



HYDRAULIC COMPONENTS  
HYDROSTATIC TRANSMISSIONS  
GEARBOXES - ACCESSORIES



Certified Company ISO 9001:2015 - 14001:2015

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ISO 14001:2015 Certificate N° 12-E-0200545-TIC

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HT 16 / M / 124 / 1218 / E

THE PRODUCTION LINE OF HANSA-TMP

## Variable Displacement Closed Loop System Axial Piston Pump

### TPV 1000





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**GENERAL INFORMATION**

**Features**

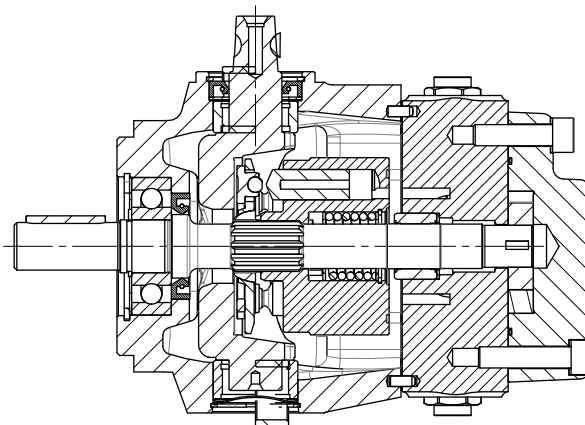
- Silent running
- High rotation speed
- Compact design
- Suitable for multiple pump assembly
- Easy maintenance
- Built-in pressure relief valves
- Optionals: screw or lever-type by-pass-valve, purge valve, adapter flange from SAE-A to SAE-B

- Accessories: auxiliary gearpumps, hydraulic and electric remote controls, mounting kit for diesel and petrol engines

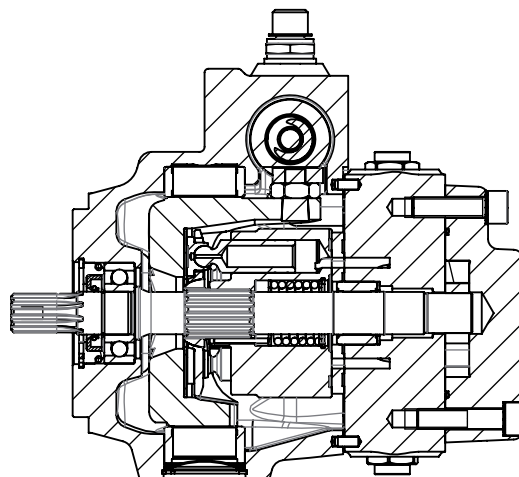
All HANSA-TMP's TPV pumps are tested dynamically and statically to ensure the quality of our product.

**TPV pumps are variable displacement axial piston pumps, with swashplate system, for closed loop hydrostatic transmissions**

**Direct Mechanical Control**



**Hydraulic Servo Control**



**TECHNICAL SPECIFICATIONS**

PUMP MODEL		TPV 6-7	TPV 8-7	TPV 9-7	TPV 11-7	TPV 12-7	TPV 13-7	TPV 15-9	TPV 17-9	TPV 18-9	TPV 19-9	TPV 21-9
Max. displacement	cm <sup>3</sup>	7,4	8,9	9,6	11,2	12,8	13,6	15,00	17,1	18,2	19,4	21,15
Flow rating <sup>(1)</sup>	L/min	25,01	31,96	34,74	40,32	46,08	48,88	54,00	61,77	66,37	69,84	76,4
Power rating <sup>(1)</sup>	kW	8,75	11,18	12,15	14,11	16,12	17,11	18,9	21,61	23,23	24,44	31,73
Boost pump displacement	cm <sup>3</sup> /n	3,9 (rear cover closed B1, B2) 4,7 (rear cover SAE-A)										
Rated pressure	MPa	21										20
Max. pressure	MPa	30	30	30	30	30	30	28	28	27	25	
Max. relief valve setting	MPa	30										
Standard boost pressure <sup>(2)</sup>	MPa	0,6 (mechanical control) 2 (hydraulic / electric servo control)										
Suction pressure	MPa (absolute)	> = 0,08										
Max. case pressure	MPa	0,15										
Min. shaft speed	n/min	500										
Rated speed	n/min	3.600										2900
Max. speed	n/min	3.900										3200
Max. oil temperature	°C	80										
Oil viscosity	cSt	15-35										
Fluid contamination		18/15/12 ISO 4406 (NAS 9)										
Dry weight (single pump) <sup>(3)</sup>	kg	9										
Dry weight (tandem pump) <sup>(3)</sup>	kg	19,5										

(1) 3.600 n/min 21 MPa

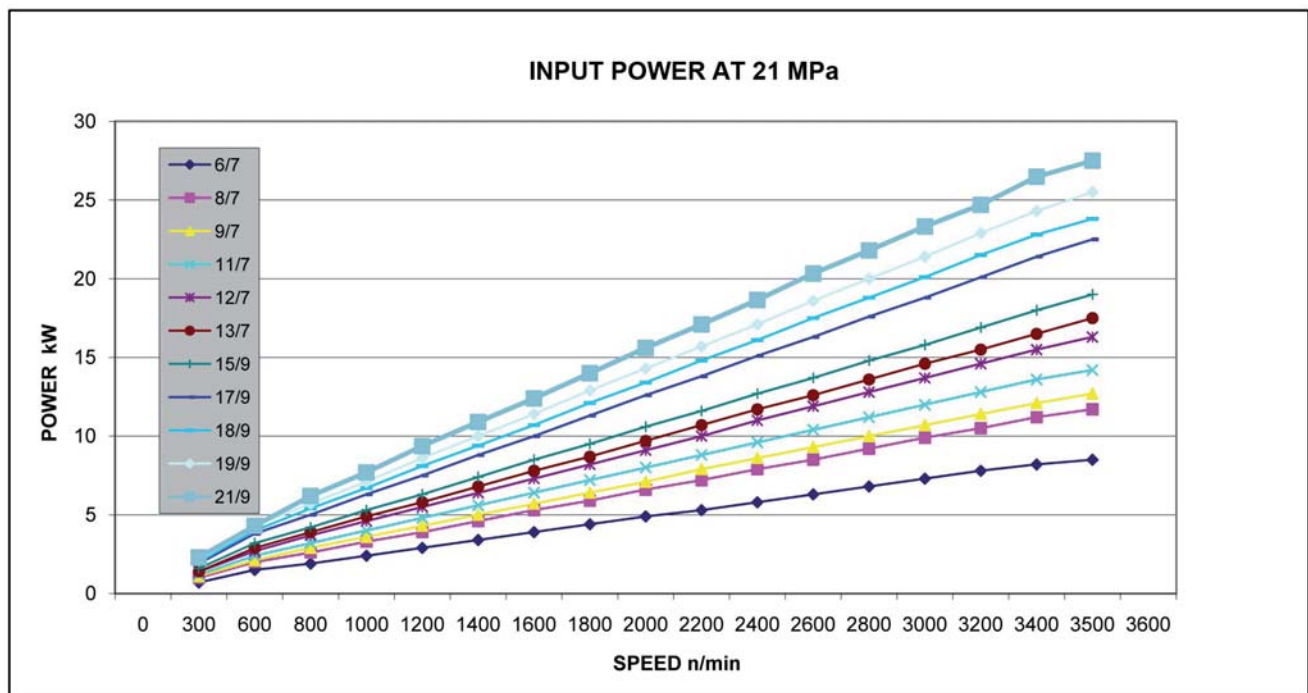
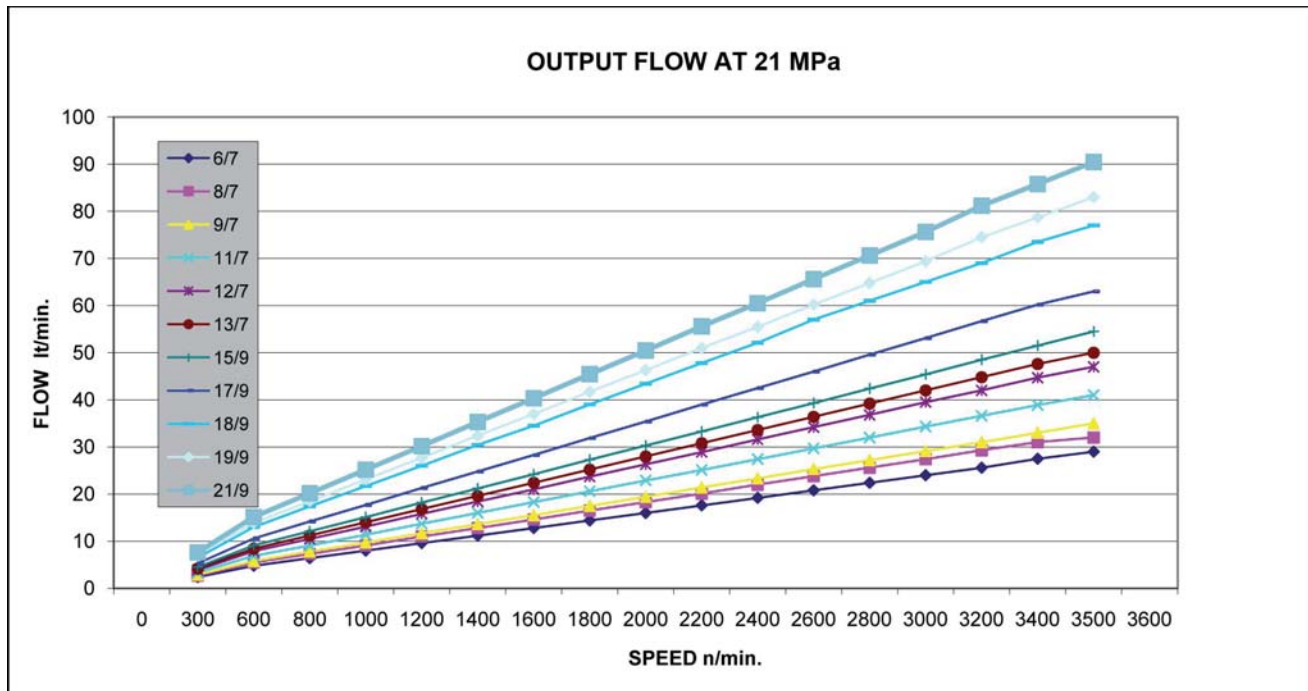
(2) 1.000 n/min

(3) Nominal data, weight varies depending on configuration and optional

**SYSTEM DESIGN PARAMETERS**

HYDRAULIC MEASURE	USEFUL FORMULAS	CONVERSION FACTORS
Flow rate: Q = (l/min)	$Q = V [cm^3/n] \times \eta_v \times n \times 10^{-3}$	1 l/min = 0,2641 US Gal/min
Pressure: P = (MPa)		1 MPa = 145 PSI
Displacement: V = (cm <sup>3</sup> /n)		
Torque: M = (Nm)	$M = \frac{\Delta p [MPa] \times V [cm^3/n]}{6.283 \times \eta_m}$	1 Nm = 8,851 in lbs
Power: P = (kW)	$P = \frac{\Delta p [MPa] \times V [cm^3/n] \times n}{60 \times 1000 \times \eta_t}$	1 KW = 1,36 HP
Shaft speed: n = n/min		
Hydraulic efficiency: = $\eta_v$		
Mechanical efficiency: = $\eta_m$		
Overall efficiency: = $\eta_t$		
		1 mm = 0,0394 in
		1 kg = 2,205 lbs
		1 N = 0,2248 lbs

PERFORMANCE DIAGRAM



## GENERAL INSTRUCTIONS

- During the assembly, check that pump is in line and concentric with the driveshaft sleeve to prevent overloading of the pump shaft bearing.
- Clean carefully all tanks and pipes internally before assembly.
- The pipe internal diameter must be suitable for the max oil speed through it.
- It is advisable to fit the pump below the oil level of tank.
- Heat exchangers must be considered in the machine design, to keep temperature level within the limit of 80°C.

### Multiple Pumps

- In case of installing a multiple pump it is advisable to mount a supplementary support.

### Maximum Shaft Torque

In the case of installation of multiple pump, verify that the total shaft torque is not more than the maximum value rated for each type of shaft.

### Optional

The TPV pumps can be supplied in different versions, with different types of shaft and equipped with different types of control devices and optionals:

- Direct mechanical control lever DM
- Spring zero return DMS
- Hydraulic servo-control SHI
- Electric proportional servo-control SEI
- By-pass lever LB
- Screw By-pass SB

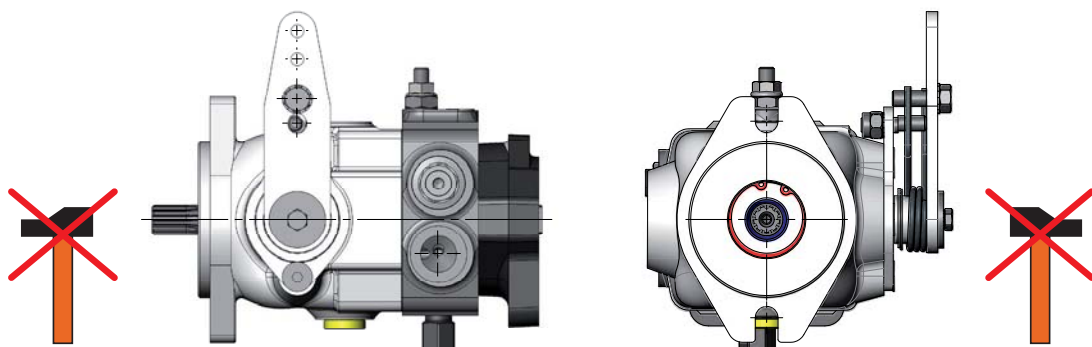
- Purge valve VS
- Adaptor flange from SAE-A to SAE-B FB
- Adaptor coupling Z = 9 / Z = 13 ST
- Purge valve + By-pass lever VSLB

### First Starting

- Before starting fill all the system components with new and filtered oil.
- Verify that the boost pressure is correct.
- Restore the tank oil level.

### Maintenance

- The first oil change must be made after approximately 500 hours of operation. In the following every 2000 hours.
- The filter cartridge must be replaced for the first time after 50 hours. In the following 500 hours; such time should be reduced if the filter clogging indicator shows that the cartridge is clogged or when the system works in a heavily polluted environment.



ORDER CODE \_\_\_\_\_

1000	TPV	6-7	-	CR	SS2	F1	DM	OA	-	10	06	B1	000	00
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14

Pag.

<b>1000</b>	<b>0 - Pump series</b> = TPV pump 1000	
<b>TPV</b>	<b>1 - Pump model</b> = Closed loop circuit single pump	<b>11</b>
<b>TPV-T</b>	= Closed loop circuit tandem pump	<b>13</b>
<b>TPV-T3</b>	= Closed loop circuit triple pump	<b>14</b>
<b>TPVS*</b>	= Closed loop circuit special pump according to customer request	
	<b>2 - Pump displacement (single or primary)</b>	
	6-7 = 7,4 cm <sup>3</sup> /n      8-7 = 8,9 cm <sup>3</sup> /n      9-7 = 9,6 cm <sup>3</sup> /n      11-7 = 11,2 cm <sup>3</sup> /n	
	12-7 = 12,8 cm <sup>3</sup> /n      13-7 = 13,6 cm <sup>3</sup> /n      15-9 = 15 cm <sup>3</sup> /n      17-9 = 17,1 cm <sup>3</sup> /n	
	18-9 = 18,2 cm <sup>3</sup> /n      19-9 = 19,4 cm <sup>3</sup> /n      21-9 = 21,15 cm <sup>3</sup> /n	
	<b>3 - Pump displacement (tandem or secondary)</b>	
	6-7 = 7,4 cm <sup>3</sup> /n      8-7 = 8,9 cm <sup>3</sup> /n      9-7 = 9,6 cm <sup>3</sup> /n      11-7 = 11,2 cm <sup>3</sup> /n	
	12-7 = 12,8 cm <sup>3</sup> /n      13-7 = 13,6 cm <sup>3</sup> /n      15-9 = 15 cm <sup>3</sup> /n      17-9 = 17,1 cm <sup>3</sup> /n	
	18-9 = 18,2 cm <sup>3</sup> /n      19-9 = 19,4 cm <sup>3</sup> /n      21-9 = 21,15 cm <sup>3</sup> /n	
	<b>4 - Rotation</b>	
<b>CR</b>	= Clockwise Rotation (right)	
<b>CC</b>	= Counter-clockwise Rotation (left)	
	<b>5 - Drive Shaft</b>	
<b>SS2</b>	= Splined shaft Z 9 - 16 / 32 D.P.	<b>16</b>
<b>PS1</b>	= Parallel keyed shaft 15,875 mm. diam. (Available only for single pump, rear cover C, B1 and B2. Please contact our technical department for SA-R request)	<b>16</b>
<b>PS3</b>	= Parallel keyed shaft 18 mm. diam. with heavy duty bearing for external radial load	<b>17</b>
<b>SS3</b>	= Splined shaft Z 13 - 16 / 32 D.P. (available only with servo-control SHI, SEI and SAE-B flange)	<b>17</b>
	<b>6 - Mounting flange</b>	
<b>F1</b>	= SAE-A 2 bolt - spigot diam. 82,5 mm.	<b>18</b>
<b>F2.2</b>	= SAE-B 2 bolt - spigot diam. 101,6 mm. (available only with servo-control SHI, SEI and shaft SS3)	<b>18</b>
	<b>7 - Controls</b>	
<b>DM</b>	= Direct mechanical (without control lever)	<b>19</b>
<b>BC</b>	= Tapered bush	<b>20</b>
<b>LC</b>	= Control lever	<b>21</b>
<b>DMS</b>	= Control lever with return to zero position (torsion spring standard diameter 3,6 mm.)	<b>22</b>
<b>DMS (30)</b>	= Control lever with return to zero position (torsion spring diameter 3 mm.)	<b>22</b>
<b>DMS (33)</b>	= Control lever with return to zero position (torsion spring diameter 3,3 mm.)	<b>22</b>
<b>DMS (40)</b>	= Control lever with return to zero position (torsion spring diameter 4 mm.)	<b>22</b>
<b>DMS (50)</b>	= Control lever with return to zero position (torsion spring diameter 5 mm.)	<b>22</b>
<b>DMZB</b>	= Control lever with return to zero position (blue compression spring standard)	<b>24</b>
<b>DMZR</b>	= Control lever with return to zero position (red compression spring)	<b>24</b>
<b>DMZV</b>	= Control lever with return to zero position (green compression spring)	<b>24</b>
<b>SHI</b>	= Hydraulic proportional servo-control	<b>26</b>
<b>SEI 1.3</b>	= Electro-proportional servo-control 12V DC	<b>28</b>
<b>SEI 2.3</b>	= Electro-proportional servo-control 24V DC	<b>28</b>



(continued)

**ORDER CODE** \_\_\_\_\_

	<b>8 - Control devices position</b> (single or primary pump)	
OA	= Position A (without lever)	31
OB	= Position B (without lever)	
LA	= Position A-left	
RA	= Position A-right	
LB	= Position B-left	
RB	= Position B-right	

	<b>9 - Control devices position</b> (tandem or secondary pump)	
OA	= Position A (without lever)	31
OB	= Position B (without lever)	
LA	= Position A-left	
RA	= Position A-right	
LB	= Position B-left	
RB	= Position B-right	

	<b>10 - Relief valve pressure setting *</b>			
	<b>10</b> = 10 MPa	<b>15</b> = 15 MPa	<b>18</b> = 18 MPa	
	<b>20</b> = 20 MPa	<b>25</b> = 25 MPa	<b>30</b> = 30 MPa	

\* The rated pressure values change according to speed

	<b>11 - Boost pump</b>	
00	= Without boost pump **	
01	= Without boost pump compact version (only for rear pump flange B1 - B2) **	
06	= Standard pump C-B1-B2 (3,9 cm <sup>3</sup> /n); SAE-A (4,7 cm <sup>3</sup> /n) Standard setting: 0,6 MPa (mechanical control) or 2 MPa (hydraulic / electric servo control) at 1000 n/min.	
06(xx)	= Other pressure settings on request (between 0,8 and 3 MPa), contact our technical department	

\*\* Upon order, please provide information on maximum external charge flow

	<b>12 - Rear pump connection option</b>	
C	= Closed cover (without rear fitting)	32
B1	= For German standard pump group 1 mounting	32
B2	= For German standard pump group 2 mounting	33
SA-R	= For SAE-A 2 bolt mounting flange (female shaft)	34

	<b>13 - Gear pump displacement ***</b>	
000	= Without pump	

<b>Group 1</b>			
<b>112</b> = 1,2 cm <sup>3</sup> /n	<b>117</b> = 1,7 cm <sup>3</sup> /n	<b>122</b> = 2,1 cm <sup>3</sup> /n	<b>126</b> = 2,6 cm <sup>3</sup> /n
<b>132</b> = 3,1 cm <sup>3</sup> /n	<b>138</b> = 3,6 cm <sup>3</sup> /n	<b>143</b> = 4,2 cm <sup>3</sup> /n	<b>149</b> = 4,9 cm <sup>3</sup> /n
<b>159</b> = 5,9 cm <sup>3</sup> /n	<b>165</b> = 6,5 cm <sup>3</sup> /n	<b>178</b> = 7,5 cm <sup>3</sup> /n	

<b>Group 2</b>			
<b>204</b> = 4,2 cm <sup>3</sup> /n	<b>206</b> = 6,0 cm <sup>3</sup> /n	<b>209</b> = 8,4 cm <sup>3</sup> /n	<b>211</b> = 10,8 cm <sup>3</sup> /n
<b>214</b> = 14,4 cm <sup>3</sup> /n	<b>217</b> = 16,8 cm <sup>3</sup> /n	<b>219</b> = 19,2 cm <sup>3</sup> /n	<b>222</b> = 22,8 cm <sup>3</sup> /n
<b>226</b> = 26,2 cm <sup>3</sup> /n			

<b>Group 2 (SAE-A)</b>			
<b>S204</b> = 4,2 cm <sup>3</sup> /n	<b>S206</b> = 6,0 cm <sup>3</sup> /n	<b>S209</b> = 8,4 cm <sup>3</sup> /n	<b>S211</b> = 10,8 cm <sup>3</sup> /n
<b>S214</b> = 14,4 cm <sup>3</sup> /n	<b>S217</b> = 16,8 cm <sup>3</sup> /n	<b>S219</b> = 19,2 cm <sup>3</sup> /n	<b>S222</b> = 22,8 cm <sup>3</sup> /n
<b>S226</b> = 26,2 cm <sup>3</sup> /n			

\*\*\* Also available multiple gear pumps (for instance: 204+117)

(continued)

**ORDER CODE**

	<b>14 - Optional</b>	
	00 = Without optional	
	LB = Lever by-pass	35
	VS = Purge valve	36
	VSLB = Lever by-pass + Purge Valve	37
	SB = Screw by-pass	38
	FB = Conversion flange from SAE-A to SAE-B	39
	ST = Conversion shaft 9 teeth to 13 teeth	39
	FBST = Conversion flange from SAE-A to SAE-B + Conversion shaft 9 teeth to 13 teeth	40
	PR = Full resistant swash plate bearing	40
	G/J/M/- = Port threads and restrictor diameter (see table below)	

\*\*\*\* Please contact our technical department to know the available configurations

	Servo control type	Port threads	Symbol
STANDARD	SEI	Plugged	-
	SHI	1/4" BSPP	G
ON REQUEST	SHI	JIC (7/16" - 20)	J
	SHI	METRIC (M12x1,5)	M

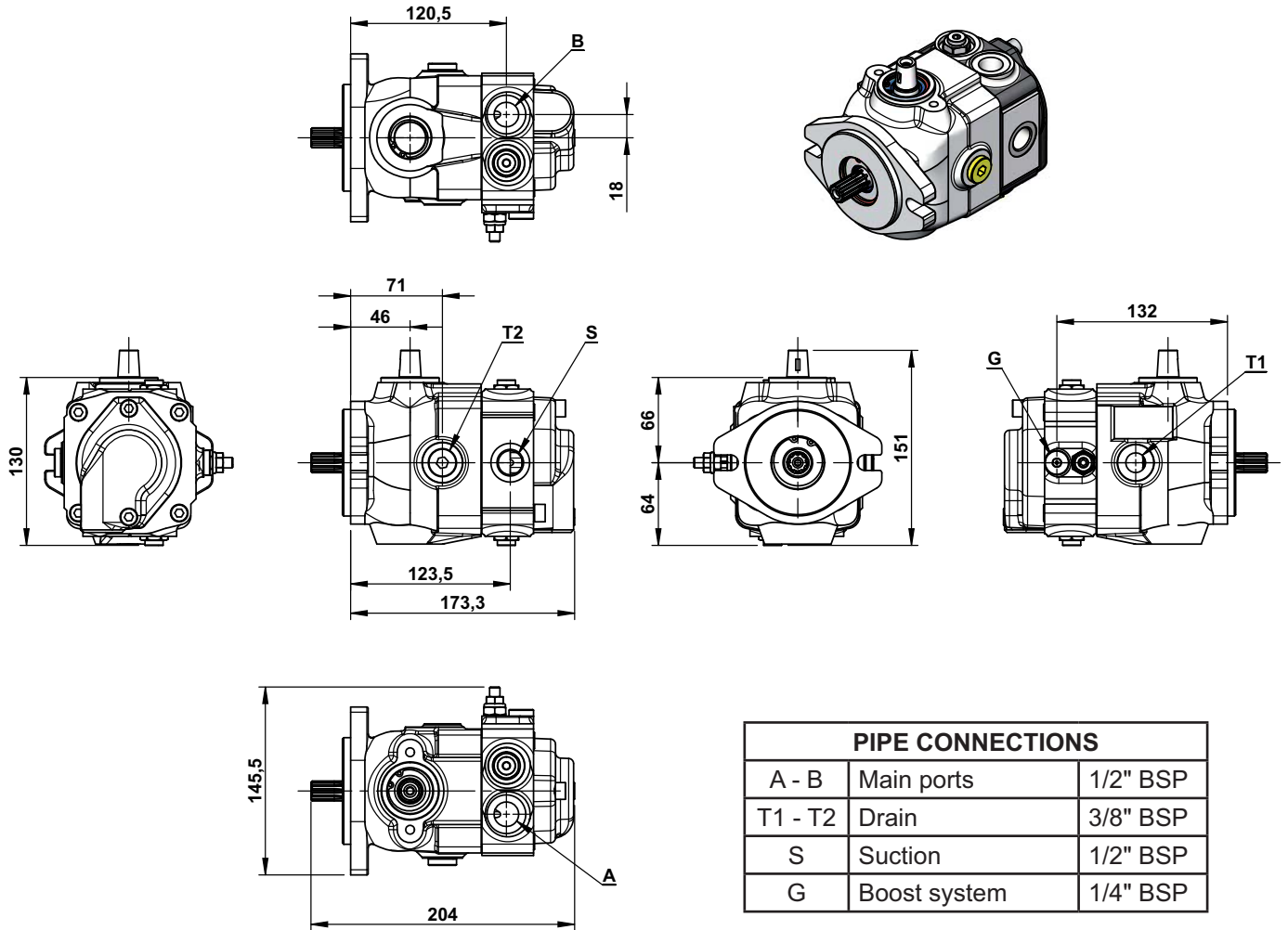
Restrictor diameter (SHI/SEI)	
-	Without restrictor
06	Restrictor orifice ø 0,6 mm
08	Restrictor orifice ø 0,8 mm
10	Restrictor orifice ø 1,0 mm
12	Restrictor orifice ø 1,2 mm
16	Restrictor orifice ø 1,6 mm
20	Restrictor orifice ø 2,0 mm

Example G/08 = 1/4" BSPP port threads and Ø 0,8 mm restrictor (SHI)

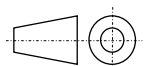
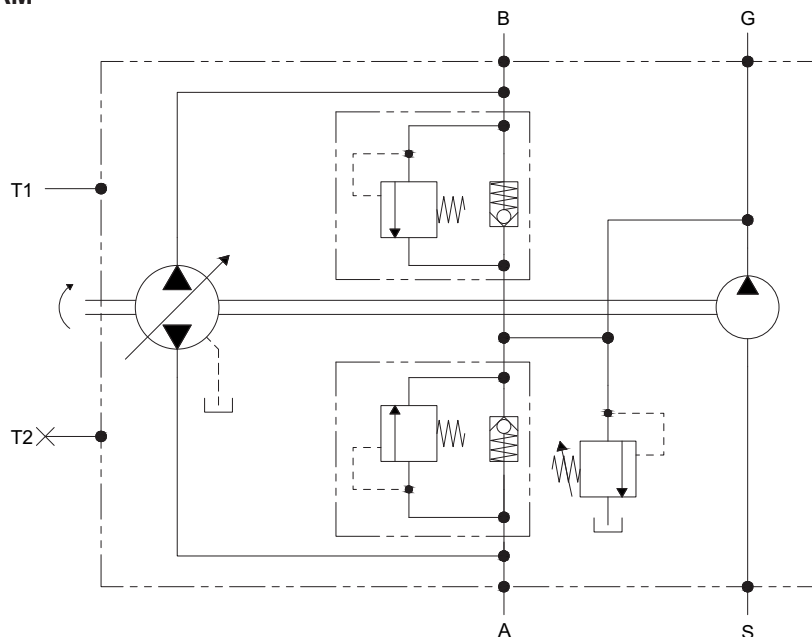
Example -/08 = Ø 0,8 mm restrictor (SEI)

**SINGLE PUMP**

(Direct mechanical control)

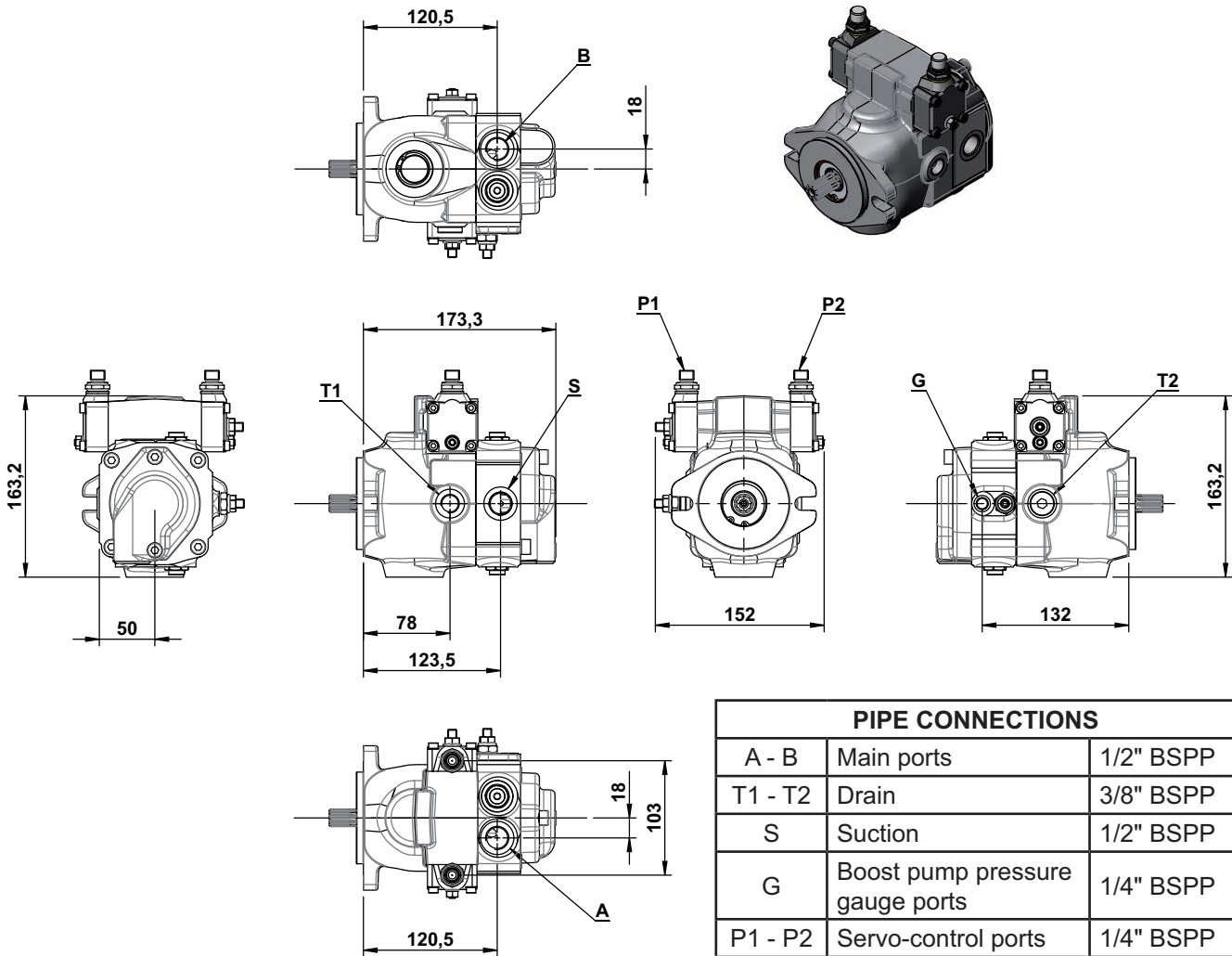


**HYDRAULIC DIAGRAM**

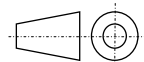
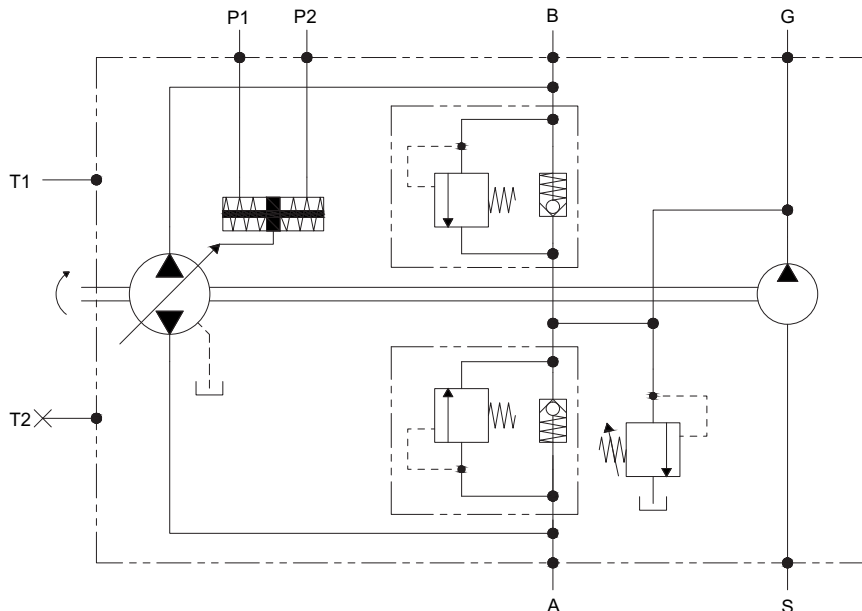


**SINGLE PUMP**

(Hydraulic servo control)

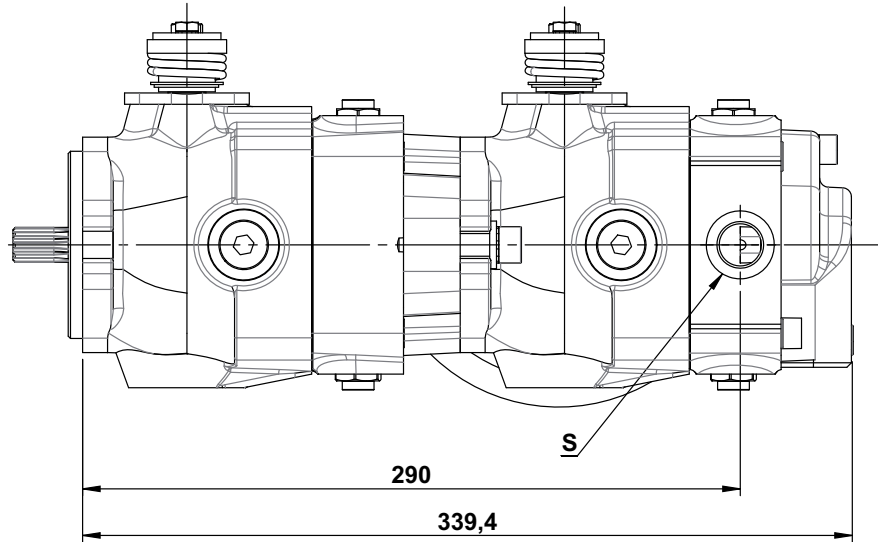


**HYDRAULIC DIAGRAM**



**TANDEM PUMP**

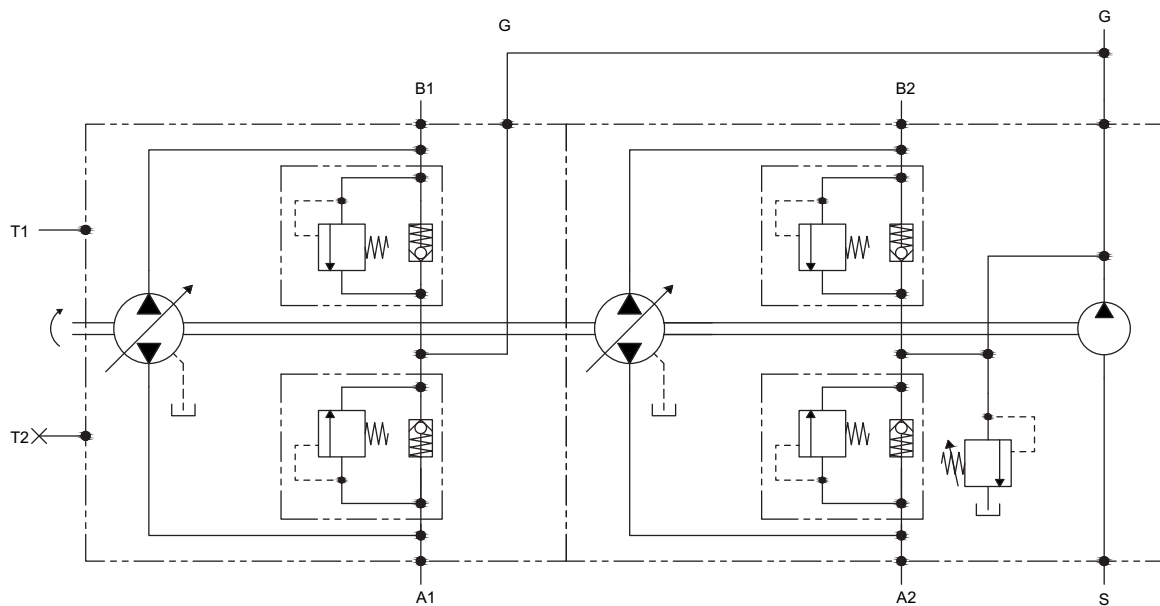
(Main dimensions)



PIPE CONNECTIONS		
A1 - B1	Main ports pump 1	1/2" BSPP
A2 - B2	Main ports pump 2	1/2" BSPP
T	Drain	3/8" BSPP
S	Suction	1/2" BSPP
G	Boost pump pressure gauge ports	1/4" BSPP

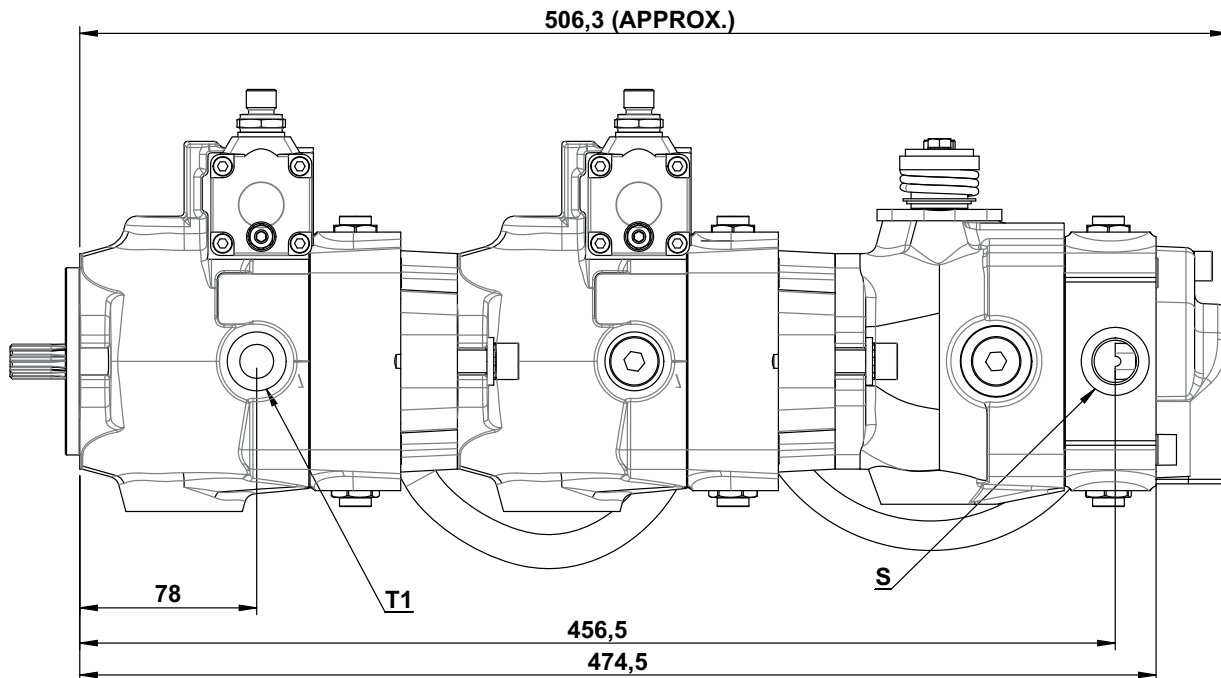
For the technical specification, please refer to the single pump

**HYDRAULIC DIAGRAM**



**TRIPLE PUMP**

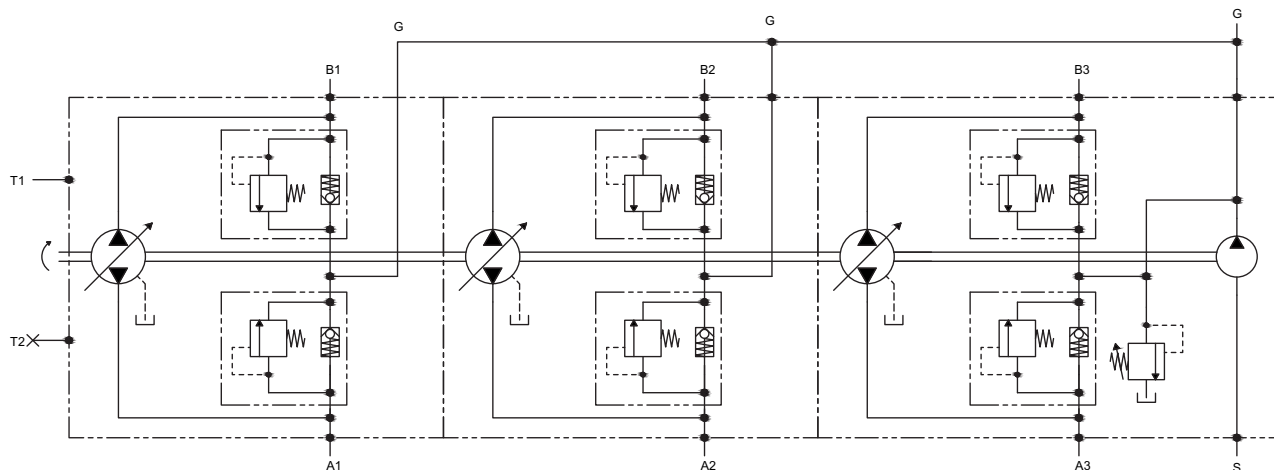
(Main dimensions)



PIPE CONNECTIONS		
A1 - B1	Main ports pump 1	1/2" BSPP
A2 - B2	Main ports pump 2	1/2" BSPP
A3 - A2	Main ports pump 3	1/2" BSPP
T	Drain	3/8" BSPP
S	Suction	1/2" BSPP
G	Boost pump pressure gauge ports	1/4" BSPP

For the technical specification, please refer to the single pump

**HYDRAULIC DIAGRAM**



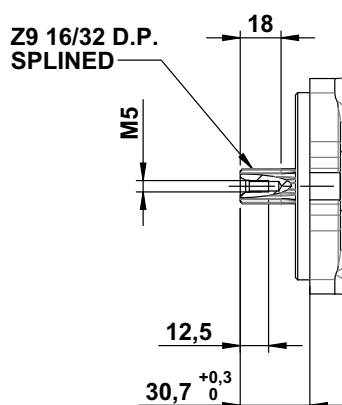
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DRIVE SHAFTS

# SS2

## SPLINED SHAFT Z = 9

Max. torque = 120 Nm

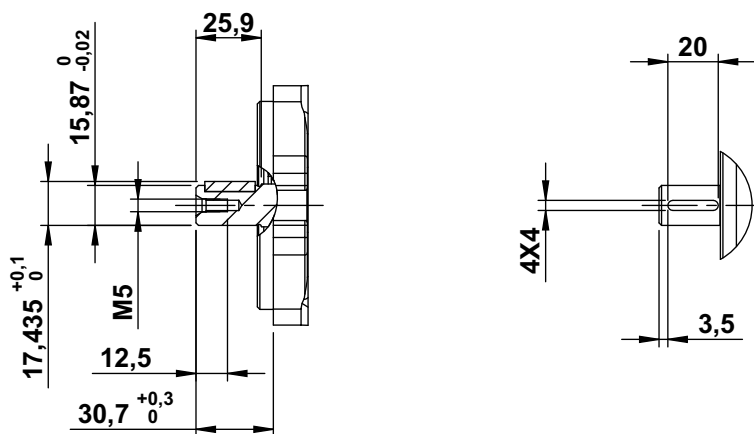


# PS1

## PARALLEL KEYED SHAFT 15,875 mm. diam.

Max. torque = 65 Nm

(Available only for single pump, rear cover C, B1 and B2. Please contact our technical department for SA-R request)





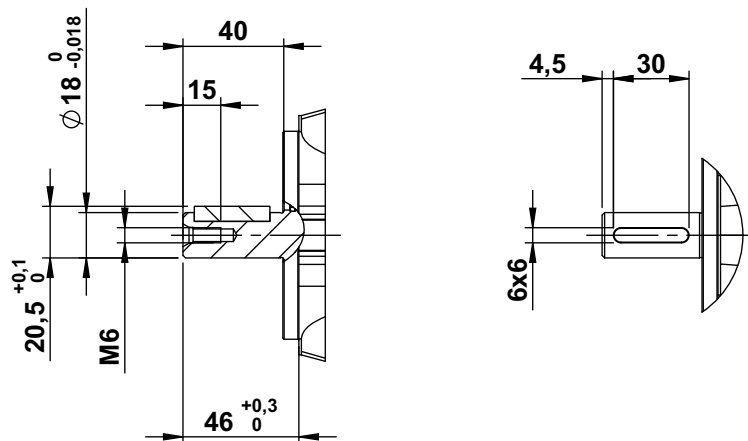
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**DRIVE SHAFTS**

**PS3**

**PARALLEL KEYED SHAFT 18 MM. DIAM.**

Max. torque = 85 Nm

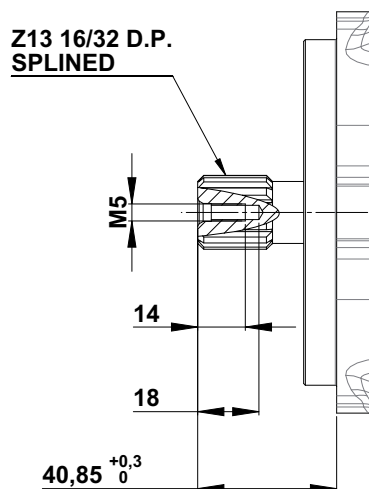


**SS3**

**SPLINED SHAFT Z = 13**

(available only for SHI, SEI and F2.2)

Max. torque = 320 Nm

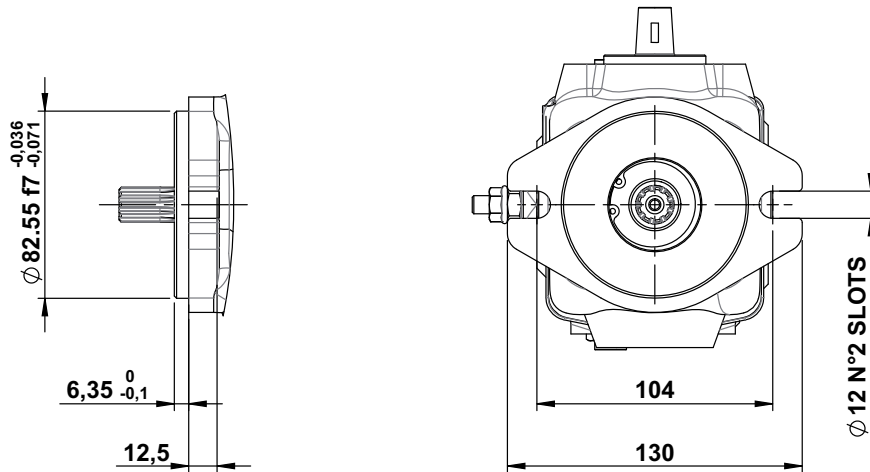


Attention: for the application of multiple pumps the total absorbed torque must not exceed the shown value.

MOUNTING FLANGE

# F1

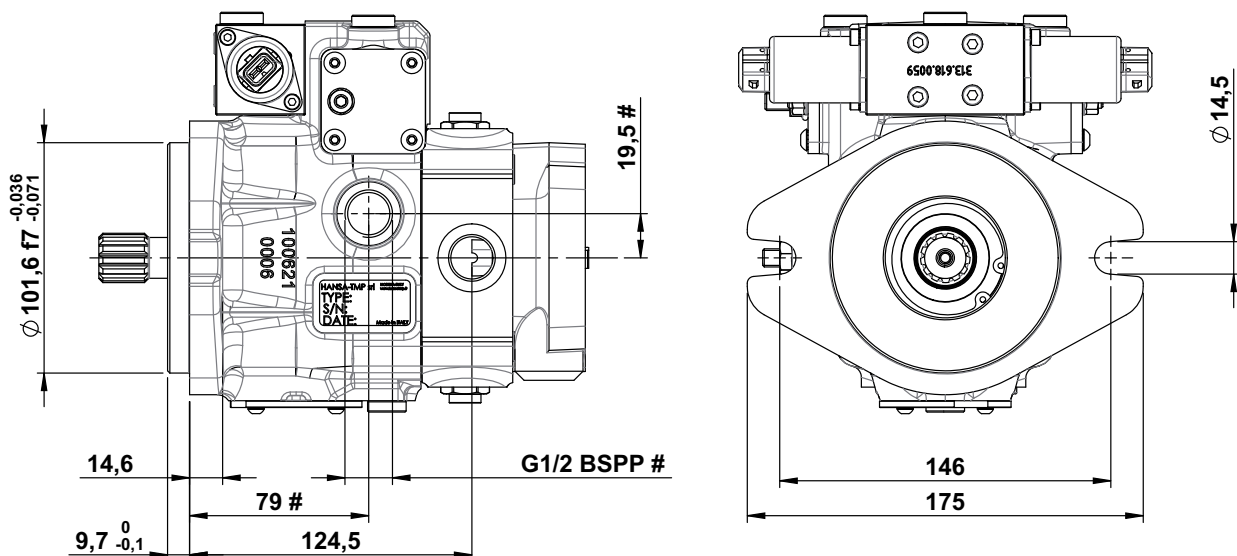
## SAE-A - 2 BOLT FLANGE



# F2.2

## SAE-B - 2 BOLT FLANGE

(available only for SHI, SEI and SS3)



# Valid only for version F2.2

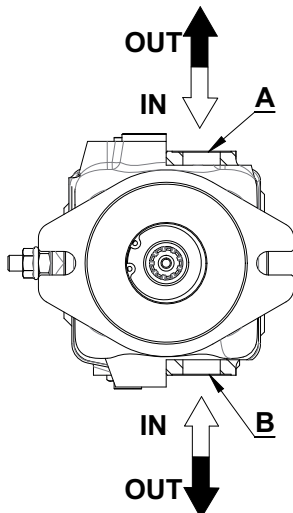
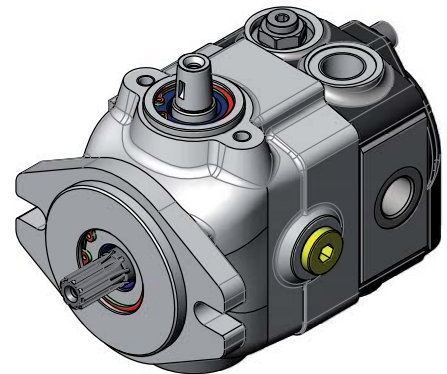
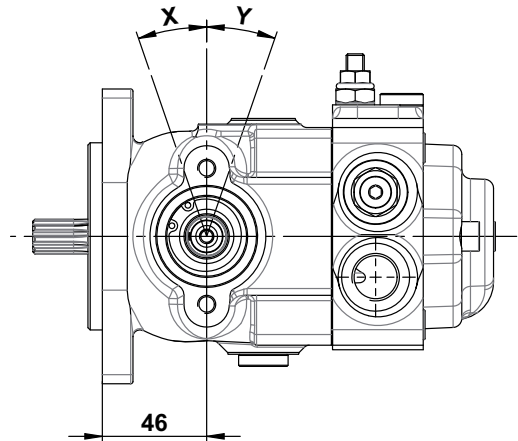
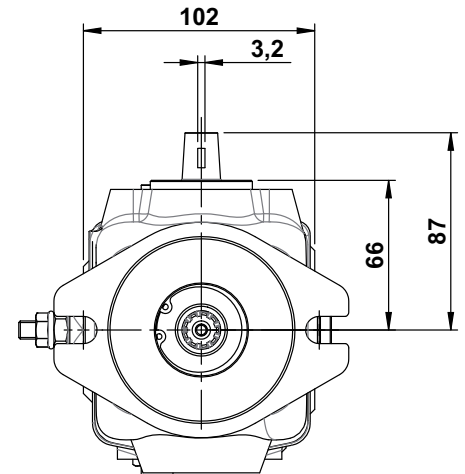
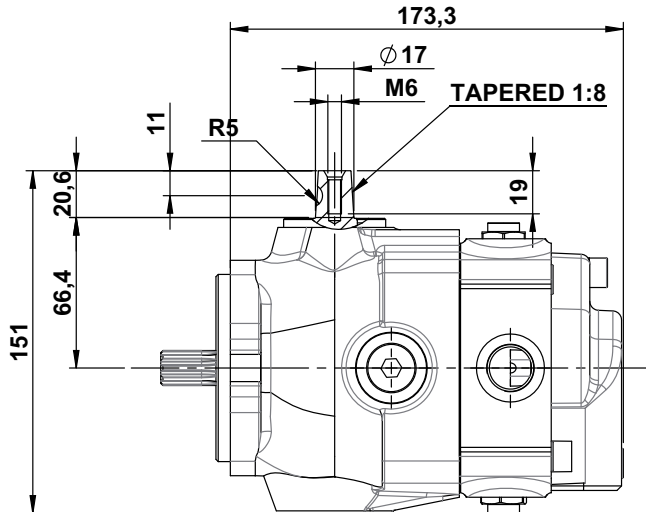


# DM

## DIRECT MECHANICAL WITHOUT CONTROL LEVER

The change of pump displacement is given by clockwise or counter-clockwise rotation of the shaft of the swashplate.

The shaft is directly linked with the swashplate.



FLOW DIRECTION	PUMP		
	Lever position	OUT	IN
Pump rotation			
Clockwise CR	X	A	B
	Y	B	A
Counter-clockwise CC	X	B	A
	Y	A	B

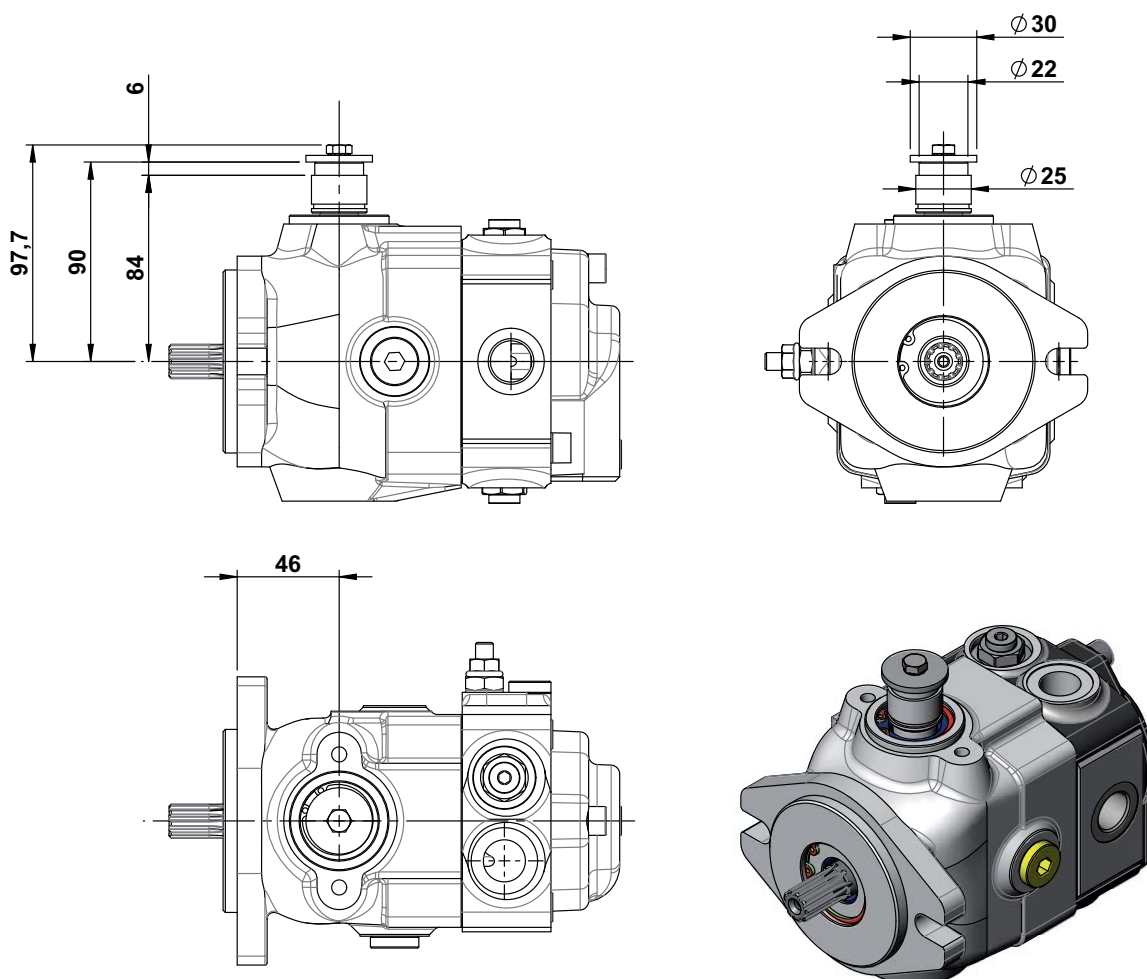
Valid for all type of direct controls



# BC

## TAPERED BUSH

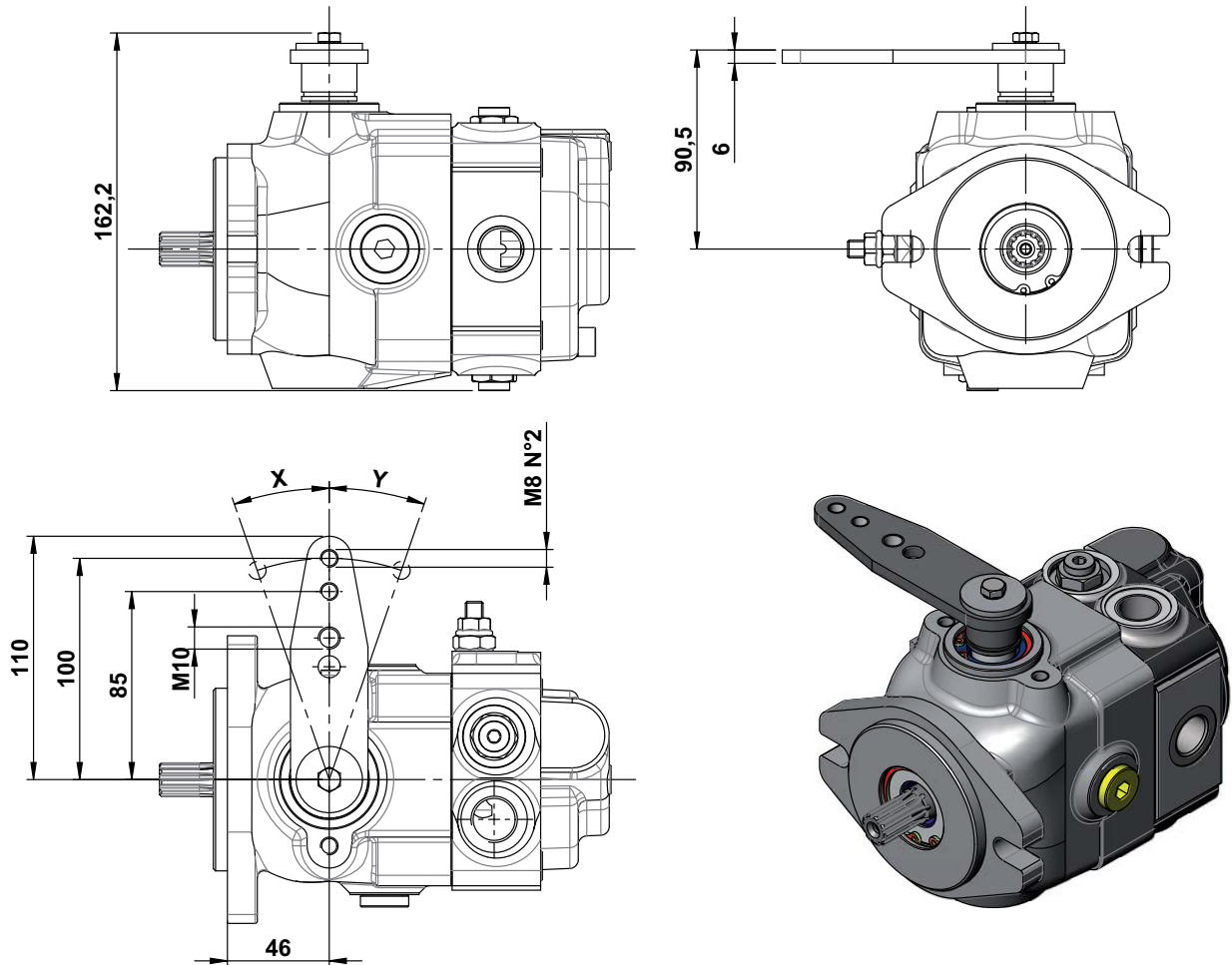
Tapered bush with woodruff key, external cylindrical.  
Suitable for arrangement of specific control levers.



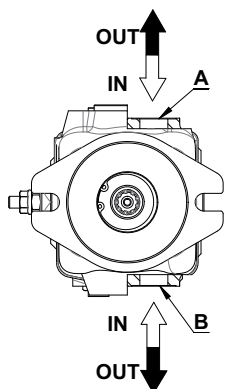
# LC

## DIRECT MECHANICAL CONTROL WITH LEVER

The pump displacement variation is given by clockwise or counter-clockwise movement of the lever. The lever shaft is directly linked to the swashplate.



Lever Angle											
Pump Model	6 / 7	8 / 7	9 / 7	11 / 7	12 / 7	13 / 7	15 / 9	17 / 9	18 / 9	19 / 9	21 / 9
Lever Angle (X - Y)	10°	12°	13°	15°	17°	18°	15°	17°	18°	19°	19°



FLOW DIRECTION	PUMP		
	Lever position	OUT	IN
Clockwise CR	X	A	B
	Y	B	A
Counter-clockwise CC	X	B	A
	Y	A	B



# DMS

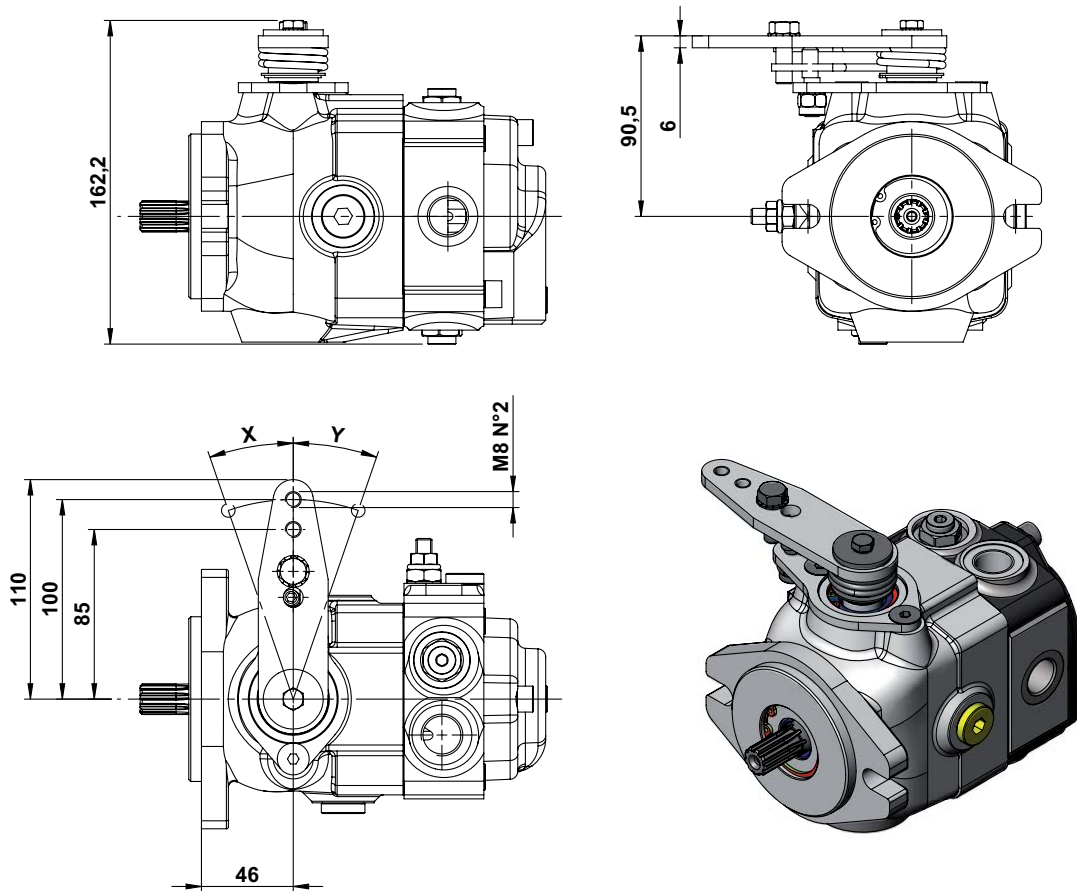
## CONTROL LEVER WITH RETURN TO ZERO FLOW POSITION

(torsion spring)

The pump displacement variation is given by a clockwise or counter-clockwise movement of the lever.

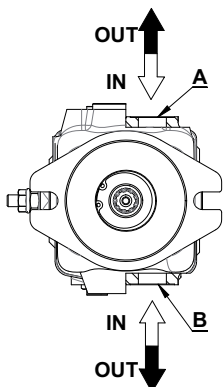
Return to zero flow is obtained by a spring which is part of the leverism.

The lever shaft is directly linked to the swashplate.



Lever Angle

Pump Model	6 / 7	8 / 7	9 / 7	11 / 7	12 / 7	13 / 7	15 / 9	17 / 9	18 / 9	19 / 9	21 / 9
Lever Angle (X - Y)	10°	12°	13°	15°	17°	18°	15°	17°	18°	19°	19°



FLOW DIRECTION	PUMP		
	Lever position	OUT	IN
Clockwise CR	X	A	B
	Y	B	A
Counter-clockwise CC	X	B	A
	Y	A	B



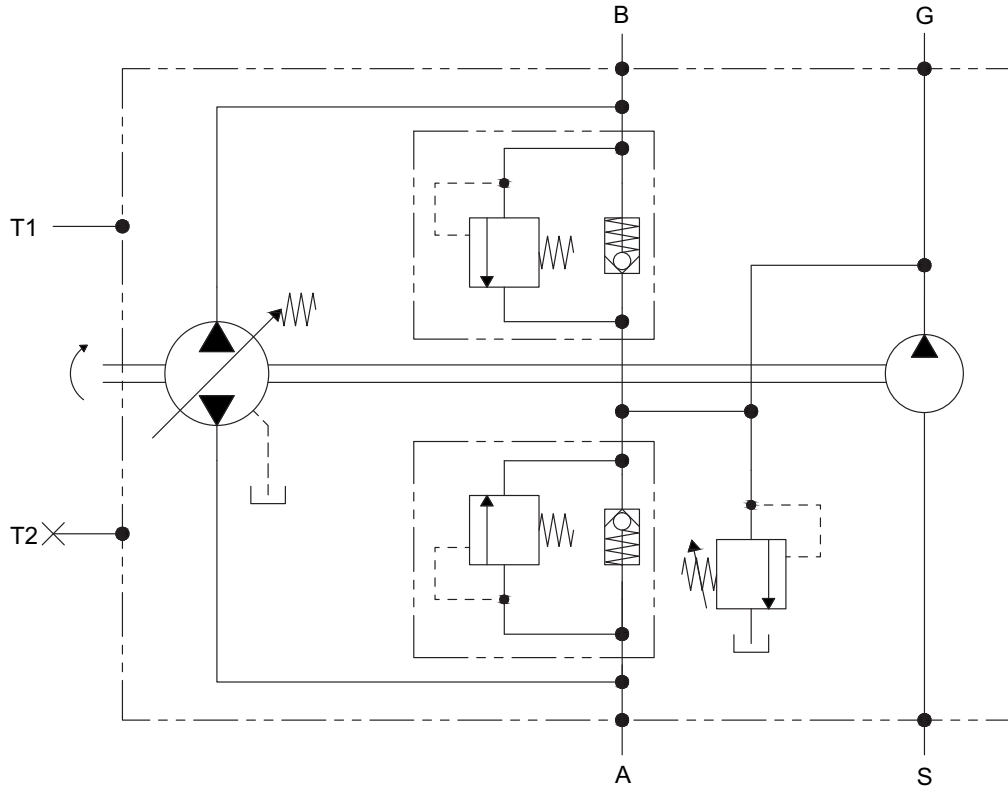
(continued)

# DMS

## CONTROL LEVER WITH RETURN TO ZERO FLOW POSITION

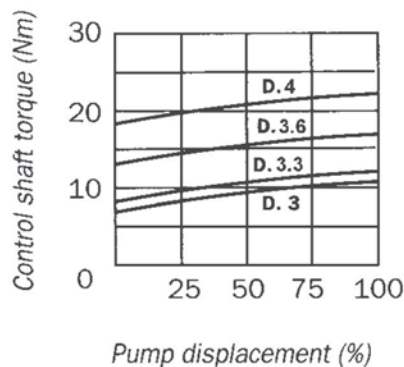
(torsion spring)

HYDRAULIC DIAGRAM

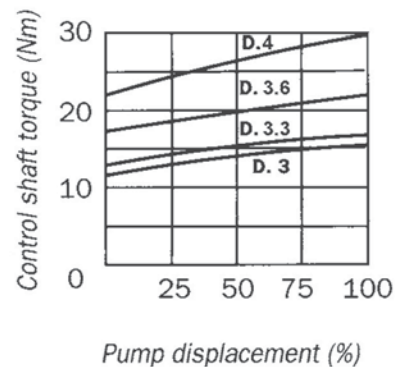


Standard spring diameter: **3,6 mm**  
 Other available diameters: **3 - 3,3 - 4 - 5 mm**

Lever force - 10 MPa



Lever force - 20 MPa



# DMZ

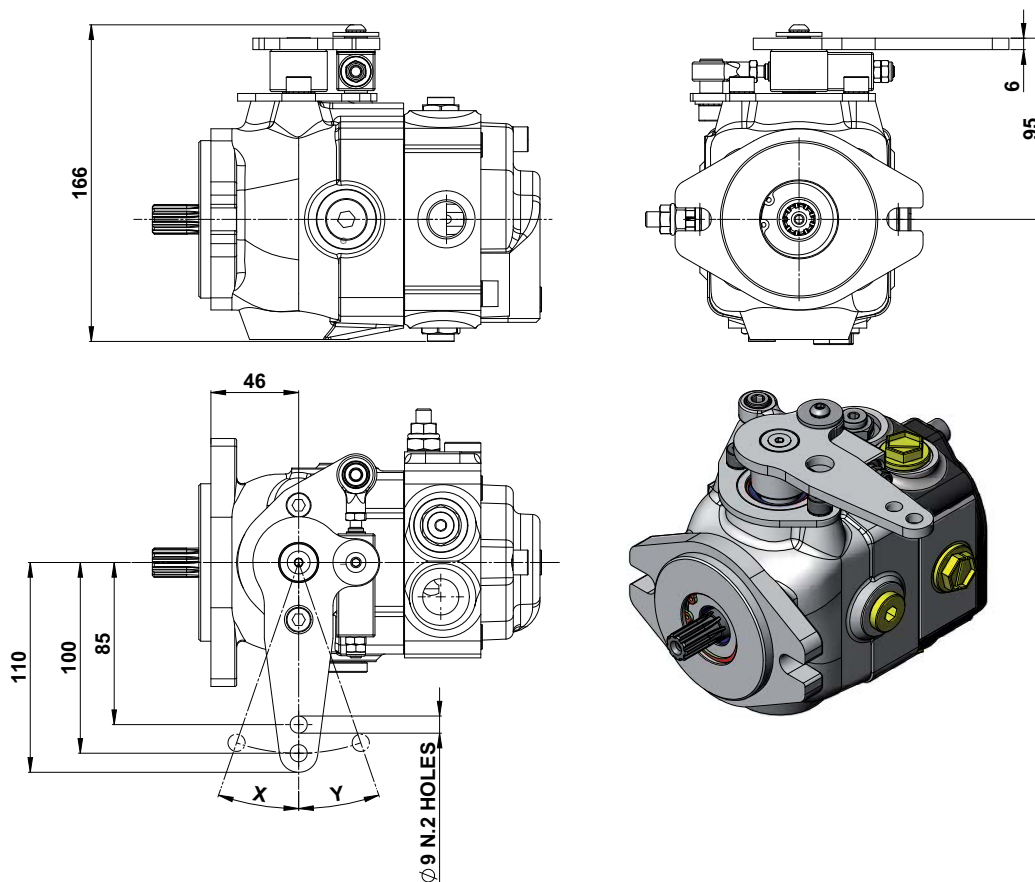
## CONTROL LEVER WITH RETURN TO ZERO FLOW POSITION

(compression spring)

The pump displacement variation is given by a clockwise or counter-clockwise movement of the lever.

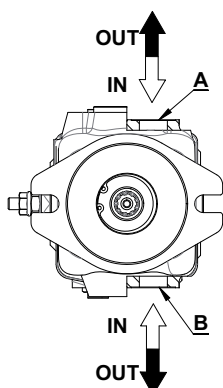
Return to zero flow is obtained by a spring which is part of the leverism.

The lever shaft is directly linked to the swashplate.

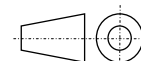


Lever Angle

Pump Model	6 / 7	8 / 7	9 / 7	11 / 7	12 / 7	13 / 7	15 / 9	17 / 9	18 / 9	19 / 9	21 / 9
Lever Angle (X - Y)	10°	12°	13°	15°	17°	18°	15°	17°	18°	19°	19°



FLOW DIRECTION	PUMP		
	Lever position	OUT	IN
Clockwise CR	X	A	B
	Y	B	A
Counter-clockwise CC	X	B	A
	Y	A	B





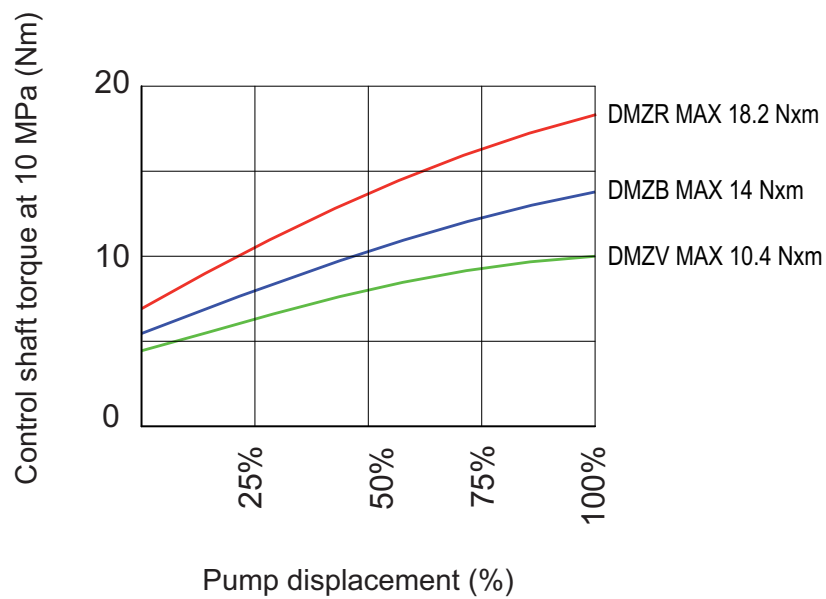
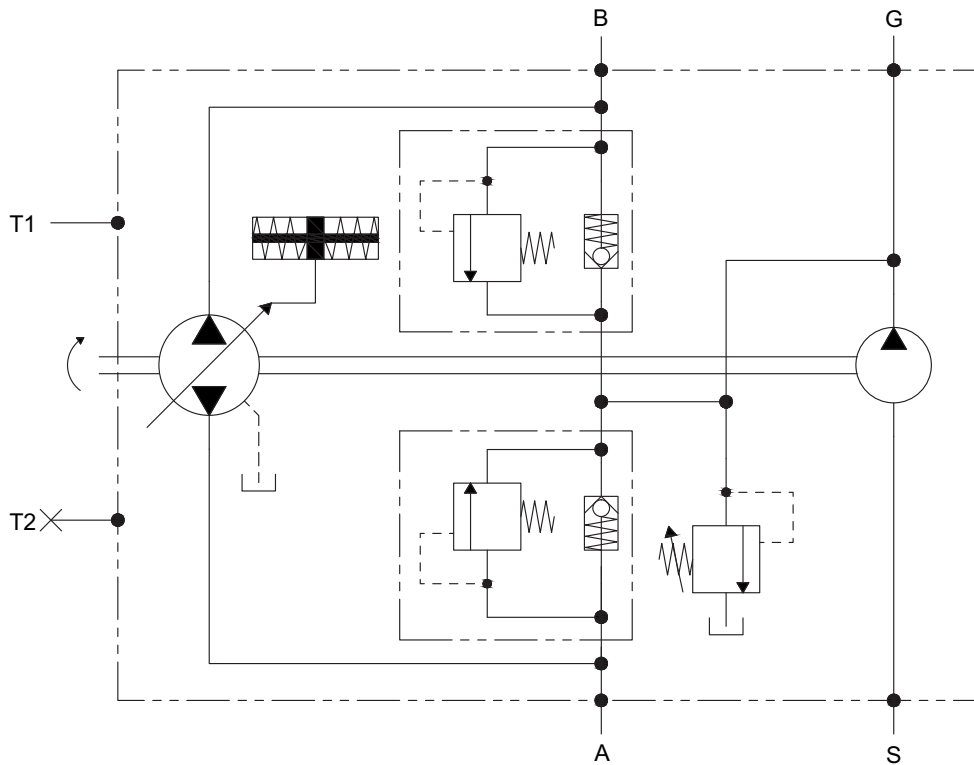
(continued)

# DMZ

## CONTROL LEVER WITH RETURN TO ZERO FLOW POSITION

(compression spring)

HYDRAULIC DIAGRAM



# SHI

## HYDRAULIC SERVO-CONTROL

The variation in pump displacement is obtained by adjusting the pressure on the P1-P2 servo control connections by means of a hydraulic proportional joystick (containing pressure reducing valves).

The oil supply for the joystick can be obtained by taking pressure from the boost pump (G port), see pag. 10.

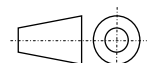
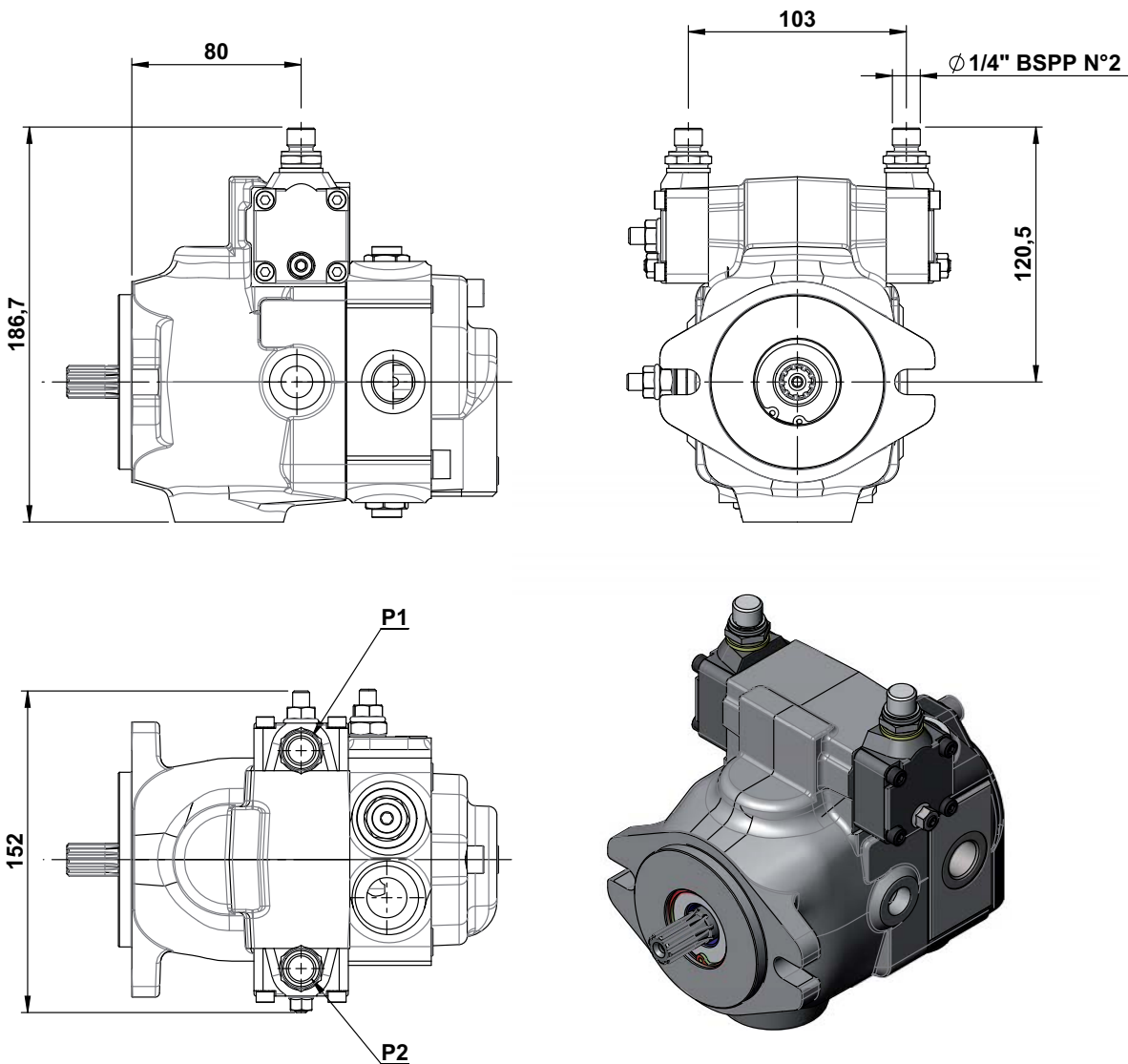
The servo control reacting time can be adju-

sted by inserting a restrictor on the joystick supply line (0,5 ÷ 1,2 mm).

The servo control operation curve in both control directions goes from 0,4 to 1,8 MPa (tolerance ± 5%).

The adjustment curve of the hydraulic control system has to be wider (0,3 ÷ 1,9 MPa).

Suggested curves for HPV series Joysticks: CR062 (see HT 73/B/105/0417/E catalogue).

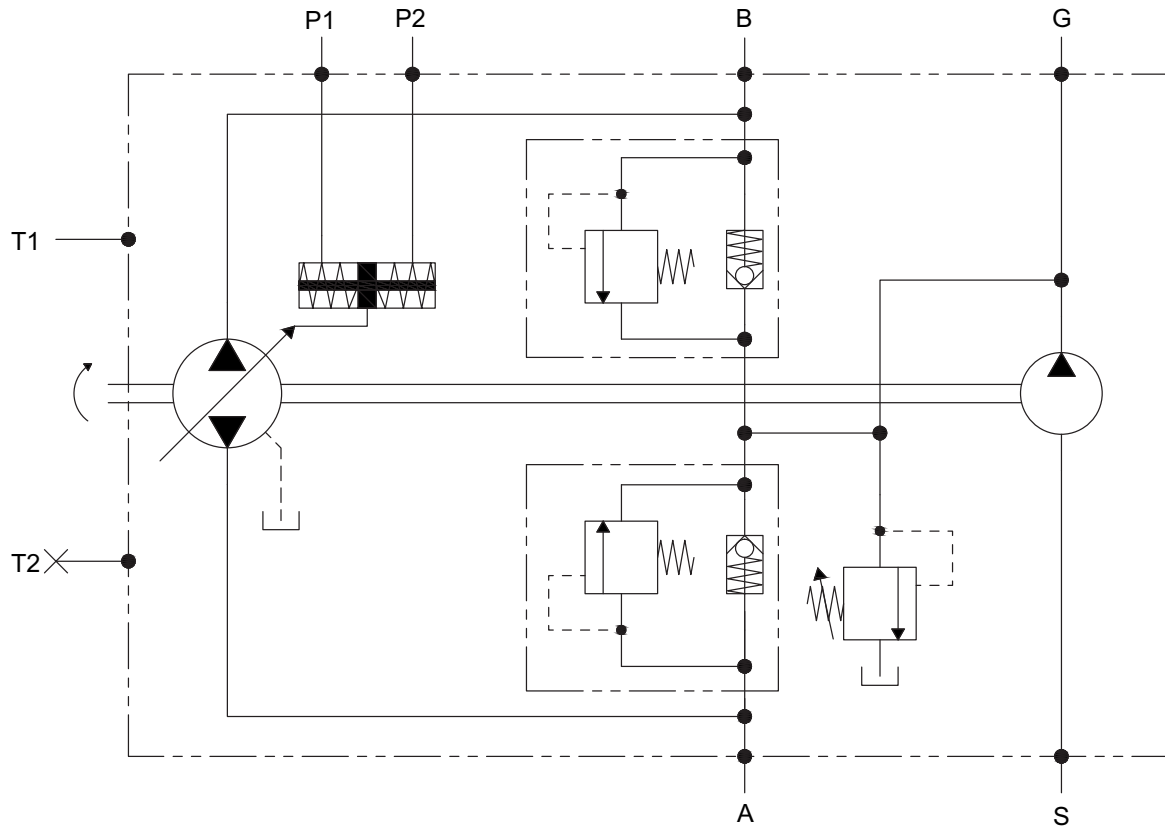


(continued)

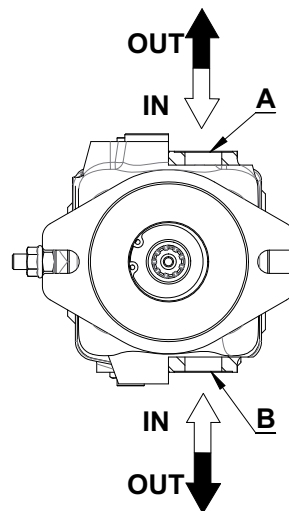
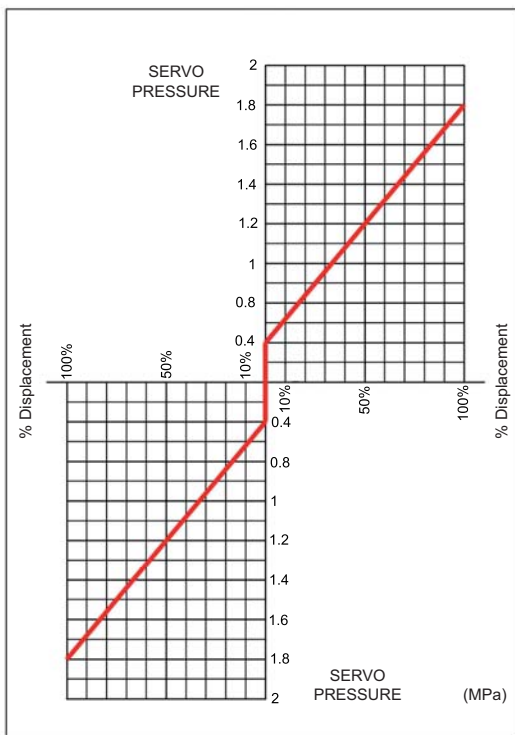
**SHI**

HYDRAULIC REMOTE SERVO-CONTROL

HYDRAULIC DIAGRAM



SERVO PRESSURE - DISPLACEMENT GRAPHIC



FLOW DIRECTION	PUMP		
	Port	OUT	IN
Rotation			
Clockwise (CR)	P <sub>1</sub>	B	A
	P <sub>2</sub>	A	B
Counter clockwise (CC)	P <sub>1</sub>	A	B
	P <sub>2</sub>	B	A

**SEI 1.3** (12V DC)

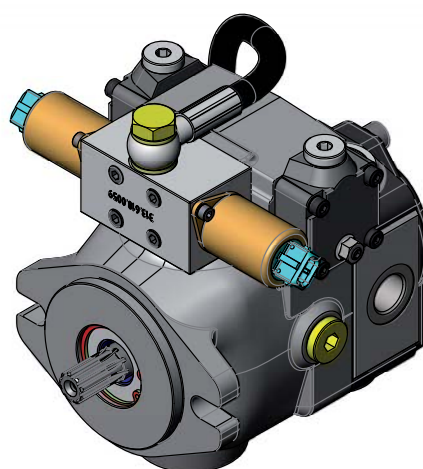
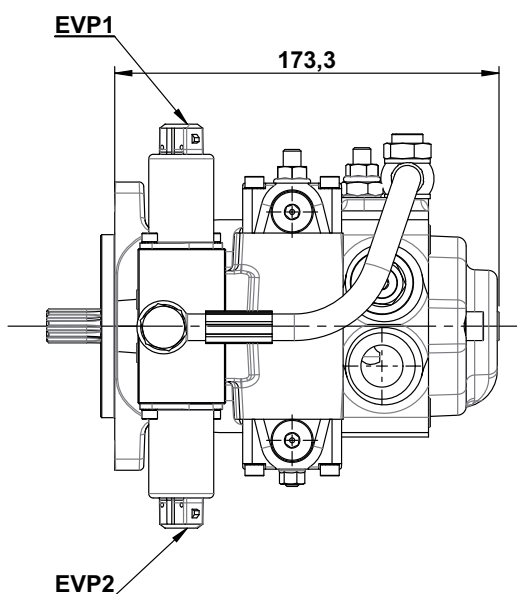
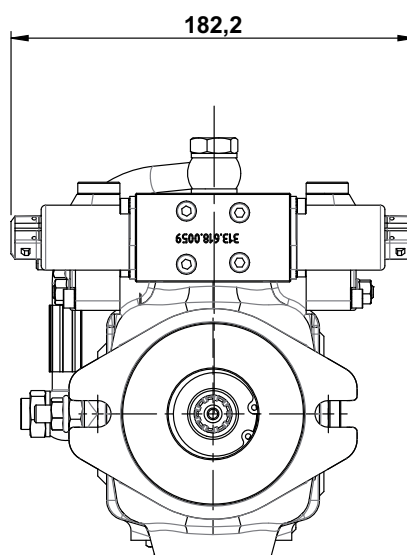
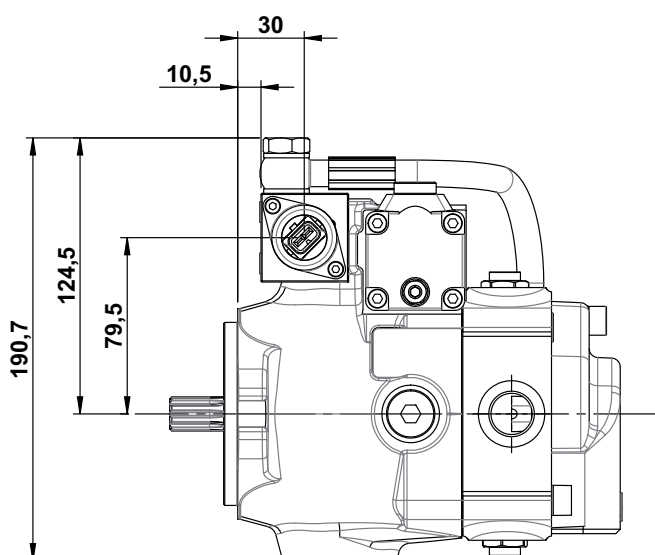
**SEI 2.3** (24V DC)

**ELECTRO-PROPORTIONAL SERVO-CONTROL**

(with AMP Junior Timer connector)

The pump displacement variation is obtained by an electric signal, which varies approx.:

- from 315 to 630 mA (24V DC voltage)
- from 630 to 1260 mA (12V DC voltage)



(continued)

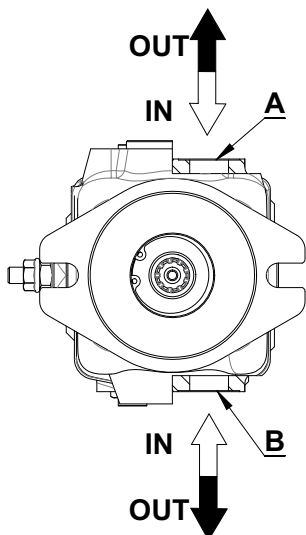
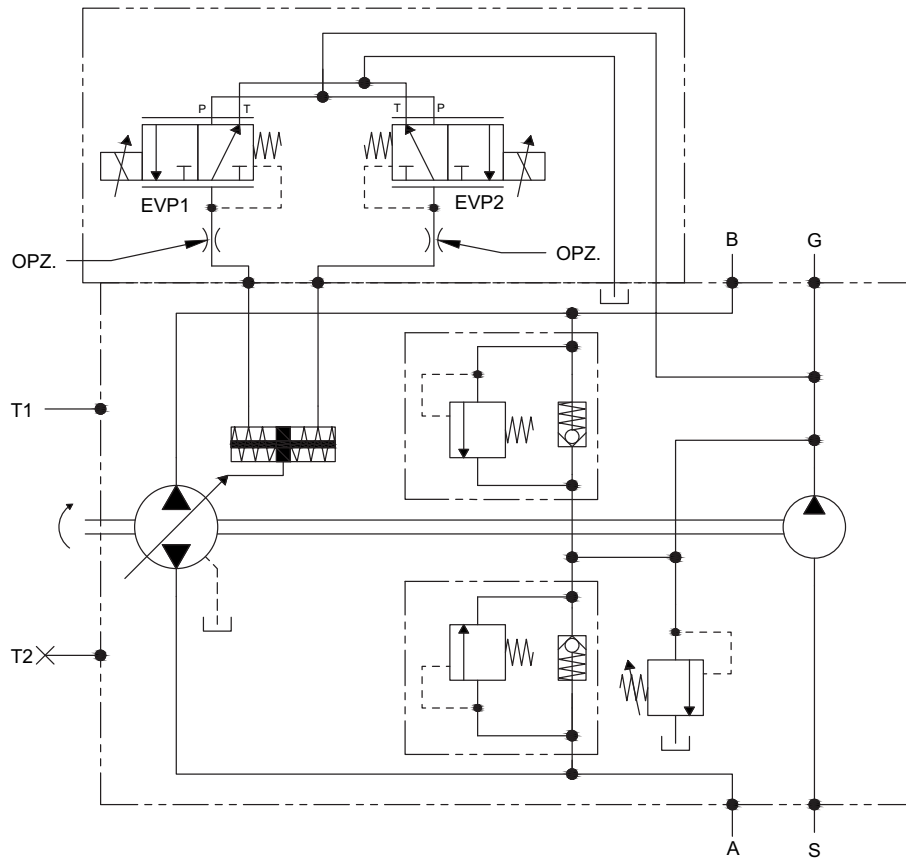
**SEI 1.3** (12V DC)


**SEI 2.3** (24V DC)

**ELECTRO-PROPORTIONAL SERVO-CONTROL**

(with AMP Junior Timer connector)

HYDRAULIC DIAGRAM



FLOW DIRECTION	PUMP		
	 EVP	OUT	IN
Rotation			
Clockwise (CR)	EVP1 EVP2	B A	A B
Counter clockwise (CC)	EVP1 EVP2	A B	B A

(continued)

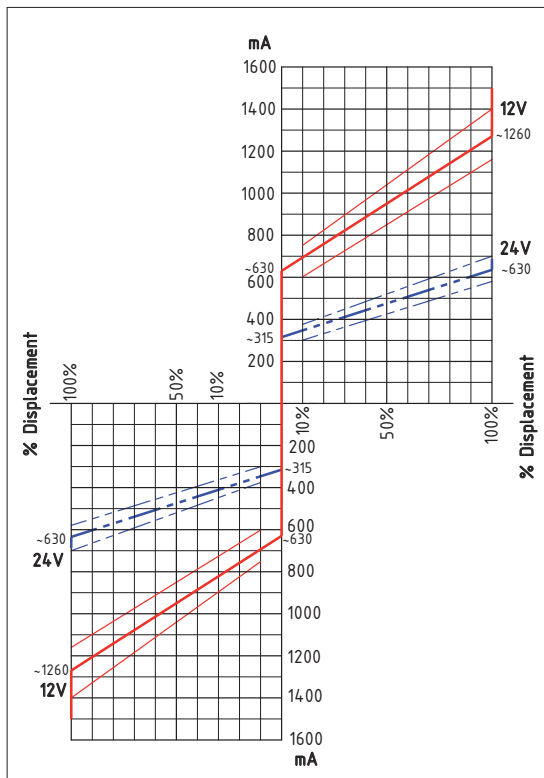
**SEI 1.3** (12V DC)

**SEI 2.3** (24V DC)

**ELECTRO-PROPORTIONAL SERVO-CONTROL**

(with AMP Junior Timer connector)

**CURRENT-DISPLACEMENT GRAPHIC**

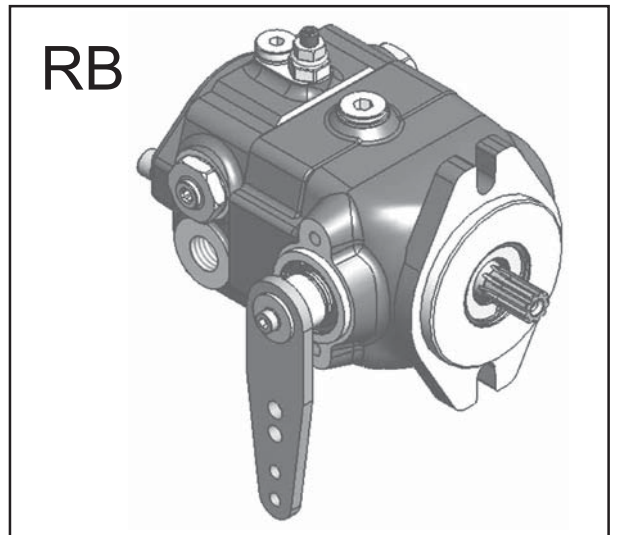
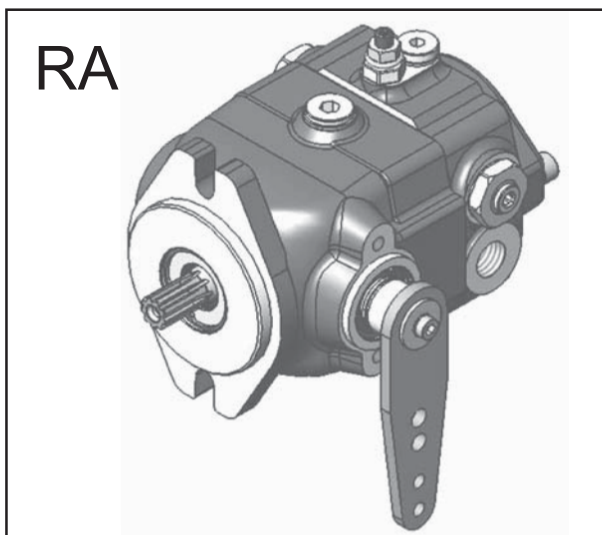
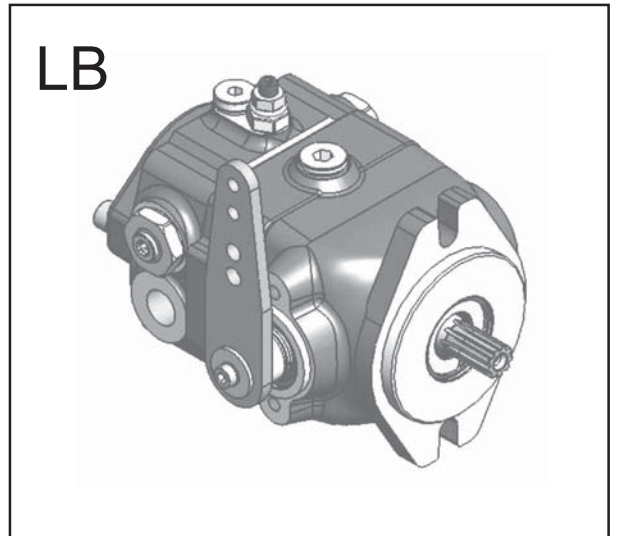
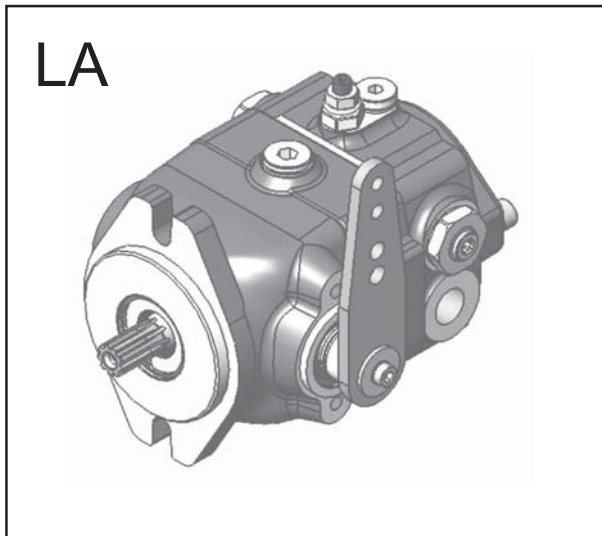
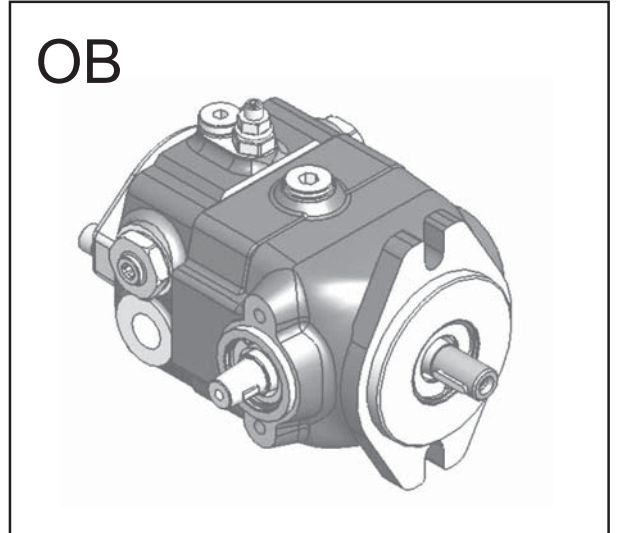
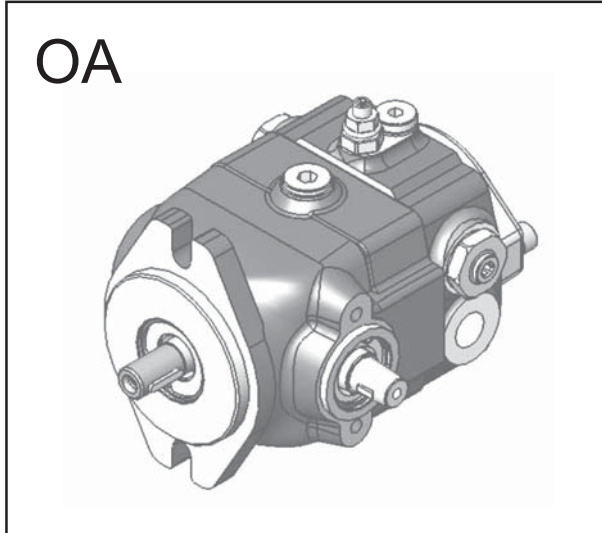


ELECTRICAL FEATURES		
Voltage	12 V	24 V
Electric current max.	1500 mA	750 mA
Load resistance	4,72 Ω ± 5%	20,8 Ω ± 5%
Type of control	Current control	
	PWM 100 Hz indicated	
Type of connection	AMP Junior Timer	
Protection class	Until IP6K6 / IPX9K	

HYDRAULIC FEATURES	
Max. pressure (P, T)	pP= 5 MPa, pT= 3 MPa
Hysteresis (w/PWM)	<0,07 MPa (pA=2,0)
	<0,1 MPa (pA=2,5)
	<0,15 MPa (pA=3,5)
Filtration ratio	125 μm
Oil contamination level	Min. filtration ratio: 20/18/15
	According ISO 4406
	Hydraulic oil DIN 51524
Min./max. oil temperature	from -40 to +105°C

**CONTROL DEVICE POSITION**

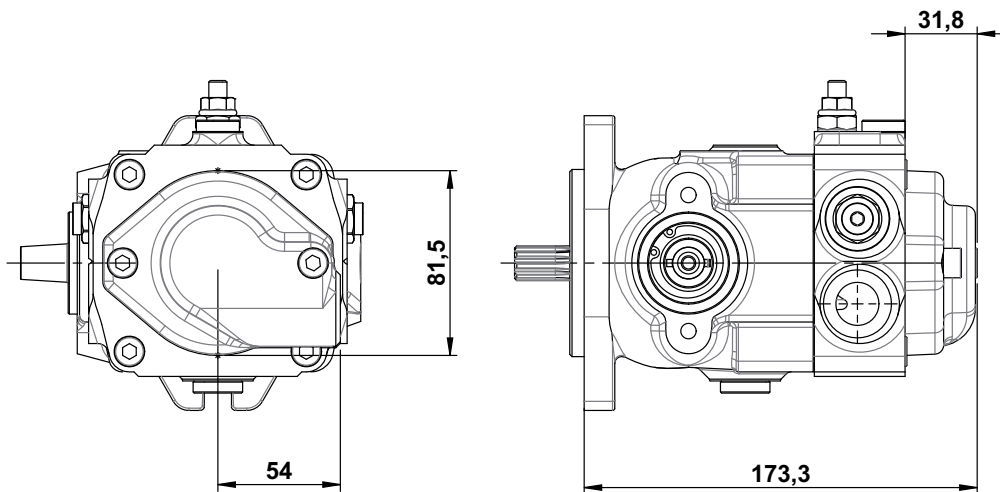
(Primary and secondary pump)



**REAR PUMP MOUNTING FLANGES**

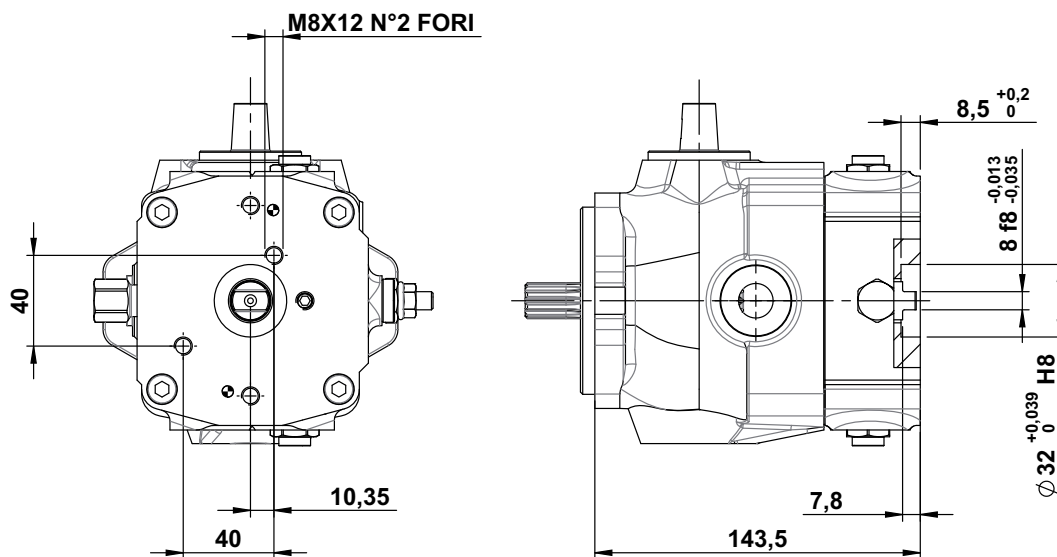
(Dimensions valid for all versions)

**C**  
CLOSED (WITHOUT CONNECTION FOR REAR PUMP) - STANDARD VERSION



**B1**  
GERMAN STANDARD (WITHOUT BOOST PUMP) COMPACT VERSION

Max. torque = 70 Nm





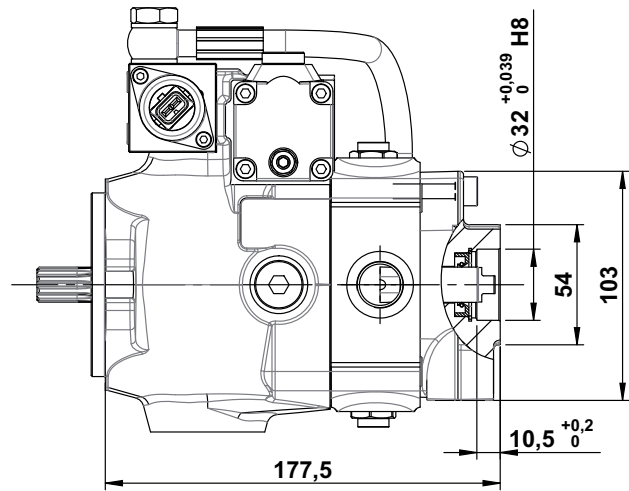
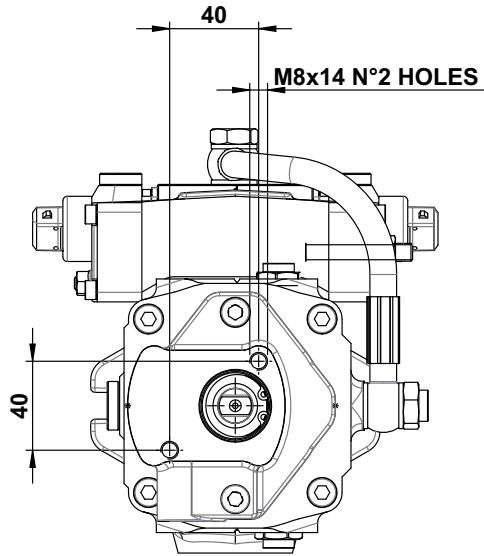
**REAR PUMP MOUNTING FLANGES**

(Dimensions valid for all versions)

**B1**

GERMAN STANDARD

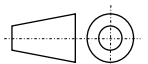
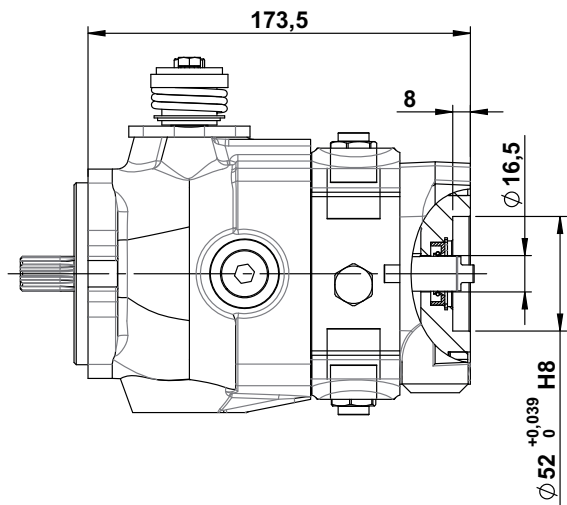
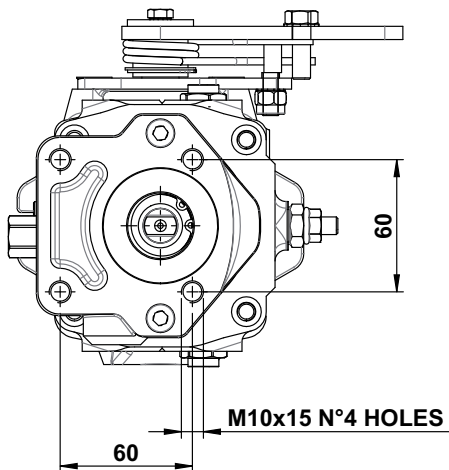
Max. torque = 70 Nm



**B2**

GERMAN STANDARD

Max. torque = 70 Nm



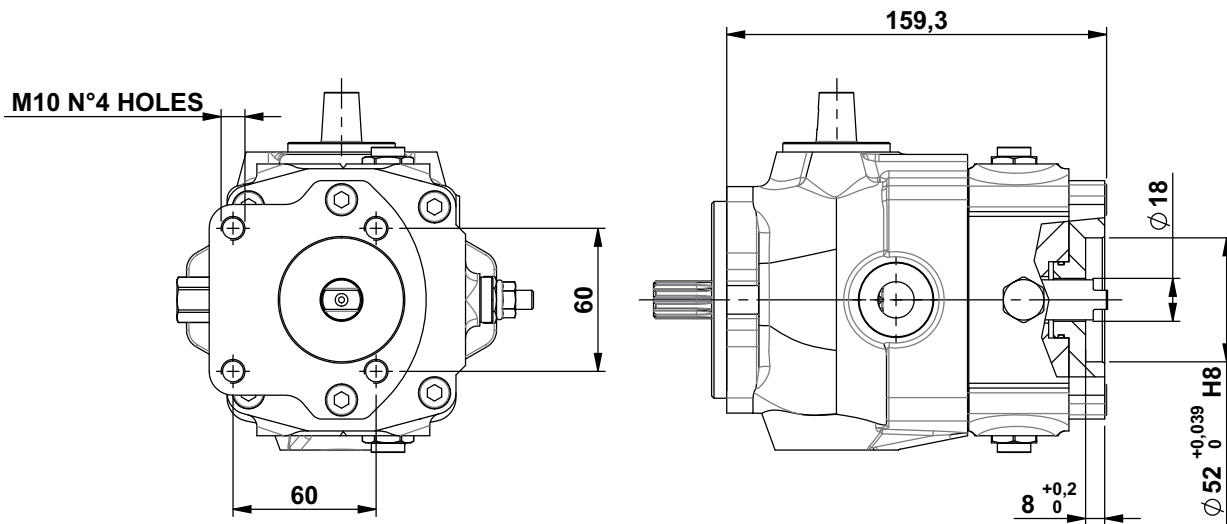
**REAR PUMP MOUNTING FLANGES**

(Dimensions valid for all versions)

**B2**

**GERMAN STANDARD (WITHOUT BOOST PUMP) COMPACT VERSION**

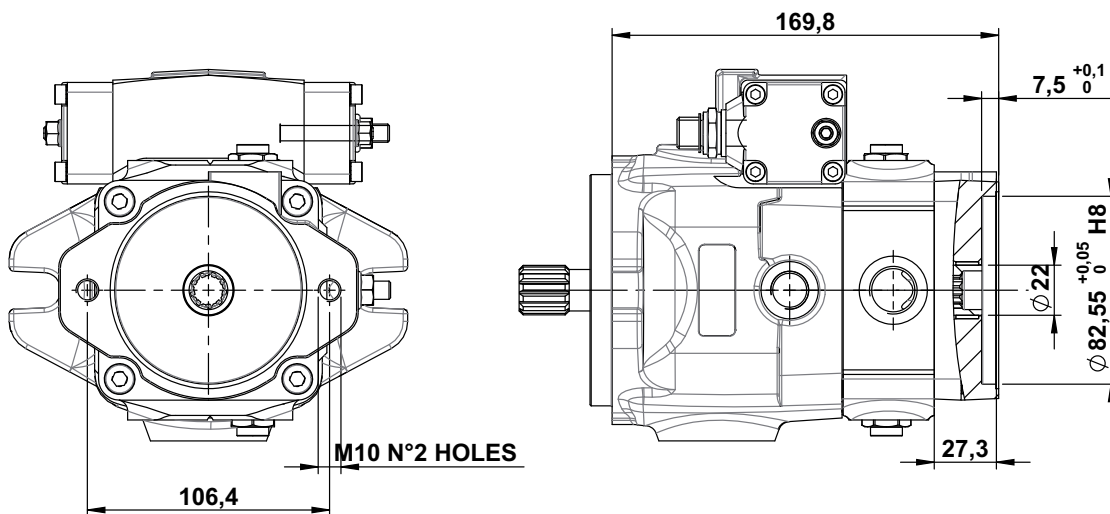
Max. torque = 70 Nm



**SA-R**

**SAE-A - 2 BOLT FLANGE**

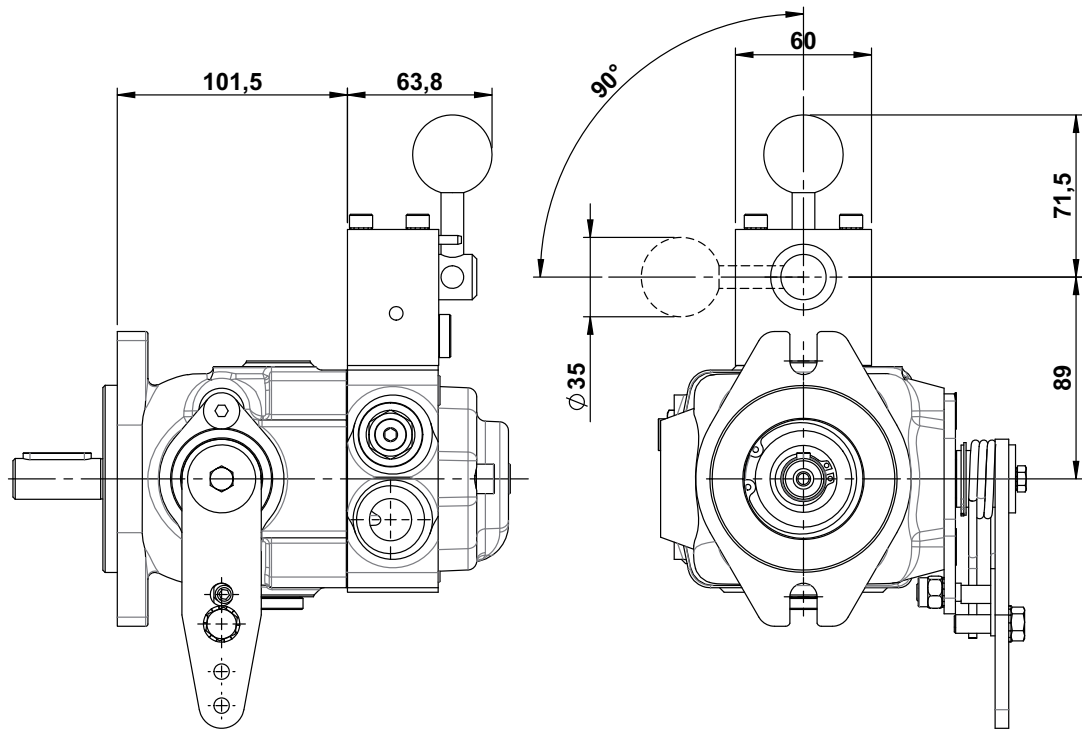
Max. torque = 120 Nm



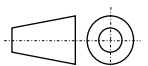
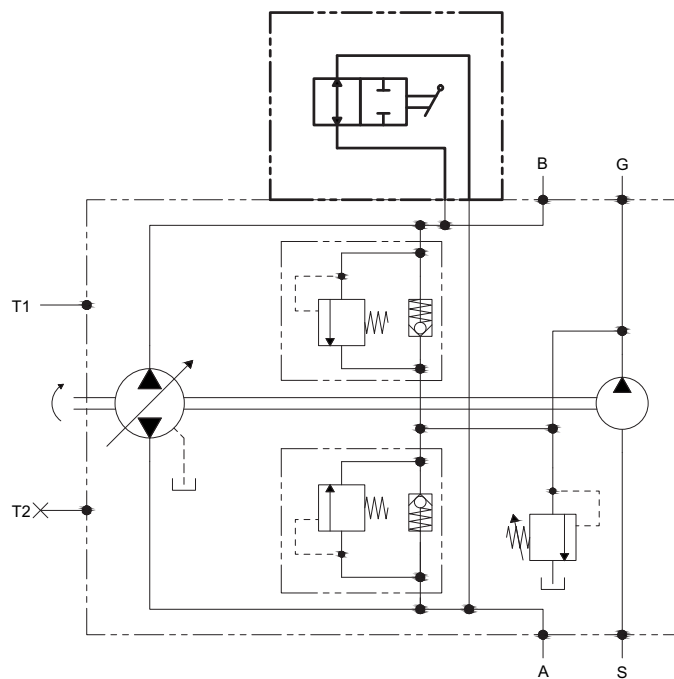
# OPTIONAL LB

## LEVER BY-PASS

Manual valve to connect the A and B ports together to allow the free-wheeling of the hydraulic motor.



HYDRAULIC DIAGRAM

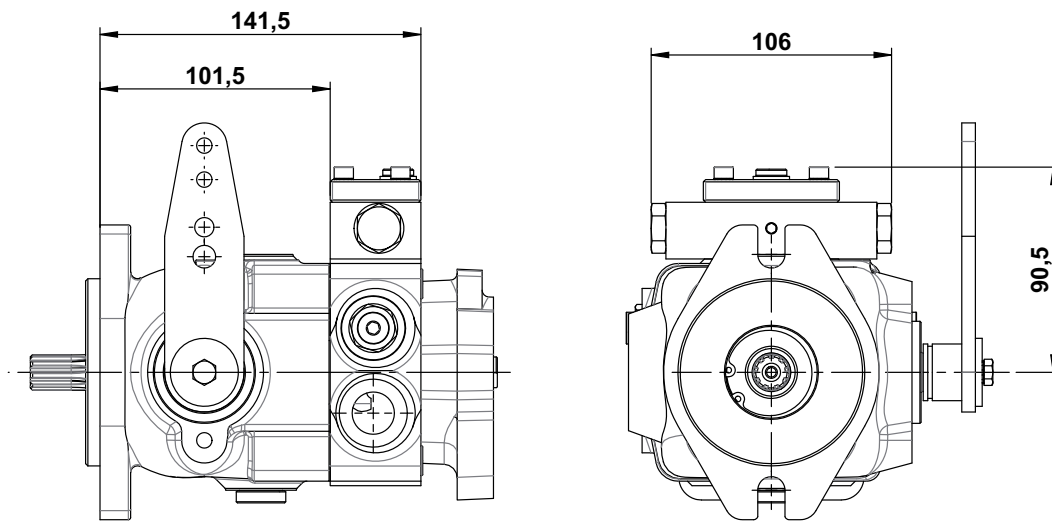


# OPTIONAL VS

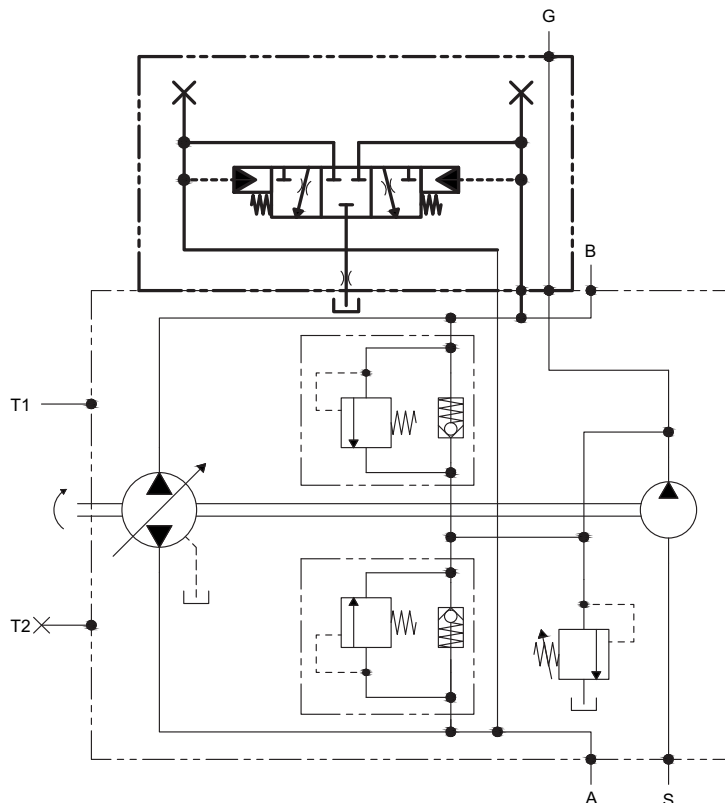
## PURGE VALVE

Subtracting warm oil from the closed circuit, the purge valve allows the flow of cool fluid from the boost system.

Oil flow for cooling = 1,5 lt/min. at 1500 n/min.



### HYDRAULIC DIAGRAM



# OPTIONAL VSLB

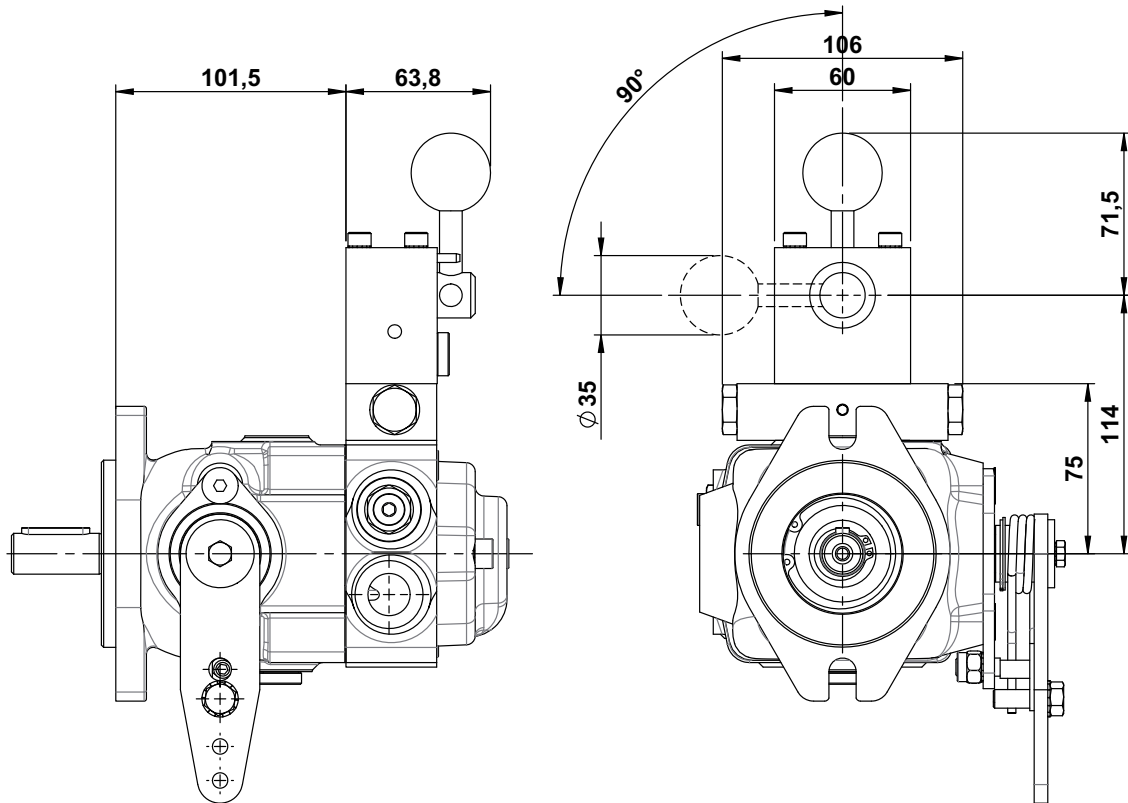
## PURGE VALVE + LEVER BY-PASS

The manual valve connects the A and B ports together to allow the free-wheeling of the hydraulic motor.

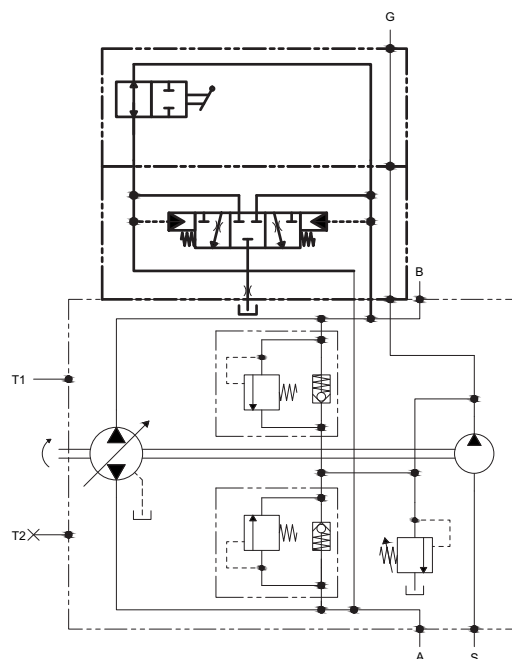
The purge valve, subtracting warm oil from

the closed circuit, allows the flow of cool fluid from the boost system.

Oil flow for cooling = 1,5 lt/min. at 1500 n/min.



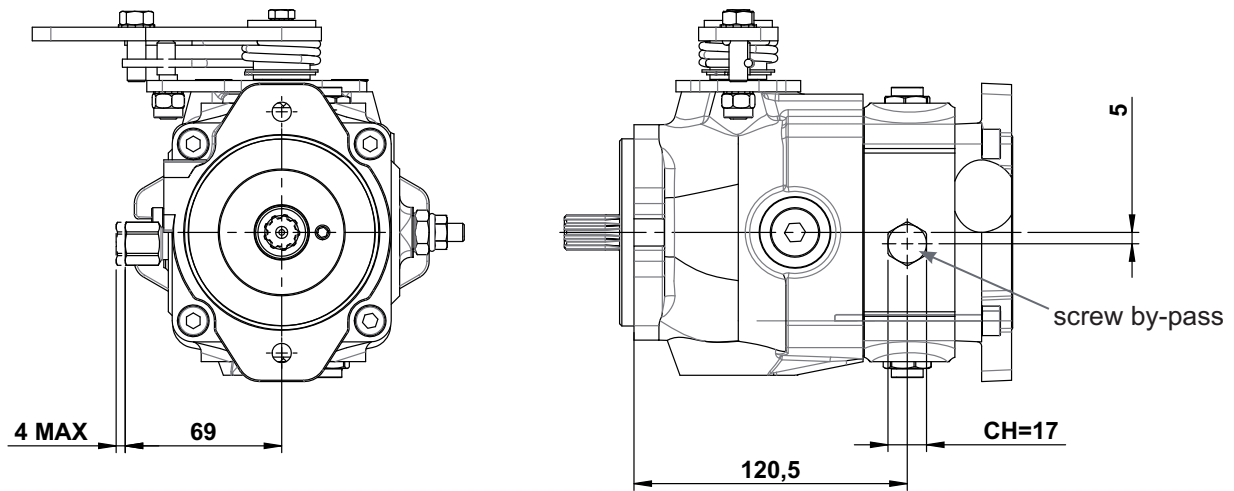
HYDRAULIC DIAGRAM



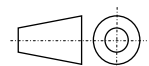
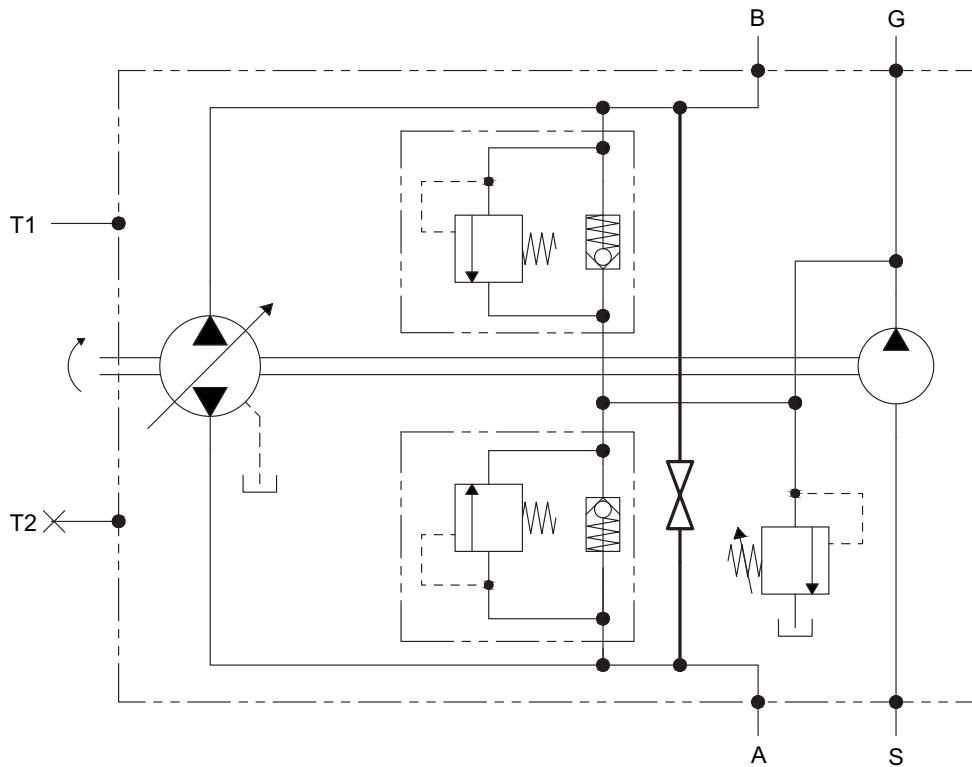
# OPTIONAL SB

## SCREW BY-PASS

Manual valve to connect the A+B ports together for free rotation of the hydraulic motor.



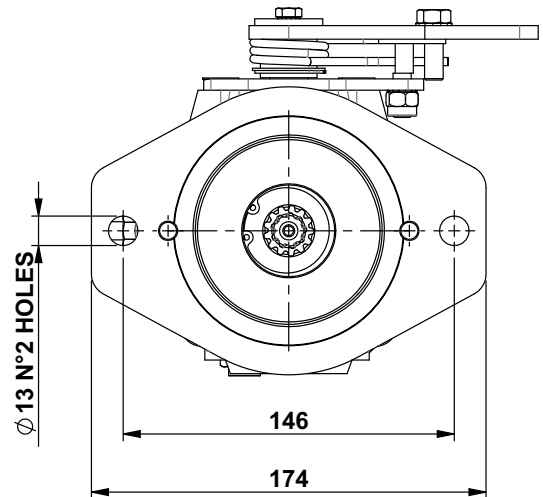
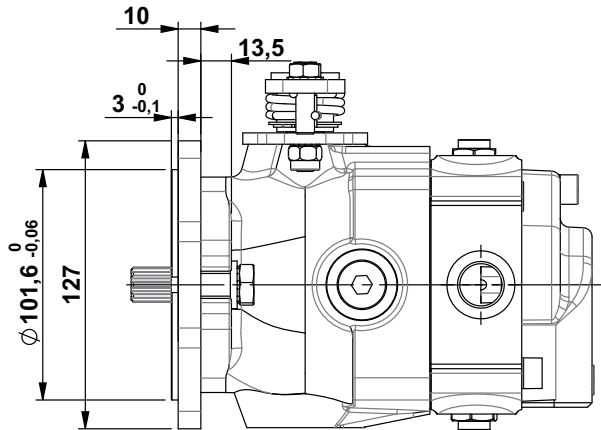
### HYDRAULIC DIAGRAM



## OPTIONAL FB

### SAE-A / SAE-B MOUNTING FLANGE (CONVERSION)

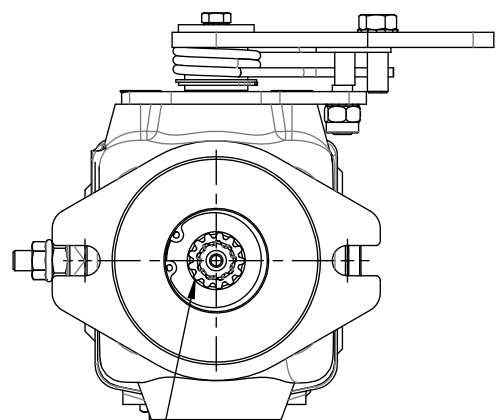
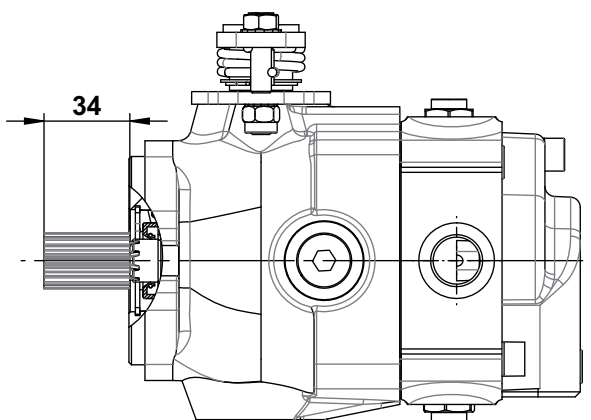
Max. torque = 120 Nm



## OPTIONAL ST

### COUPLING Z = 9 / Z = 13 (SAE-A / SAE-B CONVERSION OF SHAFT)

Max. torque = 120 Nm



Z13 16/32 D.P.  
SPLINED

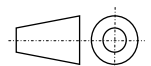
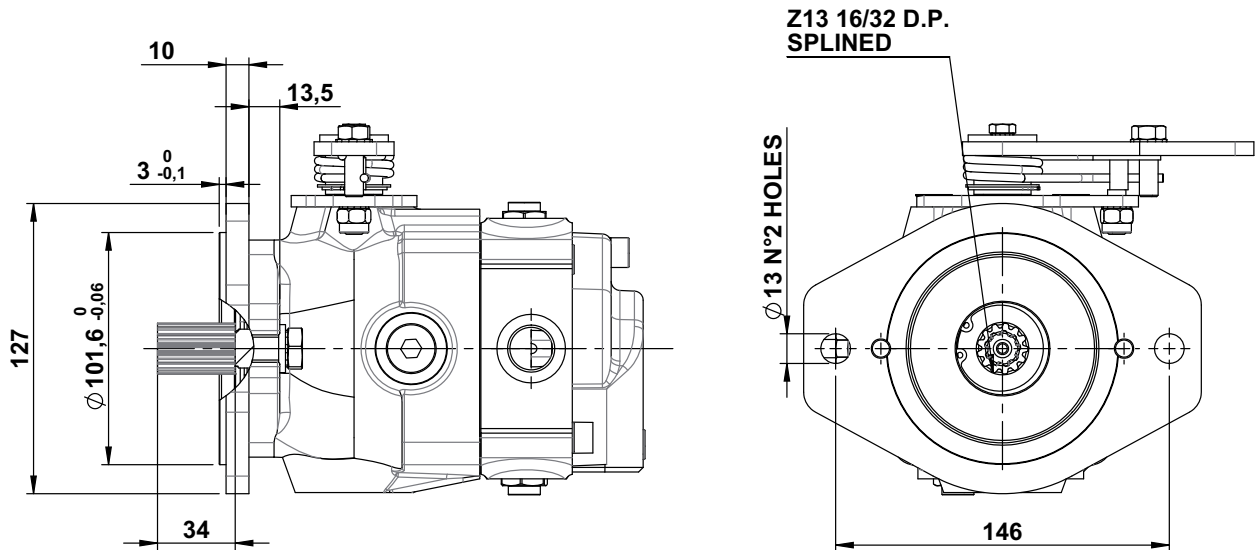


# OPTIONAL FBST

SAE-A / SAE-B MOUNTING FLANGE

COUPLING Z = 9 / Z = 13 (SAE-A / SAE-B CONVERSION OF SHAFT)

Max. torque = 120 Nm





ACCESSORIES

Hydraulic Gear Pump German Standard **B1**  
Hydraulic Gear Pump German Standard **B2**  
Hydraulic Gear Pump SAE-A Standard



For more detailed information ask for catalogue HT 15 F 20.....

Hydraulic Remote Servo Controls



For more detailed information ask for catalogue HT 73 B 10.....

Electric and Electronic Remote Servo Controls

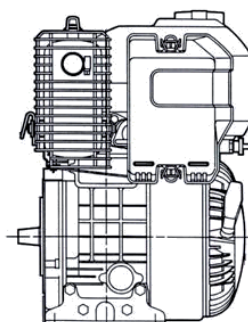
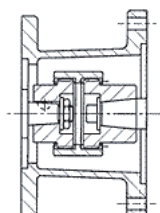


For more detailed information ask for catalogue HT 73 B 20.....

Bell Housings and Couplings for Pump Assembly on Gasoline and Diesel Engines

GASOLINE OR DIESEL ENGINES

FLANGES AND COUPLINGS



For more detailed information ask our technical departement

## PUMPS



Closed Loop Axial Piston Pumps (Variable Displacement) - 6-110 cc

Model	Displacement cm <sup>3</sup> /n.	Rated Pressure MPa	Peak Pressure MPa	Maximum speed n/min.	Weight kg (single pump)
TPV 1000 TPV 1200 BTB	6, 8, 9, 11, 12, 13	21	30	3.600	8,8
	15, 17		28		
	18		27		
	19, 21	20	25	3.200	
TPV-TPVTC 1500	17, 18, 19, 21	35	40	3.600	14
TPV 3200	21, 28	25	35		22
TPV-TPVT 3600	26, 28, 30, 31, 32, 34, 36, 38	35	45		28
TPV 4300	32, 38, 45, 50	25	35		23
TPV 5000	46, 50, 64	30	40		29
TPV 9000	55	40	45	4.000	55
	72			4.100	68
	90			4.000	
	110			3.800	



Open Loop Axial Piston Pumps (Fixed Displacement) - 32-50 cc

Model	Displacement cm <sup>3</sup> /n.	Rated Pressure MPa	Peak Pressure MPa	Maximum speed n/min.	Weight kg (single pump)
TPF 60	35, 40, 46	35	42	2.800	20,5
	50		41	2.500	



Bent Axis Pumps - 12-130 cc

Model	Displacement cm <sup>3</sup> /n.	Rated Pressure MPa	Peak Pressure MPa	Maximum speed n/min.	Weight kg
TPB - TAP 70	12.6	35	40	3.300	7,5
	17.0			3.200	
	25.4			2.550	8,5
	34.2			2.250	
	41.2, 47.1			2.200	15,5
	56.0			2.100	
	63.6			2.050	
	83.6, 90.7, 108.0			1.700	27,0
	130.0			1.600	29,5

The table values can change in function of the configuration.



As HANSA-TMP has a very extensive range of products and some products have a variety of applications, the information supplied may often only apply to specific situations.

If the catalogue does not supply all the information required, please contact HANSA-TMP.

In order to provide a comprehensive reply to queries we may require specific data regarding the proposed application.

Whilst every reasonable endeavour has been made to ensure accuracy, this publication cannot be considered to represent part of any contract, whether expressed or implied.

The data in this catalogue refer to the standard product. The policy of HANSA-TMP consists of a continuous improvement of its products. It reserves the right to change the specifications of the different products whenever necessary and without giving prior information.



**HYDRAULIC COMPONENTS**  
**HYDROSTATIC TRANSMISSIONS**  
**GEARBOXES - ACCESSORIES**

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