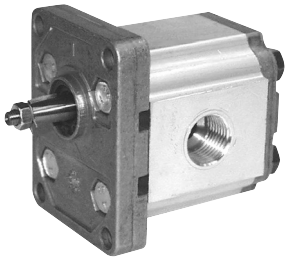
FAMCO
هایپرصنعت

KRACHT



High Pressure Gear Pumps

KP 0

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تهران، کیلومتر۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبـروی پالایشگاه نفت پـارس، پلاک ۱۲

Construction

According to its design, the Kracht KP 0 external gear pump belongs to the type of so-called gland type pumps. The essential functional elements, gearing and bearing glands are located in an aluminium housing of high-strength extruded alloy, which is limited laterally by the the cover plate and flange cover.

The gearing, made of case hardened steel with surface hardening, consists of the drive shaft wheel and pin wheel. The highest manufacturing quality is guaranteed by shaving the tooth flanks.

The shaft journals are finely ground. Due to the high number of teeth (n = 12) and the special tooth shape, a considerable reduction in design-related volume flow fluctuation and the associated pressure pulsation is achieved.

The gland bearings located on both sides of the gearing carry the journals in heavyduty multicomponent plane bearing bushes and contain additionally those sealing elements which serve for the pressure field sealing to compensate the axial clearance.

Note

1. External loads

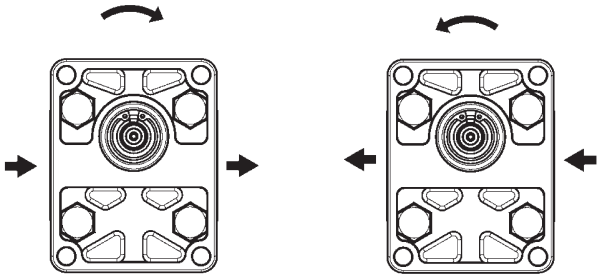
External forces acting on the drive shaft end have an influence on the operation of the bearing glands. Radial and axial forces are not permissible.
An end bearing must be used for the purpose of absorbing external forces.

2. Direction of rotation

Regarding the direction of rotation basically the following applies provided the view is directed toward the drive shaft end:

Drive shaft end rotating clockwise:
Flow direction from left to right.

Drive shaft end rotating anticlockwise:
Flow direction from right to left.



Materials

Housing	Aluminium
Bearing	double-gland bearing with multicomponent plain bearing bushes
Shafts and gear wheels	surface hardened and ground case hardened steel acc. to DIN 17210
Seals	NBR (FKM on request)

Characteristics

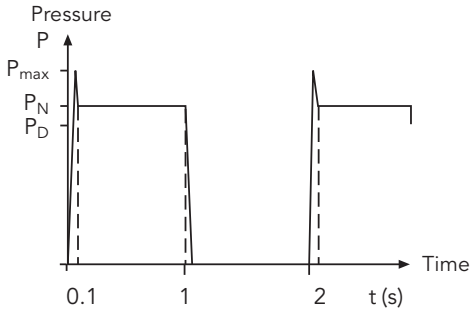
Mounting		flange mounting
Pipe connection		threaded connection
Direction of rotation		clockwise **or** anticlockwise
Fitting position		optional
Ambient temperature	$\vartheta_{u\ min}$ $\vartheta_{u\ max}$	= – 20 °C = 60 °C
Working pressure Inlet port Working pressure Short time	$p_{e\ min}$ $p_{e\ max}$	= – 0.3 bar (vacuum) = 2.5 bar
Working pressure Outlet port	$p_{e\ max}$	see technical data
Fluid temperature	$\vartheta_{m\ max}$	85 °C
Viscosity	ν_{min} ν_{max}	= 10 mm²/s = 1400 mm²/s
Recommended oil cleanliness		class 19/16 acc. to ISO/DIS 4406 ⇨ class 10 acc. to NAS 1638
Recommended filtration		filter with filtration quotient $\beta_{20} \geq 75$ for ... 280 bar $\beta_{25} \geq 75$ for ... 100 bar
Recommended viscosity range	ν	= 12 ... 90 mm²/s
Discharge flow		see chart page 6
Input power		see chart page 6
Hydraulic fluids		mineral oil acc. to DIN 51524 bio-oils of type „HEES“ can be used up to 70 °C, max. pressure must be reduced minus 20 % (use only on request)

Technical Data

Nominal size	geom. displace-ment	max. pressure	Nominal pressure	Continuous working pressure	Speed	
	V_g cm³/r	p_{max} bar	p_N bar	p_D bar	n_{max} 1/min	n_{min} 1/min
1	1.4	280	260	220	4000	700
2	1.9	280	260	220	4000	700
3	3.1	260	250	210	4000	700
4	4.4	260	250	210	4000	700
6	6.1	260	250	210	3000	700
8	7.9	200	180	160	3000	700

Maximum pressure = pressure peak
Nominal pressure pN < 6 s = 50 % ED
See time / pressure chart
max. permissible working cycles: 30 / min
Pressures as specified are applicable to $\nu \geq 30$ mm²/s

Time / pressure chart



Calculation Formulas for Hydraulic Pumps

Characteristic data, formula signs, units

1.	Discharge flow / input flow	Q	l/min
2.	Pump / motor displacement	V_g	cm³/r
3.	Pressure	p	bar
4.	Speed	n	1/min
5.	Torque	M	Nm
6.	Power	P	kW
7.	Total efficiency	η_{tot}	—
8.	Volumetric efficiency	η_{vol}	—
9.	Hydr./mech. efficiency	η_{hm}	—
10.	Flow velocity	v	m/s
11.	Pipe diameter	d	mm

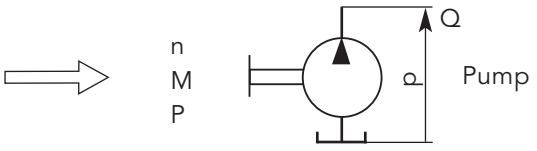
General

$Q_{th} = V_g \cdot n$, $\eta_{tot} = \eta_{vol} \cdot \eta_{hm}$

$M = 9549 \cdot \frac{P}{n}$, $v = 21.22 \frac{Q}{d_2}$

Approximate values for KRACHT products in the nominal working point

KP 0	η_{tot}	η_{vol}
1 to 4	≈ 0.75	≈ 0.85
6 to 8	≈ 0.90	≈ 0.90



Characteristic data for:

Volumetric flow

Discharge flow $Q = \frac{V_g \cdot n \cdot \eta_{vol}}{10^3}$ $\left[\frac{l}{min}\right]$

Torque

Drive torque $M = \frac{p \cdot V_g}{20 \cdot \pi \cdot \eta_{hm}}$ [Nm]

Power

Input power $P = \frac{p \cdot Q}{600 \cdot \eta_{tot}}$ [kW]

Discharge Flow and Required Input Power

Discharge flow at n = 1495 1/min

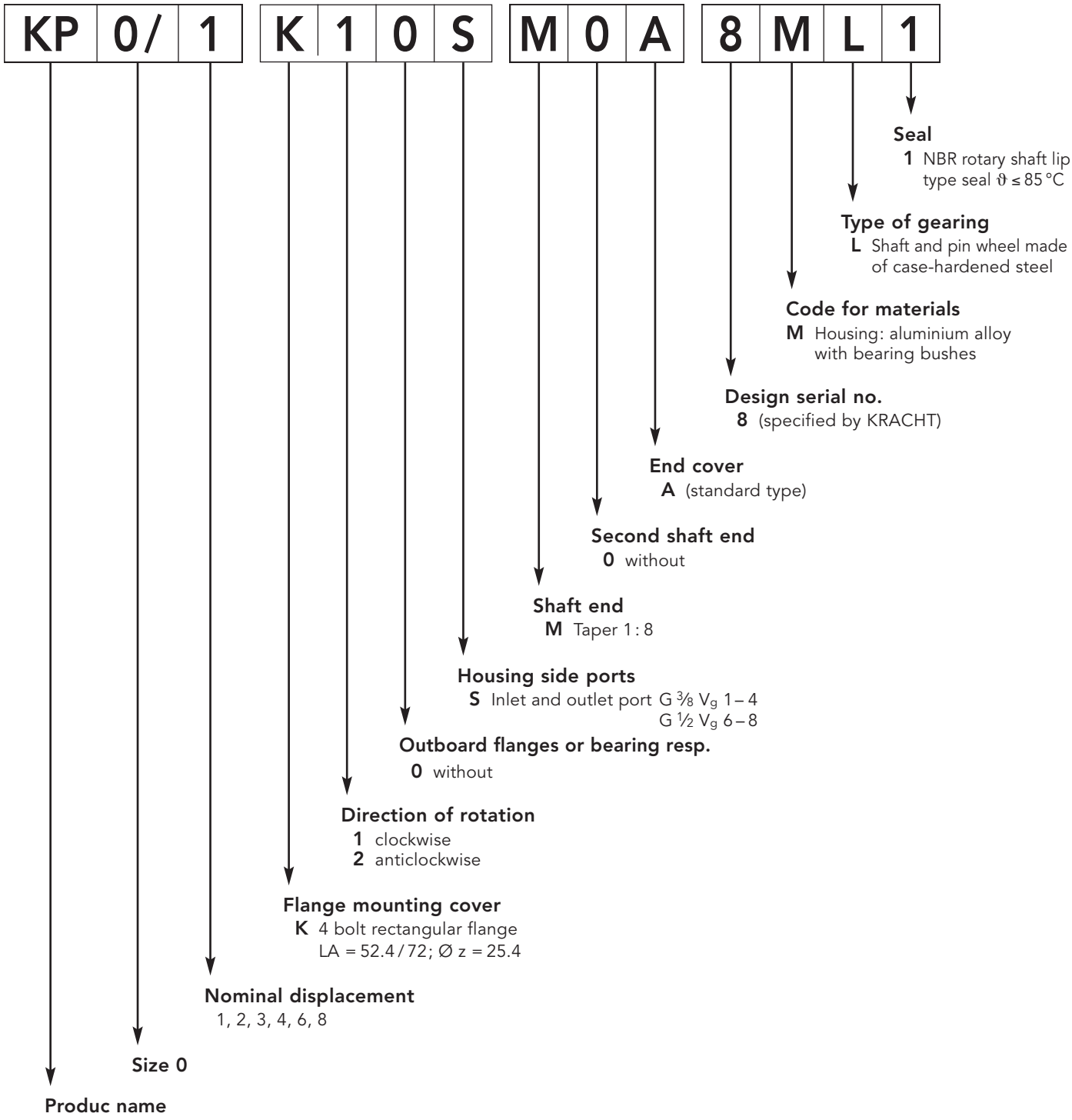
Nominal size	Discharge flow Q in l/min at 34 mm²/s Pressure p in bar 20	60	100	140	180	220	260
1	2.00	1.95	1.90	1.86	1.82	1.78	1.73
2	2.80	2.70	2.65	2.60	2.55	2.50	2.40
3	4.70	4.65	4.60	4.55	4.50	4.45	–
4	6.30	6.25	6.20	6.15	6.10	6.05	–
6	9.00	8.95	8.90	8.85	8.80	–	–
8	11.75	11.60	11.50	11.45	11.40	–	–

Required input power at n = 1495 1/min

Nominal size	Pressure p in bar 20	60	100	140	180	220	260
1	0.14	0.32	0.50	0.68	0.86	1.05	1.23
2	0.17	0.42	0.67	0.92	1.17	1.42	1.66
3	0.25	0.57	0.91	1.30	1.60	2.00	–
4	0.30	0.75	1.20	1.60	2.05	2.50	–
6	0.40	1.05	1.70	2.30	2.95	–	–
8	0.50	1.30	2.10	3.05	3.90	–	–

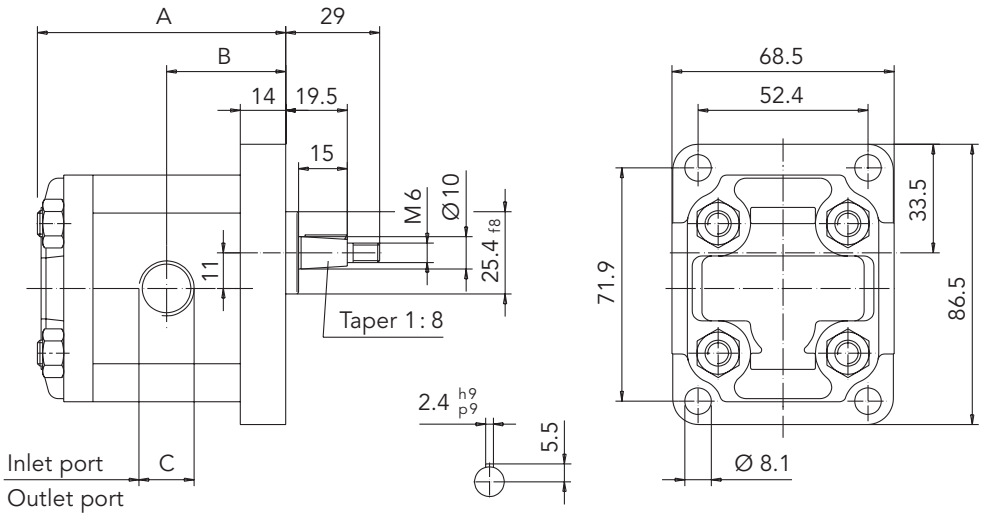
Type Key

Ordering example



Possible on request:
– Multiple pump combinations
– Motors
– Other shaft and flange types
– FKM rotary shaft lip typ seals (on request)

K-Flange, Tapered Shaft End



Ordering example:

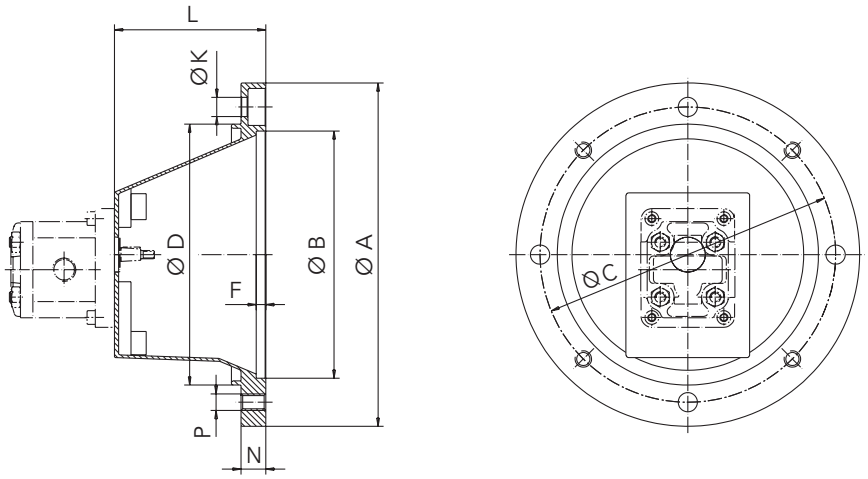
KP 0/1 K10S M0A 8ML1

The direction of rotation as represented is clockwise
In case of anticlockwise rotation the inlet and outlet ports are opposite

Shaft end: Taper 1:8

Nominal displacement	1	2	3	4	6	8
A	68.6	68.6	68.6	75.3	86.0	86.0
B	33.4	33.4	33.4	36.7	42.0	42.0
C	3/8" BSP				1/2" BSP	
Weight in kg	0.9	0.95	0.95	1.05	1.2	1.2

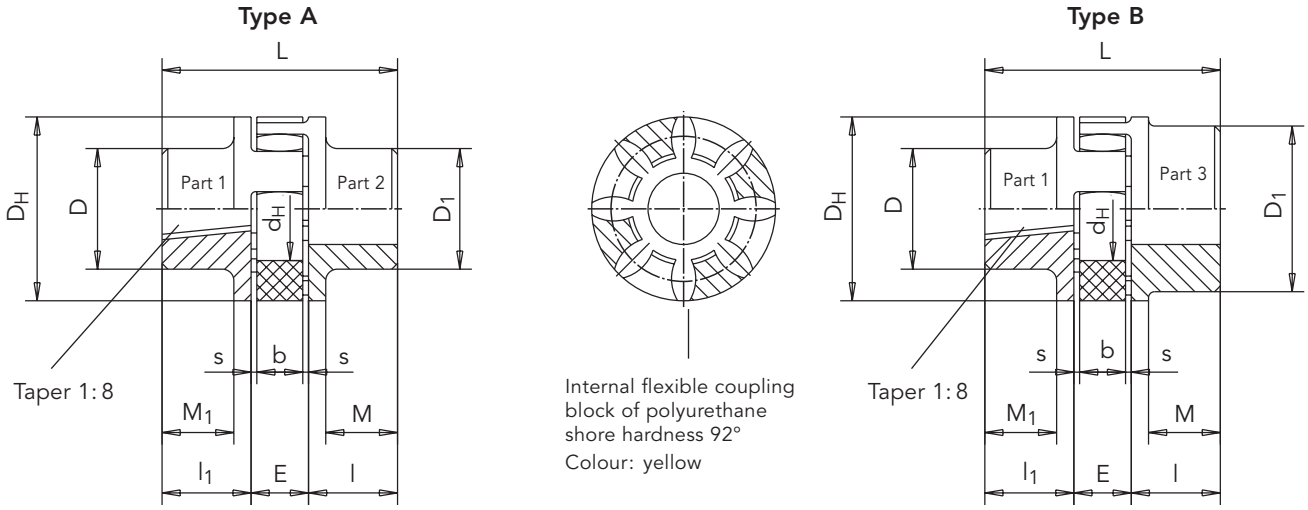
Bell Housing



Bell housing with ventilation or leakage hole on request

Motor size	A	B	C	D	F	K	L	N	P	Bell housing Weight in kg	Coupling size
71	160	110	130	110	7	9	70	13	M8	0.5	RA19 -K16/10-Z25/14
80	200	130	165	145	7	11	90	16	M10	0.8	RA19 -K25/10-Z25/19
90	200	130	165	145	7	11	90	16	M10	0.8	RA19/24-K16/10-Z25/24
100/112	250	180	215	190	7	14	110	18	M12	2.0	RA24/28-K16/10-Z50/28

Couplings



Coupling size

Length of the coupling hub and the hub bore pump sided

Length of the coupling hub and the hub bore motor sided Straight hub bore

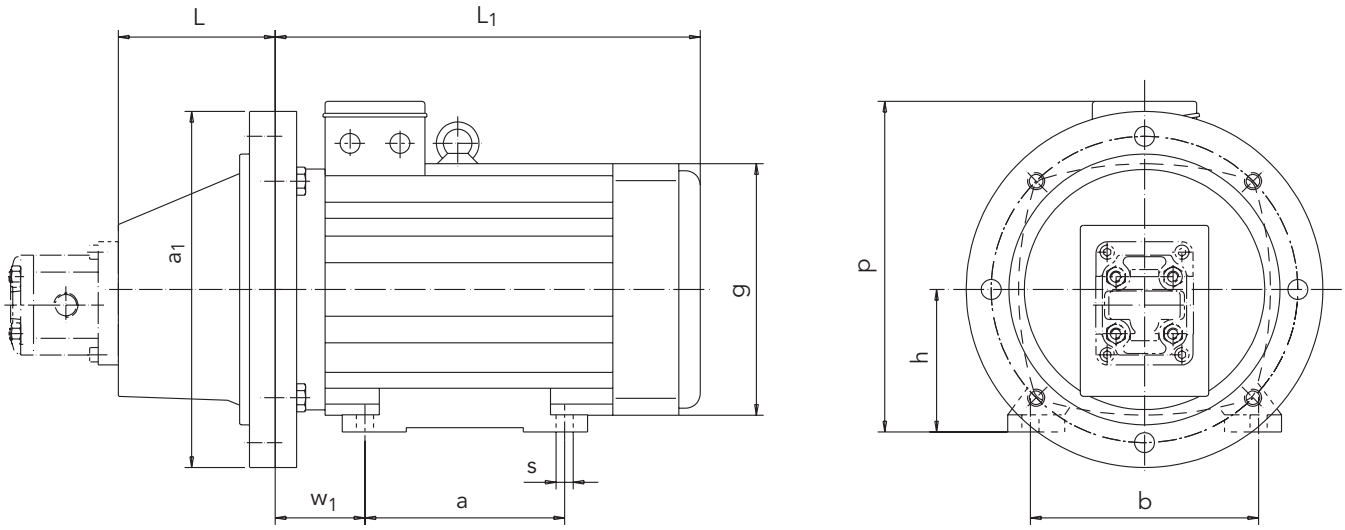
Ordering example: **RA 19 – K 16/10 – Z 25/14**

	Coupling size	Weight	Moment of inertia	Rough bore		Finished bore				Dimensions												Ordering code
						min.	min.	max.	max.													
				Part	Part	Part	Part	Part	Part													
		kg	kgm^2	2	3	2	3	2	3	l	l_1	E	s	b	L	M	M_1	D_H	D	D_1	d_H	
Type A	**19**	0.12	0.00003	–	–	6	-	19	-	25	17	16	2	12	58	20	10	40	32	–	18	**RA 19-K16/10-Z 25/14**
											25											**RA 19-K25/10-Z 25/19**
Type B	**19/24**	0.13	0.0004	–	18	–	19	–	24	25	17	16	2	12	58	20	10	41	32	41	18	**RA 19/24-K16/10-Z 25/24**
	24/28	0.22	0.0001	-	20	–	22	–	28	50	17	18	2	14	85	–	10	55	23	55	27	**RA 24/28-K16/10-Z 50/28**

Working temperatur: – 40 °C to + 90 °C (short time temperature peaks up to + 120 °C are permissible)
Weights as well as moments of inertia relate to the max. bore dia. after final machining – but without key-way
Bore finish acc. to ISO-fit class H7; key-ways acc. to DIN 6885 / part 1

RA: Hub material Al

Motor-Pump Assemblies



Nominal size	Motor 4-pole Power kW	Speed 1/min	Bell housing	Coupling size	Weight Motor 4-pole kg	Bell housing kg
71 M4A	0.25	1390	PT 160-A-025.4-70	RA 19 – K16/10 – Z25/14	7	0.6
71 M4B	0.37	1390			8	
80 M4A	0.55	1400	PT 200-A-025.4-90	RA 19 – K25/10 – Z25/19	10	0.9
80 M4B	0.75	1400			11	
90 S4A	1.1	1410	PT 200-A-025.4-90	RA 19/24 – K16/10 – Z25/24	13	1.0
90 L4A	1.5	1420			15	
100 L4A	2.2	1420	PT 250-A-025.4-110	RA 24/28 – K16/10 – Z50/28	21	1.7
100 L4B	3	1430			24	
112 M4B	4	1440			31	

Nominal size	Dimensions in mm									
	L	a_1	a	b	g	h	L_1	p	s	w_1
71	70	160	90	125	138	71	223	182	7	45
80	90	200	100	125	158	80	244	199	10	50
90 S	90	200	100	140	193	90	267	218	10	56
90 L	90	200	125	140	193	90	267	218	10	56
100	110	250	140	160	217	100	277	237	12	63
112	110	250	140	190	232	112	308	256	12	70

Motor frame sizes are based on Schäfer. Other manufactures motors can be supplied on request as IM B 35.

Note

Product Portfolio

Transfer Pumps

Transfer pumps for lubricating oil supply equipment, low pressure filling and feed systems, dosing and mixing systems.

Mobile Hydraulics

Single and multistage high pressure gear pumps, hydraulic motors and valves for construction machinery, vehicle-mounted machines.

Flow Measurement

Gear and turbine flow meters and electronics for volume and flow metering technology in hydraulics, processing and laquering technology.

Industrial Hydraulics / Test Bench Construction

Cetop directional control and proportional valves, hydraulic cylinders, pressure, quantity and stop valves for pipe and slab construction, hydraulic accessories for industrial hydraulics (mobile and stationary use).

Technology Test benches / Fluid Test benches.

KP 0 / GB / 05.10

KRACHT

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روبروی پالایشگاه نفت پارس، پلاک ۱۲

FAMCO
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KRACHT

Transfer Gear Pumps
KF 4 ... 80

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Technical data

Dimension sheets

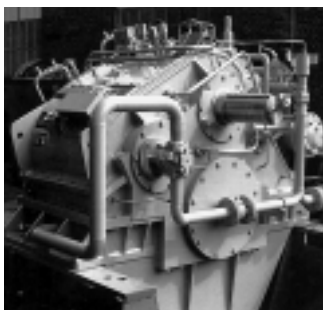
Applications from A–Z

Applications

Centrifuge construction
Coating machines
Compressors
Engine construction
Filling stations
Filter systems
Generator construction
Heat transfer systems
Heavy electrical machines
Lubricant manufacturers
Lubricating oil systems
Machine-building industry
Machine tools
Manufacture of apparatus
Marine engine construction
Metal-forming machines
Metering systems
Paint industry
Plain metal bearing production
Printing machines
PUR machinery
Refrigerators
Rubber and tire manufacturing
Tank plant construction
Transmission building
Turbine construction
Vacuum machinery
Waste oil - disposal
- transport
- treatment

Suitable fluids

Adhesives
Antifreeze
Bore oils
Cutting oils
Diesel oils
Drawing compound
Emulsions
Fuel oils, L, EL, H
Gear oils
Grease
Hardening oils
Heat transfer media
Heavy oils
Hydraulic fluids
Isocyanate
Lubricating oils
Lacquers
Motor oils
Nitrocellulose
Paint
Paraffins
Plastics
Polyols
Printing inks
Processing oils
Resins
Rolling oils
Waste oils
Waxes



Product features

KF gear pumps are used for pumping a wide variety of fluids.
KF gear pumps are distinguished especially by their wide range of variants which are assembled as required on the modular principle and also permit subsequent upgrade.
The pumps are also suitable for media with low lubricating properties.
The standard housing sections are of grey cast iron.
The gear units are manufactured from high-strength case-hardening steel, hardened and mounted in special multi-compound plain bearing bushes.
The standard drive shaft is sealed by rotary shaft lip-type seal.
All pump sizes incorporate helical tooth system.
This feature, combined with special gear geometry, results in extremely low noise levels and reduced pressure pulsation.

Variants:

- Sealing of the drive shaft
- Rotary shaft lip-type seal
- Double rotary shaft lip-type seal (Quench)
- Mechanical seal
- Outboard bearing to take up input drive-side radial load
- Pressure relief valve as safety valve for pump and system
- Uniform discharge flow direction with changing direction of rotation by means of flange-mounting valve combination (universal device).

Special design

Various shafts ends and gear units, as well as flange mounted versions, bearing alternatives, multi-stage pump combinations for your special application are available on request.
Our Sales engineers will be pleased to advise you.

Accessories:

- Connecting flanges
- Couplings
- Bell housings

Operating notes

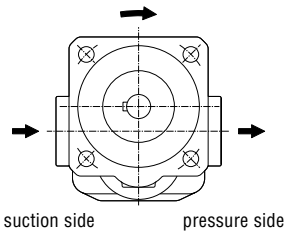
- The fluids should ensure a certain minimum lubricating properties, should not contain solids and should be chemically compatible.
- Avoid dry operation.
- The pumps may only be operated in the specified direction of rotation, as otherwise the shaft seal will be destroyed.
- In order to prevent excessive overpressure, a safety valve should be provided in the system or on the pump.
- The pressure relief valve attached to the pump may only be used as safety valve for short-term operation.
- To drain off a partial discharge flow over a prolonged period, a separate pressure relief valve with return line must be inserted in the reservoir.
- A separate pressure relief valve with return line to the reservoir must be foreseen, if a partial discharge flow has to be drained over a prolonged period.

Direction of rotation:

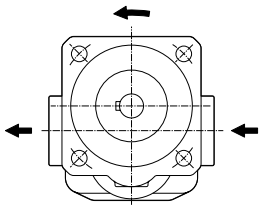
The following should be noted for direction of rotation:

- when looking at the pump shaft end, the direction of pumping is from left to right if the shaft rotates **clockwise**.
- when looking at the pump shaft end, the direction of pumping is from right to left if the shaft rotates **counterclockwise**.

Without pressure relief valve

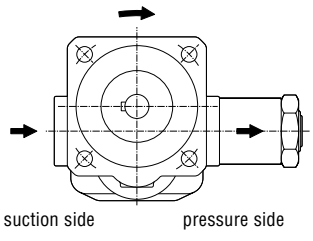


pump running cw

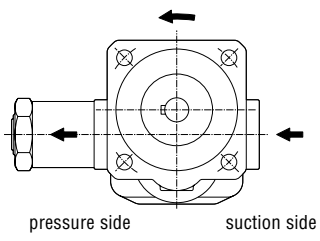


pump running ccw

With pressure relief valve



pump running cw



pump running ccw

14 Nominal displacement sizes
4...80 cm³ V_g = 4/5/6.3/8/10/12.5/16/20/25 cm³
32/40/50/63/80 cm³

Operating pressure
Suction side
$p_{e\ min}$: -0.4 bar (vacuum)
briefly on startup -0.6 bar
with universal model restriction $p_{e\ min}$
$p_{e\ max}$: 1 bar for NBR- and FKM rotary shaft lip-type seal
2 bar for PTFE-lip-type seal
10 bar for mechanical seal
(higher pressures on request)
Pressure side
p_n = 25 bar (higher pressures on request)

Speed of rotations
Nominal size 4...80 200...3000 1/min

Viscosity ν = 12...20,000
(dependent on pressure and speed of rotations)

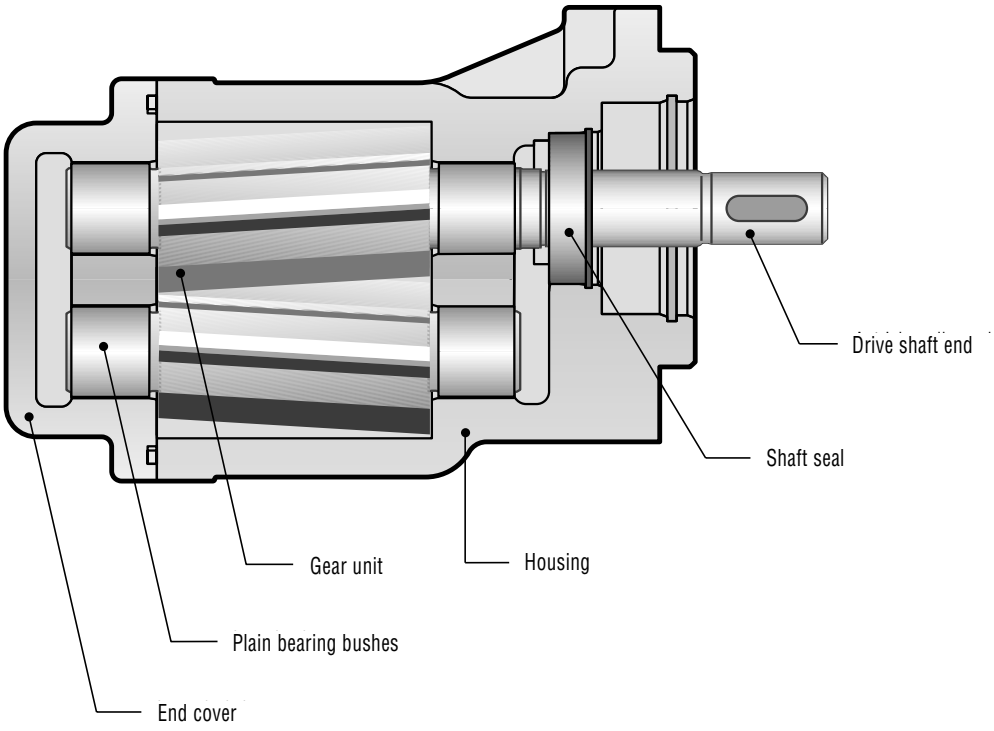
Direction of rotations: cw **or** ccw
cw **and** ccw
Mounting type: flange DIN ISO 3019
Drive shaft end: ISO R 775 short/cyl.

Pipe connection
Nominal size 4...25: Whitworth pipe thread
Nominal size 32...80: SAE flange

Fluid temperature
$\vartheta_{m\ min}$ = -10 °C
$\vartheta_{m\ max}$ = 90 °C for NBR lip-type shaft seal
= 150 °C for FKM lip-type shaft seal
= 200 °C for PTFE lip-type seal
= 150°C for GLRD with FKM aux. seals
= 200°C for GLRD with PTFE aux. seals

Ambient temperature ϑ_u = -20...60 °C

Mounting position: optional
(for exception, see Universal unit)
Discharge flow: see Table page 7
Drive power: see Table page 7 and 8



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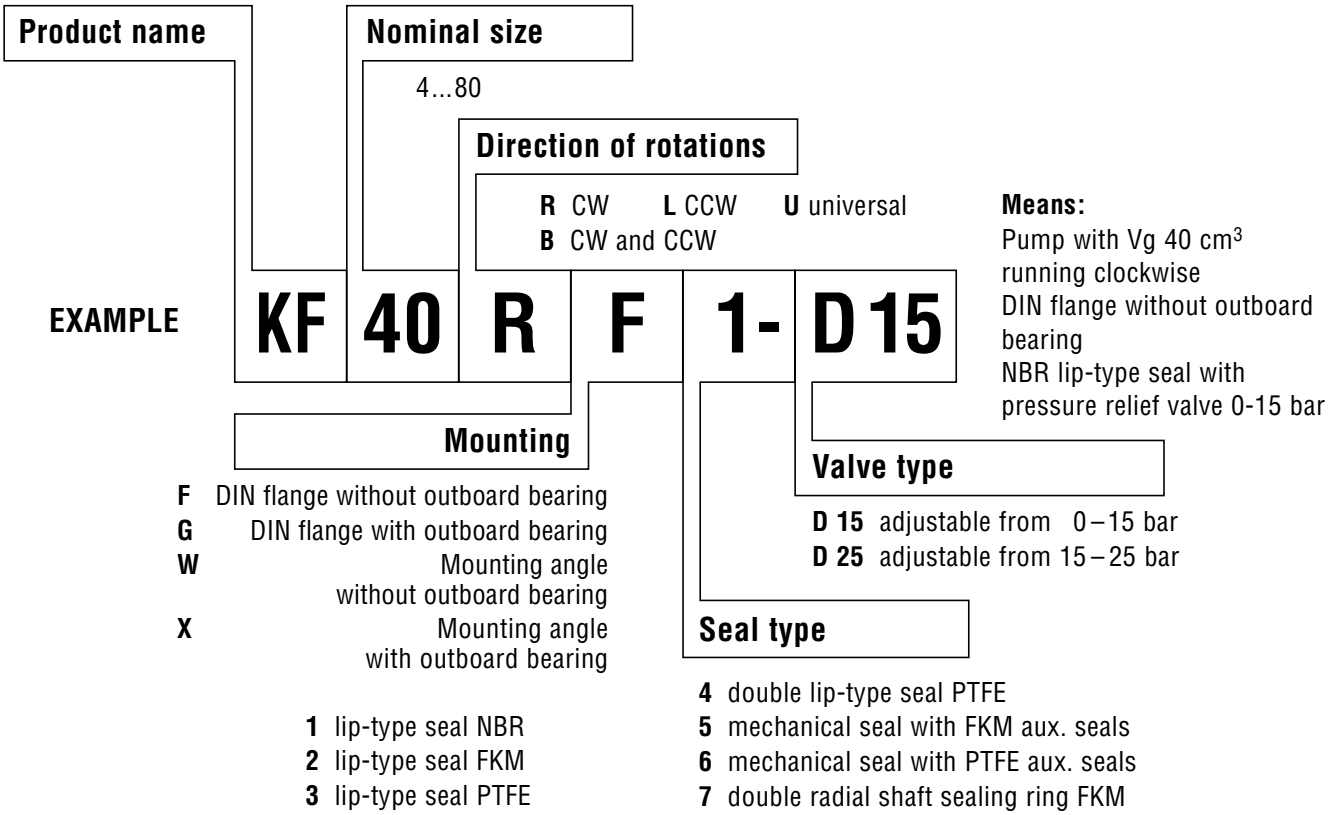


Nominal size	Geometrical displacement V_g cm³	Operating pressure p_b bar	Maximum pressure p_{max} bar	Speed range n_{min} 1/min	Speed range n_{max} 1/min	Permissible load (n=1500 1/min) F_{radial} N
4	4.03	25	40	200	3000	700
5	5.05					
6	6.38					
8	8.05					
10	10.11					
12	12.58					
16	16.09					
20	20.1					
25	25.1					
32	32.12	25	40	200	3000	1500
40	40.21					
50	50.2					
63	63.18					
80	80.5					

Remark

Operating pressure
p_b = perm. sustained pressure
Permissible load only for version with outboard bearing.
F_{radial} at centre of shaft end.
For certain operating conditions, the minimum or maximum characteristics should not be used.
For example, the max. operating pressure is not permissible in combination with low speed and low viscosity.
In such limit ranges, please consult us.

Table 1 Speed n = 950 1/min

Discharge flow Q in l/min										Power consumption P in KW							
Pressure p_b in bar								Nominal size	Pressure p_b in bar							
2	4	6	8	10	15	20	25		2	4	6	8	10	15	20	25
3.7	3.6	3.6	3.5	3.4	3.3	3.1	2.9	**4**	0.04	0.05	0.07	0.08	0.09	0.13	0.16	0.20
4.6	4.5	4.5	4.4	4.3	4.1	3.8	3.6	**5**	0.04	0.06	0.08	0.10	0.11	0.16	0.20	0.25
5.8	5.7	5.6	5.5	5.4	5.1	4.9	4.6	**6**	0.05	0.07	0.09	0.12	0.14	0.19	0.25	0.30
7.3	7.2	7.1	7.0	6.8	6.5	6.2	5.8	**8**	0.06	0.09	0.11	0.14	0.17	0.24	0.31	0.38
9.2	9.0	8.9	8.7	8.6	8.2	7.7	7.3	**10**	0.07	0.10	0.14	0.17	0.21	0.29	0.38	0.47
11.4	11.3	11.1	10.9	10.7	10.2	9.6	9.1	**12**	0.08	0.12	0.16	0.21	0.25	0.36	0.47	0.58
14.6	14.4	14.2	13.9	13.7	13.1	12.4	11.7	**16**	0.09	0.15	0.20	0.26	0.31	0.45	0.60	0.74
18.2	18.0	17.7	17.4	17.1	16.3	15.5	14.7	**20**	0.10	0.18	0.25	0.32	0.39	0.56	0.74	0.92
22.8	22.4	22.1	21.7	21.3	20.4	19.4	18.3	**25**	0.12	0.21	0.30	0.39	0.48	0.70	0.92	1.14
29	29	28	28	27	26	25	23	**32**	0.2	0.3	0.4	0.5	0.6	0.9	1.2	1.5
37	36	36	35	34	33	31	29	**40**	0.2	0.4	0.5	0.6	0.8	1.1	1.5	1.8
46	45	44	43	43	41	38	36	**50**	0.3	0.5	0.6	0.8	1.0	1.4	1.9	2.3
58	57	56	55	54	51	48	45	**63**	0.4	0.6	0.8	1.0	1.2	1.8	2.4	2.9
73	72	71	69	68	65	61	58	**80**	0.4	0.7	1.0	1.3	1.6	2.3	3.0	3.7

Table 2 Speed n = 1450 1/min

Discharge Q in l/min										Power consumption P in KW							
Pressure p_b in bar								Nominal size	Pressure p_b in bar							
2	4	6	8	10	15	20	25		2	4	6	8	10	15	20	25
5.7	5.6	5.6	5.5	5.4	5.3	5.1	4.9	**4**	0.06	0.08	0.10	0.12	0.15	0.20	0.25	0.30
7.1	7.1	7.0	6.9	6.8	6.6	6.4	6.1	**5**	0.07	0.10	0.12	0.15	0.18	0.24	0.31	0.38
9.0	8.9	8.8	8.7	8.6	8.3	8.0	7.8	**6**	0.08	0.11	0.15	0.18	0.21	0.30	0.38	0.47
11.3	11.2	11.1	11.0	10.9	10.5	10.2	9.8	**8**	0.09	0.14	0.18	0.22	0.26	0.37	0.47	0.58
14.2	14.1	14.0	13.8	13.6	13.2	12.8	12.4	**10**	0.11	0.16	0.21	0.27	0.32	0.45	0.58	0.72
17.7	17.6	17.4	17.2	17.0	16.5	15.9	15.4	**12**	0.12	0.19	0.26	0.32	0.39	0.55	0.72	0.89
22.6	22.4	22.2	22.0	21.7	21.1	20.5	19.8	**16**	0.16	0.26	0.37	0.47	0.57	0.82	1.08	1.33
28.3	28.0	27.7	27.4	27.1	26.4	25.6	24.7	**20**	0.17	0.28	0.39	0.49	0.60	0.87	1.14	1.41
35.3	35.0	34.6	34.3	33.9	32.9	31.9	30.9	**25**	0.20	0.34	0.47	0.61	0.74	1.08	1.41	1.75
45	45	44	44	43	42	40	39	**32**	0.3	0.5	0.7	0.8	1.0	1.4	1.9	2.3
56	56	55	55	54	52	50	49	**40**	0.4	0.6	0.9	1.1	1.3	1.8	2.3	2.9
70	70	69	68	67	65	63	61	**50**	0.5	0.8	1.1	1.3	1.6	2.3	2.9	3.6
89	88	87	86	85	82	79	77	**63**	0.7	1.0	1.3	1.7	2.0	2.9	3.7	4.5
113	112	111	109	108	105	101	98	**80**	0.8	1.2	1.7	2.1	2.5	3.6	4.7	5.8

The ratings refer to a mineral oil with a viscosity of 34 mm^2/s.

Margin of error for the flow Q +2,5 % ... –5 % of the tabular value.
For viscosity < 30 mm^2/s, take a reduction of the rated flow Q into account.

The output of the drive motor should be selected 20 % higher than tabular value P.

For viscosity >100 mm^2/s, an increase in the required power is necessary, in this case proceed as per description on page 7.

consumption

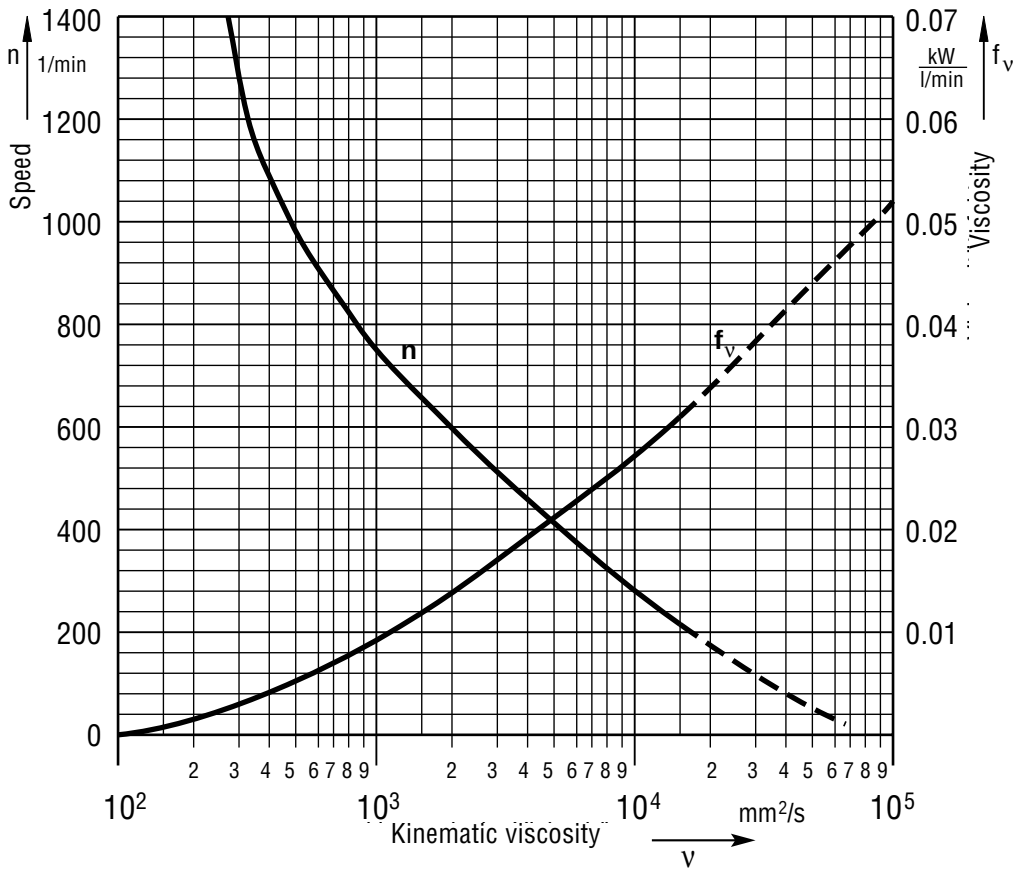


Diagram: n, $f_\nu = f(\nu)$

Note:
To determine the power consumption, always take the max. operating viscosity at starting state into consideration.
The power of the drive motor should be selected 20% higher than the value determined.

Calculation of power consumption

$$P_{1Pu} = P_{tab} \cdot \frac{n}{1450} + f_\nu \cdot Q$$

P_{1Pu} = pump power consumption (kW)

P_{tab} = power consumption per table (kW)

n = speed (1/min)
dependent on viscosity!

f_ν = viscosity factor $\left[\frac{kW}{l/min}\right]$
see diagram

Q = discharge flow (l/min) where $Q = \frac{V_g \cdot n}{1000}$

V_g = geometrical displacement (cm^3)

Example: Pump-type KF 80

Viscosity	ν	=	3000 mm²/s
Operating pressure	p	=	15 bar
at	P_{tab}	=	3.6 kW
	n	=	500 1/min
	f_ν	=	0,017 $\frac{kW}{l/min}$
	Q	=	40 l/min

becomes

$$P_{1pu} = \left(3.6 \cdot \frac{500}{1450} + 0.017 \cdot 40\right) kW$$

$P_{1Pu} = 1.92$ kW

Motor power output: $P_{2Mot} = 1.2 \cdot P_{1Pu} = 2.3$ kW

Select helical geared motor with

P = 3.0 kW

n = 500 1/min

Conversion factors

1 bar ≙ 14.5 $\frac{lb}{in^2}$ = 14.5 psi

1 $\frac{l}{min}$ ≙ 4.546 $\frac{gal}{min}$ = [U.K.]

1 $\frac{l}{min}$ ≙ 3.785 $\frac{gal}{min}$ = [US]

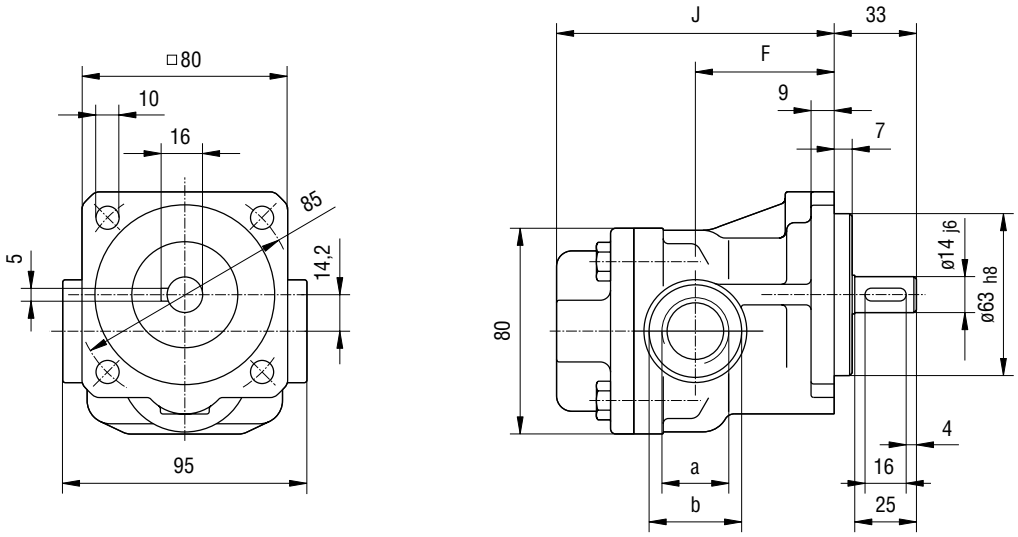
Speed recommendation

Kinematic viscosity ν mm²/s

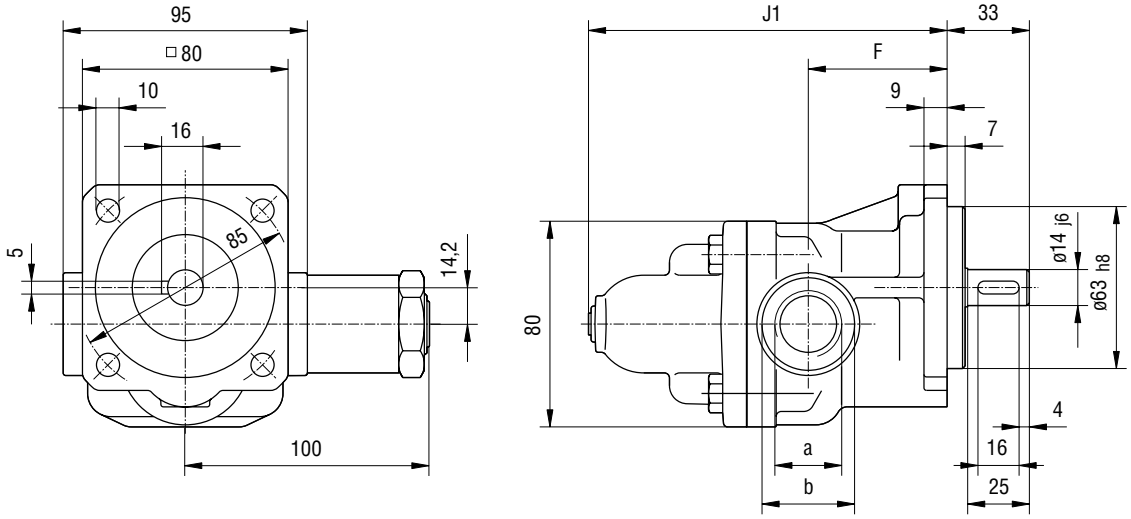
<	300	300	500	1000	2000	3000	6000	10000	20000	30000
≥	1500	1250	1000	750	600	500	400	300	200	100

Speed n_{max} 1/min

KF 4...25 Flange-mounting version

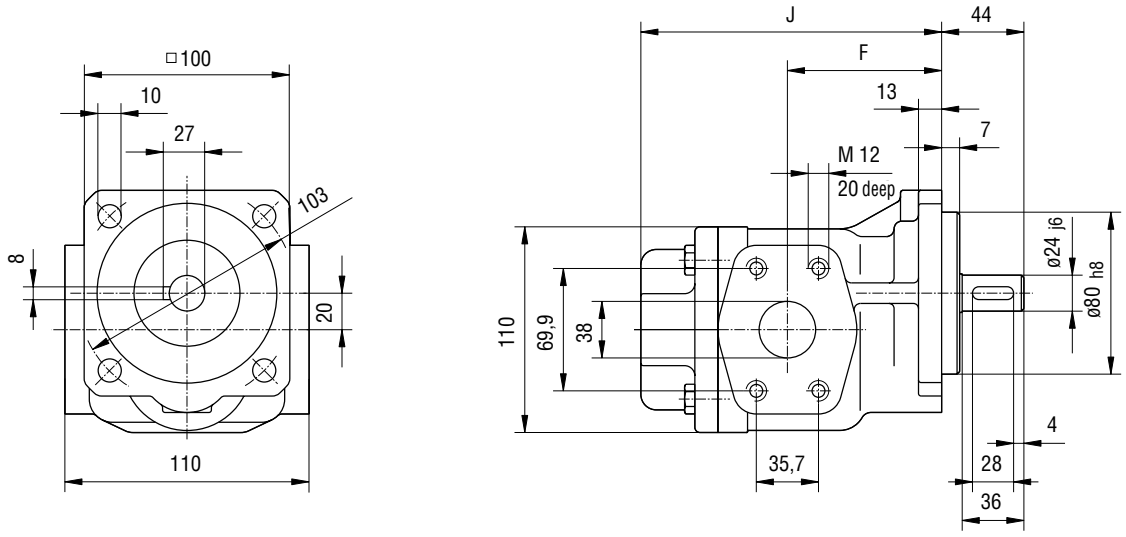


KF 4...25 Flange-mounting version with pressure relief valve

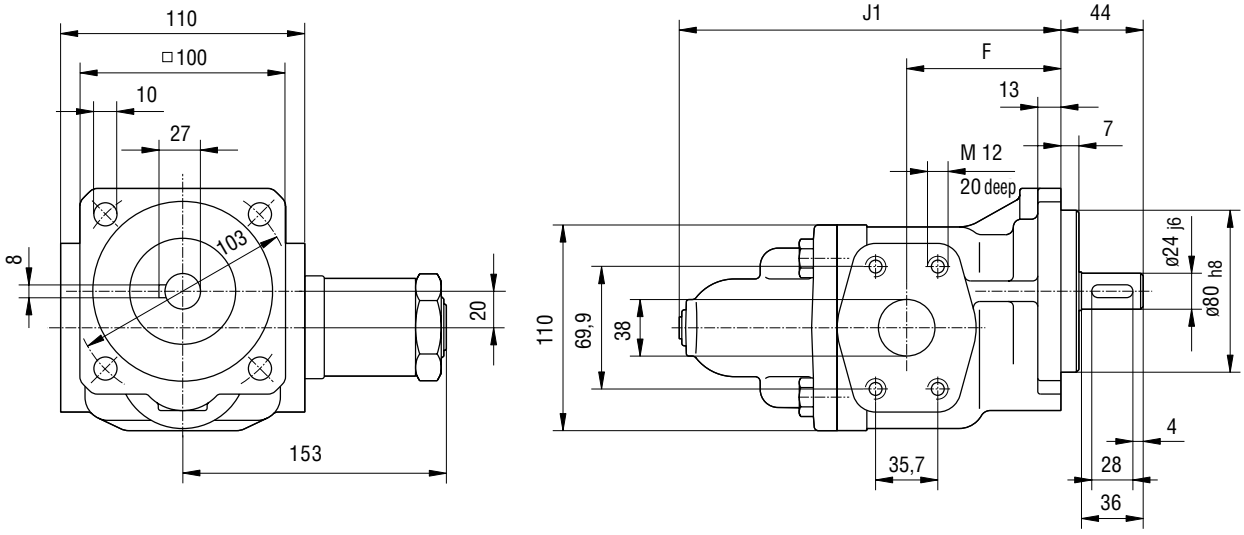


Nominal size	Suction and pressure connection		F	J	J_1	Weight in kg	
	a	b				without valve	with valve
4...12	G 3/4 17 deep	36	54	109	140	2.9	3.7
16...25	G 1 19 deep	42	63	131	162	3.5	4.3

KF 32...80 Flange-mounting version

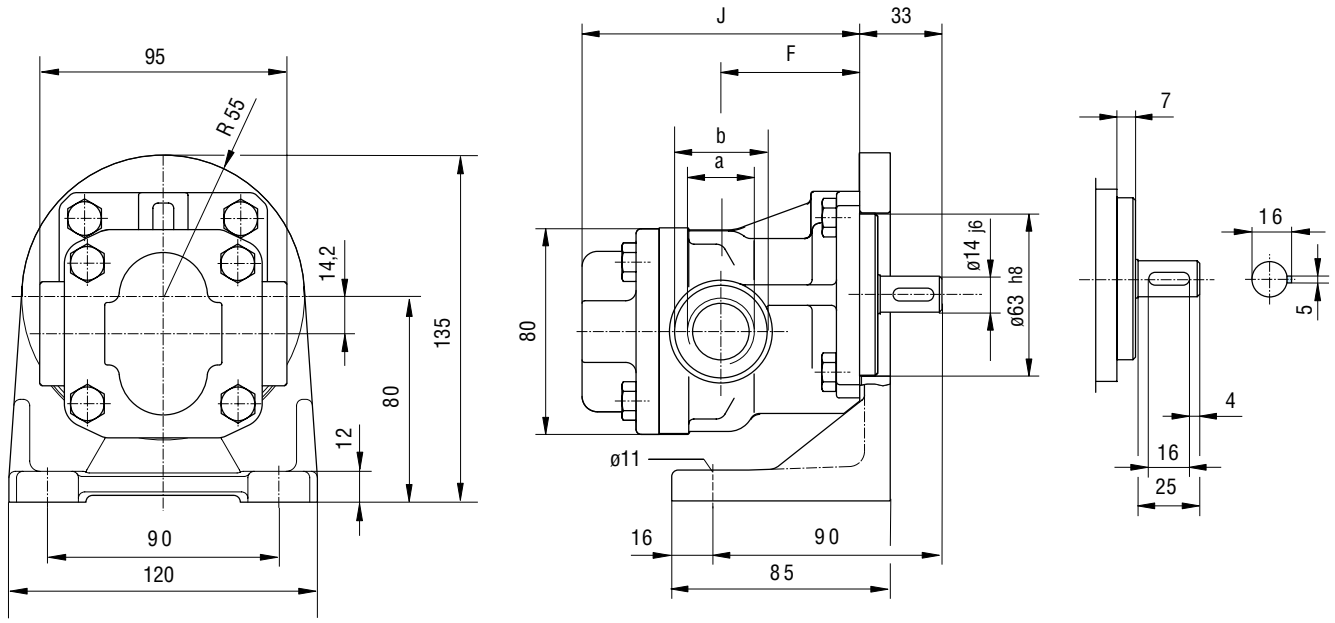


KF 32...80 Flange-mounting version with pressure relief valve

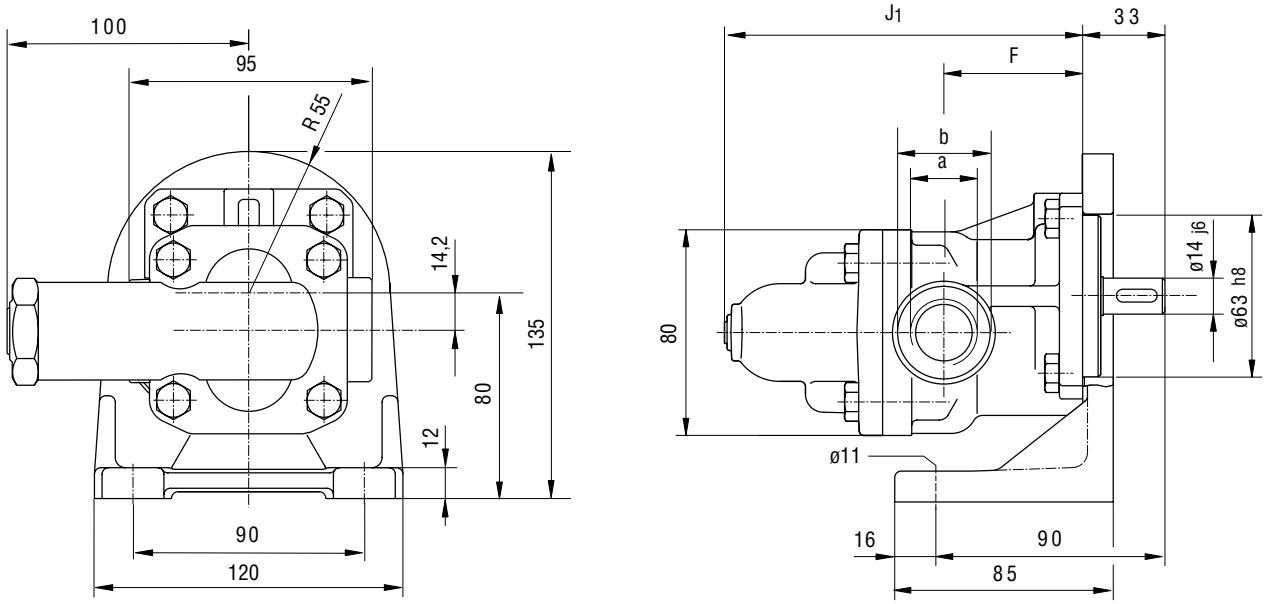


Nominal size	F	J	J_1	Weight in kg without valve	Weight in kg with valve
32...50	84	171	212	7.7	9.5
63...80	100	206	247	9.4	11.2

KF 4...25 Foot mounted version

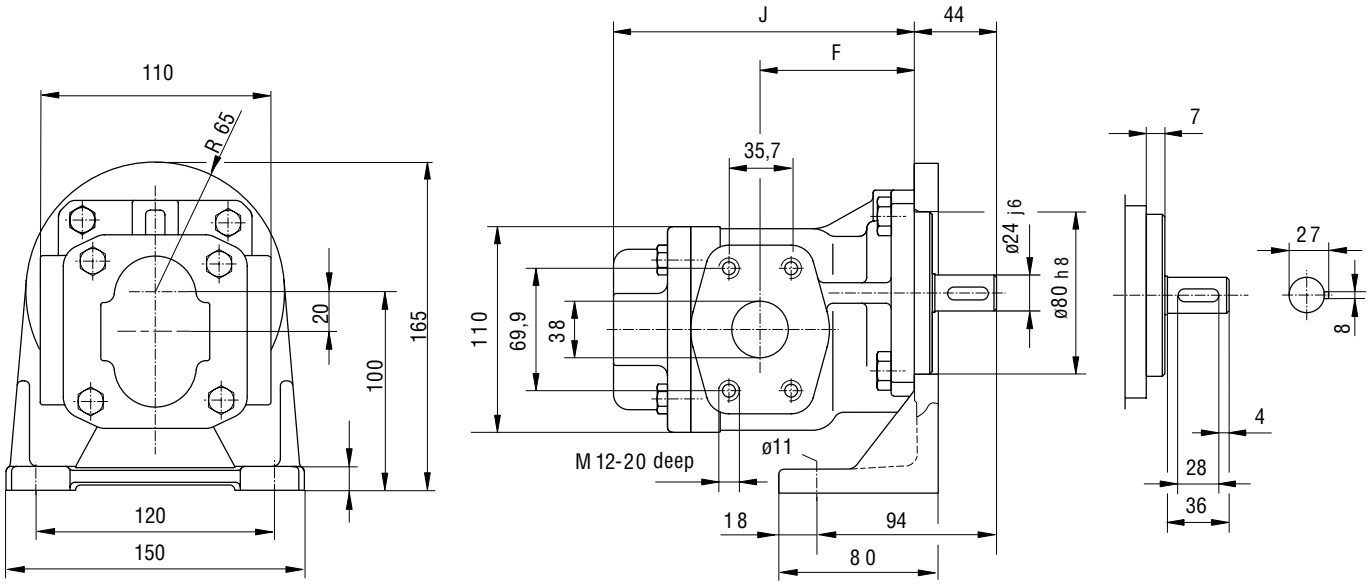


KF 4...25 Foot mounted version with pressure relief valve

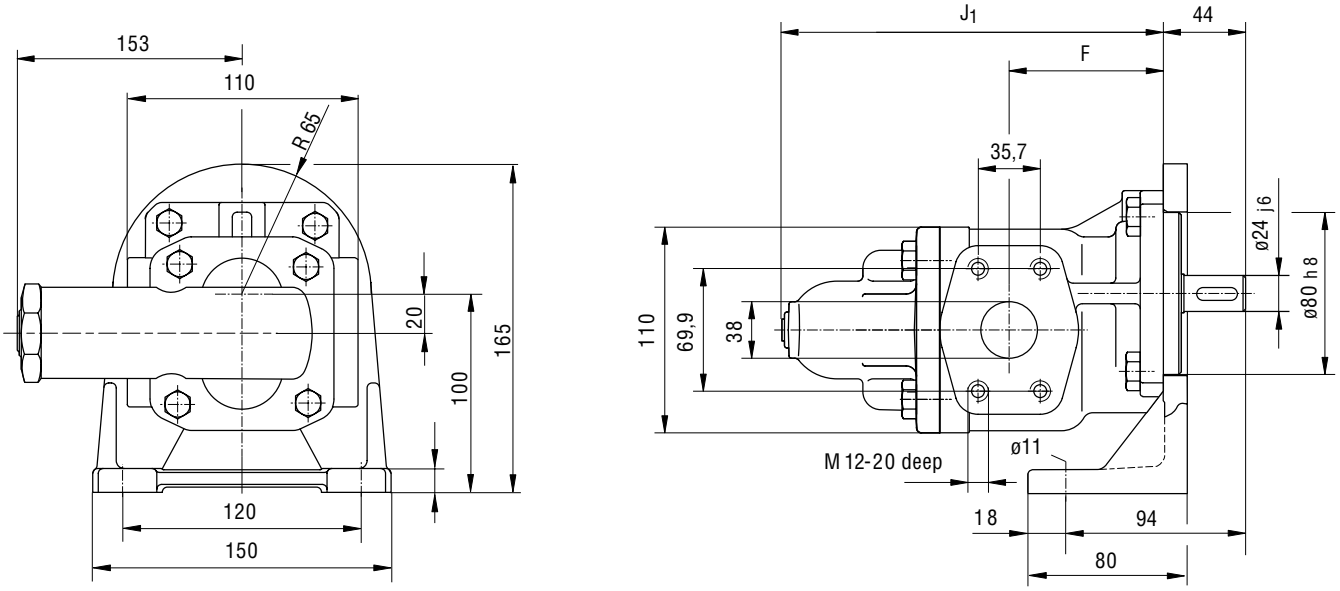


Nominal size	Suction and pressure connection		F	J	J_1	Weight in kg	
	a	b				without valve	with valve
4...12	G 3/4 17 deep	36	54	109	140	4.2	5
16...25	G 1 19 deep	42	63	131	162	4.8	5.6

KF 32...80 Foot mounted version

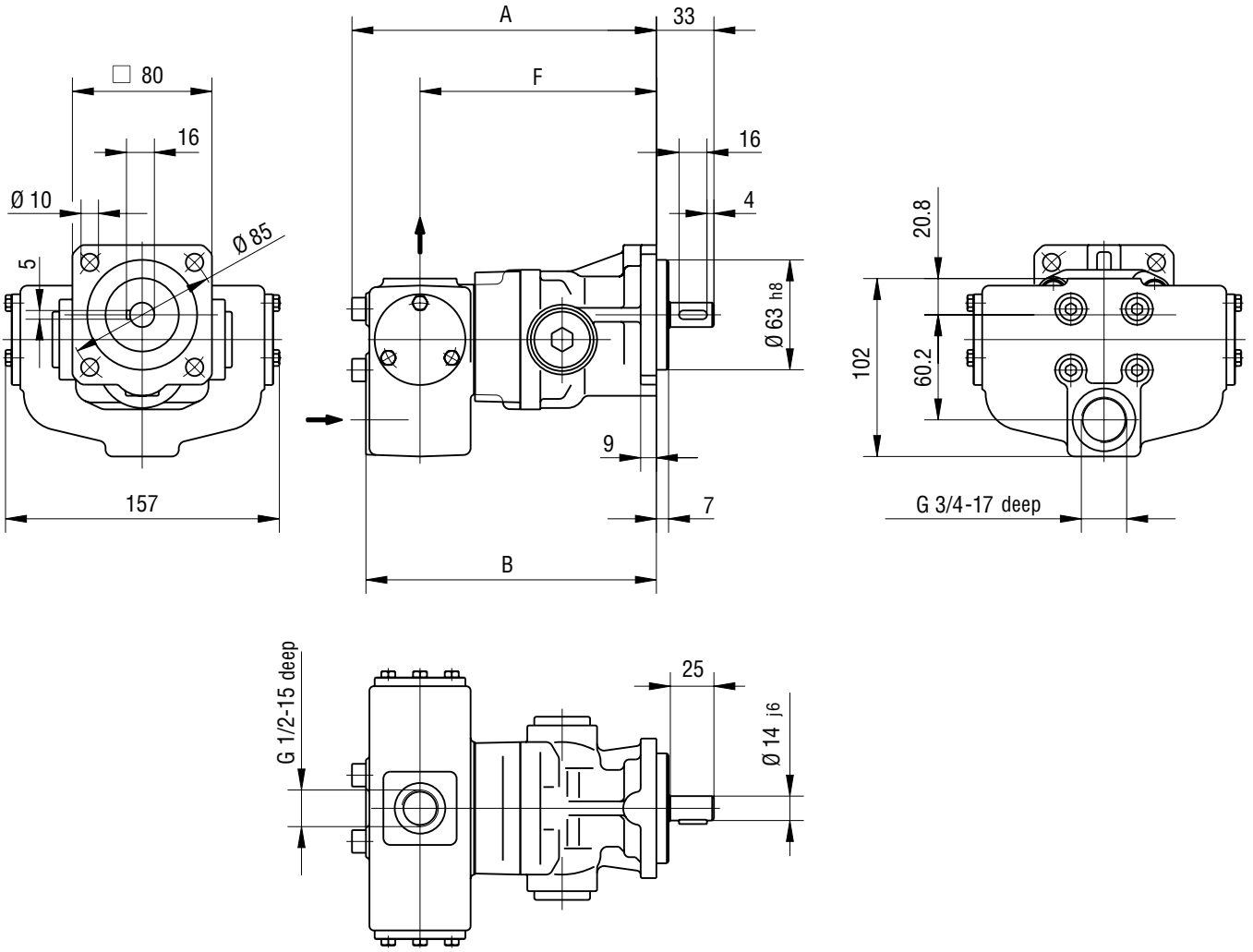


KF 32...80 Foot mounted version with pressure relief valve



Nominal size	F	J	J_1	Weight in kg without valve	Weight in kg with valve
32...50	84	171	212	9.5	11.3
63...80	100	206	247	11.2	13

KF 4...25 with universal device



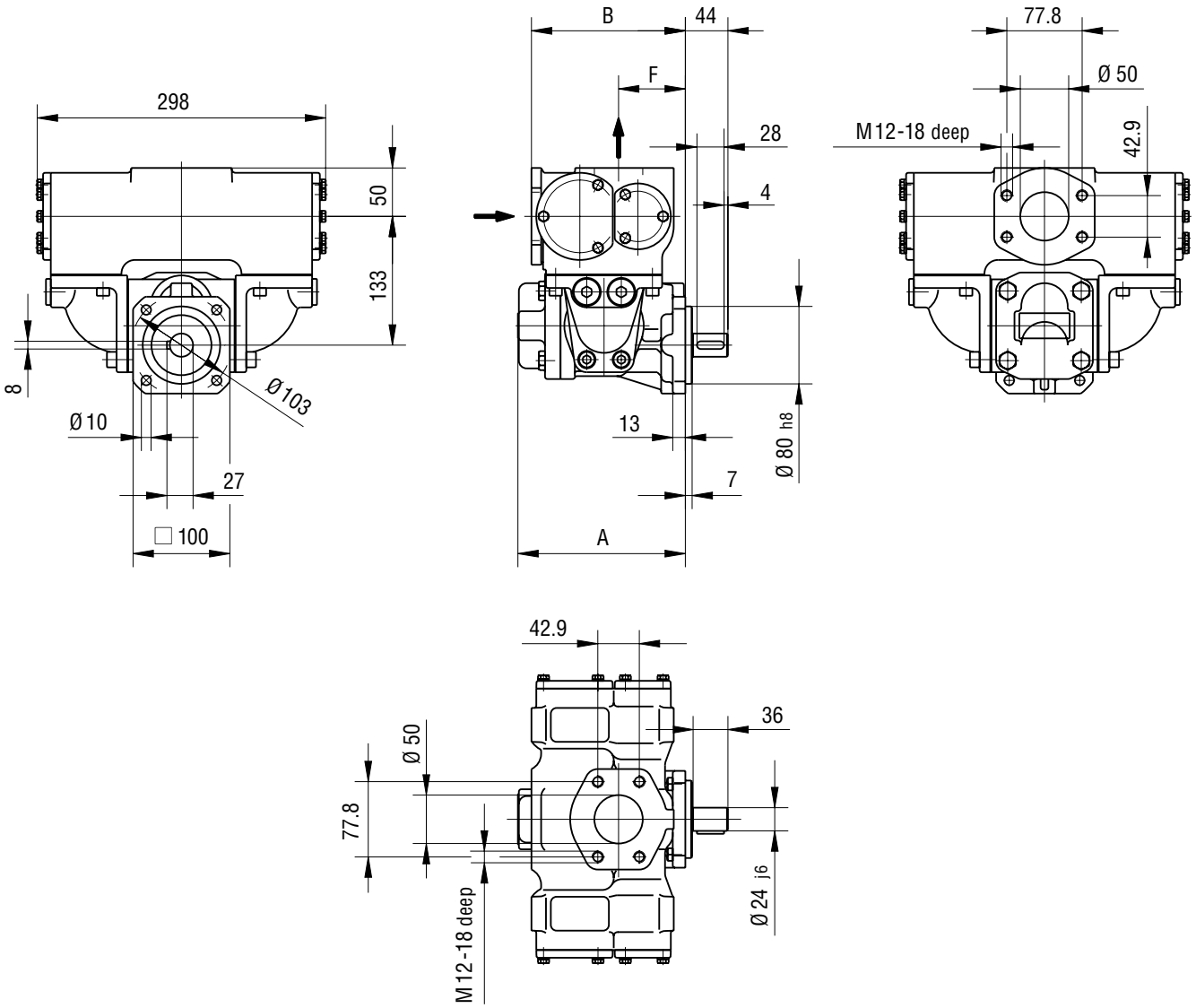
Ordering example

KF • UF •

Seals 1 2

Nominal size	A	B	F	Weight in kg	Perm. manometr. low pressure at the pump suction connection p_e bar
4 5 6 8 10 12	174.5	166.5	135.5	6.9	0.35
16 20 25	196.5	188.5	157.5	7.5	

KF 32...80 with universal device



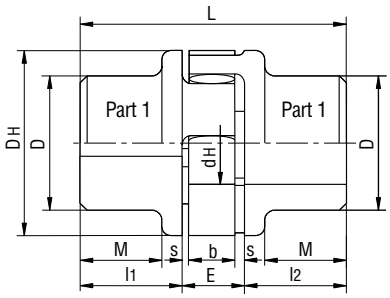
Ordering example

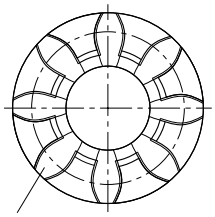
KF • UF •

Seals 1 2

Nominal size	A	B	F	Weight in kg	Perm. manometr. low pressure at the pump suction connection p_e bar
32 40 50	173	159	69	27.5	0.35
63 80	208	175	85	29.5	

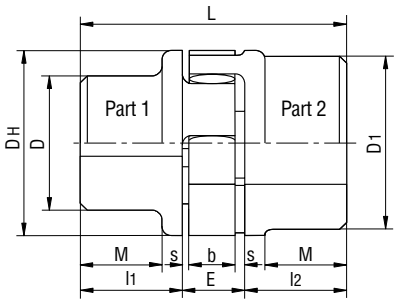
Version A





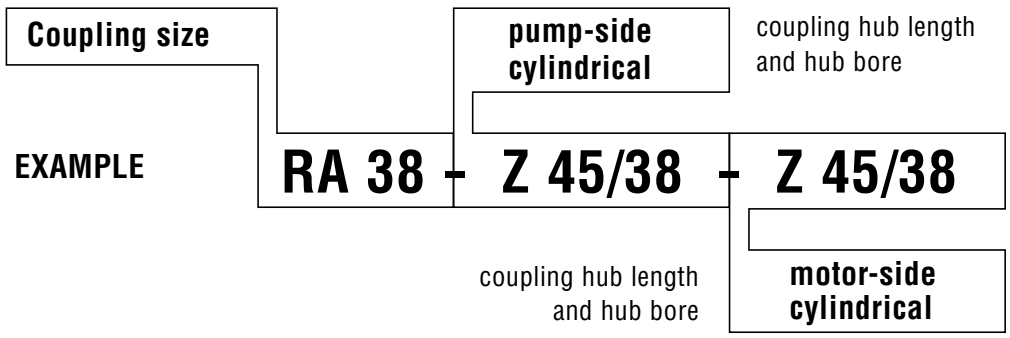
Gear rim of polyurethane (Vulkollan)
Shore hardness 92°
Colour: yellow

Version B



	Ordering code	Coupling size	Hub material (AL)		Pre-bore		Finished bore				Dimensions									
			Weight	Moment of inertia			min.		max.											
			kg	kgm²	part 1	part 2	part 1	part 2	part 1	part 2	l1/l2	E	s	b	L	M	DH	D	D_1	dh
Version A	RA 19-Z 25/..-Z 25/..	19	0.117	0.00003	4	–	6	–	19	–	25	16	2	12	66	20	40	32	–	18
	RA 24-Z 30/..-Z 30/..	24	0.24	0.00008	6	–	8	–	24	–	30	18	2	14	78	24	55	40	–	27
	RA 28-Z 35/..-Z 35/..	28	0.39	0.0002	8	–	10	–	28	–	35	20	2.5	15	90	28	65	48	–	30
	RA 38-Z 45/..-Z 45/..	38	0.82	0.0007	10	–	12	–	38	–	45	24	3	18	114	37	80	66	–	38
Version B	RA 19/24-Z 25/..-Z 25/..	19/24	0.129	0.00004	4	17	6	19	19	24	25	16	2	12	66	20	40	32	40	18
	RA 24/28-Z 30/..-Z 30/..	24/28	0.26	0.0001	6	22	8	24	24	28	30	18	2	14	78	24	55	40	48	27
	RA 28/38-Z 35/..-Z 35/..	28/38	0.46	0.0003	8	26	10	28	28	38	35	20	2.5	15	90	28	65	48	65	30
	RA 38/45-Z 45/..-Z 45/..	38/45	0.89	0.0008	10	36	12	38	38	45	45	24	3	18	114	37	80	66	76	38

Type code KF coupling

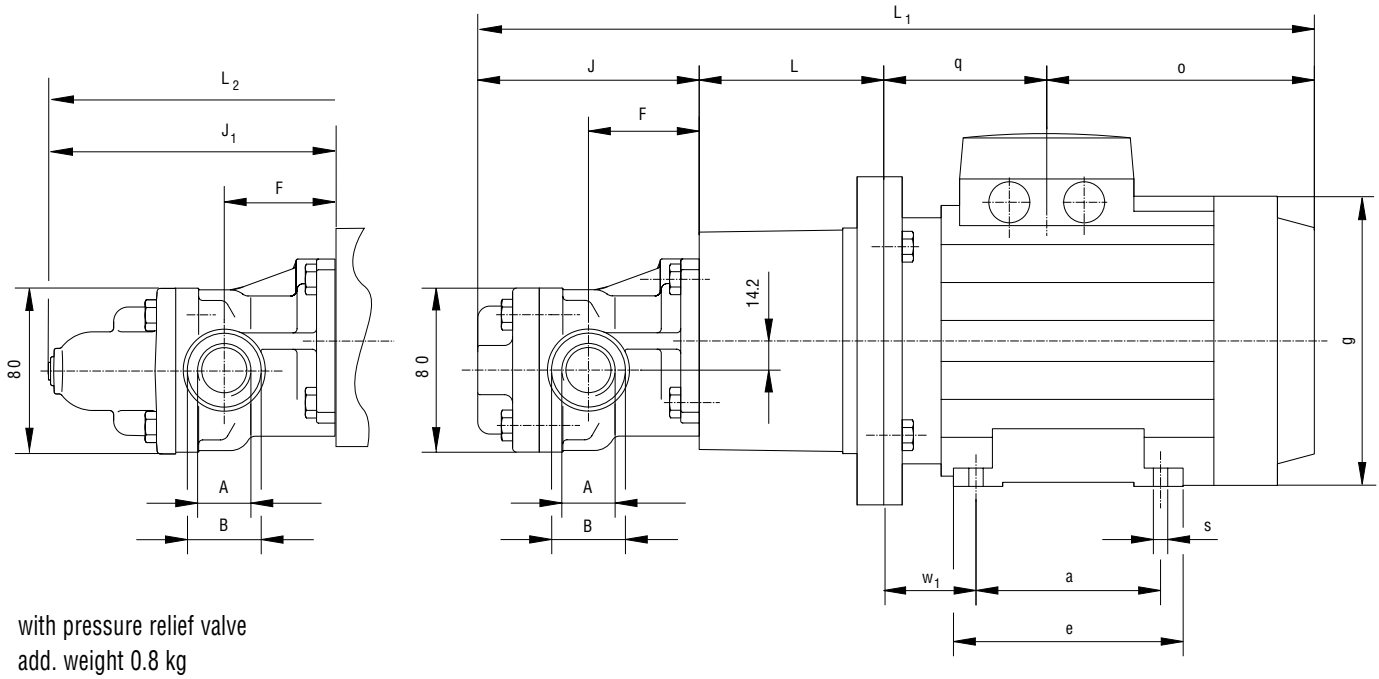


Operating temperature:
-10 °C to +80 °C (short duration temperature peaks up to 120 °C are permissible).

Weights and mass moments of inertia refer to max. finish-machined bore without slot.

Finish-machined bores to ISO Fit H7, parallel key slots in accordance with DIN 6886 Sh.1.

KF 4...25 Motor with pump

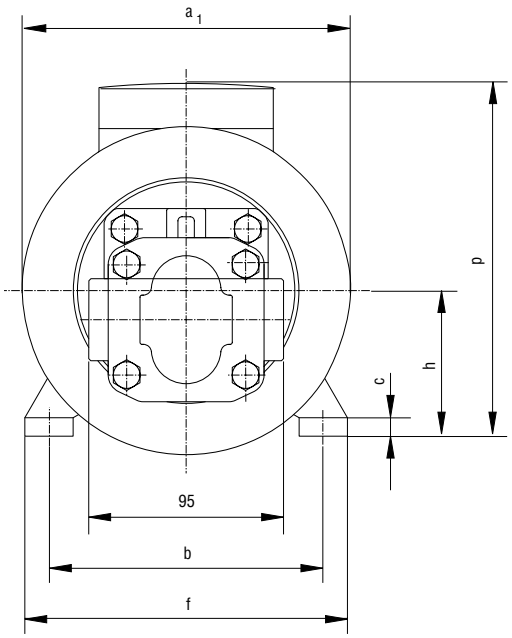


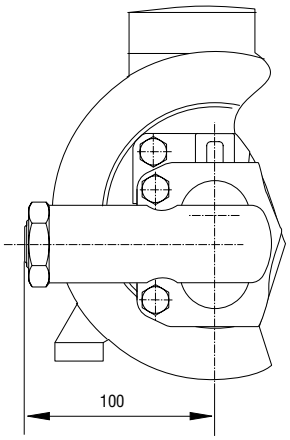
with pressure relief valve
add. weight 0.8 kg

Frame size	Power	Speed	Power	Speed	Bell housing	Coupling	Total weight kg	
	kW	1/min	kW	1/min			Nominal size	
	Motor 6 pole		Motor 4 pole				4...12	16...25
71 s	0.18	920	0.25	1400	**PT160-A-063-80**	**RA19-Z25/14-Z25/14**	10	10.5
71	0.25	920	0.37	1410			11	11.5
80 s	0.37	920	0.55	1420	**PT200-A-063-100**	**RA19-Z25/14-Z25/19**	13.5	14
80	0.55	930	0.75	1420			14.5	15
90 S	0.75	930	1.1	1410	**PT200-A-063-100**	**RA19/24-Z25/14-Z25/24**	17.5	18
90 L	1.1	930	1.5	1420			20.5	21
100 LS	–	–	2.2	1430	**PT250-A-063-120**	**RA24/28-Z30/14-Z30/28**	26.5	27
100 L	1.5	950	3	1430			29.5	30
112 M	2.2	940	4	1435			32.5	33

KF 4...25 Pump sizes

Nominal size	Suction and pressure connection		F	J	J_1
	A	B			
4...12	**G 3/4** 17 deep	**36**	**54**	**109**	**140**
16...25	**G 1** 19 deep	**42**	**63**	**131**	**162**





with pressure relief valve

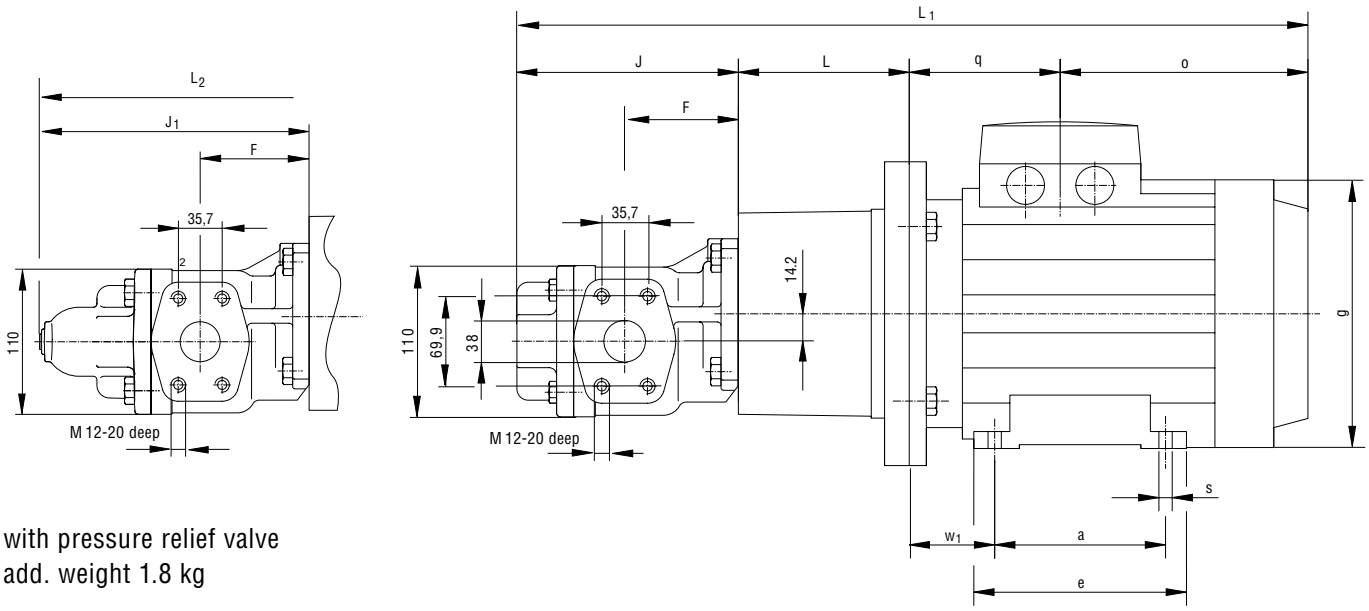
Frame size																		
	4...12	16...25	4...12	16...25	4 - 25													
	L_1	L_1	L_2	L_2	L	a_1	a	b	c	e	f	g	h	o	p	q	s	w_1
71 s	399	421	430	452	80	160	90	112	9	112	136	140	71	130	172	80	7	45
71	399	421	430	452	80	160	90	112	9	112	136	140	71	130	172	80	7	45
80 s	441	463	472	494	100	200	100	125	10	125	154	158	80	139	192	94	10	50
80	441	463	472	494	100	200	100	125	10	125	154	158	80	139	192	94	10	50
90 S	454	476	485	507	100	200	100	140	10	125	170	178	90	151	212	94	10	56
90 L	479	501	510	532	100	200	125	140	10	150	170	178	90	177	212	94	10	56
100 LS	527	549	558	580	120	250	140	160	12	172	197	198	100	201	236	97	12	63
100 L	527	549	558	580	120	250	140	160	12	172	197	198	100	201	236	97	12	63
112 M	530	552	561	583	120	250	140	190	12	168	222	221	112	161	258	140	12	70

Note:

All pump and motor sizes can be combined.

Motor frame sizes are based on ABB. Other manufactures motors can be supplied on request as IMB35.

KF 32...80 Motor with pump

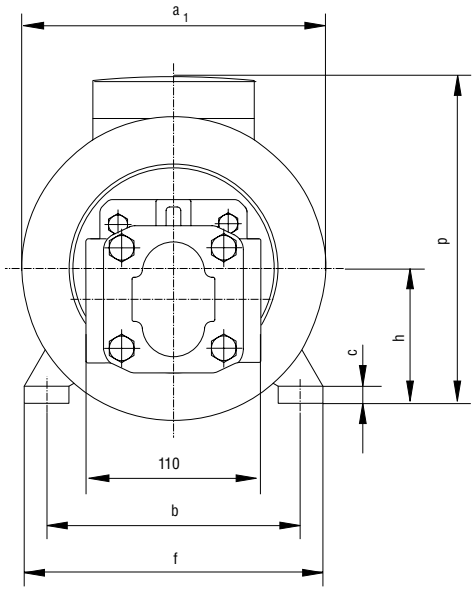


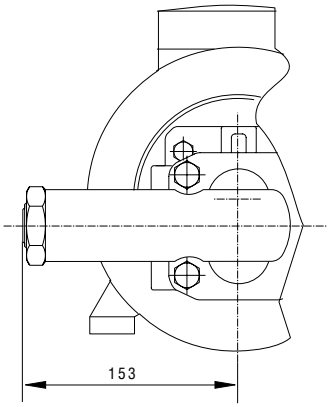
with pressure relief valve
add. weight 1.8 kg

Frame size	Power	Speed	Power	Speed	Bell housing	Coupling	Total weight kg	
	kW	1/min	kW	1/min			Nominal size	
	Motor 6 pole		Motor 4 pole				32...50	63...80
80 s	0.37	920	0.55	1420	PT200-A-080-100	RA19/24-25/24-/Z25/19	18.4	20.1
80	0.55	930	0.75	1420			19.4	21.1
90 S	0.75	930	1.1	1410	PT200-A-080-110	RA24-Z30/24-Z30/24	22.3	24
90 L	1.1	930	1.5	1420			25.3	27
100 LS	–	–	2.2	1430	PT250-A-080-124	RA24/28-Z30/24-Z30/28	31.3	33
100 L	1.5	950	3	1430			34.3	36
112 M	2.2	940	4	1435			37.3	39
132 S	3	960	5.5	1450	PT300-A-080-144	RA28/38-Z35/24-Z35/38	50	52
132 M	4	960	7.5	1450			58	60
132 M	5.5	955	–	–			64	66
160 M	7.5	9975	11	1455	PT350-A-080-188	RA38/45-Z45/24-Z45/42	91	93
160 L	11	970	15	1460			105	107

KF 32...80 Pump sizes

Nominal size	F	J	J_1
32...50	84	173	212
63...80	100	208	247





with pressure relief valve

Frame size	32...50	63...80	32...50	63...80	32 - 80													
	L_1	L_1	L_2	L_2	L	a_1	a	b	c	e	f	g	h	o	p	q	s	w_1
80 s	504	539	545	580	100	200	100	125	10	125	154	158	80	139	192	94	10	50
80	504	539	545	580	100	200	100	125	10	125	154	158	80	139	192	94	10	50
90 S	526	561	567	602	110	200	100	140	10	125	170	178	90	151	212	94	10	56
90 L	552	587	593	628	110	200	125	140	10	150	170	178	90	177	212	94	10	56
100 LS	593	628	643	669	124	250	140	160	12	172	197	198	100	201	236	97	12	63
100 L	593	628	643	669	124	250	140	160	12	172	197	198	100	201	236	97	12	63
112 M	596	631	637	672	124	250	140	190	12	168	222	221	112	161	258	140	12	70
132 S	682	717	723	748	144	300	140	216	14	212	262	261	132	216	296	151	12	89
132 M	682	717	723	748	144	300	178	216	14	212	262	261	132	216	296	151	12	89
132 M	682	717	723	748	144	300	178	216	14	212	262	261	132	216	296	151	12	89
160 M	845	880	886	921	188	350	210	254	18	292	312	316	160	344	370	142	15	108
160 L	845	880	886	921	188	350	254	254	18	292	312	316	160	344	370	142	15	108

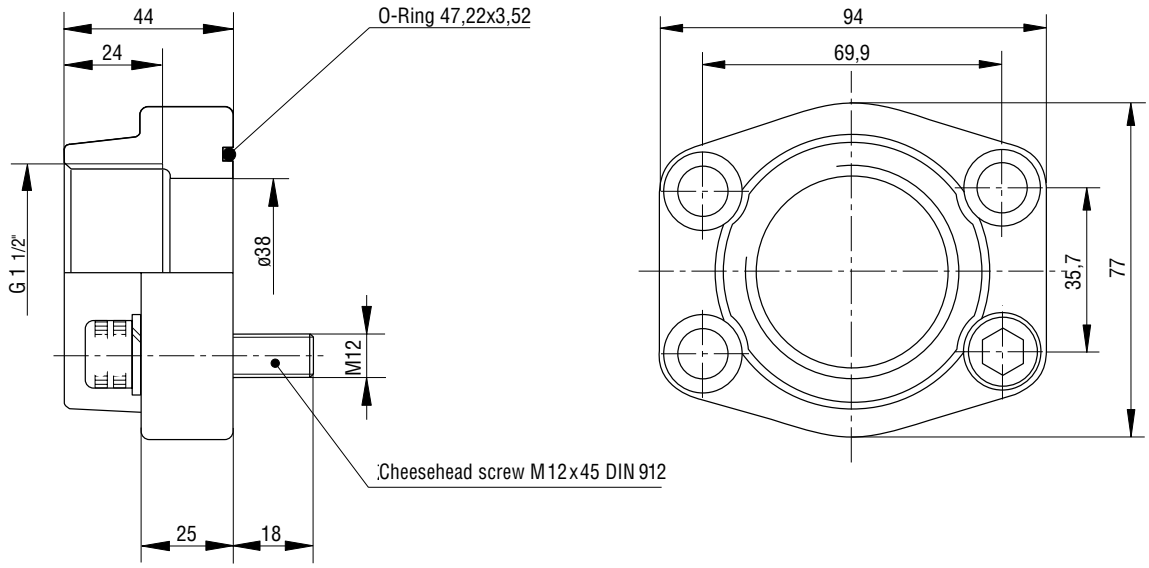
Note:

All pump and motor sizes can be combined.

Motor frame sizes are based on ABB. Other manufactures motors can be supplied on request as IMB35.

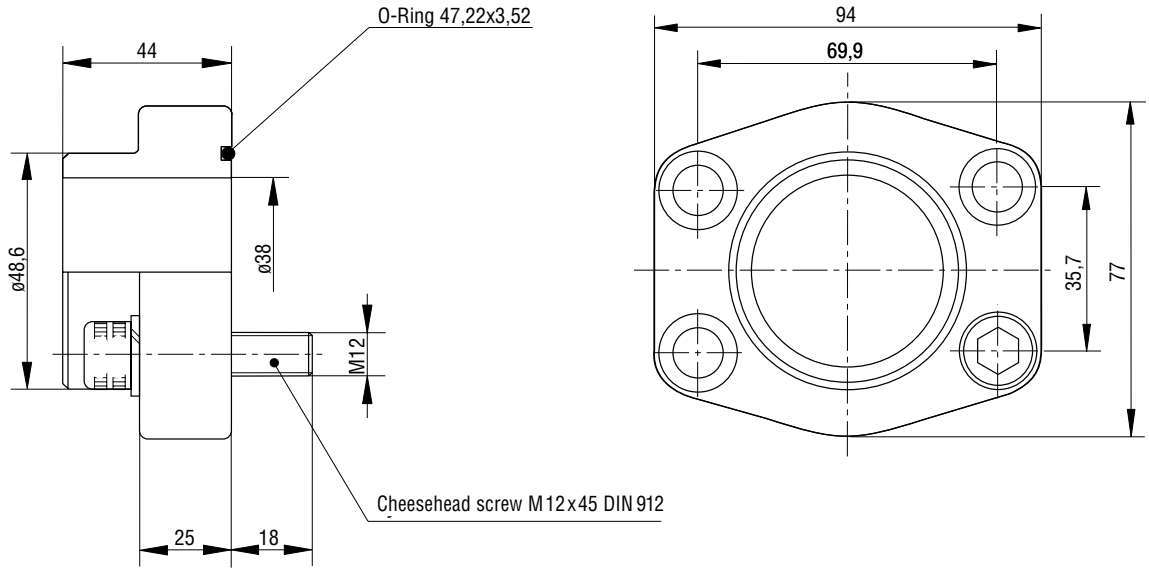
Threaded flange

G-SAE 1 1/2 – N
Weight 1.2 kg **– F**
– P



Welding flange

G-SAE 1 1/2 – N
Weight 1.2 kg **– F**
– P



N = NBR –O–Ring
F = FKM –O–Ring
P = PTFE–O–Ring

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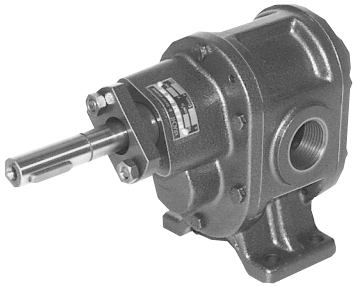

Gear Pumps

BT, BTH

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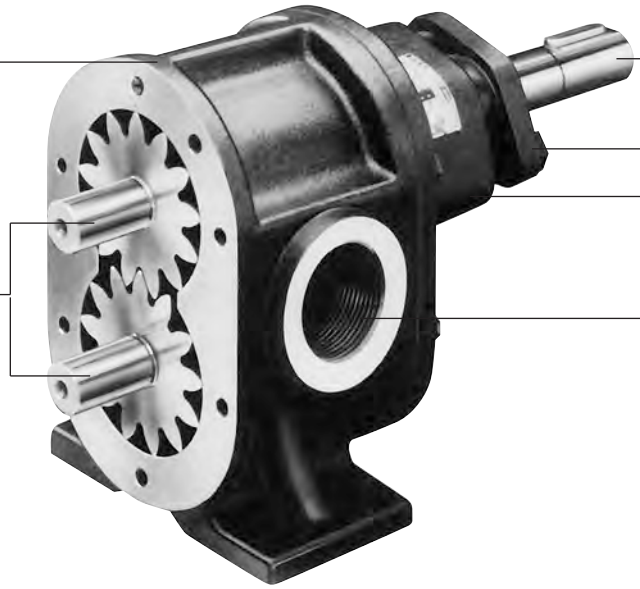
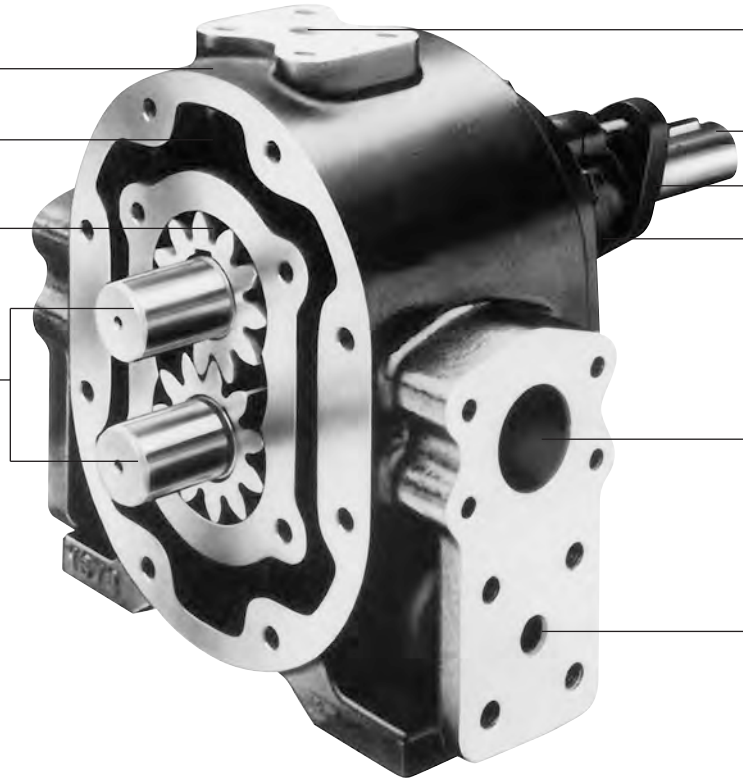
تهران، کیلومتر۲۱ بزرگراه لشگری (جاده مخصوص کرج)
روبروی پالایشگاه نفت پارس، پلاک ۱۲

Construction

Basic construction of BT (rear bearing cover removed)



Basic construction of BTH (rear bearing cover removed)



Function

Pumps series BT and BTH are low speed gear pumps for transfering medium and high viscosity fluids, provided they have certain minimum amount of lubricating property, do not contain any solids and are chemically compatable with the materials of construction.

The standard material of construction for housing, bearing cover and stuffing box cover is grey cast iron. The shafts and gears are manufactured from case hardening steel, hardened and ground.
The shafts are carried in plain bearings manufactured in bronze, with an option of sintered iron.

The rotary shaft seal is a packed gland consisting of PTFE fillied aramid yarn, and the static sealing between mating parts is by means of either, liquid sealant or gaskets. All sealing materials are asbestos free.

External axial loads are not permissable, restricted radial loads can be absorbed, dependant on their magnetude and direction.

Driving by flexible shaft coupling is preferred.

In the case of fluids which require elevated temperatures to flow i. e. bitumen, wax etc. the BTH series pump should be used. In this model the housing is double walled to provide a heating jacked.

The pump transfer chamber is heated by circulating heat transfer fluid or steam through the jacket.

The standard range of models is complimented by a range of a special models described below.

The pump size BT 2 can be supplied in a corrosion and acid - resistant construction (stainless steel body and gear) with carbone plain bearings bushes; the operating pressure of this pump is limited to 5 bars.

BT 1 up to BT 4 pumps can be manufactured with bronze housing and with further combinations of stainless steel gears and shafts or bronze gears and stainless steel shafts.

For use on liquids with an abrasive nature and high corrosive effects like resins, certain paints and varnishes as well as glues a special construction, Code No. / 04, is recommended, which is available for pump sizes BT 1 up to BT 7.

In this model all pump parts which are in contact with the transfering fluid are protected from wear and corrosion by a chemically deposited Ni/SiC- dispersion layer. This treatment substantially extends the service life compared with that of a standard model when used in these types of fluid.

General Characteristics

Fixing type			Foot mounting
Pipe connection			BT: Whitworth-Pipe thread BTH: Whitworth-Pipe thread flange, flange with counterflange
Direction of rotation			BT = clockwise **and** anticlockwise BTH = clockwise **or** anticlockwise
Weight			see page 11 ... 15
Fitting position			horizontal
Ambient temperature	$\vartheta_{u\,min}$	=	– 10 °C
	$\vartheta_{u\,max}$	=	60 °C

Operating Characteristics

Operating pressure			
Inlet port	$p_{e\,min}$	=	– 0.4 bar
Outlet port *	p_N	=	8 bar 1 bar to BT0 5 bar to BT2 stainless steel
max. pressure in the heating jacket	p_H	=	10 bar
Temperature range	$\vartheta_{m\,min}$	=	– 10 °C
	$\vartheta_{m\,max}$	=	220 °C
Viscosity range	ν_{min}	=	76 mm²/s
	ν_{max}	=	30 000 mm²/s
			Viscosities other than within this range on request
Discharge flow			see table page 9, 10
Power input speeds	n_{min}	=	100 1/min
	n_{max}	=	750 1/min

Suitable Fluids

Lubricating-, Cutting oils	Waste oils	Adhesives, Plastics	Cellulose
Soluble-, Steel hardening-,	Bitumen	Binding agents	etc.
Rolling-, Drawing oils	Paints	Resins	
Diesel oils	Greases	Glue, Glue liquors	
Fuel oil S	Synthetic resin varnishes	Molasses	
Engine oils	Nitrocellulose lacquers	Waxes	

Other Types

Pump with electric motor, coupling and coupling guard mounted on a common base plate.

Accessories

Flexible coupling

* higher operating pressure on request

Type Key

BT	0	B	Z	0	A	C	51/	.
BT	2	B	Z	0	R	T	51/	.
BT	1...4	B	Z	0	U	S T	51/	.
BT	1...7	B	Z	0	B C	K	51/	.
BT	1...7	B	Z	0	C	K	51/	04
BTH	1+2	R L	.	0	B C	K	51	.
BTH	3	R L	.	0	B C	F	51	.

Code-No. for special construction
04 Wear and corrosion protected model

Kind of sealing (Packing)
51 Arolan

Construction of gear unit
C Steel shafts and gear unhardened
K Steel shafts and gear hardened
F Steel shafts and gear hardened
S Stainless steel shaft (material No. 1.4057) bronze gear
T Stainless steel shafts and gear heat treated (material No. 1.4057)

Construction of housing and friction bearing
A Cast iron without bearing bush
B Cast iron with Bz bearing bush
C Iron bearing bush
U Bronze without bearing bush
R Stainless steel with carbon-bearing bush (mat. No. 1.4308)

Design code
0 (specified by KRACHT)

Pipe connection
Z Whitworth pipe thread
F Flange
G Flange with counter flange

Direction of rotation
R Clockwise
L Anticlockwise
B Clockwise and anticlockwise

Series

Product code
BT without heating jacket (Cylindrical shaft end without step bearing, with packing and threaded pipe connection)
BTH with heating jacket (Cylindrical shaft end without step bearing, with packing, threated pipe- or flange connection)

Gear Pumps BT – ATEX

Pumps of the series BT are also available in ATEX design.
The pumps can be used as follows:

a. In Zone 2 (Gas-Ex, Category 3G) in explosion groups IIA and IIB and IIC

b. In Zone 1 (Gas-Ex, Category 2G) in explosion groups IIA and IIB and IIC

Qualification with regard to surface temperature is T4. For all gases, vapours, mists with an ignition temperature > 135 °C, the pumps are not an ignition source.

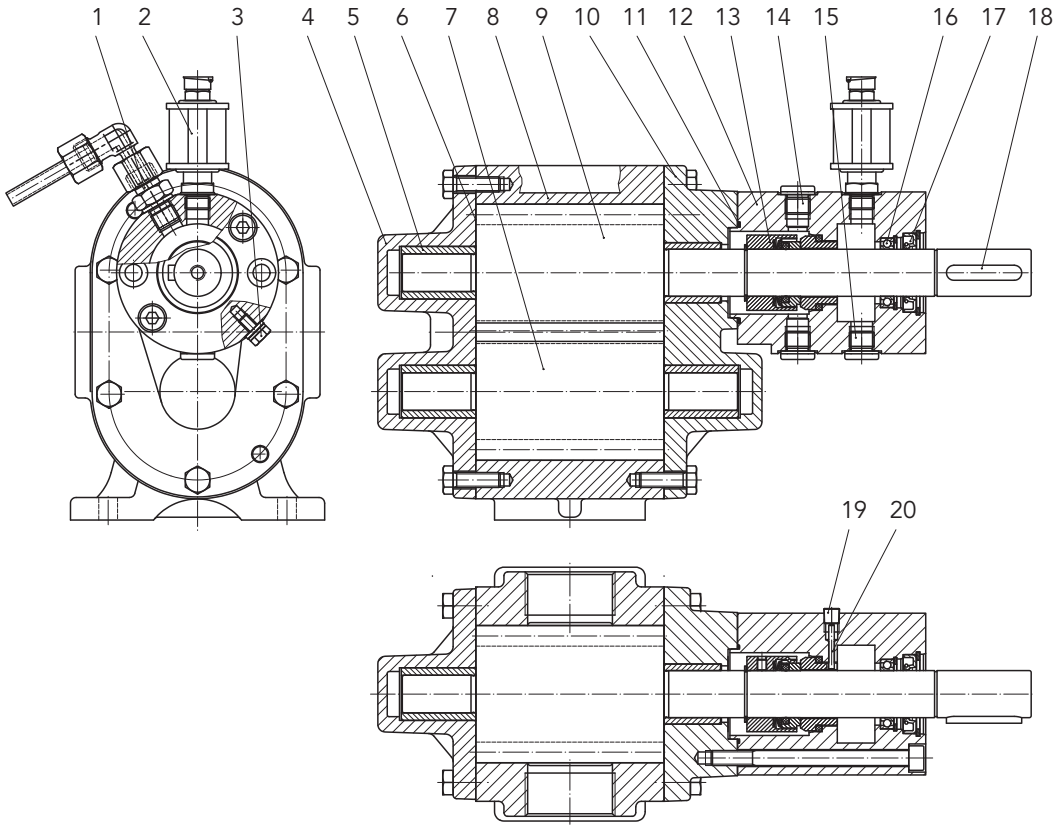
The permissible temperature range extends from –20 °C T_a 60 °C.

Identification in accordance with EC Directive RL 94/9/EG

Manufacturer:	Kracht GmbH 58791 Werdohl, Germany
Type designation:	BT …
Job No., Production Date:	xxxxxx/xx-xxx xx.xx
Tech. File Ref.:	TFR: 07.01X
Ignition protection designation:	Ex II 2 G ck T4

The ATEX design BT pumps are equipped with a mechanical seal with a fluid receiver. In the area of the fluid receiver the BT-ATEX has a connection for a container for filling the receiver fluid. An overflow serves to monitor the amount which leaks from mechanical seal.

Construction BT – ATEX



1 Overflow
2 Container for the preliminary fluid
3 Earth connection
4 Front cover
5 Plain bearing bush
6 Fluid gasket
7 Driven shaft
8 Housing
9 Driving shaft
10 Cover
11 O-Ring
12 Seal retainer
13 Mechanical seal
14 Vent screw
15 Drain plug
16 Bearing
17 Rotary shaft seal
18 Parallel key
19 Screw plug
20 Antitwist protection

Gear Pumps BT – ATEX

General Characteristics

Design	External gear pump
Pipe connection	Whitworth-Pipe thread
Mounting position	Horizontal
Fixing type	Foot mounting
Direction of rotation	clockwise **and** anticlockwise
Ambient temperature	$\vartheta_{u\,min}$ – 10 °C $\vartheta_{u\,max}$ 40 °C

Operating Characteristics

Temperature range	$\vartheta_{u\,min}$	– 10 °C
	$\vartheta_{u\,max}$	60 °C
Speed	n_{min}	100 1/min
	n_{max}	750 1/min
Viscosity	ν_{min}	76 mm^2/s
	ν_{max}	20000 mm^2/s
Operating pressure		
Inlet port	$p_{e\,min}$	– 0.4 bar
	$p_{e\,max}$	8 bar
Outlet port	$p_{n\,max}$	8 bar
Axial and centrifugal forces on shaft end		Not allowed

Filtering	Filter fineness 60 µm (If required, install a suction filter to prevent the pump from being jammed by foreign particles).
Permissible media	Inflammable and non-inflammable liquids without abrasive ingredients which are compatible with the materials of which the pump is made. The liquid must not be static charged. Flame point and minimum ignition temperature must be observed by the operator. Media-specific characteristics must be taken into consideration. The fluid must have a minimum amount of lubricity.

For certain operating conditions, the stated minimum and maximum values are not valid! Thus, for example, the maximum operating pressure is not permissible in conjunction with low rpm and minimum viscosity.

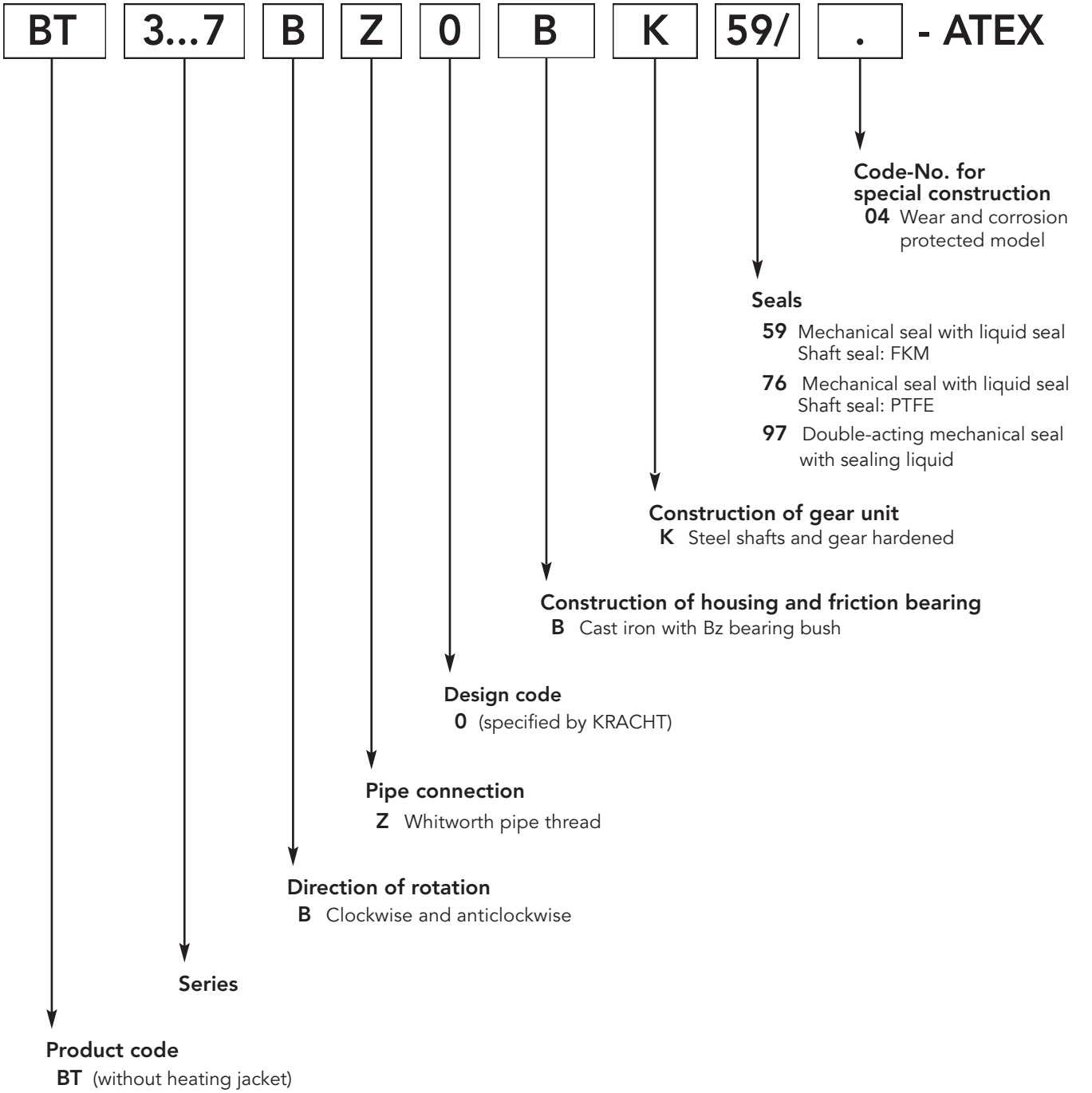
Media-specific characteristics must be observed, e.g. in the case of emulsions and solutions containing water, the maximum operating temperature is 50 °C, the pump must be located beneath the level of the liquid.

Materials

Housing, bearings, gears	see type key*
Mechanical sealing	SiC-SiC, FFKM, Stainless steel
Other media-side seals	Loctite 510, FEP with FKM-core
Uni-oiler	Ms, Plexiglas
Type plate	Stainless steel
Notched nail	Al (Mg portion < 7.5 %)
Gasket ring screw-plugs	Cu
Other parts	St

* see type label at pump: BT...

Type Key ATEX



Power Consumption

Pump type	Vg (cm³/r)	p (bar)	n = 100 1/min					n = 200 1/min					n = 300 1/min				
			Q (l/min)	Viscosity ν (mm²/s) 76	760	3800	7600	Q (l/min)	Viscosity ν (mm²/s) 76	760	3800	7600	Q (l/min)	Viscosity ν (mm²/s) 76	760	3800	7600
				required power input P (kW)					required power input P (kW)					required power input P (kW)			
BT 0	6.9	1	–	–	–	–	–	1.2	0.07	0.07	0.15	–	1.8	0.07	0.07	0.15	–
BT 1	32	2	2.5	0.07	0.07	0.07	0.07	5	0.07	0.07	0.15	0.15	7.5	0.07	0.15	0.22	0.22
		4		0.07	0.07	0.07	0.07		0.07	0.07	0.15	0.22		0.07	0.15	0.22	0.3
		6		0.07	0.07	0.07	0.07		0.07	0.15	0.15	0.22		0.15	0.15	0.3	0.3
		8		0.07	0.07	0.07	0.15		0.07	0.15	0.22	0.22		0.15	0.22	0.3	0.3
BT 2	43	2	4	0.07	0.07	0.15	0.15	8	0.07	0.15	0.22	0.3	12	0.07	0.22	0.37	0.44
		4		0.07	0.07	0.15	0.15		0.07	0.15	0.3	0.37		0.15	0.3	0.44	0.52
		6		0.07	0.07	0.15	0.15		0.15	0.22	0.3	0.37		0.22	0.3	0.44	0.52
		8		0.07	0.15	0.15	0.22		0.15	0.22	0.37	0.37		0.22	0.37	0.52	0.6
BT 3	91	2	8	0.07	0.15	0.22	0.22	16	0.15	0.22	0.44	0.52	24	0.15	0.37	0.6	0.74
		4		0.07	0.15	0.22	0.3		0.15	0.3	0.44	0.6		0.3	0.44	0.74	0.88
		6		0.15	0.15	0.3	0.3		0.22	0.37	0.52	0.6		0.37	0.52	0.81	0.96
		8		0.15	0.22	0.3	0.37		0.3	0.37	0.6	0.66		0.44	0.6	0.88	1.03
BT 4	197	2	16	0.15	0.22	0.37	0.52	32	0.22	0.44	0.81	1.03	48	0.3	0.66	1.18	1.47
		4		0.15	0.3	0.44	0.6		0.37	0.6	0.86	1.18		0.52	0.88	1.4	1.7
		6		0.22	0.37	0.52	0.6		0.44	0.66	1.03	1.25		0.66	1.03	1.55	1.84
		8		0.3	0.37	0.6	0.66		0.6	0.74	1.1	1.33		0.81	1.18	1.7	2.0
BT 5	254	2	24	0.22	0.37	0.66	0.74	48	0.44	0.74	1.25	1.55	72	0.52	1.03	1.9	2.4
		4		0.3	0.44	0.74	0.88		0.6	0.88	1.47	1.77		0.81	1.4	2.3	2.7
		6		0.37	0.52	0.81	0.96		0.74	1.1	1.7	2.0		1.03	1.7	2.5	2.9
		8		0.44	0.6	0.88	1.03		0.88	1.25	1.84	2.13		1.25	1.9	2.7	3.3
BT 6	352	2	34	0.3	0.52	0.88	1.1	68	0.6	0.96	1.77	2.2	102	0.66	1.47	2.7	3.3
		4		0.44	0.66	1.03	1.25		0.88	1.25	2.06	2.5		1.1	1.9	3.1	3.8
		6		0.6	0.74	1.18	1.4		1.1	1.47	2.28	2.7		1.47	2.2	3.5	4.1
		8		0.66	0.88	1.25	1.47		1.33	1.7	2.5	2.95		1.77	2.6	3.8	4.4
BT 7	494	2	48	0.37	0.66	1.25	1.55	96	0.74	1.33	2.4	3.0	144	0.96	2.06	3.7	4.7
		4		0.52	0.88	1.47	1.77		1.1	1.77	2.9	3.5		1.55	2.65	4.4	5.2
		6		0.66	1.03	1.62	1.9		1.47	2.06	3.2	3.8		2.06	3.2	4.8	5.7
		8		0.88	1.18	1.77	2.06		1.77	2.36	3.5	5.0		2.43	3.6	5.2	6.1
BTH 1/55	97	2	9.5	0.07	0.15	0.3	0.3	19	0.15	0.3	0.52	0.66	28.5	0.22	0.44	0.81	0.96
		4		0.15	0.22	0.3	0.37		0.22	0.37	0.6	0.74		0.37	0.6	0.88	1.1
		6		0.15	0.22	0.3	0.37		0.3	0.44	0.66	0.77		0.44	0.66	0.96	1.18
		8		0.22	0.22	0.37	0.44		0.44	0.52	0.74	0.81		0.52	0.74	1.1	1.25
BTH 1/105	186	2	17	0.15	0.3	0.52	0.6	34	0.3	0.52	0.96	1.18	51	0.37	0.81	1.4	1.8
		4		0.22	0.37	0.6	0.66		0.44	0.66	1.1	1.33		0.6	1.03	1.6	2.0
		6		0.3	0.4	0.62	0.74		0.6	0.81	1.25	1.47		0.81	1.18	1.8	2.2
		8		0.37	0.44	0.66	0.81		0.74	0.88	1.33	1.55		0.96	1.4	2.0	2.4
BTH 2/100	393	2	38	0.3	0.52	0.96	1.18	76	0.6	1.03	1.84	2.3	114	0.74	1.6	2.7	3.6
		4		0.44	0.66	1.1	1.33		0.88	1.33	2.14	2.6		1.18	2.0	3.2	4.0
		6		0.6	0.81	1.25	1.47		1.1	1.62	2.43	2.9		1.55	2.4	3.6	4.3
		8		0.66	0.88	1.33	1.55		1.33	1.84	2.65	3.1		1.9	2.7	3.9	4.7
BTH 2/130	510	2	50	0.37	0.66	1.25	1.55	100	0.74	1.3	2.4	3.0	150	1.0	2.1	3.7	4.7
		4		0.52	0.88	1.47	1.77		1.1	1.8	2.9	3.5		1.6	2.7	4.3	5.3
		6		0.66	1.03	1.62	1.9		1.5	2.1	3.2	3.8		2.1	3.2	4.8	5.8
		8		0.88	1.18	1.77	2.1		1.8	2.4	3.5	4.0		2.4	3.6	5.3	6.2
BTH 3/150	1056	2	100	0.88	1.47	2.6	3.2	200	1.5	2.9	5.1	6.3	300	2.2	4.4	7.7	9.4
		4		1.18	1.84	3.0	3.6		2.4	3.7	6.0	7.1		3.3	5.5	8.8	10.7
		6		1.47	2.14	3.3	3.8		3.0	4.3	6.5	7.7		4.2	6.4	9.7	11.6
		8		1.84	2.43	3.6	4.2		3.7	4.9	7.1	8.3		5.1	7.3	10.6	12.4

Power input required at high viscosities

Viscosities above values specified in the table require a higher power input. In such cases the power input of the pump P_{1Pu} can be determined by means of the viscosity factor f_v (see table page 10) as follows:

$$P_{1Pu} = P_{Tab\ 76} + f_v \cdot Q_{Tab}$$

Example:
BT 4 n = 200 1/min; ν = 10 000 mm²/s; p = 8 bar
with $P_{tab\ 76}$ = 0.6 kW, table data at ν = 76 mm²/s
$f_v = 27 \times 10^{-3}$ kW min/l
Q_{Tab} = 32 l/min
gives power input P_{1Pu} = 1.46 kW

Power Consumption

Pump type	Vg (cm³/r)	p (bar)	n = 400 1/min				n = 500 1/min				n = 600 1/min				n = 700 1/min			
			Q (l/min)	Viscosity ν (mm²/s) 76	760	3800	Q (l/min)	Viscosity ν (mm²/s) 76	760	3800	Q (l/min)	Viscosity ν (mm²/s) 76	760	3000	Q (l/min)	Viscosity ν (mm²/s) 76	760	2000
				req. power input P (kW)				req. power input P (kW)				req. power input P (kW)				req. power input P (kW)		
BT 0	6.9	1	2.5	0.07	0.15	—	3.1	0.15	0.15	–	3.8	0.15	0.15	–	4.4	0.15	0.15	–
BT 1	32	2	10	0.07	0.15	0.3	12.5	0.07	0.2	0.35	15	0.08	0.2	0.34	17.5	0.09	0.23	0.32
		4		0.15	0.22	0.37		0.15	0.25	0.4		0.18	0.3	0.44		0.21	0.35	0.44
		6		0.15	0.22	0.37		0.2	0.3	0.45		0.24	0.36	0.5		0.28	0.42	0.51
		8		0.22	0.3	0.44		0.22	0.35	0.5		0.26	0.38	0.52		0.3	0.44	0.53
BT 2	43	2	16	0.15	0.3	0.6	20	0.15	0.37	0.66	24	0.18	0.37	0.48	28	0.21	0.43	0.57
		4		0.22	0.37	0.66		0.27	0.44	0.74		0.32	0.51	0.62		0.37	0.59	0.73
		6		0.3	0.37	0.74		0.34	0.52	0.81		0.4	0.59	0.8		0.47	0.69	0.83
		8		0.3	0.44	0.96		0.37	0.26	1.03		0.45	0.64	0.85		0.53	0.75	0.89
BT 3	91	2	32	0.22	0.44	1.03	40	0.3	0.6	1.1	48	0.36	0.74	1.18	56	0.42	0.87	1.15
		4		0.37	0.6	1.1		0.44	0.74	1.18		0.53	0.91	1.35		0.62	1.07	1.35
		6		0.44	0.66	1.25		0.6	0.88	1.33		0.72	1.1	1.54		0.84	1.29	1.57
		8		0.52	0.74	1.33		0.66	0.96	1.4		0.8	1.18	1.62		0.93	1.38	1.66
BT 4	197	2	64	0.44	0.88	2.0	80	0.52	1.1	2.06	96	0.63	1.11	2.26	112	0.74	1.64	2.2
		4		0.66	1.18	2.2		0.88	1.47	2.36		1.05	1.53	2.68		1.23	2.13	2.69
		6		0.88	1.33	2.43		1.1	1.7	2.58		1.32	1.8	2.95		1.54	2.44	3.0
		8		1.03	1.55	2.58		1.33	1.9	2.8		1.6	2.08	3.23		1.87	2.77	3.33
BT 5	254	2	96	0.66	1.4	3.2	120	0.81	1.8	3.3	144	1.0	2.2	3.4	168	1.2	2.5	3.4
		4		1.03	1.8	3.5		1.33	2.3	3.8		1.6	2.8	4.0		1.9	3.2	4.1
		6		1.4	2.2	3.9		1.77	2.7	4.2		2.1	3.3	4.5		2.5	3.8	4.7
		8		1.7	2.5	4.2		2.14	3.1	4.6		2.6	3.8	5.0		3.0	4.3	5.2
BT 6	352	2	136	0.88	1.9	4.4	170	1.1	2.4	4.6	204	1.3	2.9	4.8	238	1.5	3.5	4.6
		4		1.47	2.5	5.0		1.9	3.2	5.2		2.3	3.9	5.8		2.7	4.6	5.8
		6		1.9	3.0	5.4		2.4	3.8	5.8		2.9	4.5	6.4		3.4	5.3	6.5
		8		2.4	3.4	6.0		3.0	4.3	6.2		3.6	5.2	7.1		4.2	6.1	7.3
BT 7	494	2	192	1.3	2.7	6.1	240	1.6	3.4	6.2	288	1.9	4.2	6.8	336	2.2	4.9	6.6
		4		2.0	3.6	6.9		2.6	4.4	7.2		3.1	5.4	8.0		3.6	6.3	8.0
		6		2.7	4.2	7.6		3.4	5.2	8.0		4.1	6.4	9.0		4.7	7.4	9.1
		8		3.3	4.7	8.1		4.0	6.0	8.7		4.8	7.1	9.7		5.6	8.3	10.0
BTH 1/55	97	2	38	0.3	0.6	1.25	47.5	0.37	0.74	1.3	57	0.44	0.9	1.4	66.5	0.52	1.05	1.4
		4		0.44	0.74	1.4		0.6	0.96	1.5		0.72	1.18	1.7		0.84	1.37	1.7
		6		0.6	0.88	1.55		0.74	1.1	1.7		0.89	1.35	1.9		1.04	1.57	1.9
		8		0.66	0.96	1.7		0.88	1.25	1.8		1.06	1.52	2.0		1.23	1.76	2.1
BTH 1/105	186	2	68	0.52	1.1	2.4	85	0.66	1.3	2.4	102	0.79	1.6	2.5	119	0.92	1.9	2.5
		4		0.81	1.4	2.6		1.03	1.7	2.8		1.24	2.1	3.0		1.45	2.4	3.0
		6		1.03	1.6	2.9		1.33	2.0	3.1		1.59	2.4	3.3		1.86	2.8	3.4
		8		1.25	1.8	3.1		1.6	2.3	3.4		1.92	2.7	3.7		2.23	3.2	3.8
BTH 2/100	393	2	152	0.96	2.1	4.7	190	1.2	2.6	4.7	228	1.4	3.2	5.3	266	1.7	3.8	5.2
		4		1.55	2.7	5.3		1.9	3.3	5.5		2.3	4.1	6.2		2.6	4.7	6.1
		6		2.1	3.2	5.8		2.6	4.0	6.1		3.1	4.9	7.0		3.6	5.7	7.1
		8		2.5	3.7	6.2		3.2	4.6	6.6		3.8	5.6	7.7		4.5	6.6	8.0
BTH 2/130	510	2	200	1.3	2.8	6.1	250	1.6	3.4	6.2	300	1.9	4.3	7.0	350	2.2	5.0	6.8
		4		2.1	3.6	6.9		2.6	4.4	7.2		3.1	5.5	8.2		3.6	6.4	8.2
		6		2.7	4.2	7.6		3.4	5.3	8.0		4.1	6.5	9.2		4.8	7.6	9.4
		8		3.3	4.7	8.1		4.1	6.0	8.7		4.9	7.3	10.0		5.8	8.6	10.4
BTH 3/150	1056	2	400	2.8	5.8	10.2	500	3.5	7.2	12.7	600	4.2	9.0	14.4	700	4.9	10.5	14.0
		4		4.4	7.4	11.8		5.5	9.2	14.7		6.6	11.4	16.8		7.7	13.3	16.8
		6		5.6	8.6	13.0		7.0	10.7	16.2		8.5	13.3	18.7		9.9	15.5	19.0
		8		6.8	9.7	14.1		7.7	12.2	17.7		9.2	14.0	19.4		10.7	16.3	19.8

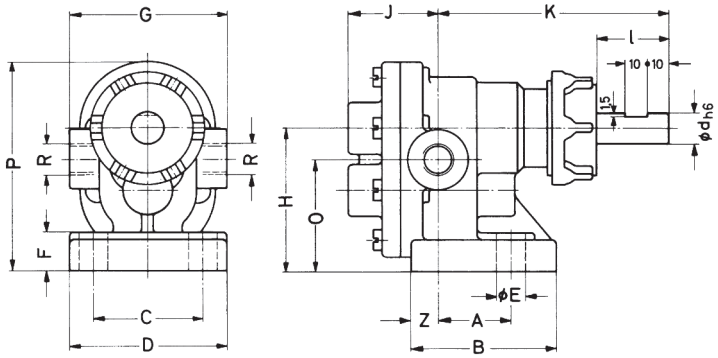
kin. viskosity ν < mm²/s	1000	2000	3000	6000	10000	20000	30000
Max. speed n_{max} 1/min	750	600	500	400	300	200	100
Viscosity factor f_v 10^{-3} kW min/l	9.5	14	17	22.5	27	34	38

Spread of output:
± 5 % of table values Q. Viscosities below 76 mm²/s effect a decrease of output flow values, Q.
The power output of driving motor must exceed the table values P by about 20 %.

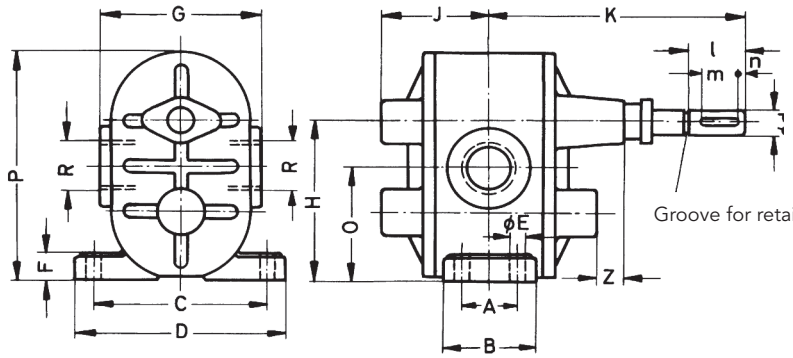
Important: When determining the power input required always consider the max. operating viscosity. (e. g. in the starting situation)!

Dimensions

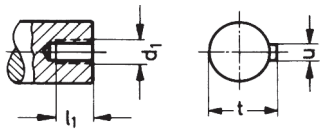
BT 0 BZ 0AC 51



BT 1...7 BZ 0.. 51
BT 1...7 BZ 0CK 51/04



Groove for retaining ring acc. to standard DIN 471



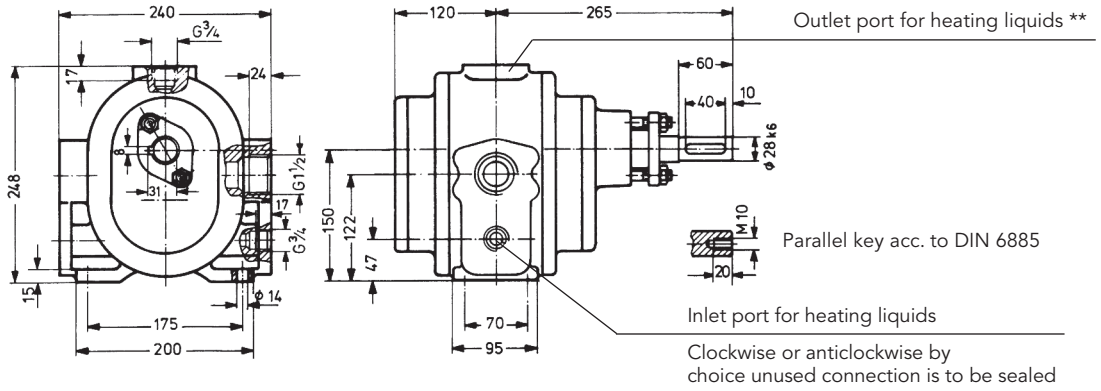
Parallel key acc. to DIN 6885

Pump type	R	A	B	C	D	ØE	F	G	H	O	J	K	P	Shaft end								Z	approx. Weight kg
														Ød	l	m	n	u	t	d_1	l_1		
BT 0	G ¼	30	60	45	65	11	15	65	60	47	38	95	88	13	22	–	–	–	–	–	–	11	2
BT 1	G ½	–	45	55	75	9	12	85	69	54	48	150	100	13	40	15	10	5	15	M6	15	20	3
BT 2	G ¾	35	55	65	90	10	12	90	88,5	71	65	165	125	15	45	25	5	5	17	M6	15	20	5
BT 3	G 1	40	65	85	105	10	12	100	111	88,5	70	190	155	18	50	30	5	6	20,5	M6	15	23	7
BT 4	G 1½	40	80	95	135	10	12	130	131,5	100	102	245	189	25	50	40	5	8	28	M8	20	28	15
BT 5	G 1½	35	75	140	180	14	20	150	145	103	98	250	213	25	50	40	5	8	28	M8	20	29	20
BT 6	G 2	35	75	185	225	14	28	175	175	126	106	245	252	25	50	40	5	8	28	M8	20	29	29
BT 7	G 2	60	100	185	225	14	28	240	175	126	123	260	252	25	50	40	5	8	28	M8	20	29	37

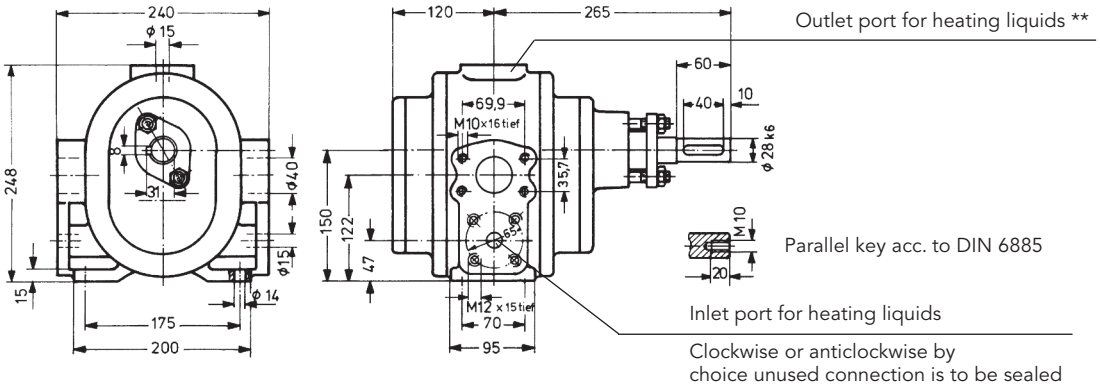
Inlet and outlet ports equally sized.

Dimensions

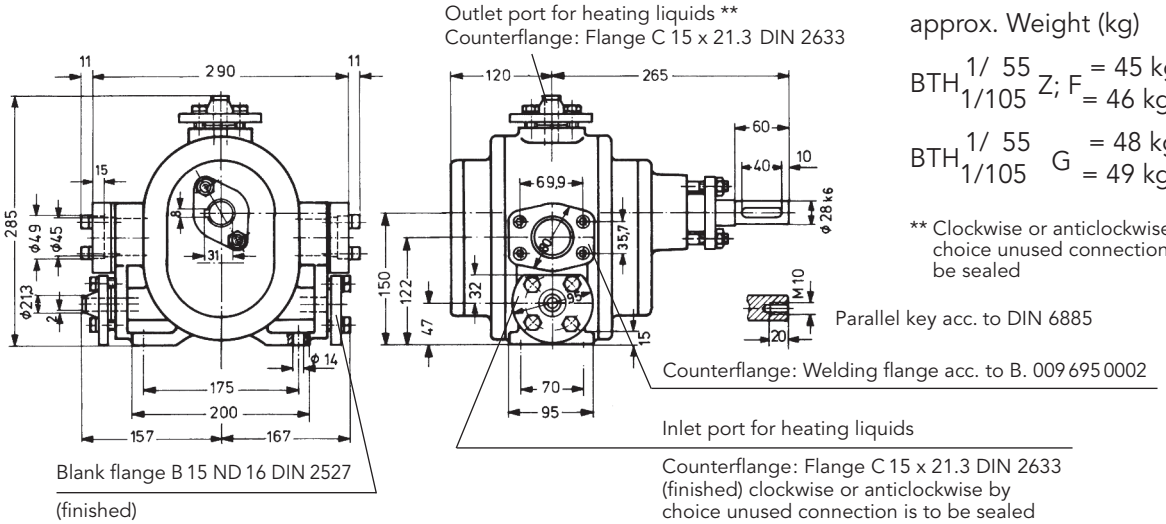
BTH 1 / $^{55}_{155}$ • Z 0 • K 51



BTH 1 / $^{55}_{105}$ • F 0 • K 51



BTH 1 / $^{55}_{105}$ • G 0 • K 51



approx. Weight (kg)

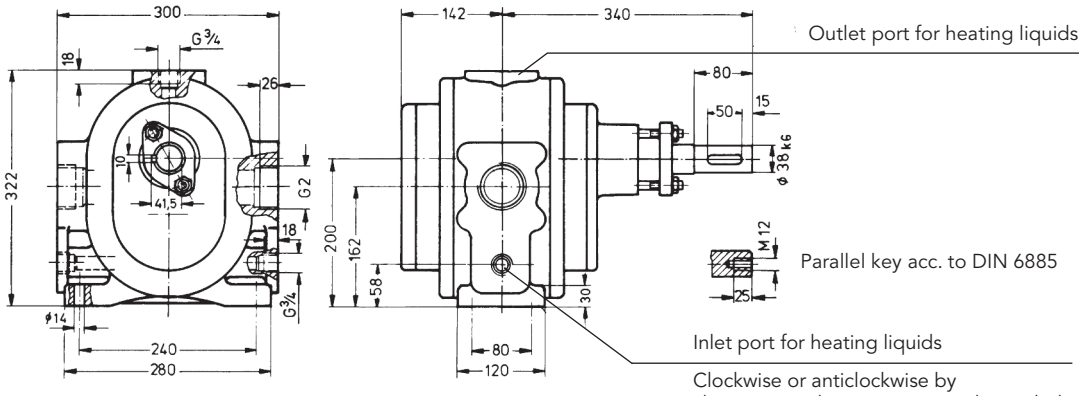
BTH $^{1/\ 55}_{1/105}$ Z; F = 45 kg = 46 kg

BTH $^{1/\ 55}_{1/105}$ G = 48 kg = 49 kg

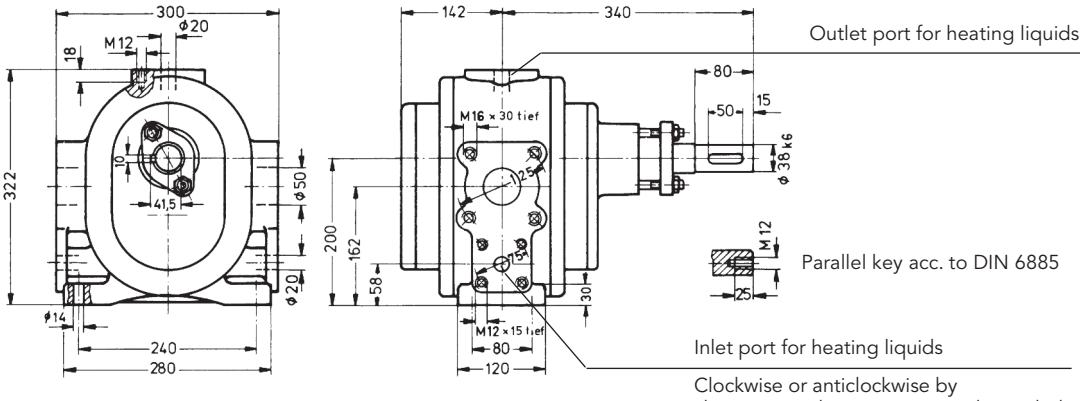
** Clockwise or anticlockwise by choice unused connection is to be sealed

Dimensions

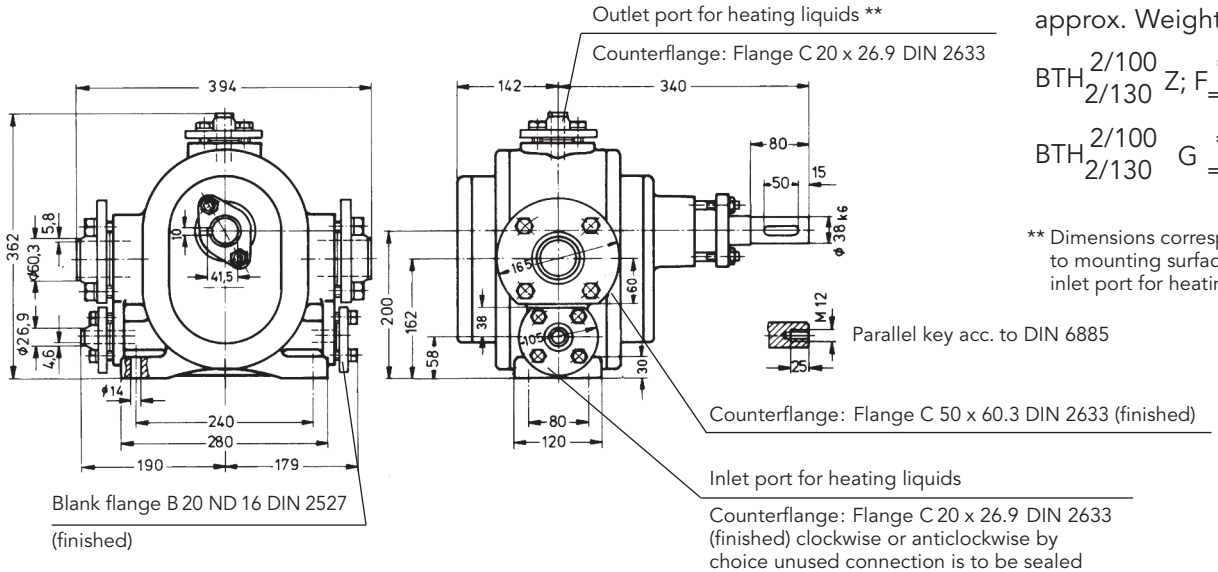
BTH 2 / $^{100}_{130}$ • Z 0 • K 51



BTH 2 / $^{100}_{130}$ • F 0 • K 51



BTH 2 / $^{100}_{130}$ • G 0 • K 51



approx. Weight (kg)

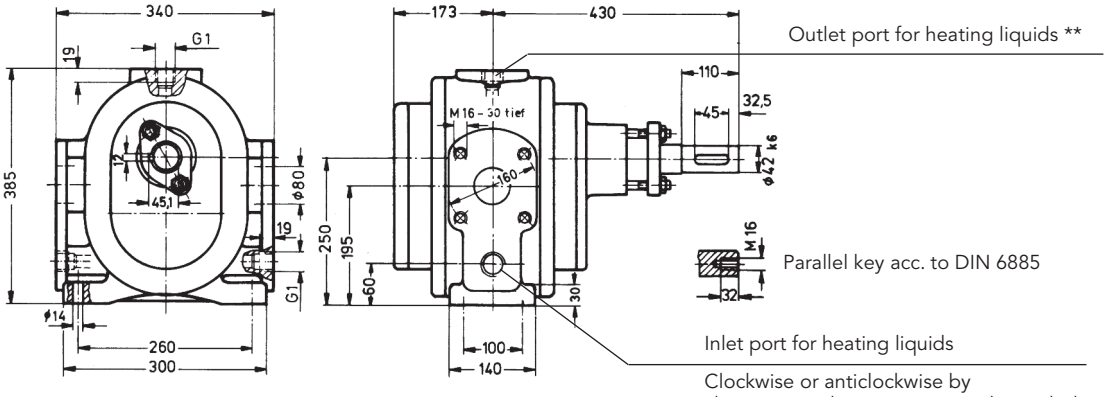
BTH $^{2/100}_{2/130}$ Z; F = 84 kg / 85 kg

BTH $^{2/100}_{2/130}$ G = 93 kg / 94 kg

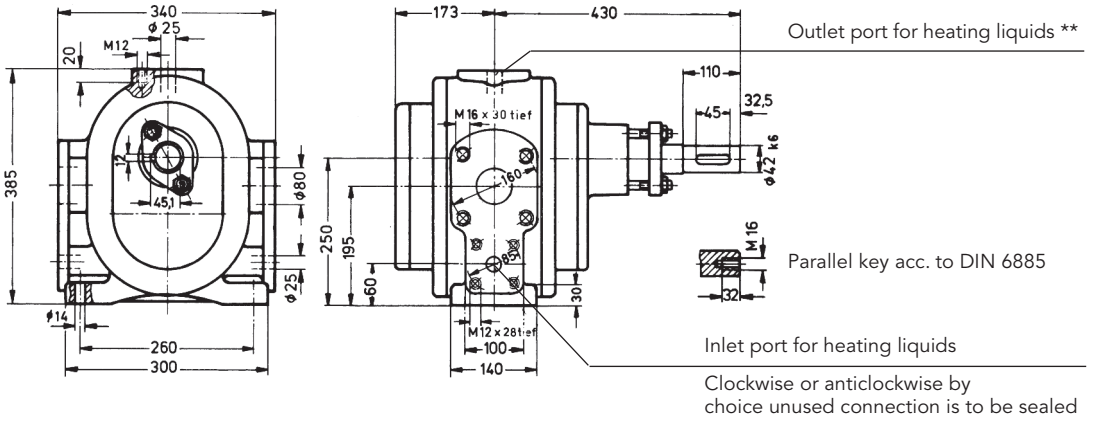
** Dimensions correspond to mounting surface of inlet port for heating liquids

Dimensions

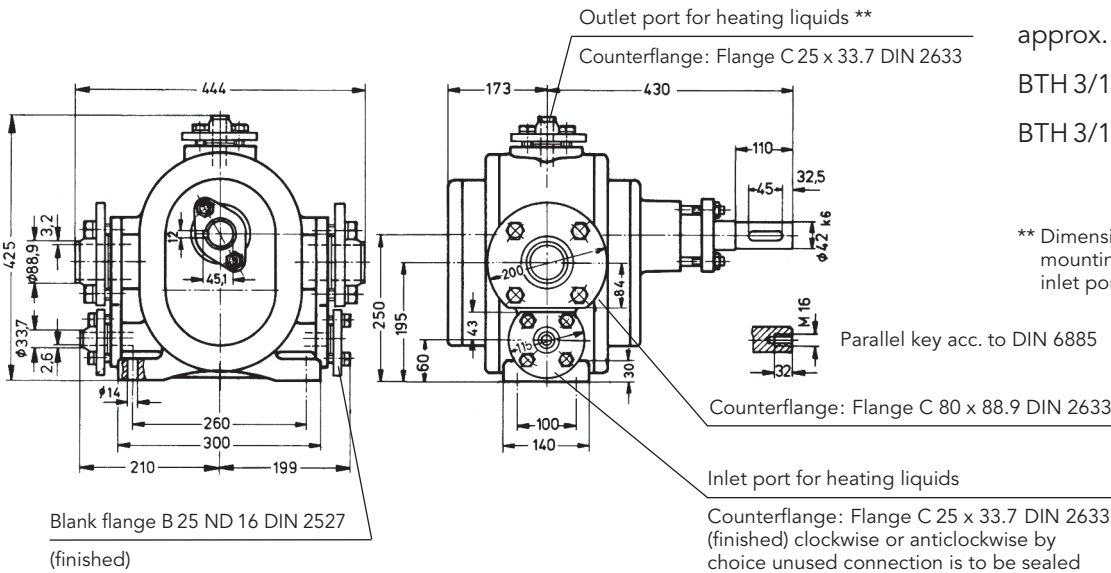
BTH 3 / 150 • Z 0 • F 51



BTH 3 / 150 • F 0 • F 51



BTH 3 / 150 • G 0 • F 51



approx. Weight (kg)

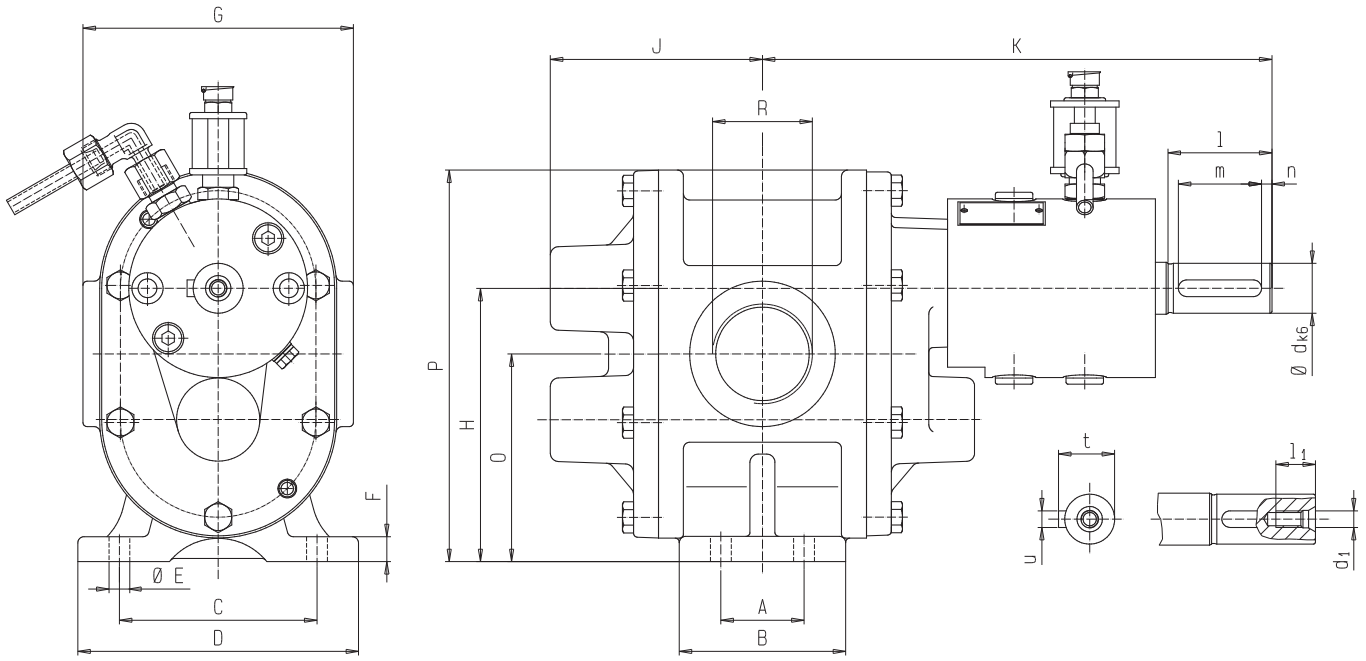
BTH 3/150 Z; F = 142 kg

BTH 3/150 G = 155 kg

** Dimensions correspond to mounting surface of inlet port for heating liquids

Dimensions

BT 1...7 BZ 0CK 59



Pump type	R	A	B	C	D	ØE	F	G	H	O	J	K	P	Shaft end								kg
														Ød	l	m	n	u	t	d_1	l_1	
BT 4	G 2	40	80	95	135	10	12	130	131.5	100	102	245	189	24	50	40	5	8	27	M 8	19	18.5
BT 6	G 2	35	75	185	225	14	28	175	175	126	106	245	252	24	50	40	5	8	27	M 8	19	33.0

Inlet and outlet ports equally sized.

FAMCO
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Product Portfolio

Gear Pumps

Gear pumps for lubricating oil supply equipment, low pressure filling and feed systems, dosing and mixing systems.

Flow Measurement

Gear, turbine and screw type flow meters and electronics for volume and flow metering technology in hydraulics, processing and laquering technology.

Hydraulics

Single and multistage high pressure gear pumps and hydraulic motors for construction machinery, vehicle-mounted machines.

Valves

Cetop directional control and proportional valves, pressure, quantity and stop valves for pipe and slab construction.

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روبروی پالایشگاه نفت پارس، پلاک ۱۲