BIERI
HYDAC INTERNATIONAL

Pumping elements

Type PEH

1000 bar
0,16 to 1,23 cm^3/stroke

Features

- Self venting
- Self priming
- High reliability
- In radial piston pumps, the direction of flow is independent of the direction of rotation of the actuator
- Very high efficiency due to high manufacturing accuracy

Applications

- For manually operated pumps in which the pump element is actuated by a lever
- For pumps in radial design with an eccentric shaft bearing as drive
- The pump element must always be immersed in the medium

Design

- Consists of a cylinder with built-in check valves in the suction and the pressure port, a piston and a piston return spring
- The medium is sucked in at the front, the pressure outlet is at the side of the piston movement
- The direction of flow is determined by the suction and outlet valves and cannot be reversed

Technical Data

Hydraulic fluid	mineral oil according to DIN 51524 (other fluids on request)
Fluid temperature range	-20 to 80 °C
Viscosity range	5 to 220 mm^2/s
Max. operating pressure	1000 bar (see overview „Product information“)
Max. speed	2000 to 3600 rpm (see overview „Product information“)
Filtration (recommendation)	according to NAS 1638 class 6 resp. ISO/DIN 4406 17/15/12
Installation position	any
Suction	-0.042 bar (gives max. 500 mm of suction height with hydraulic oil)
Fixation screws (not included in the scope of supplier)	M10 x 30 quality 8.8 tightening torque 40 Nm
Weight	see overview „Product information“
Material	piston: hardened steel cylinder: heat treated steel

Type code

Example PEH | 05 | - | 0,16 | - | 1000 | - | V | - | B | | 00

Pumping elements

Size
05
06
08
09
10
12
14

Max. geometric displacement [cm³/stroke]
See overview "Product information"

Max. operating pressure [bar]
See overview "Product information"

Seal material
V FKM
other seal materials on request

Design revision
For internal purposes

Index
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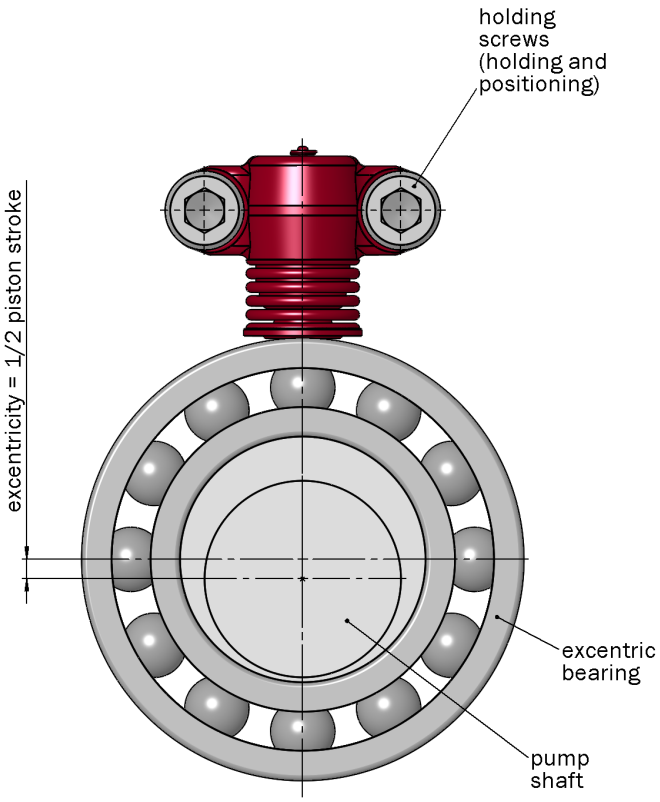
For internal purposes

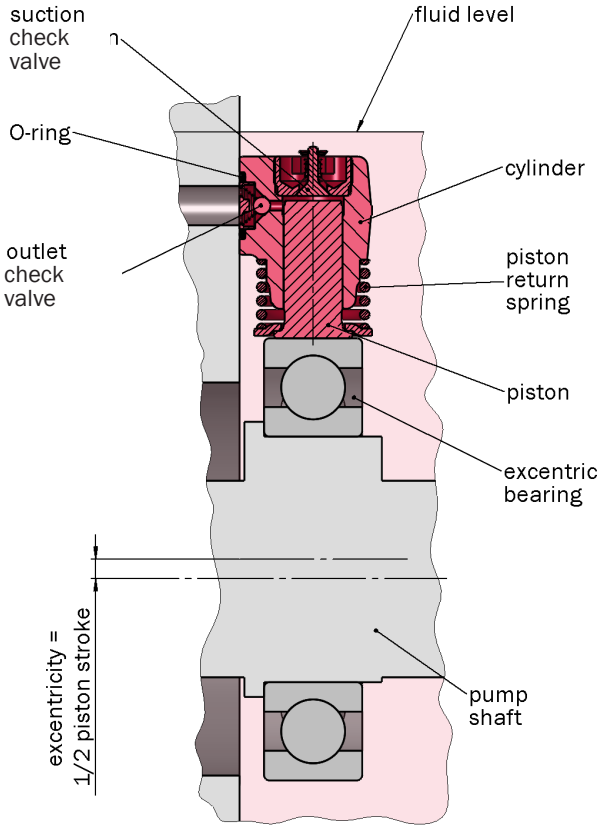
Design
00 ... 99
For internal purposes

Product information

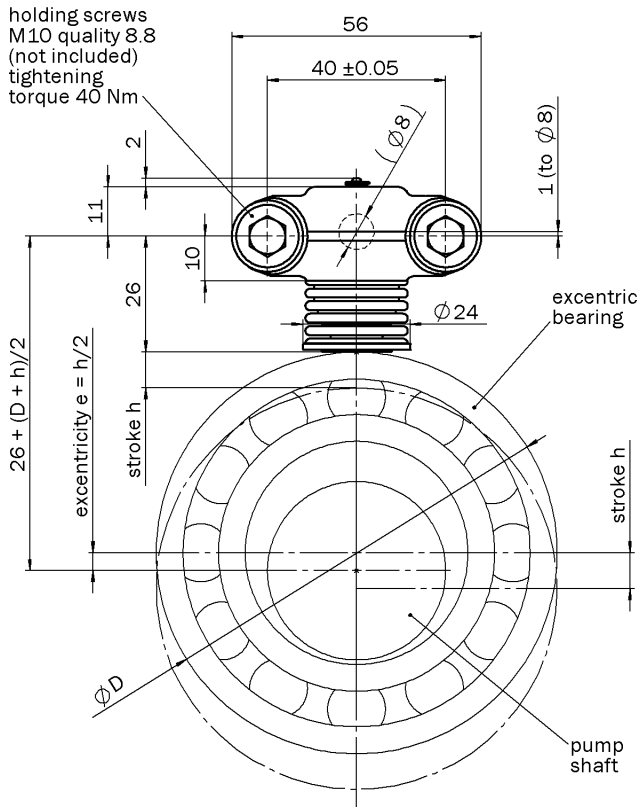
size	piston Ø [mm]	max. stroke [mm]	max. geom. displacement [cm³/stroke]	max. rotation speed [rpm]	max. flow rate at 1450 rpm [l/min]	max. operating pressure [bar]	piston force [N/bar]	weight [g]	part. nr.
05	5	8	0,16	3600	0,23	1000	1,96	156	4000832
06	6	8	0,23	3600	0,33	1000	2,83	156	4000835
08	8	8	0,40	2000	0,58	1000	5,03	159	4000838
09	9	8	0,51	2000	0,74	1000	6,36	160	4000841
10	10	8	0,63	2000	0,91	900	7,85	161	4000844
12	12	8	0,91	2000	1,31	850	11,31	161	4000850
14	14	8	1,23	2000	1,78	100	15,38	159	4474908

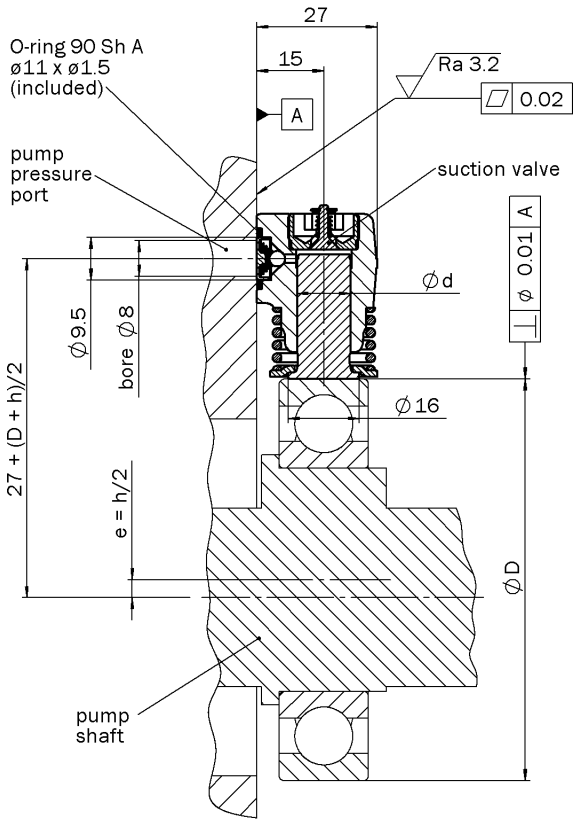
Mounting



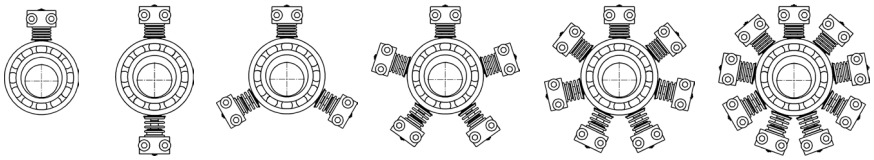


Dimensional drawing





Layout



Number of pistons	**1**	**2**	**3**	**5**	**7**	**9**
k (kinematic pulsation factor)	3.14	1.57	1.05	1.02	1.01	1
f (geom. load multiplication factor)	1	1	1	1.618	2.25	2.879

Calculation of driving motor power

$$P = \frac{p \cdot V_g \cdot n \cdot k}{\eta_t \cdot 600 \cdot 10^3}$$

P	required driving power [kW]
p	system pressure [bar]
V_G	displacement [cm³/stroke]
n	rotation speed [rpm]
η_t	efficiency, approx. 0.8
k	kinematic pulsation factor

Calculation of the piston force

Check the Hertzian stress at the contact line between piston and the excentric bearing. Set the piston diameter „d“ as diameter of the piston surface.
Force generated by the pressure of each piston:

$F_H = 0.0785 \cdot d^2 \cdot p = \mathbf{R}$ [N/bar] $\cdot$ **p** [N]

F_H	hydraulic force per piston [N]
d	diameter of piston [mm]
p	system pressure [bar]
R	piston force per 1 bar [N/bar]

Calculation of the bearing loads

It is required to calculate the bearing‘s expected life.
The resulting load on the excentric bearing is a function of the number of pistons:

$F_R = f \cdot F_H$

F_R	total load on the eccentric [N]
F_H	hydraulic force per piston [N]
f	geom. load multiplication factor

Piston loads

Keep in mind that the piston forces are concentrated on single points around the outer ring of the bearing, submitting the latter to bending loads. With large piston diameters, high pressure and few pistons it may be advisable to fit a bearing with a thicker outer ring (e. g. cam follower).

Accessories

Item description	part. no.
1 x socket head screw ISO 4762 - M10 x 30 - 8.8-A3B	6072101

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