

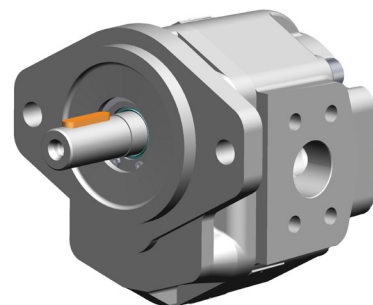
KRACHT®

- | Gear Pumps
- | Flow Measurement
- | Hydraulics
- | Valves

High-Pressure Gear Pumps

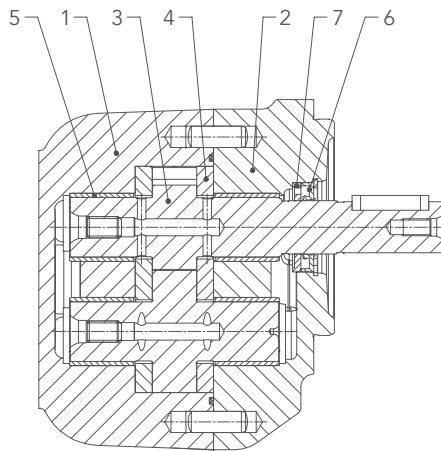
KP 2 / KP 3

Noise optimized



Description

Construction



- 1 Housing
- 2 Flange cover
- 3 Gear
- 4 Sliding plate
- 5 Plain bearing
- 6 Rotary shaft seal
- 7 Defecting plate

KP 2 / KP 3 .../364 noise optimized for medias with increased air percentage

The noise-optimised KP series pumps are designed for pumping media with increased air content, primarily for use as lubricating oil pumps in gearboxes. Special structural measures prevent the otherwise usual increase in noise with air-containing gear oils. The noise levels are not or only insignificantly higher than the measured values with oils that do not contain air. There is also no shift in the noise spectrum to higher, unpleasant frequencies. In applications without air in the medium, it is not advisable to use this variant as in this case there is no noise reduction effect.

The noise optimized version is identified by the special number **364** at the end of the type key. The pumps with the special number **364** are built as pumps in combination with an electric motor. The KP 2 / KP 3 .../**365** are available as add-on pumps. The pumps are designed for a continuous pressure of 40 bar and can be temporarily loaded up to 120 bar, e.g. for switching pressures. All variants can be supplied with ship approvals.

Notes

1. External forces

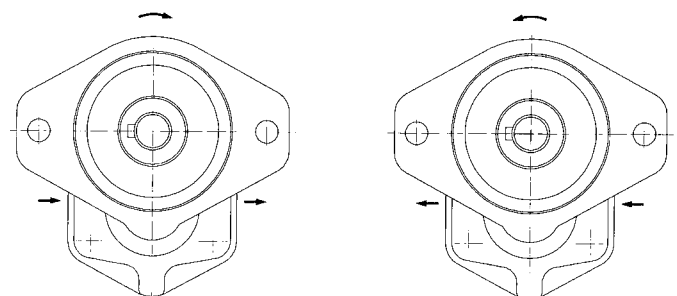
External forces acting on the drive shaft end influence the function of the bearing gland. Radial forces may be absorbed depending on size and direction of action. Axial forces are not permissible.

2. Direction of rotation

The following applies with regard to the direction of rotation – when looking at the drive shaft end – following regulation:

Clockwise rotating shaft:
Direction of flow from left to right.

Counter-clockwise rotating shaft:
Direction of flow from right to left.



Technical Data

Materials

Housing	EN-GJS-400-15
Bearing	multi-compound plain bearing bushes
Shafts and gears	surface-hardened and ground case-hardened steel according to DIN 17210
Seals	NBR rotary shaft seal $\vartheta \leq 90^\circ\text{C}$ FKM rotary shaft seal $\vartheta \leq 150^\circ\text{C}$

Characteristics

Mounting	Flange
Pipe connection	Flange
Direction of rotation	right or left
Weight	see dimension sheets
Mounting position	arbitrary
Ambient temperature	$\vartheta_{u \min} = -20^\circ\text{C}$ $\vartheta_{u \max} = 60^\circ\text{C}$
Operating pressure inlet side	$p_{e \min} = -0.4 \text{ bar}$ (underpressure) $p_{e \max} = 2 \text{ bar}$ $p_{e \max} = 5 \text{ bar}$
Short time working pressure	
Outlet port working pressure	$p_{e \max} = 120 \text{ bar}$
Media temperature	$\vartheta_{m \max} = 90^\circ\text{C}$ for NBR rotary shaft seal $\vartheta_{m \max} = 150^\circ\text{C}$ for FKM rotary shaft seal
Viscosity	$v_{\min} = 10 \text{ mm}^2/\text{s}$ $v_{\max} = 1000 \text{ mm}^2/\text{s}$
Recommended viscosity range	$v = 30 \dots 200 \text{ mm}^2/\text{s}$ (speed-dependent)
Recommended oil cleanliness	according to ISO 4406:1999 Code 21/19/16 according to NAS 1638 Class 10
Discharge flow	see table page 6
Input Power	see table page 6
Hydraulic fluids	Mineral oil according to DIN 51524/25 Motor oil according to DIN 51511 Organic oils of the "HEES" Group can be used up to 70°C and at approx. 20% reduced maximum pressure

We reserve the right to make technical changes

Technical data

Characteristics, formula signs, units

1. Discharge flow/input flow	Q	l/min
2. geom. delivery/absorption volume	V_g	cm ³ /rev
3. Pressure	p	bar
4. Speed	n	rpm
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. Piping diameter	d	mm

General

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

$$M = 9549 \cdot \frac{P}{n}, v = 21.22 \cdot \frac{Q}{d^2}$$

Characteristics for:	Volumetric flow	Discharge flow $Q = \frac{V_g \cdot n \cdot \eta_{vol}}{10^3} \frac{l}{min}$
	Torque	Drive torque $M = \frac{p \cdot V_g}{20 \cdot \pi \cdot \eta_{hm}} Nm$
	Power	Input power $P = \frac{p \cdot Q}{600 \cdot \eta_{tot}} kW$

Technical data

KP 2 .../364

Displacement Nominal size	Geometrical displacement	Max. working pressure	Pressure peak	Max. speed	Moment of inertia x 10 ⁻⁵
	V_g in cm ³ /rev	p_b in bar	p_{max} in bar	N_{max} in rpm	J in kg m ²
20	19.7	40	120	3000	34.3
25	24.6	40	120	3000	40.5
28	27.7	40	120	2800	44.3
32	31.5	40	120	2600	49.2
40	39.4	40	120	2800	59.0
50	49.2	40	120	2600	71.4
56	55.2	40	120	2400	78.9
62	61.2	40	120	2200	86.5

KP 3 .../364

Displacement Nominal size	Geometrical displacement	Max. working pressure	Pressure peak	Max. speed	Moment of inertia x 10 ⁻⁵
	V_g in cm ³ /rev	p_b in bar	p_{max} in bar	N_{max} in rpm	J in kg m ²
71	70.6	40	120	2500	187
82	81.0	40	120	2600	210
100	99.5	40	120	2500	252
112	111.1	40	120	2400	277
125	123.8	40	120	2300	306

Technical data

Discharge flow / Input power

KP 2 .../364 Speed n = 950 1/min

Pressure p _b in bar					Nominal size	Pressure p _b in bar				
10	20	30	40	120		10	20	30	40	120
17.4	16.6	15.8	14.9	6.9	20	0.5	0.9	1.2	1.6	4.4
21.8	20.8	19.7	18.6	8.7	25	0.6	1.1	1.5	1.9	5.3
24.7	23.8	22.8	21.8	12.8	28	0.7	1.2	1.6	2.1	5.9
28.2	27.2	26.2	25.1	15.8	32	0.8	1.3	1.8	2.4	6.7
35.3	34.3	33.1	31.9	21.5	40	0.9	1.6	2.2	2.9	8.2
44.3	43.1	41.8	40.5	29.0	50	1.1	1.9	2.7	3.6	10.2
49.8	48.6	47.3	46.0	34.4	56	1.2	2.1	3.0	3.9	11.3
55.3	54.1	52.8	51.4	39.7	62	1.3	2.3	3.3	4.3	12.4

Discharge flow Q in l/min Required input power P in kW

KP 2 .../364 Speed n = 1450 1/min

Pressure p _b in bar					Nominal size	Pressure p _b in bar				
10	20	30	40	120		10	20	30	40	120
27.3	26.5	25.6	24.7	16.8	20	0.8	1.4	1.9	2.4	6.6
34.1	33.1	32.0	30.9	21.0	25	1.0	1.6	2.3	2.9	8.1
38.6	37.6	36.7	35.6	26.7	28	1.1	1.8	2.5	3.2	9.0
43.9	43.0	41.9	40.9	31.5	32	1.2	2.0	2.8	3.6	10.2
55.0	54.0	52.8	51.6	41.2	40	1.4	2.4	3.4	4.4	12.6
68.9	67.7	66.4	65.1	53.6	50	1.7	2.9	4.2	5.4	15.5
77.4	76.2	74.9	73.6	62.0	56	1.8	3.2	4.6	6.0	17.2
85.9	84.7	83.4	82.0	70.3	62	2.0	3.5	5.1	6.6	18.9

Discharge flow Q in l/min Required input power P in kW

KP 3 .../364 Speed n = 950 1/min

Pressure p _b in bar					Nominal size	Pressure p _b in bar				
10	20	30	40	120		10	20	30	40	120
60.6	59.3	57.8	56.3	43.0	71	1.4	2.7	3.9	5.1	14.9
69.7	68.2	66.7	65.1	50.9	82	1.6	3.0	4.4	5.9	17.1
88.4	86.5	84.5	82.4	63.7	100	2.0	3.7	5.4	7.1	20.8
100.4	98.2	95.8	93.4	72.0	112	2.1	4.0	5.9	7.8	22.9
112.0	109.8	107.5	105.0	83.6	125	2.4	4.4	6.5	8.6	25.3

Discharge flow Q in l/min Required input power P in kW

KP 3 .../364 Speed n = 1450 1/min

Pressure p _b in bar					Nominal size	Pressure p _b in bar				
10	20	30	40	120		10	20	30	40	120
95.9	94.6	93.1	91.6	78.3	71	2.2	4.1	5.9	7.8	22.8
110.2	108.7	107.2	105.6	91.4	82	2.5	4.6	6.8	8.9	26.1
138.2	136.3	134.2	132.1	113.5	100	3.0	5.6	8.2	10.8	31.7
155.9	153.7	151.4	148.9	127.5	112	3.3	6.2	9.1	11.9	35.0
173.9	171.7	169.4	166.9	145.5	125	3.6	6.8	10.0	13.2	38.6

Discharge flow Q in l/min Required input power P in kW

The characteristic data refer to a mineral oil with a viscosity of 34 mm²/s. The power of the drive motor must be selected 20 % higher than the value P in the table.

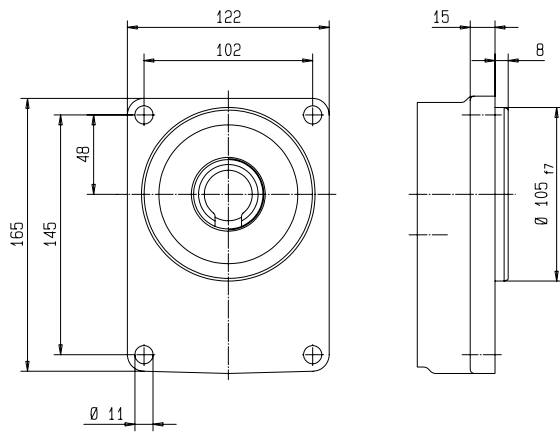
Type key

KP	2/	20	S	1	0	F	Y	0	0	4	V	L	1	/364	
														Code for special construction	
														364	Standard design
														365	Mounted pump (on request)
														Seal	
														1	NBR rotary shaft seal $\vartheta \leq 90^\circ\text{C}$
														2	FKM rotary shaft seal $\vartheta \leq 150^\circ\text{C}$
														Type of gearing	
														L	shaft and driven shaft pinion made of case-hardened steel (ground tooth flanks)
														Housing and bearing design	
														V	Housing EN-GJS-400 with multi-component plain bearings
														Construction code	
														4	KP2 (Specified by KRACHT)
														6	KP3 (Specified by KRACHT)
														Adaptor piece	
														H	Adaptor piece for multi-stage design KP 2 with KP 2
														0	Standard design (1-stage pump)
														L	KP 3 with KP 2 and KP 3 with KP 3
														2. Shaft end	
														0	Without
														W	Splined shaft profile B 28 x 25; DIN 5482; Z = 15; m=1,75
														Shaft end / shaft load capacity	
														Y	cyl. Shaft $\varnothing 24$; 230 Nm _{max} KP2; $\varnothing 32$; 550 Nm _{max} KP3
														W	Splined shaft profile B 28 x 25; DIN 5482; Z=15; m=1,75; 450Nm _{max}
														Housing connection	
														F	Inlet port 1 1/4"-SAE connection ($\varnothing 32$) up to V _g size 32 Outlet port 1"-SAE connection ($\varnothing 25$) up to V _g size 32
														G	Inlet port 1 1/2"-SAE connection ($\varnothing 40$) from V _g size 40 bis V _g 71 Outlet port 1 1/4"-SAE connection ($\varnothing 32$) from V _g size 40 bis V _g 71
														J	Inlet port 2"-SAE connection ($\varnothing 50$) from V _g size 82 Outlet port 1 1/4"-SAE connection ($\varnothing 32$) from V _g size 82
														Y	as F-housing; for multistage pump design
														Z	as G-housing; for multistage pump design
														X	as J-housing; for multistage pump design
														Outboard flange or bearing	
														0	Without
														Direction of rotation	
														1	right
														2	left
														Flange cover version (HS = hole spacing / $\varnothing Z$ = centring diameter)	
														G	Rectangular 4-hole flange, HS = 102/145; $\varnothing Z$ = 105
														S	SAE-B-2-hole flange, HS = 146; $\varnothing Z$ = 101,6
														M	2-hole flange, HS 78/90; $\varnothing Z$ = 63
														F	as M but mounting holes mirror-inverted
														T	SAE-C-2-hole flange, HS = 181; $\varnothing Z$ = 127
														V	SAE-C-4-hole flange, HS = 114,55; $\varnothing Z$ = 127
														Nominal size	
														KP 2	20 / 25 / 28 / 32 / 40 / 50 / 56 / 62
														KP 3	71 / 82 / 100 / 112 / 125
														Size 2, 3	
														Product name	

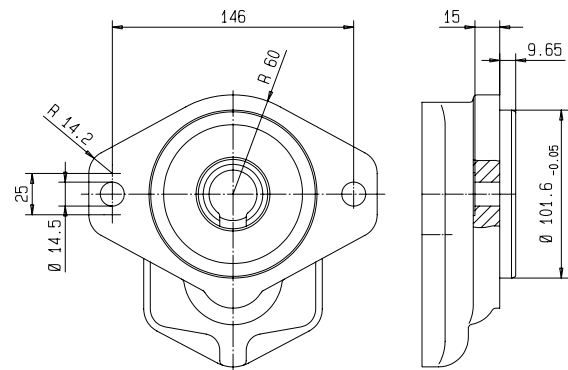
Dimensions

Flange mounting

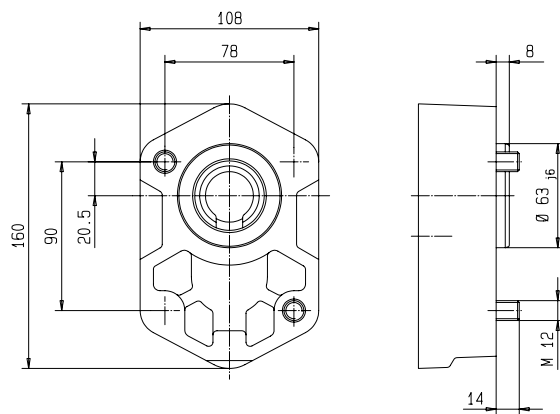
**4-hole rectangular flange G
KP2 only**



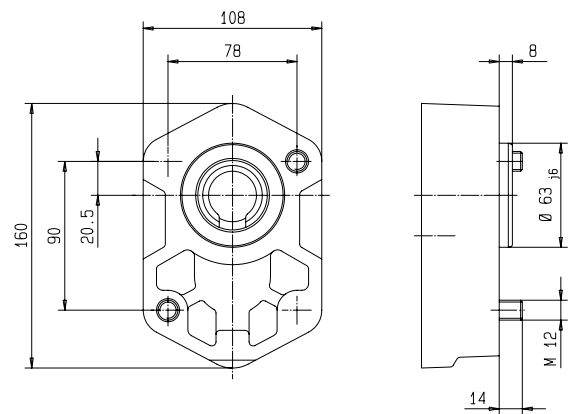
SAE-B-2-hole flange S



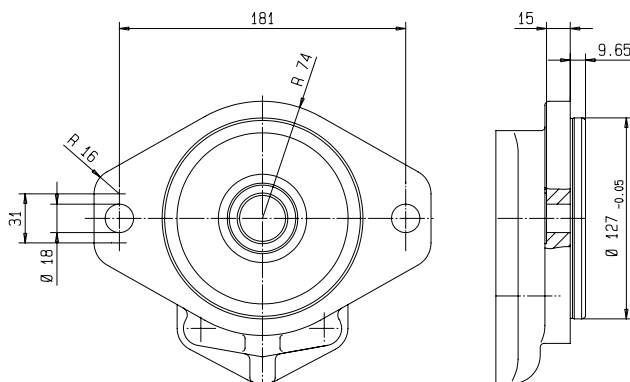
**2-hole flange F
KP2 only**



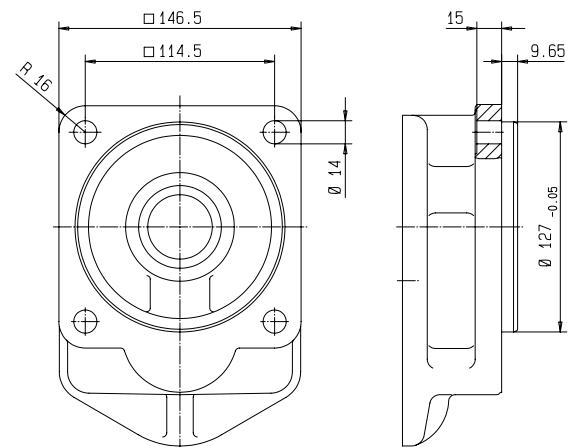
**2-hole flange M
KP2 only**



**SAE-C-2-hole flange T
KP2 only**



**SAE-C-4-hole flange V
KP3 only**

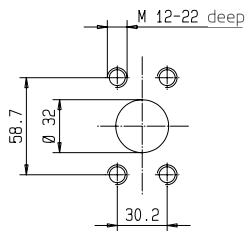


Dimensions

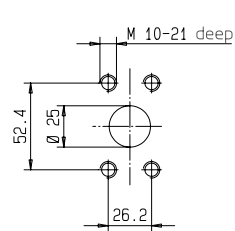
Connections

Housing connection F
 Displacement nominal size
 KP 2: 20, 25, 28, 32

Suction port
 SAE 11/4

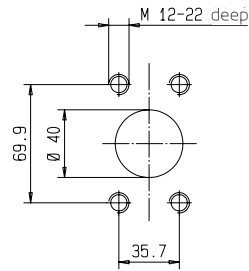


Pressure port
 SAE 1

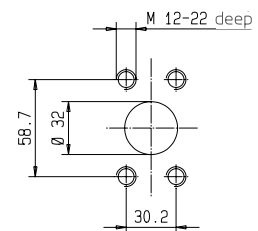


Housing connection G
 Displacement nominal size
 KP2: 40, 50, 56, 62
 KP3: 71

Suction port
 SAE 11/2

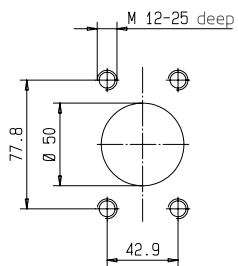


Pressure port
 SAE 11/4

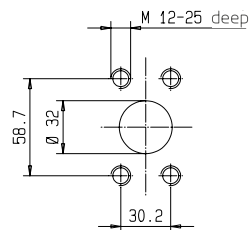


Housing connection J
 Displacement nominal size
 KP3: 82, 100, 112, 125

Suction port
 SAE 2

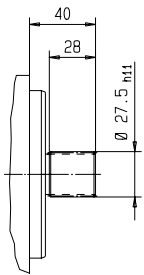


Pressure port
 SAE 11/4



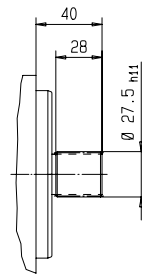
Dimensions

Shaft ends KP 2

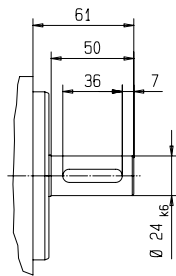


Shaft end W
 Splined shaft profile B 28 x 25
 DIN 5482
 $z = 15, m = 1,75$
 $450 \text{ Nm}_{\text{max}}$

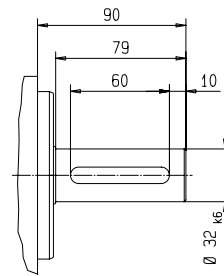
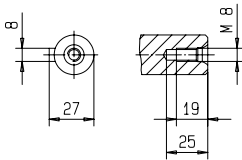
Shaft ends KP 3



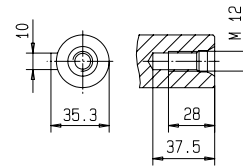
Shaft end W
 Splined shaft profile B 28 x 25
 DIN 5482
 $z = 15, m = 1,75$
 $450 \text{ Nm}_{\text{max}}$



Shaft end Y
 Cylindrical shaft
 $230 \text{ Nm}_{\text{max}}$

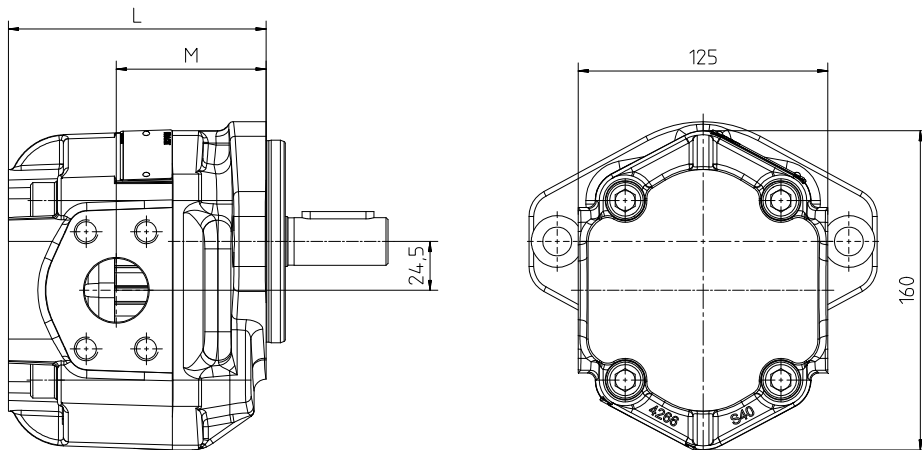


Shaft end Y
 Cylindrical shaft
 $550 \text{ Nm}_{\text{max}}$



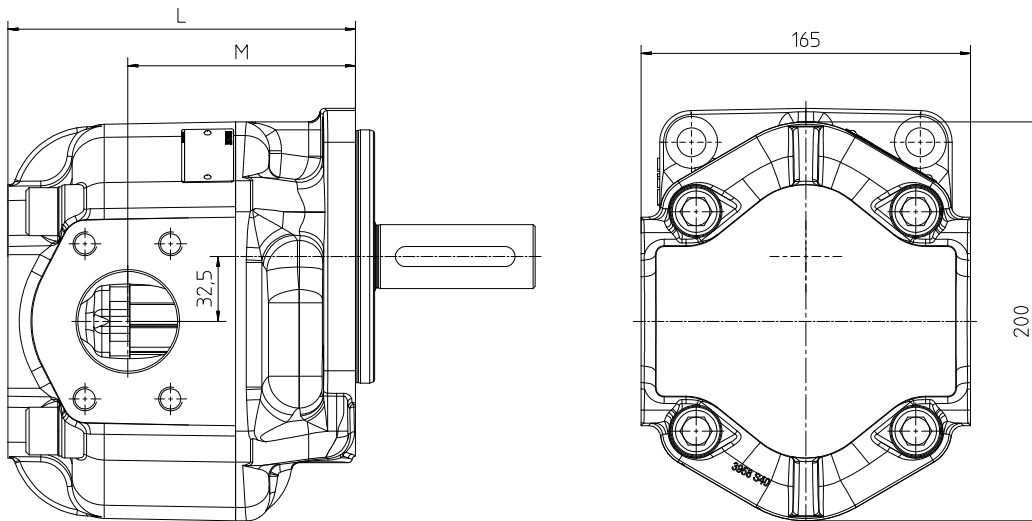
Dimensions / Weights

KP 2



Displacement Nominal size	L	M	Weight in kg		
			Version G-Flansch	Version S-Flansch	Version F/M-Flansch
20	129	75	11.0	10.0	9.0
25			11.5	10.5	9.5
28			12.0	11.0	10.0
32			12.5	11.5	10.5
40	142	85	13.0	12.5	11.5
50			13.5	13.0	12.0
56	152	85	15.0	14.0	13.0
62			15.0	14.0	13.0

KP 3



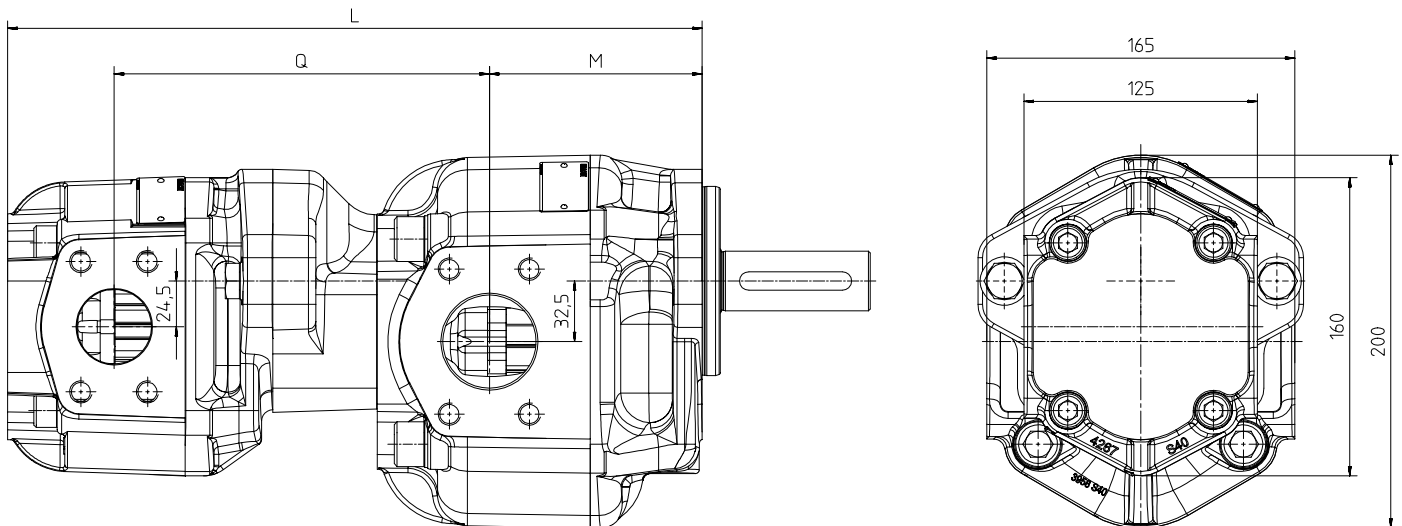
Displacement Nominal size	L	M	Weight in kg	
			Version S-Flange	Version V-Flange
71	162	102	23.0	24.0
82	174	114	24.5	25.5
100			26.0	27.0
112	185	125	27.0	28.0
125			29.0	30.0

Dimensions

Tandem design SAE-B flange, cylindrical shaft

The individual pump stages can operate in hydraulically separated circuits or with different media.

Direction of rotation shown: right
For counter-clockwise rotation, suction and pressure connections are opposite



The drive should be made using a compensating coupling!
Important: Unbalanced and/or axial forces must not occur.

Order example

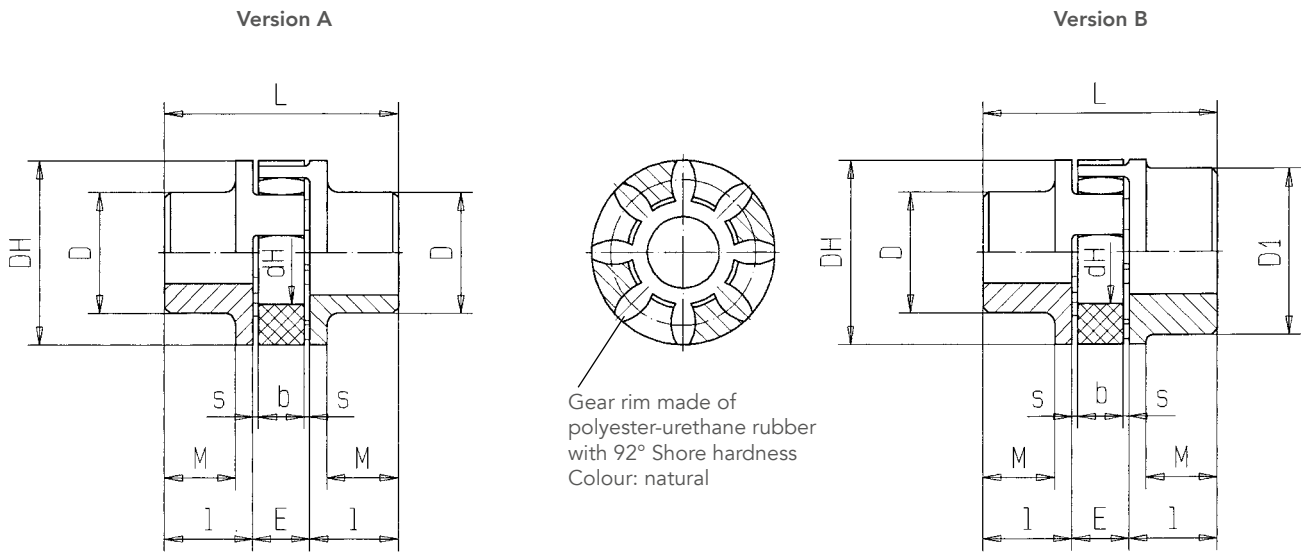
KP 3/82 S10X YWL 6VL1/364 + KP 2/40 S10G W00 4VL1/364

Displacement Nominal size 1st stage	Displacement Nominal size 2nd stage								
	71			82-100			112-125		
	Q	L	M	Q	L	M	Q	L	M
20	191	347	102	191	359	114	191	370	125
25									
28									
32									
40	201	360	102	201	372	114	201	383	125
50									
56									
62	201	370	102	201	382	114	201	393	125

In addition to the design shown, the following are available on request:

- Other pump combinations (KP 3, KP2)
- Other flange cover and shaft designs of 1st stage
- Three-stage pumps

Couplings – Dimensions and weights



Ordering code

R A 38 - Z 45/ 24 / 32 - Z 45/38

	Hub material
A	Al

Coupling size	Coupling hub length and hub bore pump-side cylindrical KP2: Ø 24; KP3: Ø 32	Coupling hub length and hub bore motor side cylindrical
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	Coupling size	Hub material: Aluminium		Pilot hole		Finished bore				Dimensions										Ordering code
		Weight in kg	Moment of inertia in kgm ²	Part 1	Part 2	min. Part 1	min. Part 2	max. Part 1	max. Part 2	l	E	s	b	L	M	D _H	D	D ₁	d _h	
Version A	28	0.39	0.0002	8	-	10	-	28	-	35	20	2.5	15	90	28	65	48	-	30	RA 28-Z 35/..-Z 35/..
	38	0.82	0.0007	10	-	12	-	38	-	45	24	3.0	18	114	37	80	66	-	38	RA 38-Z 45/..-Z 45/..
	42	1.25	0.0014	12	-	14	-	42	-	50	26	3.0	20	126	40	95	75	-	46	RA 42-Z 50/..-Z 50/..
	48	1.71	0.0024	13	-	15	-	48	-	56	28	3.5	21	140	45	105	85	-	51	RA 48-Z 56/..-Z 56/..
Version B	24/28	0.26	0.0001	6	22	8	24	24	28	30	18	2.0	14	78	24	55	40	48	27	RA 24/28-Z 30/..-Z 30/..
	28/38	0.46	0.0003	8	26	10	28	28	38	35	20	2.5	15	90	28	65	48	65	30	RA 28/38-Z 35/..-Z 35/..
	38/45	0.89	0.0008	10	36	12	38	38	45	45	24	3.0	18	114	37	80	66	76	38	RA 38/45-Z 45/..-Z 45/..
	42/55	1.39	0.0018	12	40	14	42	42	55	50	26	3.0	20	126	40	95	75	94	46	RA 42/55-Z 50/..-Z 50/..
	48/60	1.86	0.0030	13	46	15	48	48	60	56	28	3.5	21	140	45	105	85	102	51	RA 48/60-Z 56/..-Z 56/..

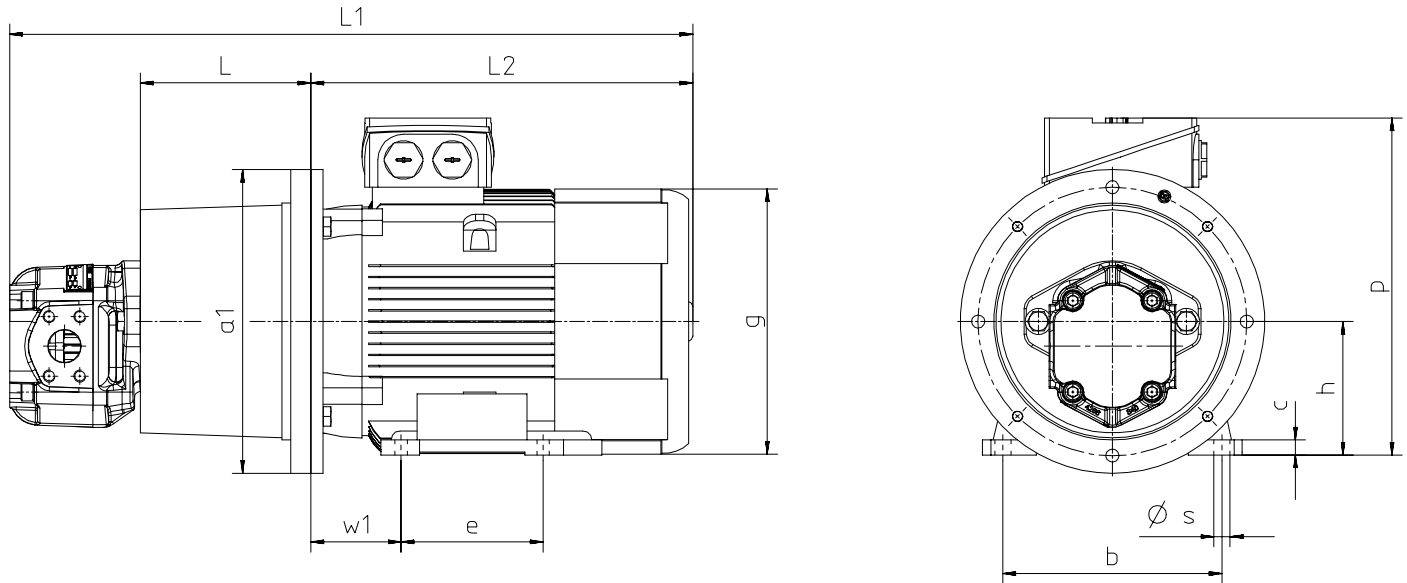
Media temperature: -10 to +80°C (short-term temperature peaks up to +120 °C are permissible)

Weights and mass moments of inertia refer to max. finished bore without keyway.

Finished bore to ISO fit H7; parallel keyway according to DIN 6885 Sheet 1

Dimensions

Pump unit KP2/ . S.O. Y00 4VL. /364



KP 2

Size	Motor 6-pole Power in kW	Motor 4-pole Power in kW	Pump support	Coupling
100 LK	-	2.2		
100 L	1.5	3.0	Z2/250/135	RA 24/28 - Z30/24 - Z30/28
112 M	2.2	4.0		
132 S	3.0	5.5	Z2/300/168	RA 28/38 - Z35/24 - Z35/38
132 M	5.5	7.5		
160 M	7.5	11.0	Z2/350/188	RA 38/45 - Z45/24 - Z45/42
160 L	11.0	15.0		
180 M	-	18.5	Z2/350/204	RA 42/55 - Z50/24 - Z50/48
180 L	15.0	22.0		

Dimensions depend on motor make

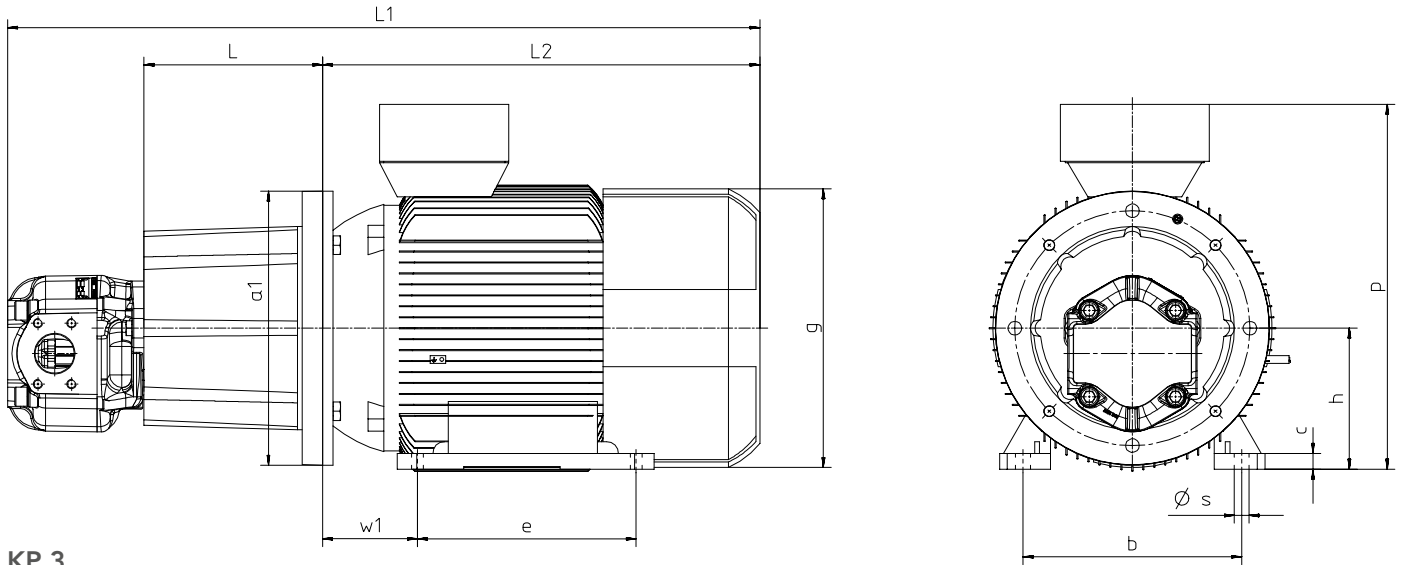
KP 2

Size	20-32			40-50			56-62			20-62							
	L1	L1	L1	L	L2	a1	a	b	c	e	f	g	h	p	s1	s2	w1
100 L	634.5	647.5	657.5	135	370.5	250	176	160	12	140	196	198	100	293	12	16	63
112 M	593.0	606.0	616.0	135	329.0	250	176	190	12	140	226	222	112	308	12	16	70
132 S	682.0	695.0	705.0	168	385.0	300	218	216	15	140	256	262	132	347	12	16	89
132 M	682.0	695.0	705.0	168	385.0	300	218	216	15	178	256	262	132	347	12	16	89
160 M	811.0	824.0	834.0	188	494.0	350	300	254	18	210	300	314	160	425	15	19	108
160 L	811.0	824.0	834.0	188	494.0	350	300	254	18	254	300	314	160	425	15	19	108
180 M	891.0	904.0	914.0	204	558.0	350	328	279	20	241	339	356	180	466	15	19	121
180 L	921.0	934.0	944.0	204	588.0	350	328	279	20	279	339	356	180	466	15	19	121

All motor dimensions and data refer to Rotor NL motor make, other motor makes on request. Motor size IMB35.

Dimensions

Pump unit KP3/ . S.O. Y00 6VL. /364



KP 3

Size	Motor 6-pole Power in kW	Motor 4-pole Power in kW	Pump support	Coupling
100 LK	-	2.2	PFL 250/18/41	RA 24/28 - Z30/32 - Z30/28
100 L	1.5	3.0		
112 M	2.2	4.0		
132 S	3.0	5.5	PL 300/7/5	RA 28/38 - Z35/32 - Z35/38
132 M	5.5	7.5		
160 M	7.5	11.0	PK 350/10/38	RA 38/45 - Z45/32 - Z45/42
160 L	11.0	15.0		RA 42/55 - Z50/32 - Z50/48
180 M	-	18.5		RA 42/55 - Z50/32 - Z50/48
180 L	15.0	22.0		RA 42/55 - Z50/32 - Z50/55
200 L	22.0	30.0	PK 400/5/23	RA 42/55 - Z50/32 - Z50/55
225 S	30.0	37.0	PK 450/3/34	RA 48/60 - Z56/32 - Z56/60
225 M	37.0	45.0		

Dimensions depend on motor make

KP 3

Baugröße	71			71-125													
	L1	L1	L1	L	L2	a1	a	b	c	e	f	g	h	p	s1	s2	w1
100 L	707.5	719.5	730.5	175	370.5	250	176	160	12	140	196	198	100	293	12	16	63
112 M	666.0	678.0	689.0	175	329.0	250	176	190	12	140	226	222	112	308	12	16	70
132 S	743.0	755.0	766.0	196	385.0	300	218	216	15	140	256	262	132	347	12	16	89
132 M	743.0	755.0	766.0	196	385.0	300	218	216	15	178	256	262	132	347	12	16	89
160 M	884.0	896.0	907.0	228	494.0	350	300	254	18	210	300	314	160	425	15	19	108
160 L	884.0	896.0	907.0	228	494.0	350	300	254	18	254	300	314	160	425	15	19	108
180 M	948.0	960.0	971.0	228	558.0	350	328	279	20	241	339	356	180	466	15	19	121
180 L	978.0	990.0	1001.0	228	588.0	350	328	279	20	279	339	356	180	466	15	19	121
200 L	1032.5	1044.5	1055.5	228	642.5	400	355	318	25	305	378	396	200	515	19	25	133
225 S	1047.0	1059.0	1070.0	262	623.0	450	361	356	34	286	436	449	225	563	19	25	149
225 M	1132.0	1144.0	1155.0	262	708.0	450	361	356	34	311	436	449	225	563	19	25	149

All motor dimensions and data refer to Rotor NL motor make, other motor makes on request. Motor size IMB35.

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Low and high-pressure gear pumps for lubricating oil, hydraulic, process and test bench applications, fuel and metering systems.



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