Dutch Hydraulic Consultants

HANSA · TMP srl

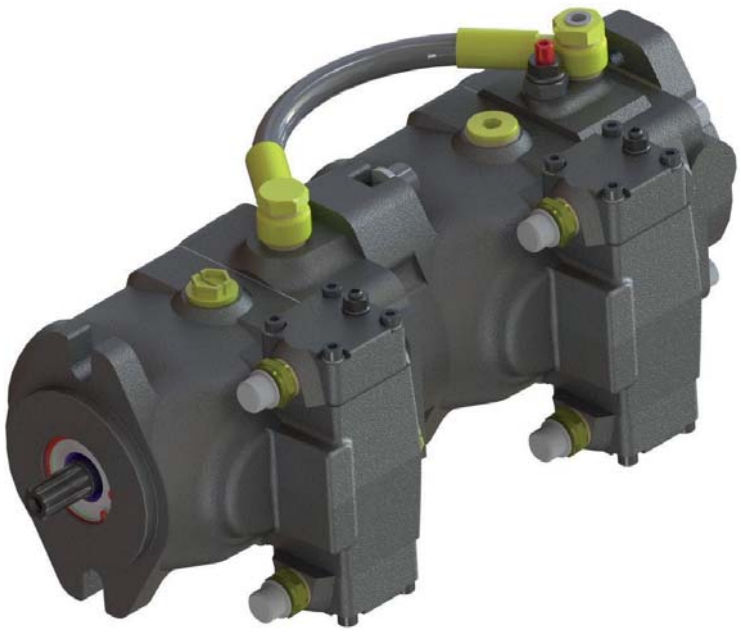
HYDRAULIC COMPONENTS
HYDROSTATIC TRANSMISSIONS
GEARBOXES - ACCESSORIES

HT 16 / M / 114 / 0814 / E

THE PRODUCTION LINE OF HANSA-TMP

Variable Displacement Closed Loop System Axial Piston Pump

TPV 1000

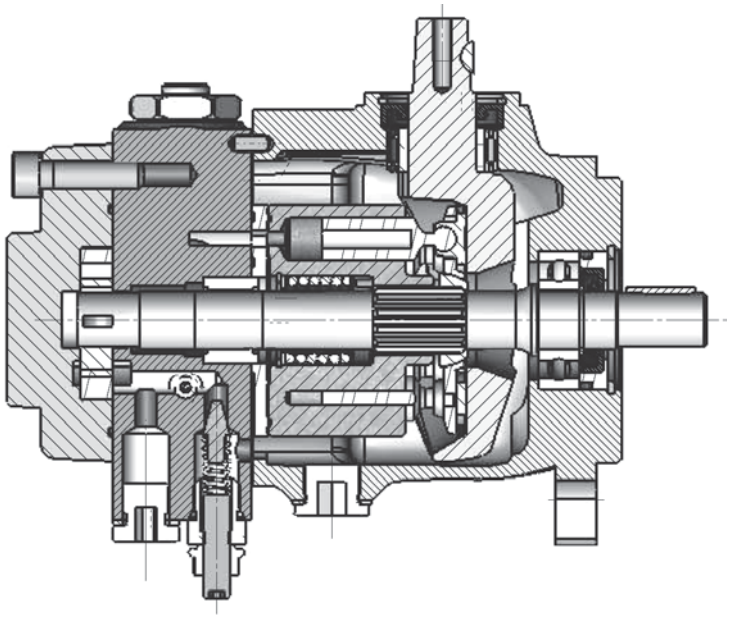


CONTENTS

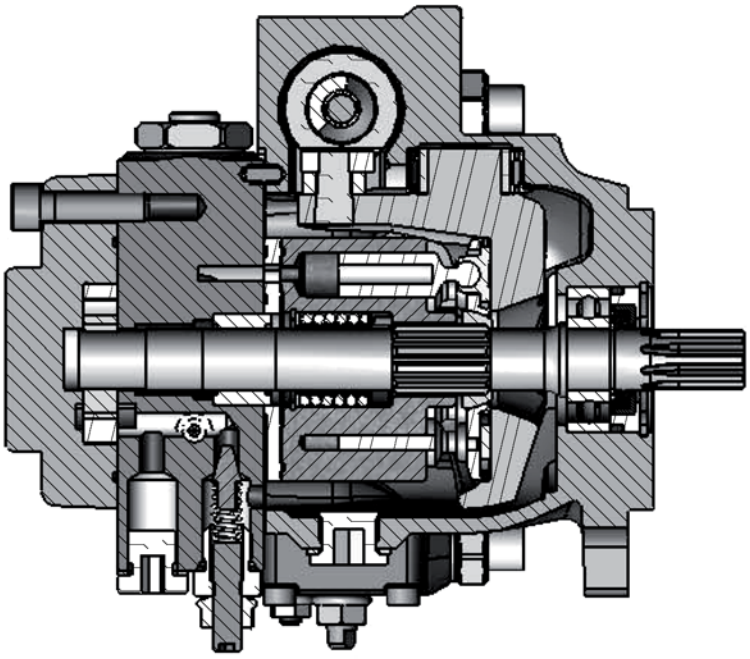
GENERAL INFORMATION

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

Direct Mechanical Control



Hydraulic Remote Control



Features

- Silent running
- High rotation speed
- Compact design
- Suitable for multiple pump assembly
- Easy maintenance
- Built-in pressure relief valves
- Optionals: screw-type or electric by-pass-valve, purge valve, adapter flange from SAE-A to SAE-B
- Accessories: auxiliary gearpumps, hydraulic and electric remote control valves, mounting kit for diesel and petrol engines

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

INSTALLATION 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 them.
- It is advisable to fit the pump lower than 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 multiple pump it is advisable to mount a supplementary support (see optional SP).
Attention: connect the support to the engine and/or use an elastic 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 shaft type.

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
- Remote hydraulic servo-control	SHI
- Remote electronic servo-control	SEI
- By-pass lever	LB
- Screw By-pass	SB
- Supplementary support for multiple pumps	SP
- Purge valve	VS
- Adaptors flange from SAE A to SAE B	FB
- Adaptors 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 charge pressure is correct.
- Restore the tank oil level.

Maintenance

- The first oil change must be made after approximately 500 hours of operations, and then every 2000 hours.
- The filter cartridge must be replaced the first time after 50 hours and then every 500 hours, such time should be reduced when the filter clogging indicator shows that the catridge is clogged or when the system works in a heavily polluted environment.

TECHNICAL SPECIFICATIONS

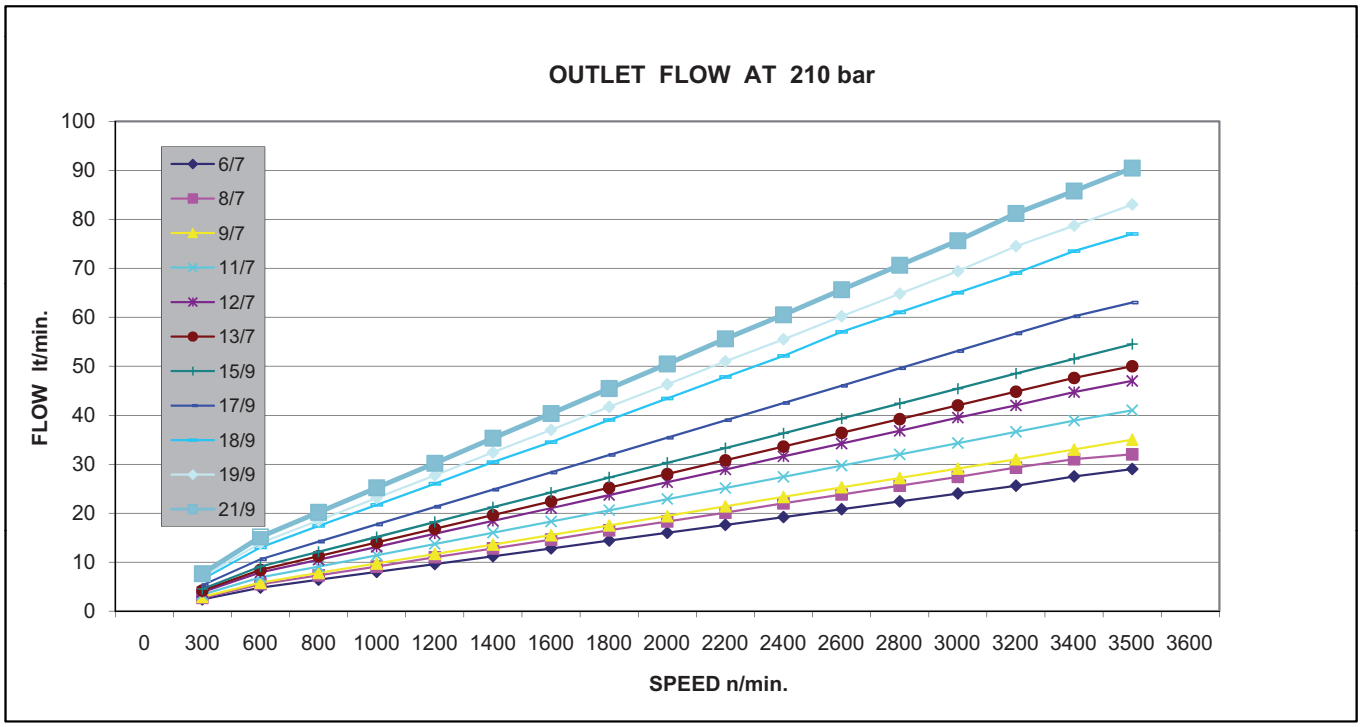
Pump Model		TPV 6-7	TPV 8-7	TPV 9-7	TPV 11-7	TPV 12-7	TPV 13-7	TPV 15-9	TPV 17-9	TPV 18-9	TPV 19-9	TPV 21-9
Max. displacement	cm^3/n	7,4	8,9	9,6	11,2	12,8	13,6	15,00	17,1	18,2	19,4	21,15
Flow rating (1)	lt/min.	25,01	31,96	34,74	40,32	46,08	48,88	54,00	61,77	66,37	69,84	76,4
Power rating (1)	kW	8,75	11,18	12,15	14,11	16,12	17,11	18,9	21,61	23,23	24,44	31,73
Boost pump displacement	cm^3/n	3,9 (Rear cover closed, B1, B2) 4,7 (Rear cover SAE A)										
Rated pressure	bar	210									200	
Max. pressure	bar	300	300	300	300	300	300	280	280	270	250	
Max. relief valve setting	bar	300										
Standard Boost pressure (2)	bar	6 (Mechanical Control) 20 (Hydraulic / Electric Servo Control)										
Suction pressure	bar (absolute)	>= 0,8										
Max.case pressure	bar	1,5										
Min. inlet shaft speed	n/min.	500										
Rated speed	n/min.	3600									2900	
Max. speed	n/min.	3900									3200	
Max. oil temperature	°C	80										
Oil viscosity	$mm^2/sec.$	15-35										
Fluid contamination		18/15/12 according to ISO 4406										
Dry weight (single pump) (3)	kg	8,8										
Dry weight (tandem pump) (3)	kg	19,5										

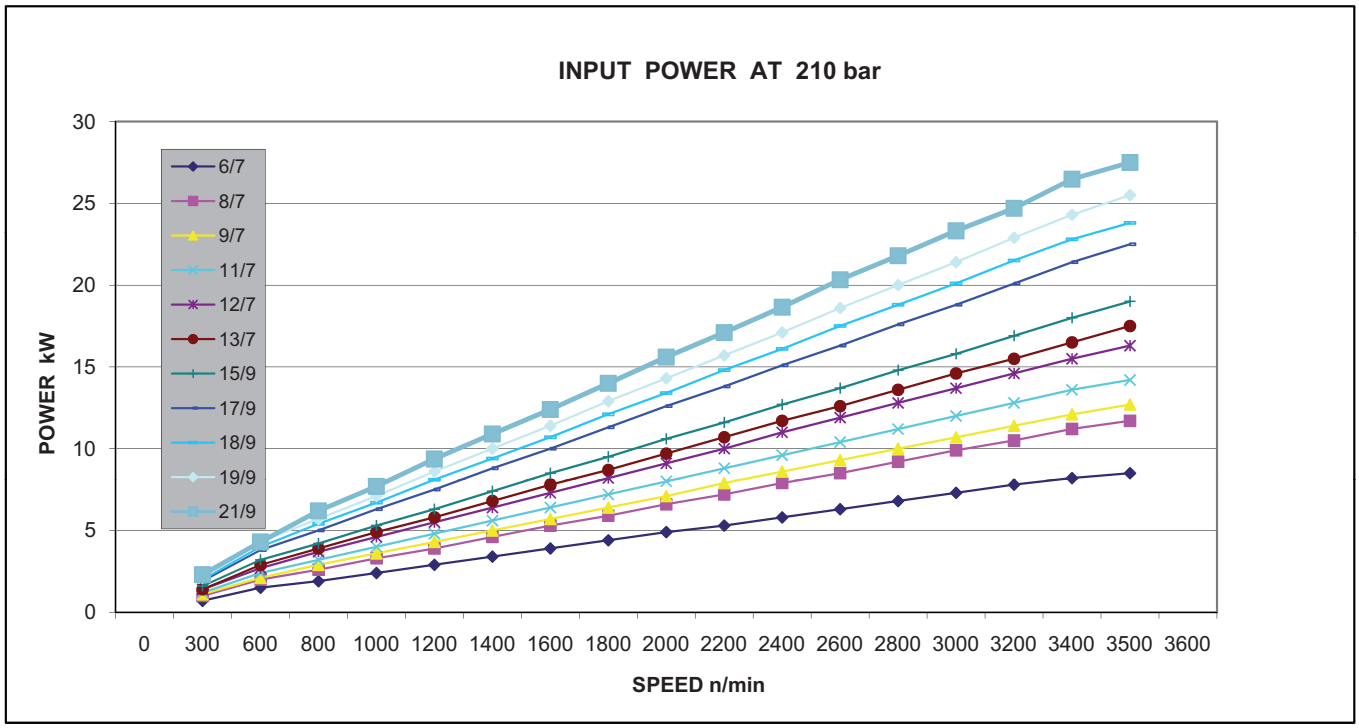
(1) 3600 n/min. 210 bar

(2) 1000 n/min.

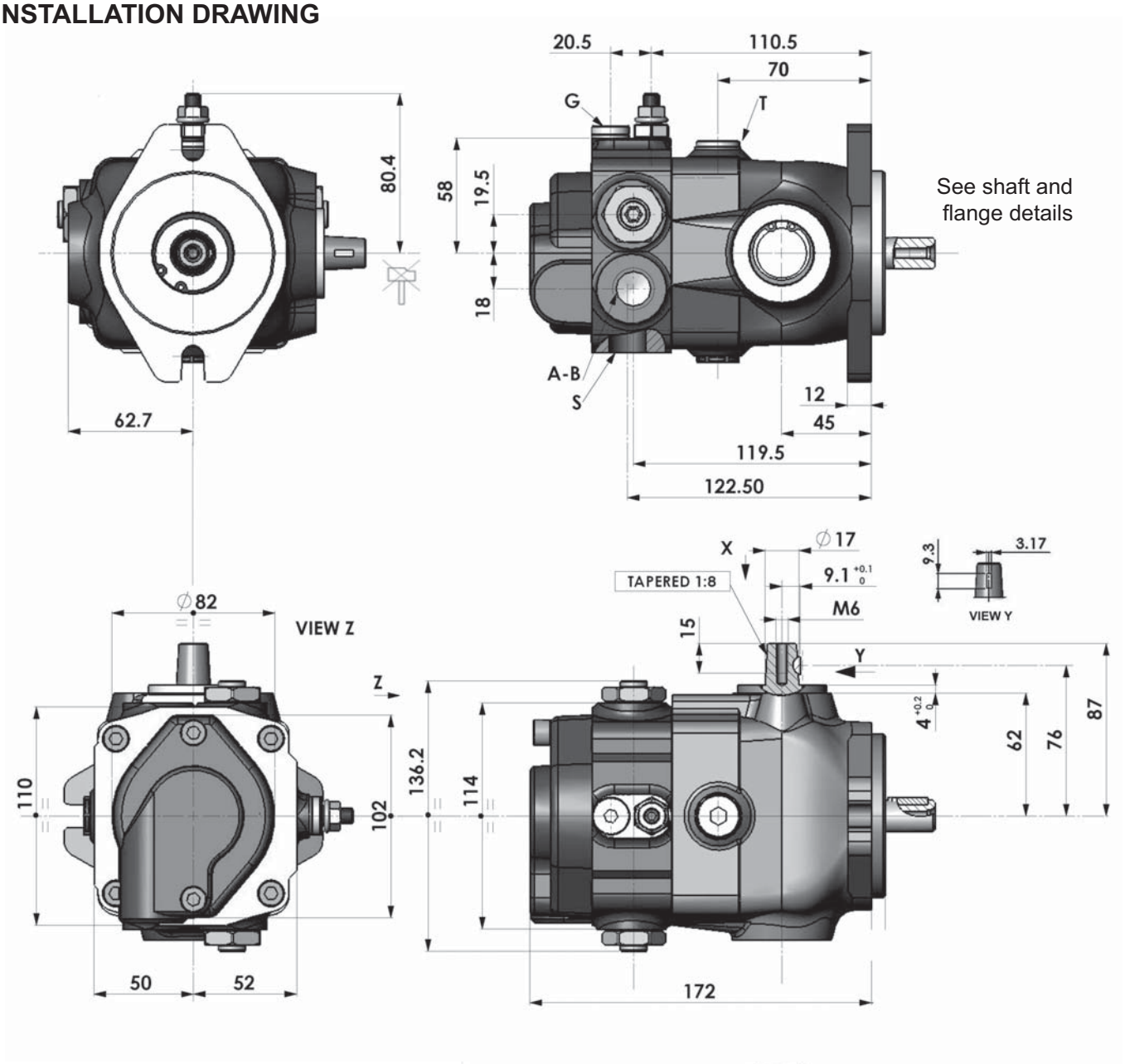
(3) Indicative values, weight varies depending on configuration and optional

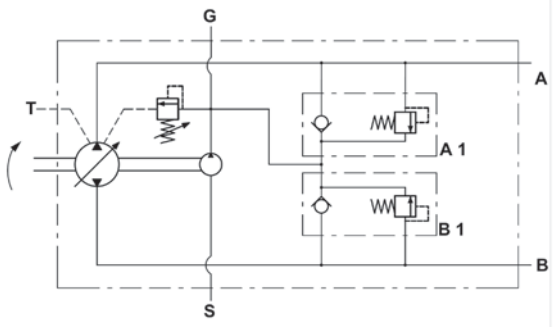
PERFORMANCE (Indicative Data)



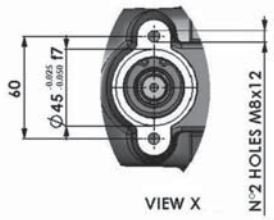


SINGLE PUMP - Direct Mechanical Control
INSTALLATION DRAWING



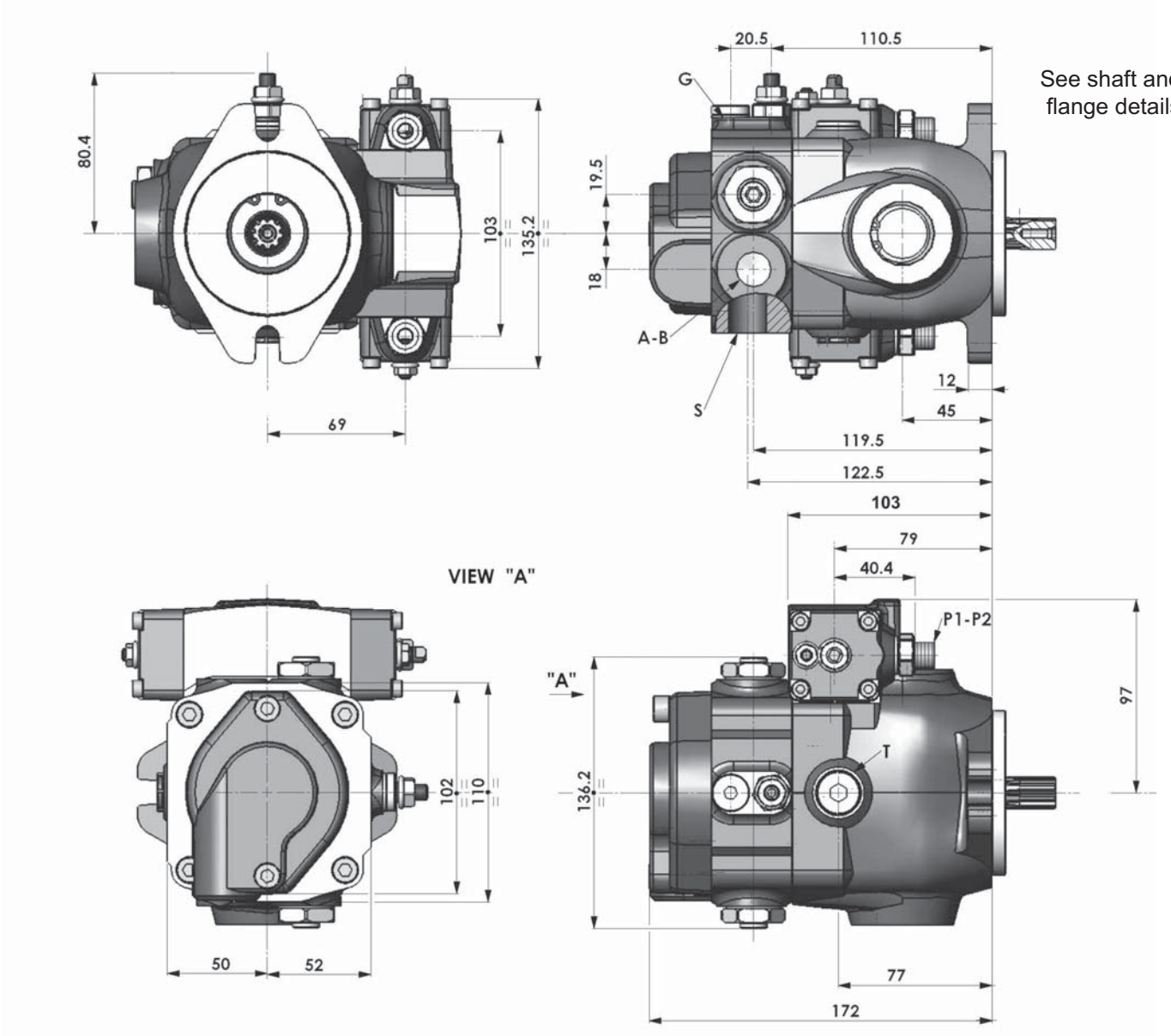


Hydraulic Diagram

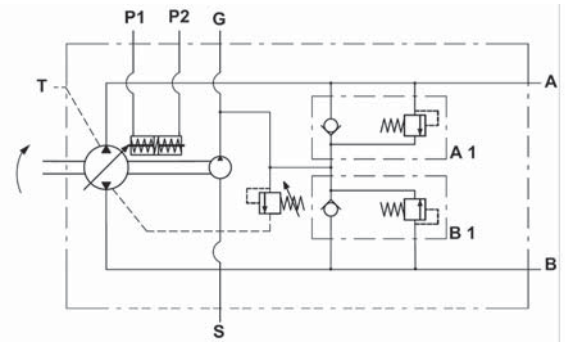


Pipe connection		
A - B	Main ports	1/2" BSP
T	Drain	3/8" BSP
S	Suction	1/2" BSP
G	Charge system	1/4" BSP

SINGLE PUMP - Hydraulic Remote Servo Control
INSTALLATION DRAWING

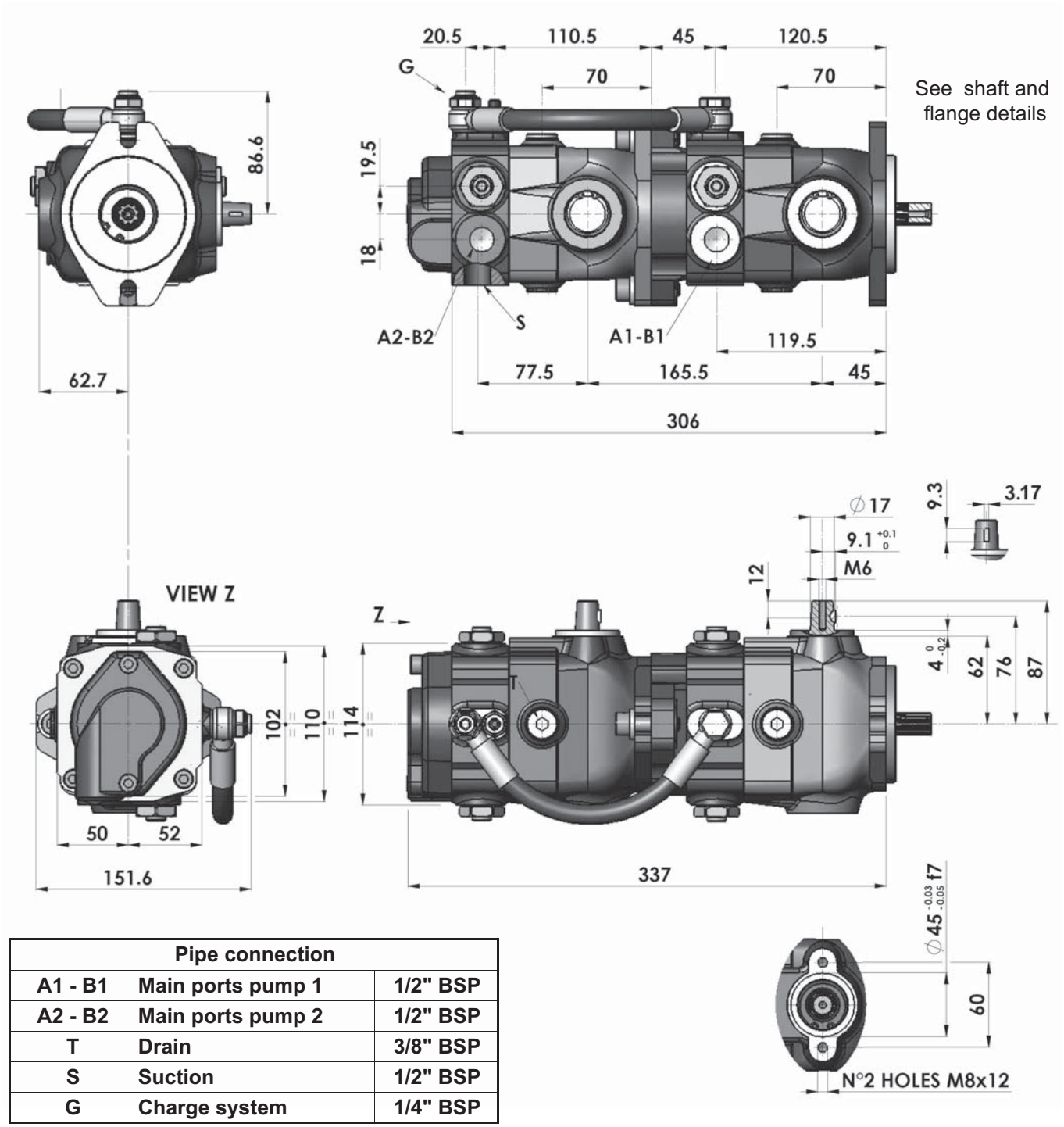


Hydraulic Diagram



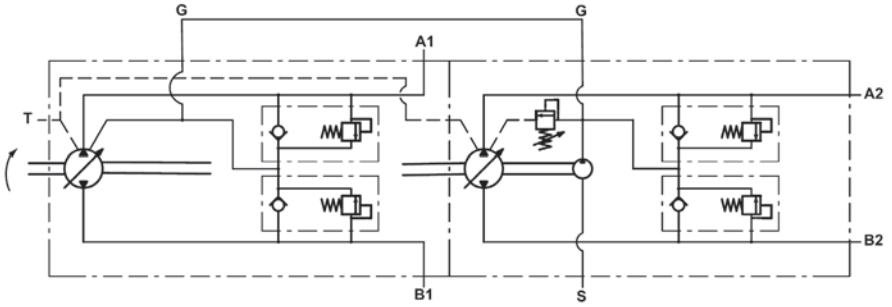
Pipe connection		
A - B	Main ports	1/2" BSP
T	Drain	3/8" BSP
S	Suction	1/2" BSP
G	Charge system	1/4" BSP
P1 - P2	Servo-control ports	1/4" BSP

TANDEM PUMP - Direct Mechanical Control
INSTALLATION DRAWING



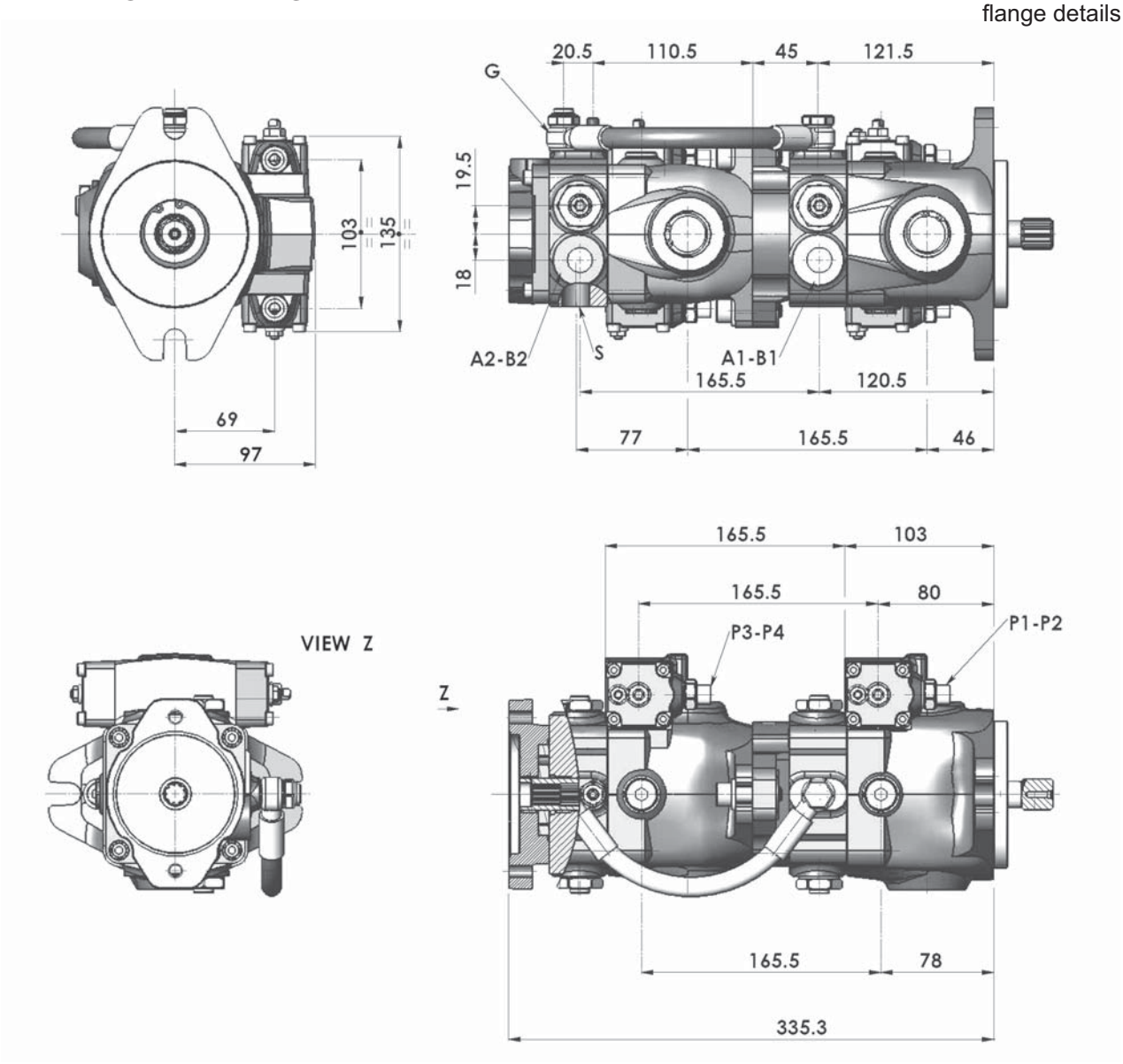
Pipe connection		
A1 - B1	Main ports pump 1	1/2" BSP
A2 - B2	Main ports pump 2	1/2" BSP
T	Drain	3/8" BSP
S	Suction	1/2" BSP
G	Charge system	1/4" BSP

Hydraulic Diagram



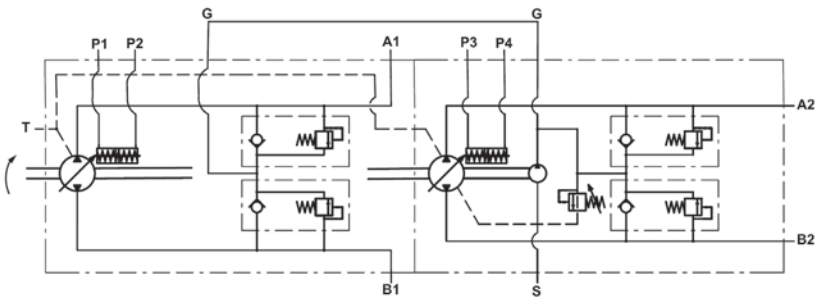
TANDEM PUMP - Hydraulic Remote Servo Control
INSTALLATION DRAWING

See shaft and flange details

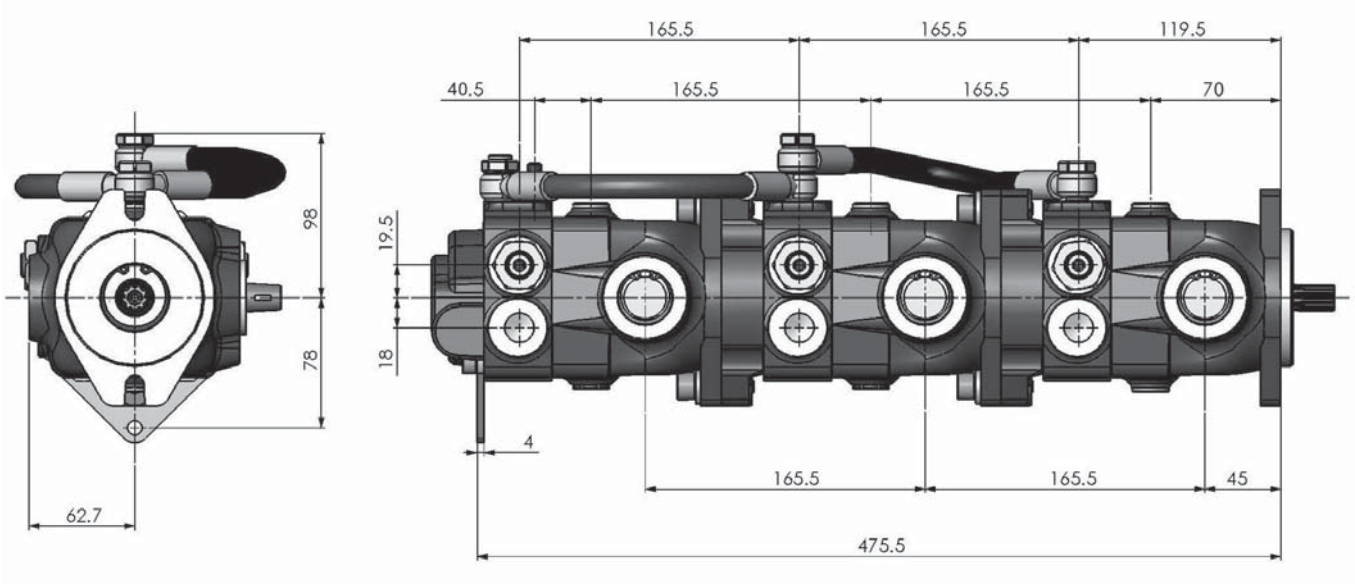


Pipe connection		
A1 - B1	Main ports pump 1	1/2" BSP
A2 - B2	Main ports pump 2	1/2" BSP
T	Drain	3/8" BSP
S	Suction	1/2" BSP
G	Charge system	1/4" BSP
P1-P2-P3-P4	Servocontrol port	1/4" BSP

Hydraulic Diagram

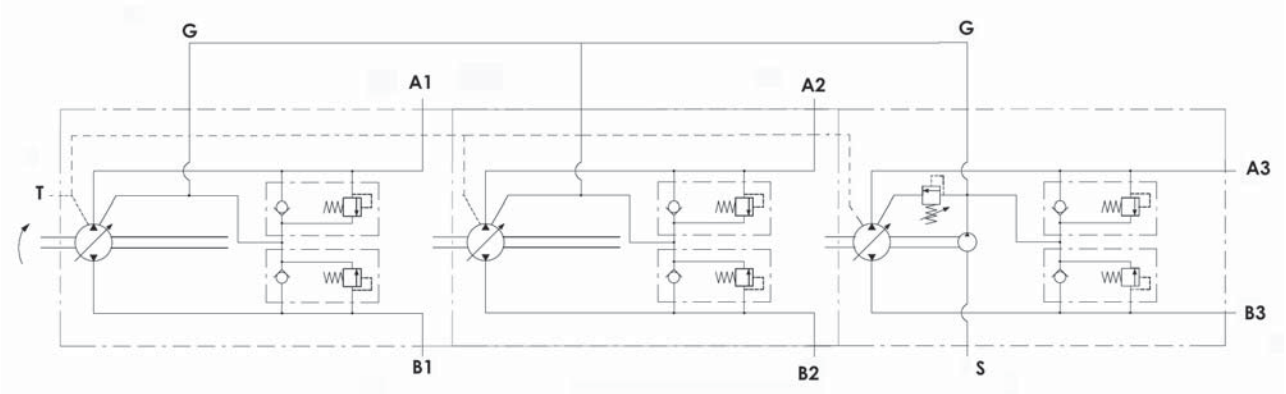


TRIPLE PUMP - Direct Mechanical Control
INSTALLATION DRAWING



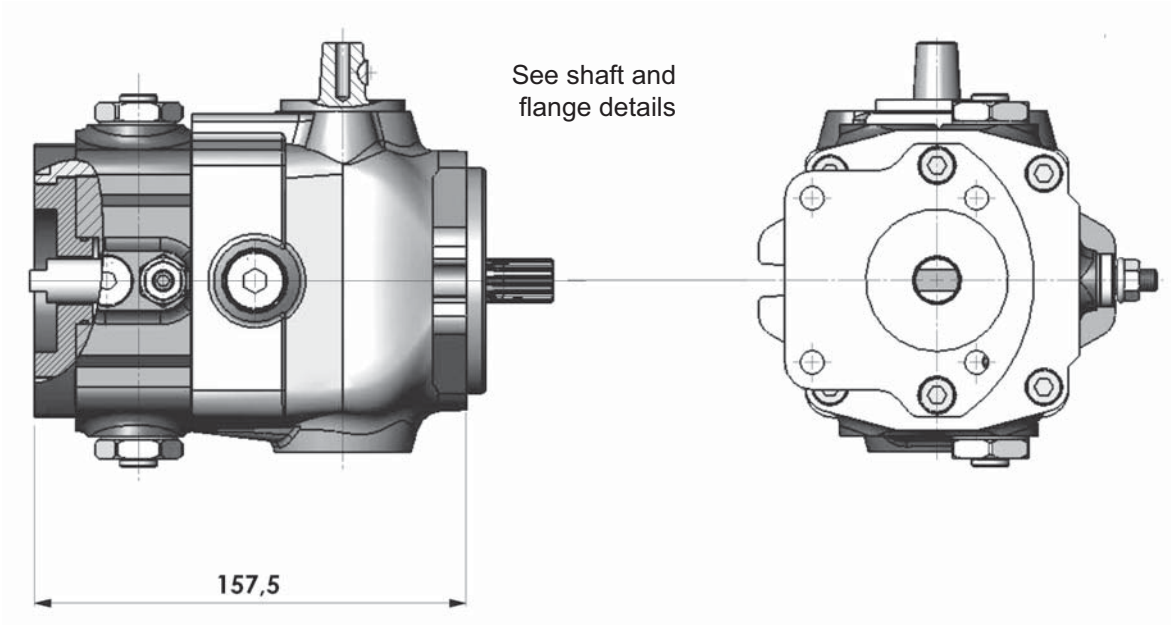
See shaft and flange details

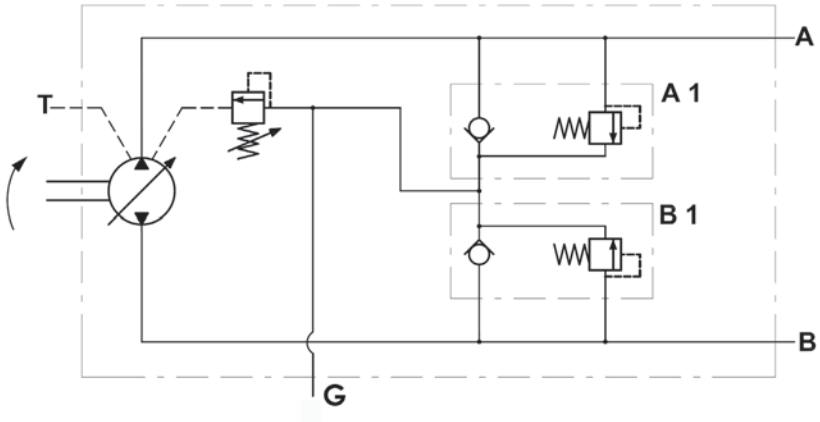
Pipe connection		
A1 - B1	Main ports pump 1	1/2" BSP
A2 - B2	Main ports pump 2	1/2" BSP
A3 - B3	Main ports pump 3	1/2" BSP
T	Drain	3/8" BSP
S	Suction	1/2" BSP
G	Charge system	1/4" BSP



Hydraulic Diagram

SINGLE PUMP - Direct Mechanical Control without Charge Pump
INSTALLATION DRAWING

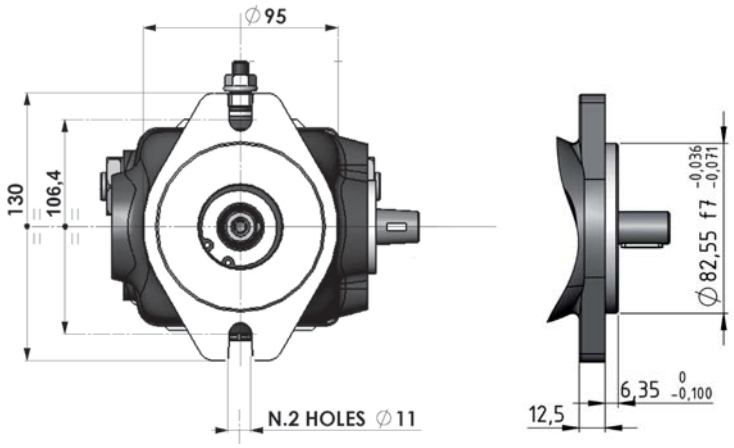




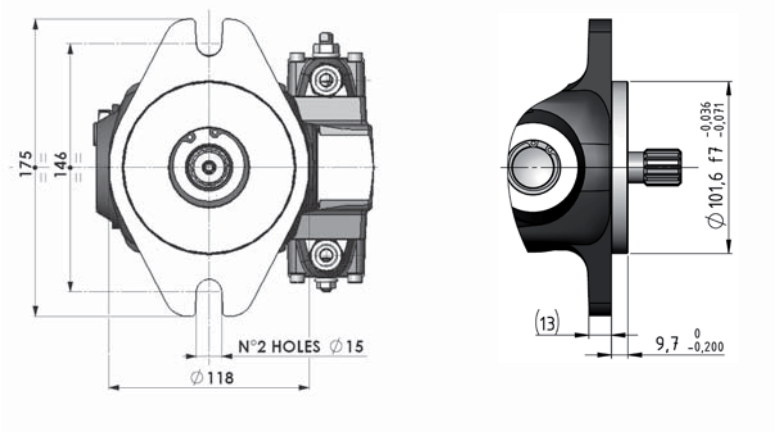
Hydraulic Diagram

Mounting Flange and Shaft Options - FLANGES

SAE A - 2 holes flange F1



SAE B - 2 holes flange F2 (only for SHI and SEI 1-2)

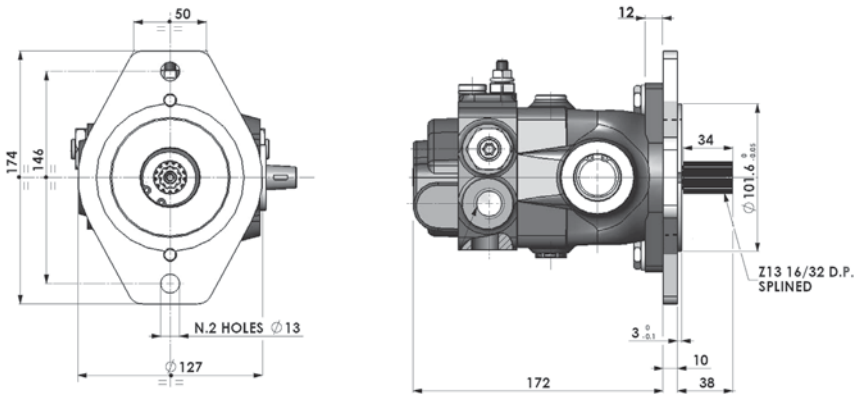


OPTIONAL

Adaptor flange from SAE A to SAE B FB

Adaptor coupling Z=9 / Z=13 ST

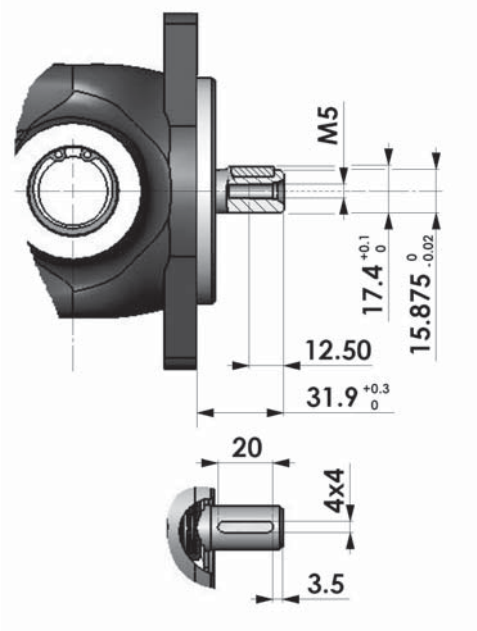
Max. torque = 120 Nm



Mounting Flange and Shaft Options - SHAFT

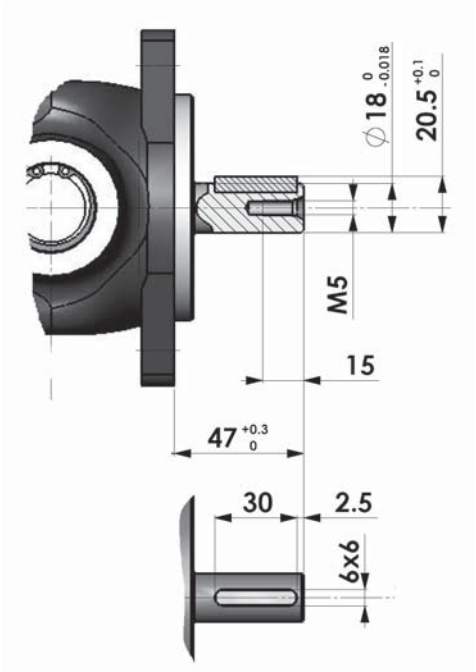
Parallel keyed shaft 15,875 mm. diam. PS1

Max. torque = 65 Nm



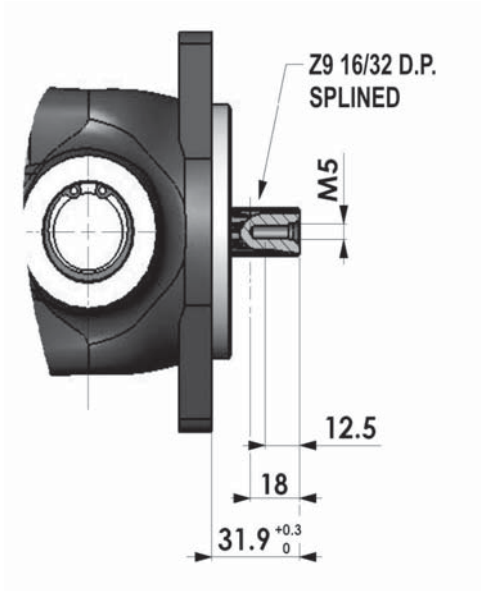
Parallel keyed shaft 18 mm. diam. PS3

Max. torque = 85 Nm



Splined shaft Z = 9 SS2

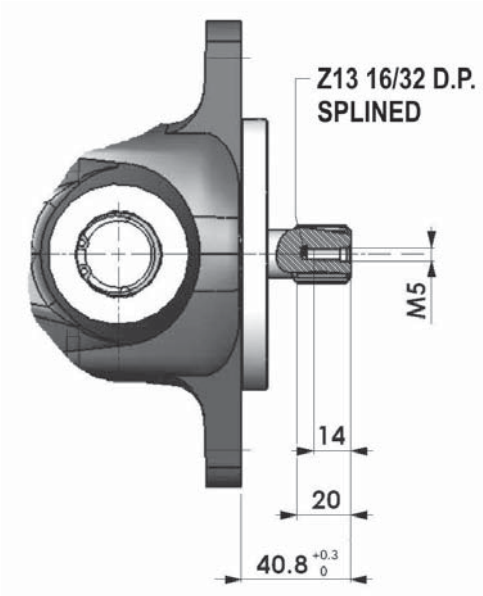
Max. torque = 120 Nm



Splined shaft Z = 13 SS3

(only for SHI, SEI 1-2 and F2)

Max. torque = 320 Nm

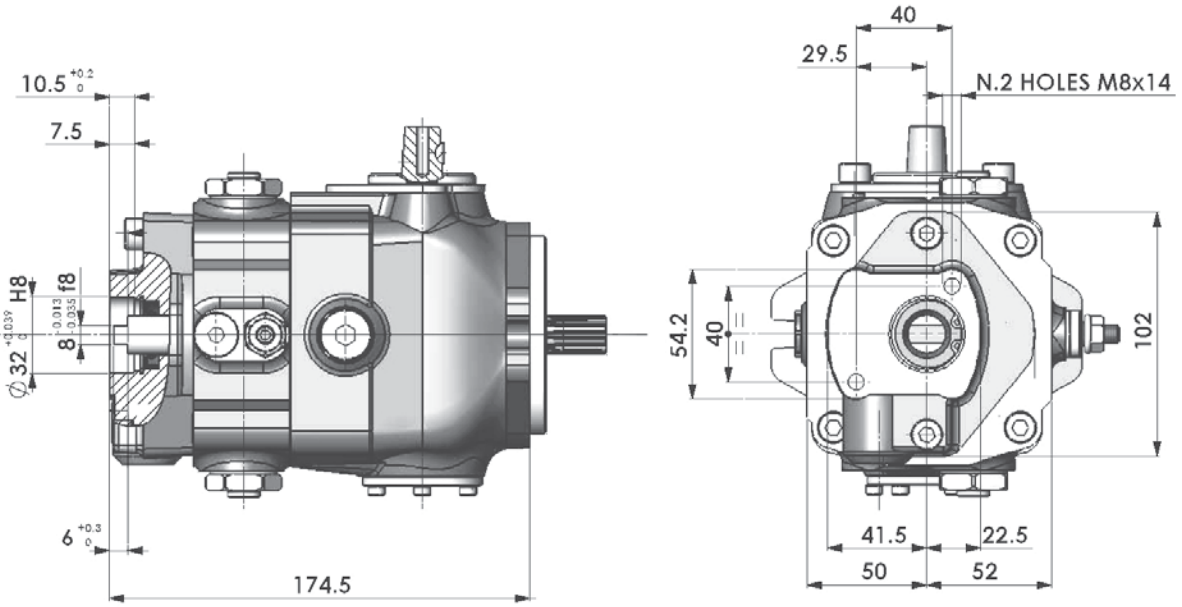


Attention: for the application of multiple pumps the total absorbed torque must not exceed the indicated value.

Rear Pump Flange Connections (Dimensions valid for all versions)

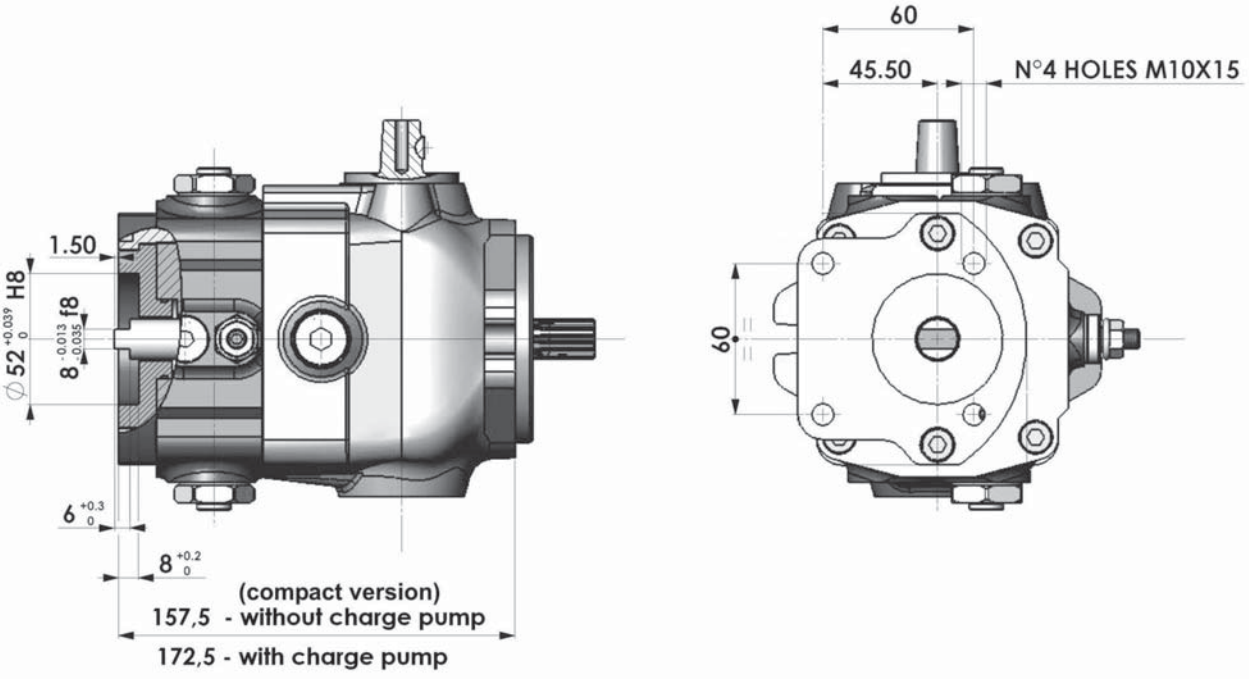
B1 - German Standard

Max. torque = 70 Nm



B2 - German Standard

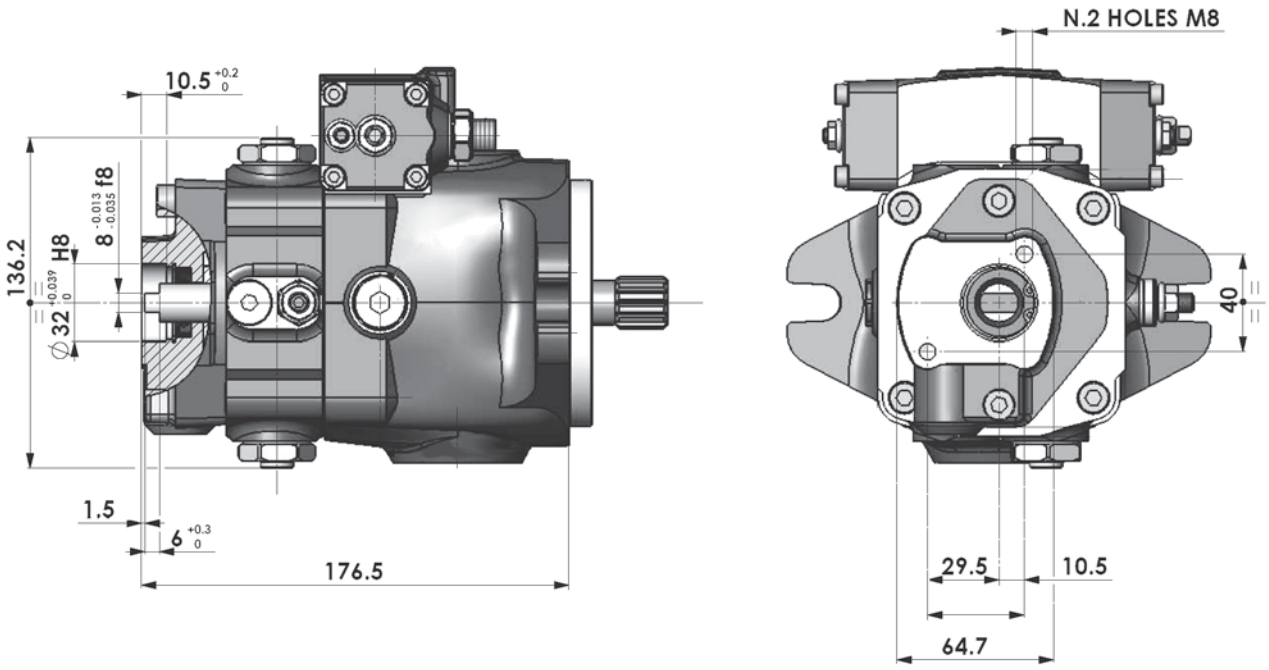
Max. torque = 70 Nm



Rear Pump Flange Connections (Dimensions valid for all versions)

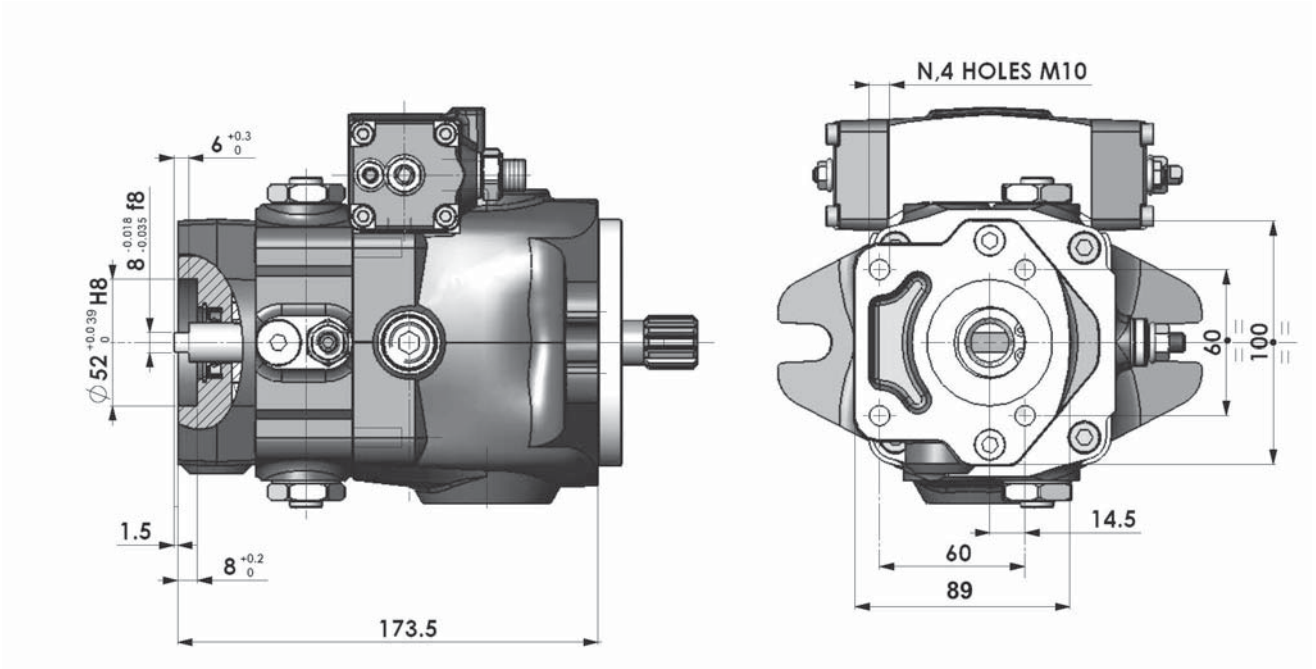
B1 - German Standard

Max. torque = 70 Nm



B2 - German Standard

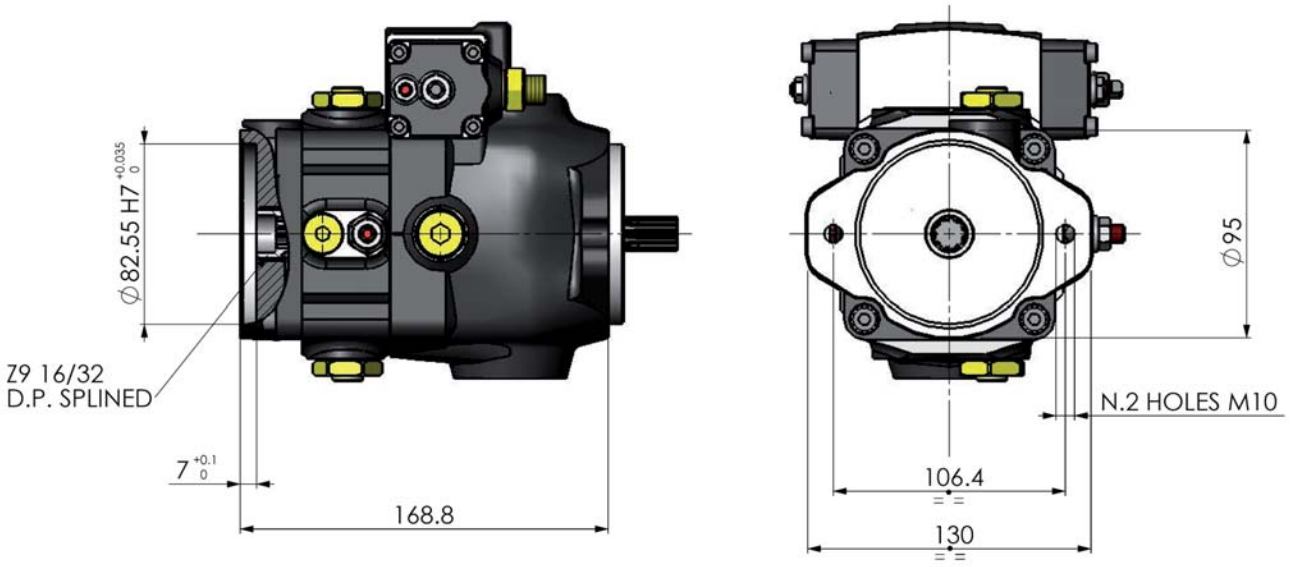
Max. torque = 70 Nm



Rear Pump Flange Connections (Dimensions valid for all versions)

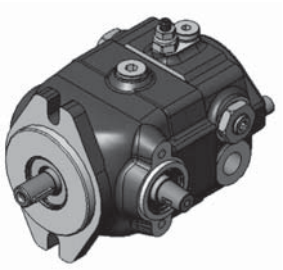
SAE A - R - 2 holes

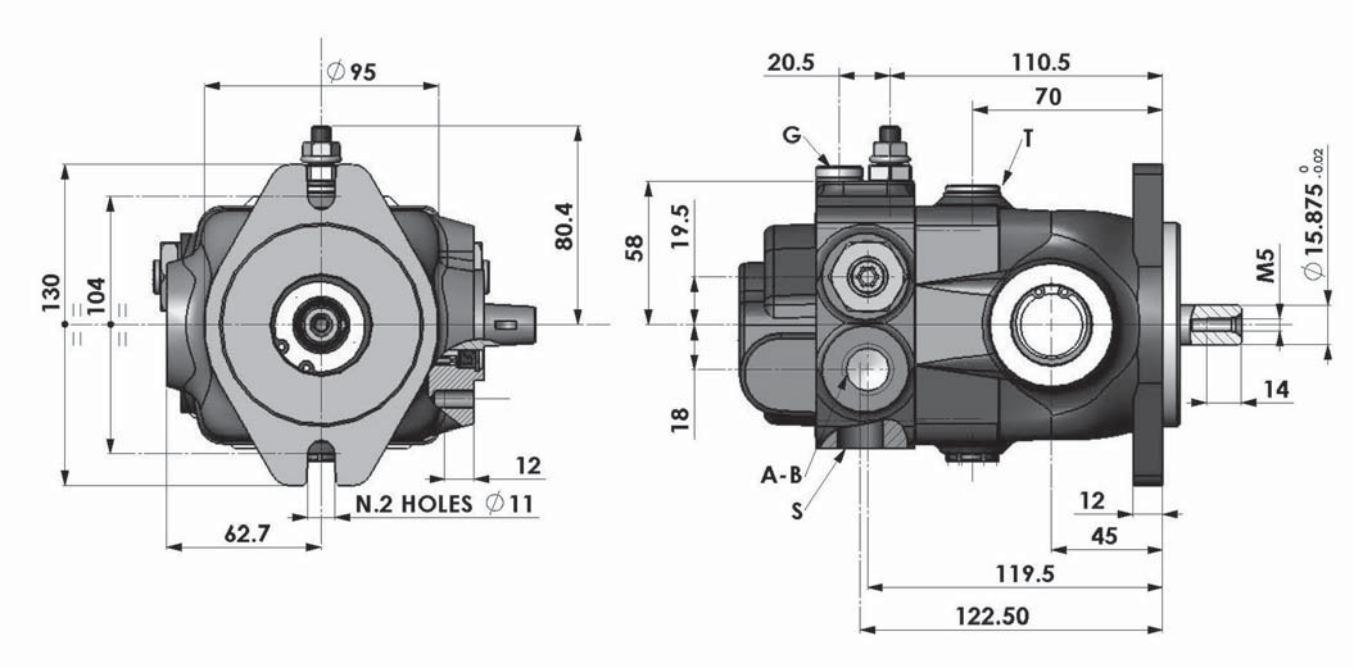
Max. torque = 120 Nm



CONTROL DEVICES

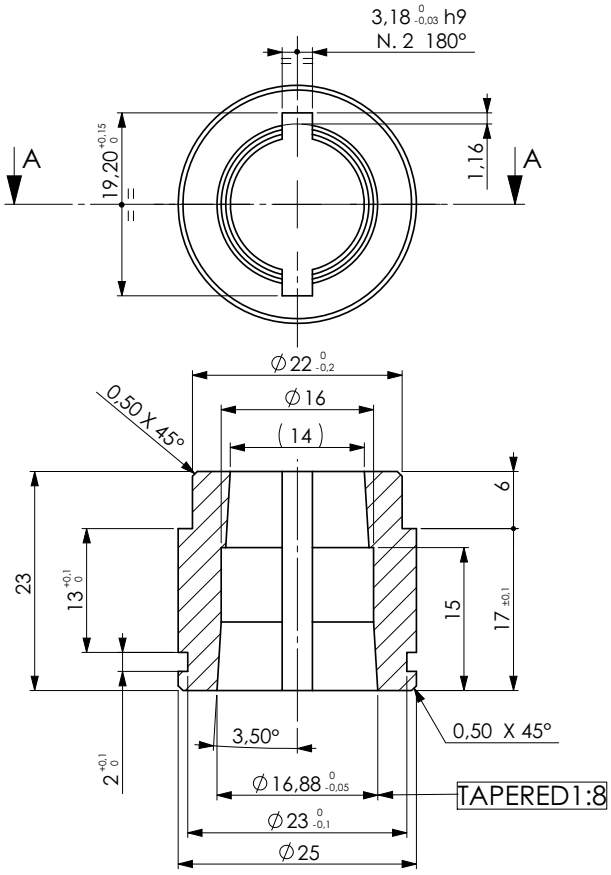
Direct Mechanical without Control Lever **DM**



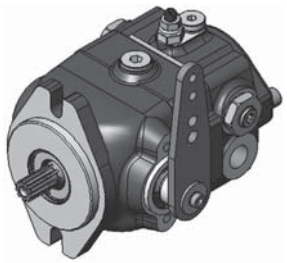


Tapered Bush **BC**

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

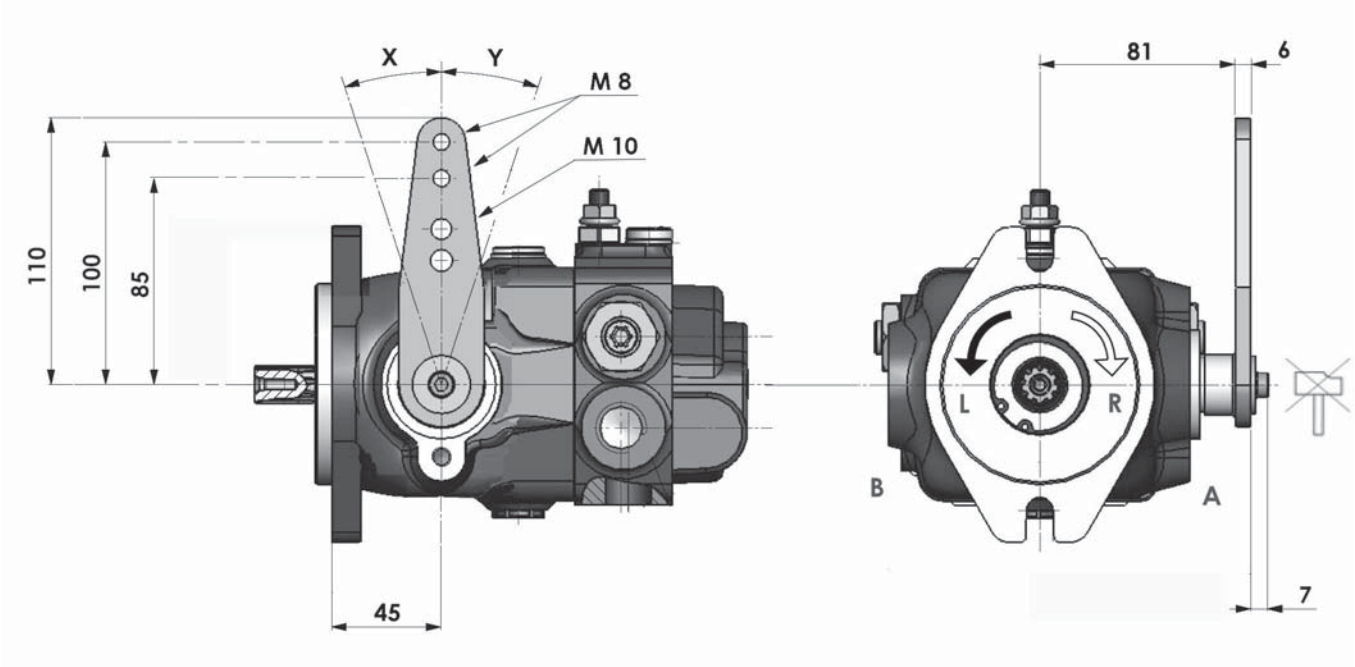


CONTROL DEVICES



Direct Mechanical Control Lever LC

The pump displacement variation is obtained
by rotate the lever shaft in a clockwise or counter-clockwise direction.
The lever shaft is directly linked to the pump swashplate by means
of a tapered mounting, this reduce the noise due to vibrations.



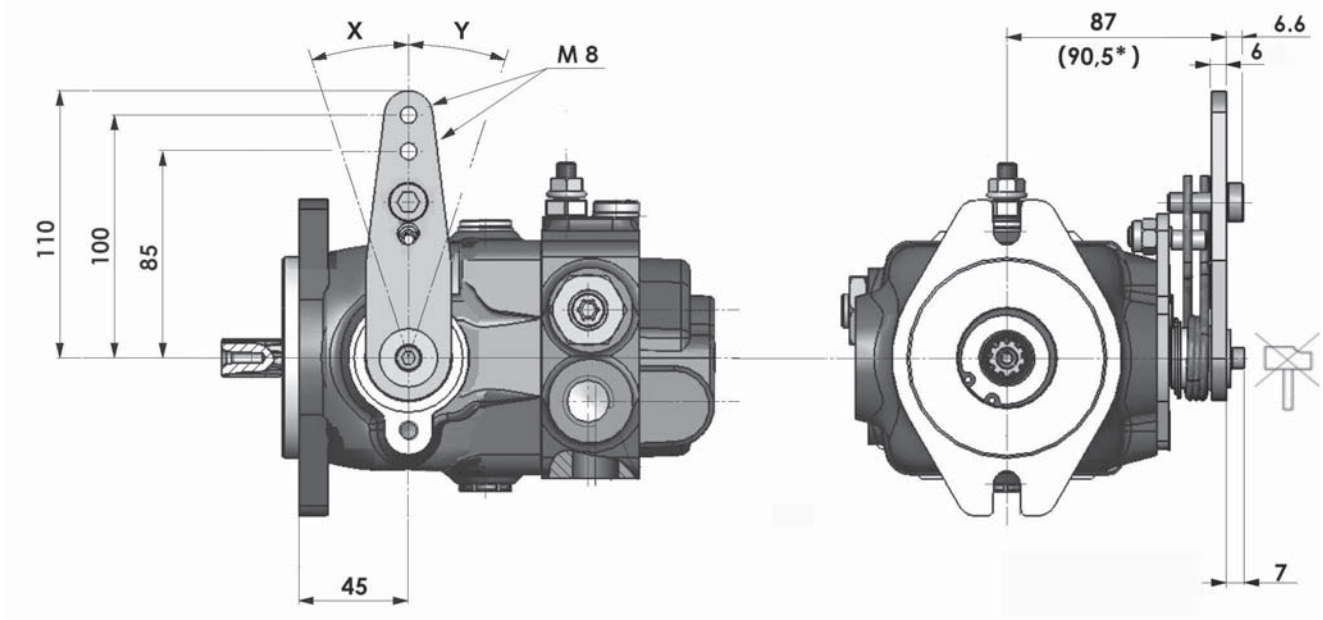
Lever Angle											
Pump Model	6 / 7	8 / 7	9 / 7	11 / 7	12 / 7	13 / 7	15 / 9	17 / 9	18 / 9	19 / 9	21 / 9
Lever Angle (X - Y)	10°	12°	13°	15°	17°	18°	15°	17°	18°	19°	19°

Flow Directional			
Pump Rotation	**Lever Position**	**Flow Out**	**Flow In**
Clockwise R	**X** **Y**	**A** **B**	**B** **A**
C. Clockwise L	**X** **Y**	**B** **A**	**A** **B**

CONTROL DEVICES

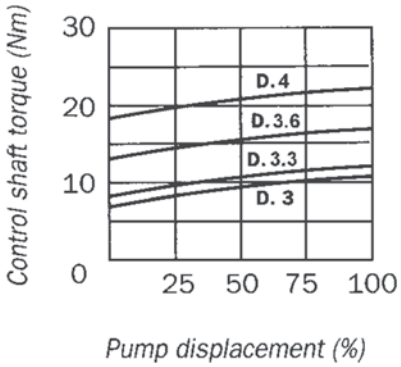
Control Lever with return to zero position DMS

The pump displacement variation is obtained
by rotate the lever shaft in a clockwise or counter-clockwise direction
(for angle and flow direction please see page 20.).
Return to zero is obtained trough a spring integrated in the lever shaft.
The lever shaft is directly linked to the pump swashplate by means
of tapered mounting, this reduce the noise due to vibrations.

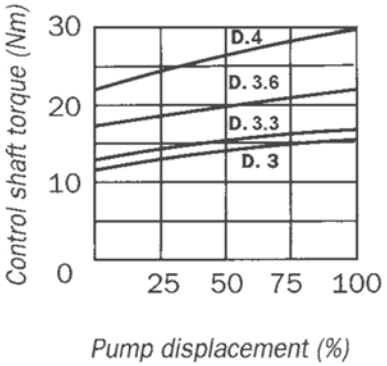


Standard Spring Diameter: **3,6 mm**
Spring Diameter Available: **3 - 3,3 - 4 - 5 mm**

Lever force - 100 bar

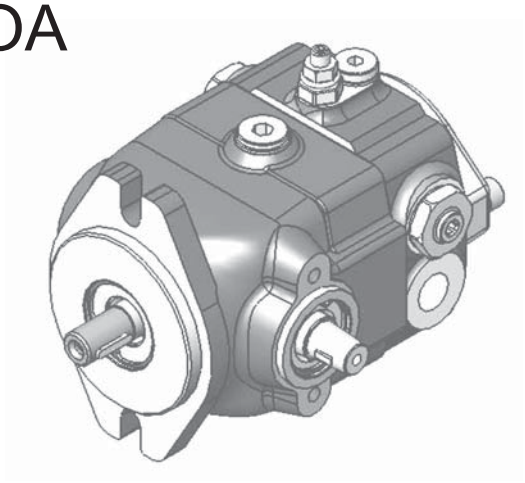


Lever force - 200 bar

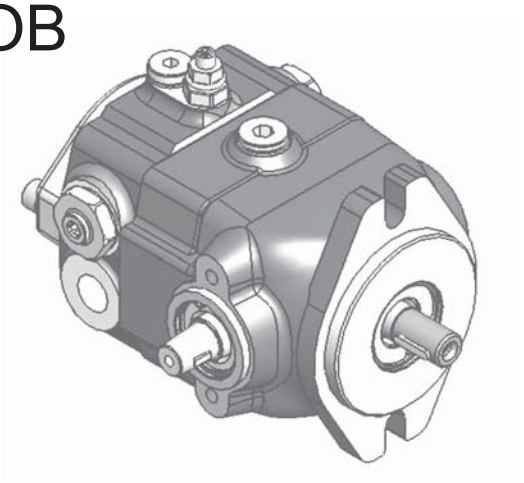


CONTROL DEVICE POSITION - Primary and Secondary Pump

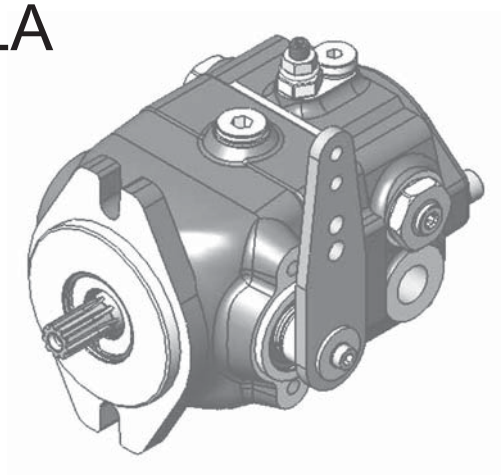
OA



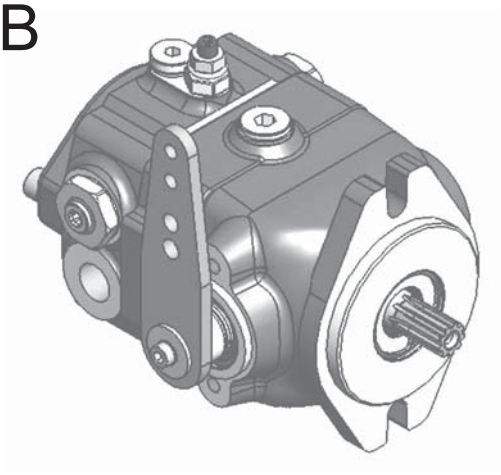
OB



LA



LB



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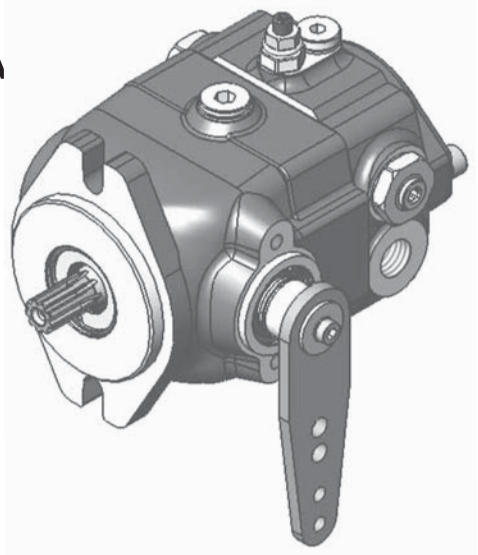

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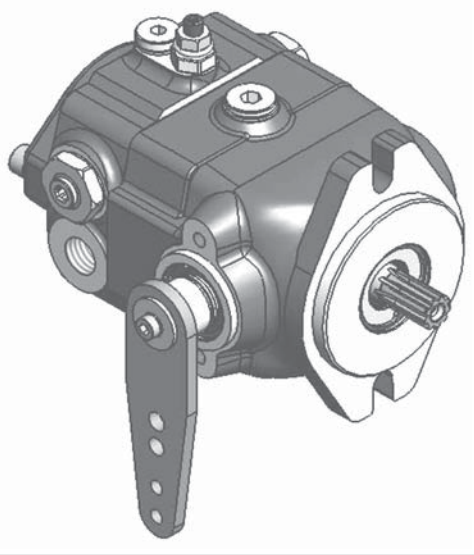
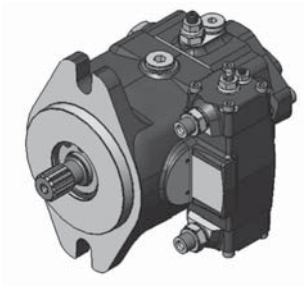
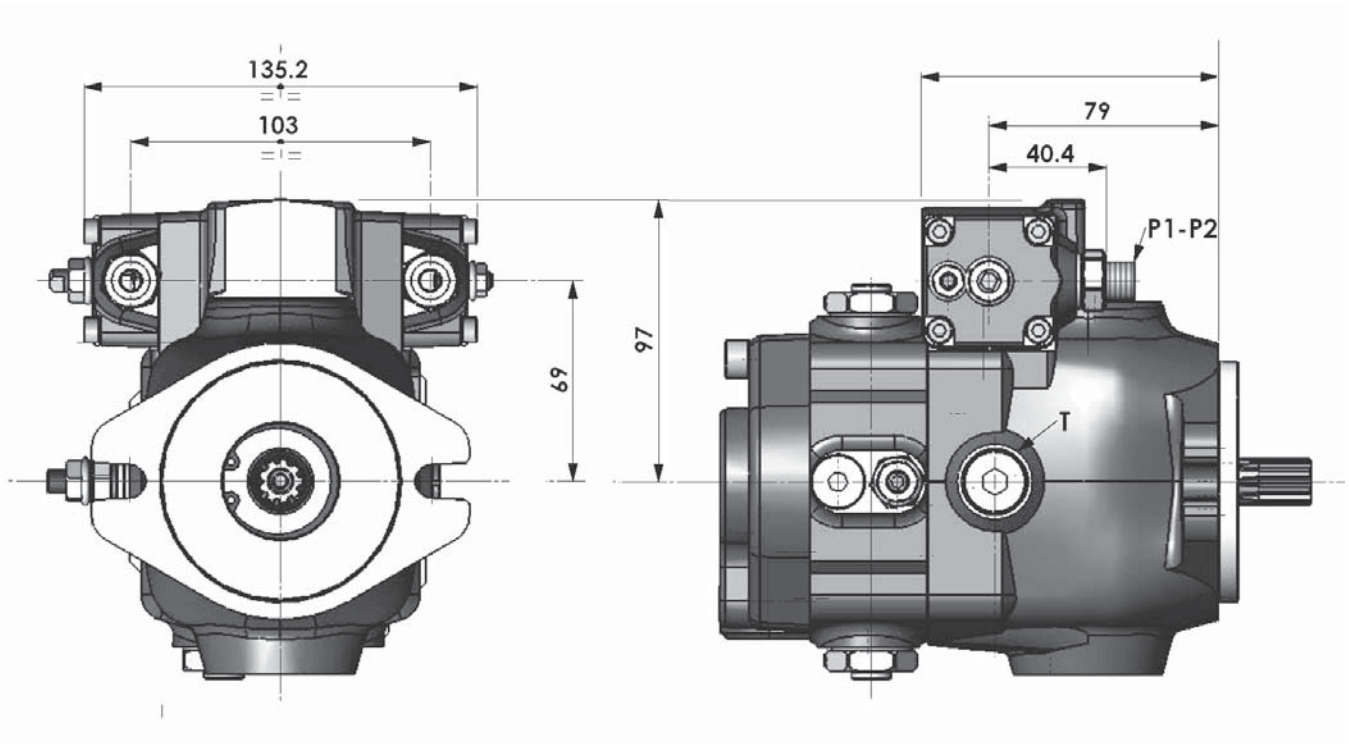


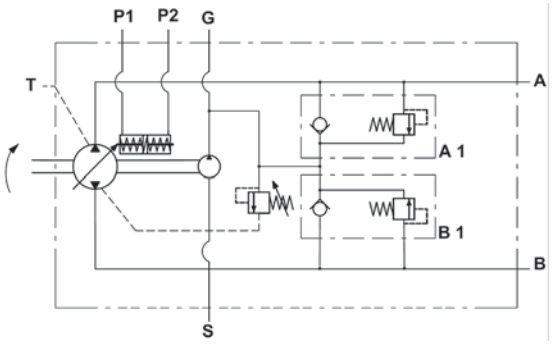
CONTROL DEVICES

Hydraulic Remote Servo-Control SHI



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 reduction valves). The joystick supply can be obtained by taking pressure from the auxiliary pump (G connection). The servo control feedback time can be adjusted by inserting a restricter on the joystick supply line (0,5 ÷ 1,2 mm). The servo control operation curve in both control directions goes from 4 to 18 bar (tolerance ± 5%). The adjustment curve of the hydraulic control system has to be wider (4 ÷ 20 bar).





Hydraulic Diagram

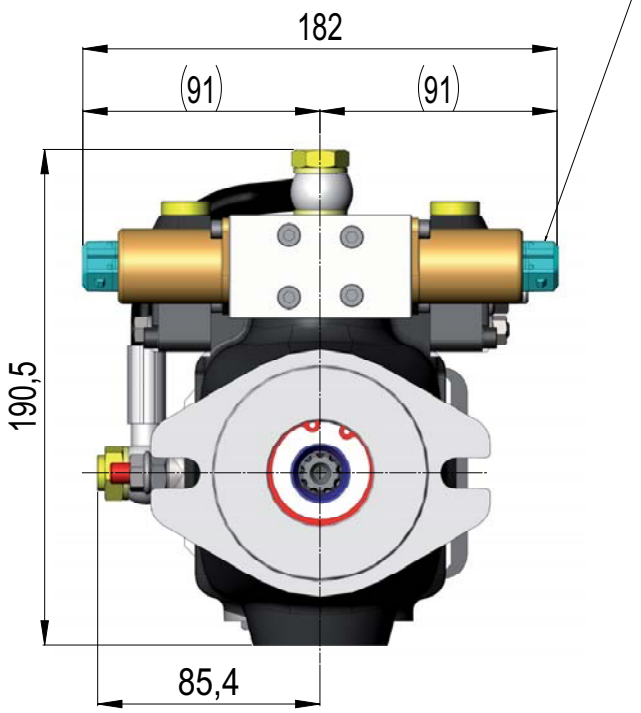
Pipe connection		
A - B	Main ports	1/2" BSP
T	Drain	3/8" BSP
S	Suction	1/2" BSP
G	Charge system	1/4" BSP
P1 - P2	Servo-control ports	1/4" BSP

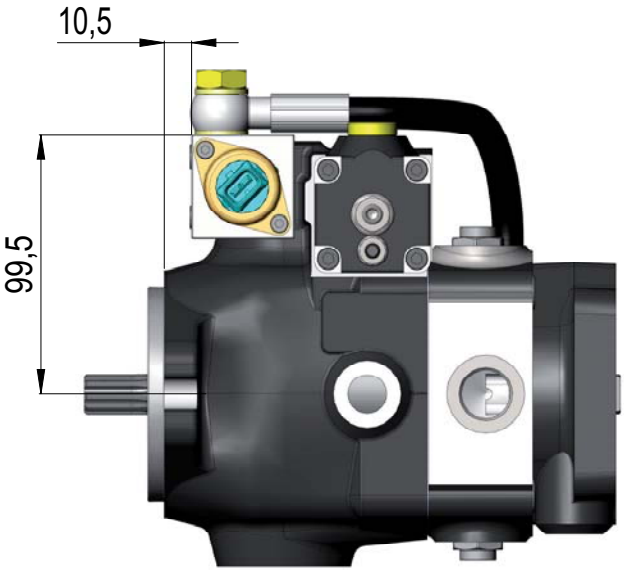
CONTROL DEVICES

Electric Remote Servo-Control **SEI**

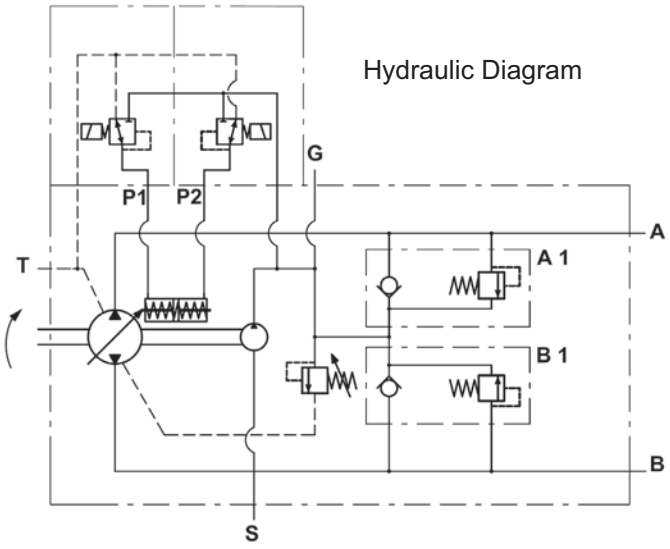
SEI1.3 (12V DC)
SEI2.3 (24V DC)

The pump displacement variation is obtained by an electric signal, which varies from 0 to 750 mA (supply voltage 24V DC) or from 0 to 1500 mA (supply voltage 12V DC).

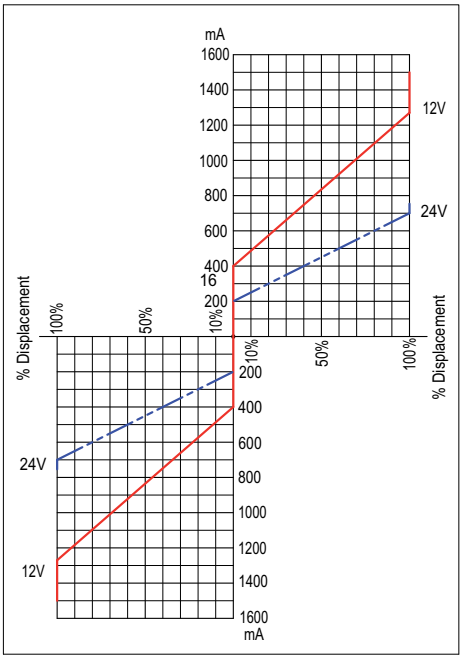




Hydraulic Diagram



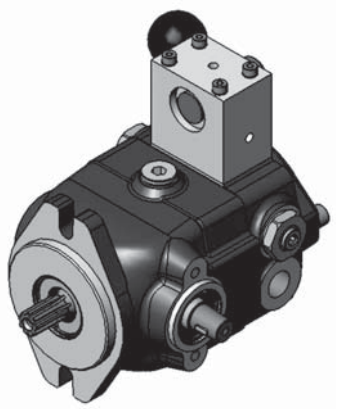
CURRENT-DISPLACEMENT GRAFIC

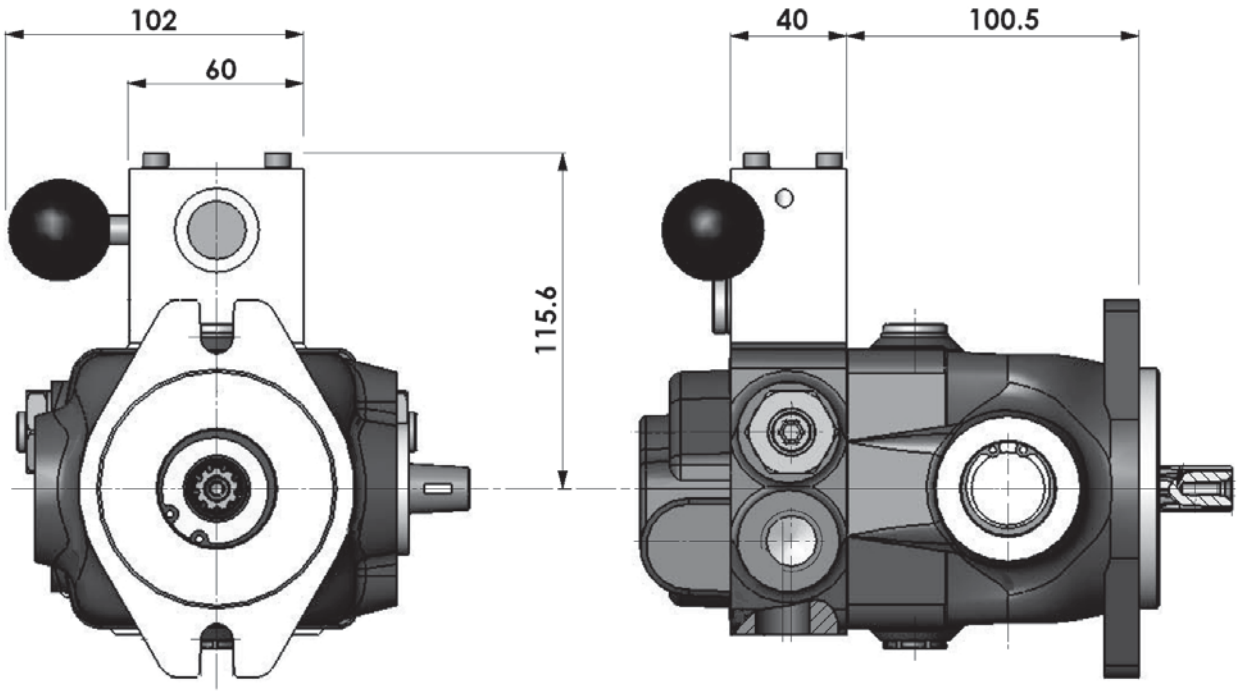


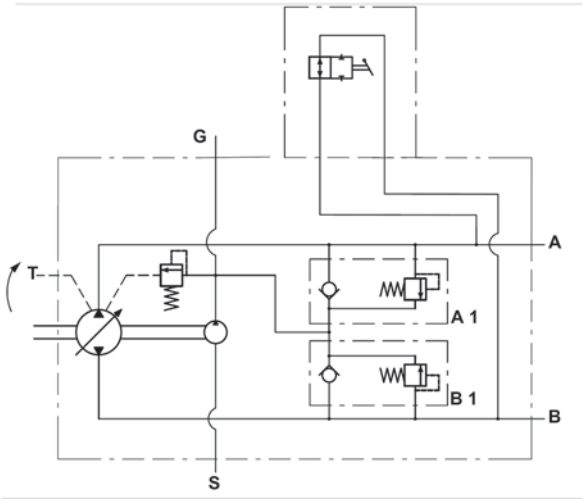
OPTIONAL

Lever By-pass LB

Hand drive valve to join the A and B ports
to allow the free-wheeling of the motor.





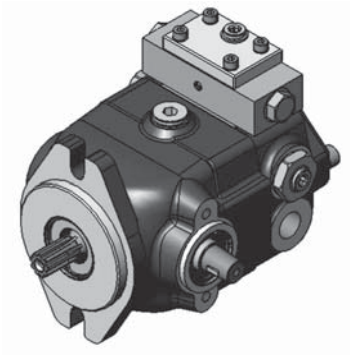


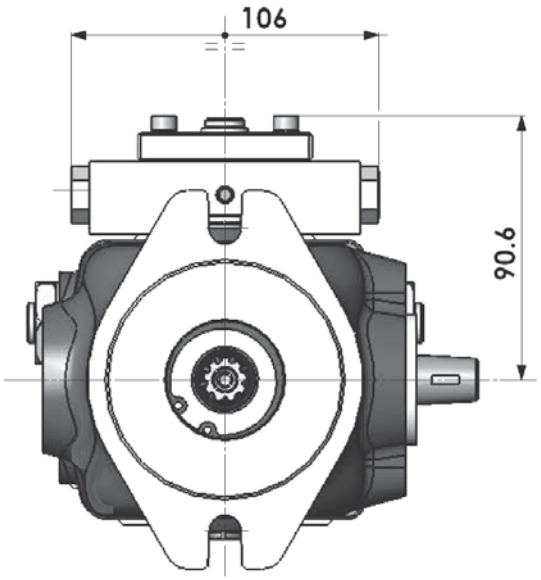
Hydraulic Diagram

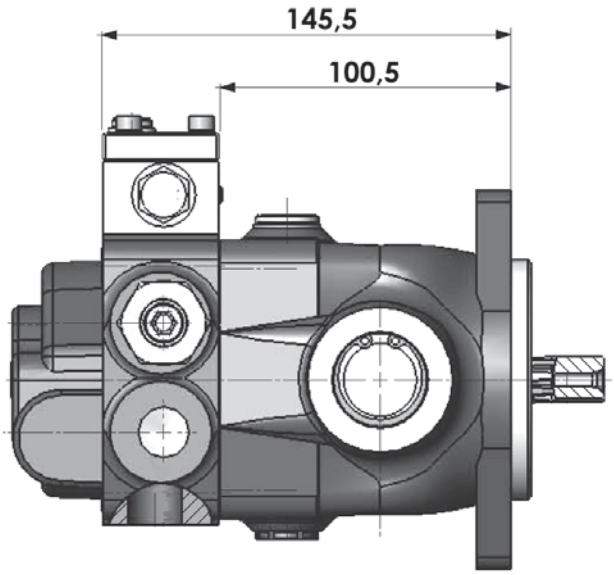
OPTIONAL

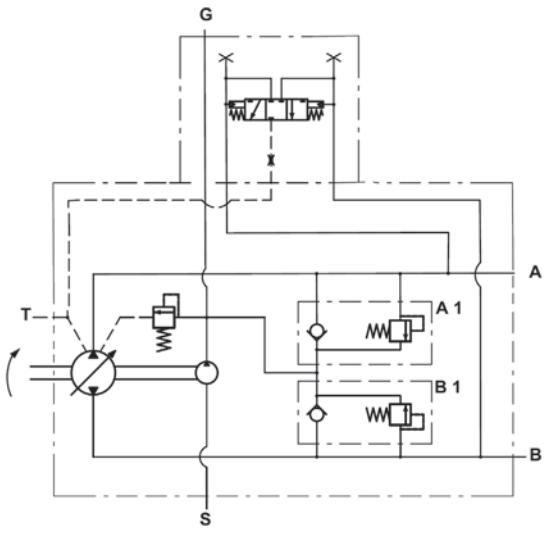
Purge Valve VS

Subtracting warm oil from the closed circuit, the purge valve allows the flow of cool fluid from the charge system.
Oil flow for cooling = 1 lt/min. at 1500 n/min.





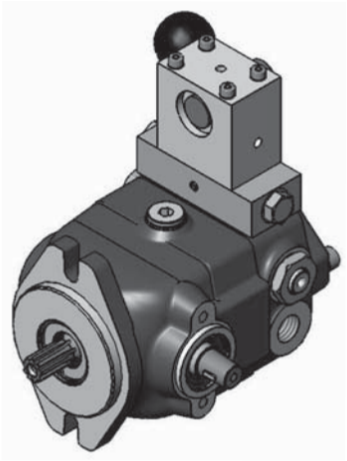




Hydraulic Diagram

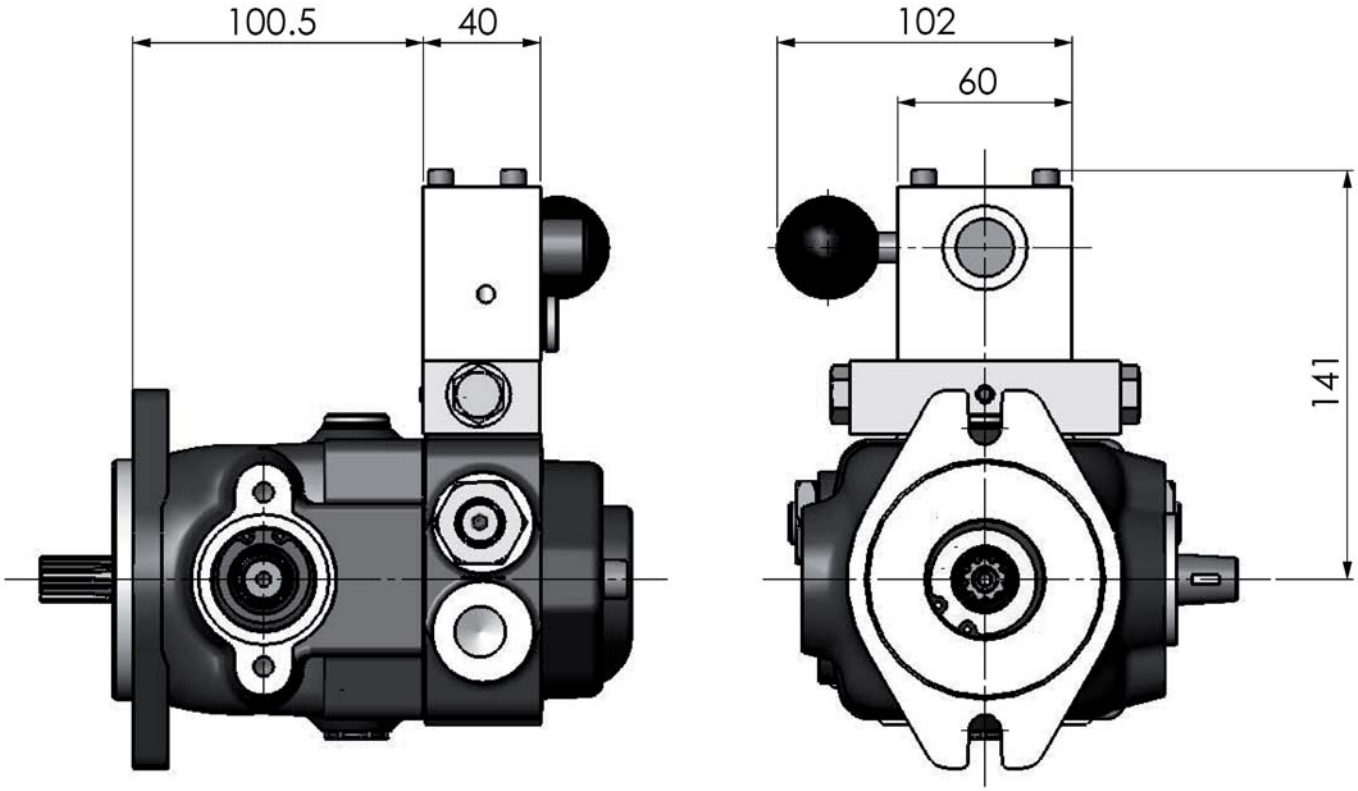
OPTIONAL

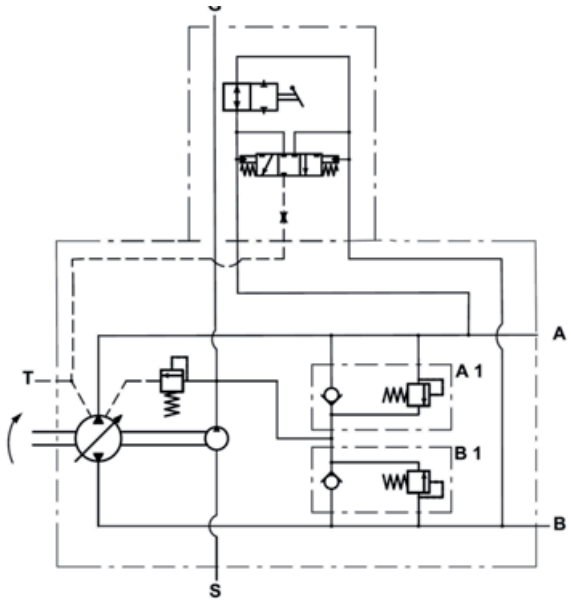
Purge Valve + Lever By-pass VSLB



The Hand drive valve join the A and B ports
to allow the free-wheeling of the motor.

The purge valve,subtracting warm oil from the closed circuit,
allows the flow of cool fluid from the charge system.
Oil flow for cooling = 1 lt/min. at 1500 n/min.





Hydraulic Diagram

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.

0 - Pump series

1000 = TPV pump 1000

1 - Pump model

TPV = Closed loop circuit single pump 8-9
TPV-T = Closed loop circuit tandem pump 10
TPV-T3 = Closed loop circuit triple pump 12
TPVS* = Closed loop circuit special pump upon customer request

2 - Pump displacement (primary) 6

6-7 = 7,4 cm^3/n **8-7** = 8,9 cm^3/n **9-7** = 9,6 cm^3/n **11-7** = 11,2 cm^3/n
12-7 = 12,8 cm^3/n **13-7** = 13,6 cm^3/n **15-9** = 15 cm^3/n **17-9** = 17,1 cm^3/n
18-9 = 18,2 cm^3/n **19-9** = 19,4 cm^3/n **21-9** = 21,15 cm^3/n

3 - Tandem pump displacement (secondary) 6

6-7 = 7,4 cm^3/n **8-7** = 8,9 cm^3/n **9-7** = 9,6 cm^3/n **11-7** = 11,2 cm^3/n
12-7 = 12,8 cm^3/n **13-7** = 13,6 cm^3/n **15-9** = 15 cm^3/n **17-9** = 17,1 cm^3/n
18-9 = 18,2 cm^3/n **19-9** = 19,4 cm^3/n **21-9** = 21,15 cm^3/n

4 - Rotation

CR = Clockwise Rotation (right)
CC = Counter-clockwise Rotation (left)

5 - Shaft (mounting side) 15

SS2 = Splined shaft Z 9 - 16 / 32 D.P.
PS1 = Parallel keyed shaft 15,875 mm. diam.
PS3 = Parallel keyed shaft 18 mm. diam. with increased bearing for external radial load
SS3 = Splined shaft Z 13 - 16 / 32 D.P. (only available with remote hydraulic servo-control with SAE B flange)

6 - Mounting flange 14

F1 = SAE A 2 holes - pilot diam. 82,5 mm.
F2 = SAE B 2 holes - pilot diam. 101,6 mm. (only available with remote hydraulic servo-control SHI and shaft SS3)

7 - Controls

DM = Direct mechanical (without control lever) 19
BC = Tapered bush 19
LC = Control lever 20
DMS = Control lever with return spring (standard spring diameter 3,6 mm.) 21
DMS(30) = Control lever with return spring (spring diameter 3 mm.) 21
DMS(33) = Control lever with return spring (spring diameter 3,3 mm.) 21
DMS(40) = Control lever with return spring (spring diameter 4 mm.) 21
DMS(50) = Control lever with return spring (spring diameter 5 mm.) 21
SHI = Integrated Hydraulic remote servo control 23
SEI1.3 = Integrated Electric remote servo control 12 V DC 24
SEI2.3 = Integrated Electric remote servo control 24 V DC 24

8 - Control devices position primary pump 22

OA = Position A (without lever)
OB = Position B (without lever)
LA = Position A-left
RA = Position A-right
LB = Position B-left
RB = Position B-right

ORDER CODE (continued)

Pag.

9 - Control devices position secondary pump — 22

OA = Position A (without lever)
OB = Position B (without lever)
LA = Position A-left
RA = Position A-right
LB = Position B-left
RB = Position B-right

10 - Relief valve pressure setting *

10 = 100 bar	**15** = 150 bar	**18** = 180 bar
20 = 200 bar	**25** = 250 bar	**30** = 300 bar

* The rated pressure value are changing with different speed.

11 - Charge pump

00 = Without charge pump
01 = Without charge pump compact version (only for rear pump flange B1 - B2)
06 = Standard pump C-B1-B2 (3,9 cm^3/n) SAE A (4,7 cm^3/n)
Standard setting: 6 bar (Mechanical Control) or 20 bar (Hydraulic/Electric Servo Control) at 1000 n/min.
06(xx) = Other pressure settings on request (between 8 and 30 bar), contact our technical department

12 - Rear pump connection option

C = Closed cover (without rear fitting)
B1 = German standard pump group 1 mounting — 16-17
B2 = German standard pump group 2 mounting — 16-17
SA-R = SAE A - 2 holes mounting flange (female shaft) — 18

13 - Gear pump displacement **

000 = Without pump

Group 1	**112** = 1,2 cm^3/n	**117** = 1,7 cm^3/n	**122** = 2,1 cm^3/n	**126** = 2,6 cm^3/n
	132 = 3,1 cm^3/n	**138** = 3,6 cm^3/n	**143** = 4,2 cm^3/n	**149** = 4,9 cm^3/n
	159 = 5,9 cm^3/n	**165** = 6,5 cm^3/n	**178** = 7,5 cm^3/n	
Group 2	**204** = 4,2 cm^3/n	**206** = 6,0 cm^3/n	**209** = 8,4 cm^3/n	**211** = 10,8 cm^3/n
	214 = 14,4 cm^3/n	**217** = 16,8 cm^3/n	**219** = 19,2 cm^3/n	**222** = 22,8 cm^3/n
	226 = 26,2 cm^3/n			

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

14 - Optional

00 = Without optional
LB = Lever by-pass — 25
VS = Purge valve — 26
VSLB = Lever by-pass + Purge Valve — 27
SB = Screw by-pass (compact version only)
SP = Multiple pump support
FB = Conversion flange from SAE A to SAE B — 14
ST = Conversion shaft 9 teeth to 13 teeth — 14
FBST = Conversion flange from SAE A to SAE B + Conversion shaft 9 teeth to 13 teeth — 14
PR = Full resistant swash plate bearing
RG = Servo control special devices

ACCESSORIES

Hydraulic Gear Pump German Standard B1
Hydraulic Gear Pump German Standard B2

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

Hydraulic Remote Servo Controls

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

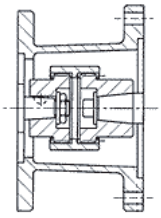
Electric Remote Servo Controls

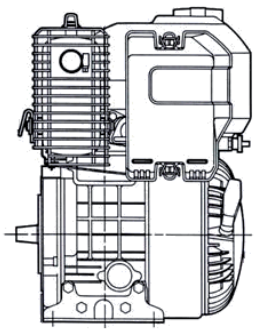
For more detailed information ask for catalogue HT 150 A.....

Flanges and Couplings for Gasoline and Diesel engines

GASOLINE OR DIESEL ENGINES

FLANGES AND COUPLINGS





For more detailed information ask for specific catalogue

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.

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