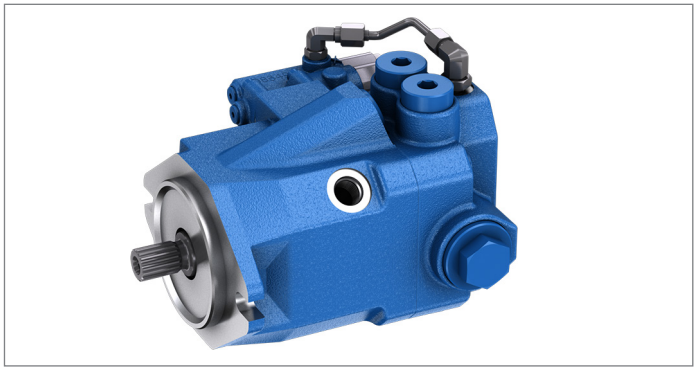
RE 92721/2025-03-27
Replaces: 2020-04-23

rexroth
A Bosch Company

Axial piston variable pump A10VWO and A10VWNO series 52



- Sizes 28 and 45
- A10VWO NG28, 45
  Nominal pressure 250 bar
  Maximum pressure 280 bar
- A10VWNO NG45
  Nominal pressure 210 bar
  Maximum pressure 250 bar
- Open circuit

Features

- Variable pump with axial piston rotary group in swashplate design for hydrostatic drives in open circuit.
- Flow is proportional to drive speed and displacement up to the pressure relief/deflection point.
- The flow can be infinitely varied by adjusting the swashplate angle.
- Alternating drive direction with constant pressure output and integrated rectifier circuit
- Compact design
- Streamlined arrangement of the valve technology in the port plate
- Constant flow specification regardless of rotational speed

Contents

Type code

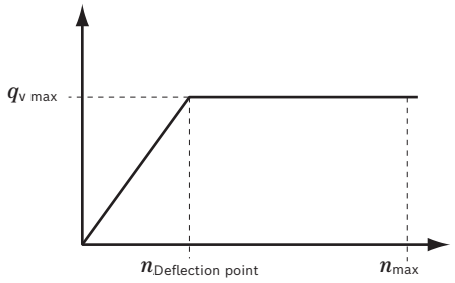
01	02	03	04		05	06		07	08	09	10	11		12
	O		**DFR1**	**/**	**52**	**W**	**–**	**V**		**C**		**N00**	**–**	**S0157**

				028	045	045	
Axial piston unit							
01	Swashplate design, variable, nominal pressure 250 bar, maximum pressure 280 bar			●	●	–	**A10VW**
	Swashplate design, variable, nominal pressure 210 bar, maximum pressure 250 bar			–	–	●	**A10VWN**
Operating mode							
02	Pump, open circuit						**O**
Size (NG)							
03	Geometric displacement, see table of values on page 6			**028**	**045**	**045**	
Control device				**028**	**045**	**045**	
04	Constant volume controller	hydraulic	X-T plugged, with flushing function	●	●	●	**DFR1**
Series							
05	Series 5, index 2						**52**
Direction of rotation				**028**	**045**	**045**	
06	Viewed on drive shaft		bi-directional	●	●	●	**W**
Sealing material				**028**	**045**	**045**	
07	FKM (fluorocarbon rubber)			●	●	●	**V**
Drive shaft				**028**	**045**	**045**	
08	Splined shaft according to ISO 3019-1	standard shaft		●	●	●	**S**
		reduced diameter, permissible input torque see page 7		●	●	●	**U**
Mounting flange				**028**	**045**	**045**	
09	ISO 3019-1		2-hole	●	●	●	**C**
Working port				**028**	**045**	**045**	
10	Threaded ports rear	UN thread (ISO 11926)		●	●	●	**64**
		pipe thread (DIN ISO 228)		●	●	●	**70**
Through drive				**028**	**045**	**045**	
12	Without through drive			●	●	●	**N00**
Standard/special version				**028**	**045**	**045**	
13	Pre-set quantity limitation via orifice in the **B** channel			●	●	●	**S0157**

● = Available ○ = On request – = Not available

Project planning note!

When ordering, specify:



Rotational speed [rpm]	n_{max}	
	$n_{deflection\ point}$	
Pressure [bar]	p_{max}	
Flow [l/min]	$q_{v\,max}$	

Notes

▶ Also note the project planning notes on page 16.

Hydraulic fluids

The variable pump A10VW(N)O is designed for operation with HLP mineral oil according to DIN 51524.
See the following data sheets for application instructions and requirements for hydraulic fluids before the start of project planning:

- 90220: Hydraulic fluids based on mineral oils and related hydrocarbons

Selection of hydraulic fluid
Bosch Rexroth rates hydraulic fluids on the basis of the Fluid Rating according to technical data sheet 90235. Hydraulic fluids with positive evaluation in the Fluid Rating are listed in the following data sheet:

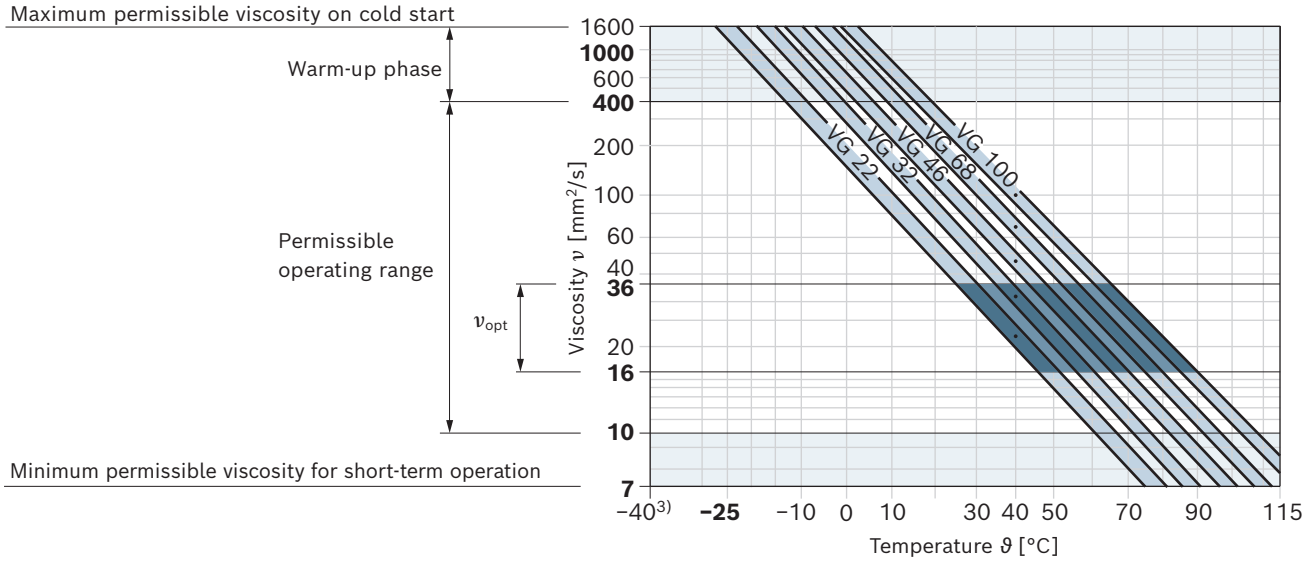
- 90245: Bosch Rexroth Fluid Rating List for Rexroth hydraulic components (pumps and motors)

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

Viscosity and temperature of hydraulic fluids

	Viscosity	Shaft seal	Temperature[2]	Remarks
Cold start	v_{max} ≤ 1600 mm²/s	FKM	ϑ_{St} ≥ −25°C	t ≤ 3 min, without load (p ≤ 30 bar), n ≤ 1000 rpm Permissible temperature difference between axial piston unit and hydraulic fluid in the system maximum 25 K
Warm-up phase	v = 1600 ... 400 mm²/s			t ≤ 15 min, p ≤ 0.7 × p_{nom} and n ≤ 0.5 × n_{nom}
Permissible operating range	v = 400 ... 10 mm²/s[1]	FKM	ϑ ≤ +110°C	Measured at port **L_X**
	v_{opt} = 36 ... 16 mm²/s			Optimal operating viscosity and efficiency range
Short-term operation	v_{min} = 7 mm²/s	FKM	ϑ ≤ +110°C	t ≤ 1 min, p ≤ 0.3 × p_{nom}, measured at port **L_X**

▼ **Selection diagram**



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

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

3) Special version, please contact us

Filtration of the hydraulic fluid

Finer filtration improves the cleanliness level of the hydraulic fluid, which increases the service life of the axial piston unit.
A cleanliness level of at least 20/18/15 under ISO 4406 should be maintained.
At a hydraulic fluid viscosity of less than 10 mm^2/s (e.g. due to high temperatures during short-term operation) at the drain port, a cleanliness level of at least 19/17/14 under ISO 4406 is required.

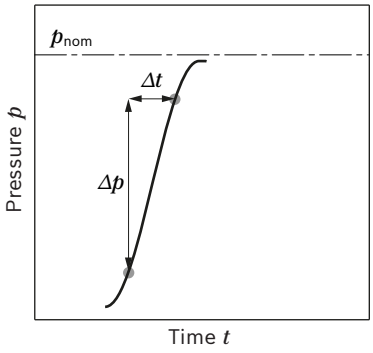
Examples of temperatures of hydraulic fluids at a viscosity of 10 mm^2/s:

- 73 °C at HLP 32
- 85 °C at HLP 46

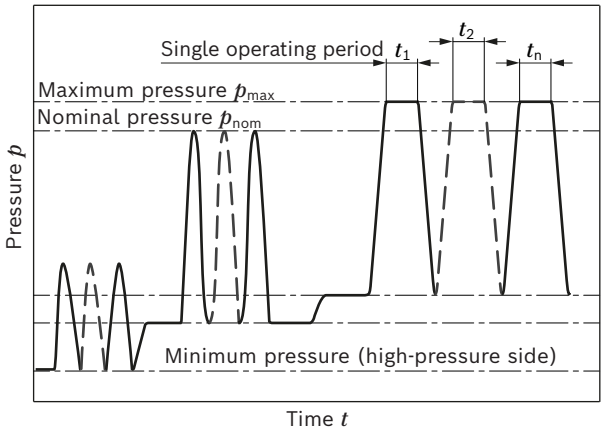
Working pressure range

Pressure at working port B	A10VWO	A10VWNO	Definition
Nominal pressure p_{nom}	250 bar	210 bar	The nominal pressure corresponds to the maximum design pressure.
Maximum pressure p_{max}	280 bar	250 bar	The maximum pressure corresponds to the maximum working pressure within a single operating period. The sum of single operating periods must not exceed the total operating period.
Single operating period	2.5 ms		
Total operating period	300 h		
Minimum pressure $p_{B\ absolute}$ (high-pressure side)	10 bar		Minimum pressure on the high-pressure side (**B**) which is required in order to prevent damage to the axial piston unit.
Rate of pressure change $R_{A\ max}$	16000 bar/s		Maximum permissible speed of pressure build-up and reduction during a pressure change across the entire pressure range.
Pressure at suction port S (inlet)			
Minimum pressure $p_{S\ min}$ Standard	1.0 bar absolute		Minimum pressure at suction port **S** (inlet) which is required to prevent damage to the axial piston unit. The axial piston unit is self-priming, an increase in inlet pressure is not permissible.
Case pressure at port L, L_1			
Maximum pressure $p_{L\ max}$	2 bar absolute		Maximum 0.5 bar higher than inlet pressure at port **S**, but not higher than $p_{L\ max}$. The case pressure must always be higher than the ambient pressure. A drain line to the reservoir is required.

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



▼ **Pressure definition**



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

Notice
Working pressure range applies when using hydraulic fluids based on mineral oils. Please contact us for values for other hydraulic fluids.

Flow direction
S to **B**

Technical data, standard unit

				A10VWO		A10VWNO
Size		**NG**		**28**	**45**	**45**
Geometric displacement, per revolution		$V_{g\,max}$	cm^3	28	45	45
Maximum rotational speed[1)2)4)5)]	at reduced pressure p ≤100 bar	$n_{max\,perm}$	rpm	4000	2850	3600
Maximum rotational speed[1)2)4)5)]	at pressure p >100 bar	n_{max}	rpm	3000	1500	3000
Flow (in flow mode) [2)3)5)7)]	maximum	$q_{v\,max}$	l/min	50	50	50
Power at $q_{v\,max}$ and Δp = 250 bar	at n_{nom}, $V_{g\,max}$	P_{max}	kW	21	21	–
Power at $q_{v\,max}$ and Δp = 210 bar	at n_{nom}, $V_{g\,max}$	P_{max}	kW	–	–	17.5
Torque at $V_{g\,max}$ and	Δp = 250 bar	M_{max}	Nm	111	179	–
	Δp = 210 bar	M_{max}	Nm	–	–	150
	Δp = 100 bar	M	Nm	45	72	72
Rotary stiffness of drive shaft	S	c	Nm/rad	22300	37500	22300
	U	c	Nm/rad	16700	30000	16700
Moment of inertia of the rotary group		J_{TW}	kgm^2	0.0017	0.0033	0.0017
Maximum angular acceleration[6)]		α	rad/s^2	5500	4000	4900
Case volume		V	l	0.3	0.5	0.3
Weight (approx.)		m	kg	18	25.5	20

Determination of the characteristics		
Flow	$q_v = \frac{V_g \times n \times \eta_v}{1000}$	[l/min]
Torque	$M = \frac{V_g \times \Delta p}{20 \times \pi \times \eta_{mh}}$	[Nm]
Power	$P = \frac{2\pi \times M \times n}{60000} = \frac{q_v \times \Delta p}{600 \times \eta_t}$	[kW]

Key

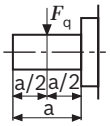
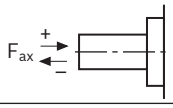
V_g	=	Displacement per revolution [cm^3]
Δp	=	Differential pressure [bar]
n	=	Rotational speed [rpm]
η_v	=	Volumetric efficiency
η_{hm}	=	Hydraulic-mechanical efficiency
η_t	=	Total efficiency ($\eta_t = \eta_v \times \eta_{hm}$)

Notice

- Theoretical values, without efficiency and tolerances; values rounded
- Operation above the maximum values or below the minimum values may result in a loss of function, a reduced service life or in the destruction of the axial piston unit. Bosch Rexroth recommends testing the loads by means of experiment or calculation / simulation and comparison with the permissible values.

1) The values are applicable:
– for the optimum viscosity range from v_{opt} = 36 to 16 mm^2/s
– with hydraulic fluid based on mineral oils
2) The values are applicable:
– at an absolute pressure p_{abs} = 1.0 bar at the suction port **S**
3) $q_{v\,max}$ must not be exceeded.
4) The maximum flow rate is reached from "$n_{deflection\ point}$" (see type code page 2) Even with further increasing rotational speed, the maximum flow rate must not increase further (V_g much smaller $V_{g\,max}$ or at zero stroke)
5) A load collective (Q over n) allows a detailed rating of requirements. System acceptance is urgently recommended.
6) The data are valid for values between the minimum required and maximum permissible rotational speed. It applies for external stimuli (e.g. diesel engine 2 to 8 times rotary frequency, cardan shaft twice the rotary frequency). The limit value is only valid for a single pump. The load capacity of the connection parts must be considered.
7) Pressure/flow setting values are dependent on each other. If higher values are desired, please contact us.

Permissible radial and axial loading of the drive shaft

Size		NG		A10VWO		A10VWNO
				28	45	45
Maximum radial force at a/2		$F_{q\,max}$	N	1200	1500	650
Maximum axial force		$\pm F_{ax\,max}$	N	1000	1500	650

Notice

- The values given are maximum values and do not apply to continuous operation. All loads of the drive shaft reduce the bearing service life! The drive with radial loading (pinion, V-belt) is not permissible!

Permissible inlet torques

Size				A10VWO		A10VWO
				28	45	
Torque at $V_{g\,max}$ and Δp = 210 bar[1]		M_{max}	Nm	–	–	150
Torque at $V_{g\,max}$ and Δp = 250 bar[1]		M_{max}	Nm	111	179	–
Max. input torque on drive shaft[2]						
	S	$M_{E\,max}$	Nm	198	319	198
		Ø	in	7/8	1	7/8
	U	$M_{E\,max}$	Nm	105	188	105
		Ø	in	3/4	7/8	3/4

1) Efficiency not considered
2) For drive shafts with no radial force

Functional description

A differential pressure is set via an orifice (**3**) installed in the pressure duct **B** of the pump.

Notice

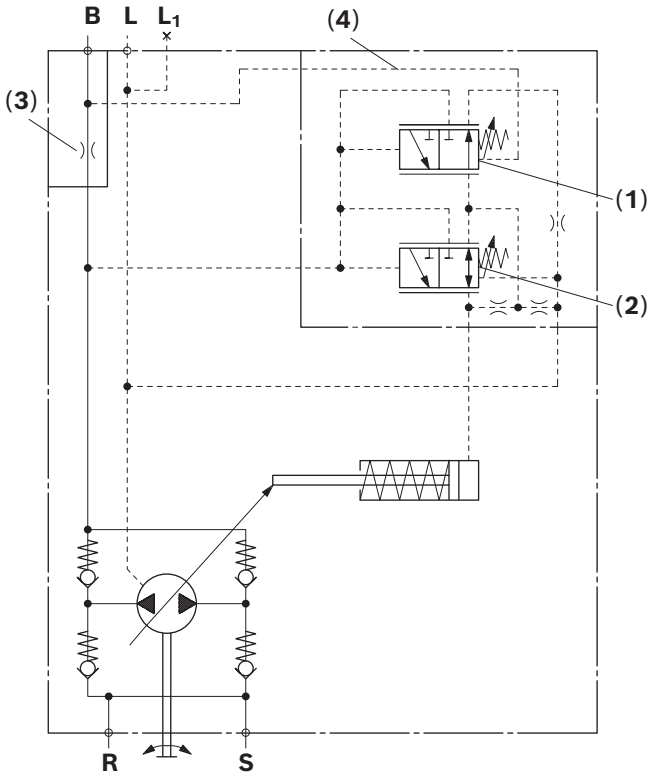
- The nozzle diameter of the orifice (nozzle) (**3**) is calculated using the ordering codes on page 2 "Project planning note". This information is absolutely required.

This differential pressure is sent to the flow controller in the pump, which specifies the necessary flow volume by changing the displacement (swivel angle).
Depending on requirement, a constant volume is made available from a certain pump speed (vehicle speed).
The A10VW(N)O can be operated with bi-directional direction of rotation whereby the flow direction **S** to **B** always remains the same.

Notice

To prevent damage, complete air bleed of the axial piston unit and the suction line is required.
For further information about installation positions, please refer to page 14.

▼ **Circuit diagram A10VW(N)O...DFR1**



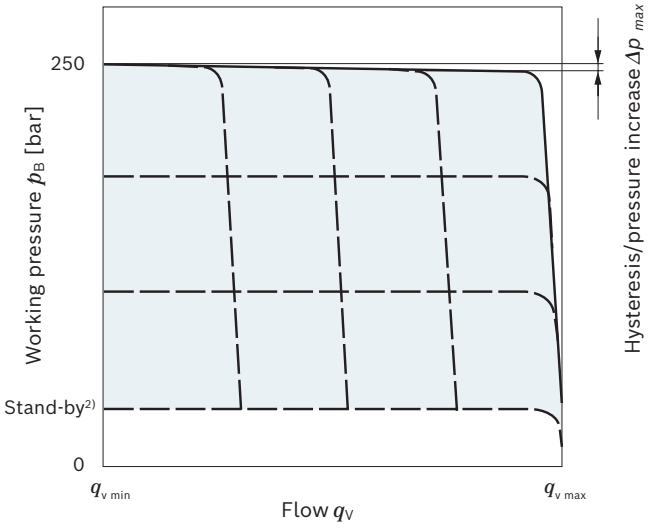
1 Constant volume controller (**FR**).
2 Pressure controller (**DR**)
3 Orifice (for constant quantity)
4 Piping

DFR1 – constant volume controller

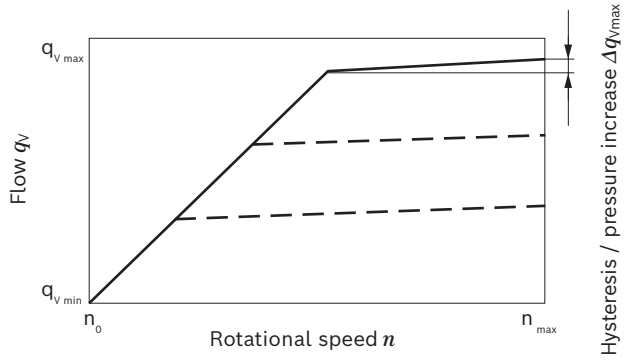
Via an orifice (**3**) in the pressure channel **B** of the pump, a differential pressure is generated and fed to the constant volume controller FR (**1**).
The pump is thus set to a defined volume, independent of speed. The set quantity is available in both directions of rotation.
The function of the pressure regulator (**2**) has priority over the constant volume controller.
The internal orifice diameter is calculated using the ordering code on page 2 "Project planning note".

- Basic position in depressurized state $V_{g\,max}$
- Setting range for A10VWO to 250 bar[1)]
- Setting range for A10VWNO to 210 bar[1)]

▼ **Characteristic curve example A10VWO**

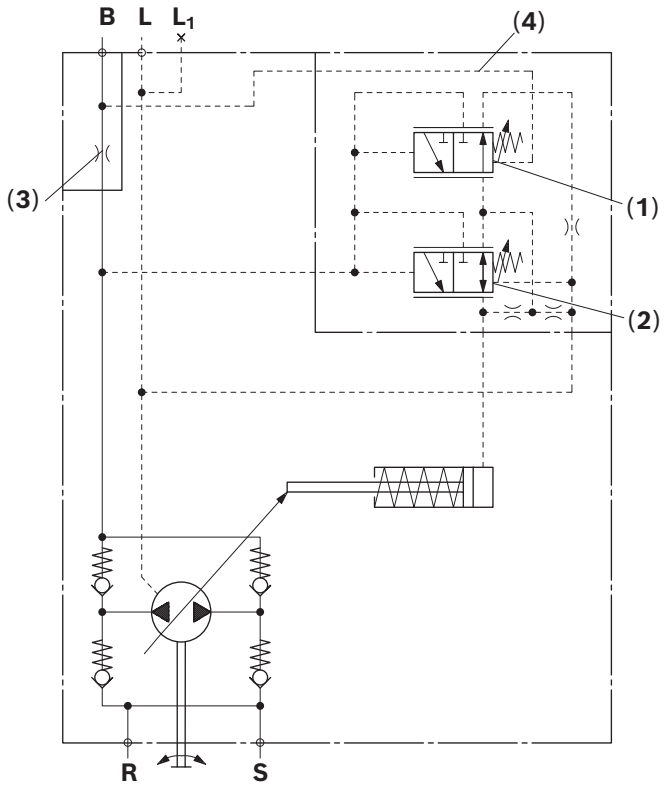


▼ **Characteristic curve at variable rotational speed**



Characteristic curve valid at n_1 = 1500 rpm and θ_{fluid} = 50 °C.

▼ **Circuit diagram DFR1, sizes 28 and 45**

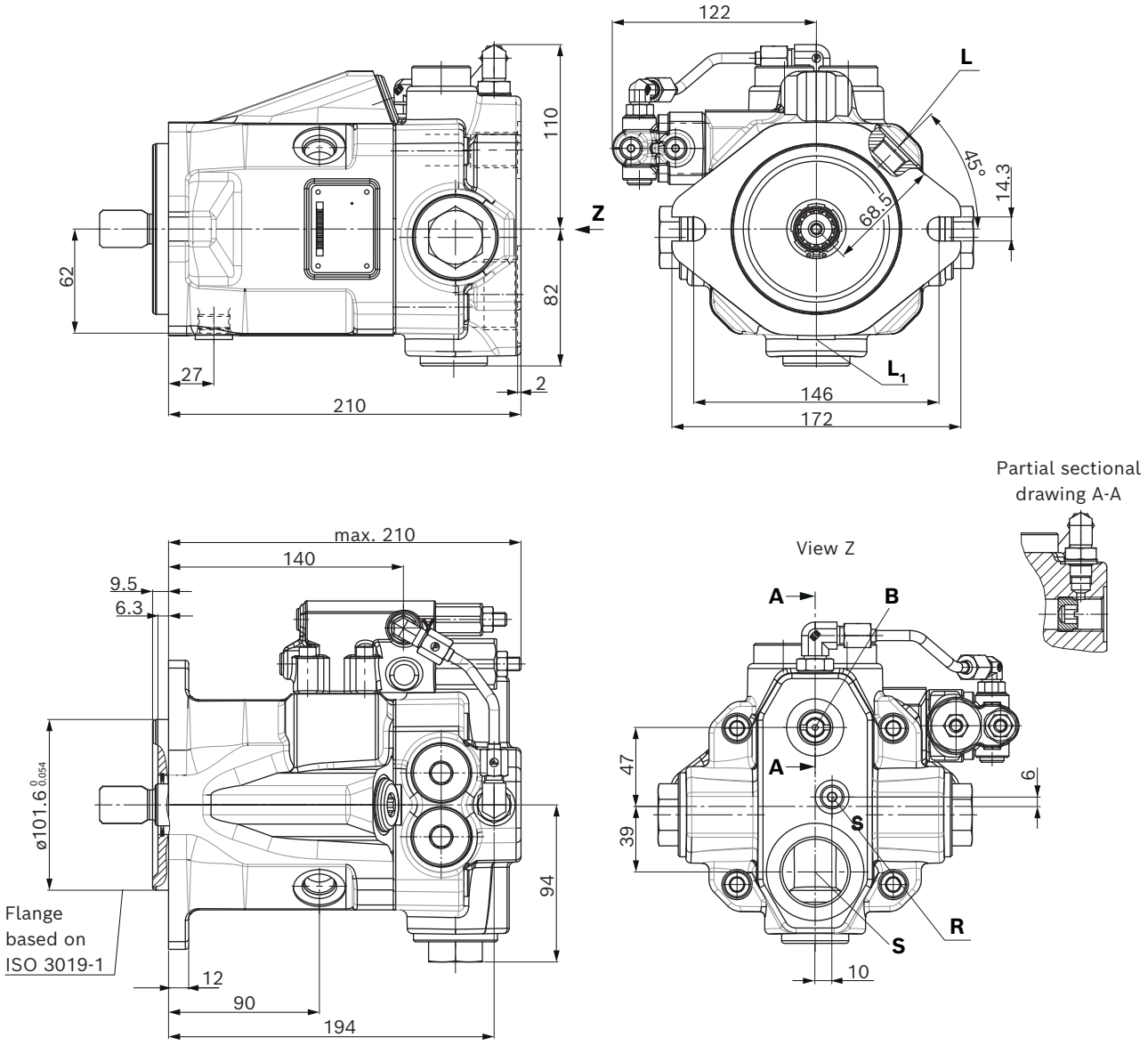


1 Constant volume controller (**FR**).
2 Pressure controller (**DR**)
3 Orifice (for constant quantity)
4 Piping

1) In order to prevent damage to the pump and the system, the permissible setting range must not be exceeded. The range of possible settings at the valve is higher.
2) Zero stroke pressure from pressure setting Δp at controller (**2**)

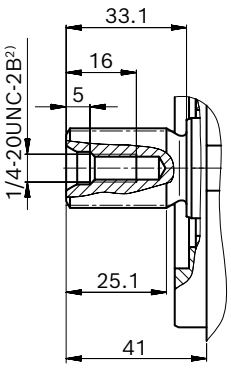
Dimensions A10VWO size 28

DFR1 – constant volume controller, hydraulic



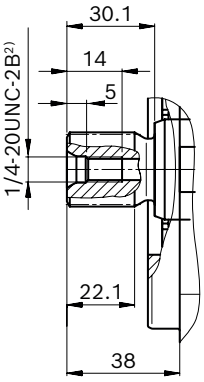
▼ **Splined shaft 7/8 in (22-4 (ISO 3019-1))**

S – 13T 16/32DP[1)]



▼ **Splined shaft 3/4 in (19-4 (ISO 3019-1))**

U – 11T 16/32DP[1)]

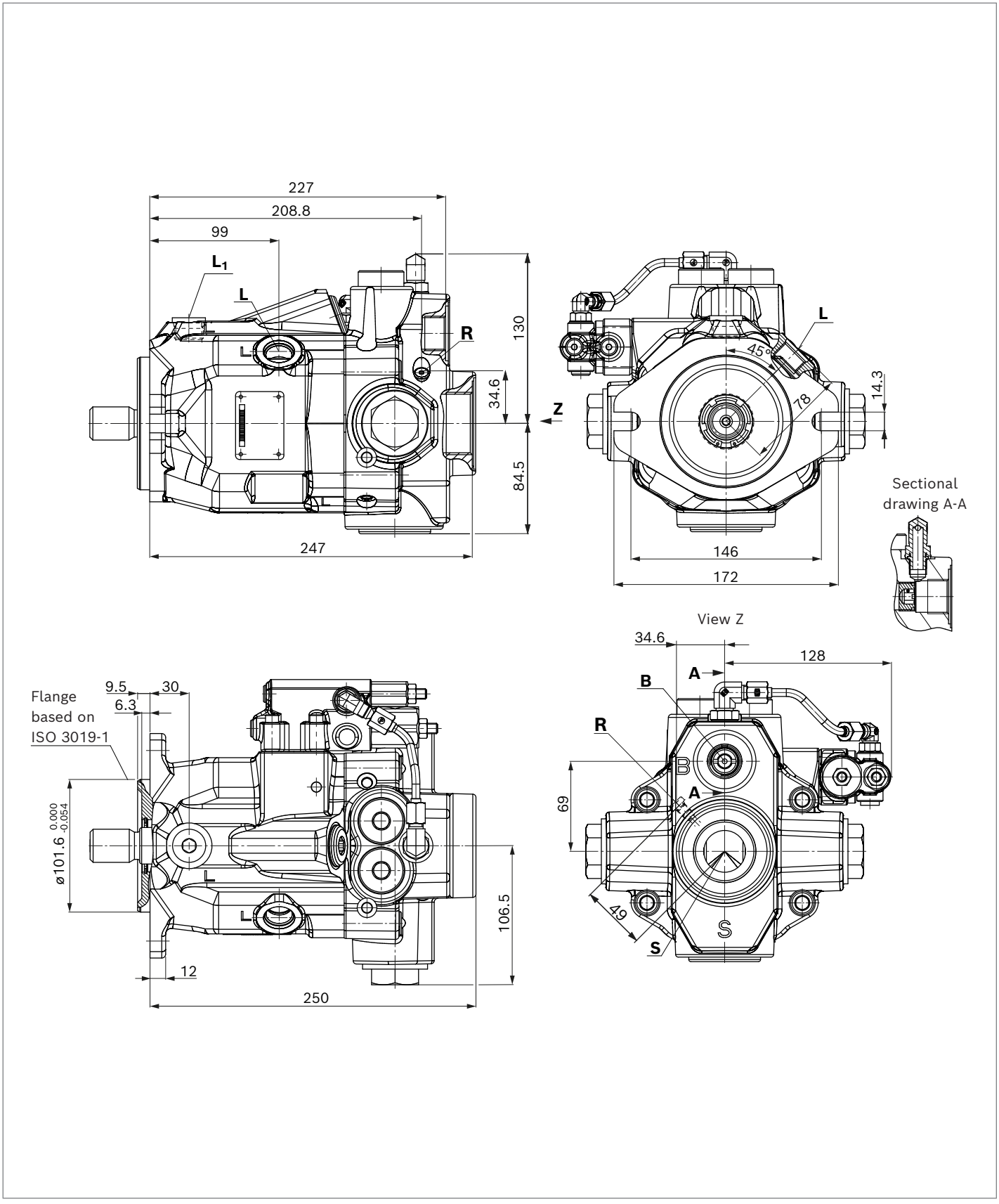


Ports			Standard	Size	$p_{max\ absolute}$ [bar][3)]	State[6)]
B	Working port	Port plate 64	ISO 11926	1 1/16 in 12UN-2B; 20 deep	280	O
		Port plate 70	DIN EN ISO 228	G 1/2; 28 deep	280	O
S	Suction port	Port plate 64	ISO 11926	1 5/8 12UN-2B; 20 deep	1	O
		Port plate 70	DIN EN ISO 228	G 1 1/4; 20 deep	1	O
L	Drain port		ISO 11926[4)]	3/4-16 UNF-2B; 12 deep	2	O[5)]
L_1	Drain port		ISO 11926[4)]	3/4-16 UNF-2B; 11 deep	2	X[5)]
R	Air bleed port	Port plate 64	ISO 11926	7/16-20UNF-2B; 12 deep	2	X
		Port plate 70	DIN 13	M10 x 1; 10 deep		

1) Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
2) Thread according to ASME B1.1
3) Depending on the application, momentary pressure peaks can occur. Keep this in mind when selecting measuring devices and fittings.
4) The countersink may be deeper than specified in the standard.
5) Depending on the installation position, **L** or **L_1** must be connected (also see installation instructions on page 16).
6) O = Must be connected (plugged on delivery)
X = plugged (in normal operation)

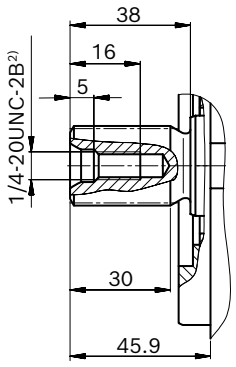
Dimensions A10VWO size 45

DFR1 – constant volume controller, hydraulic



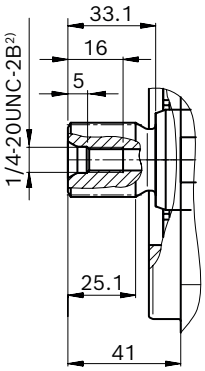
▼ **Splined shaft 1 in (25-4 (ISO 3019-1))**

S – 15T 16/32DP[1)]



▼ **Splined shaft 7/8 in (22-4 (ISO 3019-1))**

U – 13T 16/32DP[1)]

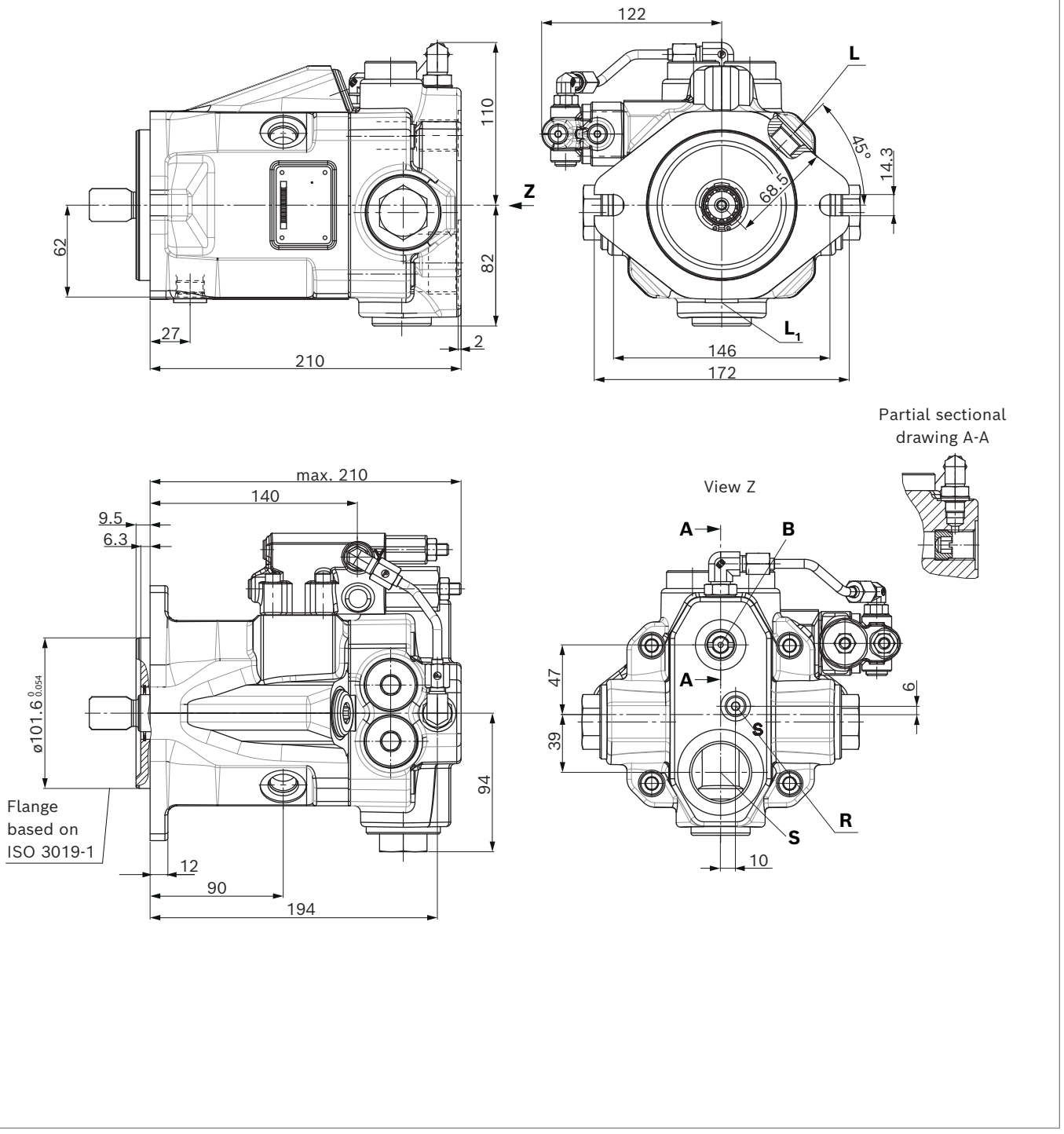


Ports			Standard	Size	$p_{max\ absolute}$ [bar][3)]	State[6)]
B	Working port	Port plate 64	ISO 11926	1 1/16 in 12UN-2B; 20 deep	280	O
		Port plate 70	DIN EN ISO 228	G 3/4; 16 deep	280	O
S	Suction port	Port plate 64	ISO 11926	1 7/8 in 12UN-2B; 20 deep	1	O
		Port plate 70	DIN EN ISO 228	G 1 1/2; 22.2 deep	1	O
L	Drain port		ISO 11926[4)]	7/8-14 UNF-2B; 13 deep	2	O[5)]
L_1	Drain port		ISO 11926[4)]	7/8-14 UNF-2B; 14.5 deep	2	X[5)]
R	Air bleed port	Port plate 64	DIN 13	M10 x 1; 10 deep	2	X
		Port plate 70	DIN 13	M10 x 1; 10 deep		

1) Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
2) Thread according to ASME B1.1
3) Depending on the application, momentary pressure peaks can occur. Keep this in mind when selecting measuring devices and fittings.
4) The countersink may be deeper than specified in the standard.
5) Depending on the installation position, **L** or **L_1** must be connected (also see installation instructions on page 16).
6) O = Must be connected (plugged on delivery)
X = plugged (in normal operation)

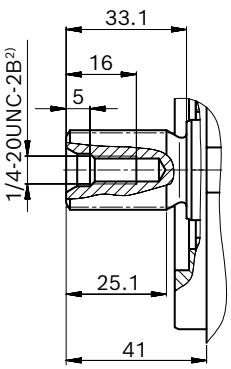
Dimensions A10VWNO size 45

DFR1 – constant volume controller, hydraulic



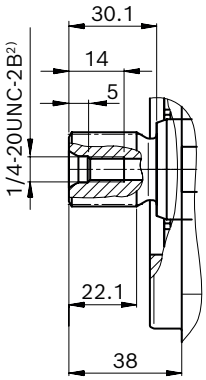
▼ **Splined shaft 7/8 in (22-4 (ISO 3019-1))**

S – 13T 16/32DP[1)]



▼ **Splined shaft 3/4 in (19-4 (ISO 3019-1))**

U – 11T 16/32DP[1)]



Ports			Standard	Size	$p_{max\ absolute}$ [bar][3)]	State[6)]
B	Working port	Port plate 64	ISO 11926	1 1/16 in 12UN-2B; 20 deep	280	O
		Port plate 70	DIN EN ISO 228	G 1/2; 28 deep	280	O
S	Suction port	Port plate 64	ISO 11926	1 5/8 12UN-2B; 20 deep	1	O
		Port plate 70	DIN EN ISO 228	G 1 1/4; 20 deep	1	O
L	Drain port		ISO 11926[4)]	3/4-16 UNF-2B; 12 deep	2	O[5)]
L_1	Drain port		ISO 11926[4)]	3/4-16 UNF-2B; 11 deep	2	X[5)]
R	Air bleed port	Port plate 64	ISO 11926	7/16-20UNF-2B; 12 deep	2	X
		Port plate 70	DIN 13	M10 x 1; 10 deep		

1) Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
2) Thread according to ASME B1.1
3) Depending on the application, momentary pressure peaks can occur. Keep this in mind when selecting measuring devices and fittings.
4) The countersink may be deeper than specified in the standard.
5) Depending on the installation position, **L** or **L_1** must be connected (also see installation instructions on page 16).
6) O = Must be connected (plugged on delivery)
X = plugged (in normal operation)

Installation instructions

General

The axial piston unit must be filled with hydraulic fluid and air bled during commissioning and operation.
This must also be observed following a longer standstill as the axial piston unit may empty via the hydraulic lines.
Filling and air bleeding must be carried out completely, particularly in the installation position "drive shaft upwards," as there is e.g. a danger of dry running.
The leakage in the housing area must be directed to the reservoir via the highest positioned drain port (**L**, **L_1**).
For combination pumps, the leakage must be drained off at each single pump.
If a shared drain line is used for several units, make sure that the respective case pressure in each unit is not exceeded. The shared drain line must be dimensioned to ensure that the maximum permissible case pressure of all connected units is not exceeded in any operating condition, particularly at cold start. If this is not possible, separate drain line must be laid.
To prevent the transmission of structure-borne noise, use elastic elements to decouple all connecting lines from all vibration-capable components (e.g. reservoir, frame parts).
Under all operating conditions, the suction lines and the drain lines must flow into the reservoir below the minimum fluid level. The minimum suction pressure at port **S** must also not fall below 1 bar absolute during operation and during a cold start.
When designing the reservoir, ensure that there is adequate distance between the suction line and the drain line. We recommend using a baffle (baffle plate) between suction line and drain line. A baffle improves the air separation ability as it gives the hydraulic fluid more time for desorption. Apart from that, this prevents the heated return flow from being drawn directly back into the suction line. The suction port must be supplied with air-free, calmed and cooled hydraulic fluid.

Notice

In certain installation positions, an influence on the adjustment or control can be expected. Gravity, dead weight and case pressure can cause minor characteristic shifts and changes in actuating time.

Installation position

See the following examples **1** to **3**.
Further installation positions are available upon request.
Recommended installation position: **1** and **3**

Key	
F	Filling / Air bleeding
S	Suction port
L; L_1	Drain port
R	Air bleed port for simplified air bleed of the A10VW(N)O during commissioning
SB	Baffle (baffle plate)
$h_{t\ min}$	Minimum required immersion depth (200 mm)
h_{min}	Minimum required distance to reservoir bottom (100 mm)
$h_{ES\ min}$	Minimum height required to prevent axial piston unit from draining (25 mm)

Notice

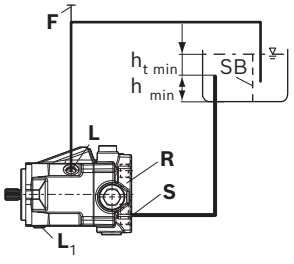
Port **F** is part of the external piping and must be provided on the customer side to simplify the filling and air bleeding.

Below-reservoir installation (standard)

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

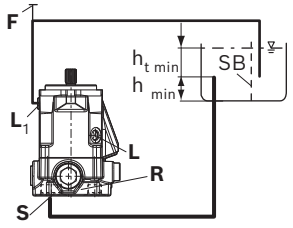
▼ **Installation position 1**[1)]

Air bleed	Filling
F (R)	**L (F)**



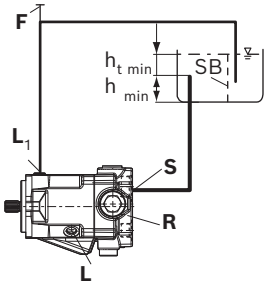
▼ **Installation position 2**[1)]

Air bleed	Filling
F	**L_1 (F)**



▼ **Installation position 3**[1)]

Air bleed	Filling
F (R)	**L_1 (F)**



For key, see page 16.

1) The auxiliary connection **R** is available for easier venting during commissioning.

Project planning notes

- The axial piston variable pump A10VW(N)O is intended to be used in an open circuit.
- The project planning, installation and commissioning of the axial piston unit requires the involvement of skilled personnel.
- Before using the axial piston unit, please read the corresponding operating instructions completely and thoroughly. If necessary, this can be requested from Bosch Rexroth.
- Before finalizing your design, please request a binding installation drawing.
- The specified data and notes contained herein must be observed.
- Depending on the operating conditions of the axial piston unit (working pressure, fluid temperature), the characteristic curve may shift.
- Preservation: Our axial piston units are supplied as standard with preservation protection for a maximum of 12 months. If longer preservation protection is required (maximum 24 months), please specify this in plain text when placing your order. The preservation periods apply under optimal storage conditions, details of which can be found in the data sheet 90312 or the operating instructions.
- Not all configuration variants of the product are approved for use in a safety function according to ISO 13849. Please consult the responsible contact at Bosch Rexroth if you require reliability parameters (e.g., $MTTF_d$) for functional safety.
- Depending on the type of control used, electromagnetic effects can be produced when using solenoids. Applying a direct current (DC) to solenoids does not create electromagnetic interference (EMI), nor is the solenoid affected by EMI. Electromagnetic interference (EMI) potential exists when operating and controlling a solenoid with a modulated direct voltage signal (e.g. PWM signal). Appropriate testing and measures should be taken by the machine manufacturer to ensure other components or operators (e.g. with pacemaker) are not affected by this potential.
- Pressure control (hydraulic or electronic) is not an adequate safeguard against pressure overload. A pressure relief valve should therefore be provided in the hydraulic system. In this connection, observe the technical limits of the pressure relief valve.
- Please note the information regarding the tightening torques of port threads and other screw connections in the operating instructions.
- The ports and fastening threads are designed for the permissible pressures p_{max} of the respective ports, see the connection tables. 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 ports and function ports are only intended to accommodate hydraulic lines.

Safety instructions

- During and shortly after operation, there is a risk of getting burnt on the axial piston unit and especially on the solenoids. Take the appropriate safety measures (e.g. by wearing protective clothing).
- Moving parts in control equipment (e.g. valve spools) can, under certain circumstances, get stuck in position as a result of contamination (e.g. contaminated hydraulic fluid, abrasion, or residual dirt from components). As a result, the hydraulic fluid flow and the build-up of torque in the axial piston unit can no longer respond correctly to the operator's specifications. Even the use of various filter elements (external or internal flow filtration) will not rule out a fault but merely reduce the risk.
  The machine/system manufacturer must test whether remedial measures are needed on the machine for the application concerned in order to bring the driven consumer into a safe position (e.g. safe stop) and ensure any measures are properly implemented.

Related documentation

Product-specific documentation

Document type	Title	Document number
Data sheet	Storage and preservation of axial piston units	90312
Operating instructions	General instruction manual for axial piston units	90300-01-B

Documentation for hydraulic fluids

Document type	Title	Document number
Data sheet	Hydraulic fluids based on mineral oils and related hydrocarbons	90220
	Rating of hydraulic fluids used in Rexroth hydraulic components (pumps and motors)	90235
	Bosch Rexroth Fluid Rating List for Rexroth hydraulic components (pumps and motors)	90245

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