 18 x 9 g



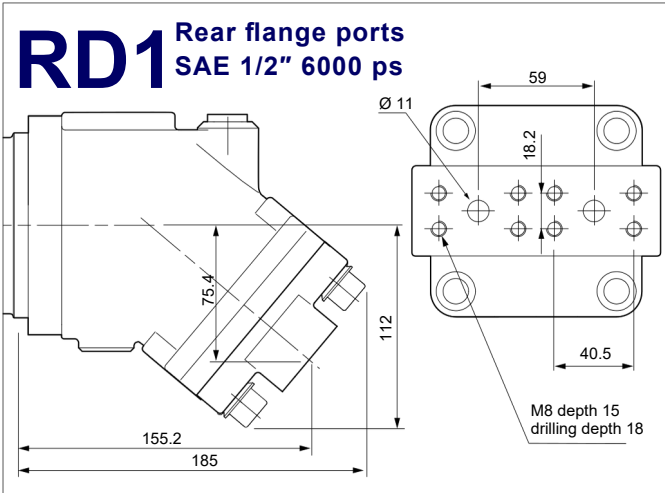
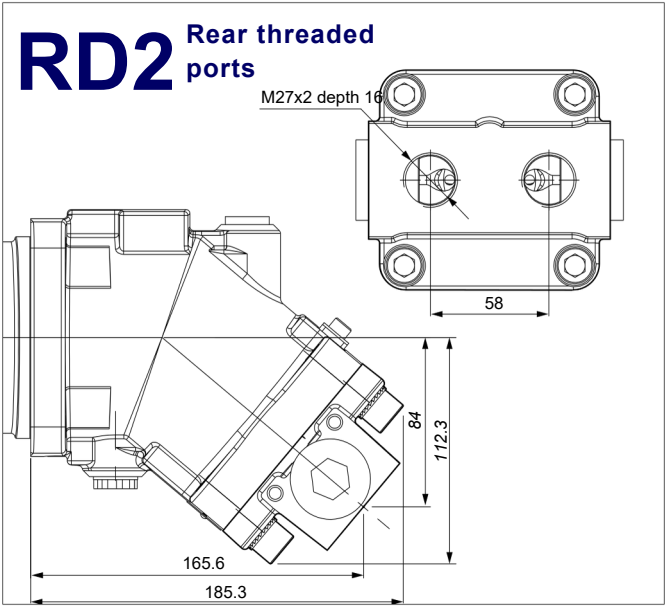
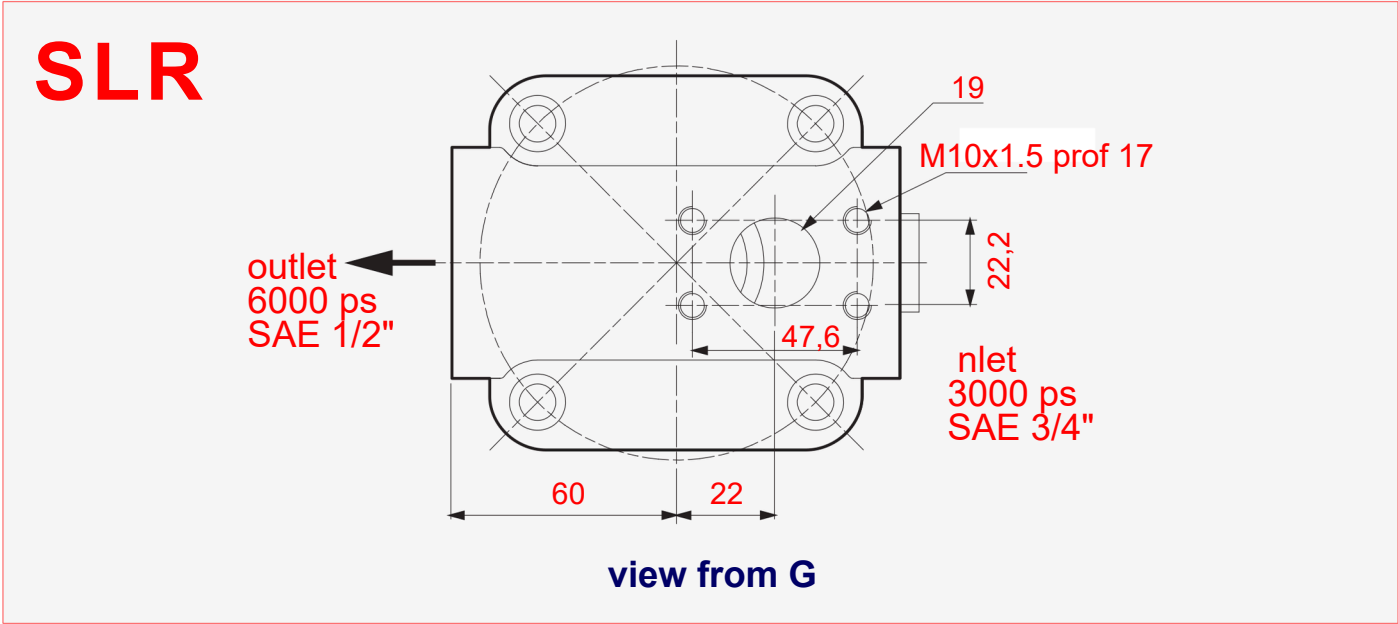
K30 Cyl ndr cal keyed shaft Ø 30
DIN 6885 AS 8 x 7 x 40



K25 Cyl ndr cal keyed shaft Ø 25
DIN 6885 AS 8 x 7 x 40



A8PO - 41 cc (ISO) Bent Ax s Pump

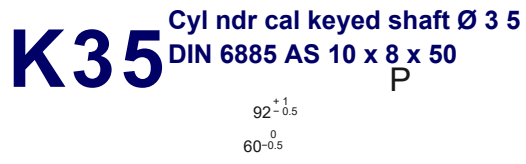
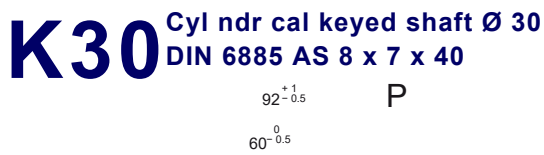
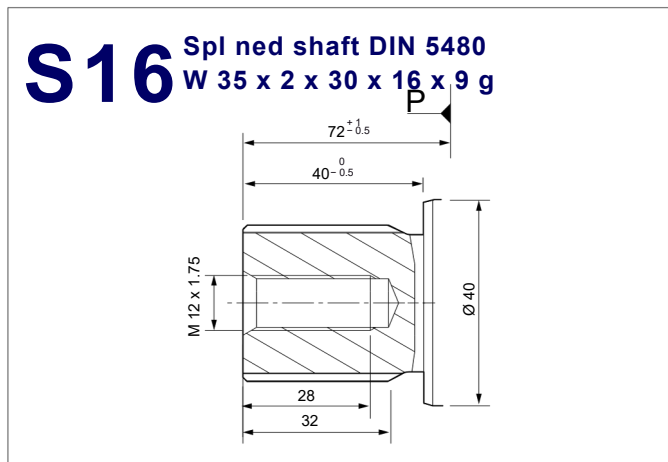
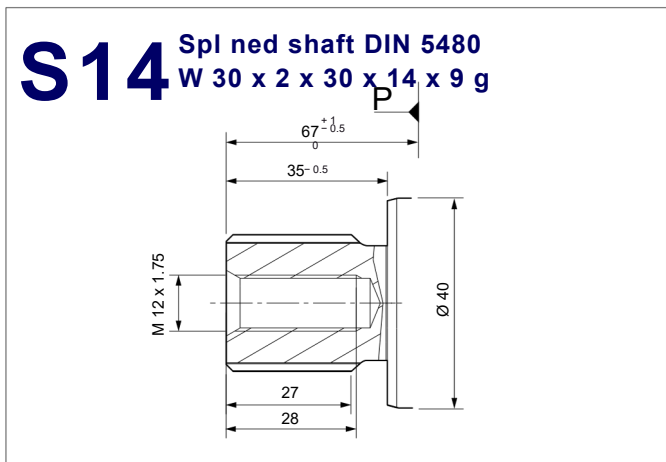
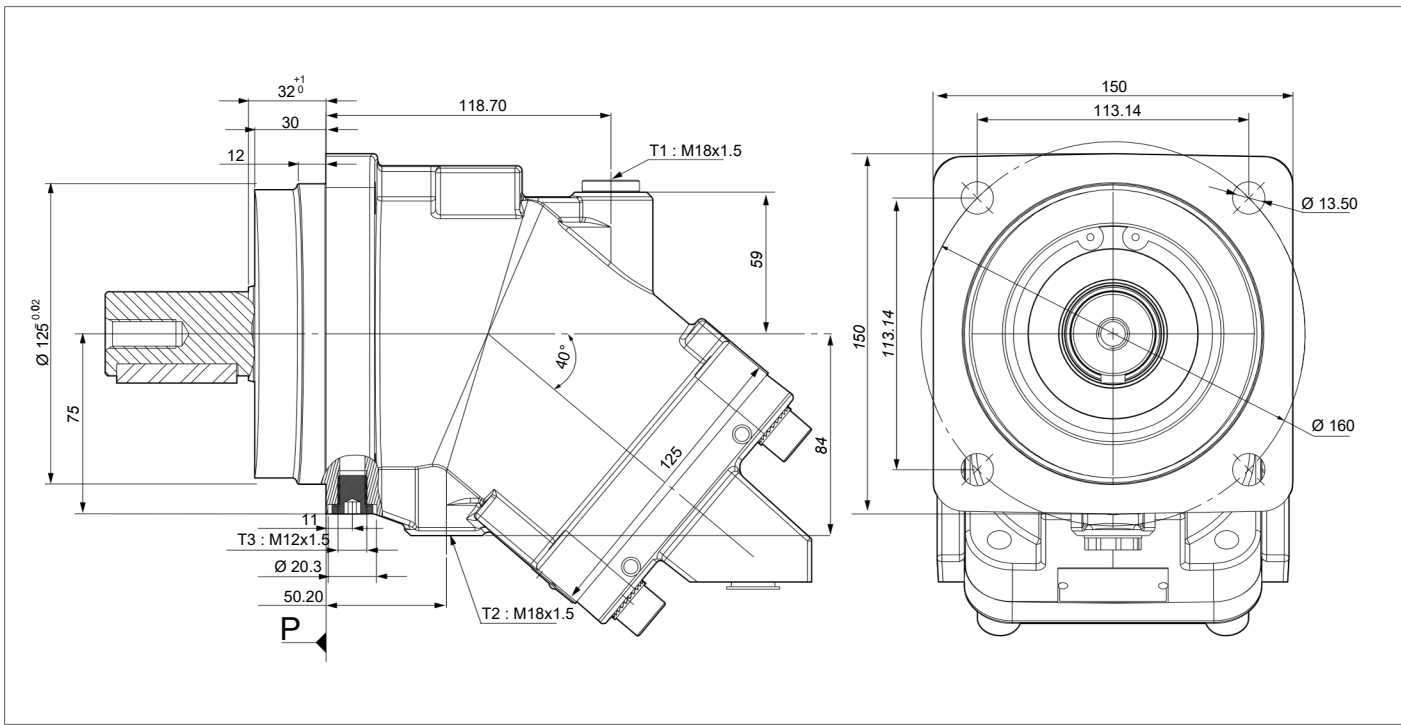


SD2 Side threaded ports
A and B

112.3
70.3
149
185.3

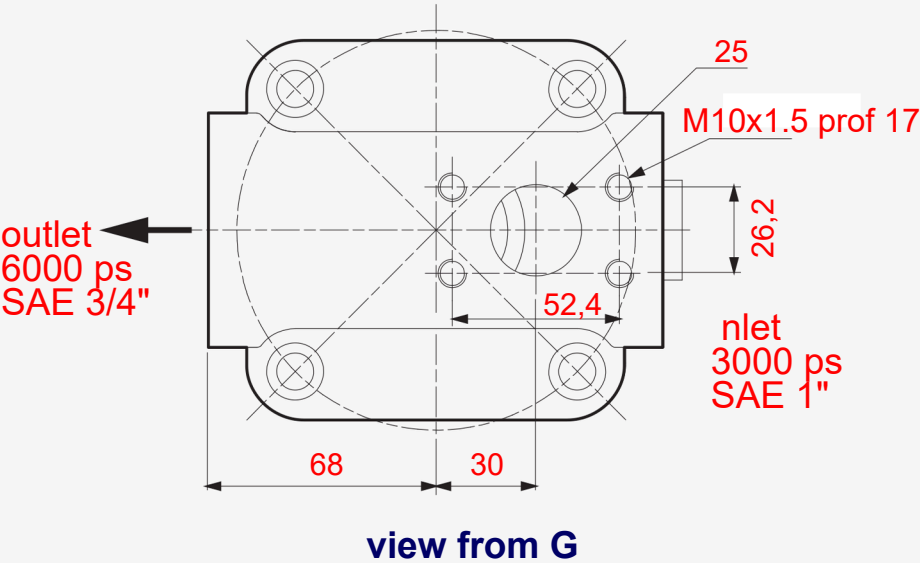
M27x2 depth 16

A8PO - 45 cc (ISO) Bent Axis Pump

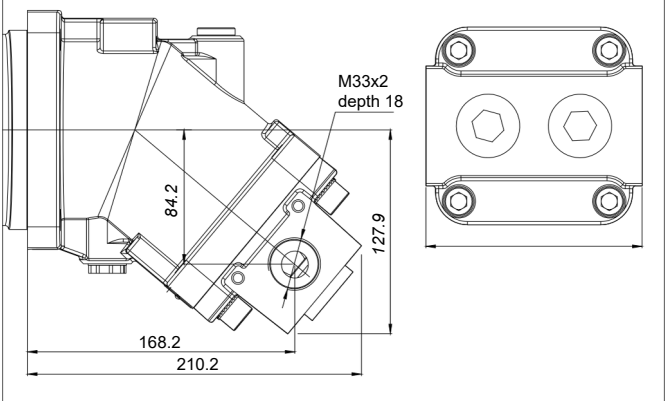


A8PO - 45 cc (ISO) Bent Ax s Pump

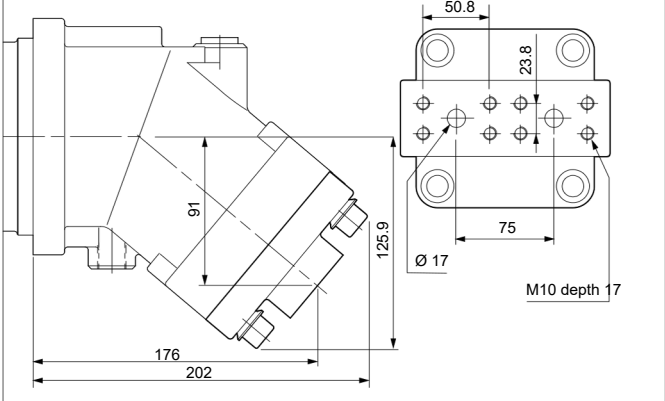
SLR



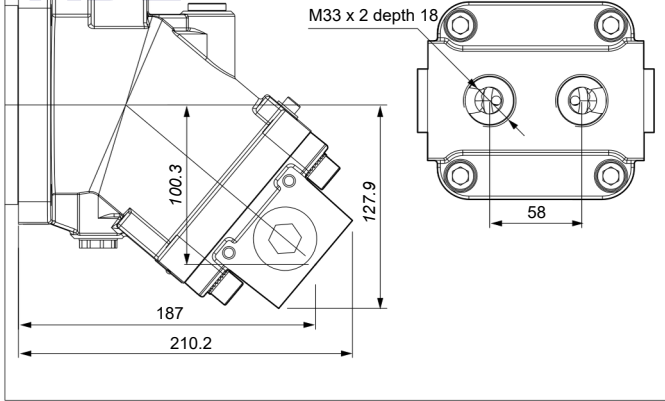
SD2 S de threaded ports
A and B



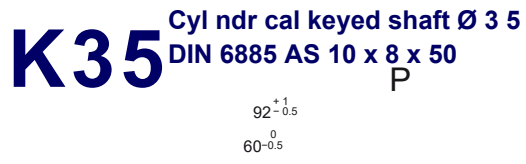
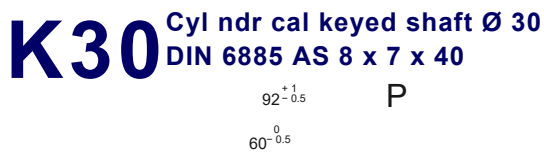
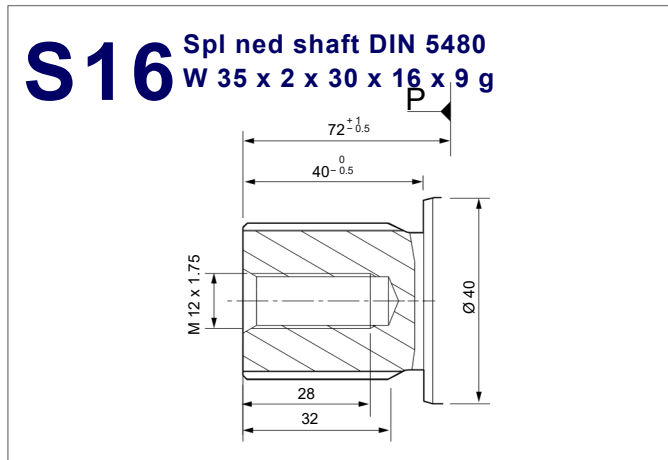
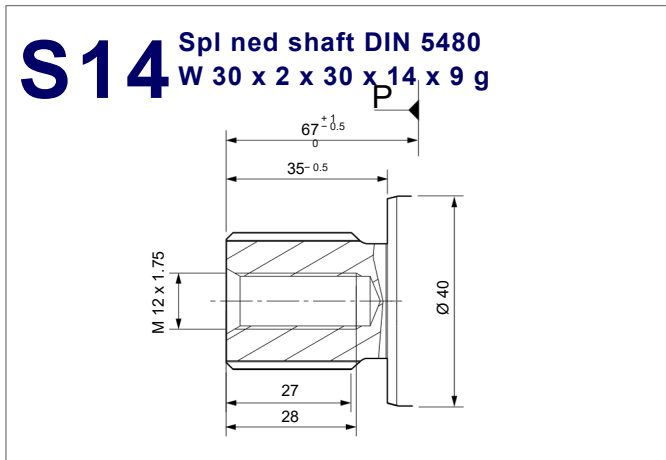
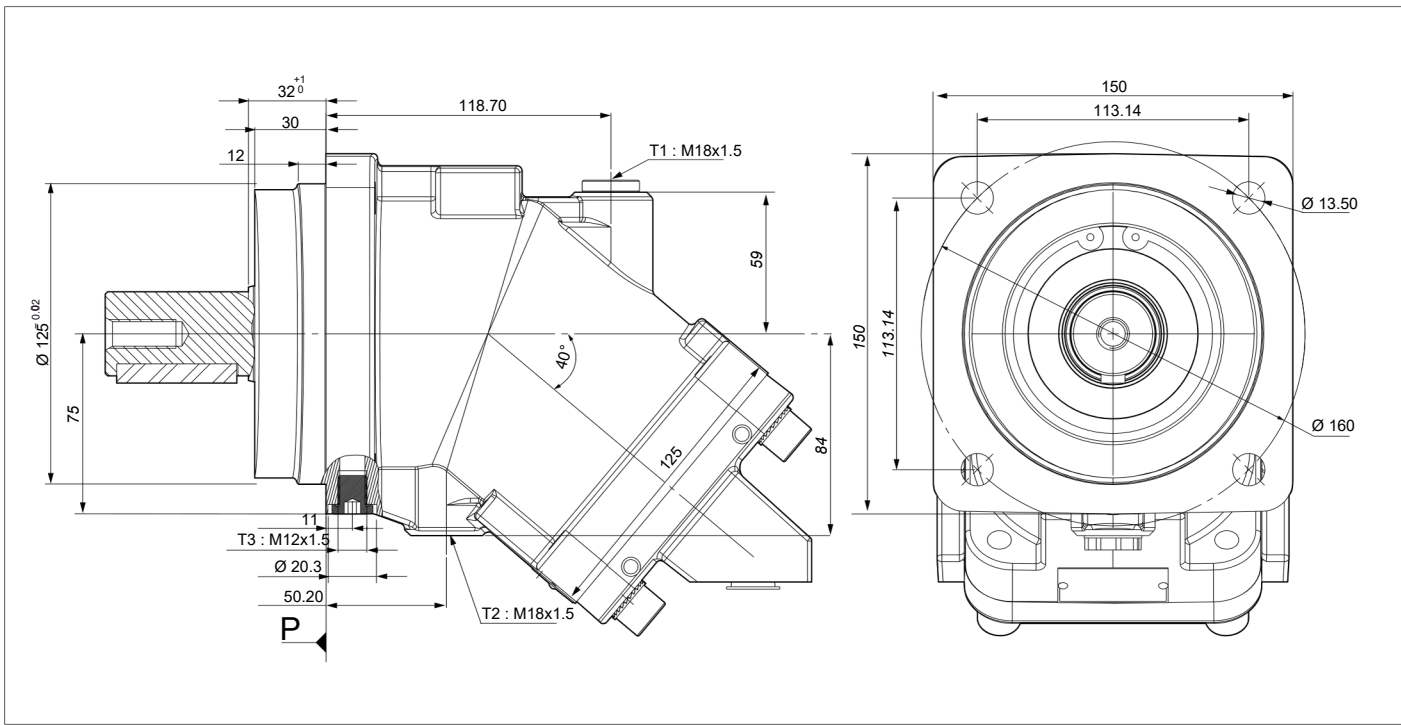
RD1 SAE flange ports, rear
SAE 3/4\" 6000 ps



RD2 Rear threaded
ports

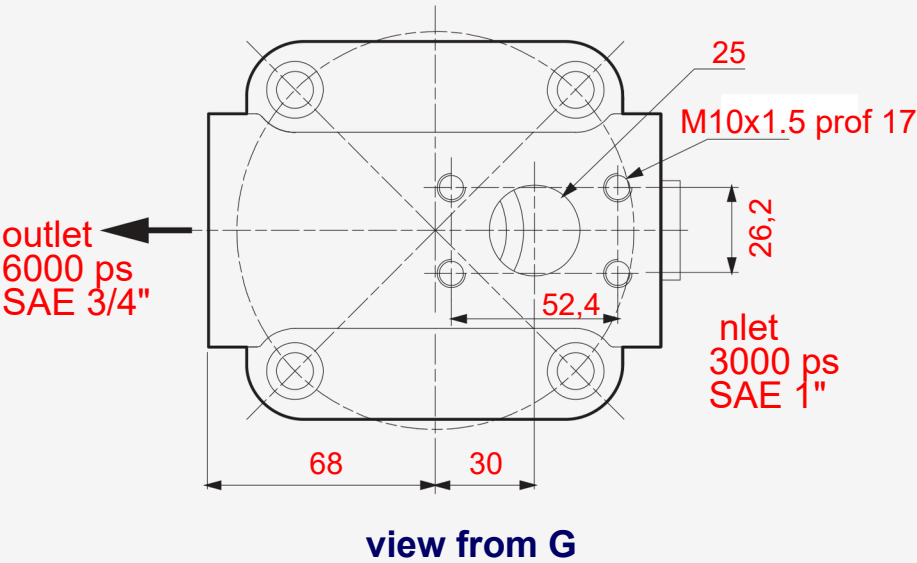


A8PO - 50 cc (ISO) Bent Axis Pump

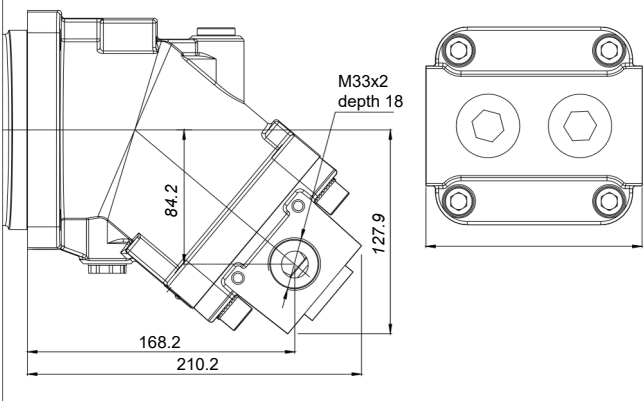


A8PO - 50 cc (ISO) Bent Ax s Pump

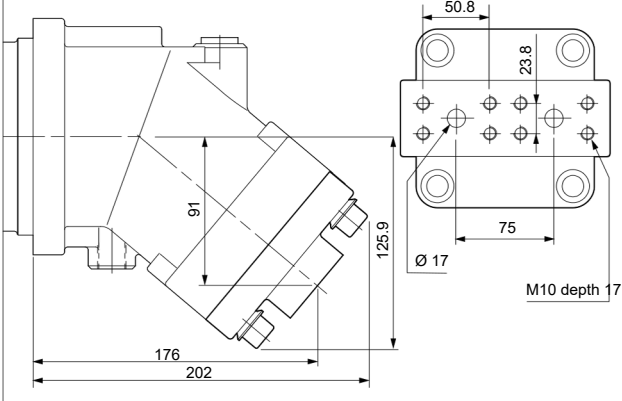
SLR



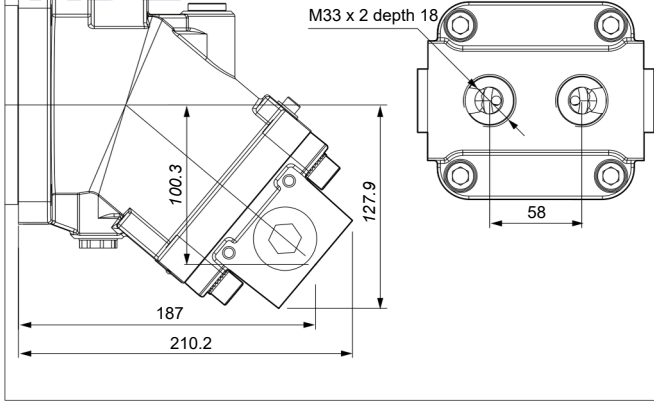
SD2 S de threaded ports
A and B



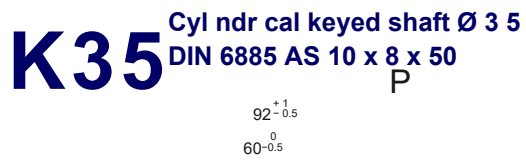
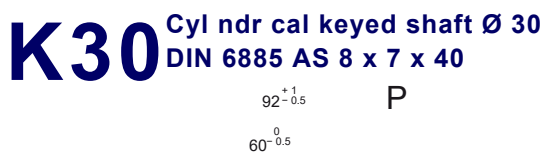
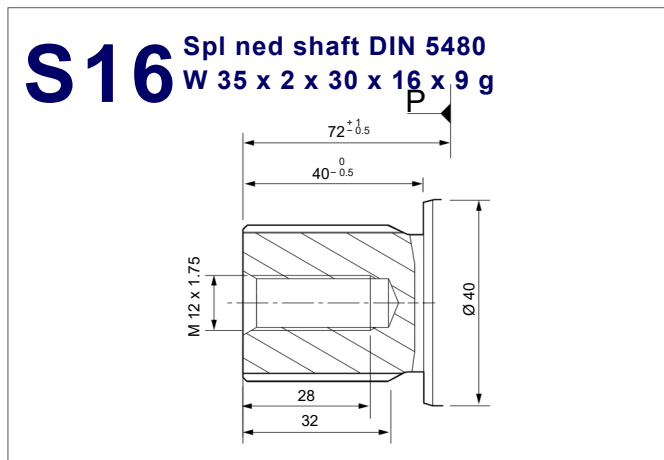
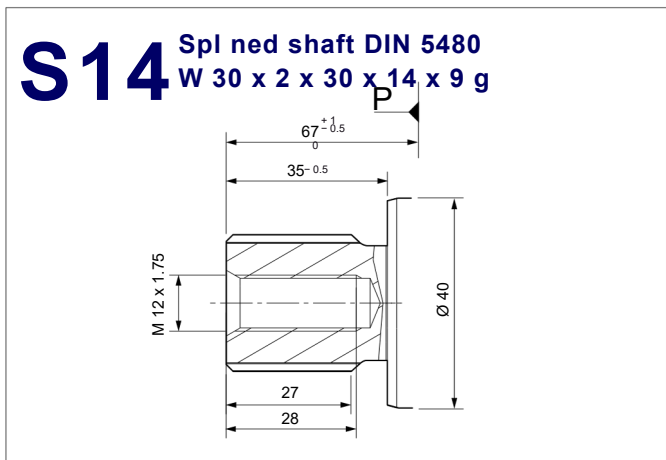
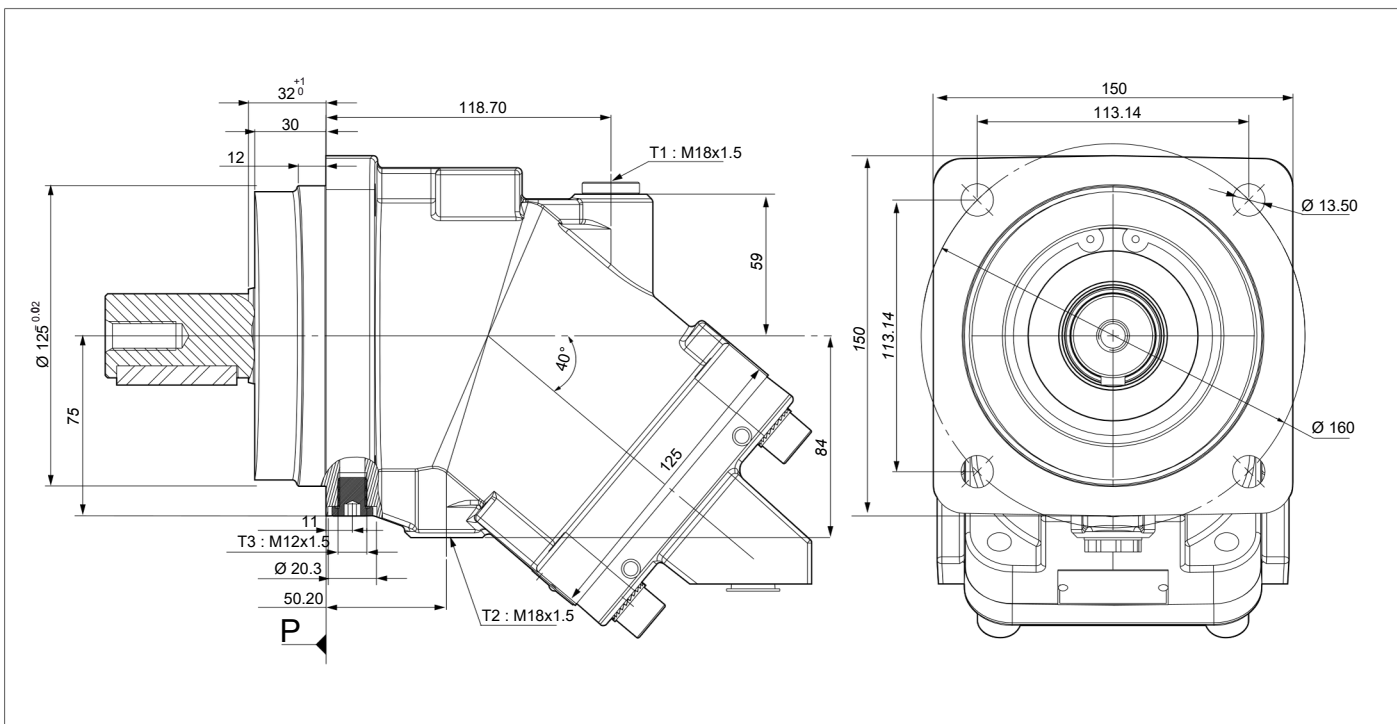
RD1 SAE flange ports, rear
SAE 3/4" 6000 ps



RD2 Rear threaded
ports

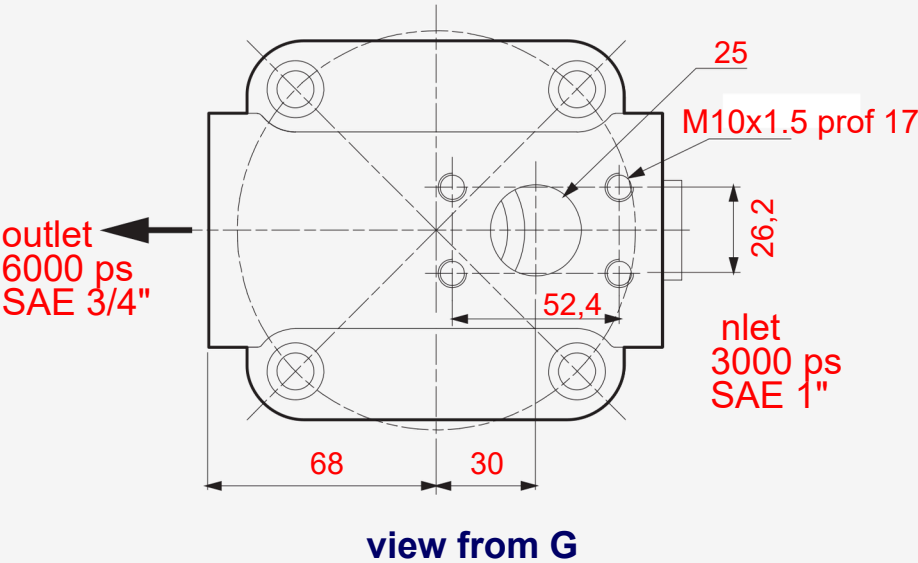


A8PO - 56 cc (ISO) Bent Axis Pump

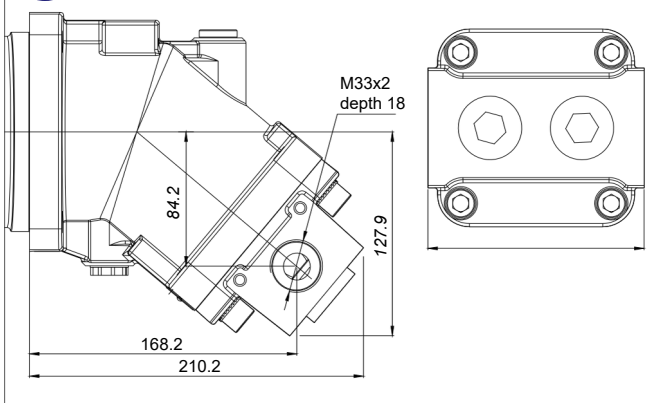


A8PO - 56 cc (ISO) Bent Ax s Pump

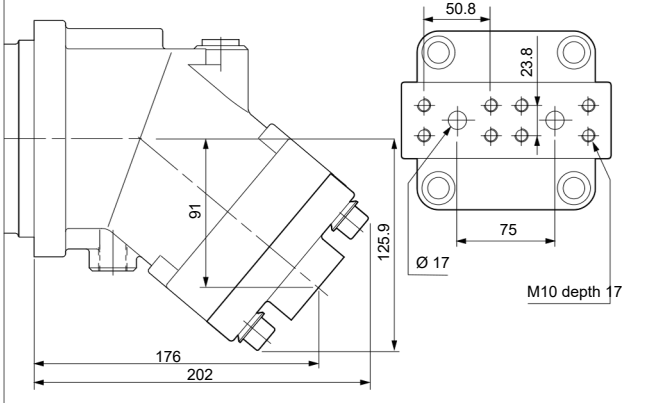
SLR



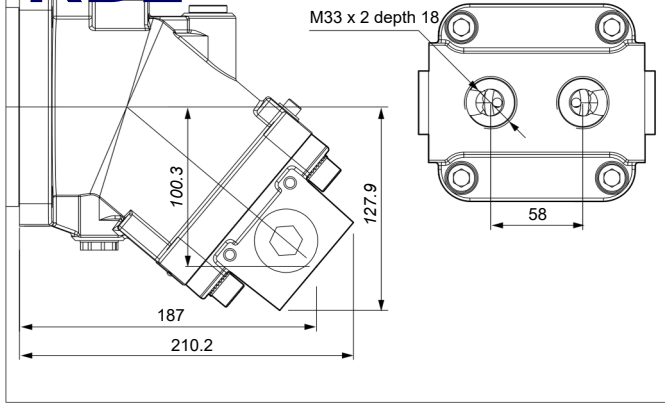
SD2 S de threaded ports
A and B



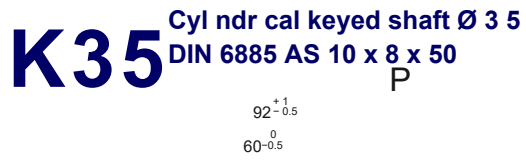
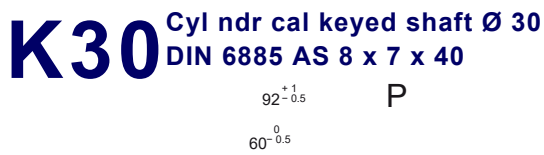
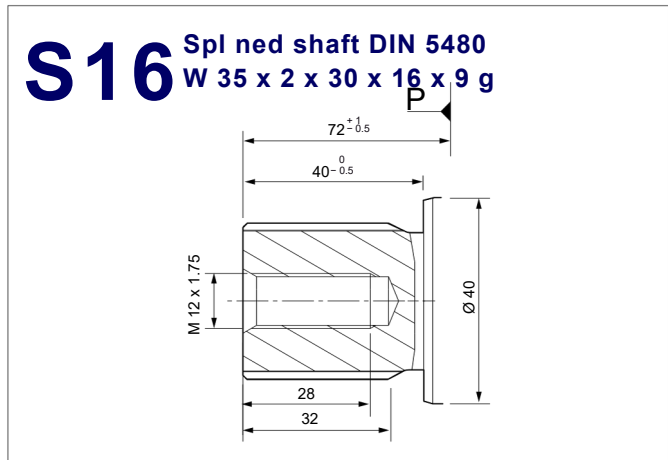
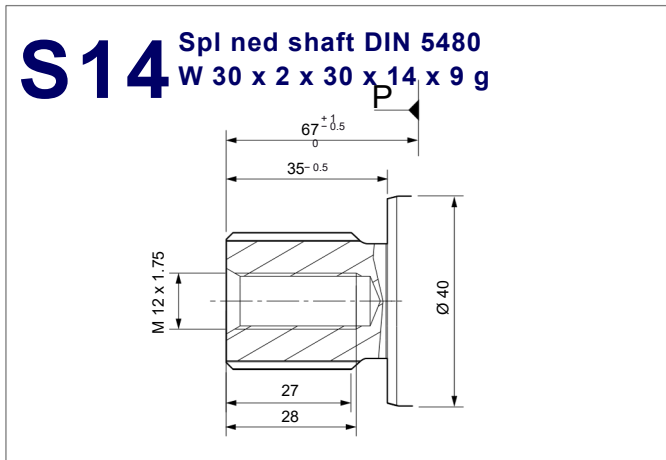
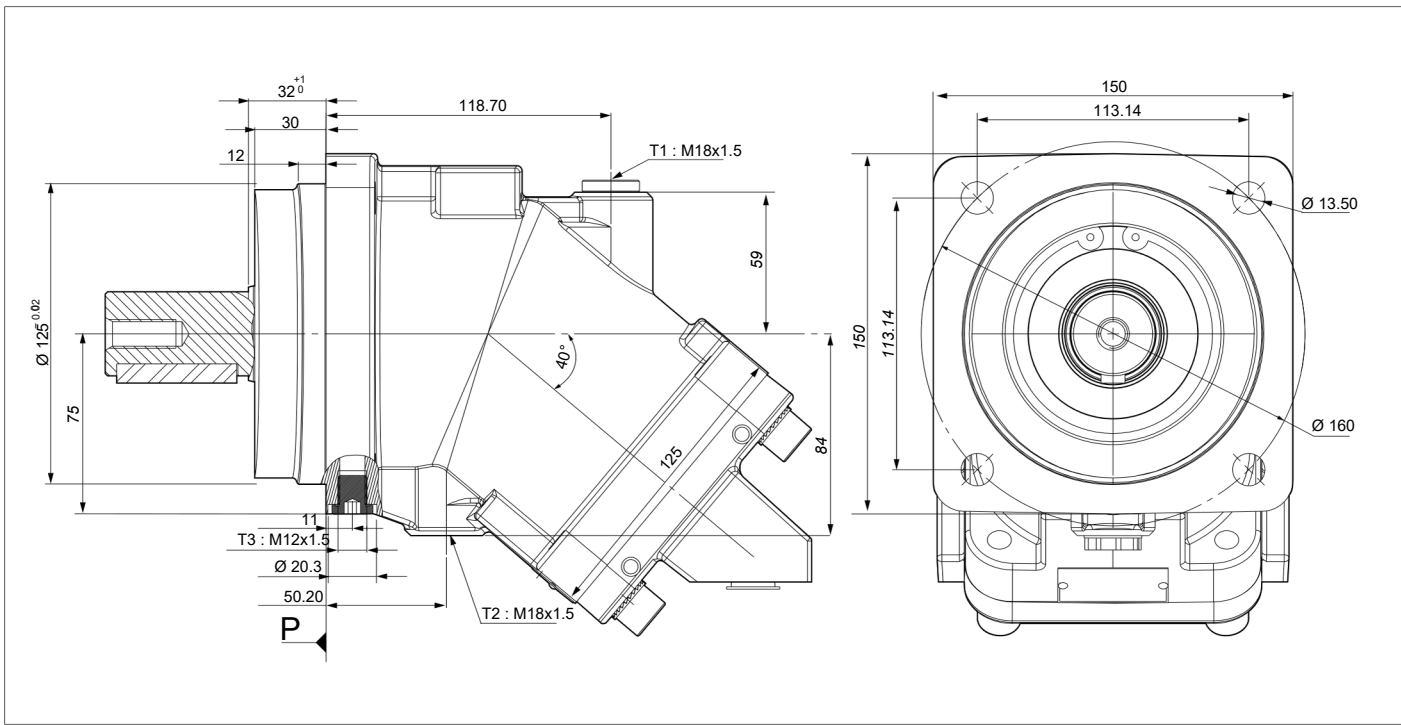
RD1 SAE flange ports, rear
SAE 3/4\" 6000 ps



RD2 Rear threaded
ports

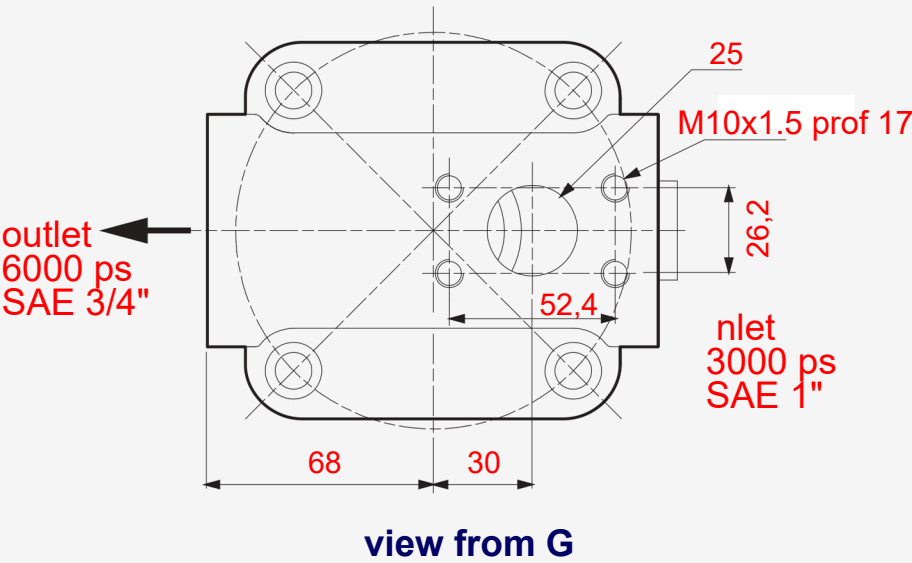


A8PO - 63 cc (ISO) Bent Axis Pump

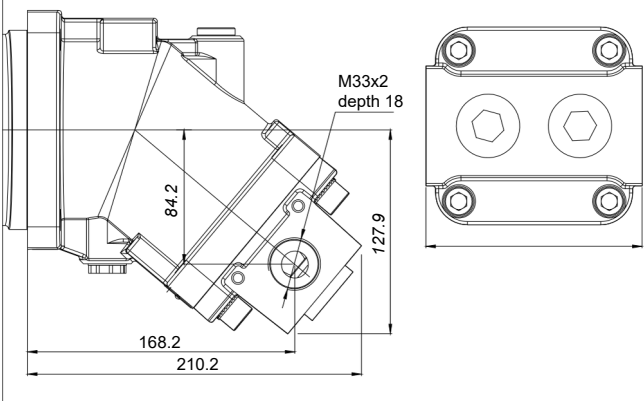


A8PO - 63 cc (ISO) Bent Ax s Pump

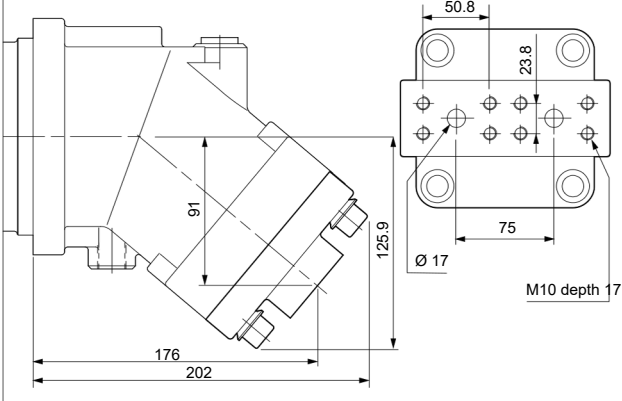
SLR



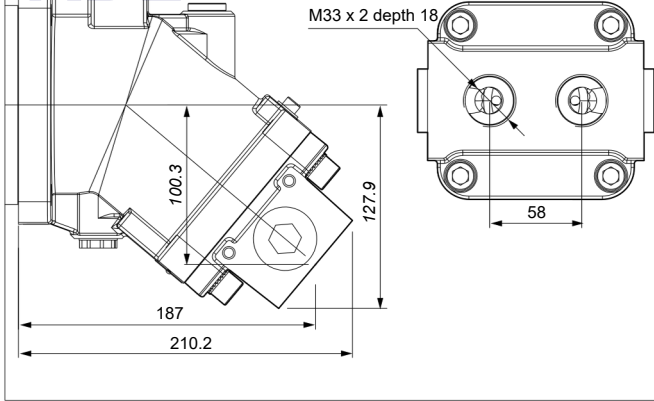
SD2 S de threaded ports
A and B



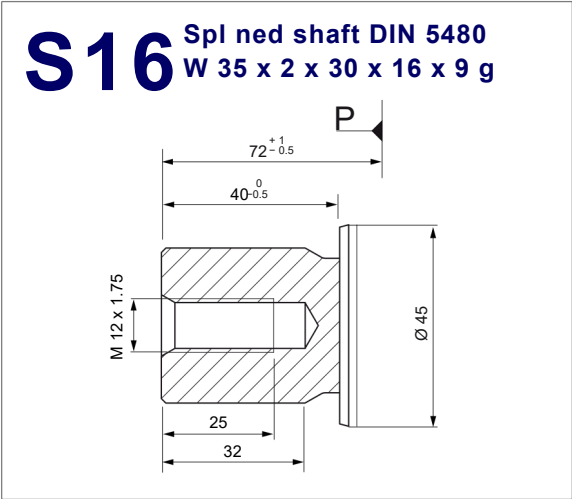
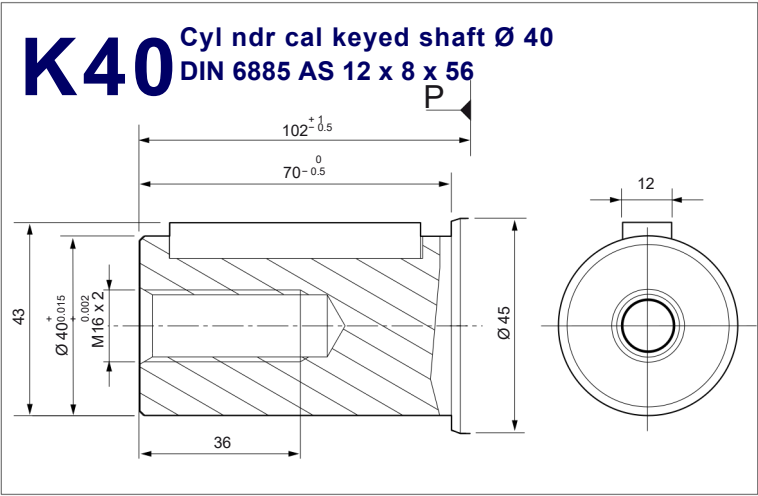
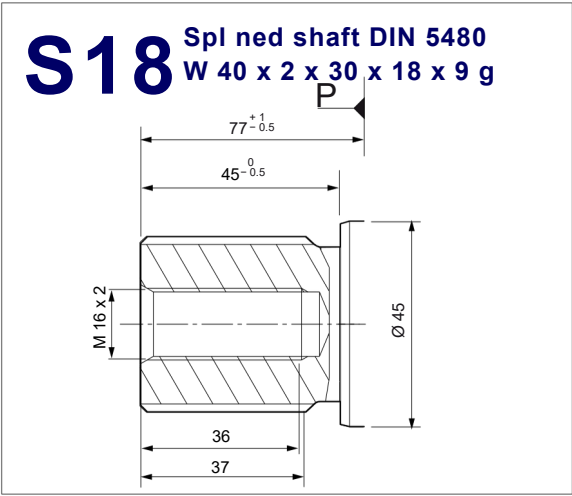
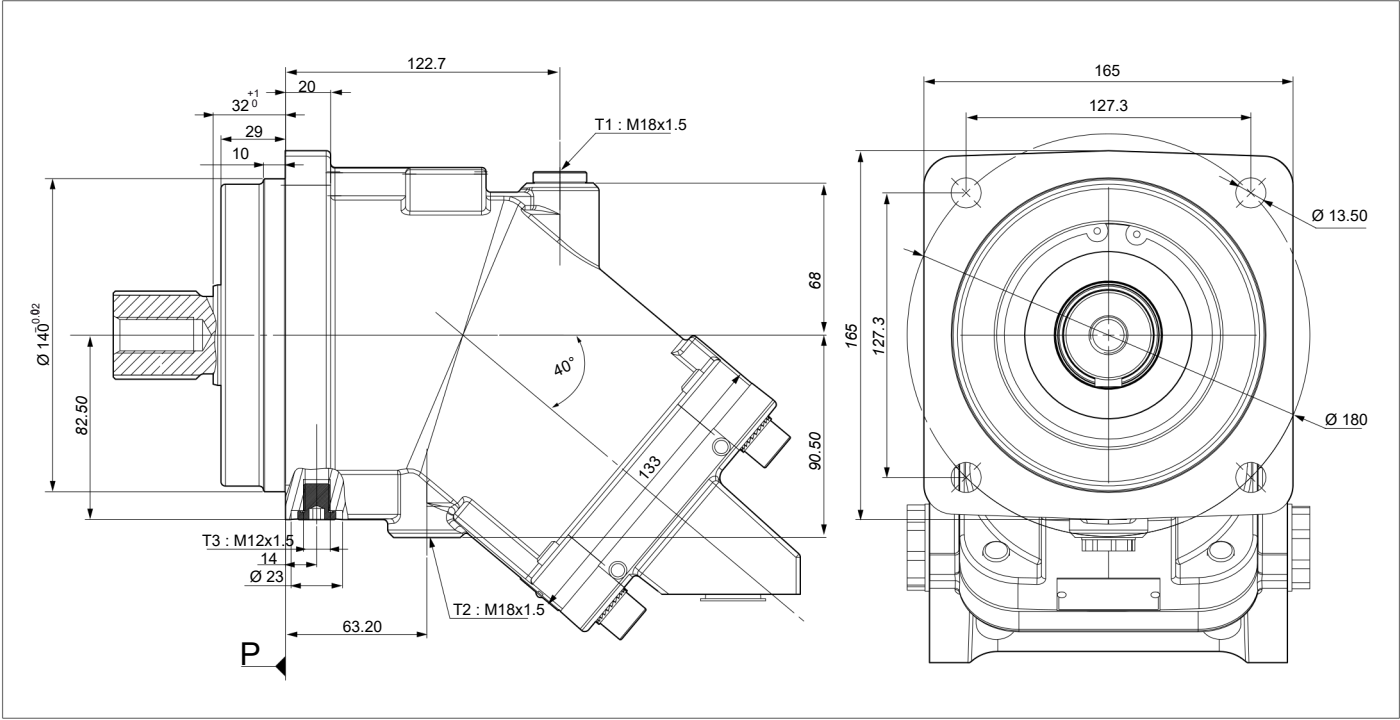
RD1 SAE flange ports, rear
SAE 3/4" 6000 ps



RD2 Rear threaded
ports

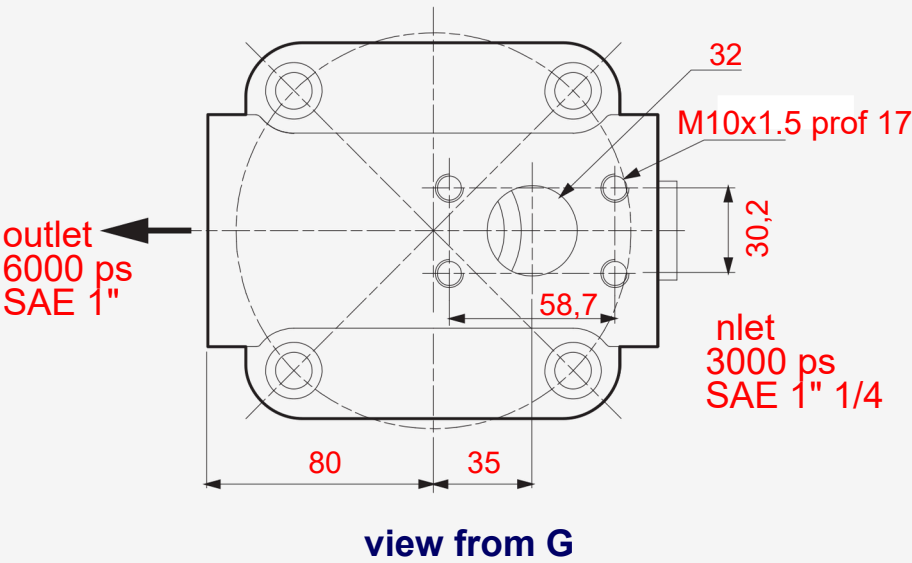


A8PO - 80 cc (ISO) Bent Axis Pump

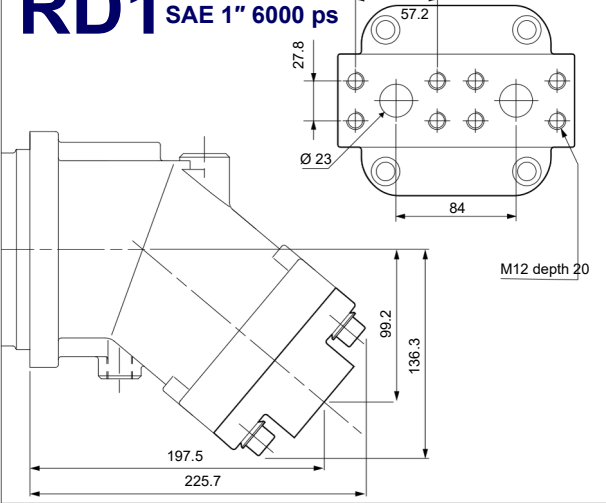


A8PO - 80 cc (ISO) Bent Ax s Pump

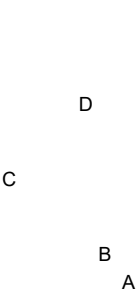
SLR



RD1 SAE flange ports, rear
SAE 1" 6000 ps

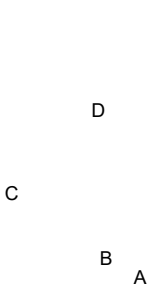


RD2 Rear threaded
ports F



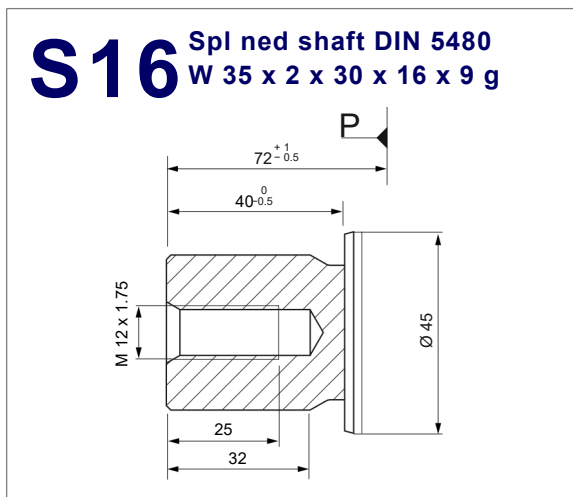
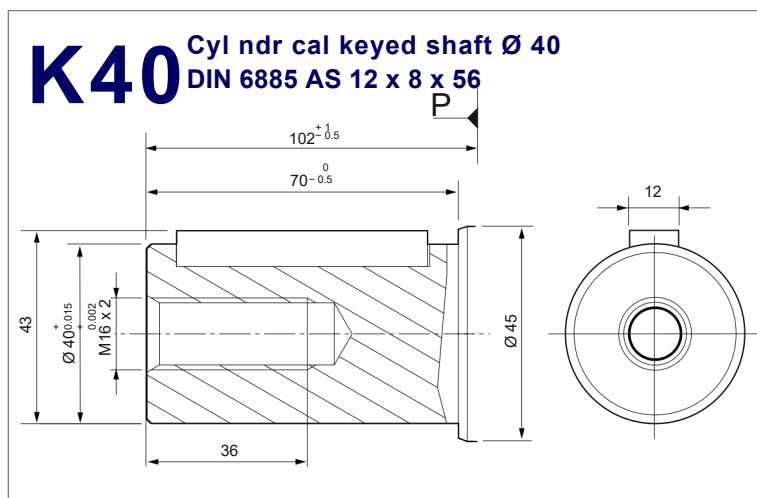
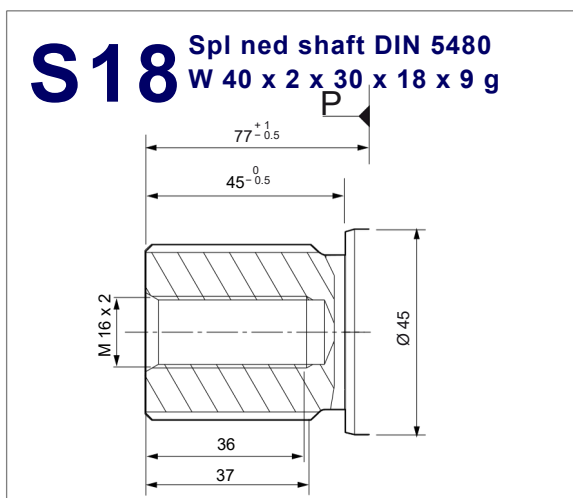
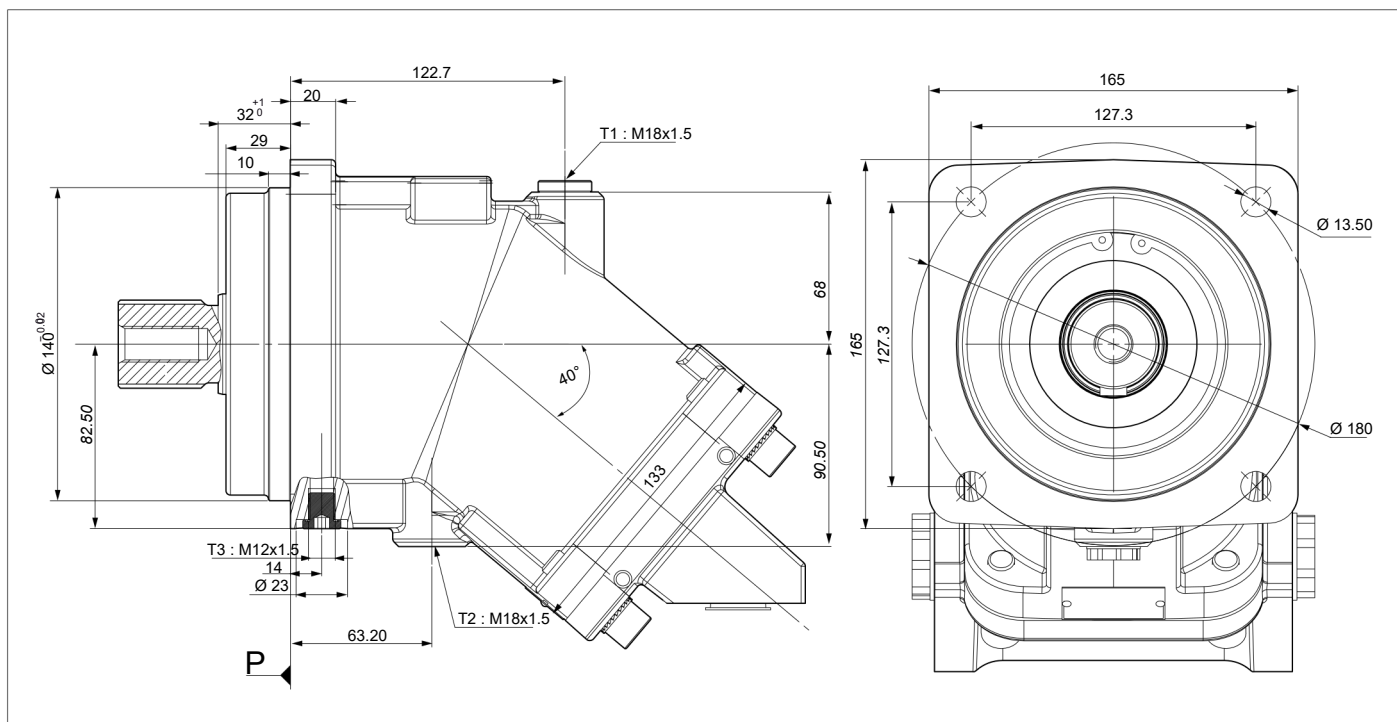
	M 80-90	M 108
A	242.7	243.3
B	216.3	216.9
c	146.4	146.9
D	114.9	115.4
e	68	66
F	M33x2 depth 18	M42x2 depth 20

SD2 S de threaded
ports



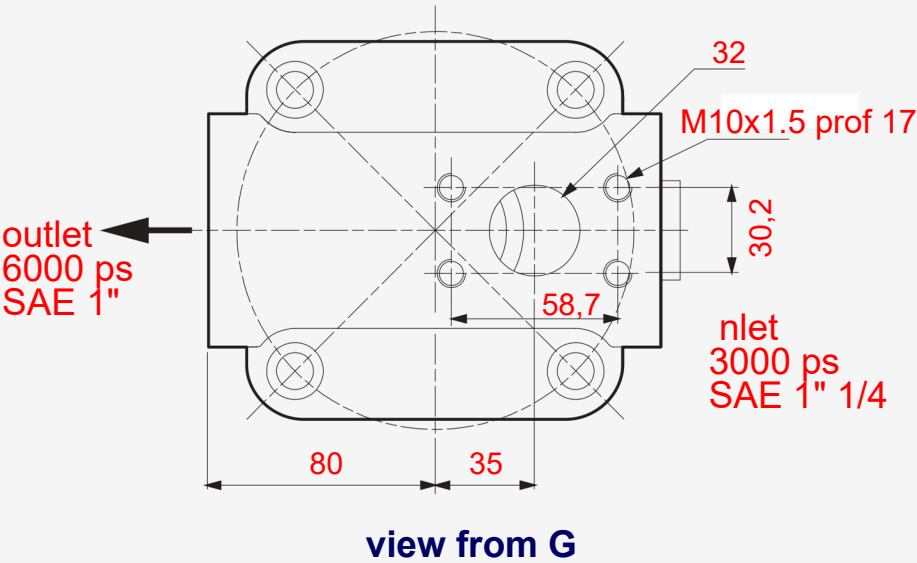
	M 80-90	M 108
F A	242.7	243.3
B	192.5	194.4
c	146.4	146.9
D	95	96.6
e	160	160
F	M33x2 depth 18	M42x2 depth 20

A8PO - 90 cc (ISO) Bent Axis Pump

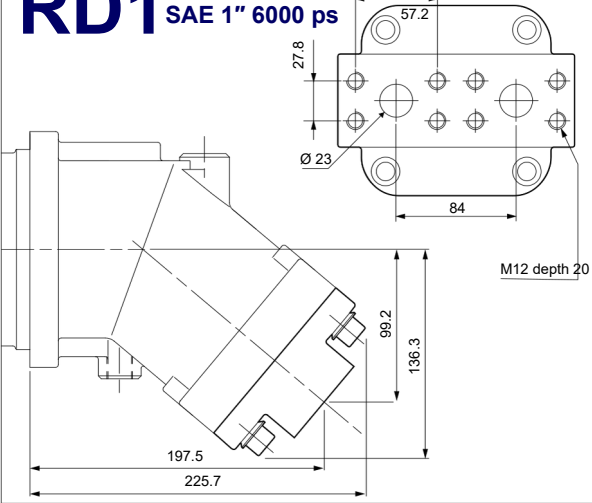


A8PO - 90 cc (ISO) Bent Ax s Pump

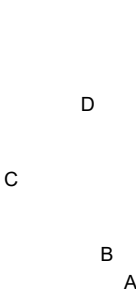
SLR



RD1 SAE flange ports, rear
SAE 1" 6000 ps

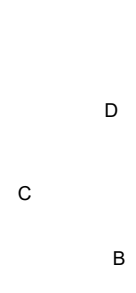


RD2 Rear threaded
ports F



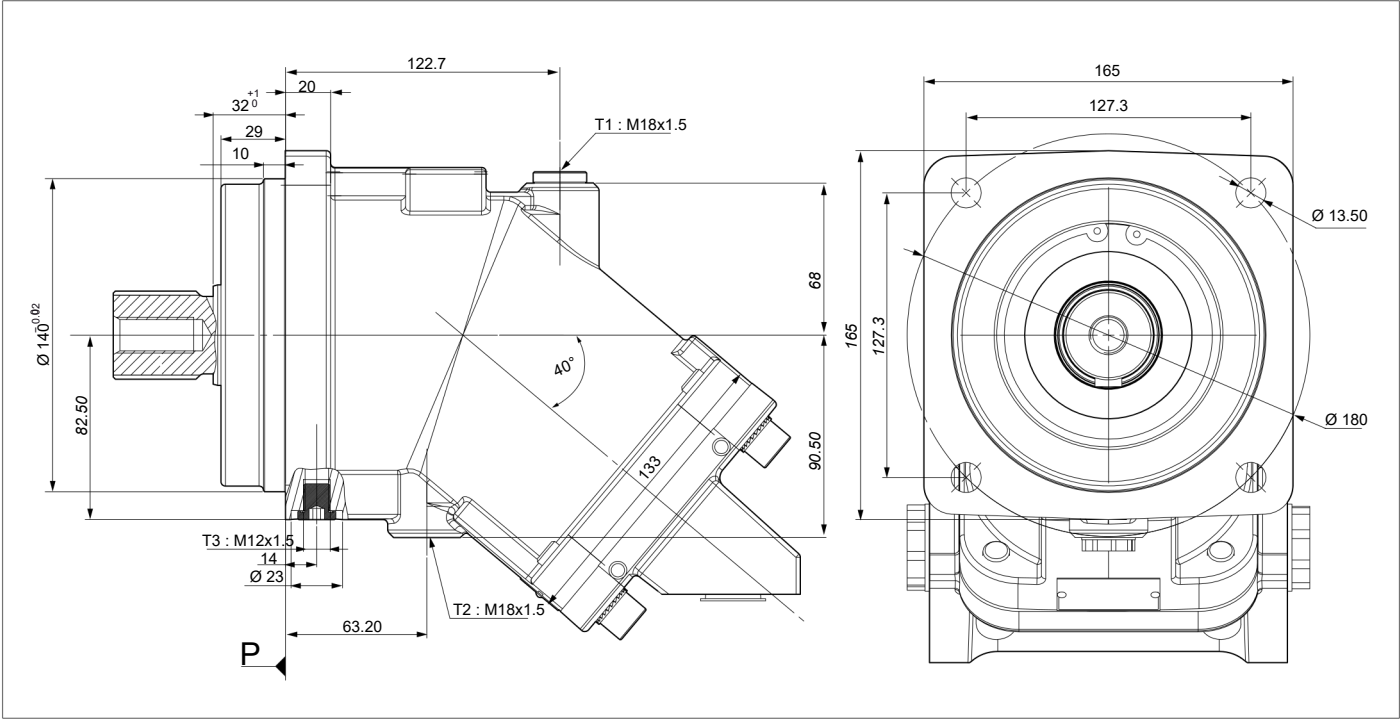
	M 80-90	M 108
A	242.7	243.3
B	216.3	216.9
c	146.4	146.9
D	114.9	115.4
e	68	66
F	M33x2 depth 18	M42x2 depth 20

SD2 S de threaded
ports

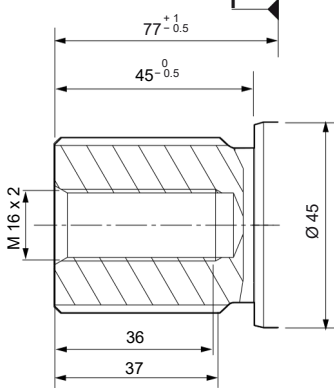


	M 80-90	M 108
F A	242.7	243.3
B	192.5	194.4
c	146.4	146.9
D	95	96.6
e	160	160
F	M33x2 depth 18	M42x2 depth 20

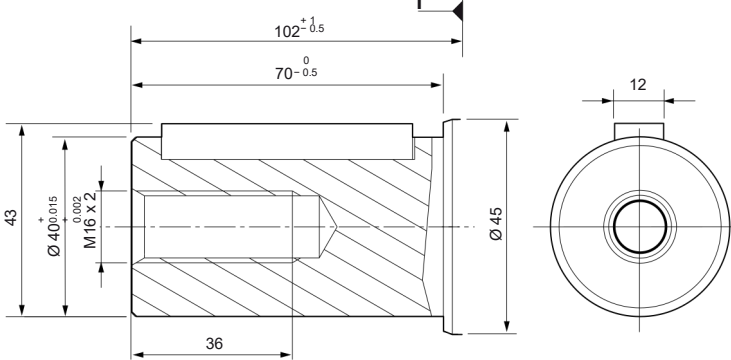
A8PO - 108 cc (ISO) Bent Axis Pump



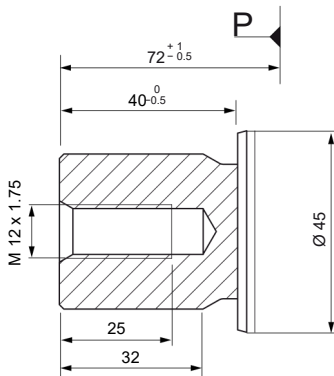
S18 Spl ned shaft DIN 5480 W 40 x 2 x 30 x 18 x 9 g



K40 Cyl ndr cal keyed shaft Ø 40 DIN 6885 AS 12 x 8 x 56

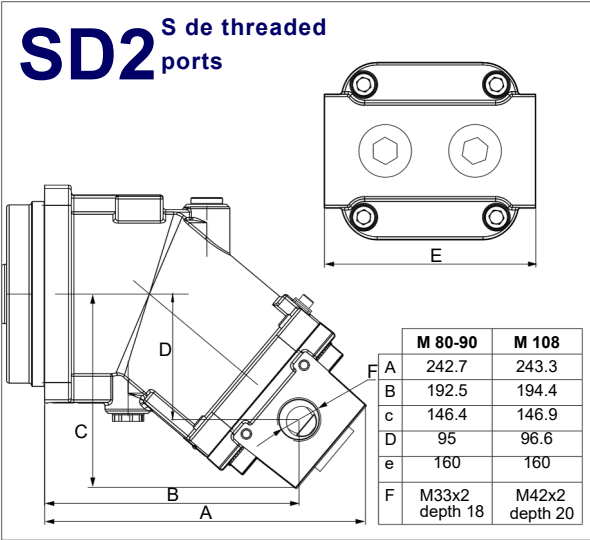
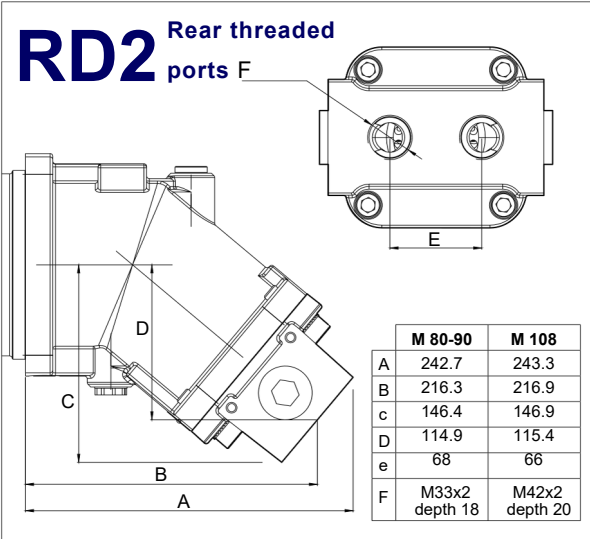
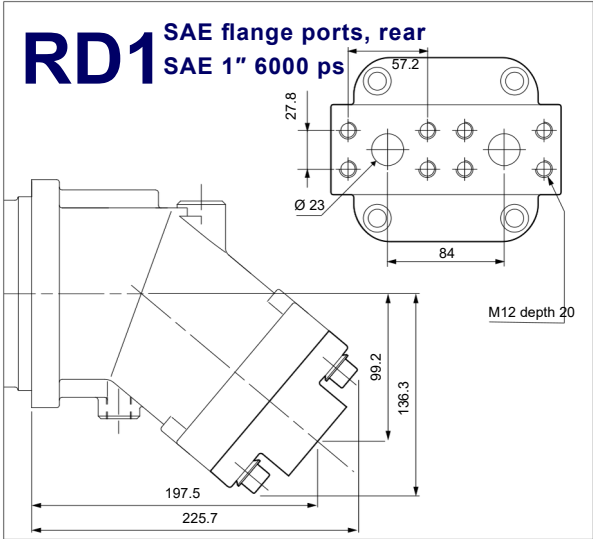
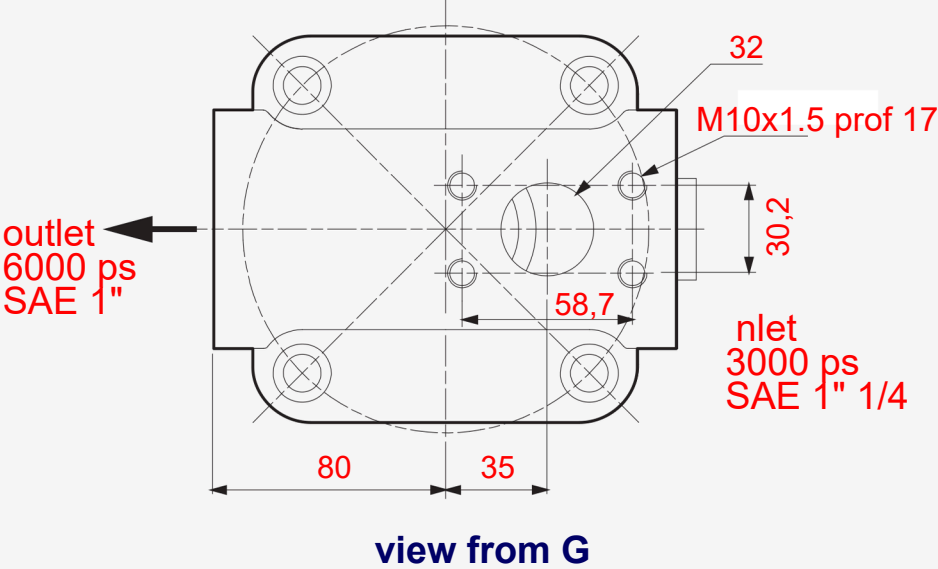


S16 Spl ned shaft DIN 5480 W 35 x 2 x 30 x 16 x 9 g

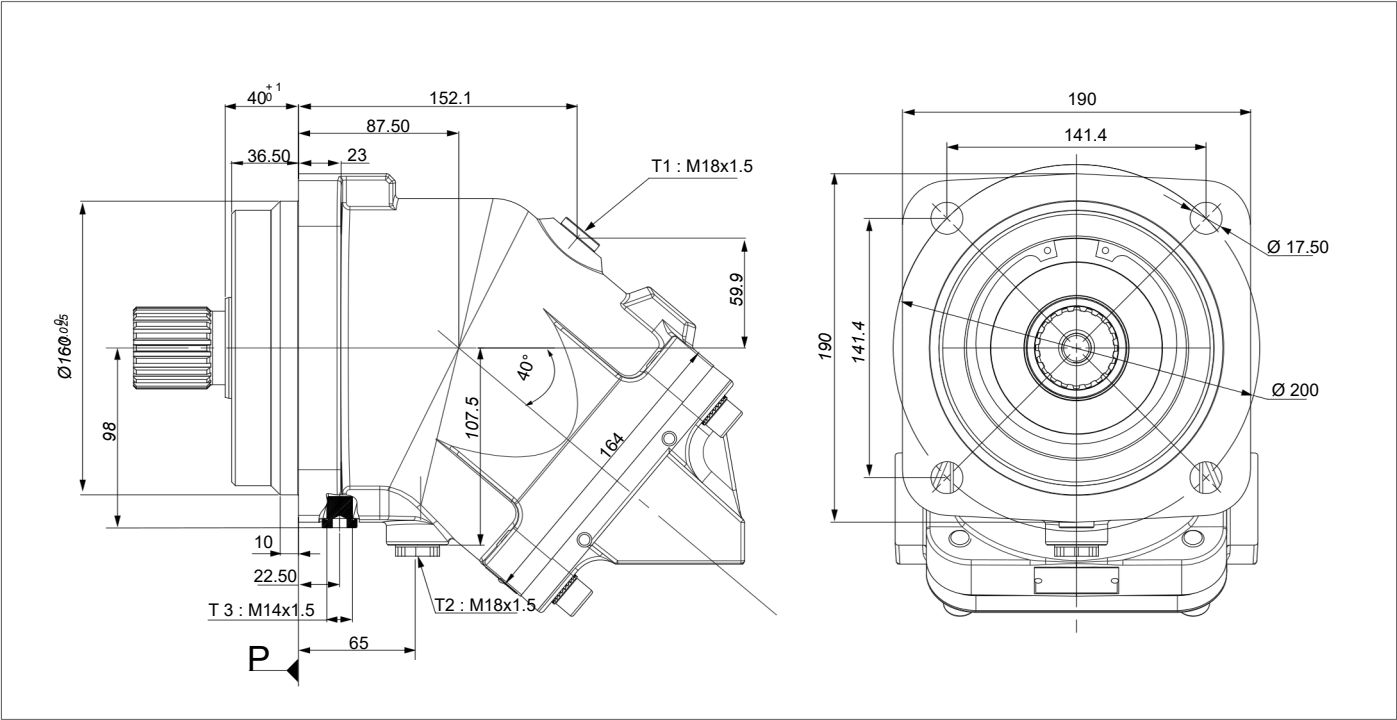


A8PO - 108 cc (ISO) Bent Ax s Pump

SLR



A8PO - 125 cc (ISO) Bent Axis Pump



S21 Spl ned shaft DIN 5480
W 45 x 2 x 30 x 21 x 9 g

P

$90^{+1}_{-0.5}$
 $50^{0}_{-0.5}$

M 16 x 2

Ø 55

$48.5^{+0.018}_{-0.002}$
~~M18x2~~

36
40

K45 Cyl ndr cal keyed shaft Ø 4 5
DIN 6885 AS 14 x 9 x 63

P

$120^{+1}_{-0.5}$
 $80^{0}_{-0.5}$

14

Ø 55

36

S18 Spl ned shaft DIN 5480
W 40 x 2 x 30 x 18 x 9 g

P

$85^{+1}_{-0.5}$
 $45^{0}_{-0.5}$

M 12 x 1.75

Ø 55

43
 $40^{+0.018}_{-0.002}$
M12 x 1.75

28
36

K40 Cyl ndr cal keyed shaft Ø 40
DIN 6885 AS 12 x 8 x 56

P

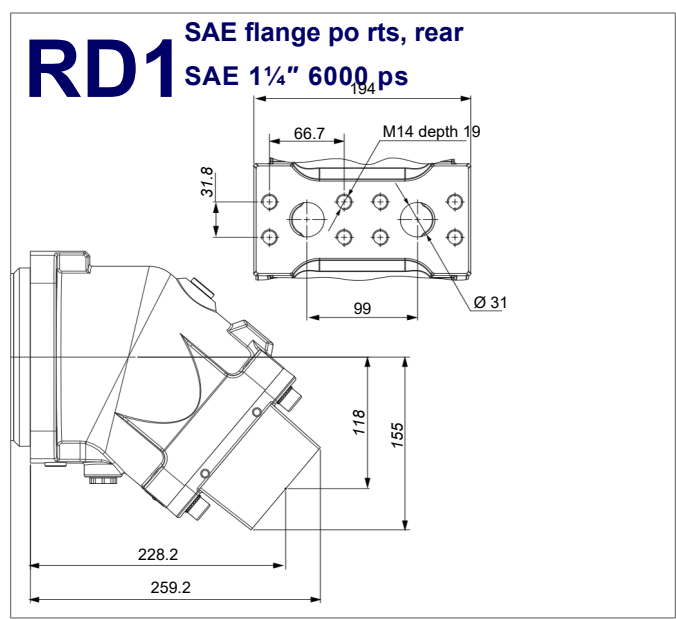
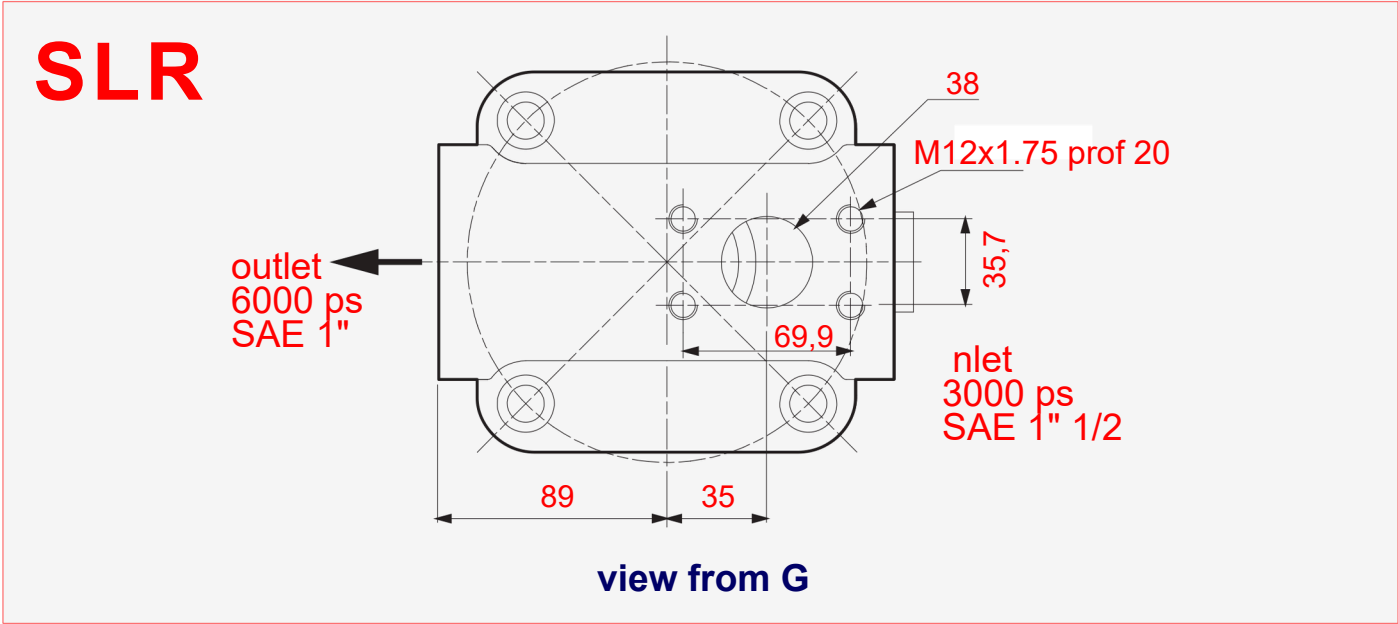
$120^{+1}_{-0.5}$
 $80^{0}_{-0.5}$

12

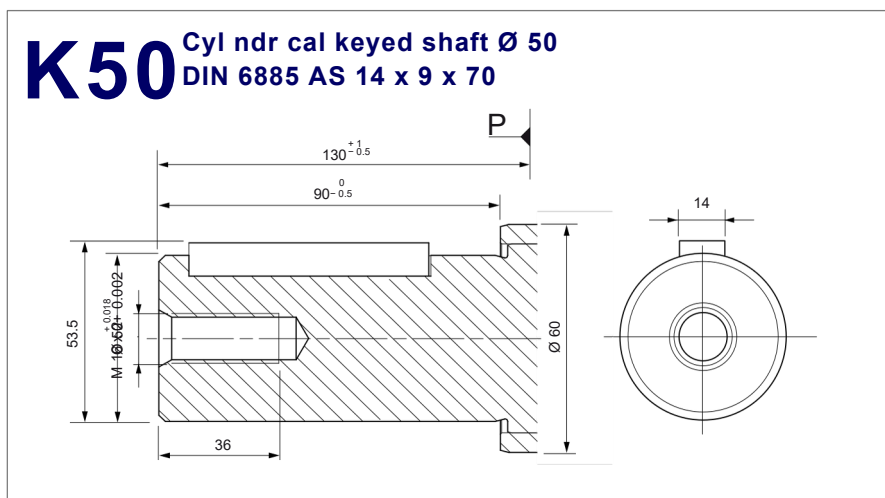
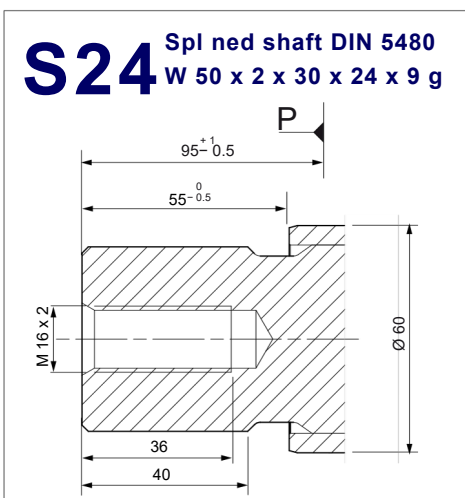
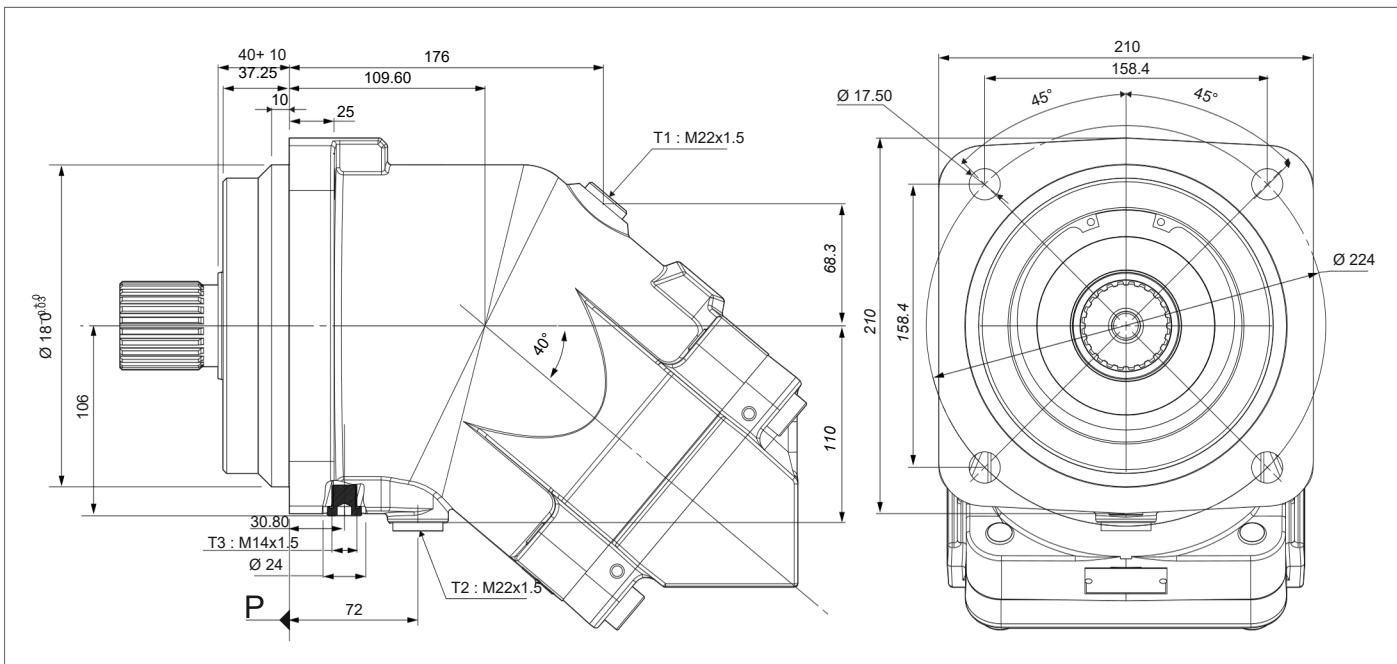
Ø 55

28

A8PO - 125 cc (ISO) Bent Ax s Pump

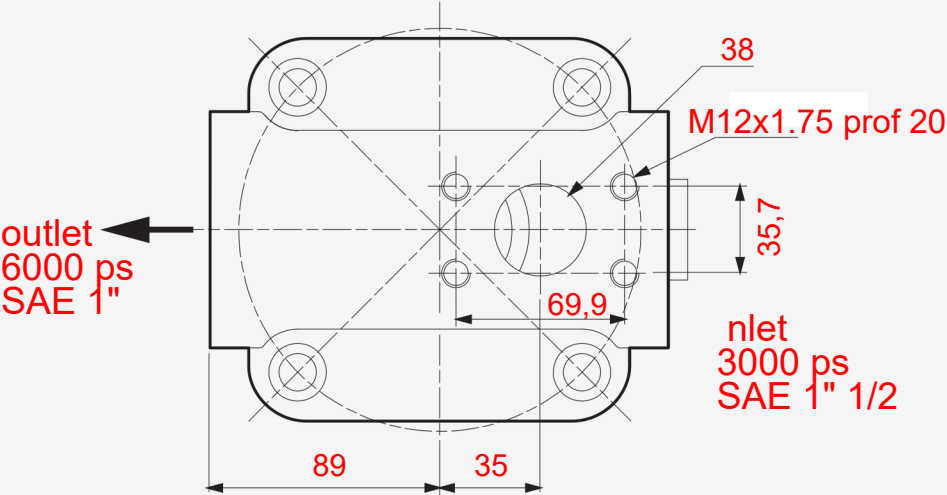


A8PO - 160 cc (ISO) Bent Axis Pump



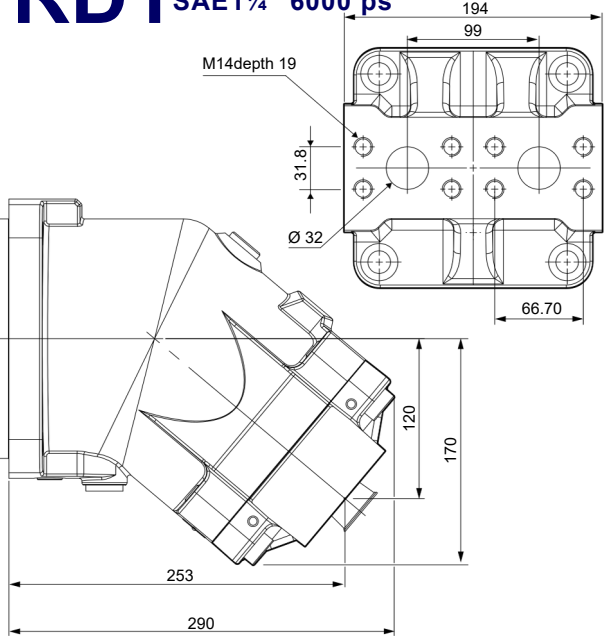
A8PO - 160 cc (ISO) Bent Ax s Pump

SLR

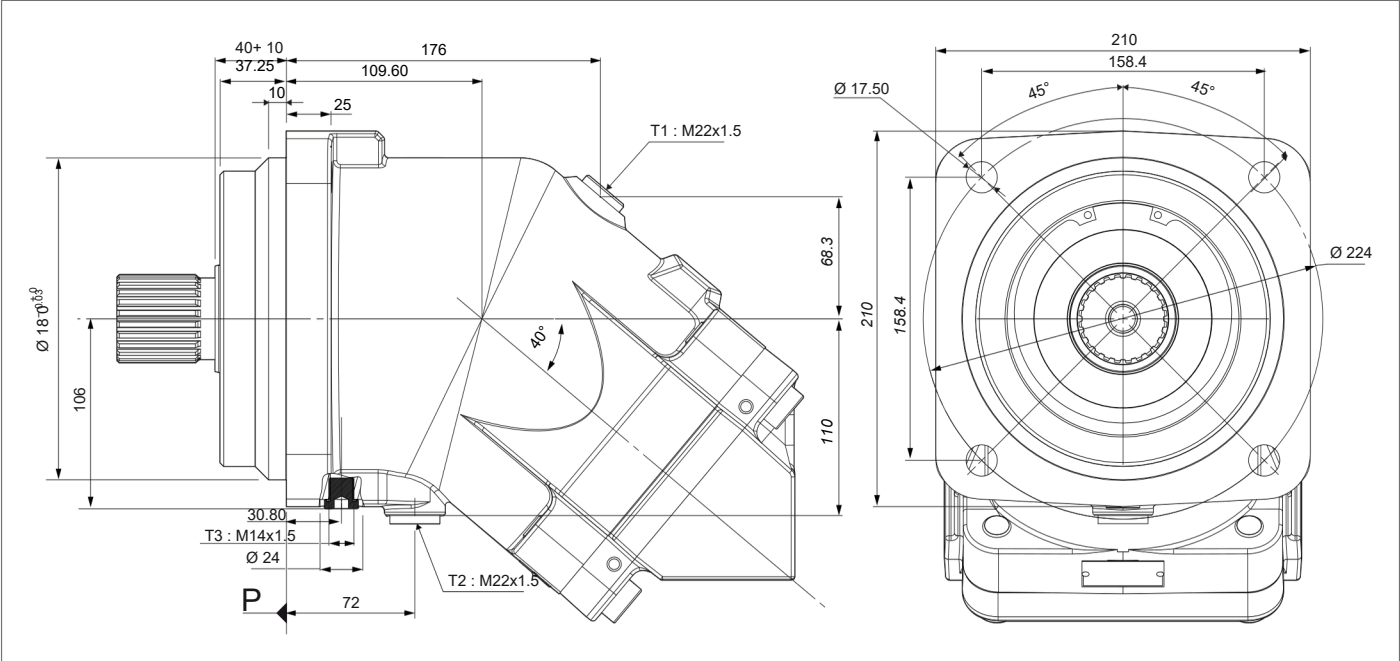


view from G

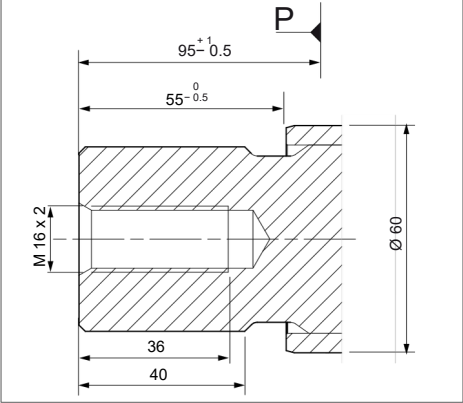
RD1 SAE flange ports, rear
SAE 1 1/4" 6000 ps



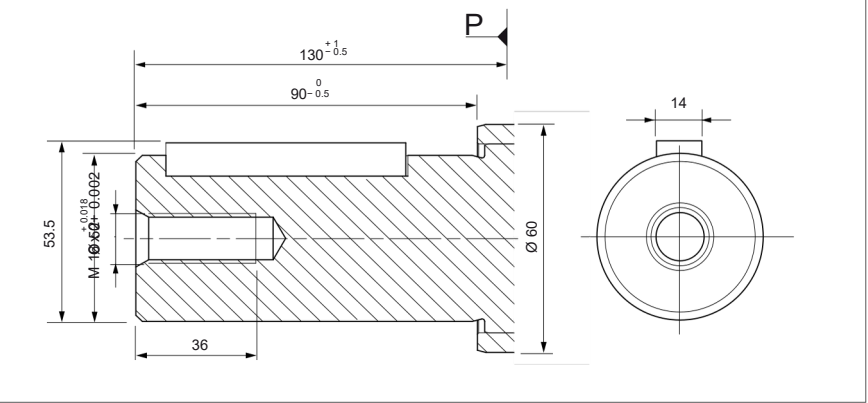
A8PO - 180 cc (ISO) Bent Axis Pump



S24 Spl ned shaft DIN 5480 W 50 x 2 x 30 x 24 x 9 g

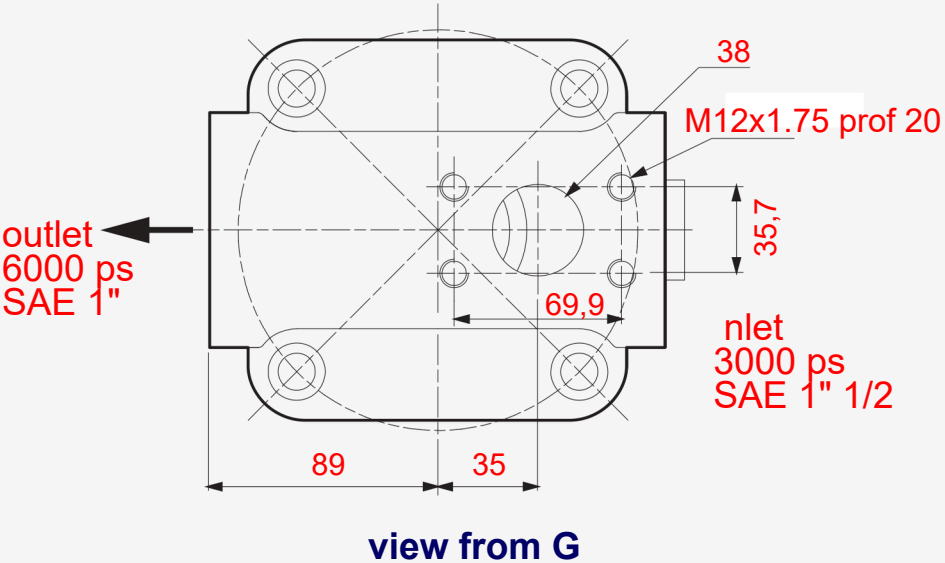


K50 Cyl ndr cal keyed shaft $\varnothing 50$ DIN 6885 AS 14 x 9 x 70

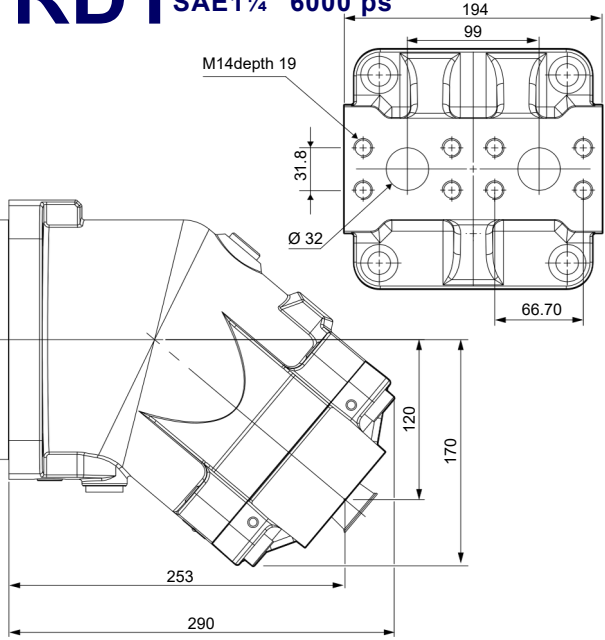


A8PO - 180 cc (ISO) Bent Ax s Pump

SLR

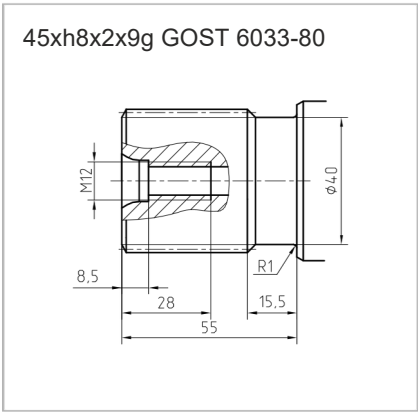
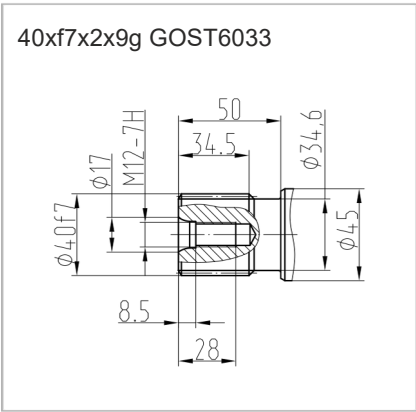
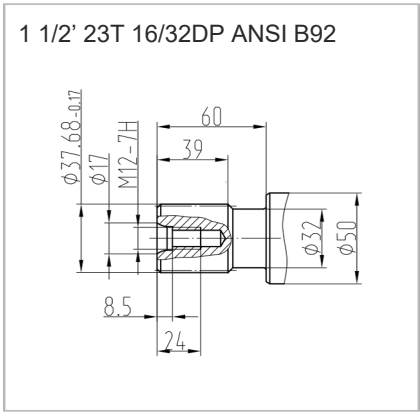
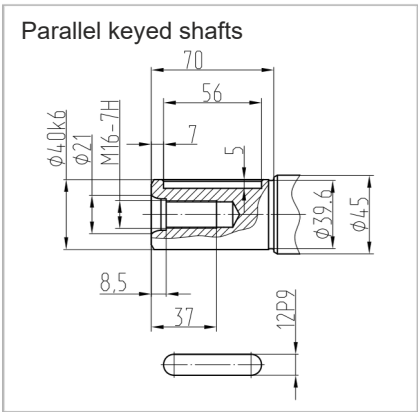
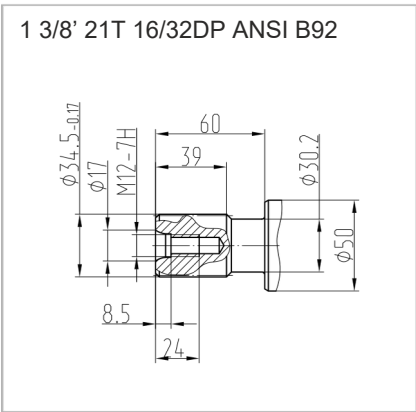
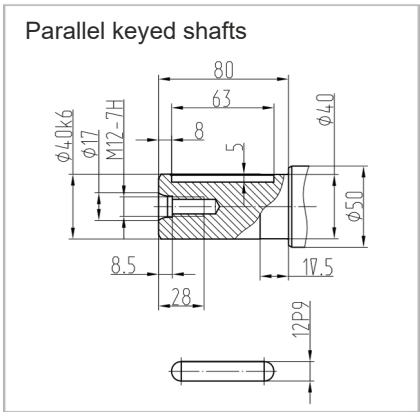
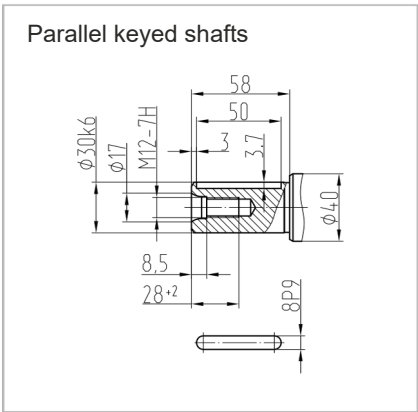
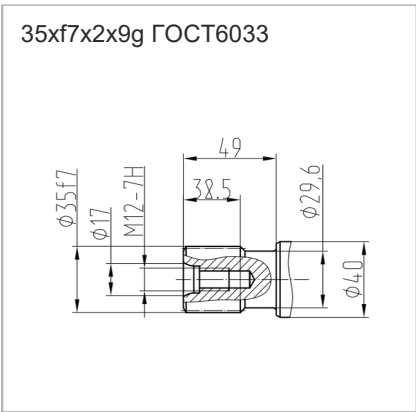
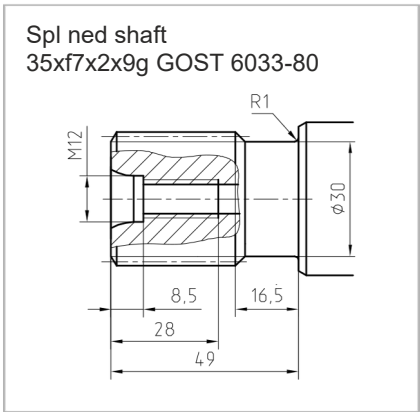


RD1 SAE flange ports, rear
SAE 1 1/4" 6000 ps



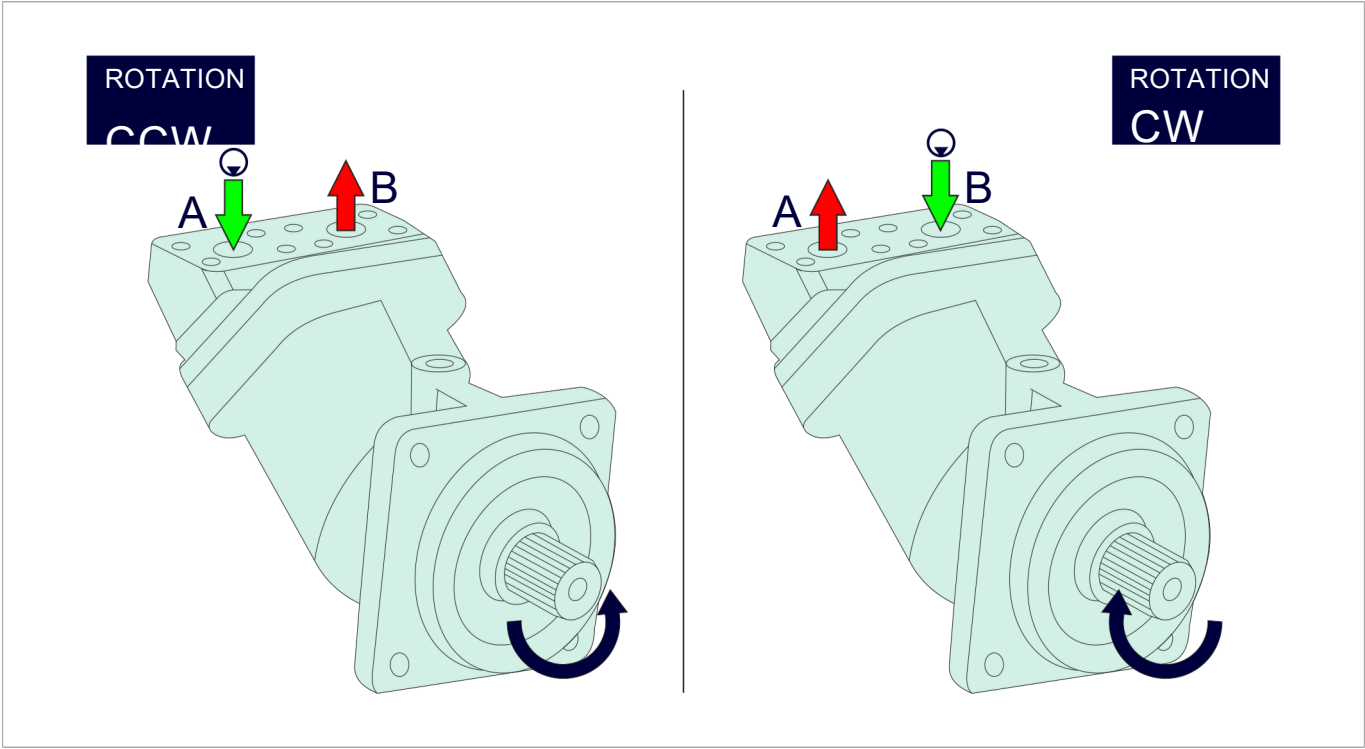
Special Shaft Drive Options for A8PO Pumps

For the Special applications, we produce Special Shaft Drive for the A8PO Pumps.
Details are listed in below.



Direction of Rotation; Reversible

The Pumps rotate clockwise or counter-clockwise depending on the direction of hydraulic flow entering the Pump.



Formulas			
Pump Output Flow	GPM	$GPM = (Speed\ (rpm) \times d\ sp.\ (cu.\ in.)) / 231$	$GPM = (n \times d) / 231$
Pump Input Horsepower	HP	$HP = GPM \times Pressure\ (ps) / 1714 \times Efficiency$	$HP = (Q \times P) / 1714 \times E$
Pump Efficiency	E	Overall Efficiency = Output HP / Input HP	$E_{overall} = HP_{out} / HP_{in} \times 100$
		Overall Efficiency = Volumetric Eff. $\times$ Mechanical Eff.	$E_{overall} = Eff_{Vol.} \times Eff_{Mech.}$
Pump Volumetric Efficiency	E	Volumetric Efficiency = Actual Flow Rate Output (GPM) / Theoretical Flow Rate Output (GPM) $\times 100$	$Eff_{Vol.} = Q_{act.} / Q_{theo.} \times 100$
Pump Mechanical Efficiency	E	Mechanical Efficiency = Theoretical Torque to Drive / Actual Torque to Drive $\times 100$	$Eff_{Mech} = T_{theo.} / T_{act.} \times 100$
Pump Displacement	CIPR	$Displacement\ (in.^3 / rev.) = Flow\ Rate\ (GPM) \times 231 / Pump\ RPM$	$CIPR = GPM \times 231 / RPM$
Pump Torque	T	Torque = Horsepower $\times 63025 / RPM$	$T = 63025 \times HP / RPM$
		Torque = Pressure (PSIG) $\times$ Pump Displacement (CIPR) / 2π	$T = P \times CIPR / 6.28$

- Horsepower for driving a pump

: For every 1 hp of drive, the equivalent of 1 gpm @ 1500 psi can be produced.
- Horsepower for idling a pump

: To idle a pump when it's unloaded will require about 5% of its full rated power
- Wattage for heating hydraulic oil

: Each watt will raise the temperature of 1 gallon of oil by 1° F. per hour.
- Flow velocity in hydraulic lines

: Pump suction lines 2 to 4 feet per second, pressure lines up to 500 psi - 10 to 15 ft./sec., pressure lines 500 to 3000 psi - 15 / 20 ft./sec.; all oil lines in a r-over-o systems; 4 ft./sec.

Installation & Assembly Informations for Bent Axis Pumps

POSITION

ISO Flange Bent Axis Pumps can be operate any position.

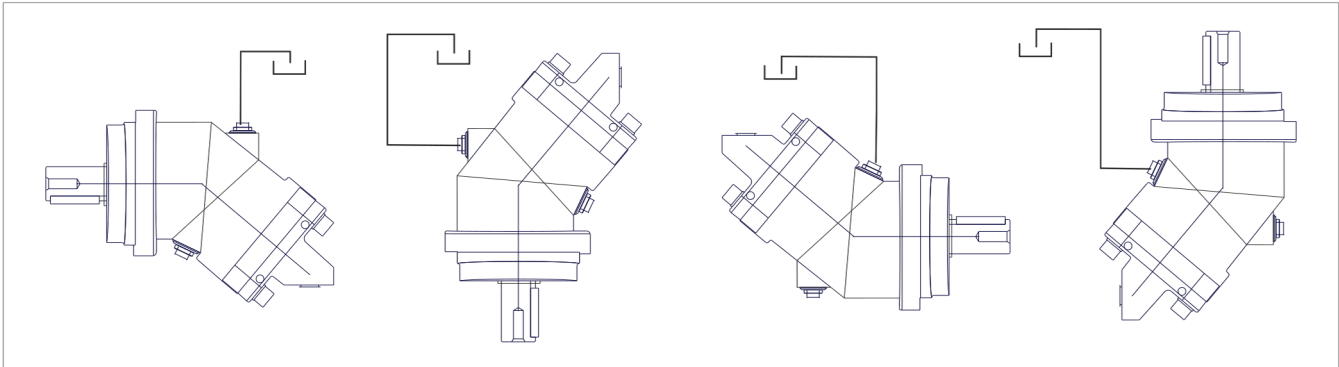
DIRECTION OF ROTATION

ISO Flange Bent Axis Pumps can be operate in both directions of rotation.

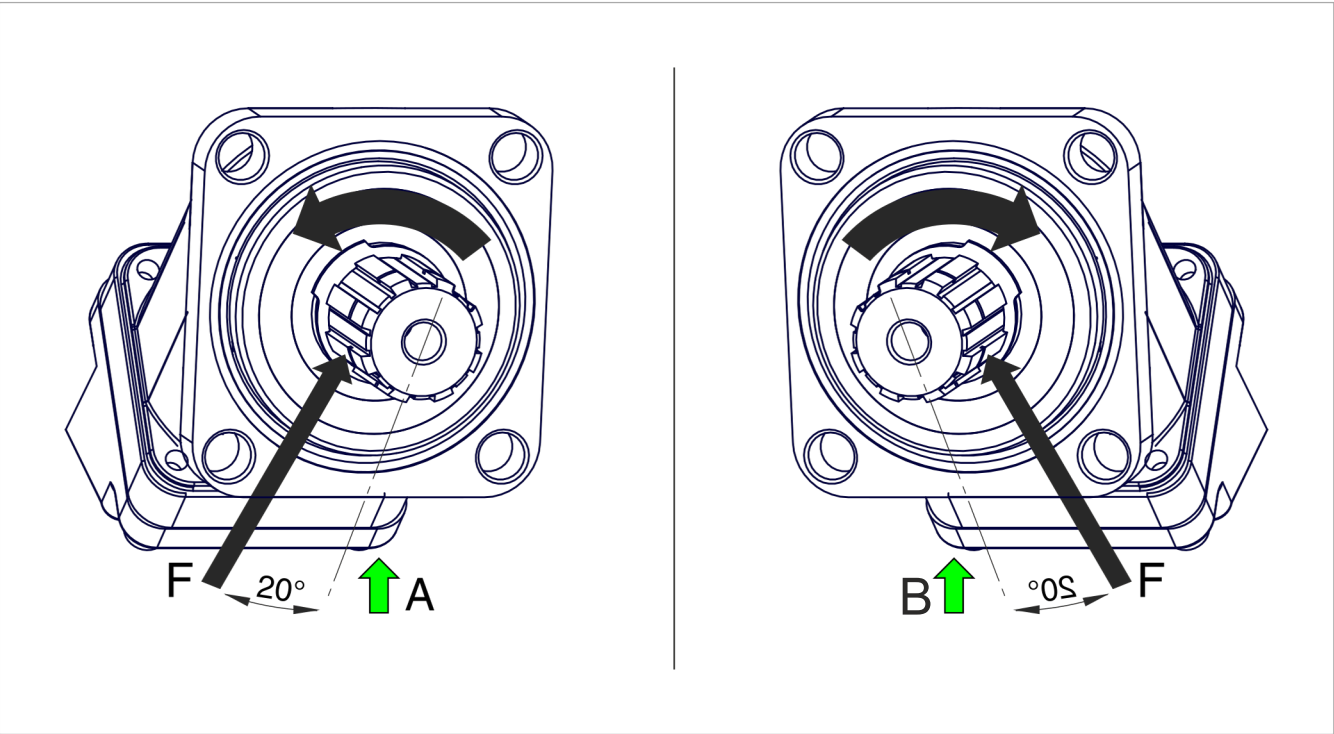
Before of Installation operation, the Pump must be filled with hydraulic fluid and a r bled.

INSTALLATION POSITION

See following examples.



HYDRAULIC FLUID
Recommended ; Generally :
between 15 and 200 cSt.
Maximum : between 5 and 1600 cSt.



FOR USE;
Available a e-mail on request or each Pump is supplied v a Starting datasheet.

Formulas, Calculations, Installation Guide

Quick Calculation

Flow rate

$$Q = \frac{VS \times n}{1000} \text{ (lpm)}$$

Torque

$$M = \frac{V_s \times DP \times \eta_{mh}}{63} \text{ (Nm)}$$

Power

$$P = \frac{2p \times M \times n}{60000} = \frac{M \times n}{9549} = \frac{Q \times DP \times h_t}{600} \text{ (kw)}$$

Speed

$$n = \frac{1000 \times Q_v \times h_v}{VS} \text{ (lpm)}$$

- V = Displacement (ccm/rev.)
- S = Differential pressure (bar)
- p = Speed (rpm)
- n = Flow (lpm)
- Q_v = Volumetric efficiency
- η_{mh} = Mechanical-hydraulic efficiency
- η_t = Total efficiency (η_t = η_v × η_{mh})

New frame sizes to meet market requirements.
Optional by-pass valve.

For use in mobile & industrial and stationary applications areas.

The pump drive shaft bearings are designed to give the service life expected in these areas of operation. Interchangeable with other bent axis pumps & Pumps

40° bent axis design giving high power, small overall dimensions, optimum efficiency and economic design. Flange and shaft designed for direct mounting on truck gearbox PTO's. The fixed displacement bent axis pumps generate a hydraulic fluid flow. It is designed for use in trucks, commercial vehicles and all stationary hydraulic applications. The pump is a fixed pump with rotary group in bent-axis design open circuits. Flow is proportional to drive speed and displacement.

For axial piston units with bent-axis design, the Pistons are arranged diagonally with respect to the drive shaft. The pump motor covers the whole displacement range 5 to 130 cm³/rev. The pump has been developed with modern styling and design to satisfy market demand as to designed new generation plate and pistons with give high flow performance, high pressures with high efficiency and very small dimensions.

The pump is available both to DIN and SAE world standards and can be mounted either directly at the gear box or via a drive shaft. If necessary it can also be augmented with a by-pass valve.

Other brand bent axis pumps compatible and interchangeable with bent axis pumps motors. Refer to the data sheet and order confirmation for the technical data, operating conditions and operating limits of the bent axis piston pumps.

A8PS (SAE) Bent Axis Pumps

High Pressure Hydraulic Bent Axis Piston Pumps, High Pressure, 450/500 BAR Working Pressure. High Rotational Speed, High Efficiency, Slim Design, Cast Iron Pump Body, Re-Designed in 2022.

Designation;

5cc, 10cc, 12cc, 18cc, 25cc, 32cc, 41cc, 50cc,
56cc, 63cc, 80cc, 108cc, 130cc, 160cc, 180cc

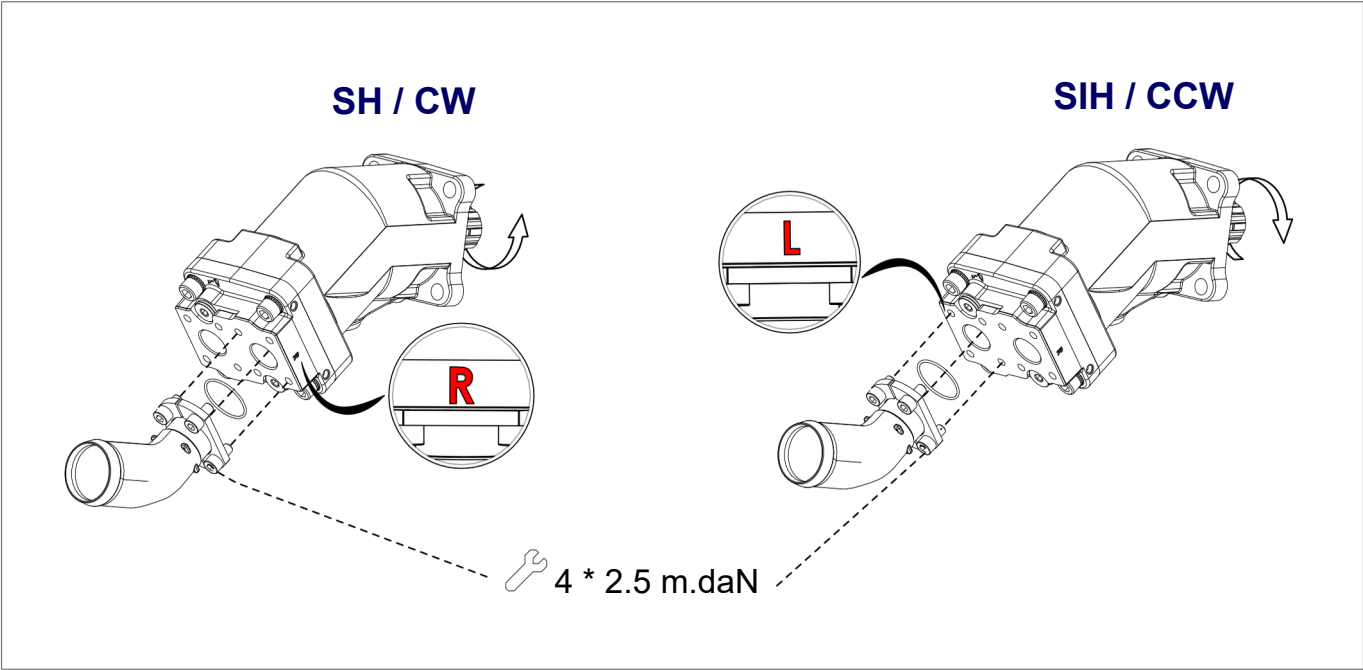


Characteristics of the A8PS - SAE Flange Bent Axis Pumps

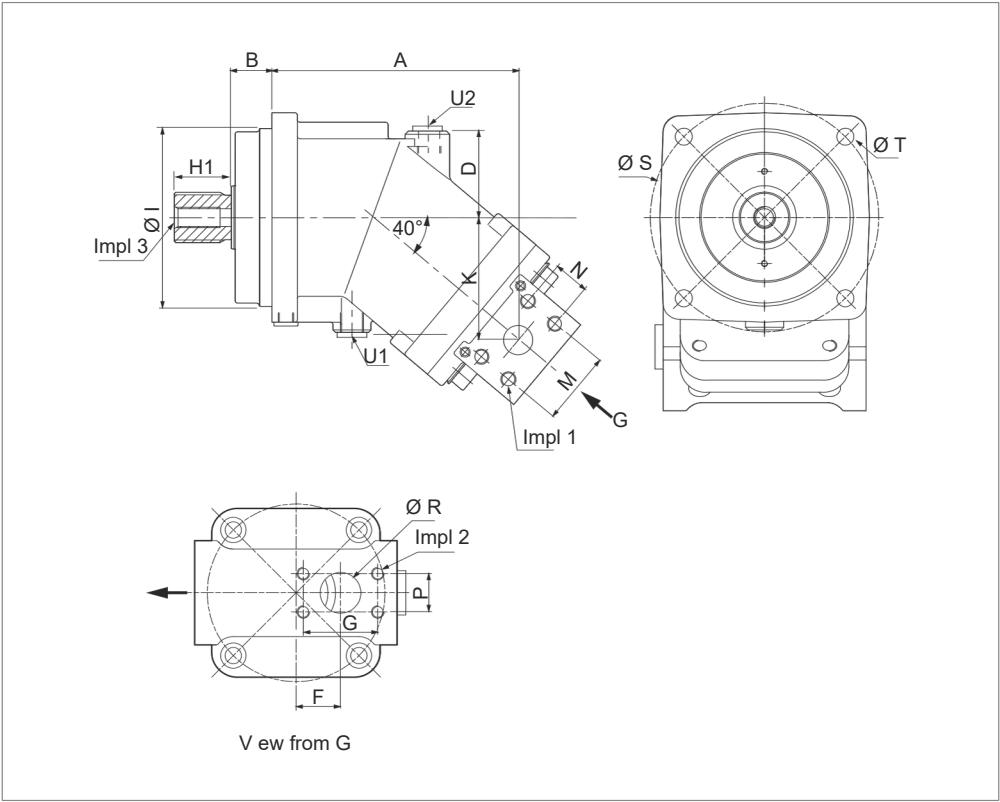
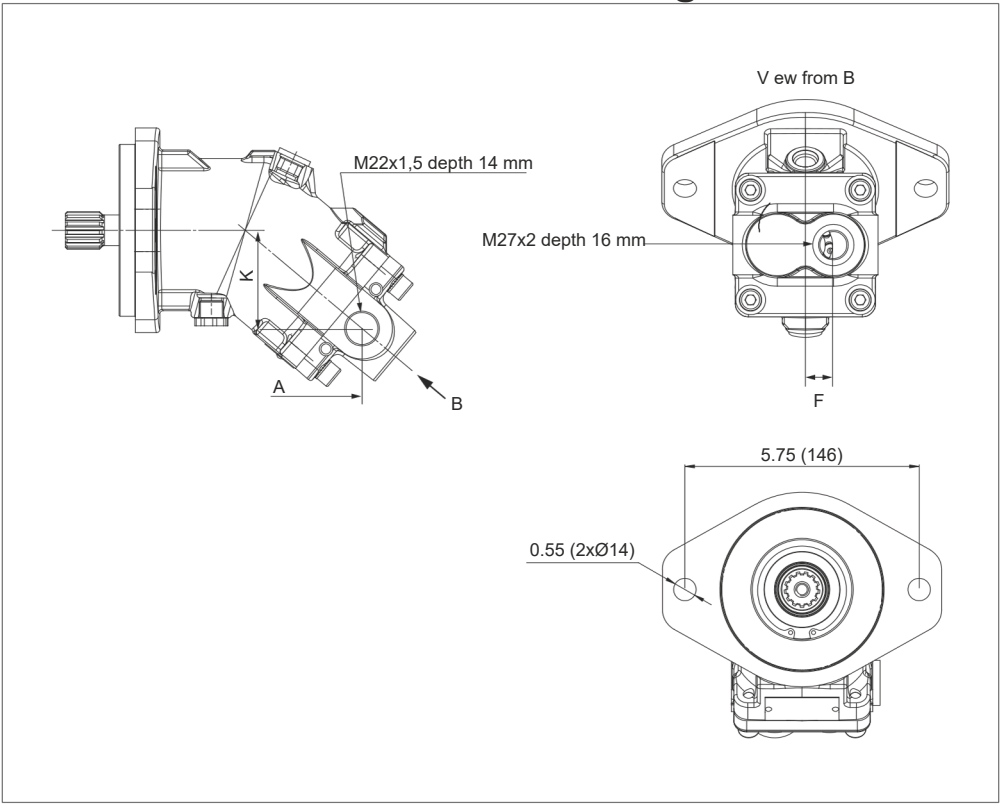
Pump MODEL	DISPL. (cc)	MAX. PEAK/CONTINUOUS PRESSURE (bar)	MAXIMUM SPEED (rpm)	MAX.TORQUE ABSORBED AT 380 BAR (N.m)	WEIGHT WITHOUT INLET FITTING (kg)	WEIGHT WITH INLET FITTING (kg)	TORQUE WITHOUT FITTING (N.m)	TORQUE WITH FITTING (N.m)
5 cc	5.1	450 / 400	3300	60	9.00	9.40	8.20	8.60
10 cc	10.2	450 / 400	3200	68	9.00	9.40	8.65	9.05
12 cc	12.0	450 / 400	3150	76	9.20	9.60	8.74	9.14
18 cc	18.0	450 / 400	2900	114	9.30	9.70	8.79	9.19
25 cc	25.0	450 / 400	2750	159	11.00	11.40	8.89	9.29
32 cc	32.0	450 / 400	2700	204	11.10	11.50	11.10	11.50
41 cc	41.0	450 / 400	2550	261	11.20	11.60	11.15	11.55
50 cc	50.3	450 / 400	2450	318	17.80	18.20	18.10	18.50
56 cc	56.0	450 / 400	2400	375	17.80	18.20	18.10	18.50
63 cc	63.0	450 / 400	2300	401	17.80	18.20	18.10	18.50
80 cc	80.4	450 / 400	2150	509	24.80	25.20	27.80	28.30
108 cc	108	450 / 400	1900	687	34.90	35.30	37.92	38.42
125 cc	125	450 / 400	1750	827	35.30	35.70	38.70	39.50
160 cc	160	450 / 400	1900	891	44.90	45.30	47.92	48.42
180 cc	180	450 / 400	1750	1006	45.30	45.70	48.70	49.50

Direction of Rotation; CW and CCW

The Pumps rotate clockwise or counter-clockwise depending on the direction of hydraulic flow entering the Pump.



Characteristics of the A8PS - SAE Flange Bent Axis Pumps



Characteristics of the A8PS - SAE Flange Bent Axis Pumps

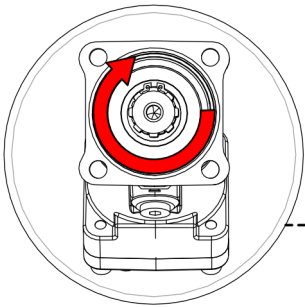
Pump MODEL	A	B	D	F	G	I	K	M	N	P	R	S	T
5 cc	134.1	7.9	41.9	17	-	101.6	58	-	-	-	-	SAE-B2	14
10 cc	134.1	7.9	41.9	17	-	101.6	58	-	-	-	-	SAE-B2	14
12 cc	134.1	7.9	41.9	17	-	101.6	58	-	-	-	-	SAE-B2	14
18 cc	134.1	7.9	41.9	17	-	101.6	58	-	-	-	-	SAE-B2	14
25 cc	157.8	7.9	56	22	47.6	127.0	66	40.5	18.2	22.2	19	162	14.3
32 cc	164.0	7.9	56	22	47.6	127.0	71	40.5	18.2	22.2	19	162	14.3
41 cc	164.0	7.9	56	22	47.6	127.0	71	40.5	18.2	22.2	19	162	14.3
50 cc	189.2	7.9	59	30	52.5	127.0	85	50.8	23.8	26.2	25	162	14.3
56 cc	189.2	7.9	59	30	52.5	127.0	85	50.8	23.8	26.2	25	162	14.3
63 cc	189.2	7.9	59	30	52.5	127.0	85	50.8	23.8	26.2	25	162	14.3
80 cc	215.2	7.9	68	35	58.7	152.4	97	57.2	27.8	30.2	32	228.6	21.0
108 cc	235.0	7.9	60	35	69.9	152.4	100.8	66.7	31.8	35.7	38	228.6	21.0
125 cc	235.0	7.9	60	35	69.9	152.4	100.8	66.7	31.8	35.7	38	228.6	21.0
160 cc	267.7	7.9	68	49.5	77.8	152.4	105.7	66.7	31.8	42.9	51	228.6	21.0
180 cc	267.7	7.9	68	49.5	77.8	152.4	105.7	66.7	31.8	42.9	51	228.6	21.0

Pump MODEL	Splined Shaft	H1	Outlet 6000 PSI	Inlet 3000 PSI	Impl 1	Impl 2	Impl 3	U1 / U2
5 cc	13T 16/32 SAE B	33.3	M22x1.5	M27x2	-	-	5/16"-18 UNC	9/19"-18 UNF
10 cc	13T 16/32 SAE B	33.3	M22x1.5	M27x2	-	-	5/16"-18 UNC	9/19"-18 UNF
12 cc	13T 16/32 SAE B	33.3	M22x1.5	M27x2	-	-	5/16"-18 UNC	9/19"-18 UNF
18 cc	13T 16/32 SAE B	33.3	M22x1.5	M27x2	-	-	5/16"-18 UNC	9/19"-18 UNF
25 cc	13T 16/32 SAE B	33.3	SAE 1/2"	SAE 3/4"	M8x1.25 dp 15	M10x1.5 prf 17	7/16"-14 UNC	3/4"-16 UNF
32 cc	13T 16/32 SAE B	33.3	SAE 1/2"	SAE 3/4"	M8x1.25 dp 15	M10x1.5 prf 17	7/16"-14 UNC	3/4"-16 UNF
41 cc	13T 16/32 SAE B	33.3	SAE 1/2"	SAE 3/4"	M8x1.25 dp 15	M10x1.5 prf 17	7/16"-14 UNC	3/4"-16 UNF
50 cc	13T 12/24 SAE C	48.0	SAE 3/4"	SAE 1"	M10x1.5 dp 17	M10x1.5 prf 17	7/16"-14 UNC	3/4"-16 UNF
56 cc	13T 12/24 SAE C	48.0	SAE 3/4"	SAE 1"	M10x1.5 dp 17	M10x1.5 prf 17	7/16"-14 UNC	3/4"-16 UNF
63 cc	13T 12/24 SAE C	48.0	SAE 3/4"	SAE 1"	M10x1.5 dp 17	M10x1.5 prf 17	7/16"-14 UNC	3/4"-16 UNF
80 cc	13T 12/24 SAE C	48.0	SAE 1"	SAE 1" 1/4	M12x1.75 dp 20	M10x1.5 prf 17	7/16"-14 UNC	3/4"-16 UNF
108 cc	13T- 8/16 SAE D	67.0	SAE 1" 1/4	SAE 2"	1/2" - 13 UNC	1/2" - 13 UNC	5/8" - 11 UNC	7/8" - 14 UNF
125 cc	13T- 8/16 SAE D	67.0	SAE 1" 1/4	SAE 2"	1/2" - 13 UNC	1/2" - 13 UNC	5/8" - 11 UNC	7/8" - 14 UNF
160 cc	13T- 8/16 SAE D	67.0	SAE 1" 1/4	SAE 2"	1/2" - 13 UNC	1/2" - 13 UNC	5/8" - 11 UNC	7/8" - 14 UNF
180 cc	13T- 8/16 SAE D	67.0	SAE 1" 1/4	SAE 2"	1/2" - 13 UNC	1/2" - 13 UNC	5/8" - 11 UNC	7/8" - 14 UNF

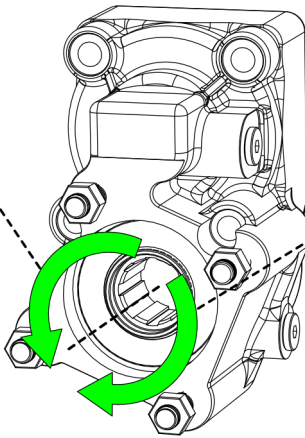
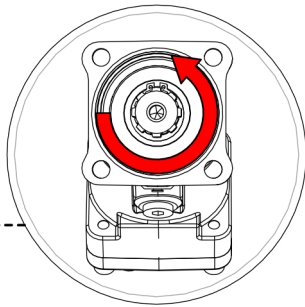
Ordering Code; A8PS - SAE Flange Bent Axis Pumps

Model Code	Displacement		Shaft Type	Flange Type	Rotation	Sealing
A8PS	25		S	B6	R	V
A8PS Bent Axis Hydraulic Pump SAE Flange	5	56	S Splined Shaft	B2 2 Bolt SAE Flange Shaft	R CW Right Direction of Rotation	V Viton High Pressure Seal
	10	63				
	12	80	K Keyed Shaft		L CCW Left Direction of Rotation	N Nitrile Seal 5/10 Bar
	18	108				
	25	125				
	32	160				
	41	180				
	50					
			B6 6 Bolt SAE Flange Shaft			

SH / CW

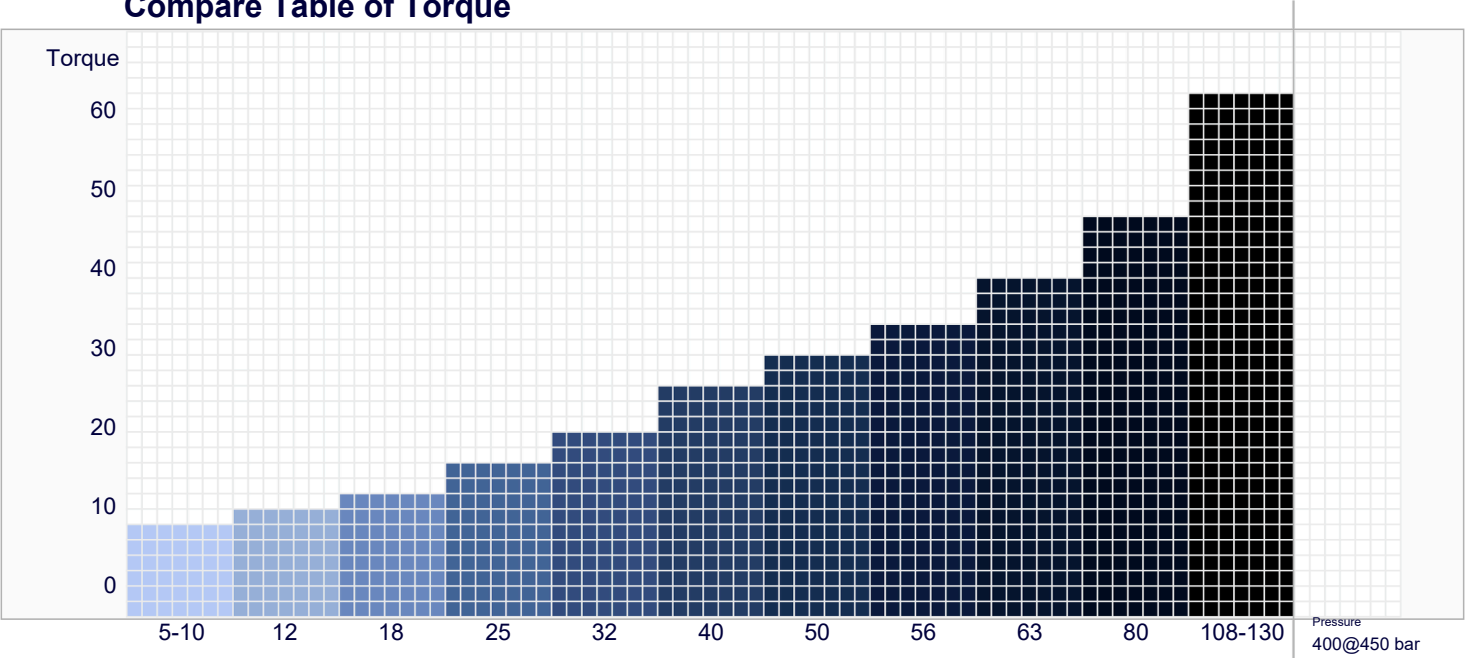


SIH / CCW

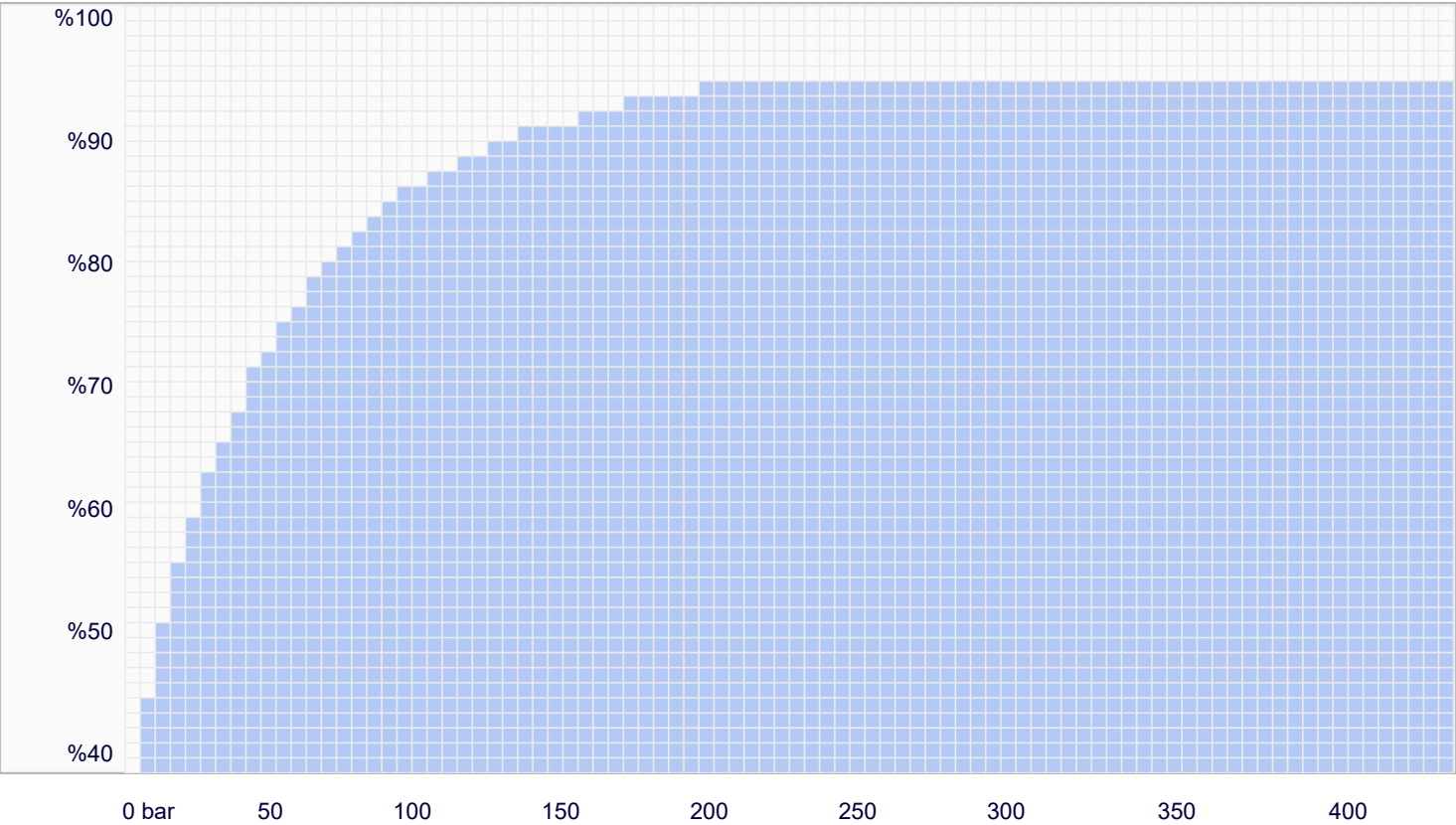


Performance, Torque, Speed and Pressure Charts

Compare Table of Torque

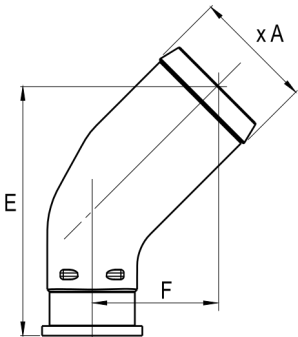


Efficiency of Bent Axis Pumps (1000 rpm)



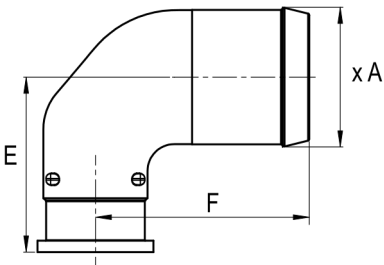
Suction Fittings for A8PS (SAE) Bent Axis Pumps

45° elbow fittings kit

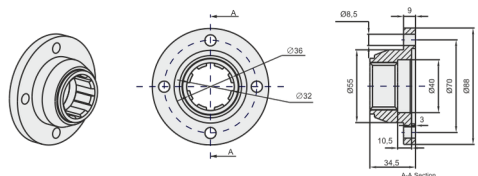
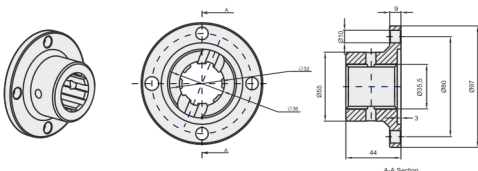
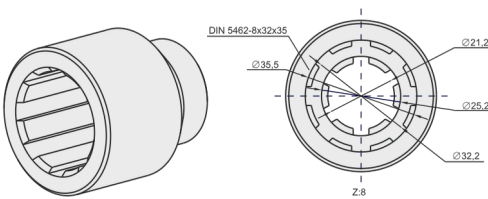
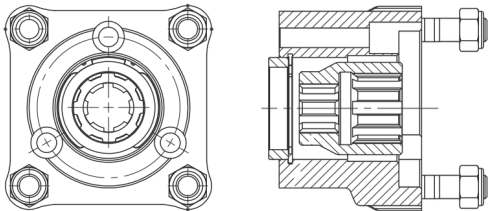


Reference	Ø hose	Ø A	E	F
450039	1 1/2"	39.1	91.7	46.7
450043	42	43	91.7	46.7
450046	1 3/4"	46	91.7	46.7
450051	2"	51.8	108.4	54.4
450064	2 1/2"	64.5	125.2	62.2

90° elbow fittings kit



Reference	Ø hose	Ø A	E	F
900039	1 1/2"	39.1	58.6	79.5
900051	2"	51.8	64.9	80.2
900064	2 1/2"	64.5	71.3	87.5



Inlet Fittings & Installation Parts

- Split Flange
- Seal
- Screw



By-Pass Valves

- 12 V
- 24 V



Hydraulic Adapters

- PTO Position Pump Adapter
- PTO Gear Pump Adapter
- Long / Short Adapter



Flanges

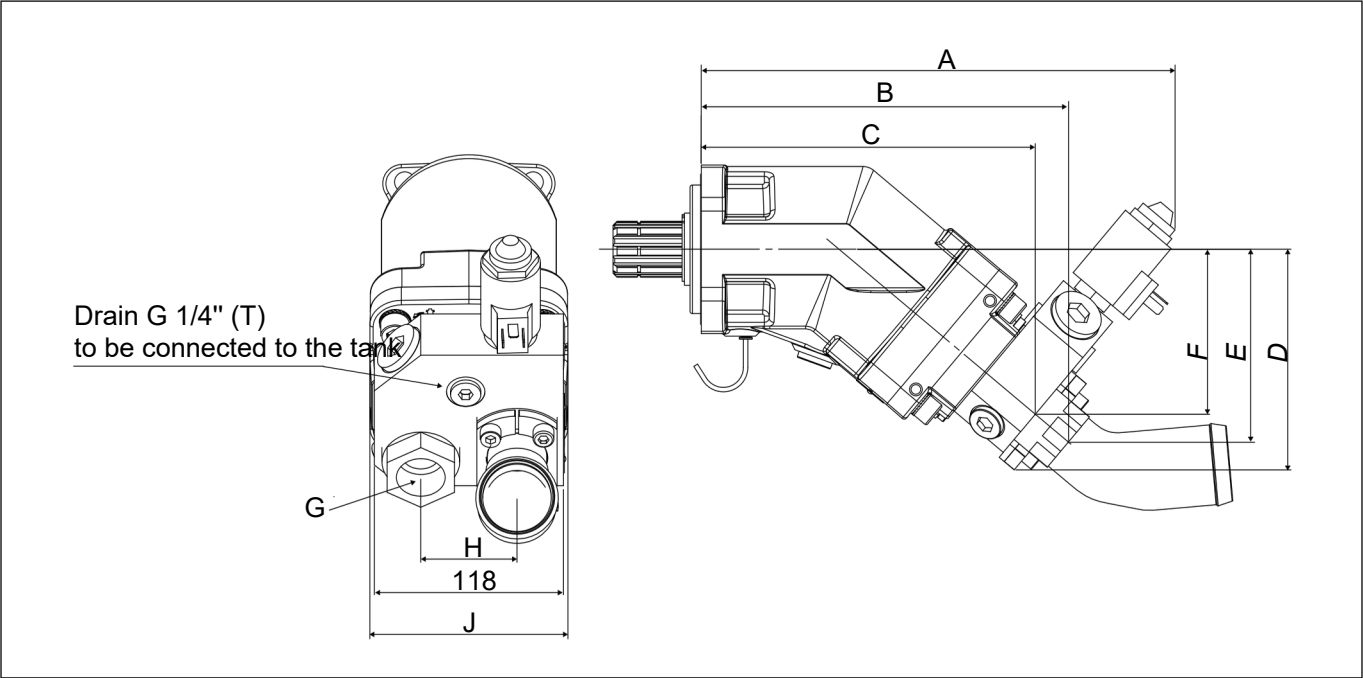
- 1120 (6 Spl ne)
- 1120 (8 Spl ne)
- 1300 (6 Spl ne)
- 1300 (8 Spl ne)



Couplers

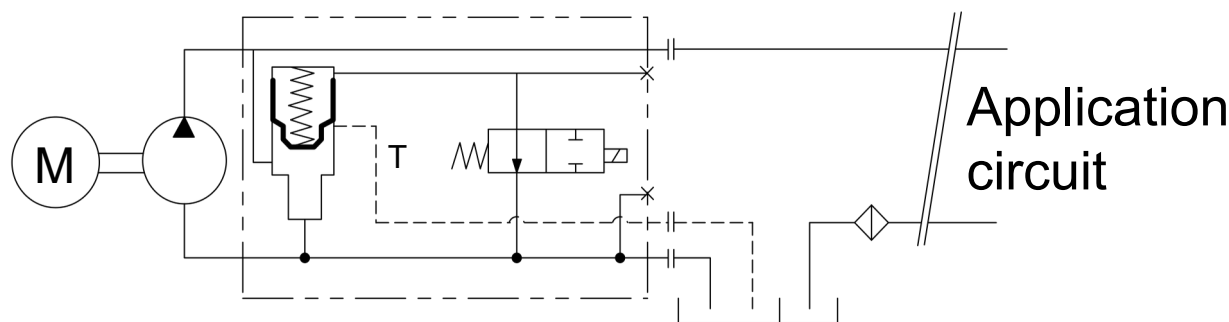
- 6 x 8 Coupler
- 6 x 8 Coupler (Long)
- 8 x 8 Coupler
- 8 x 8 Coupler (Long)

ByPass Valve for A8PS (SAE) Bent Axis Pumps



Pump MODEL	DISPL. (cc)	A	B	C	D	E	F	G	H	J
5 cc	5.1	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
10 cc	10.2	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
12 cc	12.0	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
18 cc	18.0	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
25 cc	25.0	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
32 cc	32.0	295.50	229.00	208.30	137.30	120.10	102.70	G 3/4"	54	108
41 cc	41.0	295.50	229.00	208.30	137.30	120.10	102.70	G 3/4"	54	108
50 cc	50,3	307.10	240.40	220.00	147.10	129.70	112.50	G 3/4"	54	108
56 cc	56,0	307.10	240.40	220.00	147.10	129.70	112.50	G 3/4"	54	108
63 cc	63.0	307.10	240.40	220.00	147.10	129.70	112.50	G 3/4"	54	108
80 cc	80,4	334.00	269.00	246.70	157.80	143.90	124.80	G 1"	60	123
108 cc	108	334.00	269.00	246.70	157.80	143.90	124.80	G 1"	60	123
130 cc	130	336.30	271.3	249.00	159.70	145.80	126.70	G 1"	60	123

ByPass Valve for A8PS (SAE) Bent Axis Pumps



Pump MODEL	DISPL. (cc)	WEIGHT WITHOUT INLET FITTING (kg)	WEIGHT WITH INLET FITTING (kg)	TORQUE WITHOUT FITTING (N.m)	TORQUE WITH FITTING (N.m)
5 cc	5.1	9.00	9.40	8.20	8.60
10 cc	10.2	9.00	9.40	8.65	9.05
12 cc	12.0	9.20	9.60	8.74	9.14
18 cc	18.0	9.30	9.70	8.79	9.19
25 cc	25.0	11.00	11.40	8.89	9.29
32 cc	32.0	11.10	11.50	11.10	11.50
41 cc	41.0	11.20	11.60	11.15	11.55
50 cc	50,3	11.30	11.70	11.75	12.15
56 cc	56,0	11.35	11.75	11.80	12.20
63 cc	63.0	11.45	11.85	11.85	12.25
80 cc	80,4	14.80	15.20	17.80	18.30
108 cc	108	14.90	15.30	17.92	18.42
130 cc	130	15.30	15.70	18.70	19.50

A8PS (SAE) Series
Bent Axis Pumps

40° bent axis design giving high power, small overall dimensions, optimum efficiency and economic design. Flange and shaft designed for direct mounting on truck gearbox PTO's. The fixed displacement bent axis pumps generates a hydraulic fluid flow. It is designed for use in trucks, commercial vehicles and all stationary hydraulic applications. The Pump a fixed pump with rotary group in bent-axis design open circuits. Flow is proportional to drive speed and displacement.

For axial piston units with bent-axis design, the Pistons are arranged diagonally with respect to the drive shaft. The pump covers the whole displacement range 5 to 130 cm³/rev. The pump has been developed with modern styling and design to satisfy market demand as to designed new generation plate and pistons with very high flow performance, high pressures with high efficiency and very small dimensions.

The pump is available both to SAE and SAE world standards and can be mounted either directly at the gearbox or via a drive shaft. If necessary it can also be augmented with a by-pass valve. Other brand bent axis pumps compatible and interchangeable with SAE bent axis pumps. Refer to the data sheet and order confirmation for the technical data, operating conditions and operating limits of the bent axis piston pumps.

Formulas			
Pump Output Flow	GPM	$GPM = (Speed\ (rpm) \times d\ sp.\ (cu.\ in.)) / 231$	$GPM = (n \times d) / 231$
Pump Input Horsepower	HP	$HP = GPM \times Pressure\ (ps) / 1714 \times Efficiency$	$HP = (Q \times P) / 1714 \times E$
Pump Efficiency	E	Overall Efficiency = Output HP / Input HP	$E_{overall} = HP_{out} / HP_{in} \times 100$
		Overall Efficiency = Volumetric Eff. $\times$ Mechanical Eff.	$E_{overall} = EffVol. \times EffMech.$
Pump Volumetric Efficiency	E	Volumetric Efficiency = Actual Flow Rate Output (GPM) / Theoretical Flow Rate Output (GPM) $\times$ 100	$EffVol. = Q_{act.} / Q_{theo.} \times 100$
Pump Mechanical Efficiency	E	Mechanical Efficiency = Theoretical Torque to Drive / Actual Torque to Drive $\times$ 100	$EffMech = T_{theo.} / T_{act.} \times 100$
Pump Displacement	CIPR	$Displcmnt\ (in.3/rev.) = Flow\ Rate\ (GPM) \times 231 / Pump\ RPM$	$CIPR = GPM \times 231 / RPM$
Pump Torque	T	Torque = Horsepower $\times$ 63025 / RPM	$T = 63025 \times HP / RPM$
		Torque = Pressure (PSIG) $\times$ Pump Displacement (CIPR) / 2π	$T = P \times CIPR / 6.28$

- Horsepower for driving a pump

: For every 1 hp of drive, the equivalent of 1 gpm @ 1500 psi can be produced.
- Horsepower for idling a pump

: To idle a pump when it is unloaded will require about 5% of its full rated power
- Wattage for heating hydraulic oil

: Each watt will raise the temperature of 1 gallon of oil by 1° F. per hour.
- Flow velocity in hydraulic lines

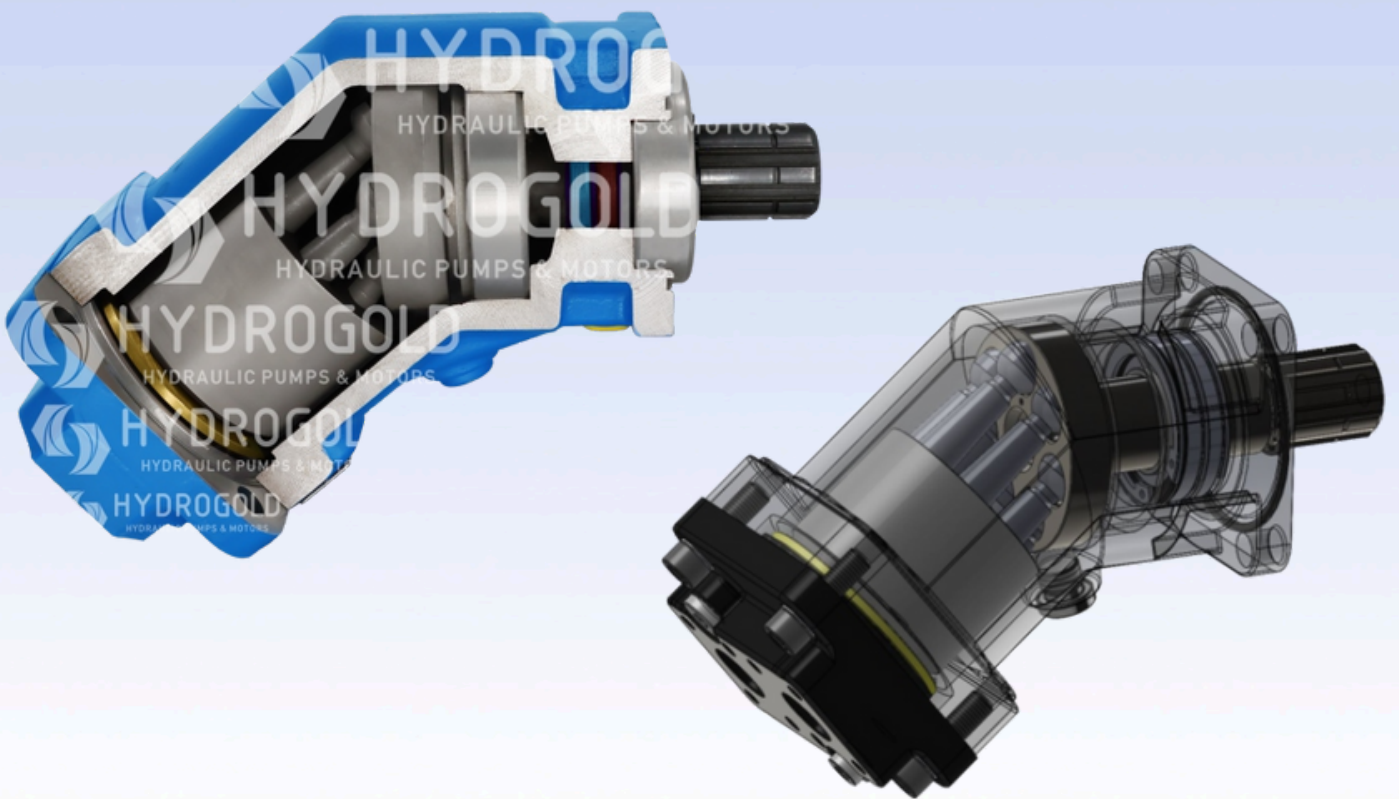
: Pump suction lines 2 to 4 feet per second, pressure lines up to 500 psi - 10 to 15 ft./sec., pressure lines 500 to 3000 psi - 15 to 20 ft./sec.; all oil lines in a re-over-oil systems; 4 ft./sec.

A10 (HYBRID) Eksenel P stonlu Pompa

HYBRID® H gh Pressure Hydraulic Bent Ax s P ston Pumps, H gh Pressure, 450/500 BAR Work ng Pressure. H gh Rotat onal Speed, H gh Effic ency, SI m Des gn, Cast Iron Pump Body, Re-Des gned n 2025.

Des gnaton;

5cc, 10cc, 12cc, 18cc, 25cc, 32cc, 41cc, 50cc,
56cc, 63cc, 80cc, 108cc, 130cc



A10 (HYBRID) Series
Bent Axis Pumps



Bi-Directional
Bent Axis Pump
380-420 Bar Working Pressure
2200 RPM Working Speed...

+



=



Bi-Directional
Bent Axis Motor
450 Bar Working Pressure
High Rotational Speed...



HYBRID®
Convertible

Ordering Code; A10 - (HYBRID) DIN Flange Bent Axis Pumps

Model Code	D splacement	Shaft Type	Flange Type	Vers on	Seal ng
A10	108	S	B4	HP	V
A10 HYBRID BentAxis Hydraul c Pump DIN Flange	5	S Spl ned Shaft (default) 8x32x36 DIN ISO 14NF	B4 ISO 7653 Ø80 4 Bolt Flange	HP HYBRID Pump Vers on	V V ton H gh Pressure Seal
	10				
	12				
	18				
	25				
	32	K Parallel Keyed Shaft (spec al) DIN 6885		HM HYBRID Motor Vers on	N N tr le Seal 5/10 Bar
	41				
	50				
	56				
	63				
	80				
	108				
	126				

Formulas			
Pump Output Flow	GPM	$GPM = (Speed\ (rpm) \times d\ sp.\ (cu.\ n.)) / 231$	$GPM = (n \times d) / 231$
Pump Input Horsepower	HP	$HP = GPM \times Pressure\ (ps) / 1714 \times Efficiency$	$HP = (Q \times P) / 1714 \times E$
Pump Efficiency	E	Overall Efficiency = Output HP / Input HP	$E_{Overall} = HP_{Out} / HP_{In} \times 100$
		Overall Efficiency = Volumetric Eff. $\times$ Mechanical Eff.	$E_{Overall} = Eff_{Vol.} \times Eff_{Mech.}$
Pump Volumetric Efficiency	E	Volumetric Efficiency = Actual Flow Rate Output (GPM) / Theoretical Flow Rate Output (GPM) $\times$ 100	$Eff_{Vol.} = Q_{Act.} / Q_{Theo.} \times 100$
Pump Mechanical Efficiency	E	Mechanical Efficiency = Theoretical Torque to Drive / Actual Torque to Drive $\times$ 100	$Eff_{Mech} = T_{Theo.} / T_{Act.} \times 100$
Pump Displacement	CIPR	$Displacement\ (In.^3 / rev.) = Flow\ Rate\ (GPM) \times 231 / Pump\ RPM$	$CIPR = GPM \times 231 / RPM$
Pump Torque	T	Torque = Horsepower $\times$ 63025 / RPM	$T = 63025 \times HP / RPM$
		Torque = Pressure (PSIG) $\times$ Pump Displacement (CIPR) / 2π	$T = P \times CIPR / 6.28$

- Horsepower for driving a pump

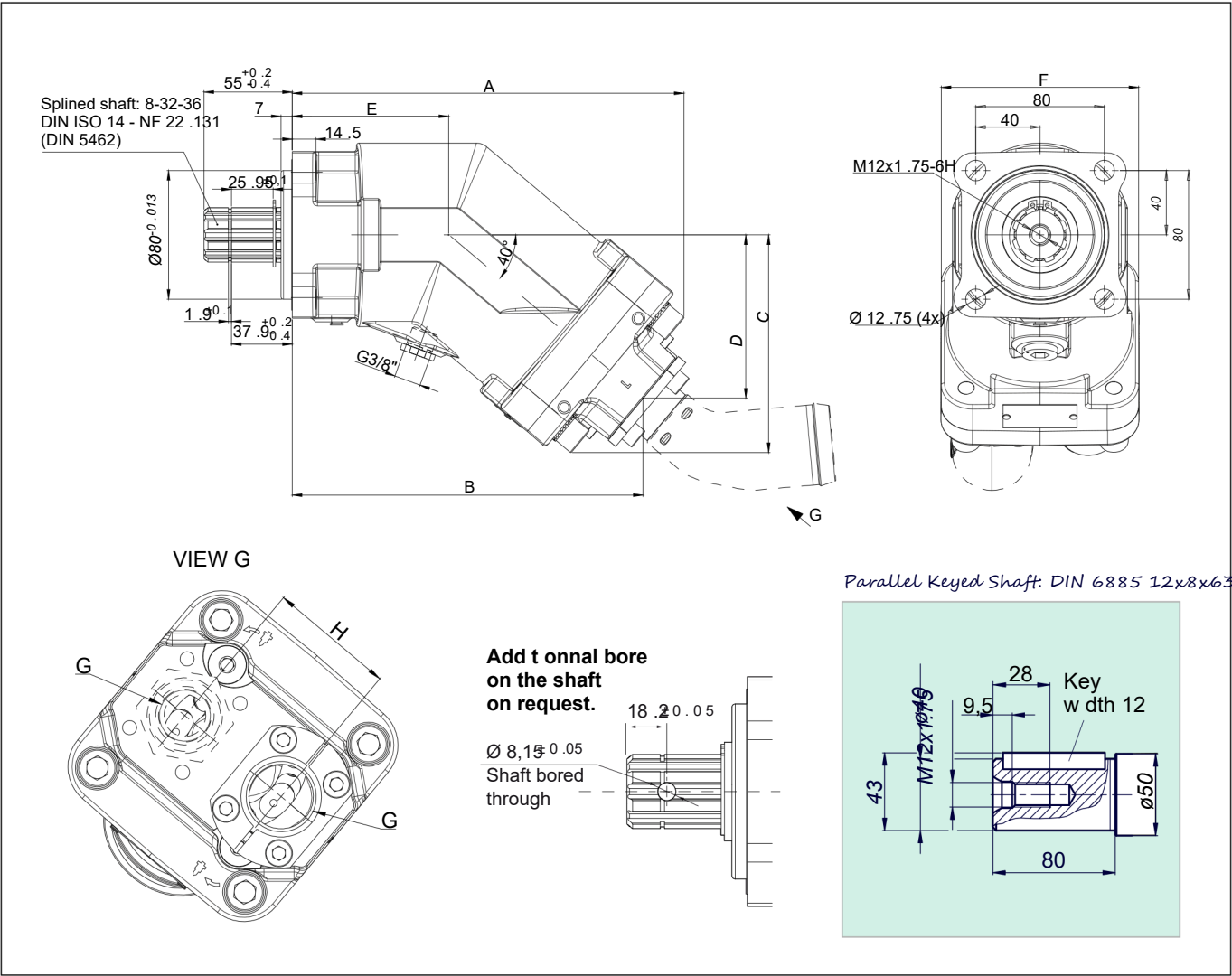
: For every 1 hp of drive, the equivalent of 1 gpm @ 1500 psi can be produced.
- Horsepower for idling a pump

: To idle a pump when it's unloaded will require about 5% of its full rated power
- Wattage for heating hydraulic oil

: Each watt will raise the temperature of 1 gallon of oil by 1° F. per hour.
- Flow velocity in hydraulic lines

: Pump suction lines 2 to 4 feet per second, pressure lines up to 500 psi - 10 to 15 ft./sec., pressure lines 500 to 3000 psi - 15 / 20 ft./sec.; all oil lines in a re-over-oil systems; 4 ft./sec.

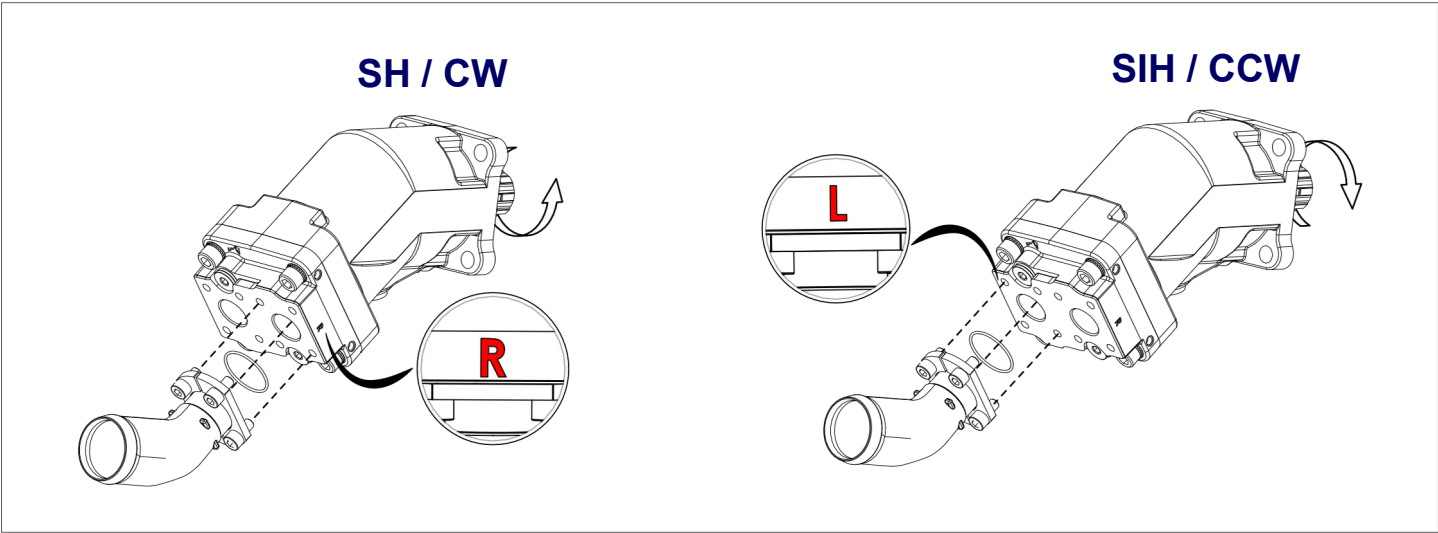
A10 (HYBRID) Series
Bent Axis Pumps



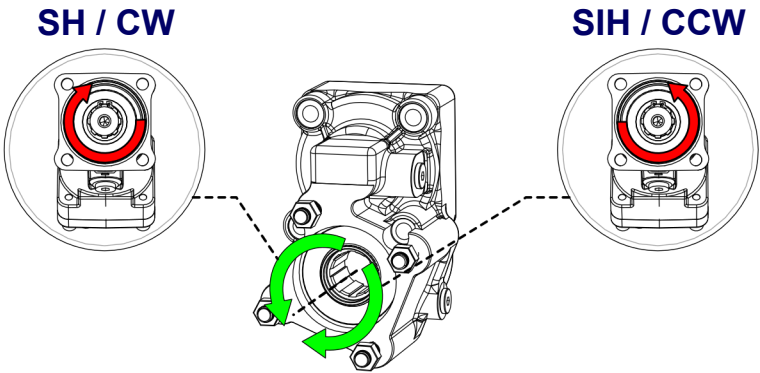
Pump MODEL	DISPL. (cc)	A	B	C	D	E	F	G	H
5 cc	5.1	196.7	177.8	77.1	103.9	85.7	108	G 3/4"	54
10 cc	10.2	196.7	177.8	77.1	103.9	85.7	108	G 3/4"	54
12 cc	12.0	196.7	177.8	77.1	103.9	85.7	108	G 3/4"	54
18 cc	18.0	196.7	177.8	77.1	103.9	85.7	108	G 3/4"	54
25 cc	25.0	196.7	177.8	77.1	103.9	85.7	108	G 3/4"	54
32 cc	32.0	202.8	184.0	82.3	109.1	85.7	108	G 3/4"	54
41 cc	41.0	202.8	184.0	82.3	109.1	85.7	108	G 3/4"	54
50 cc	50.3	214.4	195.5	92.0	118.9	85.7	108	G 3/4"	54
56 cc	56.0	214.4	195.5	92.0	118.9	85.7	108	G 3/4"	54
63 cc	63.0	214.4	195.5	92.0	118.9	85.7	108	G 3/4"	54
80 cc	80.4	241.7	220.9	103.5	133.3	97.4	123	G 1"	60
108 cc	108	241.7	222.5	104.8	133.3	97.4	123	G 1"	60
130 cc	130	244.0	224.8	106.7	135.2	97.4	123	G 1"	60

Characteristics of the A10 - DIN Flange Bent Axis Pumps

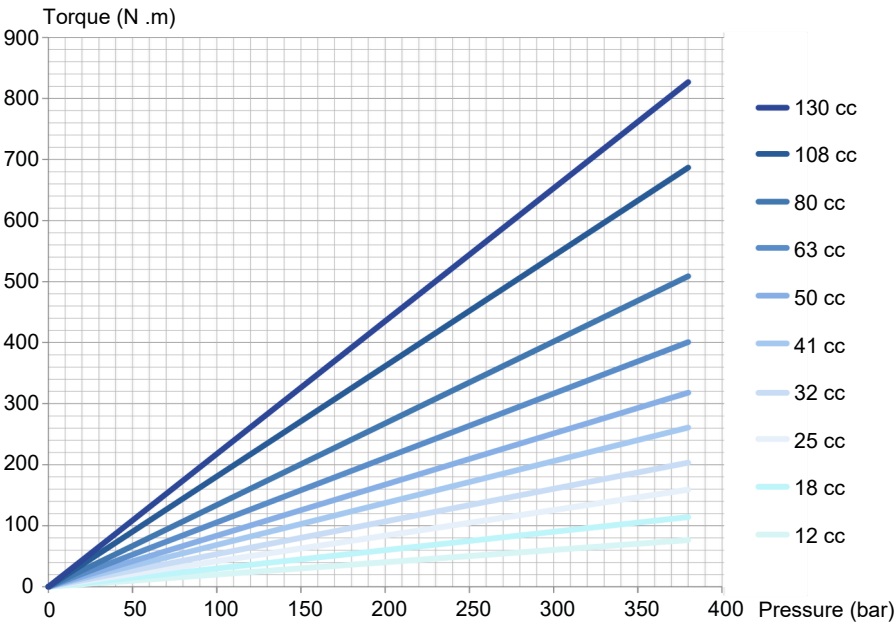
Pump Model	DISPL. (cc)	MAX. PEAK/CONTINUOUS PRESSURE (bar)	MAXIMUM SPEED (rpm)	MAX.TORQUE ABSORBED AT 380 BAR (N.m)	WEIGHT WITHOUT INLET FITTING (kg)	WEIGHT WITH INLET FITTING (kg)	TORQUE WITHOUT FITTING (N.m)	TORQUE WITH FITTING (N.m)
5 cc	5.1	420 / 380	3300	60	9.00	9.40	8.20	8.60
10 cc	10.2	420 / 380	3200	68	9.00	9.40	8.65	9.05
12 cc	12.0	420 / 380	3150	76	9.20	9.60	8.74	9.14
18 cc	18.0	420 / 380	2900	114	9.30	9.70	8.79	9.19
25 cc	25.0	420 / 380	2750	159	11.00	11.40	8.89	9.29
32 cc	32.0	420 / 380	2700	204	11.10	11.50	11.10	11.50
41 cc	41.0	420 / 380	2550	261	11.20	11.60	11.15	11.55
50 cc	50,3	420 / 380	2450	318	11.30	11.70	11.75	12.15
56 cc	56,0	420 / 380	2400	375	11.35	11.75	11.80	12.20
63 cc	63.0	420 / 380	2300	401	11.45	11.85	11.85	12.25
80 cc	80,4	420 / 380	2150	509	14.80	15.20	17.80	18.30
108 cc	108	420 / 380	1900	687	14.90	15.30	17.92	18.42
130 cc	130	420 / 380	1750	827	15.30	15.70	18.70	19.50



Direct on of Rotat on;
B-D irect onal
The Pumps rotate clockw se or counter-clockw se depend ng on the d irect on of hydraul c flow enter ng the Pump.



Performance, Torque, Speed and Pressure Charts

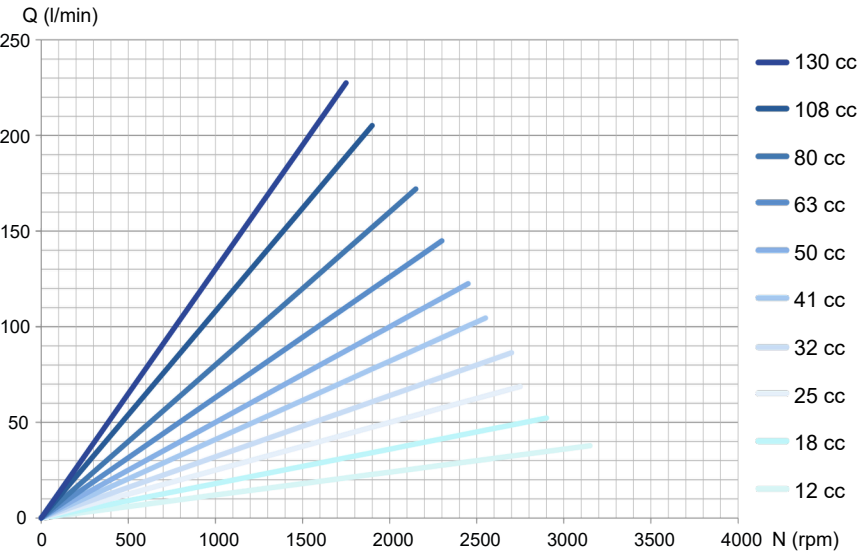


$$C = \frac{\Delta \text{Cyl} \times P}{62.8 \times \eta_{\text{meca}}}$$

With:

- C = Torque in N.m.
- Cyl = Displacement in cc/rev
- ΔP = Differential pressure in bar
- η_{meca} = Mechanical efficiency

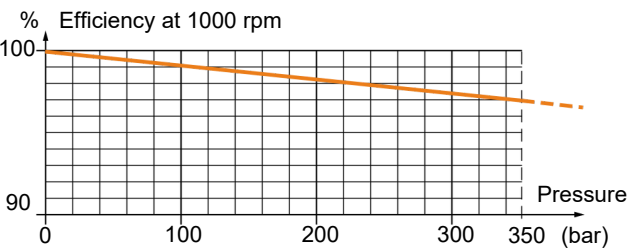
► Flow as a function of rotating speed



$$Q = \frac{N \text{ Cyl} \times \eta_{\text{vol}}}{1000}$$

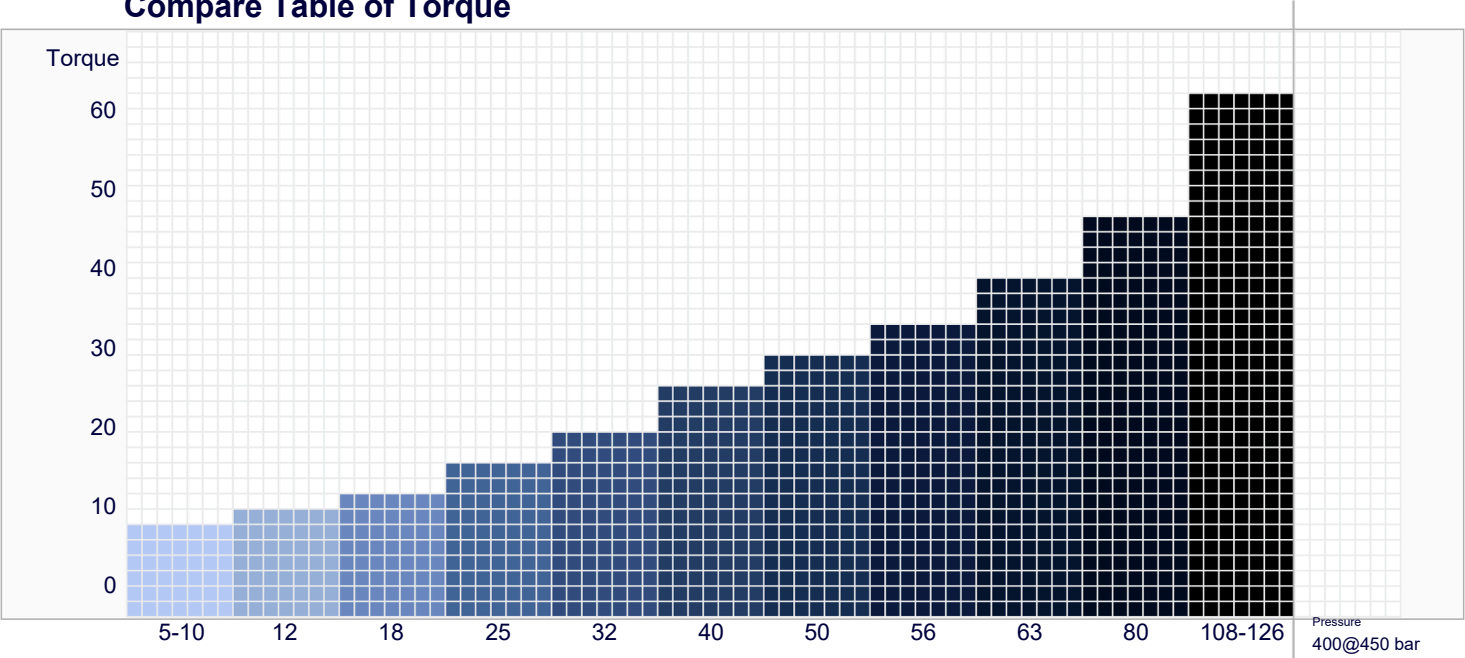
With:

- Q = Flow in l/min
- N = Speed in rpm
- η_{vol} = Volumetric efficiency
- Cyl = Displacement in cc/rev

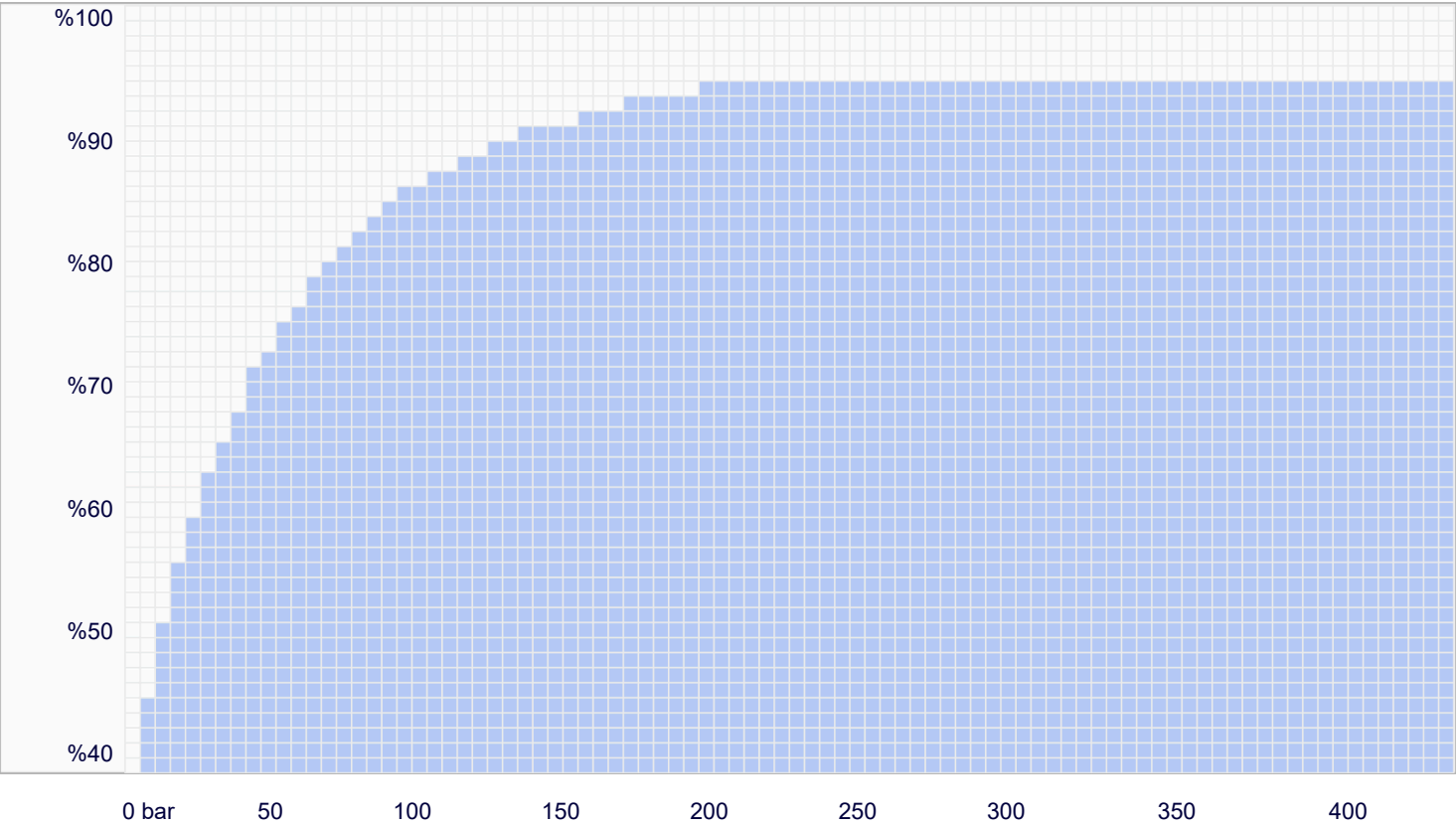


Performance, Torque, Speed and Pressure Charts

Compare Table of Torque



Efficiency of Bent Axis Pumps (1000 rpm)



Installation & Assembly Informations for Bent Axis Pumps

POSITION

DIN Flange Bent Axis Pumps can be operate any position.

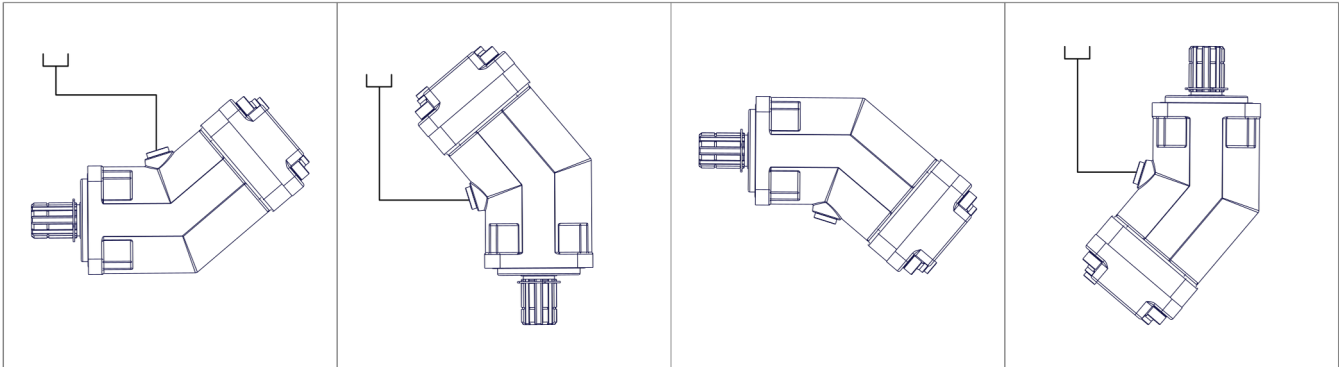
DIRECTION OF ROTATION

DIN Flange Bent Axis Pumps can be operate in both directions of rotation.

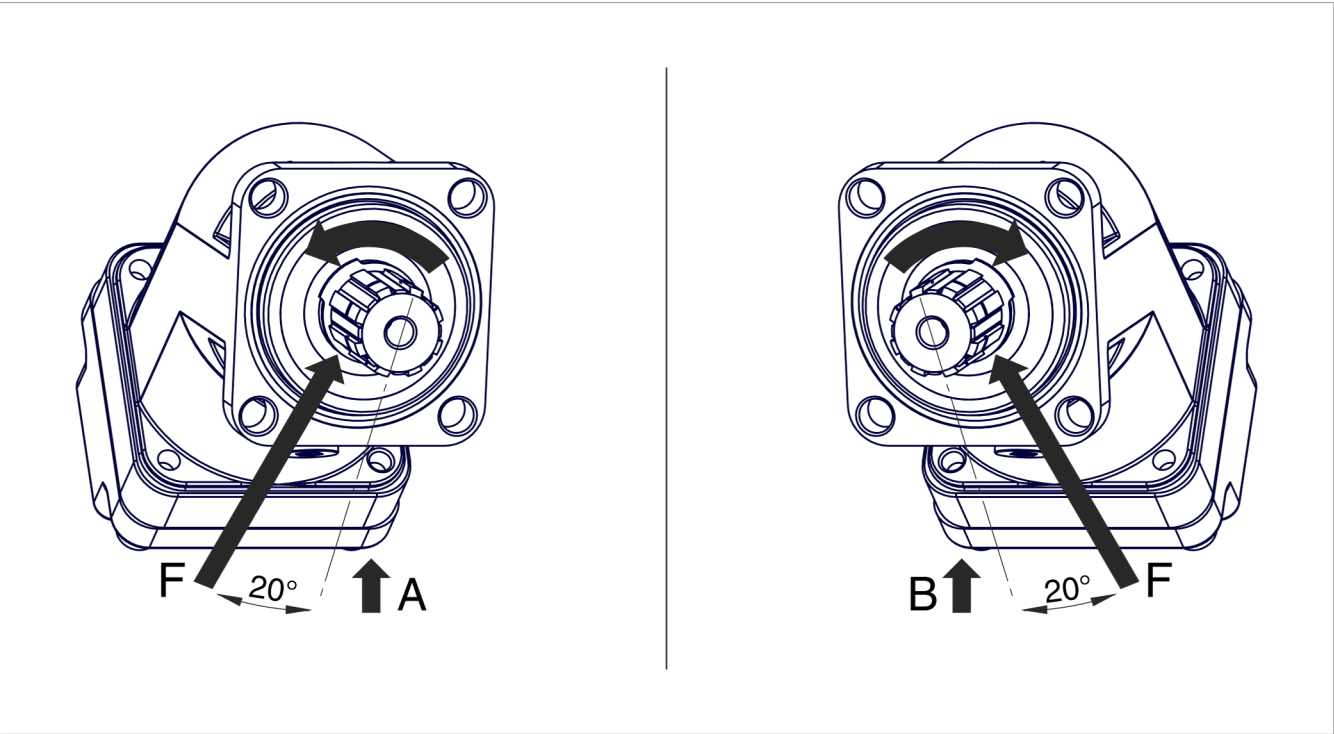
Before of Installation operation, the Pump must be filled with hydraulic fluid and a r bled.

INSTALLATION POSITION

See following examples.



HYDRAULIC FLUID
Recommended ; Generally :
between 15 and 200 cSt.
Maximum : between 5 and 1600 cSt.



FOR USE;
Available a e-mail on request or each Pump is supplied v a Starting datasheet.

Formulas, Calculations, Installation Guide

Quick Calculation

Flow rate

$$Q = \frac{VS \times n}{1000 \eta_v} \text{ (lpm)}$$

Torque

$$M = \frac{V_s \times Dp \times \eta_{mh}}{63} \text{ (Nm)}$$

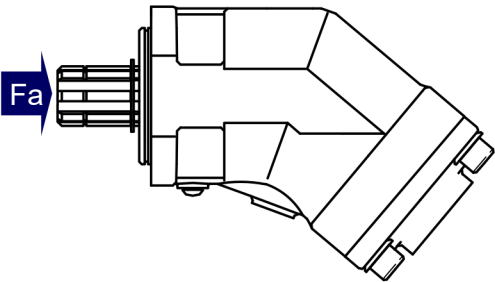
Power

$$P = \frac{2p \times M \times n}{60000} = \frac{M \times n}{9549} = \frac{Q \times Dp \times \eta_t}{600} \text{ (kw)}$$

Speed

$$n = \frac{1000 \times Q \times \eta_v}{VS} \text{ (lpm)}$$

V = Displacement (ccm/rev.)
S = Diff. pressure (bar)
lp = Speed (rpm)
n = Flow (lpm)
Q_v = Volumetric efficiency
η_{mh} = Mechanical-hydraulic efficiency
η_t = Total efficiency (η_t = η_v × η_{mh})



Pump model	5, 10, 12	18 cc	25 cc	32 cc	41 cc	50 cc	56, 63cc	80 cc	108 cc	126 cc
Fa (N/bar)	15	20	30	30	40	40	50	60	80	90

gear hub

Pump rotation on CCW
A pressure

Pump rotation on CW
B pressure

pulley hub

Pump rotation on CW
B pressure

Pump rotation on CCW
A pressure

Pump susceptible to rotation on CCW and CW

Other Advantages of DIN Flange Bent Axis Pumps

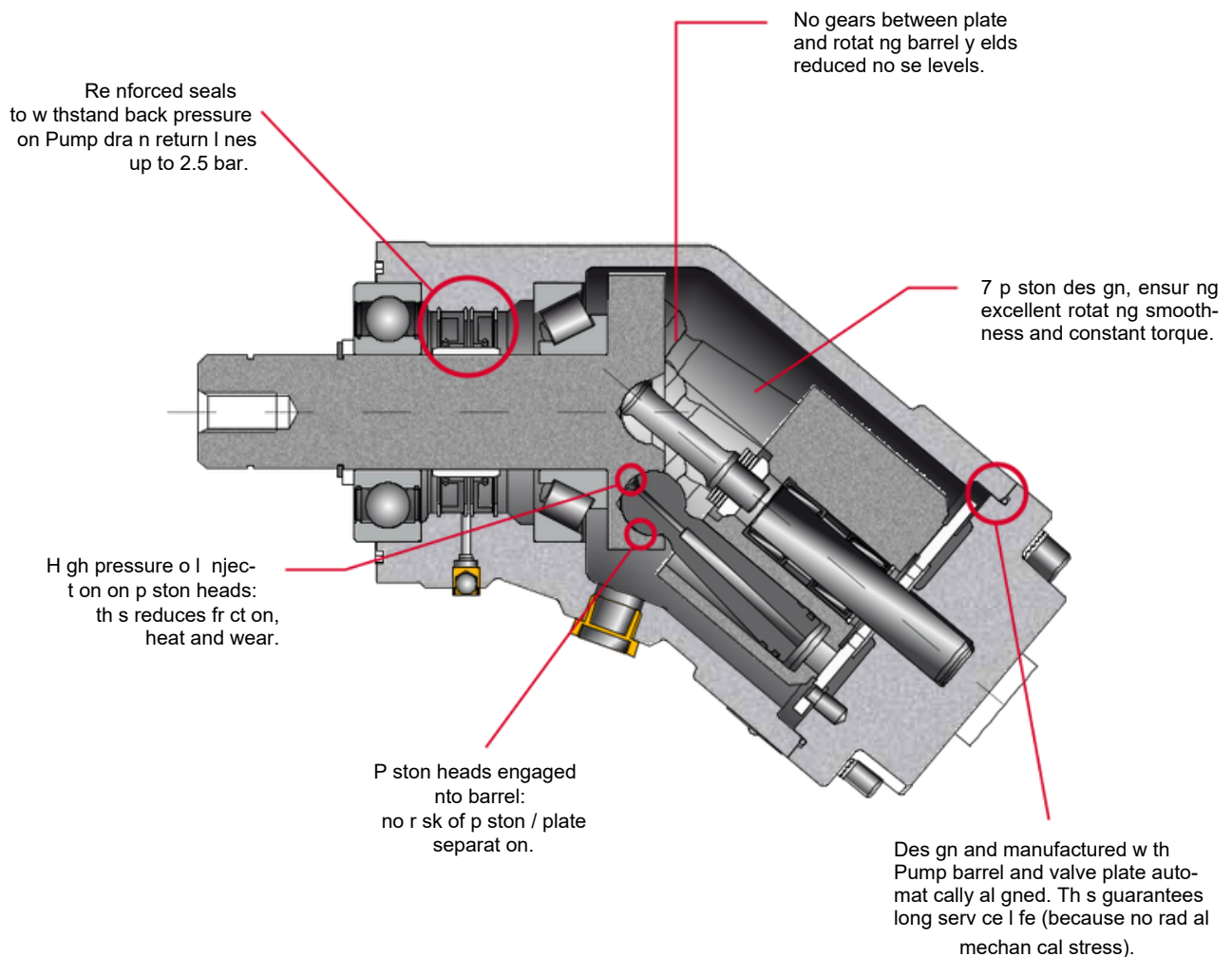
- Interchangeable and Compatible with other DIN Bent Axis Pumps,
- Special Designed Positions,
- One-Phase Position with Position Rings,
- For use in stationary and mobile applications,
- Compact Pump design and extra durable parts,
- High Operational Reliability and High Starting Torque
- Extra Warranty with Worldwide Service

Bent Axis Hydraulic Piston Pumps

40° bent axis design giving high power, small overall dimensions, optimum efficiency and economic design. Flange and shaft designed for direct mounting on the equipments. The fixed displacement bent axis Pumps generates a hydraulic fluid flow. It is designed for use in trucks, commercial vehicles, construction type equipments and all stationary hydraulic applications. The DIN Flange is a Pump with rotary group in bent-axis design. Flow is proportional to drive speed and displacement.

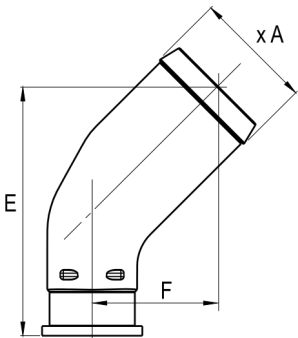
For axial piston units with bent-axis design, the Pistons are arranged diagonally with respect to the drive shaft. The Pump covers the whole displacement range 5 to 126 cm³/rev. The Pump has been developed with modern styling and design to satisfy market demand as to designed new generation plate, extra parts and pistons with give high flow performance, high pressures with high efficiency and very small dimensions.

The Pump is available both to DIN and SAE world standards and can be mounted either directly at the gear box or via a drive shaft. Other brand bent axis Pumps compatible and interchangeable with DIN Fl. bent axis Pumps. Refer to the data sheet and order confirmation for the technical data, operating conditions and operating limits of the bent axis piston Pumps.



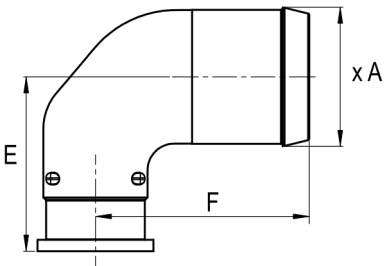
Suction Fittings for A10 (HYBRID) Bent Axis Pumps

45° elbow fittings kit

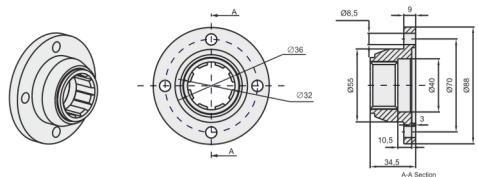
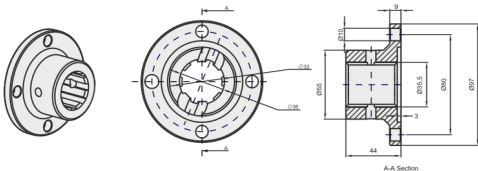
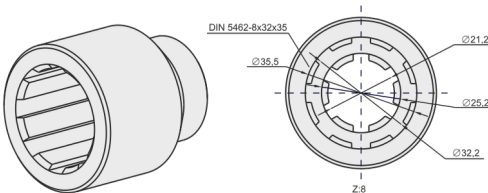
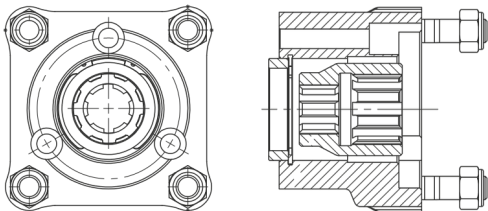


Reference	Ø hose	Ø A	E	F
450039	1 1/2"	39.1	91.7	46.7
450043	42	43	91.7	46.7
450046	1 3/4"	46	91.7	46.7
450051	2"	51.8	108.4	54.4
450064	2 1/2"	64.5	125.2	62.2

90° elbow fittings kit



Reference	Ø hose	Ø A	E	F
900039	1 1/2"	39.1	58.6	79.5
900051	2"	51.8	64.9	80.2
900064	2 1/2"	64.5	71.3	87.5



Inlet Fittings & Installation Parts

- Split Flange
- Seal
- Screw



By-Pass Valves

- 12 V
- 24 V



Hydraulic Adapters

- PTO Piston Pump Adapter
- PTO Gear Pump Adapter
- Long / Short Adapter



Flanges

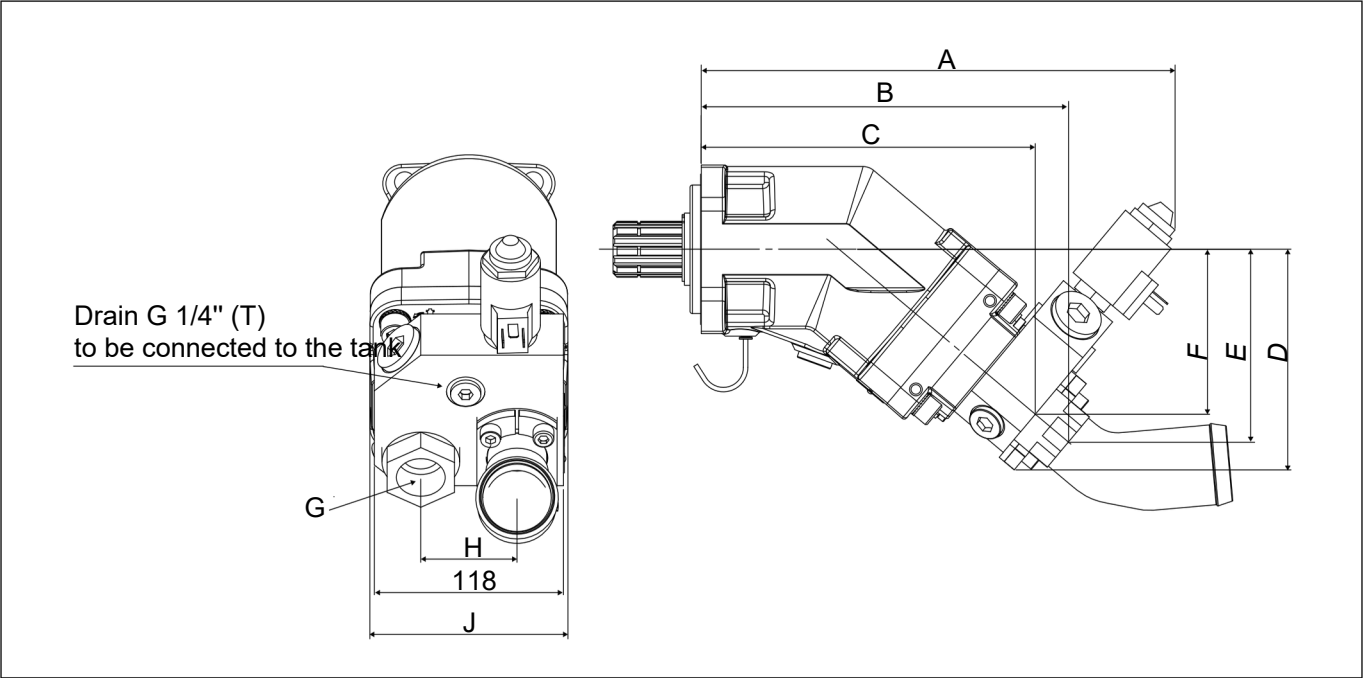
- 1120 (6 Spl ne)
- 1120 (8 Spl ne)
- 1300 (6 Spl ne)
- 1300 (8 Spl ne)



Couplers

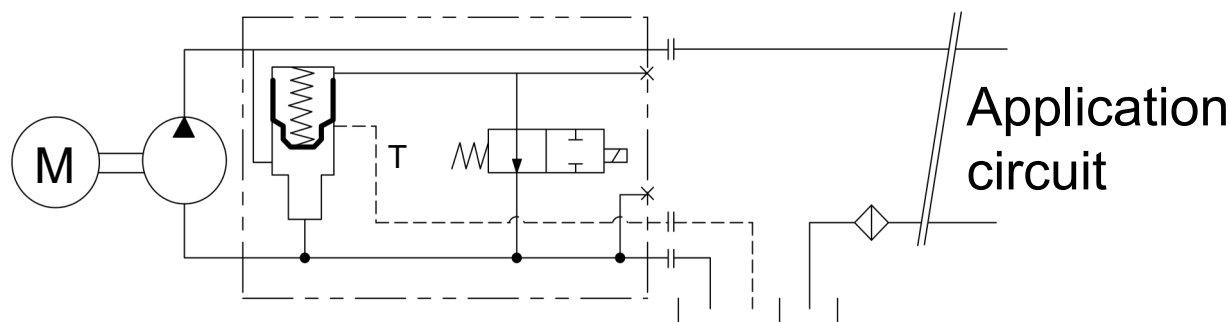
- 6 x 8 Couplar
- 6 x 8 Couplar (Long)
- 8 x 8 Couplar
- 8 x 8 Couplar (Long)

ByPass Valve for A10 (HYBRID) Bent Axis Pumps



Pump MODEL	DISPL. (cc)	A	B	C	D	E	F	G	H	J
5 cc	5.1	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
10 cc	10.2	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
12 cc	12.0	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
18 cc	18.0	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
25 cc	25.0	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
32 cc	32.0	295.50	229.00	208.30	137.30	120.10	102.70	G 3/4"	54	108
41 cc	41.0	295.50	229.00	208.30	137.30	120.10	102.70	G 3/4"	54	108
50 cc	50,3	307.10	240.40	220.00	147.10	129.70	112.50	G 3/4"	54	108
56 cc	56,0	307.10	240.40	220.00	147.10	129.70	112.50	G 3/4"	54	108
63 cc	63.0	307.10	240.40	220.00	147.10	129.70	112.50	G 3/4"	54	108
80 cc	80,4	334.00	269.00	246.70	157.80	143.90	124.80	G 1"	60	123
108 cc	108	334.00	269.00	246.70	157.80	143.90	124.80	G 1"	60	123
130 cc	130	336.30	271.3	249.00	159.70	145.80	126.70	G 1"	60	123

ByPass Valve for A10 (HYBRID) Bent Axis Pumps



Pump MODEL	DISPL. (cc)	WEIGHT WITHOUT INLET FITTING (kg)	WEIGHT WITH HOUSING INLET FITTING (kg)	TORQUE WITHOUT FITTING (N.m)	TORQUE WITH FITTING (N.m)
5 cc	5.1	9.00	9.40	8.20	8.60
10 cc	10.2	9.00	9.40	8.65	9.05
12 cc	12.0	9.20	9.60	8.74	9.14
18 cc	18.0	9.30	9.70	8.79	9.19
25 cc	25.0	11.00	11.40	8.89	9.29
32 cc	32.0	11.10	11.50	11.10	11.50
41 cc	41.0	11.20	11.60	11.15	11.55
50 cc	50,3	11.30	11.70	11.75	12.15
56 cc	56,0	11.35	11.75	11.80	12.20
63 cc	63.0	11.45	11.85	11.85	12.25
80 cc	80,4	14.80	15.20	17.80	18.30
108 cc	108	14.90	15.30	17.92	18.42
130 cc	130	15.30	15.70	18.70	19.50

A11 (SAE2) Eksenel P stonlu Pompa

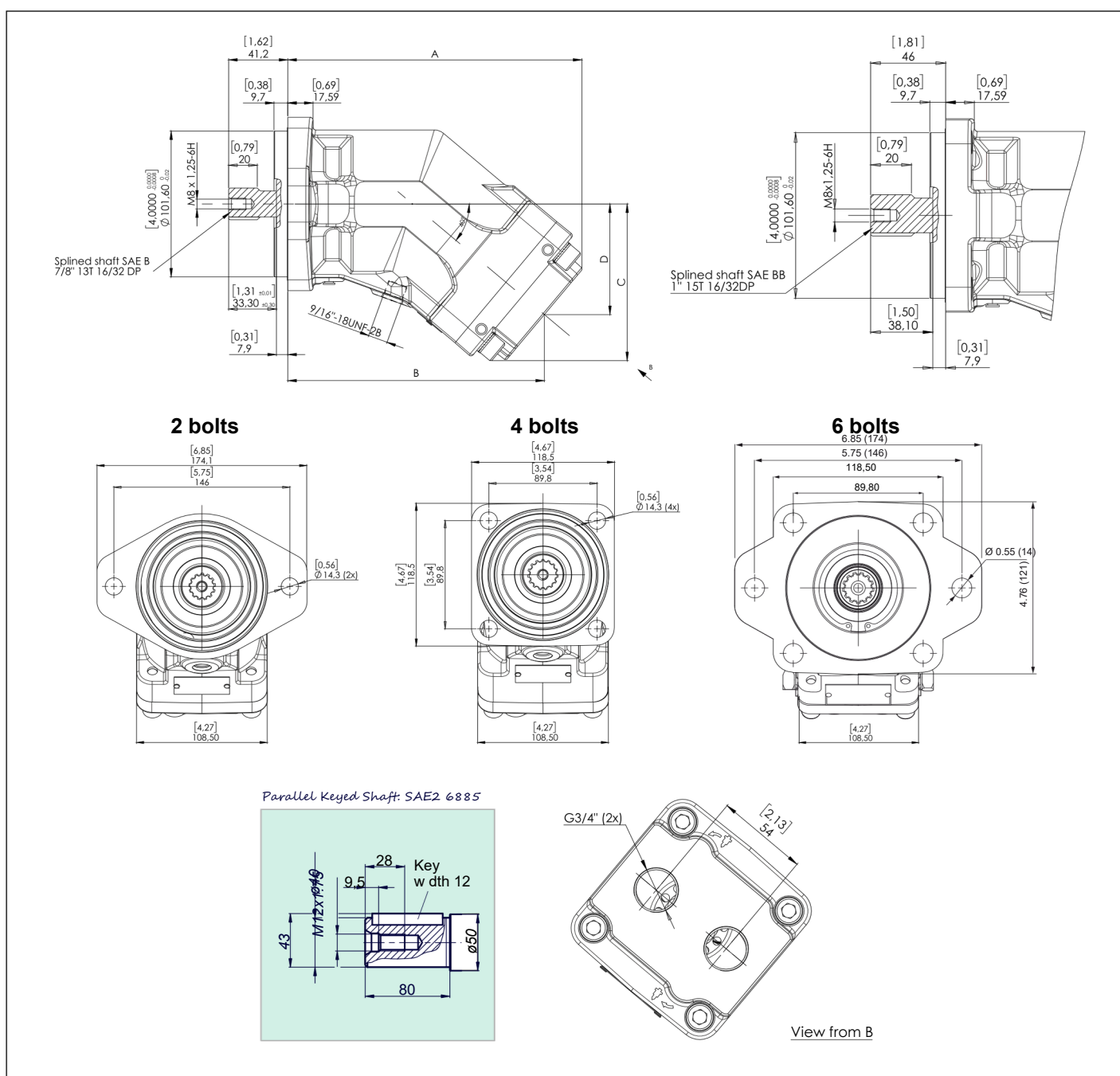
High Pressure Hydraulic Bent Axis Piston Pumps, High Pressure, 450/500 BAR Working Pressure. High Rotational Speed, High Efficiency, Slim Design, Cast Iron Pump Body, Re-Designed in 2025.

Designation;

12cc, 18cc, 25cc, 32cc, 41cc,
50cc, 56cc, 63cc,



A11 (SAE2) Ser es Bent Ax s Pumps



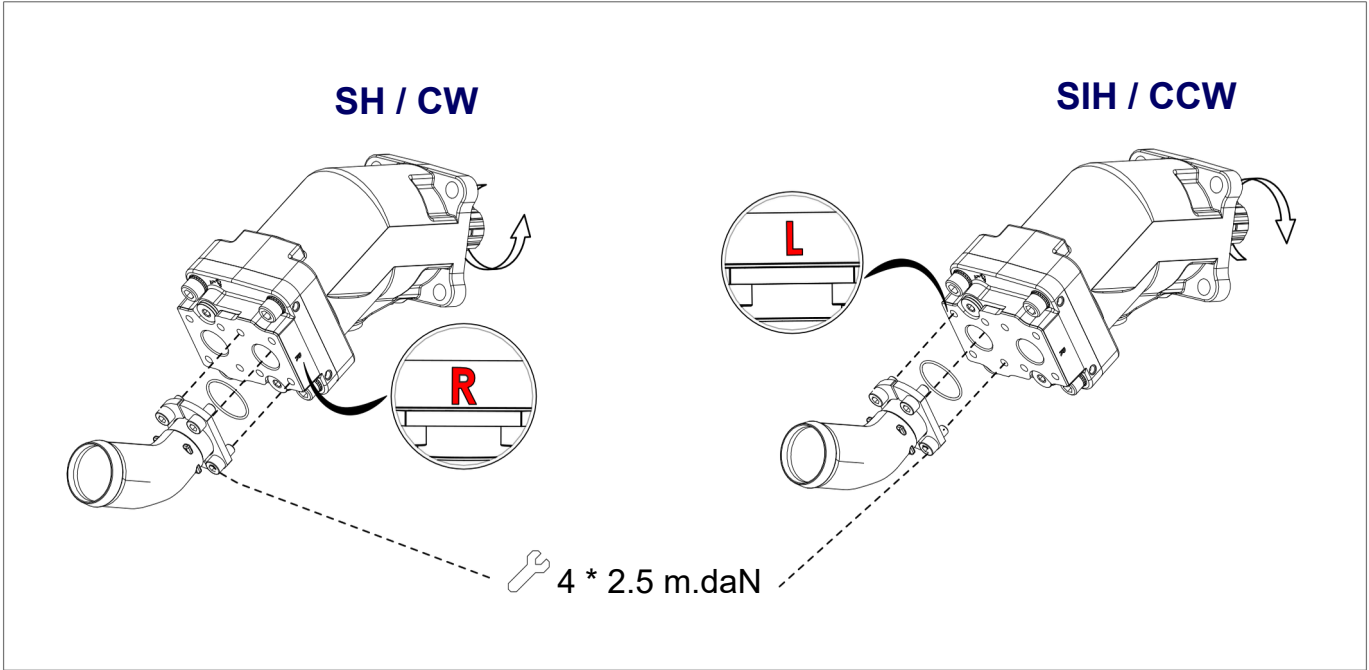
Pump MODEL	DISPL. (cc)	A	B	C	D	SHAFT (SPLINED)	SHAFT (KEYED)
12 cc (SAE J744)	12.1	197.2	172.5	103.7	73.0	SAE B 7/8"13T-16/32DP	Parallel Keyed Shaft: SAE2 6885
18 cc (SAE J744)	18.0	197.2	172.5	103.7	73.0	SAE B 7/8"13T-16/32DP	Parallel Keyed Shaft: SAE2 6885
25 cc (SAE J744)	25.1	197.2	172.5	103.7	73.0	SAE B 7/8"13T-16/32DP	Parallel Keyed Shaft: SAE2 6885
32 cc (SAE J744)	32.0	203.2	178.5	108.7	77.0	SAE B 7/8"13T-16/32DP	Parallel Keyed Shaft: SAE2 6885
41 cc (SAE J744)	41.2	203.2	178.5	108.7	77.0	SAE B 7/8"13T-16/32DP	Parallel Keyed Shaft: SAE2 6885
50 cc (SAE J744)	50.2	214.7	190.0	118.2	86.5	SAE BB 1" 15T-16/32DP	Parallel Keyed Shaft: SAE2 6885
56 cc (SAE J744)	56.0	214.7	190.0	118.2	86.5	SAE BB 1" 15T-16/32DP	Parallel Keyed Shaft: SAE2 6885
63 cc (SAE J744)	63,3	214.7	190.0	118.2	86.5	SAE BB 1" 15T-16/32DP	Parallel Keyed Shaft: SAE2 6885

Characteristics of the A11 - SAE2 Flange Bent Axis Pumps

Pump MODEL	DISPL. (cc)	CONTINUOUS MAX. SPEED (rpm)	INTERMITTENT MAX. SPEED (rpm)	MAX. FLOW ABSORBED (l/min)	TORQUE BAR (m.N/bar)	TORQUE AT 350 BAR (m.N)	Pump MAX./MIN. TEMP. (celsius)	MAX. ALLOW PRESSURE CONTN./PEAK (bar)
12 cc	12.1	8000	8800	96	0.19	66	-25 / 110	400 / 450
18 cc	18.0	8000	8800	144	0.28	98	-25 / 110	400 / 450
25 cc	25.1	6300	6900	158	0.40	140	-25 / 110	400 / 450
32 cc	32.0	6300	6900	202	0.50	175	-25 / 110	400 / 450
41 cc	41.2	5600	6200	230	0.65	227	-25 / 110	400 / 450
50 cc	50.2	5000	5500	252	0.80	280	-25 / 110	400 / 450
56 cc	56.0	5000	5500	280	0.90	320	-25 / 110	400 / 450
63 cc	63.3	5000	5500	315	1.00	350	-25 / 110	400 / 450

Direction of Rotation; **B-D** Directional

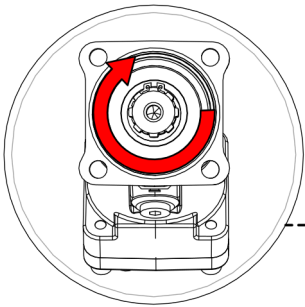
The Pumps rotate clockwise or counter-clockwise depending on the direction of hydraulic flow entering the Pump.



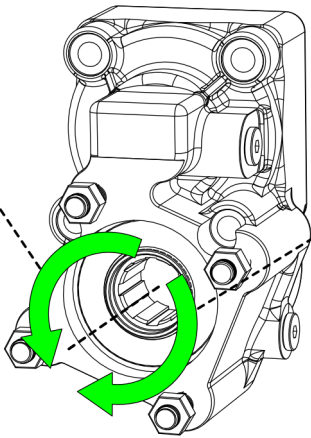
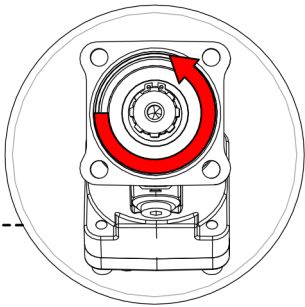
Ordering Code; A11 - SAE2 Flange Bent Axis Pumps

Model Code	D splacement	Shaft Type	Flange Type	Rotat on	Seal ng	
A11	25	S13	B6	W	V	
A11 Bent Ax s Hydraul c Pump SAE2 Flange	12	S13 Spl ned Shaft SAE B 7/8" 13T-16/32DP	B2 2 Bolt SAE2 Flange Shaft	W D rect on of Rotat on B -D rect onal	V V ton H gh Pressure Seal	
	18					
	25					
	32	S15 Spl ned Shaft SAE BB 1" 15T-16/32DP	B4 4 Bolt SAE2 Flange Shaft		N N tr le Seal 5/10 Bar	
	41					
	50					
	56					
	63					
		K40 Keyed Shaft SAE2 6885	B6 6 Bolt SAE2 Flange Shaft			

SH / CW

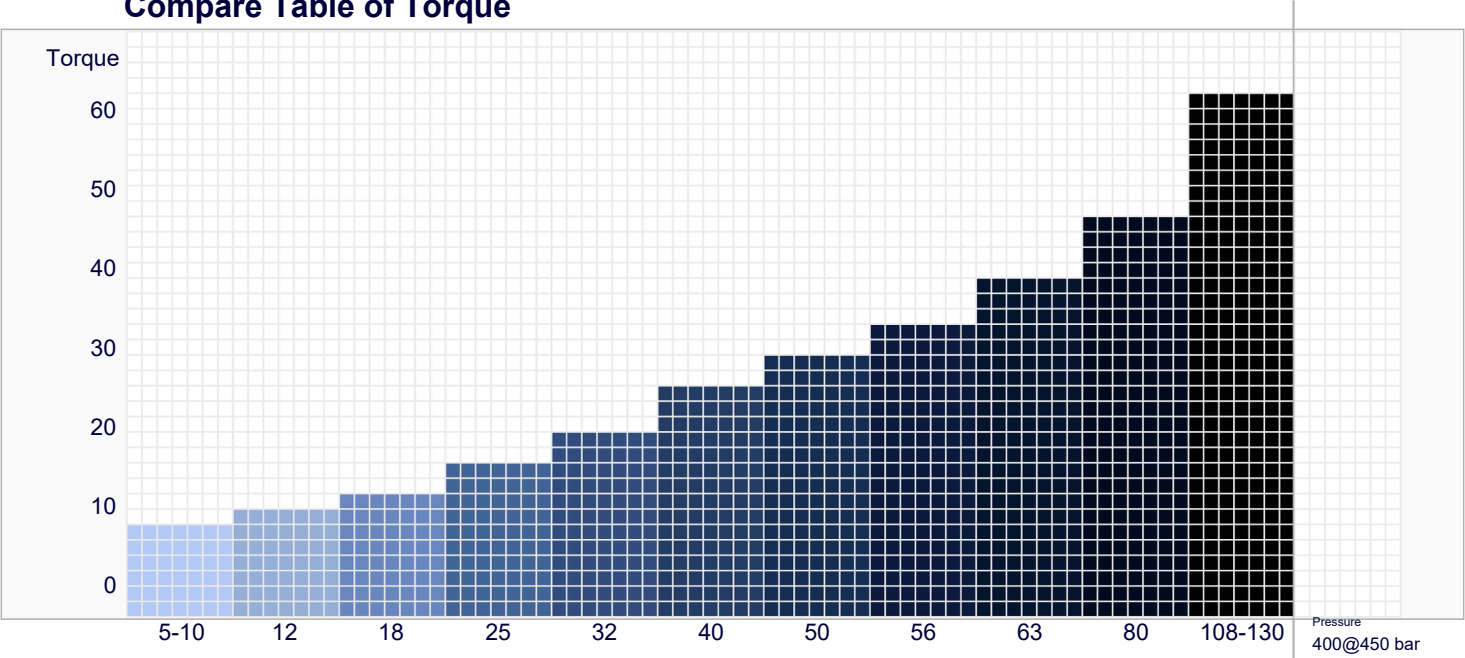


SIH / CCW

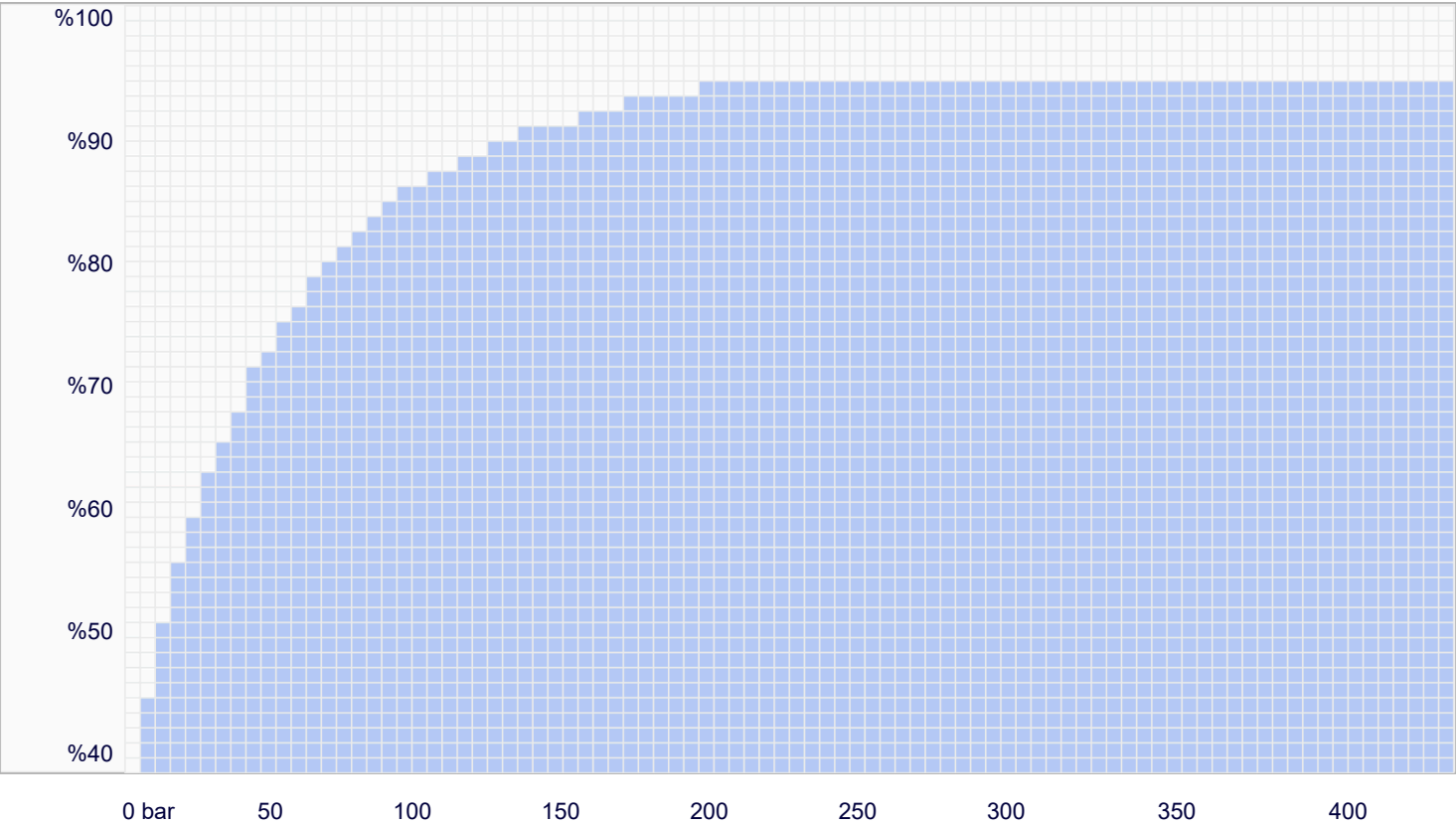


Performance, Torque, Speed and Pressure Charts

Compare Table of Torque

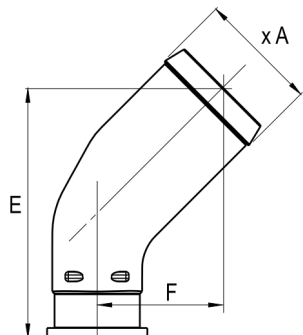


Efficiency of Bent Axis Pumps (1000 rpm)



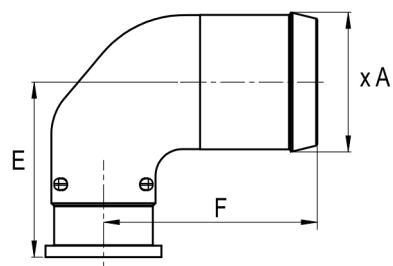
Suction Fitings for A8PS (SAE) Bent Axis Pumps

45° elbow fittings kit

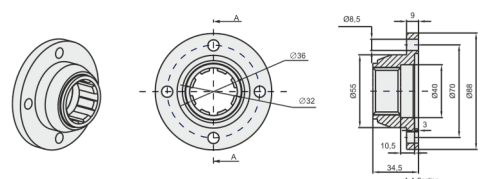
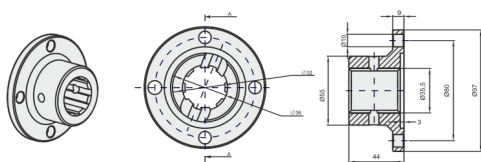
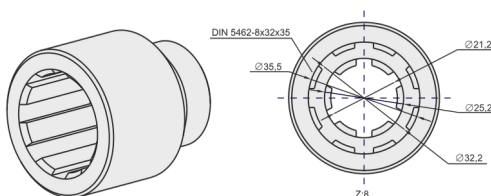
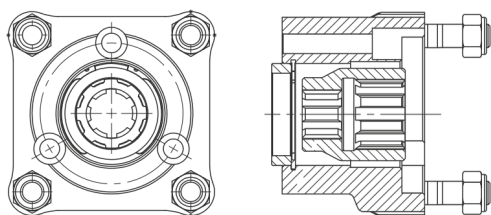


Reference	Ø hose	Ø A	E	F
450039	1 1/2"	39.1	91.7	46.7
450043	42	43	91.7	46.7
450046	1 3/4"	46	91.7	46.7
450051	2"	51.8	108.4	54.4
450064	2 1/2"	64.5	125.2	62.2

90° elbow fittings kit



Reference	Ø hose	Ø A	E	F
900039	1 1/2"	39.1	58.6	79.5
900051	2"	51.8	64.9	80.2
900064	2 1/2"	64.5	71.3	87.5



Inlet Fittings & Installation Parts

- Spl t Flange
- Seal
- Screw



By-Pass Valves

- 12 V
-24 V



Hydraulic Adapters

- PTO P ston Pump Adapter
- PTO Gear Pump Adapter
- Long / Short Adapter



Flanges

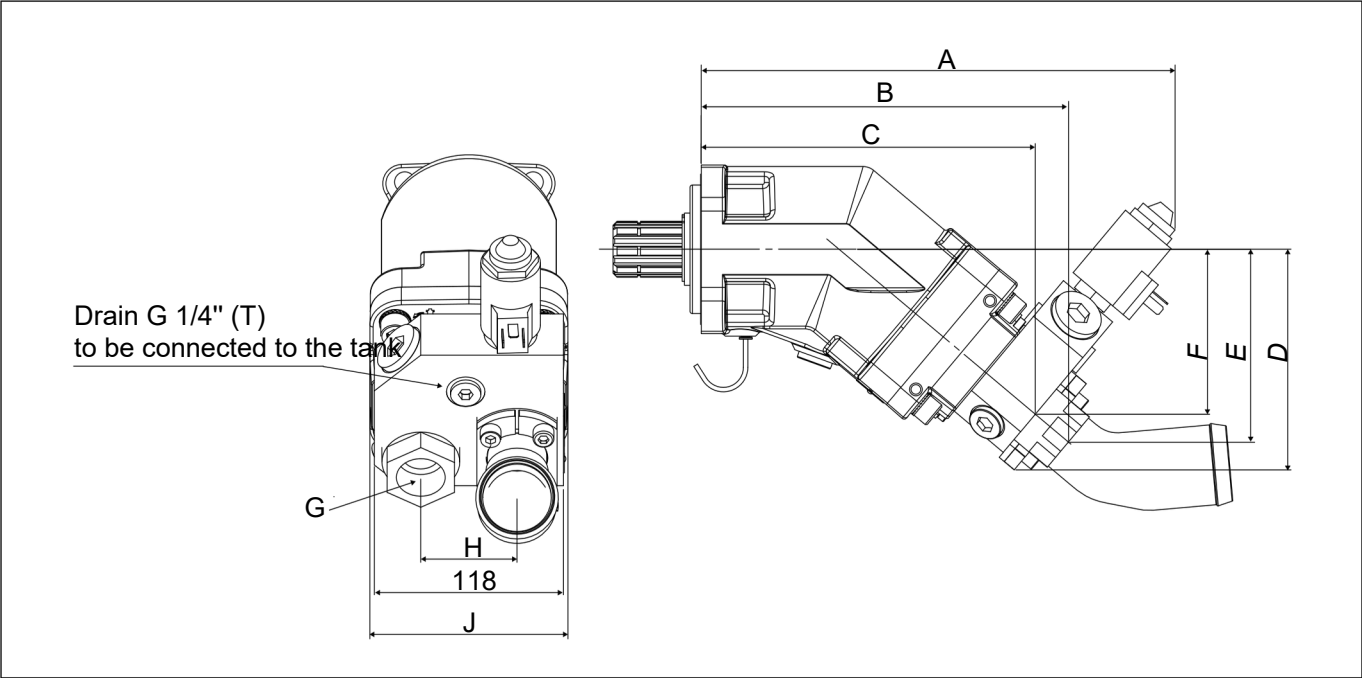
- 1120 (6 Spl ne)
- 1120 (8 Spl ne)
- 1300 (6 Spl ne)
- 1300 (8 Spl ne)



Couplars

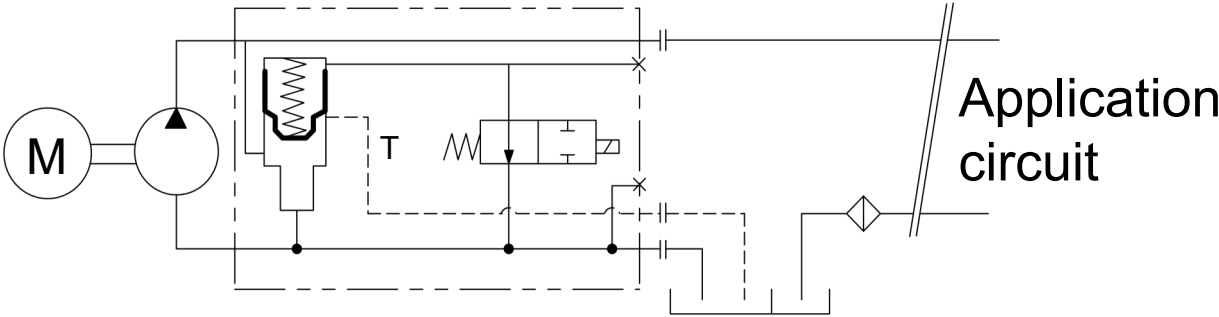
- 6 x 8 Couplar
- 6 x 8 Couplar (Long)
- 8 x 8 Couplar
- 8 x 8 Couplar (Long)

ByPass Valve for A11 (SAE2) Bent Axis Pumps



Pump MODEL	DISPL. (cc)	A	B	C	D	E	F	G	H	J
5 cc	5.1	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
10 cc	10.2	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
12 cc	12.0	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
18 cc	18.0	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
25 cc	25.0	289.35	223.04	202.19	132.20	114.72	97.58	G 3/4"	54	108
32 cc	32.0	295.50	229.00	208.30	137.30	120.10	102.70	G 3/4"	54	108
41 cc	41.0	295.50	229.00	208.30	137.30	120.10	102.70	G 3/4"	54	108
50 cc	50,3	307.10	240.40	220.00	147.10	129.70	112.50	G 3/4"	54	108
56 cc	56,0	307.10	240.40	220.00	147.10	129.70	112.50	G 3/4"	54	108
63 cc	63.0	307.10	240.40	220.00	147.10	129.70	112.50	G 3/4"	54	108
80 cc	80,4	334.00	269.00	246.70	157.80	143.90	124.80	G 1"	60	123
108 cc	108	334.00	269.00	246.70	157.80	143.90	124.80	G 1"	60	123
130 cc	130	336.30	271.3	249.00	159.70	145.80	126.70	G 1"	60	123

ByPass Valve for A11 (SAE2) Bent Axis Pumps



Pump MODEL	DISPL. (cc)	WEIGHT WITHOUT INLET FITTING (kg)	WEIGHT WITH HOUSING INLET FITTING (kg)	TORQUE WITHOUT FITTING (N.m)	TORQUE WITH FITTING (N.m)
5 cc	5.1	9.00	9.40	8.20	8.60
10 cc	10.2	9.00	9.40	8.65	9.05
12 cc	12.0	9.20	9.60	8.74	9.14
18 cc	18.0	9.30	9.70	8.79	9.19
25 cc	25.0	11.00	11.40	8.89	9.29
32 cc	32.0	11.10	11.50	11.10	11.50
41 cc	41.0	11.20	11.60	11.15	11.55
50 cc	50,3	11.30	11.70	11.75	12.15
56 cc	56,0	11.35	11.75	11.80	12.20
63 cc	63.0	11.45	11.85	11.85	12.25
80 cc	80,4	14.80	15.20	17.80	18.30
108 cc	108	14.90	15.30	17.92	18.42
130 cc	130	15.30	15.70	18.70	19.50

A11 (SAE2) Series Bent Axis Pumps

40° bent axis design giving high power, small overall dimensions, optimum efficiency and economic design. Flange and shaft designed for direct mounting on truck gearbox PTO's. The fixed displacement bent axis pumps generates a hydraulic fluid flow. It is designed for use on trucks, commercial vehicles and all stationary hydraulic applications. The Pump a fixed pump with rotary group in bent-axis design open circuits. Flow is proportional to drive speed and displacement.

For axial piston units with bent-axis design, the Pistons are arranged diagonally with respect to the drive shaft. The pump covers the whole displacement range 5 to 130 cm³/rev. The pump has been developed with modern styling and design to satisfy market demand as to designed new generation plate and pistons with very high flow performance, high pressures with high efficiency and very small dimensions.

The pump is available both to SAE2 and SAE world standards and can be mounted either directly at the gearbox or via a drive shaft. If necessary it can also be augmented with a by-pass valve. Other brand bent axis pumps compatible and interchangeable with SAE2 bent axis pumps. Refer to the data sheet and order confirmation for the technical data, operating conditions and operating limits of the bent axis piston pumps.

Formulas			
Pump Output Flow	GPM	$GPM = (Speed (rpm) \times d.s.p. (cu. in.)) / 231$	$GPM = (n \times d) / 231$
Pump Input Horsepower	HP	$HP = GPM \times Pressure (ps) / 1714 \times Efficiency$	$HP = (Q \times P) / 1714 \times E$
Pump Efficiency	E	Overall Efficiency = Output HP / Input HP	$E_{overall} = HP_{out} / HP_{in} \times 100$
		Overall Efficiency = Volumetric Eff. $\times$ Mechanical Eff.	$E_{overall} = Eff_{Vol.} \times Eff_{Mech.}$
Pump Volumetric Efficiency	E	Volumetric Efficiency = Actual Flow Rate Output (GPM) / Theoretical Flow Rate Output (GPM) $\times 100$	$Eff_{Vol.} = Q_{Act.} / Q_{Theo.} \times 100$
Pump Mechanical Efficiency	E	Mechanical Efficiency = Theoretical Torque to Drive / Actual Torque to Drive $\times 100$	$Eff_{Mech} = T_{Theo.} / T_{Act.} \times 100$
Pump Displacement	CIPR	$Displmnt (in. 3/ rev.) = Flow Rate (GPM) \times 231 / Pump RPM$	$CIPR = GPM \times 231 / RPM$
Pump Torque	T	Torque = Horsepower $\times 63025 / RPM$	$T = 63025 \times HP / RPM$
		Torque = Pressure (PSIG) $\times$ Pump Displacement (CIPR) / 2π	$T = P \times CIPR / 6.28$

Horsepower for driving a pump : For every 1 hp of drive, the equivalent of 1 gpm @ 1500 psi can be produced.

Horsepower for driving a pump : To drive a pump when it is unloaded will require about 5% of its full rated power

Wattage for heating hydraulic oil : Each watt will raise the temperature of 1 gallon of oil by 1° F. per hour.

Flow velocity in hydraulic lines : Pump suction lines 2 to 4 feet per second, pressure lines up to 500 psi - 10 to 15 ft./sec., pressure lines 500 to 3000 psi - 15 to 20 ft./sec.; all oil lines in a re-over-oil systems; 4 ft./sec.