

KRACHT



High Pressure Gear Pumps

KP .../434

Description

The KP.../434 high-pressure gear pumps are suitable for non-abrasive fluids.

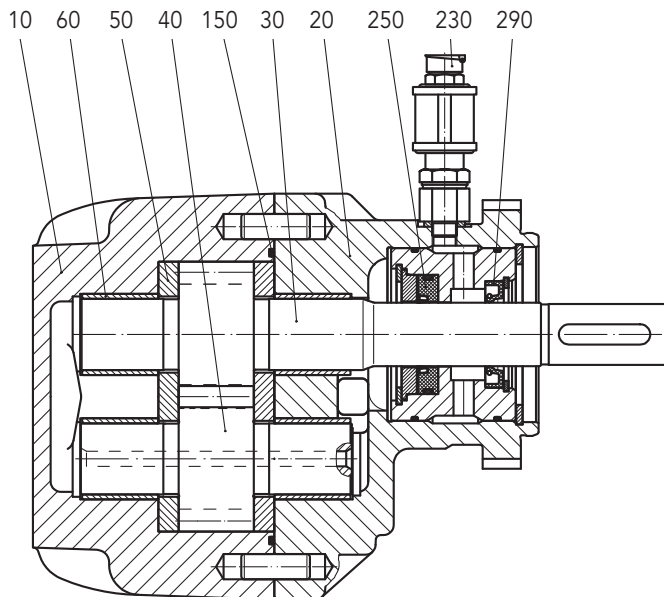
Examples of such fluids are, e.g., silicates (sodium silicate), isocyanates and polyols without fillers such as are used in PUR technology.

The gear is supported in multicomponent plain bearings, is case hardened and is super-finished. The sliding plates are made of high-strength material with special surface hardness. Depending on the pumping medium, at drive speeds of 1500 1/min working pressures of up to 150 bar are feasible.

The main application area for these high-pressure gear pumps are mainly multi-component systems in PUR technology without fillers.

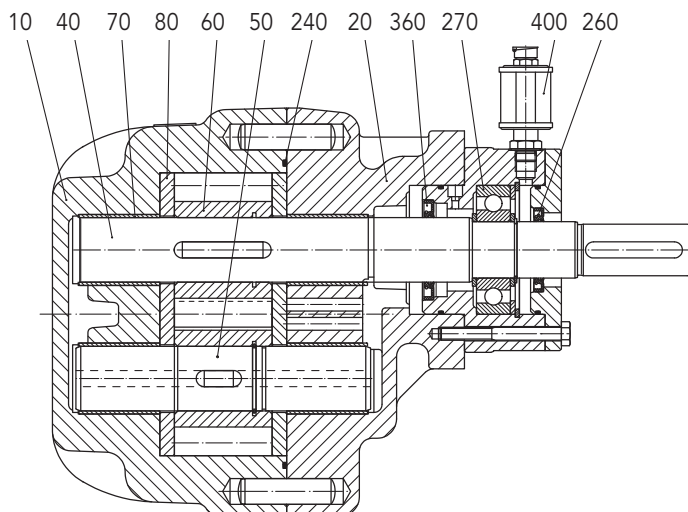
The double seal with quench tank reliably prevents crystallisation on the seal to the pumping medium.

Construction KP 2 / KP 3



- 10 Housing
- 20 Flange cover
- 30 Driving Shaft
- 40 Driven Shaft
- 50 Sliding plate
- 60 Bearing bush
- 150 O-ring
- 230 Quench tank
- 250 Special seal
- 290 Rotary shaft seal

Construction KP 5



- 10 Housing
- 20 Flange cover
- 40 Driving Shaft
- 50 Driven Shaft
- 60 Gear
- 70 Bearing bush
- 80 Sliding plate
- 240 O-ring
- 260 Rotary shaft seal
- 270 Roller bearing
- 360 Rotary shaft seal
- 400 Quench tank

Materials

Housing	EN-GJL-300 (GG 30)
Flange cover	EN-GJL-300 (GG 30)
Gear	Steel, case hardened
Sliding plates	EN-GJS-600-3 nitrocarburized
Bearing bush	Multicomponent plain bearings
Shaft seal	Double rotary shaft seal with Quench chamber incl. Quench tank

Characteristics

Geometrical displacement	V_g	KP 2 = 28, 40 cm ³ /r KP 3 = 63, 100, 125 cm ³ /r KP 5 = 150, 200, 250 cm ³ /r		
Mounting position		horizontal		
Fixing type		KP 2 / KP 3 = flange (4-hole flange, DIN ISO 7653) KP 5 = flange (SAE-C-2-hole flange)		
Inlet port		SAE 1¼" - 1½" - 2" - 2½"-flange		
Outlet port		SAE 1" - 1¼" - 2"-flange		
Max. working pressure		150 bar = KP 2/28, KP 2/40 150 bar = KP 3/63, KP 3/100 110 bar = KP 3/125 100 bar = KP 5/150, KP 5/200, KP 5/250		
Max. inlet pressure		Pressure inlet port bar KP 2 / KP 3	Pressure inlet port bar KP 5	Speed 1/min
		- 0.4 ... 20	- 0.4 ... 9	max. 400
		- 0.4 ... 16	- 0.4 ... 9	max. 500
		- 0.4 ... 11	- 0.4 ... 5.5	max. 750
		- 0.4 ... 8	- 0.4 ... 4.5	max. 1000
		- 0.4 ... 5	- 0.4 ... 3	max. 1500
Viscosity	ν	34 up to 50 000 mm ² /s (higher viscosities on request)		
Media temperature	ϑ_{\max}	= 120 °C		
Ambient temperature	$\vartheta_{u \min}$ $\vartheta_{u \max}$	= - 20 °C = 60 °C		
Shaft end		KP 2 / KP 3 = Cylindrical shaft Ø 24 mm KP 5 = Cylindrical shaft Ø 32 mm		

Input Power

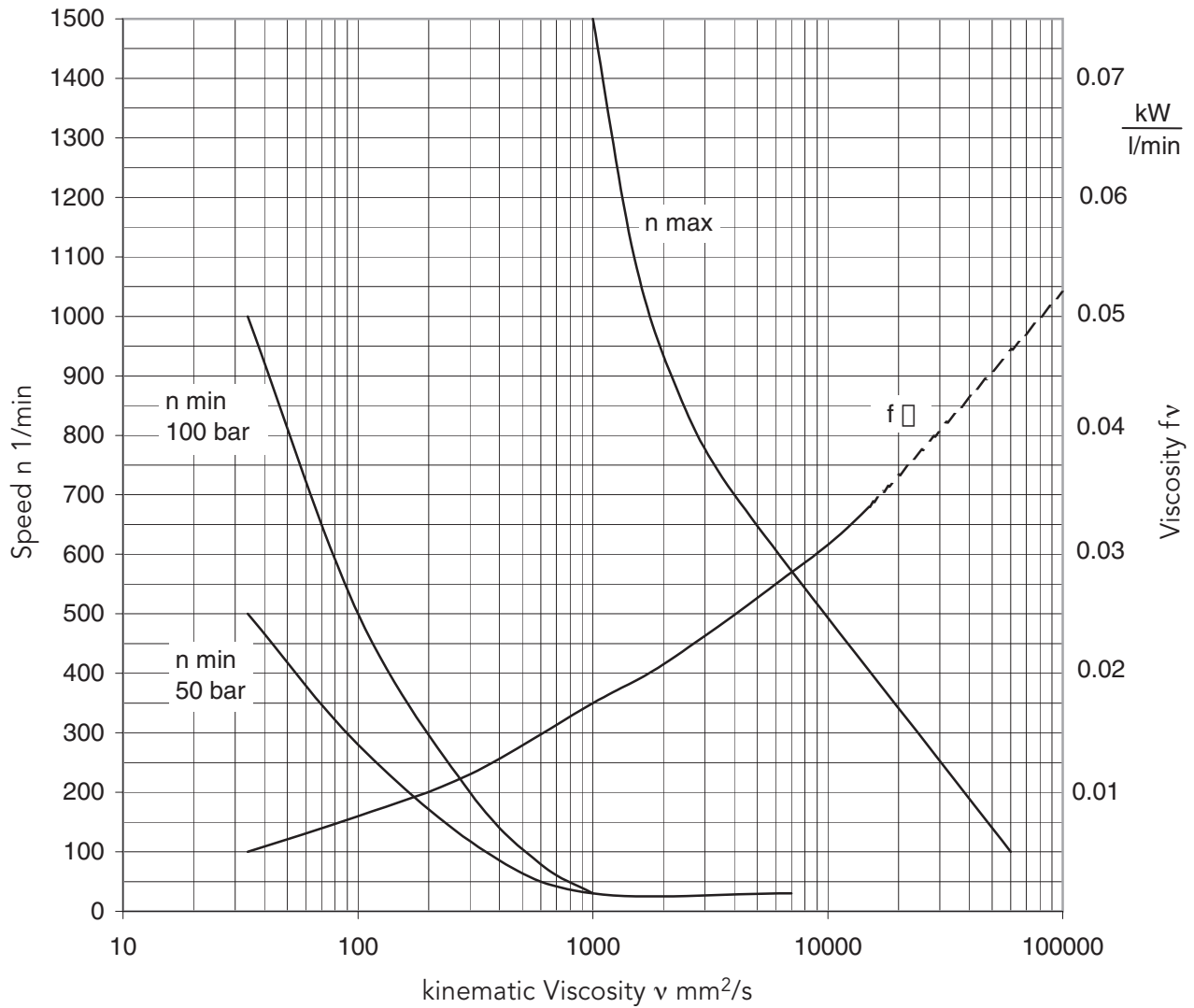


Diagramm: $n, f_v = f(v)$

Note:

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

Discharge Flow / Input Power

Calculation

- P_{Pu} = Pump power consumption (kW)
- P = Power consumption
- n = Speed (1/min)
Dependent on viscosity!
(see chart)
- f_v = Viscosity factor $\left[\frac{\text{kW}}{\text{l/min}} \right]$
(see chart)
- Q = Discharge flow (l/min) with $Q = \frac{V_g \cdot n}{1000}$
- V_g = Geometrical displacement (cm^3/r)

Conversion factors

- 1 bar \triangleq 14.5 $\frac{\text{lb}}{\text{in}^2}$ = 14.5 psi
- 1 $\frac{\text{l}}{\text{min}}$ \triangleq 0.220 $\frac{\text{gal}}{\text{min}}$ = [U.K.]
- 1 $\frac{\text{l}}{\text{min}}$ \triangleq 0.264 $\frac{\text{gal}}{\text{min}}$ = [US]

Example: Pump type KP 3/63

- Viscosity $v = 3000 \text{ mm}^2/\text{s}$
- Working pressure $p = 50 \text{ bar}$
- at $P = 2.89 \text{ kW}$
- $n = 500 \text{ 1/min}$
- $f_v = 0.023 \frac{\text{kW}}{\text{l/min}}$
- $Q = 28 \text{ l/min}$

becomes

$$P_{Pu} = (2.89 + 0.023 \cdot 28) \text{ kW}$$

$$P_{Pu} = 3.53 \text{ kW}$$

Motorpower output:

$$P_{Mot} = 1.2 \cdot P_{Pu} = 4 \text{ kW}$$

Select helical

geared motor with

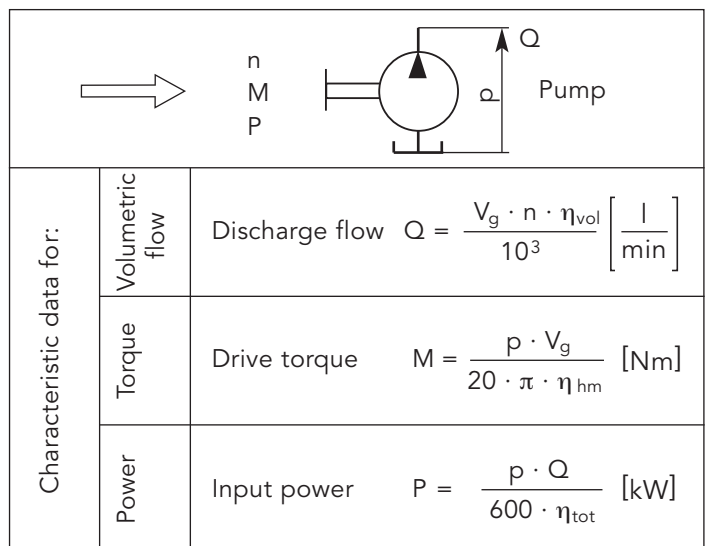
$$P = 4.0 \text{ kW}$$

$$n = 500 \text{ 1/min}$$

Calculation Formulas for Hydraulic Pumps

Characteristic data, formula signs, units

Discharge flow / input flow	Q	l/min
Pump / motor displacement	V_g	cm^3/r
Pressure	p	bar
Speed of rotation	n	1/min
Torque	M	Nm
Power	P	kW
Total efficiency	η_{tot}	-
Volumetric efficiency	η_{vol}	-
Hydr./mech. efficiency	η_{hm}	-
Flow velocity	v	m/s
Pipe diameter	d	mm



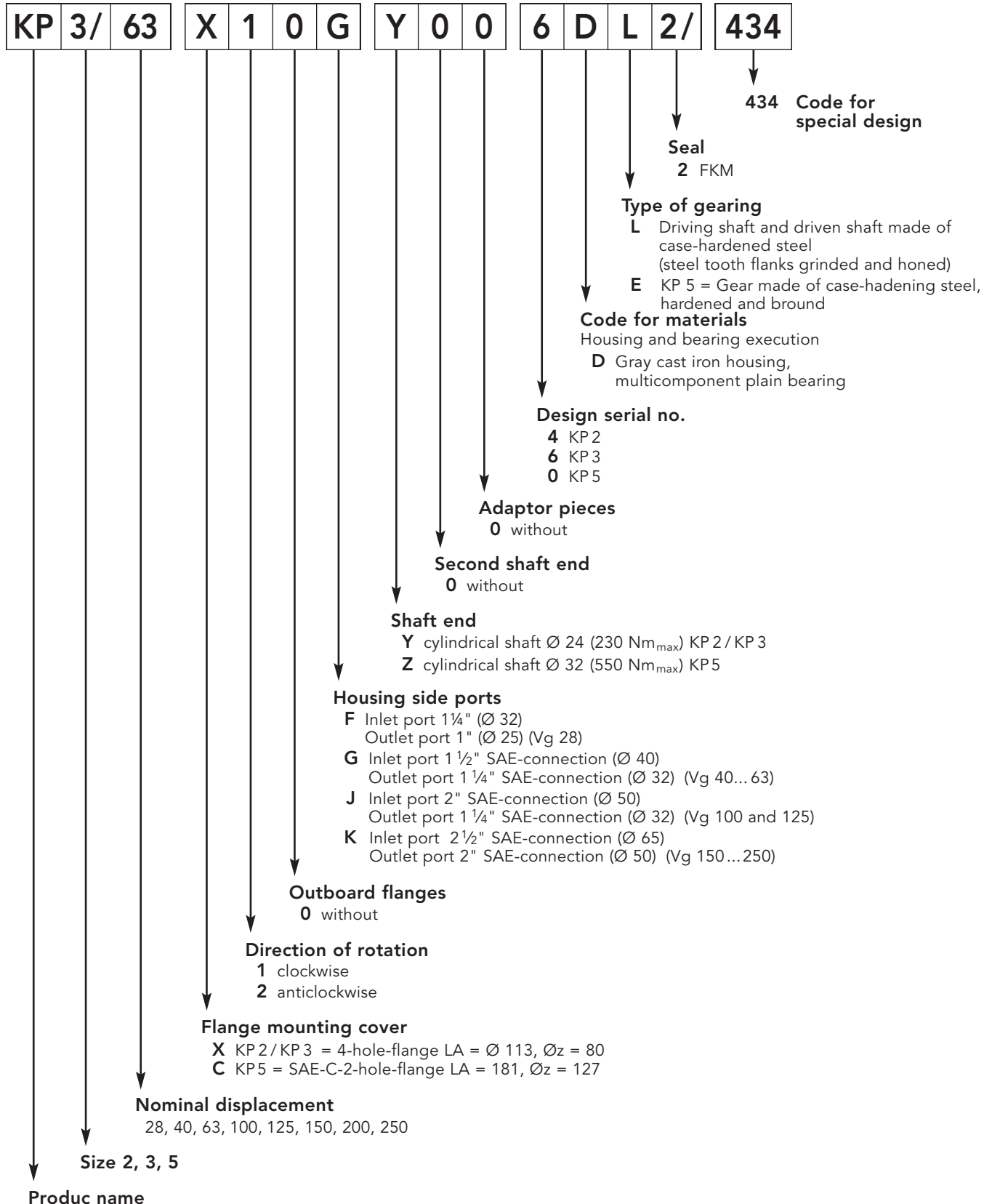
General

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

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

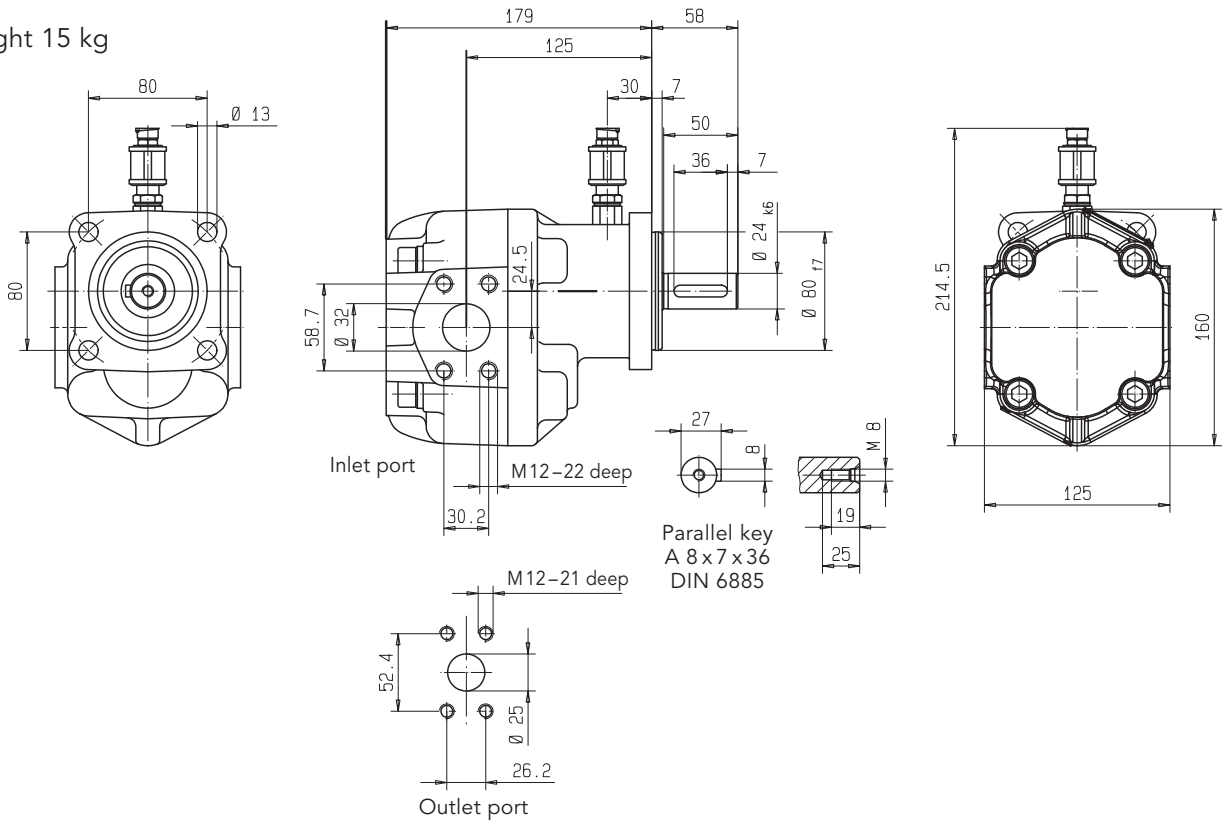
Type Key

Ordering example



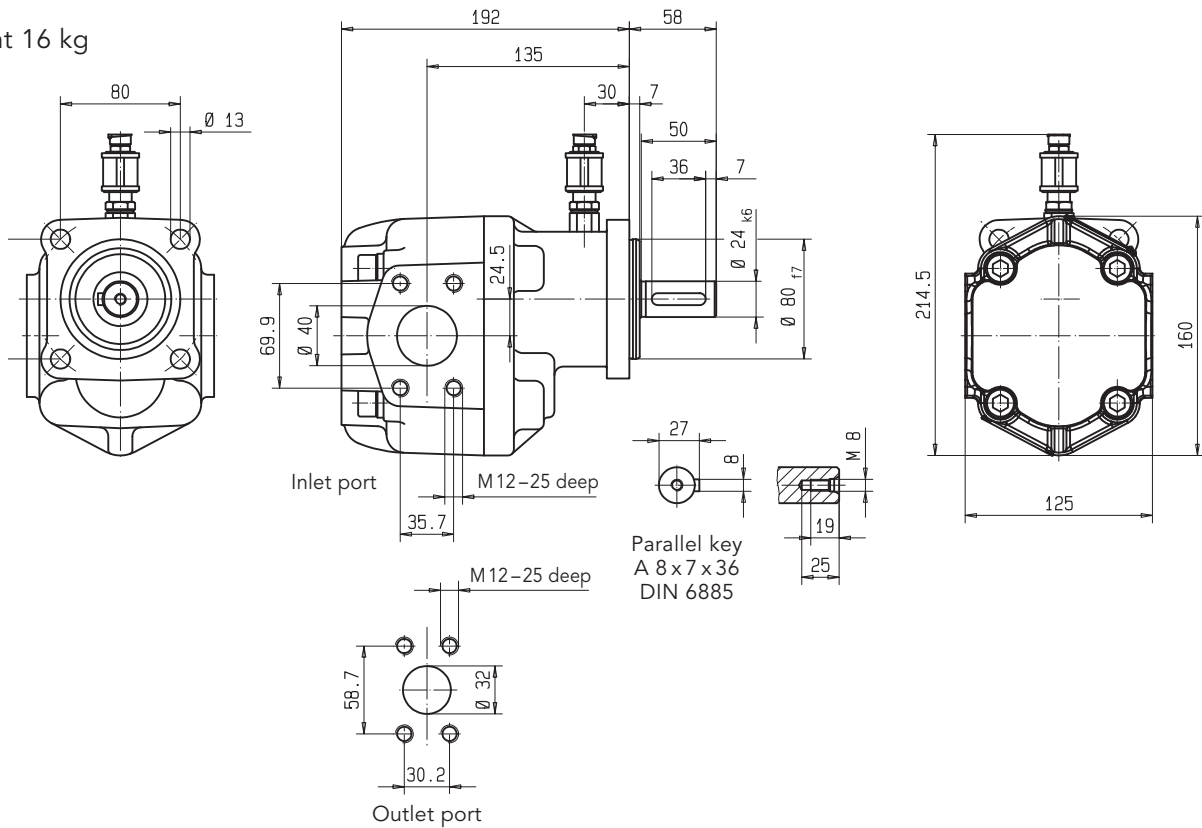
Dimensions KP 2/28.../434 (in mm)

Weight 15 kg



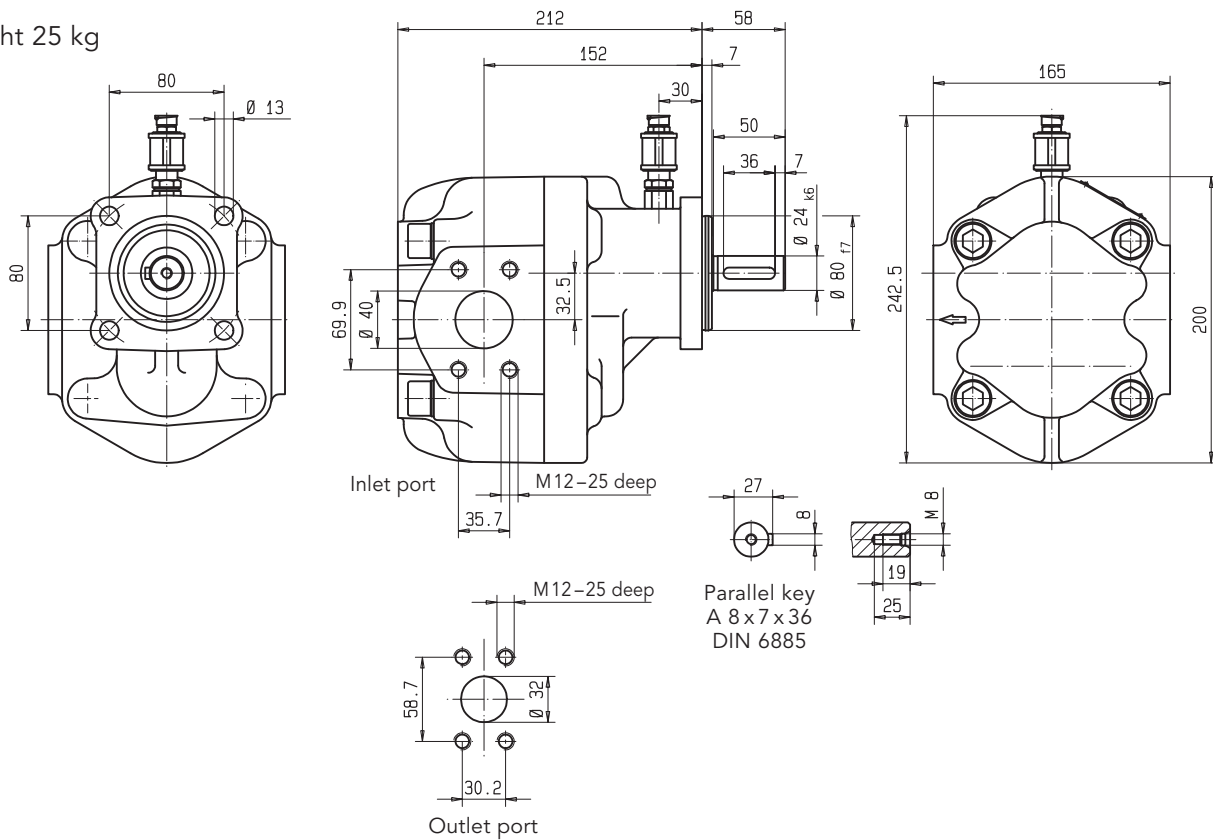
Dimensions KP 2/40.../434 (in mm)

Weight 16 kg



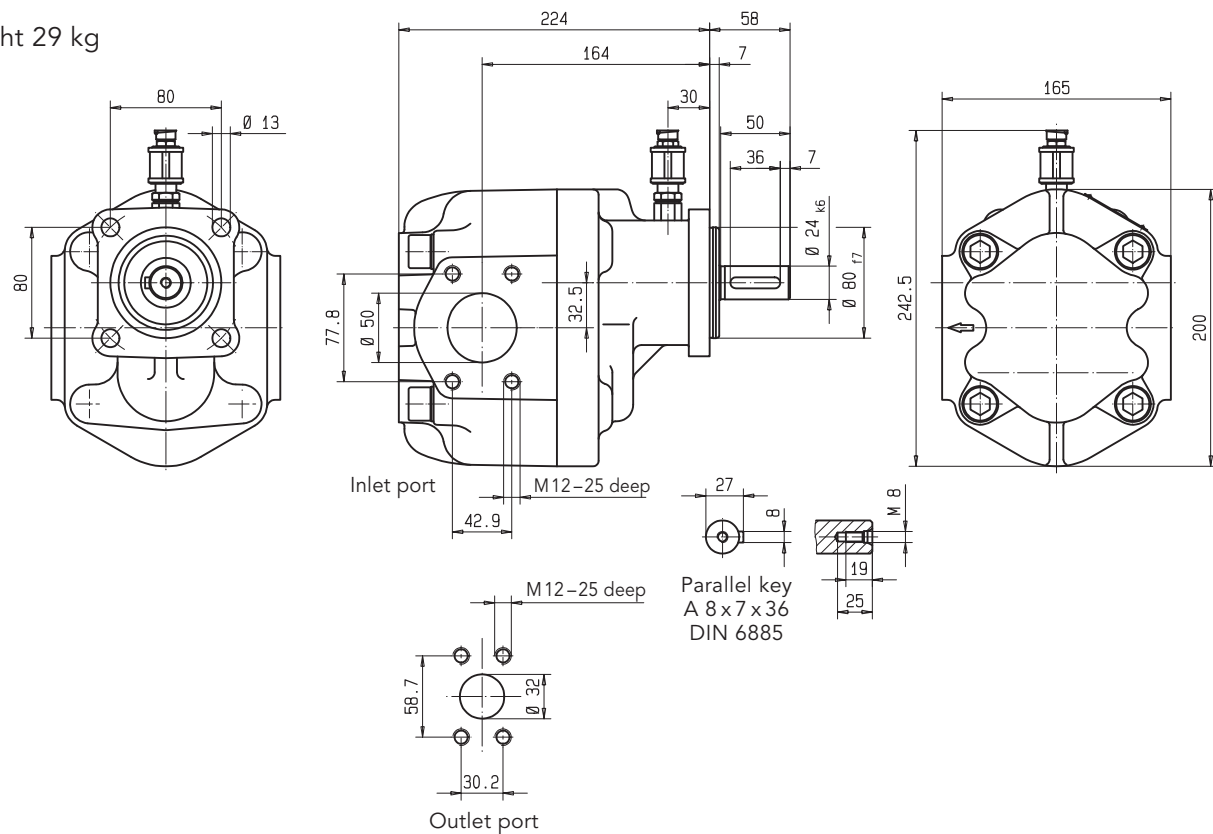
Dimensions KP 3/63.../434 (in mm)

Weight 25 kg



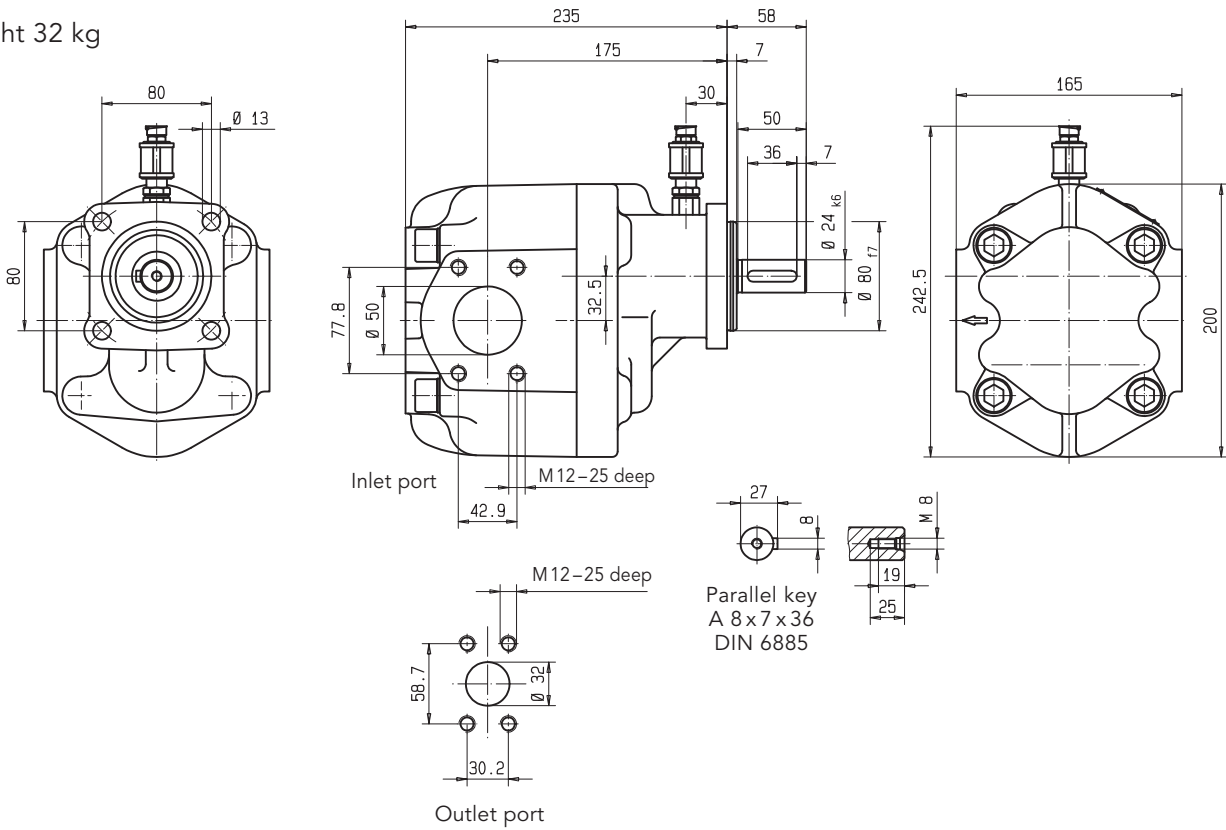
Dimensions KP 3/100.../434 (in mm)

Weight 29 kg



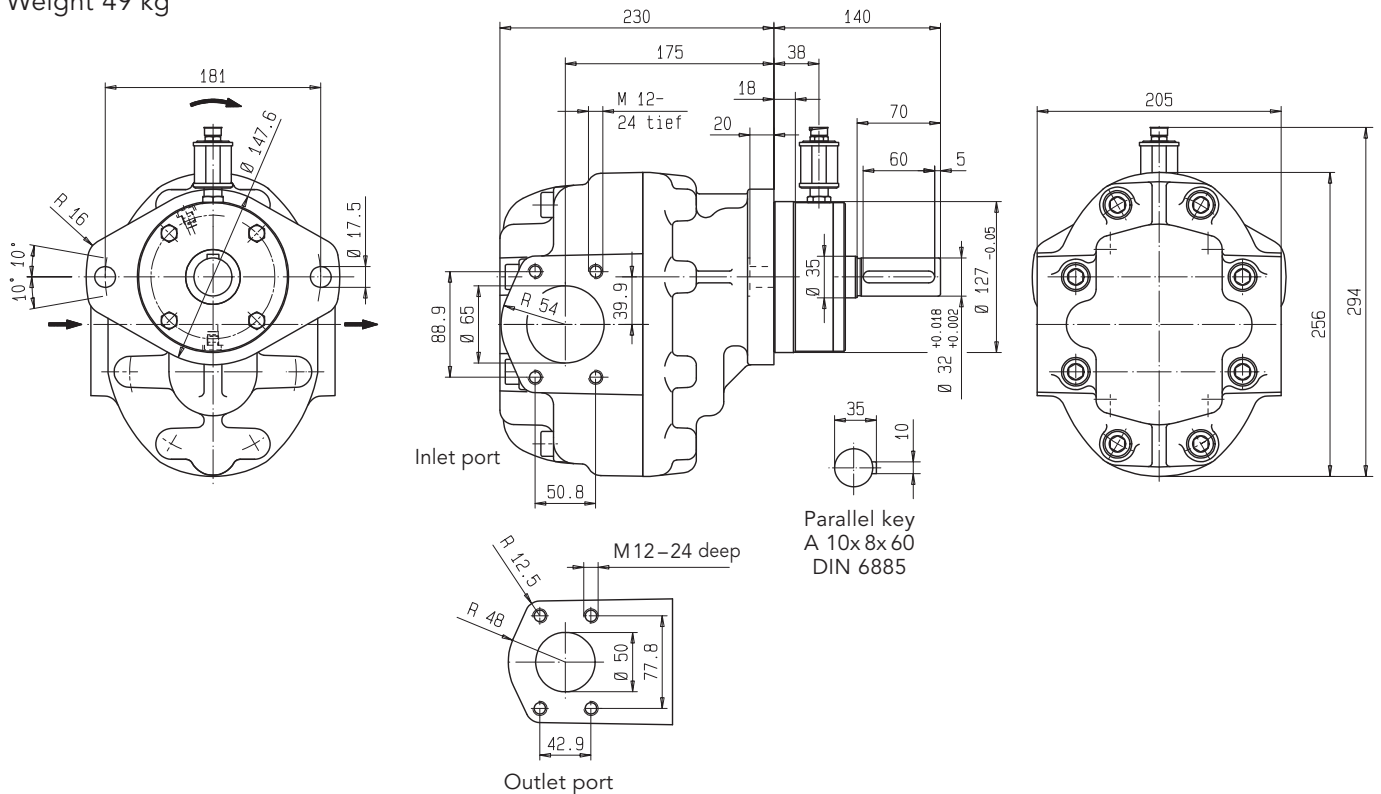
Dimensions KP 3/125.../434 (in mm)

Weight 32 kg



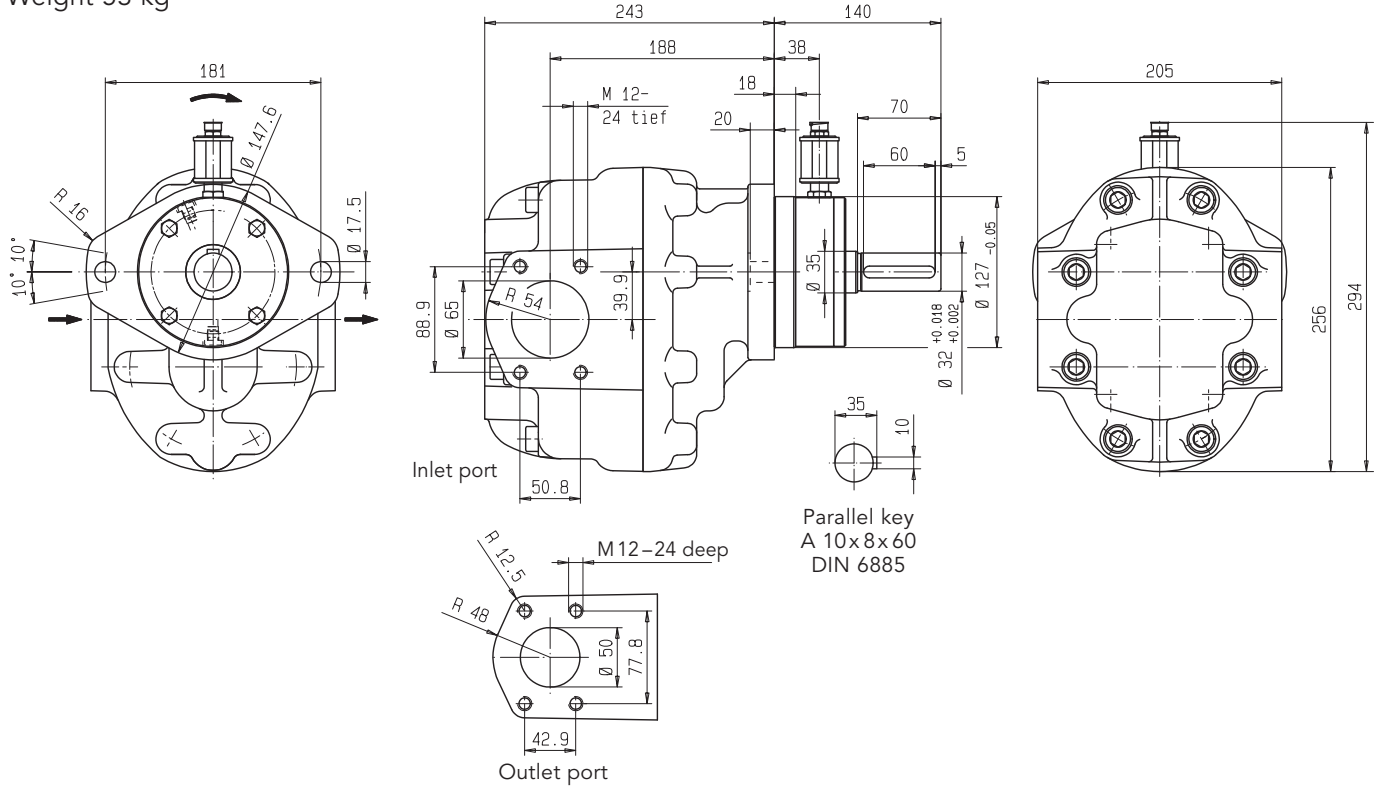
Dimensions KP 5/150.../434 (in mm)

Weight 49 kg



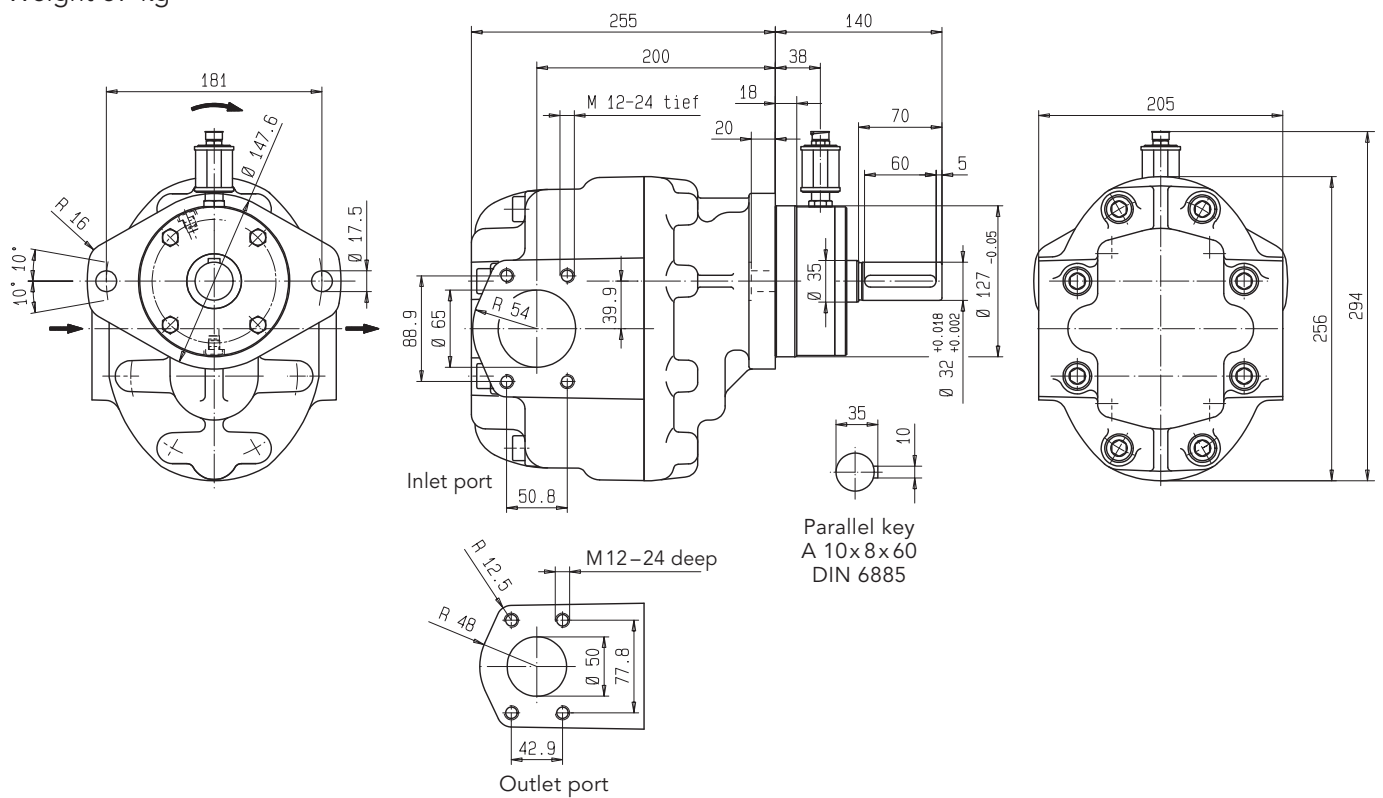
Dimensions KP 5/200.../434 (in mm)

Weight 53 kg

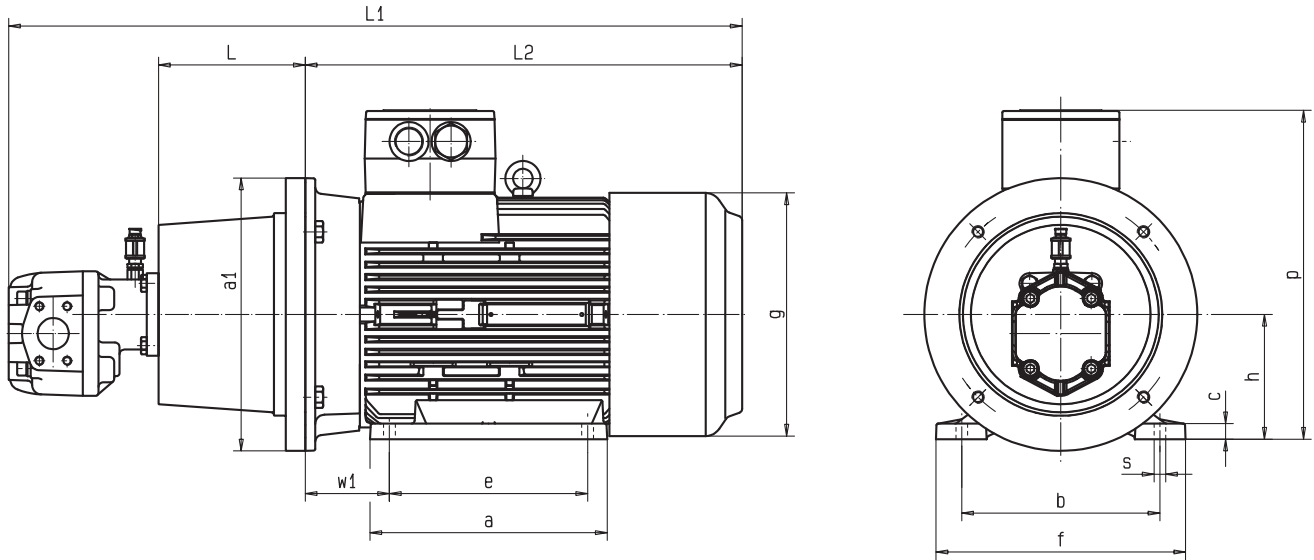


Dimensions KP 5/250.../434 (in mm)

Weight 57 kg



Motor-Pump Assemblies KP 2



KP 2

Size	Motor 8-pole Power kW	Speed 1/min	Motor 6-pole Power kW	Speed 1/min	Motor 4-pole Power kW	Speed 1/min	Bell housing	Coupling
132 S	2.2	710	3.0	960	5.5	1440	PK300/04/42-00	RA28/38-Z35/24-Z35/38
132 M	3.0	710	5.5	970	7.5	1440		
160 M	4.0	720	7.5	970	11.0	1460	PK350/04/46-00	RA38/45-Z45/24-Z45/42
160 L	5.5	720	11.0	970	15.0	1470		
180 M	–	–	–	–	18.5	1470	PK350/06/58-00	RA42/55-Z50/24-Z50/48
180 L	11.0	730	15.0	970	22.0	1480		
200 L	15.0	730	22.0	970	30.0	1480	PK400/04/34-00	RA42/55-Z50/24-Z50/55

All motor dimensions and date refer to AC motors; other motor makes on enquiry. Motor type IMB35.

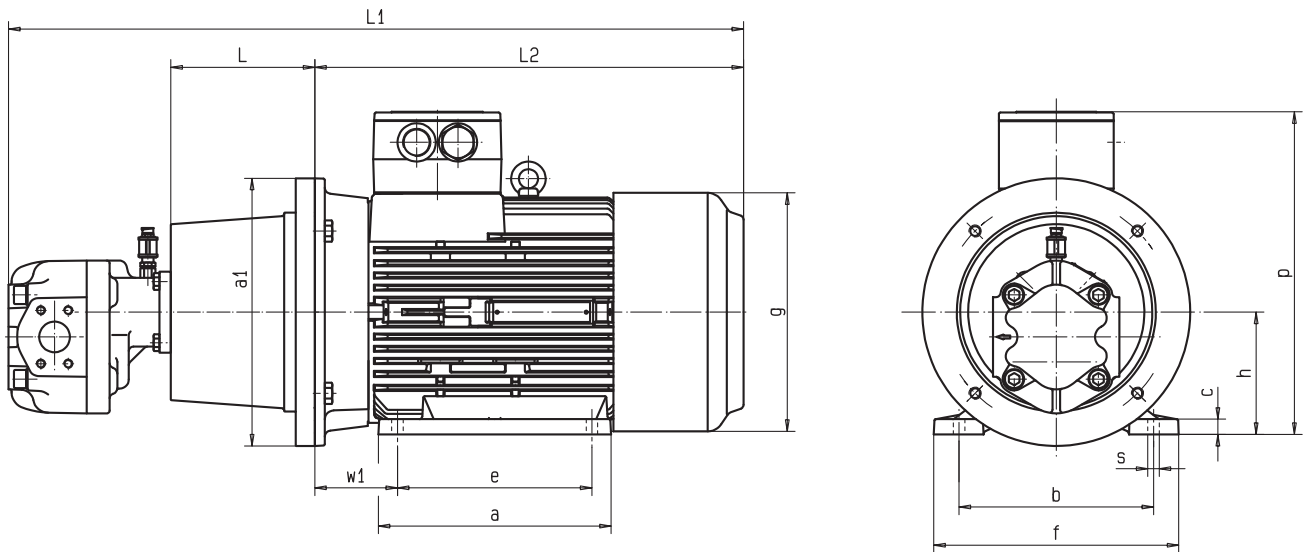
KP 2

Size	KP 2/28 L1	KP 2/40 L1	L	a ₁	a	b	c	e	f	g	h	L ₂	p	s	w ₁
132 S	729	742	155	300	186	216	15	140	262	258	132	395	320	12	89
132 M	767	780	155	300	224	216	15	178	262	258	132	433	320	12	89
160 M	865	878	188	350	260	254	20	210	314	314	160	498	411	15	108
160 L	909	922	188	350	304	254	20	254	314	314	160	542	411	15	108
180 M	961	974	204	350	311	279	22	241	349	355	180	578	447	15	121
180 L	999	1012	204	350	349	279	22	279	349	355	180	616	447	15	121
200 L	1052	1065	204	400	369	318	25	305	388	397	200	669	525	19	133

All pump nominal sizes and motor sizes can be combined with each other.

(Dimensions in mm)

Motor-Pump Assemblies KP 3



KP3

Size	Motor 8-pole		Motor 6-pole		Motor 4-pole		Bell housing	Coupling
	Power kW	Speed 1/min	Power kW	Speed 1/min	Power kW	Speed 1/min		
132 S	2.2	710	3.0	960	5.5	1440	PK300/04/42-00	RA28/38-Z35/24-Z35/38
132 M	3.0	710	5.5	970	7.5	1440		
160 M	4.0	720	7.5	970	11.0	1460	PK350/04/46-00	RA38/45-Z45/24-Z45/42
160 L	5.5	720	11.0	970	15.0	1470		
180 M	–	–	–	–	18.5	1470	PK350/06/58-00	RA42/55-Z50/24-Z50/48
180 L	11.0	730	15.0	970	22.0	1480		
200 L	15.0	730	22.0	970	30.0	1480	PK400/04/34-00	RA42/55-Z50/24-Z50/55
225 S	18.5	730	–	–	37.0	1480	PK450/02/55-50	RA48/60-Z56/24-Z56/60
225 M	22.0	730	30.0	980	45.0	1480		
250 M	30.0	730	37.0	980	55.0	1480	PL550/08/68-50	RG55/70-Z65/24-Z65/65

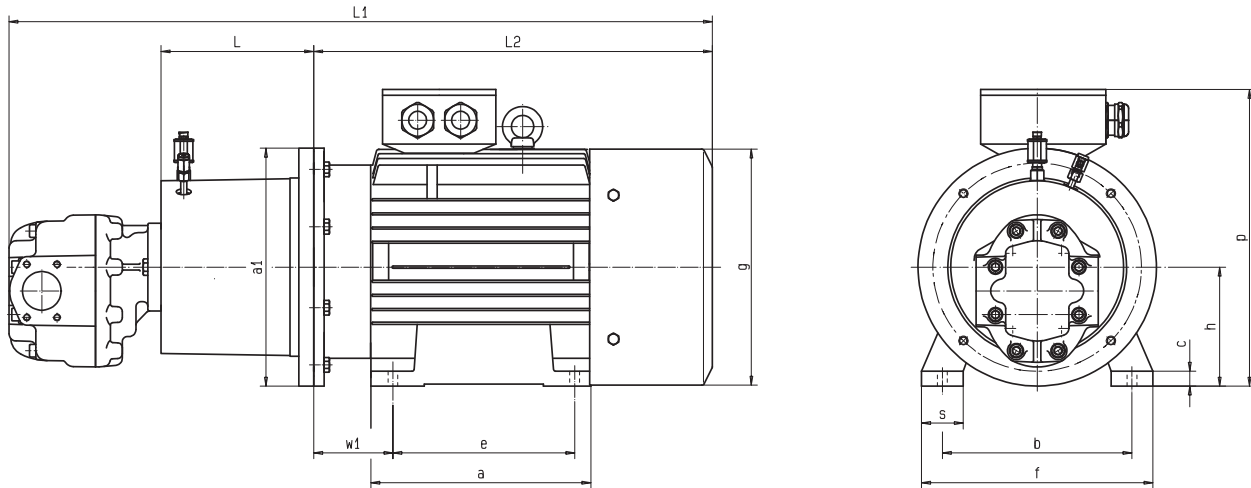
All motor dimensions and date refer to AC motors; other motor makes on enquiry. Motor type IMB35.

KP3

Size	KP3/63	KP3/100	KP3/125	L	a ₁	a	b	c	e	f	g	h	L ₂	p	s	w ₁
	L1	L1	L1													
132 S	762	774	785	155	300	186	216	15	140	262	258	132	395	320	12	89
132 M	800	812	823	155	300	224	216	15	178	262	258	132	433	320	12	89
160 M	898	910	921	188	350	260	254	20	210	314	314	160	498	411	15	108
160 L	942	954	965	188	350	304	254	20	254	314	314	160	542	411	15	108
180 M	994	1006	1017	204	350	311	279	22	241	349	355	180	578	447	15	121
180 L	1032	1044	1055	204	350	349	279	22	279	349	355	180	616	447	15	121
200 L	1085	1097	1108	204	400	369	318	25	305	388	397	200	669	525	19	133
225 S	1130	1142	1153	234	450	368	356	28	286	431	446	225	684	547	19	149
225 M	1155	1167	1178	234	450	393	356	28	311	431	446	225	709	547	19	149
250 M	1230	1242	1253	248	550	445	406	30	349	484	485	250	770	608	24	168

All pump nominal sizes and motor sizes can be combined with each other.
(Dimensions in mm)

Motor-Pump Assemblies KP 5



KP 5

Size	Motor 8-pole		Motor 6-pole		Motor 4-pole		Bell housing	Coupling
	Power kW	Speed 1/min	Power kW	Speed 1/min	Power kW	Speed 1/min		
160 M	4.0	720	7.5	970	11.0	1460	PL 350/07/64-special	Bowex M42.42-32
160 L	5.5	720	11.0	970	15.0	1470		
180 M	–	–	–	–	18.5	1470	PL 350/07/64-special	Bowex M48.48-32
180 L	11.0	730	15.0	970	22.0	1480		
200 L	15.0	730	22.0	970	30.0	1480	PL 400/05/18-special	Bowex M65.55-32
225 S	18.5	–	–	–	37.0	1480	PL 450/03/15-special	Bowex M65.60-32
225 M	22.0	730	30.0	980	45.0	1480		
250 M	30.0	730	37.0	980	55.0	1480	PL 550/03/21-special	Bowex M65.65-32

All motor dimensions and date refer to AC motors; other motor makes on enquiry. Motor type IMB35.

KP 5

Size	KP 5/150	KP 5/200	KP 5/250													
	L1	L1	L1	L	a ₁	a	b	c	e	f	g	h	L ₂	p	s	w ₁
160 M	984	997	1016	256	350	260	254	20	210	314	314	160	498	411	15	108
160 L	1028	1041	1016	256	350	304	254	20	254	314	314	160	542	411	15	108
180 M	1064	1077	1052	256	350	311	279	22	241	349	355	180	578	447	15	121
180 L	1102	1115	1052	256	350	349	279	22	279	349	355	180	616	447	15	121
200 L	1155	1168	1180	256	400	369	318	25	305	388	397	200	669	525	19	133
225 S	1199	1212	1252	285	450	368	356	28	286	431	446	225	684	547	19	149
225 M	1224	1237	1252	285	450	393	356	28	311	431	446	225	709	547	19	149
250 M	1295	1308	1413	295	550	445	406	30	349	484	485	250	770	608	24	168

All pump nominal sizes and motor sizes can be combined with each other.
(Dimensions in mm)

Product Portfolio

Gear Pumps

Gear 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, turbine and screw type 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.../434/GB/04.15

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