BIERI
HYDAC INTERNATIONAL

Pumping element

Type PEH

1000 bar

0,16 up to 1,23 cm^3/stroke

Features

- Self priming
- High reliability
- 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 non-return 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 pressure valves and cannot be reversed

Technical Data

Hydraulic fluid	Mineral oil according to DIN 51524 (other fluids on request)
Fluid temperature range	-20 up to 80 °C
Viscosity range	12 to 400 mm^2/s
Max. operating pressure	1000 bar (Exceptions see standard design)
Filtration (recommendation)	According to NAS 1638 class 6 resp. ISO/DIN 4406 17/15/12
Max. speed	2000 min^{-1}
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 standard design
Material	Piston: Case-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 standard design

Max. operating pressure [bar]
see standard design

Seal material
V FKM
other seal materials on request

Special design
01 ... 99
(00 for standard)

Part index
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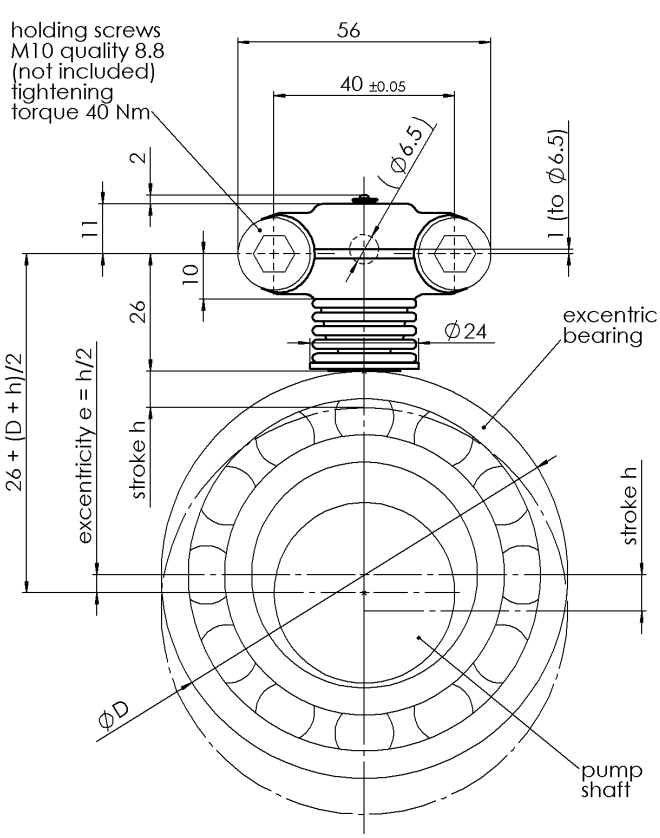
For internal purposes

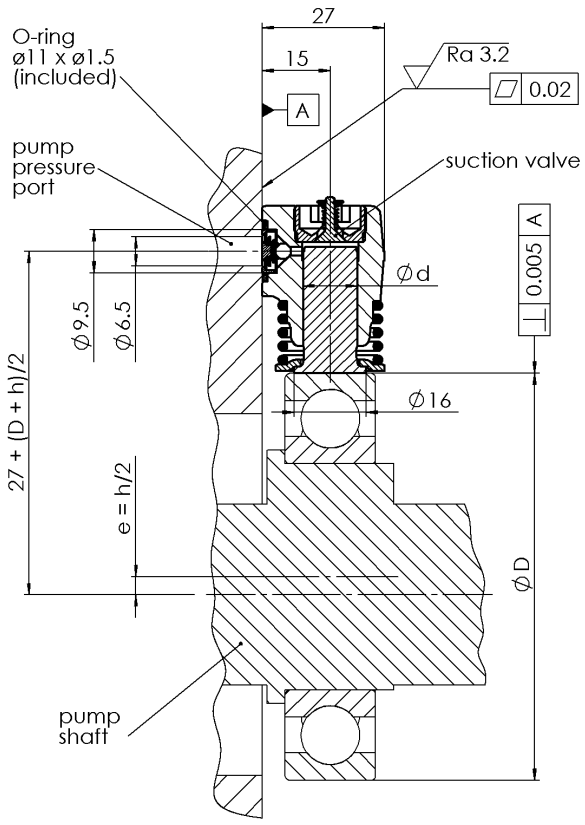
Design revision
For internal purposes

Standard design

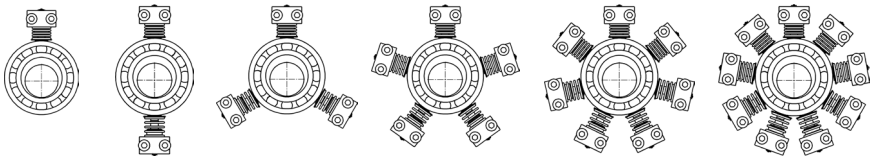
Size	Piston Ø [mm]	Stroke max. [mm]	Max. geom. displacement [cm³/stroke]	Max. flow rate at 1'450 rpm [l/min]	Operating pressure max. [bar]	Piston force per bar [N/bar]	Weight ca. [g]	Part No.
05	5	8	0,16	0,23	1000	1,96	156	4000832
06	6	8	0,23	0,33	1000	2,83	156	4000835
08	8	8	0,40	0,58	1000	5,03	159	4000838
09	9	8	0,51	0,74	1000	6,36	160	4000841
10	10	8	0,63	0,91	900	7,85	161	4000844
12	12	8	0,91	1,31	850	11,31	161	4000850
14	14	8	1,23	1,78	100	15,38	159	4474908

Dimensional drawings





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 overall 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 eccentric bearing. Setthe piston diameter d as diameter of the piston surface.
Force generated by the pressure of each piston:

$F_H = 0.0785 \cdot d^2 \cdot p =$ **R** [N/bar] **· 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 eccentric 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

Bieri Hydraulik AG
Könizstrasse 274
CH-3097 Liebefeld
Tel. +41 31 970 09 09 | Fax +41 31 970 09 10
info@bierihydraulics.com | www.bierihydraulics.com