

Axial piston variable motor A10VM Plug-in version A10VE

RE 91703/03.10
Replaces: 06.09

1/28

Data sheet

Series 52
Size 28 to 85
Nominal pressure 280 bar
Maximum pressure 350 bar
Open and closed circuit



A10VM



A10VE

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Features

- Dual displacement motor, axial piston swashplate design, for hydrostatic transmissions in open and closed circuits
- Output speed is directly proportional to inlet flow and inversely proportional to motor displacement
- Output torque increases proportional to the pressure difference between high and low pressure sides and increasing displacement
- Heavy duty bearings for long service life
- High permissible output speed
- Well proven A10-rotary unit technology
- High power/weight ratio – compact dimensions
- Cost effective
- Low noise
- External control pressure supply possible
- Minimum displacement can be set externally
- SAE-2-bolt mounting flange on A10VM
- Special 2-bolt mounting flange on A10VE

Ordering code for standard program

A10V	M			/	52	W		-	V		C				
01	02	03	04		05	06	07		08	09	10	11	12	13	14

Axial piston unit

01	Swash plate design, variable, nominal pressure 280 bar, maximum pressure 350 bar	A10V
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Operating Mode

02	Motor, open and closed circuit	M
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Size (NG)

03	Displacement $V_{g \max}$ in cm^3	028	045	063	085
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Control devices

		028 045 063 085						
04	Two point control	Directly operated, external control supply, without pilot valve	●	●	●	●	DG	
		Hydraulically operated	Stroking time orifice	without	●	●	●	○
	with		●	●	●	○	HZ6	
	Electrically with solenoid valve control voltage 12V	Stroking time orifice	without	●	●	●	●	EZ1
		with	●	●	●	●	EZ6	
	Electrically with solenoid valve control voltage 24V	Stroking time orifice	without	●	●	●	○	EZ2
with		●	●	●	○	EZ7		

Series

05	Series 5, Index 2	52
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Direction of rotation

06	Viewed on shaft end	Bi-directional	W
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Minimum displacement

		028 045 063 085					
07	$V_{g \min}$ (in cm^3) steplessly adjustable	from/to	8/28	12/25	16/38	22/50	1
	Adjustment state in clear text	from/to	-	26/45	40/62	48/85	2

Seals

08	FKM (flour-rubber)	V
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Drive shaft

		028 045 063 085				
09	Splined shaft, ANSI B92.1 a-1976, for higher drive torque	●	●	●	●	R
	Splined shaft, ANSI B92.1 a-1976, for reduced drive torque	-	●	●	●	W

Mounting flange

10	SAE J744 2-bolt	C
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Ports for service lines

		028 045 063 085				
11	SAE flanges, at side-same side, metric fixing screws	●	●	●	●	10N00
	SAE flanges at rear, metric fixing screws	○	●	○	○	11N00
	Threaded ports on side, same side, metric thread	●	●	●	○	16N00

Valves

		028 045 063 085				
12	Without valves	●	●	●	●	0
	Integrated flushing valve, only with side ports (10N00 and 16N00)	●	●	●	●	7

Speed pickup

		028 045 063 085				
13	Without speed pickup	●	●	●	●	-
	Prepared for inductive type of speed pickup ID R	●	●	●	○	D

Connector for solenoids

		028 045 063 085				
14	HIRSCHMANN - connector - without suppressor diod	▲	▲	▲	▲	H
	DEUTSCH - connector, molded, 2-pin - without suppressor diod	●	●	●	●	P

● = available

○ = in preparation

- = not available

▲ = not for new projects

Ordering code for standard program

A10V	E			/	52	W		-	V		F				
01	02	03	04		05	06	07		08	09	10	11	12	13	14

Axial piston unit

01	Swash plate design, variable, nominal pressure 280 bar, maximum pressure 350 bar	A10V
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Operating mode

02	Motor, plug in type, open and closed circuit	E
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Size (NG)

03	Displacement $V_{g \max}$ in cm^3	028	045	063
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Control devices

				028	045	063	
04	Two point control	Directly operated, external control supply, without pilot valve		●	●	○	DG
		Hydraulically	Stroking time orifice	without	●	●	HZ
			with	●	●	HZ6	
	Electrically with solenoid valve control voltage 12V	Stroking time orifice	without	●	●	EZ1	
			with	●	●	EZ6	
	Electrically with solenoid valve control voltage 24V	Stroking time orifice	without	●	●	EZ2	
		with	●	●	EZ7		

Series

05	Series 5, Index 2	52
----	-------------------	-----------

Direction of rotation

06	Viewed on shaft end	Bi-directional	W
----	---------------------	----------------	----------

Minimum displacement

				028	045	063	
07	$V_{g \min}$ (in cm^3) stepples adjustable	from/to		10/28	12/25	16/38	1
	Adjustment please state in clear text	from/to		-	26/45	40/62	2

Seals

08	FKM (flour-rubber)	V
----	--------------------	----------

Drive shaft

				028	045	063	
09	Splined shaft, ANSI B92.1a-1976, for higher drive torque			●	●	●	R
	Splined shaft, ANSI B92.1a-1976, for reduced drive torque			-	●	●	W

Mounting flange

10	Special 2-bolt	F
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Ports for service line

11	SAE flanges at side-same side, metric fixing screws	●	●	●	10N00
	SAE flanges at rear, metric fixing screws	○	●	○	11N00
	Threaded ports on side, same side, metric thread	●	●	●	16N00

Valves

12	Without valves	●	●	●	0
	Integrated flushing valve, only with side ports (10N00 and 16N00)	●	●	●	7

Speed pickup

13	Without speed pickup	●	●	●	-
	Prepared for inductive type of speed pickup ID R	○	●	○	D

Connector for solenoids

14	HIRSCHMANN - connector – without suppressor diod	▲	▲	▲	H
	DEUTSCH - connector, molded, 2-pin – without suppressor diod	●	●	●	P

● = available

○ = in preparation

- = not available

▲ = not for new projects

Technical data

Fluid

Prior to project design please see our data sheets RE 90220 (mineral oil), RE 90221 (ecologically acceptable fluids) and RE90223 (HF-fluids) for detailed information on fluids and application conditions.

When operating on ecologically acceptable fluids, limitations to the technical data may be necessary.

Please contact us and state the fluid used in clear text when ordering.

Operating viscosity range

For optimum efficiency and service life we recommend an operating viscosity (at operating temperature) in the range

$$v_{opt} = \text{opt. operating viscosity } 16 \dots 36 \text{ mm}^2/\text{s}$$

referred to circuit temperature in closed circuits or tank temperature in open circuits.

The following limits are valid for extreme operating conditions:

$$v_{min} = 5 \text{ mm}^2/\text{s (closed circuit)}$$

$$v_{min} = 10 \text{ mm}^2/\text{s (open circuit)}$$

briefly ($t \leq 1$ min) at max. permissible temperature of 115 °C.

Please note, that the max. fluid temperature of 115 °C may also not be exceeded in certain areas (for instance bearing area) The temperature in the bearing area is approx. 5 K higher than the average fluid temperature.

$$v_{max} = 1600 \text{ mm}^2/\text{s}$$

briefly ($t \leq 1$ min)

on cold start ($t_{min} = -25^\circ\text{C}$, $p \leq 30$ bar, $n \leq 1000$ rpm).

At temperatures between -25°C and -40°C special measures may be required for certain installation positions. Please consult us for further information

For detailed information on operation at very low temperatures see RE 90300-03-B.

Notes on the selection of the hydraulic fluid

In order to select the correct fluid, it is necessary to know the operating temperature in the tank (open circuit), circuit temperature (closed circuits), in relation to the ambient temperature.

The fluid should be selected, so that within the operating temperature range, the viscosity lies within the optimum range (v_{opt}), see shaded section of the selection diagram. We recommend to select the higher viscosity grade in each case.

Example: at an ambient temperature of X °C the operating temperature in the tank is 60 °C. In the optimum viscosity range (v_{opt} ; shaded area) this corresponds to viscosity grades VG 46 resp. VG 68; select VG 68.

Important: The leakage fluid (case drain fluid) temperature is influenced by pressure and motor speed and is always higher than the tank temperature. However, at no point in the circuit may the temperature exceed 115 °C.

If it is not possible to comply with the above conditions because of extreme operating parameters or high ambient temperatures please consult us

Filtration of fluid

The finer the filtration the better the achieved cleanliness of the fluid and the longer the life of the axial piston unit.

To ensure a reliable functioning of the axial piston unit, a minimum cleanliness of

20/18/15 to ISO 4406 is necessary.

At very high fluid temperatures (90 °C to max. 115 °C) the minimum cleanliness has to be at least

19/17/14 to ISO 4406.

If above cleanliness classes cannot be met please consult us.

Operating pressure range

Pressure at port A or B

(Pressure data to DIN 24312)

Nominal pressure p_N 280 bar ¹⁾

Maximum pressure p_{max} 350 bar

With motors connected in series please consult us.

Case drain pressure

Max. permissible pressure at leakage port L

p_{abs} max operation as a motor in open circuit 4 bar abs

p_{abs} max operation as a motor in closed circuit 4 bar abs

p_{abs} max motor/pump operation in open circuit 2 bar abs

Direction of rotation

Direction of rotation, viewed on shaft end

clockwise

counter-clockwise

B to A

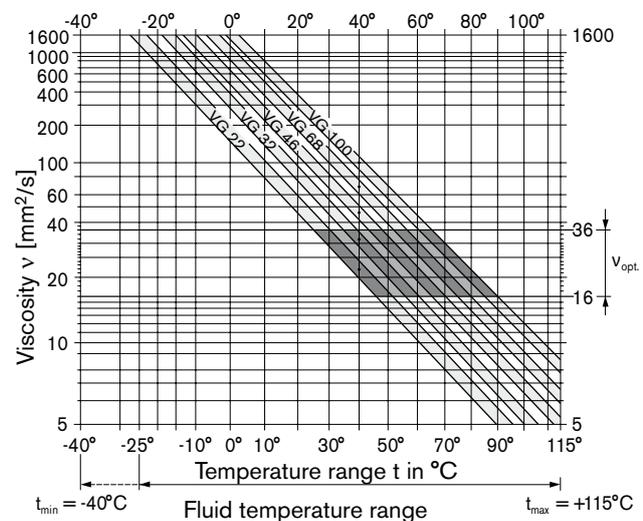
A to B

Adjustment of displacement

The minimum displacement is steplessly adjustable within the range of the screw lengths 1 or 2 (see ordering code).

Please state minimum displacement in clear text when ordering.

Selection diagram



Technical data

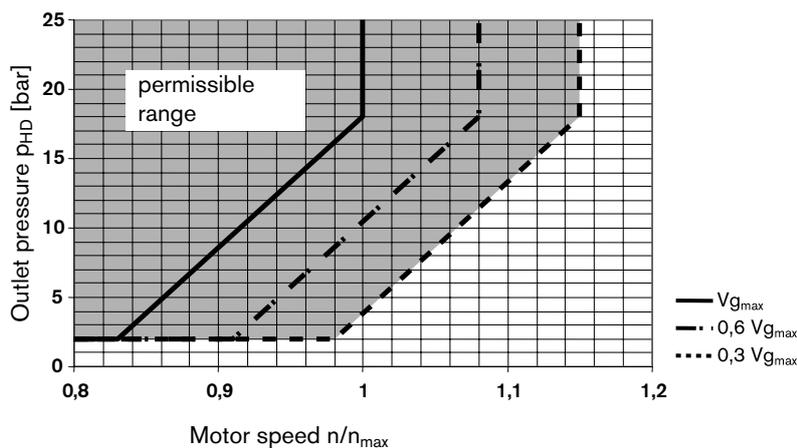
Table of values (theoretical values, without efficiency levels and tolerances; values rounded)

Size			28	45	63	85	
Displacement	$V_{g \max}$	cm ³	28	45	62	87	
	$V_{g \min}$	cm ³	8 (VM)/10(VE)	12	16	22	
Speed ¹⁾							
max. at $V_{g \max}$	$n_{0 \max}$	min ⁻¹	4700	4000	3300	3100	
max. at $V_{g \min}$	$n_{0 \max \text{ zul}}$	min ⁻¹	5400	4600	3900	3560	
Min. speed in cont. operation	$n_{0 \min}$	min ⁻¹	250	250	250	250	
Inlet flow							
bei $n_{0 \max}$ and $V_{g \max}$	$q_{V0 \max}$	L/min	131,6	180	205	270	
Torque constant ²⁾ at $V_{g \max}$	T_K	Nm/bar	0,445	0,716	1,002	1,35	
Torque							
at $V_{g \max}$ $p_N = 280 \text{ bar}$	T_{\max}	Nm	125	200	276	387	
Actual starting torque							
at $n = 0 \text{ min}^{-1}$ $p_N = 280 \text{ bar}$	T	Nm ca.	92	149	205	253	
Rotary stiffness	Shaft R	c	Nm/rad	26000	41000	69400	152900
	Shaft W	c	Nm/rad	19800	34400	54000	117900
Mass moment of inertia (about output shaft)	J	kgm ²	0,0017	0,0033	0,0056	0,012	
Filling volume	V	L	0,6	0,7	0,8	1,0	
Weight approx.	m	kg	14	18	26	34	

1) At maximal speed in closed circuit operation make sure that motor outlet pressure is at least $\geq 18 \text{ bar}$.

2) In open circuit $\Delta p 280 \text{ bar}$ at $p_{\text{boostpress. } 2 \text{ bar}}$
 In closed circuit $\Delta p 260 \text{ bar}$ at $p_{\text{boostpress. } 20 \text{ bar}}$

Minimum required outlet pressure (low pressure) at port A (B) depending on motor speed

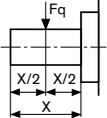
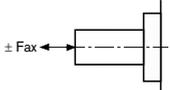


Technical data

Calculating size

Flow	$q_v = \frac{V_g \cdot n}{1000 \cdot \eta_v}$	[L/min]	$V_g =$ Displacement per rev. in cm^3
Torque	$T = \frac{1,59 \cdot V_g \cdot \Delta p \cdot \eta_{mh}}{100}$	[Nm]	$\Delta p =$ Differential pressure in bar
or	$T = T_K \cdot \Delta p \cdot \eta_{mh}$		$n =$ speed in rpm
Output power	$P = \frac{2\pi \cdot T \cdot n}{60000} = \frac{q_v \cdot \Delta p \cdot \eta_t}{600}$	[kW]	$\eta_v =$ Volumetric efficiency
Output speed	$n = \frac{q_v \cdot 1000 \cdot \eta_v}{V_g}$	$[\text{min}^{-1}]$	$\eta_{mh} =$ Mechanical-hydraulic efficiency
			$\eta_t =$ Total efficiency ($\eta_t = \eta_v \cdot \eta_{mh}$)
			$T_K =$ Torque constant

Permissible radial and axial forces on drive shaft

Size		28	45	63	85
Max. radial force	 at X/2 $F_{q \max}$ N	1200	1500	1700	2000
Max. axial force	 $\pm F_{ax}$ F_{ax} N	1000	1500	2000	3000

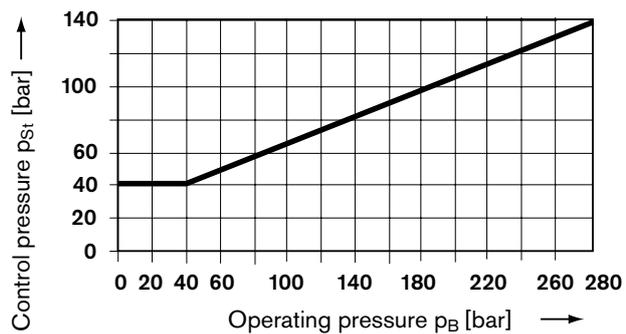
Two-point direct control DG

Normally the motor is at max. displacement. By applying an external pressure to port G, the control piston is directly pressurized and the motor swivels back to min. displacement

The minimum required control pressure is $p_{St} \geq 40$ bar

Please note, that this minimum required control pressure at port G depends directly on the operating pressure p_B in port A or B. (Pressure in A or B), see control pressure diagram below. With a control pressure above this minimum required pressure level the motor will destroke properly.

Control pressure diagram



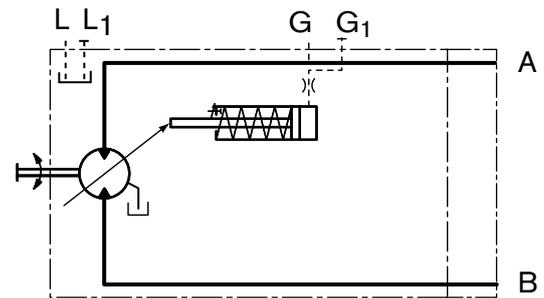
Control pressure = 0 bar $\triangleq V_{g \max}$

Control pressure ≥ 40 bar $\triangleq V_{g \min}$ (see circuit diagram)

The max. permissible control pressure is $p_{St} = 280$ bar.

$V_{g \min}$ adjustment please state in clear text with order

Circuit diagram



Ports for

A, B	Pressure
L, L ₁	Case drain (L ₁ plugged)
G, G ₁	For external control pressure (G ₁ plugged)

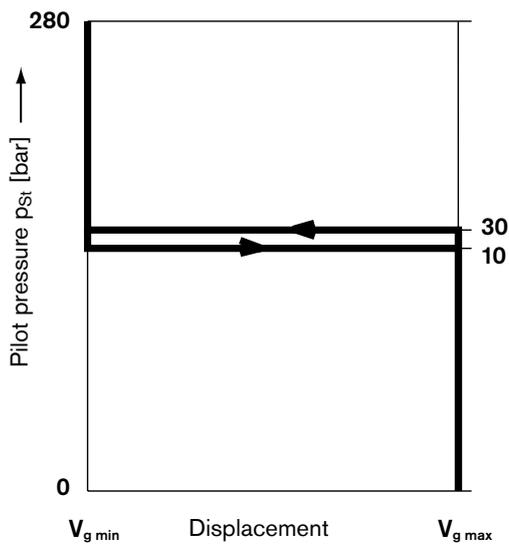
Two-point control, hydraulically operated HZ/HZ6

Normally the motor is at max. displacement. By applying a pilot pressure p_x to port X the pilot valve shifts and the control piston is pressurized causing the motor to swivel to min. displacement ($p_x \geq 30\text{bar}$).

The necessary control pressure is via a shuttle valve taken out of the motor pressure side A or B. A minimum pressure difference of $\Delta p_{A,B} \geq 20\text{ bar}$ between the motor pressure sides is required.

Only $V_{g\text{ max}}$ or $V_{g\text{ min}}$ are possible.

$V_{g\text{ min}}$ - adjustment please state in clear text when ordering.



Pilot pressure $p_x = 0\text{ bar} \triangleq V_{g\text{ max}}$

Pilot pressure $p_x \geq 30\text{ bar} \triangleq V_{g\text{ min}}$

Techn. data HZ/HZ6	
Minimum pilot pressure	30 bar
Maximum permissible pilot pressure	280 bar

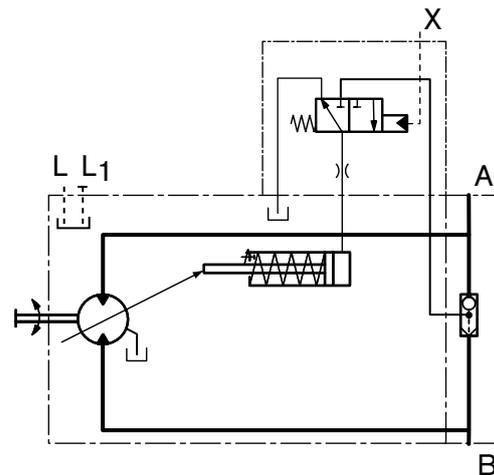
Version HZ6 with stroking time shuttle orifice

Slow down of swivel action by means of shuttle orifice.

This enables a smooth swivel action.

Standard orifice size = 0.21 mm; other sizes on request.

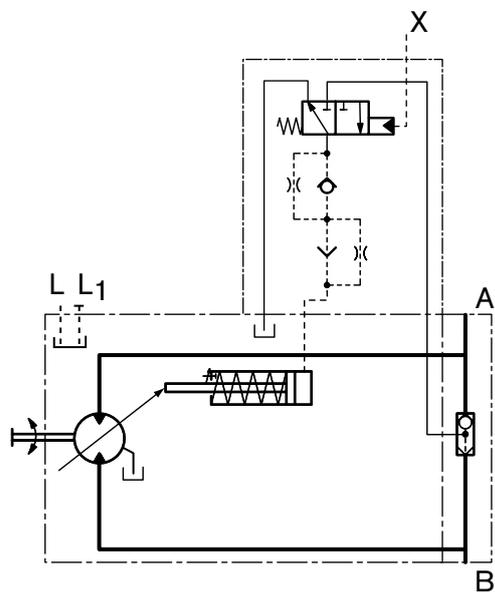
Circuit diagram HZ



Ports for

A, B	Pressure
L, L ₁	Cause drain (L ₁ plugged)
X	Pilot pressure (plugged)

Circuit diagram HZ6



Ports for

A, B	Pressure
L, L ₁	Cause drain (L ₁ plugged)
X	Pilot pressure (plugged)

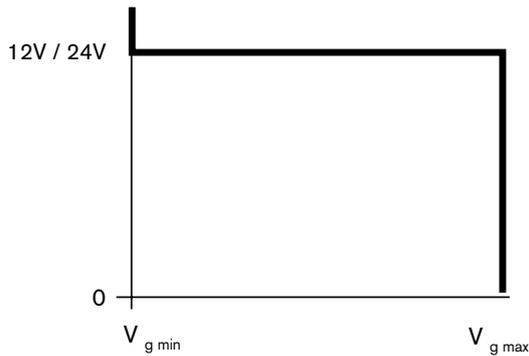
Two-point control, electrically operated EZ¹⁾

Normally the motor is at maximum displacement. By energizing the solenoid of the control valve, the control piston is pressurized and the motor swivels to minimum displacement.

The control pressure is via a shuttle valve taken out of the motor pressure side A or B. A minimum pressure difference of $\Delta p_{A,B} \geq 20$ bar between the pressure sides is required.

The motor can only swivel between $V_{g \max}$ or $V_{g \min}$.

$V_{g \min}$ - adjustment please state in clear text when ordering.



De-energized $\triangleq V_{g \max}$
 Energized $\triangleq V_{g \min}$

Techn. data EZ		
Version	EZ 1/6	EZ 2/7
Supply voltage	12V DC	24V DC
Nom. current at 20°C	1.5 A	0.8 A
Duty cyler	100% ED	100% ED
Plug protection class to DIN 43650	IP 65	IP 65

Ambient temperature range -20°C to +60°C.
 If the above temperature range cannot be met please consult us

Features

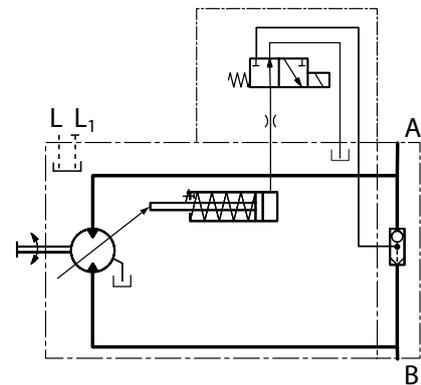
- with spring return at solenoid
- Solenoid plug can be turned 4 x 90°

Version EZ6/7 with stroking time shuttle orifice.

Slow down of swivel action by means of shuttle orifice. This enables a smooth swivel action.
 Standard orifice size = 0.21 mm; other sizes on request.

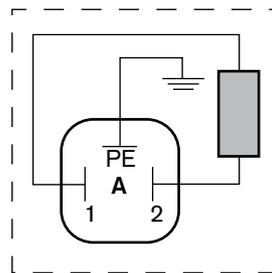
More information see page 25

Circuit diagram EZ1/2

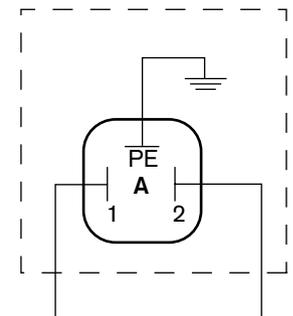


Ports for	
A, B	Pressure
L, L ₁	Cause drain (L ₁ plugged)

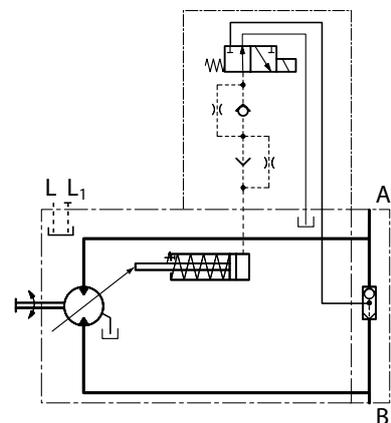
Connection to solenoid according to DIN 43650



Plug connection to DIN EN 175301-803-A Cable screw joint M 16x1.5



Circuit diagram EZ6/7



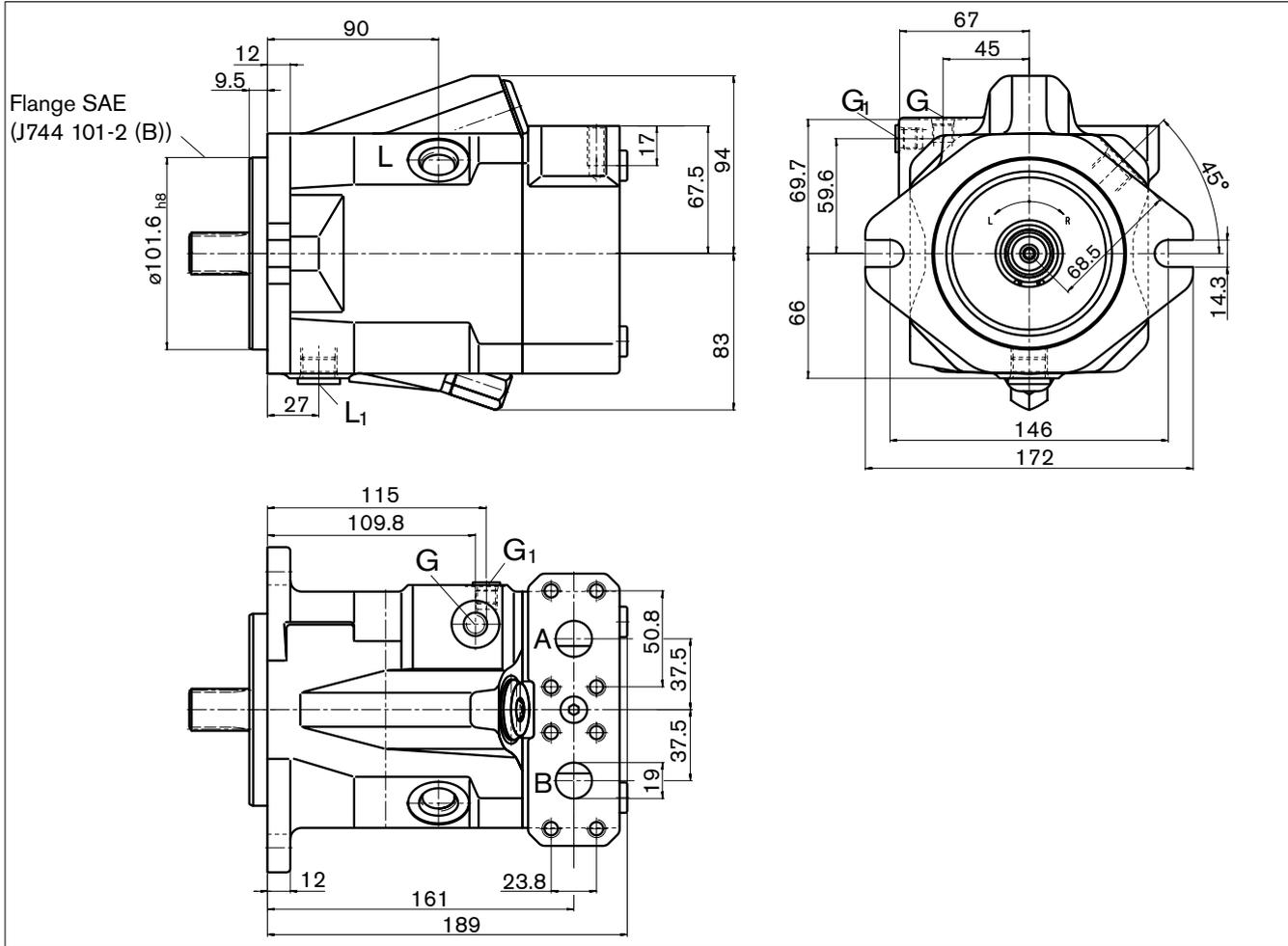
Ports for	
A, B	Pressure
L, L ₁	Cause drain (L ₁ plugged)

¹⁾ Shown in the unit dimensions: DIN connector from HIRSCHMANN;
 Preferred for mobile applications (other dimensions): DEUTSCH connector molded, 2-pin - without suppressor diode

Dimensions A10VM size28

Before finalising your design please request a certified installation drawing.
Dimensions in mm

A10VM 28DG/52WX-VXC10N000



Ports

Designation	Port for	Standard	Size ²⁾	Max. press. [bar] ³⁾	State
A, B	Pressure (High pressure series, code 62)	SAE J518	3/4 in	350	O
	Fixing thread (port plate 10)	DIN 13	M10; 17 deep		O
A, B	Pressure (port plate 16)	DIN 3852-1 ⁵⁾	M27x2; 16 deep	350	O
L	Case drain	ISO 11926 ⁵⁾	3/4-16UNF-2B	4	O ⁴⁾
L ₁	Case drain	ISO 11926 ⁵⁾	3/4-16UNF-2B	4	X ⁴⁾
G	External control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 12 deep	350	O
G ₁	External control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 12 deep	350	X
X	Pilot pressure	ISO 11926 ⁵⁾	7/16-20UNF-2B; 10 deep	350	O

1) ANSI B92.1a-1976, 30° pressure angle, flat root, side fit, tolerance class 5

2) Observe the general instruction on page 28 for the maximum tightening torques.

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

4) Depending on installation position L oder L₁ must be connected (see also page 27).

5) The spot face can be deeper than specified in the appropriate standard.

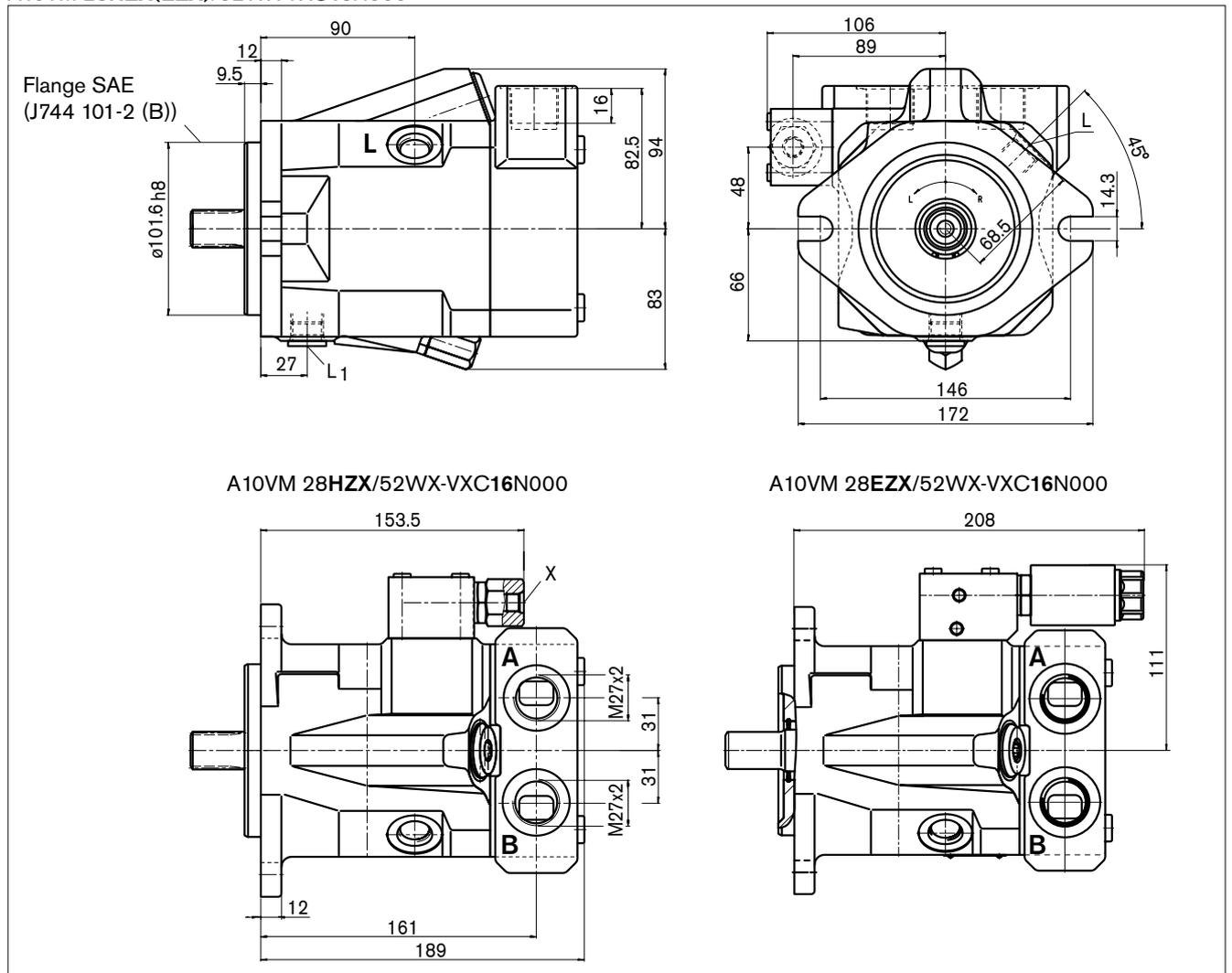
O = must be connected (plugged on delivery)

X = Plugged (in normal operation)

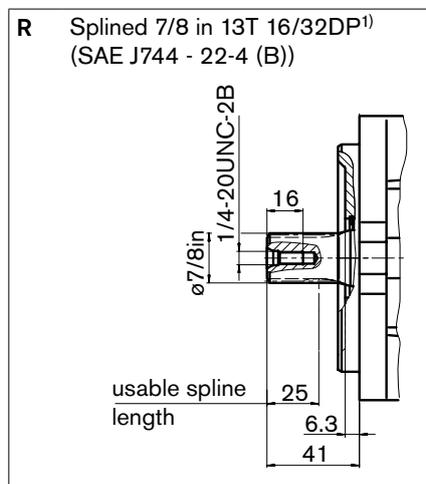
Dimensions A10VM size 28

Before finalising your design please request a certified installation drawing.
Dimensions in mm

A10VM 28HZX(EZX)/52WX-VXC16N000



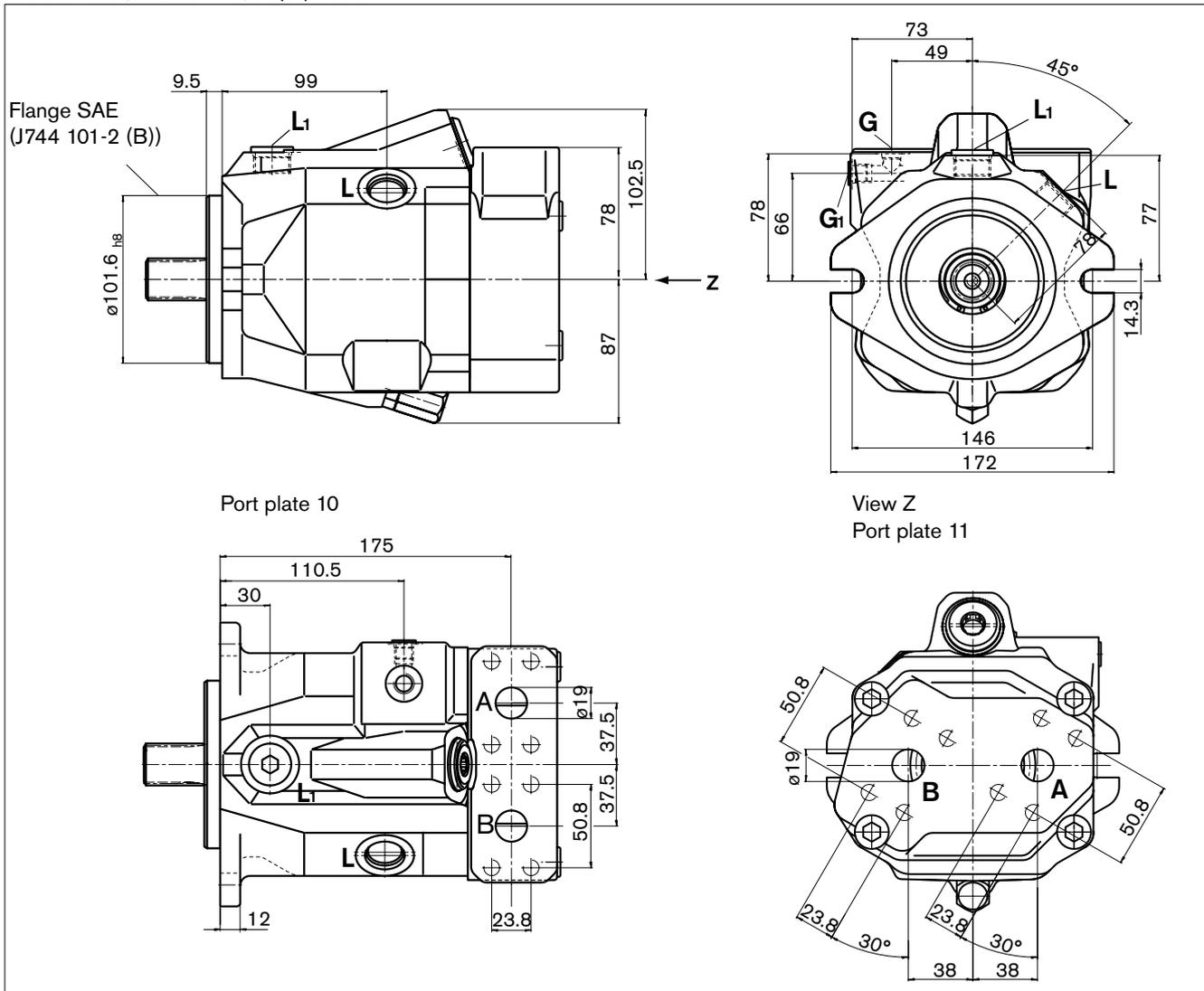
Drive shaft



Dimensions A10VM size 45

Before finalising your design please request a certified installation drawing.
Dimensions in mm

A10VM 45DG/52WX-VXC10(11)N000



Ports

Designation	Port for	Standard	Size ²⁾	Max. press. [bar] ³⁾	State
A, B	Pressure (high pressure series, code 62)	SAE J518	3/4 in	350	O
	Fixing thread (port plate 10)	DIN 13	M10; 17 deep		O
A, B	Pressure (port plate 16)	DIN 3852-1 ⁵⁾	M27x2; 16 deep	350	O
L	Case drain	ISO 11926 ⁵⁾	7/8-14UNF-2B	4	O ⁴⁾
L ₁	Case drain	ISO 11926 ⁵⁾	7/8-14UNF-2B	4	X ⁴⁾
G	External control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 12 deep	350	O
G ₁	External control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 12 deep	350	X
X	Pilot pressure	ISO 11926 ⁵⁾	7/16-20UNF-2B; 10 deep	350	O

1) ANSI B92.1a-1976, 30° pressure angle, flat root, side fit, tolerance class 5

2) Observe the general instruction on page 28 for the maximum tightening torques.

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

4) Depending on installation position L oder L₁ must be connected (see also page 27).

5) The spot face can be deeper than specified in the appropriate standard.

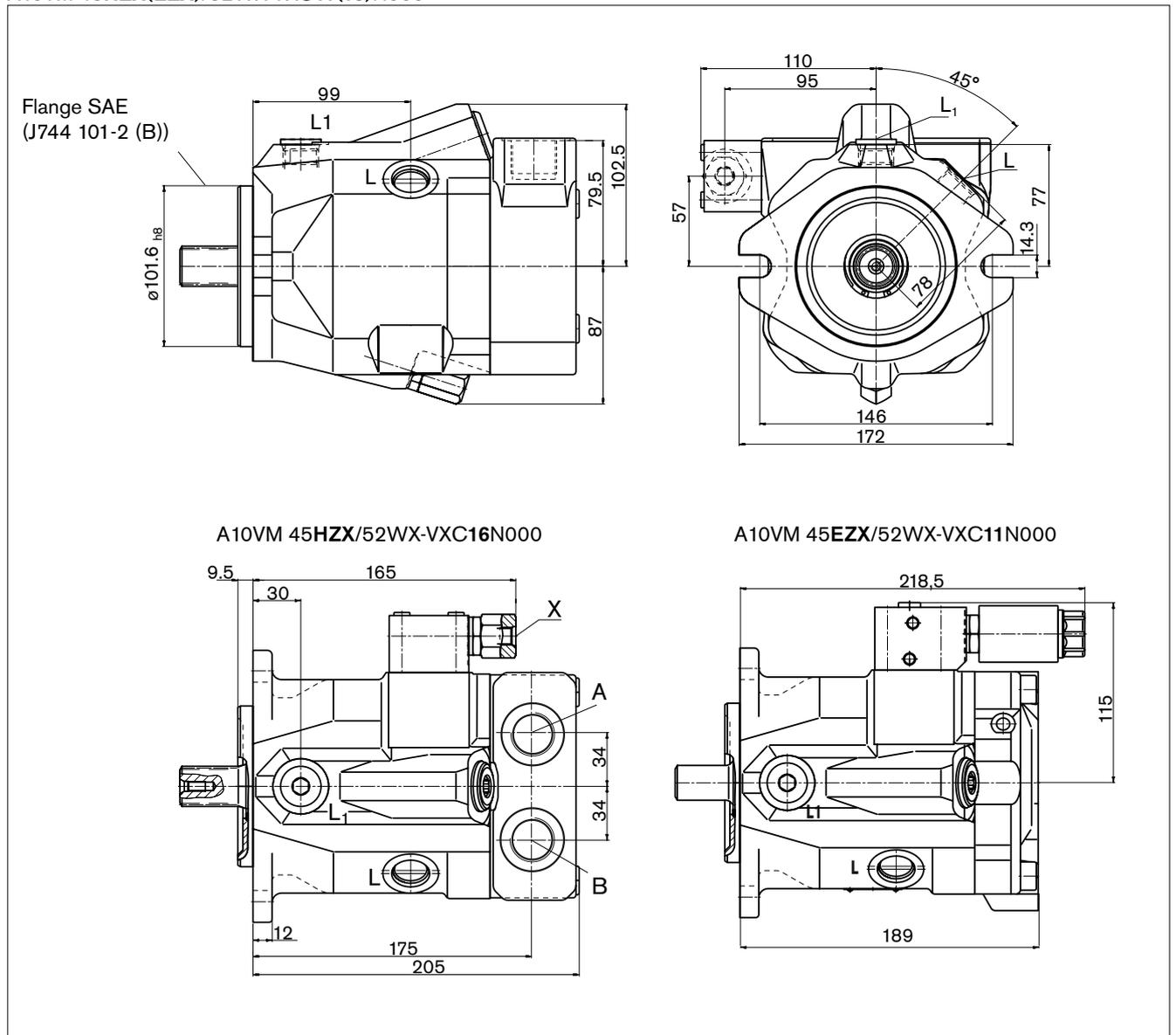
O = must be connected (plugged on delivery)

X = Plugged (in normal operation)

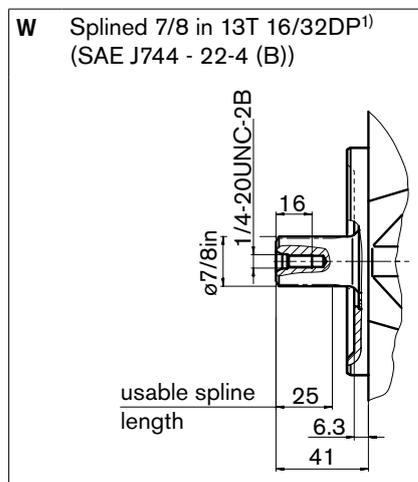
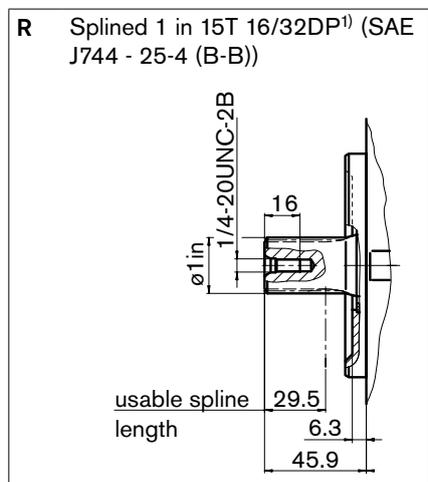
Dimensions A10VM size 45

Before finalising your design please request a certified installation drawing.
Dimensions in mm

A10VM 45HZX(EZX)/52WX-VXC11(16)N000



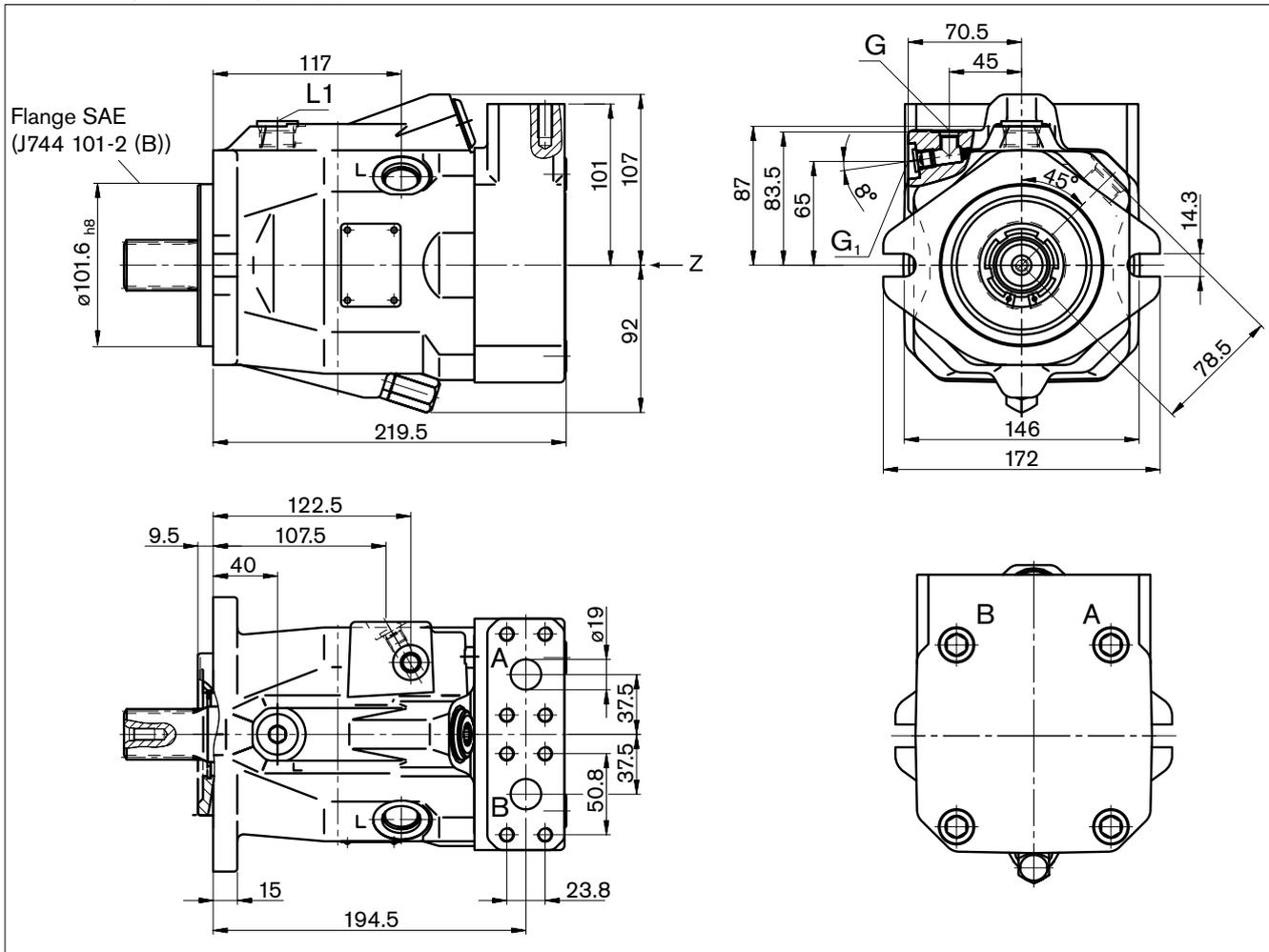
Drive shaft



Dimensions A10VM size 63

Before finalising your design please request a certified installation drawing.
Dimensions in mm

A10VM 63DG/52WX-VXC10N000



Ports

Designation	Port for	Standard	Size ²⁾	Max. press. [bar] ³⁾	State
A, B	Pressure (high pressure series, code 62)	SAE J518	3/4 in	350	O
	Fixing thread (port plate 10)	DIN 13	M10; 17 deep		O
A, B	Pressure (port plate 16)	DIN 3852-1 ⁵⁾	M27x2; 16 deep	350	O
L	Case drain	ISO 11926 ⁵⁾	7/8-14UNF-2B	4	O ⁴⁾
L ₁	Case drain	ISO 11926 ⁵⁾	7/8-14UNF-2B	4	X ⁴⁾
G	External control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 12 deep	350	O
G ₁	External control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 12 deep	350	X
X	Pilot pressure	ISO 11926 ⁵⁾	7/16-20UNF-2B; 10 deep	350	O

1) ANSI B92.1a-1976, 30° pressure angle, flat root, side fit, tolerance class 5

2) Observe the general instruction on page 28 for the maximum tightening torques.

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

4) Depending on installation position L oder L₁ must be connected (see also page 27).

5) The spot face can be deeper than specified in the appropriate standard.

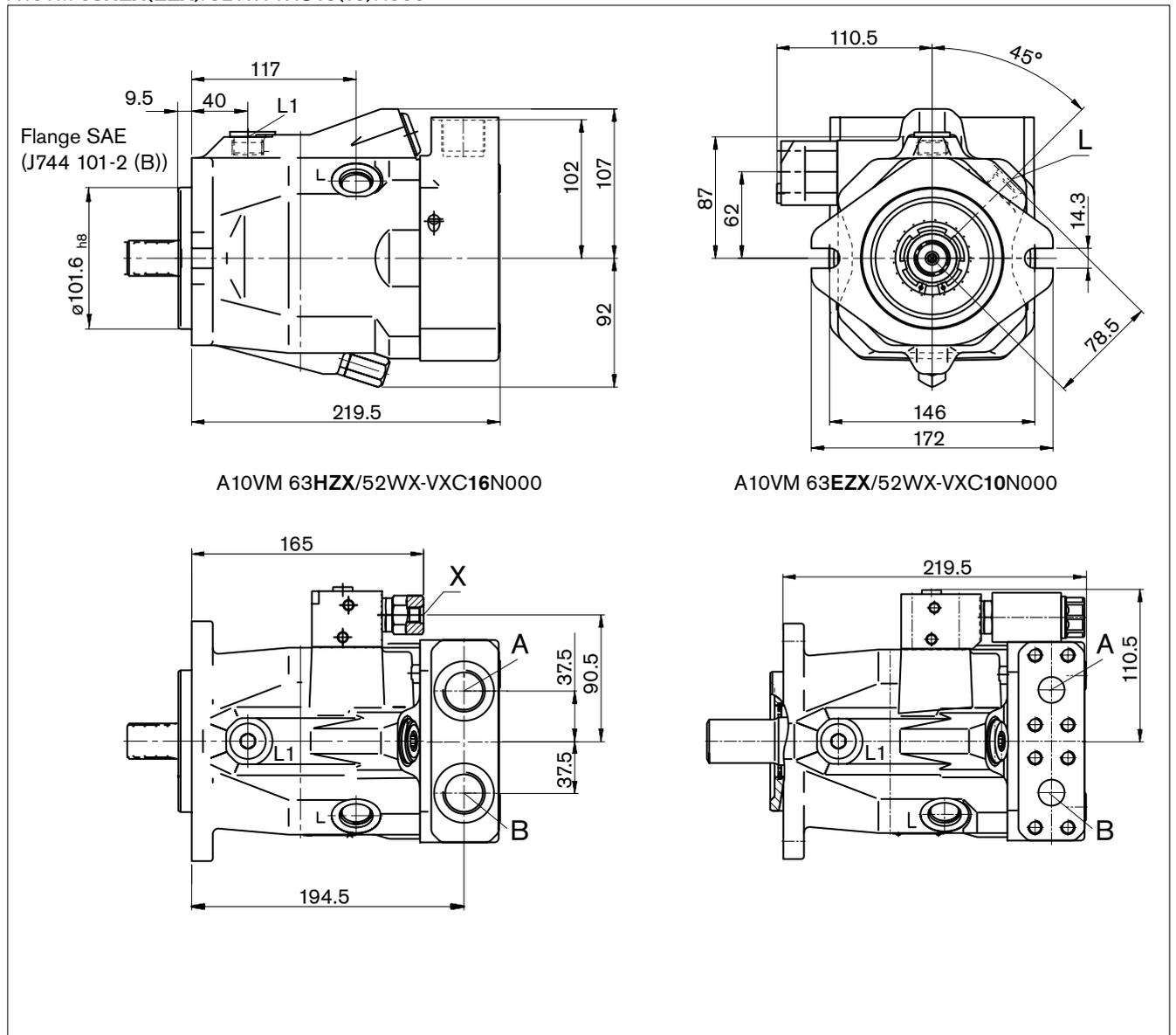
O = must be connected (plugged on delivery)

X = Plugged (in normal operation)

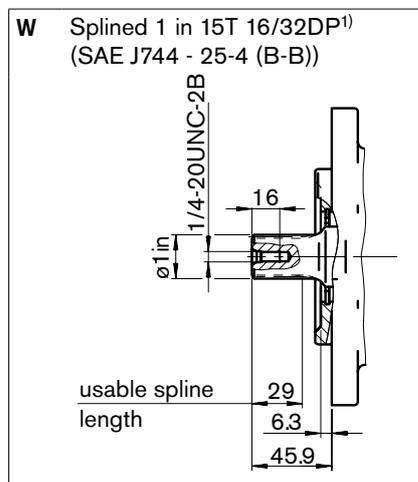
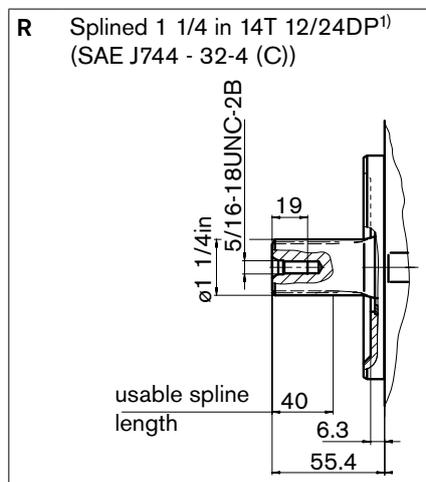
Dimensions A10VM size 63

Before finalising your design please request a certified installation drawing.
Dimensions in mm

A10VM 63HZX(EZX)/52WX-VXC10(16)N000



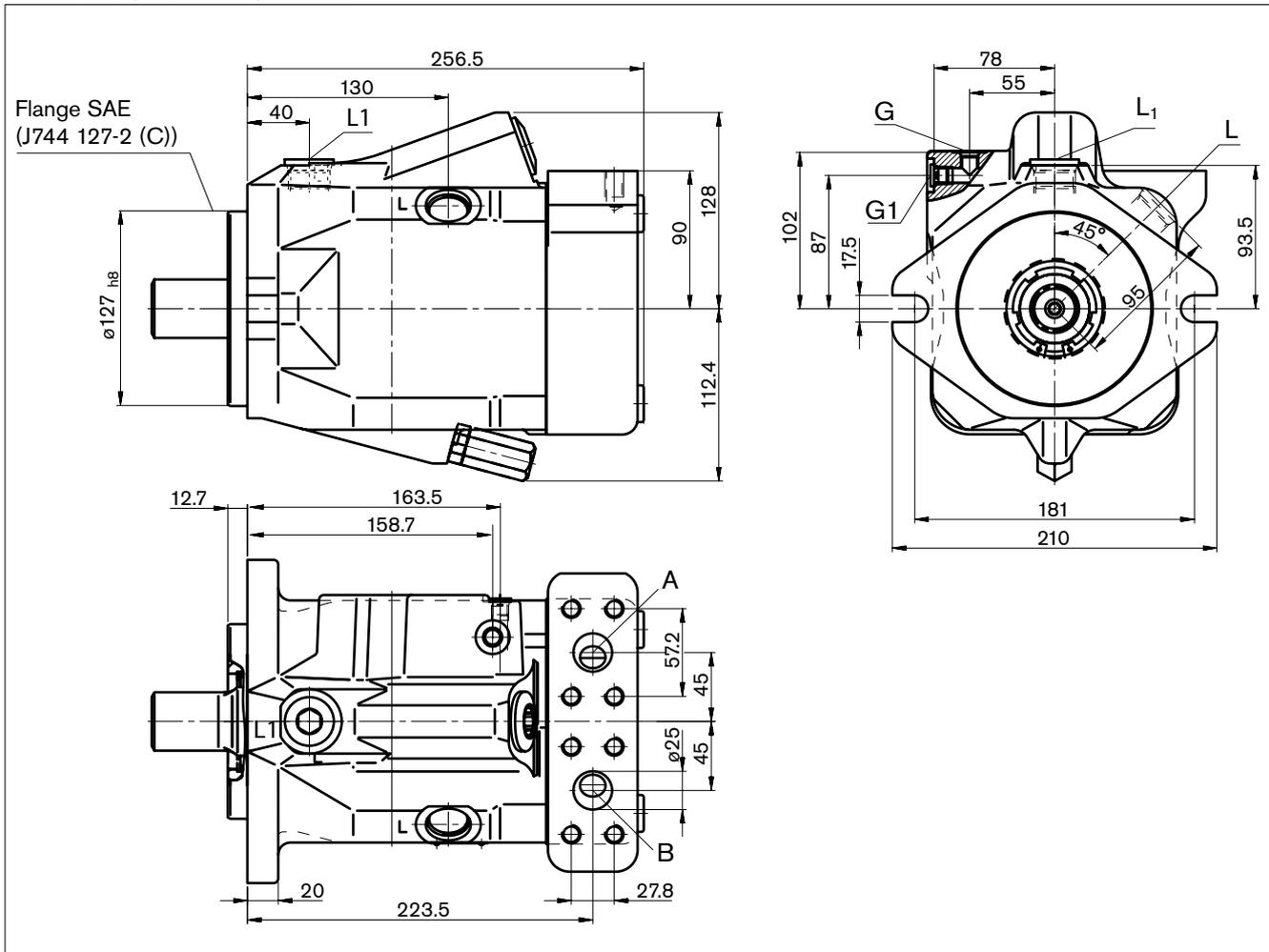
Drive shaft



Dimensions A10VM size 85

Before finalising your design please request a certified installation drawing.
Dimensions in mm

A10VM 85DG/52WX-VXC10N000



Ports

Designation	Port for	Standard	Size ²⁾	Max. press. [bar] ³⁾	State
A, B	Pressure (high pressure series, code 62)	SAE J518C	1 in	350	O
	Fixing thread (port plate 10)	DIN 13	M12; 17 deep		O
L	Case drain	ISO 11926 ⁵⁾	1 1/16-12UN-2B	4	O ⁴⁾
L ₁	Case drain	ISO 11926 ⁵⁾	1 1/16-12UN-2B	4	X ⁴⁾
G	external control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 12 deep	350	O
G ₁	external control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 12 deep	350	X

1) ANSI B92.1a-1976, 30° pressure angle, flat root, side fit, tolerance class 5

2) Observe the general instruction on page 28 for the maximum tightening torques.

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

4) Depending on installation position L oder L₁ must be connected (see also page 27).

5) The spot face can be deeper than specified in the appropriate standard.

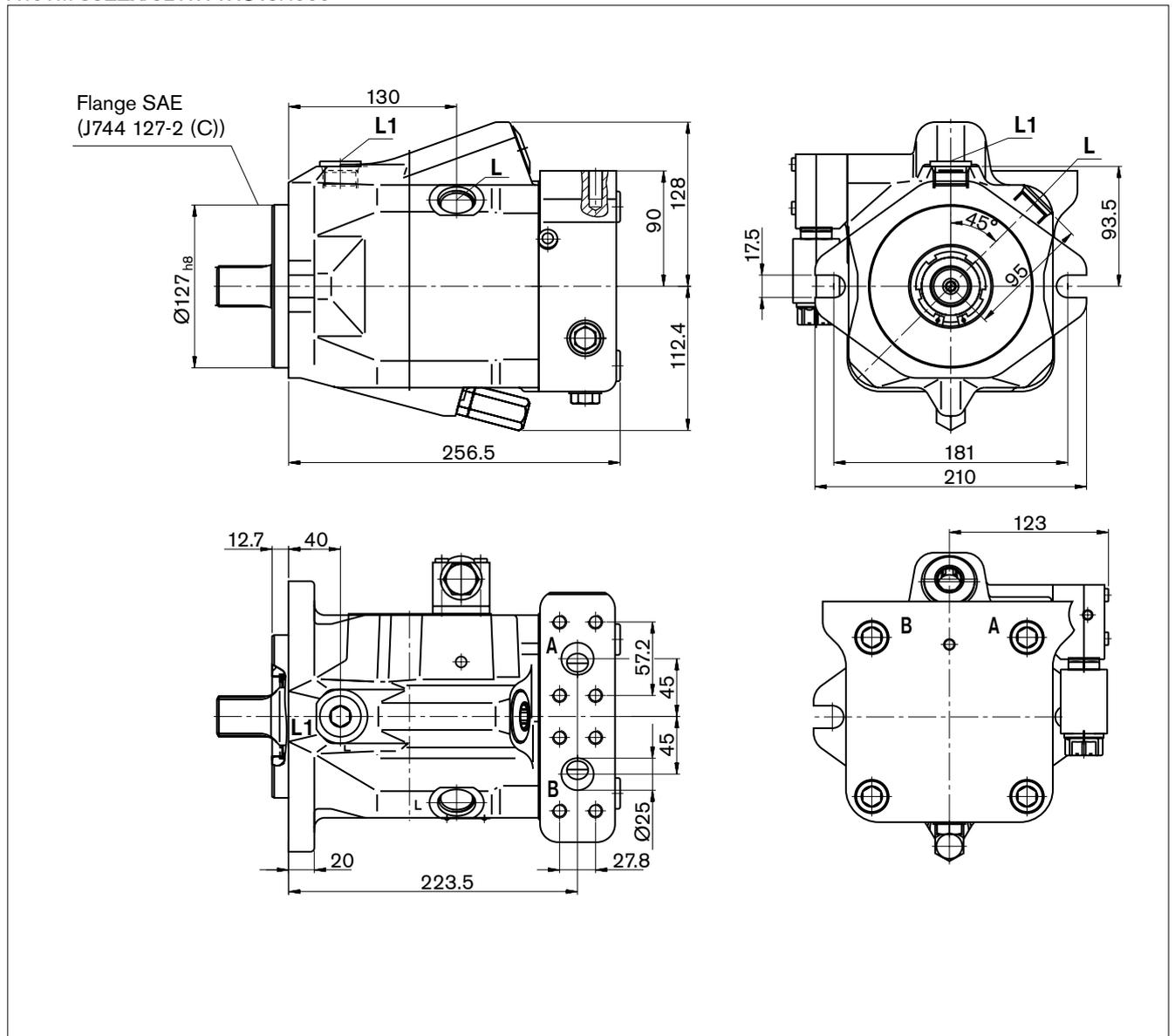
O = must be connected (plugged on delivery)

X = Plugged (in normal operation)

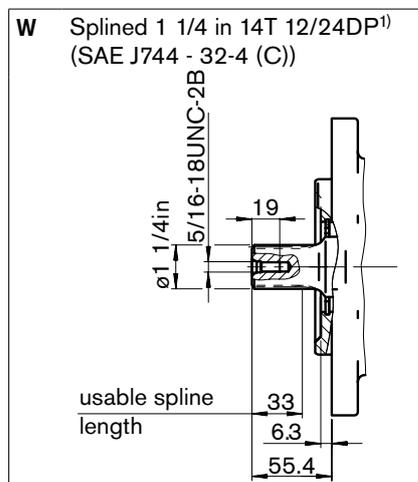
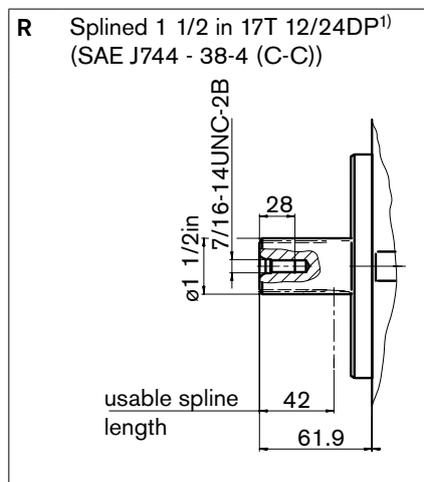
Dimensions A10VM size 85

Before finalising your design please request a certified installation drawing.
Dimensions in mm

A10VM 85EZX/52WX-VXC10N000



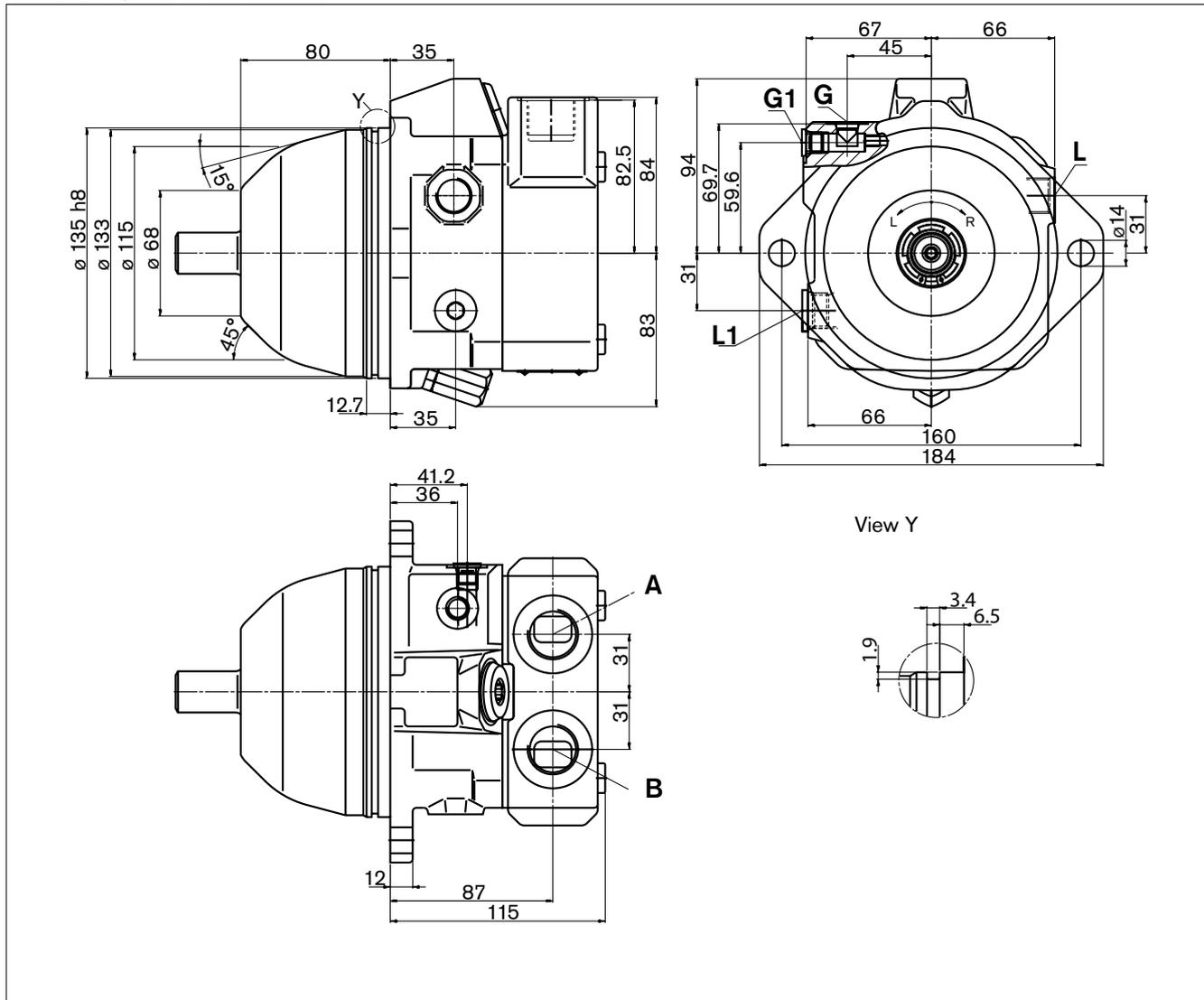
Drive shaft



Dimensions A10VE size 28

Before finalising your design please request a certified installation drawing.
Dimensions in mm

A10VE 28DG/52WX-VXF16N000



Ports

Designation	Port for	Standard	Size ²⁾	Max. press. [bar] ³⁾	State
A, B	Pressure (high pressure series, code 62)	SAE J518	3/4 in	350	O
	Fixing thread (port plate 10)	DIN 13	M10; 17 deep		O
A, B	Pressure (port plate 16)	DIN 3852-1 ⁵⁾	M27x2; 16 deep	350	O
L	Case drain	ISO 11926 ⁵⁾	3/4-16UNF-2B	4	O ⁴⁾
L ₁	Case drain	ISO 11926 ⁵⁾	3/4-16UNF-2B	4	X ⁴⁾
G	External control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 12 deep	350	O
G ₁	External control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 12 deep	350	X
X	Pilot pressure	ISO 11926 ⁵⁾	7/16-20UNF-2B; 10 deep	350	O

1) ANSI B92.1a-1976, 30° pressure angle, flat root, side fit, tolerance class 5

2) Observe the general instruction on page 28 for the maximum tightening torques.

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

4) Depending on installation position L oder L₁ must be connected (see also page 27).

5) The spot face can be deeper than specified in the appropriate standard.

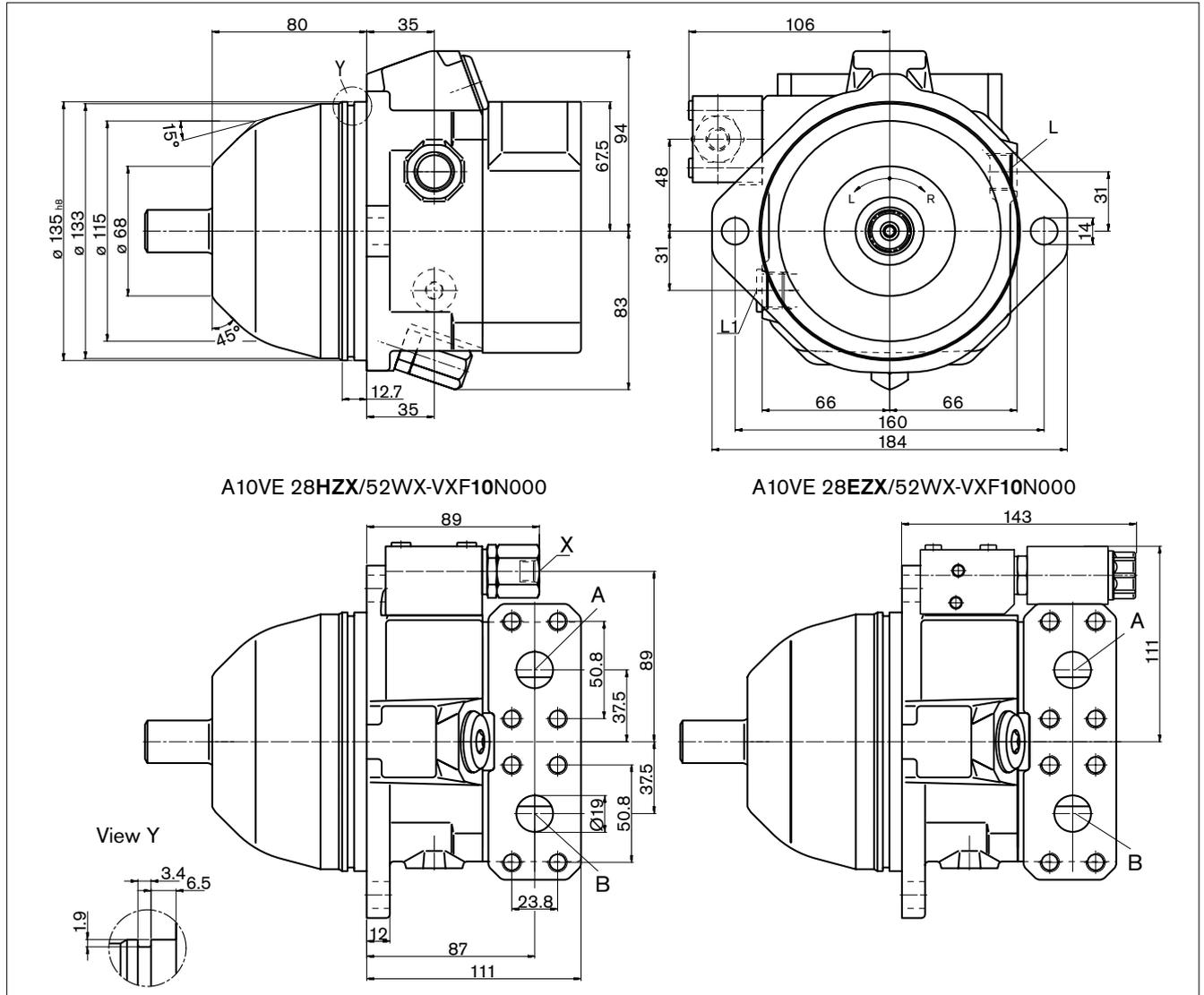
O = must be connected (plugged on delivery)

X = Plugged (in normal operation)

Dimensions A10VE size 28

Before finalising your design please request a certified installation drawing.
Dimensions in mm

A10VE 28HZX(EZX)/52WX-VXF10N000

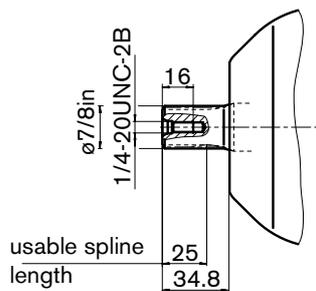


A10VE 28HZX/52WX-VXF10N000

A10VE 28EZX/52WX-VXF10N000

Drive shaft

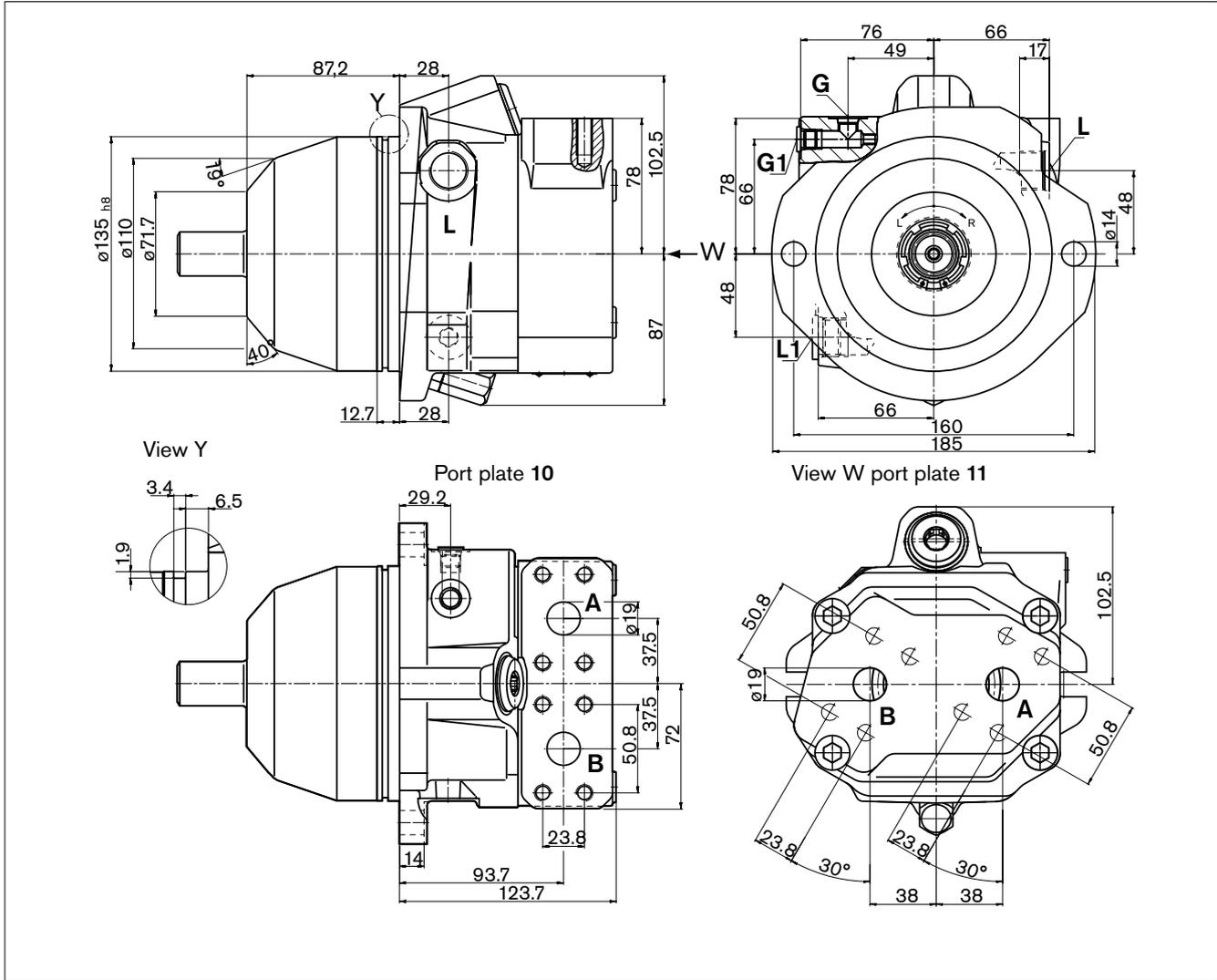
R Splined 7/8 in 13T 16/32DP¹⁾
(SAE J744 - 22-4 (B))



Dimensions A10VE size 45

Before finalising your design please request a certified installation drawing.
Dimensions in mm

A10VE 45DG/52WX-VXF10(11)N000



Ports

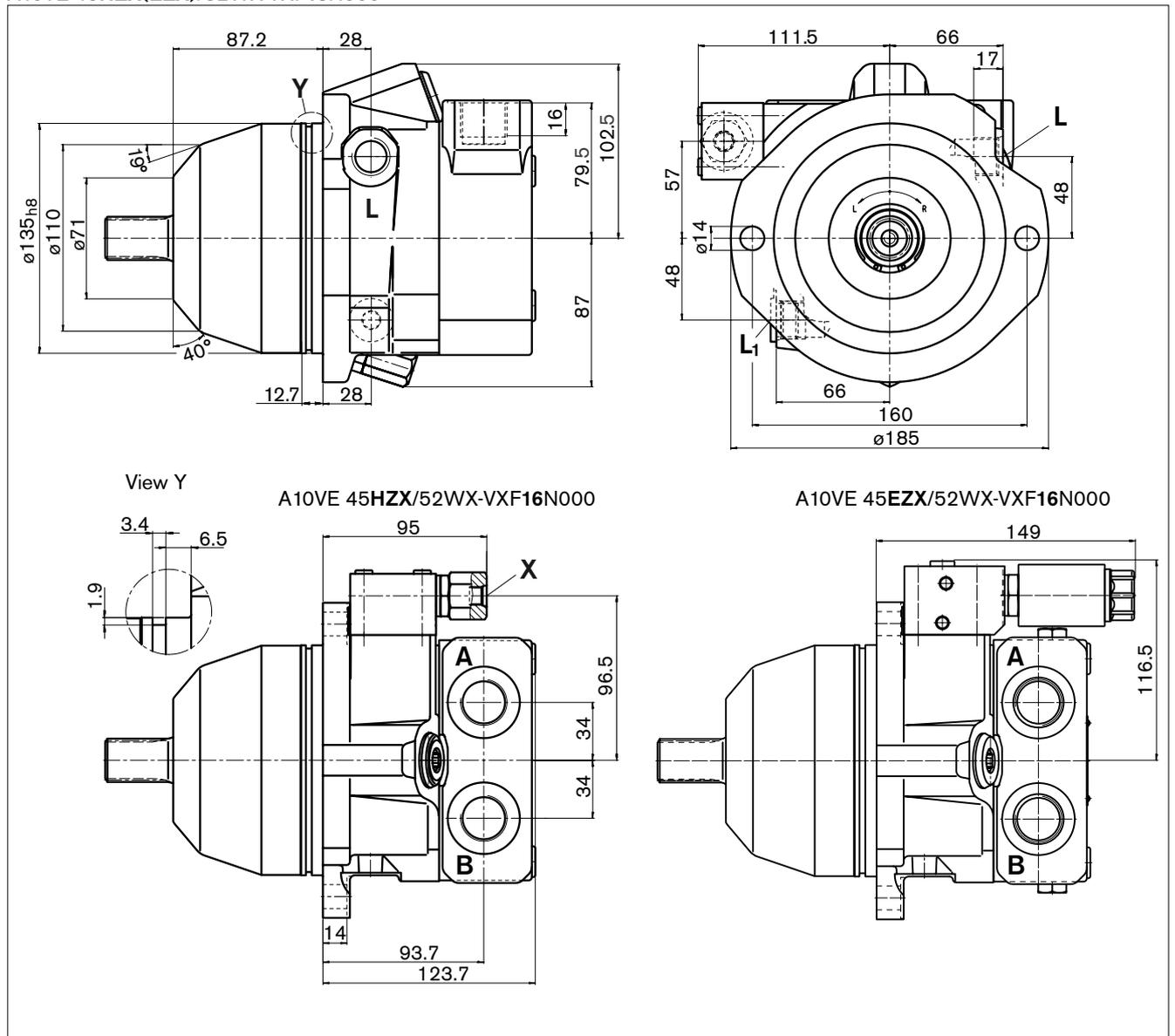
Designation	Port for	Standard	Size ²⁾	Max. press. [bar] ³⁾	State
A, B	Pressure (high pressure series, code 62)	SAE J518	3/4 in	350	O
	Fixing thread (port plate 10, 11)	DIN 13	M10; 17 deep		O
A, B	Pressure (port plate 16)	DIN 3852-1 ⁵⁾	M27x2; 16 deep	350	O
L	Case drain	ISO 11926 ⁵⁾	7/8-14UNF-2B	4	O ⁴⁾
L ₁	Case drain	ISO 11926 ⁵⁾	7/8-14UNF-2B	4	X ⁴⁾
G	External control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 12 deep	350	O
G ₁	External control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 12 deep	350	X
X	Pilot pressure	ISO 11926 ⁵⁾	7/16-20UNF-2B; 10 deep	350	O

- 1) ANSI B92.1a-1976, 30° pressure angle, flat root, side fit, tolerance class 5
 - 2) Observe the general instruction on page 28 for the maximum tightening torques.
 - 3) Short-term pressure spikes may occur depending on the application. Keep this in mind when selecting measuring devices and fittings.
 - 4) Depending on installation position L oder L₁ must be connected (see also page 27).
 - 5) The spot face can be deeper than specified in the appropriate standard.
- O = must be connected (plugged on delivery)
X = Plugged (in normal operation)

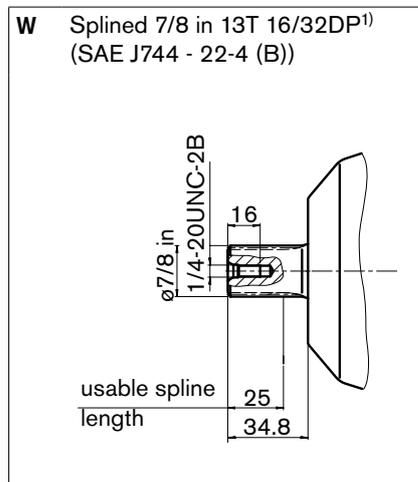
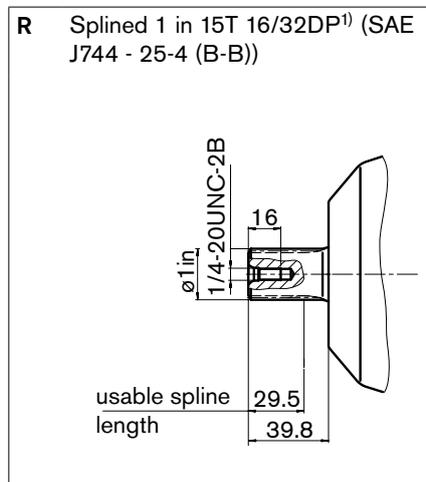
Dimensions A10VE size 45

Before finalising your design please request a certified installation drawing.
Dimensions in mm

A10VE 45HZX(EZX)/52WX-VXF16N000



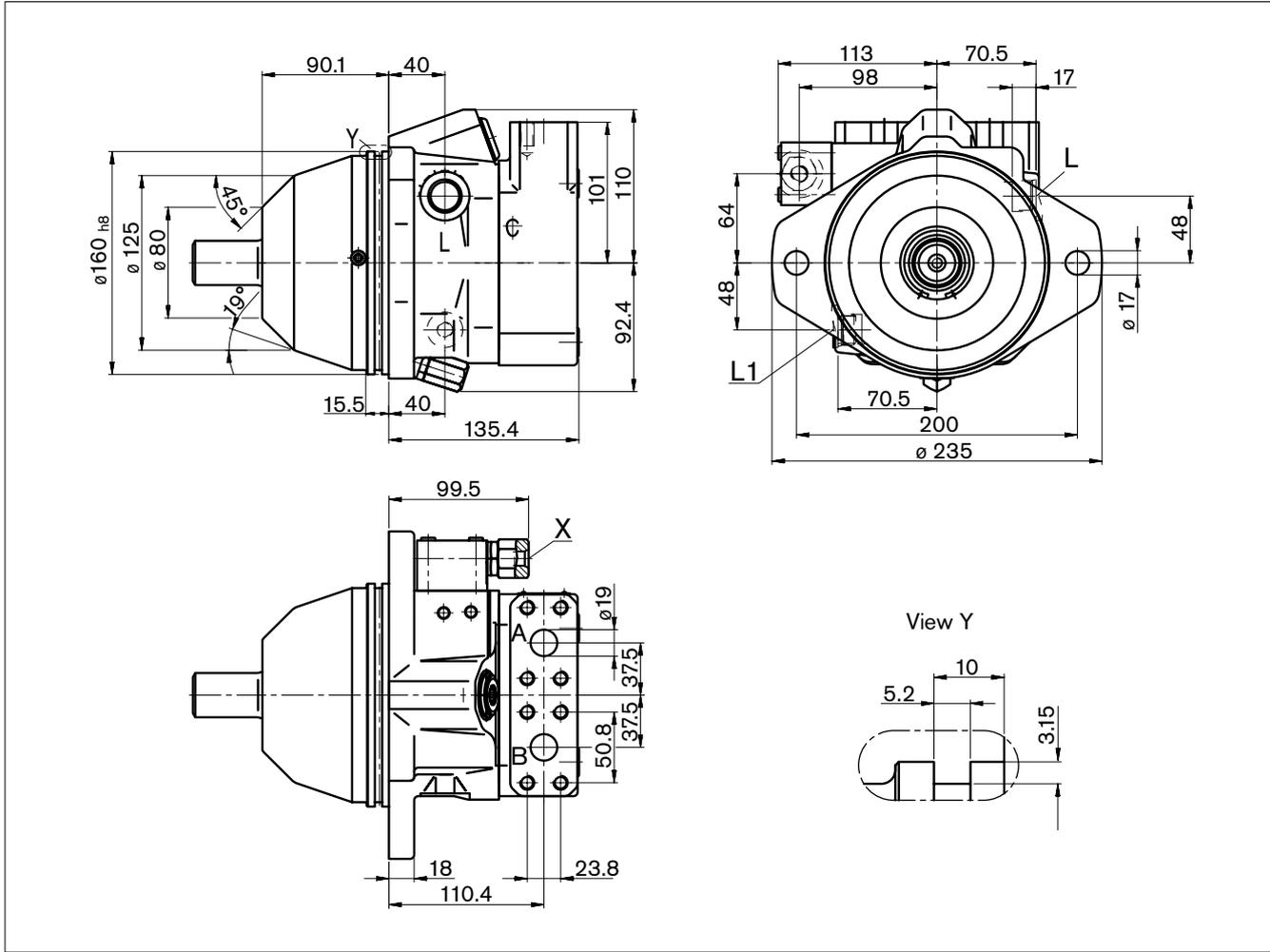
Drive shaft



Dimensions A10VE size 63

Before finalising your design please request a certified installation drawing.
Dimensions in mm

A10VE 63HZ/52WX-VXF10N000



Ports

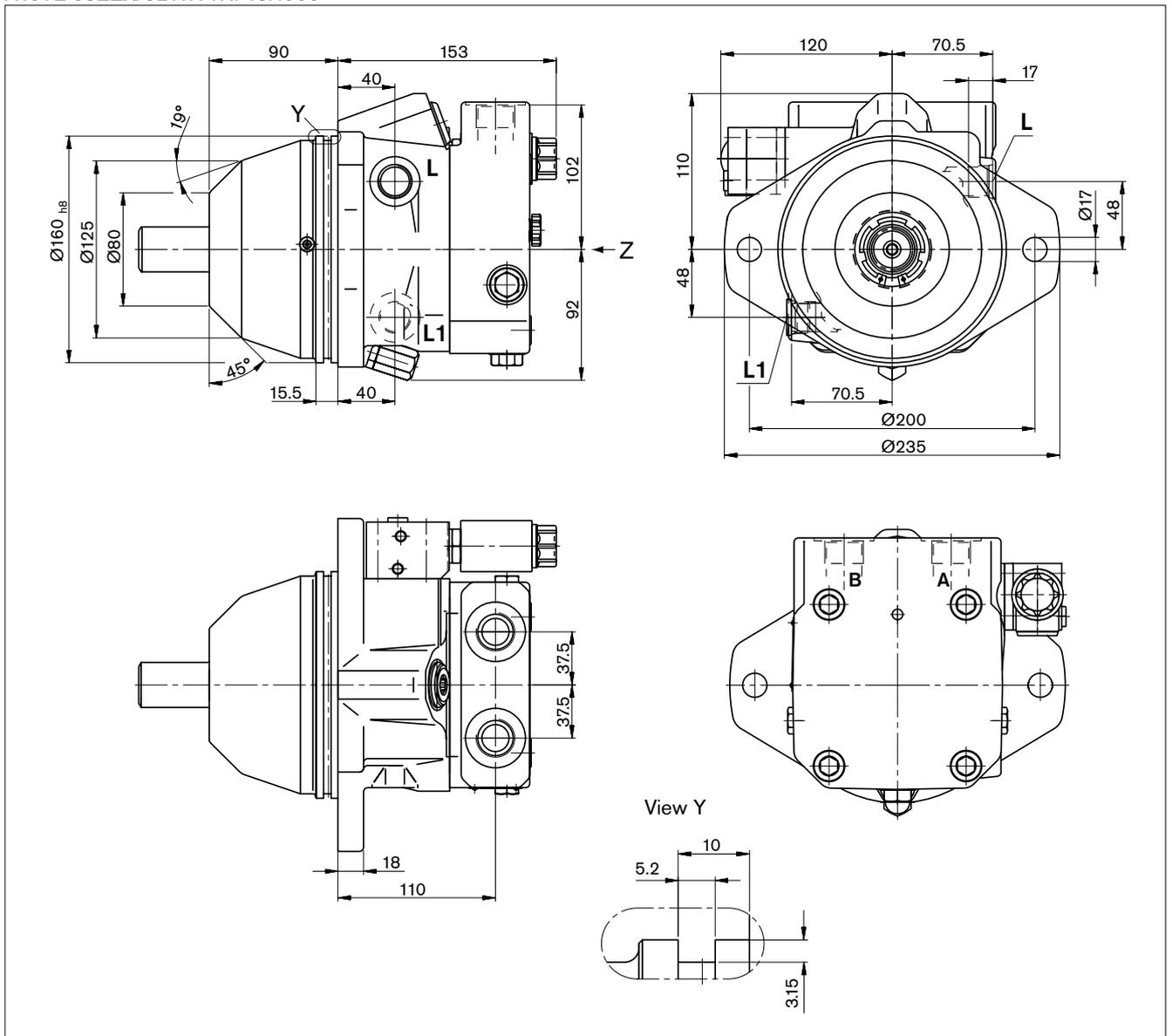
Designation	Port for	Standard	Size ²⁾	Max. press. [bar] ³⁾	State
A, B	Pressure (high pressure series, code 62)	SAE J518	3/4 in	350	O
	Fixing thread (port plate 10)	DIN 13	M10; 17 deep		
A, B	Pressure (port plate 16)	DIN 3852-1 ⁵⁾	M27x2; 16 deep	350	O ⁴⁾
L	Case drain	ISO 11926 ⁵⁾	7/8-14UNF-2B	4	O ⁴⁾
L ₁	Case drain	ISO 11926 ⁵⁾	7/8-14UNF-2B	4	X ⁴⁾
X	External control pressure	ISO 11926 ⁵⁾	7/16-20UNF-2B; 10 deep	350	O

- 1) ANSI B92.1a-1976, 30° pressure angle, flat root, side fit, tolerance class 5
 - 2) Observe the general instruction on page 28 for the maximum tightening torques.
 - 3) Short-term pressure spikes may occur depending on the application. Keep this in mind when selecting measuring devices and fittings.
 - 4) Depending on installation position L oder L₁ must be connected (see also page 27).
 - 5) The spot face can be deeper than specified in the appropriate standard.
- O = must be connected (plugged on delivery)
X = Plugged (in normal operation)

Dimensions A10VE size 63

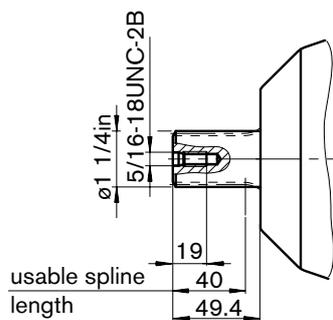
Before finalising your design please request a certified installation drawing.
Dimensions in mm

A10VE 63EZ_X/52WX-VXF16N000

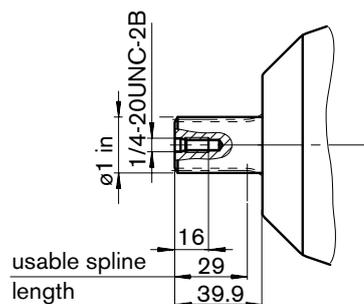


Drive shaft

R Splined 1 1/4 in 14T 12/24DP¹⁾
(SAE J744 - 32-4 (C))



W Splined 1 in 15T 16/32DP¹⁾ (SAE
J744 - 25-4 (B-B))



Integrated flushing and boost press. relief valve, N007

The flushing and boost pressure relief valve is used in closed circuits to flush an unacceptable heat load out of the circuit and to maintain a minimum boost pressure level (fixed setting). The valve is integrated into the port plate.

A built-in fixed orifice determines the flushing flow, which is taken out of the low pressure side of the loop and directed into the motor housing. It leaves the housing together with the case drain flow. This combined flow must be replenished with fresh, cool fluid by means of the boost pump.

Standard flushing flow

With a pressure of $p_{ND} = 20$ bar in the low pressure side of the circuit and an orifice dia. of $\varnothing 1.6$ mm the flushing flow amounts to 5.5 L/min (Size 28 - 85).

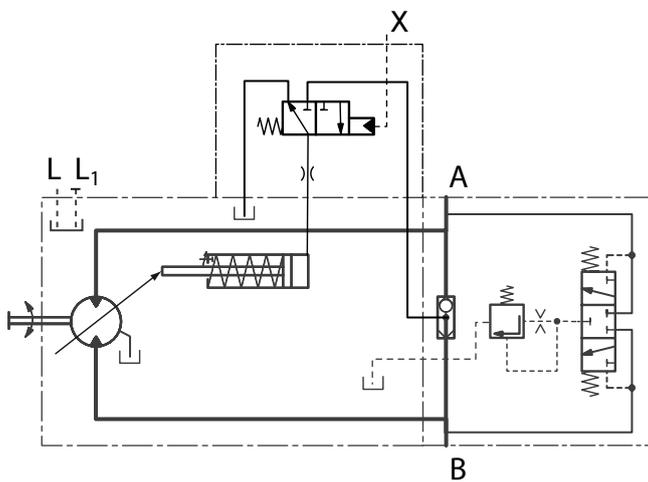
Other orifice diameters can be ordered in clear text.

Further flushing flows for sizes 28 - 85 see table:

Flushing flow (L/min)	Orifice dia. in mm
3.5	1.2
5.5	1.6
7.2	1.8

Circuit diagram

e.g. A10VO..HZ/...N007



Ports for	
A, B	pressure
L, L ₁	case drain (L ₁ plugged)
X	pilot pressure

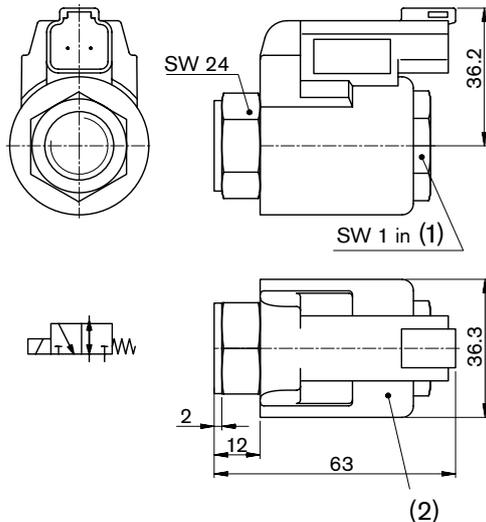
Connector for solenoids

DEUTSCH WKM08130D-01-C-V-XXDN, 2-pin

Molded, without bidirectional suppressor diode
(Standard) _____ P

Rexroth part-No. R902650409 _____ 12V
R902650408 _____ 24V

Technical data of electric	
Voltage	Cocurrent flow
Supply voltage	12 or 24 V
Nominal current	1.5 A
Voltage tolerance	-15 % bis +15 %
Operating period	100 %
Protection class	IP 65
Technical data of hydraulic	
Nominal pressure	maximum 350 bar
Flow	maximum 25 L/min
Sealing	FKM (flour-rubber)
Operating temperature of fluid	-20 °C to +120 °C
Viscosity range	10 mm ² /s to 420 mm ² /s
Function	D



The female connector is not part of the scope of supply. This can be supplied by Rexroth on request.

HIRSCHMANN DIN EN 175 301-803-A /ISO 4400

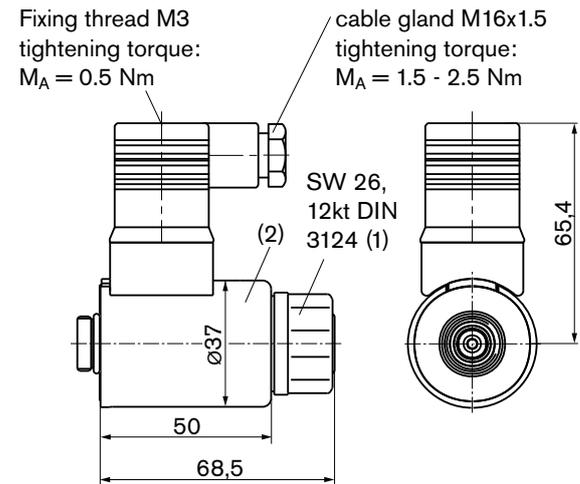
(not for new projects)

without bidirectional suppressor diode _____ H

Degree of protection to DIN/EN 60529: IP65

The sealing ring in the cable gland (M16x1,5) is suitable for cables 4.5 mm to 10 mm in diameter.

The HIRSCHMANN-connector is part of the scope of supply of the motor.



Note for round solenoids:

The position of the connector can be changed by turning the solenoid body.

Proceed as follows:

- 1. Loosen fixing nut (1)
- 2. Turn the solenoid body (2) to the desired position.
- 3. Tighten the fixing nut

Tightening torque of fixing nut: 5+1 Nm

Electronic controls

Control	Electronic function	Electronics		Further information
Electric pressure control	Regulated current outout	RA	analogue	RD 95 230
		VT2000	analogue	RD 29 904
		RC2-2/21 ¹⁾	digital	RD 95 201

¹⁾ Current outputs for 2 valves, sparately controllabile

Speed pickup

The version A10VM/E...D („prepared for speed pickup“) comprises gearing around the rotary unit.

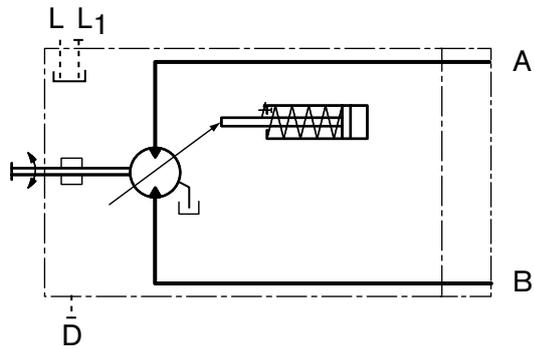
In this case, the rotating cylinder barrel can provide a speed dependent signal, which can be picked up by a suitable sensor and processed for further evaluation. The sensor port will be plugged for delivery.

This preparation for speed pickup does not include the necessary working parts. They must be ordered separately as a kit with a corresponding part number.

Inductive speed sensor ID R 18/20-L250 (see RE 95130) and mounting parts (spacer and 2 seals per kit) can be ordered separately under the following part numbers:

Size	Part Nr.	Number of teeth
28	R902428802	48
45	R902437557	48
63	R902428802	56
85	in preparation	

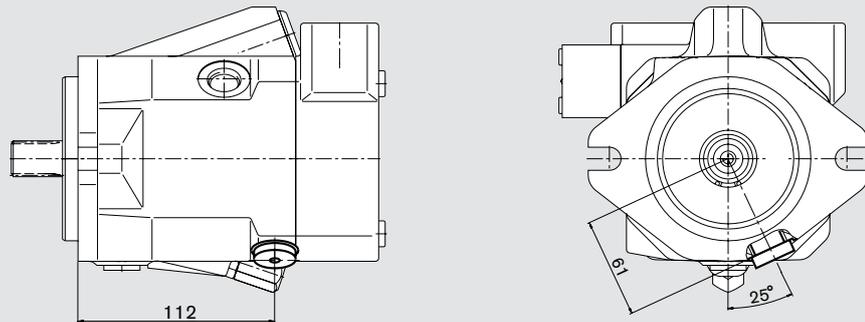
Circuit diagram



Before finalising your design please request a certified installation drawing.
Dimensions in mm

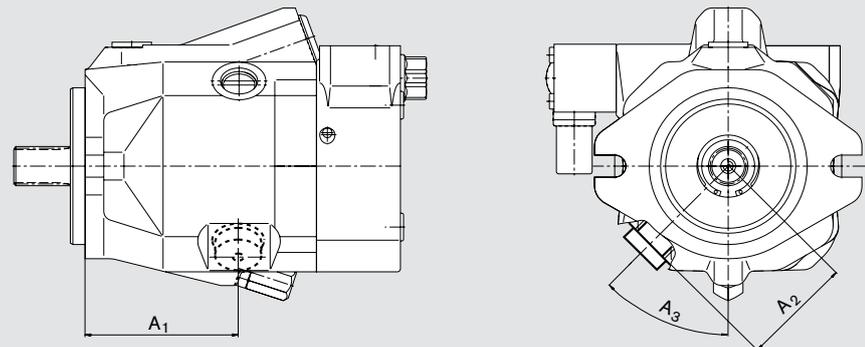
Dimension port D

A10VM 28

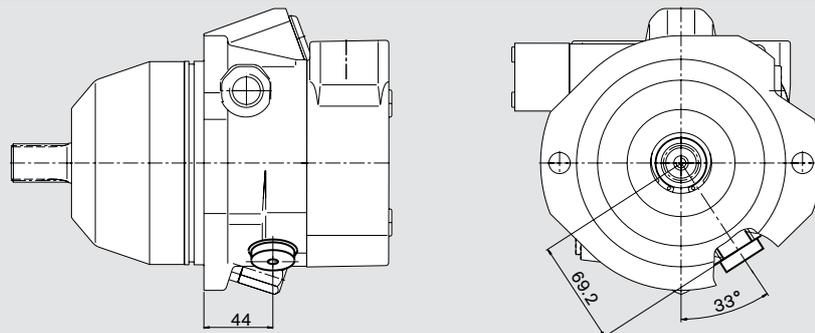


A10VM 45, 63 and 85

Size	A1	A2	A3
45	96	69.2	45°
63	140.5	71	57.5°
85	130	91.3	45°



A10VE 45



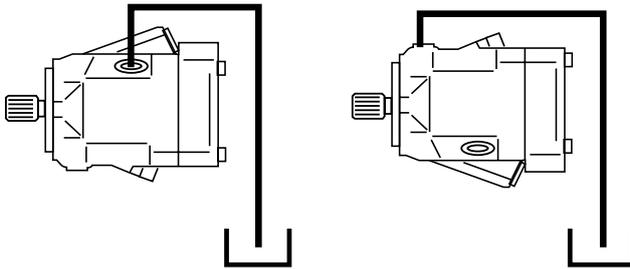
Mounting position

The motor housing must be filled during start up and operation. The drain line must be arranged, so that the housing cannot empty itself when the motor is at standstill. The end of the drain line must enter the tank below the minimum fluid level.

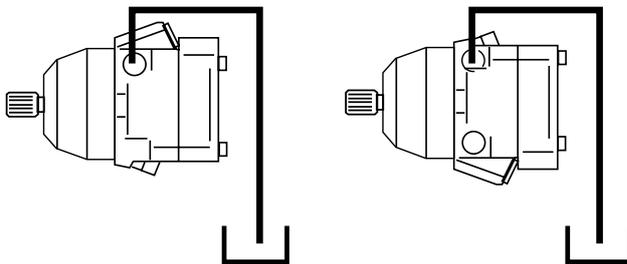
In all installation positions the highest case drain port must be used to fill the housing and to connect the drain line.

In case of a vertical installation please consult us.

A10VM



A10VE



General instructions

- The A10VM/VE is designed for operation in open and closed circuits
- Systems design, installation and commissioning requires trained technicians or tradesmen.
- Be sure to read the entire operating instructions thoroughly and completely before using the axial piston unit. If necessary, request them at Rexroth.
- All hydraulic ports can only be used for the fastening of hydraulic service lines.
- During and shortly after operation of an axial piston unit the housing and especially a solenoid can be extremely hot, avoid being burned; take suitable safety measures (wear protective clothing).
- Dependent on the operating conditions of the axial piston unit (operating pressure, fluid temperature) deviations in the performance curves can occur.
- Pressure ports:
All materials and port threads are selected and designed in such a manner, that they can withstand the maximum pressure. The machine and system manufacturer must ensure, that all connecting elements and hydraulic lines are suitable for the actual operating pressures.
- Pressure cut off and pressure control are not suitable for providing system protection against excessive pressures. A suitable overall main line relief valve must be incorporated.
- All given data and information must be adhered to.
- The following tightening torques are valid:
 - Female threads in the axial piston unit:
the maximum permissible tightening torques $M_{G_{max}}$ are maximum values for the female threads in the pump casting and may not be exceeded. Value see table below.
 - Fittings:
please comply with the manufacturer's information regarding the max. permissible tightening torques for the used fittings.
 - Fastening bolts:
for fastening bolts to ISO 68 we recommend to check the permissible tightening torques in each individual case to VDI 2230.
 - Plugs:
for the metal plugs, supplied with the axial piston unit the following min. required tightening torques M_V apply (see table).

Threaded port sizes		Maximum permissible tightening torque of the threaded holes $M_{G_{max}}$	Required tightening torque of the locking screws M_V	WAF hexagon socket of the locking screws
7/8-14 UNF-2B	ISO 11926	240 Nm	127 Nm	3/8 in
7/16-20UNF-2B	ISO 11926	40 Nm	15 Nm	3/16 in
3/4-16 UNF-2B	ISO 11936	160 Nm	62 Nm	5/16 in
1 1/16-12 UNF-2B	ISO 11926	360 Nm	147 Nm	9/16 in
M14x1,5	DIN 3852	80 Nm	35 Nm	6 mm
M16x1,5	DIN 3852	100 Nm	50 Nm	8 mm
M18x1,5	DIN 3852	140 Nm	60 Nm	8 mm
M22x1,5	DIN 3852	210 Nm	80 Nm	10 mm
M27x2	DIN 3852	330 Nm	135 Nm	12 mm