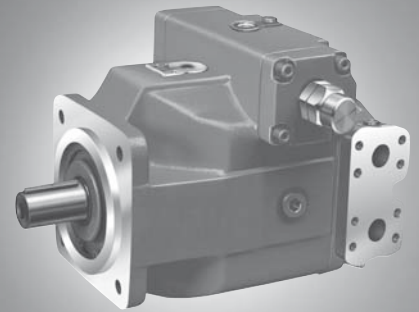


# Axial Piston Variable Pump A4VSG

**RE 92100/05.11** 1/68  
**Replaces: 11.95**

## Data sheet

Series 10, 11 and 30  
Size 40 to 1000  
Nominal pressure 350 bar  
Maximum pressure 400 bar  
Closed circuit



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## Features

- Flow and pressure side reversible (over centre operation)
- Motor mode possible
- Low noise level
- Long service life
- Drive shaft can absorb axial and radial forces
- High power/weight ratio
- Modular design
- Short response times
- Through drive and pump combinations possible
- Visual swivel angle indicator
- Optional installation position
- Operation on HF-fluids under reduced operational data possible

The A4VSG axial piston variable pump in swashplate design is designed for hydrostatic drives in closed circuits. Flow is proportional to drive speed and displacement. By adjusting the swashplate angle it is possible to steplessly vary the output flow.

For descriptions of the control devices, see separate data sheets:

RE 92056, RE 92060, RE 92072,  
RE 92076, RE 92080, RE 92084

## Ordering code for standard program

	<b>A4VS</b>	<b>G</b>			/			-				<b>10</b>			
01	02	03	04	05		06	07		08	09	10	11	12	13	14

**Hydraulic fluid**

		40	71	125	180	250	355	500	750	1000	
01	Mineral oil and HFD-fluids (no code)	●	●	●	●	●	●	●	●	●	
	HFA-, HFB and HFC-hydraulic fluids	●	●	●	●	●	●	●	-	-	E-

**Axial piston unit**

02	Swashplate design, variable														<b>A4VS</b>
----	-----------------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	-------------

**Operation mode**

03	Pump, closed circuit														<b>G</b>
----	----------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	----------

**Size (NG)**

04	$\Delta$ displacement $V_{g \max}$ [cm <sup>3</sup> ]	40	71	125	180	250	355	500	750	1000
----	---	----	----	-----	-----	-----	-----	-----	-----	------

**Control devices**

		40	71	125	180	250	355	500	750	1000	
05	Manual control (RE 92072)	●	●	●	●	●	●	●	-	-	MA..
	Electric motor control	●	●	●	●	●	●	●	-	-	EM..
	Hydraulic control, control volume dependent	●	●	●	●	●	●	●	●	●	HM..
	Hydraulic control, with servo/proportional valve (RE 92076)	●	●	●	●	●	●	●	●	●	HS..
	Hydraulic control, with proportional valve	●	●	●	●	●	●	●	●	●	EO..
	Hydraulic control, pilot pressure dependent (RE 92080)	●	●	●	●	●	●	●	●	●	HD.. <sup>1)</sup>
	Electrohydraulic control with proportional solenoid (RE 92084)	●	●	●	●	●	●	●	●	○	EP.. <sup>1)</sup>
	Pressure control, swiveling to one side of centre (RE 92060)	●	●	●	●	●	●	●	●	●	DR.. <sup>1)2)</sup>
	Pressure control for parallel operation	●	●	●	●	●	●	●	●	●	DP.. <sup>1)2)</sup>
	Secondary speed control (RE 92056)	●	●	●	●	●	●	●	●	●	DS..

**Series**

06	Series 1, index 0 (index 1)	●	●	-	-	-	-	-	-	-	10(11) <sup>3)</sup>
	Series 3, index 0	-	-	●	●	●	●	●	●	●	30

**Direction of rotation**

07	Viewed on drive shaft	clockwise	<b>R</b>
		counter clockwise	<b>L</b>
		bi-directional	<b>W<sup>1)</sup></b>

**Seals**

		40	71	125	180	250	355	500	750	1000	
08	NBR (nitrile-caoutchouc), shaft seal FKM	●	●	●	●	●	●	●	●	●	P
	FKM (fluor-caoutchouc) / HFD operation	●	●	●	●	●	●	●	●	●	V

**Drive shaft**

09	Parallel keyed shaft DIN 6885										<b>P</b>
	Splined shaft DIN 5480										<b>Z</b>

**Mounting flange**

		40	71	125	180	250	355	500	750	1000	
10	Based on ISO 3019-2 metric	4-hole	●	●	●	●	●	-	-	-	<b>B</b>
		8-hole	-	-	-	-	-	-	●	●	●

● = Available      ○ = On request      - = Not available

1) Bi-directional rotation not possible in all cases, please observe separate data sheets for the controls

2) Operation only on one side of centre

3) Design with HD- and EP-controls in series 11

# Ordering code for standard program

	<b>A4VS</b>	<b>G</b>			/			-				<b>10</b>			
01	02	03	04	05		06	07		08	09	10	11	12	13	14

## Service line ports

11	SAE flange ports A and B, located on same side, metric fastening thread	10
----	---	----

## Through drive

			40	71	125	180	250	355	500	750	1000	
Without attachment pump, without through drive			●	●	●	●	●	●	●	●	●	N00
With through drive for mounting an axial piston or gear pump			●	●	●	●	●	●	●	●	●	K...
Flange	Coupler for splined shaft	to mount										
125, 4-hole (ISO <sup>4</sup> )	32x2x14x9g	A4VSO/G 40	●	●	●	●	●	○	○	○	○	31
140, 4-hole (ISO <sup>4</sup> )	40x2x18x9g	A4VSO/G 71	-	●	●	●	●	●	●	○	●	33
160, 4-hole (ISO <sup>4</sup> )	50x2x24x9g	A4VSO/G 125	-	-	●	●	●	●	●	○	○	34
160, 4-hole (ISO <sup>4</sup> )	50x2x24x9g	A4VSO/G 180	-	-	-	●	●	●	●	○	○	34
224, 4-hole (ISO <sup>4</sup> )	60x2x28x9g	A4VSO/G, A4CSG 250	-	-	-	-	●	●	●	●	●	35
224, 4-hole (ISO <sup>4</sup> )	70x3x22x9g	A4VSO/G, A4CSG 355	-	-	-	-	-	●	●	○	○	77
315, 8-hole (ISO <sup>4</sup> )	80x3x25x9g	A4VSO/G, A4CSG 500	-	-	-	-	-	-	●	○	○	43
400, 8-hole (ISO <sup>4</sup> )	90x3x28x9g	A4VSO/G, A4CSG 750	-	-	-	-	-	-	-	●	●	76
400, 8-hole (ISO <sup>4</sup> )	100x3x32x9g	A4VSO/G 1000	-	-	-	-	-	-	-	-	●	88
80, 2-hole (ISO <sup>4</sup> )	3/4in 19-4 (SAE A-B)	A10VSO 10/52, 18/31	○	○	○	○	○	○	○	○	○	B2
100, 2-hole (ISO <sup>4</sup> )	7/8in 22-4 (SAE B)	A10VSO 28/31	●	○	●	○	●	○	○	○	○	B3
100, 2-hole (ISO <sup>4</sup> )	1in 25-4 (SAE B-B)	A10VSO 45/31	○	●	○	●	●	○	○	○	○	B4
125, 2-hole (ISO <sup>4</sup> )	1 1/4in 32-4 (SAE C)	A10VSO 71/31	-	●	●	●	●	●	●	○	○	B5
160, 4-hole (ISO <sup>4</sup> )	1 1/4in 32-4 (SAE C)	A10VSO 71/32	-	○	○	○	○	○	○	○	○	B8
125, 2-hole (ISO <sup>4</sup> )	1 1/2in 38-4 (SAE C-C)	A10VSO 100/31	-	-	●	●	●	●	●	●	○	B6
180, 4-hole (ISO <sup>4</sup> )	1 1/2in 38-4 (SAE C-C)	A10VSO 100/32	-	-	○	○	○	○	○	○	○	B9
180, 4-hole (ISO <sup>4</sup> )	1 3/4in 44-4 (SAE D)	A10VSO 140/31/32	-	-	-	●	●	●	●	●	○	B7
82-2 (SAE A)	5/8in 16-4 (SAE A)	AZPF-1X-004...022	●	●	●	●	●	●	●	●	○	01
82-2 (SAE A)	3/4in 19-4 (SAE A-B)	A10VSO 10, 18/31/52(3)	○	○	○	○	○	○	●	○	○	52
101-2 (SAE B)	7/8in 22-4 (SAE B)	AZPN-1X-020...032, A10VO 28/31/52(3)	●	●	●	●	●	●	●	○	○	68
101-2 (SAE B)	1in 25-4 (SAE B-B)	PGH4, A10VO45/31	○	●	●	●	●	●	●	○	○	04
127-2 (SAE C)	1 1/4in 32-4 (SAE C)	A10VO 71/31	-	○	●	●	●	●	●	●	●	07
127-2 (SAE C)	1 1/2in 38-4 (SAE C-C)	PGH5, A10VO100/31	-	-	●	●	●	●	●	●	●	24
152-4 (SAE D)	1 3/4in 44-4 (SAE D)	A10VO 140/31	-	-	●	●	●	●	●	●	○	17
with through-drive shaft, without shaft coupler, without adapter flange, closed with cover plate			●	●	●	●	●	●	●	●	●	99
<b>Boost pump mounted</b>												
A piped auxiliary pump for the boost circuit			●	●	●	●	▲	▲	▲	▲	●	H02
A common piped auxiliary pump for the boost and control circuit (only for EO1 and EO1K)			●	●	●	-	▲	-	-	-	-	H04
Separately piped auxiliary pumps for the boost circuit and the control circuit (only for HD1T and HD1U) including a pressure relief valve for the control circuit			●	●	●	●	▲	▲	▲	▲	●	H06

## Combination pumps

1. Combination pumps consisting of axial piston units – for ordering example, see page 34; for summary of mounting options, see page 36

2. If delivery with mounted gear pump is desired, please contact us

● = Available      ▲ = Not for new projects, please contact us, replacement A4CSG see RE 92105  
○ = On request      - = Not available

4) Acc. to ISO 3019-2 metric

## Ordering code for standard program

	<b>A4VS</b>	<b>G</b>			/			-				<b>10</b>			
01	02	03	04	05		06	07		08	09	10	11	12	13	14

Valves		40	71	125	180	250	355	500	750	1000	
13	Without valve block	●	●	●	●	●	●	●	●	●	0
	Valve block SDVB mounted	●	●	●	●	▲	▲	▲	▲	●	9
	Valve block SDVB 16/40 mounted <sup>5)</sup>	○	○	○	○	-	-	-	-	-	4

Filtration		40	71	125	180	250	355	500	750	1000	
14	Without filter	●	●	●	●	●	●	●	●	●	N
	Filter mounted in boost circuit	●	●	●	●	●	●	●	○	○	F
	Sandwich plate filter (for HS- and DS-control, see RE 92076 and RE 92056)	●	●	●	●	●	●	● <sup>6)</sup>	-	-	Z
	Filter mounted in boost circuit and sandwich plate filter for HS- and DS-controls	●	●	●	●	●	●	● <sup>6)</sup>	-	-	U

● = Available      ▲ = Not for new projects, please contact us, replacement A4CSG see RE 92105  
○ = On request      - = Not available

5) With direct operated flushing spool and pilot operated high-pressure relief valve

6) For the size 500 only available for the DS-control, HS see RE 92076

# Technical data

## Hydraulic fluid

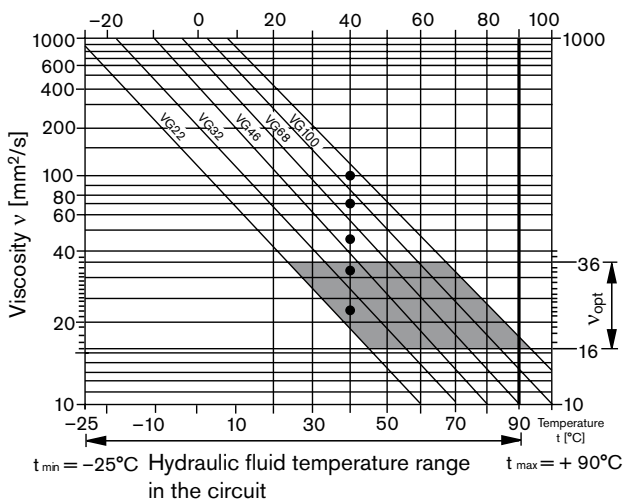
Before starting project planning, please refer to our data sheets RE 90220 (mineral oil), RE 90221 (environmentally acceptable hydraulic fluids) and RE 90223 (HF hydraulic fluids) for detailed information regarding the choice of hydraulic fluid and conditions of use.

The variable pump A4VSG is suitable for operation with HFA, HFB, HFC and HFD fluids.

When operating with HF or environmentally acceptable hydraulic fluids, restrictions of the technical data and seals are required acc. to RE 90223 or RE 90221.

When ordering, indicate the hydraulic fluid that is to be used.

## Selection diagram



## Details regarding the choice of hydraulic fluid

The correct choice of hydraulic fluid requires knowledge of the operating temperature in relation to the ambient temperature: in a closed circuit, the circuit temperature.

The hydraulic fluid should be chosen so that the operating viscosity in the operating temperature range is within the optimum range ( $\nu_{opt}$ ), see shaded area of the selection diagram. We recommend, that the higher viscosity class is selected in each case.

Example: At an ambient temperature of X °C, an operating temperature of 60 °C is set in the circuit. In the optimum operating viscosity range ( $\nu_{opt}$ , shaded area), this corresponds to the viscosity classes VG 46 or VG 68; to be selected: VG 68.

## Note

The case drain temperature, which is affected by pressure and speed, is always higher than the circuit temperature. At no point of the component may the temperature be higher than 90 °C, however.

If the above conditions cannot be maintained due to extreme operating parameters, please contact us.

## Viscosity and temperature

	Viscosity [mm <sup>2</sup> /s]	Temperature	Comment
Transport and storage		$T_{min} \geq -50^\circ\text{C}$ $T_{opt} = +5^\circ\text{C}$ to $+20^\circ\text{C}$	up to 12 months with standard factory preservation up to 24 months with long-term factory preservation
(Cold) start-up <sup>1)</sup>	$\nu_{max} = 1000$	$T_{St} \geq 40^\circ\text{C}$	$t \leq 3$ min, without load ( $p \leq 50$ bar), $n \leq 1000$ rpm
Permissible temperature difference		$\Delta T \leq 25$ K	between axial piston unit and hydraulic fluid
Warm-up phase	$\nu < 1000$ to 100	$T = -40^\circ\text{C}$ to $-25^\circ\text{C}$	for $p_{nom}$ , $0.5 \cdot n_{max}$ and $t \leq 15$ min
Operating phase			
Maximum temperature		$90^\circ\text{C}$	measured at the case drain port
Continuous operation	$\nu = 100$ to 15 $\nu_{opt} = 16$ to 36	$T = -25^\circ\text{C}$ to $+90^\circ\text{C}$	measured at the case drain port, no restriction within the permissible data
Short-term operation	$\nu_{min} = < 15$ to 5	$T_{max} = +90^\circ\text{C}$	measured at the case drain port, $t < 3$ min, $p < 0.3 \cdot p_{nom}$
FKM shaft seal <sup>1)</sup>		$T \leq +90^\circ\text{C}$	see page 6

1) At temperatures below  $-25^\circ\text{C}$ , an NBR shaft seal is required (permissible temperature range:  $-40^\circ\text{C}$  to  $+90^\circ\text{C}$ ).

# Technical data

## Bearing flushing

For the following operating conditions bearing flushing is required for a safe, continuous operation:

- Applications with water-containing special fluids due to limited lubricity and narrow operating temperature range
- Operation with limiting conditions for temperature and viscosity
- With vertical installation (drive shaft facing upwards) to ensure lubrication of the front bearing and the shaft seal.

Bearing flushing is carried out at port "U" in the front flange area of the variable pump. The flushing fluid flows through the front bearing and leaves the pump together with the case drain fluid.

Depending on pump size, the following flushing flows are recommended:

Size	40	71	125	180	250
recommended $q_{Sp}$ L/min flushing flow	3	4	5	7	10

Size	355	500	750	1000
recommended $q_{Sp}$ L/min flushing flow	15	20	30	40

These recommended flushing flows will cause a pressure drop of approx. 2 bar (series 1) and 3 bar (series 3) between the entrance to port „U“ and the pump case ( including the pipe fittings).

### Notes regarding series 30

When using external bearing flushing, the throttle screw in port U must be turned in to the end stop.

## 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.

To ensure the functional reliability of the axial piston unit, a gravimetric analysis of the hydraulic fluid is necessary to determine the amount of solid contaminant and to determine the cleanliness level according to ISO 4406. A **cleanliness level** of at least **20/18/15** is to be maintained.

Depending on the system and the application, for the A4VSG, we recommend

Filter cartridges  $\beta_{20} \geq 100$ .

With an increasing differential pressure at the filter cartridges, the  $\beta$  value must not deteriorate.

"A filter mounted in the boost circuit" is optionally available with er designation **F** or **U**.

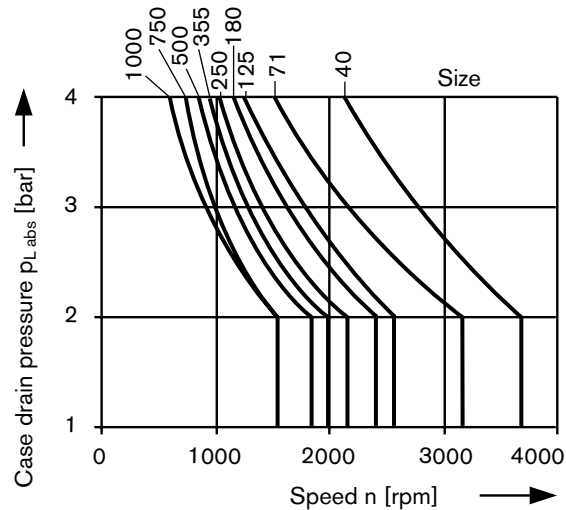
For description, see page 65

## Shaft seal

### Permissible pressure loading

The service life of the shaft seal is influenced by the pump speed and the case drain pressure. It is recommended that the average, continuous case drain pressure of 2 bar absolute at operating temperature not be exceeded (maximum permissible case drain pressure 4 bar absolute at reduced speed, see diagram). Momentary ( $t < 0.1$  s) pressure spikes of up to 10 bar absolute are permitted. The service life of the shaft seal decreases with an increase in the frequency of pressure spikes.

The case pressure must be equal to or greater than the external pressure on the shaft seal.



### Temperature range

The FKM shaft seal is permissible for case drain temperatures from -25 °C to +90 °C.

### Note

For application cases below -25 °C, an NBR shaft seal is required (permissible temperature range: -40 °C to +90 °C). See RE 90300-03-B.

# Technical data

## Operating pressure range

Pressure at service line port (pressure port) A or B

Nominal pressure  $p_{nom}$  \_\_\_\_\_ 350 bar absolute

Maximum pressure  $p_{max}$  \_\_\_\_\_ 400 bar absolute

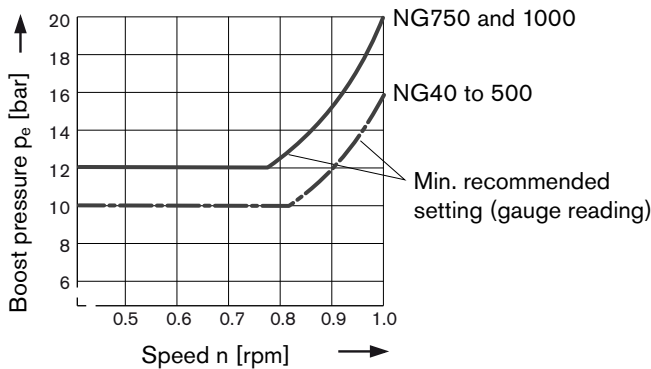
Single operating period \_\_\_\_\_ 1 s

Total operating period \_\_\_\_\_ 300 h

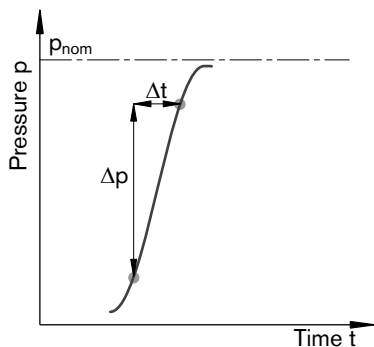
Minimum pressure (high-pressure side) \_\_\_\_\_ 15 bar

Minimum pressure (low-pressure side)

The minimum pressure is speed related, see diagram



Rate of pressure change  $R_{A max}$  \_\_\_\_\_ 16000 bar/s



### Inlet

Recommended boost pressure  $p_{Sp}$

NG	40	71	125	180	250	355	500	750	1000
bar	16	16	16	16	16	16	16	25	25

Recommended boost pressure for a common auxiliary pump for boost and control fluid circuit (EO1...H04)

$p_{Sp}$  \_\_\_\_\_ 25 bar

Maximum boost pressure – auxiliary pump  $p_{Sp max}$  for

MA-, EM-, HM-, HS-, EO-, DS-control \_\_\_\_\_ 50 bar

HD- and EP-control \_\_\_\_\_ 25 bar

DR- and DP-control \_\_\_\_\_ 16 bar

Auxiliary pump inlet pressure, see data sheet for the mounted auxiliary pump.

**Boost pump, see page 54.**

Observe details on the **control pressure** from the respective, separate data sheets for the control devices.

### Definition

**Nominal pressure  $p_{nom}$**

The nominal pressure corresponds to the maximum design pressure.

**Maximum pressure  $p_{max}$**

The maximum pressure corresponds the maximum operating pressure within the single operating period. The sum of the single operating periods must not exceed the total operating period.

**Minimum pressure (high-pressure side)**

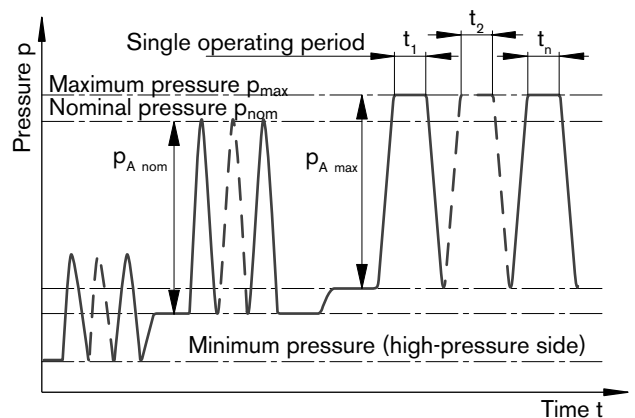
Minimum pressure at the high-pressure side (A or B) which is required in order to prevent damage to the axial piston unit.

**Minimum pressure (low-pressure side)**

Minimum pressure at the low-pressure side (A or B), which is required in order to prevent damage to the axial piston unit.

**Rate of pressure change  $R_A$**

Maximum permissible rate of pressure rise and reduction during a pressure change over the entire pressure range.

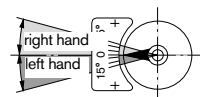


Total operating period =  $t_1 + t_2 + \dots + t_n$

### Flow direction

Direction of rotation	Swivel range*	
clockwise	counter-clockwise	
<b>B to A</b>	<b>A to B</b>	right hand
<b>A to B</b>	<b>B to A</b>	left hand

\* cf. swivel angle indicator



# Technical data

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

Size	NG	40	71	125	180	250	355	500	750	1000
Displacement geometric, per revolution										
	$V_{g \max}$ cm <sup>3</sup>	40	71	125	180	250	355	500	750	1000
Speed										
maximum at $V_{g \max}$	$n_{\max}$ rpm	3700	3200	2600	2400	2200	2000	1800	1600	1600
Flow										
at $n_{\max}$	$q_{v \max}$ L/min	148	227	325	432	550	710	900	1200	1600
at $n_E = 1500$ rpm	$q_{vE}$ L/min	60	107	186	270	375	533	750	1125	1500
Power										
at $n_{\max}$ $\Delta p = 350$ bar	$P_{\max}$ kW	86	132	190	252	321	414	525	700	933
at $n_E = 1500$ rpm	$P_E$ kW	35	62	109	158	219	311	438	656	875
Torque										
at $V_{g \max}$ and $\Delta p = 350$ bar	$T_{\max}$ Nm	223	395	696	1002	1391	1976	2783	4174	5565
	$\Delta p = 100$ bar	$T$ Nm	64	113	199	286	398	564	795	1193
Rotary stiffness of drive shaft										
	$P$ c kNm/rad	80	146	260	328	527	800	1145	1860	2730
	$Z$ c kNm/rad	77	146	263	332	543	770	1136	1812	2845
Moment of inertia for rotary group	$J_{GR}$ kgm <sup>2</sup>	0.0049	0.0121	0.03	0.055	0.0959	0.19	0.3325	0.66	1.20
Maximum angular acceleration <sup>1)</sup>	$\alpha$ rad/s <sup>2</sup>	17000	11000	8000	6800	4800	3600	2800	2000	1450
Case volume	$V$ L	2	2.5	5	4	10	8	14	19	27
Mass approx. (Pump with HS4-control without valve block)	$m$ kg	42	60	107	112	220	235	335	500	644

- 1) The data are valid for values between zero and maximum permissible speed.  
 Valid for external excitation (e. g. engine 2 to 8 times rotary frequency; cardan shaft twice the rotary frequency).  
 The limit value applies for a single pump only.  
 The load capacity of the connection parts must be considered.

## 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. We recommend testing the loads by means of experiment or calculation / simulation and comparison with the permissible values.

## Calculation of pump size

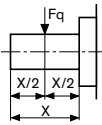
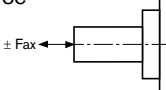
Flow	$q_v = \frac{V_g \cdot n \cdot \eta_v}{1000}$	[L/min]	$V_g$ = Displacement per revolution in cm <sup>3</sup>
			$\Delta p$ = Differential pressure in bar
Torque	$T = \frac{V_g \cdot \Delta p}{20 \cdot \pi \cdot \eta_{mh}}$	[Nm]	$n$ = Speed in rpm
			$\eta_v$ = Volumetric efficiency
Power	$P = \frac{2\pi \cdot T \cdot n}{60000} = \frac{q_v \cdot \Delta p}{600 \cdot \eta_t}$	[kW]	$\eta_{mh}$ = Mechanical-hydraulic efficiency
			$\eta_t$ = Total efficiency ( $\eta_t = \eta_v \cdot \eta_{mh}$ )

For boost pump parameters, see page 54.



## Technical data

### Permissible radial and axial forces on the drive shaft

Size	40	71	125	180	250	355	500	750*	1000
Maximum radial force for X/2  $F_{q \max}$ N	1000	1200	1600	2000	2000	2200	2500	3000	3500
Maximum axial force  $\pm F_{ax \max}$ N	600	800	1000	1400	1800	2000	2000	2200	2200

#### Note

Special requirements apply in the case of belt drives. Please contact us.

Influence on the direction of the permissible axial force:

- +  $F_{ax \max}$  = Increase in bearing life
- $F_{ax \max}$  = Reduction in bearing life (avoid)

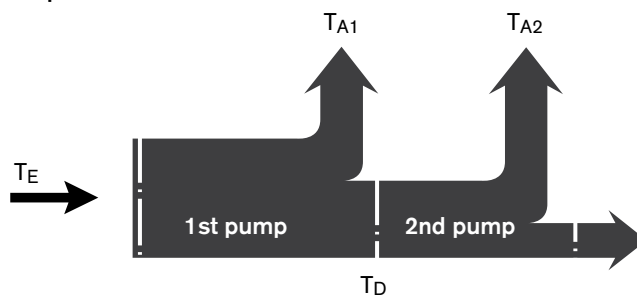
### Permissible input and through-drive torques

Size	NG	40	71	125	180	250	355	500	750	1000
Torque at $V_{g \max}$ and $\Delta p = 350 \text{ bar}^1$	$T_{\max}$ Nm	223	395	696	1002	1391	1976	2783	4174	5565
Input torque at drive shaft, maximum <sup>2)</sup>										
Splined shaft Z	$T_{E \max}$ Nm	446	790	1392	2004	2782	3952	5566	8348	11130
Shaft key P	$T_{E \max}$ Nm	380	700	1392	1400	2300	3557	5200	7513	9444
Maximum through-drive torque		$T_{D \max} = T_{E \max}$								

1) Efficiency not considered

2) For drive shafts without radial force

#### Torque distribution



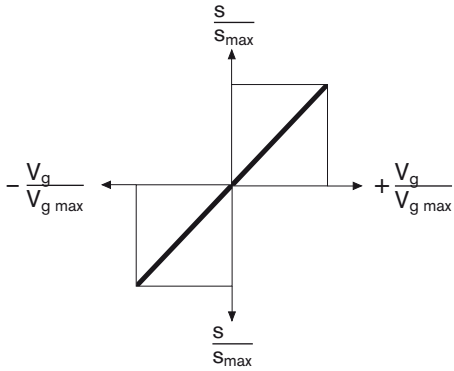
# Summary of control devices

## MA – Manual control

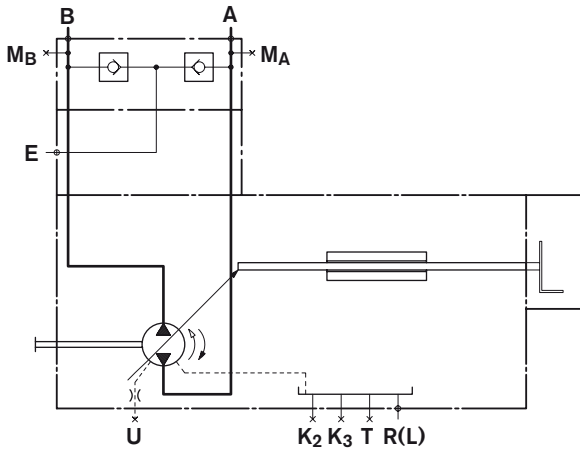
(see RE 92072)

Infinitely variable adjustment of displacement by means of a handwheel.

### Characteristic



### Schematic



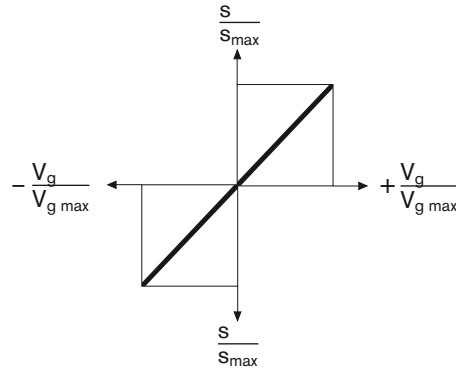
## EM – Electric motor control

(see RE 92072)

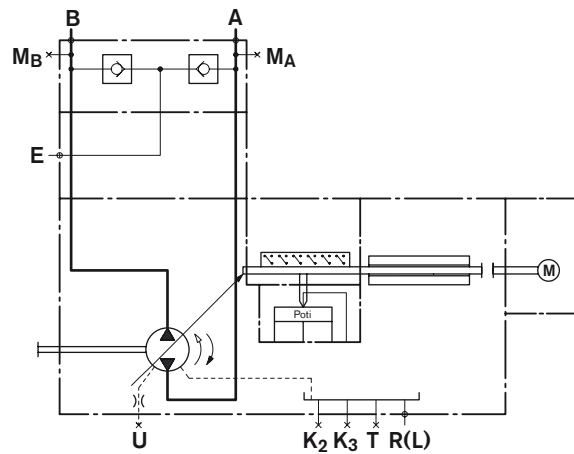
Infinitely variable adjustment of displacements via an electric motor.

Various intermediate displacement values can be selected with a programmed sequence control by means of built on limit switches and an optional potentiometer for feedback of the swivel angle.

### Characteristic



### Schematic



## Summary of control devices

### HD – Hydraulic control, pilot-pressure related

(see RE 92080)

Infinitely variable adjustment of the pump displacement in relation to the pilot pressure. The control is proportional to the applied pilot pressure (difference between pilot pressure and case pressure).

Optional:

Pilot pressure curves (HD1, HD2, HD3)

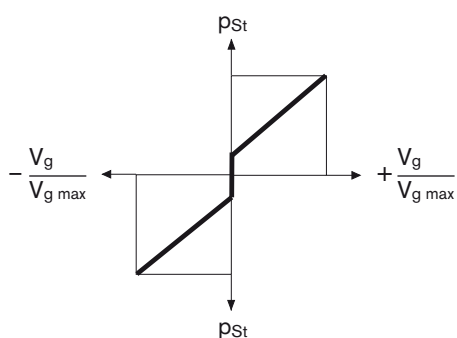
Pressure control (HD.A, HD.B, HD.D)<sup>1)</sup>,

Remote pressure control (HD.GA, HD.GB, HD.G)<sup>1)</sup>

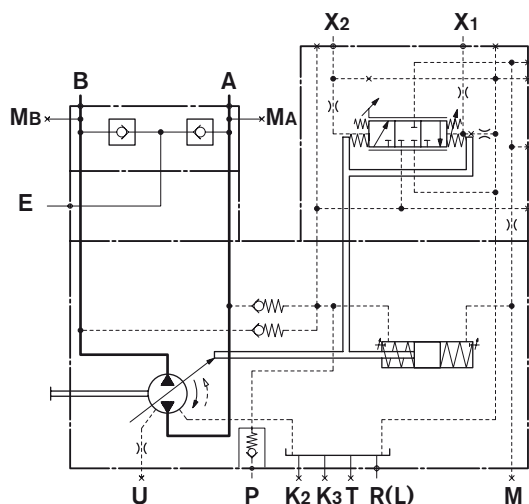
Overriding power control (HD1P)

Electric control of pilot pressure signal (HD1T)

#### Characteristic



#### Schematic



### EP – Electrohydraulic control with proportional solenoid

(see RE 92084)

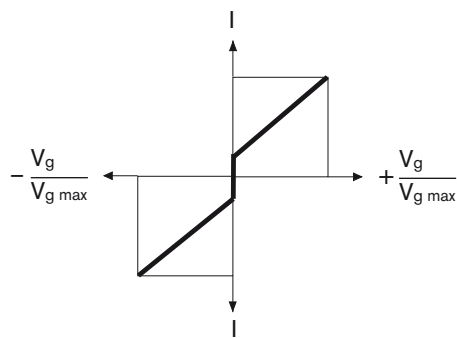
EP control adjusts the pump displacement proportionally to the current at the solenoid. Current-regulated controllers with pulse-width modulation are recommended for controlling the solenoids.

Optional:

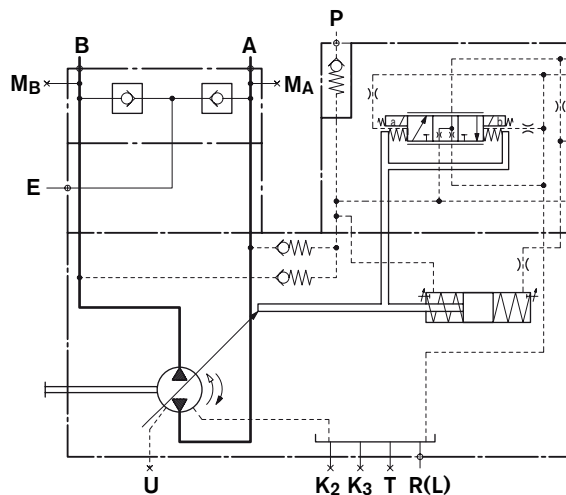
Pressure control (EPA, EPB, EPD)<sup>1)</sup>

Remote pressure control (EPGA, EPGB, EPG)<sup>1)</sup>

#### Characteristic



#### Schematic



1) Bi-directional direction of rotation not possible.

# Summary of control devices

## HM 1/2 – Hydraulic control, volume dependent

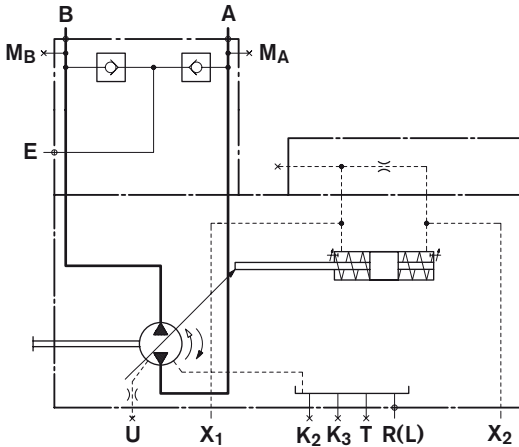
(see RE 92076)

The pump displacement is infinitely variable in relation to the control oil volume in ports  $X_1$  and  $X_2$

Application:

- 2-point control
- Basic control device for servo or proportional valve control.

### Schematic



## HS – Control system with servo valve

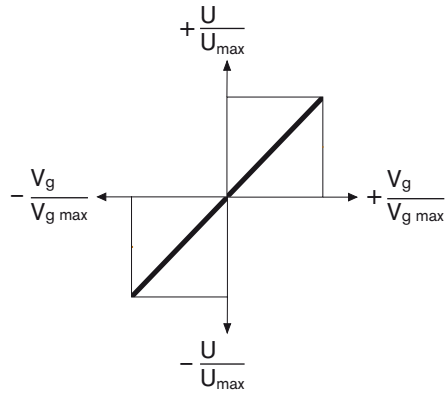
(see RE 92076)

This infinitely variable displacement control is accomplished by means of a servo valve and electrical feedback of the swivel angle.

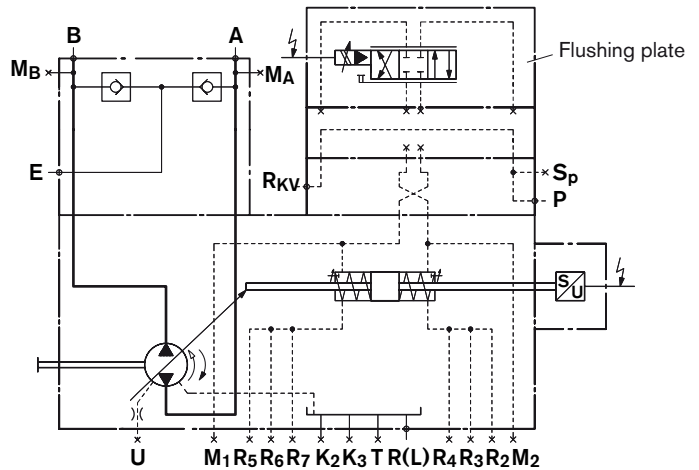
Optional:

- Short circuit valve (HSK);
- Without valves (HSE).

### Characteristic



### Schematic



# Summary of control devices

## HS4 – Control system, with proportional valve

(see RE 92076)

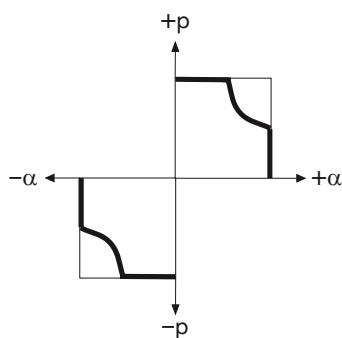
The infinitely variable displacement control is accomplished by means of a proportional valve and electrical feedback of the swivel angle.

The HS4P control system is equipped with mounted pressure transducers, which makes it suitable for electric pressure and power control.

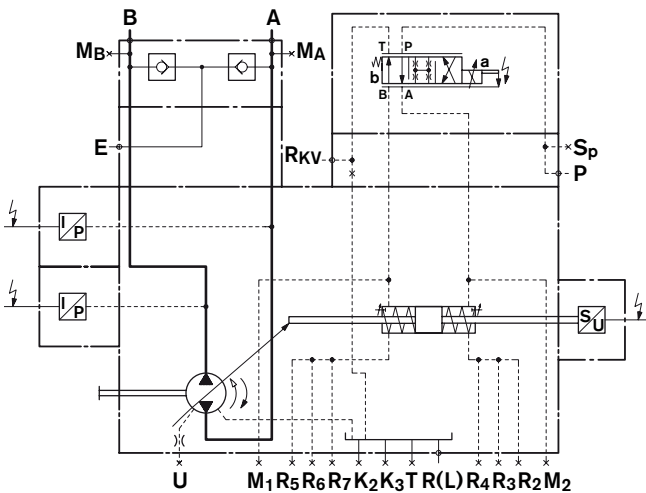
Optional:

- With pressure transducer (HS4P);
- Short circuit valve (HS4K, HS4KP);
- For oil-immersed use (HS4M)

### Characteristic



### Schematic



## EO1/2 – Control system

(see RE 92076)

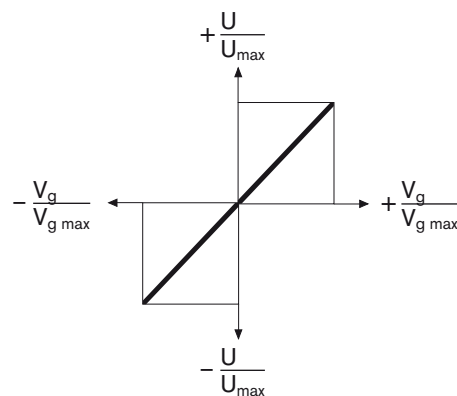
This infinitely variable displacement control is accomplished by means of a proportional valve and electrical feedback of the swivel angle.

This makes it suitable for electric control of displacement

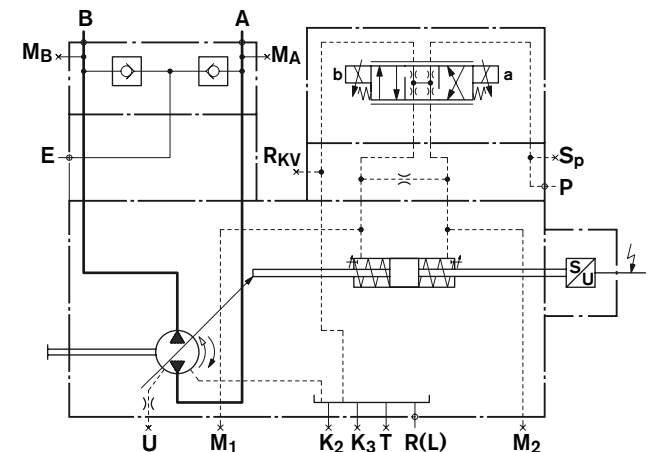
Optional:

- Control pressure range (EO1, EO2)
- Short circuit valve (EO1K, EO2K)

### Characteristic



### Schematic



# Summary of control devices

## DR - Pressure control

(see RE 92060)

Swiveling to one side of centre

The DR pressure control limits the maximum pressure at the pump outlet within the control range of the pump. This max. pressure level can be steplessly set at the control valve.

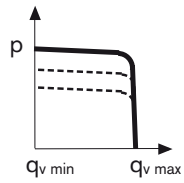
Recommended setting range 50...350 bar

Bi-directional rotation not possible.

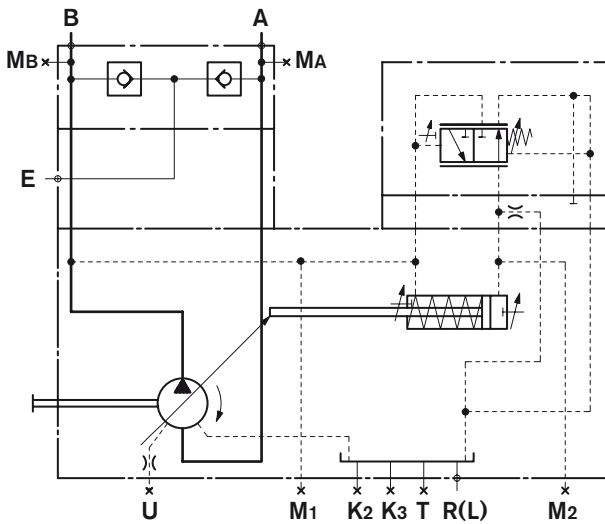
Optional:

Remote control (DRG)

### Characteristic



### Schematic



## DP – Pressure control for parallel operation

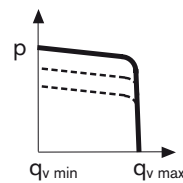
(see RE 92060)

Swiveling to one side of centre

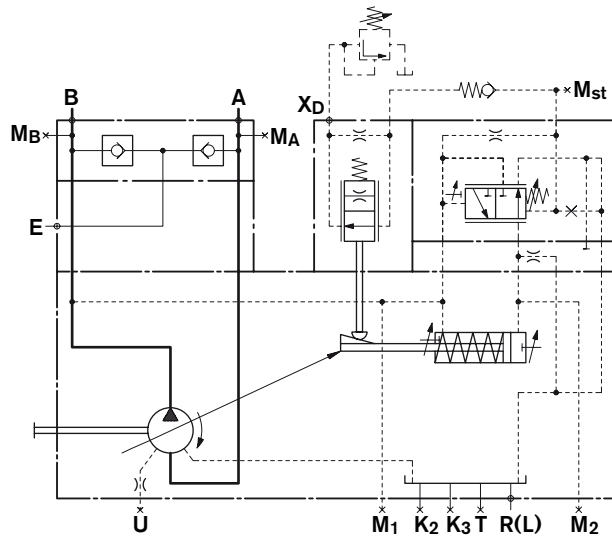
Suitable for pressure control of multiple A4VSG axial piston units in parallel operation.

Bi-directional rotation not possible.

### Characteristic



### Schematic



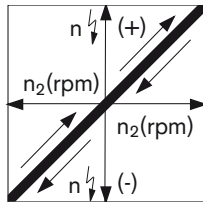
# Summary of control devices

## DS1 – Secondary speed control

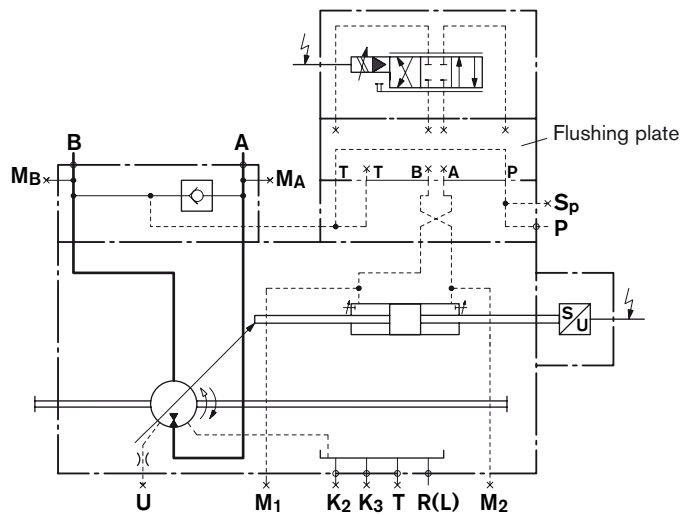
(see RE 92056)

The speed control DS1 controls the secondary unit (motor) in such a manner, that this motor delivers sufficient torque to maintain the required output speed. When connected to a constant pressure system, this torque is proportional to motor displacement and thus also proportional to the swivel angle.

### Characteristic



### Schematic

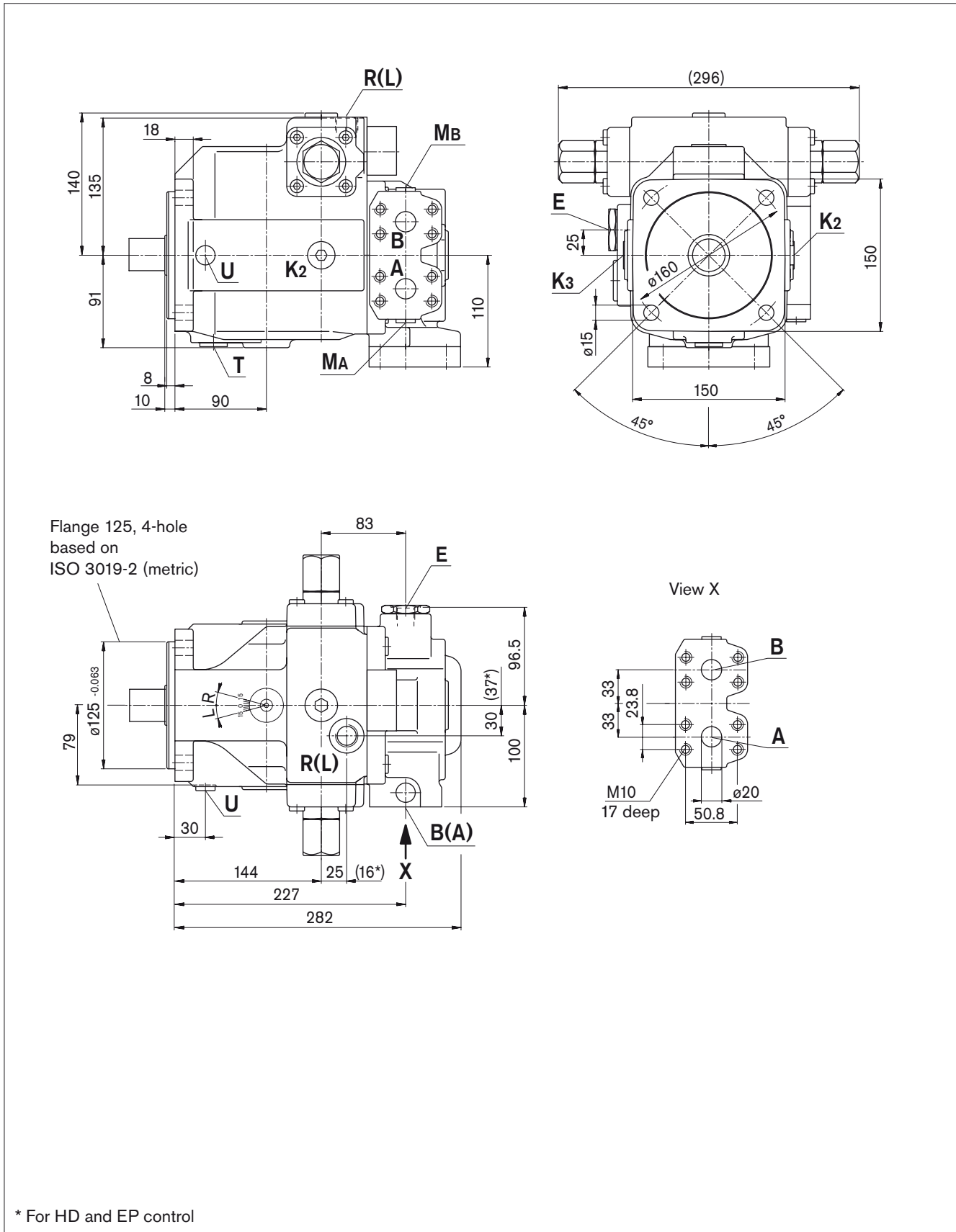


# Dimensions size 40

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

## Series 1

Example: HM control; for exact dimensions of the control device, see separate data sheets

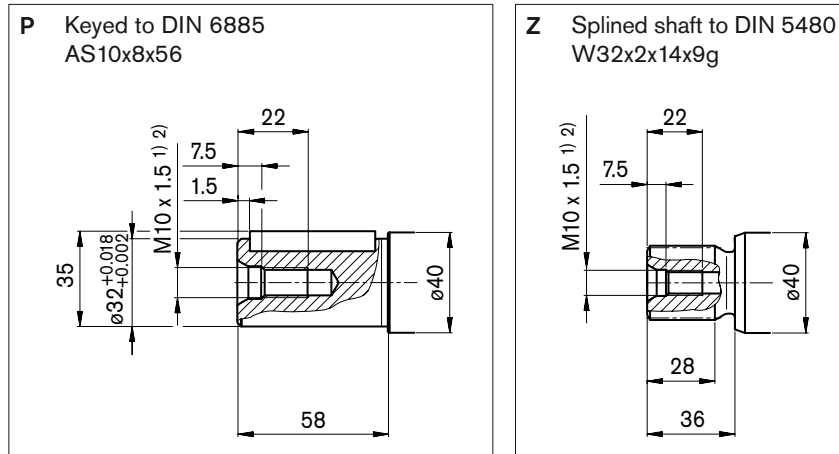




# Dimensions size 40

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

## Drive shafts



## Ports

Designation	Port for	Standard	Size <sup>2)</sup>	Maximum pressure [bar] <sup>3)</sup>	State
A, B	Service line (pressure port)	SAE J518 <sup>4)</sup>	3/4 in (high-pressure series)	400	O
	Fastening thread A/B	DIN 13	M10 x 1.5; 17 deep		O
M <sub>A</sub> , M <sub>B</sub>	Measuring operating pressure A/B	DIN 3852	M14 x 1.5; 12 deep	400	X
T	Drain	DIN 3852 <sup>5)</sup>	M22 x 1.5; 14 deep	4	X <sup>6)</sup>
E	Boost pressure inlet	DIN 3852	M18 x 1.5; 12 deep	50	O
K <sub>2</sub> , K <sub>3</sub>	Fill + air bleed	DIN 3852 <sup>5)</sup>	M22 x 1.5; 14 deep	4	X <sup>6)</sup>
R(L)	Tank line(case drain port)			4	O <sup>6)</sup>
U	Bearing flushing	DIN 3852 <sup>5)</sup>	M14 x 1.5; 12 deep	7	X

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

2) Observe the general instructions on page 68 for the maximum tightening torques.

3) Momentary pressure spikes may occur depending on the application. Keep this in mind when selecting measuring devices and fittings.

4) Only dimensions according to SAE J518, metric fastening thread is a deviation from standard.

5) The countersink may be deeper than specified in the standard.

6) Depending on the installation position, T, K<sub>2</sub>, K<sub>3</sub> or R(L) must be connected (see also pages 66 and 67)

O = Must be connected (plugged on delivery)

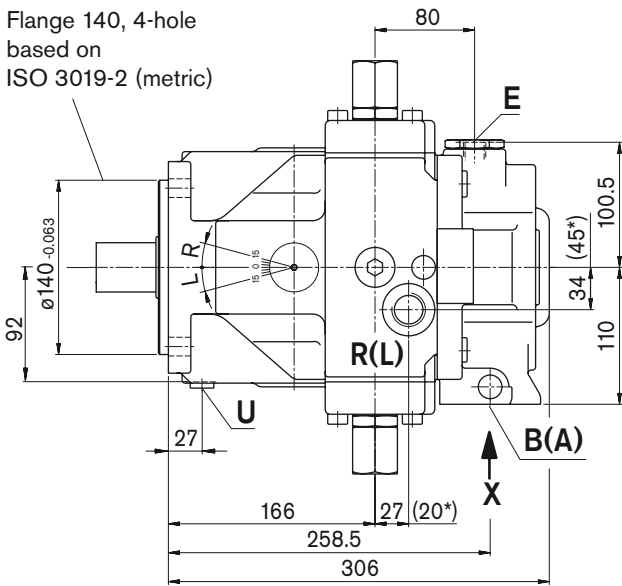
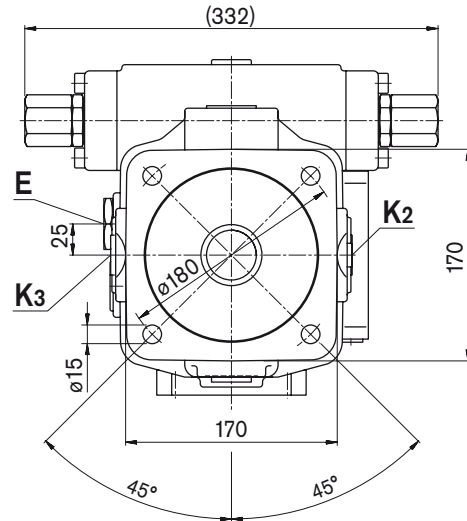
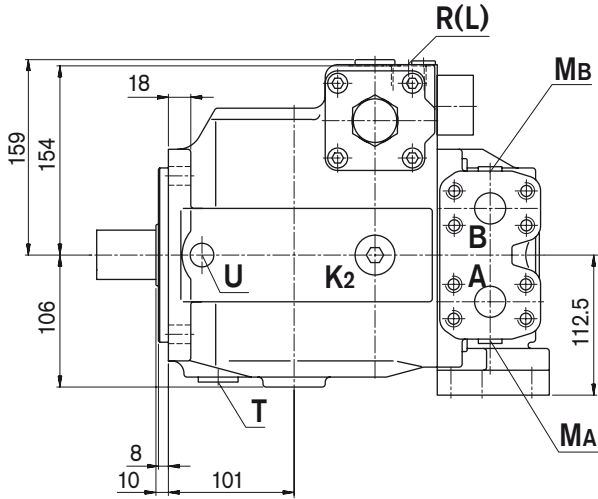
X = Plugged (in normal operation)

# Dimensions, size 71

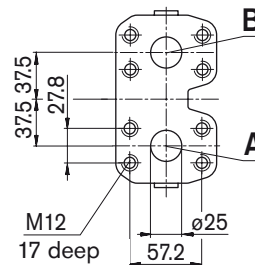
Before finalizing your design, request a binding installation drawing. Dimensions in mm.

## Series 1

Example: HM control; for exact dimensions of the control device, see separate data sheets



View X

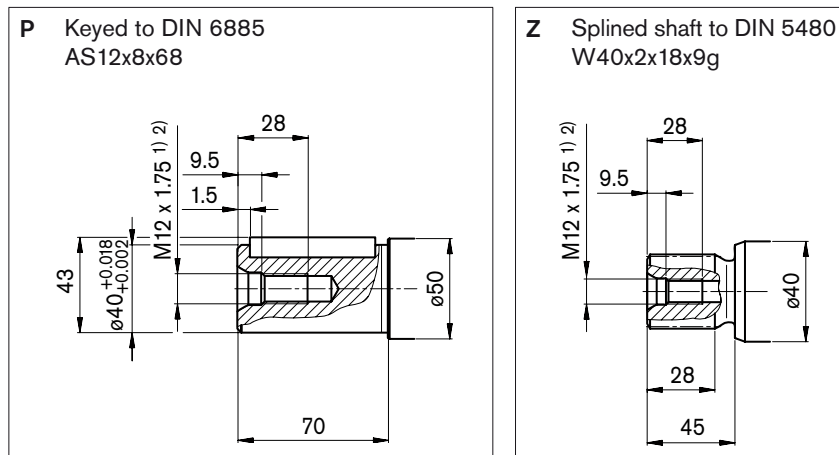


\* For HD and EP control

# Dimensions, size 71

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

## Drive shafts



## Ports

Designation	Port for	Standard	Size <sup>2)</sup>	Maximum pressure [bar] <sup>3)</sup>	State
A, B	Service line (pressure port)	SAE J518 <sup>4)</sup>	1 in (high-pressure series)	400	O
	Fastening thread A/B	DIN 13	M12 x 1.75; 17 deep		
M <sub>A</sub> , M <sub>B</sub>	Measuring operating pressure A/B	DIN 3852	M14 x 1.5; 12 deep	400	X
T	Drain	DIN 3852 <sup>5)</sup>	M27 x 2; 16 deep	4	X <sup>6)</sup>
E	Boost pressure inlet	DIN 3852	M18 x 1.5; 12 deep	50	O
K <sub>2</sub> , K <sub>3</sub>	Fill + air bleed	DIN 3852 <sup>5)</sup>	M27 x 2; 16 deep	4	X <sup>6)</sup>
R(L)	Tank line(case drain port)			4	O <sup>6)</sup>
U	Bearing flushing	DIN 3852 <sup>5)</sup>	M14 x 1.5; 12 deep	7	X

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

2) Observe the general instructions on page 68 for the maximum tightening torques.

3) Momentary pressure spikes may occur depending on the application. Keep this in mind when selecting measuring devices and fittings.

4) Only dimensions according to SAE J518, metric fastening thread is a deviation from standard.

5) The countersink may be deeper than specified in the standard.

6) Depending on the installation position, T, K<sub>2</sub>, K<sub>3</sub> or R(L) must be connected (see also pages 66 and 67)

O = Must be connected (plugged on delivery)

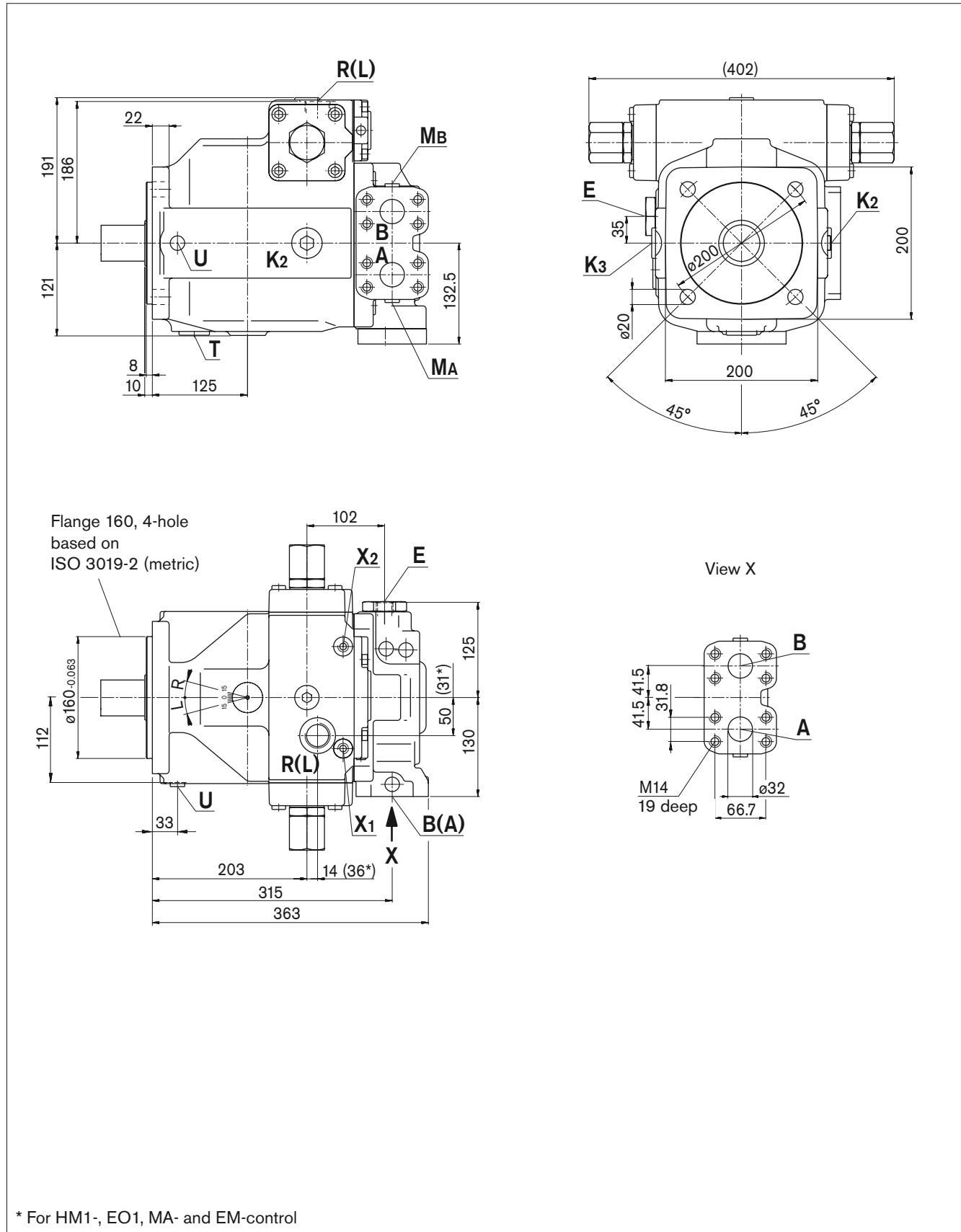
X = Plugged (in normal operation)

# Dimensions size 125

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

## Series 3

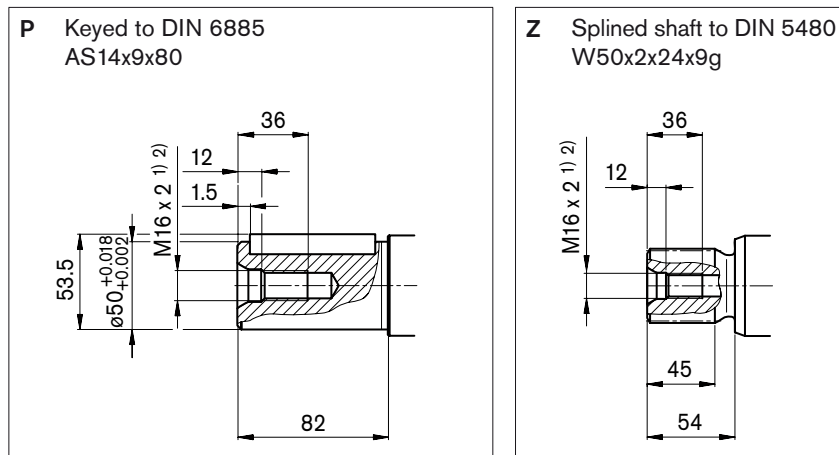
Example: HM control; for exact dimensions of the control device, see separate data sheets



# Dimensions size 125

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

## Drive shafts



## Ports

Designation	Port for	Standard	Size <sup>2)</sup>	Maximum pressure [bar] <sup>3)</sup>	State
A, B	Service line (pressure port)	SAE J518 <sup>4)</sup>	1 1/4 in (high-pressure series)	400	O
	Fastening thread A/B	DIN 13	M14 x 2; 19 deep		O
M <sub>A</sub> , M <sub>B</sub>	Measuring operating pressure A/B	DIN 3852	M14 x 1.5; 12 deep	400	X
T	Drain	DIN 3852 <sup>5)</sup>	M33 x 2; 18 deep	4	X <sup>6)</sup>
E	Boost pressure inlet	DIN 3852	M22 x 1.5 14 deep	50	O
K <sub>2</sub> , K <sub>3</sub>	Fill + air bleed	DIN 3852 <sup>5)</sup>	M33 x 2; 18 deep	4	X <sup>6)</sup>
R(L)	Tank line(case drain port)			4	O <sup>6)</sup>
U	Bearing flushing	DIN 3852 <sup>5)</sup>	M14 x 1.5; 12 deep	7	X

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

2) Observe the general instructions on page 68 for the maximum tightening torques.

3) Momentary pressure spikes may occur depending on the application. Keep this in mind when selecting measuring devices and fittings.

4) Only dimensions according to SAE J518, metric fastening thread is a deviation from standard.

5) The countersink may be deeper than specified in the standard.

6) Depending on the installation position, T, K<sub>2</sub>, K<sub>3</sub> or R(L) must be connected (see also pages 66 and 67)

O = Must be connected (plugged on delivery)

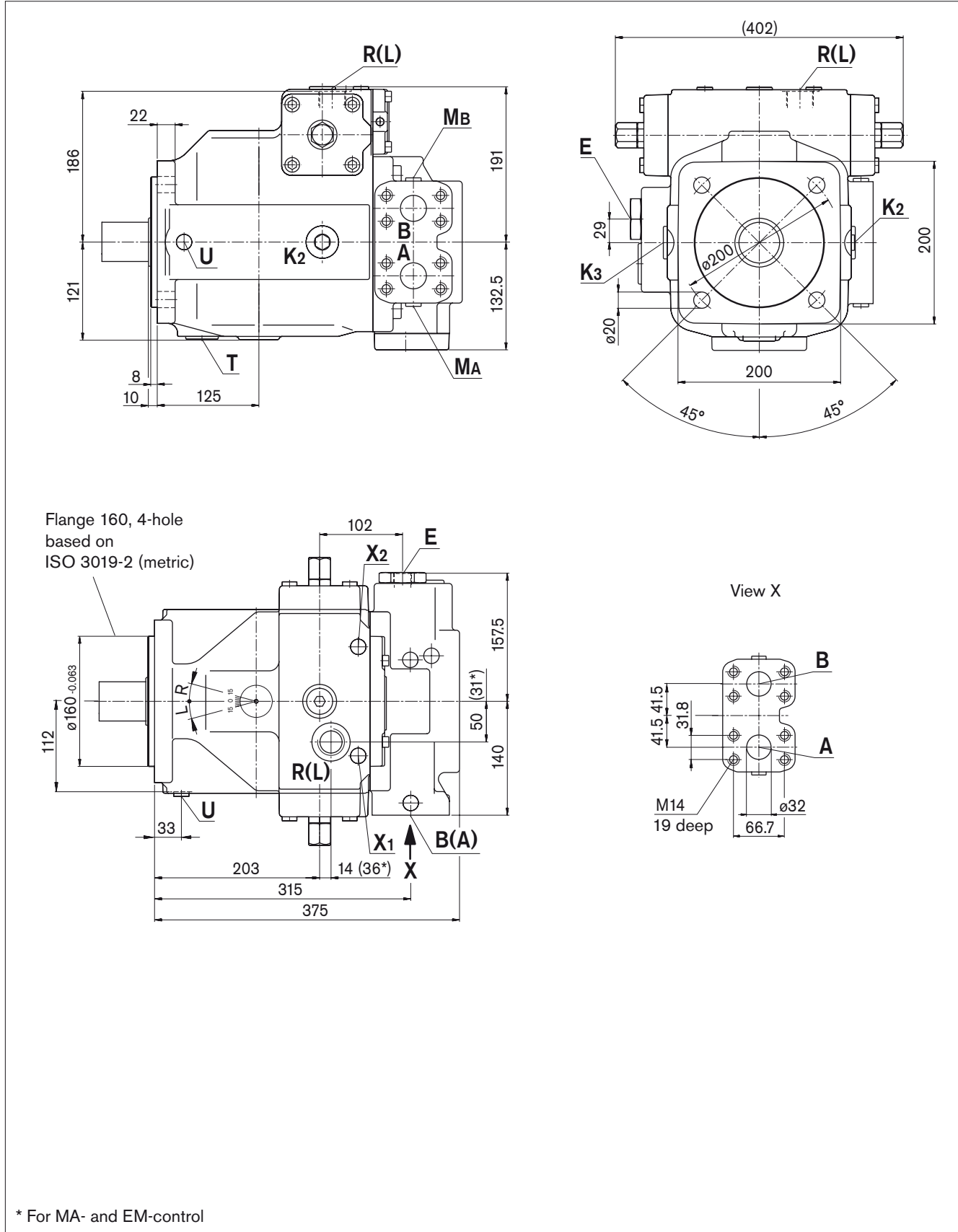
X = Plugged (in normal operation)

# Dimensions size 180

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

## Series 3

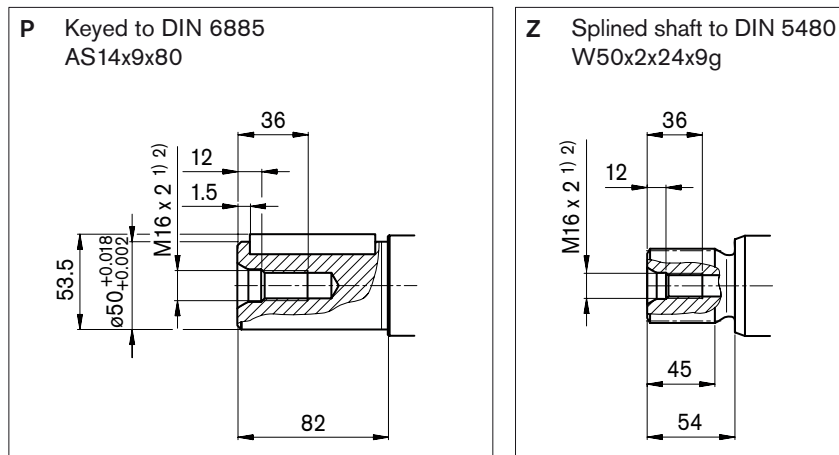
Example: HM control; for exact dimensions of the control device, see separate data sheets



# Dimensions size 180

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

## Drive shafts



## Ports

Designation	Port for	Standard	Size <sup>2)</sup>	Maximum pressure [bar] <sup>3)</sup>	State
A, B	Service line (pressure port)	SAE J518 <sup>4)</sup>	1 1/4 in (high-pressure series)	400	O
	Fastening thread A/B	DIN 13	M14 x 2; 19 deep		
M <sub>A</sub> , M <sub>B</sub>	Measuring operating pressure A/B	DIN 3852	M14 x 1.5; 12 deep	400	X
T	Drain	DIN 3852 <sup>5)</sup>	M33 x 2; 18 deep	4	X <sup>6)</sup>
E	Boost pressure inlet	DIN 3852	M22 x 1.5; 14 deep	50	O
K <sub>2</sub> , K <sub>3</sub>	Fill + air bleed	DIN 3852 <sup>5)</sup>	M33 x 2; 18 deep	4	X <sup>6)</sup>
R(L)	Tank line (case drain port)			4	O <sup>6)</sup>
U	Bearing flushing	DIN 3852 <sup>5)</sup>	M14 x 1.5; 12 deep	7	X

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

2) Observe the general instructions on page 68 for the maximum tightening torques.

3) Momentary pressure spikes may occur depending on the application. Keep this in mind when selecting measuring devices and fittings.

4) Only dimensions according to SAE J518, metric fastening thread is a deviation from standard.

5) The countersink may be deeper than specified in the standard.

6) Depending on the installation position, T, K<sub>2</sub>, K<sub>3</sub> or R(L) must be connected (see also pages 66 and 67)

O = Must be connected (plugged on delivery)

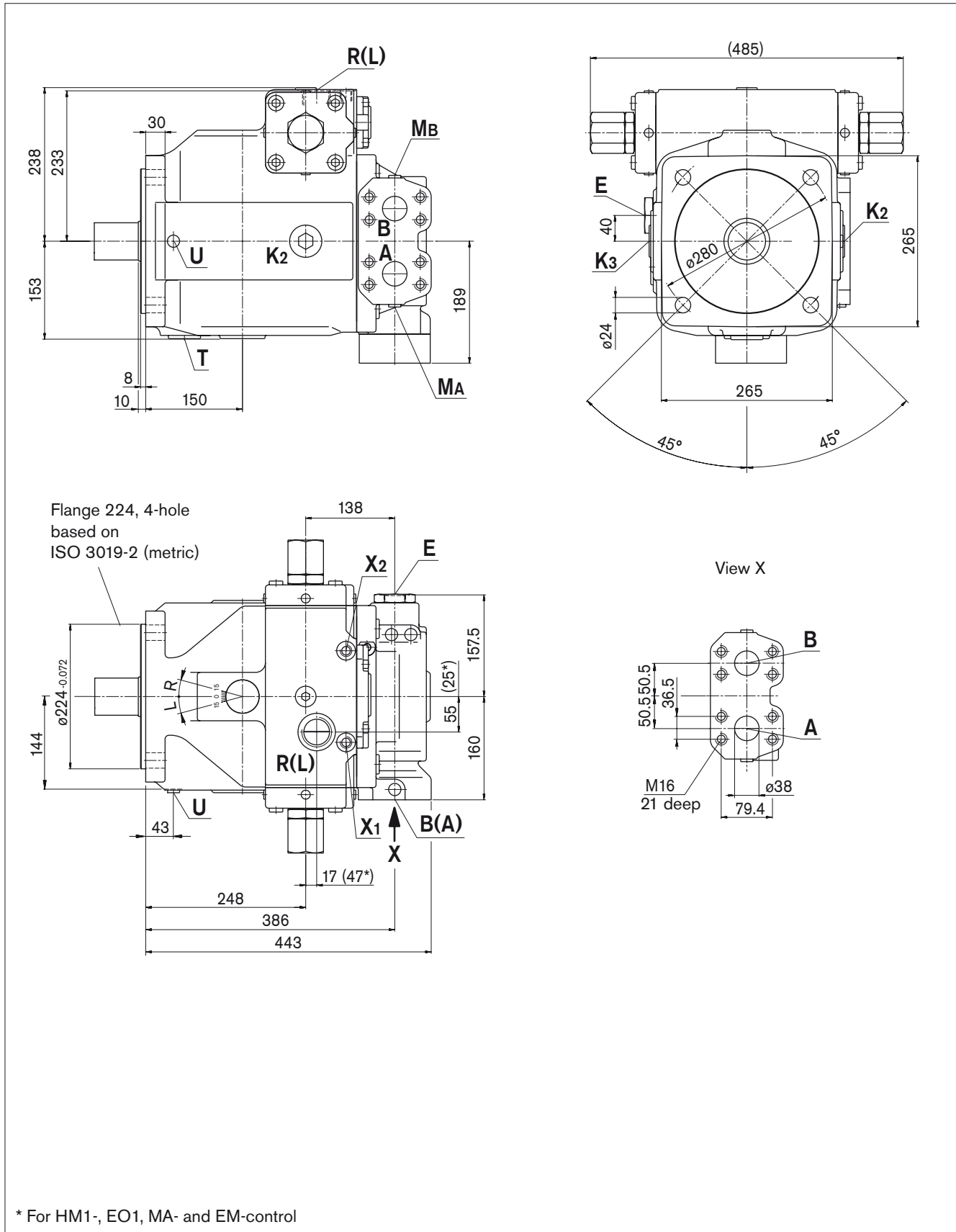
X = Plugged (in normal operation)

# Dimensions size 250

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

## Series 3

Example: HM control; for exact dimensions of the control device, see separate data sheets

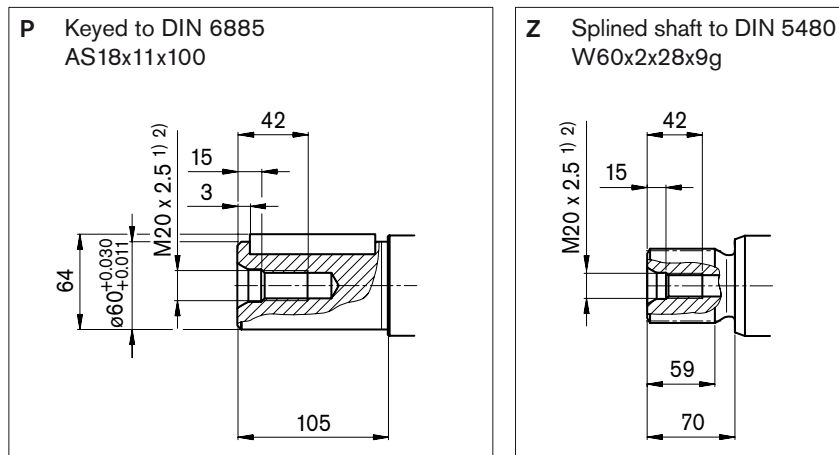




# Dimensions size 250

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

## Drive shafts



## Ports

Designation	Port for	Standard	Size <sup>2)</sup>	Maximum pressure [bar] <sup>3)</sup>	State
A, B	Service line (pressure port)	SAE J518 <sup>4)</sup>	1 1/2 in (high-pressure series)	400	O
	Fastening thread A/B	DIN 13	M16 x 2; 21 deep		O
M <sub>A</sub> , M <sub>B</sub>	Measuring operating pressure A/B	DIN 3852	M14 x 1.5; 12 deep	400	X
T	Drain	DIN 3852 <sup>5)</sup>	M42 x 2; 20 deep	4	X <sup>6)</sup>
E	Boost pressure inlet	DIN 3852	M33 x 2; 18 deep	50	O
K <sub>2</sub> , K <sub>3</sub>	Fill + air bleed	DIN 3852 <sup>5)</sup>	M42 x 2; 20 deep	4	X <sup>6)</sup>
R(L)	Tank line (case drain port)			4	O <sup>6)</sup>
U	Bearing flushing	DIN 3852 <sup>5)</sup>	M14 x 1.5; 12 deep	7	X

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

2) Observe the general instructions on page 68 for the maximum tightening torques.

3) Momentary pressure spikes may occur depending on the application. Keep this in mind when selecting measuring devices and fittings.

4) Only dimensions according to SAE J518, metric fastening thread is a deviation from standard.

5) The countersink may be deeper than specified in the standard.

6) Depending on the installation position, T, K<sub>2</sub>, K<sub>3</sub> or R(L) must be connected (see also pages 66 and 67)

O = Must be connected (plugged on delivery)

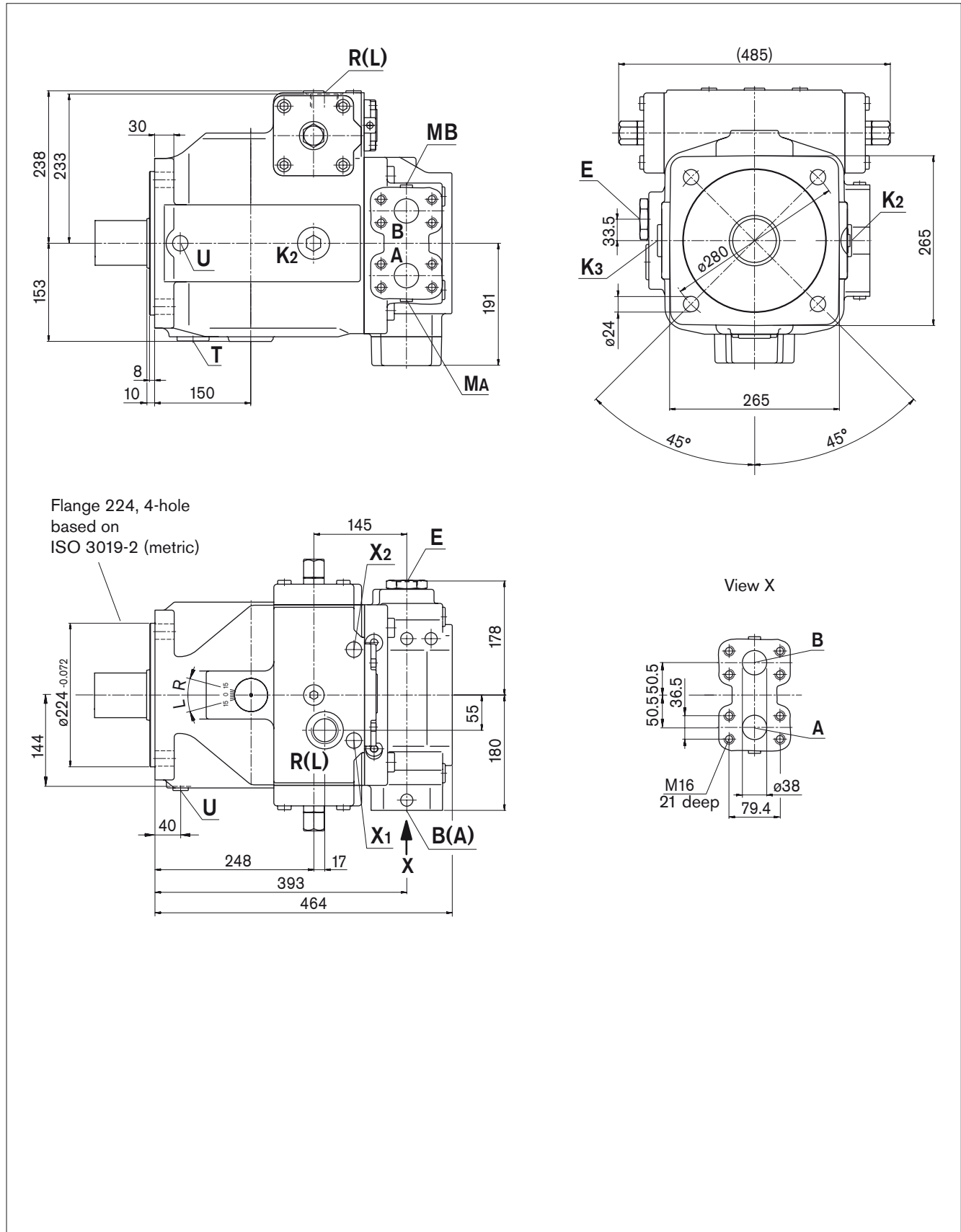
X = Plugged (in normal operation)

# Dimensions size 355

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

## Series 3

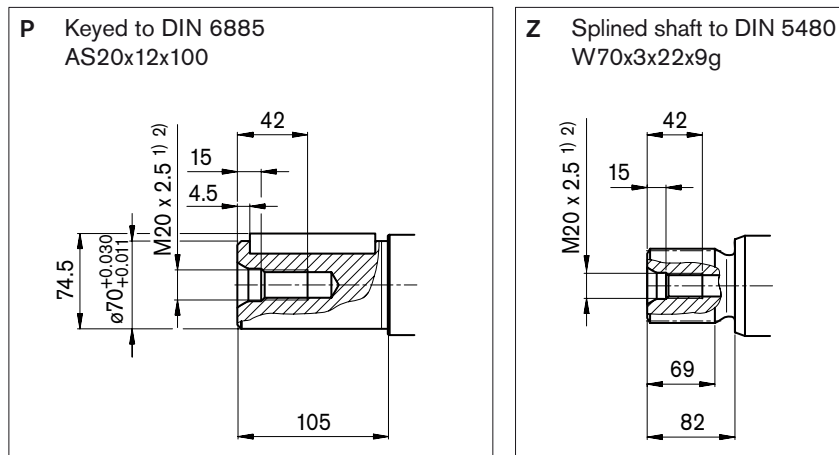
Example: HM control; for exact dimensions of the control device, see separate data sheets



# Dimensions size 355

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

## Drive shafts



## Ports

Designation	Port for	Standard	Size <sup>2)</sup>	Maximum pressure [bar] <sup>3)</sup>	State
A, B	Service line (pressure port)	SAE J518 <sup>4)</sup>	1 1/2 in (high-pressure series)	400	O
	Fastening thread A/B	DIN 13	M16 x 2; 21 deep		O
M <sub>A</sub> , M <sub>B</sub>	Measuring operating pressure A/B	DIN 3852	M14 x 1.5; 12 deep	400	X
T	Drain	DIN 3852 <sup>5)</sup>	M42 x 2; 20 deep	4	X <sup>6)</sup>
E	Boost pressure inlet	DIN 3852	M33 x 2; 18 deep	50	O
K <sub>2</sub> , K <sub>3</sub>	Fill + air bleed	DIN 3852 <sup>5)</sup>	M42 x 2; 20 deep	4	X <sup>6)</sup>
R(L)	Tank line (case drain port)			4	O <sup>6)</sup>
U	Bearing flushing	DIN 3852 <sup>5)</sup>	M18 x 1.5; 12 deep	7	X

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

2) Observe the general instructions on page 68 for the maximum tightening torques.

3) Momentary pressure spikes may occur depending on the application. Keep this in mind when selecting measuring devices and fittings.

4) Only dimensions according to SAE J518, metric fastening thread is a deviation from standard.

5) The countersink may be deeper than specified in the standard.

6) Depending on the installation position, T, K<sub>2</sub>, K<sub>3</sub> or R(L) must be connected (see also pages 66 and 67)

O = Must be connected (plugged on delivery)

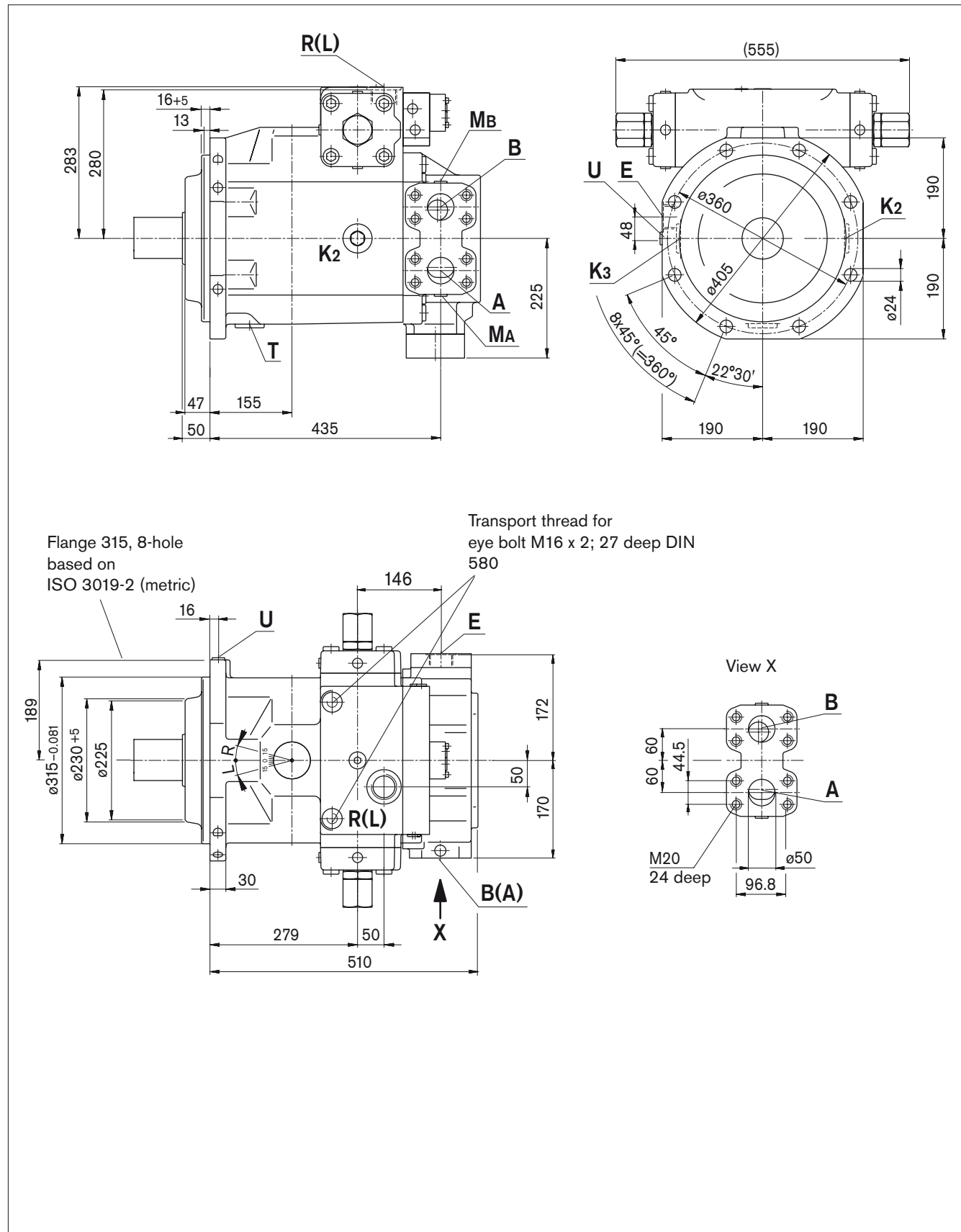
X = Plugged (in normal operation)

# Dimensions size 500

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

## Series 3

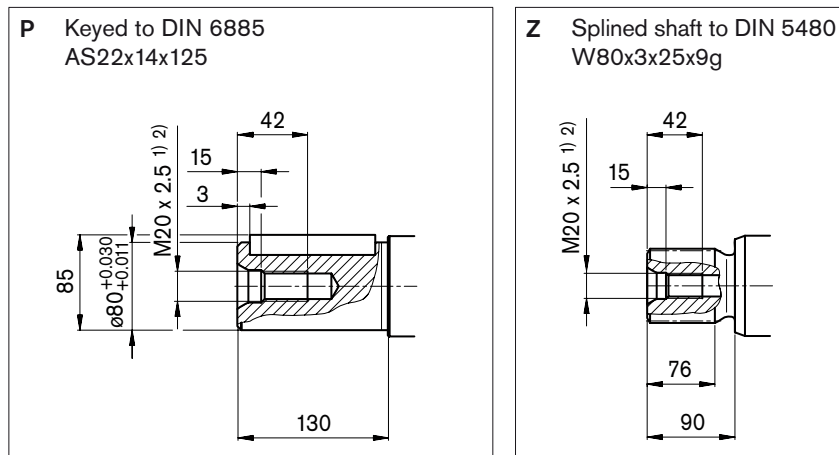
Example: HM control; for exact dimensions of the control device, see separate data sheets



# Dimensions size 500

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

## Drive shafts



## Ports

Designation	Port for	Standard	Size <sup>2)</sup>	Maximum pressure [bar] <sup>3)</sup>	State
A, B	Service line (pressure port)	SAE J518 <sup>4)</sup>	2 in (high-pressure series)	400	O
	Fastening thread A/B	DIN 13	M20 x 2.5; 24 deep		
M <sub>A</sub> , M <sub>B</sub>	Measuring operating pressure A/B	DIN 3852	M18 x 1.5; 12 deep	400	X
T	Drain	DIN 3852 <sup>5)</sup>	M48 x 2; 20 deep	4	X <sup>6)</sup>
E	Boost pressure inlet	DIN 3852	M33 x 2; 18 deep	50	O
K <sub>2</sub> , K <sub>3</sub>	Fill + air bleed	DIN 3852 <sup>5)</sup>	M48 x 2; 20 deep	4	X <sup>6)</sup>
R(L)	Tank line (case drain port)				
U	Bearing flushing	DIN 3852 <sup>5)</sup>	M18 x 1.5; 12 deep	7	X

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

2) Observe the general instructions on page 68 for the maximum tightening torques.

3) Momentary pressure spikes may occur depending on the application. Keep this in mind when selecting measuring devices and fittings.

4) Only dimensions according to SAE J518, metric fastening thread is a deviation from standard.

5) The countersink may be deeper than specified in the standard.

6) Depending on the installation position, T, K<sub>2</sub>, K<sub>3</sub> or R(L) must be connected (see also pages 66 and 67)

O = Must be connected (plugged on delivery)

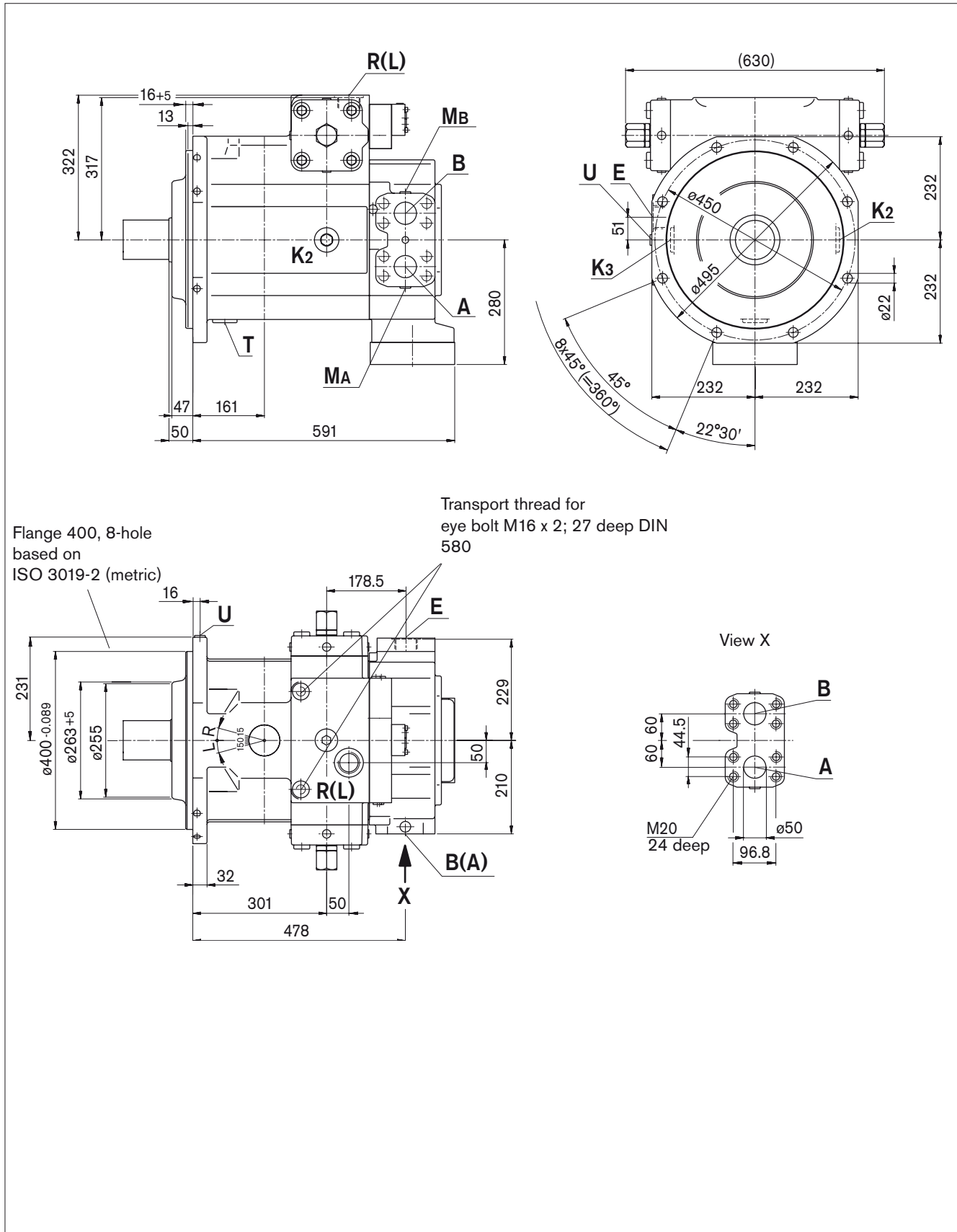
X = Plugged (in normal operation)

# Dimensions size 750

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

## Series 3

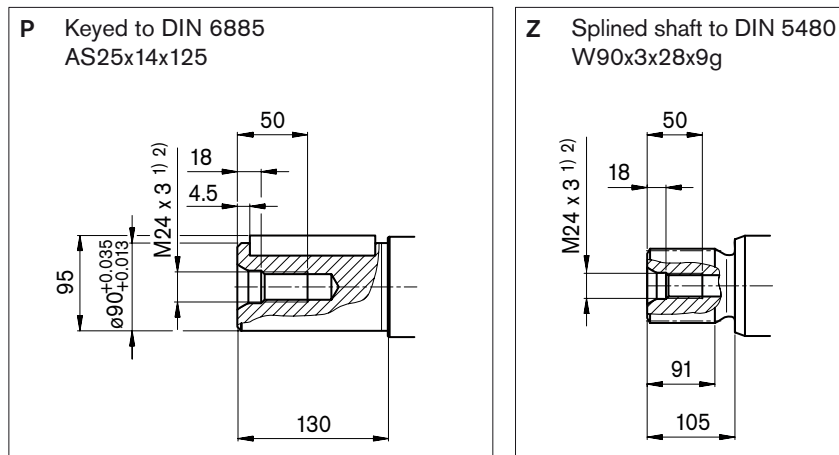
Example: HM control; for exact dimensions of the control device, see separate data sheets



# Dimensions size 750

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

## Drive shafts



## Ports

Designation	Port for	Standard	Size <sup>2)</sup>	Maximum pressure [bar] <sup>3)</sup>	State
A, B	Service line (pressure port)	SAE J518 <sup>4)</sup>	2 in (high-pressure series)	400	O
	Fastening thread A/B	DIN 13	M20 x 2.5; 24 deep		O
M <sub>A</sub> , M <sub>B</sub>	Measuring operating pressure A/B	DIN 3852	M18 x 1.5; 12 deep	400	X
T	Drain	DIN 3852 <sup>5)</sup>	M48 x 2; 20 deep	4	X <sup>6)</sup>
E	Boost pressure inlet	DIN 3852	M48 x 2; 20 deep	50	O
K <sub>2</sub> , K <sub>3</sub>	Fill + air bleed	DIN 3852 <sup>5)</sup>	M48 x 2; 20 deep	4	X <sup>6)</sup>
R(L)	Tank line (case drain port)			4	O <sup>6)</sup>
U	Bearing flushing	DIN 3852 <sup>5)</sup>	M18 x 1.5; 12 deep	7	X

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

2) Observe the general instructions on page 68 for the maximum tightening torques.

3) Momentary pressure spikes may occur depending on the application. Keep this in mind when selecting measuring devices and fittings.

4) Only dimensions according to SAE J518, metric fastening thread is a deviation from standard..

5) The countersink may be deeper than specified in the standard.

6) Depending on the installation position, T, K<sub>2</sub>, K<sub>3</sub> or R(L) must be connected (see also pages 66 and 67)

O = Must be connected (plugged on delivery)

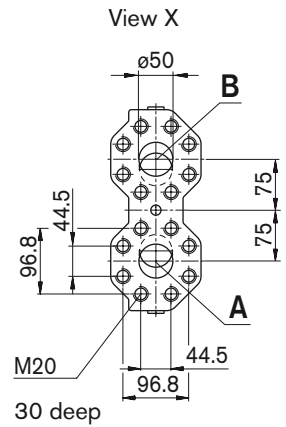
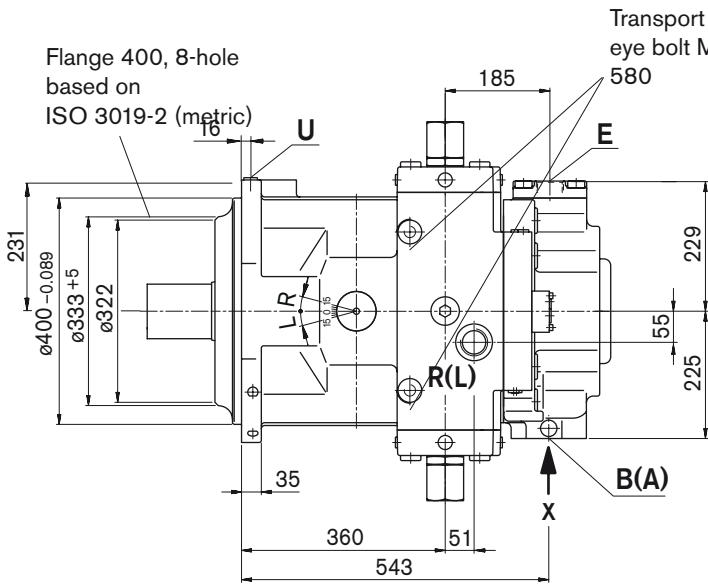
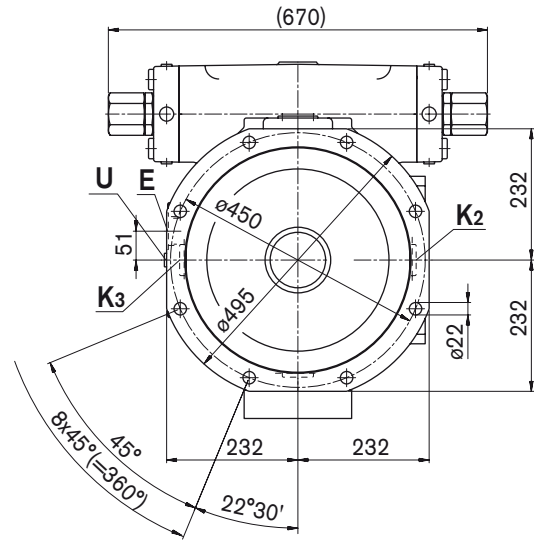
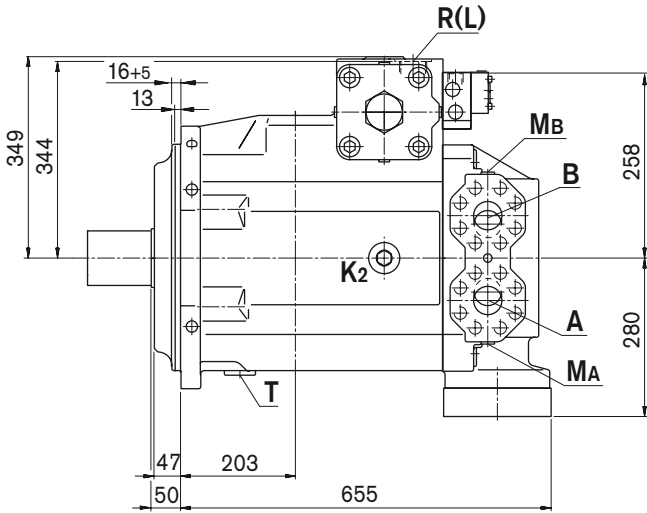
X = Plugged (in normal operation)

# Dimensions size 1000

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

## Series 3

Example: HM control; for exact dimensions of the control device, see separate data sheets



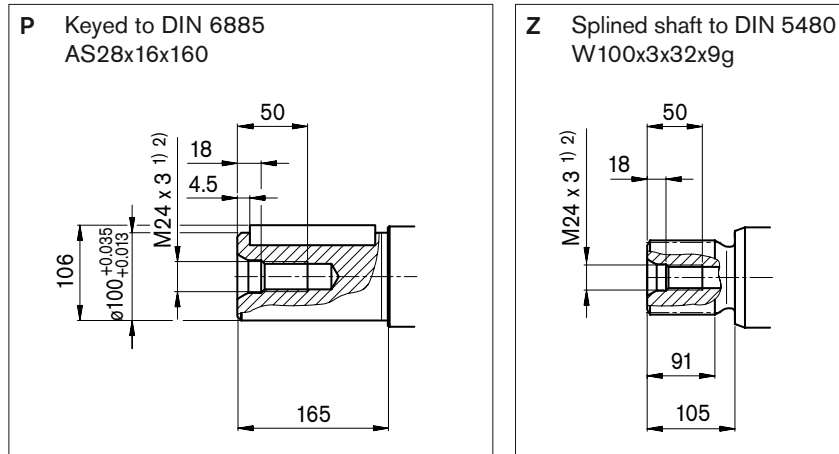
Flange 400, 8-hole based on ISO 3019-2 (metric)



# Dimensions size 1000

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

## Drive shafts



## Ports

Designation	Port for	Standard	Size <sup>2)</sup>	Maximum pressure [bar] <sup>3)</sup>	State
A, B	Service line (pressure port)	SAE J518 <sup>4)</sup>	2 in (high-pressure series)	400	O
	Fastening thread A/B	DIN 13	M20 x 2.5; 30 deep		O
M <sub>A1</sub> , M <sub>B1</sub>	Measuring operating pressure	DIN 3852	M18 x 1.5; 12 deep	400	X
T	Drain	DIN 3852 <sup>5)</sup>	M48 x 2; 20 deep	4	X <sup>6)</sup>
E	Boost pressure inlet	DIN 3852	M48 x 2; 20 deep	50	O
K <sub>2</sub> , K <sub>3</sub>	Fill + air bleed	DIN 3852 <sup>5)</sup>	M48 x 2; 20 deep	4	X <sup>6)</sup>
R(L)	Tank line (case drain port)			4	O <sup>6)</sup>
U	Bearing flushing	DIN 3852 <sup>5)</sup>	M18 x 1.5; 12 deep	7	X

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

2) Observe the general instructions on page 68 for the maximum tightening torques.

3) Momentary pressure spikes may occur depending on the application. Keep this in mind when selecting measuring devices and fittings.

4) Only dimensions according to SAE J518, metric fastening thread is a deviation from standard.

5) The countersink may be deeper than specified in the standard.

6) Depending on the installation position, T, K<sub>2</sub>, K<sub>3</sub> or R(L) must be connected (see also pages 66 and 67)

O = Must be connected (plugged on delivery)

X = Plugged (in normal operation)

## Through drive

The A4VSG axial piston unit can be delivered with a through drive, as shown in the type code on page 3.

The through drive version is designated by codes K 31 through 99.

The maximum number of units in a combination pump is determined by the permissible mass bending moment, see page 35.

### Single pump with through drive

If no further pumps are factory-mounted the simple type code is sufficient.

#### The delivery contents include:

For all through drives except for K 99

Coupling, fixing screws, seal and, if applicable, an intermediate flange

For K 99

With through-drive shaft, without coupling, without intermediate flange; unit is closed fluid tight with pressure-tight cover.

## Combination pumps

Independent circuits are available for the user when further pumps are built on.

1. If the combination pump consists of **2 Rexroth axial piston units** and these are to **be supplied pre-assembled**, the two model designations are to be linked with "+".

Ordering example:

A4VSG 125 EO1 / 30 R – PPB10K339F + A4VSG 71 HM1 / 10 R – PZB10N000N

2. If a **gear pump** is to be **factory mounted** as attachment pump, please contact us.

3. **Mounted and piped auxiliary pumps** (see page 54)

Depending on the application, various auxiliary pumps and/or piping are available.

Ordering example: A4VSG 125 EO1 / 30R – PPB10H029F  
A4VSG with a mounted auxiliary pump piped for the boost circuit.

A4VSG 71EO1/10R – PPB10 H069F

A4VSG with two mounted auxiliary pumps; one is piped for the boost circuit and the other for the control circuit.

#### Note for control units HD.P, HD.T and HD.U:

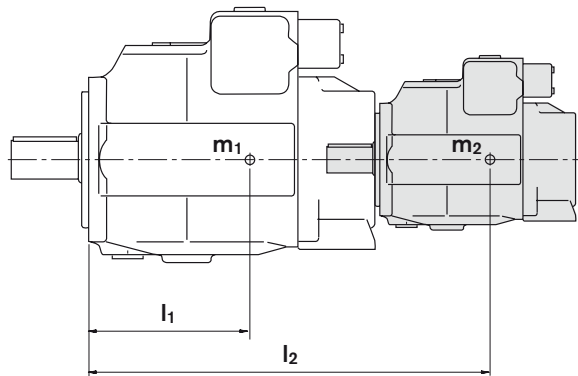
For **combination pump** in tandem design **A4 + A4**, some combinations may result in dimensional restrictions for the mounting of the power control valve or proportional pressure relief valve.

In the following cases, we recommend to carry out the valve mounted on the rear pump or to consult us:

NG40	+	NG40
NG71 with pressure control	+	NG71

# Permissible mass bending moment of inertia

Relative to the mounting flange of the main pump



$m_1, m_2$  [kg] Weight of pump

$l_1, l_2$  [mm] Distance center of gravity

$$T_m = m_1 \cdot l_1 \cdot \frac{1}{102} + m_2 \cdot l_2 \cdot \frac{1}{102} \text{ [Nm]}$$

Size			40	71	125	180	250	355	500	750	1000
Permissible mass moment	$T_{m \text{ perm.}}$	Nm	1800	2000	4200	4200	9300	9300	15600	19500	19500
Permissible mass moment at dynam. acceleration $10 \text{ g} \hat{=} 98.1 \text{ m/sec}^2$	$T_{m \text{ perm.}}$	Nm	180	200	420	420	930	930	1560	1950	1950
Weight (A4VSG...EO2...9)	$m$	kg	47	60	100	114	214	237	350	500	630
Distance center of gravity	$l_1$	mm	120	140	170	180	210	220	230	260	290

# Overview of mounting options on A4VSG

Through drive - A4VSG			Mounting option of 2nd pump					Through drive
Flange	Coupling for splined shaft	Code	A4VSO/G NG (shaft)	A4CSG NG (shaft)	A10V(S)O/31(2) <sup>5)</sup> NG (shaft)	A10V(S)O/52(3) NG (shaft)	External/internal gear pump	available for NG
<b>Flange ISO 3019-2 (metric)</b>								
80, 2-hole	19-4 (3/4in, 11T) <sup>3)</sup>	<b>KB2</b>	–	–	18 (S)/31	10 (S)	–	71, 125
100, 2-hole	22-4 (7/8in, 13T) <sup>3)</sup>	<b>KB3</b>	–	–	28 (S)/31	–	–	40 to 180
	25-4 (1in, 15T) <sup>3)</sup>	<b>KB4</b>	–	–	45 (S)/31	–	–	40 to 500
125, 2-hole	32-4 (1 1/4in, 14T) <sup>3)</sup>	<b>KB5</b>	–	–	71 (S)/31	–	–	71 to 500
	38-4 (1 1/2in, 17T) <sup>3)</sup>	<b>KB6</b>	–	–	100 (S)/31	–	–	125 to 750
125, 4-hole	W 32x2x14x9g <sup>2)</sup>	<b>K31</b>	40 (Z)	–	–	–	–	40 to 500
140, 4-hole	W 40x2x18x9g <sup>2)</sup>	<b>K33</b>	71 (Z)	–	–	–	–	71 to 1000
160, 4-hole	W 50x2x24x9g <sup>2)</sup>	<b>K34</b>	125 (Z)	–	–	–	–	125 to 750
			180 (Z)	–	–	–	–	180 to 750
	32-4 (1 1/4in, 14T) <sup>3)</sup>	<b>KB8</b>	–	–	71 (S)/32	–	–	in preparation
180, 4-hole	44-4 (1 3/4in, 13T) <sup>3)</sup>	<b>KB7</b>	–	–	140 (S)/31/32	–	–	180 to 750
	38-4 (1 1/2in, 17T) <sup>3)</sup>	<b>KB9</b>	–	–	100 (S)/32	–	–	in preparation
224, 4-hole	W 60x2x28x9g <sup>2)</sup>	<b>K35</b>	250 (Z)	250 (Z)	–	–	–	250 to 1000
	W 70x3x22x9g <sup>2)</sup>	<b>K77</b>	355 (Z)	355 (Z)	–	–	–	355, 500
315, 8-hole	W 80x3x25x9g <sup>2)</sup>	<b>K43</b>	500 (Z)	500 (Z)	–	–	–	500, 750
400, 8-hole	W 90x3x28x9g <sup>2)</sup>	<b>K76</b>	750 (Z)	750 (Z)	–	–	–	750, 1000
	W 100x3x32x9g <sup>2)</sup>	<b>K88</b>	1000 (Z)	–	–	–	–	1000
<b>Flange SAE J 744 (ISO 3019-1)</b>								
82-2 (A) <sup>1)</sup>	16-4 (5/8in, 9T) <sup>3)</sup>	<b>K01</b>	–	–	–	–	AZ-PF-1X-004 to 022 <sup>4)</sup>	40 to 750
	19-4 (3/4in, 11T) <sup>3)</sup>	<b>K52</b>	–	–	18 (S)/31	10, 18 (S)	–	40, 71, 355
101-2 (B) <sup>1)</sup>	22-4 (7/8in, 13T) <sup>3)</sup>	<b>K68</b>	–	–	28 (S)/31	28 (S)	AZ-PN-1X-020 to 032 <sup>4)</sup>	40 to 750
	25-4 (1in, 15T) <sup>3)</sup>	<b>K04</b>	–	–	45 (S)/31	45 (S)	PGH4	40 to 500
127-2 (C) <sup>1)</sup>	32-4 (1 1/4in, 14T) <sup>3)</sup>	<b>K07</b>	–	–	71 (S)/31	–	–	71 to 1000
	38-4 (1 1/2in, 17T) <sup>3)</sup>	<b>K24</b>	–	–	100 (S)/31	85 (S)	PGH5	125 to 1000
152-4 (D) <sup>1)</sup>	44-4 (1 3/4in, 13T) <sup>3)</sup>	<b>K17</b>	–	–	140 (S)/31	–	–	180 to 750

<sup>1)</sup> 2 = 2-hole, 4 = 4-hole

<sup>2)</sup> According to DIN 5480

<sup>3)</sup> Splined shafts acc. to SAEJ744 OCT83

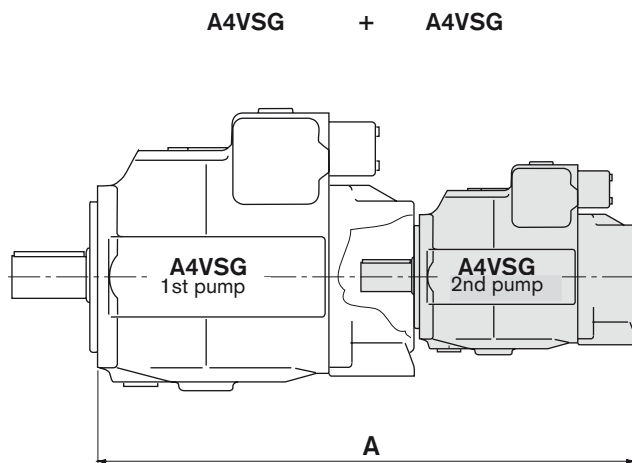
<sup>4)</sup> Bosch Rexroth recommends special versions of the gear pumps. Please contact us.

<sup>5)</sup> If a through drive for an A10V(S)O with R-shaft is desired, please contact us.

# Notes

# Combination pumps dimensions

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



## Overall length A

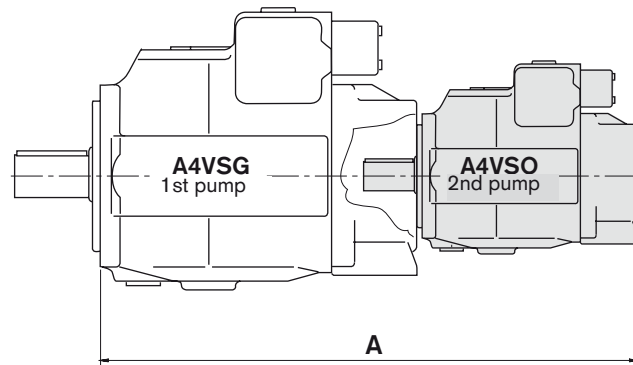
A4VSG (1st pump)	A4VSG (2nd pump)								
	NG40	NG71	NG125	NG180	NG250	NG355	NG500	NG750	NG1000
NG40	570	–	–	–	–	–	–	–	–
NG71	598	622	–	–	–	–	–	–	–
NG125	655	679	743	–	–	–	–	–	–
NG180	679	703	766	778	–	–	–	–	–
NG250	713	737	832	844	912	–	–	–	–
NG355	*	766	861	873	941	962	–	–	–
NG500	*	811	868	880	984	1005	1100	–	–
NG750	*	*	*	*	1034	*	*	1246	–
NG1000	*	934	*	*	1107	*	*	1319	1383

\* on request

# Combination pumps dimensions

A4VSG + A4VSO

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



## Overall length A

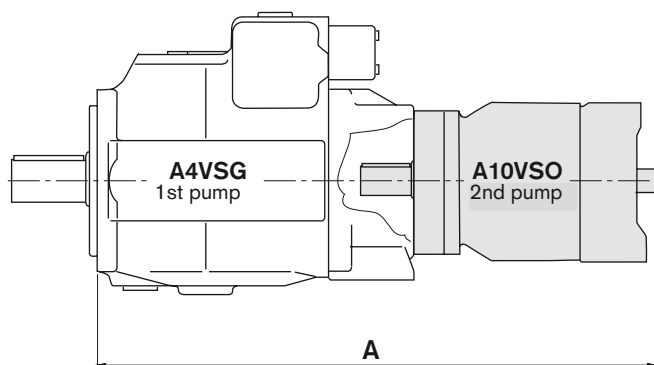
A4VSG (1st pump)	A4VSO (2nd pump)								
	NG40	NG71	NG125	NG180	NG250	NG355	NG500	NG750	NG1000
NG40	554	–	–	–	–	–	–	–	–
NG71	582	611	–	–	–	–	–	–	–
NG125	639	668	735	–	–	–	–	–	–
NG180	663	692	758	778	–	–	–	–	–
NG250	697	726	824	844	904	–	–	–	–
NG355	*	755	853	873	933	962	–	–	–
NG500	*	800	860	880	976	1005	1110	–	–
NG750	*	*	*	*	1026	*	*	1215	–
NG1000	*	923	*	*	1099	*	*	1288	1361

\* on request

# Combination pumps dimensions

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

A4VSG + A10VSO



## Overall length A

A4VSG (1st pump)	A10VSO.../31 (2nd pump)					
	NG18	NG28	NG45	NG71	NG100	NG140
NG40	*	496	*	–	–	–
NG71	*	*	540	578	–	–
NG125	*	584	*	635	707	732
NG180	*	*	595	659	731	756
NG250	*	637	655	688	780	*
NG355	*	*	*	717	809	835
NG500	*	*	*	762	834	*
NG750	*	*	*	*	884	917
NG1000	*	*	*	*	*	*

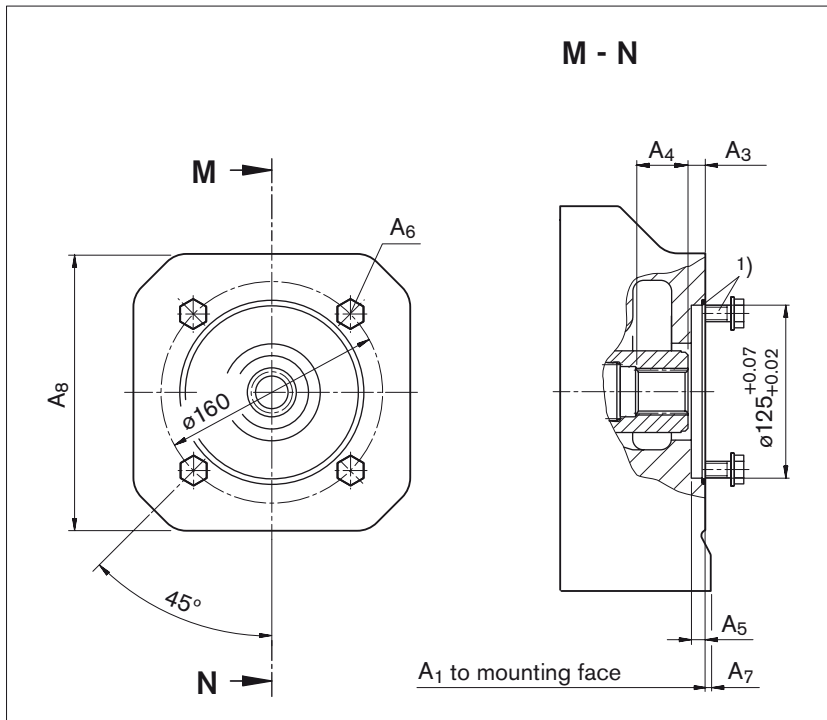
\* on request



# Through drive dimensions

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

**K31** Flange ISO 3019-2 125, 4-hole  
Shaft coupler to DIN 5480 N32x2x14x8H  
for mounting an A4VSO/G 40 splined shaft

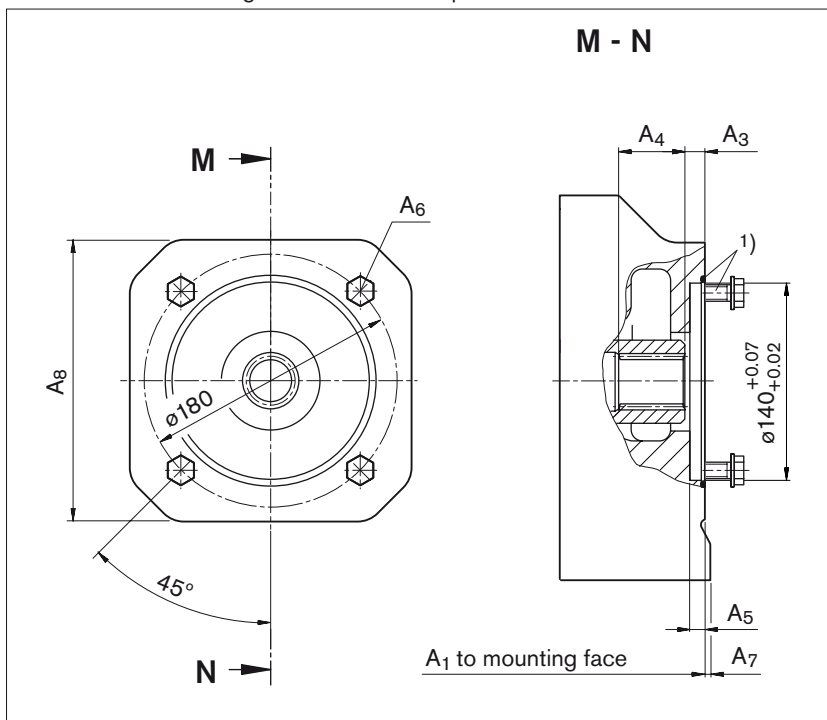


NG	A <sub>1</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub> <sup>2)</sup>
40	288	12.5	41.4	10	M12
71	316	12.5	33.6	10	M12
125	373	12.5	42	10	M12
180	397	12.5	42	10	M12
250	431	12.5	37.9	10	M12
355	on request				
500	on request				
750	on request				
1000	on request				

NG	A <sub>7</sub>	A <sub>8</sub>
40	–	–
71	–	–
125	–	–
180	–	–
250	10	200
355	on request	
500	on request	
750	on request	
1000	on request	

**K33** Flange ISO 3019-2 140, 4-hole  
Shaft coupler to DIN 5480 N40x2x18x8H  
for mounting an A4VSO/G 71 splined shaft



NG	A <sub>1</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub> <sup>2)</sup>
71	316	12	44	9	M12
125	373	12.5	50	10	M12
180	397	12.5	43.8	10	M12
250	431	12.5	49	10	M12
355	460	12.5	49	10	M12
500	505	12.5	44	10	M12
750	on request				
1000	628	12.5	64.5	10	M12

NG	A <sub>7</sub>	A <sub>8</sub>
71	–	–
125	–	–
180	–	–
250	10	200
355	–	–
500	–	–
750	on request	
1000	27	280

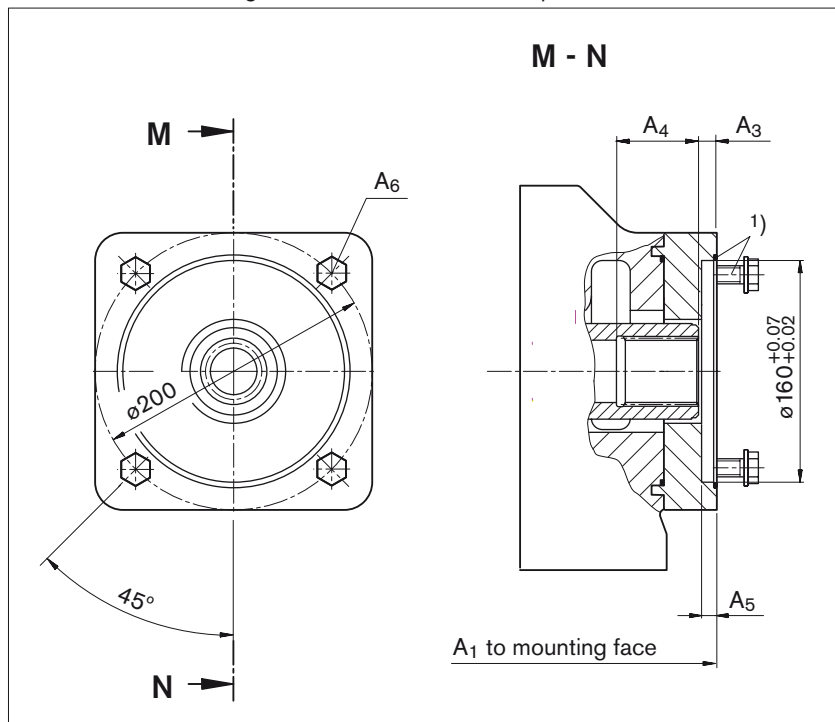
1) Fastening screws and O-ring seal are included in the delivery contents.

2) Thread according to DIN 13, observe the general instructions on page 68 for the maximum tightening torques.

# Through drive dimensions

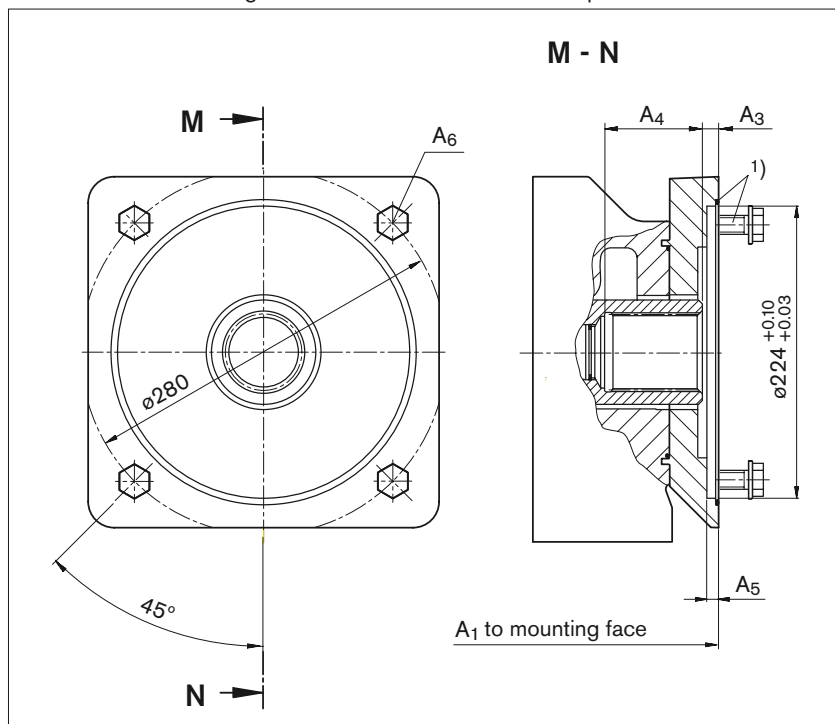
Before finalizing your design, request a binding installation drawing. Dimensions in mm.

**K34** Flange ISO 3019-2 160, 4-hole  
**Shaft coupler** to DIN 5480 N50x2x24x8H  
 for mounting an A4VSO/G 125 or 180 splined shaft



NG	A <sub>1</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub> <sup>2)</sup>
125	380	12.5	58	10	M16
180	403	12.5	58	10	M16
250	469	12.5	60	10	M16
355	498	12.5	60	10	M16
500	505	12.5	60	10	M16
750	on request				
1000	on request				

**K35** Flange ISO 3019-2 224, 4-hole  
**Shaft coupler** to DIN 5480 N60x2x28x8H  
 for mounting an A4VSO/G or A4CSG 250 splined shaft



NG	A <sub>1</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub> <sup>2)</sup>
250	469	12.5	75	9	M20
355	498	12.5	75	9	M20
500	541	12.5	74	10	M20
750	591	12.5	74	10	M20
1000	664	12.5	69.5	10	M20

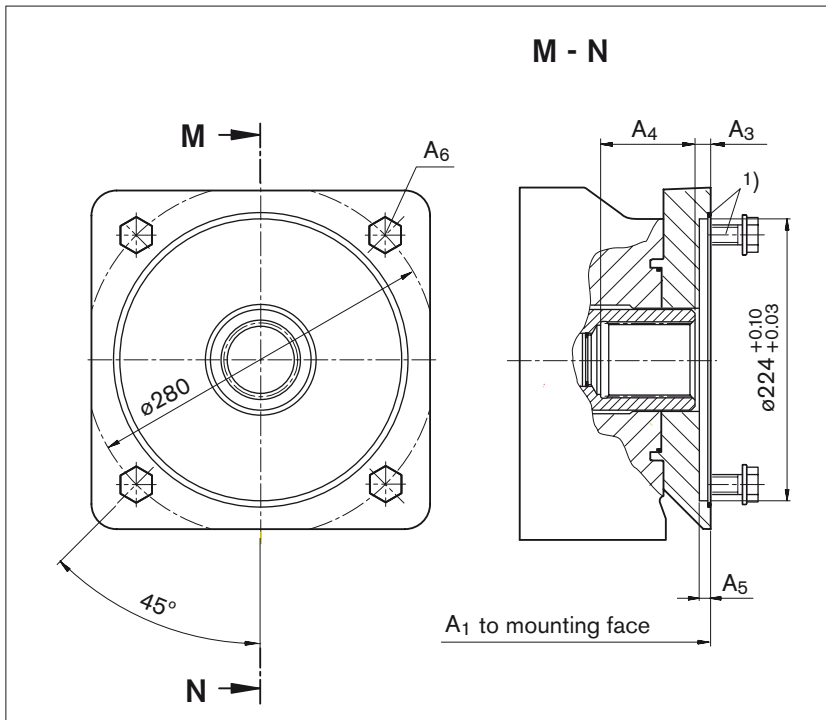
1) Fastening screws and O-ring seal are included in the delivery contents

2) Thread according to DIN 13, observe the general instructions on page 68 for the maximum tightening torques.

# Through drive dimensions

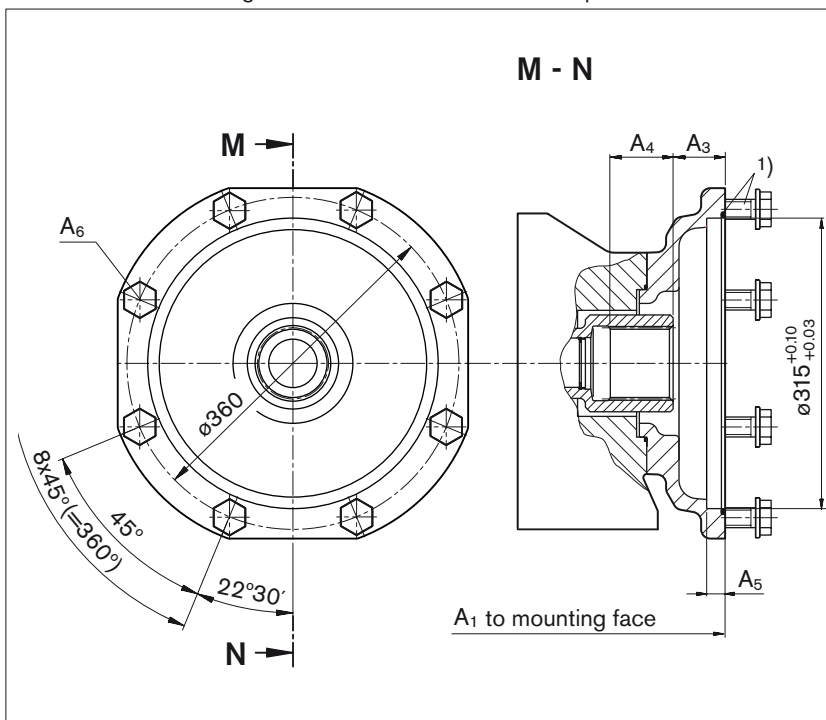
Before finalizing your design, request a binding installation drawing. Dimensions in mm.

**K77** Flange ISO 3019-2 224, 4-hole  
**Shaft coupler** to DIN 5480 N70x3x22x8H  
 for mounting an A4VSO/G or A4CSG 355 splined shaft



NG	A <sub>1</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub> <sup>2)</sup>
355	498	12.5	82	9	M20
500	541	12.5	82	10	M20
750	on request				
1000	on request				

**K43** Flange ISO 3019-2 315, 8-hole  
**Shaft coupler** to DIN 5480 N80x3x25x8H  
 for mounting an A4VSO/G or A4CSG 500 splined shaft



NG	A <sub>1</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub> <sup>2)</sup>
500	590	53.5	71.9	19	M20
750	on request				
1000	on request				

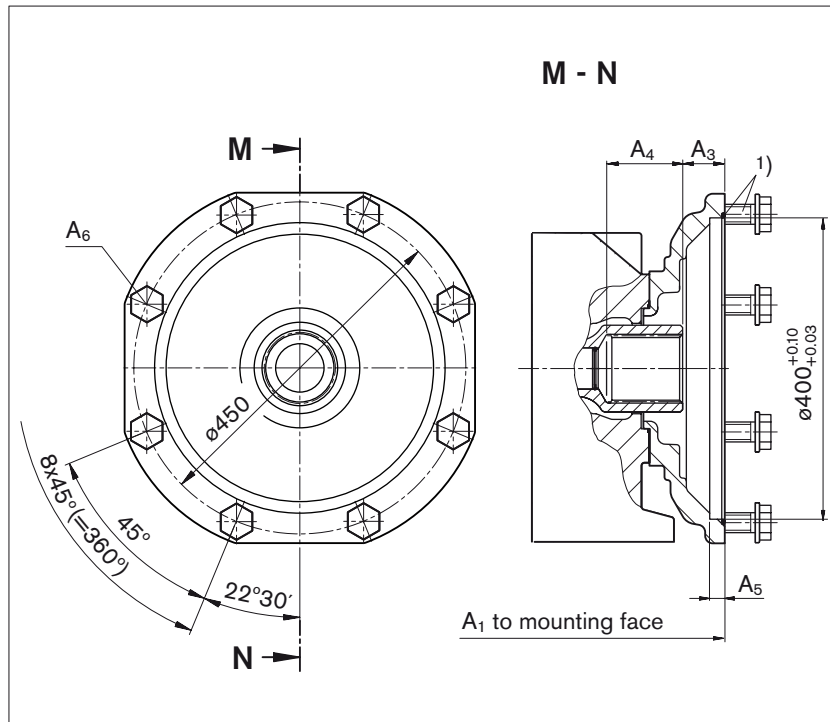
1) Fastening screws and O-ring seal are included in the delivery contents.

2) Thread according to DIN 13, observe the general instructions on page 68 for the maximum tightening torques.

# Through drive dimensions

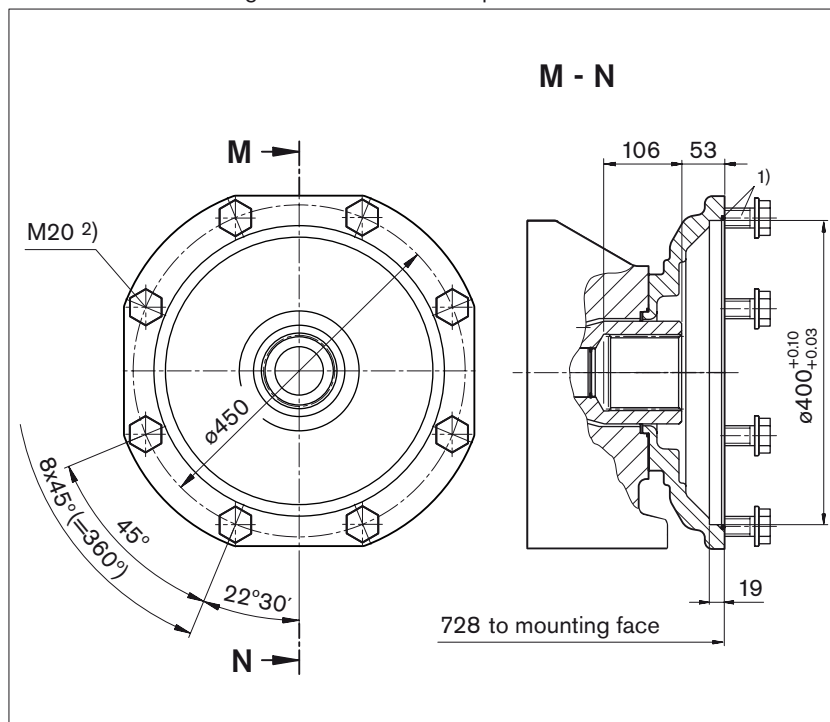
Before finalizing your design, request a binding installation drawing. Dimensions in mm.

**K76** Flange ISO 3019-2 400, 8-hole  
**Shaft coupler** to DIN 5480 N90x3x28x8H  
 for mounting an A4VSO/G, A4CSG 750 splined shaft



NG	A <sub>1</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub> <sup>2)</sup>
750	655	104	53	19	M20
1000	728	109	53	19	M20

**K88** Flange ISO 3019-2 400, 8-hole  
**Shaft coupler** to DIN 5480 N100x3x32x8H  
 for mounting an A4VSO/G 1000 splined shaft

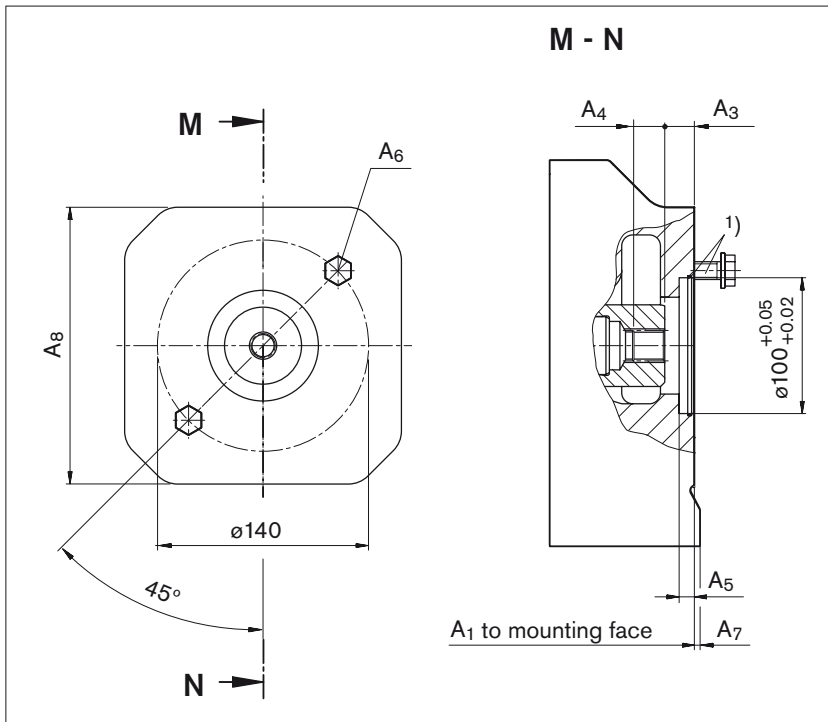


- 1) Fastening screws and O-ring seal are included in the delivery contents.
- 2) Thread according to DIN 13, observe the general instructions on page 68 for the maximum tightening torques.

# Through drive dimensions

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

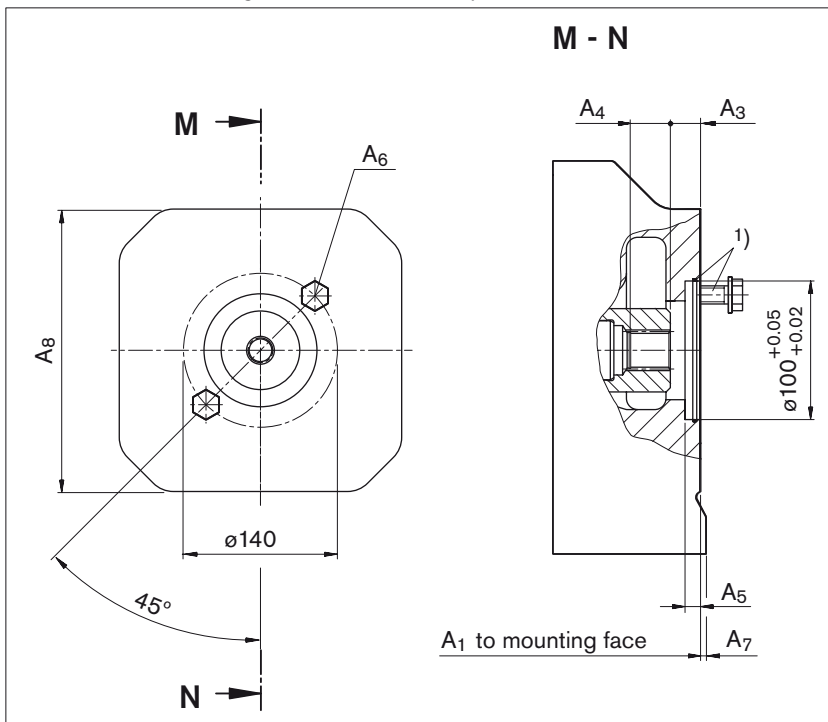
**KB3** Flange ISO 3019-2 100, 2-hole  
**Shaft coupler for splined shaft 22-4 SAE B, 7/8 in, 16/32 DP; 13 T<sup>3)</sup>**  
 for mounting an A10VSO 28/31 splined shaft S (see RE 92711)



NG	A <sub>1</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub> <sup>2)</sup>
40	290	20.4	23	10	M12
71	on request				
125	378	20.3	24.5	10	M12
180	on request				
250	431	20.5	23	10	M12
355	on request				
500	on request				
750	on request				
1000	on request				

NG	A <sub>7</sub>	A <sub>8</sub>
40	-	-
71	on request	
125	-	-
180	on request	
250	10	200
355	on request	
500	on request	
750	on request	
1000	on request	

**KB4** Flange ISO 3019-2 100, 2-hole  
**Shaft coupler for splined shaft 25-4 SAE B-B, 1 in, 16/32 DP; 15 T<sup>3)</sup>**  
 for mounting an A10VSO 45/31 splined shaft S – see RE 92711



NG	A <sub>1</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub> <sup>2)</sup>
40	on request				
71	316	20.8	27.5	8	M12
125	on request				
180	371	21.8	27.9	10	M12
250	431	20.9	27.5	10	M12
355	on request				
500	on request				
750	on request				
1000	on request				

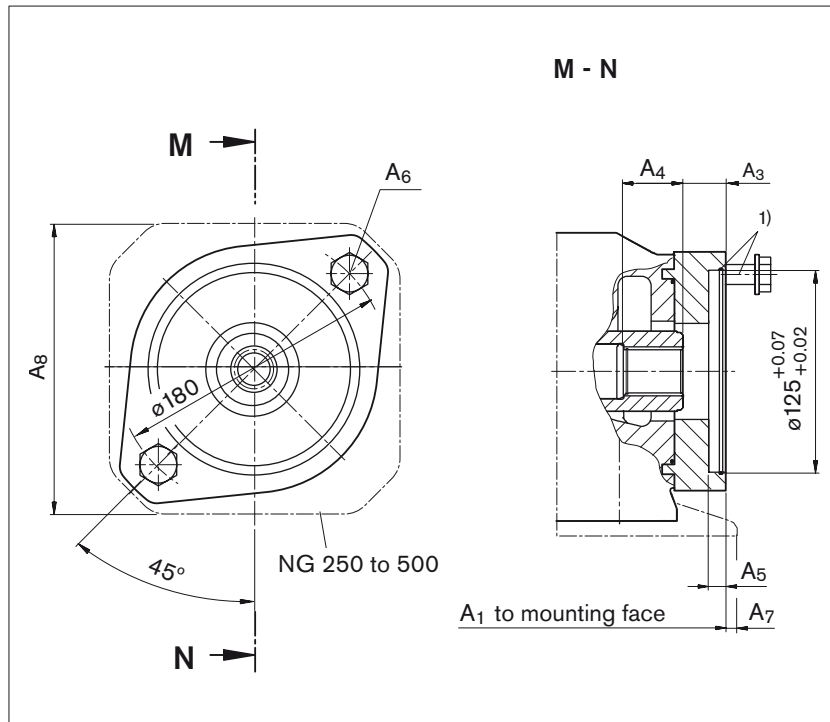
NG	A <sub>7</sub>	A <sub>8</sub>
40	on request	
71	-	-
125	on request	
180	-	-
250	10	200
355	on request	
500	on request	
750	on request	
1000	on request	

- 1) 2 fastening screws and O-ring seal are included in the delivery contents
- 2) Thread according to DIN 13, observe the general instructions on page 68 for the maximum tightening torques.
- 3) According to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5

# Through drive dimensions

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

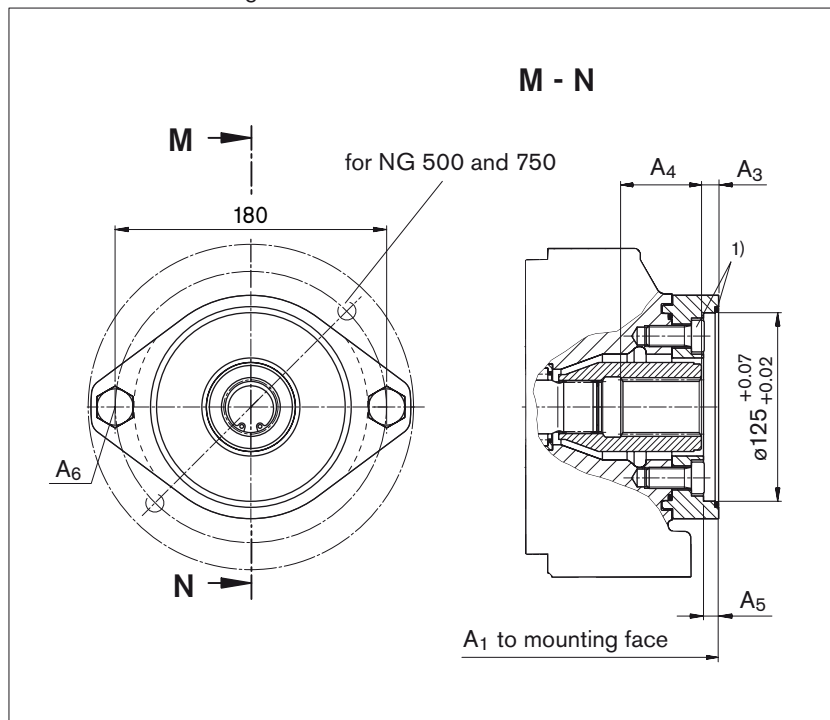
**KB5** Flange ISO 3019-2 125, 2-hole  
**Shaft coupler** for splined shaft 32-4 SAE C, 1 1/4 in, 12/24 DP; 14 T<sup>3)</sup>  
 for mounting an A10VSO 71/31 splined shaft S – see RE 92711



NG	A <sub>1</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub> <sup>2)</sup>
71	321	23.1	38.1	10	M16
125	378	23.7	38.1	10	M16
180	402	23.7	38.1	10	M16
250	431	22	36.1	10	M16
355	460	22	36.1	10	M16
500	505	19.3	40.4	10	M16
750	on request				
1000	on request				

NG	A <sub>7</sub>	A <sub>8</sub>
71	–	–
125	–	–
180	–	–
250	10	200
355	–	–
500	–	–
750	on request	
1000	on request	

**KB6** Flange ISO 3019-2 125, 2-hole  
**Shaft coupler** for splined shaft 38-4 SAE C-C, 1 1/2 in, 12/24 DP; 17 T<sup>3)</sup>  
 for mounting an A10VSO 100/31 – see RE 92711



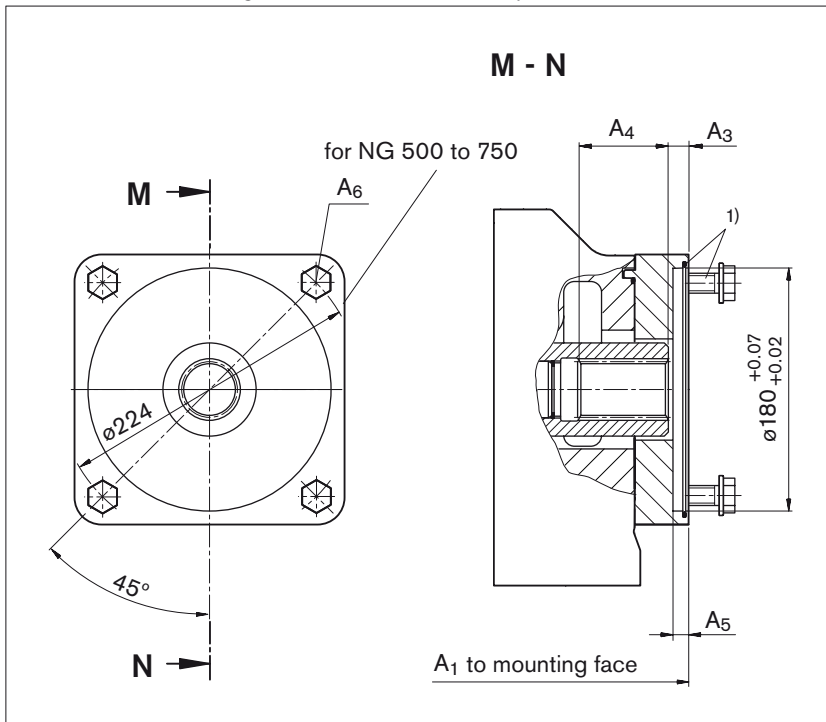
NG	A <sub>1</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub> <sup>2)</sup>
125	378	11.4	54	10	M16
180	402	11.4	54	10	M16
250	451	11	57.1	10	M16
355	480	11	57.1	10	M16
500	505	11	56	10	M16
750	555	11	56	10	M16
1000	on request				

- 1) 2 fastening screws and O-ring seal are included in the delivery contents
- 2) Thread according to DIN 13, observe the general instructions on page 68 for the maximum tightening torques.
- 3) According to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5

# Through drive dimensions

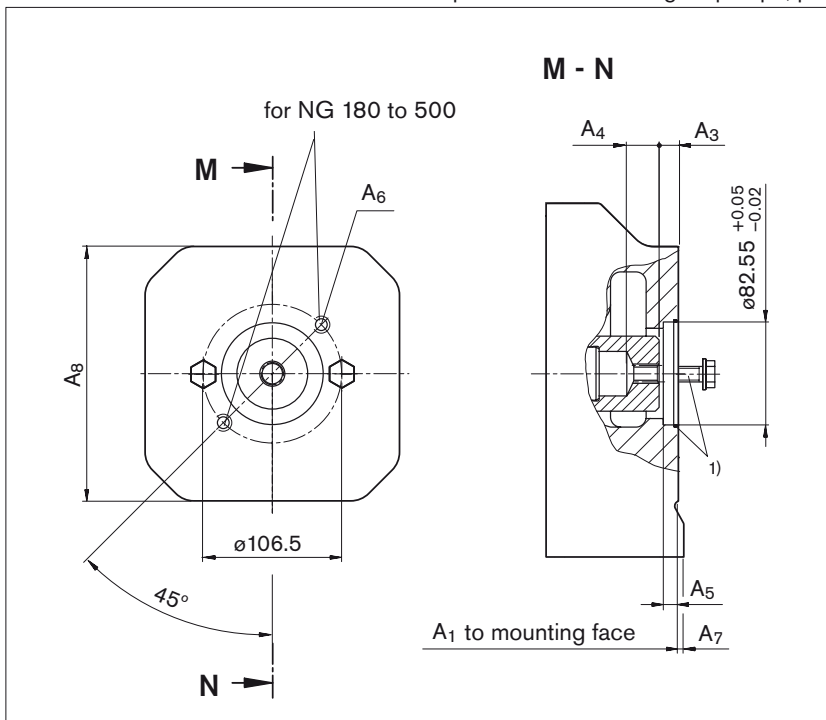
Before finalizing your design, request a binding installation drawing. Dimensions in mm.

**KB7** Flange ISO 3019-2 180, 4-hole  
**Shaft coupler** for splined shaft 44-4 SAE D, 1 3/4 in, 8/16 DP; 13 T<sup>3)</sup>  
 for mounting an A10VSO 140/31/32 splined shaft S – see RE 92711 (RE 92714)



NG	A <sub>1</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub> <sup>2)</sup>
125	395	10.5	45	10	M16
180	419	10.5	45	10	M16
250	on request				
355	498	11	69.3	10	M16
500	on request				
750	580	11	63	10	M16
1000	on request				

**K01** Flange ISO 3019-1 82-2 (SAE A)  
**Shaft coupler** for splined shaft 16-4 SAE A, 5/8 in, 16/32 DP; 9T<sup>3)</sup>  
 for mounting an external gear pump AZ-PF-1X-004...022 (see RE 10089)  
 Bosch Rexroth recommends a special version of the gear pumps, please contact us



NG	A <sub>1</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub> <sup>2)</sup>
40	263	9	25.9	10	M10
71	291	10.5	25.4	10	M10
125	347	10.3	28	10	M10
180	371	9	28	10	M10
250	431	9	30	10	M10
355	460	10	30	10	M10
500	505	10	33	10	M10
750	555	10	33	10	M10
1000	on request				

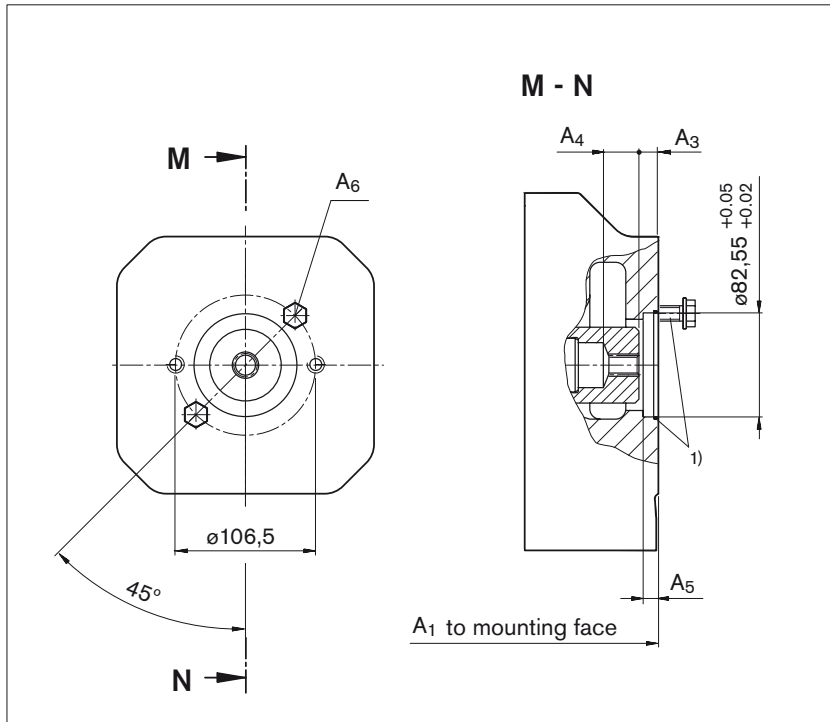
NG	A <sub>7</sub>	A <sub>8</sub>
40	18	130
71	15	140
125	13	150
180	–	–
250	10	200
355	–	–
500	–	–
750	–	–
1000	on request	

- 1) 2 or 4 fastening screws and O-ring seal are included in the delivery contents
- 2) Thread according to DIN 13, observe the general instructions on page 68 for the maximum tightening torques.
- 3) According to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5

# Through drive dimensions

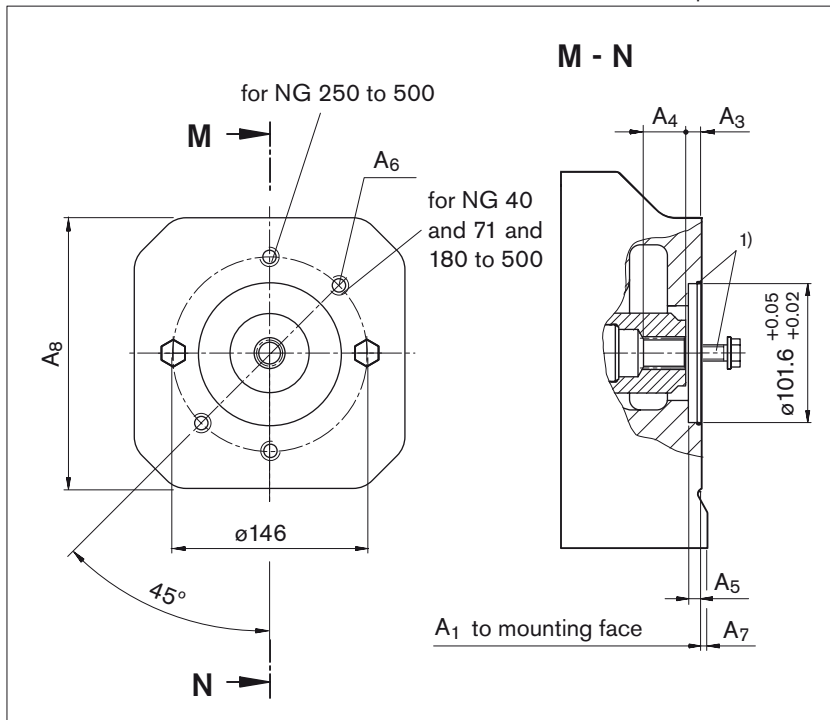
Before finalizing your design, request a binding installation drawing. Dimensions in mm.

**K52** Flange ISO 3019-1 82-2 (SAE A)  
**Shaft coupler** for splined shaft 19-4 SAE A-B, 3/4 in, 16/32 DP; 11T<sup>3)</sup>  
 for mounting an A10VSO 18/31 splined shaft S (see RE 92711)  
 or A10VSO 10/52 or 18/53 splined shaft S (see RE 92703)



NG	A <sub>1</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub> <sup>2)</sup>
40	on request				
71	on request				
125	on request				
180	on request				
250	on request				
355	460	11	32.4	10	M10
500	on request				
750	on request				
1000	on request				

**K68** Flange ISO 3019-1 101-2 (SAE B)  
**Shaft coupler** for splined shaft 22-4 SAE B, 7/8 in, 16/32 DP; 13T<sup>3)</sup>  
 for mounting an external gear pump AZ-PN-1X020...032 (see RE 10091) or an A10VO 28/31 and 52(53) splined shaft S  
 (see RE 92701 and 92703) Bosch Rexroth recommends special versions of the gear pumps, please contact us



NG	A <sub>1</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub> <sup>2)</sup>
40	290	11	33.2	10	M12
71	322	11	34.4	10	M12
125	347	11	35.3	10	M12
180	371	11	38.7	10	M12
250	431	20.5	29.4	10	M12
355	460	19.2	32.9	10	M12
500	505	11	41	10	M12
750	on request				
1000	on request				

NG	A <sub>7</sub>	A <sub>8</sub>
40	-	-
71	-	-
125	13	150
180	-	-
250	10	200
355	-	-
500	-	-
750	on request	
1000	on request	

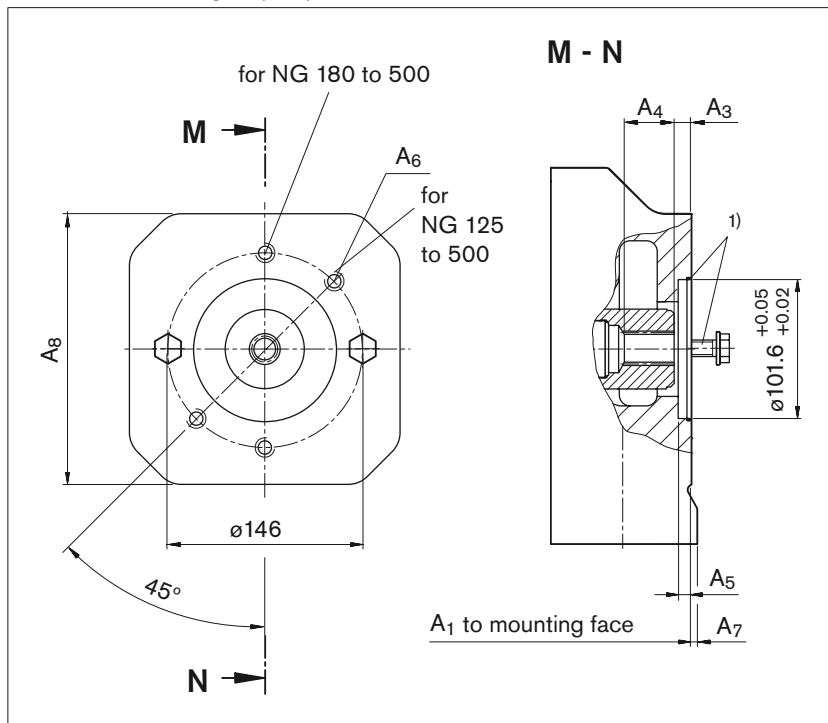
1) 2 fastening screws and O-ring seal are included in the delivery contents  
 2) Thread according to DIN 13, observe the general instructions on page 68 for the maximum tightening torques.  
 3) According to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5



# Through drive dimensions

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

- K04** Flange ISO 3019-1 101-2 (SAE B)  
**Shaft coupler** for splined shaft 25-4 SAE B-B, 1 in, 16/32 DP; 15T<sup>3)</sup>  
 for mounting an A10VO 45/31 and /52 (53) splined shaft S (see RE 92701 and 92703) or an internal gear pump PGH4 (see RE 10223)

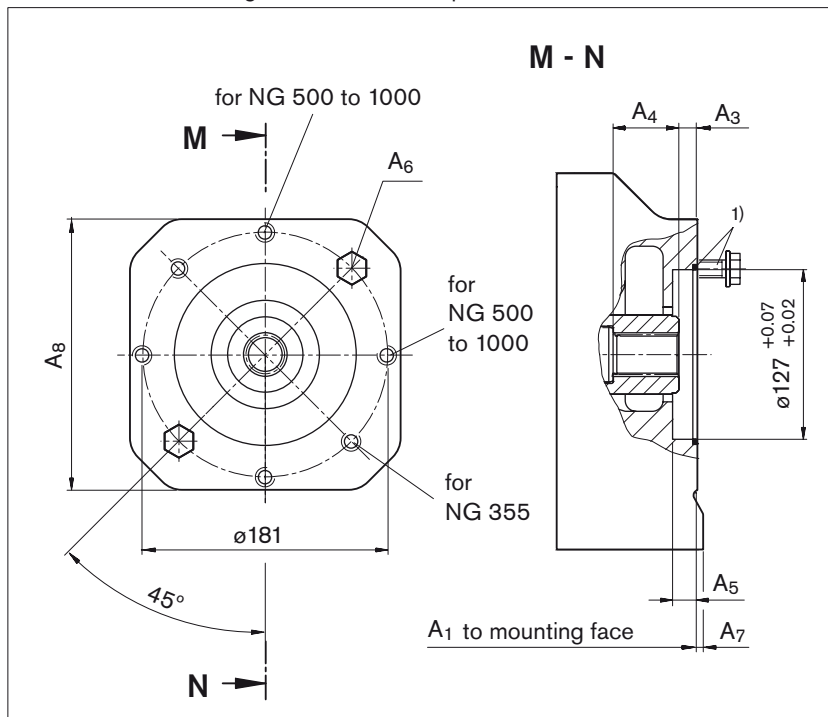


NG	A <sub>1</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub> <sup>2)</sup>
40	on request				
71	322	11	35.1	10	M12
125	379	12.4	37.5	10	M12
180	371	11	35.3	10	M12
250	431	11	41.4	10	M12
355	460	11	41.4	10	M12
500	505	11	44	10	M12
750	on request				
1000	on request				

NG	A <sub>7</sub>	A <sub>8</sub>
40	18	130
71	–	–
125	–	–
180	–	–
250	10	200
355	–	–
500	–	–
750	on request	
1000	on request	

- K07** Flange ISO 3019-1 127-2 (SAE C)  
**Shaft coupler** for splined shaft 32-4 SAE C, 1 1/4 in, 12/24 DP; 14 T<sup>3)</sup>  
 for mounting an A10VO 71/31 splined shaft S (see RE 92701)



NG	A <sub>1</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub> <sup>2)</sup>
71	on request				
125	377	10.4	50	13	M16
180	401	10.4	50	13	M16
250	431	10.4	51	13	M16
355	460	10.4	51	13	M16
500	505	11.3	51.7	13	M16
750	555	11.3	51.7	13	M16
1000	628	10.4	54.6	13	M16

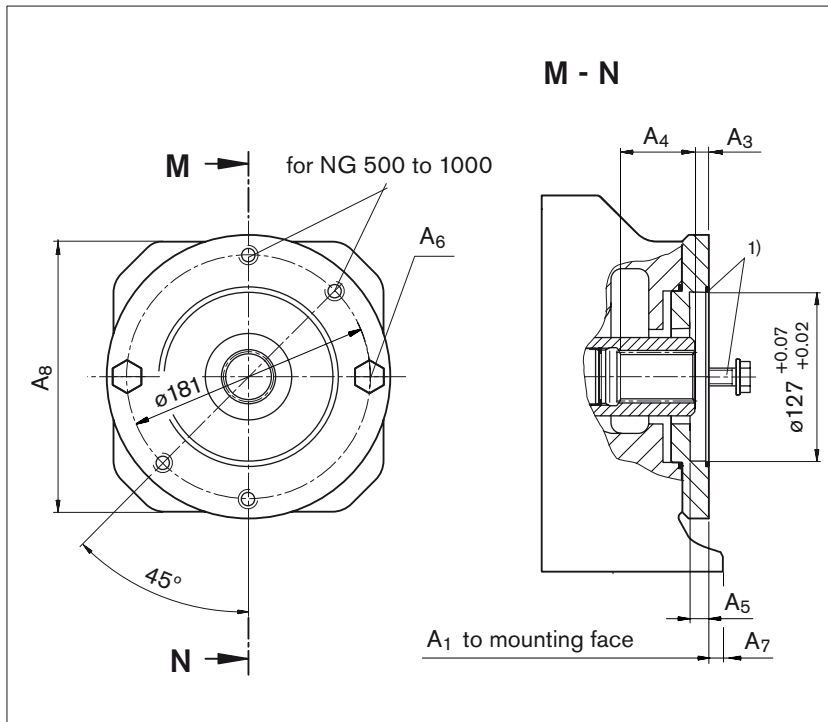
NG	A <sub>7</sub>	A <sub>8</sub>
71	on request	
125	–	–
180	–	–
250	10	200
355	–	–
500	–	–
750	23	250
1000	25	280

- 1) 2 fastening screws and O-ring seal are included in the delivery contents  
 2) Thread according to DIN 13, observe the general instructions on page 68 for the maximum tightening torques.  
 3) According to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5

# Through drive dimensions

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

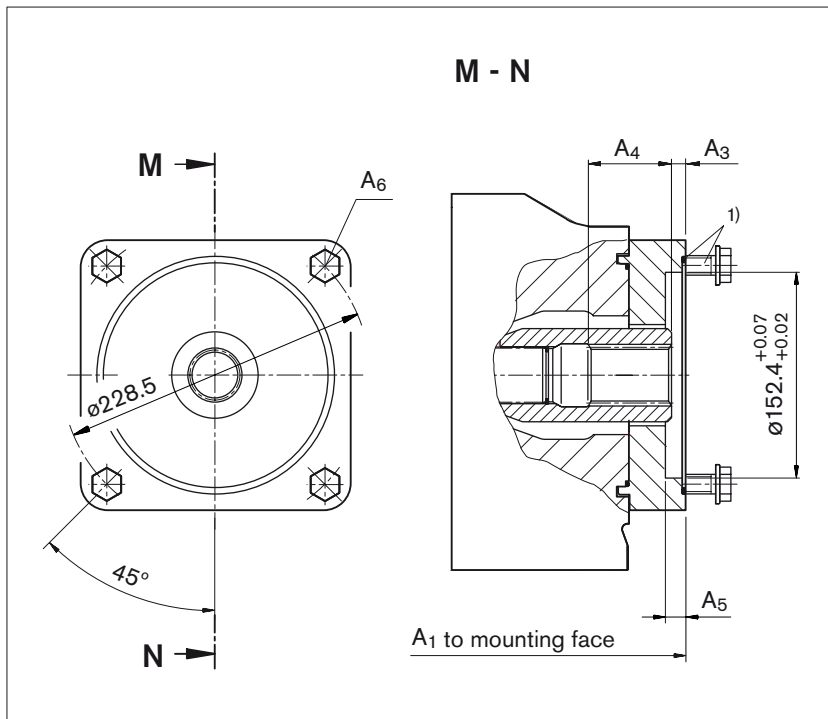
**K24** Flange ISO 3019-1 127-2 (SAE C)  
**Shaft coupler** for splined shaft 38-4 SAE C-C, 1 1/2 in, 12/24 DP; 17 T<sup>3)</sup>  
 for mounting an A10VO 100/31 splined shaft S (see RE 92701) or an A10VO 85/52(53) splined shaft S (see RE 92703) or a PGH5 internal gear pump (see RE 10223)



NG	A <sub>1</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub> <sup>2)</sup>
125	377	10.4	53.7	13	M16
180	401	10.4	54	13	M16
250	451	10.5	57.6	13	M16
355	480	10.5	57.6	13	M16
500	505	10.3	56.7	13	M16
750	555	10.3	56.7	13	M16
1000	628	10.4	56.6	13	M16

NG	A <sub>7</sub>	A <sub>8</sub>
125	-	-
180	-	-
250	-	-
355	-	-
500	-	-
750	23	250
1000	25	280

**K17** Flange ISO 3019-1 152-4 (SAE D)  
**Shaft coupler** for splined shaft 44-4 SAE D, 1 3/4 in 8/16 DP; 13 T<sup>3)</sup>  
 for mounting an A10VO 140/31 splined shaft S (see RE 92701)



NG	A <sub>1</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub> <sup>2)</sup>
125	382	10.4	67	13	M16
180	406	10.4	67	13	M16
250	469	10.4	62	13	M16
355	498	10.5	62	13	M16
500	530	10.4	63.6	13	M16
750	580	10.4	63.6	13	M16
1000	in preparation				

1) 2 or 4 fastening screws and O-ring seal are included in the delivery contents  
 2) Thread according to DIN 13, observe the general instructions on page 68 for the maximum tightening torques.  
 3) According to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5

# Notes

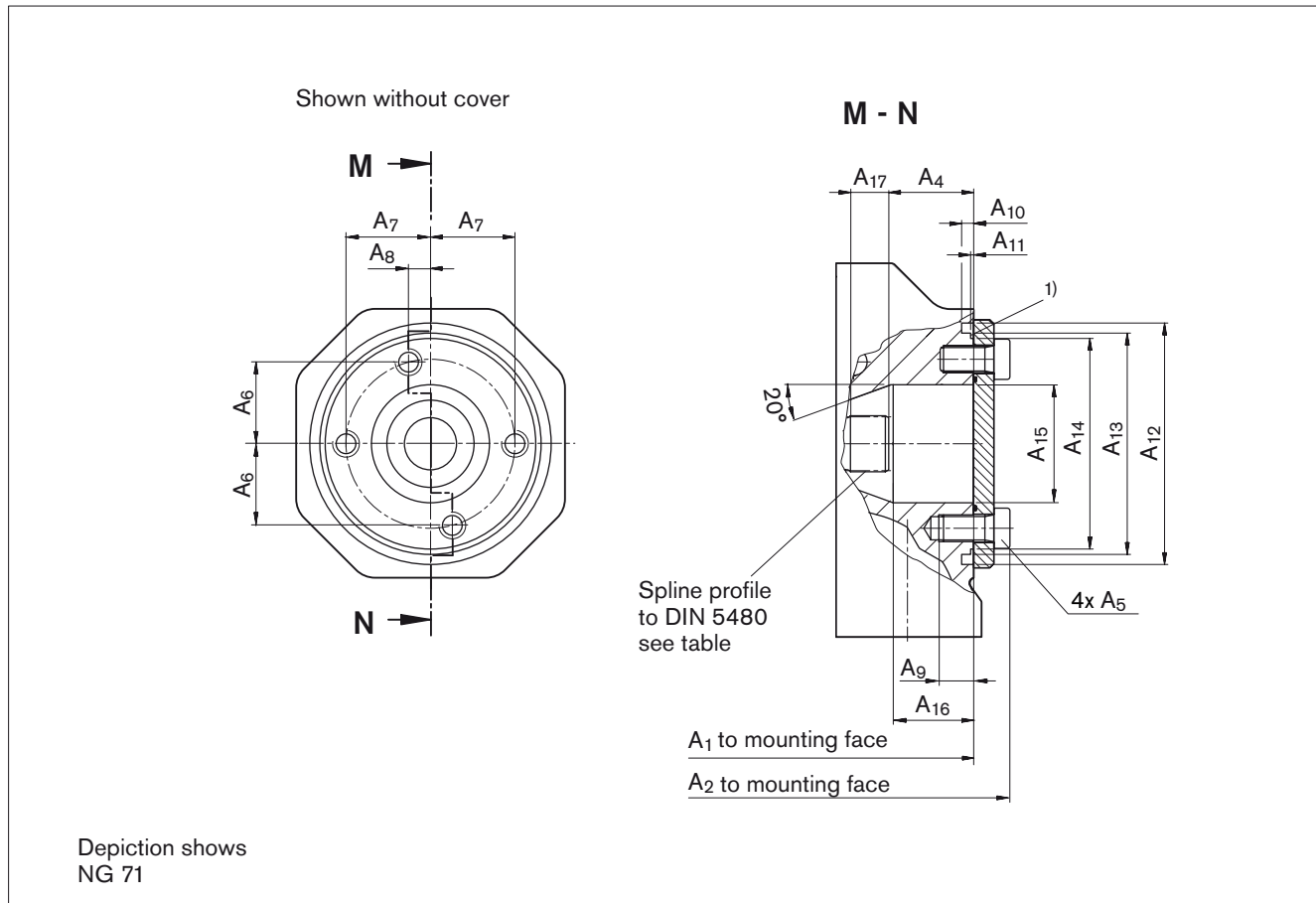
Before finalizing your design, request a binding installation drawing. Dimensions in mm.

# Through drive dimensions

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

## K99 Sizes 40 to 355

with through-drive shaft, without shaft coupler, without adapter flange, closed with fluid-tight and pressure-tight cover



NG Main pump	A <sub>1</sub>	A <sub>2</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub>	A <sub>7</sub>	A <sub>8</sub>	A <sub>9</sub>	A <sub>10</sub>	A <sub>11</sub>	A <sub>12</sub>	A <sub>13</sub>
40	263	280	51.3±1	M12x25	37±0.2	37±0.2	0	18	9	2.3 <sup>+0.1</sup>	∅118	∅105 <sub>g6</sub>
71	291	310	48±1	M12x25	42.3 ±0.15	45 ±0.15	15.4±0.15	18	9	2.7 <sup>+0.1</sup>	∅130	∅116 <sub>g6</sub>
125	347	368	49.7±1	M14x30	47	47	0	18	7	2.3 <sup>+0.1</sup>	∅137	∅124 <sub>g6</sub>
180	371	392	49.7±1	M14x30	47	47	0	18	7	2.3 <sup>+0.1</sup>	∅137	∅124 <sub>g6</sub>
250	431	458	61.4±1	M20x40	63	63	0	26	9	2.3 <sup>+0.1</sup>	∅180	∅165 <sub>g6</sub>
355	460	487	61.4±1	M20x40	63	63	0	26	9	2.3 <sup>+0.1</sup>	∅180	∅165 <sub>g6</sub>

NG Main pump	A <sub>14</sub>	A <sub>15</sub>	A <sub>16</sub>	A <sub>17</sub>	Spline profile to DIN 5480	<sup>1)</sup> O-ring for retrofitting (not included in the delivery contents)
40	∅97.6 <sub>-0.4</sub>	∅52	44	14	W25 x 1.25 x 18 x 9g	99 x 3 70 SH A
71	∅106.4 <sub>-0.4</sub>	∅63	39	16	W30 x 1.25 x 22 x 9g	110.72 x 3.53 70 SH A
125	∅116 <sub>-0.4</sub>	∅70	46	22	W35 x 1.25 x 26 x 9g	119 x 3 70 SH A
180	∅116 <sub>-0.4</sub>	∅70	57	25	W35 x 1.25 x 26 x 9g	119 x 3 70 SH A
250	∅157 <sub>-0.4</sub>	∅88	64	34.2	W42 x 1.25 x 32 x 9g	160 x 3 70 SH A
355	∅157 <sub>-0.4</sub>	∅88	64	34.3	W42 x 1.25 x 32 x 9g	160 x 3 70 SH A

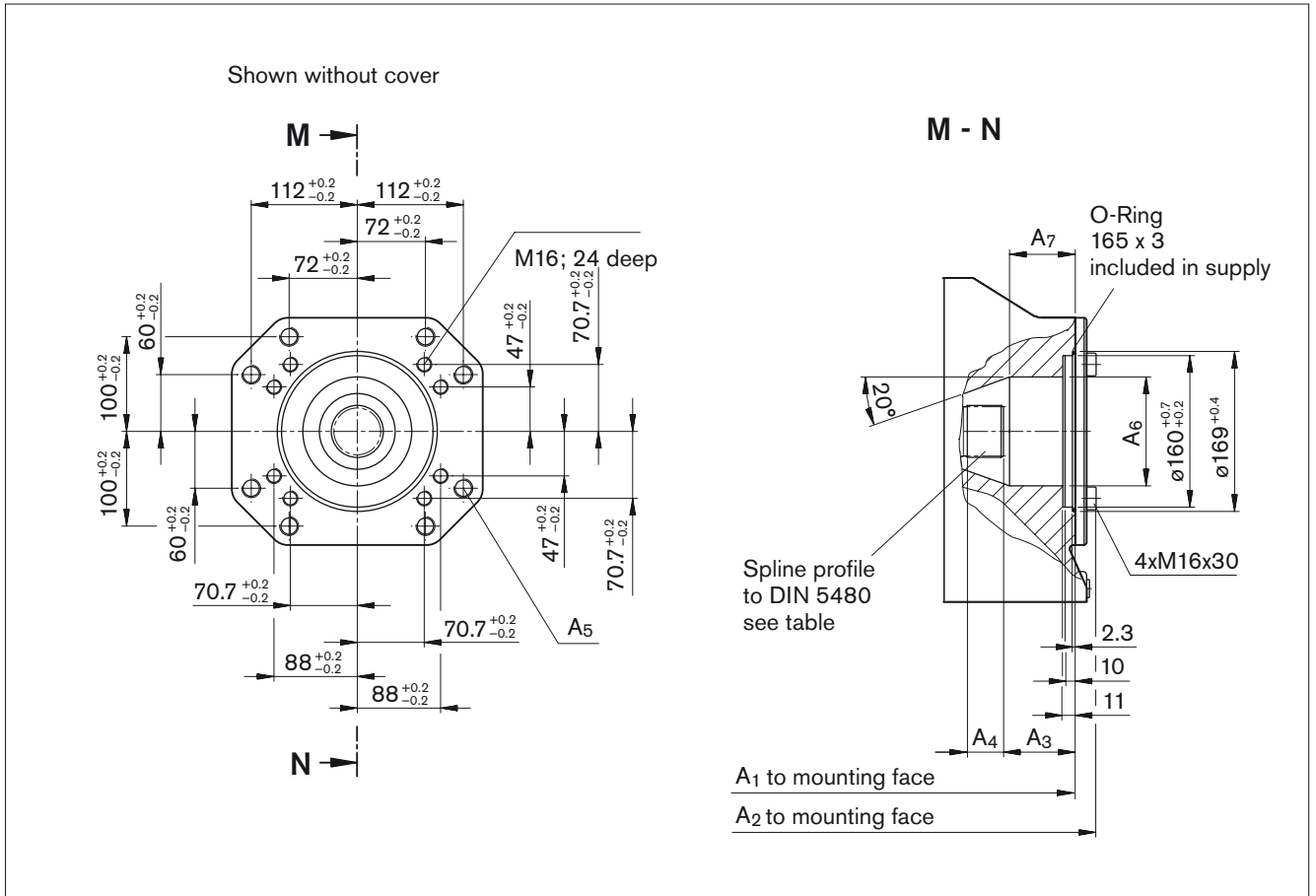
Sizes 500 to 1000, see page 53

# Through drive dimensions

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

## K99 Sizes 500 to 1000

with through-drive shaft, without shaft coupler, without adapter flange, closed with fluid-tight and pressure-tight cover



NG	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub>	A <sub>7</sub>	Spline profile to DIN 5480
Main pump								
500	505	520	73	41	M20; 24 deep	ø115	75	W55 x 1.25 x 42 x 9g
750	555	577	73	41	M20; 24 deep	ø115	75	W55 x 1.25 x 42 x 9g
1000	628	653	75	50	M20; 30 deep	ø142	65	W65 x 1.25 x 50 x 9g

Sizes 40 to 355 see page 52

# Mounted and piped auxiliary pumps H02, H04 and H06

Factory mounted and piped are the following auxiliary pumps:

Code designation	Size A4VSG	40	71	125	180	250	355	500	750	1000		
H02	<b>A piped auxiliary pump for the boost circuit</b>											
	Auxiliary pump type	AZPF		AZPN		AZPG	PGH4	PGH5				
	Size	11	16	25	32	38	80	100	160	200		
H04	<b>A common piped auxiliary pump for the boost and control circuit (only EO1 and EO1K)</b>											
	Auxiliary pump type	–	AZPF	AZPN	–	AZPG	–	–	–	–		
	Size	–	16	25	–	38	–	–	–	–		
H06	<b>Separately piped auxiliary pumps for the boost circuit and the control circuit (only for HD1T and HD1U) including a pressure relief valve for the control circuit <sup>1)</sup></b>											
	Boost circuit	Auxiliary pump type	AZPF		AZPN		AZPG	PGH4	PGH5			
		Size	11	16	25	32	38	80	100	160	200	
	Control circuit	Auxiliary pump type	AZPF					PGF2				
		Size	08					11				

**Note:** The different leakage rates of the gear pump at various speeds must be considered in all cases.

Additional technical data sheets are available for the technical data of the gear pumps:

AZPF: RE 10 089

AZPN: RE 10 091

AZPG: RE 10 093

PGF2: RE 10 213

PGH4 and PGH5: RE 10 223

**Note:** The AZPF, AZPN and AZPG series are special versions of gear pumps for mounting on axial piston pumps. They are adapted to fit onto the through drive shaft end and the flange mounting pattern on axial piston pumps.

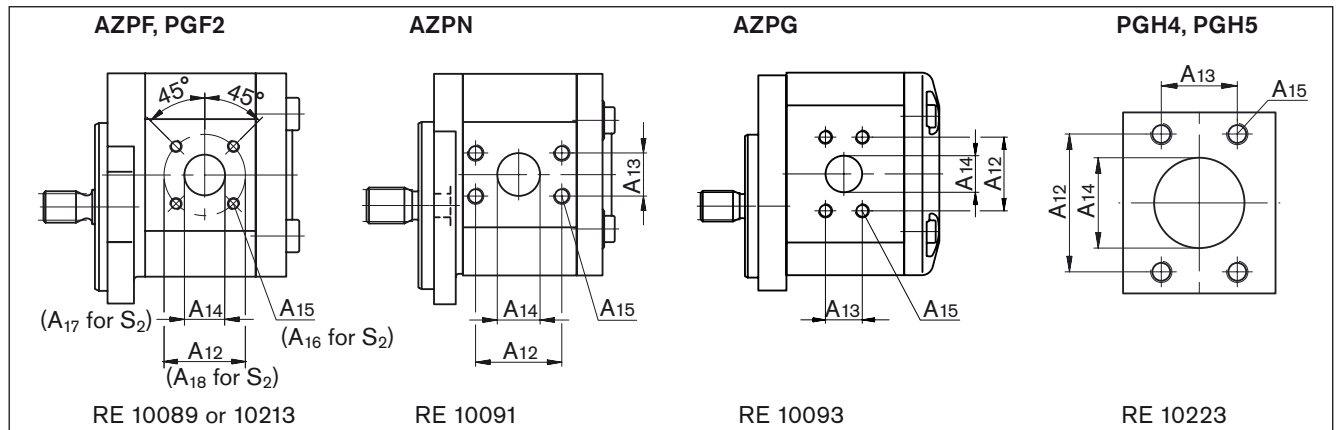
<sup>1)</sup> DB 10 K2-4X/50YV  
pressure setting to 50 bar

# Dimensions suction port - auxiliary pumps

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

Ports **S**, **S<sub>1</sub>** and **S<sub>2</sub>** (for selection, see page 54)

Views Z and W from pages 58 and 62



## Ports<sup>1)</sup>

NG	S, S <sub>1</sub>	S <sub>2</sub> (2nd auxiliary pump - control pump)
40	Square flange	Square flange
71	Square flange	Square flange
125	SAE 1 in (standard pressure series)	Square flange
180	SAE 1 in (standard pressure series)	Square flange
250	SAE 1 in (standard pressure series)	Square flange
355	SAE 2 in (standard pressure series)	Square flange
500	SAE 2 in (standard pressure series)	Square flange
750	SAE 3 in (standard pressure series)	Square flange
1000	SAE 3 in (standard pressure series)	Square flange

1) Observe the general instructions on page 68 for the maximum tightening torques.

## Dimensions

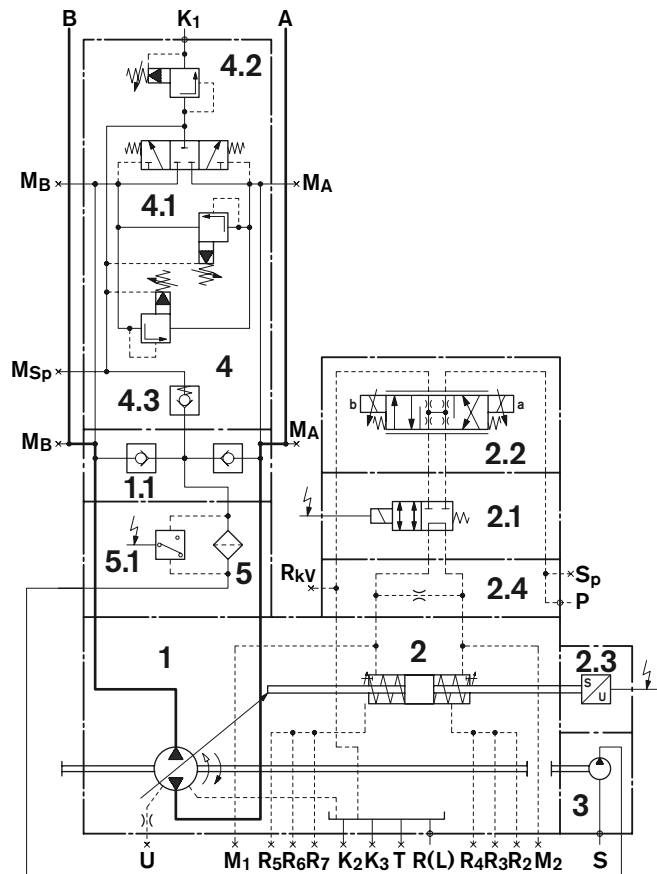
NG	(2nd auxiliary pump - control pump)						
	A <sub>12</sub>	A <sub>13</sub>	A <sub>14</sub>	A <sub>15</sub> for S and S <sub>1</sub>	A <sub>16</sub> for S <sub>2</sub>	A <sub>17</sub> for S <sub>2</sub>	A <sub>18</sub> for S <sub>2</sub>
40	ø40	–	ø20	M6; 13 deep	M6; 13 deep	ø20	ø40
71	ø40	–	ø20	M6; 13 deep	M6; 13 deep	ø20	ø40
125	52.4	26.2	ø26	M10; 14 deep	M6; 13 deep	ø20	ø40
180	52.4	26.2	ø26	M10; 14 deep	M6; 13 deep	ø20	ø40
250	52.4	26.2	ø26	M10; 16 deep	M6; 13 deep	ø20	ø40
355	77.8	42.9	ø51	M12; 10 deep	M6; 10 deep	ø20	ø40
500	77.8	42.9	ø51	M12; 10 deep	M6; 10 deep	ø20	ø40
750	106.4	61.9	ø76	M16; 10 deep	M6; 10 deep	ø20	ø40
1000	106.4	61.9	ø76	M16; 10 deep	M6; 10 deep	ø20	ø40

# Complete schematic H02

A4VSG with an auxiliary pump for the boost circuit, valve block and filter

Example: H029F with EO2K

Sizes 40 to 180 (other sizes on request)



## Ports

Designation	Port for	State
A, B	Service line (pressure port)	O
S	Suction - auxiliary pump	O
K <sub>1</sub>	Outlet circuit flushing	O
R(L)	Fill and air bleed (case drain port)	O
K <sub>2</sub> , K <sub>3</sub>	Fill and air bleed (case drain port)	X
T	Drain	X
M <sub>A</sub> , M <sub>B</sub>	Measuring operating pressure	X
P	Control pressure	O
S <sub>P</sub>	Accumulator - control pressure	X
M <sub>Sp</sub>	Measuring flushing pressure	X
M <sub>1</sub> , M <sub>2</sub>	Measuring control pressure	X
R <sub>kV</sub>	Control fluid return line	X
U	Bearing flushing	X
R <sub>2</sub> ...R <sub>7</sub>	Air bleeding of stroking chamber	X

For components, see page 57; for dimensions, see pages 58 and 59

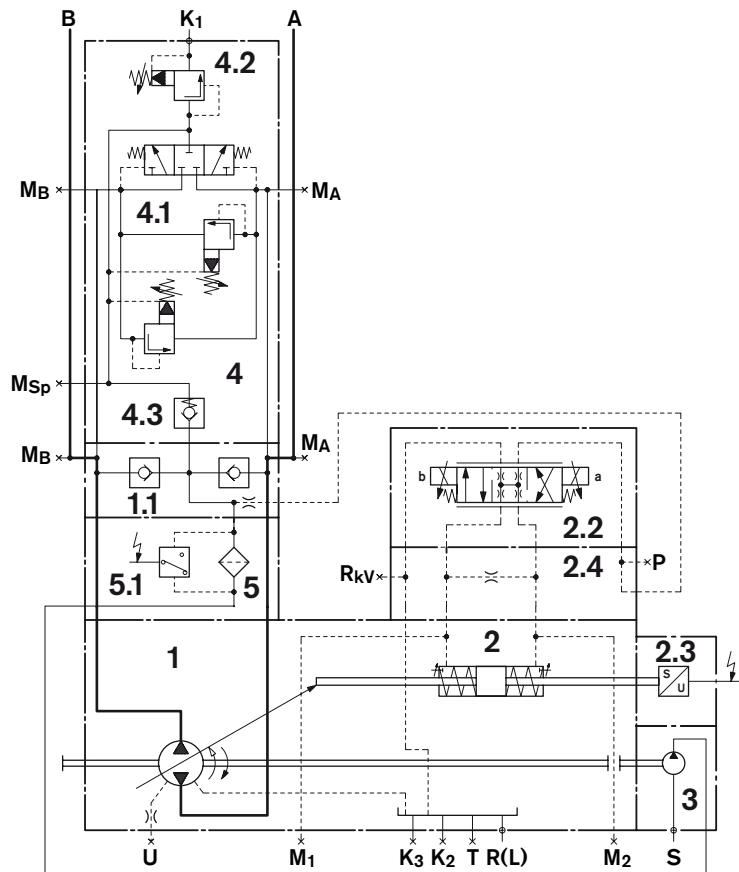


# Complete schematic H04

A4VSG with a common auxiliary pump for boost and control circuit, valve block and filter

Example: H049F with EO1

Sizes 40, 71, 125 and 250



## Component

Item	Order designation	Information
1	Variable pump A4VSG 40-180	<b>A4VSG</b>
1.1	Boost check valves	standard for A4VSG
2	Hydraulic control device	<b>EO2K</b> or <b>EO1</b> See RE 92076
2.1	Short circuit valve (for EO.K)	
2.2	4/3-directional proportional valve	
2.3	Inductive pos. transducer (actual value transmitter)	
2.4	Adapter plate	
3	An auxiliary pump for the boost circuit only (mounted and piped)	<b>H 02</b> or For selection, see page 54
	A common, mounted and piped auxiliary pump for the boost and control circuit (only for EO1 and EO1K)	<b>H 04</b>
4	Valve block SDVB 16 for A4VSG 40 to 180	<b>9</b> For NG250 to 500 SDVB 30, switching type 1 is used and for NG750 and 1000, SDVB 50 is used acc. to RE 95533
4.1	Main high pressure relief	
4.2	Flushing valve	
4.3	Check valve	
5	Boost circuit filter	<b>F</b> See page 65
5.1	Optical contamination indicator	
Control electronics are not included in delivery contents, please order separately		

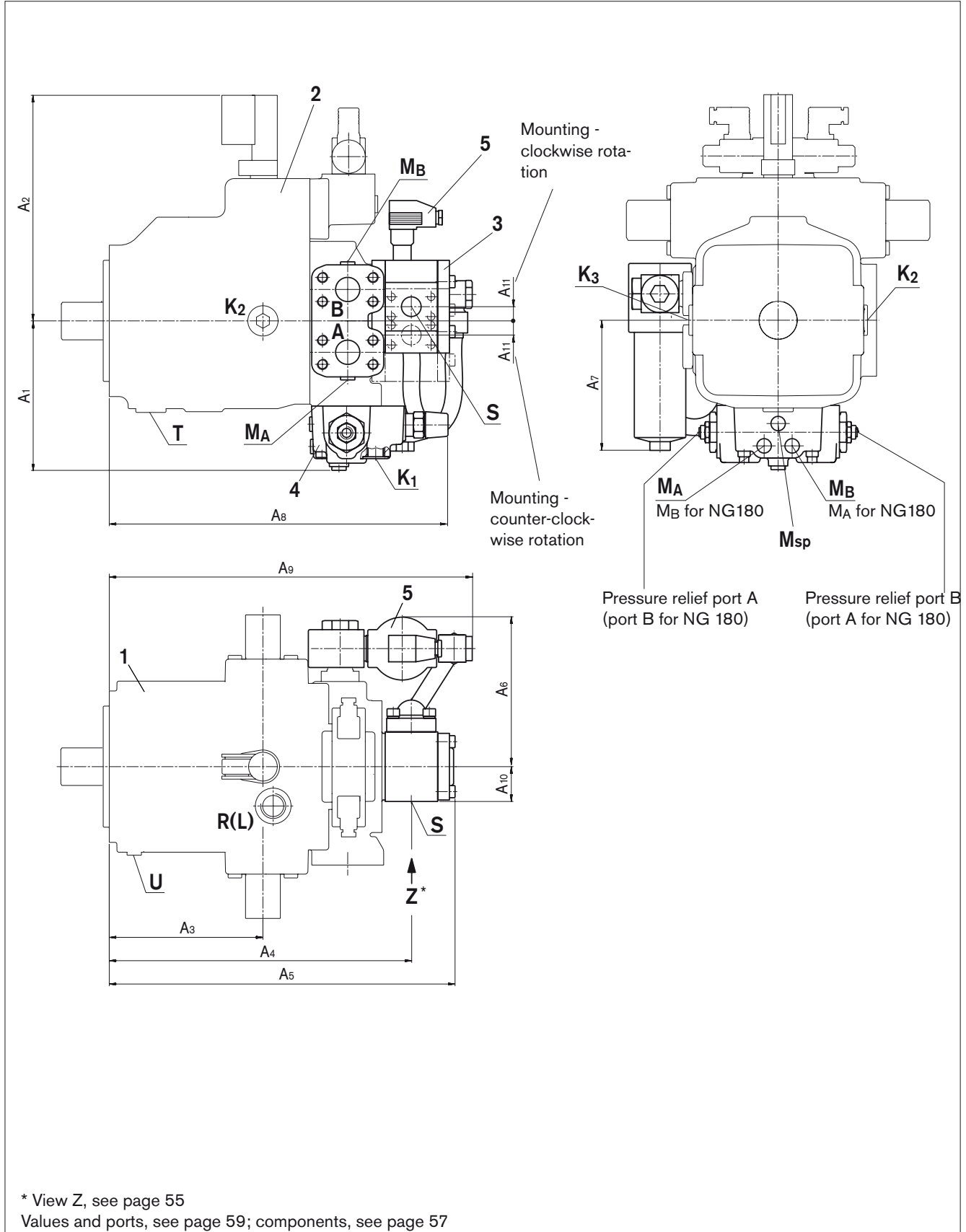
For dimensions, see page 58

# Dimensions H02 9F and H04 9F

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

## A4VSG with an auxiliary pump, valve block and filter

Example: sizes 40 to 180



# Dimensions H02 9F and H04 9F

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

## A4VSG with an auxiliary pump, valve block and filter

### Ports

Designation	Port for	Standard	Maximum pressure [bar] <sup>1)</sup>	State
<b>S</b>	See data sheet for auxiliary pump; for selection, see page 54			
<b>K<sub>1</sub></b>	Flushing	DIN 3852-1	5	O
<b>M<sub>SP</sub></b>	Measuring flushing pressure	DIN 3852-1	50	X
<b>M<sub>A</sub>, M<sub>B</sub></b>	Measuring operating pressure	DIN 3852-1	400	X

1) Momentary pressure spikes may occur depending on the application. Keep this in mind when selecting measuring equipment and fittings.

O = Must be connected (plugged on delivery)

X = Plugged (in normal operation)

For other ports, see dimensions of base pump A4VSG beginning on page 16 and separate data sheet of the control unit.

### Ports<sup>2)</sup>

NG	K <sub>1</sub>	M <sub>SP</sub>	M <sub>A</sub> , M <sub>B</sub>
<b>40</b>	M22 x 1.5; 14 deep	M14 x 1.5; 12 deep	M14 x 1.5; 12 deep
<b>71</b>	M22 x 1.5; 14 deep	M14 x 1.5; 12 deep	M14 x 1.5; 12 deep
<b>125</b>	M22 x 1.5; 14 deep	M14 x 1.5; 12 deep	M14 x 1.5; 12 deep
<b>180</b>	M22 x 1.5; 14 deep	M14 x 1.5; 12 deep	M14 x 1.5; 12 deep
<b>250</b>	M33 x 2; 18 deep	M22 x 1.5; 14 deep	M14 x 1.5; 12 deep
<b>355</b>	M33 x 2; 18 deep	M22 x 1.5; 14 deep	M14 x 1.5; 12 deep
<b>500</b>	M33 x 2; 18 deep	M22 x 1.5; 14 deep	M14 x 1.5; 12 deep
<b>750</b>	M48 x 2; 20 deep	M14 x 1.5; 12 deep	M18 x 1.5; 12 deep
<b>1000</b>	M48 x 2; 20 deep	M14 x 1.5; 12 deep	M18 x 1.5; 12 deep

2) Observe the general instructions on page 68 for the maximum tightening torques.

### Dimensions

NG	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub>	A <sub>7</sub>	A <sub>8</sub>	A <sub>9</sub>	A <sub>10</sub>	A <sub>11</sub>
<b>40</b>	174	246	144	310	357	175	115	364	400	42	15.7
<b>71</b>	178	265	166	338	395	181	115	386	421	42	15.7
<b>125</b>	198	298	203	402	463	201	172(240) <sup>3)</sup>	448	481	46	18.75
<b>180</b>	198	298	203	430	495	234	178(233) <sup>3)</sup>	448	506	46	18.75
<b>250</b>	317	345	248	497	574	245	211	448	651	55	22.9
<b>355</b>	319	345	248	559	664	264	217	464	657	74.6	–
<b>500</b>	353	392	279	628	739	370	203	510	705	105.3	–
<b>750</b>	446	427	301	693	819	393	372	591	*	105.3	–
<b>1000</b>	446	456	360	775	910	427	372	655	*	105.3	–

\* On request

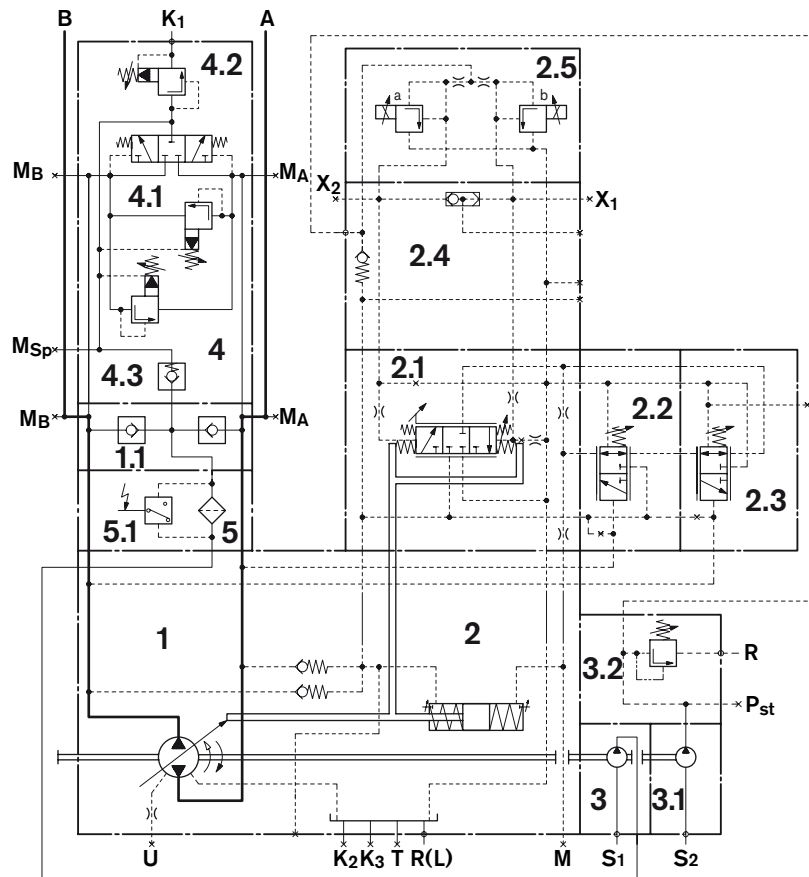
3) With HD.D and HD.G control

# Complete schematic H06 9F

A4VSG with a separately auxiliary double pump for boost and control circuit, valve block and filter

**Example: H069F with HD1DT**

Sizes 40 to 180 (other sizes on request)



## Ports

Designation	Port for	State
A, B	Service line (pressure port)	O
S <sub>1</sub> , S <sub>2</sub>	Suction - auxiliary pump	O
K <sub>1</sub>	Outlet circuit flushing	O
R(L)	Fill and air bleed (case drain port)	O
K <sub>2</sub> , K <sub>3</sub>	Fill and air bleed (case drain port)	X
T	Drain	X
M <sub>A</sub> , M <sub>B</sub>	Measuring operating pressure	X
M	Measuring stroking chamber pressure	X
P <sub>St</sub> , X <sub>1</sub> , X <sub>2</sub>	Measuring pilot pressure	X
R	Return line	O
M <sub>Sp</sub>	Measuring flushing pressure	X
U	Bearing flushing	X

For components, see page 61; for dimensions, see pages 62 and 63.

# Components H06 9F

A4VSG with a separate double auxiliary pump for boost and control circuit, valve block and filter

## Example: H069F with HD1DT

Sizes 40 to 180 (other sizes on request)

### Components

Item	Ordering code	Information
1 Variable pump A4VSG 40-180	A4VSG	
1.1 Boost check valves	standard for A4VSG	
2 Hydraulic control device	HD1DT	See RE 92080
2.1 Control device		
2.2 Pressure control valve, port A (port B for counter-clockwise rotation)		
2.3 Pressure control valve, port B (port A for counter-clockwise rotation)		
2.4 Sandwich plate for mounting proportional valve		
2.5 Proportional pressure relief valve		
3 Auxiliary pump for the boost circuit (mounted and piped)	H 06	For selection, see page 54
3.1 Auxiliary pump for the control circuit (mounted and piped)		
3.2 Pressure relief valve, control circuit DB 10 K2-4X/50YV		
4 Valve block SDVB 16 for A4VSG 40-180	9	For NG250 to 500 SDVB 30, operating type 1 is used and for NG750 and 1000, SDVB 50 is used acc. to RE 95533
4.1 Pressure relief		
4.2 Flushing valve		
4.3 Check valve		
5 Boost circuit filter	F	See page 65
5.1 Optical contamination indicator		

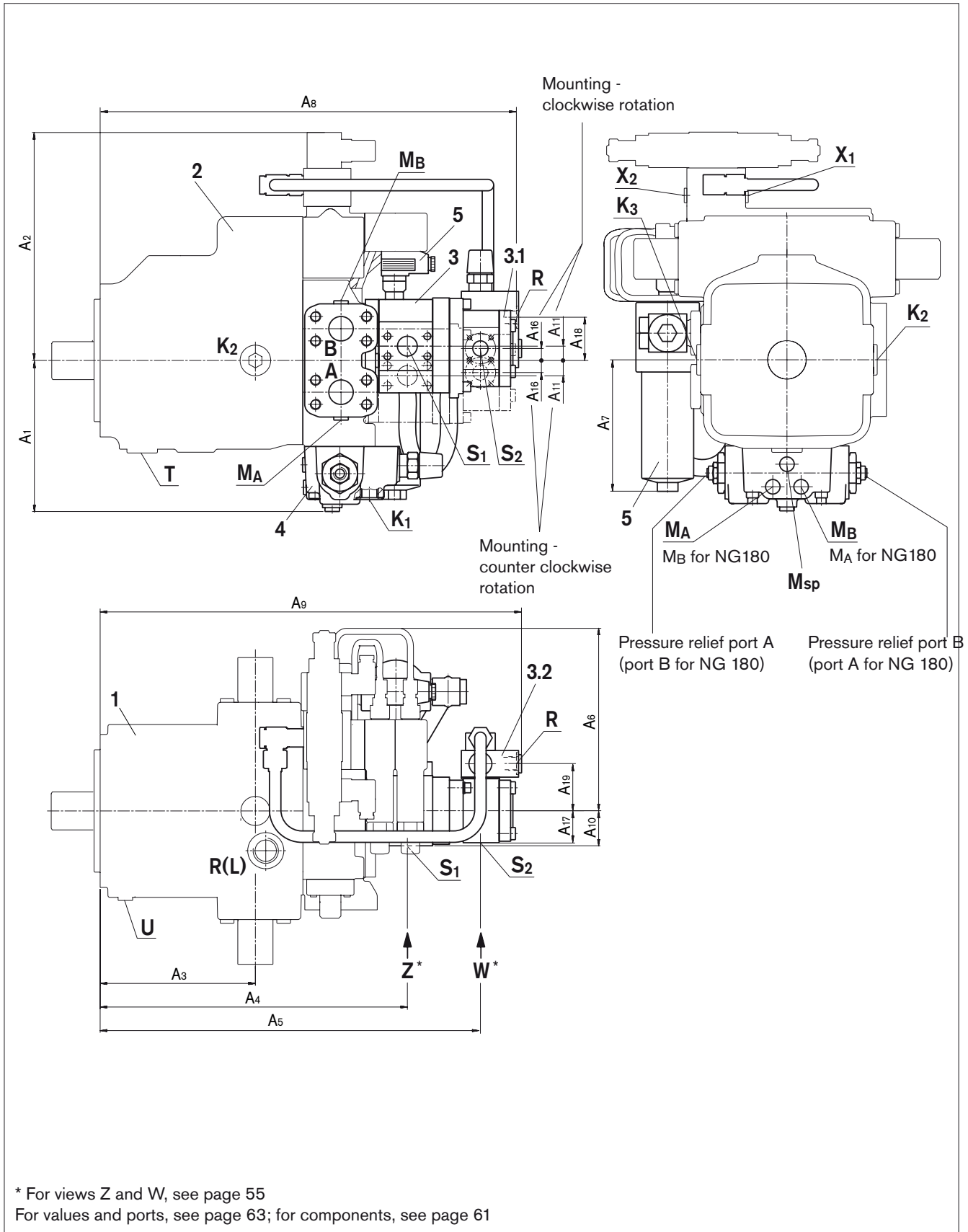
For dimensions, see pages 62 and 63.

# Dimensions H06 9F

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

## A4VSG with a separate double auxiliary pump for the boost and control circuit, valve block and filter

Example: sizes 40 to 180



# Dimensions H06 9F

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

## A4VSG with a separate double auxiliary pump for boost and control circuit, valve block and filter

### Ports

Designation	Port for	Standard	Maximum pressure [bar] <sup>1)</sup>	State
S <sub>1</sub> , S <sub>2</sub>	See data sheet for auxiliary pump; for selection, see page 54			
K <sub>1</sub>	Flushing	DIN 3852-1	5	O
M <sub>SP</sub>	Measuring flushing pressure	DIN 3852-1	50	X
M <sub>A</sub> , M <sub>B</sub>	Measuring operating pressure	DIN 3852-1	400	X

1) Momentary pressure spikes may occur depending on the application. Keep this in mind when selecting measuring equipment and fittings.

O = Must be connected (plugged on delivery)

X = Plugged (in normal operation)

For other ports, see dimensions of base pump A4VSG beginning on page 16 and separate data sheet of the control unit.

### Ports<sup>2)</sup>

NG	K <sub>1</sub>	M <sub>SP</sub>	M <sub>A</sub> , M <sub>B</sub>
40	M22 x 1.5; 14 deep	M14 x 1.5; 12 deep	M14 x 1.5; 12 deep
71	M22 x 1.5; 14 deep	M14 x 1.5; 12 deep	M14 x 1.5; 12 deep
125	M22 x 1.5; 14 deep	M14 x 1.5; 12 deep	M14 x 1.5; 12 deep
180	M22 x 1.5; 14 deep	M14 x 1.5; 12 deep	M14 x 1.5; 12 deep
250	M33 x 2; 18 deep	M22 x 1.5; 14 deep	M14 x 1.5; 12 deep
355	M33 x 2; 18 deep	M22 x 1.5; 14 deep	M14 x 1.5; 12 deep
500	M33 x 2; 18 deep	M22 x 1.5; 14 deep	M14 x 1.5; 12 deep
750	M48 x 2; 20 deep	M14 x 1.5; 12 deep	M18 x 1.5; 12 deep
1000	M48 x 2; 20 deep	M14 x 1.5; 12 deep	M18 x 1.5; 12 deep

2) Observe the general instructions on page 68 for the maximum tightening torques.

### Dimensions

NG	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub>	A <sub>7</sub>	A <sub>8</sub>	A <sub>9</sub>	A <sub>10</sub>	A <sub>11</sub>	A <sub>16</sub>	A <sub>17</sub>	A <sub>18</sub>	A <sub>19</sub>
40	174	*	144	310	400	*	115	*	*	42	15.7	15.7	42	*	*
71	178	*	166	338	436	*	115	*	*	42	15.7	15.7	42	*	*
125	198	302	203	402	498	239	240	547	552	46	18.75	15.7	42	56.7	61.5
180	198	302	203	430	529	236	233	602	607	46	18.75	20.25	42	61.3	61.5
250	317	336	248	497	619	243	167	672	669	55	22.9	20.25	42	56.7	61.5
355	319	336	248	559	775	264	218	824	830	74.6	5.4	7.7	52.5	48.2	72
500	353	406	279	628	840	369	203	888	895	105.3	–	7.7	52.5	33.3	72
750	446	423	301	693	945	392	372	994	1000	105.3	–	7.7	52.5	48.2	72
1000	446	444	360	775	1036	426	372	1084	1091	105.3	–	7.7	52.5	48.2	72

\* On request

# Valve block SDVB

**The following versions are mounted standard:**

**Valve block SDVB 16** for A4VSG sizes 40 to 180,

**SDVB 30** operating type 1 for A4VSG sizes 250 to 500 and

**SDVB 50** for A4VSG sizes 750 and 1000

For technical data and detailed information, see RE 95533



## Filter mounted in boost circuit...F

If a filter is factory mounted in the boost circuit (ordering code: **F**), the following filters (with electric optical contamination indicator) are used depending on the size of the axial piston units:

Sizes 40 and 71: \_\_\_\_\_ LFBN/HC60G20D1.0/V-L24

Sizes 125 and 180: \_\_\_\_\_ LFBN/HC110G20D1.0/V-L24

Sizes 250 and 355: \_\_\_\_\_ LFBN/HC240G20D1.0/V-L24

Size 500: \_\_\_\_\_ LFBN/HC330G20D1.0/V-L24

Sizes 750 and 1000: \_\_\_\_\_ LFBN/HC660G20D1.0/V-L24

Please contact us for further details on the filter

# Installation instructions

## General

During commissioning and operation, the axial piston unit must be filled with hydraulic fluid and air bled. This must also be observed following a relatively long standstill as the axial piston unit may drain back to the reservoir via the hydraulic lines.

The commissioning must be carried out at low speed and without load until the system has been air bled completely.

Especially when mounted with the "drive shaft upwards" (examples 6 and 12), **bearing flushing** is necessary for lubrication of the front bearing and of the shaft seal at port U. See page 6.

The case drain fluid in the pump housing must be directed to the reservoir via the highest available drain port (T, R(L), K<sub>2</sub>, K<sub>3</sub>).

For combinations of multiple units, make sure that the respective case pressure in each unit is not exceeded. In the event of pressure differences at the drain ports of the units, the shared drain line must be changed so that the minimum permissible case pressure of all connected units is not exceeded in any situation. If this is not possible, separate drain lines 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 and case drain lines must flow into the reservoir below the minimum fluid level. At version with mounted attachment pump the permissible suction height  $h_S$  results from the overall loss of pressure; it must not, however, be higher than  $h_{S\ max} = 800\text{ mm}$ .

**The minimum suction pressure at port S may not fall below 0.8 bar absolute in operation.**

With mounted attachment pumps, please refer to the data sheet for details on the minimum suction pressure, see page 54.

## Installation position

See the following examples 1 to 12.

Further installation positions are available upon request.

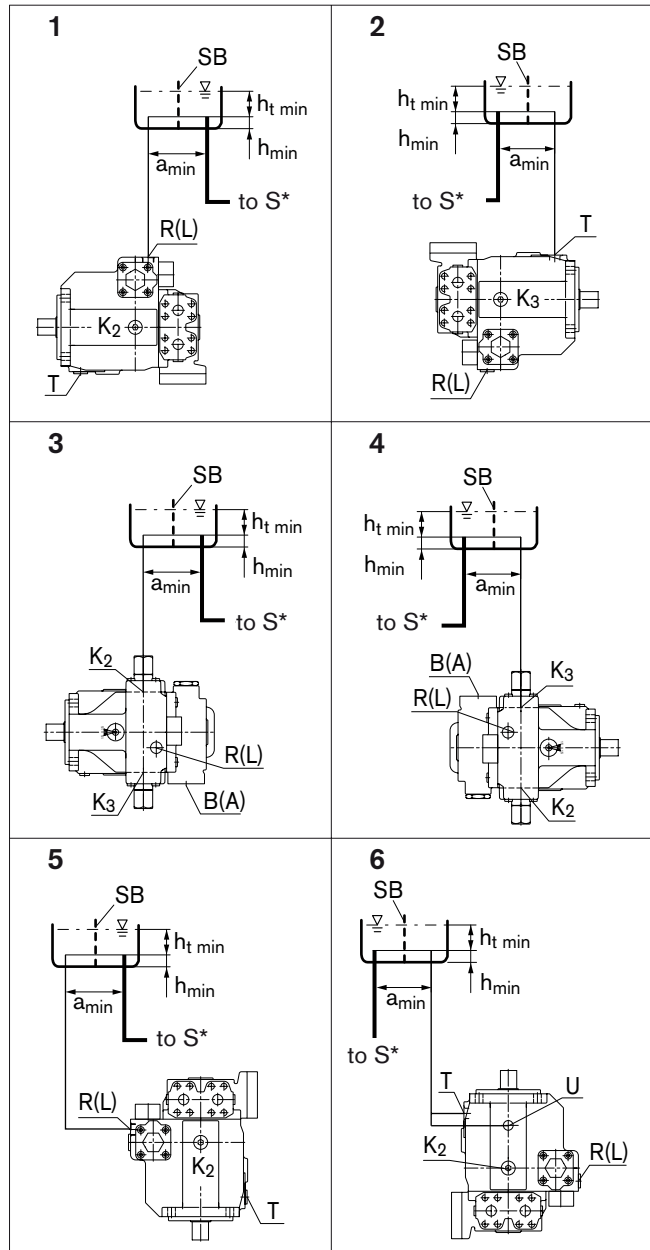
Recommended installation position: 1 and 2.

## Instructions

- Before installation, fill the pump case with the pump in a horizontal position. Port T to the reservoir plugged. Filling option when mounted with shaft end upward: fill via R(L) and air bleed at T, then plug port R(L).
- To achieve an optimum control function, the stroking chambers must be bled via the highest available air bleed port R<sub>2</sub> to R<sub>7</sub> depending on the installation position for HM, HS, HS4 and EO.
- At installation positions 3, 4, 9 and 10 an influence on the control characteristics can be expected. Gravity, unit weight and case pressure can cause minor shifts in control characteristics and changes in response time.

## Below-reservoir installation (standard)

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



Installation position	Fill / air bleed case
1	R(L)
2	T; plug R(L)
3	K <sub>2</sub> ; plug R(L)
4	K <sub>3</sub> ; plug R(L)
5	R(L)
6	T; plug R(L)

\* With a mounted attachment pump, please observe the details in the corresponding data sheet, see page 54

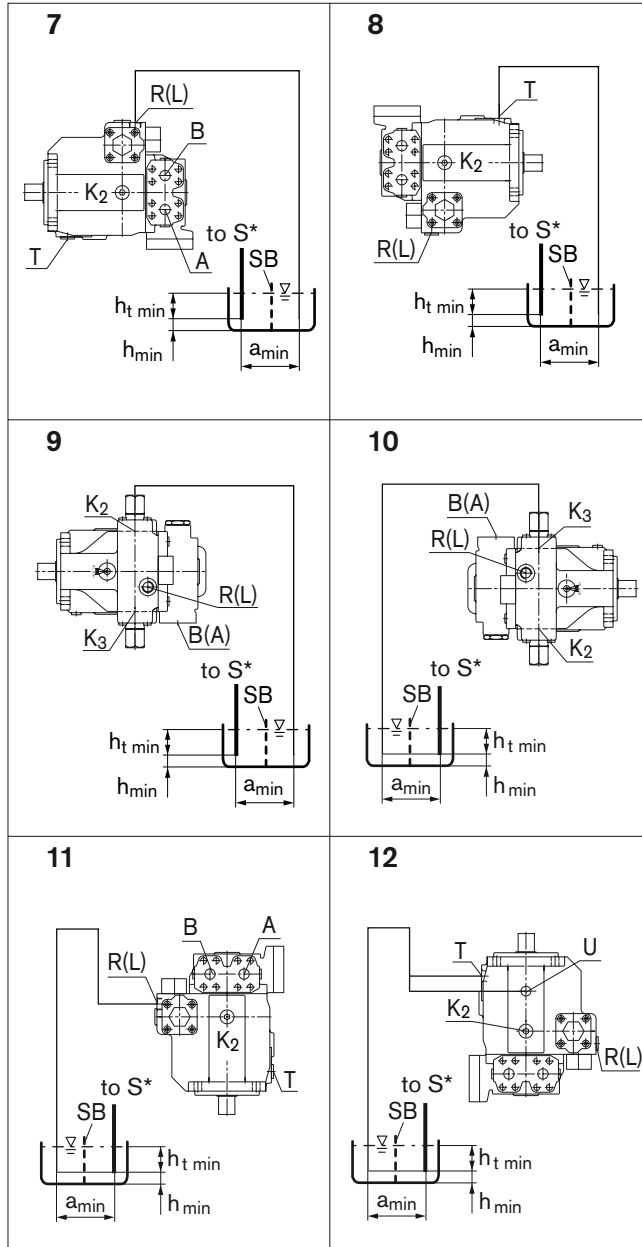
Key, see page 67.

# Installation instructions

## Above-reservoir installation

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

A check valve in the case drain line is to be avoided. Exceptions may be permissible, please consult us first.



Installation position	Fill / air bleed case
7	R(L)
8	T; plug R(L)
9	K <sub>2</sub> ; plug R(L)
10	K <sub>3</sub> ; plug R(L)
11	R(L)
12	T; plug R(L)

L<sub>1</sub> Filling / air bleeding

S Suction port

T, K<sub>2</sub>, K<sub>3</sub>, R(L) Fill + air bleed (case drain port)

A, B Pressure port

SB Baffle (baffle plate)

$h_{t \min}$  Minimum permissible immersion depth (200 mm)

$h_{\min}$  Minimum permissible spacing from suction port to reservoir bottom (100 mm)

$a_{\min}$  When designing the reservoir, ensure adequate spacing between the suction line and the case drain line. This prevents the heated, return flow from being drawn directly back into the suction line.

\* With a mounted attachment pump, please observe details on suction height or minimum inlet pressure from the data sheet for the attachment pump, see page 54

# General instructions

- The A4VSG pump is designed to be used in closed circuits.
- Project planning, installation and commissioning of the axial piston units requires the involvement of qualified personnel.
- Before using the axial piston unit, please read the general instruction manual (RE 90300-B) completely and thoroughly. If necessary, these can be requested from Bosch Rexroth.
- During and shortly after operation, there is a risk of burns on the axial piston unit and especially on the solenoids. Take appropriate safety measures (e.g. by wearing protective clothing).
- Depending on the operating conditions of the axial piston unit (operating pressure, fluid temperature), the characteristics may shift.
- Service line ports (pressure 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 service line ports and function ports can only be used to accommodate hydraulic lines.
- The data and notes contained herein must be adhered to.
- The product is not approved as a component for the safety concept of a general machine according to DIN EN ISO 13849.
- The following tightening torques apply:
  - Fittings:
    - Observe the manufacturer's instruction regarding the tightening torques of the fittings used.
  - Mounting bolts:
    - For mounting bolts with metric ISO thread according to DIN 13, we recommend checking the tightening torque in individual cases in accordance with VDI 2230.
  - Female thread of the axial piston unit:
    - The maximum permissible tightening torques  $M_{G \max}$  are maximum values of the female thread and must not be exceeded. For values, see the following table.
  - Threaded plugs:
    - For the metallic threaded plugs, supplied with the axial piston unit, the required tightening torques of threaded plugs  $M_V$  apply. For values, see the following table.

Ports		Maximum permissible tightening torque of the female threads $M_{G \max}$	Required tightening torque of the threaded plugs $M_V$	WAF hexagon socket of the threaded plugs
Standard	Size of thread			
DIN 3852-1	M10 x 1	30 Nm	12 Nm	5 mm
	M14 x 1.5	80 Nm	35 Nm	6 mm
	M18 x 1.5	140 Nm	60 Nm	8 mm
	M22 x 1.5	210 Nm	80 Nm	10 mm
	M27 x 2	330 Nm	135 Nm	12 mm
	M33 x 2	540 Nm	310 Nm	17 mm
	M42 x 2	720 Nm	360 Nm	22 mm
	M48 x 2	900 Nm	400 Nm	24 mm