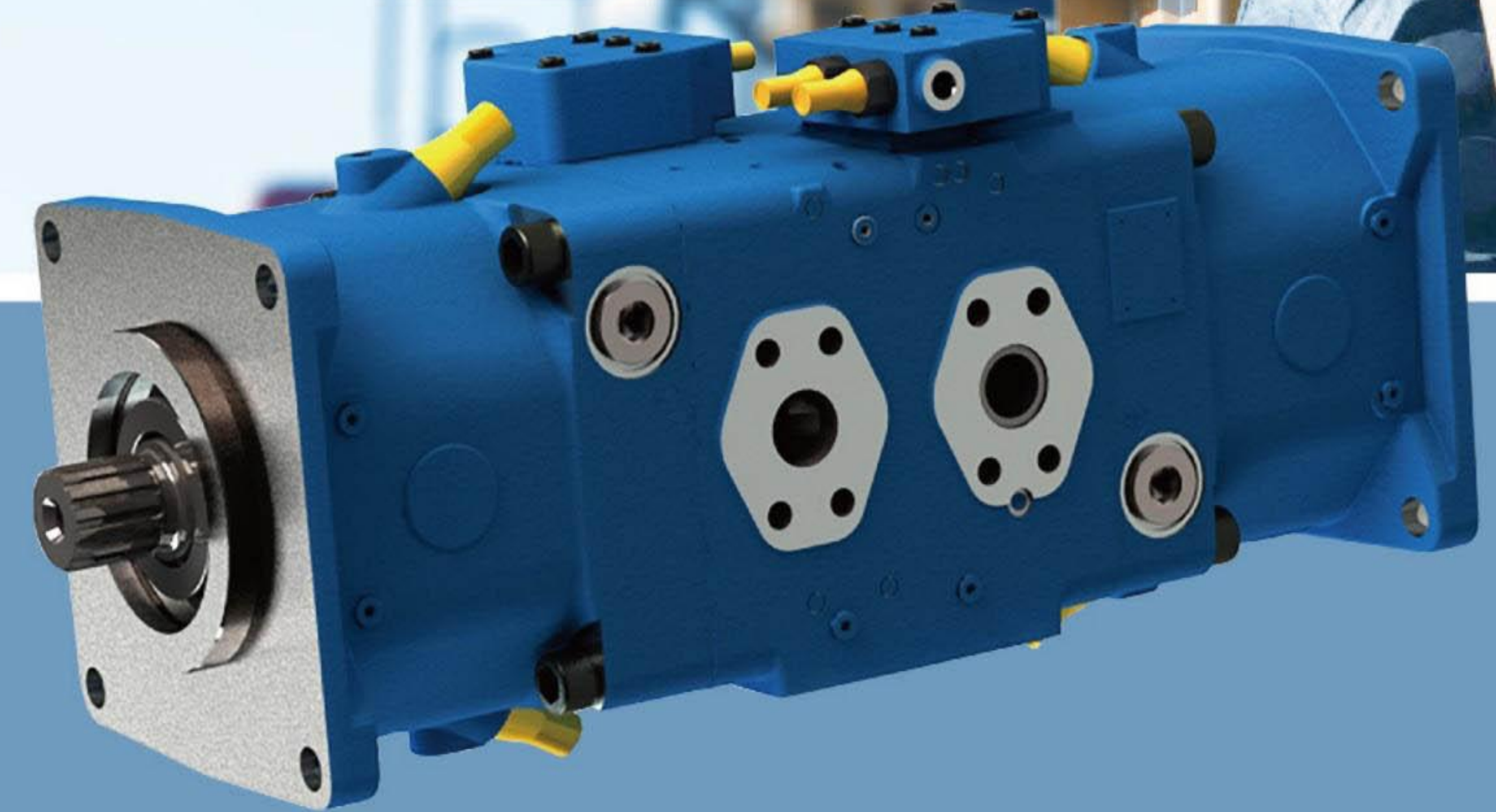


ZP20VO

Axial Piston Variable Double Pump

- Sizes (ml/r): 60,95...520
- Nominal pressure : 250/315 bar
- Peak pressure: 350/400 bar



Open circuit

- Variable pump with two axial piston rotary groups in swashplate design for use in open circuit hydrostatic drives
- For use in mobile and stationary applications
- The pump consists of proven components from the ZP11VO ZP10VO/53 or ZP4VSO variable pumps The pump operates under self-priming condition, with tank pressurisation or with charge pump
- A wide variety of controls are available.
- Setting of the constant power control is possible via external adjustments, even when the unit is operating (only with power control).
- The pump is available with a through drive to mount a gear pump or a second axial piston pump
- Output flow is proportional to drive speed and pump displacement and is steplessly variable between maximum and zero displacement

ZP20V		O		/	10								
01	02	03	04	05	06	07	08	09	10	11	12		

Axial piston unit

01	Swashplate design, variable (Back to back - design)	ZP20V
----	---	-------

Charge pump (impeller)

		60	95	190	260	520
02	without charge pump	●	●	-	-	●
	with charge pump	-	-	●	●	-
						L

Operation

03	Double pump, open circuit	O
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Size

04	Displacement	60	95	190	260	520
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Control devices

		60	95	190	260	520
05	see ZP10vo/53	●	-	-	-	-
	see ZP11vo/11	-	●	●	●	-
	see ZP 4vso	-	-	-	-	●

Series

06	Series 1, Index 0	10
----	-------------------	----

Direction of rotation

07	viewed on shaft end	clockwise	R
		counter-clockwise	L

● available - not available ▲ on request

Seals

08	NBR(nitril-caoutchouc), shaft seal ring in FKM (fluor-caoutchouc)	●	●	●	●	-	N
	FKM (fluor-caoutchouc)	-	-	-	-	●	V

Shaft end

		60	95	190	260	520	
09	Splined shaft DIN 5480	-	●	●	●	●	Z
	Splined shaft, ANSI B92.1a-1976	●	●	-	-	-	S
	Parallel keyed shaft, DIN 6885	-	-	●	●	-	T
		-	-	-	-	●	P

Mounting flange

		60	95	190	260	520	
10	SAE J744-4 hole	●	●	●	●	-	D
	To fit flywheel housing (conformin to SAE J617) of internal combustion engine (details on request)	-	●	●	-	-	G
	ISO 3019-2-8 hole	-	-	-	-	●	H

Service line ports

		60	95	190	260	520	
11	Two service line ports and one scution port at site, opposite (fastening thread metric)	●	●	●	●	-	24
	At the site two service line ports each, opposite and one suction port displaced by 90° (fastening thread metric)	-	-	-	-	●	26

Boost pump and through drive

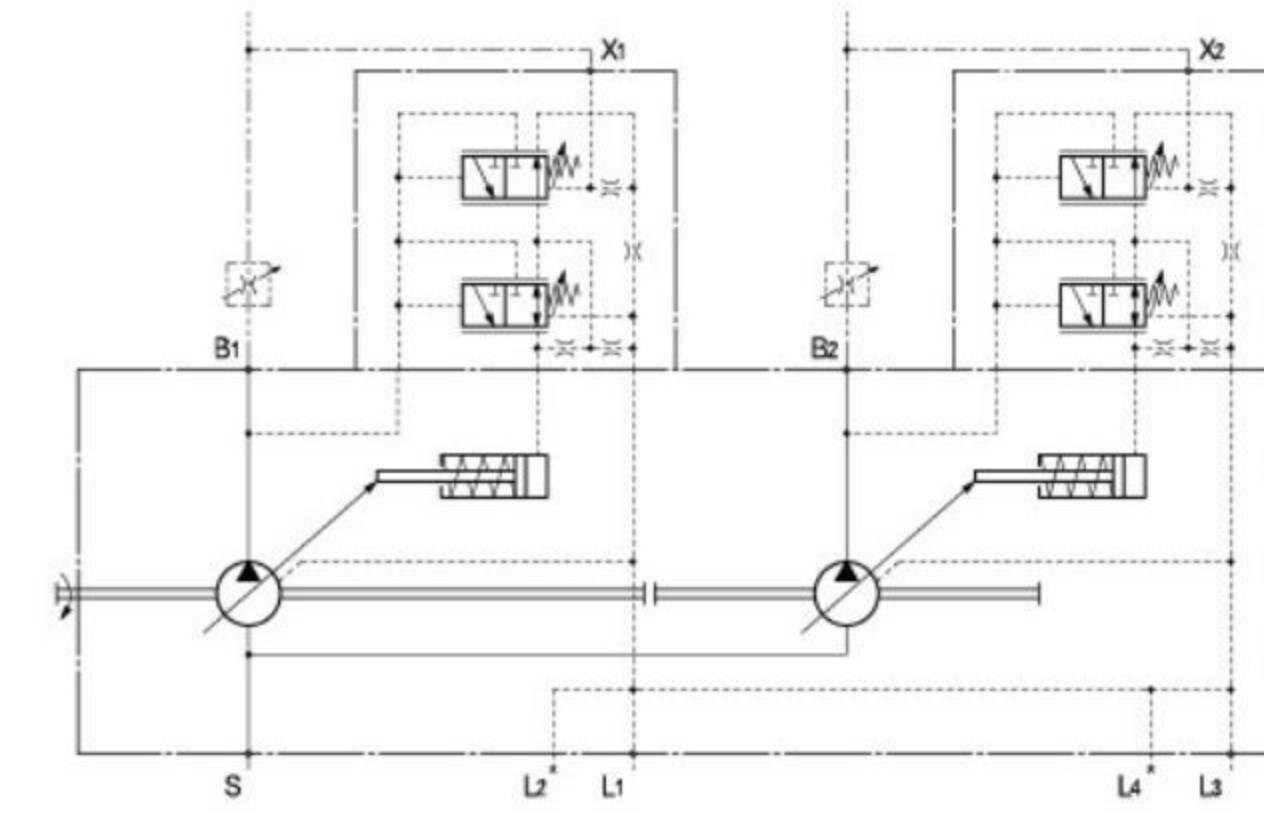
		60	95	190	260	520	
12	without boost pump, without through drive	●	●	●	●	-	N00
	without boost pump, with through drive						

Technical Data

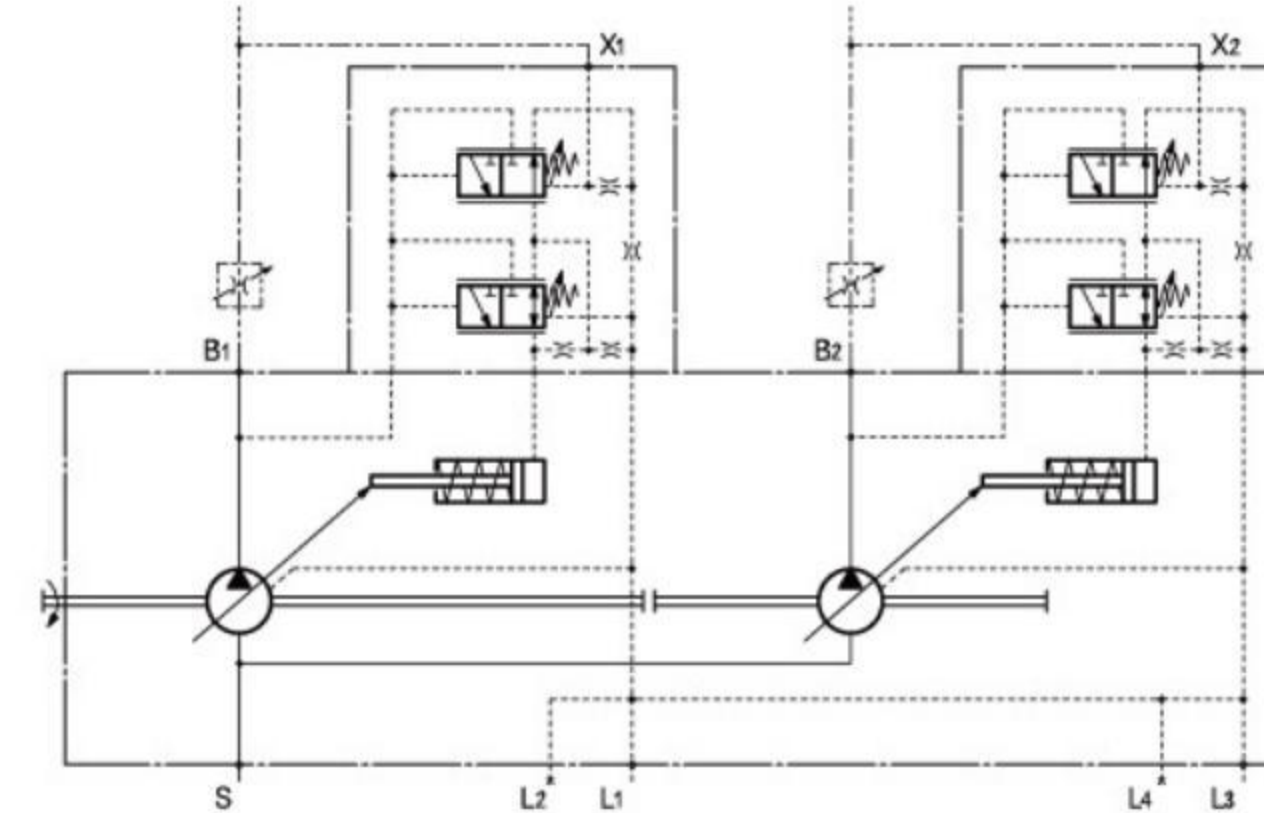
Table of values (theoretical values, without efficiencies η_{mh} η_v and values rounded)

Size	without charge pump						
	with charge pump	60	95	190	260	520	
Displacement	V_{gmax}	cm ³	60	93.8	192.7	260	520
	V_{gmin}	cm ³	0	0	0	0	0
Speed, at V_{gmax}	n_{max}	min ⁻¹	2700	2350	2500	2300	1450
Speed max., at $V_g \leq V_{gmax}$	n_{max}	min ⁻¹	3200	2780	2500	2300	1720
Flow, at $n_{max} \leq V_{gmax}$	q_{vmax}	L/min	2x162	2x220	2x482	2x598	2x754
Power, at q_{vmax} and $\Delta P = 350$ bar	P_{max}	KW	135	257	562	698	880
DisplaceTorque at V_{gmax} at long-term ($\Delta p = 350$ bar) max. perm., short term ($\Delta p = 400$ bar) ment	T_{max}	Nm	477	1045	2147	2897	5793
	T_{max}	Nm	602	1194	2454	3310	6621
Moment of inertia (of the rotating parts)	J	kgm ²	0.0113	0.00346	0.0604	0.0912	0.0912
Mass approx	m	kg	44	44	217	281	640

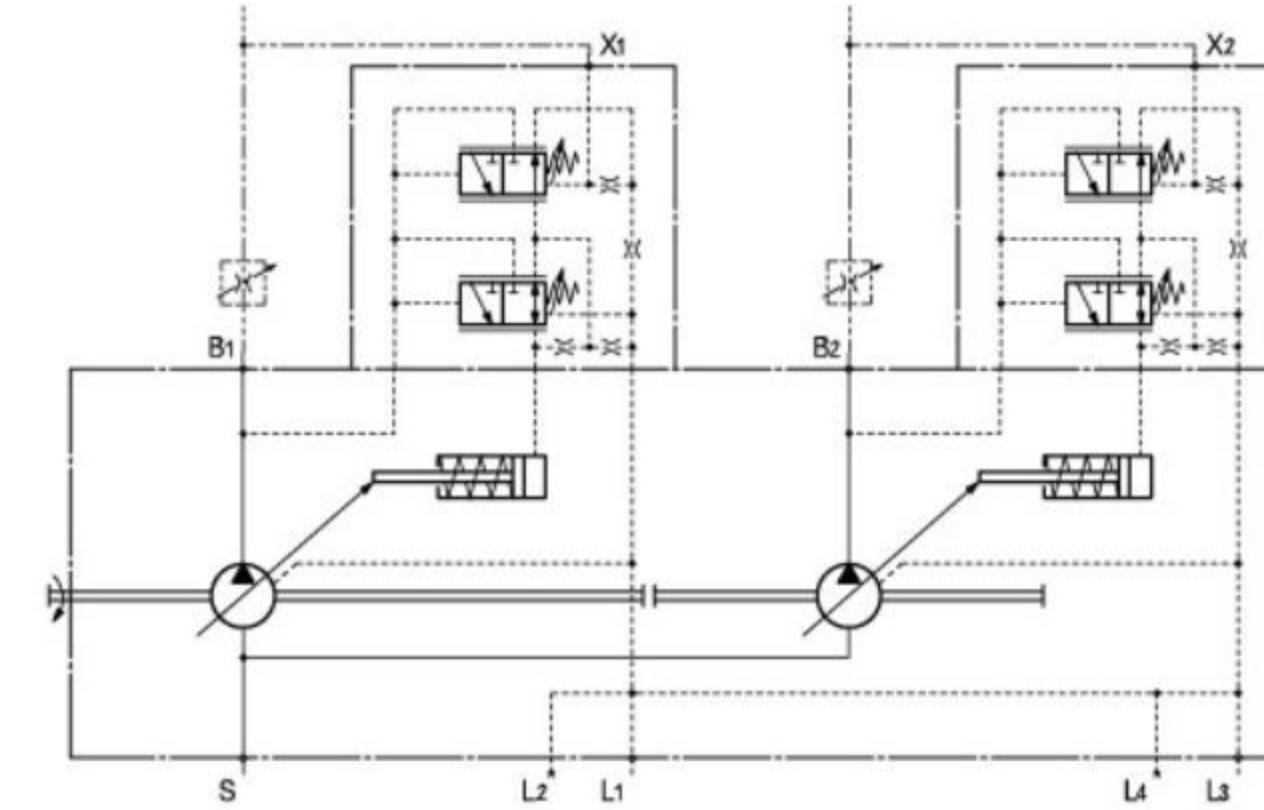
Example circuit diagram
Size: 60: DFR



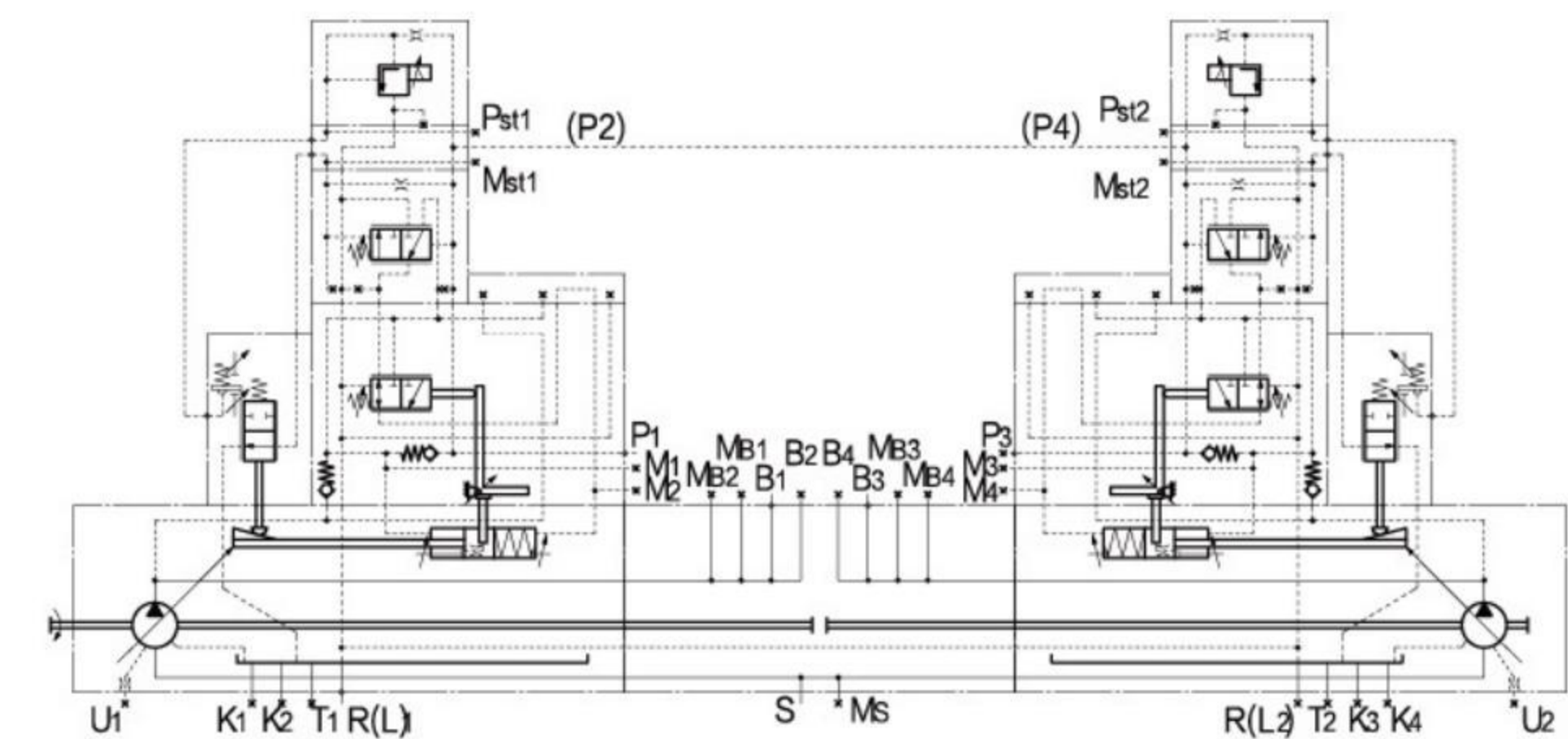
Example circuit diagram
Size: 95...26: HD1D

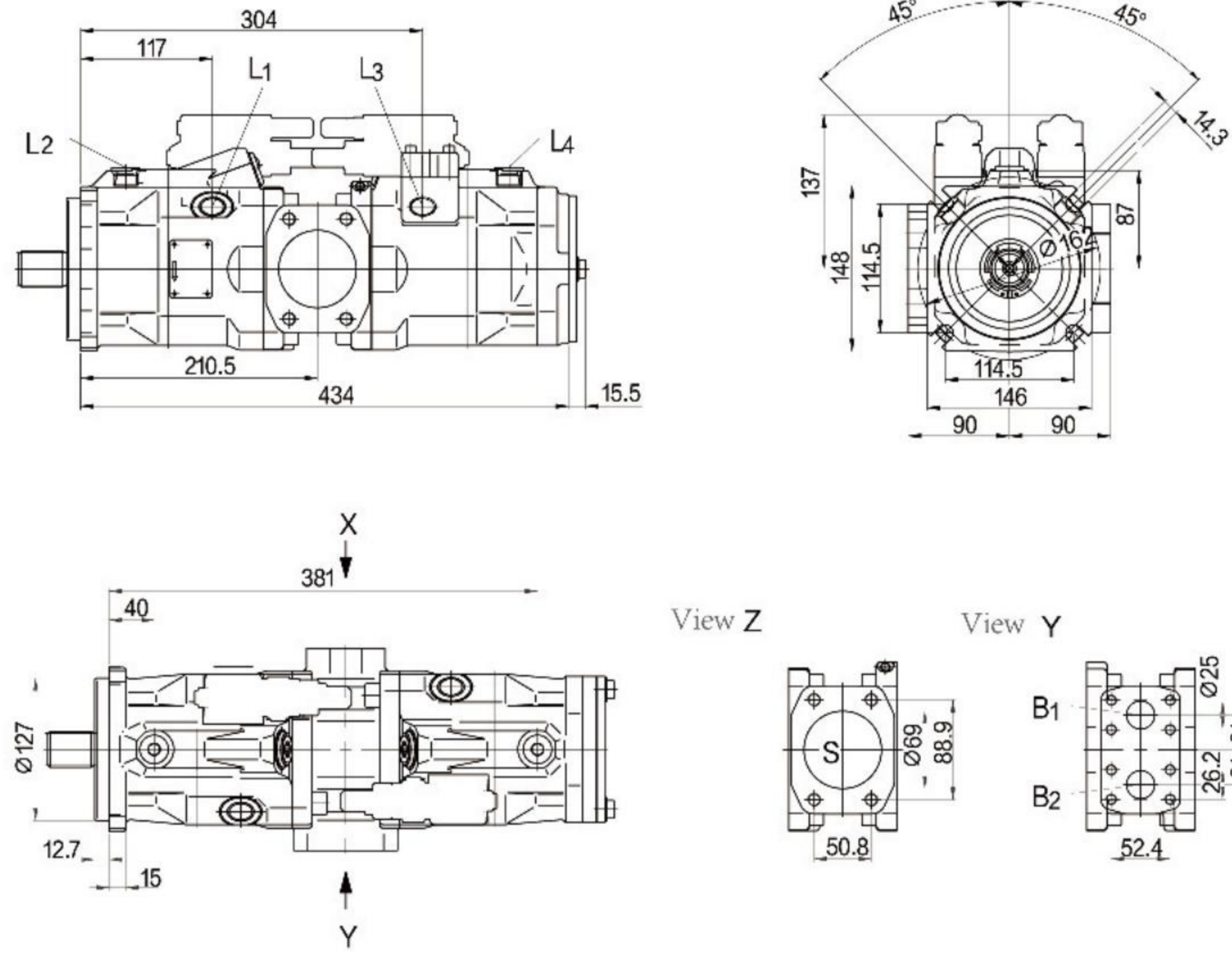


Example circuit diagram
Size: 190, 260 DRS

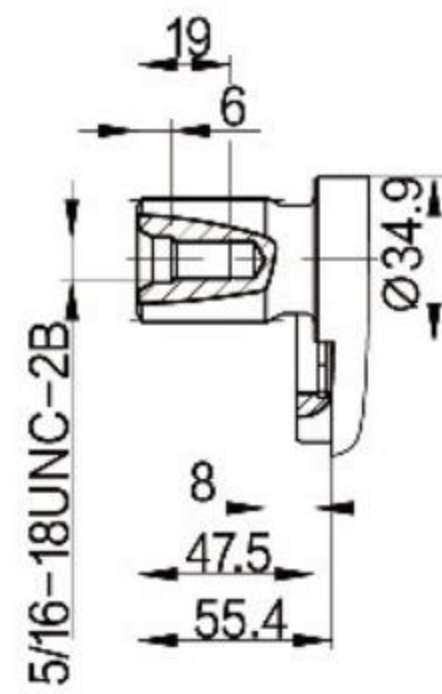


Example circuit diagram
Size: 520: LR2DN



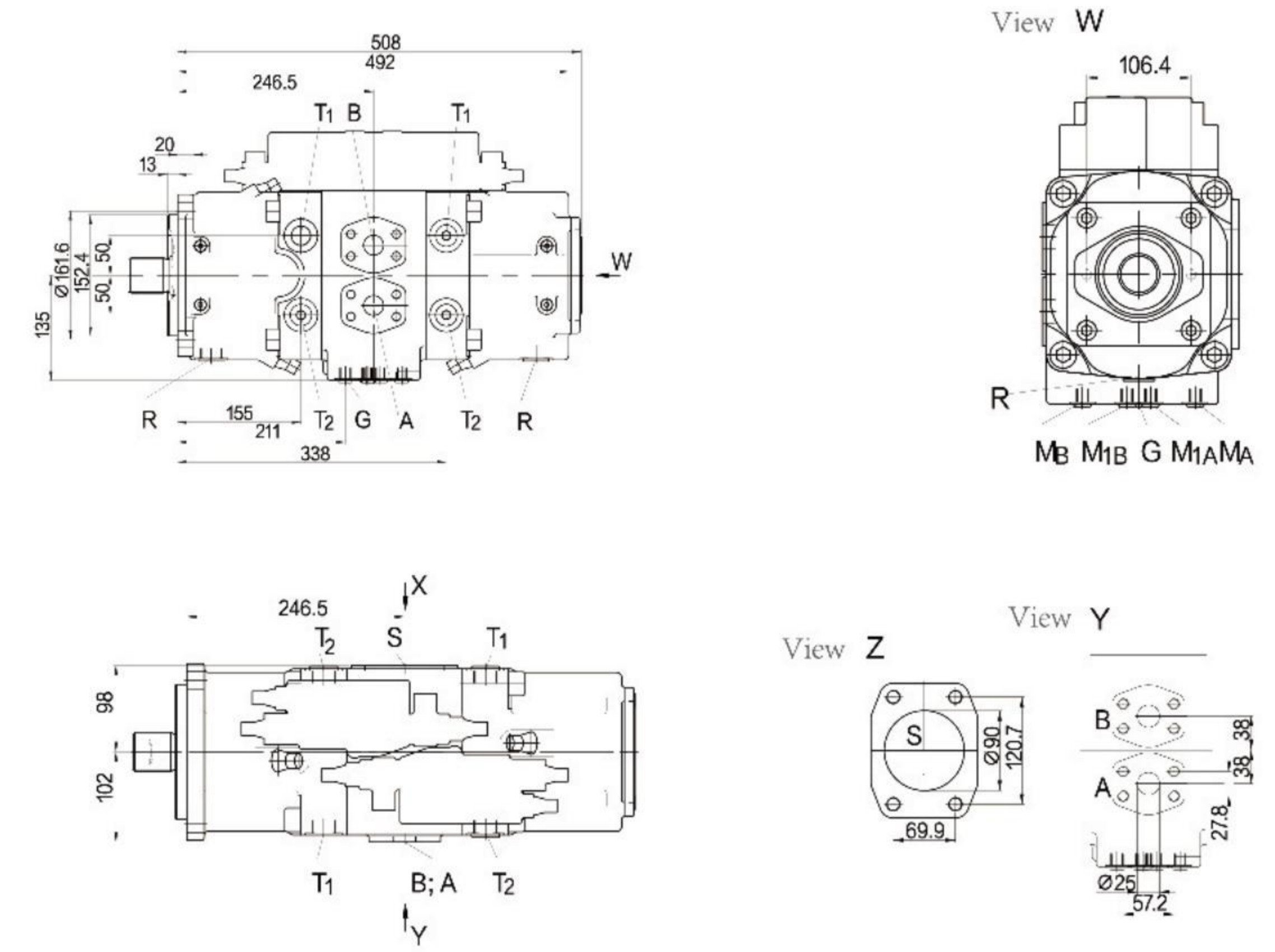


Shaft ends
S Splined shaft SAE
 J744-32-4 1 1/4in14T 12/24DP

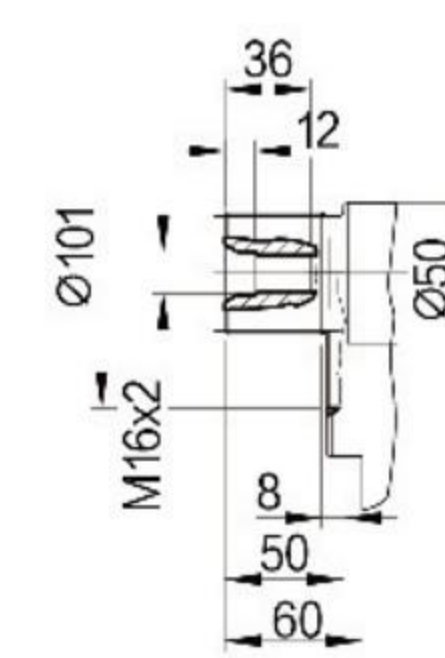


Ports

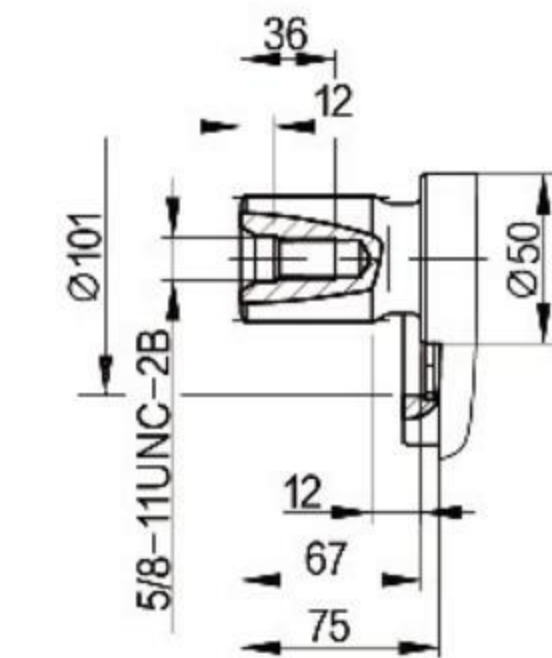
B ₁ B ₂	Service ports (High pressure series)	SAE J518	1 in	
	Fastening thread	DIN 13	M10×1.5	Deep 17
S	Suction port	SAE J518	2 1/2 in	
	Fastening thread	DIN13	M12x1.75	Deep 20
L _{1,2,3}	Case drain	DIN3852	7/8-14UNF-2B	240Nm



Shaft ends
Z Splined shaft DIN 5480
 W45x2x30x21x9g



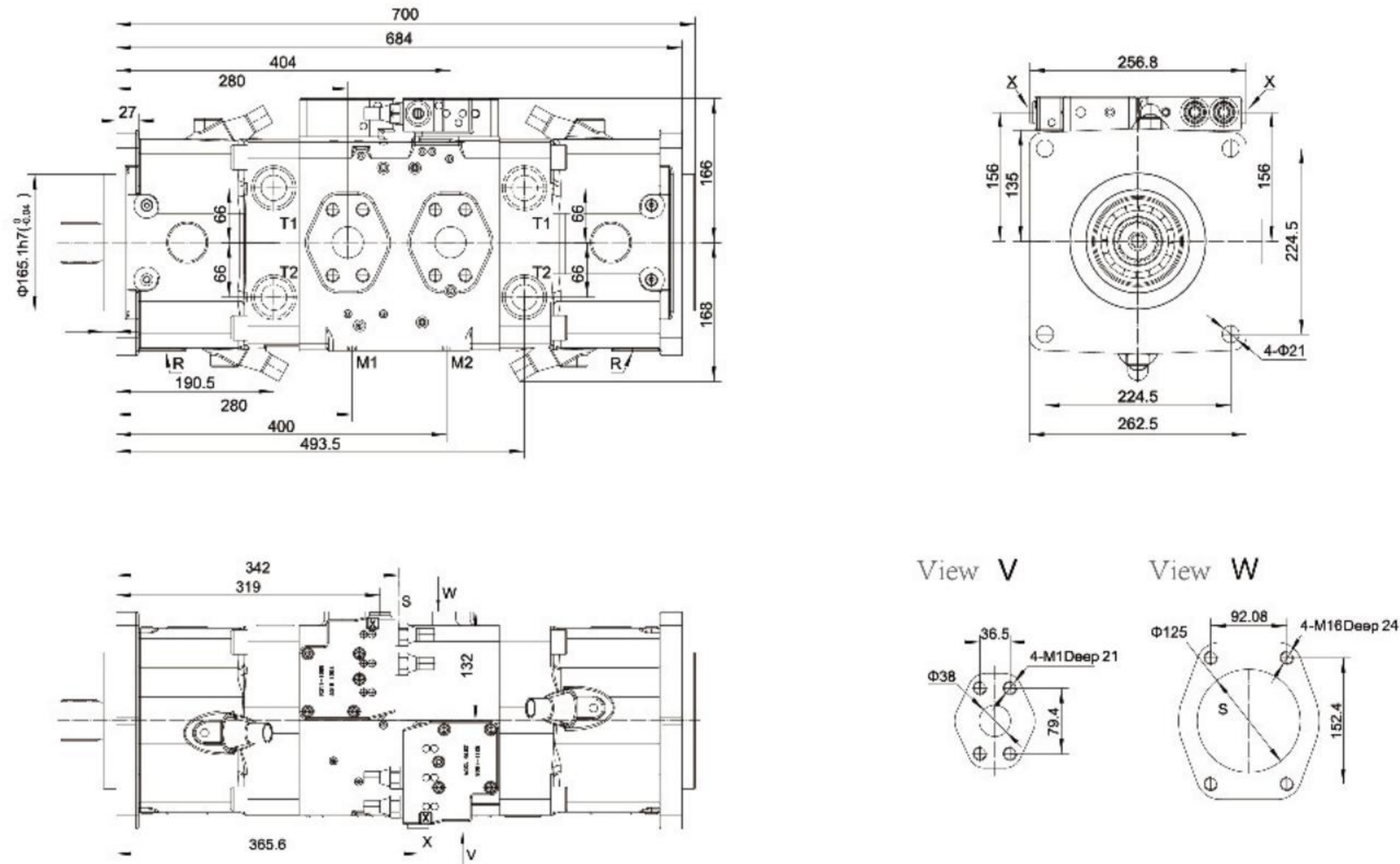
S Splined shaft SAE
 J477-44-4 1 1/3 in 13T 8/16DP



Ports

A,B	Service ports (High pressure series)	SAEJ518	1 in	
	Fastening threads	DIN13	M12×1.75	Deep 17
S	Suction port (standard series)	SAEJ518	3 1/2 in	
	Fastening threads	DIN13	M16×2	Deep 24
T ₁ T ₂	Case drain	DIN3852	M26×1.5	Deep 14 230Nm
M _B M _A	Gauge point positioning chamber	DIN3852	M26×1.5	Deep 14 50Nm
R	Air bleed, drain port	DIN3852	M14×1.5	Deep 14 230Nm
G	Control pressure port (controller)	DIN3852	M14×1.5	Deep 12 80Nm

Unit Dimensions, Size 190



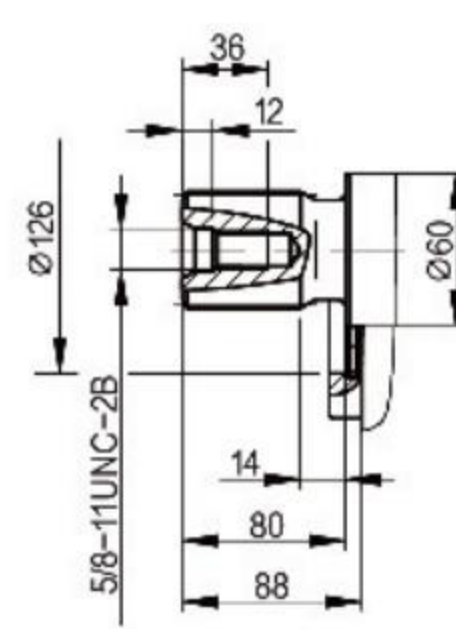
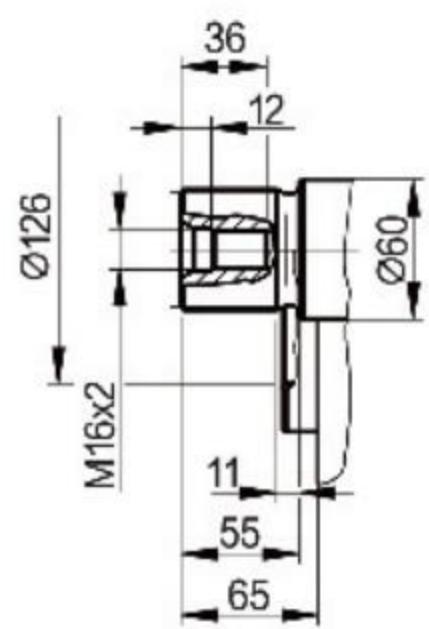
Shaft ends

Z Splined shaft DIN 5480

W35x2x30x24x9g

T Splined shaft SAE

J744-50-4 2 in 15T 8/16DP

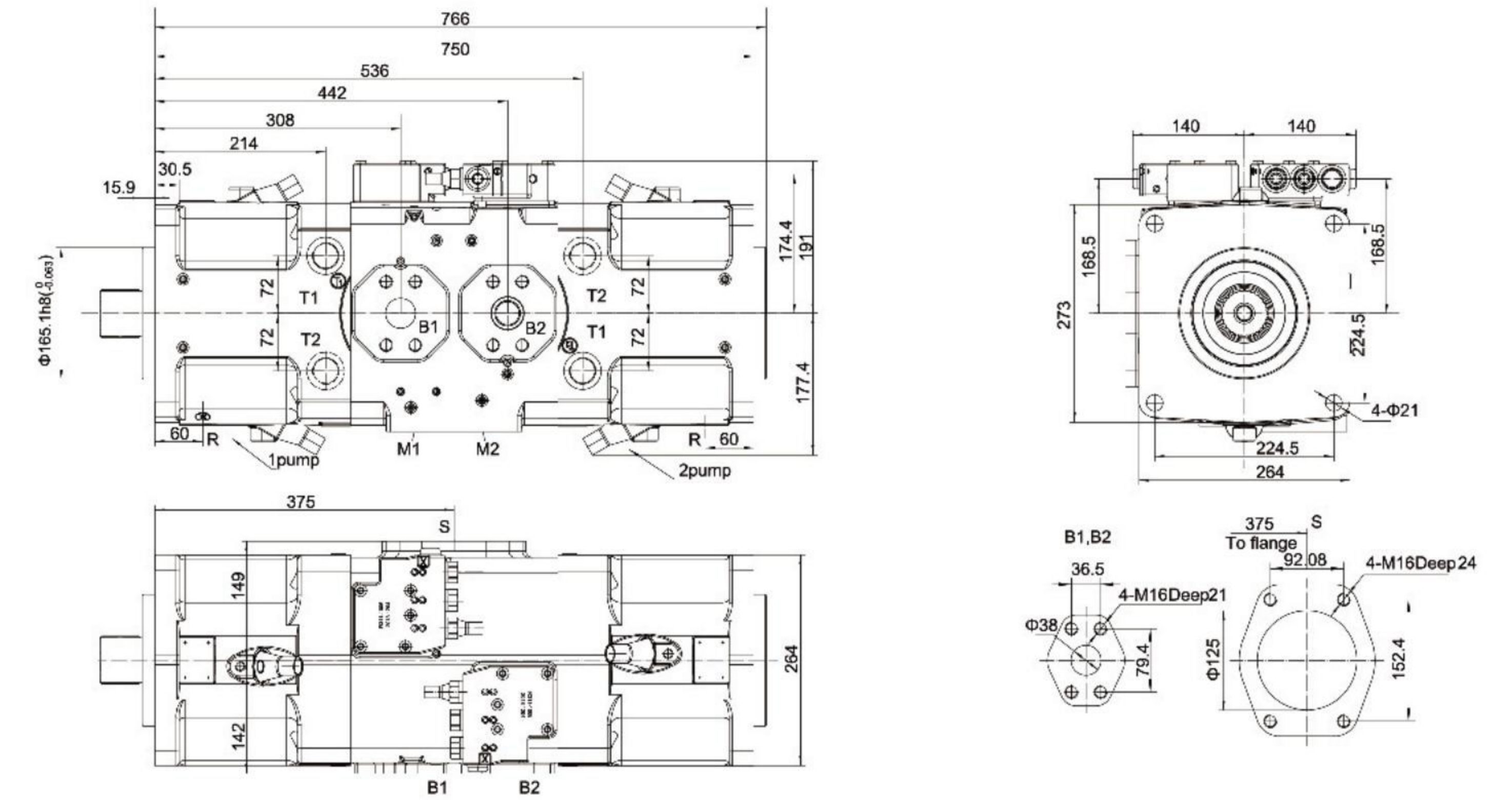


ANSI B92.1a-1976, pressure angle 30°, flat root, side fit, tolerance class 5

Ports

Port	Description	Standard	Size	Depth
B ₁ , B ₂	Service ports	SAE J518	1 1/2 in	Deep 21
	Fastening threads	DIN13	M16 × 2	
S	Suction port (standard series)	SAE J518	5 in	Deep 24
	Fastening threads	DIN13	M16 × 2	
R	Air bleed, drain port	DIN3852	M33 × 2	Deep 18
T ₁ , T ₂	Case drain	DIN3852	M33 × 2	Deep 18
M ₁ , M ₂	Gauge point positioning chamber	DIN3852	M12 × 1.5	Deep 12
X	Pilot control ports	DIN3852	M14 × 1.5	Deep 12

Unit Dimensions, Size 260



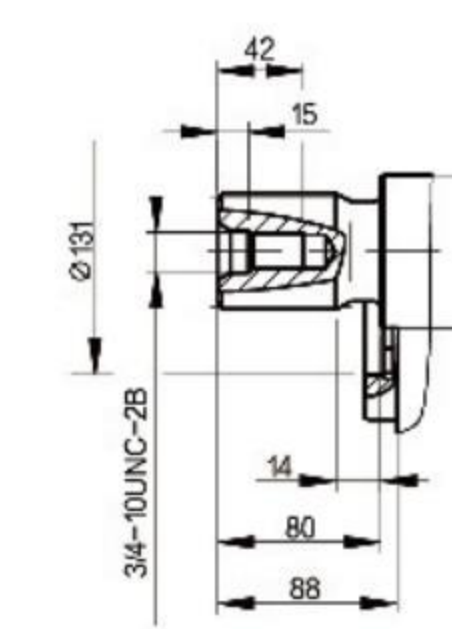
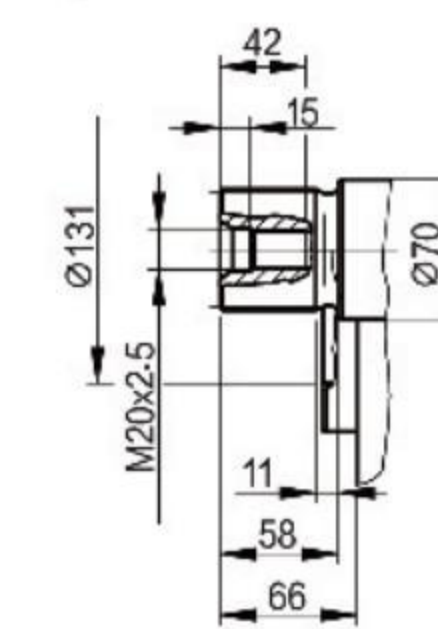
Shaft ends

Z Splined shaft DIN 5480

W60x2x30x28x9g

T Splined shaft

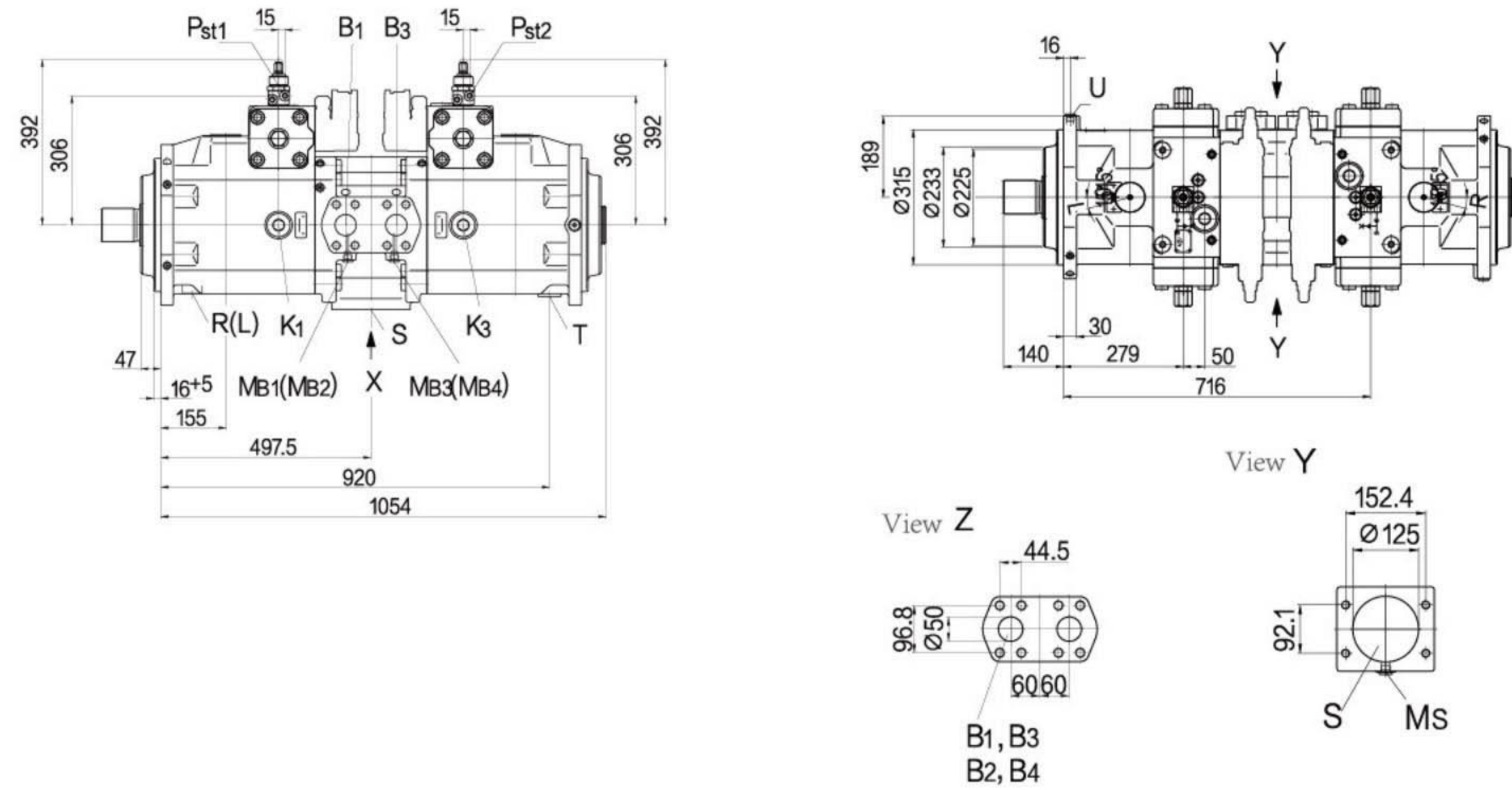
2 1/4 in 17T 8/16DP



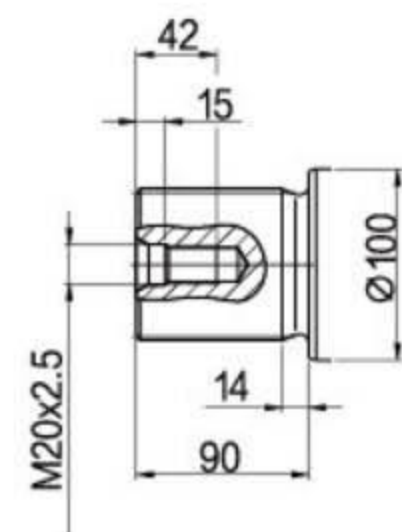
ANSI B92.1a-1976, pressure angle 30°, flat root, side fit, tolerance class 5

Connections

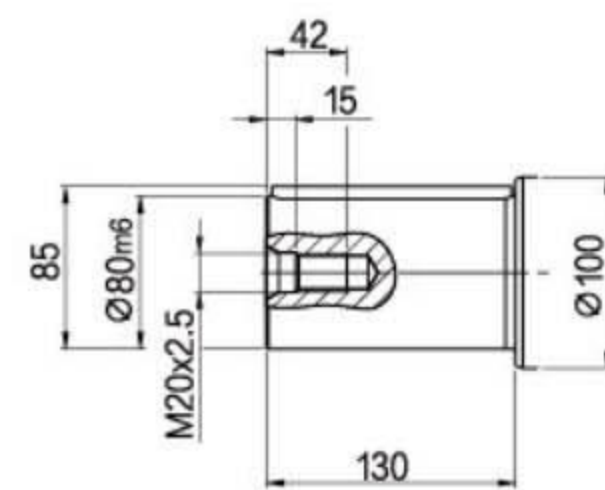
Port	Description	Standard	Size	Depth
B ₁ , B ₂	Service ports	SAE J518	1 1/2 in	Deep 21
	Fastening threads	DIN13	M16 × 2	
S	Suction port (standard series)	SAE J518	5 in	Deep 24
	Fastening threads	DIN13	M16 × 2	
R	Air bleed, drain port	DIN3852	M33 × 2	Deep 18
T ₁ , T ₂	Case drain	DIN3852	M33 × 2	Deep 18
M ₁ , M ₂	Gauge point positioning chamber	DIN3852	M12 × 1.5	Deep 12
X	Pilot control ports	DIN3852	M14 × 1.5	Deep 12



Shaft ends
Z Splined shaft DIN 5480
80x3x30x25x9g



P Parallel keyed shaft DIN 6885



Ports

B ₁ -B ₄	Service line ports (High pressure series)	SAEJ518	2 in		
	Fastening threads	DIN13	M20 × 2.5	Deep 24	
S	Suction port (standard series)	SAEJ518	5 in		
	Fastening threads	DIN13	M16 × 2	Deep 24	
K ₁ -K ₃	Flush ports		M48 × 2	Deep 22	960Nm
M _{B1} , M _{B2}	Gauge point for operating pressure	DIN3852	M18 × 1.5	Deep 12	140Nm
M _{B1} , M _{B2}	Gauge point for suction port	DIN3852	M18 × 1.5	Deep 12	140Nm
P _{st1} , P _{st2}	Pilot pressure port		M14 × 1.5	Deep 22	960Nm
R(L)	Air bleed, drain port	DIN3852	M48 × 2	Deep 22	960Nm
T	Case drain	DIN3852	M48 × 2	Deep 22	960Nm
U	Flush port	DIN3852	M18 × 1.5	Deep 12	140Nm

