

Axial Piston Variable Motor A10VM Plug-in Version A10VE

RA 91 703-A/03.10
Replaces: 11.07

1/28

Data sheet

Series 52
Size 28 to 85
Nominal pressure 4000 psi (280 bar)
Maximum pressure 5100 psi (350 bar)
Open and closed circuit



A10 VM

A10 VE

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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
- 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 - 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 4000 psi (280 bar), maximum pressure 5100 psi (350 bar)	A10V
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Operating Mode

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

	028	045	063	085
03 Displacement $V_{g \max}$ in in ³ /rev.	1.71	2.75	3.78	5.19
Displacement $V_{g \max}$ in cm ³ /rev.	28	45	63	85

Control devices

	028	045	063	085		
04	Two point control	Directly operated, external control supply, without pilot valve			●	DG
		Hydraulically operated	Stroking time	without	●	○
	orifice		with	●	○	HZ6
	Electrically with solenoid valve	Stroking time	without	●	●	EZ1
		control voltage 12V	orifice	with	●	●
	Electrically with solenoid valve	Stroking time	without	●	○	EZ2
control voltage 24V		orifice	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 in ³ (in cm ³) steplessly adjustable	from/to	0.49/1.71 (8/28)	0.73/1.52 (12/25)	0.98/2.32 (16/38)	1.34/3.05 (22/50)	1
Adjustment state in clear text	from/to	-	1.59/2.75 (26/45)	2.44/3.78 (40/62)	2.93/5.19 (48/85)	2

Seals

08	FKM (flour-rubber)	V
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Drive shaft

	028	045	063	085	
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	SAE 2-bolt	C
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Ports for service lines

	028	045	063	085	
11 SAE flanges, at side-same side, UNC fixing screws	●	●	●	●	60N00
SAE flanges at rear, UNC fixing screws	○	●	○	○	61N00
Threaded ports on side, same side, UNC thread	●	●	●	○	66N00

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 - Standard program

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

Axial Piston Units

01	Swash plate design, variable, nominal pressure 4000 psi (280 bar), maximum pressure 5100 psi (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)**028 045 063**

03	Displacement $V_{g \max}$ in in ³ /rev.	1.71	2.75	3.78
	Displacement $V_{g \max}$ in cm ³ /rev.	28	45	63

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
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Minimum displacement**028 045 063**

07	$V_{g \min}$ in in ³ (in cm ³) stepples adjustable	from/to	0.61/1.71 (10/28)	0.73/1.52 (12/25)	0.98/2.32 (16/38)	1
	Adjustment please state in clear text	from/to	-	1.59/2.75 (26/45)	2.44/3.78 (40/62)	2

Seals

08	FKM (flour-rubber)	V
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Drive shaft**028 045 063**

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	Special 2-bolt	F
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Ports for service line

11	SAE flanges at side-same side, UNC fixing screws	●	●	●	60N00
	SAE flanges at rear, UNC fixing screws	○	●	○	61N00
	Threaded ports on side, same side, UNC thread	●	●	●	66N00

Valves

12	Without valves	●	●	●	0
	Integrated flushing valve, with side ports only (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

$$v_{opt} = \text{opt. operating viscosity } 80 \dots 170 \text{ SUS } (16 \dots 36 \text{ mm}^2/\text{s})$$

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

The following limits are valid for extreme operating conditions:

$$v_{min} = 42 \text{ SUS } (5 \text{ mm}^2/\text{s}) \text{ (closed circuit)}$$

$$v_{min} = 60 \text{ SUS } (10 \text{ mm}^2/\text{s}) \text{ (open circuit)}$$

briefly ($t \leq 1 \text{ min}$) at max. permissible temperature of 240°F (115°C).

Please note, that the max. fluid temperature of 240°F (115 °C) may also not be exceeded in certain areas (for instance bearing area) The temperature in the bearing area is approx. 9°F (5 K) higher than the average fluid temperature.

$$v_{max} = 7400 \text{ SUS } (1600 \text{ mm}^2/\text{s})$$

briefly ($t \leq 1 \text{ min}$)
on cold start ($t_{min} = -13^\circ\text{F } (-25^\circ\text{C})$, $p \leq 435 \text{ psi}$ (30 bar), $n \leq 1000 \text{ rpm}$).

At temperatures between -13°F (-25°C) and -40°F (-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°F (X °C) the operating temperature in the tank is 140°F (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 240°F (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 (194°F (90 °C) to max. 240°F (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 _____ 4000 psi (280 bar) ¹⁾

Maximum pressure p_{max} _____ 5100 psi (350 bar)

With motors connected in series please consult us.

Case drain pressure

Max. permissible pressure at leakage port L

$p_{abs \text{ max}}$ operation as a motor in open circuit 58 psi (4 bar abs)

$p_{abs \text{ max}}$ operation as a motor in closed circuit 58 psi (4 bar abs)

$p_{abs \text{ max}}$ motor/pump operation in open circuit 29 psi (2 bar abs)

Direction of rotation

Direction of rotation, viewed on shaft end

clockwise

counter-clockwise

B to A

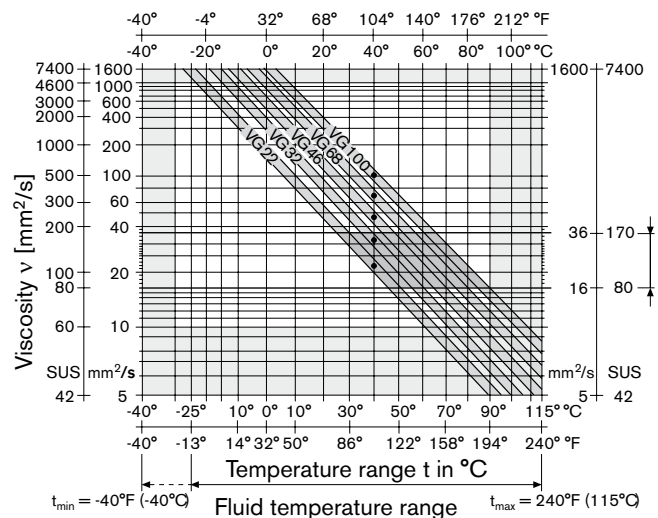
A to B

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

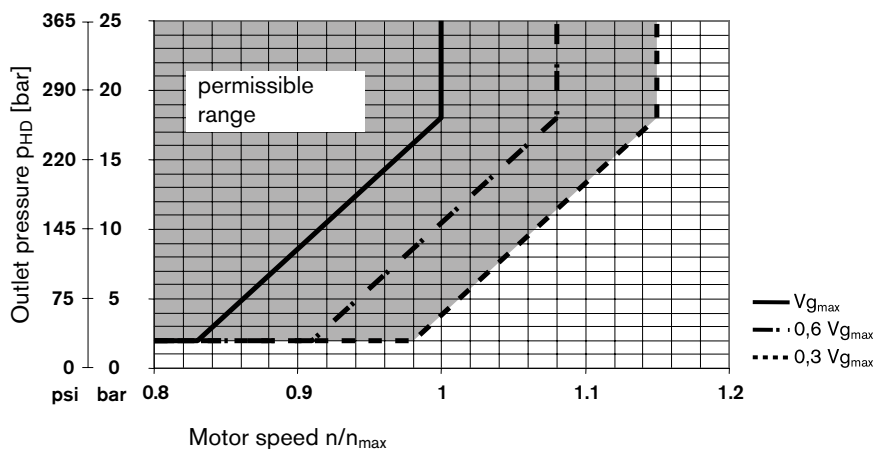
Table of values (theoretical values, without efficiency levels and tolerances; values rounded)

Size			28	45	63	85	
Displacement	$V_{g \max}$	in ³ (cm ³)	1.71 (28)	2.75 (45)	3.78 (62)	5.31 (87)	
	$V_{g \min}$	in ³ (cm ³)	0.49 (8) (VM) 0.61 (10) (VE)	0.73 (12)	0.98 (16)	1.34 (22)	
Speed ¹⁾							
max. at $V_{g \max}$	$n_{0 \max}$	rpm	4700	4000	3300	3100	
max. at $V_{g \min}$	$n_{0 \max \text{ zul}}$	rpm	5400	4600	3900	3560	
Min. speed in cont. operation	$n_{0 \min}$	rpm	250	250	250	250	
Inlet flow							
at $n_{0 \max}$ and $V_{g \max}$	$q_{V0 \max}$	rpm (L/min)	91 (131.6)	47.5 (180)	54 (205)	71.3 (270)	
Torque constant ²⁾ at $V_{g \max}$							
	T_K	lp-ft/psi (Nm/bar)	0.022 (0.445)	0.036 (0.716)	0.049 (1.002)	0.071 (1.35)	
Torque							
at $V_{g \max}$	$p_N = 4000 \text{ psi}$ (280 bar)	T_{\max}	lb-ft (Nm)	91 (125)	146 (200)	200 (276)	283 (387)
Actual starting torque							
at $n = 0 \text{ rpm}$	$p_N = 4000 \text{ psi}$ (280 bar)	T	lb-ft approx. (Nm ca.)	67 (92)	108 (149)	149 (205)	184 (253)
Rotary stiffness							
	Shaft R		lb-ft/rad (Nm/rad)	18900 (26000)	29800 (41000)	50500 (69400)	111600 (152900)
	Shaft W		lb-ft/rad (Nm/rad)	14400 (19800)	25000 (34400)	39300 (54000)	85800 (117900)
Mass moment of inertia (about output shaft)							
	J	ld-ft ² (kgm ²)	0.0403 (0.0017)	0.0783 (0.0033)	0.1329 (0.0056)	0.2847 (0.012)	
Filling volume							
		gal (L)	0.16 (0.6)	0.185 (0.7)	0.21 (0.8)	0.26 (1.0)	
Weight approx.							
	m	lbs (kg)	30.9 (14)	39.7 (18)	57.3 (26)	75.0 (34)	

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

2) in open circuit $\Delta p 4000 \text{ psi}$ (280 bar) at $p_{\text{boostpress.}} 30 \text{ psi}$ (2 bar)
in closed circuit $\Delta p 3700 \text{ psi}$ (260 bar) at $p_{\text{boostpress.}} 290 \text{ psi}$ (20 bar)

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



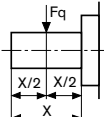
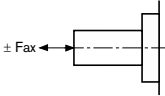
Technical data

Calculating size

Flow	$q_v = \frac{V_g \cdot n}{231 \cdot \eta_v}$	[gpm]	$V_g =$ geometric displacement per rev. in in ³
			$\Delta p =$ Differential pressure in psi
Torque	$T = \frac{V_g \cdot \Delta p \cdot \eta_{mh}}{24 \cdot \pi}$	[Nm]	$n =$ speed in rpm
			$\eta_v =$ volumetric efficiency
			$\eta_{mh} =$ mechanical-hydraulic efficiency
Output power	$P = \frac{T \cdot n}{5252} = \frac{q_v \cdot \Delta p \cdot \eta_t}{1714}$	[kW]	$\eta_t =$ Total efficiency ($\eta_t = \eta_v \cdot \eta_{mh}$)
			$T_K =$ Torque constant
Output speed	$n = \frac{q_v \cdot 231 \cdot \eta_v}{V_g}$	[min ⁻¹]	

Flow	$q_v = \frac{V_g \cdot n}{1000 \cdot \eta_v}$	[L/min]	$V_g =$ geometric displacement per rev. in cm ³
			$\Delta p =$ Differential pressure in bar
Torque	$T = \frac{1.59 \cdot V_g \cdot \Delta p \cdot \eta_{mh}}{100}$	[Nm]	$n =$ speed in rpm
or	$T = T_K \cdot \Delta p \cdot \eta_{mh}$		$\eta_v =$ volumetric efficiency
			$\eta_{mh} =$ mechanical-hydraulic efficiency
Output power	$P = \frac{2\pi \cdot T \cdot n}{60000} = \frac{q_v \cdot \Delta p \cdot \eta_t}{600}$	[kW]	$\eta_t =$ Total efficiency ($\eta_t = \eta_v \cdot \eta_{mh}$)
			$T_K =$ Torque constant
Output speed	$n = \frac{q_v \cdot 1000 \cdot \eta_v}{V_g}$	[min ⁻¹]	

Permissible radial and axial forces on drive shaft

Size	28	45	63	85
Max. radial force  at X/2 $F_{q \max}$ lb-ft N	270 (1200)	337 (1500)	382 (1700)	450 (2000)
Max. axial force  F_{ax} N	225 (1000)	337 (1500)	450 (2000)	674 (3000)

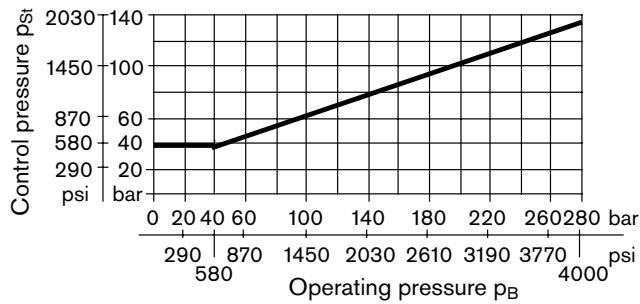
Two-point direct control DG

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 $p_{St} \geq 580$ psi (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



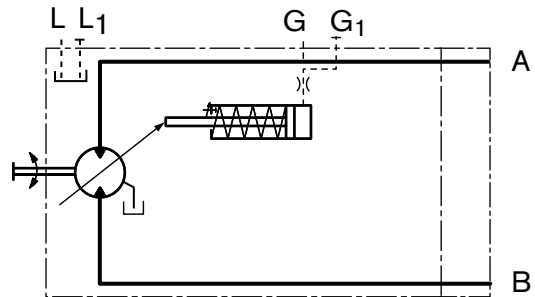
Control pressure = 0 psi (0 bar) $\triangleq V_{g \max}$

Control pressure ≥ 580 psi (40 bar) $\triangleq V_{g \min}$ (see diagram)

The max. permissible control pressure is $p_{St} = 4000$ psi (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)

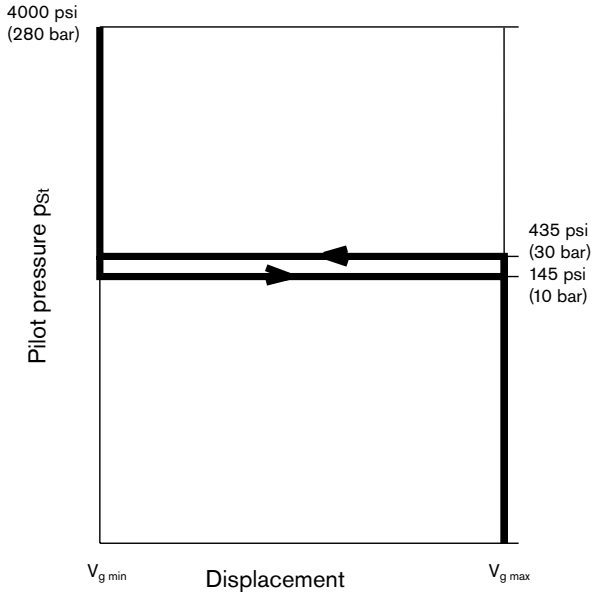
Two-point control, hydraulically operated HZ/HZ6

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 ($p_x \geq 435$ psi (30bar)).

The necessary control pressure is via a shuttle valve taken out of the motor pressure side A or B. A minimum pressure difference of $\Delta p_{A,B} \geq 290$ psi (20 bar) between the motor pressure sides is required.

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

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



Pilot pressure $p_x = 0$ psi (0 bar) $\triangleq V_{g \max}$

Pilot pressure $p_x \geq 435$ psi (30 bar) $\triangleq V_{g \min}$

Techn. data HZ/HZ6	
Minimum pilot pressure	435 psi (30 bar)
Maximum permissible pilot pressure	4000 psi (280 bar)

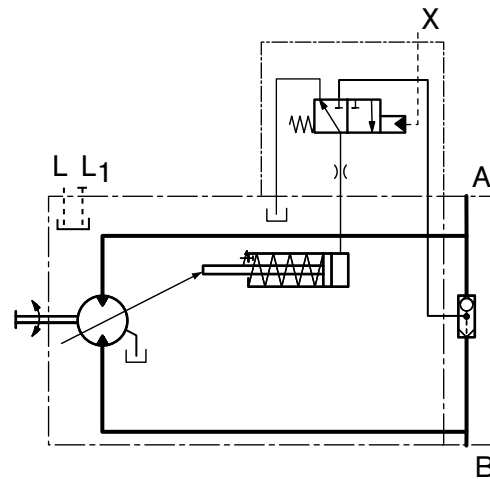
Version HZ6 with stroking time shuttle orifice

Slow down of swivel action by means of shuttle orifice.

This enables a smooth swivel action.

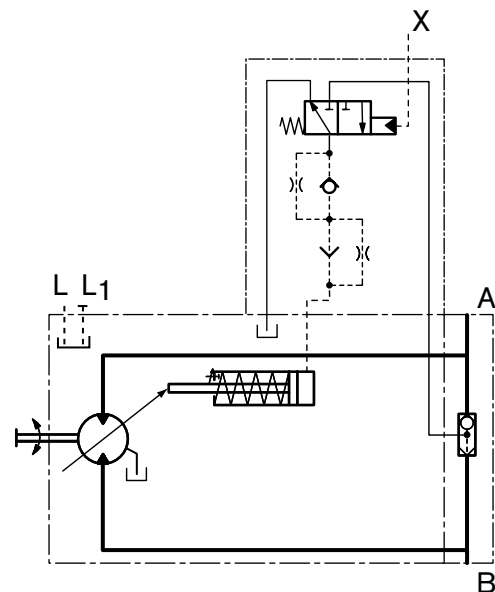
Standard orifice size = dia. 0.0083 in (\varnothing 0.21 mm); other sizes on request.

Circuit diagram HZ



Ports for	
A, B	Pressure
L, L ₁	Case drain (L ₁ plugged)
X	Pilot pressure (plugged)

Circuit diagram HZ6



Ports for	
A, B	Pressure
L, L ₁	Case drain (L ₁ plugged)
X	Pilot pressure (plugged)

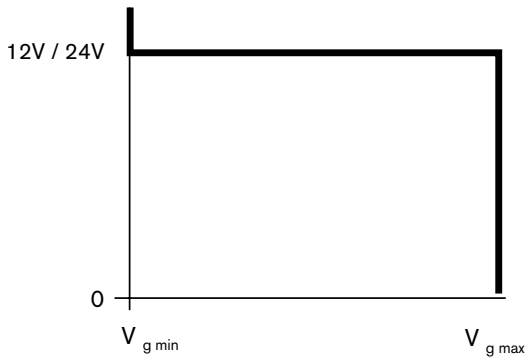
Two-point control, electrically operated EZ¹⁾

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 $\Delta p_{A,B} \geq 290$ psi (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 68 °F (20°C)	1.5 A	0.8 A
Duty cycler	100% ED	100% ED
Plug protection class to DIN 43650	IP 65	IP 65

Ambient temperature range -4 °F (-20°C) to 140 °F (+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.

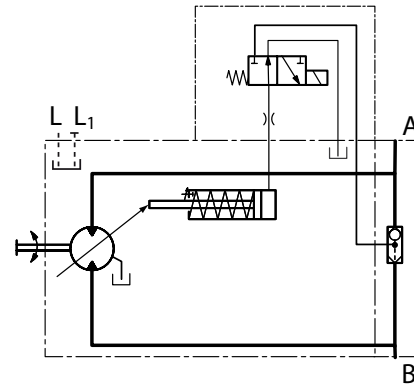
Slow down of swivel action by means of shuttle orifice.
This enables a smooth swivel action.

Standard orifice size = dia 0.0083 in (Ø 0.21 mm); other sizes on request.

More information see page 25

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

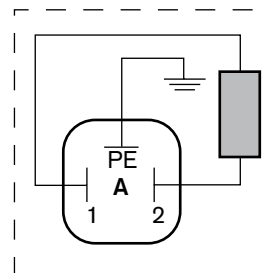
Circuit diagram EZ1/2



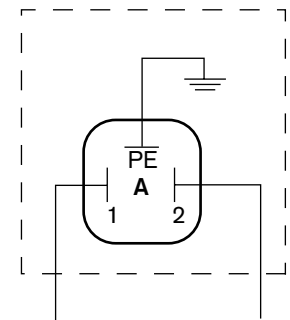
Ports for

A, B	Pressure
L, L ₁	Case drain (L ₁ plugged)

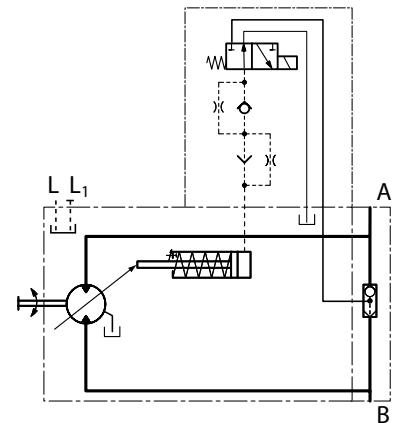
Connection to solenoid according to DIN 43650



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



Circuit diagram EZ6/7



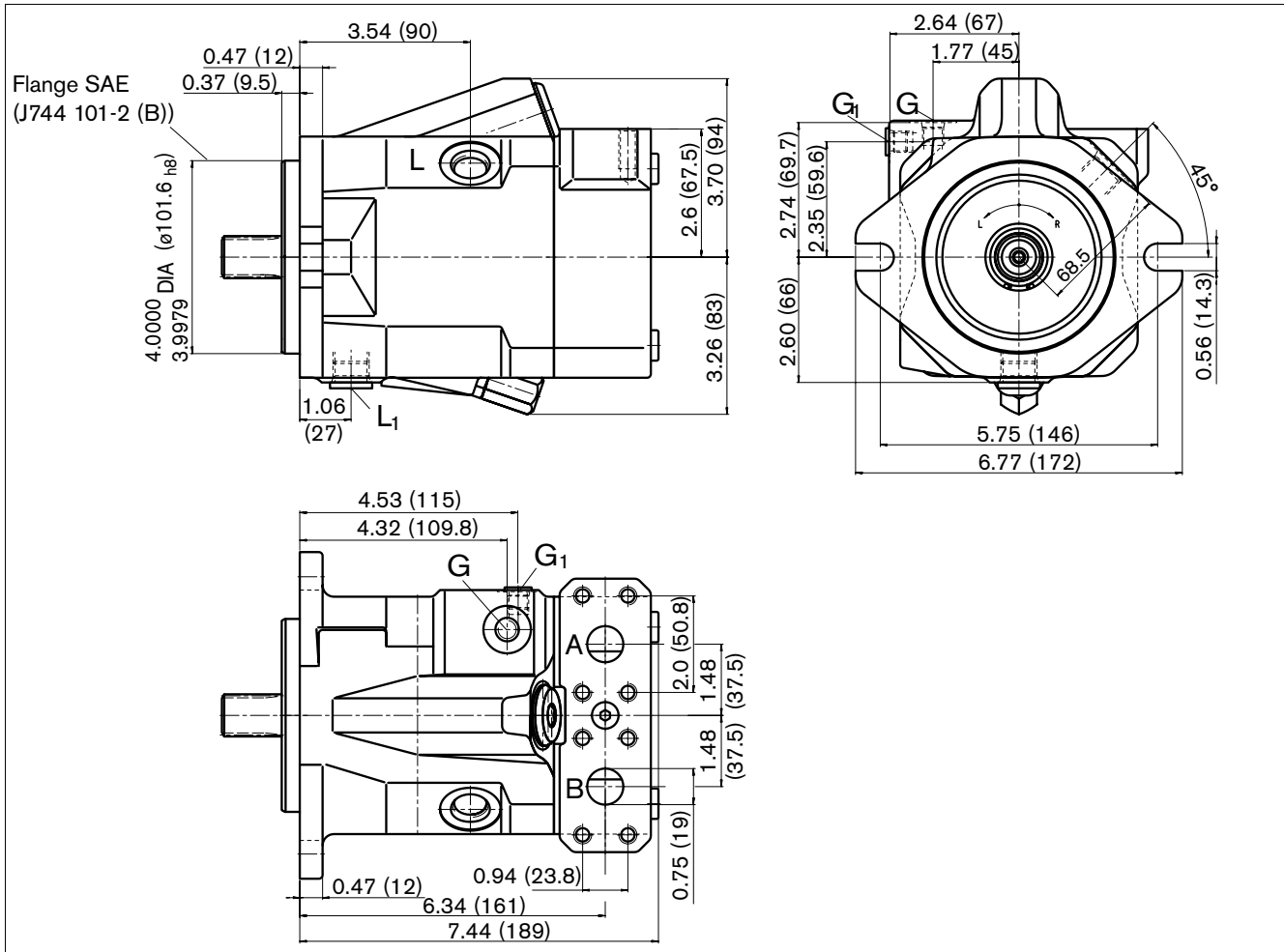
Ports for

A, B	Pressure
L, L ₁	Case drain (L ₁ plugged)

Dimensions size 28

Before finalizing your design please request a certified installation drawing.
Dimensions in inches (mm)

A10VM 28DG/52WX-VXC60N000



Ports

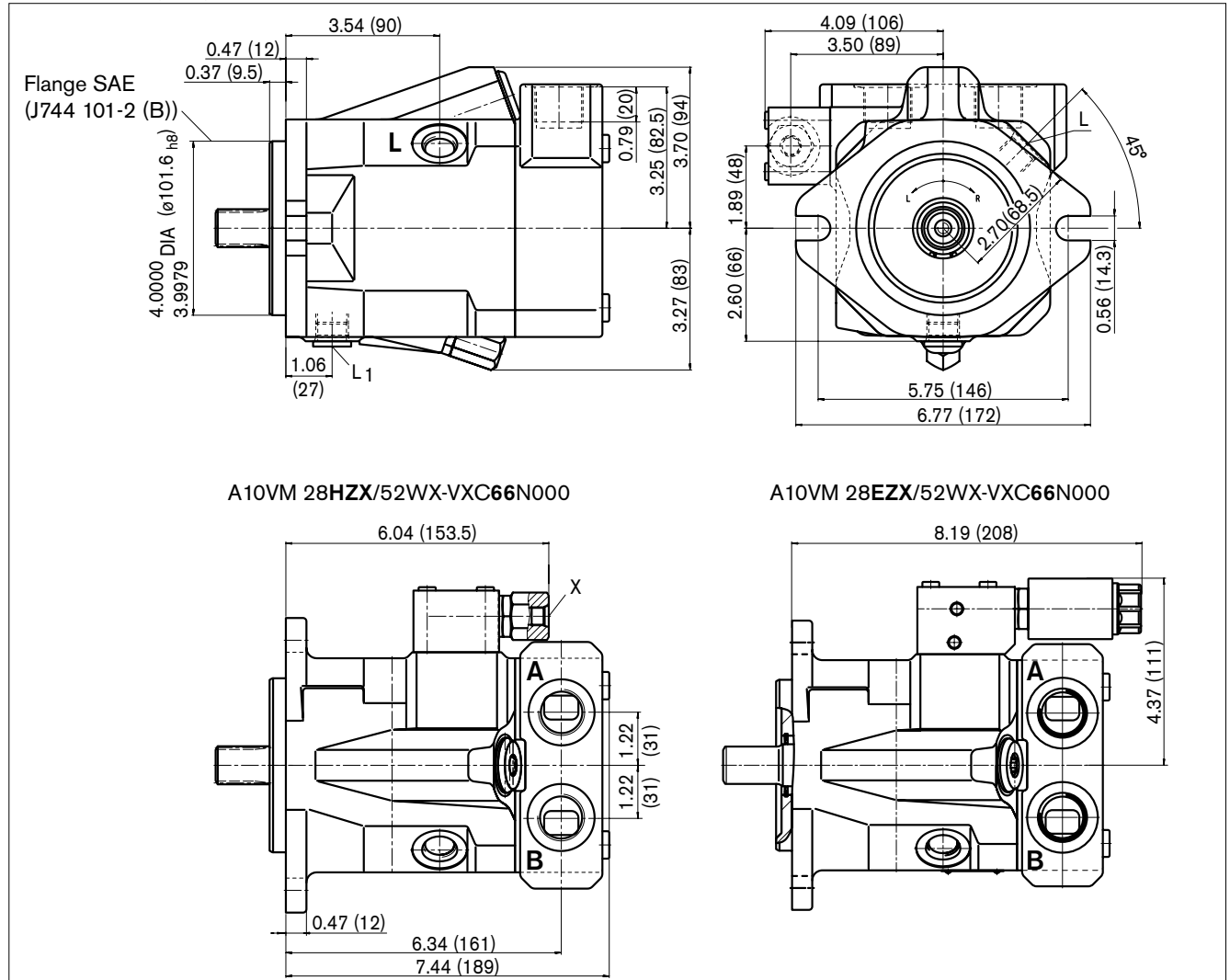
Designation	Port for	Standard	Size ²⁾	Max. press. [psi (bar)] ³⁾	State
A, B	Pressure (High pressure series, code 62)	SAE J518	3/4 in	5100 (350)	O
	Fixing thread (port plate 60)	DIN 68	3/8-16UNC-2B; 0.83 (21) deep		O
A, B	Pressure (port plate 66)	DIN 3852-2 ⁵⁾	1 1/16-12UN-2B; 0.79 (16) deep	5100 (350)	O
L	Case drain	ISO 11926 ⁵⁾	3/4-16UNF-2B	60 (4)	O ⁴⁾
L ₁	Case drain	ISO 11926 ⁵⁾	3/4-16UNF-2B	60 (4)	X ⁴⁾
G	External control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 0.47 (12) deep	5100 (350)	O
G ₁	External control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 0.47 (12) deep	5100 (350)	X
X	Pilot pressure	ISO 11926 ⁵⁾	7/16-20UNF-2B; 0.39 (10) deep	5100 (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)

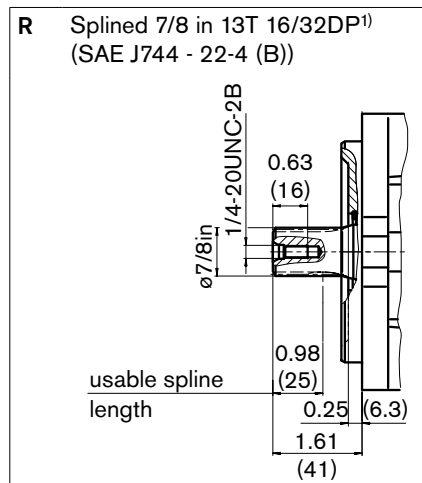
Dimensions size 28

Before finalizing your design please request a certified installation drawing.
Dimensions in inches (mm)

A10VM 28HZX(EZX)/52WX-VXC66N000



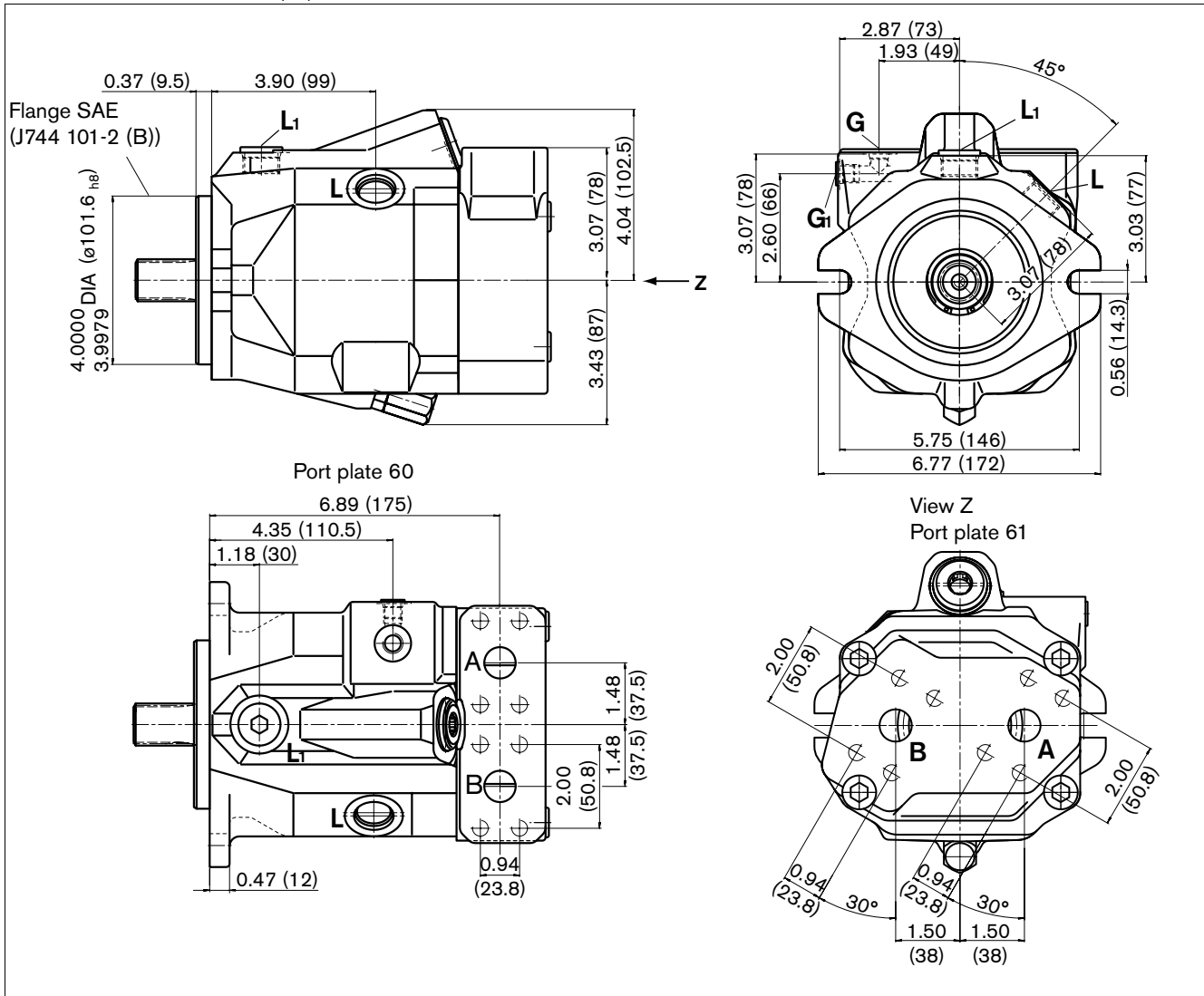
Drive shaft



Dimensions size 45

Before finalizing your design please request a certified installation drawing.
Dimensions in inches (mm)

A10VM 45DG/52WX-VXC60(61)N000



Ports

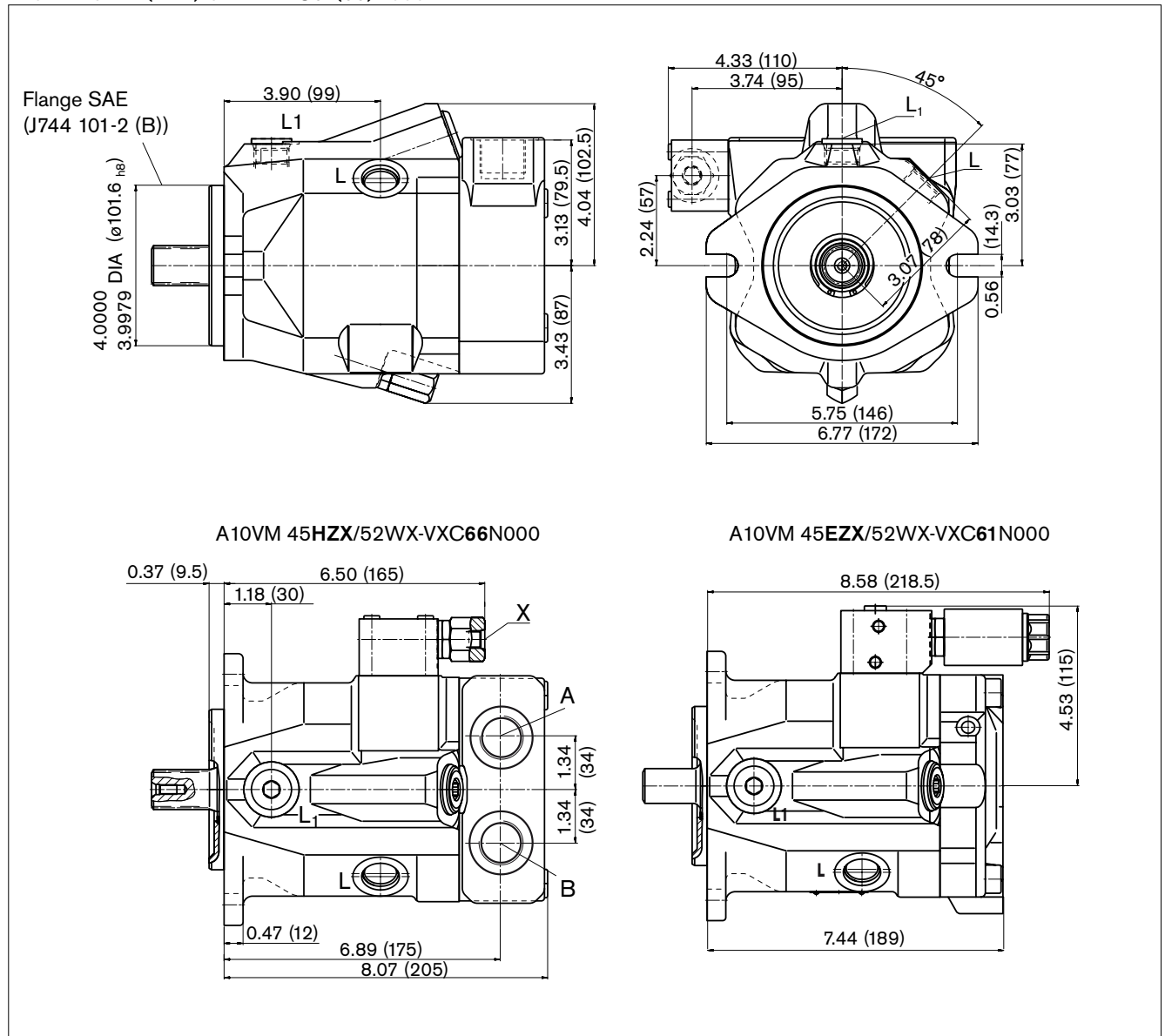
Designation	Port for	Standard	Size ²⁾	Max. press. [psi (bar)] ³⁾	State
A, B	Pressure (high pressure series, code 62) Fixing thread (port plate 60)	SAE J518 DIN 68	3/4 in 3/8-16UNC-2B; 0.83 (21) deep	5100 (350)	O O
A, B	Pressure (port plate 66)	DIN 3852-2 ⁵⁾	1 1/16-12UN-2B; 0.79 (16) deep	5100 (350)	O
L	Case drain	ISO 11926 ⁵⁾	7/8-14UNF-2B	60 (4)	O ⁴⁾
L ₁	Case drain	ISO 11926 ⁵⁾	7/8-14UNF-2B	60 (4)	X ⁴⁾
G	External control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 0.47 (12) deep	5100 (350)	O
G ₁	External control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 0.47 (12) deep	5100 (350)	X
X	Pilot pressure	ISO 11926 ⁵⁾	7/16-20UNF-2B; 0.39 (10) deep	5100 (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)
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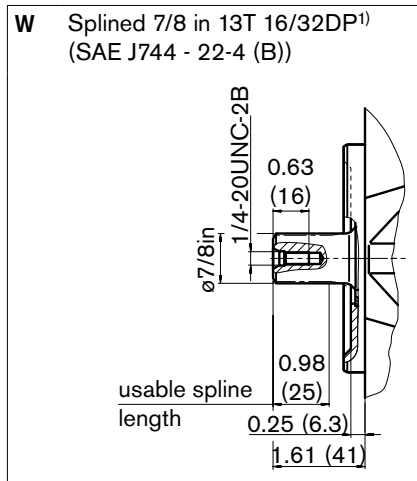
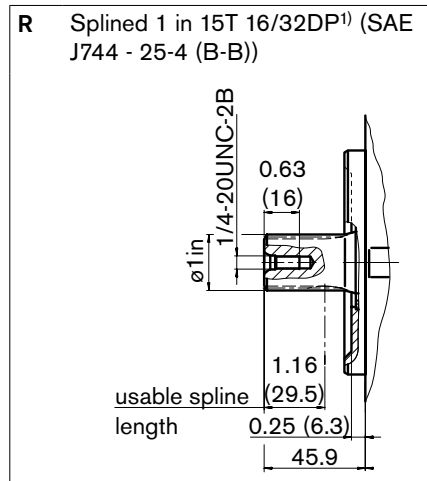
Dimensions size 45

Before finalizing your design please request a certified installation drawing.
Dimensions in inches (mm)

A10VM 45HZX(EZX)/52WX-VXC61(66)N000



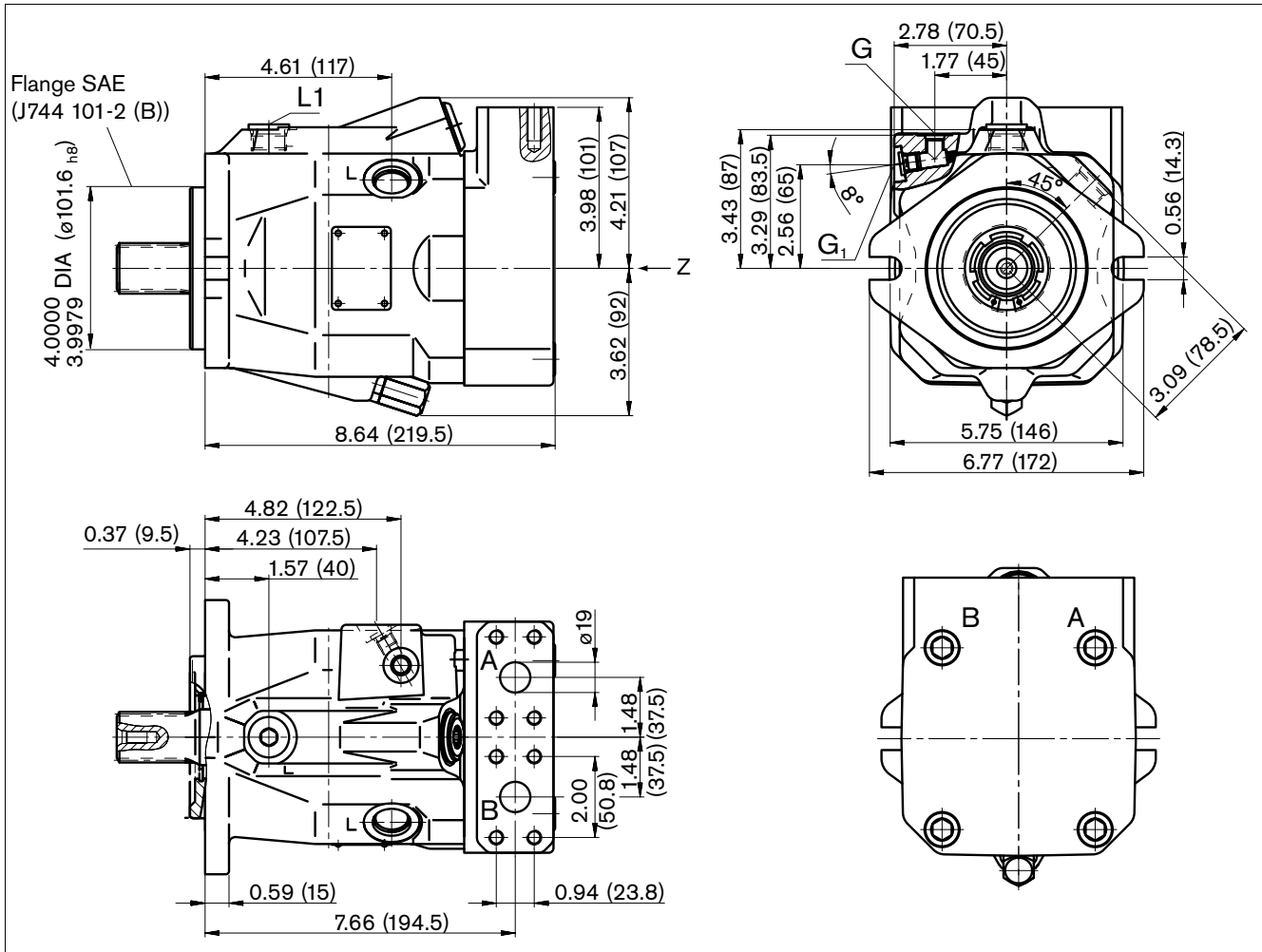
Drive shaft



Dimensions size 63

Before finalizing your design please request a certified installation drawing.
Dimensions in inches (mm)

A10VM 63DG/52WX-VXC60N000



Ports

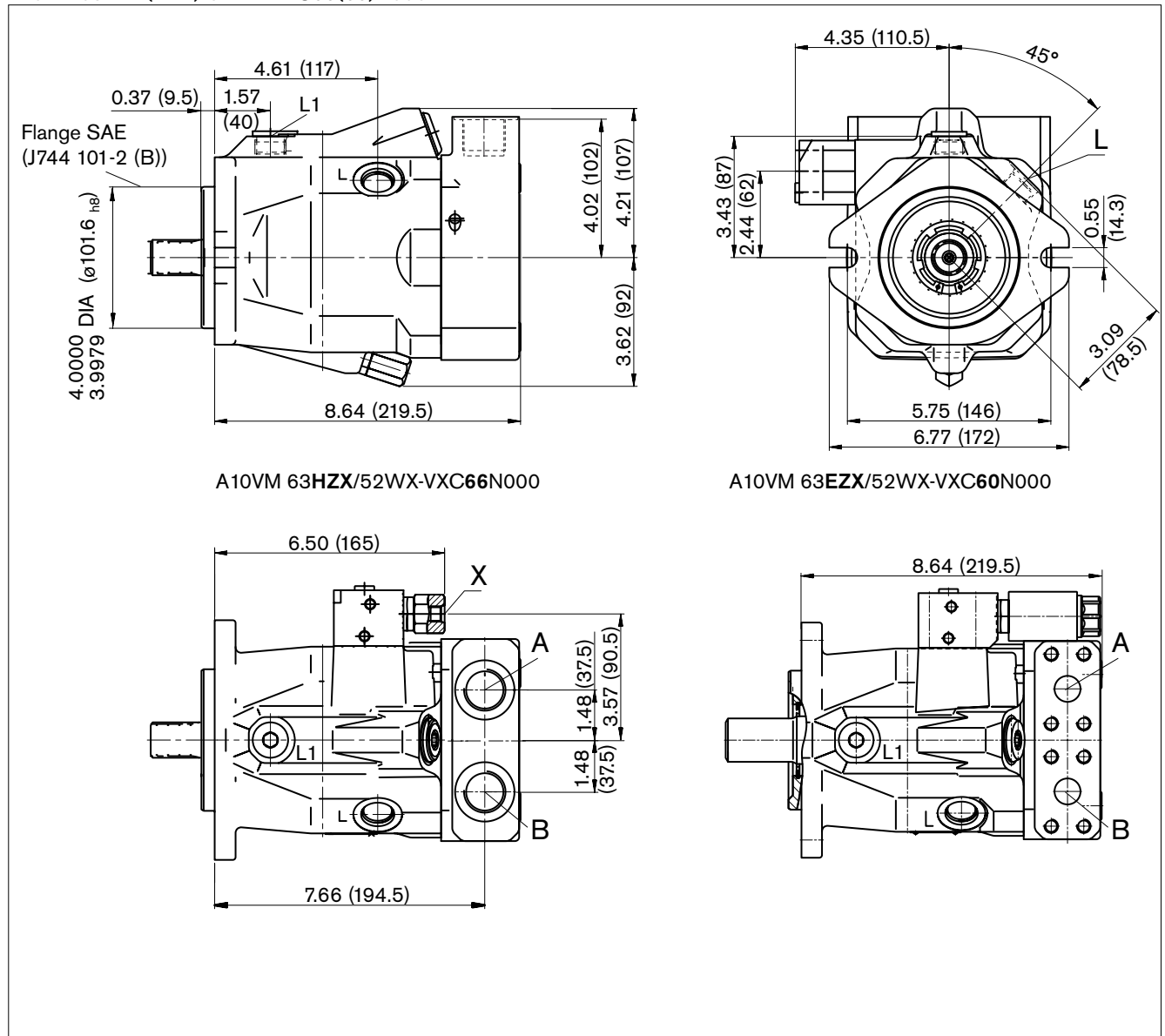
Designation	Port for	Standard	Size ²⁾	Max. press. [psi (bar)] ³⁾	State
A, B	Pressure (high pressure series, code 62) Fixing thread (port plate 60)	SAE J518 DIN 68	3/4 in 3/8-16UNC-2B; 0.83 (17) deep	5100 (350)	O O
A, B	Pressure (port plate 66)	DIN 3852-2 ⁵⁾	1 1/16-12UN-2B; 0.79 (16) deep	5100 (350)	O
L	Case drain	ISO 11926 ⁵⁾	7/8-14UNF-2B	60 (4)	O ⁴⁾
L ₁	Case drain	ISO 11926 ⁵⁾	7/8-14UNF-2B	60 (4)	X ⁴⁾
G	External control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 0.47 (12) deep	5100 (350)	O
G ₁	External control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 0.47 (12) deep	5100 (350)	X
X	Pilot pressure	ISO 11926 ⁵⁾	7/16-20UNF-2B; 0.39 (10) deep	5100 (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)

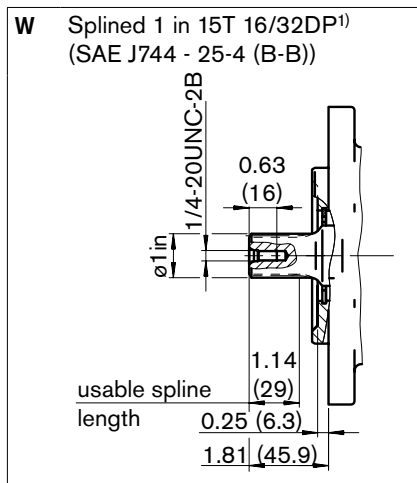
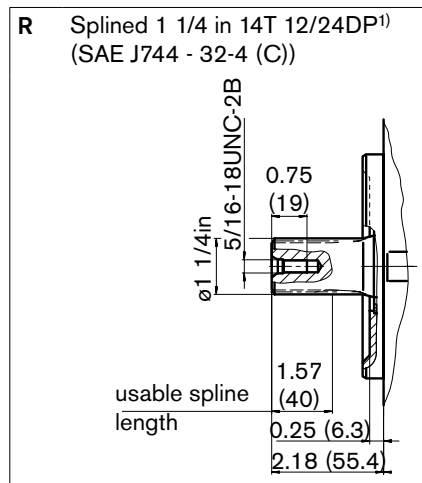
Dimensions size 63

Before finalizing your design please request a certified installation drawing.
Dimensions in inches (mm)

A10VM 63HZX(EZX)/52WX-VXC60(66)N000



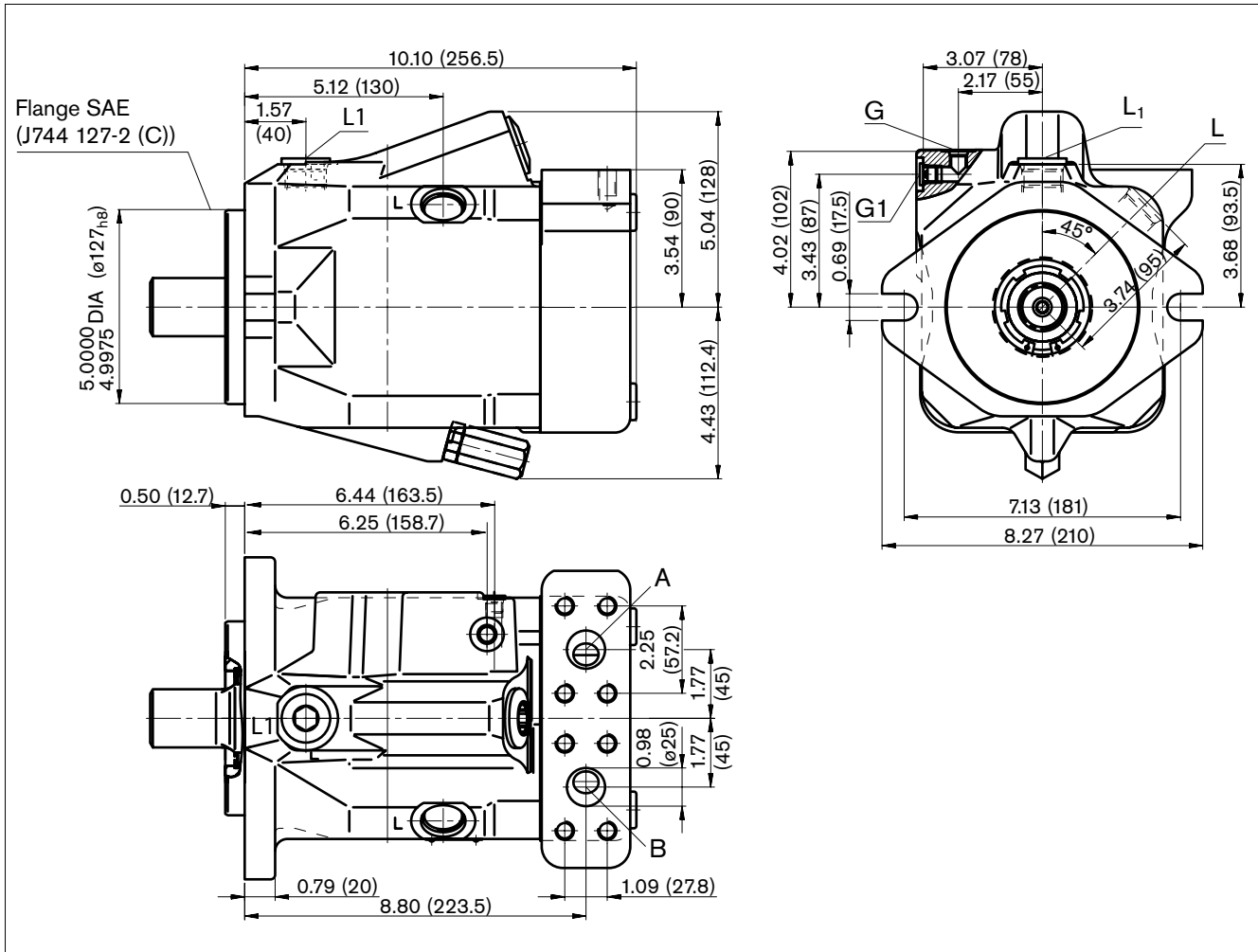
Drive shaft



Dimensions size 85

Before finalizing your design please request a certified installation drawing.
Dimensions in inches (mm)

A10VM 85DG/52WX-VXC60N000



Ports

Designation	Port for	Standard	Size ²⁾	Max. press. [psi (bar)] ³⁾	State
A, B	Pressure (high pressure series, code 62)	SAE J518C	1 in	5100 (350)	O
	Fixing thread (port plate 60)	DIN 68	7/16-14UNC-2B; 0.87 (22) deep		O
L	Case drain	ISO 11926 ⁵⁾	1 1/16-12UN-2B	60 (4)	O ⁴⁾
L ₁	Case drain	ISO 11926 ⁵⁾	1 1/16-12UN-2B	60 (4)	X ⁴⁾
G	external control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 0.47 (12) deep	5100 (350)	O
G ₁	external control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 0.47 (12) deep	5100 (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.

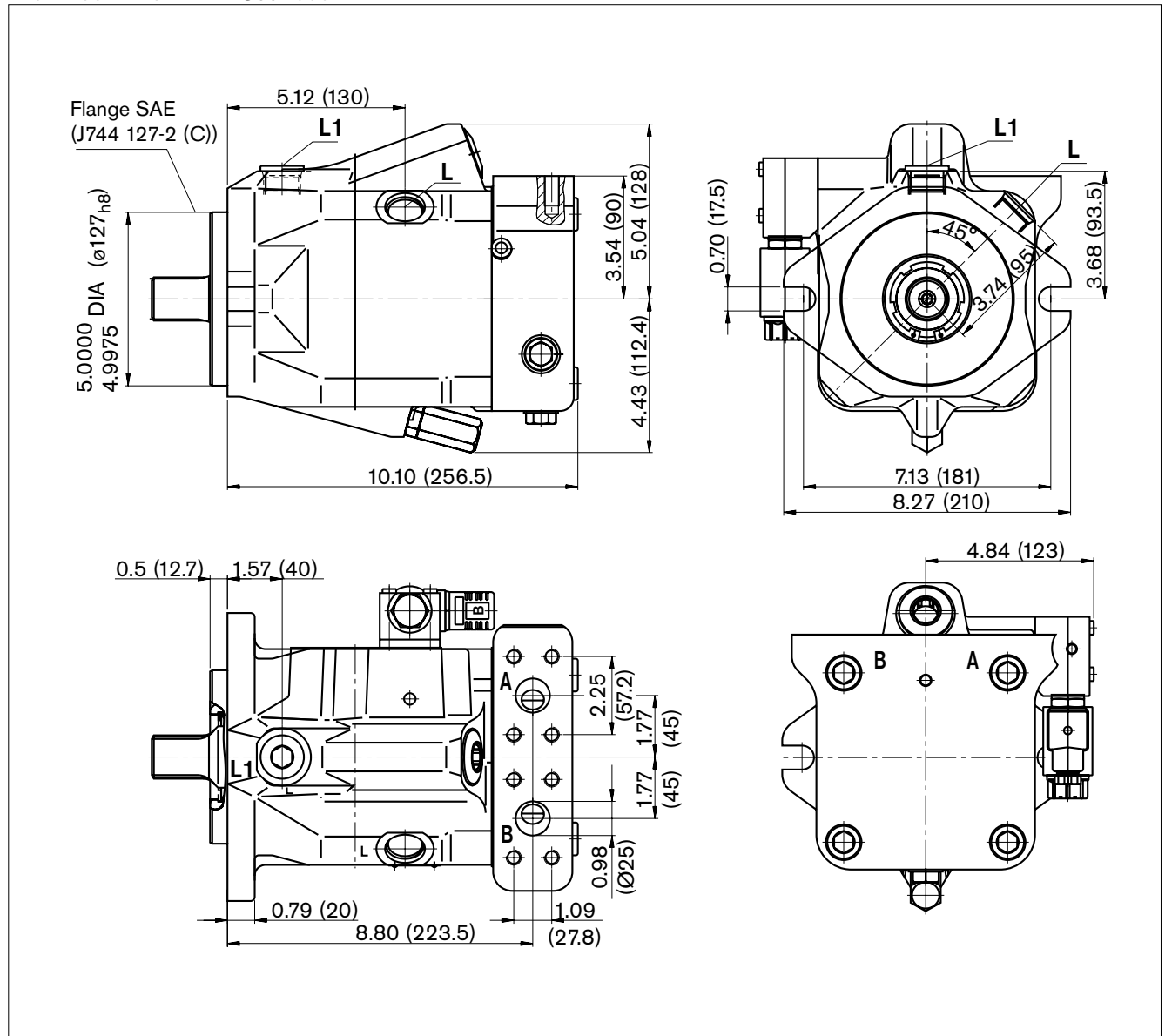
O = must be connected (plugged on delivery)

X = Plugged (in normal operation)

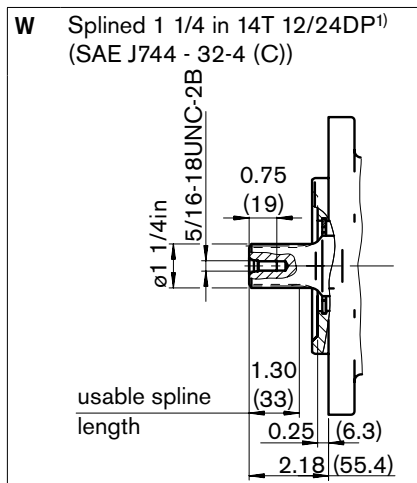
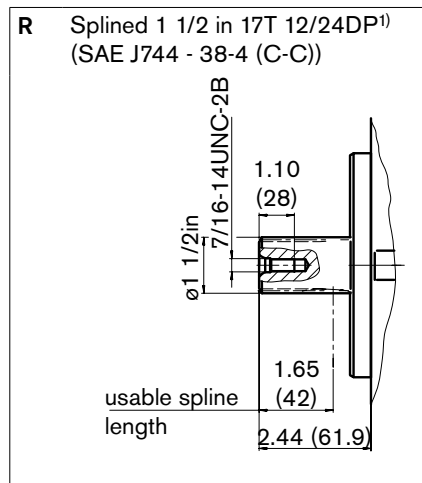
Dimensions size 85

Before finalizing your design please request a certified installing drawing.
Dimensions in inches (mm)

A10VM 85EZ \times 52WX-VXC60N000



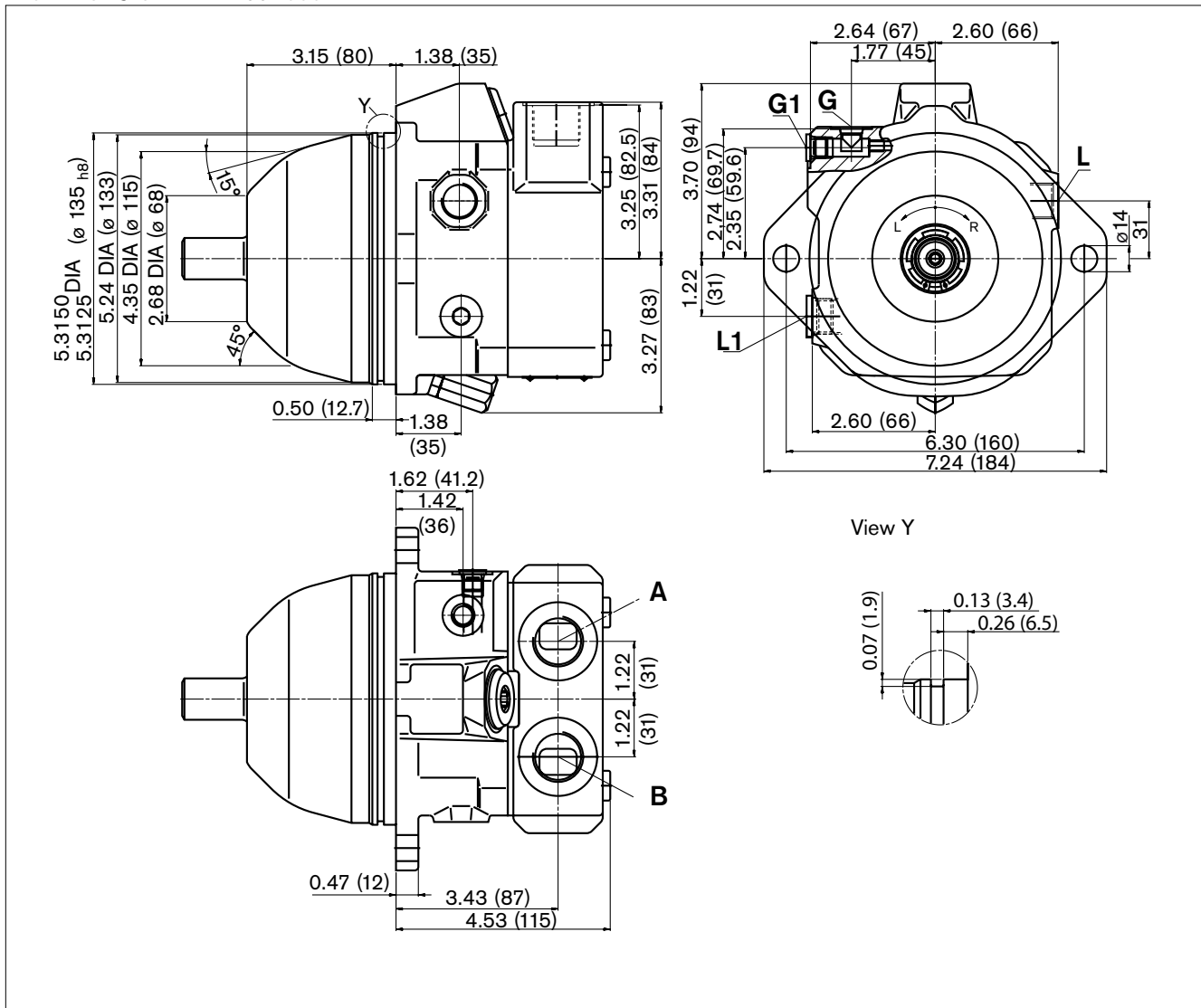
Drive shaft



Dimensions size 28

Before finalizing your design please request a certified installation drawing.
Dimensions in inches (mm)

A10VE 28DG/52WX-VXF66N000



Ports

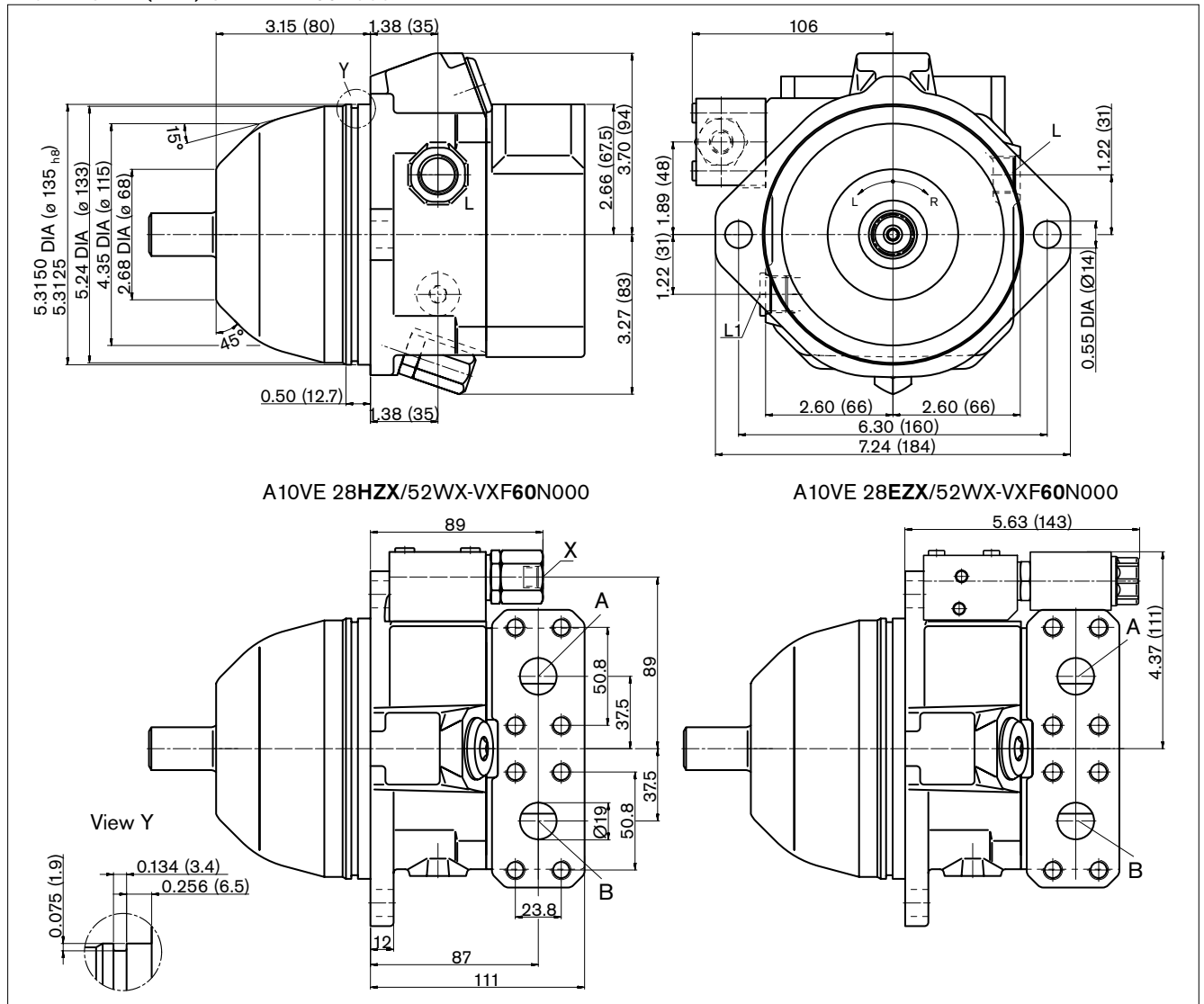
Designation	Port for	Standard	Size ²⁾	Max. press. [psi (bar)] ³⁾	State
A, B	Pressure (high pressure series, code 62) Fixing thread (port plate 60)	SAE J518 DIN 68	3/4 in 3/8-16UNC-2B; 0.83 (21) deep	5100 (350)	O O
A, B	Pressure (port plate 66)	DIN 3852-2 ⁵⁾	1 1/16-12UN-2B; 0.79 (20) deep	5100 (350)	O
L	Case drain	ISO 11926 ⁵⁾	3/4-16UNF-2B	60 (4)	O ⁴⁾
L ₁	Case drain	ISO 11926 ⁵⁾	3/4-16UNF-2B	60 (4)	X ⁴⁾
G	External control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 0.47 (12) deep	350	O
G ₁	External control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 0.47 (12) deep	350	X
X	Pilot pressure	ISO 11926 ⁵⁾	7/16-20UNF-2B; 0.39 (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 size 28

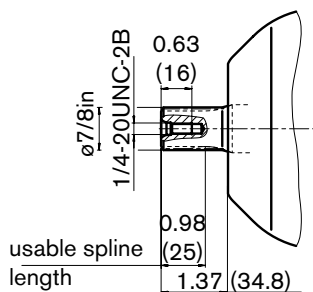
Before finalizing your design please request a certified installation drawing.
Dimensions in inches (mm)

A10VE 28HZX(EZX)/52WX-VXF60N000



Drive shaft

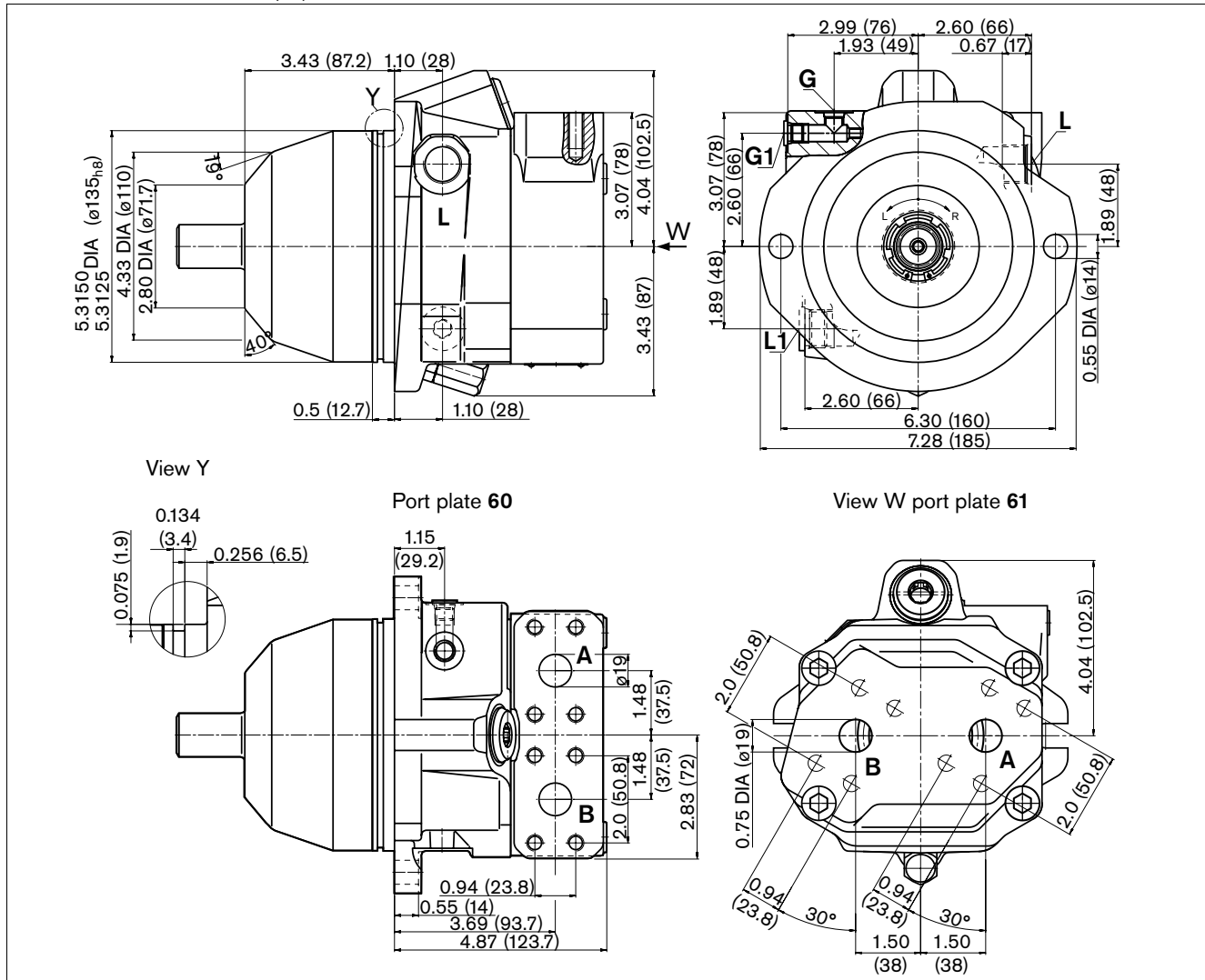
R Splined 7/8 in 13T 16/32DP¹⁾
(SAE J744 - 22-4 (B))



Dimensions size 45

Before finalizing your design please request a certified installation drawing.
Dimensions in inches (mm)

A10VE 45DG/52WX-VXF60(61)N000



Ports

Designation	Port for	Standard	Size ²⁾	Max. press. [psi (bar)] ³⁾	State
A, B	Pressure (high pressure series, code 62)	SAE J518	3/4 in	5100 (350)	O
	Fixing thread (port plate 60, 61)	DIN 68	3/8-16UNC-2B; 0.83 (21) deep		O
A, B	Pressure (port plate 66)	DIN 3852-2 ⁵⁾	1 1/16-12UN-2B; 0.79 (20) deep	5100 (350)	O
L	Case drain	ISO 11926 ⁵⁾	7/8-14UNF-2B	60 (4)	O ⁴⁾
L ₁	Case drain	ISO 11926 ⁵⁾	7/8-14UNF-2B	60 (4)	X ⁴⁾
G	External control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 0.47 (12) deep	5100 (350)	O
G ₁	External control pressure	ISO 11926 ⁵⁾	7/16-20 UNF-2B; 0.47 (12) deep	5100 (350)	X
X	Pilot pressure	ISO 11926 ⁵⁾	7/16-20UNF-2B; 0.39 (10) deep	5100 (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.

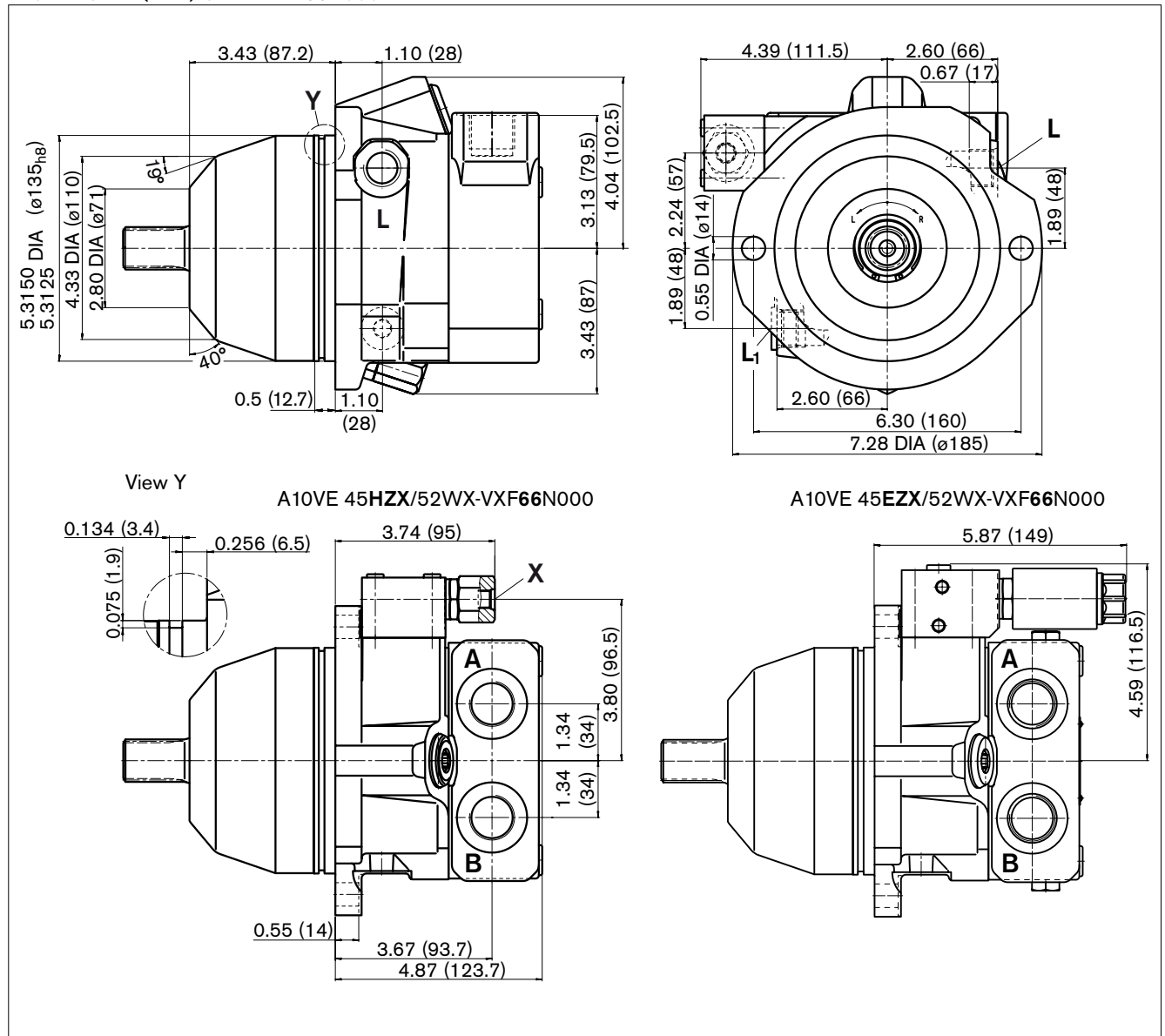
O = must be connected (plugged on delivery)

X = Plugged (in normal operation)

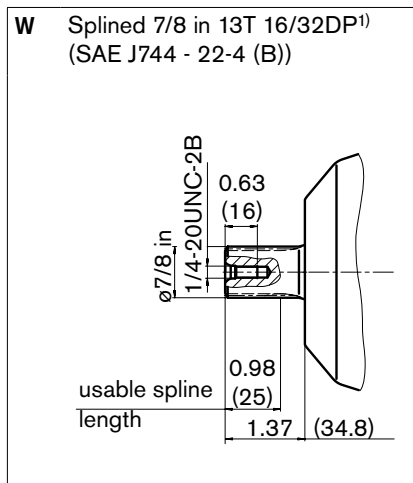
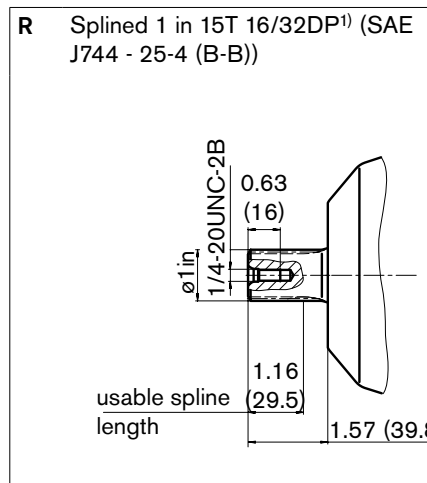
Dimensions size 45

Before finalizing your design please request a certified installing drawing.
Dimensions in inches (mm)

A10VE 45HZX(EZX)/52WX-VXF66N000



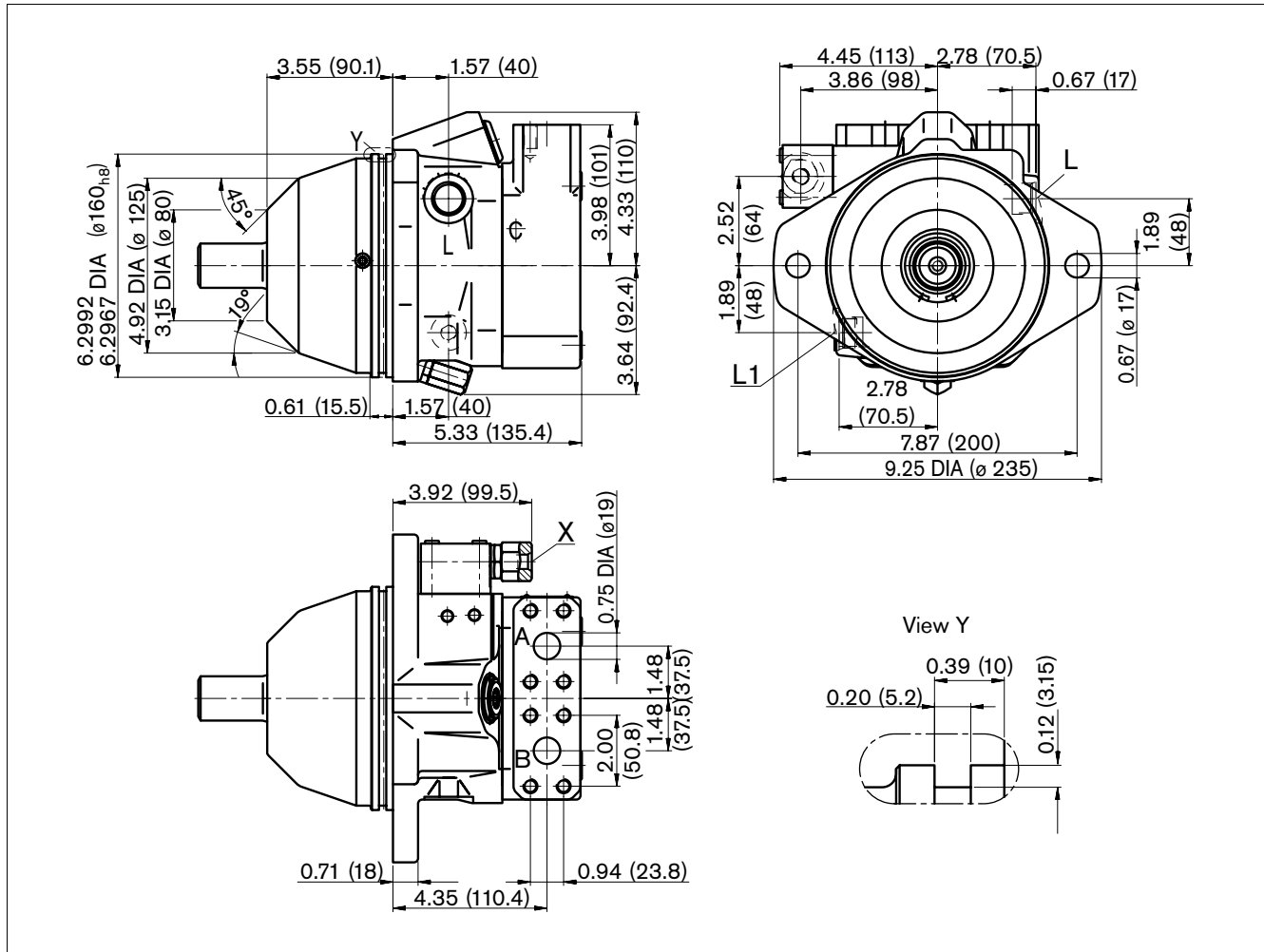
Drive shaft



Dimensions size 63

Before finalizing your design please request a certified installation drawing.
Dimensions in inches (mm)

A10VE 63HZ/52WX-VXF60N000



Ports

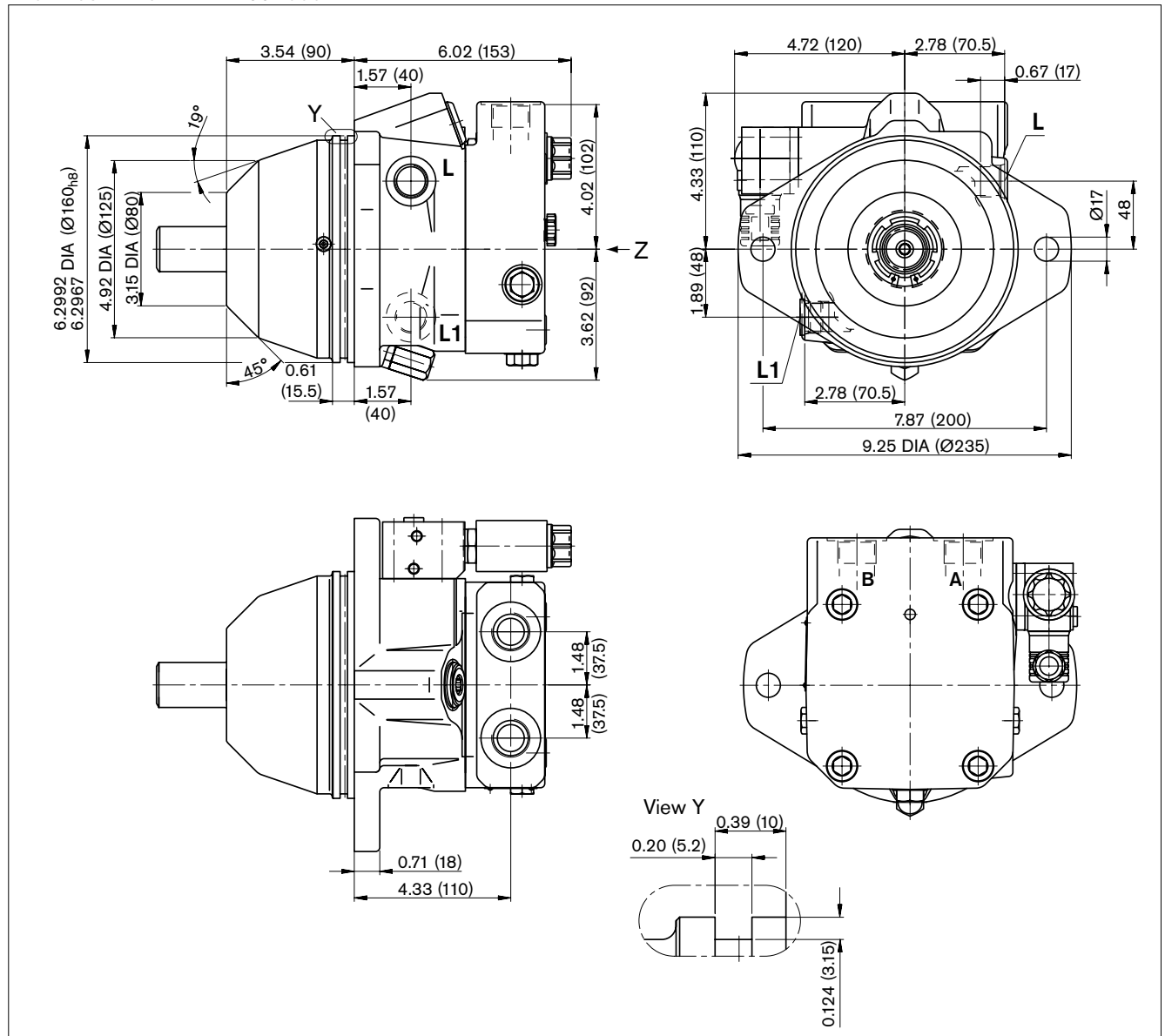
Designation	Port for	Standard	Size ²⁾	Max. press. [psi (bar)] ³⁾	State
A, B	Pressure (high pressure series, code 62) Fixing thread (port plate 10)	SAE J518 DIN 68	3/4 in 3/8-16UNC-2B; 0.83 (21) deep	5100 (350)	O O
A, B	Pressure (port plate 16)	DIN 3852-2 ⁵⁾	1 1/16-12UN-2B; 0.79 (20) deep	5100 (350)	O
L	Case drain	ISO 11926 ⁵⁾	7/8-14UNF-2B	60 (4)	O ⁴⁾
L ₁	Case drain	ISO 11926 ⁵⁾	7/8-14UNF-2B	60 (4)	X ⁴⁾
X	External control pressure	ISO 11926 ⁵⁾	7/16-20UNF-2B; 0.39 (10) deep	5100 (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.
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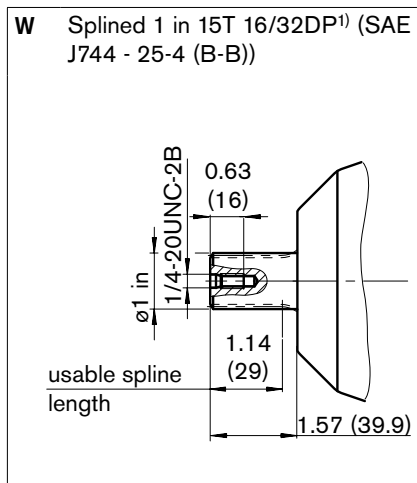
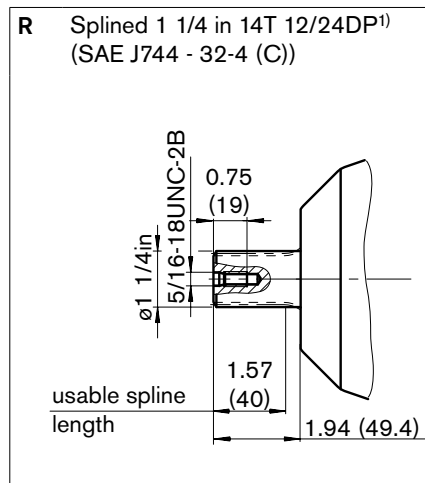
Dimensions size 63

Before finalizing your design please request a certified installation drawing.
Dimensions in inches (mm)

A10VE 63EZ/52WX-VXF66N000



Drive shaft



Integrated flushing and boost pressure 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 $p_{ND} = 290$ psi (20 bar) in the low pressure side of the circuit and an orifice dia. of 0.063 inches ($\varnothing 1.6$ mm) the flushing flow amounts to 1.45 gpm (5.5 L/min) (Size 28 - 85).

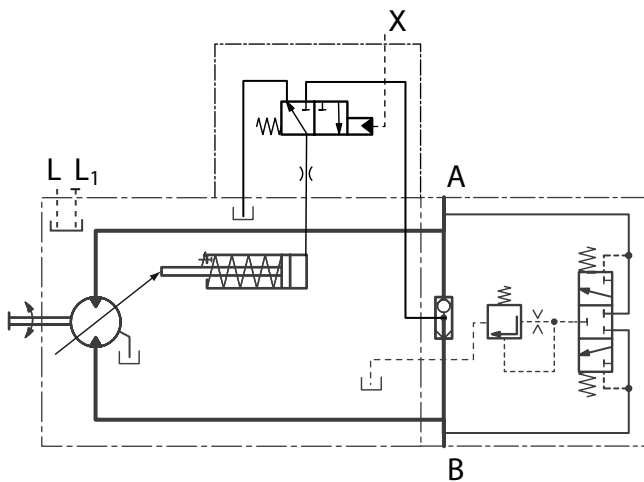
Other orifice diameters can be ordered in clear text.

Further flushing flows for sizes 28 - 85 see table:

Flushing flow gpm (L/min)	Orifice dia. in inches (mm)
0.92 (3.5)	0.047 (1.2)
1.45 (5.5)	0.063 (1.6)
2.38 (7.2)	0.071 (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

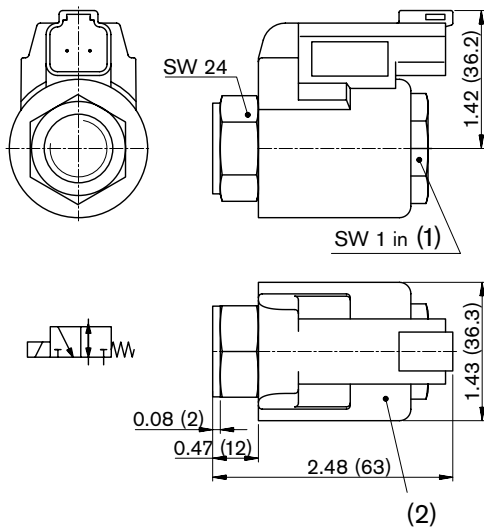
Connector for solenoids

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	max. 5100 psi (350 bar)
Flow	max. 6.60 gpm (25 L/min)
Sealing	FKM (flour-rubber)
Operating temperature of fluid	-4 °F (-20 °C) to +248 °F (+120 °C)
Viscosity range	60 SUS (10 mm ² /s) to 1900 SUS (420 mm ² /s)
Function	D



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

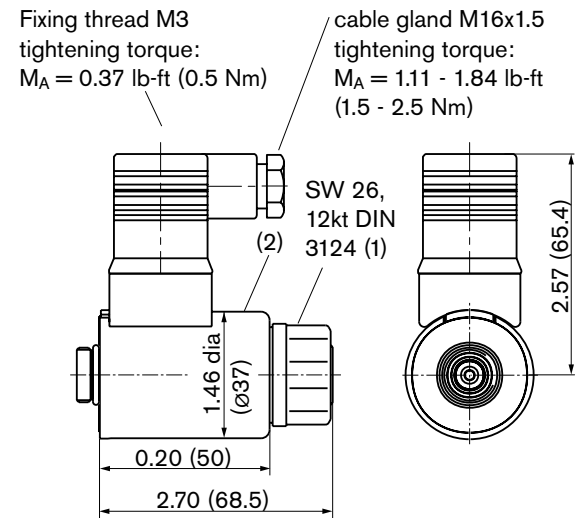
(not for new projects)

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 0.17 inches (4.5 mm) to 0.39 inches (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: 3.68 +0.73 lb-ft (5+1 Nm)

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

Electronic controls

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

¹⁾ Current outputs for 2 valves, separately controllable

Speed pickup

Before finalizing your design please request a certified installation drawing.
Dimensions in inches (mm)

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

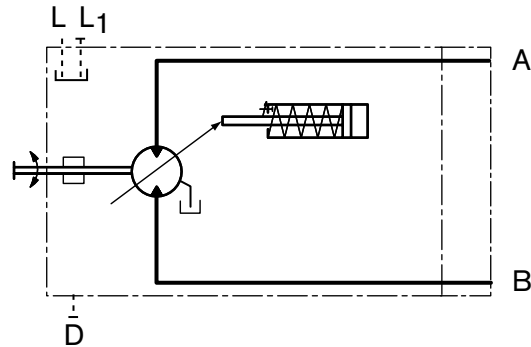
In this case, the rotating cylinder barrel can provide a speed dependent signal, which can be picked up by a suitable sensor and processed for further evaluation. The sensor port will be plugged for delivery.

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:

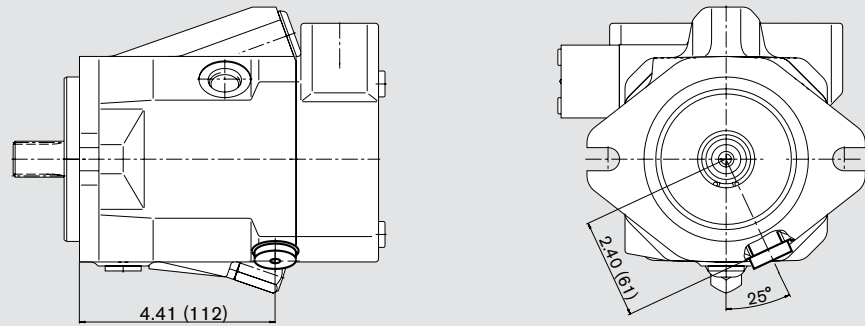
Size	Part Nr.	Number of teeth
28	R902428802	48
45	R902437557	48
63	R902428802	56
85	in preparation	

Circuit diagram



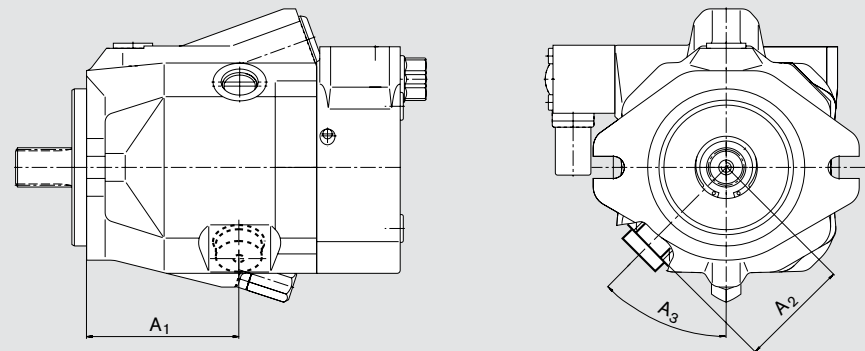
Dimension port D

A10VM 28

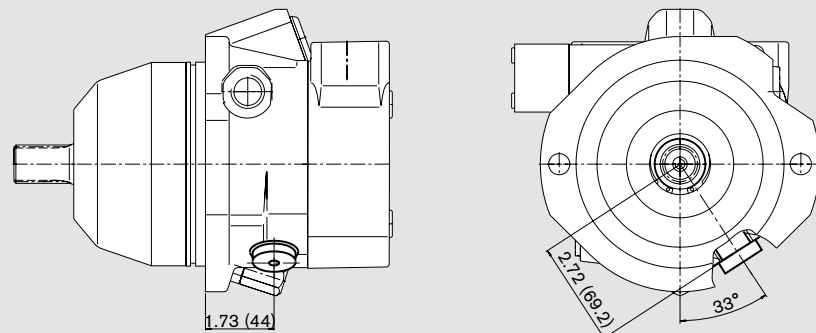


A10VM 45, 63 and 85

Size	A1	A2	A3
45	3.78 (96)	2.72 (69.2)	45°
63	5.53 (140.5)	2.79 (71)	57.5°
85	5.12 (130)	3.59 (91.3)	45°



A10VE 45



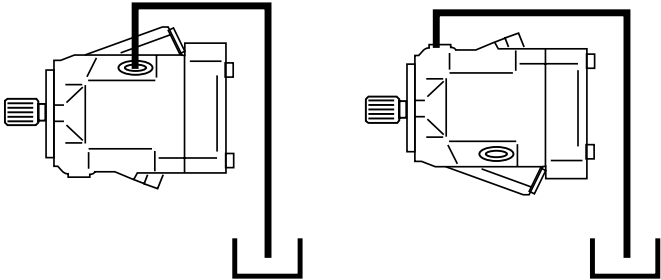
Mounting position

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.

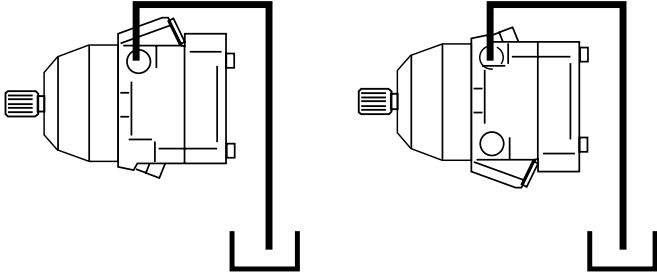
In all installation positions the highest case drain port must be used to fill the housing and to connect the drain line.

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 $M_{G \text{ Max}}$ 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 $M_{G \text{ max}}$	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

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Subject to change.