Part number:

HYDROMA
HYDRAULICKÉ SYSTÉMY

HIDROMA SISTEMS
UKŁADY HYDRAULICZNE

HYDROMA
ГИДРАВЛИЧЕСКИЕ СИСТЕМЫ

MANUFACTURING
THE PRODUCTION LINE OF HANSA-TMP

HT 16 / M / 403 / 1110 / E

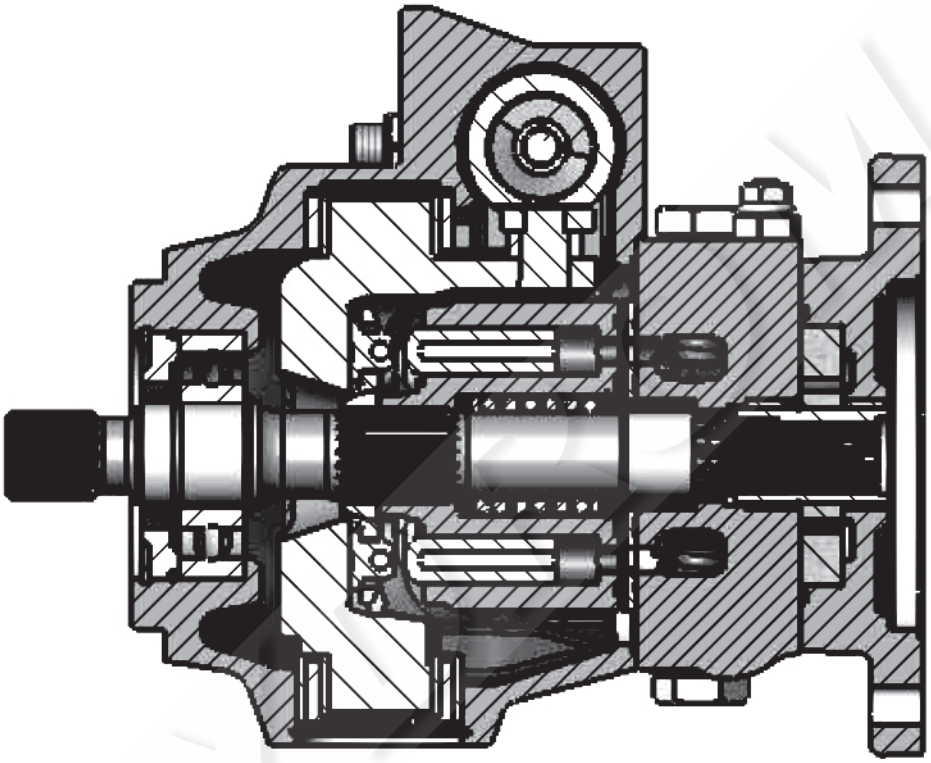
Variable Displacement Closed Loop System Axial Piston Pump

TPV 4200

CONTENTS

DESCRIPTION

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



Features:

- Silent running
- High rotation speed
- Compact design
- Suitable for multiple pump assembly
- Easy maintenance
- Built-in pressure relief valves
- Optional: Electro-hydraulic constant power remote servo-control with or without automotive and special versions

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

Installation Instruction

- During the assembly, check that pump is in line and concentric with the drive shaft sleeve to prevent overloading of the pump shaft bearing.
- Clean carefully all tanks and pipes internally before assembly.
- The pipe internal diameters 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.

Control Devices

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

- Hydraulic Remote Servo-Control **SHI**
- Electro-Hydraulic Remote Servo-Control **SEI 1.1** (12 V dc)
- Electro-Hydraulic Remote Servo-Control **SEI 2.1** (24 V dc)

Optional

- Full resistant front bearing **RB**
- Screw By-pass **SB**
- Multiple pump support **SP**

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 cartridge is clogged or when the system works in a heavily polluted environment.

SPECIFICATIONS

Pump Model			**TPV 32**	**TPV 38**	**TPV 45**	**TPV 50**
Theorical max. displacement	$V_{max.}$	cm^3/min.	32	38	45	50
Flow rating(1)	Q	l/min.	115	137	162	180
Power rating(1)	W	kW	48	57	67,5	75
Charge pump displacement	V_{bp}	cm^3/n	14			
Rated pressure	$P_{nom.}$	bar	280			
Max. pressure	$P_{max.}$	bar	320			
Charge pressure(2)	P_{bp}	bar	15-26			
Absolute suction pressure(3)	P_s	bar	>= 0,8			
Cold start absolute suction pressure	P_{s1}	bar	>= 0,5			
Max. case pressure	P_{case}	bar	1,5			
Moment of inertia	J	kgm^2	0,0029			
Minimum speed	$n_{min.}$	n/min.	700			
Rated speed	$n_{max-cont.}$	n/min.	3.600			
Max. speed	$n_{max-int.}$	n/min.	3.900			
Max. fluid temperature	T	°C	80			
Fluid viscosity	v	mm^2/sec.	15-35			
Fluid contamination			18/15 according ISO 4406 (Class NAS 9)			
Mass (single pump with hydr-servo)	m	kg	24			
Mass (tandem pump with hydr-servo)	m	kg	49,5			

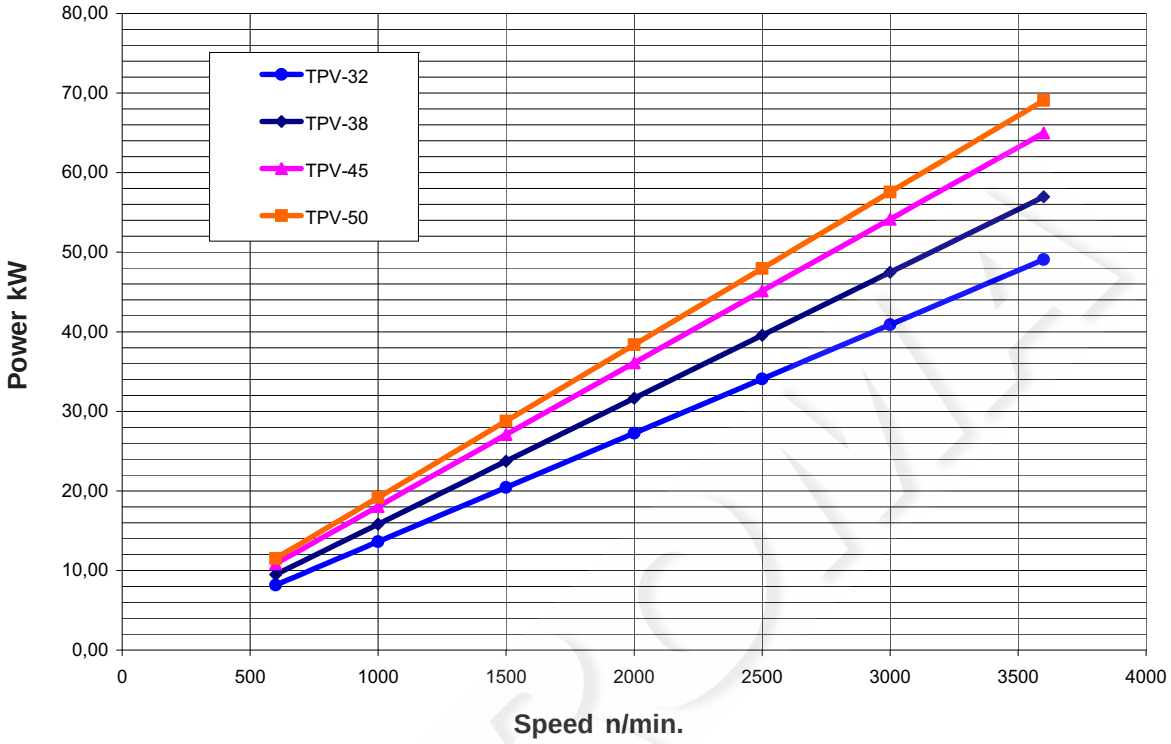
(1) $[V_{max.}\text{-}n_{max.}]$

(2) 1500 n/min.

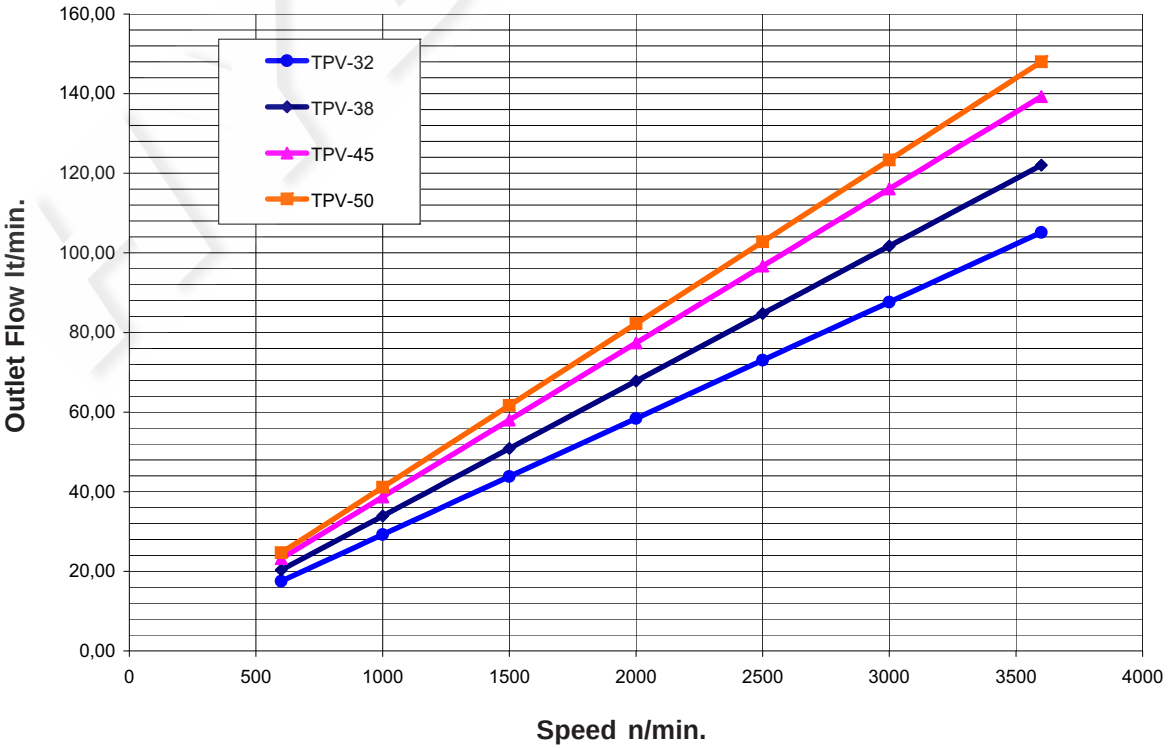
(3) v <= 30 mm^2/s

PERFORMANCE (Indicative data)

Power at 280 bar (max. displacement)

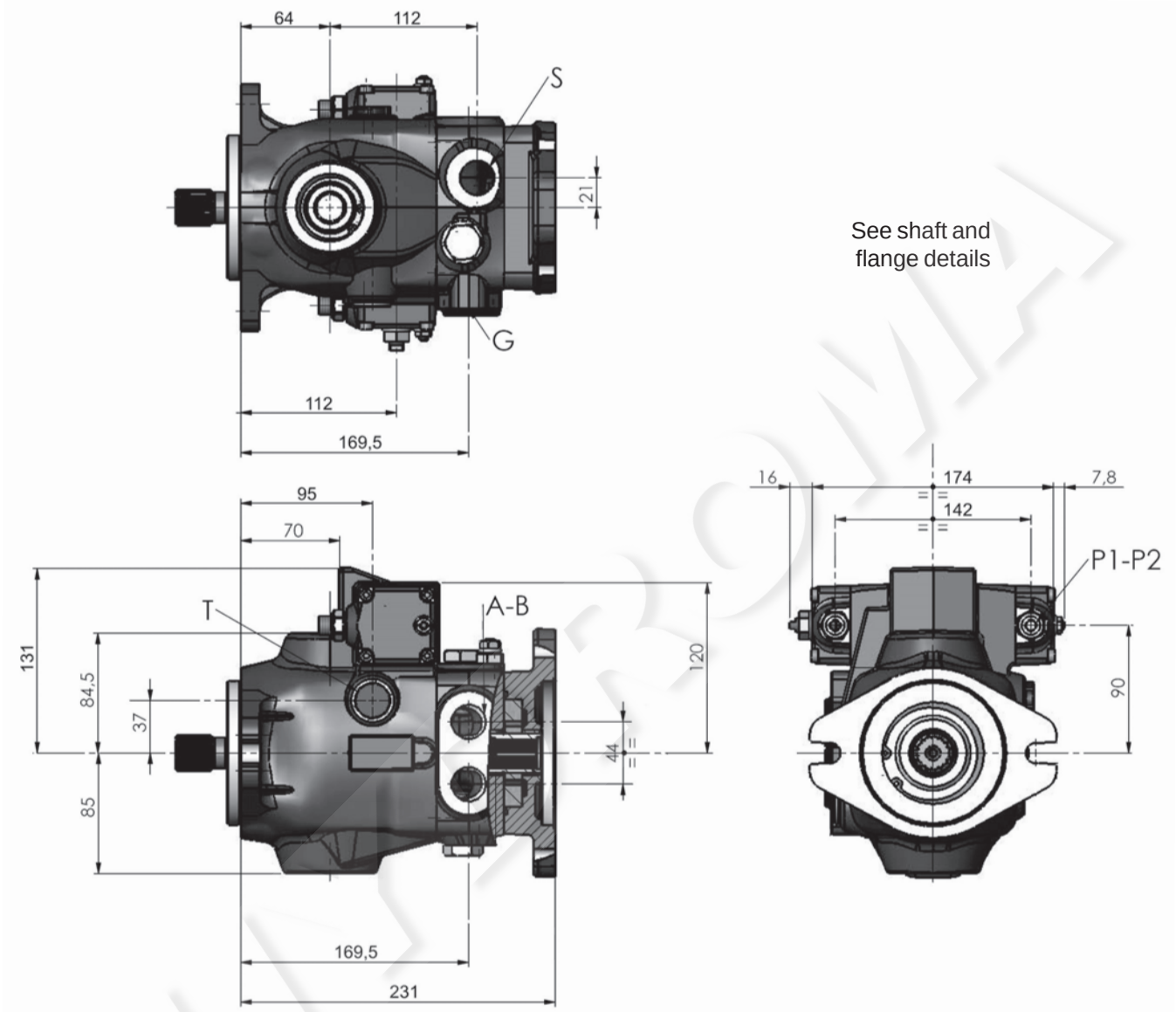


Outlet Flow at 280 bar (max. displacement)



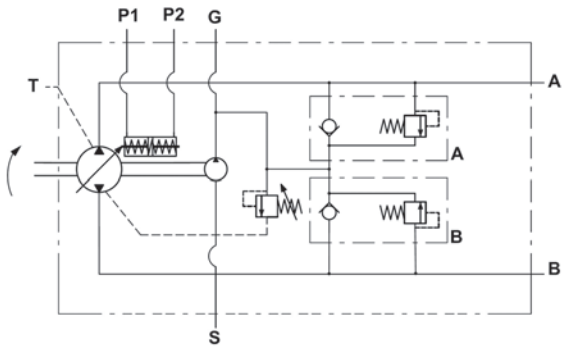
SINGLE PUMP - Hydraulic Remote Servo-Control

INSTALLATION DRAWING



See shaft and flange details

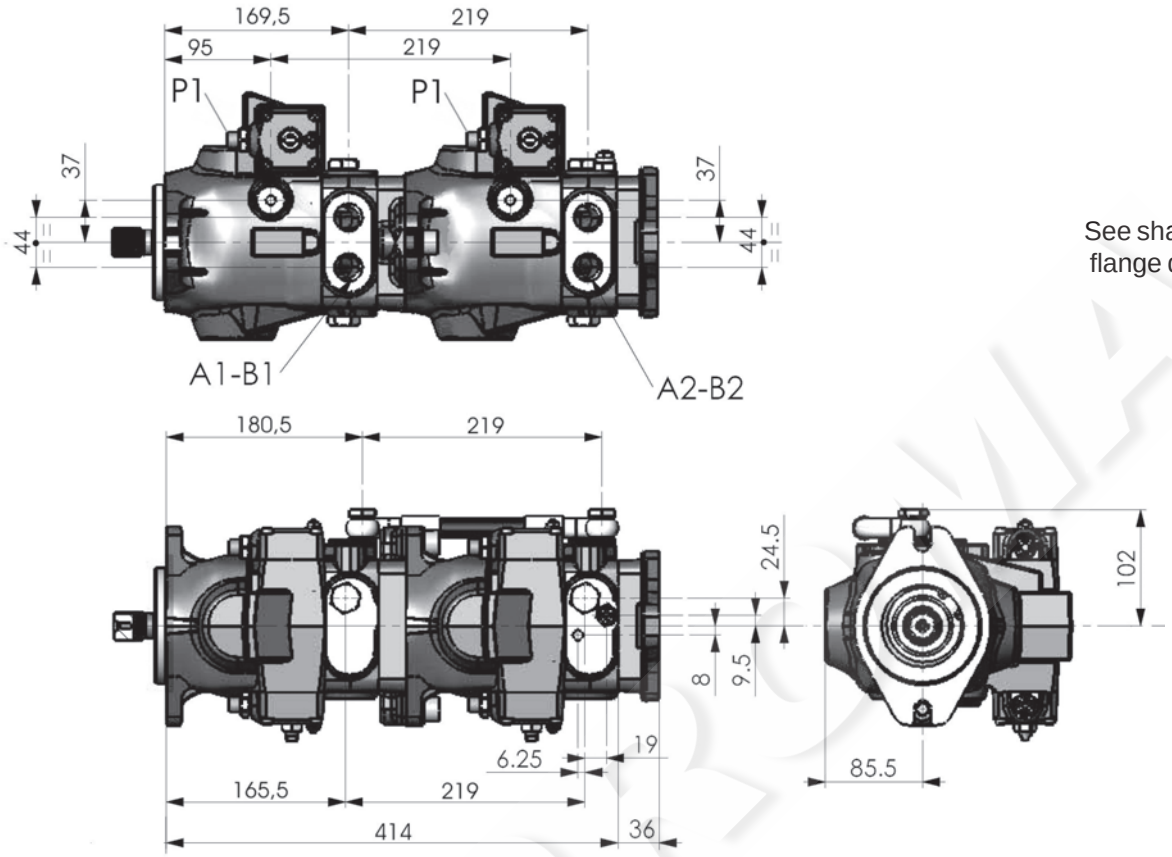
Hydraulic diagram



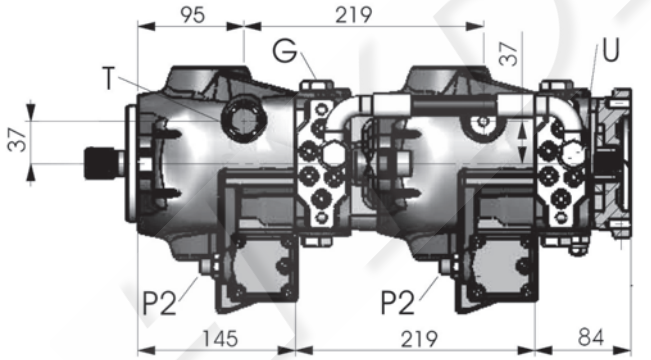
TPV 4200 CONNECTIONS		
A-B	SERVICES	3/4" BSP
T	DRAIN	1/2" BSP
S	SUCTION	3/4" BSP
G	CHARGE SYSTEM	1/4" BSP
P1-P2	SERVO CONTROL PORTS	1/4" BSP

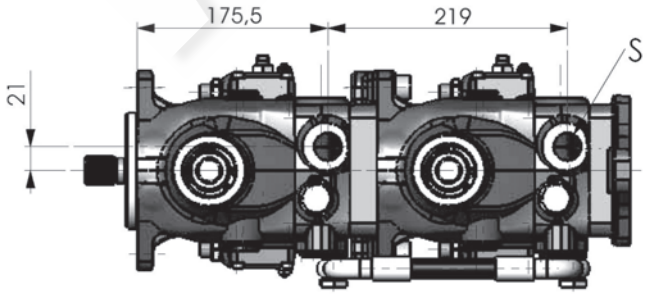
TANDEM PUMP - Hydraulic Remote Servo-Control

INSTALLATION DRAWING



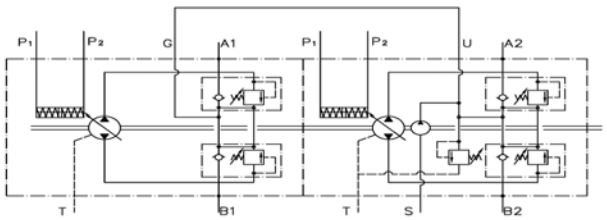
See shaft and flange details





TPVT 4200 CONNECTIONS		
A1-B1	SERVICES	3/4" BSP
A2-B2	SERVICES	3/4" BSP
T	DRAIN	1/2" BSP
S	SUCTION	3/4" BSP
G	CHARGE SYSTEM	1/4" BSP
U	GAUGE PORTS	1/8" BSP
P1-P2	SERVO CONTROL PORTS	1/4" BSP

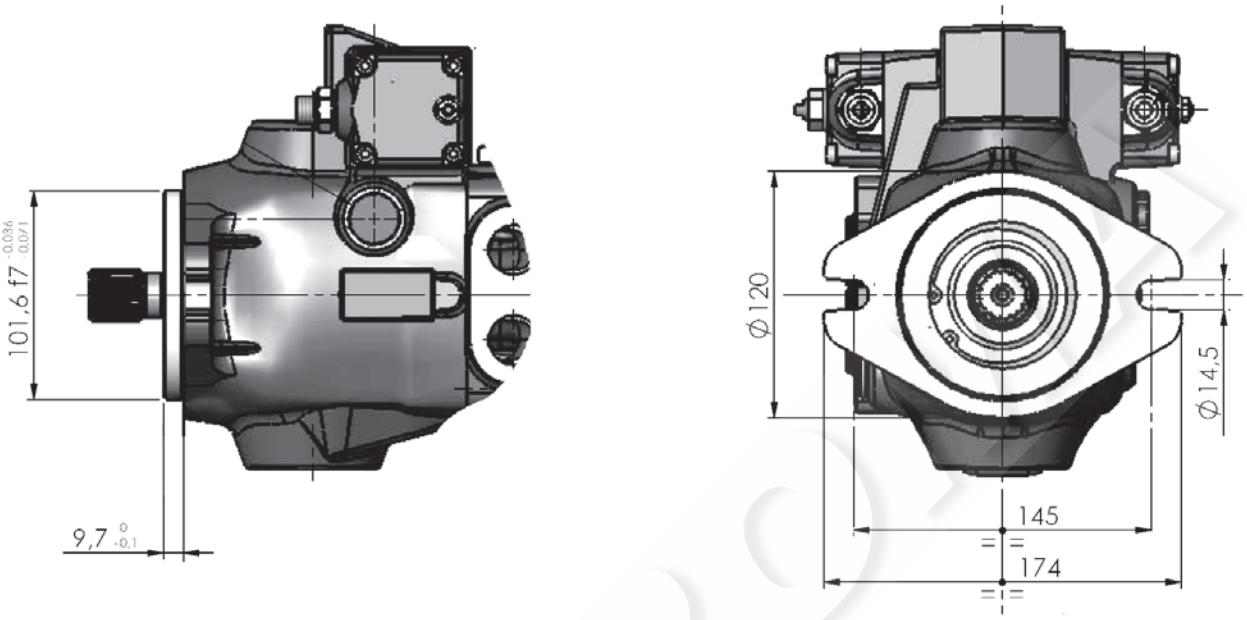
Hydraulic diagram



Mounting Flange and Shaft Options

FLANGES

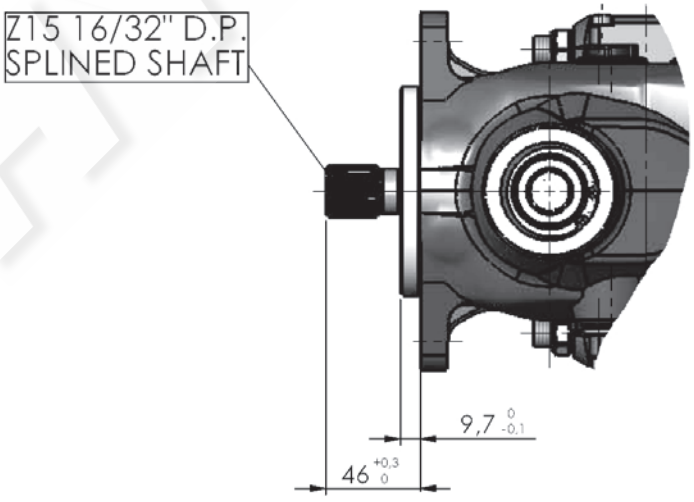
SAE B - 2 holes flange F2



SHAFT

Splined shaft Z = 15 SS5

Max. torque = 360 Nm

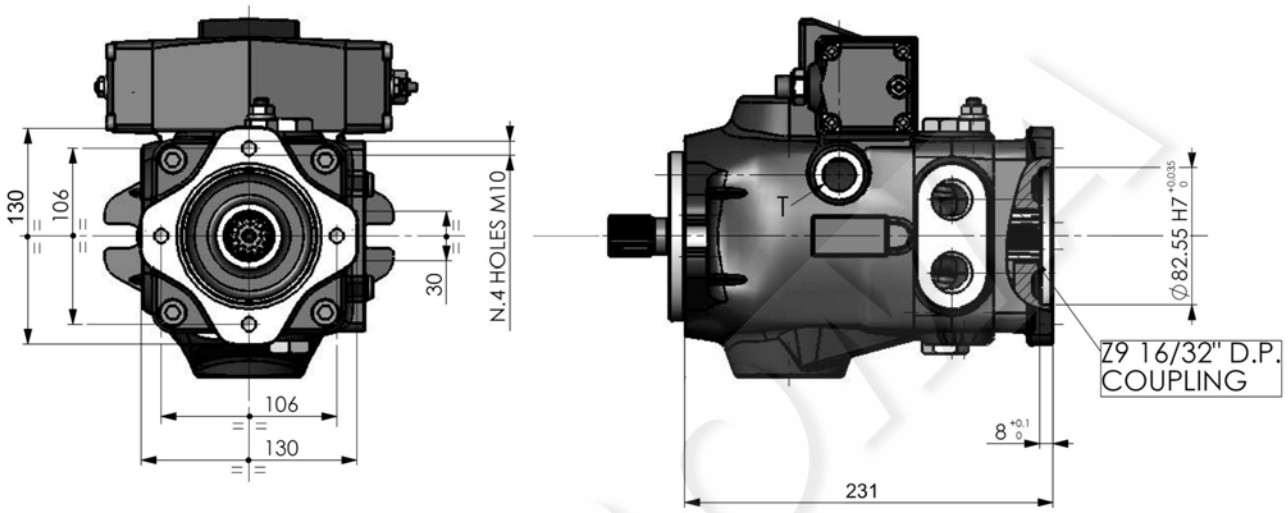


Attention: for the application of multiple pumps the total absorbed torque must not exceed the indicated value.

REAR PUMP FLANGE CONNECTIONS
(Pump with Hydraulic Remote Servo-Control)

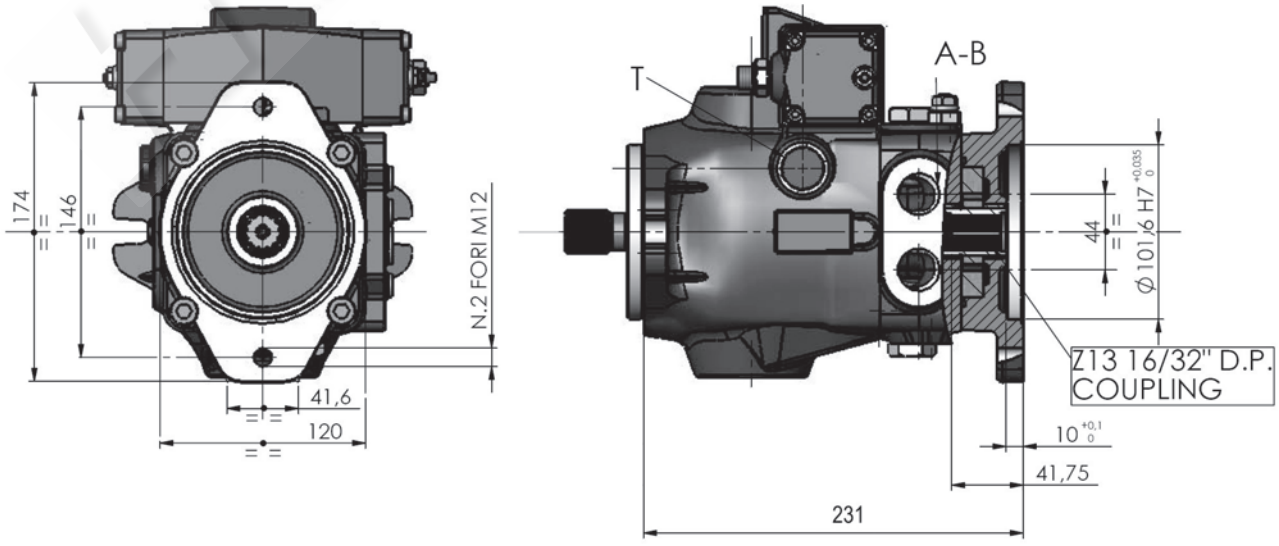
SAE A - 4 holes SA

Max. torque = 80 Nm



SAE B - 2 holes SB

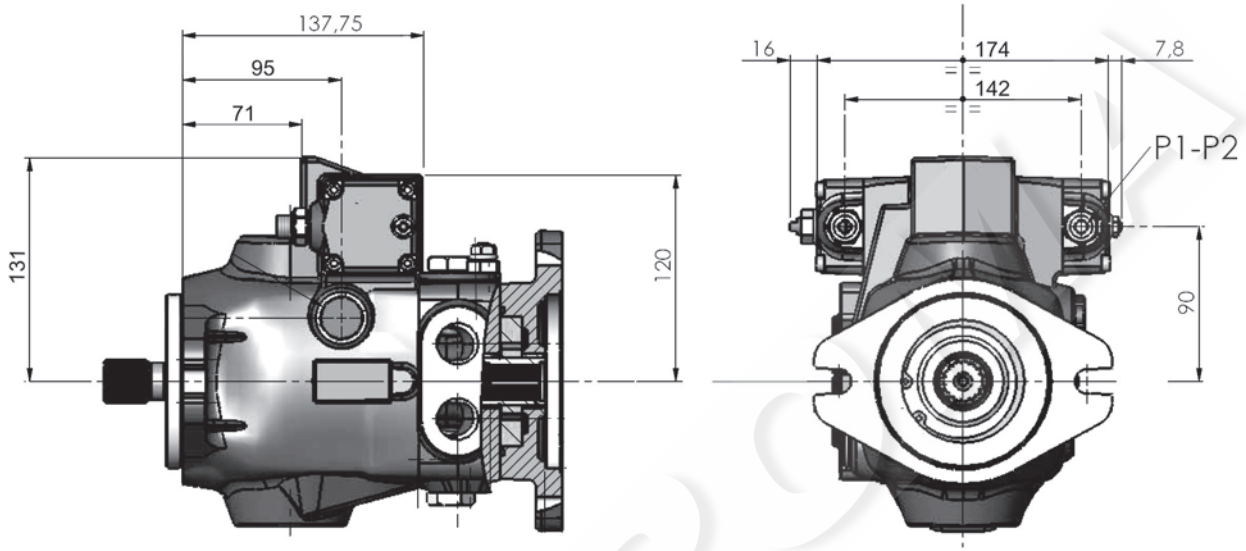
Max. torque = 230 Nm



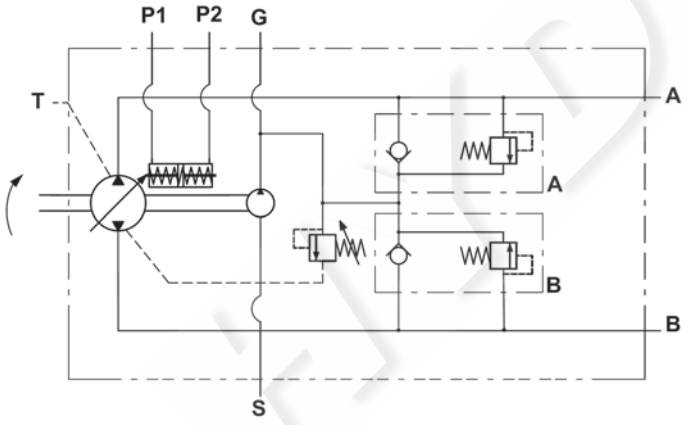
CONTROL DEVICES

Hydraulic Remote Servo-Control SHI

The displacement pump variation is obtained by adjusting the pressure on the P1 and P2 servo control connections by means of a hydraulic proportional joystick (containing pressure reducing valves).
The servo control supply can be obtained by taking pressure from the charge pump (G connection).
The servo control return time can be adjusted by inserting a restrictor on the joystick supply line.
The servo control operation curve in both control directions goes from 10 to 25 bar (tollerance +- 5%)
The adjustement curve of the hydraulic joystick has to be (10-25 bar) plus with final step.



Hydraulic diagram



TPV 4200 CONNECTIONS		
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P1-P2	SERVO CONTROL PORTS	1/4" BSP

Hydraulic Remote Servo-Control Position

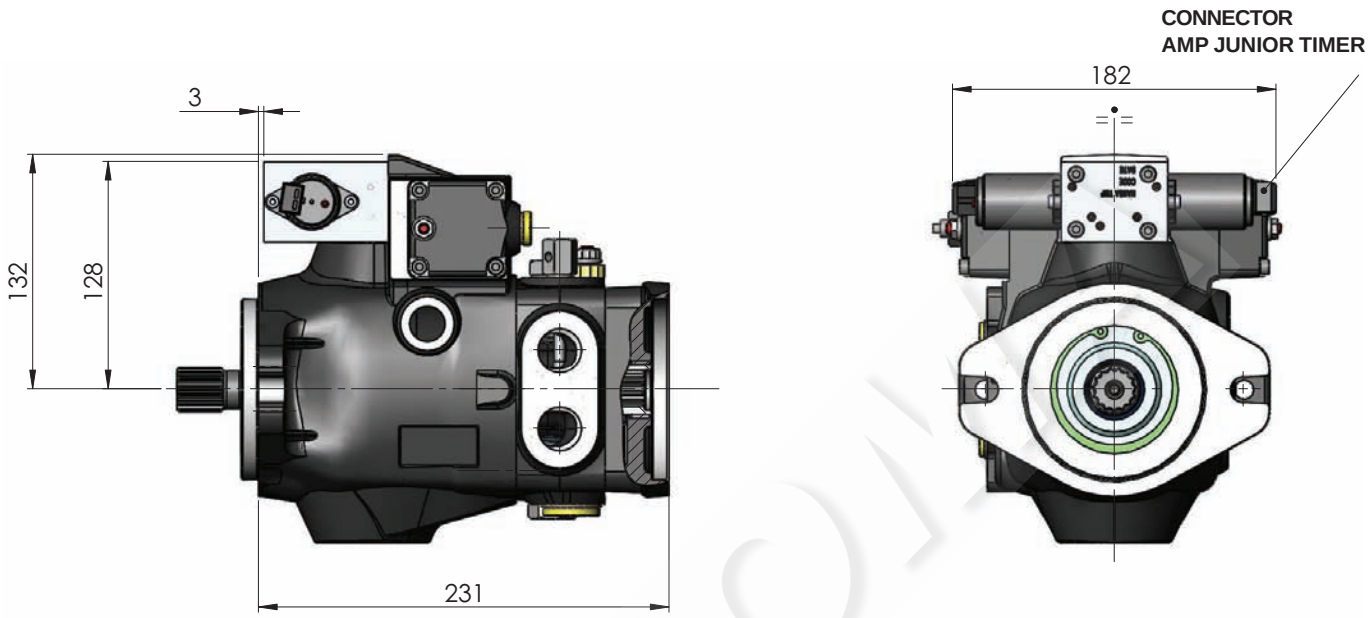
OA

OB

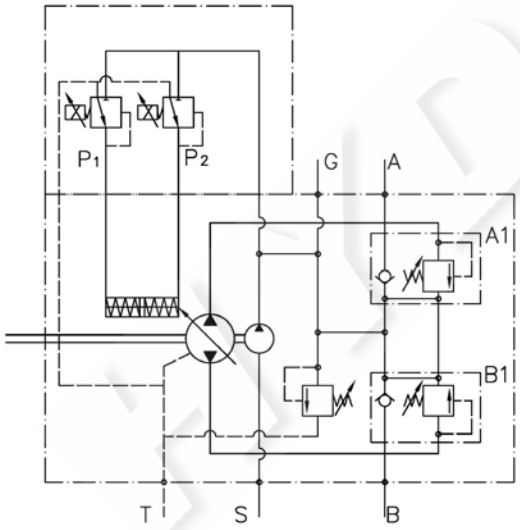
CONTROL DEVICES

Electro-Hydraulic Remote Servo-Control SEI...

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



Hydraulic diagram



Electric characteristics

SPECIFICATIONS	
Max. pressure	35 bar
Sealing	NBR
Available voltage	12 - 24V DC
Coil resistance	12V 5,0 ± 6% Ω 24V 19,6 ± 6% Ω
Max. current 12V DC	1500 mA
Max. current 24V DC	750 mA
Hysteresis	< 0,5 bar
PWM	100 Hz
Protection index with connector	IP 65

Electro-Hydraulic Remote Servo-Control Position

OA

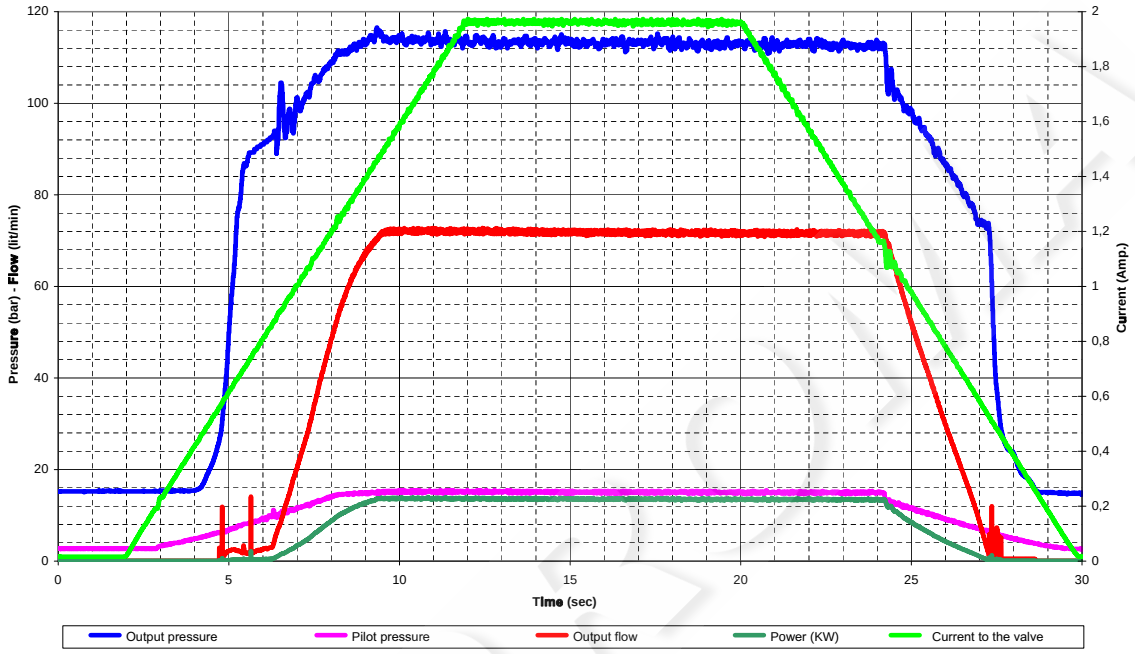
OB (Available on request, please, contact our Technical Department for details).

CONTROL DEVICES

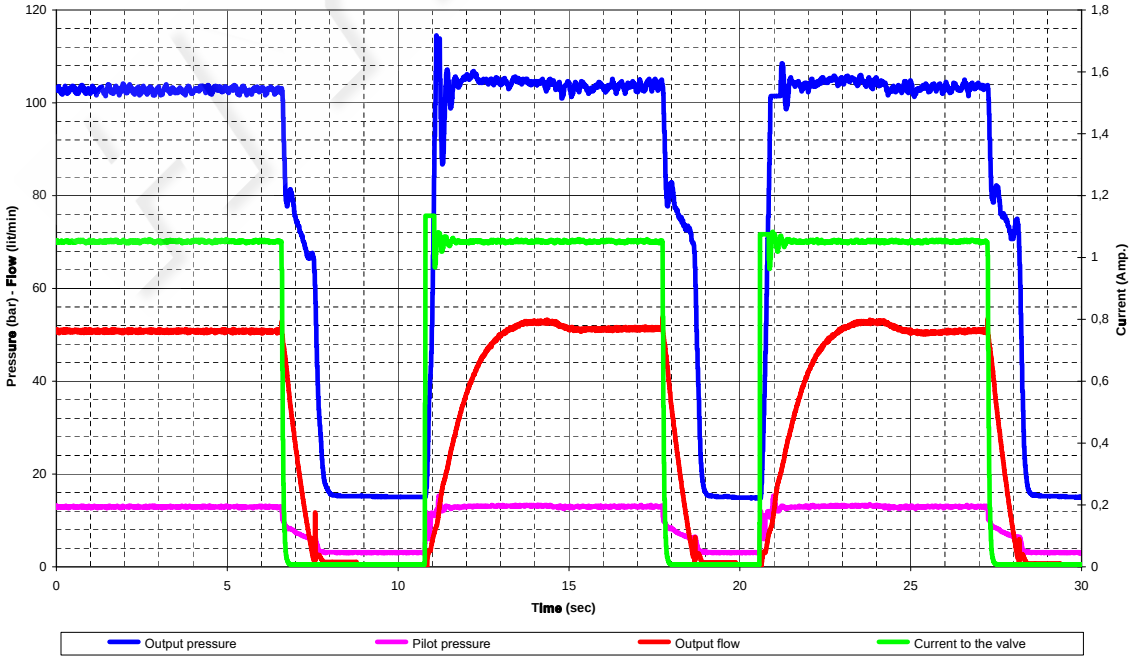
Electro-Hydraulic Remote Servo-Control SEI...

Characteristic Curves

Pressure Reducing Valve Modulation



Reaction Time with On-Off Current



ORDER CODE

4200	TPV	32	-	CR	SS5	F2	SHI	OA	-	15	00	C	000	00
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14

Pag.

0 - Pump series
4200 = TPV pump 4200

1 - Pump model
TPV = Closed loop circuit single pump **8**
TPVT = Closed loop circuit tandem pump **9**

2 - Pump displacement (single or primary pump) **6**
32 = 32 cm^3/n
38 = 38 cm^3/n
45 = 45 cm^3/n
50 = 50 cm^3/n

3 - Tandem pump displacement (secondary pump) **6**
32 = 32 cm^3/n
38 = 38 cm^3/n
45 = 45 cm^3/n
50 = 50 cm^3/n

4 - Pump rotation (shaft end view)
CR = Clockwise Rotation (right)

5 - Shaft (mounting side) **10**
SS5 = Splined shaft Z 15 - 16 / 32 D.P.

6 - Mounting side flange **10**
F2 = SAE B 2 holes - pilot diam. 101,6 mm.

7 - Control devices
SHI = Hydraulic remote servo-control **12**
SEI1.1 = Electro-hydraulic remote servo-control (12 V dc) **13 - 14**
SEI2.1 = Electro-hydraulic remote servo-control (24 V dc) **13 - 14**

8 - Control devices position (single or primary pump) **12 - 13**
OA = Position A
OB = Position B (for SEI... versions available on request, please, contact our technical department for details)

9 - Control devices position (secondary pump) **12 - 13**
OA = Position A
OB = Position B (for SEI... versions available on request, please, contact our technical department for details)

ORDER CODE

Pag.

10 - Relief valve pressure setting

15 = 150 bar
18 = 180 bar
20 = 200 bar
25 = 250 bar
30 = 300 bar
35 = 350 bar

11 - Charge pump

00 = Without charge pump
10 = Standard charge pump 10 cm^3/n - pressure 16 bar (1500 n/min) for single pump
14 = Standard charge pump 14 cm^3/n - pressure 16 bar (1500 n/min) for tandem pump

12 - Rear pump connection option

C = Closed (without rear fitting)
SA = SAE A 4 holes mounting flange (female shaft) **11**
SB = SAE B 2 holes mounting flange (female shaft) **11**

13 - Auxiliary gear pump displacement

000 = Without pump

Group 2 SAE A

S 204 = 4,2 cm^3/n	**S 206** = 6,0 cm^3/n	**S 209** = 8,4 cm^3/n	**S 211** = 10,8 cm^3/n
S 214 = 14,4 cm^3/n	**S 217** = 16,8 cm^3/n	**S 219** = 19,2 cm^3/n	**S 222** = 22,8 cm^3/n
S 226 = 26,2 cm^3/n	**S 230** = 30,0 cm^3/n	**S 240** = 40,0 cm^3/n	

Group 3 SAE B

S 315 = 15,0 cm^3/n	**S 318** = 18,0 cm^3/n	**S 321** = 21,0 cm^3/n	**S 327** = 27,0 cm^3/n
S 332 = 32,0 cm^3/n	**S 338** = 38,0 cm^3/n	**S 343** = 43,0 cm^3/n	**S 347** = 47,0 cm^3/n
S 351 = 51,0 cm^3/n	**S 354** = 54,0 cm^3/n	**S 361** = 61,0 cm^3/n	**S 364** = 64,0 cm^3/n
S 370 = 70,0 cm^3/n	**S 374** = 74,0 cm^3/n	**S 390** = 90,0 cm^3/n	

14 - Optional

00 = Without optional
RB = Full resistant front bearing
SB = Screw by-pass
SP = Multiple pump support

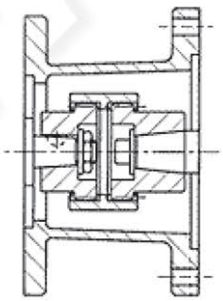
ACCESSORIES

Hydraulic Gear Pump Gr2 - SAE A - 2 Holes SA

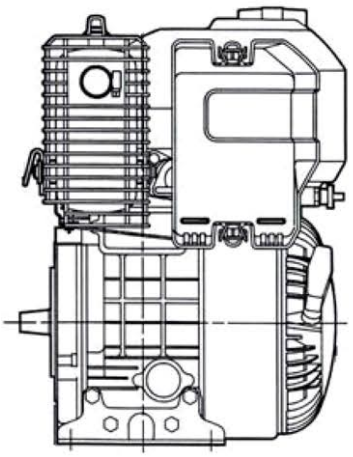
For more detailed information ask for catalogue HT 15 / F / 200 / 0703 / E

Flanges and Couplings for Gasoline and Diesel Engines

FLANGES AND COUPLINGS



GASOLINE OR DIESEL ENGINES



For more detailed information ask for catalogue HT 39 / D / 101 / 1206 / IE