HYDRAULIC PISTON PUMPS

BHR | AXIAL PISTON PUMP
20cm³/rev. to 114cm³/rev.

CTI BHR 2304 - 02

ABER HYDRAULICS S.A.
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General Information

BHR Series is an axial piston pumps with fixed displacement. They are available from 20 to 114 cm³/rev and with a maximum pressure of 350 bar. They can be assembled directly into the PTO.

Contents

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Ordering Code

BHR	25	3	19	EN	0	0
01	02	03	04	05	06	07

Displacement	**20**	**30**	**41**	**51**	**61**	**71**	**82**	**92**	**114**

Series

01		Oil-Hydraulic Axial Pistons Pump	BHR

Piston Diameter

02	Piston Diameter	●	●	●	●	●	●	●	●	●	25

Piston Number

03	3 Pistons	●	●								3
	4 Pistons			●							4
	5 Pistons				●						5
	6 Pistons					●					6
	7 Pistons						●				7
	8 Pistons							●			8
	9 Pistons								●	●	9

Shaft Angle

04	13 degrees	●					●	●	●		13
	16 degrees									●	16
	19 degrees		●	●	●	●					19

Mounting Flanges and Drive Shafts

05	ISO 7653-D Flange Splined Shaft, DIN 5462 B8x32x36 with Ø8 Hole	●	●	●	●	●	●	●	●	●	EN
	4 Bolt Flange Splined Male Shaft, DIN 9611	○	○	○	○	○	○	○	○	○	DA
	4 Bolt Flange Splined Female Shaft, DIN 9611	○	○	○	○	○	○	○	○	○	DI
	4 Bolt Flange Splined Shaft, DIN 5482	○	○	○	○	○	○	○	○	○	DM
	UNI 3 Bolt Flange Splined Shaft, DIN 5463	○	○	○	○	○	○	○	○	○	UNI

Line Ports

06	ISO DIN 228, BSP Threads	●	●	●	●	●	●	●	●	●	0
	Metric	○	○	○	○	○	○	○	○	○	3

Seals

07	NBR Seals	●	●	●	●	●	●	●	●	●	0
	FKM Seals	○	○	○	○	○	○	○	○	○	V

● Standard version ○ Available under request

Other combinations can be made, for more information please consult ABER.

The options with the number 0 does not need to be included in the ordering code.

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Technical Data

BHR_EN		25313	25319	25419	25519	25619	25713	25813	25913	25916
Displacement	$cm^3/rev.$	20.4	30.4	40.6	50.7	60.8	71.4	81.6	91.8	114
Nominal pressure	bar	350	350	350	350	350	350	350	350	300
Max intermittent pressure (1)	bar	400	400	400	400	400	400	400	400	350
Max. rotation speed (2)	rpm	1400	1400	1400	1400	1400	1200	1200	1200	1200
Min. rotation speed	rpm	500	500	500	500	500	500	500	500	500
Mass inertia torque (rotary group)	$kg.m^2$	0.002	0.002	0.002	0.002	0.002	0.006	0.006	0.006	0.006
Weight torque	Nm	12.62	12.62	12.94	13.15	13.36	30.04	29.91	22.78	22.78
Weight	kg	12	12	12.3	12.5	12.7	22.6	22.5	22.4	22.4
Recommended fluids		mineral oils type ISO HM or DIN 51524-2 HLP								
Recommended viscosity range		16 to 36 cSt (mm^2/s) at working temperature								
Limits viscosity range		10 to 400 cSt (mm^2/s)								
Start-up viscosity range, without load		400 to 1500 cSt (mm^2/s)								
Filtration requirements (3)		ISO 4406 18/13								
Ambient temperature		-40°C to +60°C								
Oil temperature		-25°C to +75°C								
Max. housing pressure		3 bar								
Min. inlet pressure		0.80 bar abs								

Data contained in this table are rounded, theoretical and without efficiency or tolerances.
(1) Max. 6 seconds per minute.
(2) These values are valid at an absolute pressure of 1 bar in suction port when operating with a mineral oil at a viscosity of 30 mm^2/s (cSt) and max swash plate angle.
(3) The first filter to be applied into the system must be replaced as soon as it reaches the 50 working hours; after the first replacement, it must be replaced along with the oil or when pressures out of the common are verified in the return.

Characteristic Diagrams

Diagram
Flow - Speed

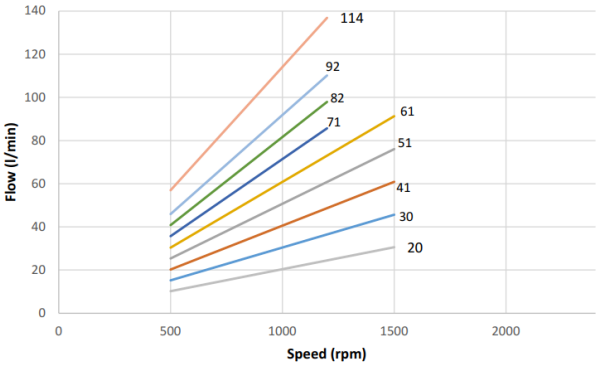
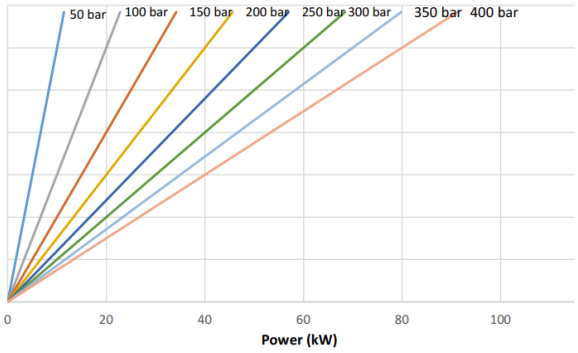


Diagram
Input Power - Flow – Pressure



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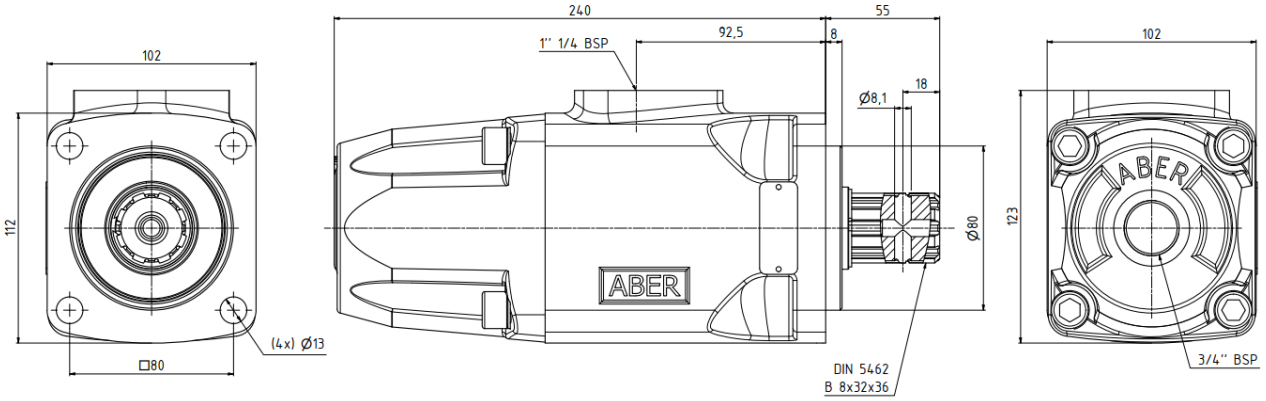
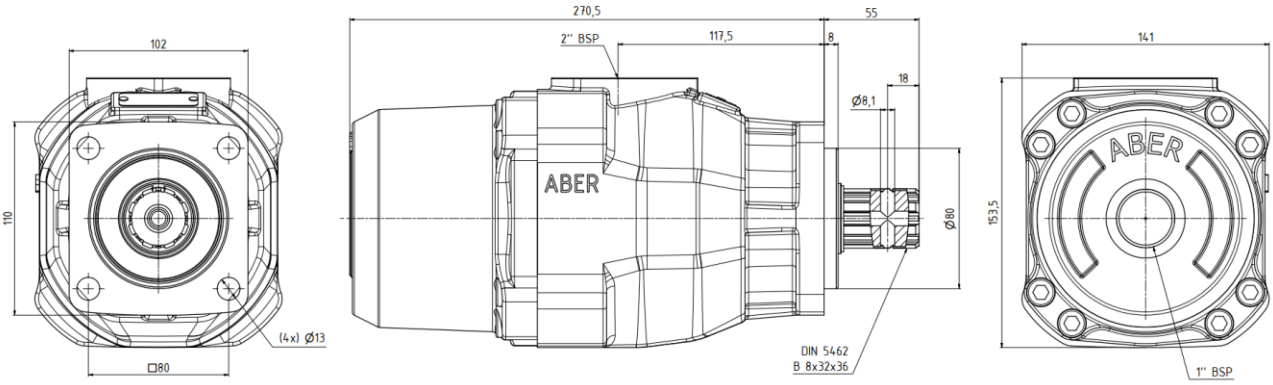
Dimensions

Standard version - Mounting flange ISO 7653-1985, type D direct coupling / Splined drive shaft DIN 5462, B8x32x36 / Line ports ISO DIN 228, G threads (BSP).
Dimensions in mm.

BHR 25313, 25319, 25419, 25519, 25619



BHR 25713, 25813, 25913, 25916



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Pump Selection

To ensure that the PTO will not be overloaded, and gets the correct flow requirements with the speed of the engine chosen, it is important to use a pump with the right capacity. Pump capacity (D), expressed in cm^3/rev., can be calculated using the following formula:

$$D = \frac{Q \times 1000}{N \times Z}$$

D-Pump displacement [cm^3/rev.]
Q-Flow required [l/min]
N-Motor speed
Z-Engine to PTO ratio

In order to not overload the PTO's mechanical units, it is important to calculate the torque and power consumed by the pumps. Torque and power are calculated with the following expressions:

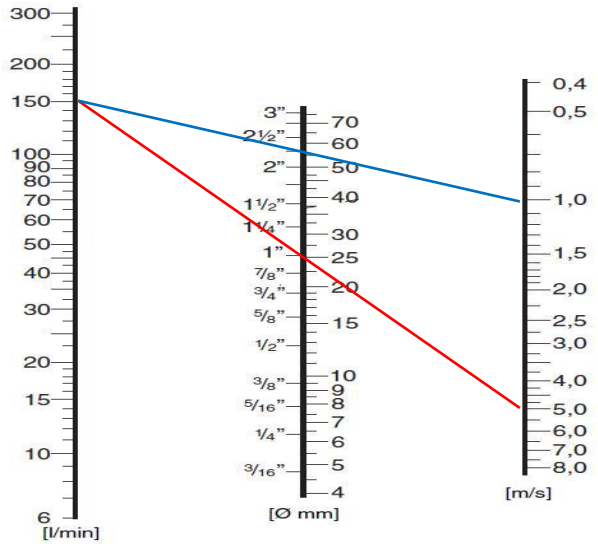
$$M = \frac{D \times Pb}{63} \qquad P = \frac{D \times N \times Z \times Pb}{600 \times 0{,}95 \times 1000}$$

M-Torque [Nm]
Pb-Pressure [bar]
P-Power [kW]
N-Motor speed [rpm]
Z-PTO ratio
0,95-Pump efficiency (can change from one pump to another)

If the calculated load exceeds the maximum allowed for the PTO, a different combination should be selected.

Hose Selection

In order to avoid intense heat generation and cavitation phenomenon that causes noise and deterioration of the pump, ABER recommends the following speeds and dimensions of the hoses. Inlet pressure range must be always respected. LS line should be 10% of the pressure line. Drain line depends from the internal pump pressure it must be at least 15mm. All the hoses must be selected according the pressures.



Admission line
0,5…1 m/s

Return line
2…3 m/s

Pressure line
P = 0...50 bar - 3,5 m/s
P = 50…100 bar - 3,5…4,5 m/s
P = 100…150 bar - 4,5…5 m/s
P = 150...200 bar - 5…5,5 m/s
P = 200…300 bar - 5,5…6 m/s

The recommended speeds and dimensions specified may not be enough when the temperatures are too low, the tank is below the level of the pump, the inlet hose is long or there are many valves and fittings in the inlet hosing. In these cases we recommend increasing the diameter of the hoses and reducing the pump rotation speed.

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Recommendations Before Start up

- The tank must be always higher than the pump level.
- Grease spline shaft with solid lubricant before installation. Connect the pump to the PTO (apply 80Nm torque in the tightening nuts). High efforts or shocks are not recommended during the installation. The pump must be connected without making use of any type of tool that forces its assembly. In driving gear application and couplings use circlips and/or washers with one M10 screw and locking fluid (70Nm). During the installation always leave the inlet port in a higher or equal level than outlet port. This increases the pump life.
- Remove all protection covers from the threaded holes (inlet/outlet). Apply the inlet and outlet fittings into the pump (query the tightening information from the fittings manufacturer). Connect the outlet and the inlet pipes to the accessories (always respect recommended hoses)

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Faults / Causes / Remedies

Faults	Causes	Remedies
No oil flow	1.Empty tank 2.Closed valve in inlet hose 3.Air in inlet hose 4.Wrong sense of rotation 5.Reversed hoses 6.No input power 7.Pump damaged	1.Fill tank with recommended fluid 2.Open valve 3.Put tank above the pump level 4.Change rotation sense 5.Reverse hoses 6.Replace power source or other damaged equipment 7.Replace pump
Equipment works with irregular movements	1.Air in housing 2.Air leakage in inlet hose 3.Low oil level 4.Pump damaged	1.Fill housing with recommended fluid 2.Repair air leakage 3.Fill tank with recommended fluid 4. Replace pump
Pump is noisy	1.Small diameter hose 2.Restriction in inlet hose 3.Very thick oil 4.Air in inlet hose 5.Pump damaged	1.Replace inlet hose for other with a larger diameter 2.Remove restrictions 3.Replace for an recommended fluid 4.Put tank above the pump level, check air pressure in the tank 5.Replace pump
Oil is too hot	1.Low oil level 2.Small tank 3.Dirty oil 4.Relief valve improperly set 5.Relief valve stuck in open position 6.Very thick oil 7.Too much flow	1.Fill tank with recommended fluid 2.Replace for a bigger tank 3.Replace oil and filter 4.Adjust for equipment specifications or replace if necessary 5.Clean and re-set for equipment specifications 6.Replace for an recommended fluid 7.Reduce speed or replace for a smaller displacement pump
Equipment works very slow compared with the usual	1.Relief valve improperly set 2.Relief valve stuck in open position 3. LS pressure setting 4.Pump damaged	1.Adjust for equipment specifications or replace if necessary 2.Clean and re-set for equipment specifications 3.Change load sense (LS) factory setting. Tight LS pressure set adjuster 4.Replace pump
Oil leakage	1.From inlet/outlet lines 2.From below the nameplate 3.From body sections	1.Tighten fittings and hoses, or replace if necessary 2.Stop the system immediately to determine the cause of the leak and correct the problem source 3.Tighten bolts for specified torque, or replace damaged o'ring or body

When the pump is working, never touch or pull hoses or intermediate shaft when applied. When intermediate shaft is applied take into account that parts can be ejected.
The application of the pumps must follow all the instructions hereby mentioned in order to assure the safety of all personal working with the equipment including its surroundings, assure a long life to the product and preserve the warranty of the brand. All applications that do not follow the hereby instruction are solely the users responsibility. If there should happen any malfunctioning, it is strictly forbidden the disassembly of the product except if it is being made by a qualified technician of the brand or if there is a special authorization to do that. If this specification should not be followed, all warranties might be lost.

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