Ordering code for standard program

	A2F		M		/	6		W	–	V						
01	02	03	04	05		06	07	08		09	10	11	12	13	14	15

Hydraulic fluid

01	Mineral oil and HFD. HFD for sizes 250 to 1000 only in combination with long-life bearings "L" (without code)		
	HFB, HFC hydraulic fluid	Sizes 5 to 200 (without code)	
		Sizes 250 to 1000 (only in combination with long-life bearings "L")	E-

Axial piston unit

02	Bent-axis design, fixed	A2F

Drive shaft bearing

		5 to 200	250 to 500	710 to 1000	
03	Standard bearing (without code)	●	●	–	
	Long-life bearing	–	●	●	L

Operating mode

04	Motor (plug-in motor A2FE, see RE 91008)	M

Size (NG)

05	Geometric displacement, see table of values on page 7																				
	5	10	12	16	23	28	32	45	56	63	80	90	107	125	160	180	200	250	355	500	710	1000

Series

06		6

Index

07		NG10 to 180	1
		NG200	3
		NG5 and 250 to 1000	0

Direction of rotation

08	Viewed on drive shaft, bidirectional	W

Seals

09	FKM (fluor-caoutchouc)	V

	Drive shafts	5	10	12	16	23	28	32	45	56	63	80	90	107	125	160	180	200	250 to 1000	
10	Splined shaft DIN 5480	–	●	●	●	●	●	●	–	●	●	●	●	●	●	●	●	●	–	A
		–	●	●	–	●	●	–	●	●	–	●	–	●	–	●	–	–	●	Z
	Parallel keyed shaft DIN 6885	●	●	●	●	●	●	●	–	●	●	●	●	●	●	●	●	●	–	B
		–	●	●	–	●	●	–	●	●	–	●	–	●	–	●	–	–	●	P
	Conical shaft[1]	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	C

Mounting flanges

			5 to 250	355 to 1000	
11	ISO 3019-2	4-hole	●	–	B
		8-hole	–	●	H

● = Available ○ = On request – = Not available ▭ = Preferred program

1) Conical shaft with threaded pin and woodruff key (DIN 6888). The torque must be transmitted via the tapered press fit.

Ordering code for standard program

	A2F		M		/	6		W	–	V						
01	02	03	04	05		06	07	08		09	10	11	12	13	14	15

	Port plates for service lines[2]			5	10-16	23	28, 32	45	56,63	80,90	107-125	160-180	200	250	355-500	1000	
12	SAE flange ports A and B at rear	01	0	–	–	●	●	●	●	●	●	●	●	●	●	●	010
			7	–	–	–	–	–	–	–	–	–	–	–	●	–	017
	SAE flange ports A and B at side, opposite	02	0	–	–	●	●	●	●	●	●	●	–	●	–	–	020
			7	–	–	–	–	●	▲	▲	●	●	–	●	–	–	027
			9	–	–	–	–	–	●	●	–	–	–	–	–	–	029
	Threaded ports A and B at side, opposite	03	0	●	●	●	●	–	–	–	–	–	–	–	–	–	030
	Threaded ports A and B at side and rear[3]	04	0	–	●	●	●	●	●	–	–	–	–	○	–	–	040
	SAE flange ports A and B at bottom (same side)	10	0	–	–	–	●	●	●	●	●	●	–	–	○	–	100
	Port plate with 1-level pressure-relief valves for mounting a counterbalance valve[5]	BVD 17	1	–	–	–	–	–	–	–	●	–					171 178
		18	8	–	–	–	●	●	●	●	●	●	–	–	–	–	181
		BVE 18		–	–	–	–	–	–	–	●	●	–	–[4]	–	–	188
	Port plate with pressure-relief valves	19	1	–	–	–	●	●	●	●	●	●	–	–	–	–	191
			2	–	–	–	●	●	●	●	●	●	–	–	–	–	192

	Valves (see pages 34 to 41)	
	Without valve	0
	Pressure-relief valve (without pressure boost facility)	1
	Pressure-relief valve (with pressure boost facility)	2
	Flushing and boost pressure valve, mounted	7
	Counterbalance valve BVD/BVE mounted[5][6]	8
	Flushing and boost pressure valve, integrated	9

	Speed sensors (see pages 42 and 43)	5 to 16	23 to 180	200	250 to 500	710 to 1000[4]	
	Without speed sensor (without code)	●	●	●	●	●	
	Prepared for HDD speed sensor	–	▲	▲	●	–	F
13	HDD speed sensor mounted[7]	–	▲	▲	●	–	H
	Prepared for DSA speed sensor	–	○	○	○	–	U
	DSA speed sensor mounted[7]	–	○	○	○	–	V

	Special version	
14	Standard version (without code)	
	Special version for slew drives (standard with port plate 19)	J

	Standard / special version	
	Standard version (without code)	
15	Standard version with installation variants, e. g. T ports against standard open or closed	-Y
	Special version	-S

● = Available ○ = On request – = Not available ▲ = Not for new projects ▭ = Preferred program

2) Fastening thread or threaded ports, metric
3) Threaded ports at the sides (sizes 10 to 63) plugged with threaded plugs
4) Please contact us.
5) Note the restrictions on page 39.
6) Specify ordering code of counterbalance valve according to data sheet (BVD – RE 95522, BVE – RE 95525) separately.
7) Specify ordering code of sensor according to data sheet (DSA – RE 95133, HDD – RE 95135) separately and observe the requirements on the electronics

Technical data

Table of values (theoretical values, without efficiency and tolerances; values rounded)

Size	NG		5	10	12	16	23	28	32	45	56	63	80
Displacement geometric, per revolution	V_g	cm^3	4.93	10.3	12	16	22.9	28.1	32	45.6	56.1	63	80.4
Speed maximum[1]	n_{nom}	rpm	10000	8000	8000	8000	6300	6300	6300	5600	5000	5000	4500
	n_{max}[2]	rpm	11000	8800	8800	8800	6900	6900	6900	6200	5500	5500	5000
Input flow[3]													
at n_{nom} and V_g	q_V	L/min	49	82	96	128	144	177	202	255	281	315	362
Torque[4]													
at V_g and $\Delta p = 350$ bar	T	Nm	24.7[5]	57	67	89	128	157	178	254	313	351	448
$\Delta p = 400$ bar	T	Nm	–	66	76	102	146	179	204	290	357	401	512
Rotary stiffness	c	kNm/rad	0.63	0.92	1.25	1.59	2.56	2.93	3.12	4.18	5.94	6.25	8.73
Moment of inertia for rotary group	J_{GR}	kgm^2	0.00006	0.0004	0.0004	0.0004	0.0012	0.0012	0.0012	0.0024	0.0042	0.0042	0.0072
Maximum angular acceleration	α	rad/s^2	5000	5000	5000	5000	6500	6500	6500	14600	7500	7500	6000
Case volume	V	L		0.17	0.17	0.17	0.20	0.20	0.20	0.33	0.45	0.45	0.55
Mass (approx.)	m	kg	2.5	5.4	5.4	5.4	9.5	9.5	9.5	13.5	18	18	23

Size	NG		90	107	125	160	180	200	250	355	500	710	1000
Displacement geometric, per revolution	V_g	cm^3	90	106.7	125	160.4	180	200	250	355	500	710	1000
Speed maximum[1]	n_{nom}	rpm	4500	4000	4000	3600	3600	2750	2700	2240	2000	1600	1600
	n_{max}[2]	rpm	5000	4400	4400	4000	4000	3000	–	–	–	–	–
Input flow[3]													
at n_{nom} and V_g	q_V	L/min	405	427	500	577	648	550	675	795	1000	1136	1600
Torque[4]													
at V_g and $\Delta p = 350$ bar	T	Nm	501	594	696	893	1003	1114	1393	1978	2785	3955	5570
$\Delta p = 400$ bar	T	Nm	573	679	796	1021	1146	1273	–	–	–	–	–
Rotary stiffness	c	kNm/rad	9.14	11.2	11.9	17.4	18.2	57.3	73.1	96.1	144	270	324
Moment of inertia for rotary group	J_{GR}	kgm^2	0.0072	0.0116	0.0116	0.0220	0.0220	0.0353	0.061	0.102	0.178	0.55	0.55
Maximum angular acceleration	α	rad/s^2	6000	4500	4500	3500	3500	11000	10000	8300	5500	4300	4500
Case volume	V	L	0.55	0.8	0.8	1.1	1.1	2.7	2.5	3.5	4.2	8	8
Mass (approx.)	m	kg	23	32	32	45	45	66	73	110	155	325	336

1) The values are valid:
   - for the optimum viscosity range from $v_{opt} = 36$ to 16 mm^2/s
   - with hydraulic fluid based on mineral oils
2) Intermittent maximum speed: overspeed for unload and overhauling processes, $t < 5$ s and $\Delta p < 150$ bar
3) Restriction of input flow with counterbalance valve, see page 39
4) Torque without radial force, with radial force see page 8
5) Torque at $\Delta p = 315$ bar

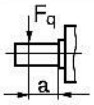
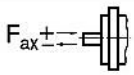
Note

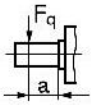
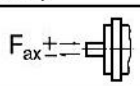
Operation above the maximum values or below the minimum values may result in a loss of function, a reduced service life or in the destruction of the axial piston unit. Other permissible limit values, with respect to speed variation, reduced angular acceleration as a function of the frequency and the permissible start up angular acceleration (lower than the maximum angular acceleration) can be found in data sheet RE 90261.

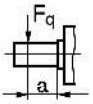
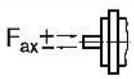
Technical data

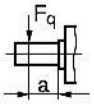
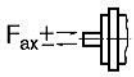
Permissible radial and axial forces of the drive shafts

(splined shaft and parallel keyed shaft)

Size	NG		5	5[3]	10	10	12	12	16	23	23
Drive shaft	ø	mm	12	12	20	25	20	25	25	25	30
Maximum radial force[1] at distance a (from shaft collar) 	$F_{q\,max}$	kN	1.6	1.6	3.0	3.2	3.0	3.2	3.2	5.7	5.4
	a	mm	12	12	16	16	16	16	16	16	16
with permissible torque	T_{max}	Nm	24.7	24.7	66	66	76	76	102	146	146
≙ permissible pressure Δp	Δp_{perm}	bar	315	315	400	400	400	400	400	400	400
Maximum axial force[2] 	$+F_{ax\,max}$	N	180	180	320	320	320	320	320	500	500
	$-F_{ax\,max}$	N	0	0	0	0	0	0	0	0	0
Permissible axial force per bar operating pressure	$\pm F_{ax\,perm/bar}$	N/bar	1.5	1.5	3.0	3.0	3.0	3.0	3.0	5.2	5.2

Size	NG		28	28	32	45	56	56[4]	56	63	80
Drive shaft	ø	mm	25	30	30	30	30	30	35	35	35
Maximum radial force[1] at distance a (from shaft collar) 	$F_{q\,max}$	kN	5.7	5.4	5.4	7.6	9.5	7.8	9.1	9.1	11.6
	a	mm	16	16	16	18	18	18	18	18	20
with permissible torque	T_{max}	Nm	179	179	204	290	357	294	357	401	512
≙ permissible pressure Δp	Δp_{perm}	bar	400	400	400	400	400	330	400	400	400
Maximum axial force[2] 	$+F_{ax\,max}$	N	500	500	500	630	800	800	800	800	1000
	$-F_{ax\,max}$	N	0	0	0	0	0	0	0	0	0
Permissible axial force per bar operating pressure	$\pm F_{ax\,perm/bar}$	N/bar	5.2	5.2	5.2	7.0	8.7	8.7	8.7	8.7	10.6

Size	NG		80[4]	80	90	107	107	125	160	160	180
Drive shaft	ø	mm	35	40	40	40	45	45	45	50	50
Maximum radial force[1] at distance a (from shaft collar) 	$F_{q\,max}$	kN	11.1	11.4	11.4	13.6	14.1	14.1	18.1	18.3	18.3
	a	mm	20	20	20	20	20	20	25	25	25
with permissible torque	T_{max}	Nm	488	512	573	679	679	796	1021	1021	1146
≙ permissible pressure Δp	Δp_{perm}	bar	380	400	400	400	400	400	400	400	400
Maximum axial force[2] 	$+F_{ax\,max}$	N	1000	1000	1000	1250	1250	1250	1600	1600	1600
	$-F_{ax\,max}$	N	0	0	0	0	0	0	0	0	0
Permissible axial force per bar operating pressure	$\pm F_{ax\,perm/bar}$	N/bar	10.6	10.6	10.6	12.9	12.9	12.9	16.7	16.7	16.7

Size	NG		200	250	355	500	710	1000
Drive shaft	ø	mm	50	50	60	70	90	90
Maximum radial force[1] at distance a (from shaft collar) 	$F_{q\,max}$	kN	20.3	1.2[6]	1.5[6]	1.9[6]	3.0[6]	2.6[6]
	a	mm	25	41	52.5	52.5	67.5	67.5
with permissible torque	T_{max}	Nm	1273	[5]	[5]	[5]	[5]	[5]
≙ permissible pressure Δp	Δp_{perm}	bar	400	[5]	[5]	[5]	[5]	[5]
Maximum axial force[2] 	$+F_{ax\,max}$	N	1600	2000	2500	3000	4400	4400
	$-F_{ax\,max}$	N	0	0	0	0	0	0
Permissible axial force per bar operating pressure	$\pm F_{ax\,perm/bar}$	N/bar	16.7	[5]	[5]	[5]	[5]	[5]

1) With intermittent operation
2) Maximum permissible axial force during standstill or when the axial piston unit is operating in non-pressurized condition.
3) Conical shaft with threaded pin and woodruff key (DIN 6888)
4) Restricted technical data only for splined shaft
5) Please contact us.
6) When at a standstill or when axial piston unit operating in non-pressurized conditions. Higher forces are permissible when under pressure, please contact us.

Note

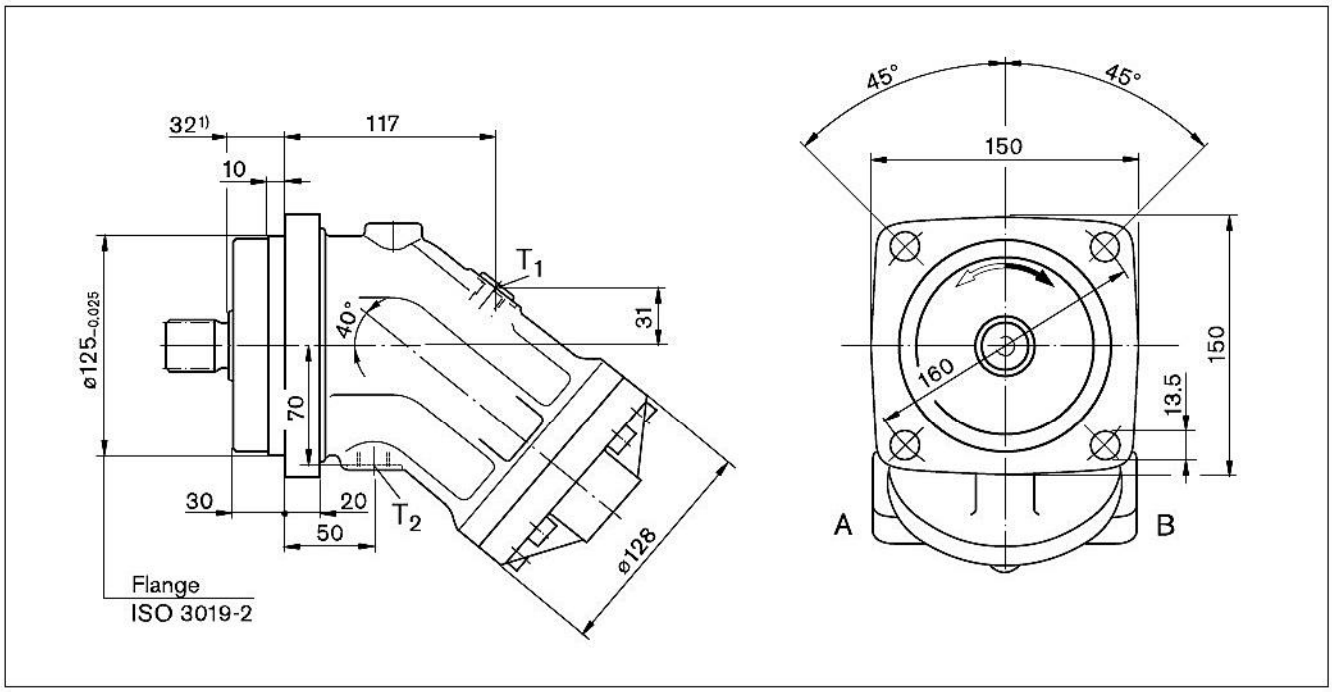
Influence of the direction of the permissible axial force:

$+F_{ax\,max}$ = Increase in service life of bearings

$-F_{ax\,max}$ = Reduction in service life of bearings (avoid)

Dimensions sizes 56, 63

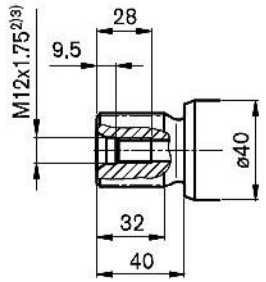
Before finalizing your design, request a binding installation drawing. Dimensions in mm.



Drive shafts

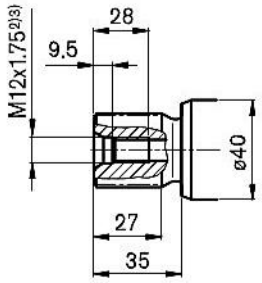
NG56, 63

A Splined shaft DIN 5480
W35x2x16x9g



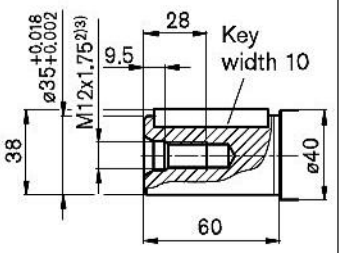
NG56

Z Splined shaft DIN 5480
W30x2x14x9g



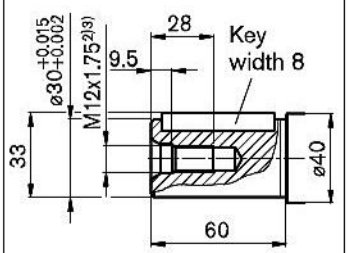
NG56, 63

B Parallel keyed shaft
DIN 6885, AS10x8x50



NG56

P Parallel keyed shaft
DIN 6885, AS8x7x50



Ports

Designation	Port for	Standard	Size[3]	Maximum pressure [bar][4]	State[7]
A, B	Service line (see port plates)			450	
T_1	Drain line	DIN 3852[6]	M18 x 1.5; 12 deep	3	X[5]
T_2	Drain line	DIN 3852[6]	M18 x 1.5; 12 deep	3	O[5]

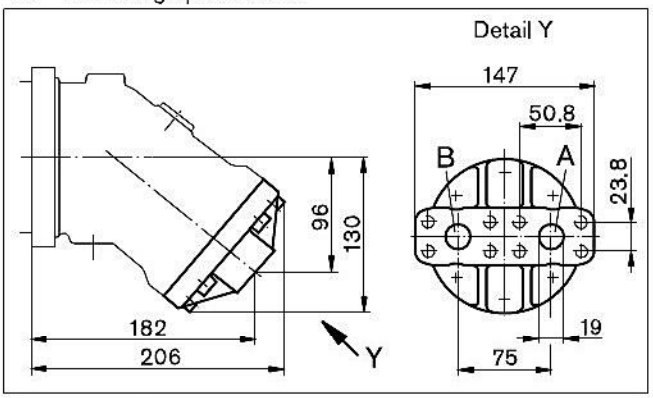
1) To shaft collar
2) Center bore according to DIN 332 (thread according to DIN 13)
3) Observe the general instructions on page 46 for the maximum tightening torques.
4) Momentary pressure spikes may occur depending on the application. Keep this in mind when selecting measuring devices and fittings.
5) Depending on installation position, T_1 or T_2 must be connected (see also installation instructions on page 44).
6) The spot face can be deeper than specified in the appropriate standard.
7) O = Must be connected (plugged on delivery)
X = Plugged (in normal operation)

Dimensions sizes 56, 63

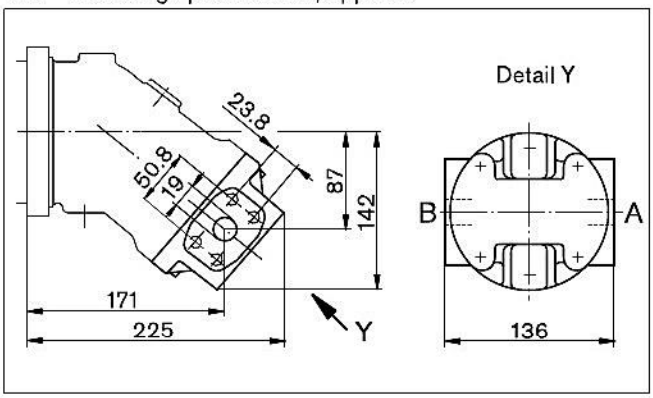
Before finalizing your design, request a binding installation drawing. Dimensions in mm.

Location of the service line ports on the port plates

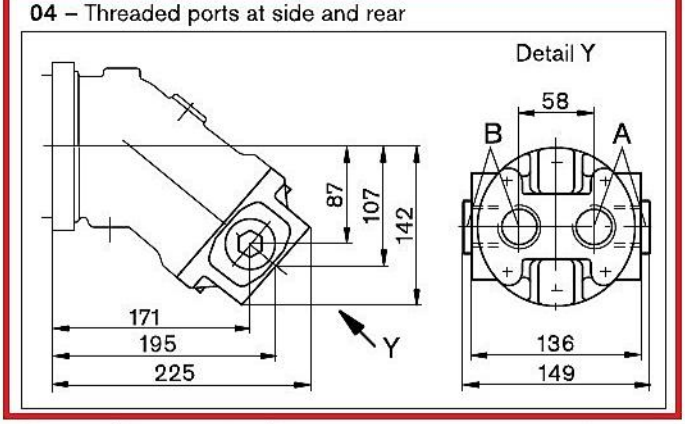
01 – SAE flange ports at rear



02 – SAE flange ports at side, opposite



04 – Threaded ports at side and rear



10 – SAE flange ports at bottom (same side)

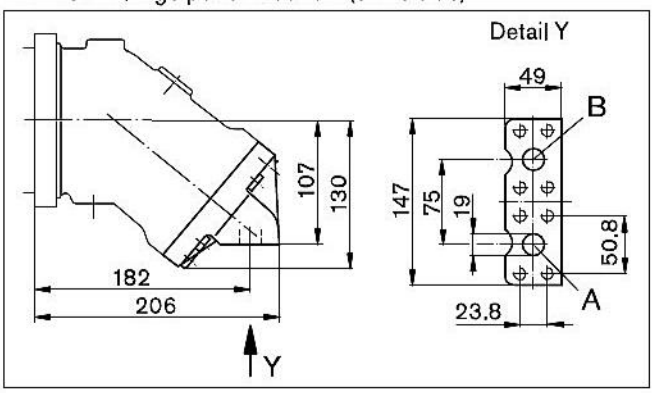


Plate	Designation	Port for	Standard	Size[1]	Maximum pressure [bar][2]	State[5]
01, 02, 10	A, B	Service line Fastening thread A/B	SAE J518[3] DIN 13	3/4 in M10 x 1.5; 17 deep	450	O
04		Service line	DIN 3852[4]	M33 x 2; 18 deep	450	1x O each

1) Observe the general instructions on page 46 for the maximum tightening torques
2) Momentary pressure spikes may occur depending on the application. Keep this in mind when selecting measuring devices and fittings.
3) Only dimensions according to SAE J518, metric fastening thread is a deviation from standard.
4) The spot face can be deeper than specified in the appropriate standard.
5) O = Must be connected (plugged on delivery)