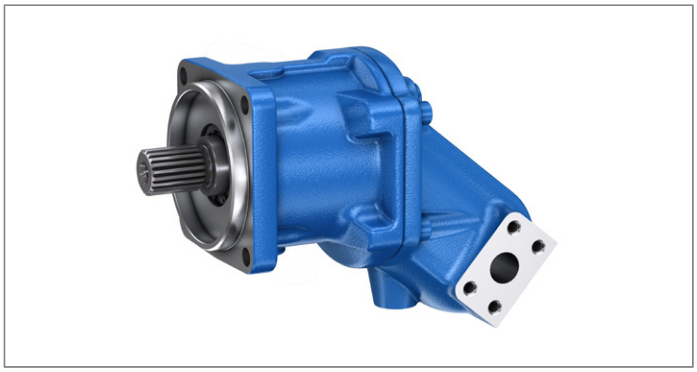
rexroth
A Bosch Company

Axial piston fixed pump A2FO series 70

Americas



- Compact high-pressure pump with short installation length
- Sizes 45 ... 125
- Nominal pressure 5800 psi (400 bar)
- Maximum pressure 6500 psi (450 bar)
- Open circuit
- SAE version (for the US market)

Features

- All-purpose high pressure pump
- Robust pump with long service life
- High power density
- Compact dimensions
- Very high total efficiency
- Robust 40° bent-axis technology

Contents

Type code

01	02	03	04		05	06	07	08	09	10	11	12		13
A2F	**O**	**M**		**/**	**70**	**C**		**V**			**50**	**0**	–	

Axial piston unit

01	Bent-axis design, fixed displacement	**A2F**

Operating mode

02	Pump, open circuit	**O**

Pressure range

03	Nominal pressure: 5800 psi (400 bar), maximum pressure: 6500 psi (450 bar)	**M**

Size (NG)

04	Geometric displacement, see technical data on page 6	**045**	**056**	**063**	**080**	**090**	**107**	**125**	

Series

05	Series 7, Index 0	**70**

Version of port and fastening threads

06	Ports based on ISO 11926 with O-ring seal (ANSI), metric fastening threads according to DIN 13 at working ports	**C**

Direction of rotation

07	Viewed on drive shaft	clockwise	**R**
		counter-clockwise	**L**

Sealing material

08	FKM (fluoroelastomer)	**V**

Mounting flange			**045**	**056**	**063**	**080**	**090**	**107**	**125**	
09	SAE J744	127-4	●	●	●	●	●	–	–	**C4**
		152-4	–	–	–	–	–	●	●	**D4**

Drive shaft			**045**	**056**	**063**	**080**	**090**	**107**	**125**	
10	Splined shaft SAE J744 (ANSI B92.1a)	1 1/4in 14T 12/24DP	●	●	●	●	●	–	–	**S7**
		1 3/8in 21T 16/32DP	–	●	●	●	●	–	–	**V8**
		1 1/2in 23T 16/32DP	–	–	–	–	–	●	●	**V9**
		1 3/4in 13T 8/16DP	–	–	–	–	–	●	●	**T1**
	Parallel keyed shaft DIN 6885	ø30	●	●	–	–	–	–	–	**P6**
		ø35	–	●	●	●	–	–	–	**P8**
		ø40	–	–	–	●	●	●	–	**P9**
		ø45	–	–	–	–	–	●	●	**B1**

Working port		**045**	**056**	**063**	**080**	**090**	**107**	**125**	
11	SAE working port **A**/**B** at side and SAE working port **S** at rear	●	●	●	●	●	●	●	**50**

Special version

12	Standard version	**0**

Standard/special version

13	Standard version	**0**
	Standard version with installation variants, e.g. **T** ports against standard open or closed	**Y**
	Special version	**S**

● = Available – = Not available

Notice

- ▶ Note the project planning notes on page 17.
- ▶ Please note that not all type code combinations are available although the individual functions are marked as being available.

Hydraulic fluids

The axial piston unit is designed for operation with HLP mineral oil according to DIN 51524.
Application instructions and requirements for hydraulic fluids should be taken from the following data sheets before the start of project planning:

- 90220: Hydraulic fluids based on mineral oils and related hydrocarbons
- 90221: Environmentally acceptable hydraulic fluids

Selection of hydraulic fluid

Bosch Rexroth evaluates hydraulic fluids on the basis of the Fluid Rating according to the technical data sheet 90235.

Hydraulic fluids with positive evaluation in the Fluid Rating are provided in the following technical data sheet:

- 90245: Bosch Rexroth Fluid Rating List for Rexroth hydraulic components (pumps and motors)

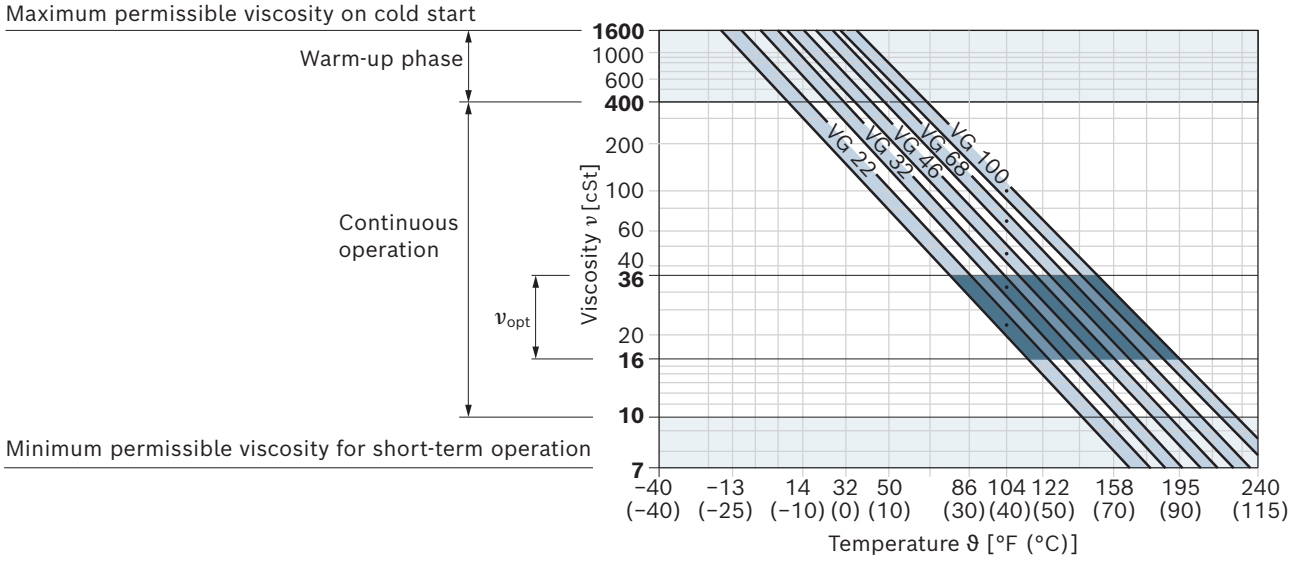
Selection of hydraulic fluid shall make sure that the operating viscosity in the operating temperature range is within the optimum range (v_{opt}; see selection diagram).

Notice
For operation with HF hydraulic fluids, please contact us.

Viscosity and temperature of hydraulic fluids

	Viscosity	Shaft seal	Temperature[3]	Comment
Cold start	v_{max} ≤ 1600 cSt	NBR[2]	ϑ_{St} ≥ −40 °F (−40 °C)	t ≤ 3 min, without load (p ≤ 725 psi (50 bar)), n ≤ 1000 rpm Permissible temperature difference between axial piston unit and hydraulic fluid in the system maximum 25 K
		FKM	ϑ_{St} ≥ −13 °F (−25 °C)	
Warm-up phase	v = 1600 ... 400 cSt			t ≤ 15 min, p ≤ 0.7 × p_{nom} and n ≤ 0.5 × n_{nom}
Continuous operation	v = 400 ... 10 cSt[1]	NBR[2]	ϑ ≤ +172 °F (+78 °C)	measured at port **T**
		FKM	ϑ ≤ +217 °F (103 °C)	
	v_{opt} = 36 ... 16 cSt			Range of optimum operating viscosity and efficiency
Short-term operation	v_{min} = 10 ... 7 cSt	NBR[2]	ϑ ≤ +172 °F (+78 °C)	t ≤ 3 min, p ≤ 0.3 × p_{nom} , measured at port **T**
		FKM	ϑ ≤ +217 °F (103 °C)	

▼ **Selection diagram**



1) This corresponds, for example on the VG 46, to a temperature range of 39.2 °F to +185 °F (+4 °C to +85 °C) (see selection diagram)

2) Special version, please contact us

3) If the temperature at extreme operating parameters cannot be adhered to, please contact us.

Filtration of the hydraulic fluid

Finer filtration improves the cleanliness level of the hydraulic fluid, which increases the service life of the axial piston unit.

A cleanliness level of at least 20/18/15 is to be maintained according to ISO 4406.

At a hydraulic fluid viscosity of less than 10 cSt (e.g. due to high temperatures during short-term operation) at the drain port, a cleanliness level of at least 19/17/14 under ISO 4406 is required.

For example, the viscosity is 10 cSt at:

- HLP 32 a temperature of 163.4 °F (73 °C)
- HLP 46 a temperature of 185 °F (85 °C)

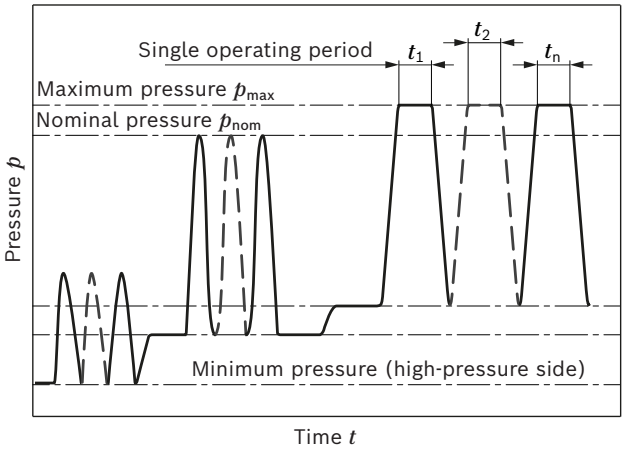
Working pressure range

Pressure at working port A or B		**Definition**
Nominal pressure p_{nom}	5800 psi (400 bar)	The nominal pressure corresponds to the maximum design pressure.
Maximum pressure p_{max}	6500 psi (450 bar)	The maximum pressure corresponds to the maximum working pressure within the single operating period. The sum of the single operating periods must not exceed the total operating period.
Single operating period	10 s	
Total operating period	300 h	
Minimum pressure (high-pressure side)	365 psi (25 bar)	Minimum pressure at the high-pressure side (**A** or **B**) which is required to prevent damage to the axial piston unit.
Rate of pressure change $R_{A\ max}$	232000 psi/s (16000 bar/s)	Maximum permissible speed of pressure build-up and reduction during a pressure change across the entire pressure range.
Pressure at suction port S (inlet)		
Minimum pressure $p_{S\ min}$	≥ 12 psi (0.8 bar) absolute	Minimum pressure at suction port **S** (inlet) which is required to prevent damage to the axial piston unit. The minimum pressure depends on the rotational speed and displacement of the axial piston unit (see diagram).
Maximum pressure $p_{S\ max}$	435 psi (30 bar) absolute	
Case pressure at port T		
Continuous differential pressure $\Delta p_{T\ cont}$	30 psi (2 bar)	Maximum averaged differential pressure at the shaft seal (case to ambient pressure)
Pressure peak $p_{T\ peak}$	145 psi (10 bar)	t < 0.1 s

Notice

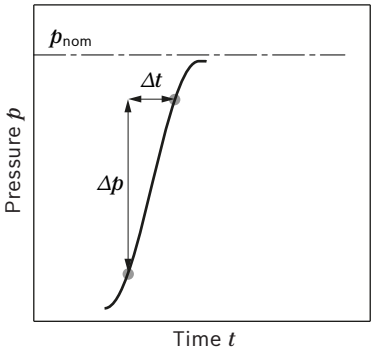
- Working pressure range valid when using hydraulic fluids based on mineral oils. Please contact us for values for other hydraulic fluids.
- In addition to the hydraulic fluid and the temperature, the service life of the shaft seal is influenced by the rotational speed of the axial piston unit and the case pressure.
- The service life of the shaft seal decreases with ncreasing frequency of pressure peaks and increasing mean differential pressure.
- The case pressure must be higher than the external pressure (ambient pressure) at the shaft seal.

▼ **Pressure definition**



Total operating period = $t_1 + t_2 + ... + t_n$

▼ **Rate of pressure change $R_{A\,max}$**



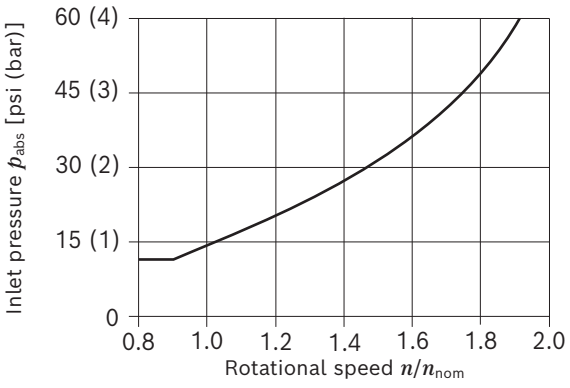
Flow direction

Direction of rotation, viewed on drive shaft	
clockwise	counter-clockwise
S to **B**	**S** to **A**

Technical data

Size		NG		45	56	63	80	90	107	125
Displacement, geometric, per revolution		V_g	in³	2.74	3.45	3.84	4.87	5.52	6.51	7.63
			cm³	44.9	56.6	63.0	79.8	90.5	106.7	125.0
Rotational speed maximum[1]		n_{nom}[2]	rpm	2240	2000	2000	1800	1800	1600	1600
		n_{max}[3]	rpm	4250	3750	3750	3350	3350	3000	3000
Flow	at n_{nom}	q_v	gpm	26.7	29.9	33.3	38	43.1	45.1	52.8
			l/min	101	113	126	144	163	171	200
Torque	at Δp = 5800 psi (400 bar)	M	lb-ft	211	266	296	375	425	501	587
			Nm	286	360	401	508	576	679	796
Rotary stiffness		c_{min}	lb-ft/rad	3429	5140	5981	6711	7264	9212	10068
			kNm/rad	4.65	6.97	8.11	9.10	9.85	12.49	13.65
Moment of inertia for rotary group		J_{TW}	lb-ft²	0.078	0.081	0.083	0.133	0.138	0.209	0.216
			kgm²	0.0033	0.0034	0.0035	0.0056	0.0058	0.0088	0.0091
Case volume		V	gal	0.159	0.159	0.159	0.172	0.172	0.291	0.291
			l	0.6	0.6	0.6	0.65	0.65	1.1	1.1
Weight approx.		m	lbs	37	37	37	51	51	72	72
			kg	17	17	17	23	23	32.8	32.8

▼ **Maximum speed**



Notice

- Theoretical values, without efficiency and tolerances; values rounded
- 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, such as speed variation, reduced angular acceleration as a function of the frequency and the permissible angular acceleration at start (lower than the maximum angular acceleration) can be found in data sheet 90261.

Determining the characteristics		
Flow	$q_v = \frac{V_g \times n \times \eta_v}{1000}$	[l/min]
	$q_v = \frac{V_g \times n \times \eta_v}{231}$	[gpm]
Torque	$M = \frac{V_g \times \Delta p}{20 \times \pi \times \eta_{hm}}$	[Nm]
	$M = \frac{V_g \times \Delta p}{24 \times \pi \times \eta_{hm}}$	[lb-ft]
Power	$P = \frac{2 \pi \times M \times n}{60000} = \frac{q_v \times \Delta p}{600 \times \eta_t}$	[kW]
	$P = \frac{2 \pi \times M \times n}{33000} = \frac{q_v \times \Delta p}{1714 \times \eta_t}$	[hp]

Key

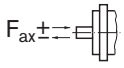
V_g	=	Displacement per revolution [in³ (cm³)]
Δp	=	Differential pressure [psi (bar)]
n	=	Rotational speed [rpm]
η_v	=	Volumetric efficiency
η_{hm}	=	Hydraulic-mechanical efficiency
η_t	=	Total efficiency ($\eta_t = \eta_v \times \eta_{hm}$)

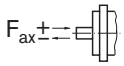
1) The values are applicable:
   - for the optimum viscosity range v_{opt} = 36 ... 16 cSt
   - with hydraulic fluid based on mineral oils

2) The values apply at absolute pressure p_{abs} = 15 psi (1 bar) at suction port **S**

3) Maximum speed (speed limit) with increased inlet pressure p_{abs} at suction port **S** (see diagram).

Permissible radial and axial forces of the drive shafts

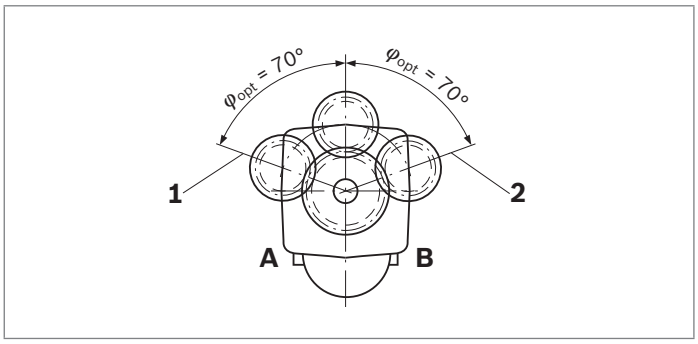
Size		**NG**		**45**		**56**				**63**			**80**		
Drive shaft	type code			S7	P6	S7	V8	P6	P8	S7	V8	P8	S7	V8	P8
	with splined shaft	ø	in	1 1/4	–	1 1/4	1 3/8	–	–	1 1/4	1 3/8	–	1 1/4	1 3/8	–
	with parallel keyed shaft	ø	in	–	1.18	–	–	1.18	1.38	–	–	1.38	–	–	1.38
			mm	–	30	–	–	30	35	–	–	35	–	–	35
Maximum radial force[1] at distance a (from shaft collar) 		$F_{q\ max}$	lbf	1619	1709	2046	1866	2158	1844	2136	2068	2068	2091	2608	2608
			kN	7.2	7.6	9.1	8.3	9.6	8.2	9.5	9.2	9.2	9.3	11.6	11.6
		a	in	0.94	0.71	0.94	0.94	0.71	0.71	0.94	0.94	0.71	0.94	0.94	0.79
			mm	24	18	24	24	18	18	24	24	18	24	24	20
Maximum torque at $F_{q\ max}$		$M_{q\ max}$	lb-ft	211	211	266	266	266	266	277	296	296	198	375	375
			Nm	286	286	360	360	360	360	376	401	401	268	508	508
Maximum differential pressure at $F_{q\ max}$		$\Delta p_{\ q\ max}$	psi	5800	5800	5800	5800	5800	5800	5440	5800	5800	4210	5800	5800
			bar	400	400	400	400	400	400	375	400	400	290	400	400
Maximum axial force at standstill or pressure-free operation 		+ $F_{ax\ max}$	lbf/N	0	0	0	0	0	0	0	0	0	0	0	0
		− $F_{ax\ max}$	lbf	180	180	180	180	180	180	180	180	180	225	225	225
			N	800	800	800	800	800	800	800	800	800	1000	1000	1000
Permissible axial force per psi (bar) working pressure		+ $F_{ax\ perm}$/ psi (bar)	lbf/psi	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.16	0.16	0.16
			N/bar	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	10.6	10.6	10.6

Size		**NG**		**80**	**90**			**107**				**125**		
Drive shaft	type code			P9	S7	V8	P9	V9	T1	P9	B1	V9	T1	B1
	with splined shaft	ø	in	–	1 1/4	1 3/8	–	1 1/2	1 3/4	–	–	1 1/2	1 3/4	–
	with parallel keyed shaft	ø	in	1.57	–	–	1.57	–	–	1.57	1.77	–	–	1.77
			mm	40	–	–	40	–	–	40	45	–	–	45
Maximum radial force[1] at distance a (from shaft collar) 		$F_{q\ max}$	lbf	2293	2113	2968	2585	3215	2743	3058	2720	3754	3215	3170
			kN	10.2	9.4	13.2	11.5	14.3	12.2	13.6	12.1	16.7	14.3	14.1
		a	in	0.79	0.94	0.94	0.79	1.06	1.32	0.79	0.79	1.06	1.32	0.79
			mm	20	24	24	20	27	33.5	20	20	27	33.5	20
Maximum torque at $F_{q\ max}$		$M_{q\ max}$	lb-ft	375	276	425	425	501	501	501	501	587	587	587
			Nm	508	374	576	576	679	679	679	679	796	796	796
Maximum differential pressure at $F_{q\ max}$		$\Delta p_{\ q\ max}$	psi	5800	3770	5800	5800	5800	5800	5800	5800	5800	5800	5800
			bar	400	260	400	400	400	400	400	400	400	400	400
Maximum axial force at standstill or pressure-free operation 		+ $F_{ax\ max}$	lbf/N	0	0	0	0	0	0	0	0	0	0	0
		− $F_{ax\ max}$	lbf	225	225	225	225	281	281	281	281	281	281	281
			N	1000	1000	1000	1000	1250	1250	1250	1250	1250	1250	1250
Permissible axial force per psi (bar) working pressure		+ $F_{ax\ perm}$/ psi (bar)	lbf/psi	0.16	0.16	0.16	0.16	0.20	0.20	0.20	0.20	0.20	0.20	0.20
			N/bar	10.6	10.6	10.6	10.6	12.9	12.9	12.9	12.9	12.9	12.9	12.9

Effect of radial force F_q on bearing service life

By selecting a suitable direction of radial force F_q, the load on the bearings, caused by the internal rotary group forces can be reduced, thus optimizing the service life of the bearings. Recommended position of mating gear is dependent on direction of rotation. Examples:

▼ **Gear drive**

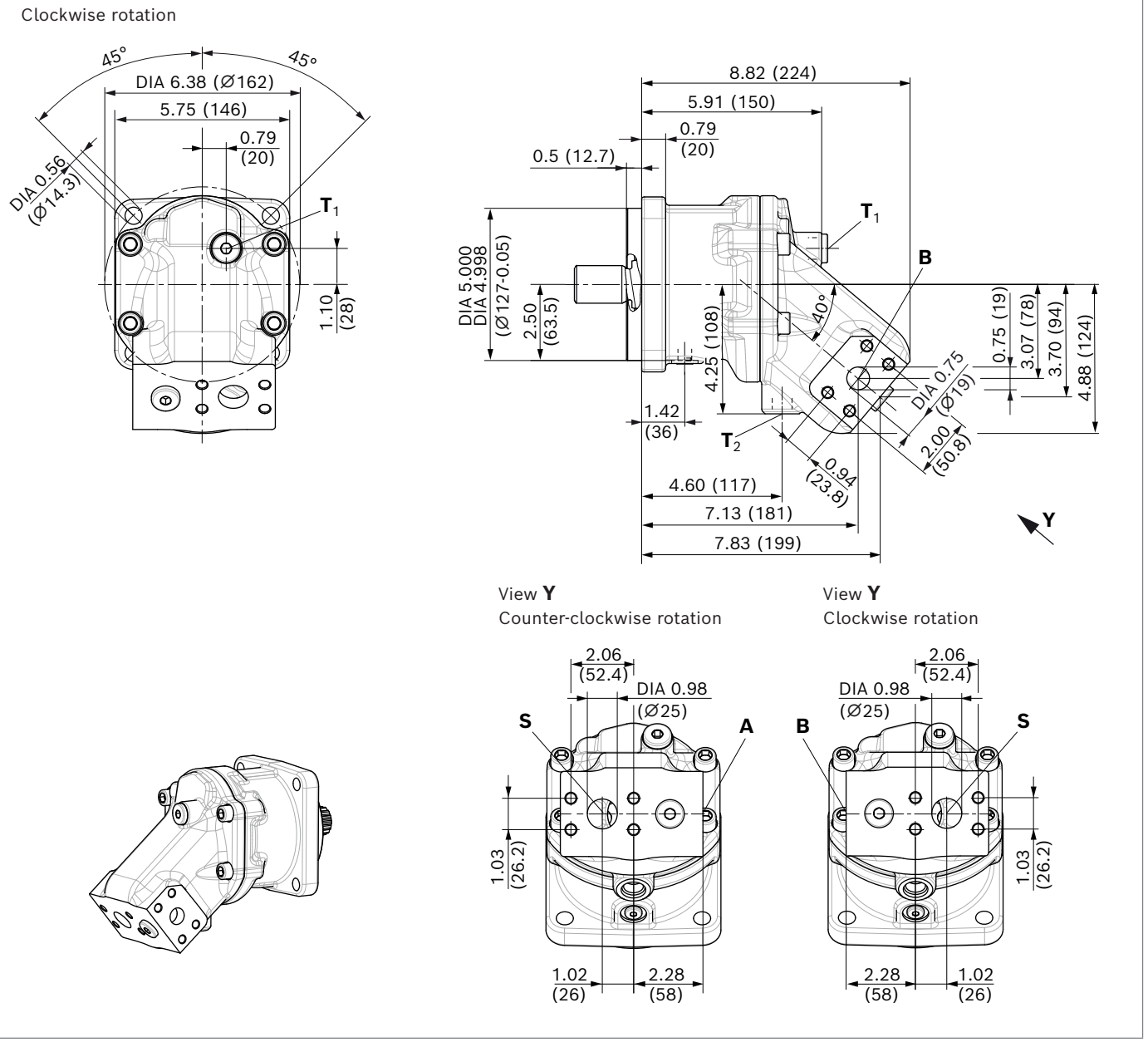


1 “Clockwise” rotation, pressure at port **B**
2 “Counter-clockwise” rotation, pressure at port **A**

Notice

- The values given are maximum values and do not apply to continuous operation.
- The permissible axial force in direction $-F_{ax}$ is to be avoided as the service life of the bearing is reduced.
- Special requirements apply in the case of belt drives. Please contact us.

Dimensions for sizes 45, 56 and 63

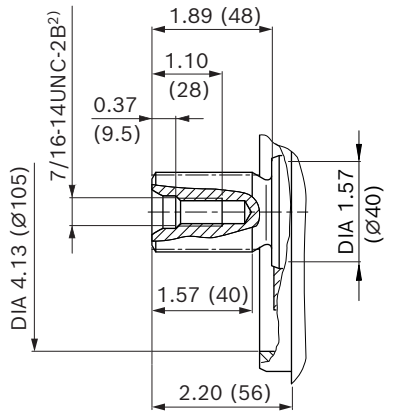


Ports		Standard	Size	p_{max} [psi (bar)][2]	State[5]
A, B	Working port Fastening thread	SAE J518[1] DIN 13	3/4 in M10 × 1.5; (17) deep	6500 (450)	O
S	Suction port Fastening thread	SAE J518[1] DIN 13	1 in M10 × 1.5; (17) deep	435 (30)	O
T_1	Drain port	ISO 11926[4]	3/4-16UNF-2B; 0.59 (15) deep	45 (3)	X[3]
T_2	Drain port	ISO 11926[4]	3/4-16UNF-2B; 0.59 (15) deep	45 (3)	O[3]
R	Air bleed port	ISO 11926[4]	7/16-24UNF-2B; 0.47 (12) deep	45 (3)	X

1) Only dimensions according to SAE J518, metric fastening thread is a deviation from the standard.
2) Depending on the application, momentary pressure peaks may occur. Keep this in mind when selecting measuring devices and fittings.
3) Depending on installation position, T_1 or T_2 must be connected (see also installation instructions on page 15).
4) The countersink can be deeper than as specified in the standard.
5) O = Must be connected (plugged on delivery)
X = Plugged (in normal operation)

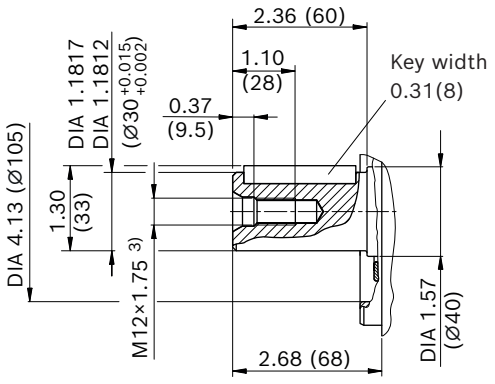
▼ **Splined shaft SAE J744, Size 45, 56 and 63**

S7 – 1 1/4 in 14T 12/24 DP[1)]



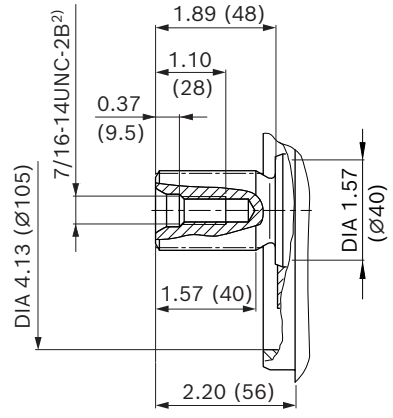
▼ **Parallel keyed shaft, DIN 6885, Size 45 and 56**

P6 – AS8×7×50



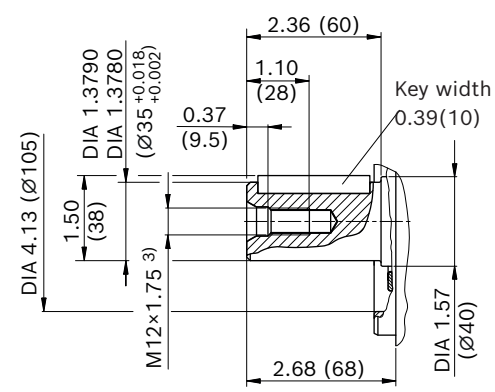
▼ **Splined shaft SAE J744, Size 56 and 63**

V8 – 1 3/8 in 21T 16/32 DP[1)]



▼ **Parallel keyed shaft, DIN 6885, Size 56 and 63**

P8 – AS10×8×50

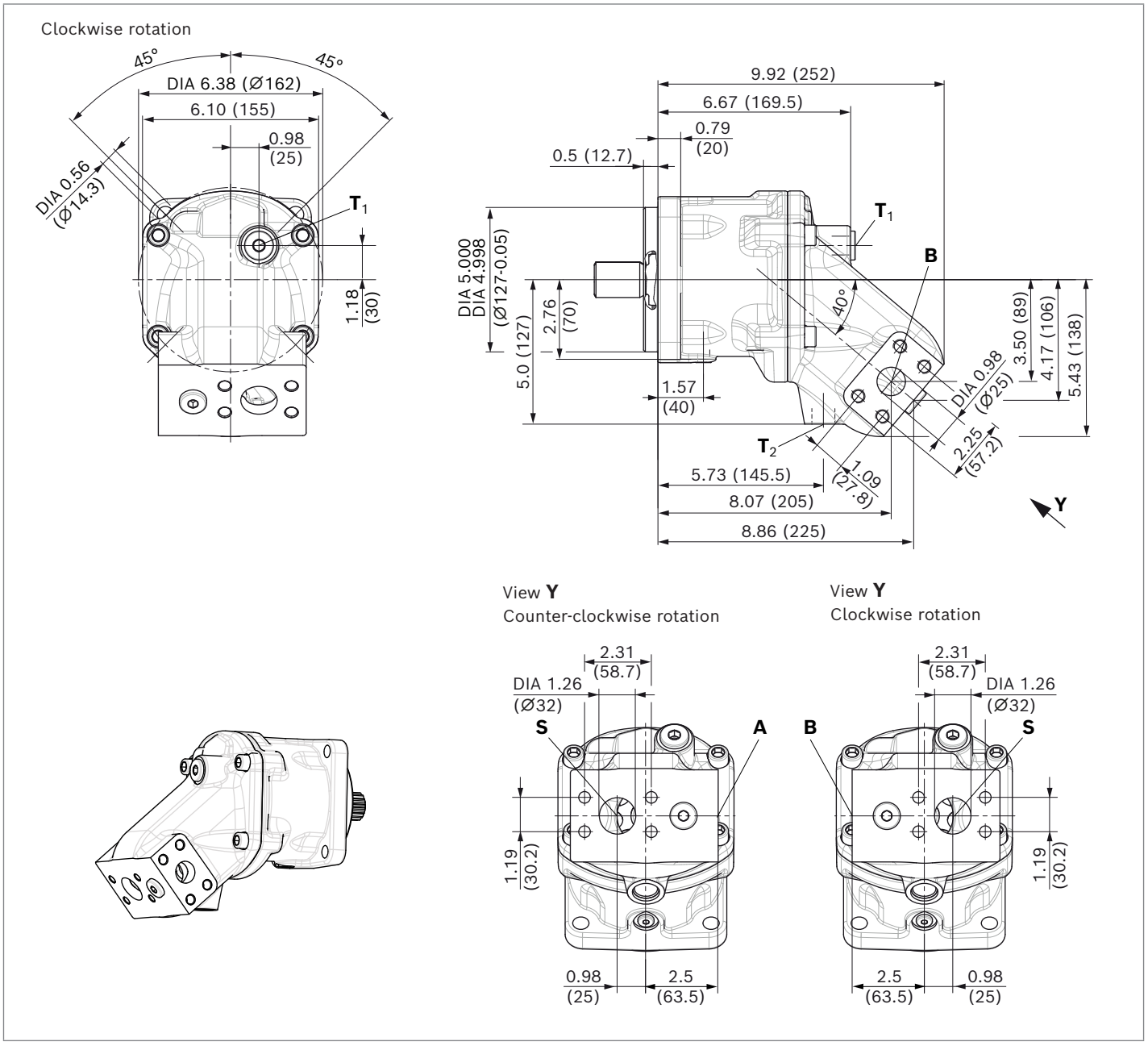


1) ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5

2) Thread according to ASME B1.1

3) Center bore according to DIN 332 (thread according to DIN 13)

Dimensions for sizes 80 and 90

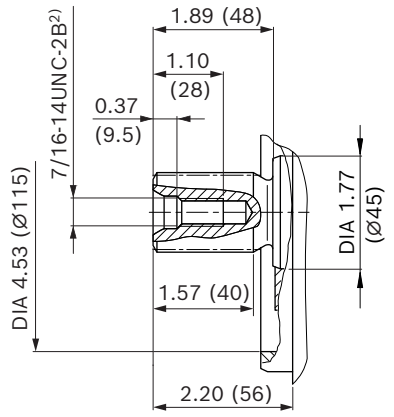


Ports		Standard	Size	p_{max} [psi (bar)][2]	State[5]
A, B	Working port Fastening thread	SAE J518[1] DIN 13	1 in M12 × 1.75; 0.67 (17) deep	6500 (450)	O
S	Suction port Fastening thread	SAE J518[1] DIN 13	1 1/4 in M10 × 1.5; 0.67 (17) deep	435 (30)	O
T_1	Drain port	ISO 11926[4]	7/8-14UNF-2B; 0.67 (17) deep	45 (3)	X[3]
T_2	Drain port	ISO 11926[4]	7/8-14UNF-2B; 0.67 (17) deep	45 (3)	O[3]
R	Air bleed port	ISO 11926[4]	7/16-20UNF-2B; 0.47 (12) deep	45 (3)	X

1) Only dimensions according to SAE J518, metric fastening thread is a deviation from the standard.
2) Depending on the application, momentary pressure peaks can occur. Keep this in mind when selecting measuring devices and fittings.
3) Depending on installation position, T_1 or T_2 must be connected (see also installation instructions on page 15).
4) The countersink can be deeper than as specified in the standard.
5) O = Must be connected (plugged on delivery)
X = Plugged (in normal operation)

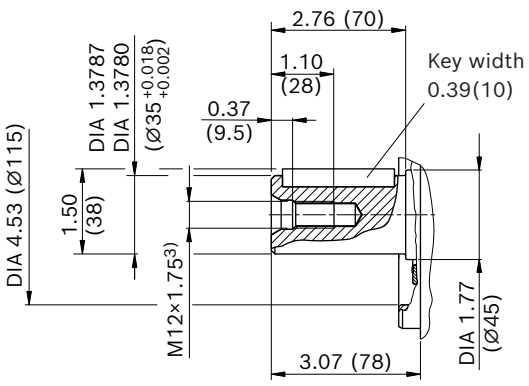
▼ **Splined shaft SAE J744, Size 80 and 90**

S7 – 1 1/4 in 14T 12/24 DP[1)]



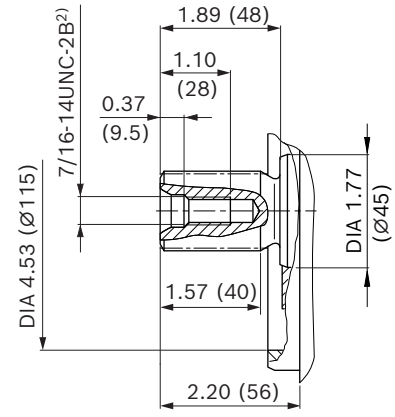
▼ **Parallel keyed shaft, DIN 6885, Size 80**

P8 – AS10×8×56



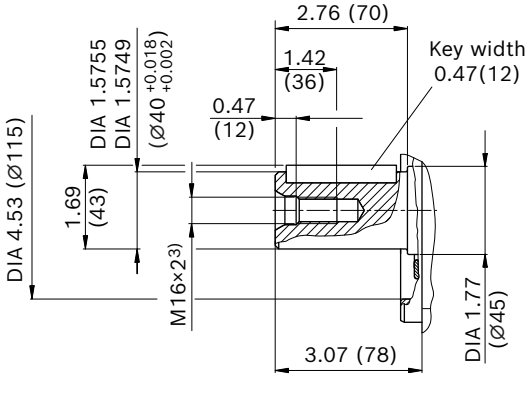
▼ **Splined shaft SAE J744, Size 80 and 90**

V8 – 1 3/8 in 21T 16/32 DP[1)]



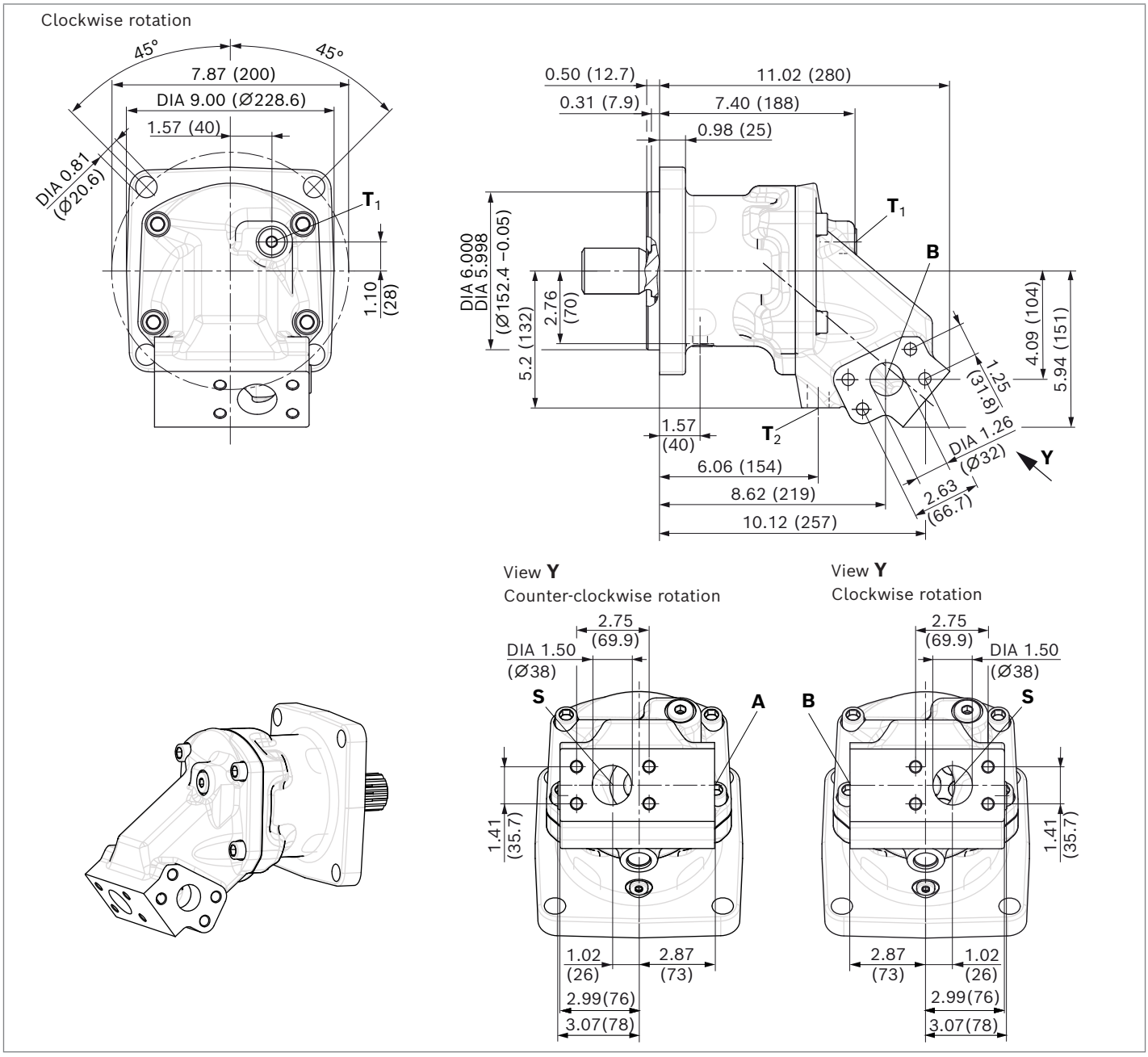
▼ **Parallel keyed shaft, DIN 6885, Size 80 and 90**

P9 – AS12×8×56



1) ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
2) Thread according to ASME B1.1
3) Center bore according to DIN 332 (thread according to DIN 13)

Dimensions for sizes 107 and 125

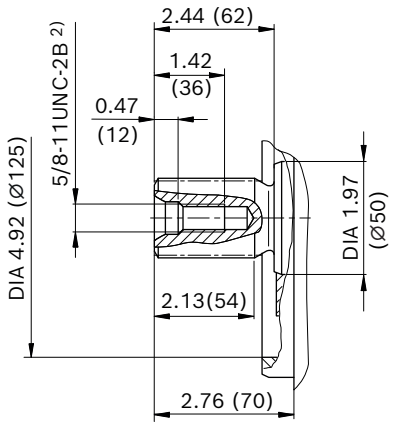


Ports		Standard	Size	p_{max} [psi (bar)][2]	State[5]
A, B	Working port Fastening thread	SAE J518[1] DIN 13	1 1/4 in M14 × 12; 0.91 (23) deep	6500 (450)	O
S	Suction port Fastening thread	SAE J518[1] DIN 13	1 1/2 in M12x1.75; 0.91 (23) deep	435 (30)	O
T_1	Drain port	ISO 11926[4]	7/8-14UNF-2B; 0.67 (17) deep	45 (3)	X[3]
T_2	Drain port	ISO 11926[4]	7/8-14UNF-2B; 0.67 (17) deep	45 (3)	O[3]
R	Air bleed port	ISO 11926[4]	9/16-20UNF-2B; 0.55 (14) deep	45 (3)	X

1) Only dimensions according to SAE J518, metric fastening thread is a deviation from the standard.
2) Depending on the application, momentary pressure peaks can occur. Keep this in mind when selecting measuring devices and fittings.
3) Depending on installation position, **T_1** or **T_2** must be connected (see also installation instructions on page 15).
4) The countersink can be deeper than as specified in the standard.
5) O = Must be connected (plugged on delivery)
X = Plugged (in normal operation)

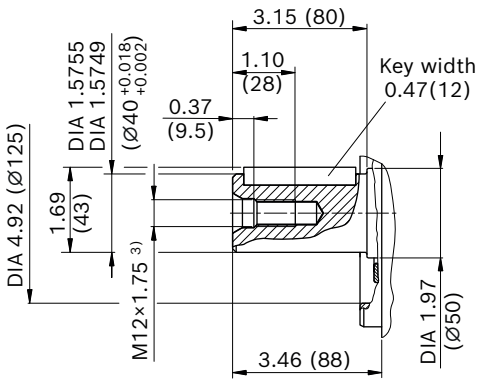
▼ **Splined shaft SAE J744, Size 107 and 125**

V9 – 1 1/2in 23T 16/32DP[1)]



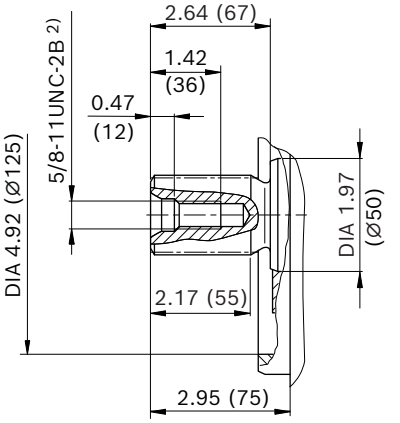
▼ **Parallel keyed shaft, DIN 6885, Size 107**

P9 – AS12×8×63



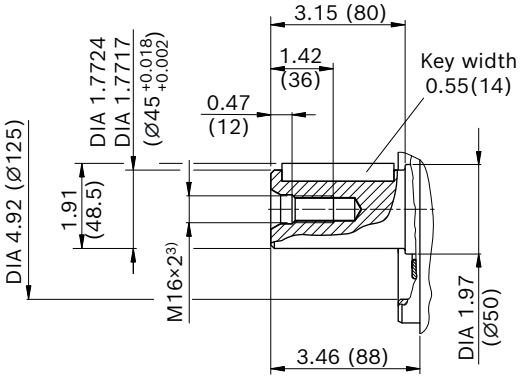
▼ **Splined shaft SAE J744, Size 107 and 125**

T1 – 1 3/4in 13T 8/16DP[1)]



▼ **Parallel keyed shaft, DIN 6885, Size 107 and 125**

B1 – AS14x9x63



1) ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
2) Thread according to ASME B1.1
3) Center bore according to DIN 332 (thread according to DIN 13)

Installation instructions

General

The axial piston unit must be filled with hydraulic fluid and air bled during commissioning and operation. This must also be observed following a longer standstill as the axial piston unit may empty via the hydraulic lines.
Particularly in the installation position “drive shaft upwards”, filling and air bleeding must be carried out completely as there is, for example, a danger of dry running.
The leakage in the housing area must be directed to the reservoir via the highest drain port (**T_1**, **T_2**).
If a shared drain line is used for several units, make sure that the respective case pressure is not exceeded. The shared drain line must be dimensioned to ensure that the maximum permissible case pressure of all connected units is not exceeded in any operational circumstances, particularly at cold start. If this is not possible, separate drain line must be laid, if necessary.
To achieve favorable noise values, decouple all connecting lines using elastic elements and avoid above-reservoir installation.
In all operating conditions, the suction line and drain line must flow into the reservoir below the minimum fluid level.
The permissible suction height h_S results from the total pressure loss. However, it must not be higher than $h_{S\ max}$ = 31.5 in (800 mm). The minimum suction pressure at port S must also not fall below 12 psi (0.8 bar) absolute during operation or upon a cold start.
When designing the reservoir, ensure that there is adequate distance between the suction line and the drain line. This minimizes oil turbulence and carries out degassing, which prevents the heated hydraulic fluid from being sucked directly back in again.

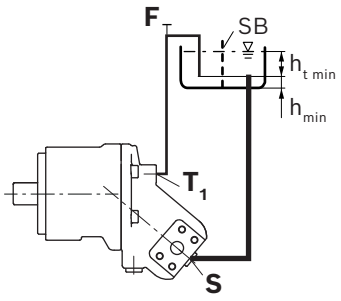
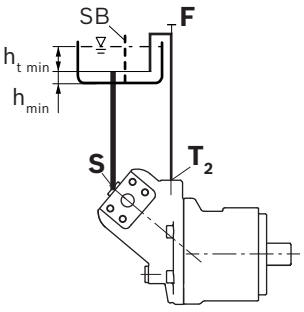
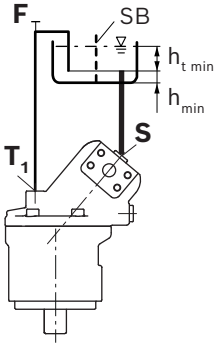
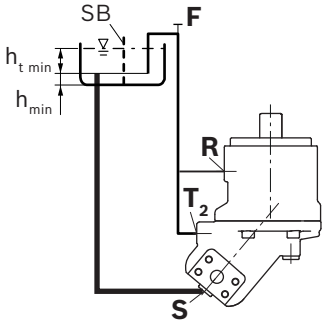
Key	
F	Filling/air bleeding
R	Air bleed port
S	Suction port
T_1, T_2	Drain port
SB	Baffle (baffle plate)
$h_{t\ min}$	Minimum required immersion depth (8 in / 200 mm)
h_{min}	Minimum required distance to reservoir bottom (4 in / 100 mm)
$h_{S\ max}$	Maximum permissible suction height (31.5 in / 800 mm)

Installation position

See the following examples **1** ... **8**.
Further installation positions are available upon request.
Recommended installation position: **1** and **2**

Below-reservoir installation (standard)

Below-reservoir installation means that the axial piston unit is installed outside of the reservoir and below the minimum fluid level of the reservoir.

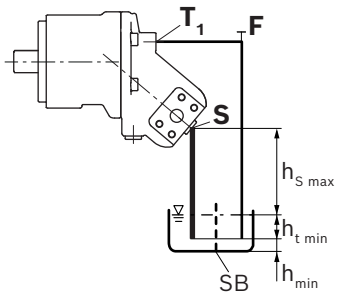
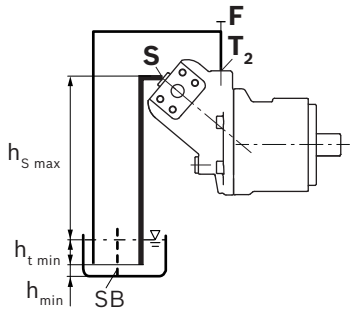
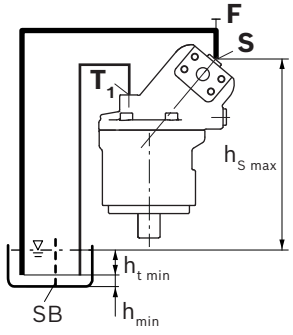
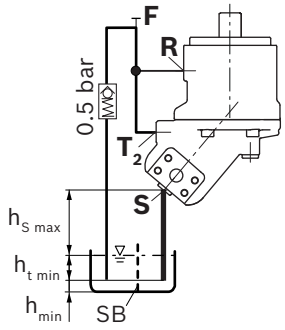
Installation position	Air bleed	Filling
1 	**F**	**T_1**
2 	**F**	**T_2**
3 	**F**	**T_1**
4 	**R**	**T_2**

Above-reservoir installation

Above-reservoir installation means that the axial piston unit is installed above the minimum fluid level of the reservoir.

Recommendation for installation position **8** (drive shaft upward):

A check valve in the drain line (cracking pressure 7.5 psi / 0.5 bar) can prevent the housing area from draining.

Installation position	Air bleed	Filling
5 	**F**	**T1 (F)**
6 	**F**	**T2 (F)**
7 	**F**	**T1 (F)**
8 	**R**	**T2 (F)**

Notice

Port **F** is part of the external piping and must be provided on the customer side to make filling and air bleeding easier.

Project planning notes

- The A2FO pump is designed to be used in open circuits.
- The project planning, installation and commissioning of the axial piston unit requires the involvement of qualified skilled personnel.
- Before using the axial piston unit, please read the corresponding instruction manual completely and thoroughly. If necessary, this can be requested from Bosch Rexroth.
- Before finalizing your design, please request a binding installation drawing.
- The specified data and notes contained herein must be observed.
- Depending on the operating conditions of the axial piston unit (working pressure, fluid temperature), the characteristic curve may shift.
- Preservation: Our axial piston units are supplied as standard with preservative protection for a maximum of 12 months. If longer preservative protection is required (maximum 24 months), please specify this in plain text when placing your order. The preservation periods apply under optimal storage conditions, details of which can be found in the data sheet 90312 or in the instruction manual.
- Be sure to add a pressure relief valve to the hydraulic system.
- Please note the details regarding the tightening torques of port threads and other threaded joints in the instruction manual.
- Working ports:
  - The ports and fastening threads are designed for the specified maximum pressure. The machine or system manufacturer must ensure that the connecting elements and lines correspond to the specified application conditions (pressure, flow, hydraulic fluid, temperature) with the necessary safety factors.
  - The working ports and function ports are only intended to accommodate hydraulic lines.

Safety instructions

- During and shortly after operation, there is a risk of getting burnt on the axial piston unit. Take appropriate safety measures (e.g. by wearing protective clothing).

Bosch Rexroth Corporation
8 Southchase Court
Fountain Inn, SC 29644-9018
USA
Telephone (864) 967-2777
Facsimile (864) 962-5338
www.boschrexroth-us.com