KRACHT

Transfer Gear Pumps
KF 4 . . . 80

Contents

Technical data

Dimension sheets

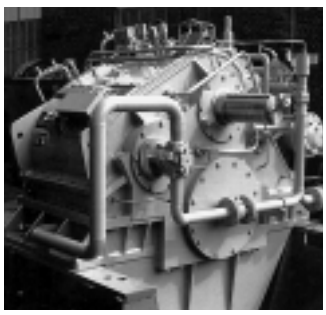
Applications from A – Z

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



KRACHT GmbH · Postbox 1420/1440 · D-58774 Werdohl · Phone 0049 (23 92) 935-0 · Fax 0049 (23 92) 935 209 · Internet: www.kracht-hydraulik.de · e-mail: info@kracht-hydraulik.de

Descriptions

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

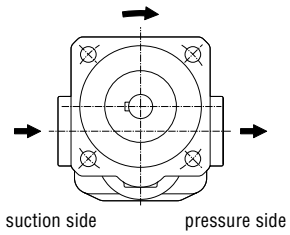
- The fluids should ensure a certain minimum lubricating properties, should not contain solids and should be chemically compatible.
- Avoid dry operation.
- The pumps may only be operated in the specified direction of rotation, as otherwise the shaft seal will be destroyed.
- In order to prevent excessive 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:

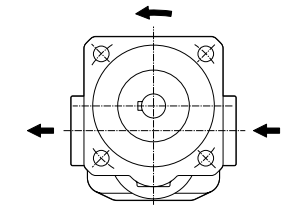
The following should be noted for direction of rotation:

- 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

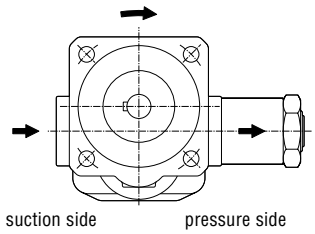


pump running cw

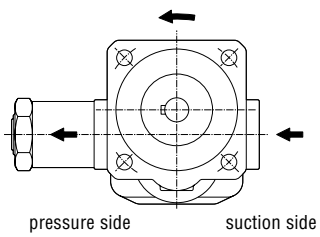


pump running ccw

With pressure relief valve



pump running cw



pump running ccw

Characteristics

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)

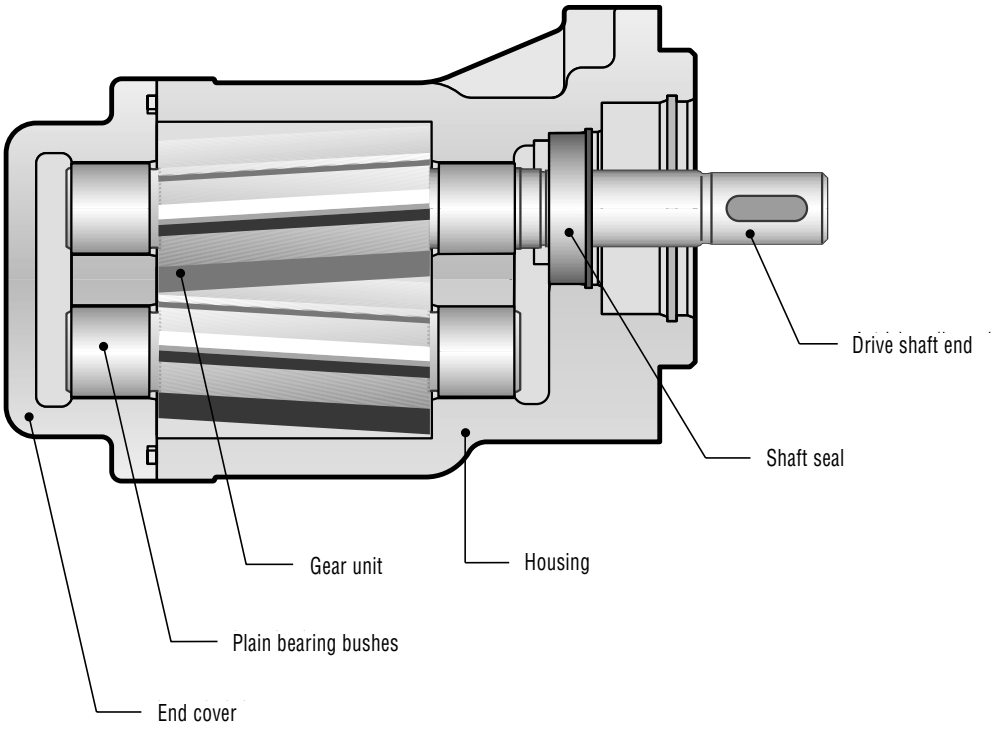
Direction of rotations: cw **or** ccw
cw **and** ccw
Mounting type: flange DIN ISO 3019
Drive shaft end: ISO R 775 short/cyl.

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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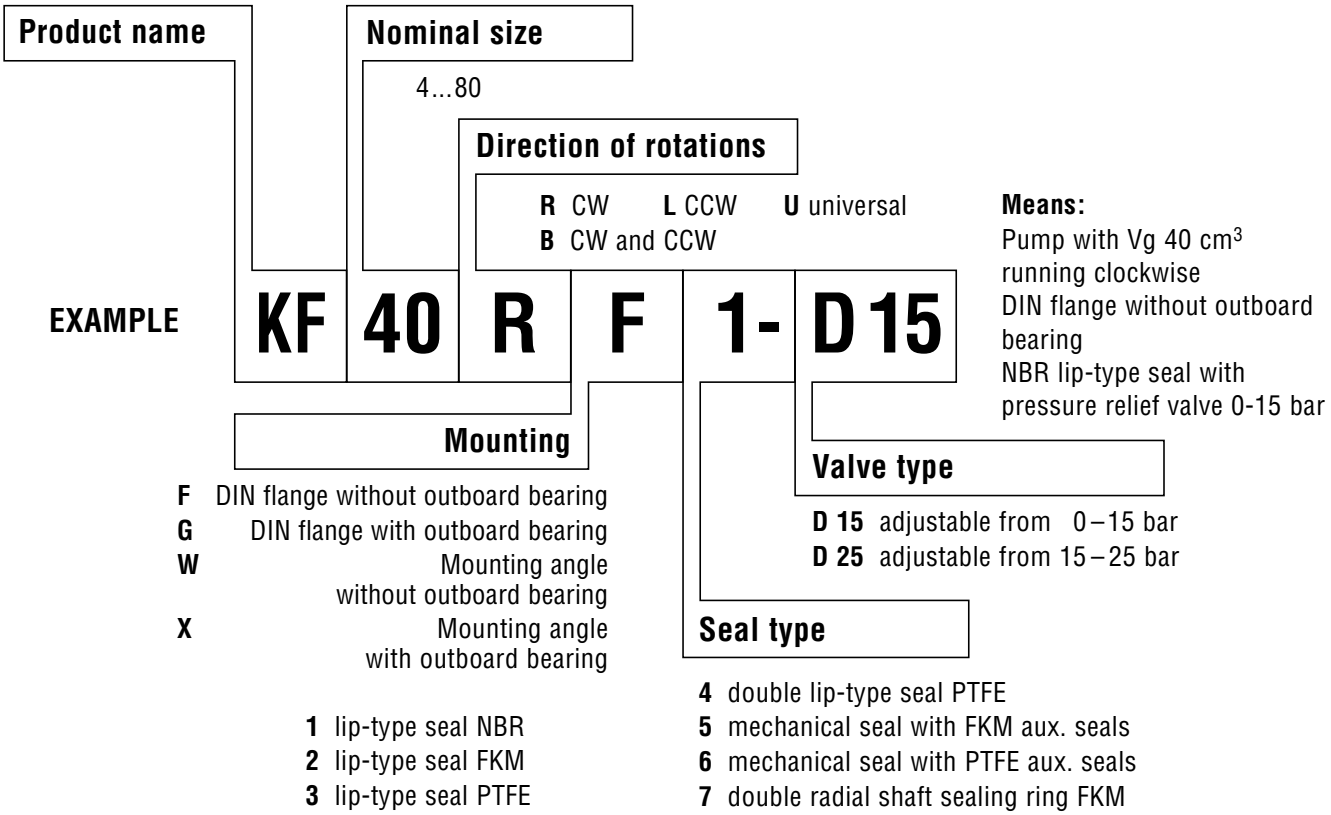
Type code



Nominal size	Geometrical displacement	Operating pressure	Maximum pressure	Speed range		Permissible load (n=1500 1/min)
	V_g cm³	p_b bar	p_{max} bar	n_{min} 1/min	n_{max} 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.

Power consumption

Table 1 Speed n = 950 1/min

Discharge flow Q in l/min

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

Power consumption P in KW

Table 2 Speed n = 1450 1/min

Discharge Q in l/min

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

Power consumption P in KW

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.

Power consumption

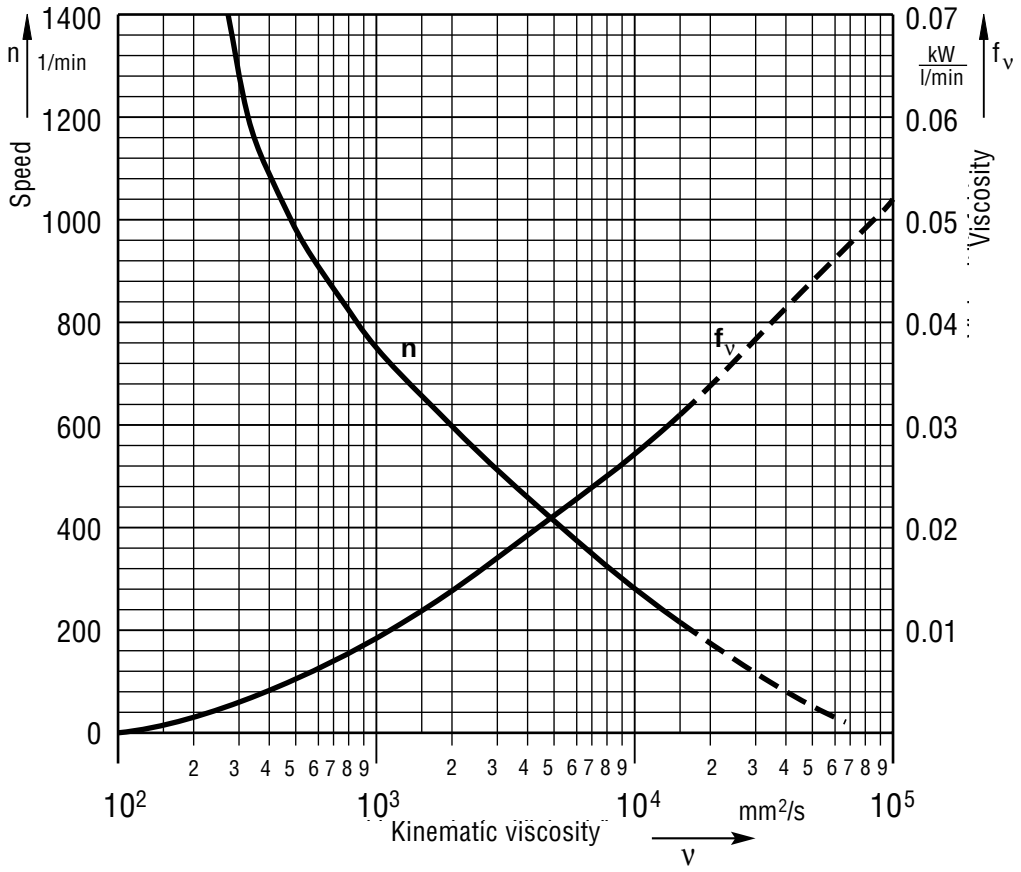


Diagram: $n, f_\nu = f(\nu)$

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 $Q = \frac{Vg \cdot n}{1000}$

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]

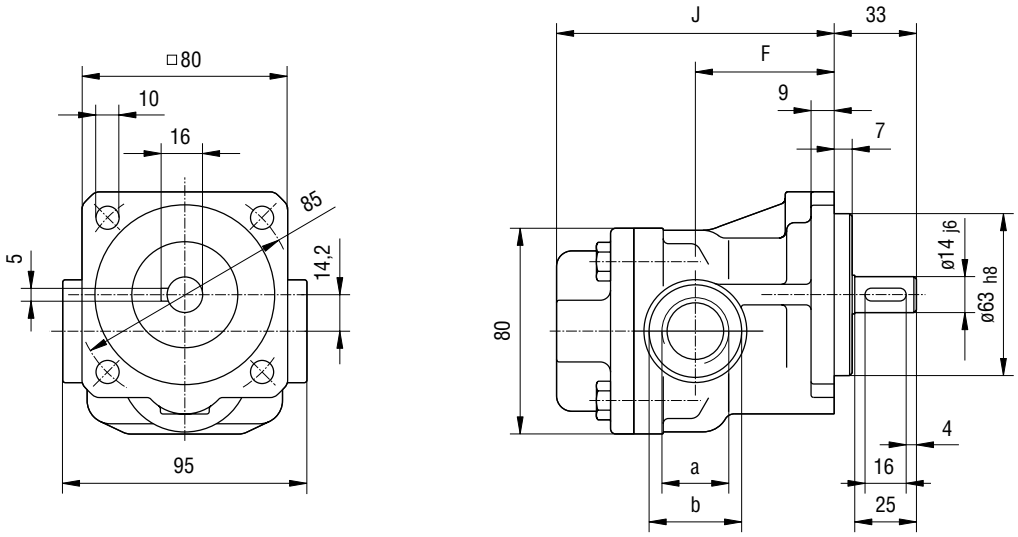
Speed recommendation

Kinematic viscosity ν mm²/s

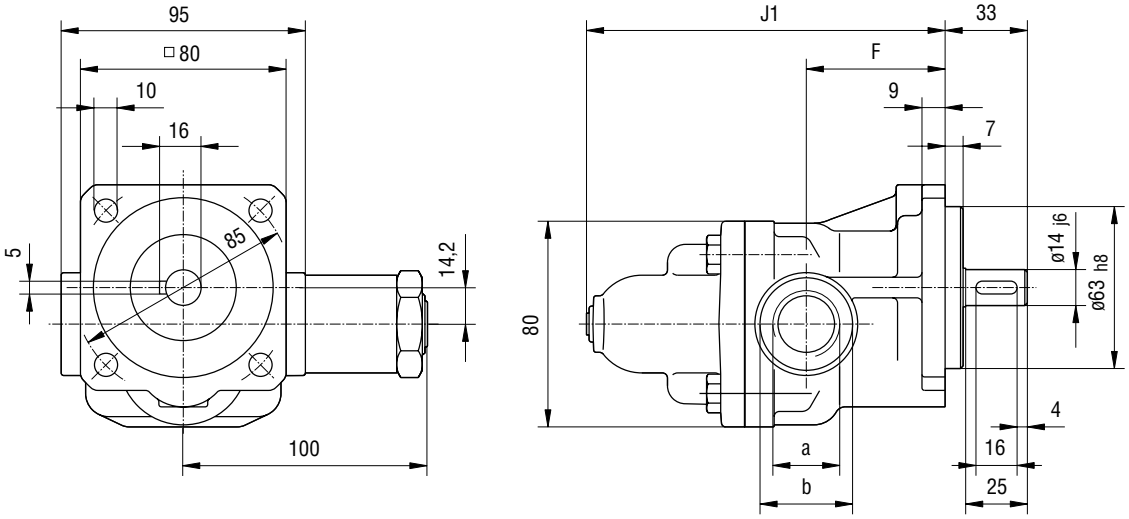
<	300	300	500	1000	2000	3000	6000	10000	20000	30000
≥	1500	1250	1000	750	600	500	400	300	200	100

Speed n_{max} 1/min

KF 4...25 Flange-mounting version

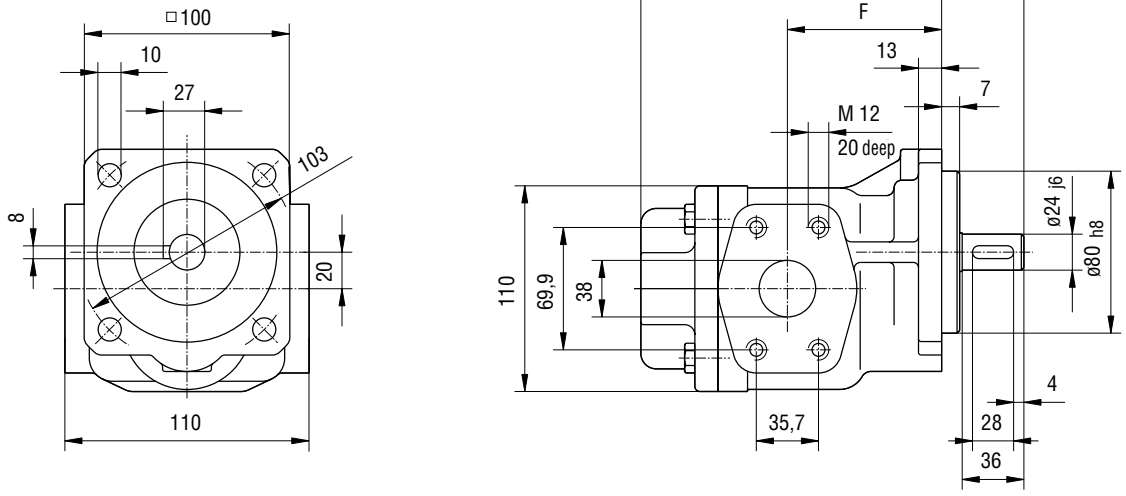


KF 4...25 Flange-mounting version with pressure relief valve

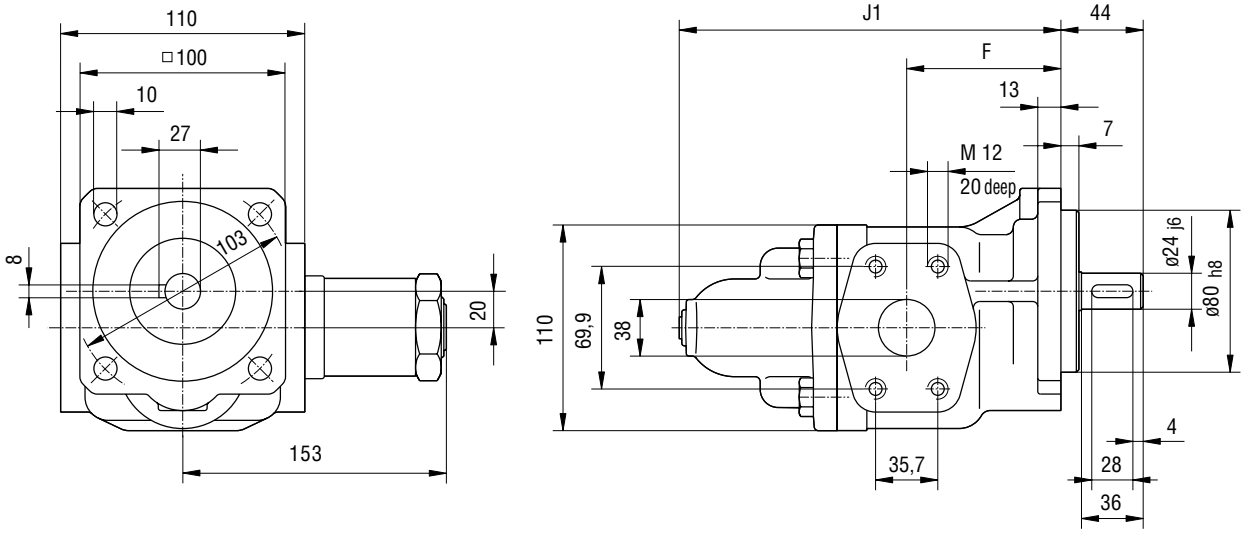


Nominal size	Suction and pressure connection		F	J	J_1	Weight in kg	
	a	b				without valve	with valve
4...12	**G 3/4** 17 deep	**36**	**54**	**109**	**140**	**2.9**	**3.7**
16...25	**G 1** 19 deep	**42**	**63**	**131**	**162**	**3.5**	**4.3**

KF 32...80 Flange-mounting version

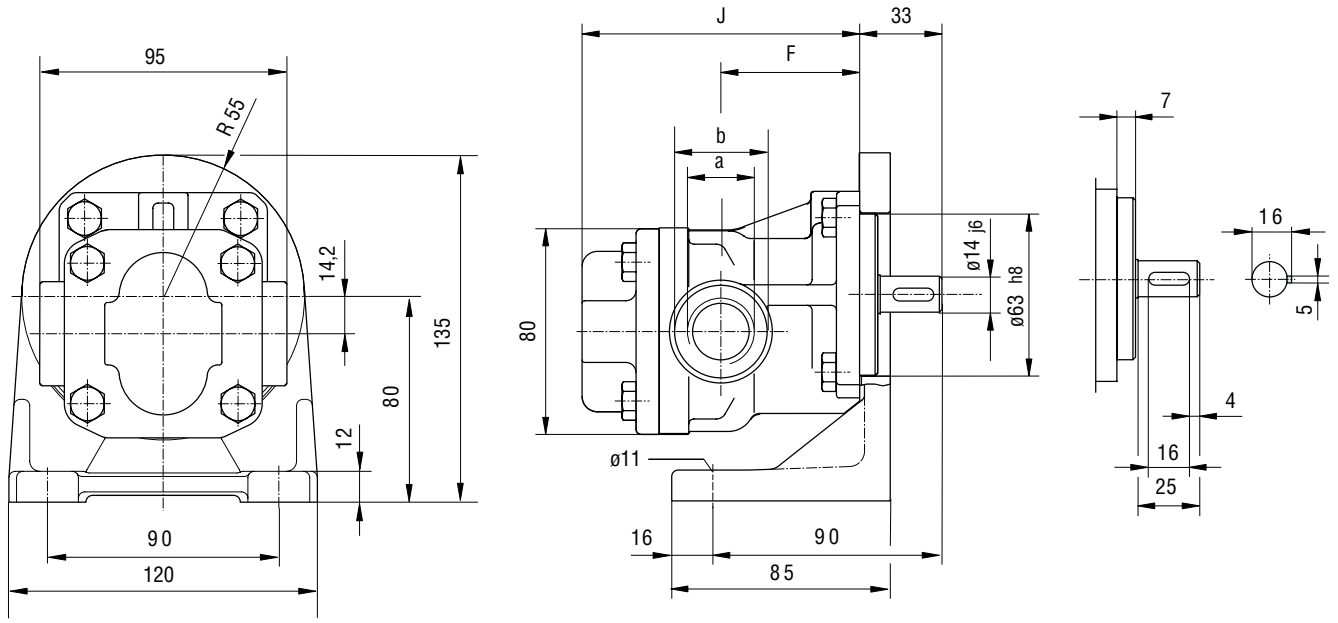


KF 32...80 Flange-mounting version with pressure relief valve

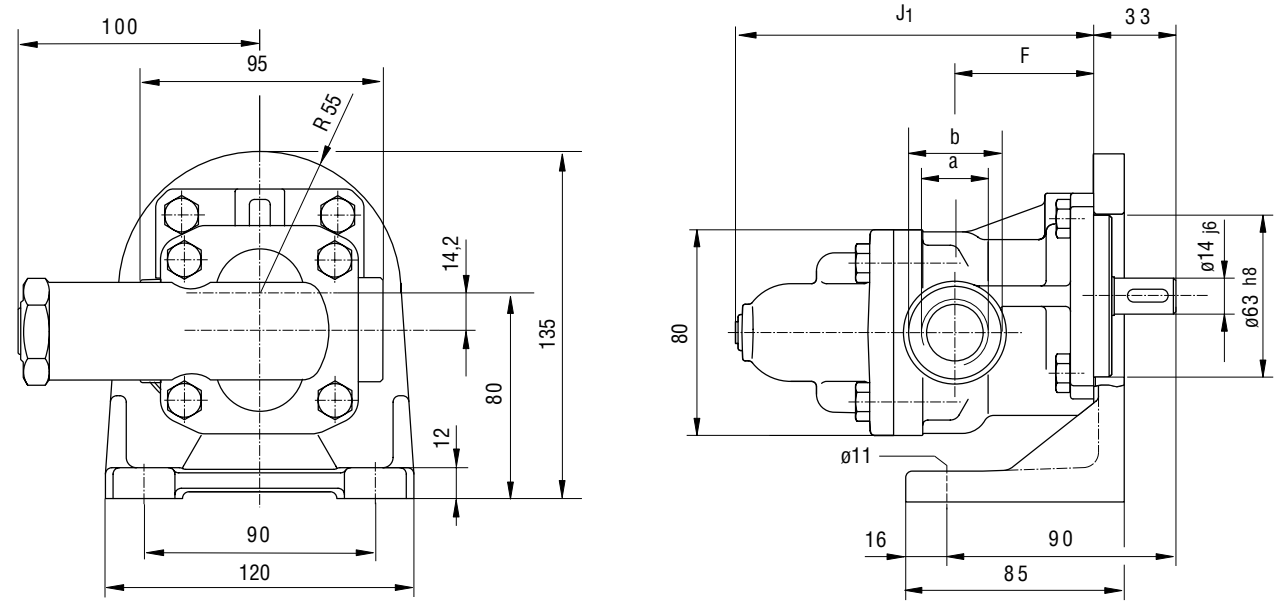


Nominal size	F	J	J_1	Weight in kg without valve	Weight in kg with valve
32...50	**84**	**171**	**212**	**7.7**	**9.5**
63...80	**100**	**206**	**247**	**9.4**	**11.2**

KF 4…25 Foot mounted version



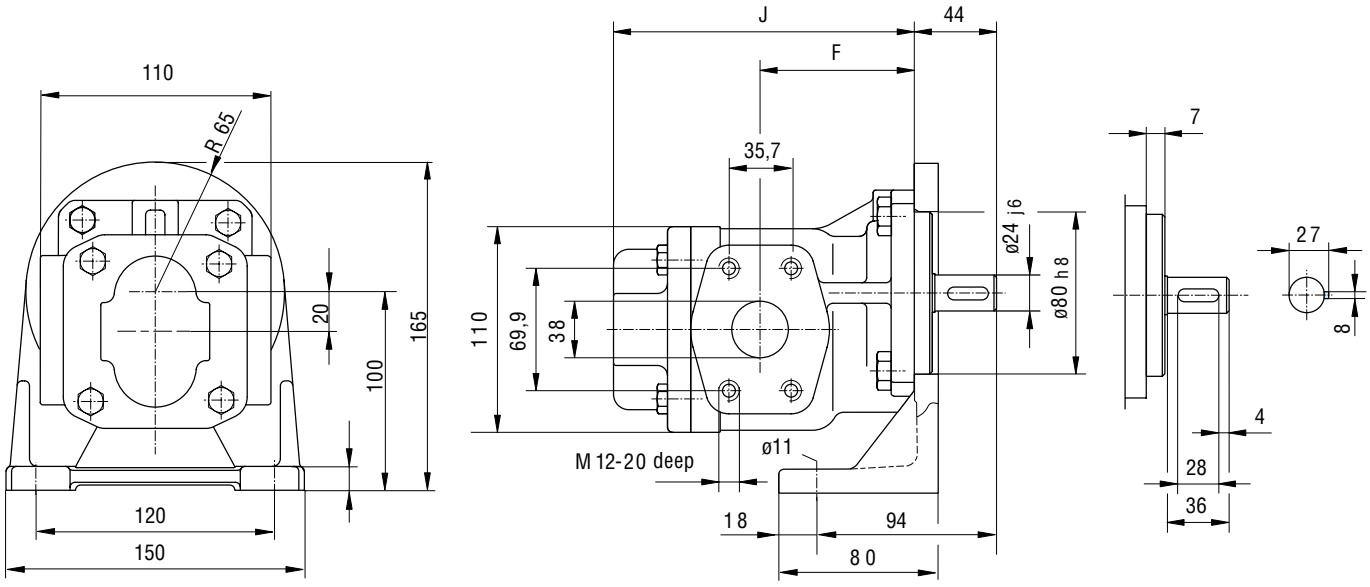
KF 4…25 Foot mounted version with pressure relief valve



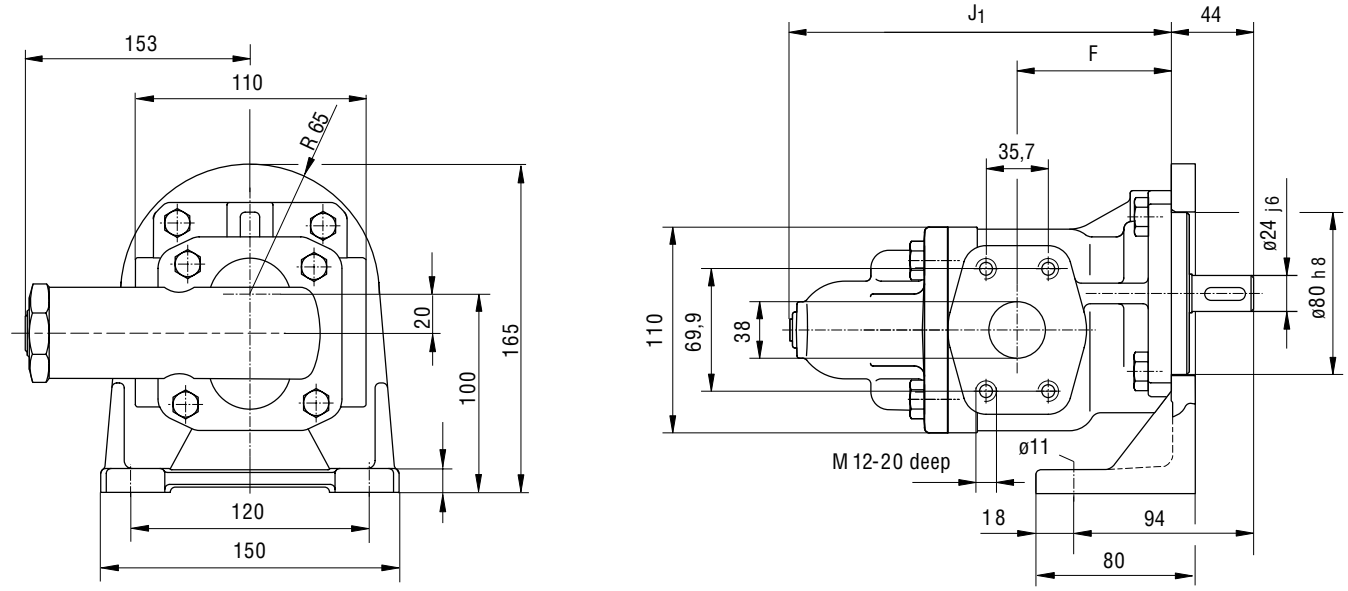
Nominal size	Suction and pressure connection		F	J	J_1	Weight in kg	
	a	b				without valve	with valve
4…12	G 3/4 17 deep	36	54	109	140	4.2	5
16…25	G 1 19 deep	42	63	131	162	4.8	5.6

Foot mounted pump

KF 32...80 Foot mounted version

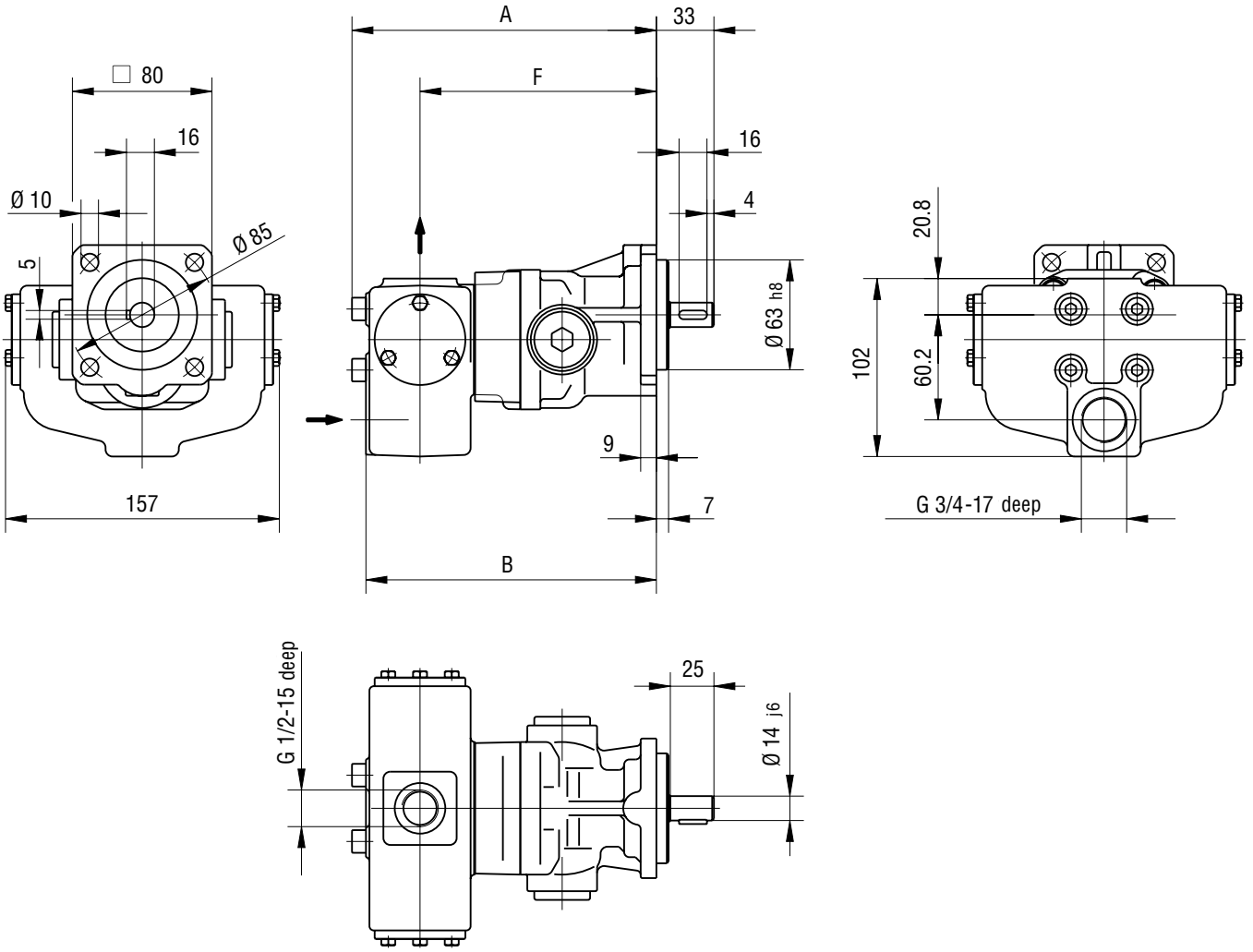


KF 32...80 Foot mounted version with pressure relief valve



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



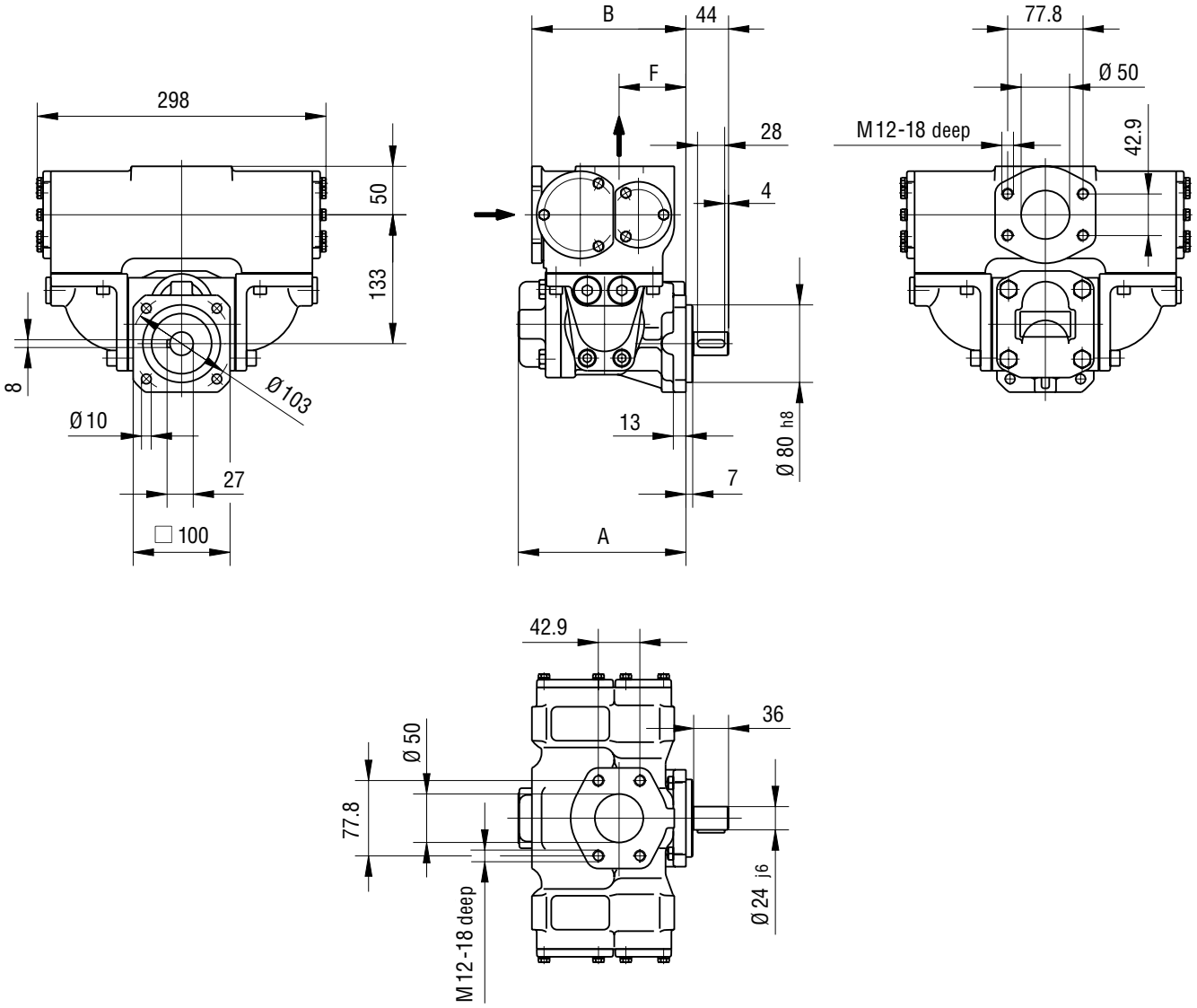
Ordering example

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

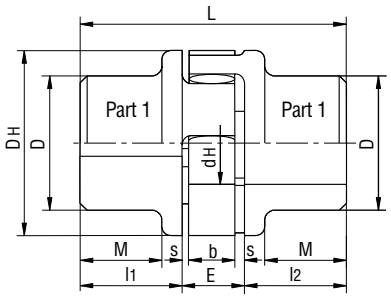
KF • UF •

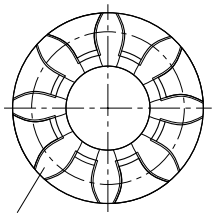
Seals 1 2

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	

Accessory: Couplings

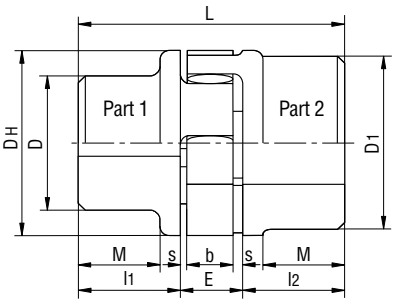
Version A





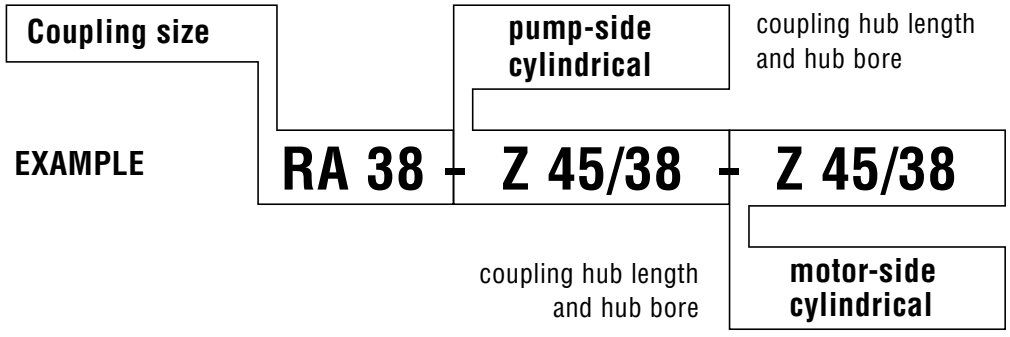
Gear rim of
polyurethane (Vulkollan)
Shore hardness 92°
Colour: yellow

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
Version A	**RA 24-Z 30/..-Z 30/..**	**24**	0.24	0.00008	6	–	8	–	24	–	30	18	2	14	78	24	55	40	–	27
Version A	**RA 28-Z 35/..-Z 35/..**	**28**	0.39	0.0002	8	–	10	–	28	–	35	20	2.5	15	90	28	65	48	–	30
Version A	**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
Version B	**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
Version B	**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
Version B	**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



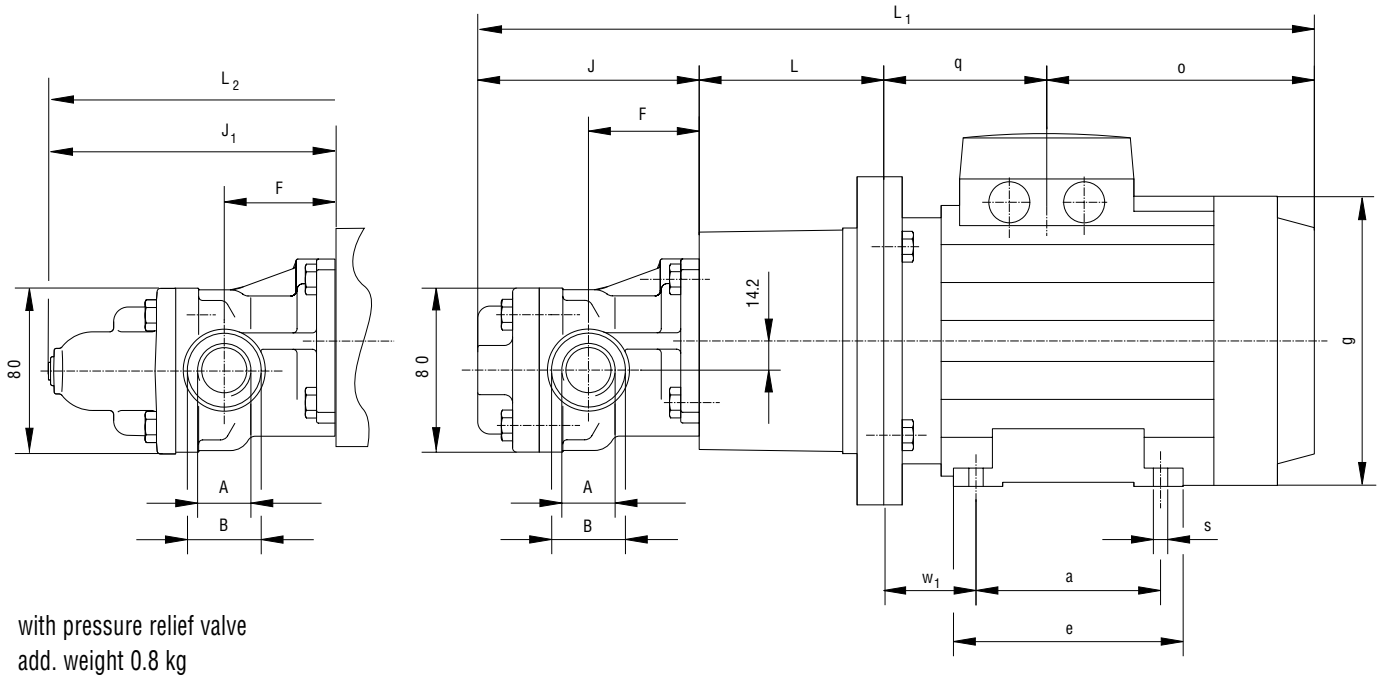
Operating temperature:
-10 °C to +80 °C (short duration temperature peaks up to 120 °C are permissible).

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.

Motor-pump assemblies

KF 4…25 Motor with pump



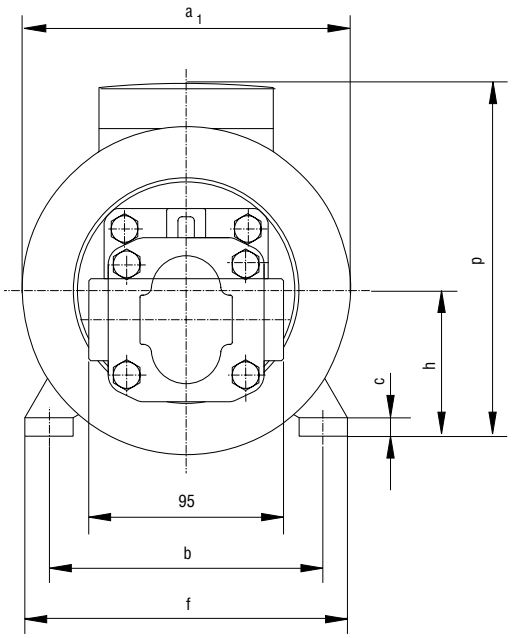
with pressure relief valve
add. weight 0.8 kg

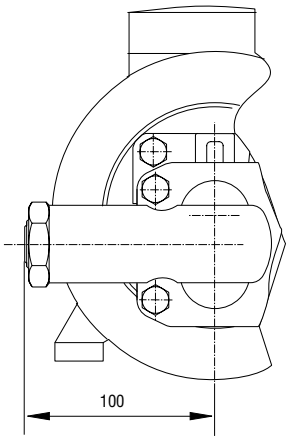
Frame size	Power	Speed	Power	Speed	Bell housing	Coupling	Total weight kg	
	kW	1/min	kW	1/min			Nominal size	
	Motor 6 pole		Motor 4 pole				4…12	16…25
71 s	0.18	920	0.25	1400	**PT160-A-063-80**	**RA19-Z25/14-Z25/14**	10	10.5
71	0.25	920	0.37	1410			11	11.5
80 s	0.37	920	0.55	1420	**PT200-A-063-100**	**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**

Motor-pump assemblies





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

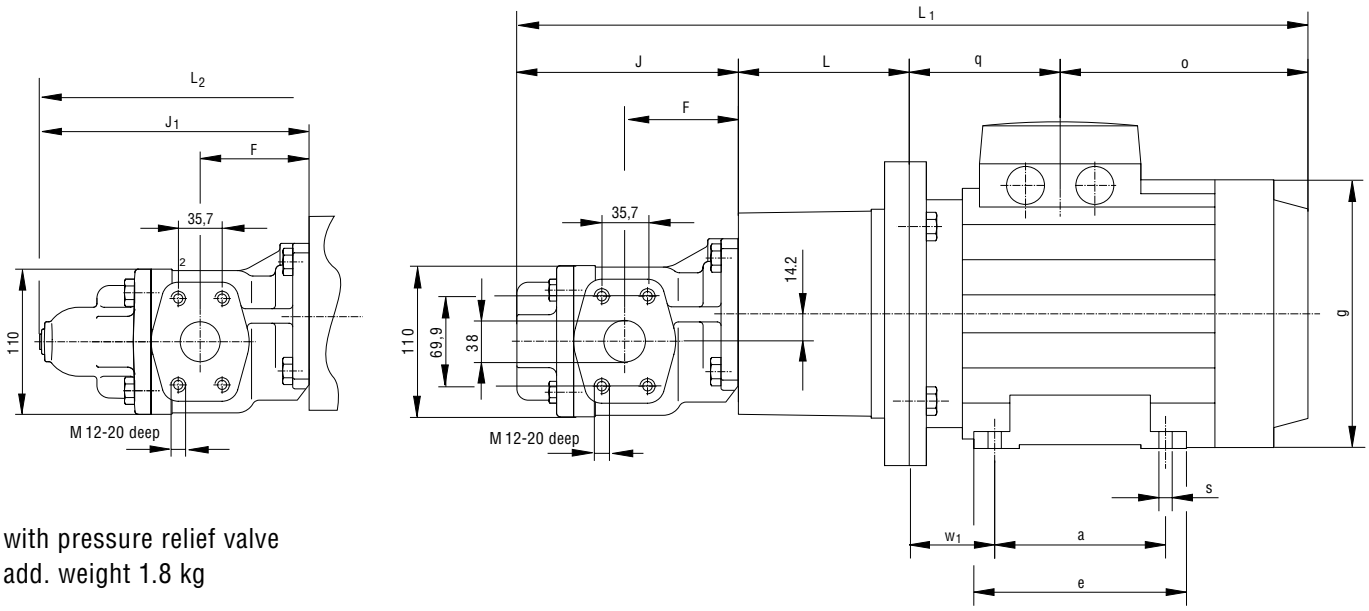
Note:

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.

Motor-pump assemblies

KF 32...80 Motor with pump



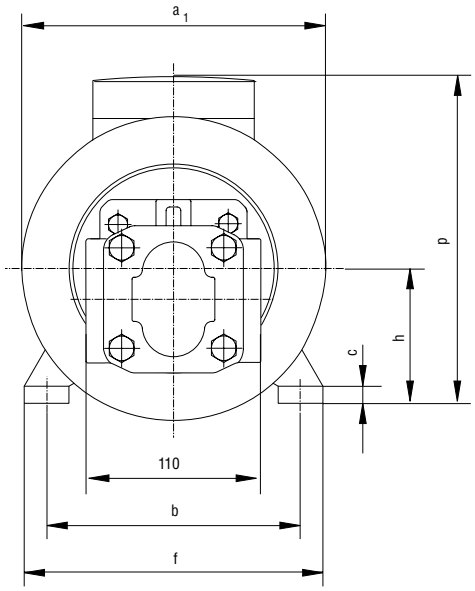
with pressure relief valve
add. weight 1.8 kg

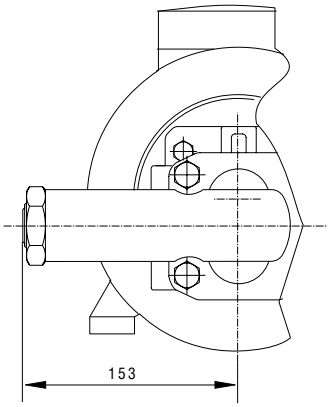
Frame size	Power	Speed	Power	Speed	Bell housing	Coupling	Total weight kg	
	kW	1/min	kW	1/min			Nominal size	
	Motor 6 pole		Motor 4 pole				32...50	63...80
80 s	0.37	920	0.55	1420	PT200-A-080-100	RA19/24-25/24-/Z25/19	18.4	20.1
80	0.55	930	0.75	1420			19.4	21.1
90 S	0.75	930	1.1	1410	PT200-A-080-110	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

Motor-pump assemblies





with pressure relief valve

Frame size					32 - 80													
	32...50	63...80	32...50	63...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:

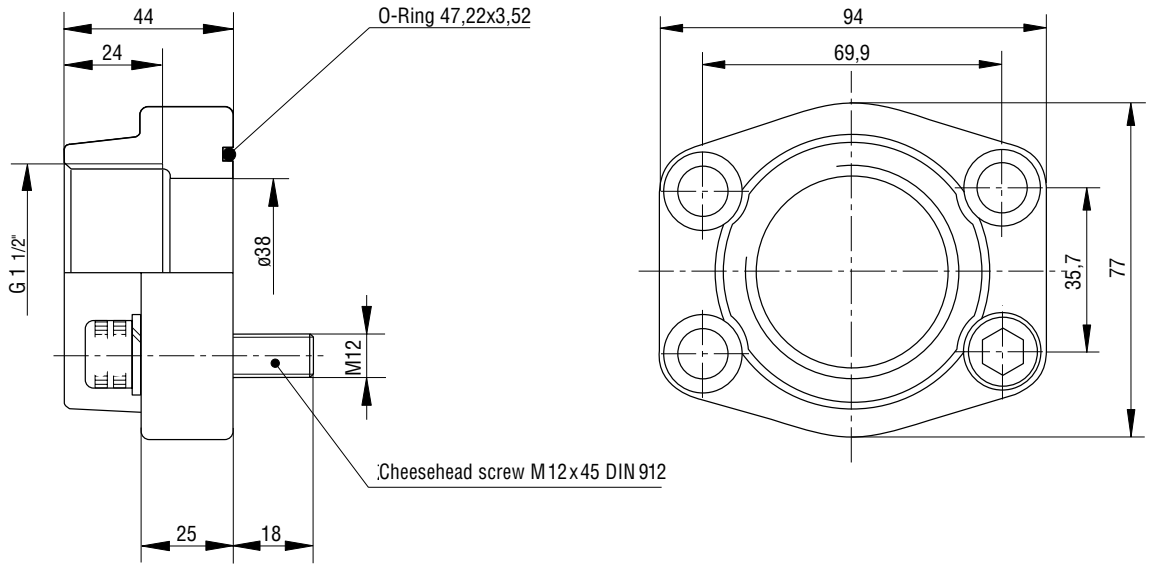
All pump and motor sizes can be combined.

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

Accessory: Connections

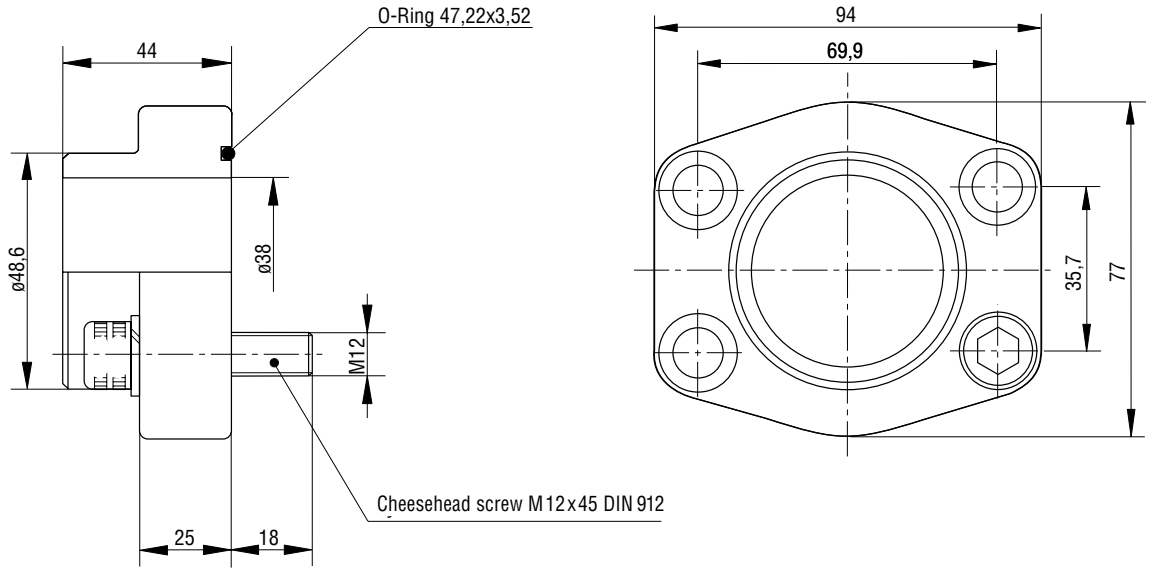
Threaded flange

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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