

Ordering code for standard program

A4V	G			D						/ 32		- N											
01	02	03	04	05	06	07	08	09		10	11		12	13	14	15	16	17	18	19	20	21	22

Axial piston unit

01	Swashplate design, variable, nominal pressure 400 bar, maximum pressure 450 bar																				A4V
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Operating mode

02	Pump, closed circuit																				G
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Sizes (NG)

03	Geometric displacement, see table of values on page 8								28	40	56	71	90	125	180	250
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Control devices

		28	40	56	71	90	125	180	250		
04	Without control module	●	●	●	●	●	●	●	●	NV	
	Proportional control hydraulic	pilot-pressure related p = 6 to 18 bar		●	●	●	●	●	●	●	HD3
		mechanical servo ¹⁾		●	●	●	●	●	●	●	HW
	Proportional control electric	U = 12 V DC		●	●	●	●	●	●	●	EP3
		U = 24 V DC		●	●	●	●	●	●	●	EP4
	Two-point control electric	U = 12 V DC		●	●	●	●	●	●	●	EZ1
		U = 24 V DC		●	●	●	●	●	●	●	EZ2
	Automatic control speed-related	U = 12 V DC		●	●	●	●	●	●	●	DA1
		U = 24 V DC		●	●	●	●	●	●	●	DA2
	Hydraulic control, direct controlled		●	●	●	●	●	●	●	●	DG

Pressure cut-off (see page 55)

		28	40	56	71	90	125	180	250	
05	Pressure cut-off (standard)	●	●	●	●	●	●	●	●	D

Neutral position switch (only for HW, see page 13)

		28	40	56	71	90	125	180	250	
06	Without neutral position switch (without code)	●	●	●	●	●	●	●	●	
	Neutral position switch	●	●	●	●	●	●	●	●	L

Mechanical stroke limiter (see page 56)

		28	40	56	71	90	125	180	250	
07	Without mechanical stroke limiter (without code)	●	●	●	●	●	●	●	●	
	Mechanical stroke limiter, externally adjustable	●	●	●	●	●	●	●	●	M

Ports X₃, X₄ for stroking chamber pressure (see page 56)

		28	40	56	71	90	125	180	250	
08	Without ports X ₃ , X ₄ (without code)	●	●	●	●	●	●	●	●	
	Ports X ₃ , X ₄ for stroking chamber pressure	●	●	●	●	●	●	●	●	T

DA control valve (see page 17)

		NV	HD	HW	DG	DA	EP	EZ		
09	Without DA control valve	●	●	●	●	-	●	●	1	
	DA control valve fixed setting	-	●	●	●	●	●	-	2	
	DA control valve mechanically adjustable, with position lever	actuating direction right	-	●	●	●	●	●	-	3R
		left	-	●	●	●	●	●	-	3L
	DA control valve fixed setting and braking inch valve mounted, control with brake fluid	according to ISO 4925, no mineral oil	-	-	-	-	●	-	-	4
		based on mineral oil	-	-	-	-	●	-	-	8
	DA control valve fixed setting, ports for pilot control device	-	●	●	●	●	●	●	-	7

● = Available

○ = On request

- = Not available

■ = Preferred program

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01	02	03	04	05	06	07	08	09		10	11		12	13	14	15	16	17	18	19	20	21	22

Series

10	Series 3, index 2	32
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Directions of rotation

11	Viewed on drive shaft	clockwise	R
		counter-clockwise	L

Seals

12	NBR (nitrile-caoutchouc), shaft seal in FKM (fluor-caoutchouc)	N
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Drive shafts (permissible input torques see page 9)

		28	40	56	71	90	125	180	250	
13	Splined shaft DIN 5480	for single pump	●	●	●	●	●	●	●	Z
		for combination pump – 1st pump	– ²⁾	●	●	●	●	– ²⁾	– ²⁾	A
	Splined shaft ANSI B92.1a	for single pump	●	●	●	●	●	●	●	S
		for combination pump – 1st pump	– ³⁾	– ³⁾	●	●	– ³⁾	●	●	T
	Only for combination pump – 2nd pump	–	●	–	–	●	–	–	U	

Mounting flanges

		28	40	56	71	90	125	180	250	
14	SAE J744	2-hole	●	●	●	–	–	–	–	C
		4-hole	–	–	–	–	–	●	●	D
		2+4-hole	–	–	–	●	●	●	–	F

Service line ports

		28	40 to 180	250		
15	SAE flange ports A and B, top and bottom	suction port S bottom	–	●	–	02
		top	–	○	–	03
	SAE flange ports A and B, same side	right suction port S bottom	●	–	●	10
		left suction port S top	○	–	○	13

Boost pump

		28	40	56	71	90	125	180	250	
16	Without integrated boost pump	without through drive	●	●	●	●	●	●	●	N00
		with through drive	●	●	●	●	●	●	●	K..
	Integrated boost pump	without through drive	●	●	●	●	●	●	●	F00
		with through drive	●	●	●	●	●	●	●	F..

Through drives (mounting options, see page 53)

		28	40	56	71	90	125	180	250	
17	Flange SAE J744 ⁴⁾	Coupling for splined shaft								
	82-2 (A)	5/8 in	9T 16/32DP ⁵⁾	●	●	●	●	●	●	.01
	101-2 (B)	7/8 in	13T 16/32DP ⁵⁾	●	●	●	●	●	●	.02
		1 in	15T 16/32DP ⁵⁾	●	●	●	●	●	●	.04
	127-2 (C)	1 in	15T 16/32DP ⁵⁾	–	●	–	–	–	–	.09
		1 1/4 in	14T 12/24DP ⁵⁾	–	–	●	●	●	●	.07
	152-2/4 (D)	W35	2x16x9g ⁶⁾	–	–	–	●	–	–	.73
		1 3/4 in	13T 8/16DP ⁵⁾	–	–	–	–	●	●	.69
	165-4 (E)	1 3/4 in	13T 8/16DP ⁵⁾	–	–	–	–	–	●	.72

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01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	

Valves (see page 54)		Setting range Δp	28	40	56	71	90	125	180	250		
18	High-pressure relief valve, pilot operated	100 to 420 bar with bypass	-	-	-	●	●	●	●	●	1	
	High-pressure relief valve direct controlled, fixed setting	250 to 420 bar	w/o bypass	●	●	●	-	-	-	-	3	
			with bypass	●	●	●	-	-	-	-	5	
		100 to 250 bar	w/o bypass	●	●	●	-	-	-	-	-	4
			with bypass	●	●	●	-	-	-	-	-	6

Filtration boost circuit / external supply (see pages 57 to 60)		28	40	56	71	90	125	180	250	
19	Filtration in the boost pump suction line	●	●	●	●	●	●	●	●	S
	Filtration in the boost pump pressure line	●	●	●	●	●	●	●	●	D
	Ports for external boost circuit filtration (F_e and F_a) and cold start valve	-	●	●	●	●	●	●	-	K
	Filter mounted with cold start valve	-	●	●	●	●	●	●	-	F
	Filter mounted with cold start valve and contamination indicator through:	inspection window	-	●	●	●	●	●	-	P
		electric signal	-	●	●	●	●	●	-	B
External supply (on version without integrated boost pump – N00, K...)	●	●	●	●	●	●	●	●	E	

Swivel angle sensor (see page 61)		28	40	56	71	90	125	180	250	
20	Without swivel angle sensor (without code)	●	●	●	●	●	●	●	●	
	Electric swivel angle sensor mounted ⁷⁾	●	●	●	●	●	●	●	●	R

Connector for solenoids⁹⁾ (see page 62)		28	40	56	71	90	125	180	250	
21	DEUTSCH molded connector, 2-pin	●	●	●	●	●	●	●	●	P
		without suppressor diode	●	●	●	●	●	●	●	Q
		with suppressor diode (only for EZ and DA)	●	●	●	●	●	●	●	

Standard / special version			
22	Standard version	without code	
		combined with attachment part or attachment pump	-K
	Special version		-S
		combined with attachment part or attachment pump	-SK

● = Available ○ = On request - = Not available = Preferred program

Technical data

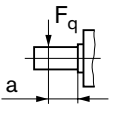
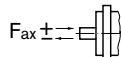
Table of values (theoretical values, without efficiency and tolerances; values rounded)

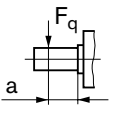
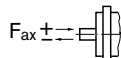
Size	NG		28	40	56	71	90	125	180	250	
Displacement geometric, per revolution											
variable pump	$V_{g \max}$	cm ³	28	40	56	71	90	125	180	250	
boost pump (at p = 20 bar)	$V_{g Sp}$	cm ³	6.1	8.6	11.6	19.6	19.6	28.3	39.8	52.5	
Speed ¹⁾											
maximum at $V_{g \max}$	n_{nom}	rpm	4250	4000	3600	3300	3050	2850	2500	2400	
limited maximum ²⁾	n_{max}	rpm	4500	4200	3900	3600	3300	3250	2900	2600	
intermittent maximum ³⁾	n_{max}	rpm	5000	5000	4500	4100	3800	3450	3000	2700	
minimum	n_{min}	rpm	500	500	500	500	500	500	500	500	
Flow											
at n_{nom} and $V_{g \max}$	q_v	L/min	119	160	202	234	275	356	450	600	
Power ⁴⁾											
at n_{nom} , $V_{g \max}$ and $\Delta p = 400$ bar	P	kW	79	107	134	156	183	238	300	400	
Torque ⁴⁾											
at $V_{g \max}$ and	$\Delta p = 400$ bar	T	Nm	178	255	357	452	573	796	1146	1592
	$\Delta p = 100$ bar	T	Nm	45	64	89	113	143	199	286	398
Rotary stiffness drive shaft											
	S	c	kNm/rad	31.4	69	80.8	98.8	158.1	218.3	244.5	354.5
	T	c	kNm/rad	–	–	95	120.9	–	252.1	318.4	534.3
	A	c	kNm/rad	–	79.6	95.8	142.4	176.8	256.5	–	–
	Z	c	kNm/rad	32.8	67.5	78.8	122.8	137	223.7	319.6	624.2
	U	c	kNm/rad	–	50.8	–	–	107.6	–	–	–
Moment of inertia for rotary group	J_{GR}	kgm ²	0.0022	0.0038	0.0066	0.0097	0.0149	0.0232	0.0444	0.0983	
Maximum angular acceleration ⁵⁾	α	rad/s ²	38000	30000	24000	21000	18000	14000	11000	6700	
Case volume	V	L	0.9	1.1	1.5	1.3	1.5	2.1	3.1	6.3	
Mass approx. (without through drive)	m	kg	29	31	38	50	60	80	101	156	
Center of gravity ⁶⁾											
	X	mm	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	
	Y	mm	24	20	20	15	20	30	33	30	
	Z	mm	105	112	106	135	145	160	180	203	

Technical data

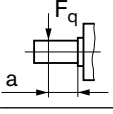
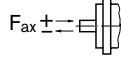
Permissible radial and axial forces of the drive shafts

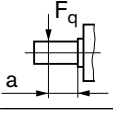
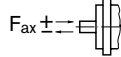
Splined shaft DIN 5480

Size	NG		28	40	40	56	56	71	71	90	
Drive shaft			W25	W30	W35	W30	W35	W35	W40	W35	
Maximum radial force at distance a (from shaft collar)		$F_{q \max}$	N	3030	3608	3092	5051	4329	5489	4803	6957
		a	mm	17.5	17.5	20	17.5	20	20	22.5	20
Maximum axial force		$-F_{ax \max}$	N	1557	2120	2120	2910	2910	4242	4242	4330
		$+F_{ax \max}$	N	417	880	880	1490	1490	2758	2758	2670

Size	NG		90	125	125	180	250	
Drive shaft			W45	W40	W45	W50	W55	
Maximum radial force at distance a (from shaft collar)		$F_{q \max}$	N	5411	8455	7516	9740	12298
		a	mm	25	22.5	25	27.5	29
Maximum axial force		$-F_{ax \max}$	N	4330	6053	6053	7500	4150
		$+F_{ax \max}$	N	2670	3547	3547	4500	4150

Splined shaft ANSI B92.1a

Size	NG		28	40	40	56	56	71	71	90	
Drive shaft		in	1	1	1 1/4	1 1/4	1 3/8	1 1/4	1 3/8	1 1/4	
Maximum radial force at distance a (from shaft collar)		$F_{q \max}$	N	2983	4261	3409	4772	4338	6050	5500	7670
		a	mm	19	19	24	24	24	24	24	24
Maximum axial force		$-F_{ax \max}$	N	1557	2120	2120	2910	2910	4242	4242	4330
		$+F_{ax \max}$	N	417	880	880	1490	1490	2758	2758	2670

Size	NG		90	125	125	180	180	250	250	
Drive shaft		in	1 3/4	1 3/4	2	1 3/4	2 1/4	1 3/4	2 1/4	
Maximum radial force at distance a (from shaft collar)		$F_{q \max}$	N	5478	7609	6658	10956	8522	15217	11836
		a	mm	33.5	33.5	40	33.5	40	33.5	40
Maximum axial force		$-F_{ax \max}$	N	4330	6053	6053	7500	7500	4150	4150
		$+F_{ax \max}$	N	2670	3547	3547	4500	4500	4150	4150

Technical data

Permissible input and through-drive torques

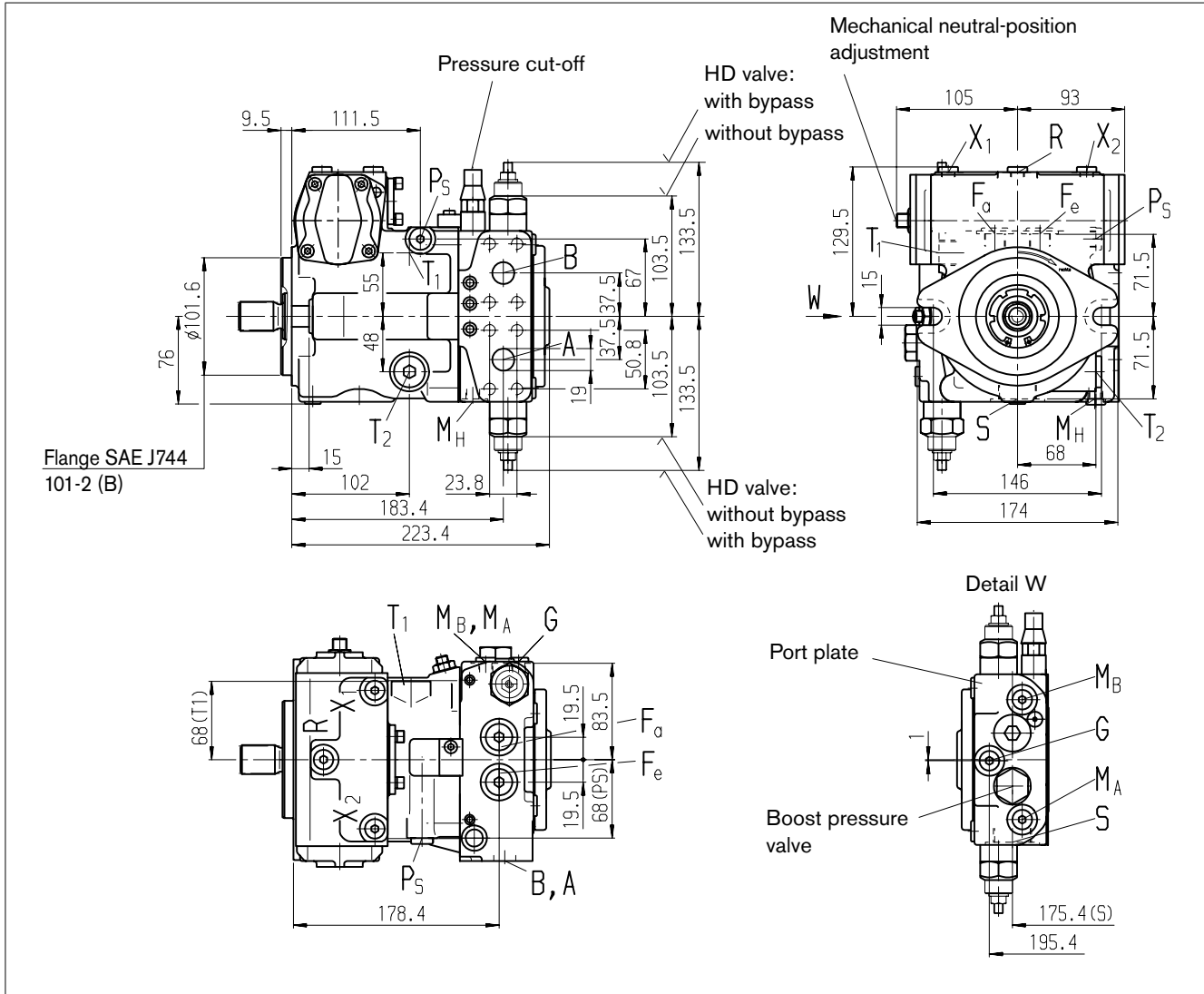
Size		NG		28	40	56	71	90	125	180	250
Torque at $V_{g \max}$ and $\Delta p = 400 \text{ bar}^1$		T	Nm	178	255	357	452	573	796	1146	1592
Input torque at drive shaft, maximum ²⁾											
DIN 5480	Z	$T_{E \max}$	Nm	352	522	522	912	912	1460	3140	4350
				W25	W30	W30	W35	W35	W40	W50	W55
	A	$T_{E \max}$	Nm	–	912	912	1460	2190	2190	–	–
					W35	W35	W40	W45	W45		
ANSI B92.1a (SAE J744)	S	$T_{E \max}$	Nm	314	602	602	602	1640	1640	1640	1640
				1 in	1 1/4 in	1 1/4 in	1 1/4 in	1 3/4 in	1 3/4 in	1 3/4 in	1 3/4 in
	T	$T_{E \max}$	Nm	–	–	970	970	–	2670	4070	4070
						1 3/8 in	1 3/8 in		2 in	2 1/4 in	2 1/4 in
	U ³⁾	$T_{E \max}$	Nm	–	314	–	–	602	–	–	–
					1 in			1 1/4 in			
Maximum through-drive torque ⁴⁾		$T_{D \max}$	Nm	231	314	521	660	822	1110	1760	2230

Dimensions size 28

NV – Version without control module

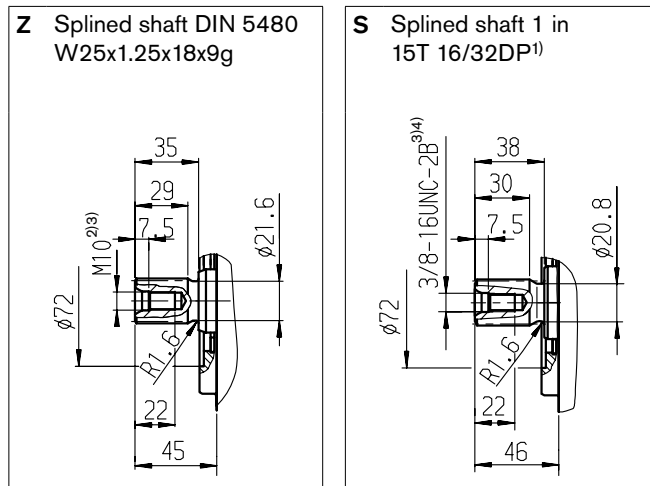
Standard: Suction port S at bottom (10)

Option: Suction port S at top (13): port plate turned through 180°



Dimensions size 28

Drive shafts



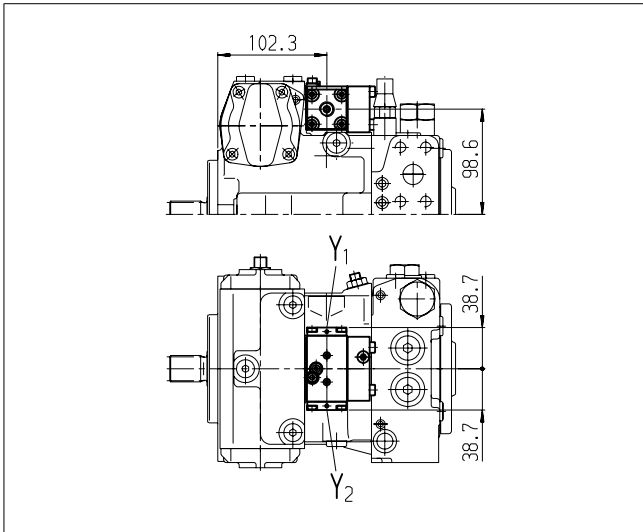
Ports

Designation	Port for	Standard	Size ³⁾	Maximum pressure [bar] ⁵⁾	State ¹¹⁾
A, B	Service line Fastening thread A/B	SAE J518 ⁶⁾ DIN 13	3/4 in M10 x 1.5; 17 deep	450	O
S	Suction line	DIN 3852 ⁹⁾	M33 x 2; 18 deep	5	O ⁷⁾
T ₁	Drain line	DIN 3852 ⁹⁾	M22 x 1.5; 14 deep	3	O ⁸⁾
T ₂	Drain line	DIN 3852 ⁹⁾	M22 x 1.5; 14 deep	3	X ⁸⁾
R	Air bleed	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	3	X
X ₁ , X ₂	Control pressure (upstream of orifice)	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	40	X
X ₁ , X ₂	Control pressure (upstream of orifice, DG only)	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	40	O
X ₃ , X ₄ ¹⁰⁾	Stroking chamber pressure	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	40	X
G	Boost pressure	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	40	X
P _S	Pilot pressure	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	40	X
P _S	Pilot pressure (DA7 only)	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	40	O
Y	Pilot pressure (DA7 only)	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	40	O
M _A , M _B	Measuring pressure A, B	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	450	X
M _H	Measuring high pressure	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	450	X
F _a	Boost pressure inlet	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	X
F _e	Boost pressure outlet	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	X
Y ₁ , Y ₂	Pilot signal (HD only)	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	40	O
Z	Inch signal (DA4 and 8 only)	DIN 3852 ⁹⁾	M10 x 1; 8 deep	40	X

Dimensions size 28

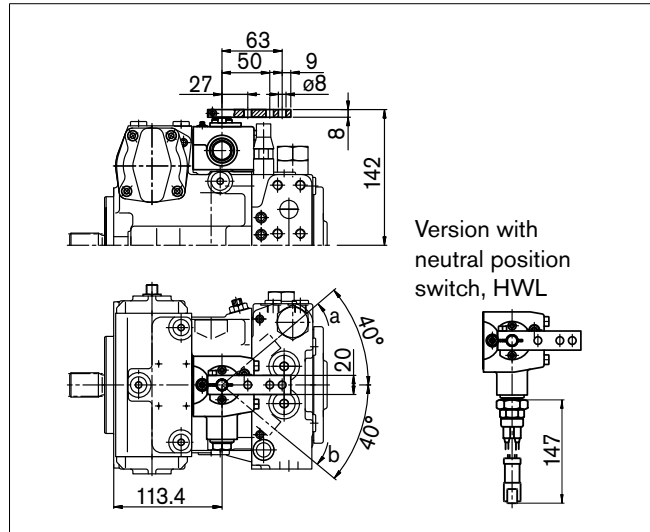
HD

Proportional control hydraulic, pilot-pressure related



HW

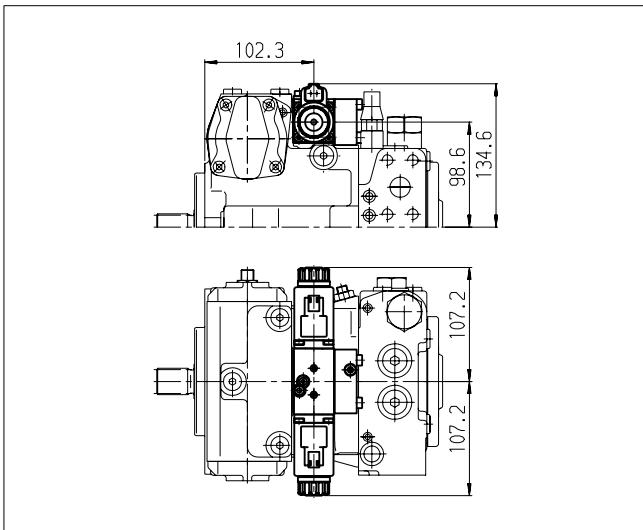
Proportional control hydraulic, mechanical servo



Version with neutral position switch, HWL

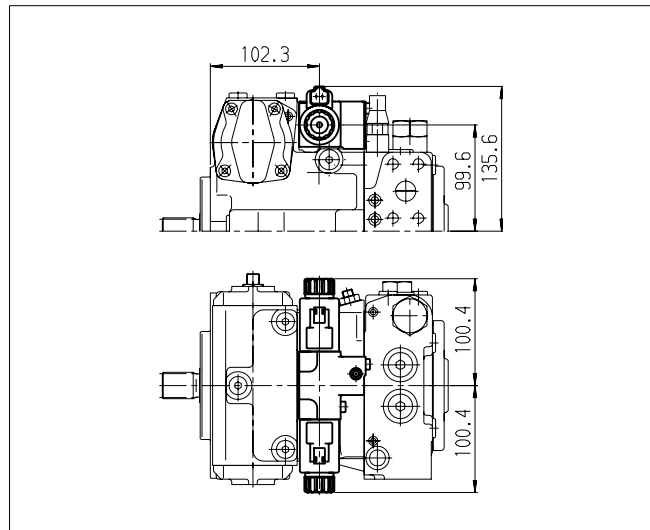
EP

Proportional control electric



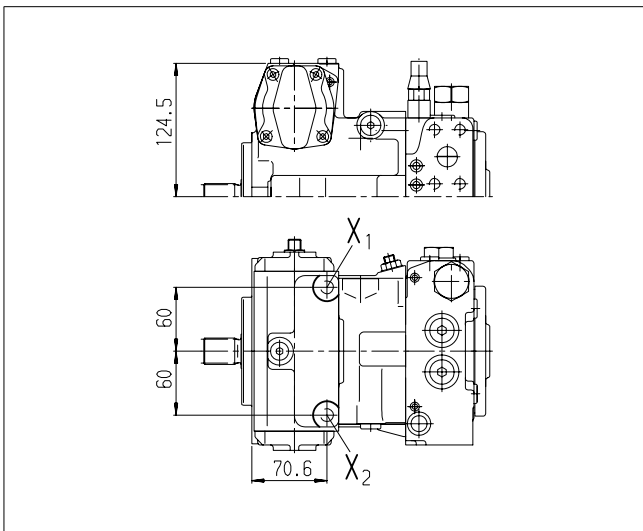
EZ

Two-point control electric



DG

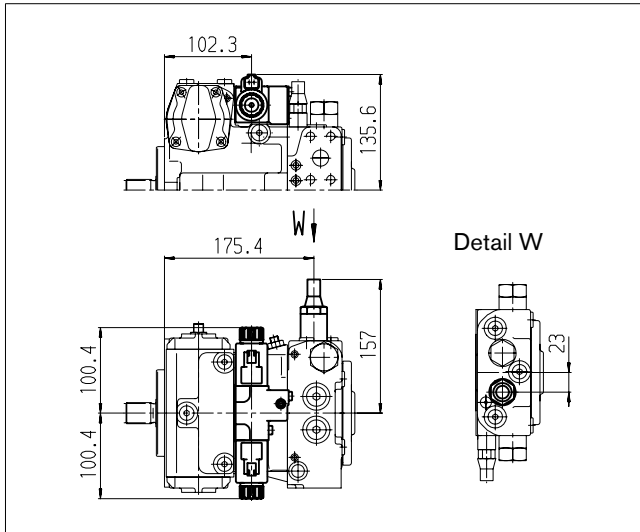
Hydraulic control, direct controlled



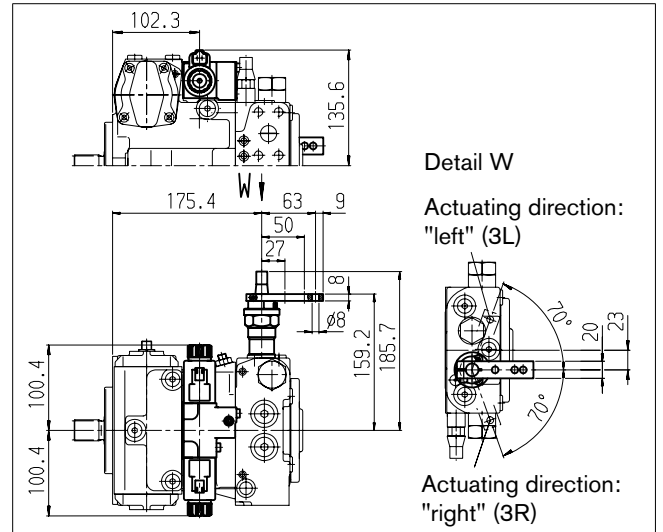
Dimensions size 28

DA – control valve

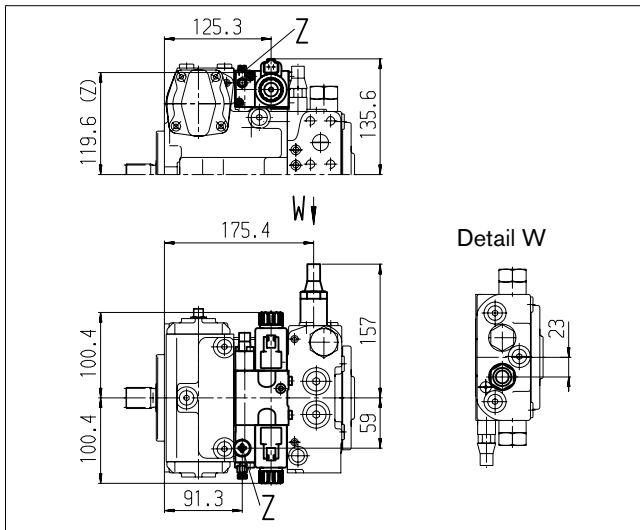
Version 2 – fixed setting



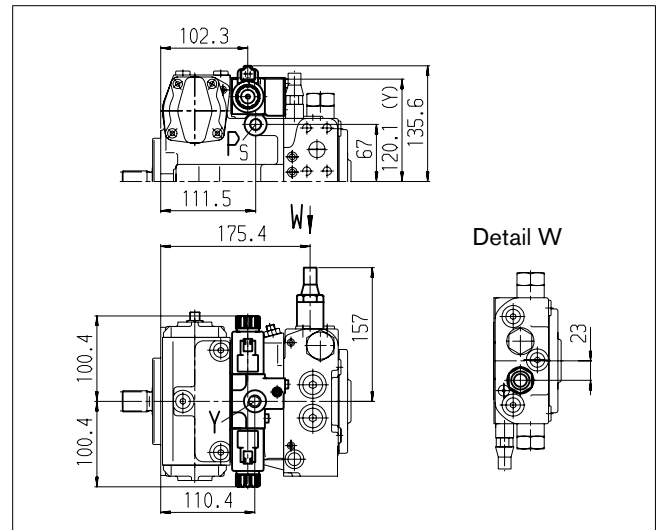
Version 3 – mechanically adjustable with position lever



Version 4/8 – fixed setting and inch valve mounted



Version 7 – fixed setting and ports for pilot control device

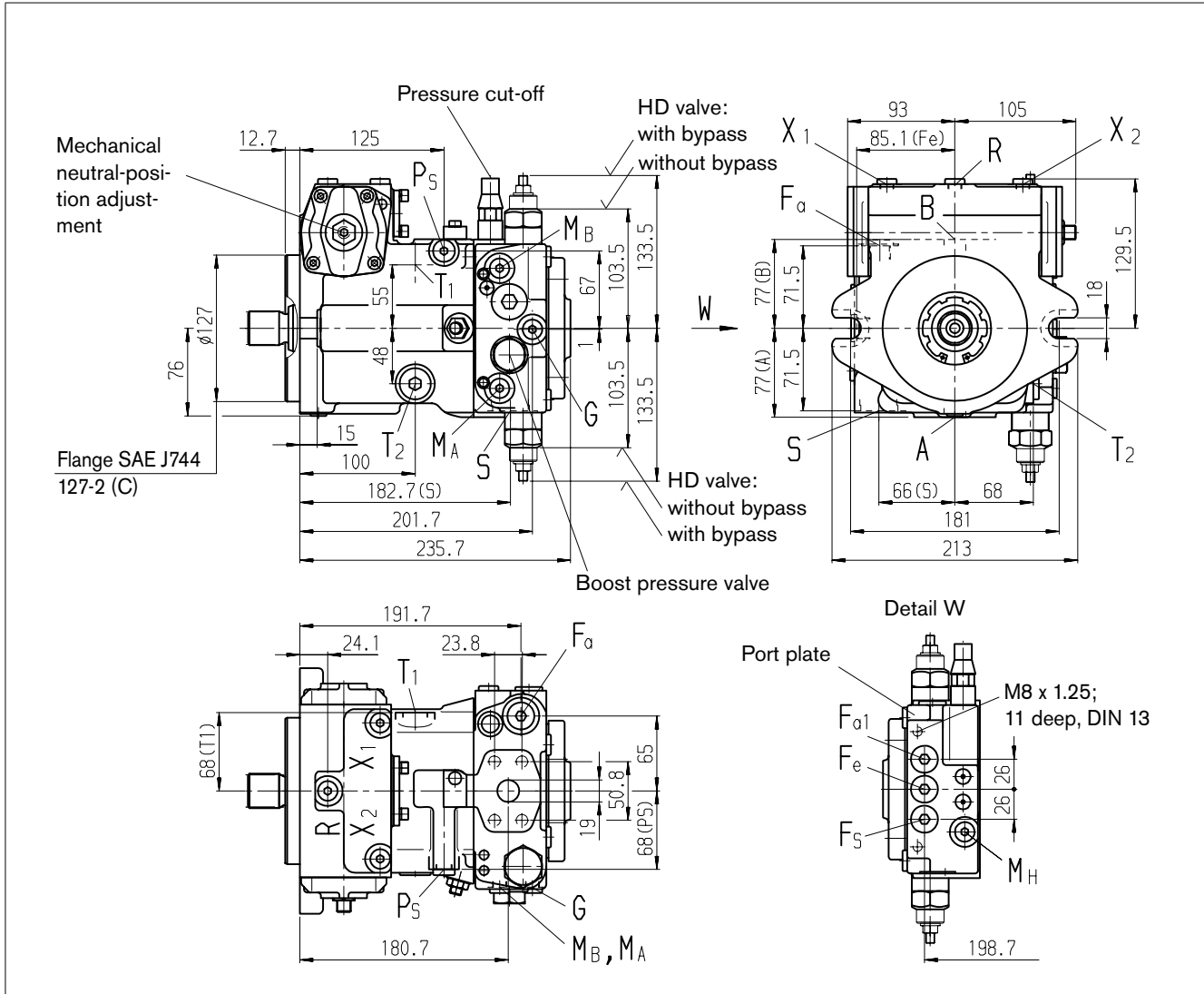


Dimensions size 40

NV – Version without control module

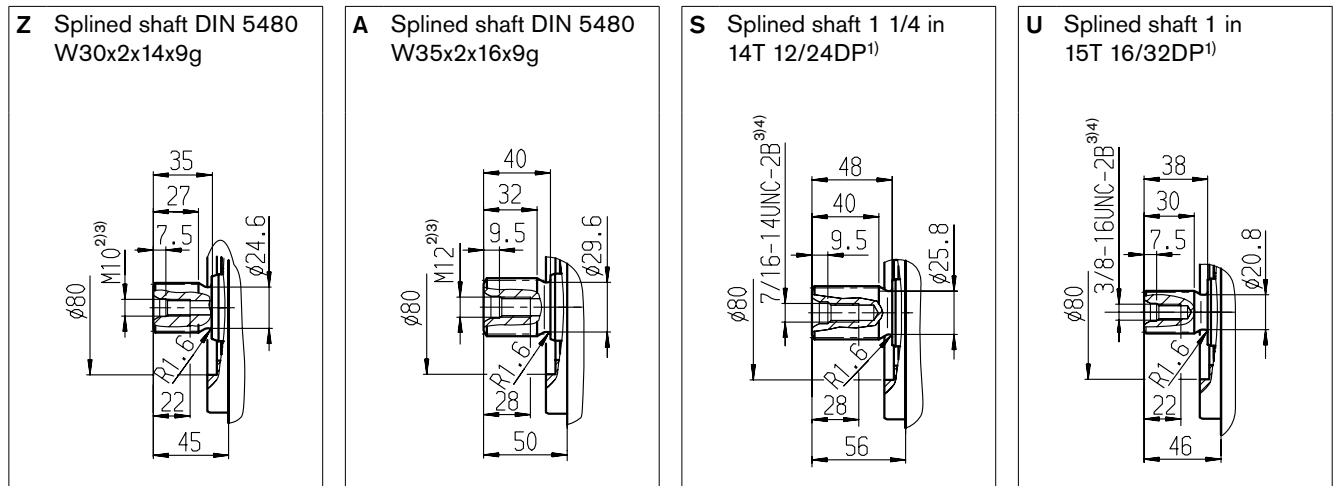
Standard: Suction port S at bottom (02)

Option: Suction port S at top (03); port plate turned through 180°



Dimensions size 40

Drive shafts



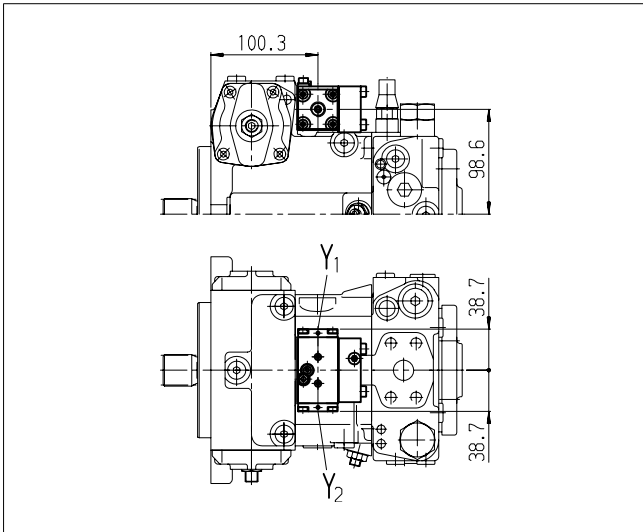
Ports

Designation	Port for	Standard	Size ³⁾	Maximum pressure [bar] ⁵⁾	State ¹¹⁾
A, B	Service line Fastening thread A/B	SAE J518 ⁶⁾ DIN 13	3/4 in M10 x 1.5; 17 deep	450	O
S	Suction line	DIN 3852 ⁹⁾	M33 x 2; 18 deep	5	O ⁷⁾
T ₁	Drain line	DIN 3852 ⁹⁾	M22 x 1.5; 14 deep	3	O ⁸⁾
T ₂	Drain line	DIN 3852 ⁹⁾	M22 x 1.5; 14 deep	3	X ⁸⁾
R	Air bleed	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	3	X
X ₁ , X ₂	Control pressure (upstream of orifice)	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	40	X
X ₁ , X ₂	Control pressure (upstream of orifice, DG only)	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	40	O
X ₃ , X ₄ ¹⁰⁾	Stroking chamber pressure	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	40	X
G	Boost pressure	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	40	X
P _S	Pilot pressure	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	40	X
P _S	Pilot pressure (DA7 only)	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	40	O
Y	Pilot pressure (DA7 only)	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	40	O
M _A , M _B	Measuring pressure A, B	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	450	X
M _H	Measuring high pressure	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	450	X
F _a	Boost pressure inlet	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	X
F _{a1}	Boost pressure, inlet (mountable filter)	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	X
F _e	Boost pressure outlet	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	X
F _S	Line from filter to suction line (cold start)	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	X
Y ₁ , Y ₂	Pilot signal (HD only)	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	40	O
Z	Inch signal (DA4 and 8 only)	DIN 3852 ⁹⁾	M10 x 1; 8 deep	40	X

Dimensions size 40

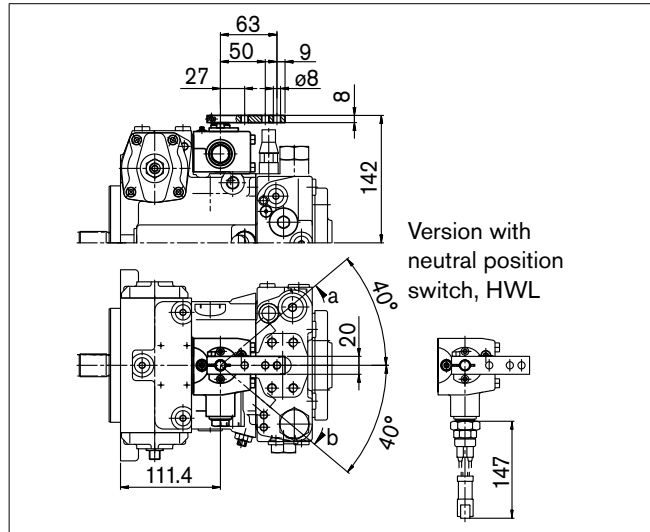
HD

Proportional control hydraulic, pilot-pressure related



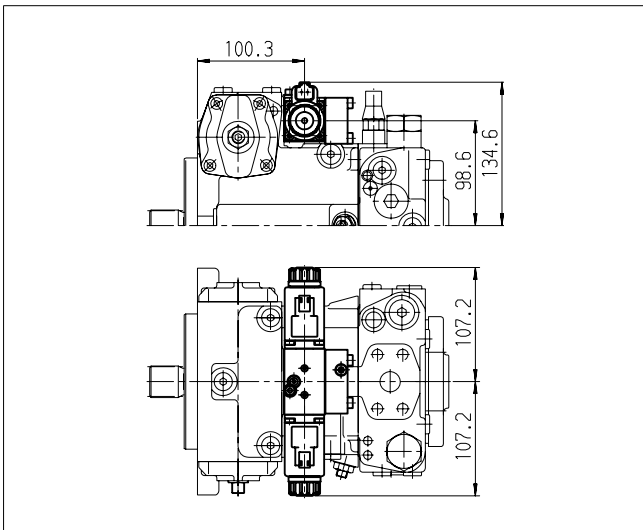
HW

Proportional control hydraulic, mechanical servo



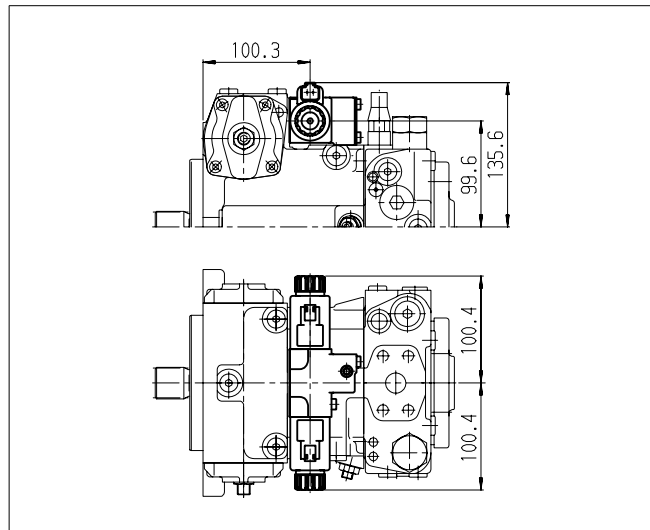
EP

Proportional control electric



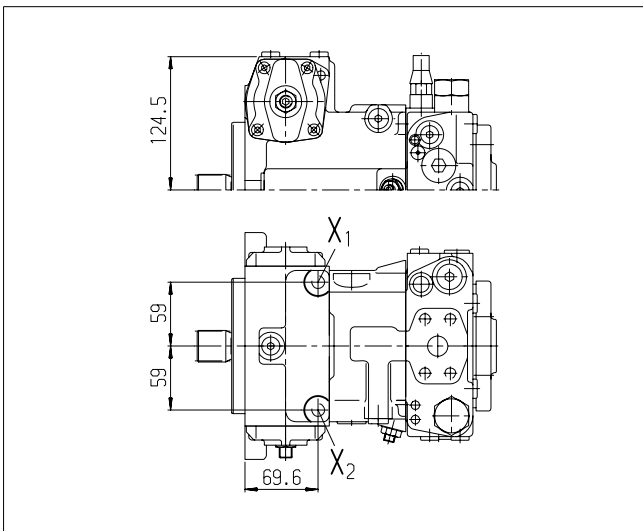
EZ

Two-point control electric



DG

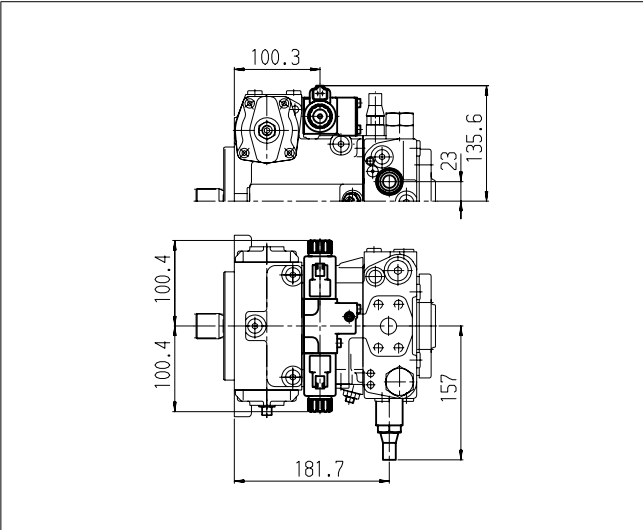
Hydraulic control, direct controlled



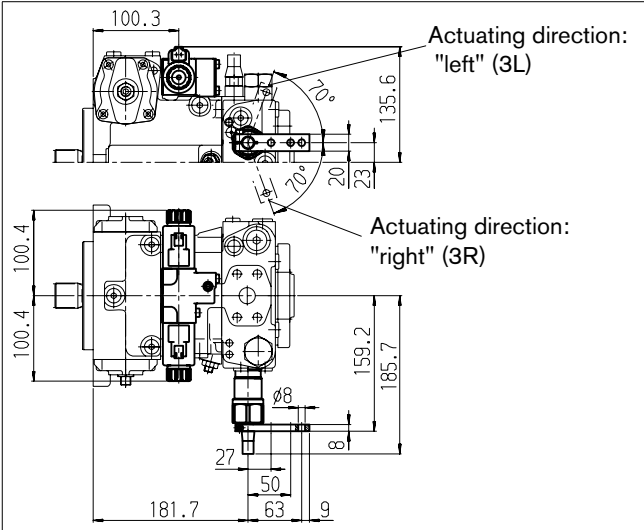
Dimensions size 40

DA – control valve

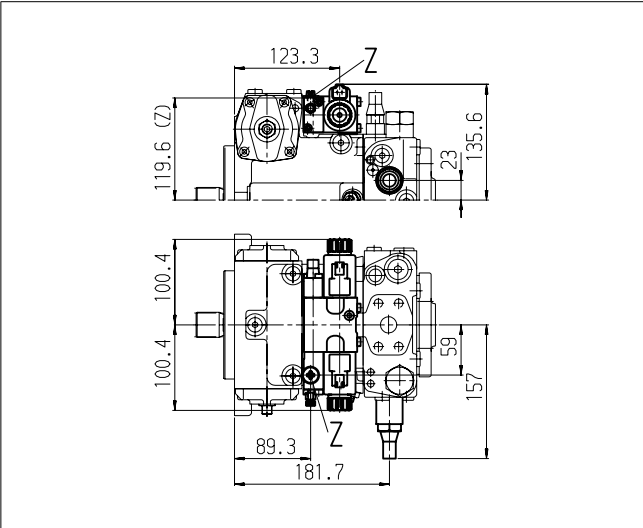
Version 2 – fixed setting



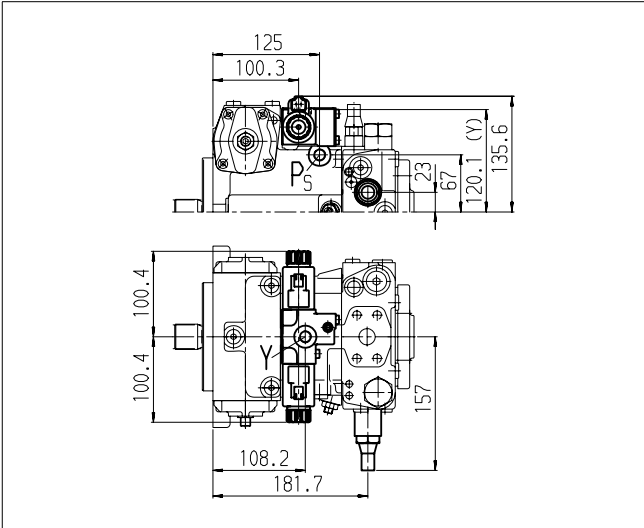
Version 3 – mechanically adjustable with position lever



Version 4/8 – fixed setting and inch valve mounted



Version 7 – fixed setting and ports for pilot control device

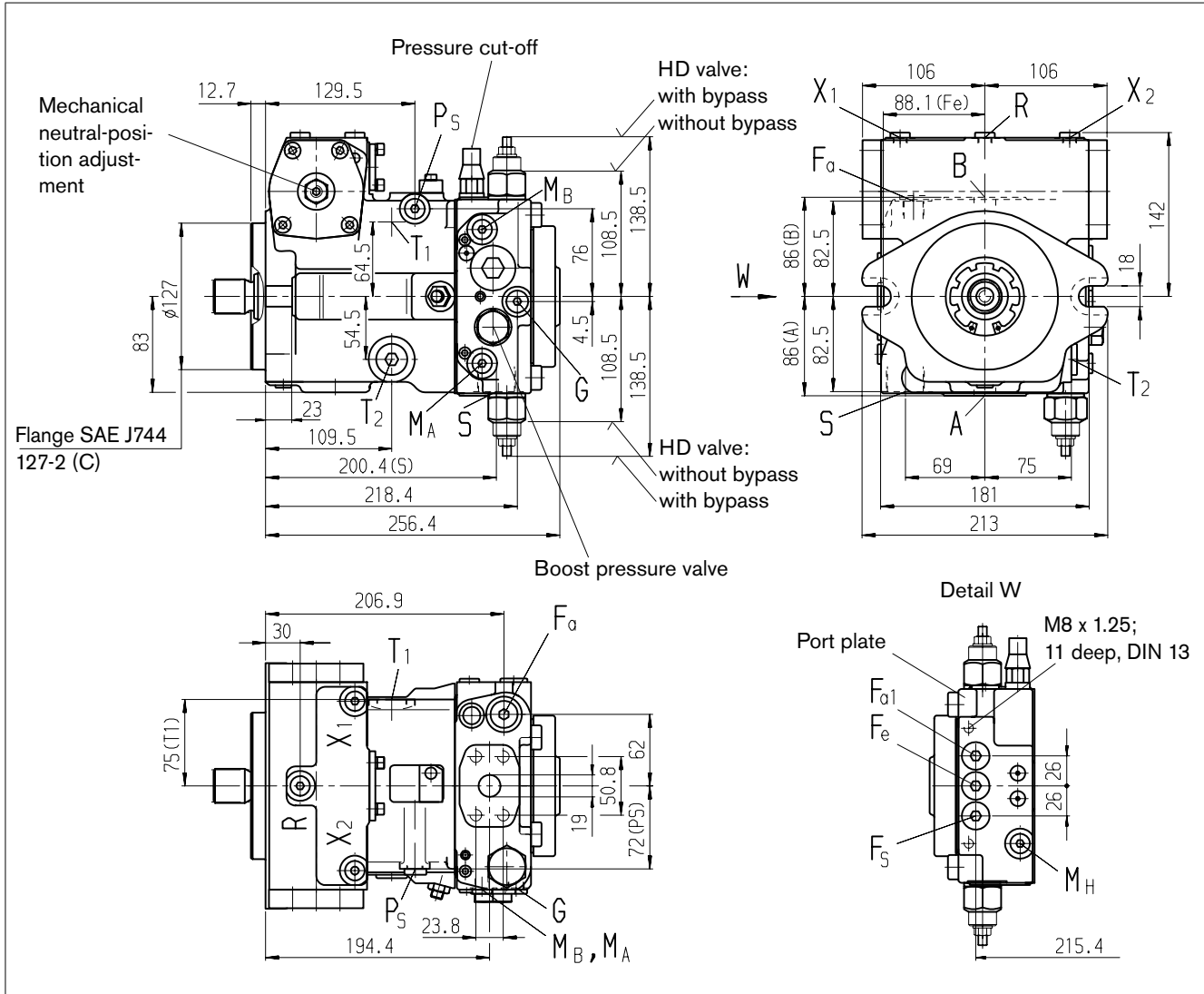


Dimensions size 56

NV – Version without control module

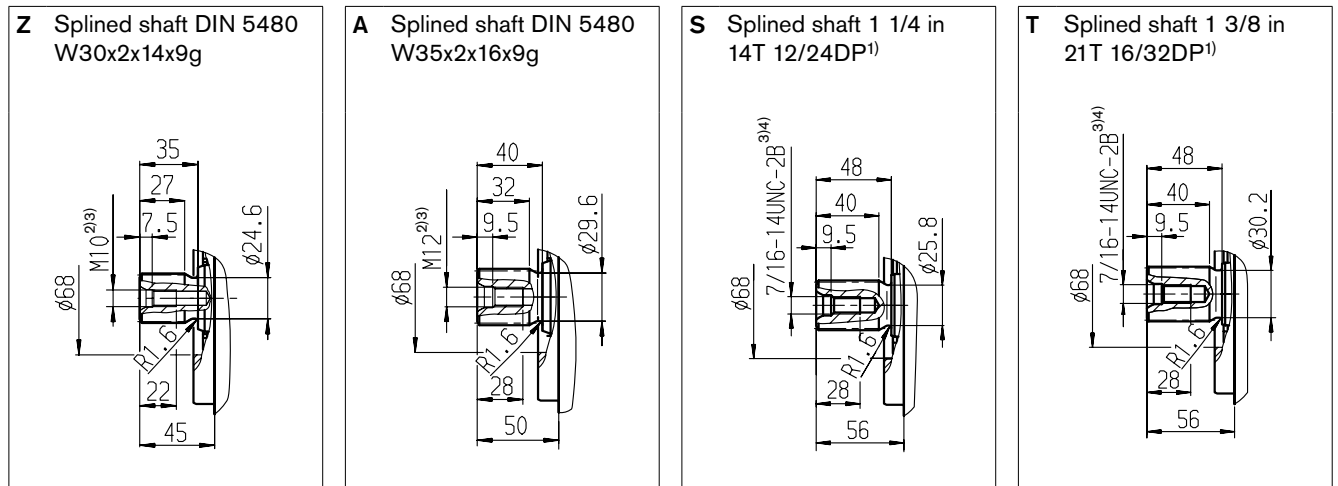
Standard: Suction port S at bottom (02)

Option: Suction port S at top (03); port plate turned through 180°



Dimensions size 56

Drive shafts



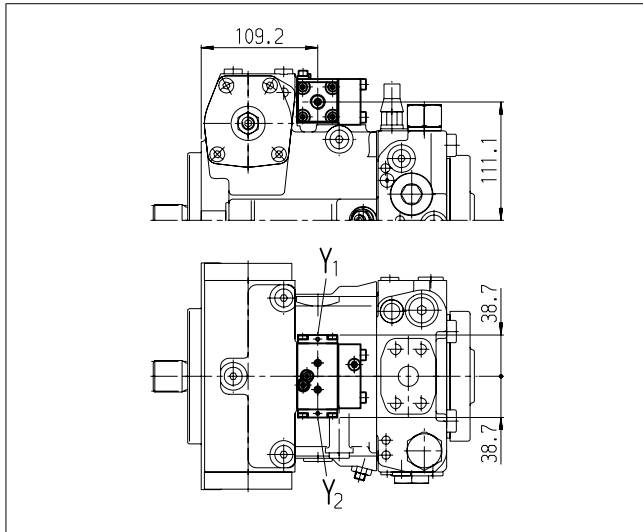
Ports

Designation	Port for	Standard	Size ³⁾	Maximum pressure [bar] ⁵⁾	State ¹¹⁾
A, B	Service line Fastening thread A/B	SAE J518 ⁶⁾ DIN 13	3/4 in M10 x 1.5; 17 deep	450	O
S	Suction line	DIN 3852 ⁹⁾	M33 x 2; 18 deep	5	O ⁷⁾
T ₁	Drain line	DIN 3852 ⁹⁾	M22 x 1.5; 14 deep	3	O ⁸⁾
T ₂	Drain line	DIN 3852 ⁹⁾	M22 x 1.5; 14 deep	3	X ⁸⁾
R	Air bleed	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	3	X
X ₁ , X ₂	Control pressure (upstream of orifice)	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	40	X
X ₁ , X ₂	Control pressure (upstream of orifice, DG only)	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	40	O
X ₃ , X ₄ ¹⁰⁾	Stroking chamber pressure	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	40	X
G	Boost pressure	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	40	X
P _S	Pilot pressure	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	40	X
P _S	Pilot pressure (DA7 only)	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	40	O
Y	Pilot pressure (DA7 only)	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	40	O
M _A , M _B	Measuring pressure A, B	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	450	X
M _H	Measuring high pressure	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	450	X
F _a	Boost pressure inlet	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	X
F _{a1}	Boost pressure, inlet (mountable filter)	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	X
F _e	Boost pressure outlet	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	X
F _S	Line from filter to suction line (cold start)	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	X
Y ₁ , Y ₂	Pilot signal (HD only)	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	40	O
Z	Inch signal (DA4 and 8 only)	DIN 3852 ⁹⁾	M10 x 1; 8 deep	40	X

Dimensions size 56

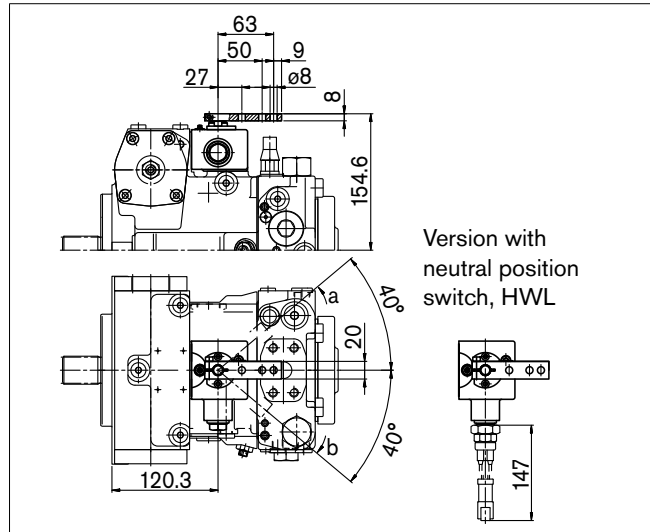
HD

Proportional control hydraulic, pilot-pressure related



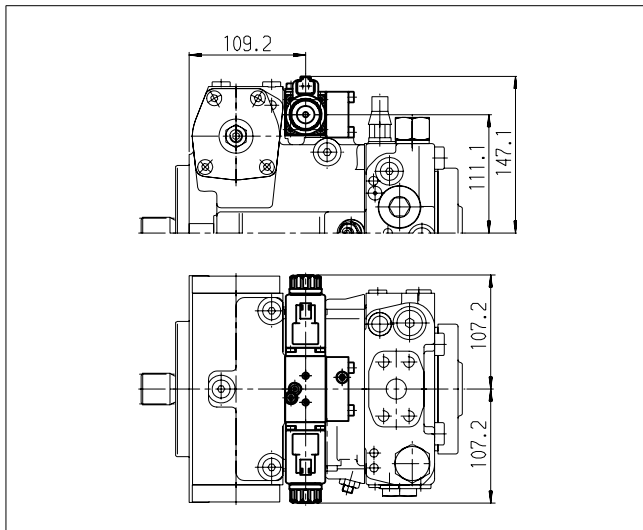
HW

Proportional control hydraulic, mechanical servo



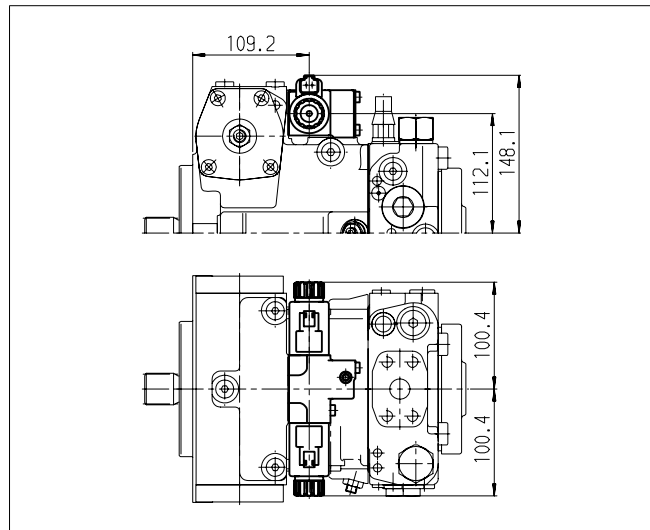
EP

Proportional control electric



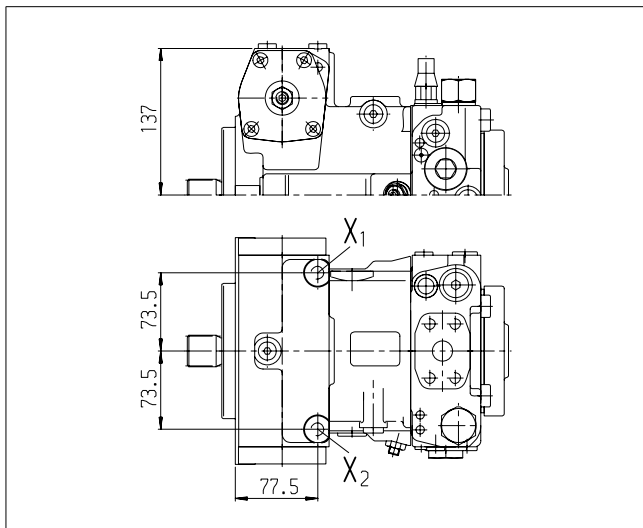
EZ

Two-point control electric



DG

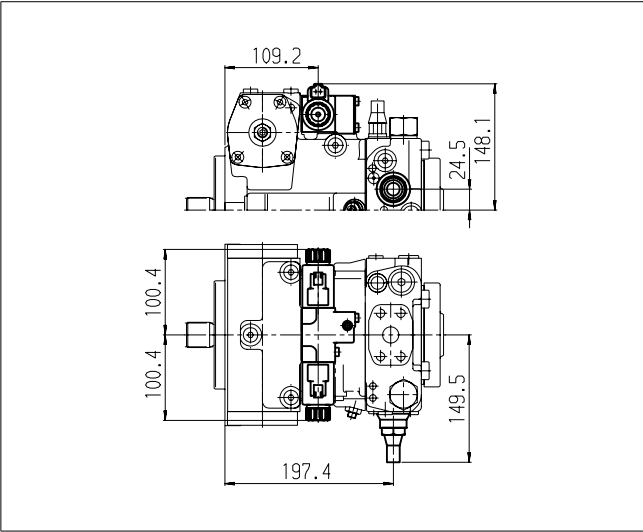
Hydraulic control, direct controlled



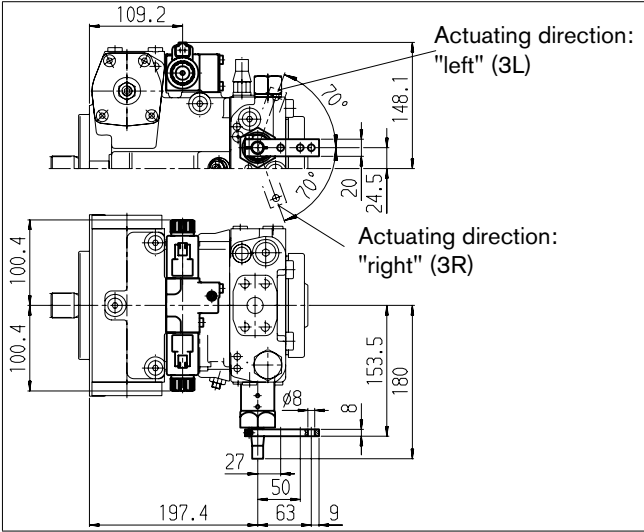
Dimensions size 56

DA – control valve

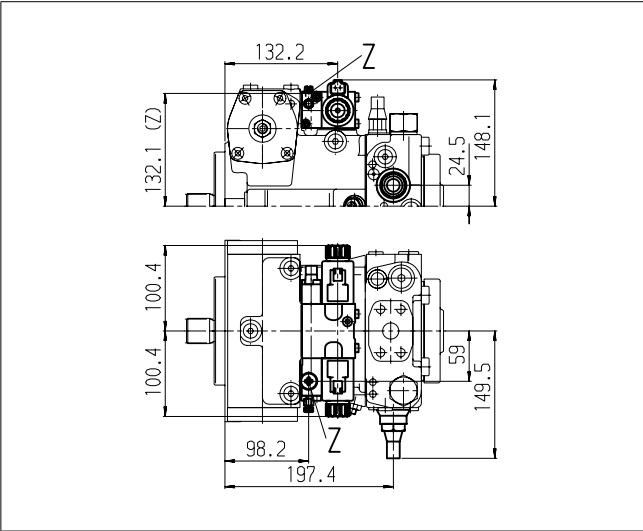
Version 2 – fixed setting



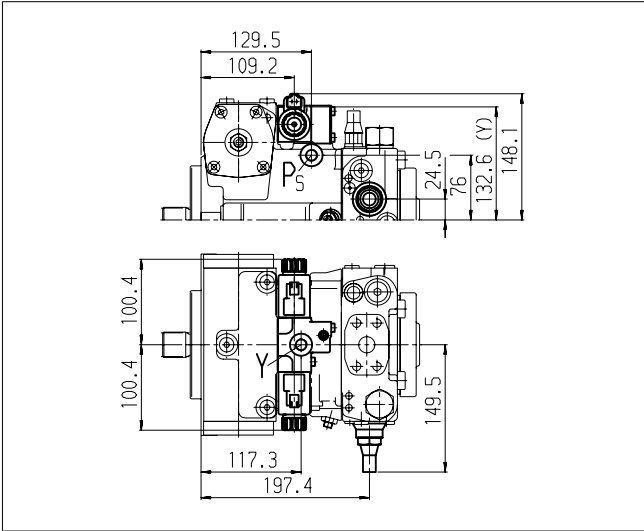
Version 3 – mechanically adjustable with position lever



Version 4/8 – fixed setting and inch valve mounted



Version 7 – fixed setting and ports for pilot control device

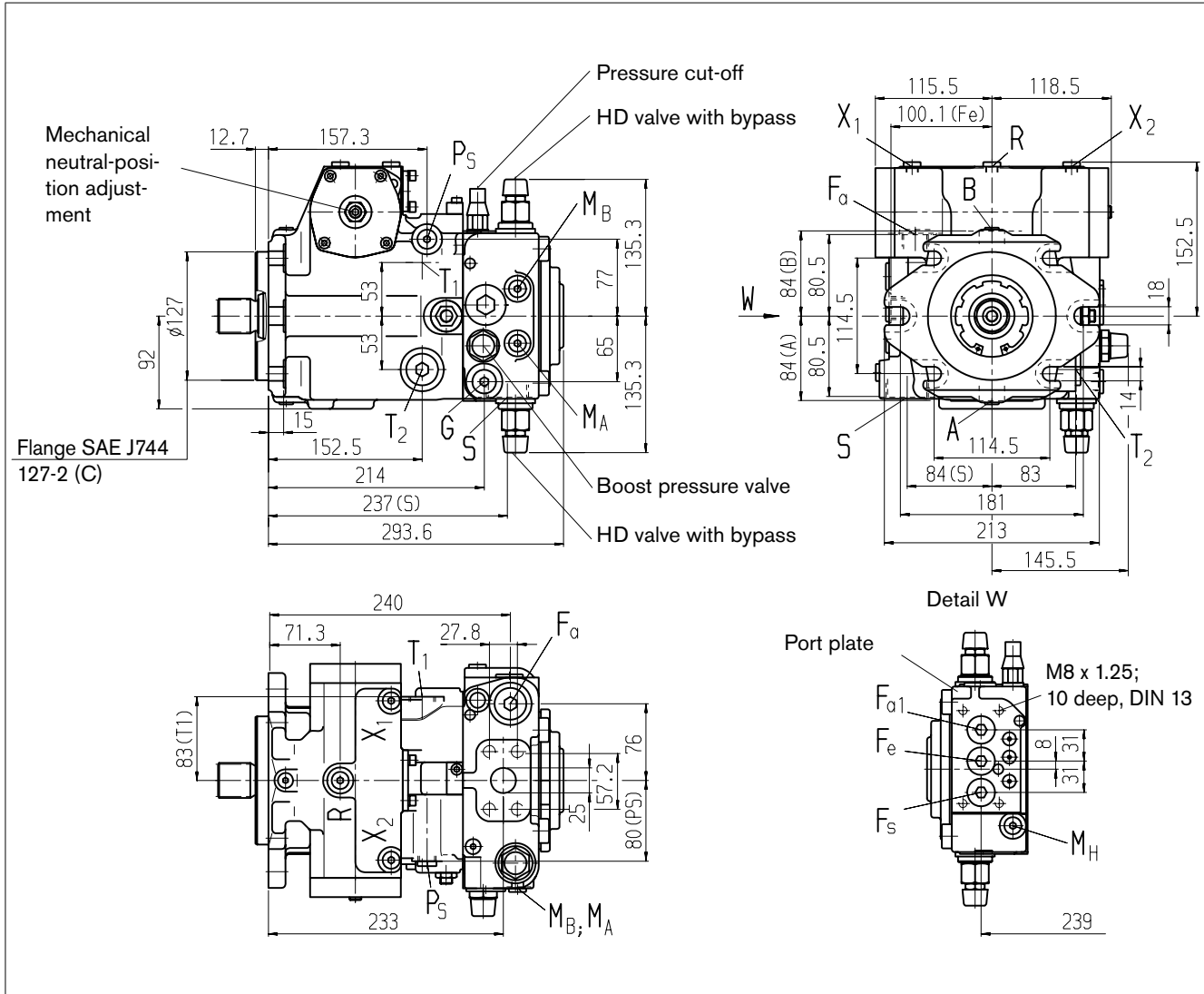


Dimensions size 71

NV – Version without control module

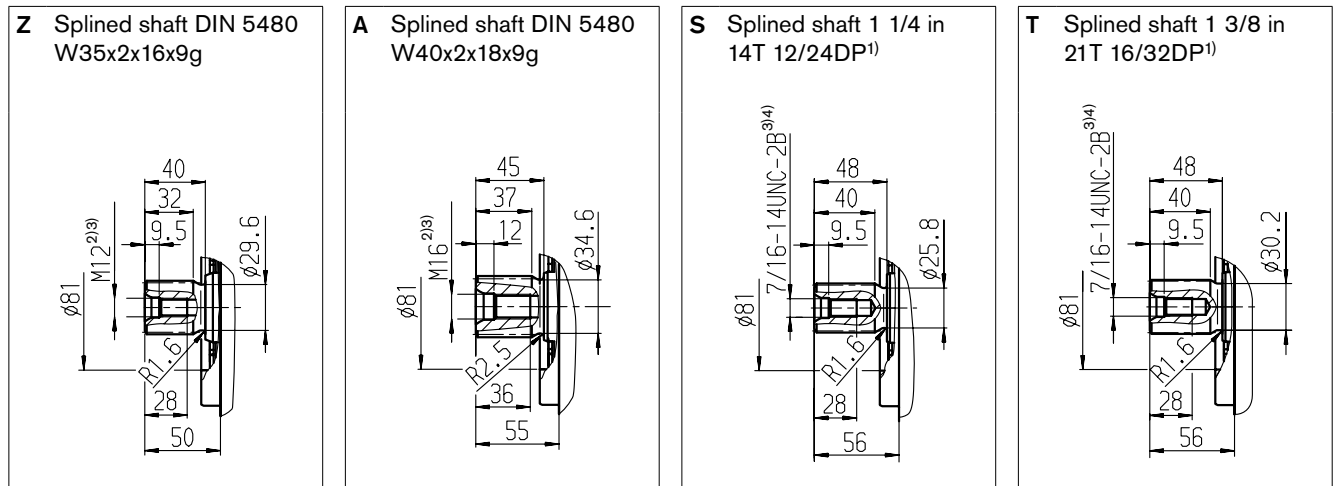
Standard: Suction port S at bottom (02)

Option: Suction port S at top (03); port plate turned through 180°



Dimensions size 71

Drive shafts



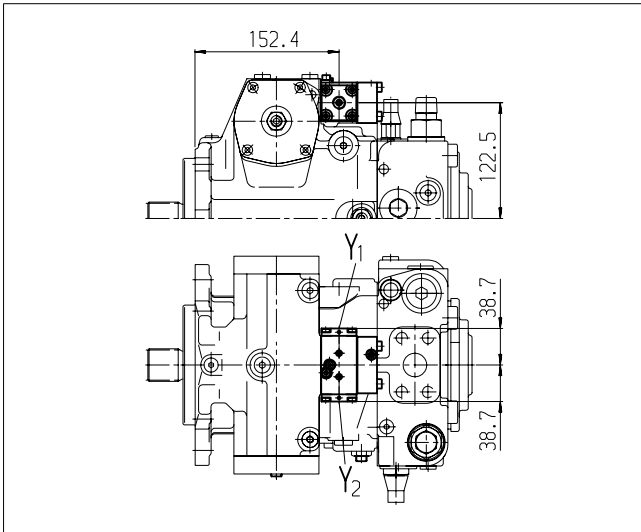
Ports

Designation	Port for	Standard	Size ³⁾	Maximum pressure [bar] ⁵⁾	State ¹¹⁾
A, B	Service line Fastening thread A/B	SAE J518 ⁶⁾ DIN 13	1 in M12 x 1.75; 17 deep	450	O
S	Suction line	DIN 3852 ⁹⁾	M42 x 2; 20 deep	5	O ⁷⁾
T ₁	Drain line	DIN 3852 ⁹⁾	M26 x 1.5; 16 deep	3	O ⁸⁾
T ₂	Drain line	DIN 3852 ⁹⁾	M26 x 1.5; 16 deep	3	X ⁸⁾
R	Air bleed	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	3	X
X ₁ , X ₂	Control pressure (upstream of orifice)	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	40	X
X ₁ , X ₂	Control pressure (upstream of orifice, DG only)	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	40	O
X ₃ , X ₄ ¹⁰⁾	Stroking chamber pressure	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	40	X
G	Boost pressure	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	X
P _S	Pilot pressure	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	40	X
P _S	Pilot pressure (DA7 only)	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	40	O
Y	Pilot pressure (DA7 only)	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	40	O
M _A , M _B	Measuring pressure A, B	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	450	X
M _H	Measuring high pressure	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	450	X
F _a	Boost pressure inlet	DIN 3852 ⁹⁾	M26 x 1.5; 16 deep	40	X
F _{a1}	Boost pressure, inlet (mountable filter)	DIN 3852 ⁹⁾	M22 x 1.5; 14 deep	40	X
F _e	Boost pressure outlet	DIN 3852 ⁹⁾	M22 x 1.5; 14 deep	40	X
F _S	Line from filter to suction line (cold start)	DIN 3852 ⁹⁾	M22 x 1.5; 14 deep	40	X
Y ₁ , Y ₂	Pilot signal (HD only)	DIN 3852 ⁹⁾	M14 x 1.5; 8 deep	40	O
Z	Inch signal (DA4 and 8 only)	DIN 3852 ⁹⁾	M10 x 1; 12 deep	40	X

Dimensions size 71

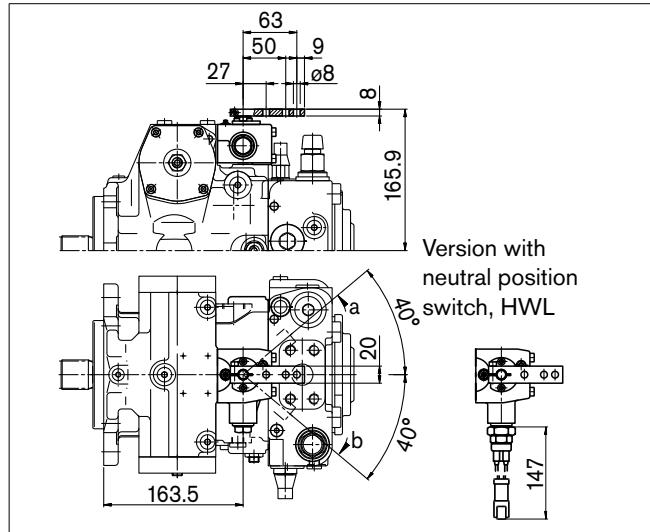
HD

Proportional control hydraulic, pilot-pressure related



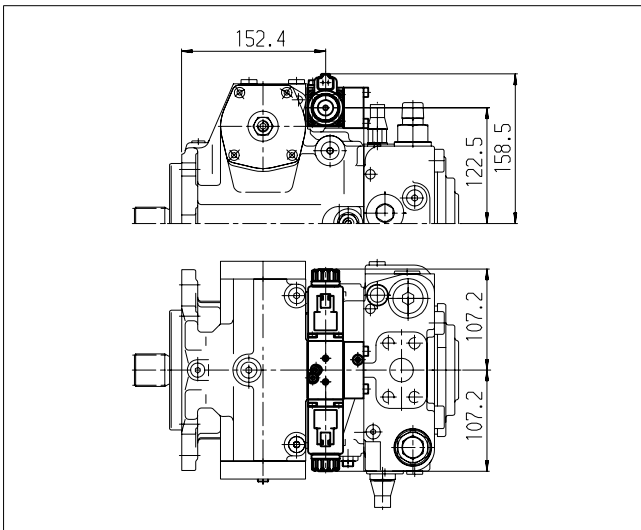
HW

Proportional control hydraulic, mechanical servo



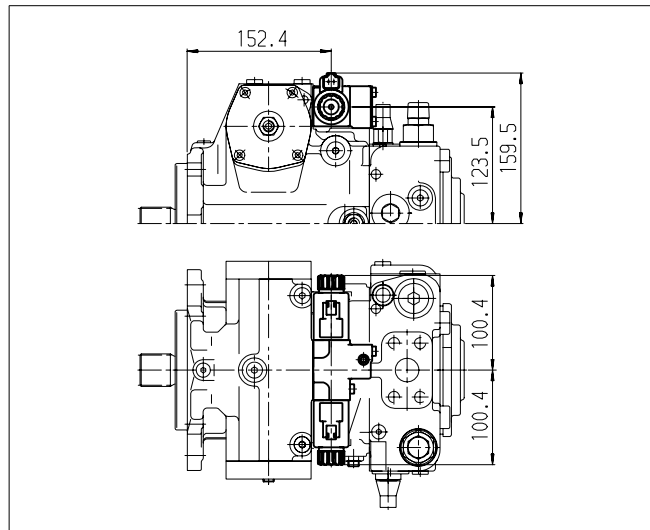
EP

Proportional control electric



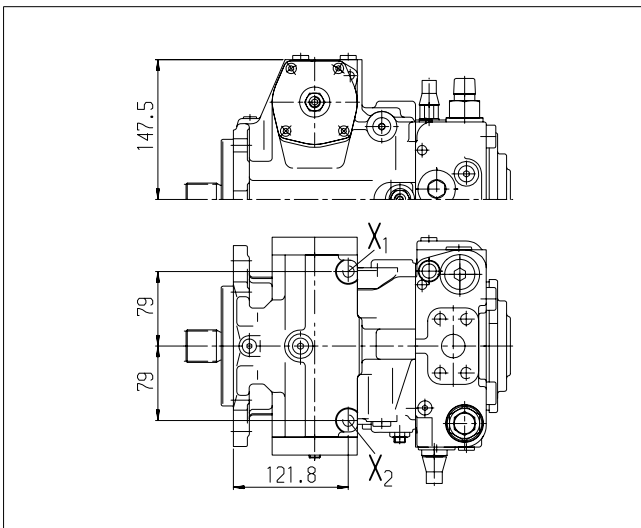
EZ

Two-point control electric



DG

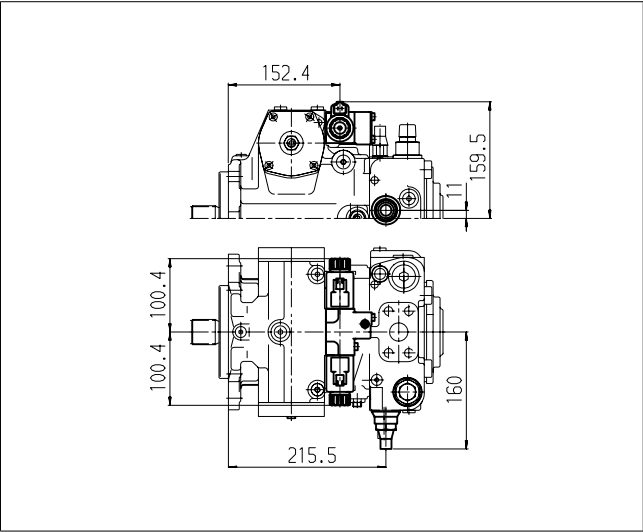
Hydraulic control, direct controlled



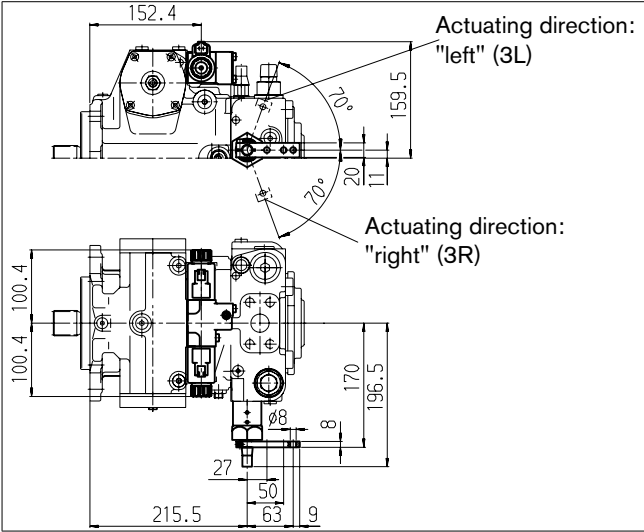
Dimensions size 71

DA – control valve

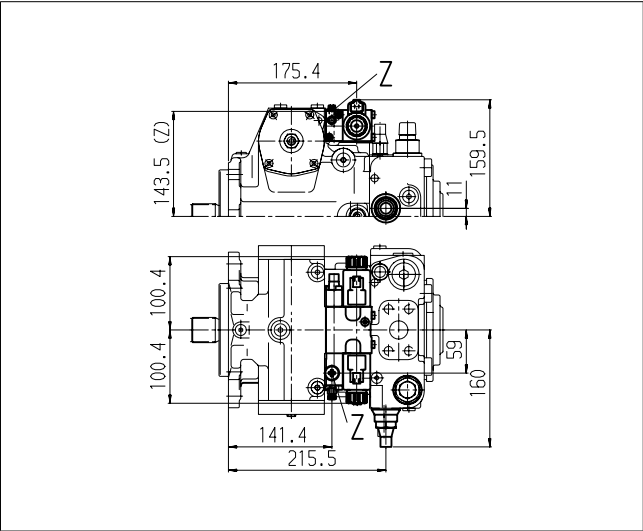
Version 2 – fixed setting



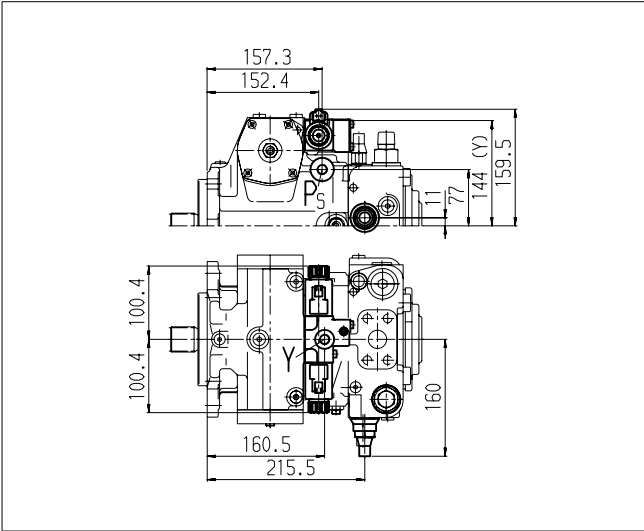
Version 3 – mechanically adjustable with position lever



Version 4/8 – fixed setting and inch valve mounted



Version 7 – fixed setting and ports for pilot control device

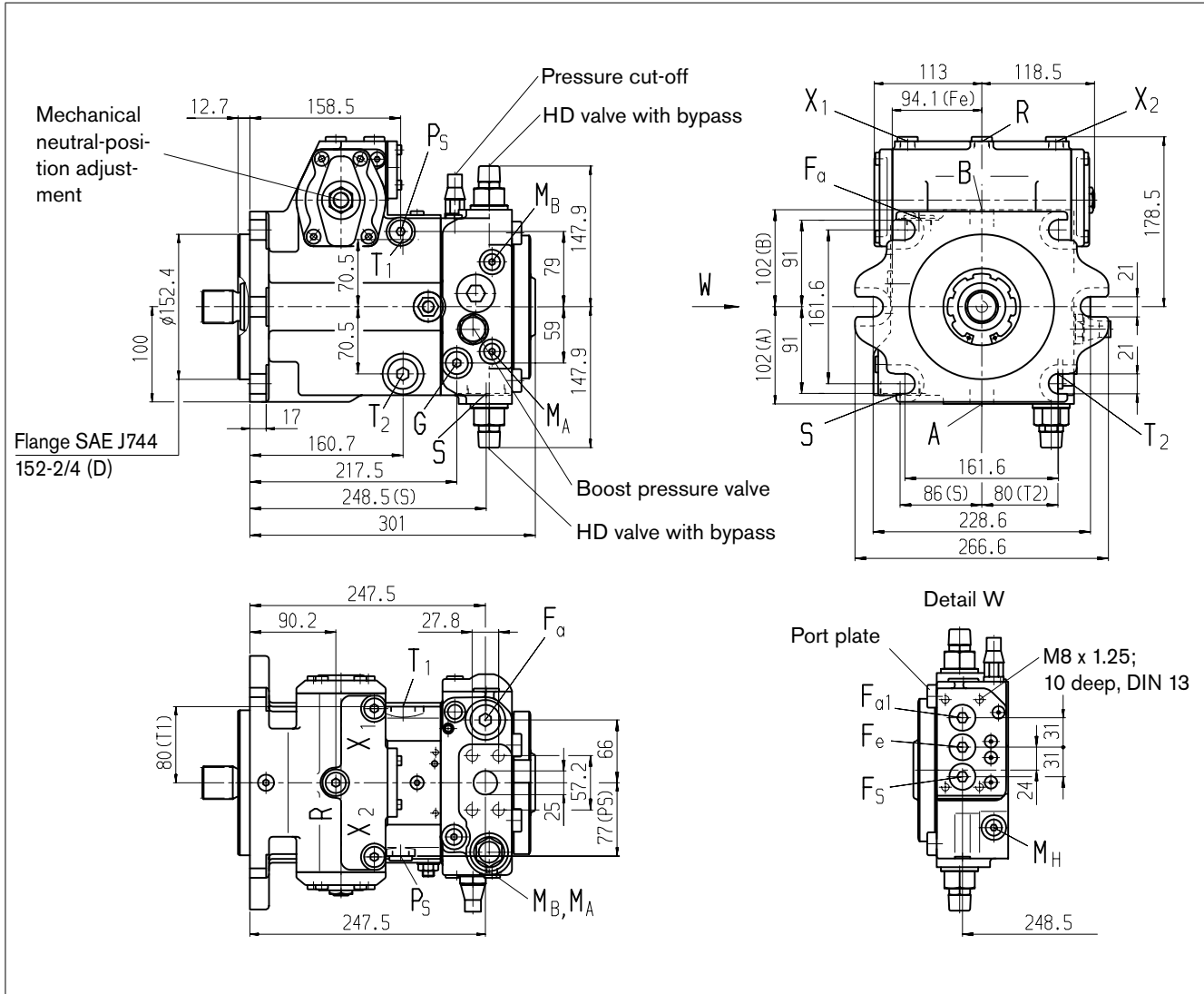


Dimensions size 90

NV – Version without control module

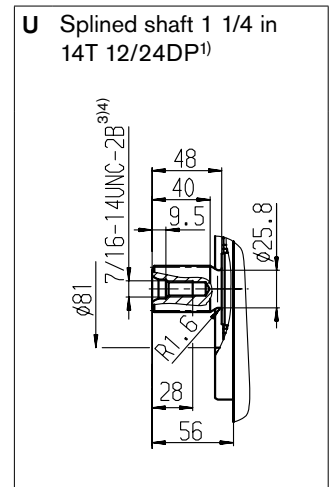
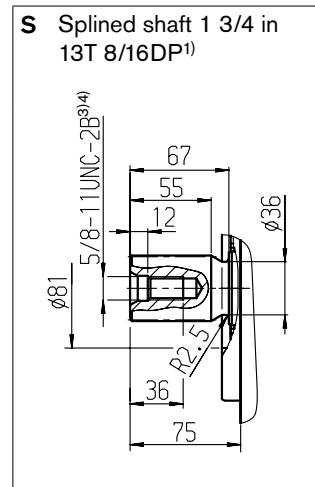
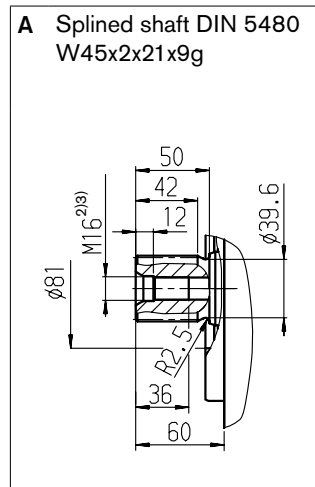
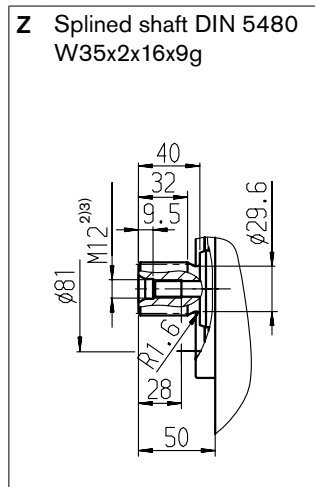
Standard: Suction port S at bottom (02)

Option: Suction port S at top (03); port plate turned through 180°



Dimensions size 90

Drive shafts



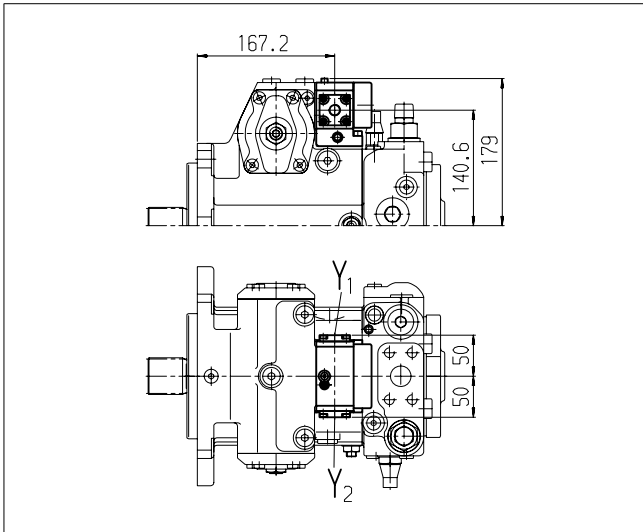
Ports

Designation	Port for	Standard	Size ³⁾	Maximum pressure [bar] ⁵⁾	State ¹¹⁾
A, B	Service line Fastening thread A/B	SAE J518 ⁶⁾ DIN 13	1 in M12 x 1.75; 17 deep	450	O
S	Suction line	DIN 3852 ⁹⁾	M42 x 2; 20 deep	5	O ⁷⁾
T ₁	Drain line	DIN 3852 ⁹⁾	M26 x 1.5; 16 deep	3	O ⁸⁾
T ₂	Drain line	DIN 3852 ⁹⁾	M26 x 1.5; 16 deep	3	X ⁸⁾
R	Air bleed	DIN 3852 ⁹⁾	M16 x 1.5; 12 deep	3	X
X ₁ , X ₂	Control pressure (upstream of orifice)	DIN 3852 ⁹⁾	M16 x 1.5; 12 deep	40	X
X ₁ , X ₂	Control pressure (upstream of orifice, DG only)	DIN 3852 ⁹⁾	M16 x 1.5; 12 deep	40	O
X ₃ , X ₄ ¹⁰⁾	Stroking chamber pressure	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	40	X
G	Boost pressure	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	X
P _S	Pilot pressure	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	X
P _S	Pilot pressure (DA7 only)	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	O
Y	Pilot pressure (DA7 only)	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	O
M _A , M _B	Measuring pressure A, B	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	450	X
M _H	Measuring high pressure	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	450	X
F _a	Boost pressure inlet	DIN 3852 ⁹⁾	M26 x 1.5; 16 deep	40	X
F _{a1}	Boost pressure, inlet (mountable filter)	DIN 3852 ⁹⁾	M22 x 1.5; 14 deep	40	X
F _e	Boost pressure outlet	DIN 3852 ⁹⁾	M22 x 1.5; 14 deep	40	X
F _S	Line from filter to suction line (cold start)	DIN 3852 ⁹⁾	M22 x 1.5; 14 deep	40	X
Y ₁ , Y ₂	Pilot signal (HD only)	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	40	O
Z	Inch signal (DA4 and 8 only)	DIN 3852 ⁹⁾	M10 x 1; 8 deep	40	X

Dimensions size 90

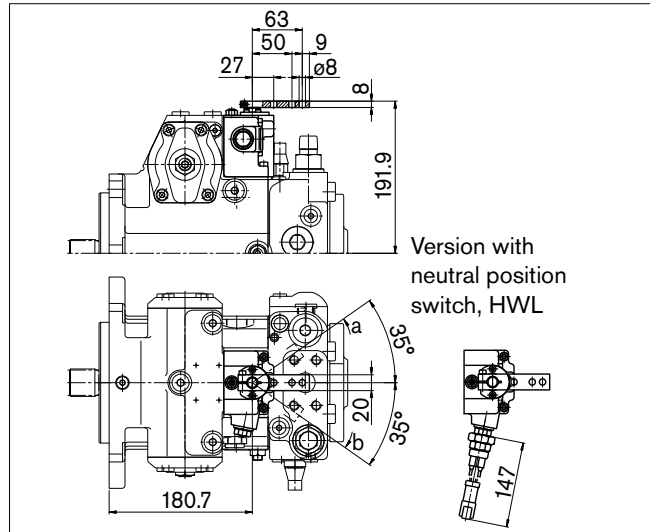
HD

Proportional control hydraulic, pilot-pressure related



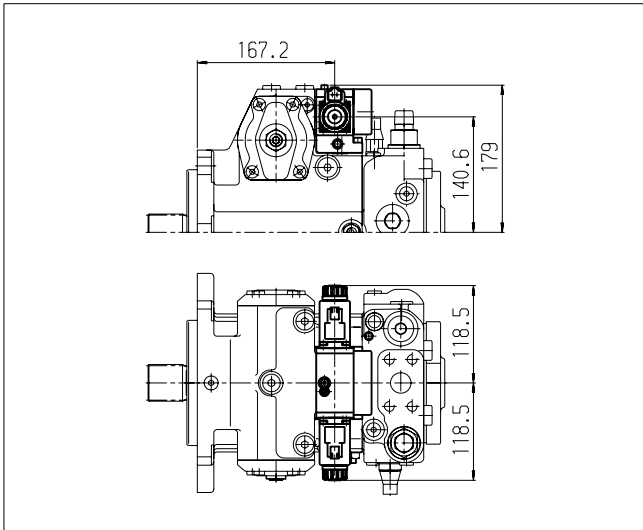
HW

Proportional control hydraulic, mechanical servo



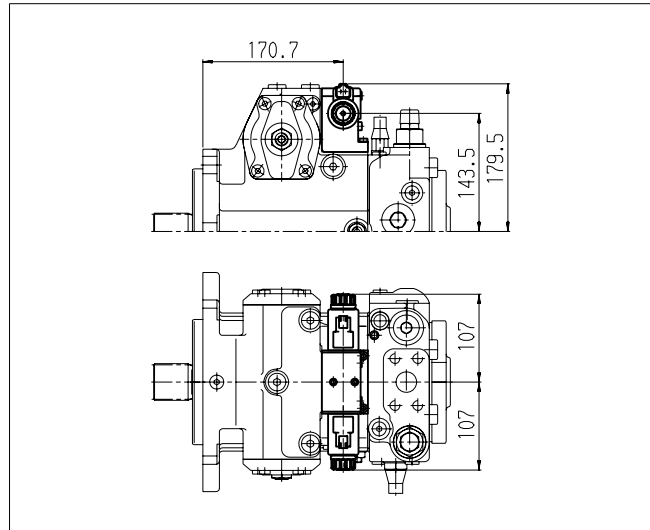
EP

Proportional control electric



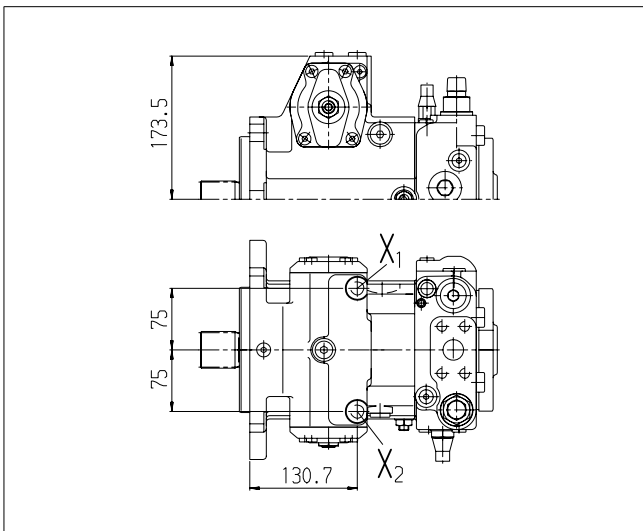
EZ

Two-point control electric



DG

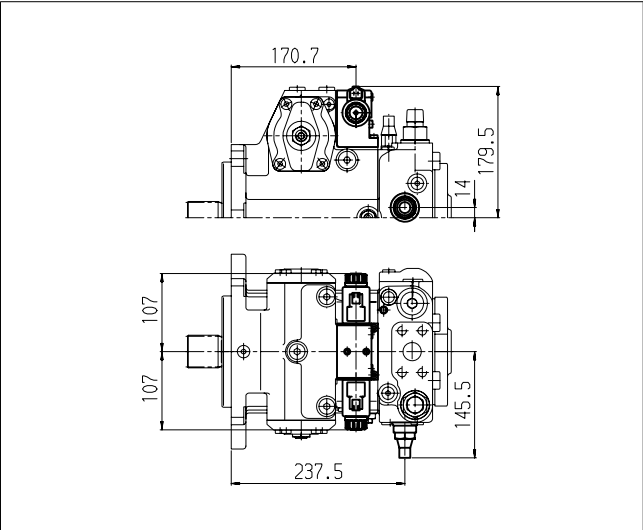
Hydraulic control, direct controlled



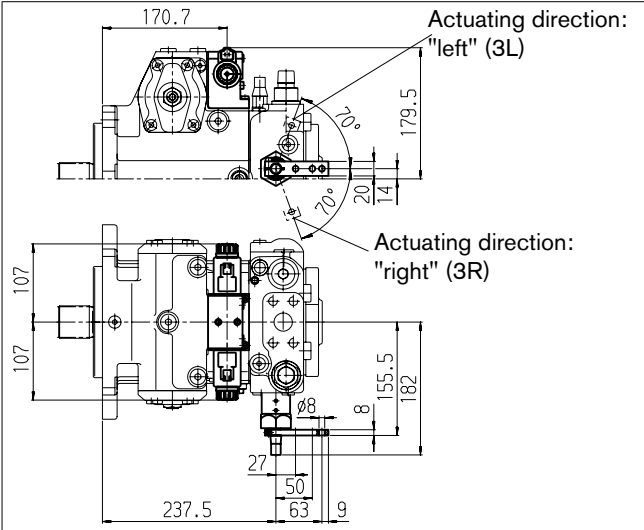
Dimensions size 90

DA – control valve

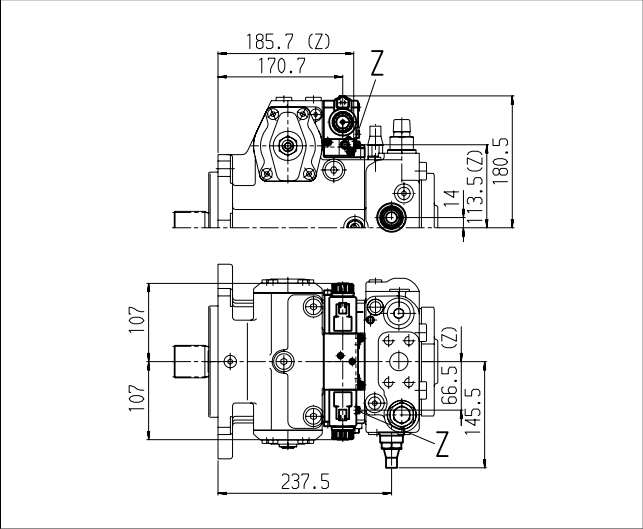
Version 2 – fixed setting



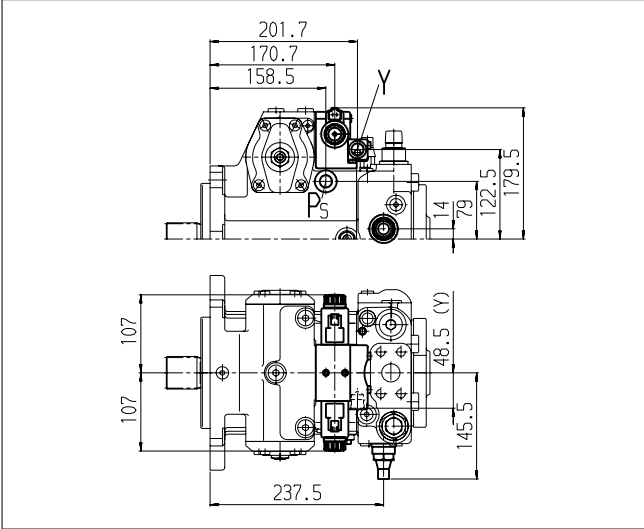
Version 3 – mechanically adjustable with position lever



Version 4/8 – fixed setting and inch valve mounted



Version 7 – fixed setting and ports for pilot control device

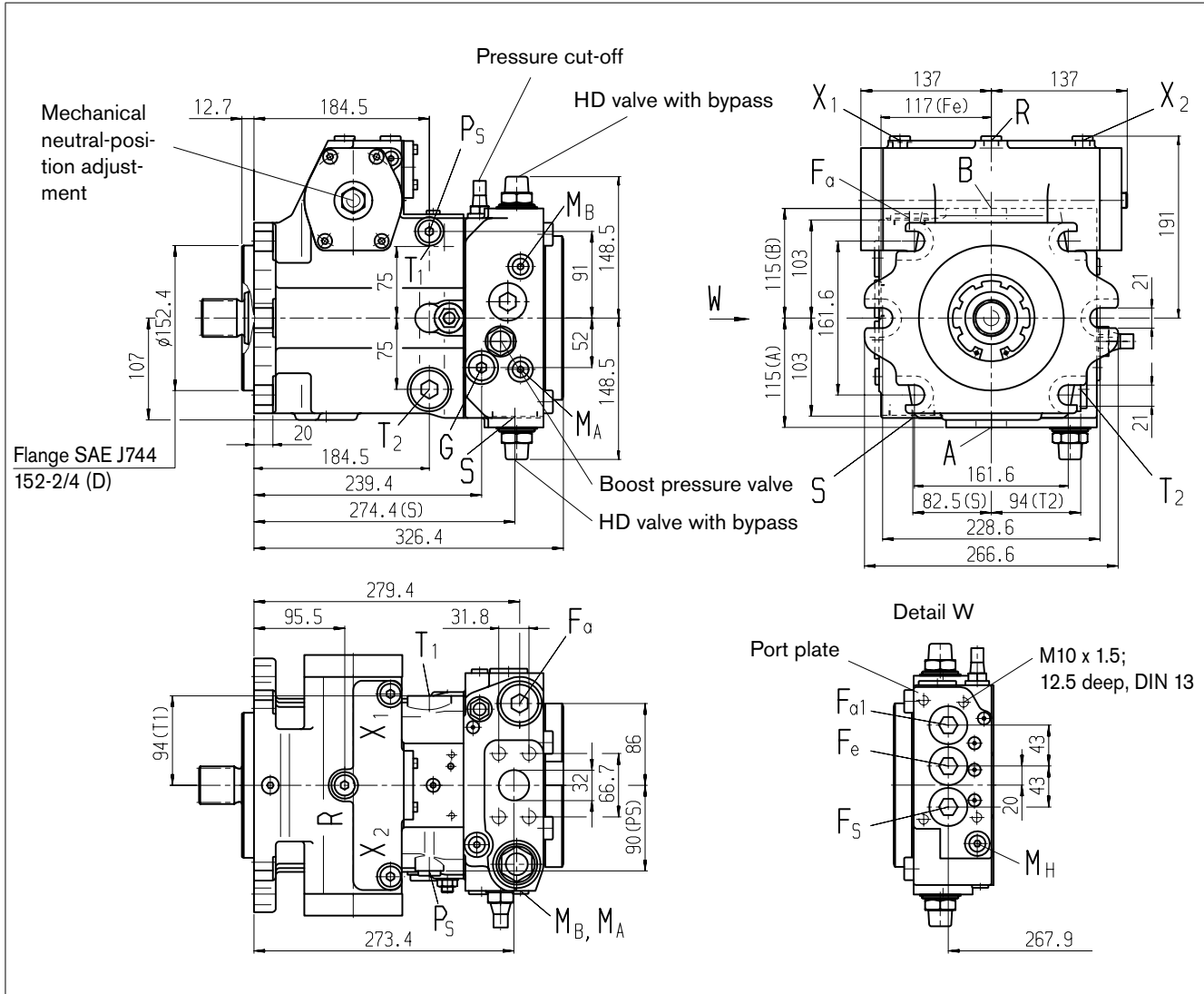


Dimensions size 125

NV – Version without control module

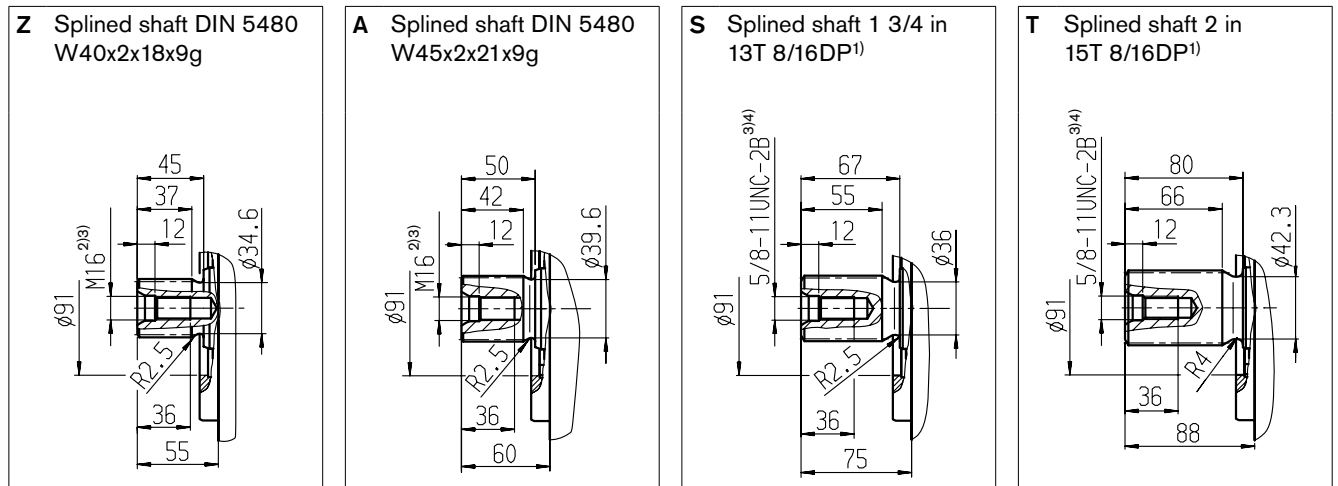
Standard: Suction port S at bottom (02)

Option: Suction port S at top (03); port plate turned through 180°



Dimensions size 125

Drive shafts



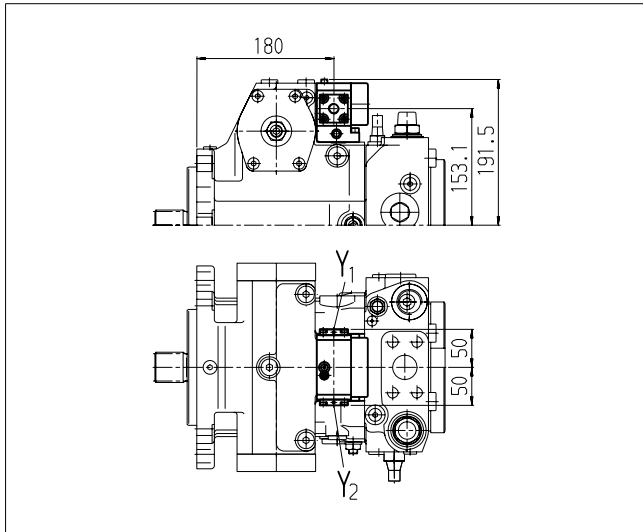
Ports

Designation	Port for	Standard	Size ³⁾	Maximum pressure [bar] ⁵⁾	State ¹¹⁾
A, B	Service line Fastening thread A/B	SAE J518 ⁶⁾ DIN 13	1 1/4 in M14 x 2; 19 deep	450	O
S	Suction line	DIN 3852 ⁹⁾	M48 x 2; 22 deep	5	O ⁷⁾
T ₁	Drain line	DIN 3852 ⁹⁾	M33 x 2; 18 deep	3	O ⁸⁾
T ₂	Drain line	DIN 3852 ⁹⁾	M33 x 2; 18 deep	3	X ⁸⁾
R	Air bleed	DIN 3852 ⁹⁾	M16 x 1.5; 12 deep	3	X
X ₁ , X ₂	Control pressure (upstream of orifice)	DIN 3852 ⁹⁾	M16 x 1.5; 12 deep	40	X
X ₁ , X ₂	Control pressure (upstream of orifice, DG only)	DIN 3852 ⁹⁾	M16 x 1.5; 12 deep	40	O
X ₃ , X ₄ ¹⁰⁾	Stroking chamber pressure	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	40	X
G	Boost pressure	DIN 3852 ⁹⁾	M22 x 1.5; 14 deep	40	X
P _S	Pilot pressure	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	X
P _S	Pilot pressure (DA7 only)	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	O
Y	Pilot pressure (DA7 only)	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	O
M _A , M _B	Measuring pressure A, B	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	450	X
M _H	Measuring high pressure	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	450	X
F _a	Boost pressure inlet	DIN 3852 ⁹⁾	M33 x 2; 18 deep	40	X
F _{a1}	Boost pressure, inlet (mountable filter)	DIN 3852 ⁹⁾	M33 x 2; 18 deep	40	X
F _e	Boost pressure outlet	DIN 3852 ⁹⁾	M33 x 2; 18 deep	40	X
F _S	Line from filter to suction line (cold start)	DIN 3852 ⁹⁾	M33 x 2; 18 deep	40	X
Y ₁ , Y ₂	Pilot signal (HD only)	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	40	O
Z	Inch signal (DA4 and 8 only)	DIN 3852 ⁹⁾	M10 x 1; 8 deep	40	X

Dimensions size 125

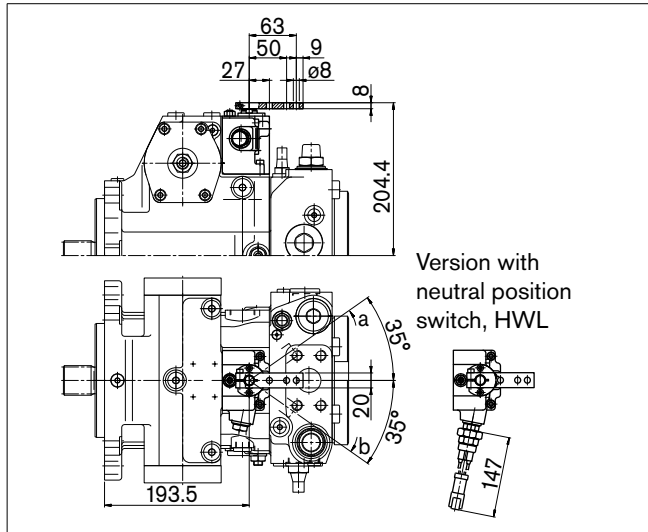
HD

Proportional control hydraulic, pilot-pressure related



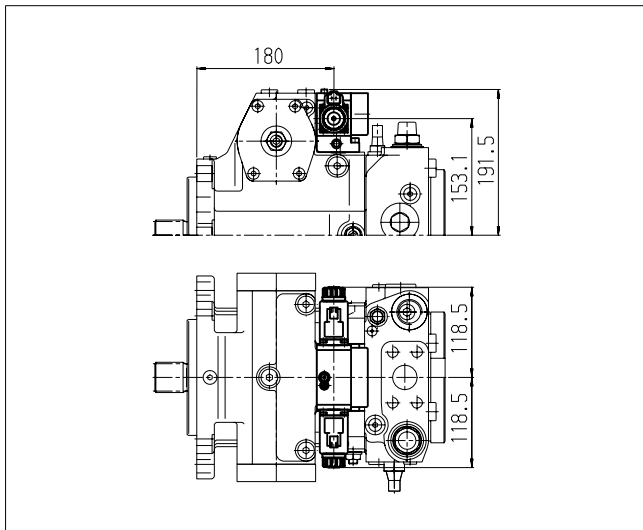
HW

Proportional control hydraulic, mechanical servo



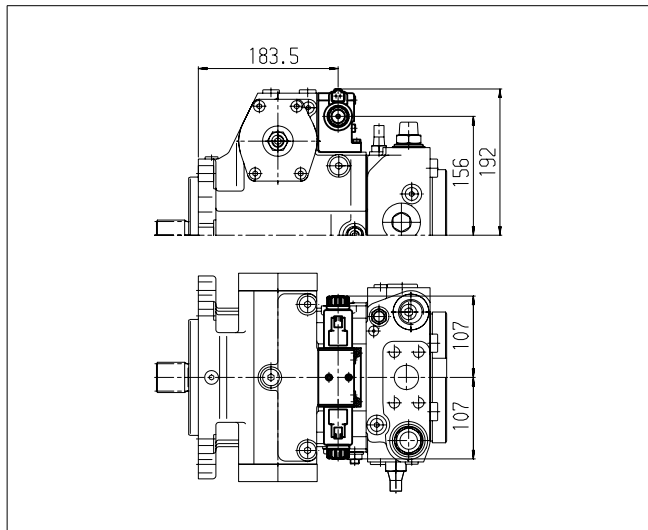
EP

Proportional control electric



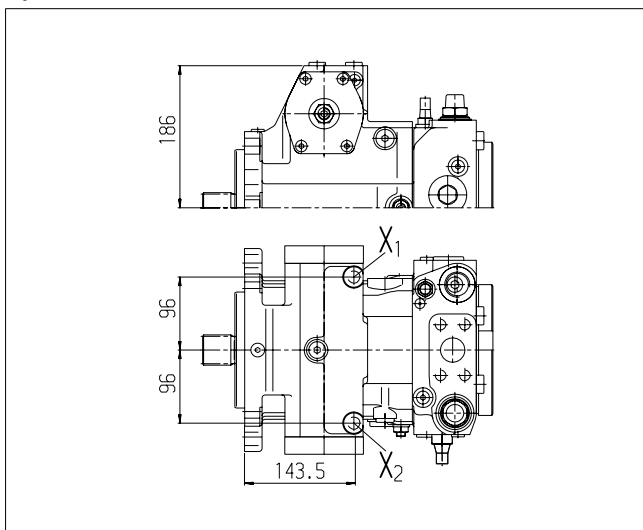
EZ

Two-point control electric



DG

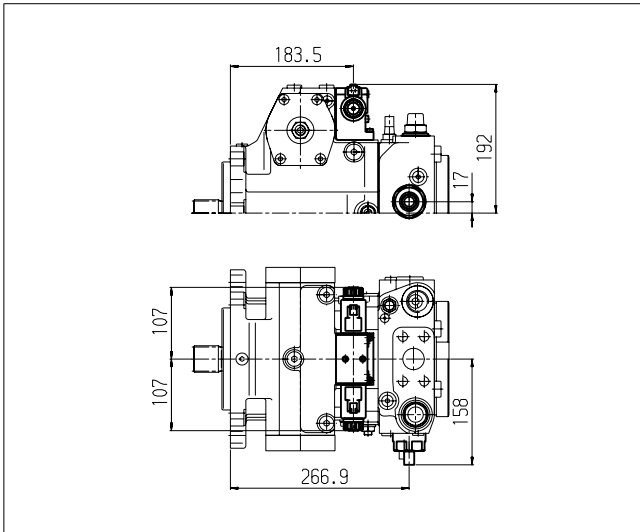
Hydraulic control, direct controlled



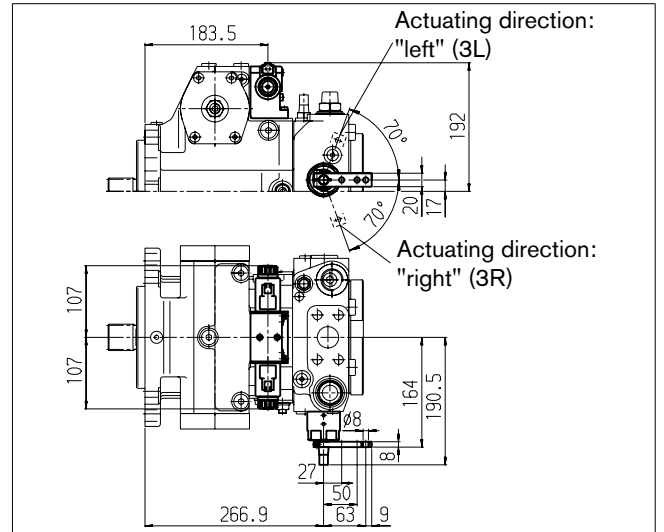
Dimensions size 125

DA – control valve

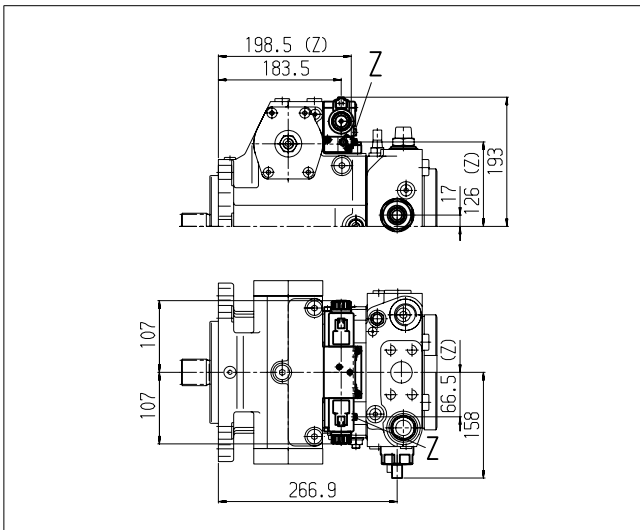
Version 2 – fixed setting



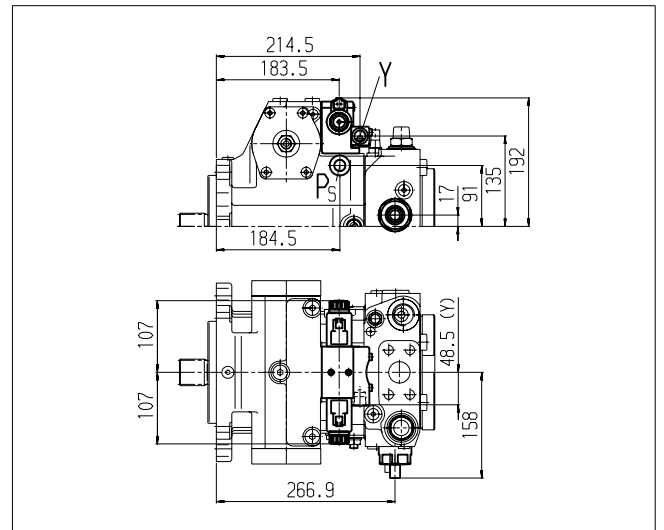
Version 3 – mechanically adjustable with position lever



Version 4/8 – fixed setting and inch valve mounted



Version 7 – fixed setting and ports for pilot control device

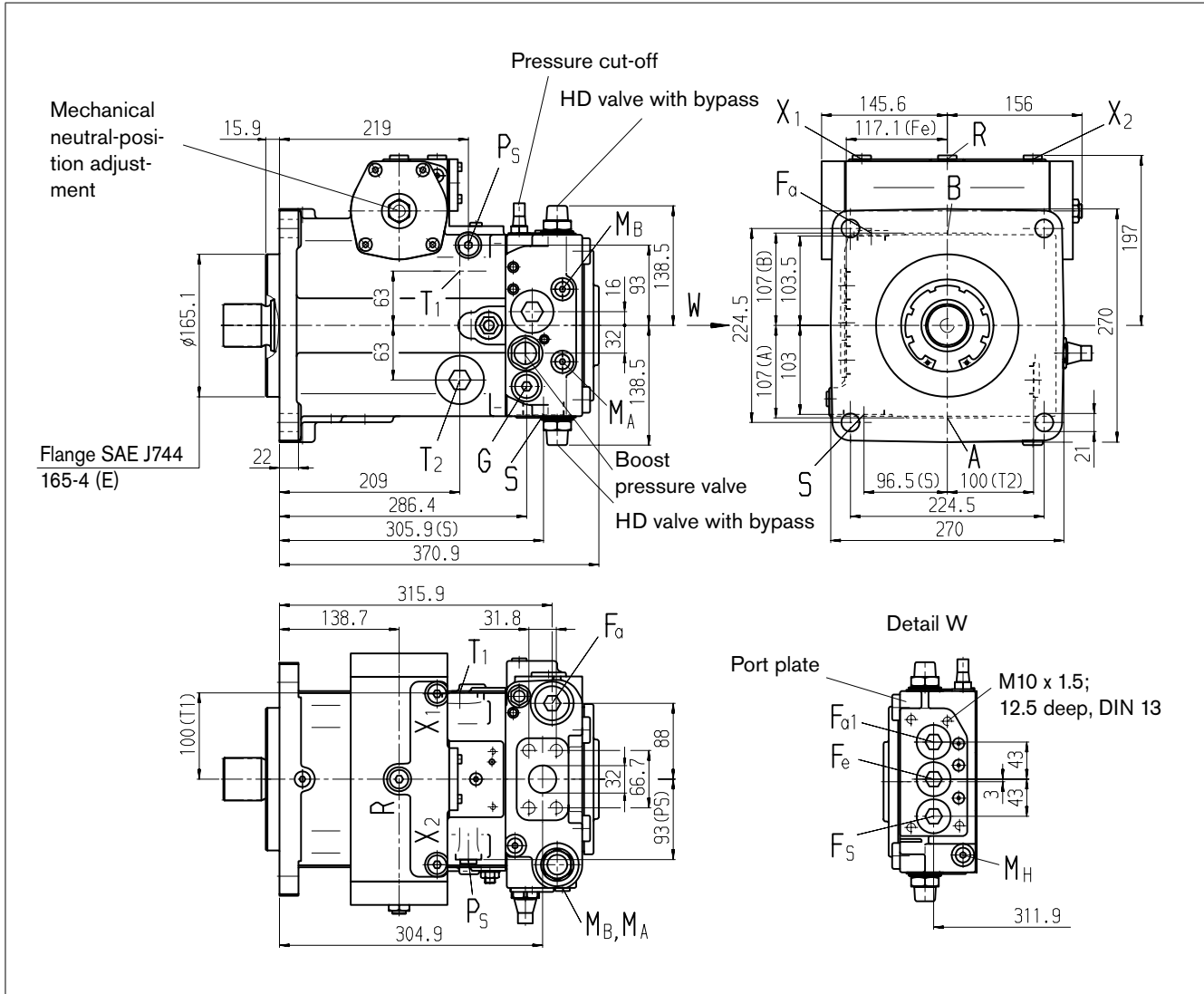


Dimensions size 180

NV – Version without control module

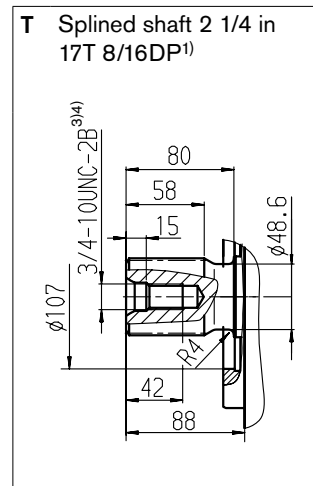
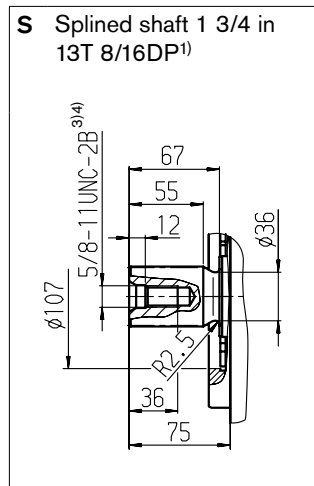
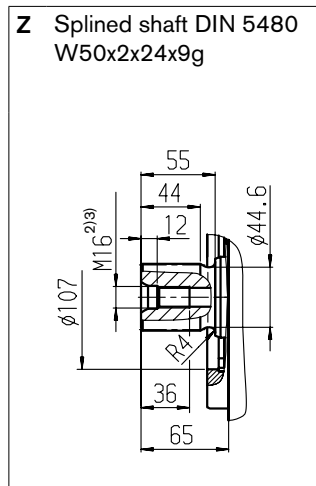
Standard: Suction port S at bottom (02)

Option: Suction port S at top (03): port plate turned through 180°



Dimensions size 180

Drive shafts



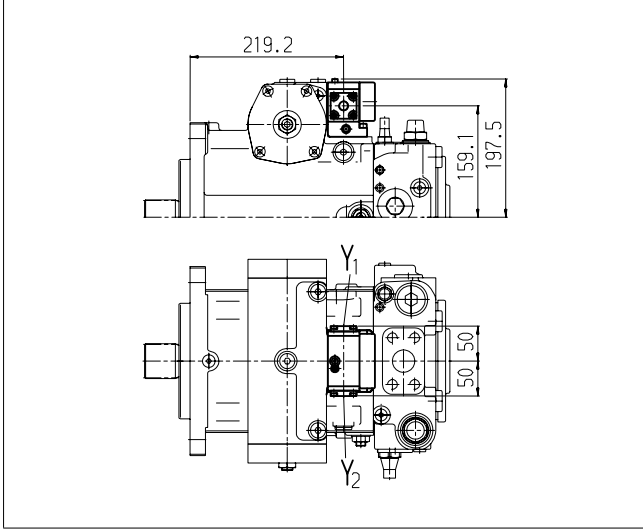
Ports

Designation	Port for	Standard	Size ³⁾	Maximum pressure [bar] ⁵⁾	State ¹¹⁾
A, B	Service line Fastening thread A/B	SAE J518 ⁶⁾ DIN 13	1 1/4 in M14 x 2; 19 deep	450	O
S	Suction line	DIN 3852 ⁹⁾	M48 x 2; 22 deep	5	O ⁷⁾
T ₁	Drain line	DIN 3852 ⁹⁾	M42 x 2; 20 deep	3	O ⁸⁾
T ₂	Drain line	DIN 3852 ⁹⁾	M42 x 2; 20 deep	3	X ⁸⁾
R	Air bleed	DIN 3852 ⁹⁾	M16 x 1.5; 12 deep	3	X
X ₁ , X ₂	Control pressure (upstream of orifice)	DIN 3852 ⁹⁾	M16 x 1.5; 12 deep	40	X
X ₁ , X ₂	Control pressure (upstream of orifice, DG only)	DIN 3852 ⁹⁾	M16 x 1.5; 12 deep	40	O
X ₃ , X ₄ ¹⁰⁾	Stroking chamber pressure	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	40	X
G	Boost pressure	DIN 3852 ⁹⁾	M22 x 1.5; 14 deep	40	X
P _S	Pilot pressure	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	X
P _S	Pilot pressure (DA7 only)	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	O
Y	Pilot pressure (DA7 only)	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	O
M _A , M _B	Measuring pressure A, B	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	450	X
M _H	Measuring high pressure	DIN 3852 ⁹⁾	M12 x 1.5; 12 deep	450	X
F _a	Boost pressure inlet	DIN 3852 ⁹⁾	M33 x 2; 18 deep	40	X
F _{a1}	Boost pressure, inlet (mountable filter)	DIN 3852 ⁹⁾	M33 x 2; 18 deep	40	X
F _e	Boost pressure outlet	DIN 3852 ⁹⁾	M33 x 2; 18 deep	40	X
F _S	Line from filter to suction line (cold start)	DIN 3852 ⁹⁾	M33 x 2; 18 deep	40	X
Y ₁ , Y ₂	Pilot signal (HD only)	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	40	O
Z	Inch signal (DA4 and 8 only)	DIN 3852 ⁹⁾	M10 x 1; 8 deep	40	X

Dimensions size 180

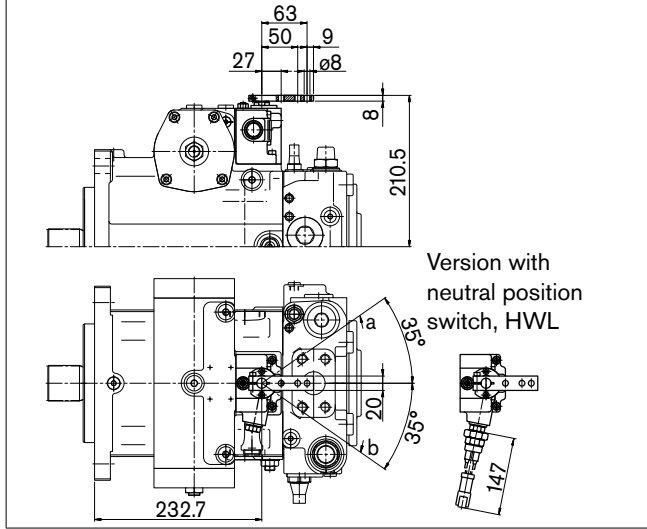
HD

Proportional control hydraulic, pilot-pressure related



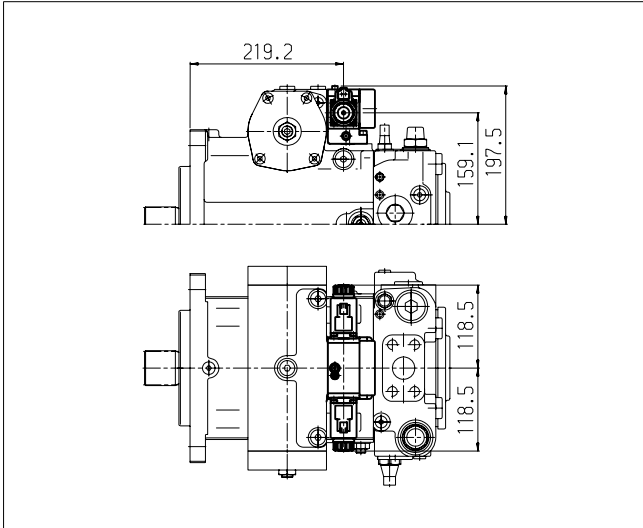
HW

Proportional control hydraulic, mechanical servo



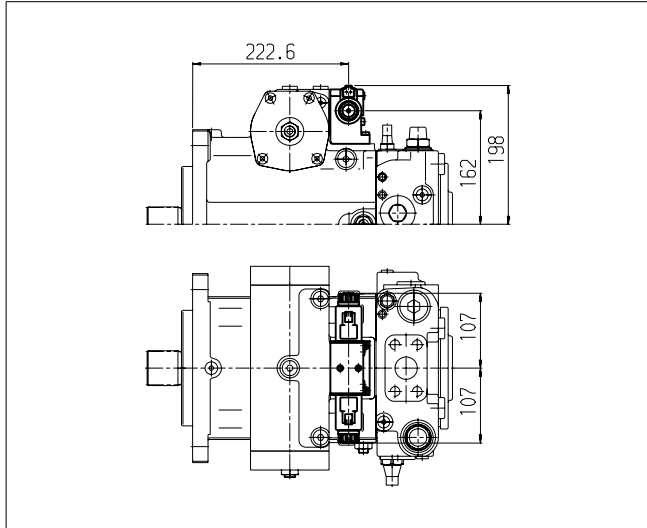
EP

Proportional control electric



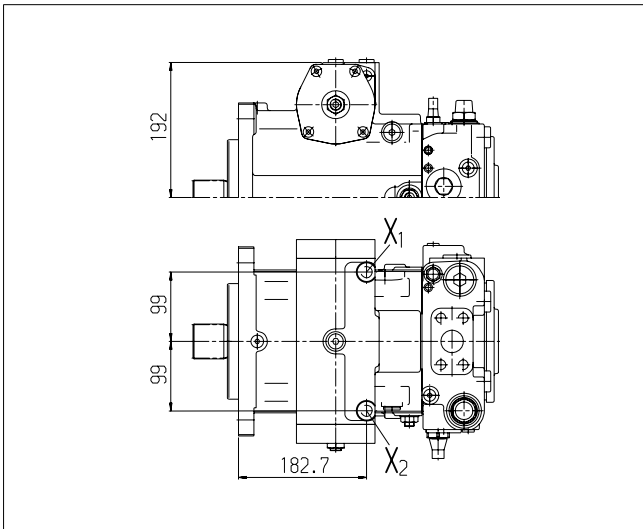
EZ

Two-point control electric



DG

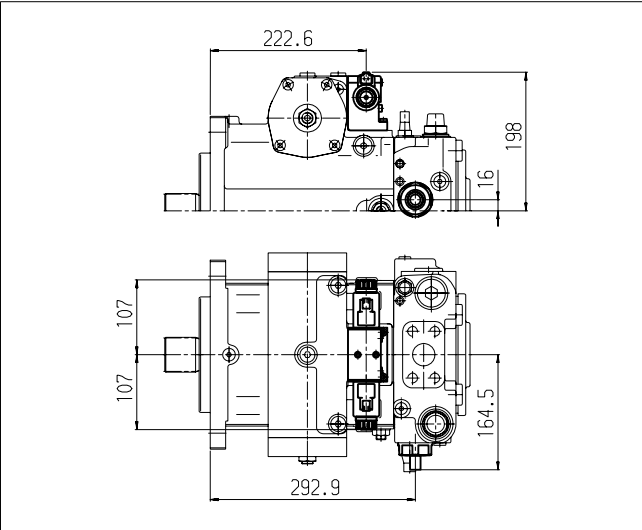
Hydraulic control, direct controlled



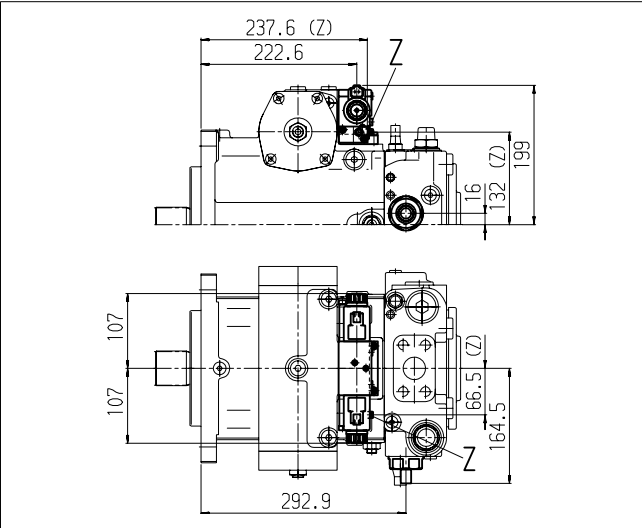
Dimensions size 180

DA – control valve

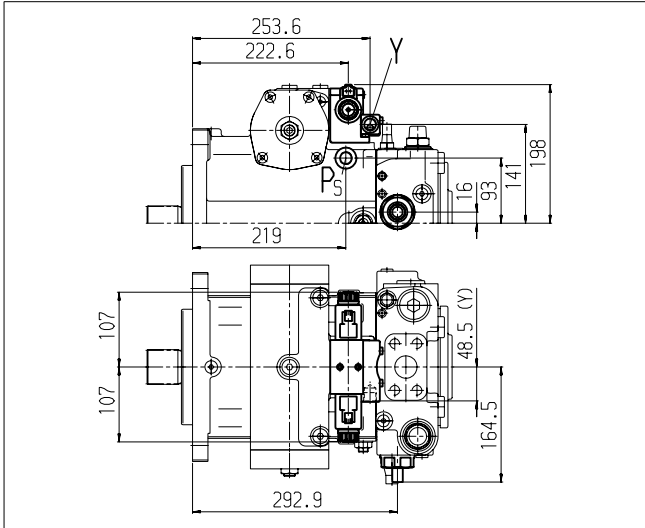
Version 2 – fixed setting



Version 4/8 – fixed setting and inch valve mounted



Version 7 – fixed setting and ports for pilot control device

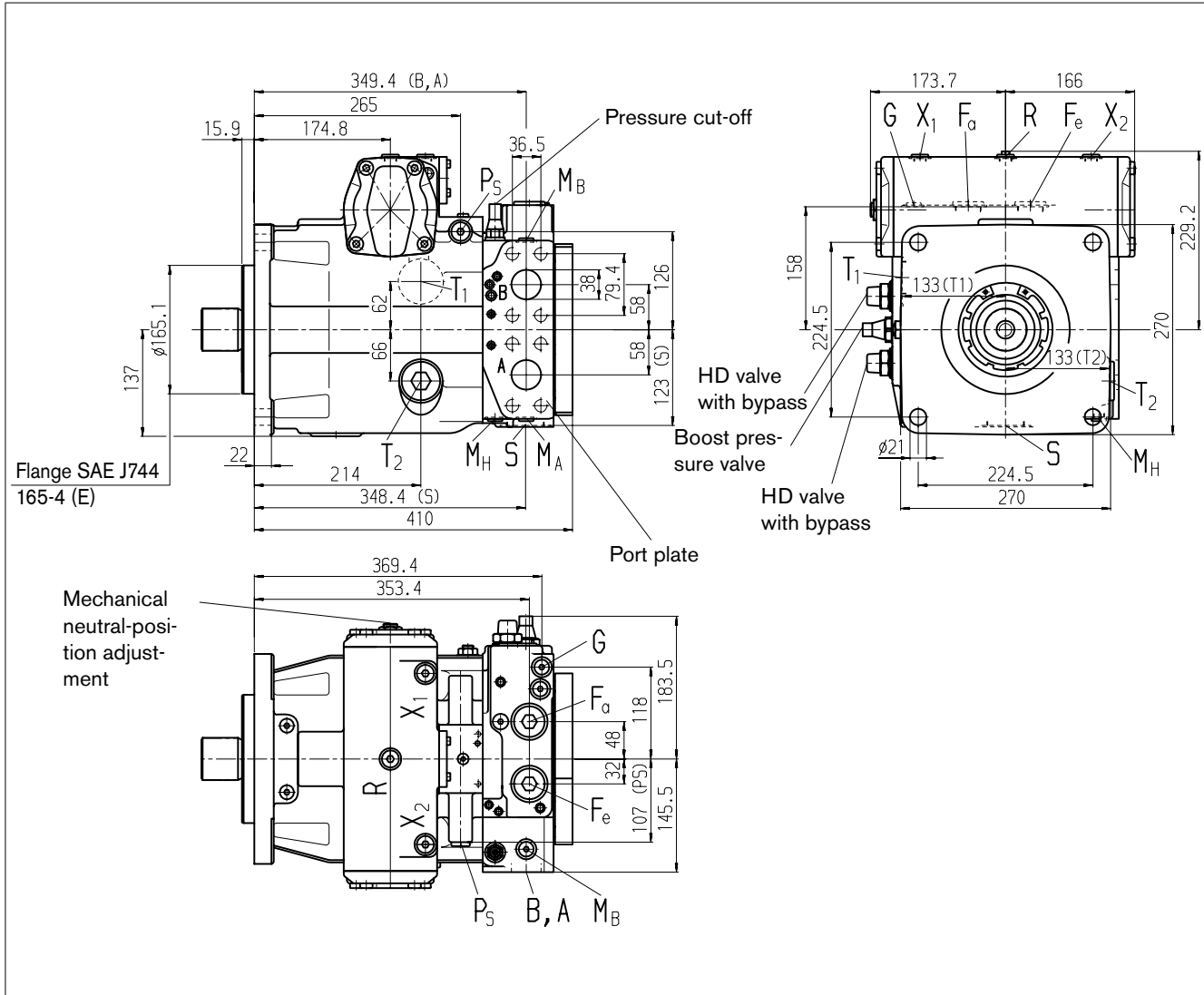


Dimensions size 250

NV – Version without control module

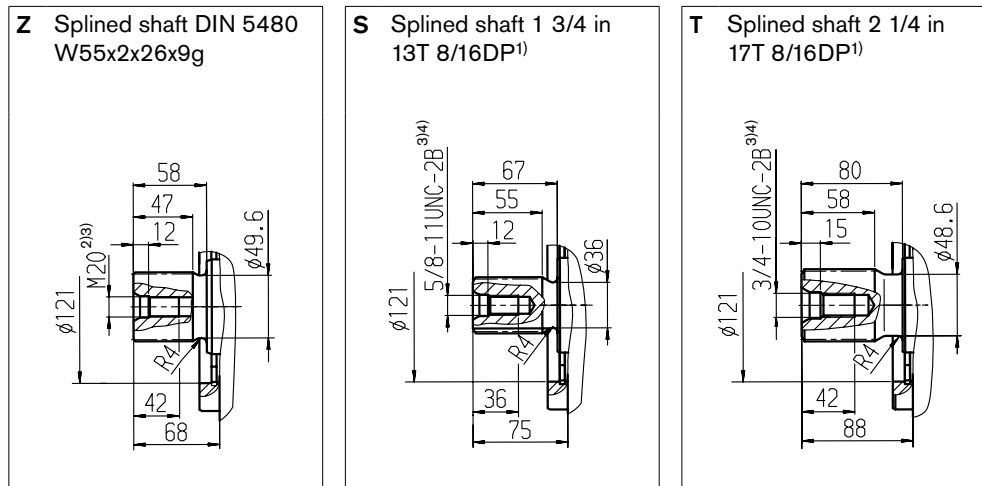
Standard: Suction port S at bottom (10)

Option: Suction port S at top (13): port plate turned through 180°



Dimensions size 250

Drive shafts



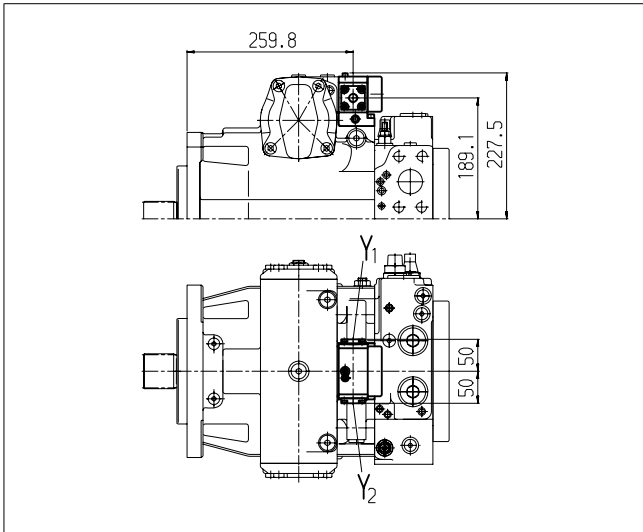
Ports

Designation	Port for	Standard	Size ³⁾	Maximum pressure [bar] ⁵⁾	State ¹¹⁾
A, B	Service line Fastening thread A/B	SAE J518 ⁶⁾ DIN 13	1 1/2 in M16 x 2; 21 deep	450	O
S	Suction line	DIN 3852 ⁹⁾	M48 x 2; 22 deep	5	O ⁷⁾
T ₁	Drain line	DIN 3852 ⁹⁾	M42 x 2; 20 deep	3	O ⁸⁾
T ₂	Drain line	DIN 3852 ⁹⁾	M42 x 2; 20 deep	3	X ⁸⁾
R	Air bleed	DIN 3852 ⁹⁾	M16 x 1.5; 12 deep	3	X
X ₁ , X ₂	Control pressure (upstream of orifice)	DIN 3852 ⁹⁾	M16 x 1.5; 12 deep	40	X
X ₁ , X ₂	Control pressure (upstream of orifice, DG only)	DIN 3852 ⁹⁾	M16 x 1.5; 12 deep	40	O
X ₃ , X ₄ ¹⁰⁾	Stroking chamber pressure	DIN 3852 ⁹⁾	M16 x 1.5; 12 deep	40	X
G	Boost pressure	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	40	X
P _S	Pilot pressure	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	X
P _S	Pilot pressure (DA7 only)	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	O
Y	Pilot pressure (DA7 only)	DIN 3852 ⁹⁾	M18 x 1.5; 12 deep	40	O
M _A , M _B	Measuring pressure A, B	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	450	X
M _H	Measuring high pressure	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	450	X
F _a	Boost pressure inlet	DIN 3852 ⁹⁾	M33 x 2; 18 deep	40	X
F _e	Boost pressure outlet	DIN 3852 ⁹⁾	M33 x 2; 18 deep	40	X
Y ₁ , Y ₂	Pilot signal (HD only)	DIN 3852 ⁹⁾	M14 x 1.5; 12 deep	40	O
Z	Inch signal (DA4 and 8 only)	DIN 3852 ⁹⁾	M10 x 1; 8 deep	40	X

Dimensions size 250

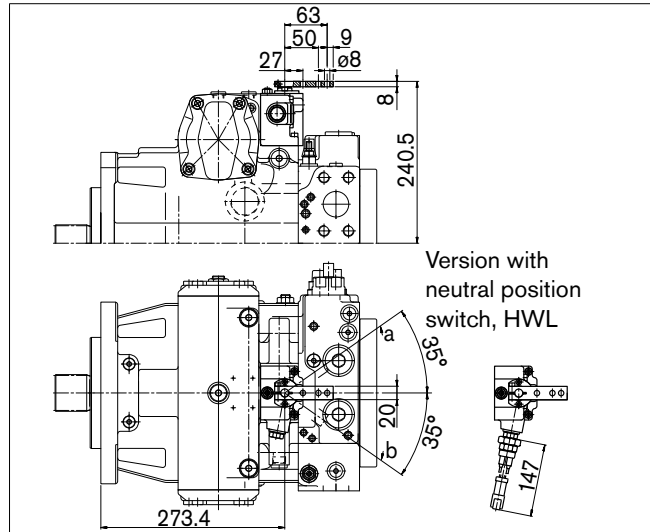
HD

Proportional control hydraulic, pilot-pressure related



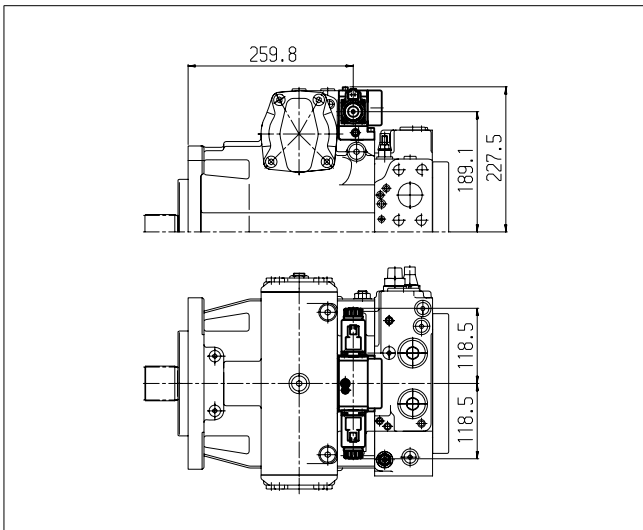
HW

Proportional control hydraulic, mechanical servo



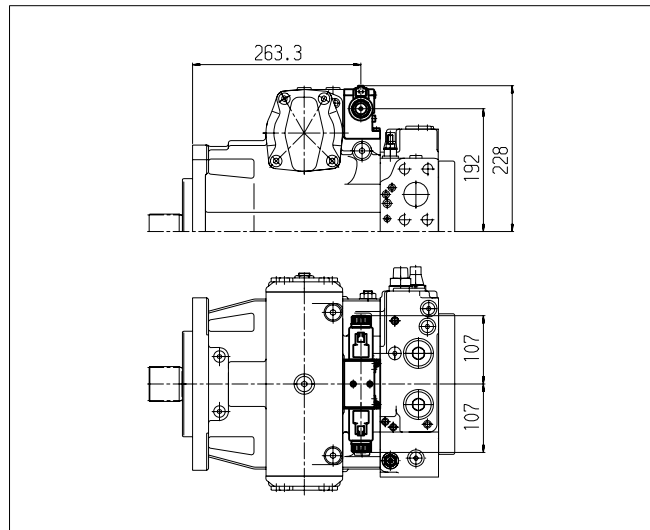
EP

Proportional control electric



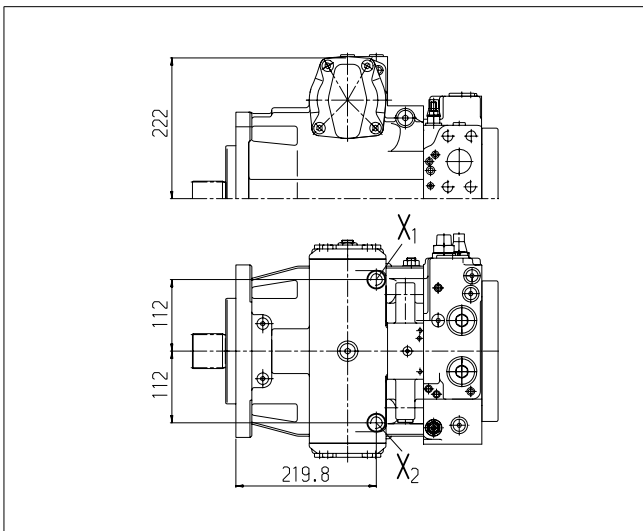
EZ

Two-point control electric



DG

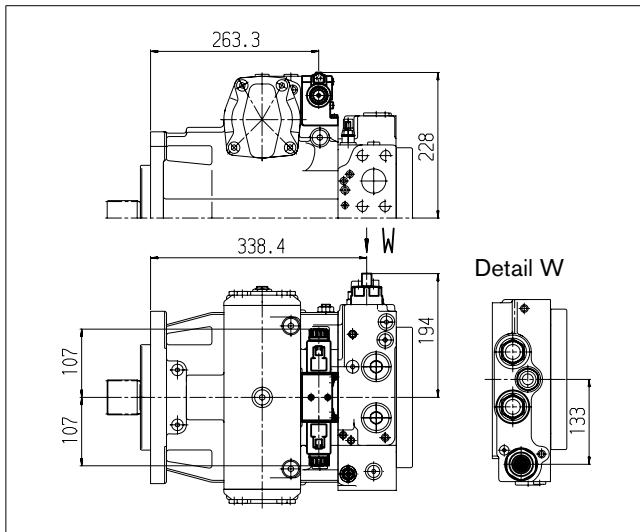
Hydraulic control, direct controlled



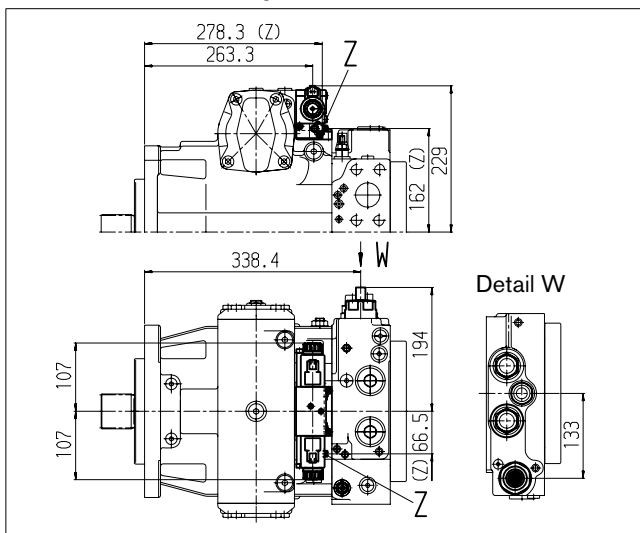
Dimensions size 250

DA – control valve

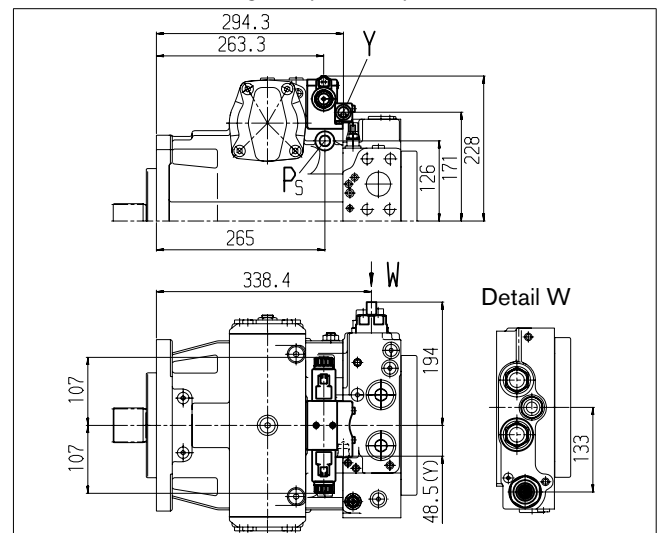
Version 2 – fixed setting



Version 4/8 – fixed setting and inch valve mounted



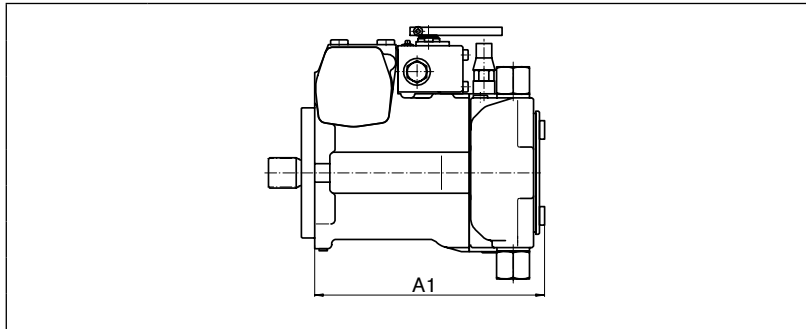
Version 7 – fixed setting and ports for pilot control device



Through drive dimensions

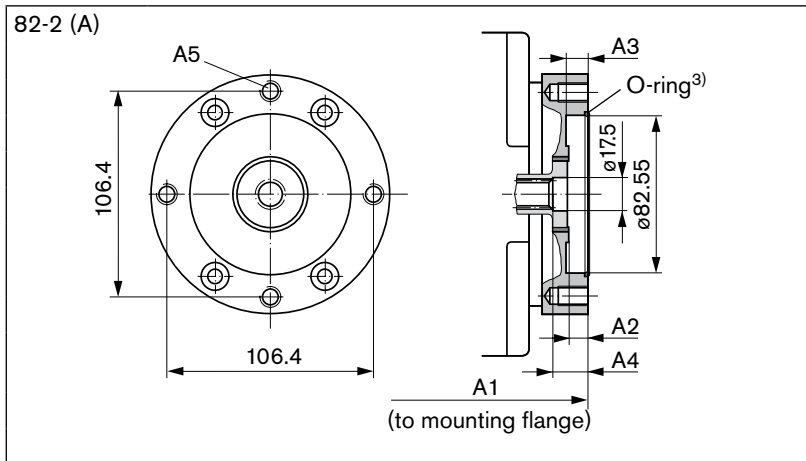
Flange SAE J744	Coupling for splined shaft (according to ANSI B92.1a) ¹⁾	28	40	56	71	90	125	180	250	
82-2 (A)	5/8 in 9T 16/32DP	●	●	●	●	●	●	●	●	.01
101-2 (B)	7/8 in 13T 16/32DP	●	●	●	●	●	●	●	●	.02
	1 in 15T 16/32DP	●	●	●	●	●	●	●	●	.04

N00 – Without boost pump, without through drive / **F00** – With boost pump, without through drive



NG	A1 (N00)	A1 (F00)
28	213.9	223.4
40	220.2	235.7
56	239.4	256.4
71	279.1	293.6
90	287	301
125	320.9	326.4
180	370.9	370.9
250	398.2	409

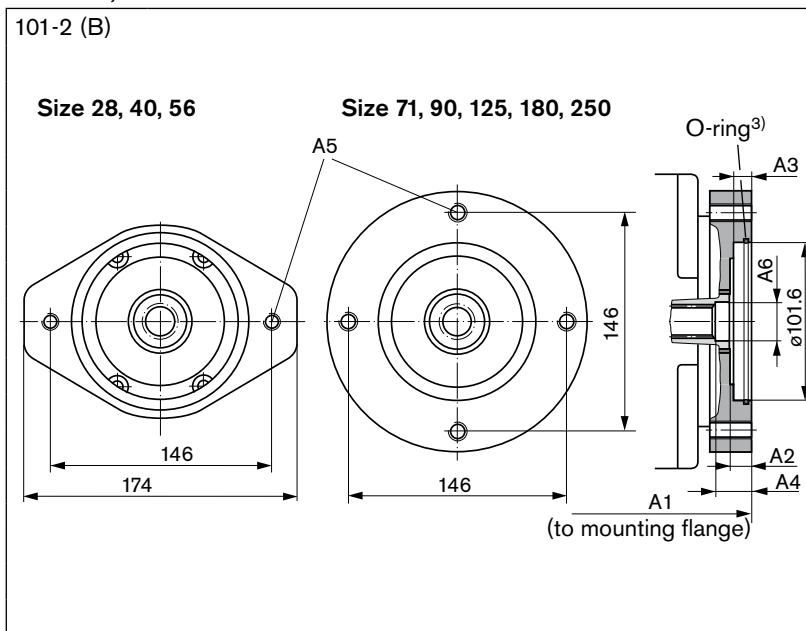
F01/K01⁴⁾



NG	A1 (F01)	A1 (K01)	A2	A3	A4
28	227.9	227.9	7.5	7.5	14.5
40	239.7	234.2	9	9	18
56	261.4	254.9	10	10	18
71	297.6	297.6	9	10	17
90	304	304	9	8	-
125	330.9	330.9	10.5	9	-
180	378.4	378.4	7.5	7.5	15.5
250	426.9	426.2	11	11	18

NG	A5 ²⁾
28 to 125	M10 x 1.5; 15 deep
180, 250	M10 x 1.5; 16.5 deep

F02/K02; F04/K04⁴⁾



NG	A1	A2	A3	A4 (02)	A4 (04)
28	230.4	9.7	9.7	16.2	13.7
40	240.7	11	11 ⁵⁾	17	16
56	262.4	12	11	19.5	18.5
71	300.6	13	9.8	17	15.5
90	305	9	11	17	15
125	330.9	10	11	17	16.5
180	381.4	11	11	19	18
250	428.9	11	11	16	15.5

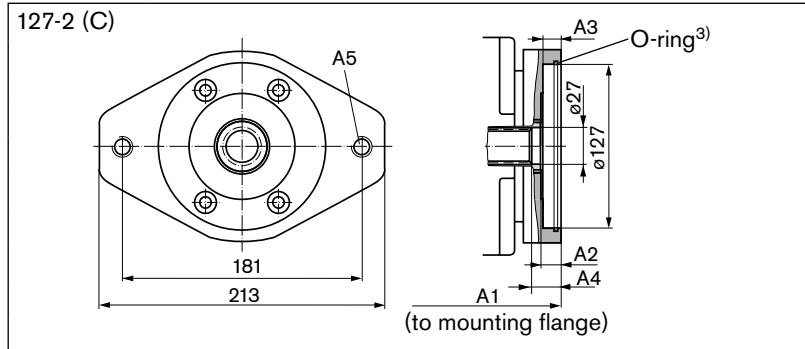
NG	A5 ²⁾
28 to 56	M12 x 1.75; 19 deep
71, 90, 180, 250	M12 x 1.75; 21 deep
125	M12 x 1.75; 18 deep

	A6
F02 / K02	ø 24
F04 / K04	ø 27

Through drive dimensions

Flange SAE J744	Coupling for splined shaft (according to ANSI B92.1a) ¹⁾		28	40	56	71	90	125	180	250	
127-2 (C)	1 in	15T 16/32DP	-	●	-	-	-	-	-	-	.09
	1 1/4 in	14T 12/24DP	-	-	●	●	●	●	●	●	.07
152-2/4 (D)	W35	2x16x9g (according to DIN 5480)	-	-	-	-	●	-	-	-	.73
	1 3/4 in	13T 8/16DP	-	-	-	-	-	●	●	●	.69

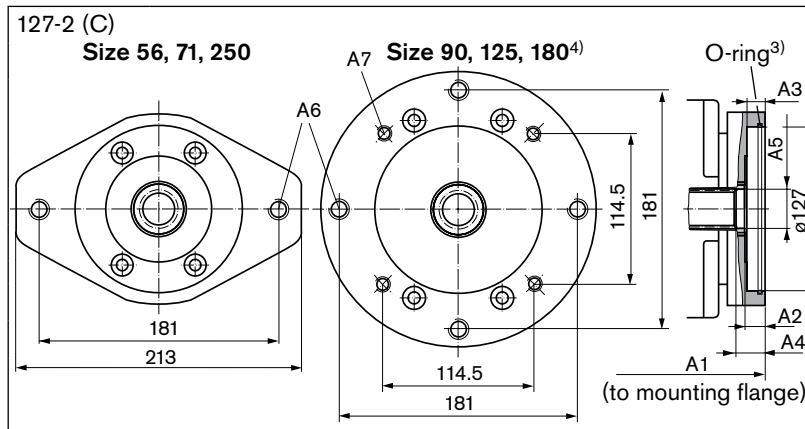
F09/K09



NG	A1	A2	A3	A4
40	244.7	14	14	19.5

NG	A5 ²⁾
40	M16 x 2; 20 deep

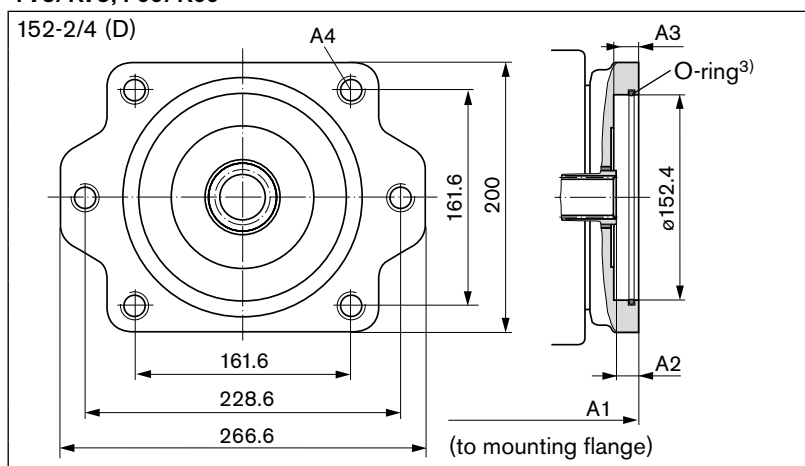
F07/K07⁵⁾



NG	A1	A2	A3	A4	A5
56	266.4	15	14	17.5	ø32.7
71	303.6	15	13.5	20	
90	309	13	14	20.5	
125	335.9	15	15.5	22.5	ø33.5
180	384.4	14	19	17	
250	425.9	16	14	16	

NG	A6 ²⁾	A7 ²⁾
56	M16 x 2; 20 deep	-
71, 250	M16 x 2; 24 deep	-
90, 125, 180	M16 x 2; 23 deep	M12 x 1.75; 18 deep

F73/K73; F69/K69⁶⁾

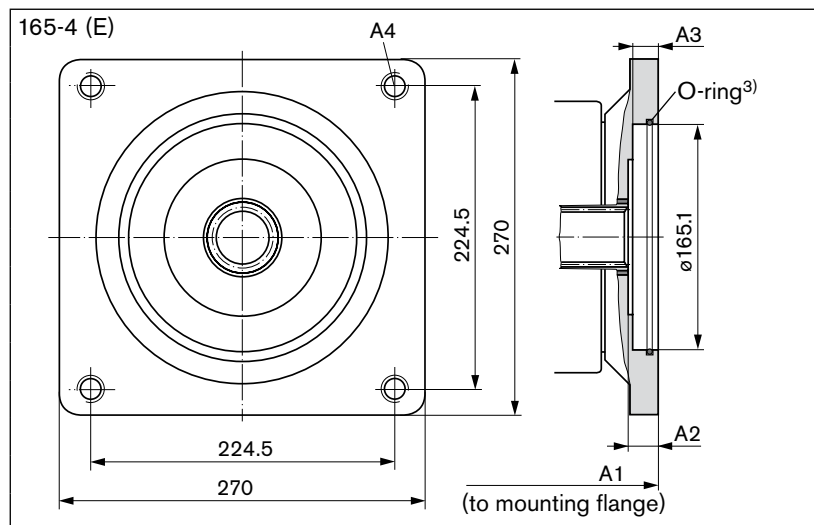


NG	A1	A2	A3	A4 ²⁾
90	309	12	14	
125	343.9	18	14	M20 x 2.5;
180	391.9	20.9	18	20 deep
250	444.9	9	17	

Through drive dimensions

Flange SAE J744	Coupling for splined shaft (according to ANSI B92.1a) ¹⁾	28	40	56	71	90	125	180	250	
165-4 (E)	1 3/4 in 13T 8/16DP	-	-	-	-	-	-	●	●	.72

F72/K72



NG	A1	A2	A3	A4 ²⁾
180	391.9	20.9	18	M20 x 2.5;
250	444.9	9	17	20 deep

1) 30° pressure angle, flat root, side fit, tolerance class 5

2) Thread according to DIN 13, observe the general instructions on page 68 for the maximum tightening torques.

3) O-ring included in the delivery contents

Overview of mounting options

Through drive ¹⁾			Mounting options – 2nd pump						
Flange	Coupling for splined shaft	Short code	A4VG/32 NG (shaft)	A10V(S)O/31 Size (shaft)	A10V(S)O/53 Size (shaft)	A4FO NG (shaft)	A11VO/1 NG (shaft)	A10VG NG (shaft)	External gear pump ²⁾
82-2 (A)	5/8 in	F/K01	-	18 (U)	10 (U)	-	-	-	Series F Size 4 to 22
101-2 (B)	7/8 in	F/K02	-	28 (S, R) 45 (U, W)	28 (S, R) 45 (U, W)	16 (S) 22 (S) 28 (S)	-	18 (S)	Series N Size 20 to 36 Series G Size 32 to 50
	1 in	F/K04	28 (S)	45 (S, R)	45 (S, R) 60 (U, W)	-	40 (S)	28 (S) 45 (S)	-
127-2 (C)	1 in	F/K09	40 (U)	71 (U, W)	60 (U, W)	-	-	-	-
	1 1/4 in	F/K07	40 (S) 56 (S) 71 (S)	71 (S, R) 100 (U, W)	85 (U, W)	-	60 (S)	63 (S)	-
152-2/4 (D)	W35	F/K73	90 (Z)	-	-	-	-	-	-
	1 3/4 in	F/K69	90 (S) 125 (S)	140 (S)	-	-	95 (S) 130 (S) 145 (S)	-	-
165-4 (E)	1 3/4 in	F/K72	180 (S) 250 (S)	-	-	-	190 (S) 260 (S)	-	-

Combination pumps A4VG + A4VG

Total length A

A4VG (1st pump)	A4VG (2nd pump) ³⁾							
	NG28	NG40	NG56	NG71	NG90	NG125	NG180	NG250
NG28	453.8	–	–	–	–	–	–	–
NG40	464.1	480.4	–	–	–	–	–	–
NG56	485.8	502.1	522.8	–	–	–	–	–
NG71	524.0	539.3	560.0	597.2	–	–	–	–
NG90	528.4	544.7	565.4	602.6	610.0	–	–	–
NG125	554.3	571.6	592.3	629.5	644.9	670.3	–	–
NG180	604.8	620.1	640.8	678.0	692.9	718.3	762.8	–
NG250	652.3	661.6	682.3	719.5	745.9	771.3	815.8	854.8

