Axial piston variable pump
A10V(S)O Series 31

- Size 18 (A10VSO)
- Sizes 28 to 140 (A10VO)
- Nominal pressure 280 bar
- Maximum pressure 350 bar
- Open circuit

Features

- Variable pump with axial piston rotary group in swash-plate design for hydrostatic drives in open circuit.
- The flow is proportional to the drive speed and displacement.
- The flow can be infinitely varied by adjusting the swash-plate angle.
- 2 drain ports
- Excellent suction performance
- Low noise level
- Long service life
- Favorable power/weight ratio
- Versatile controller range
- Short control time
- The through drive is suitable for adding gear pumps and axial piston pumps up to the same size, i.e., 100% through drive.

Contents

Type code

01	02	03	04	05		06	07		08	09	10	11	12	13
	A10V(S)	O			/	31		–	V					

Version

		18	28	45	71	88	100	140	
01	Standard version (without code)	●	●	●	●	●	●	●	
	High-speed version (external dimensions are the same as the standard version)	–	–	●	●	–	●	●	H

Axial piston unit

02	Swashplate design, variable, nominal pressure 280 bar, maximum pressure 350 bar	●	–	–	–	–	–	–	A10VS
		–	●	●	●	●	●	●	A10V

Operating mode

03	Pump, open circuit	O

Size (NG)

		18	28	45	71	88	100	140
04	Geometric displacement, see table of values on pages 6 and 7	18	28	45	71	88	100	140

Control device

05	Two-point control, direct operated				●	●	●	●	●	●	●	DG
	Pressure controller	hydraulic			●	●	●	●	●	●	●	DR
	with flow controller	hydraulic	X-T open		●	●	●	●	●	●	●	DFR
			X-T plugged with flushing function		●	●	●	●	●	●	●	DFR1
			X-T plugged without flushing function		●	●	●	●	●	●	●	DRSC
	with flow and differential pressure control, electrically variable				●	●	●	●	●	●	●	EF[1)]
	with pressure cut-off	hydraulic	remote controlled		●	●	●	●	●	●	●	DRG
		electrical	negative control	*U* = 12 V	●	●	●	●	●	●	●	ED71
				U = 24 V	●	●	●	●	●	●	●	ED72
		electrical	positive control	*U* = 12 V	●	●	●	●	●	●	●	ER71
				U = 24 V	●	●	●	●	●	●	●	ER72
	Pressure-flow power control				–	●	●	●	●	●	●	DFLR

Series

06	Series 3, index 1	31

Direction of rotation

07	Viewed on drive shaft	clockwise	R
		counter-clockwise	L

Sealing material

08	FKM (fluoroelastomer)	V

Drive shaft

			18	28	45	71	88	100	140	
09	Splined shaft ANSI B92.1a	standard shaft	●	●	●	●	●	●	●	S
		similar to shaft “S” however for higher input torque	●	●	●	●	●	–	–	R
		reduced diameter, limited suitability for through drive (see table of values, page 9)	●	●	●	●	●	●	○	U
		same as “U”, higher torque; limited suitability for through drive (see table of values, page 9)	–	●	●	●	●	●	●	W

Mounting flange

10	ISO 3019-1 (SAE)	2-hole	●	●	●	●	●	●	●	C
		4-hole	–	–	–	–	–	–	●	D

1) See data sheet 92709

01	02	03	04	05		06	07		08	09	10	11	12	13
	A10V(S)	**O**			**/**	**31**		**–**	**V**					

Working port				**18**	**28**	**45**	**71**	**88**	**100**	**140**	
11	SAE flange ports according to J518 Working ports **metric**	Fastening thread **metric**; rear	not for through drive	–	●	●	–	–	●	●	**11**
				–	–	–	●	●	–	–	**41**
		Fastening thread **metric**; lateral top bottom	for through drive	●	●	●	–	–	●	●	**12**
				–	–	–	●	●	–	–	**42**
	SAE flange ports according to J518 Working ports **UNF**	Fastening thread **UNF**; rear	not for through drive	–	●	●	–	–	●	●	**61**
				–	–	–	●	●	–	–	**91**
		Fastening thread **UNF**; lateral top bottom	for through drive	●	●	●	–	–	●	●	**62**
				–	–	–	●	●	–	–	**92**

Through drive (for mounting options, see page 53)

12	Flange ISO 3019-1 Diameter	Hub for splined shaft[2] Diameter		**18**	**28**	**45**	**71**	**88**	**100**	**140**	
	without through drive			●	●	●	●	●	●	●	**N00**
	82-2 (A)	5/8 in	9T 16/32DP	●	●	●	●	●	●	●	**K01**
		3/4 in	11T 16/32DP	●	●	●	●	●	●	●	**K52**
	101-2 (B)	7/8 in	13T 16/32DP	–	●	●	●	●	●	●	**K68**
		1 in	15T 16/32DP	–	–	●	●	●	●	●	**K04**
	127-2 (C)	1 1/4 in	14T 12/24DP	–	–	–	●	●	●	●	**K07**
		1 1/2 in	17T 12/24DP	–	–	–	–	–	●	●	**K24**
	152-4 (D)	1 3/4 in	13T 8/16DP	–	–	–	–	–	–	●	**K17**[4]

Connectors for solenoids[3]

13	Without connector (without solenoid, with hydraulic control only, without code)	●	●	●	●	●	●	●	
	DEUTSCH - molded connector, 2-pin, without suppressor diode	●	●	●	●	●	●	●	**P**

● = Available ○ = On request – = Not available

Notice

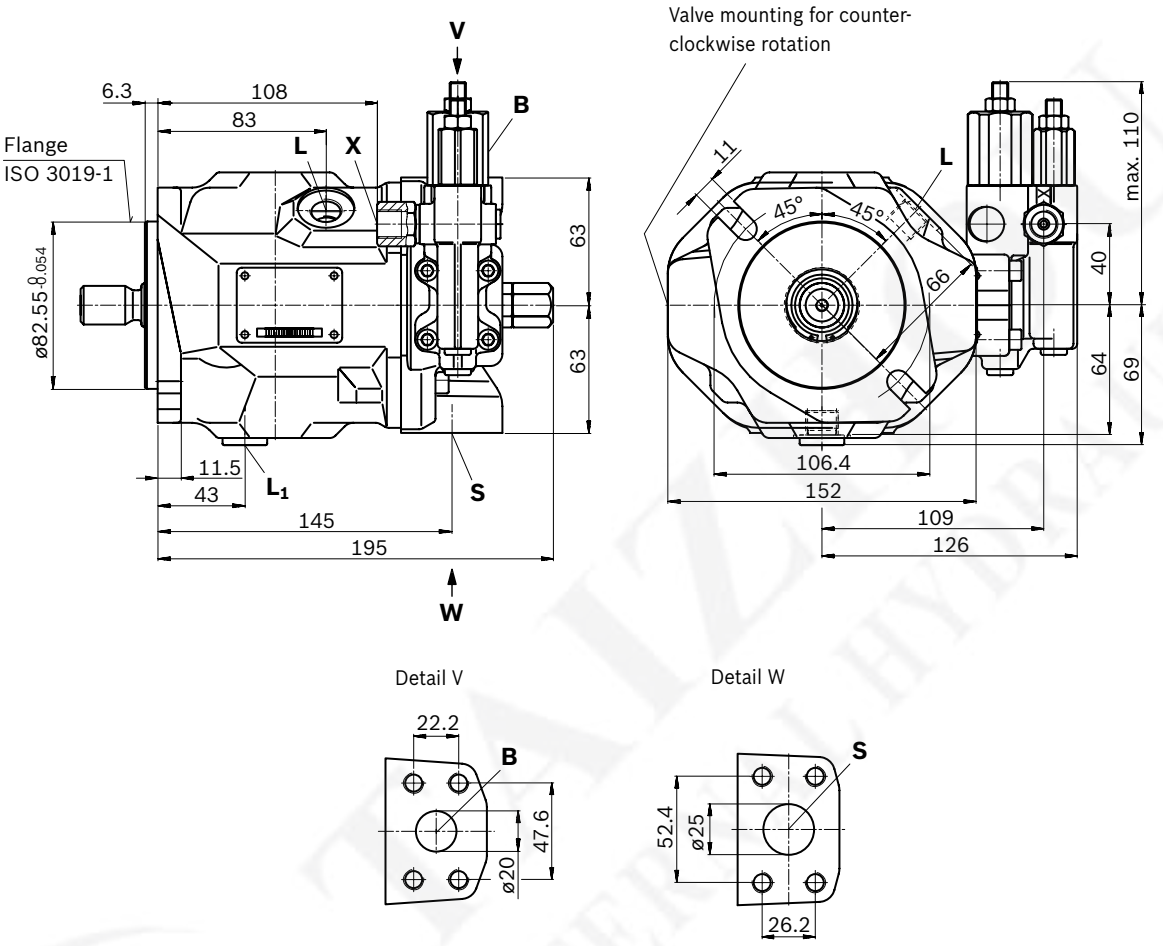
- ▶ Note the project planning notes on page 59.
- ▶ In addition to the type code, please specify the relevant technical data when placing your order.

2) Hub for splined shaft according to ANSI B92.1a
3) Connectors for other electric components can deviate.
4) Only with mounting flange D

Dimensions, size 18

DFR / DFR1 / DRSC – Pressure and flow control, hydraulic; clockwise rotation, version: Ports metric

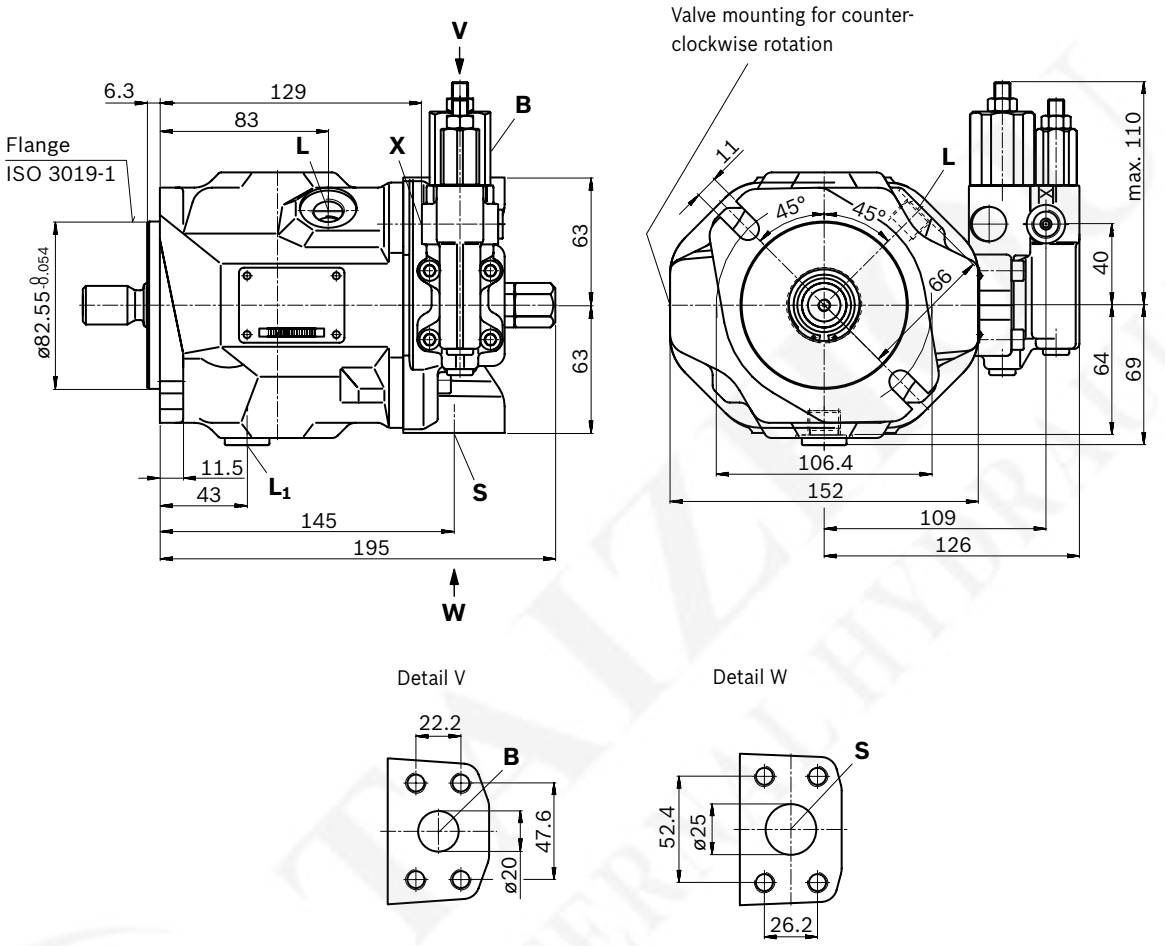
▼ **Port plate 12**



Dimensions, size 18

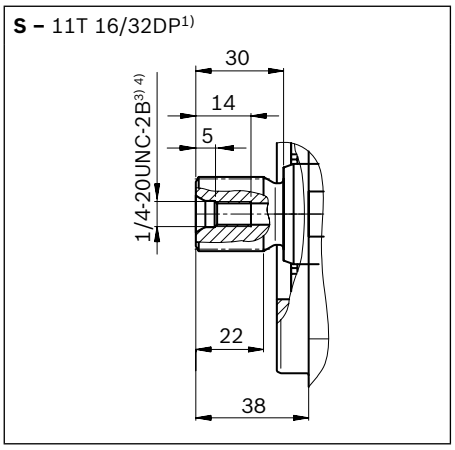
DFR / DFR1 / DRSC – Pressure and flow control, hydraulic; clockwise rotation, version: SAE ports

▼ **Port plate 62**



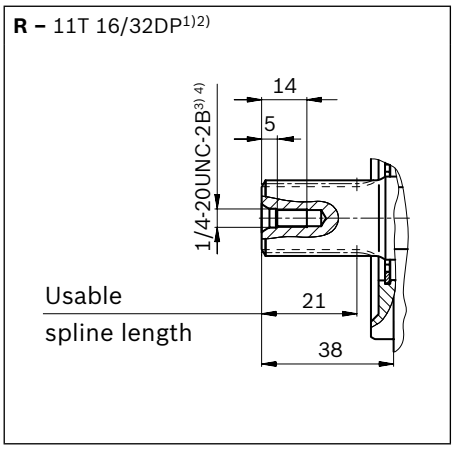
▼ **Splined shaft 3/4 in (SAE J744)**

S – 11T 16/32DP[1)]



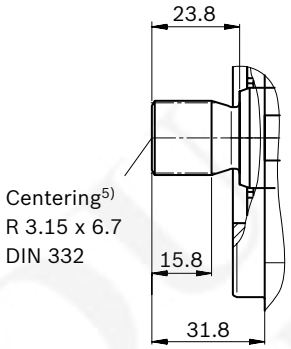
▼ **Splined shaft 3/4 in (SAE J744)**

R – 11T 16/32DP[1)2)]



▼ **Splined shaft 5/8 in (SAE J744)**

U – 9T 16/32DP[1)]



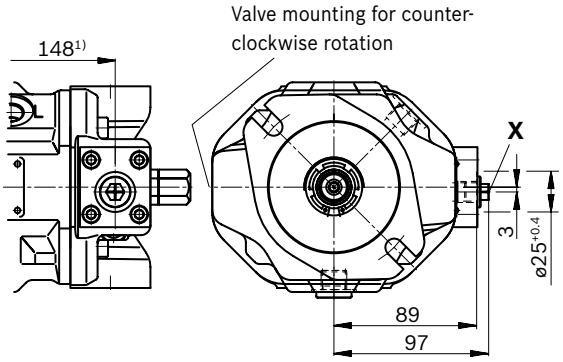
Ports - version metric port plate 12		Standard	Size[4)]	$p_{max\ abs}$ [bar][6)]	State[10)]
B	Working port (standard pressure series) Fastening thread	SAE J518[7)] DIN 13	3/4 in M10 × 1.5; 17 deep	350	O
S	Suction port (standard pressure series) Fastening thread	SAE J518[7)] DIN 13	1 in M10 × 1.5; 17 deep	10	O
L	Drain port	DIN 3852[8)]	M16 × 1.5; 12 deep	2	O[9)]
L_1	Drain port	DIN 3852[8)]	M16 × 1.5; 12 deep	2	X[9)]
X	Pilot pressure	DIN 3852	M14 × 1.5; 12 deep	350	O
X	Pilot pressure with DG-control	DIN ISO 228	G1/4 in; 12 deep	350	O

Ports - version SAE port plate 62		Standard	Size[4)]	$p_{max\ abs}$ [bar][6)]	State[10)]
B	Working port (standard pressure series) Fastening thread	SAE J518 ASME B1.1	3/4 in 3/8-16 UNC-2B; 20 deep	350	O
S	Suction port (standard pressure series) Fastening thread	SAE J518 ASME B1.1	1 in 3/8-16 UNC-2B; 20 deep	10	O
L	Drain port	ISO 11926[8)]	9/16-18 UNF-2B; 12 deep	2	O[9)]
L_1	Drain port	ISO 11926[8)]	9/16-18 UNF-2B; 12 deep	2	X[9)]
X	Pilot pressure	ISO 11926	7/16-20 UNF-2B; 11.5 deep	350	O
X	Pilot pressure with DG-control	DIN ISO 228	G1/4 in; 12 deep	350	O

1) Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
2) Splines according to ANSI B92.1a, run out of spline is a deviation from standard.
3) Thread according to ASME B1.1
4) For notes on tightening torques, see the instruction manual
5) Coupling axially secured, e.g. with a clamp coupling or radially mounted clamping screw
6) Depending on the application, momentary pressure peaks can occur. Keep this in mind when selecting measuring devices and fittings.
7) Metric fastening thread is a deviation from standard.
8) The countersink can be deeper than as specified in the standard.
9) Depending on the installation position, L or L_1 must be connected (also see installation instructions starting on page 56).
10) O = Must be connected (plugged when delivered)
X = Plugged (in normal operation)

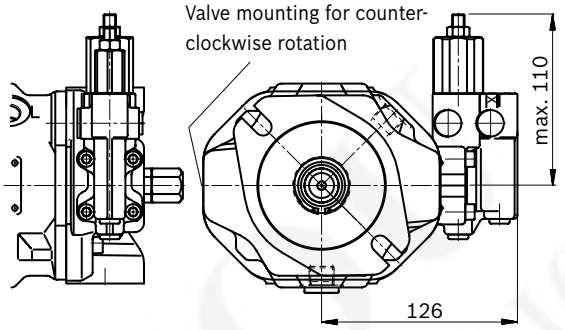
▼ DG – Two-point control, direct operated

Port plate 12 (62)



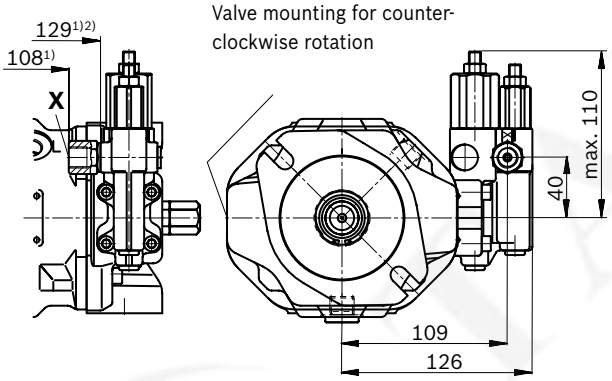
▼ DR – Pressure controller

Port plate 12 (62)



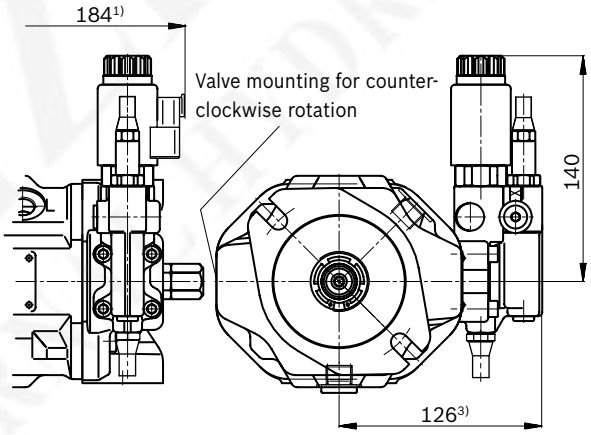
▼ DRG – Pressure controller, remote controlled

Port plate 12 (62)



▼ ED7.,ER7. – Electro-hydraulic pressure control

Port plate 12 (62)

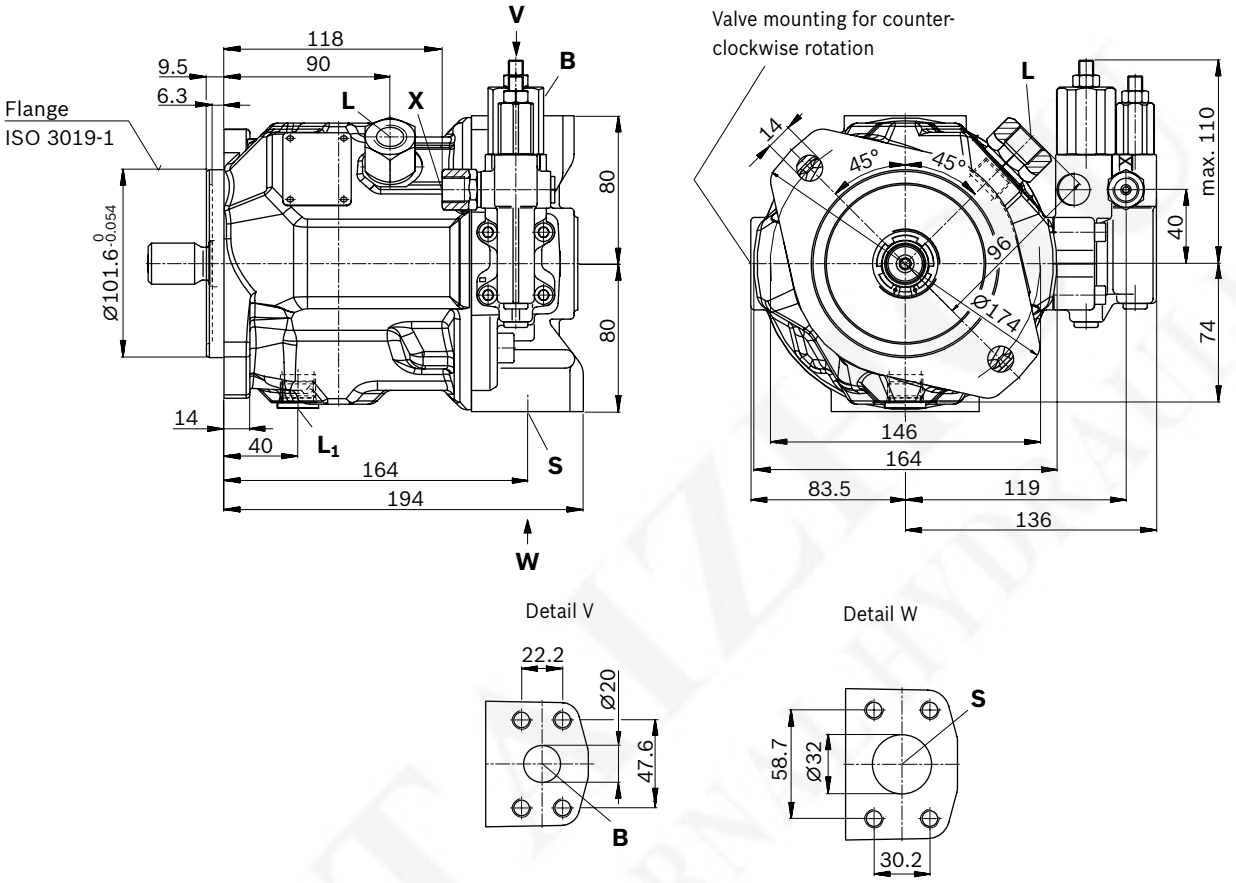


1) To flange surface
2) For version port plates 62
3) ER7.: 161 mm if using an intermediate plate pressure controller

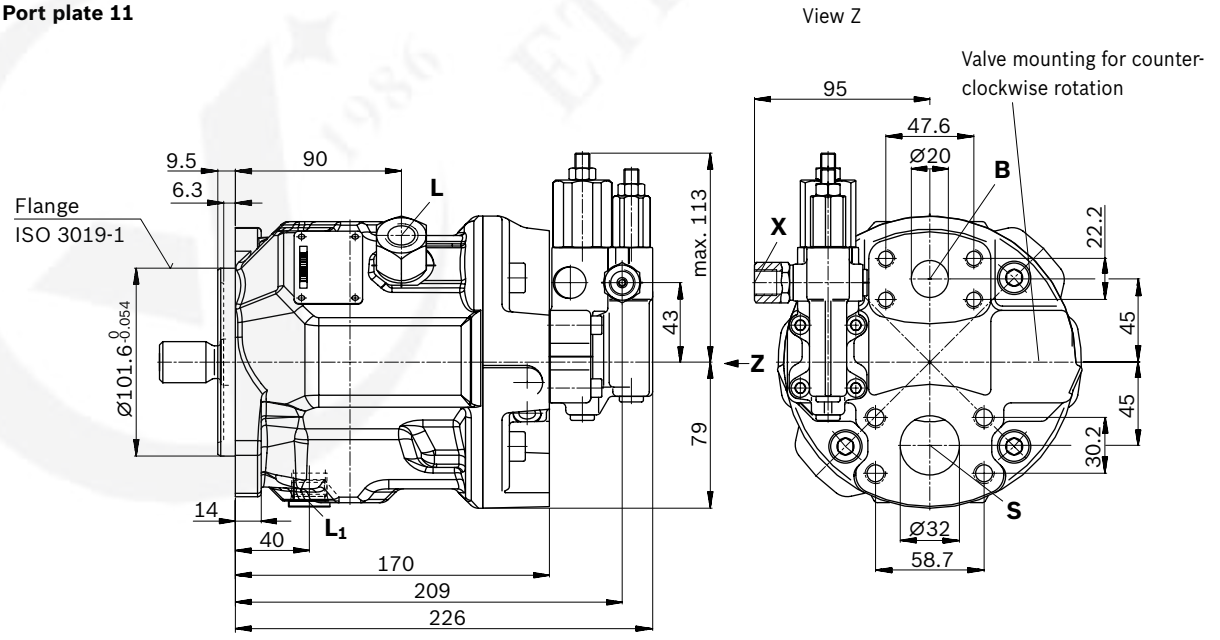
Dimensions, size 28

DFR / DFR1 / DRSC – Pressure and flow control, hydraulic; clockwise rotation, version: Ports metric

▼ **Port plate 12**



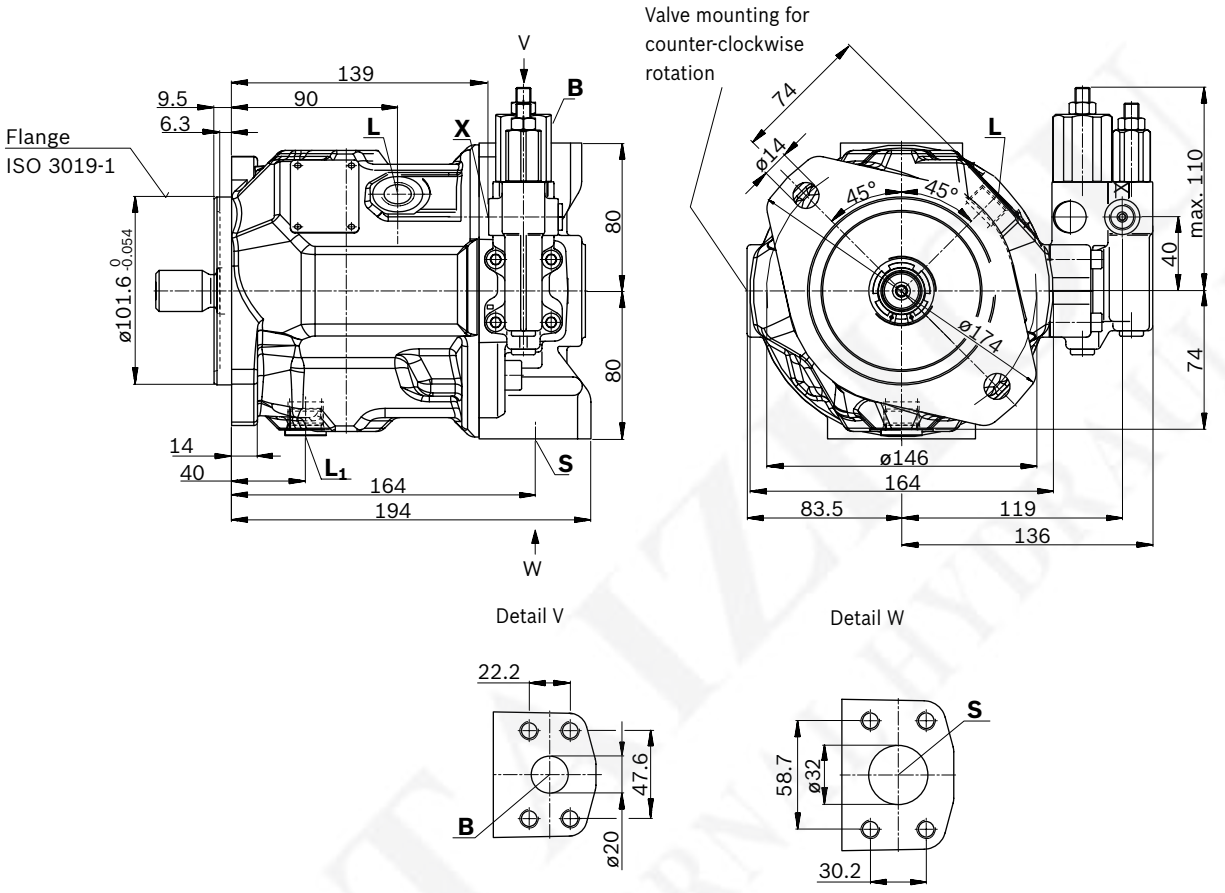
▼ **Port plate 11**



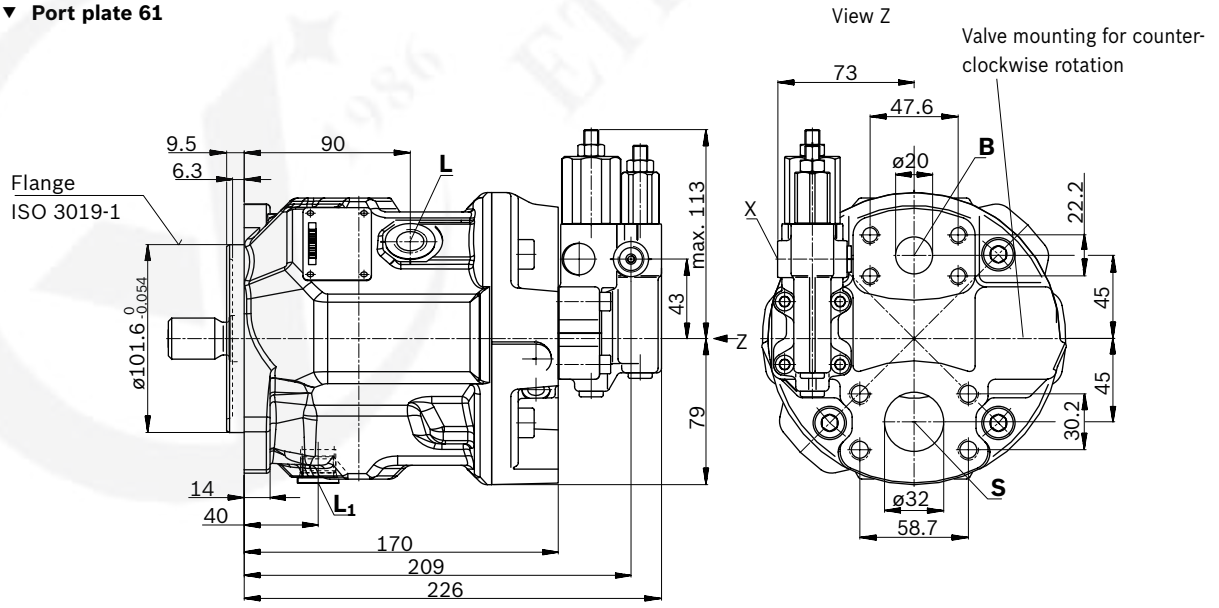
Dimensions, size 28

DFR / DFR1 / DRSC – Pressure and flow control, hydraulic; clockwise rotation, version: SAE ports

▼ **Port plate 62**

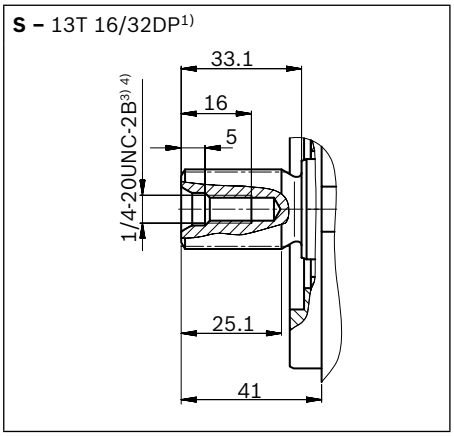


▼ **Port plate 61**



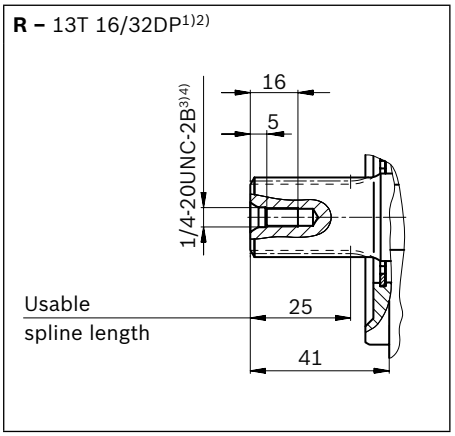
▼ **Splined shaft 7/8 in (SAE J744)**

S – 13T 16/32DP[1)]



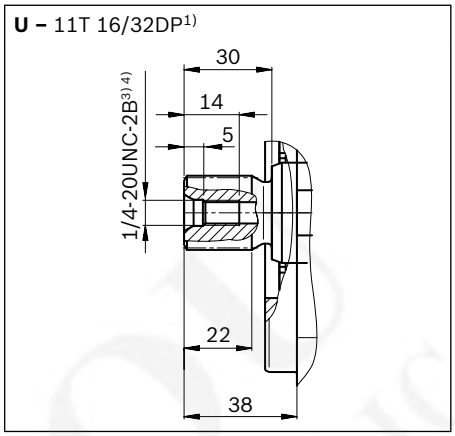
▼ **Splined shaft 7/8 in (SAE J744)**

R – 13T 16/32DP[1)2)]



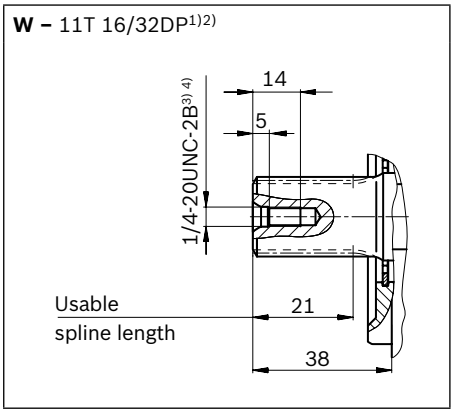
▼ **Splined shaft 3/4 in (SAE J744)**

U – 11T 16/32DP[1)]



▼ **Splined shaft 3/4 in (SAE J744)**

W – 11T 16/32DP[1)2)]



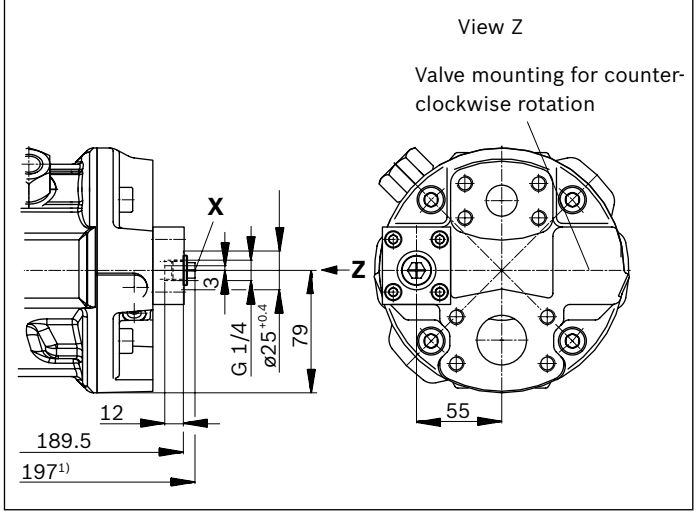
Ports - version metric port plate 11/12		**Standard**	**Size**[4)]	$p_{max\ abs}$ **[bar]**[5)]	**State**[9)]
B	Working port (standard pressure series) Fastening thread	SAE J518[6)] DIN 13	3/4 in M10 × 1.5; 17 deep	350	O
S	Suction port (standard pressure series) Fastening thread	SAE J518[6)] DIN 13	1 1/4 in M10 × 1.5; 17 deep	10	O
L	Drain port	DIN 3852[7)]	M18 × 1.5; 12 deep	2	O[8)]
L_1	Drain port	ISO 11926[7)]	3/4-16 UNF-2B; 14 deep	2	X[8)]
X	Pilot pressure	DIN 3852	M14 × 1.5; 12 deep	350	O
X	Pilot pressure with DG-control	DIN ISO 228	G1/4 in; 12 deep	350	O

Ports - version SAE port plate 61/62		**Standard**	**Size**[4)]	$p_{max\ abs}$ **[bar]**[5)]	**State**[9)]
B	Working port (standard pressure series) Fastening thread	SAE J518 ASME B1.1	3/4 in 3/8-16 UNC-2B; 20 deep	350	O
S	Suction port (standard pressure series) Fastening thread	SAE J518 ASME B1.1	1 1/4 in 7/16-14 UNC-2B; 24 deep	10	O
L	Drain port	ISO 11926[7)]	3/4-16 UNF-2B; 14 deep	2	O[8)]
L_1	Drain port	ISO 11926[7)]	3/4-16 UNF-2B; 14 deep	2	X[8)]
X	Pilot pressure	ISO 11926	7/16-20 UNC-2B; 11.5 deep	350	O
X	Pilot pressure with DG-control	DIN ISO 228	G1/4 in; 12 deep	350	O

1) Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
2) Splines according to ANSI B92.1a, run out of spline is a deviation from standard.
3) Thread according to ASME B1.1
4) For notes on tightening torques, see the instruction manual
5) Depending on the application, momentary pressure peaks can occur. Keep this in mind when selecting measuring devices and fittings.
6) Metric fastening thread is a deviation from standard.
7) The countersink can be deeper than as specified in the standard.
8) Depending on the installation position, L or L_1 must be connected (also see installation instructions starting on page 56).
9) O = Must be connected (plugged when delivered)
X = Plugged (in normal operation)

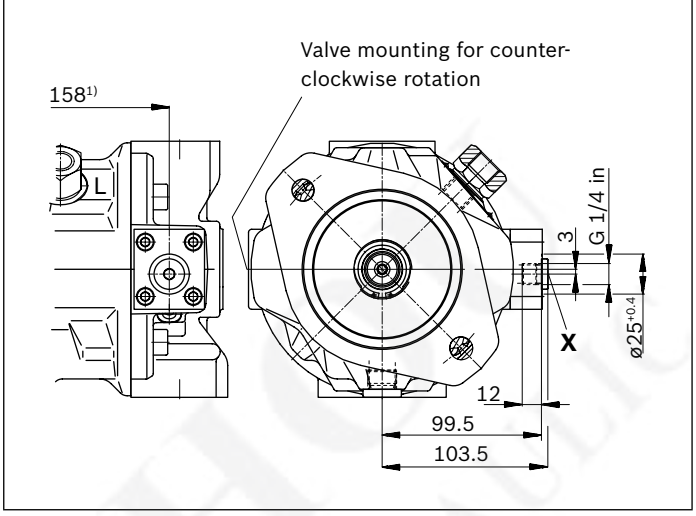
▼ **DG – Two-point control, direct operated**

Port plate 11 (61)



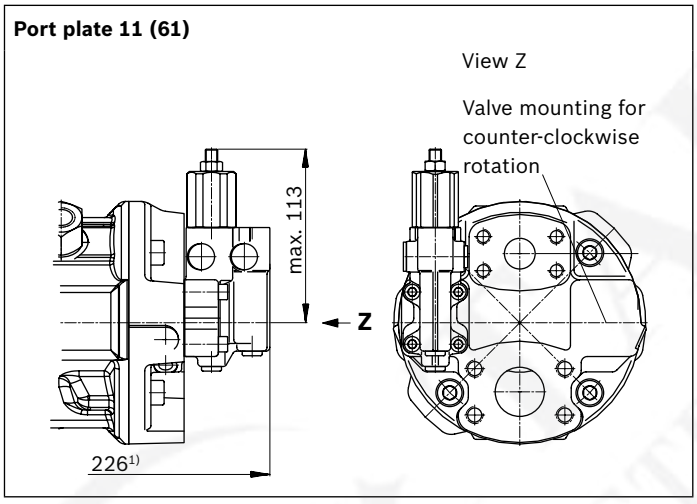
▼ **DG – Two-point control, direct operated**

Port plate 12 (62)



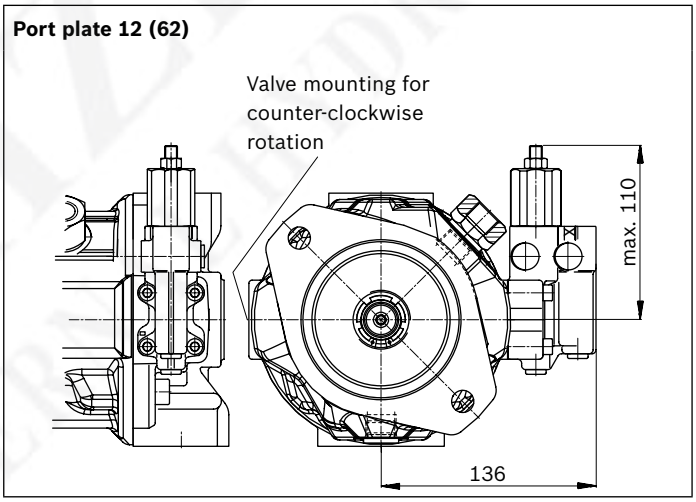
▼ **DR – Pressure controller**

Port plate 11 (61)



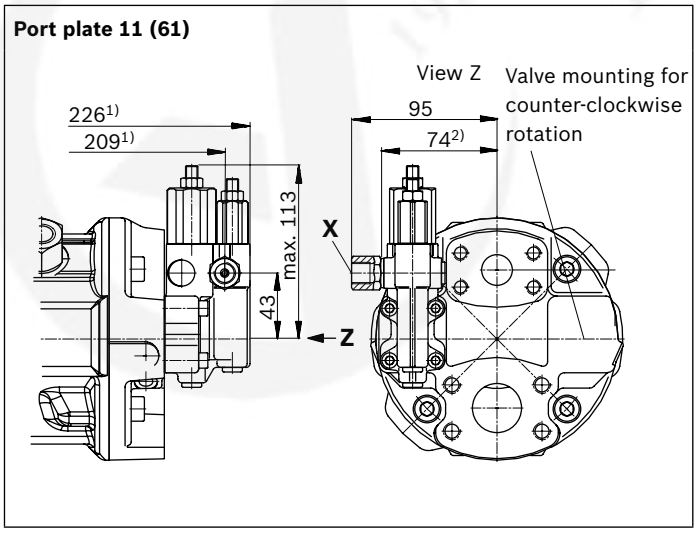
▼ **DR – Pressure controller**

Port plate 12 (62)



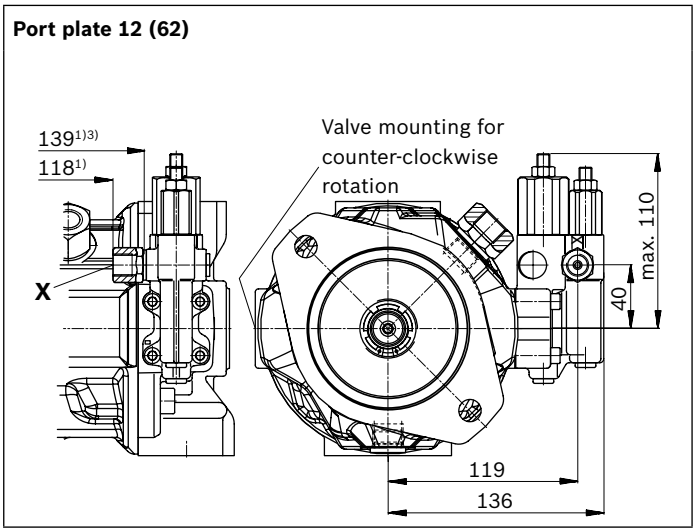
▼ **DRG – Pressure controller, remote controlled**

Port plate 11 (61)



▼ **DRG – Pressure controller, remote controlled**

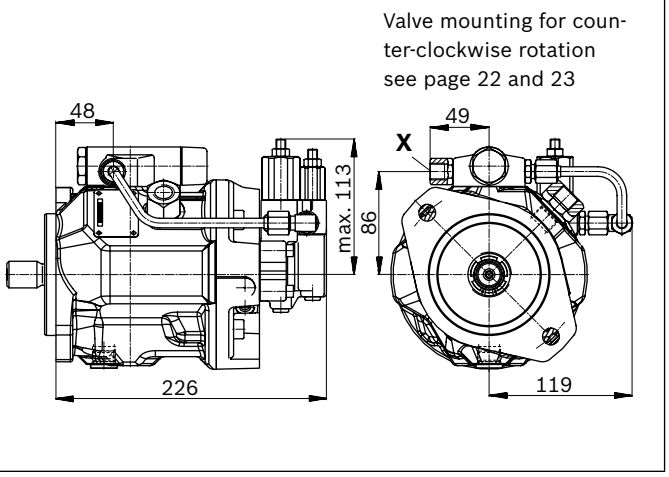
Port plate 12 (62)



1) To flange surface
2) For version port plate 61
3) For version port plate 62

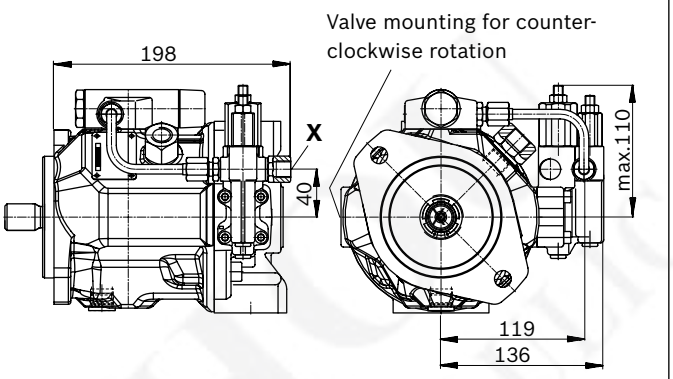
▼ **DFLR – Pressure, flow and power controller**

Port plate 11 (61)



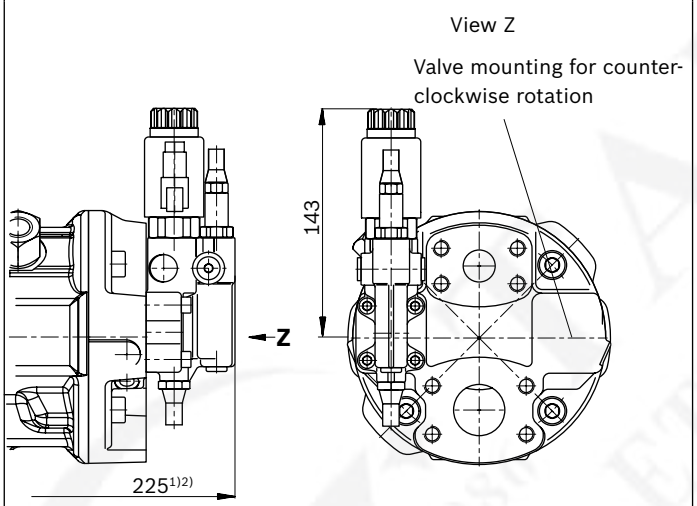
▼ **DFLR – Pressure, flow and power controller**

Port plate 12 (62)



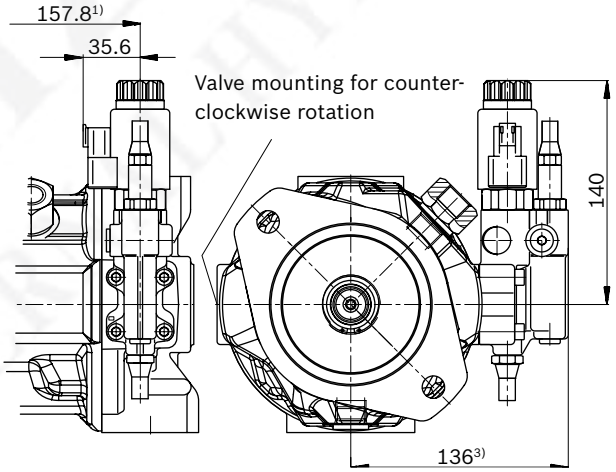
▼ **ED7. / ER7. – Electro-hydraulic pressure control**

Port plate 11 (61)



▼ **ED7. / ER7. – Electro-hydraulic pressure control**

Port plate 12 (62)

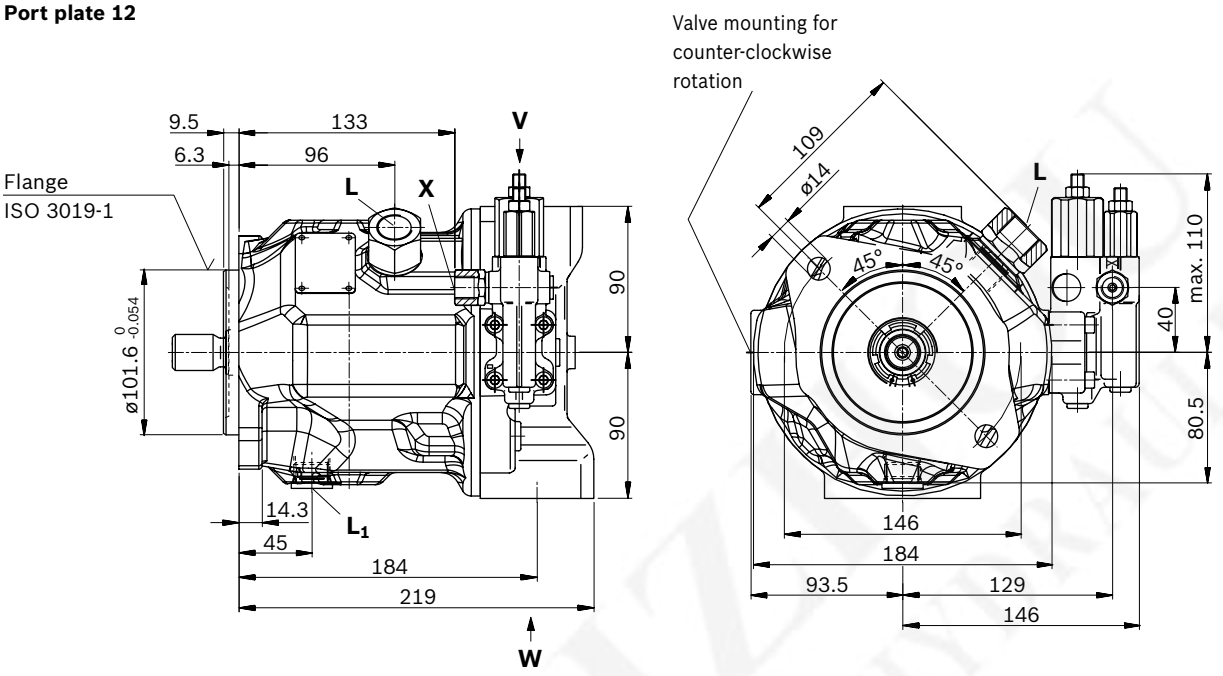


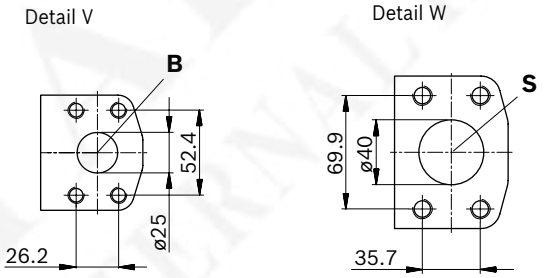
1) To flange surface
2) ER7.: 260 mm if using an intermediate plate pressure controller
3) ER7.: 171 mm if using an intermediate plate pressure controller

Dimensions, size 45

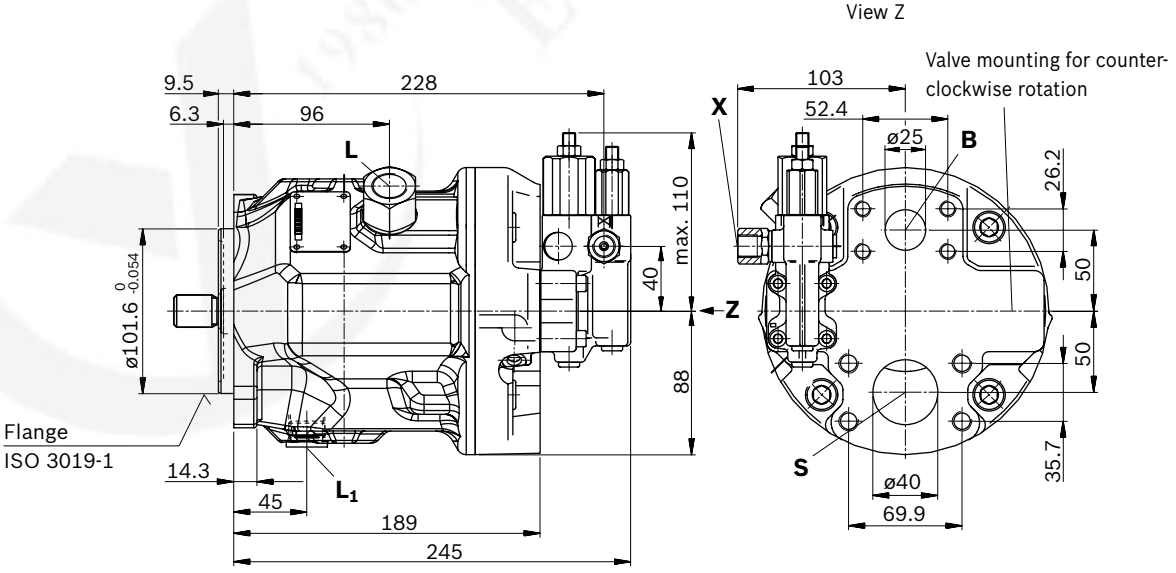
DFR / DFR1 / DRSC – Pressure and flow control, hydraulic; clockwise rotation, version: Ports metric

▼ **Port plate 12**





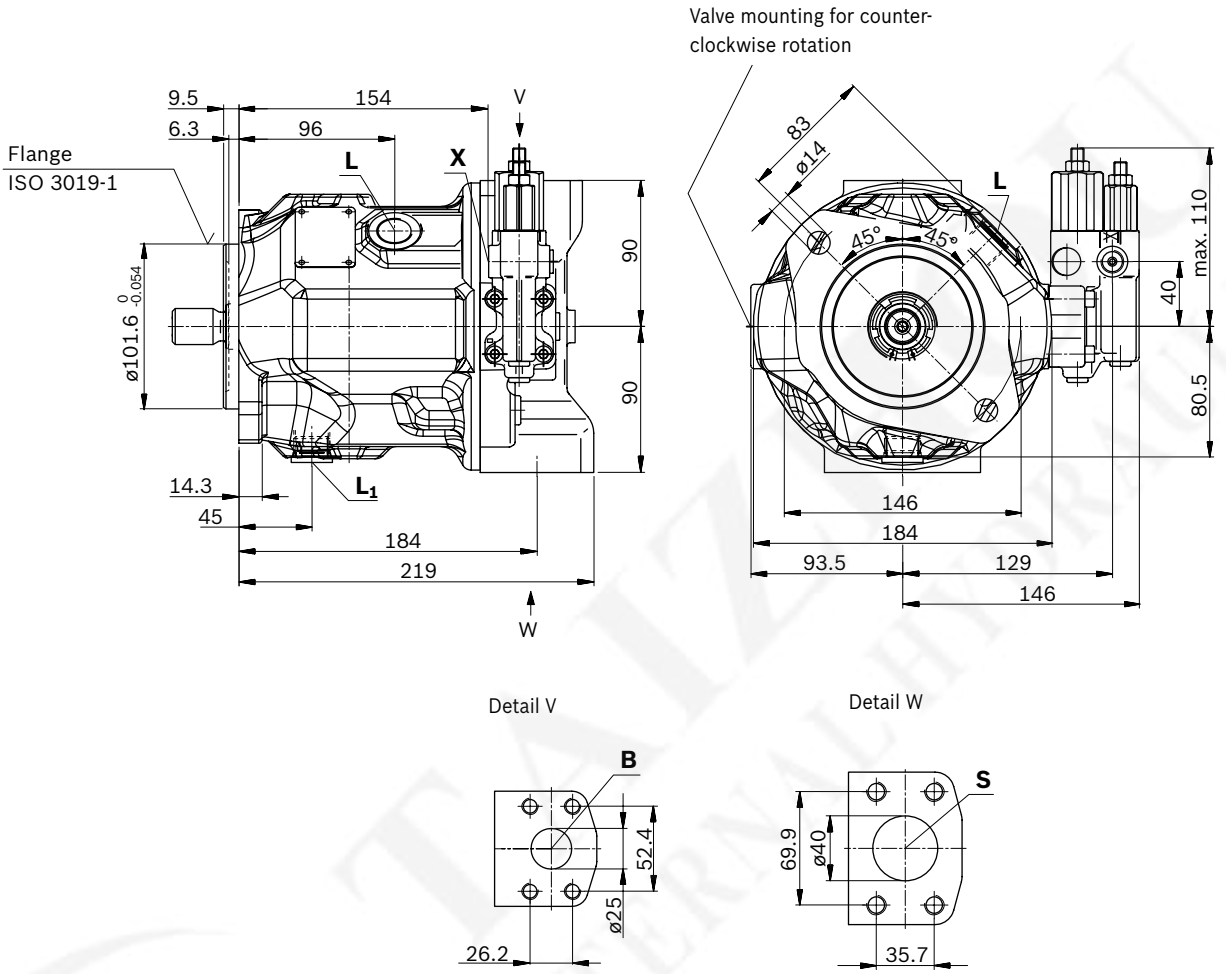
▼ **Port plate 11**



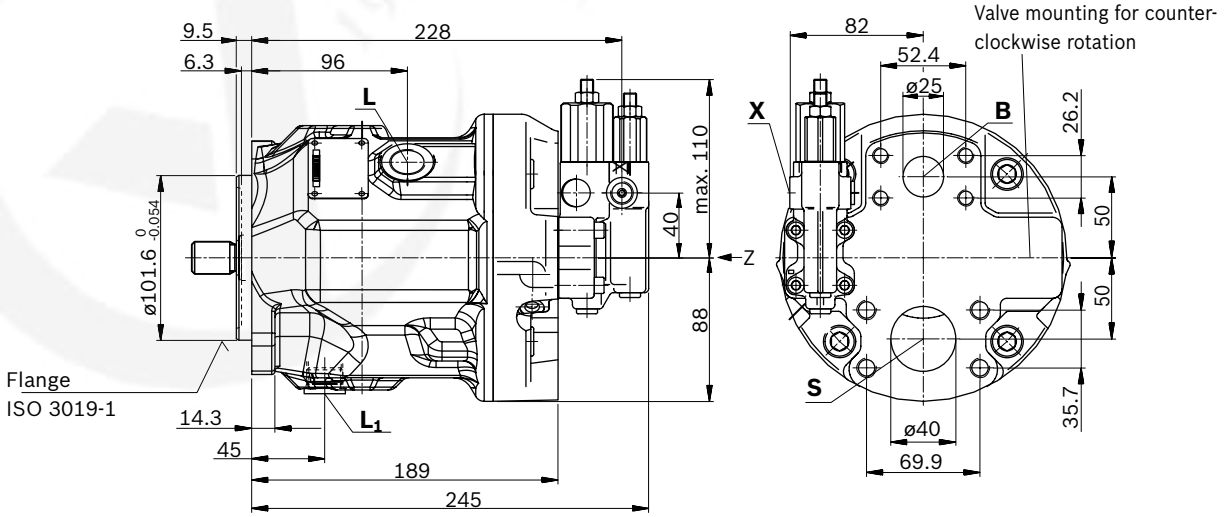
Dimensions, size 45

DFR / DFR1 / DRSC – Pressure and flow control, hydraulic; clockwise rotation, version: SAE ports

▼ **Port plate 62**

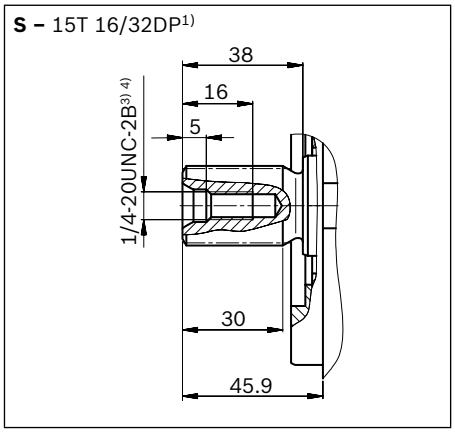


▼ **Port plate 61**



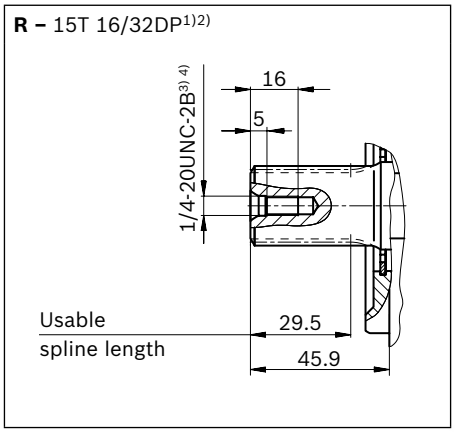
▼ **Splined shaft 1 in (SAE J744)**

S – 15T 16/32DP[1)]



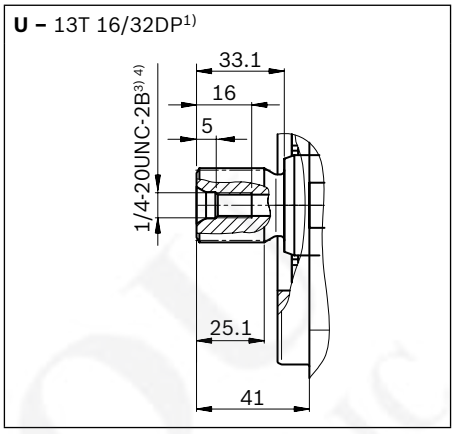
▼ **Splined shaft 1 in (SAE J744)**

R – 15T 16/32DP[1)2)]



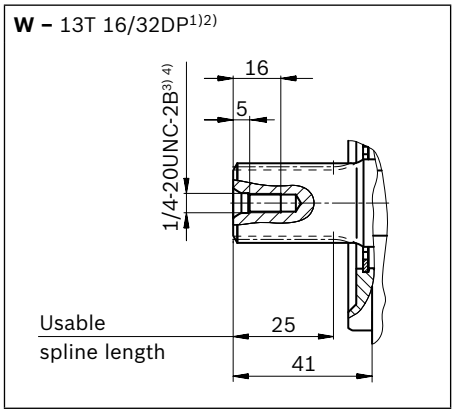
▼ **Splined shaft 7/8 in (SAE J744)**

U – 13T 16/32DP[1)]



▼ **Splined shaft 7/8 in (SAE J744)**

W – 13T 16/32DP[1)2)]



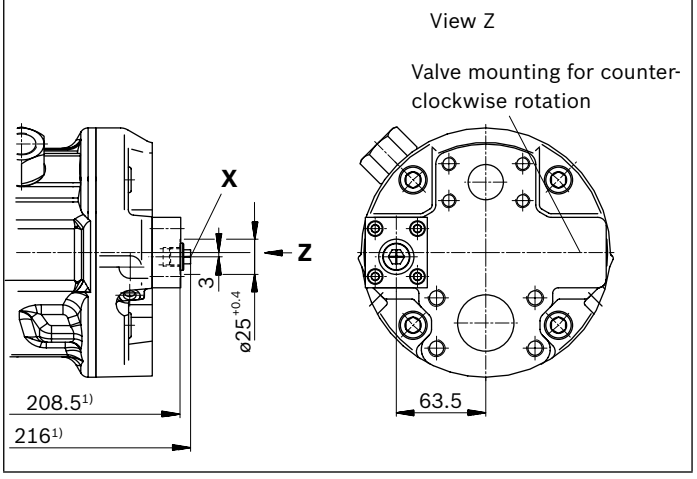
Ports - version metric port plate 11/12		Standard	Size[4)]	$p_{max\ abs}$ [bar][5)]	State[9)]
B	Working port (standard pressure series) Fastening thread	SAE J518[6)] DIN 13	1 in M10 × 1.5; 17 deep	350	O
S	Suction port (standard pressure series) Fastening thread	SAE J518[6)] DIN 13	1 1/2 in M12 × 1.75; 20 deep	10	O
L	Drain port	DIN 3852[7)]	M22 × 1.5; 14 deep	2	O[8)]
L_1	Drain port	ISO 11926[7)]	7/8-14 UNF-2B; 16 deep	2	X[8)]
X	Pilot pressure	DIN 3852	M14 × 1.5; 12 deep	350	O
X	Pilot pressure with DG-control	DIN ISO 228	G1/4 in; 12 deep	350	O

Ports - version SAE port plate 61/62		Standard	Size[4)]	$p_{max\ abs}$ [bar][5)]	State[9)]
B	Working port (standard pressure series) Fastening thread	SAE J518 ASME B1.1	1 in 3/8-16 UNC-2B; 17 deep	350	O
S	Suction port (standard pressure series) Fastening thread	SAE J518 ASME B1.1	1 1/2 in 1/2-13 UNC-2B; 20 deep	10	O
L	Drain port	ISO 11926[7)]	7/8-14 UNF-2B; 16 deep	2	O[8)]
L_1	Drain port	ISO 11926[7)]	7/8-14 UNF-2B; 16 deep	2	X[8)]
X	Pilot pressure	ISO 11926	7/16-20 UNF-2B; 11.5 deep	350	O
X	Pilot pressure with DG-control	DIN ISO 228	G1/4 in; 12 deep	350	O

1) Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
2) Splines according to ANSI B92.1a, run out of spline is a deviation from standard.
3) Thread according to ASME B1.1
4) For notes on tightening torques, see the instruction manual
5) Depending on the application, momentary pressure peaks can occur. Keep this in mind when selecting measuring devices and fittings.
6) Metric fastening thread is a deviation from standard.
7) The countersink can be deeper than as specified in the standard.
8) Depending on the installation position, L or L_1 must be connected (also see installation instructions starting on page 56).
9) O = Must be connected (plugged when delivered)
X = Plugged (in normal operation)

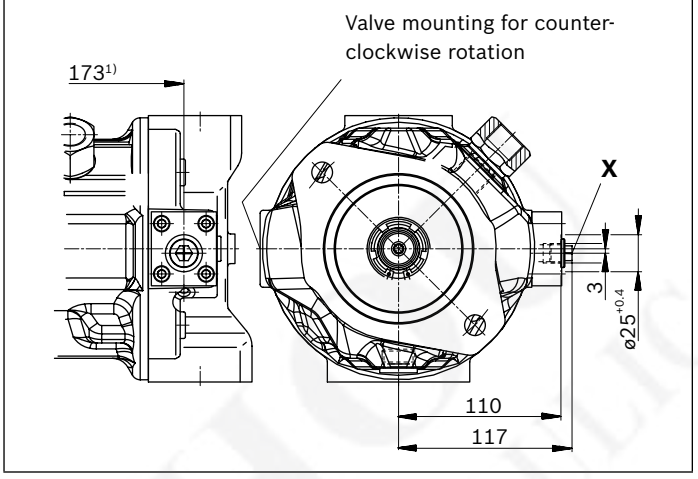
▼ **DG – Two-point control, direct operated**

Port plate 11 (61)



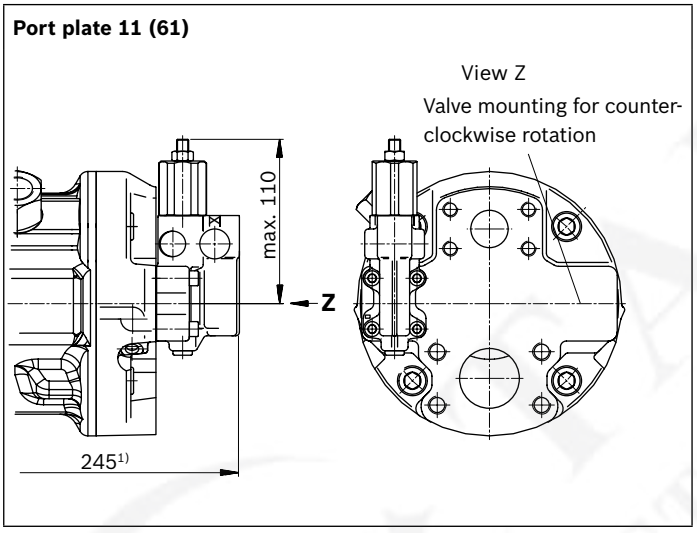
▼ **DG – Two-point control, direct operated**

Port plate 12 (62)



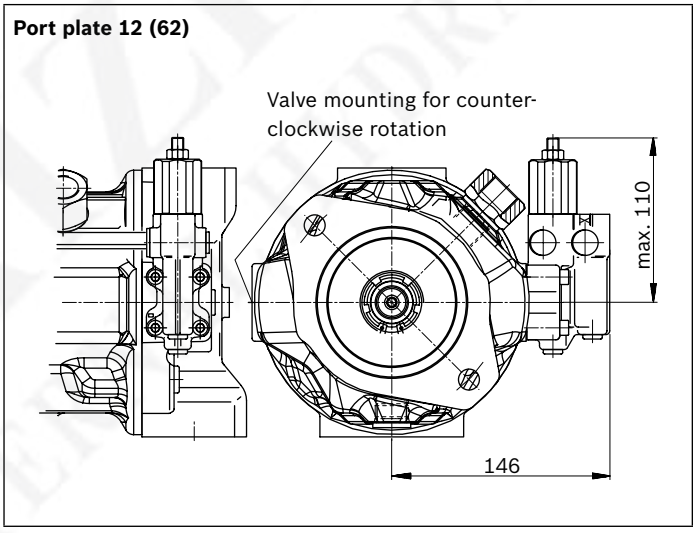
▼ **DR – Pressure controller**

Port plate 11 (61)



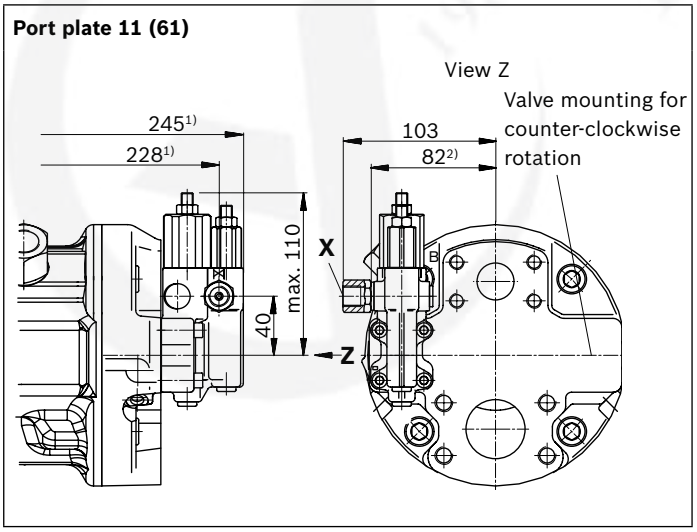
▼ **DR – Pressure controller**

Port plate 12 (62)



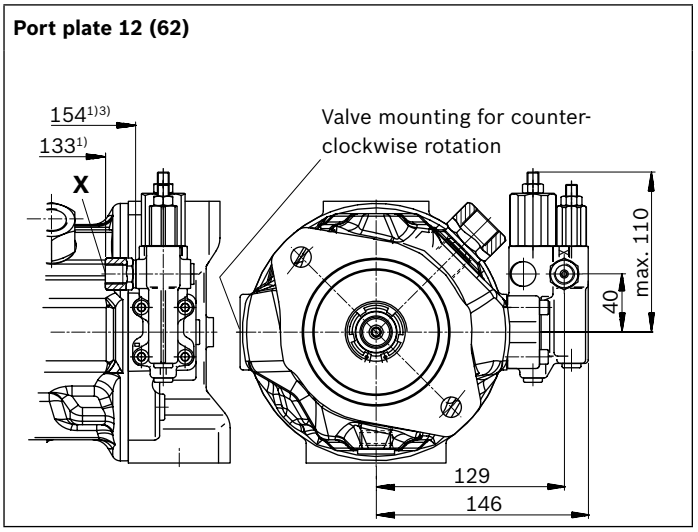
▼ **DRG – Pressure controller, remote controlled**

Port plate 11 (61)



▼ **DRG – Pressure controller, remote controlled**

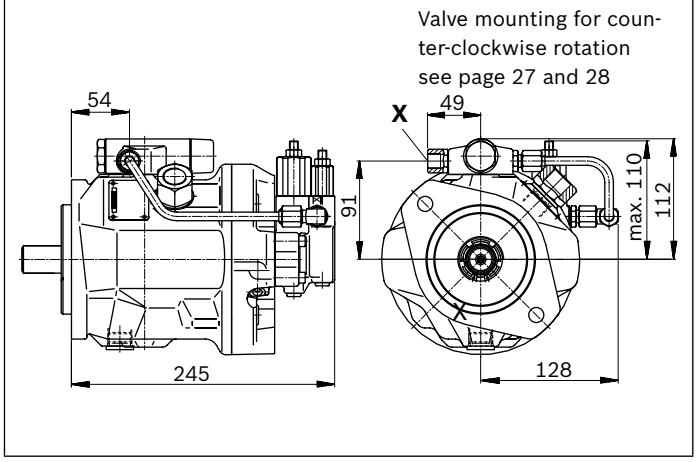
Port plate 12 (62)



1) To flange surface
2) For version port plate 61
3) For version port plate 62

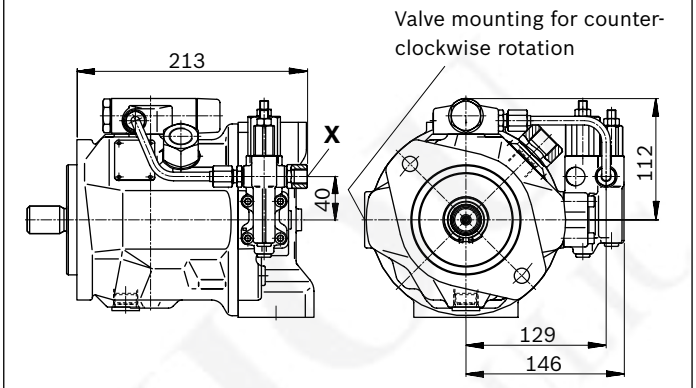
▼ **DFLR – Pressure, flow and power controller**

Port plate 11 (61)



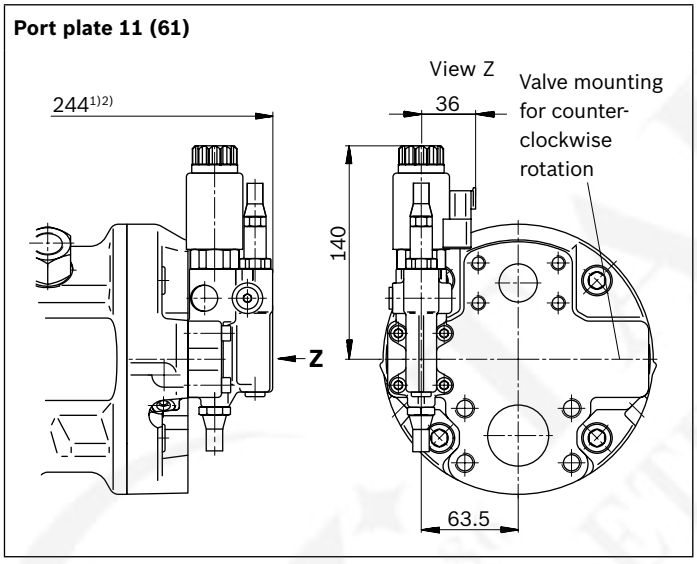
▼ **DFLR – Pressure, flow and power controller**

Port plate 12 (62)



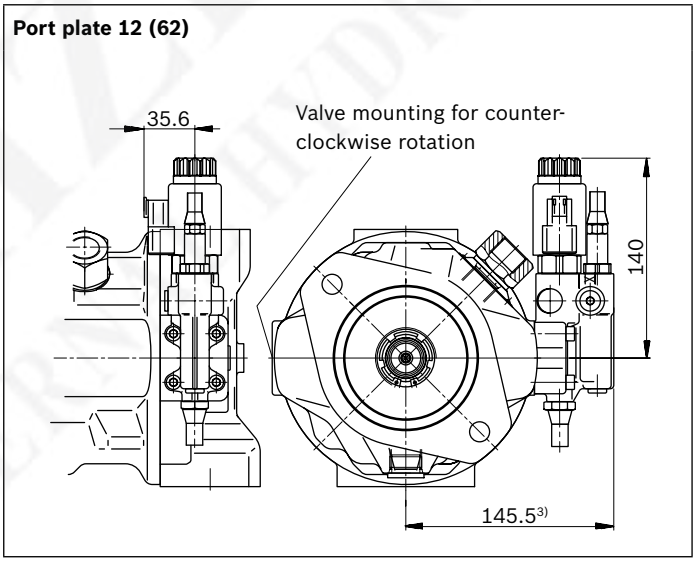
▼ **ED7. / ER7. – Electro-hydraulic pressure control**

Port plate 11 (61)



▼ **ED7. / ER7. – Electro-hydraulic pressure control**

Port plate 12 (62)

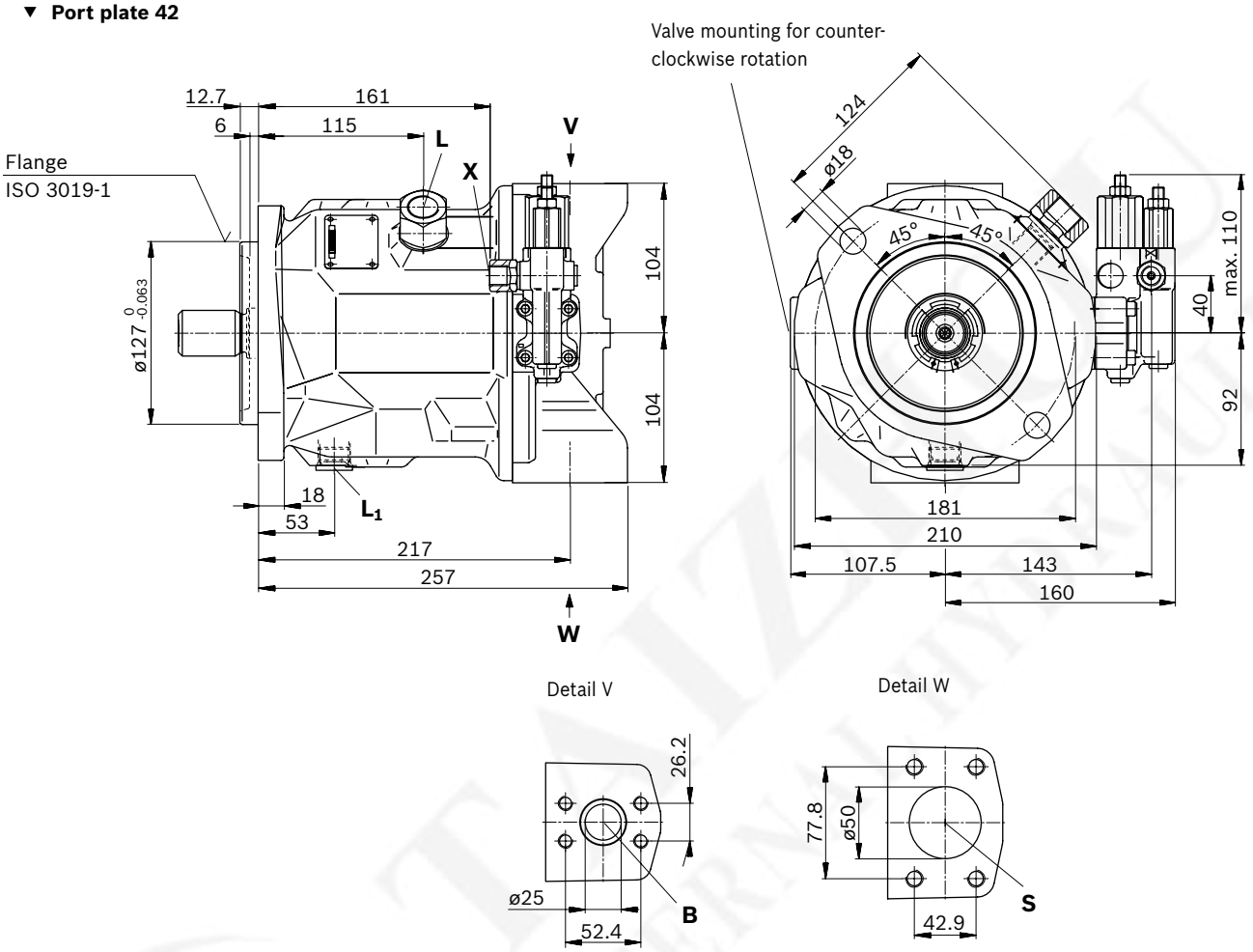


1) To flange surface
2) ER7.: 279 mm if using an intermediate plate pressure controller
3) ER7.: 180.9 mm if using an intermediate plate pressure controller

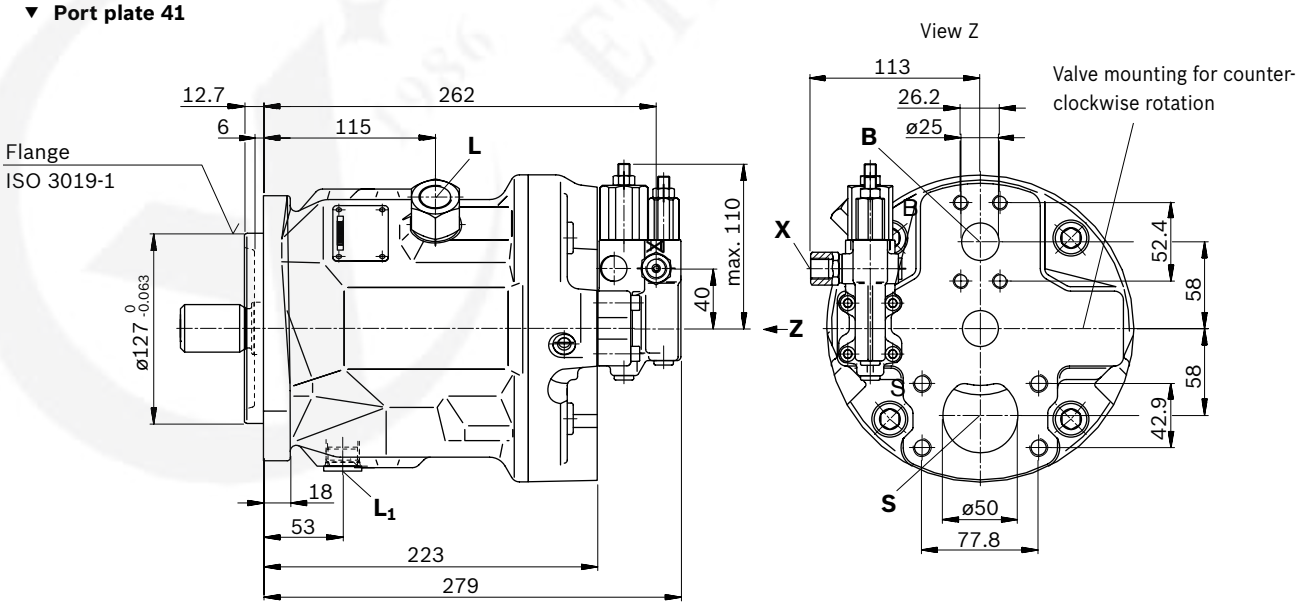
Dimensions sizes 71 and 88

DFR / DFR1 / DRSC – Pressure and flow control, hydraulic; clockwise rotation, version: Ports metric

▼ **Port plate 42**



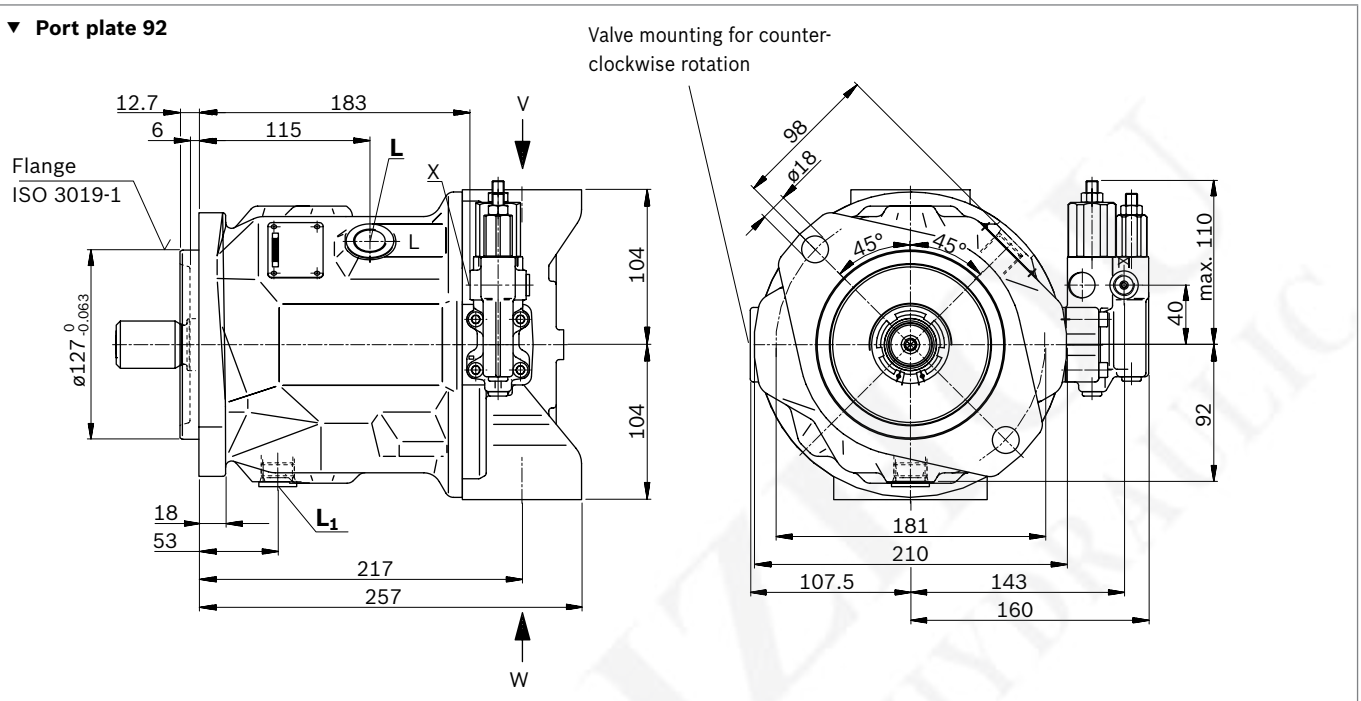
▼ **Port plate 41**

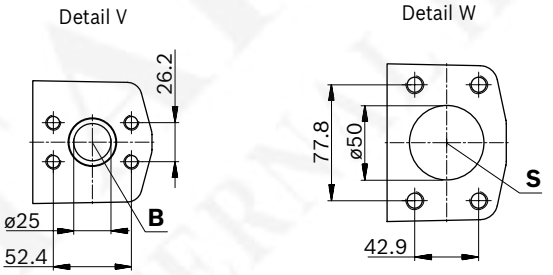


Dimensions sizes 71 and 88

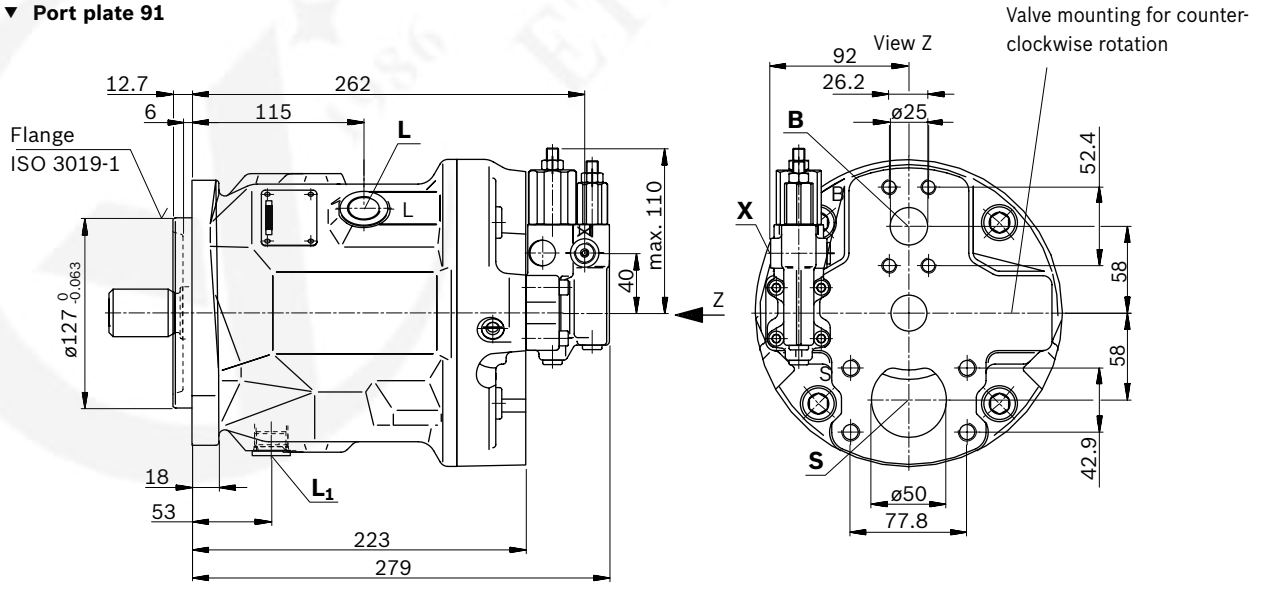
DFR / DFR1 / DRSC – Pressure and flow control, hydraulic; clockwise rotation, version: SAE ports

▼ **Port plate 92**



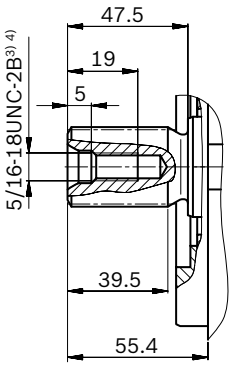


▼ **Port plate 91**



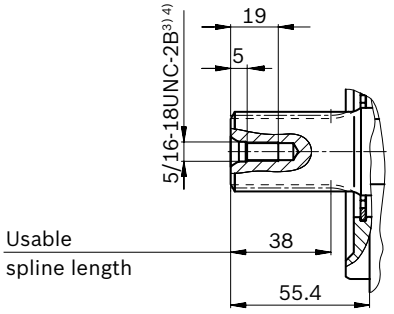
▼ **Splined shaft 1 1/4 in (SAE J744)**

S – 14T 12/24DP[1)]



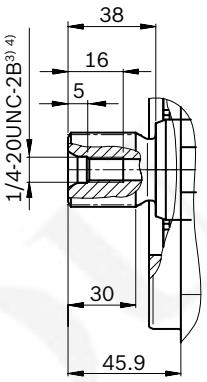
▼ **Splined shaft 1 1/4 in (SAE J744)**

R – 14T 12/24DP[1)2)]



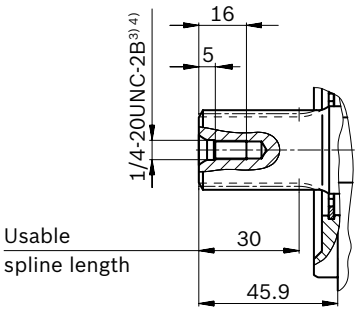
▼ **Splined shaft 1 in (SAE J744)**

U – 15T 16/32DP[1)]



▼ **Splined shaft 1 in (SAE J744)**

W – 15T 16/32DP[1)2)]



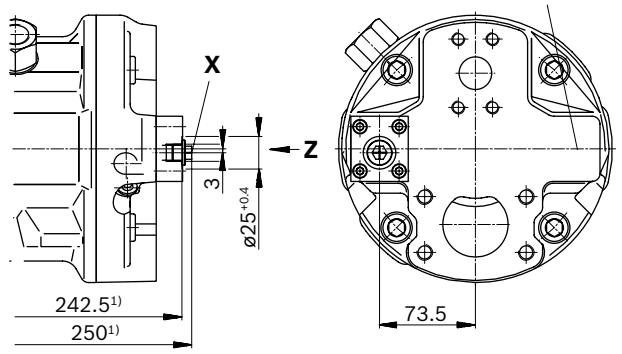
Ports - version metric port plate 41/42		**Standard**	**Size[4)]**	$p_{max\ abs}$ **[bar][5)]**	**State[9)]**
B	Working port (standard pressure series) Fastening thread	SAE J518[6)] DIN 13	1 in M10 × 1.5; 17 deep	350	O
S	Suction port (standard pressure series) Fastening thread	SAE J518[6)] DIN 13	2 in M12 × 1.75; 20 deep	10	O
L	Drain port	DIN 3852[7)]	M22 × 1.5; 14 deep	2	O[8)]
L_1	Drain port	ISO 11926[7)]	7/8-14 UNF-2B; 16 deep	2	X[8)]
X	Pilot pressure	DIN 3852	M14 × 1.5; 12 deep	350	O
X	Pilot pressure with DG-control	DIN ISO 228	G1/4 in; 12 deep	350	O

Ports - version SAE port plate 91/92		**Standard**	**Size[4)]**	$p_{max\ abs}$ **[bar][5)]**	**State[9)]**
B	Working port (standard pressure series) Fastening thread	SAE J518 ASME B1.1	1 in 3/8-16 UNC-2B; 18 deep	350	O
S	Suction port (standard pressure series) Fastening thread	SAE J518 ASME B1.1	2 in 1/2-13UNC-2B; 22 deep	10	O
L	Drain port	ISO 11926[7)]	7/8-14 UNF-2B; 16 deep	2	O[8)]
L_1	Drain port	ISO 11926[7)]	7/8-14 UNF-2B; 16 deep	2	X[8)]
X	Pilot pressure	ISO 11926	7/16-20 UNF-2B; 11.5 deep	350	O
X	Pilot pressure with DG-control	DIN ISO 228	G1/4 in; 12 deep	350	O

1) Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
2) Splines according to ANSI B92.1a, run out of spline is a deviation from standard.
3) Thread according to ASME B1.1
4) For notes on tightening torques, see the instruction manual
5) Depending on the application, momentary pressure peaks can occur. Keep this in mind when selecting measuring devices and fittings.
6) Metric fastening thread is a deviation from standard.
7) The countersink can be deeper than as specified in the standard.
8) Depending on the installation position, L or L_1 must be connected (also see installation instructions starting on page 56).
9) O = Must be connected (plugged when delivered)
X = Plugged (in normal operation)

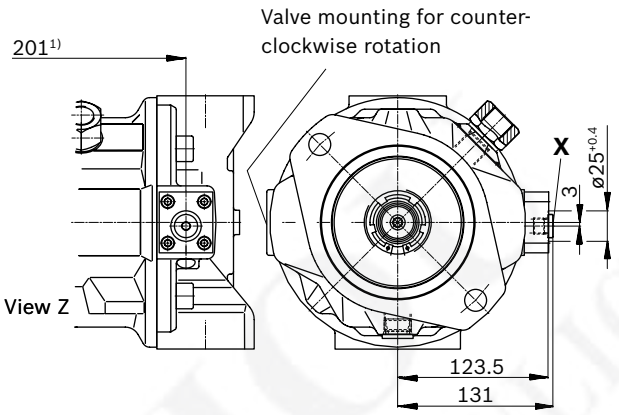
▼ **DG – Two-point control, direct operated**

Port plate 41 (91)



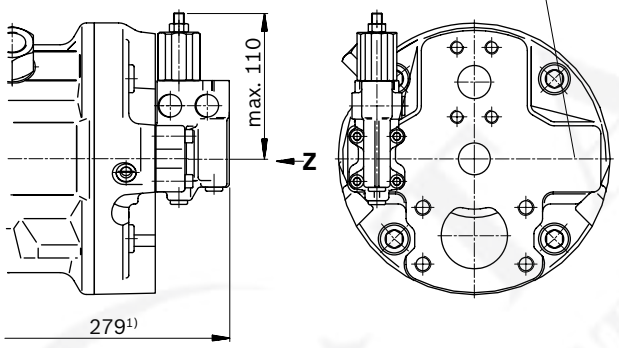
▼ **DG – Two-point control, direct operated**

Port plate 42 (92)



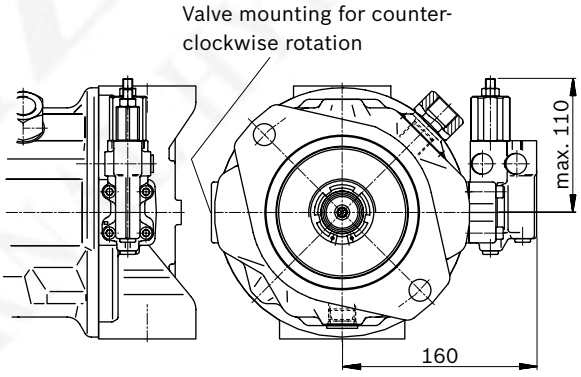
▼ **DR – Pressure controller**

Port plate 41 (91)



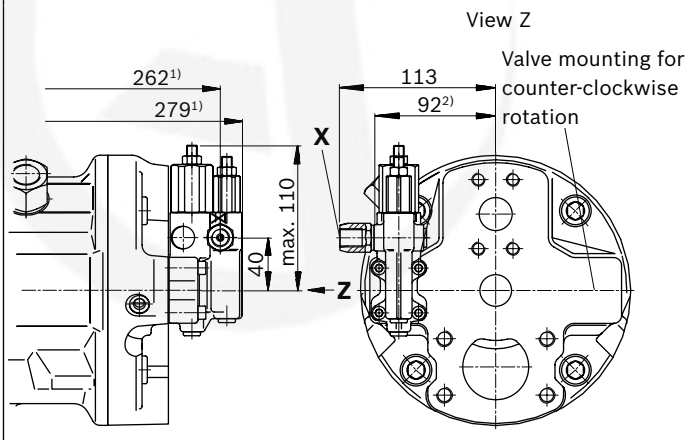
▼ **DR – Pressure controller**

Port plate 42 (92)



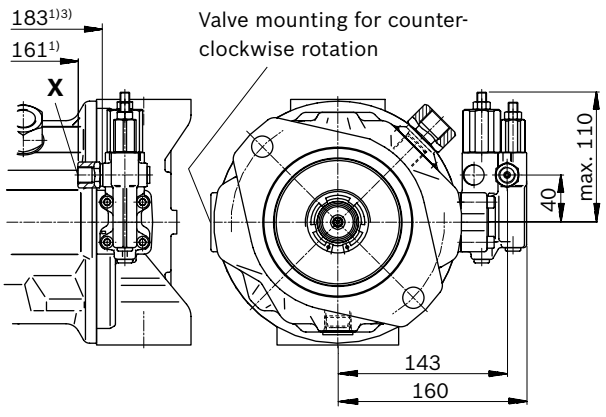
▼ **DRG – Pressure controller, remote controlled**

Port plate 41 (91)



▼ **DRG – Pressure controller, remote controlled**

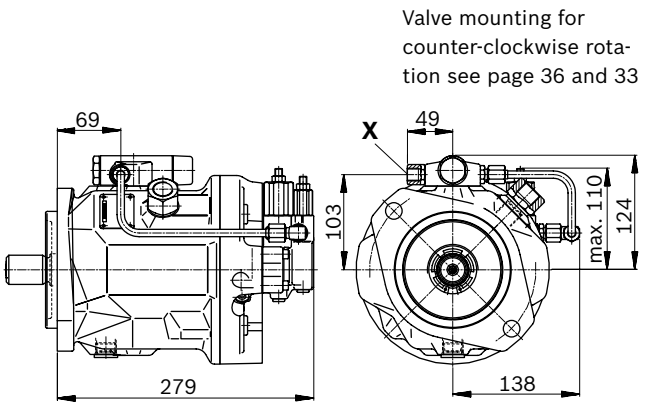
Port plate 42 (92)



1) To flange surface
2) For version port plate 91
3) For version port plate 92

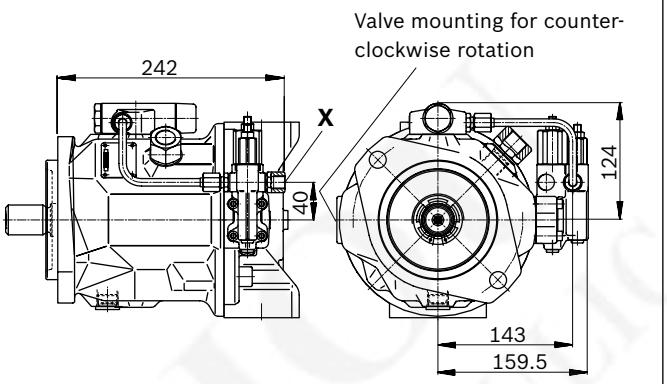
▼ **DFLR – Pressure, flow and power controller**

Port plate 41 (91)



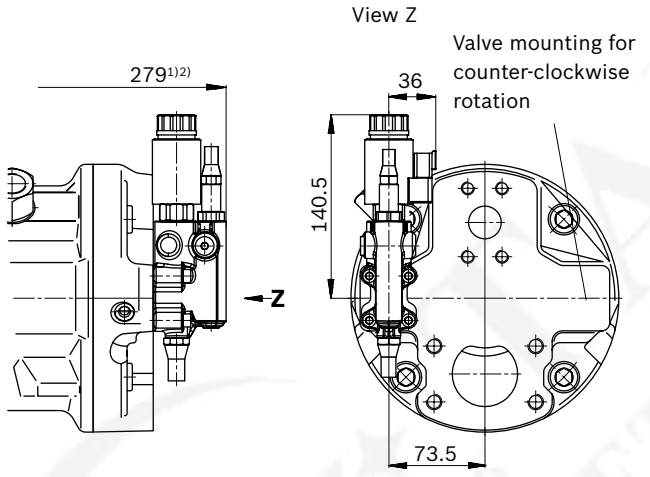
▼ **DFLR – Pressure, flow and power controller**

Port plate 42 (92)



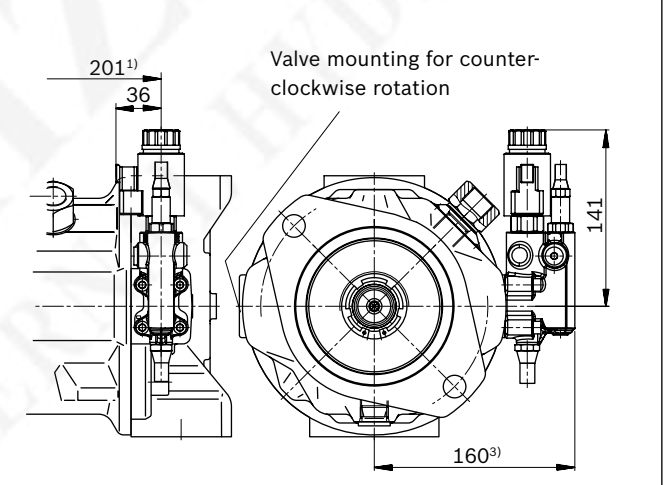
▼ **ED7. / ER7. – Electro-hydraulic pressure control**

Port plate 41 (91)



▼ **ED7. / ER7. – Electro-hydraulic pressure control**

Port plate 42 (92)

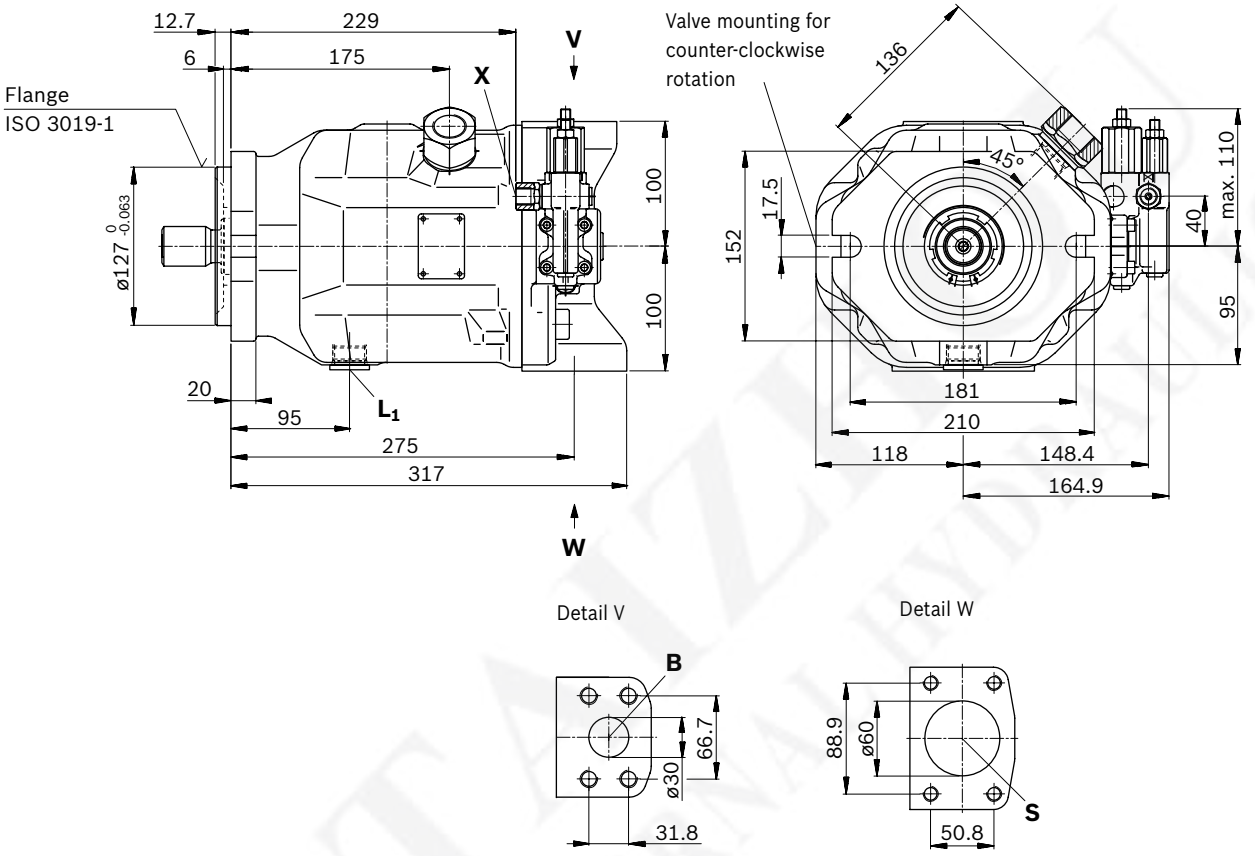


1) To flange surface
2) ER7.: 314 mm if using an intermediate plate pressure controller
3) ER7.: 195 mm if using an intermediate plate pressure controller

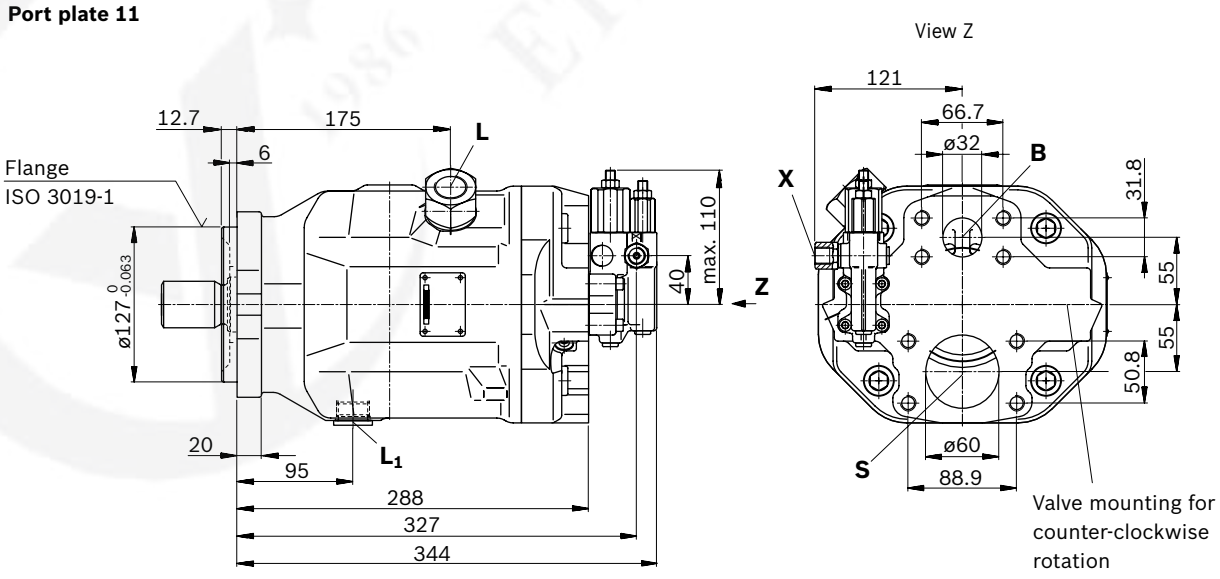
Dimensions, size 100

DFR / DFR1 / DRSC – Pressure and flow control, hydraulic; clockwise rotation, version: Ports metric

▼ **Port plate 12**



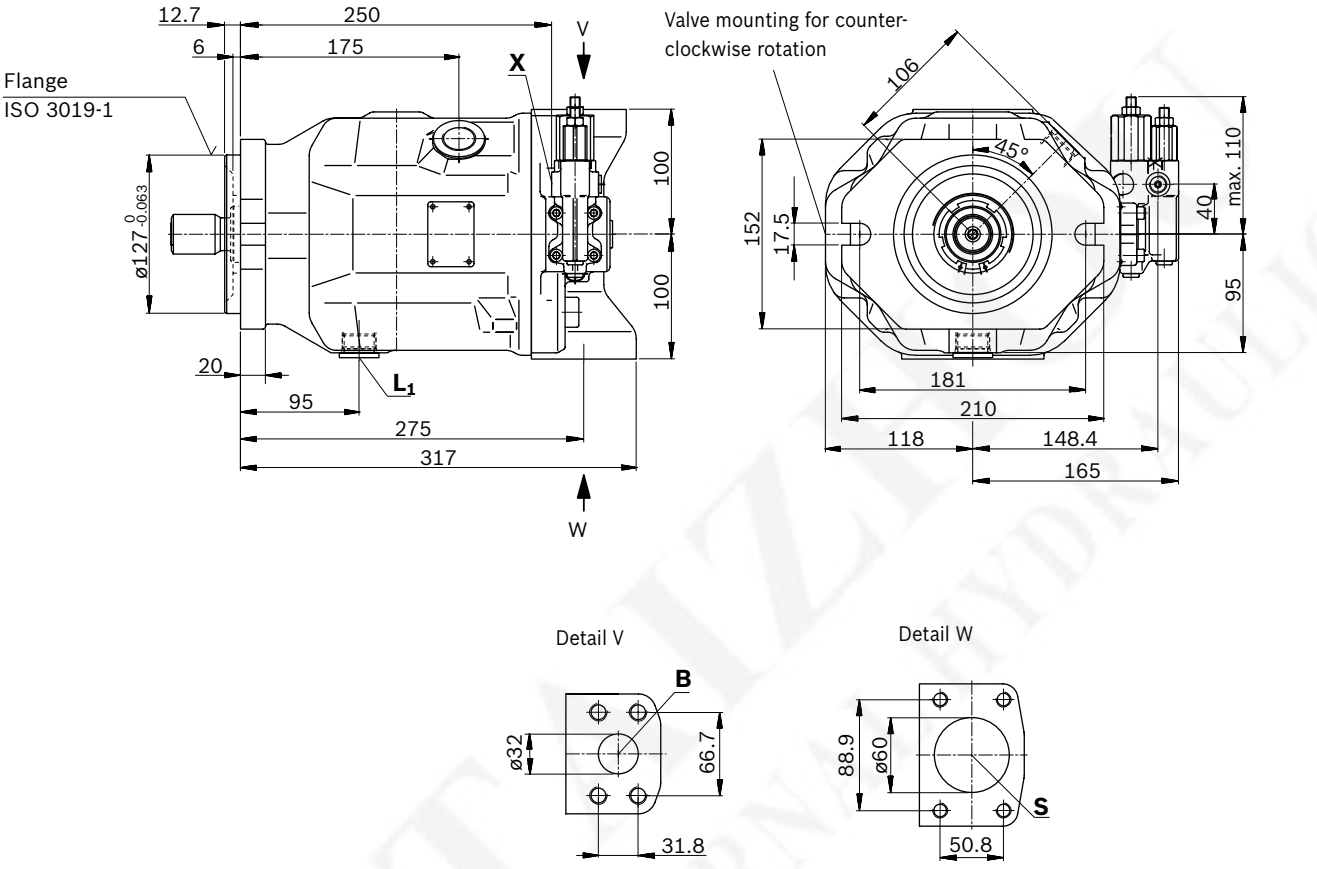
▼ **Port plate 11**



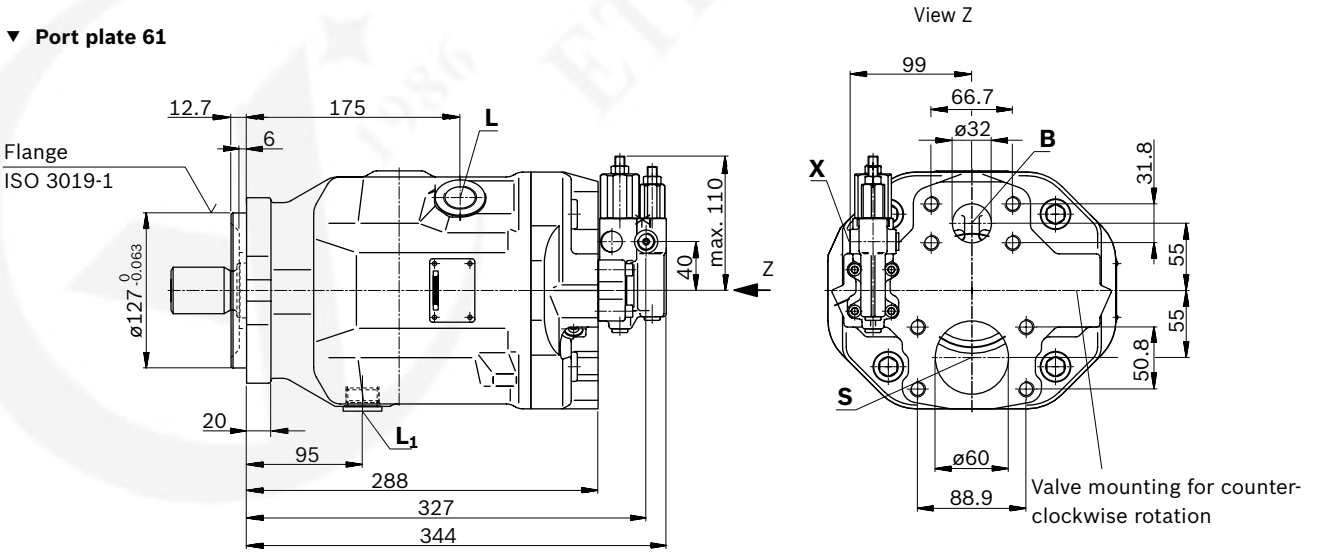
Dimensions, size 100

DFR / DFR1 / DRSC – Pressure and flow control, hydraulic; clockwise rotation, version: SAE ports

▼ **Port plate 62**

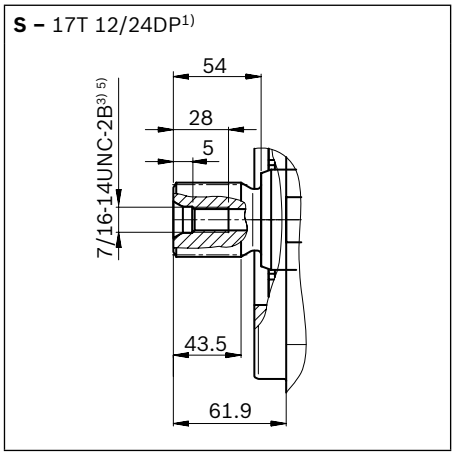


▼ **Port plate 61**



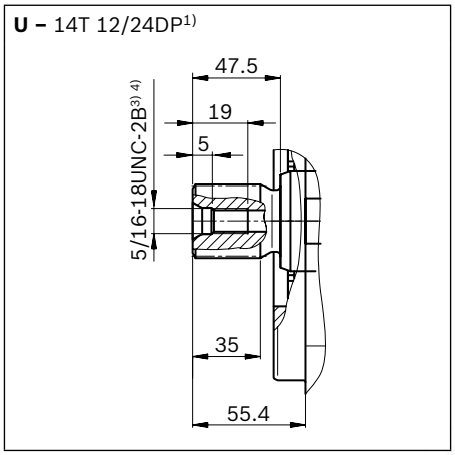
▼ **Splined shaft 1 1/2 in (SAE J744)**

S – 17T 12/24DP[1)]



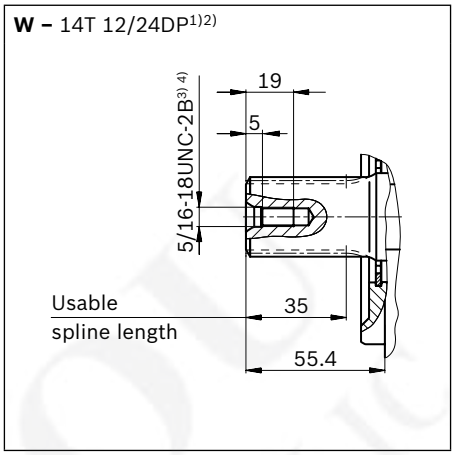
▼ **Splined shaft 1 1/4 in (SAE J744)**

U – 14T 12/24DP[1)]



▼ **Splined shaft 1 1/4 in (SAE J744)**

W – 14T 12/24DP[1)2)]



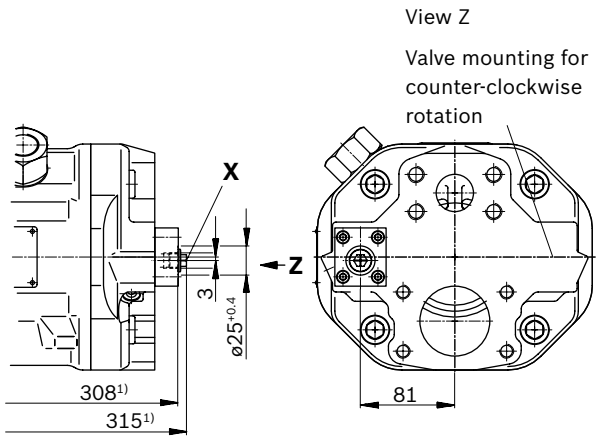
Ports - version metric port plate 11/12		Standard	Size[4)]	$p_{max\ abs}$ [bar][5)]	State[9)]
B	Working port (high-pressure series) Fastening thread	SAE J518[6)] DIN 13	1 1/4 in M14 × 2; 19 deep	350	O
S	Suction port (standard pressure series) Fastening thread	SAE J518[6)] DIN 13	2 1/2 in M12 × 1.75; 17 deep	10	O
L	Drain port	DIN 3852[7)]	M27 × 2; 16 deep	2	O[8)]
L_1	Drain port	ISO 11926[7)]	1 1/16-12 UNF-2B; 18 deep	2	X[8)]
X	Pilot pressure	DIN 3852	M14 × 1.5; 12 deep	350	O
X	Pilot pressure with DG-control	DIN ISO 228	G1/4 in; 12 deep	350	O

Ports - version SAE port plate 61/62		Standard	Size[4)]	$p_{max\ abs}$ [bar][5)]	State[9)]
B	Working port (high-pressure series) Fastening thread	SAE J518 ASME B1.1	1 1/4 in 1/2-13 UNC-2B; 19 deep	350	O
S	Suction port (standard pressure series) Fastening thread	SAE J518 ASME B1.1	2 1/2 in 1/2-13 UNC-2B; 22 deep	10	O
L	Drain port	ISO 11926[7)]	1 1/16-12 UNF-2B; 18 deep	2	O[8)]
L_1	Drain port	ISO 11926[7)]	1 1/16-12 UNF-2B; 18 deep	2	X[8)]
X	Pilot pressure	ISO 11926	7/16-20 UNF-2B; 11.5 deep	350	O
X	Pilot pressure with DG-control	DIN ISO 228	G1/4 in; 12 deep	350	O

1) Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
2) Splines according to ANSI B92.1a, run out of spline is a deviation from standard.
3) Thread according to ASME B1.1
4) For notes on tightening torques, see the instruction manual
5) Depending on the application, momentary pressure peaks can occur. Keep this in mind when selecting measuring devices and fittings.
6) Metric fastening thread is a deviation from standard.
7) The countersink can be deeper than as specified in the standard.
8) Depending on the installation position, L or L_1 must be connected (also see installation instructions starting on page 56).
9) O = Must be connected (plugged when delivered)
X = Plugged (in normal operation)

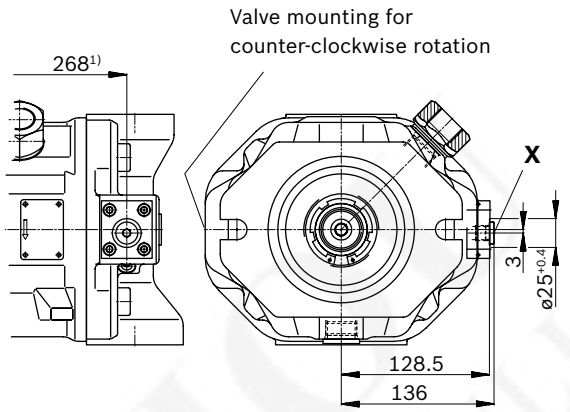
▼ **DG – Two-point control, direct operated**

Port plate 11 (61)



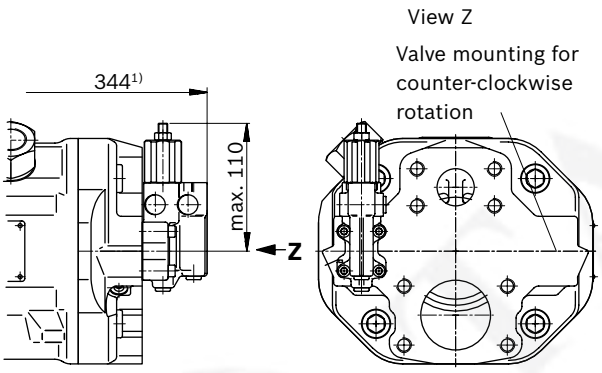
▼ **DG – Two-point control, direct operated**

Port plate 12 (62)



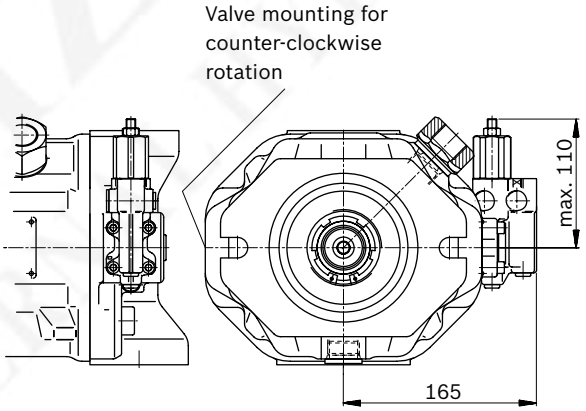
▼ **DR – Pressure controller**

Port plate 11 (61)



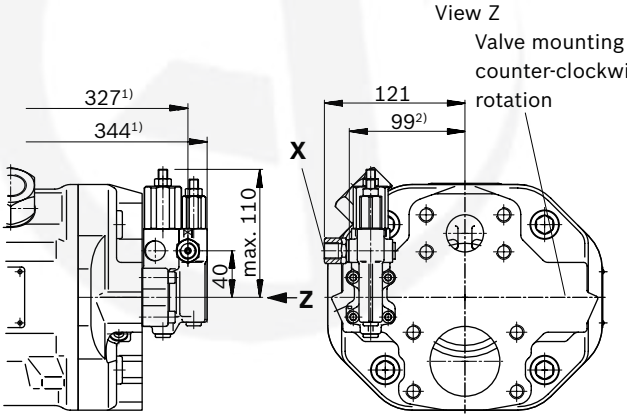
▼ **DR – Pressure controller**

Port plate 12 (62)



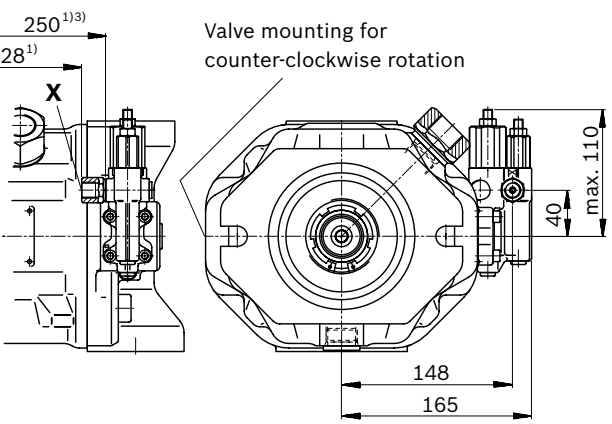
▼ **DRG – Pressure controller, remote controlled**

Port plate 11 (61)



▼ **DRG – Pressure controller, remote controlled**

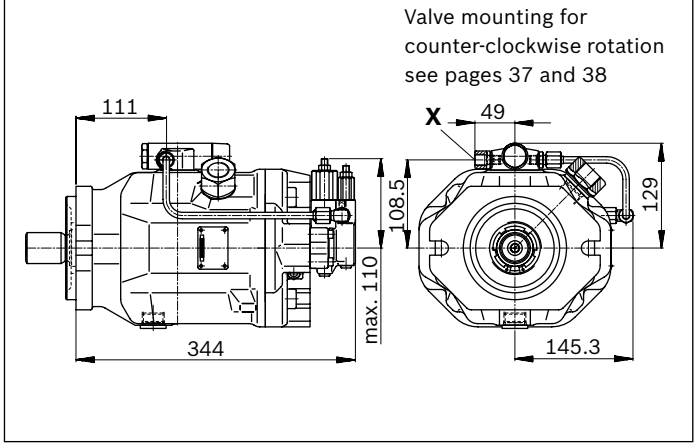
Port plate 12 (62)



1) To flange surface
2) For version port plate 61
3) For version port plate 62

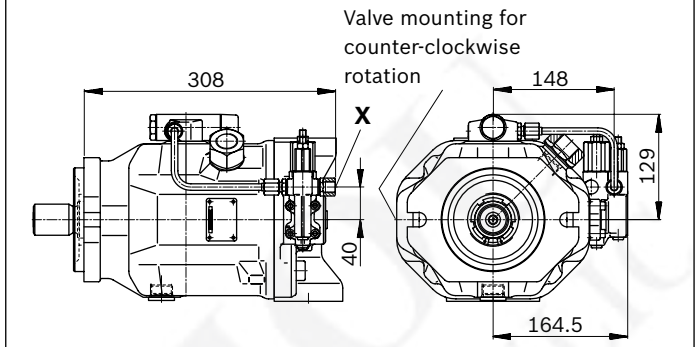
▼ **DFLR – Pressure, flow and power controller**

Port plate 11 (61)



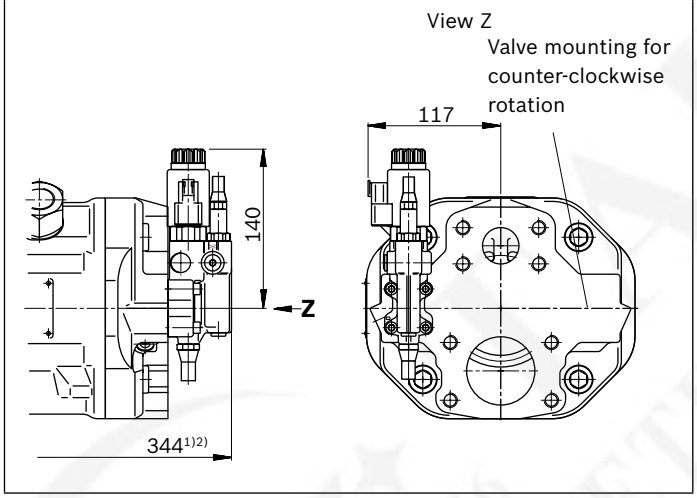
▼ **DFLR – Pressure, flow and power controller**

Port plate 12 (62)



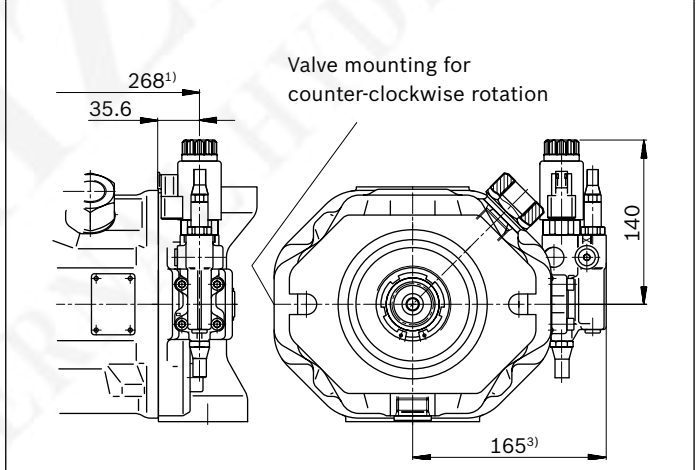
▼ **ED7. / ER7. – Electro-hydraulic pressure control**

Port plate 11 (61)



▼ **ED7. / ER7. – Electro-hydraulic pressure control**

Port plate 12 (62)

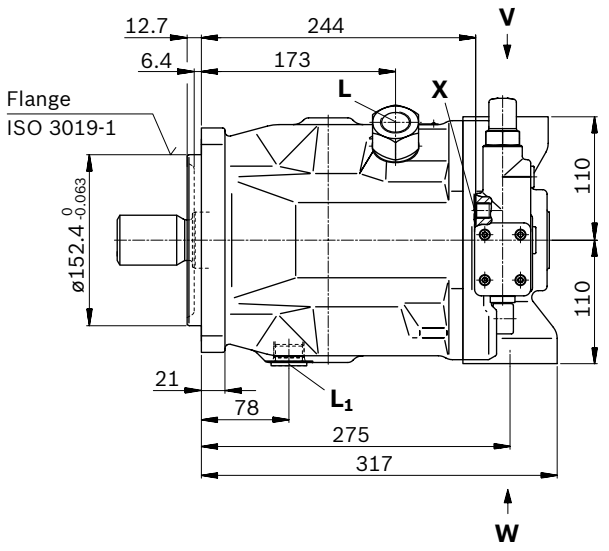


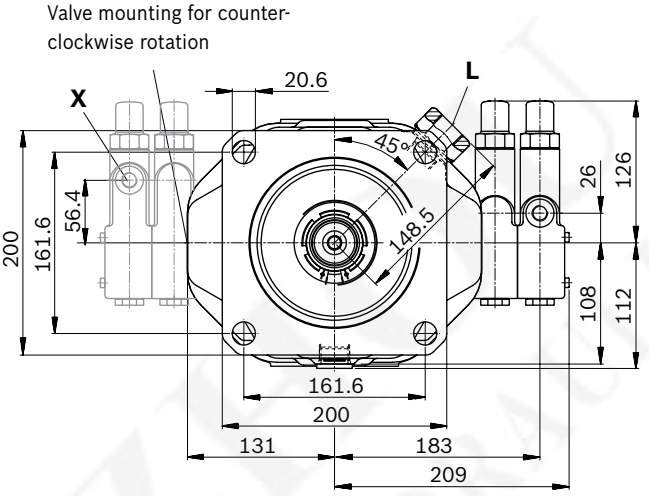
1) To flange surface
2) ER7.: 379 mm if using an intermediate plate pressure controller
3) ER7.: 200 mm if using an intermediate plate pressure controller

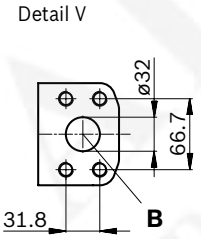
Dimensions, size 140

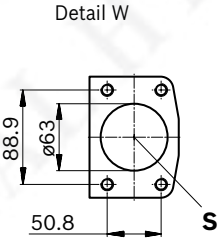
DFR / DFR1 / DRSC – Pressure and flow control, hydraulic, clockwise rotation, mounting flange D, version metric

▼ **Port plate 12**

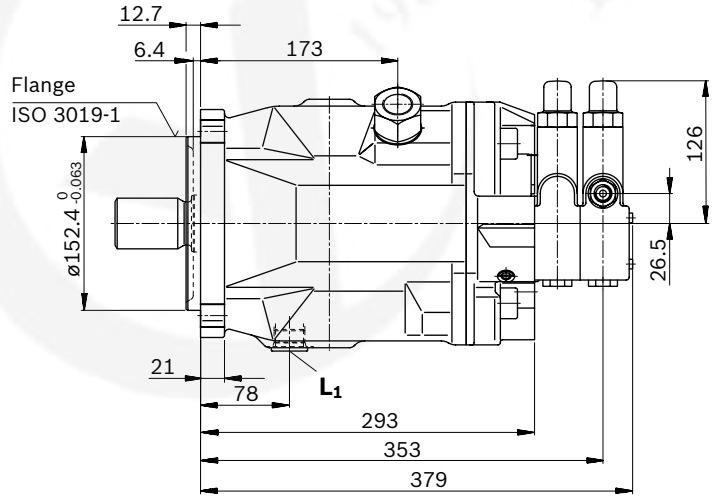


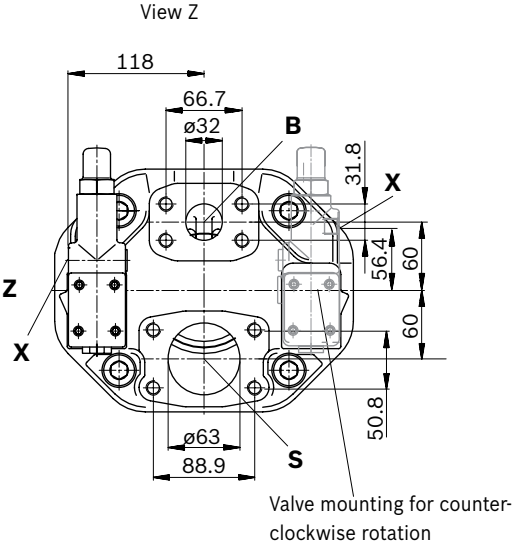






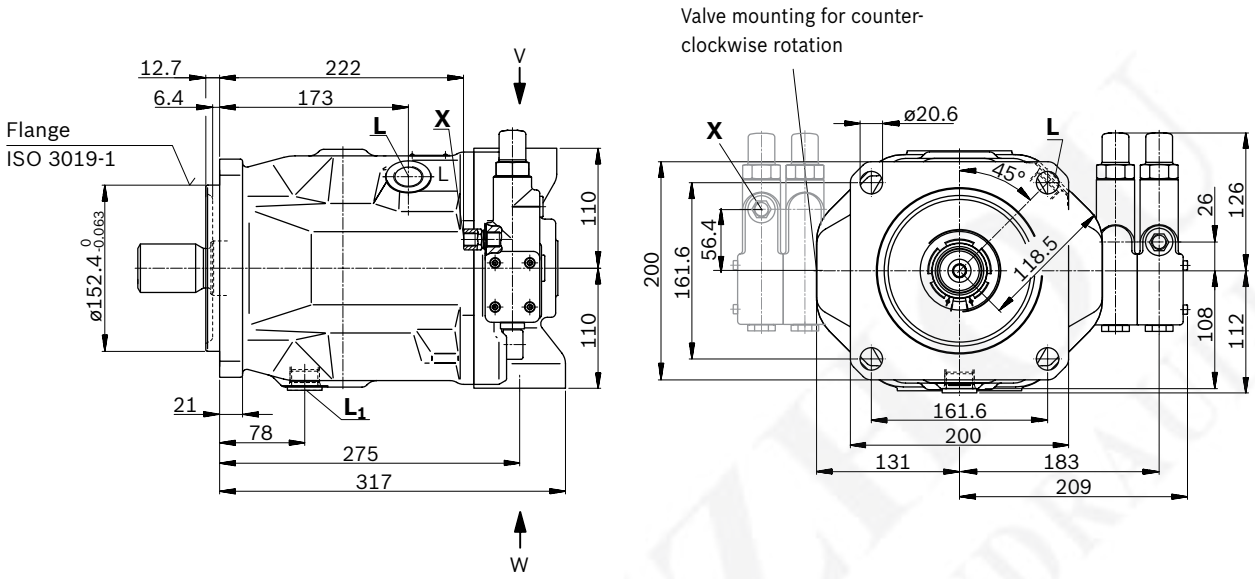
▼ **Port plate 11**



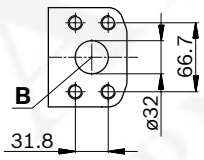


DFR / DFR1 / DRSC – Pressure and flow control, hydraulic, clockwise rotation, mounting flange D, version SAE

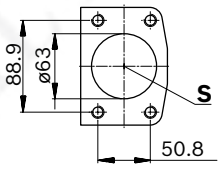
▼ **Port plate 62**



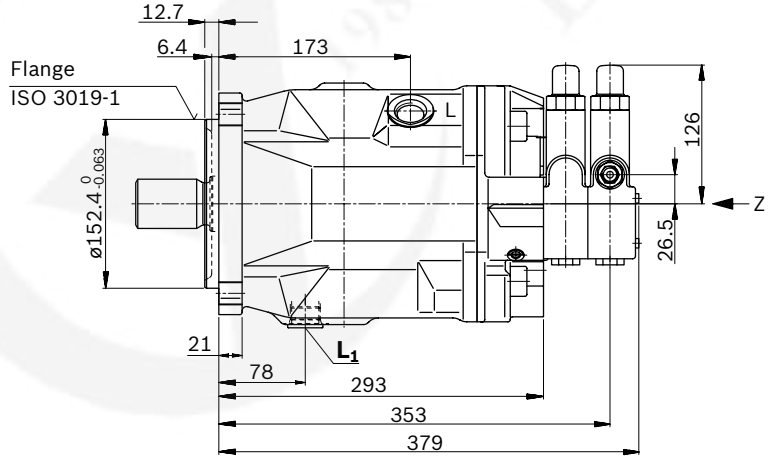
Detail V

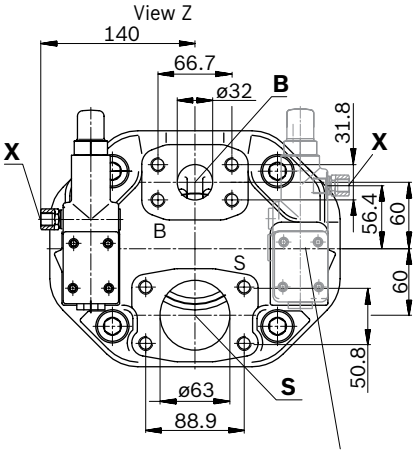


Detail W



▼ **Port plate 61**

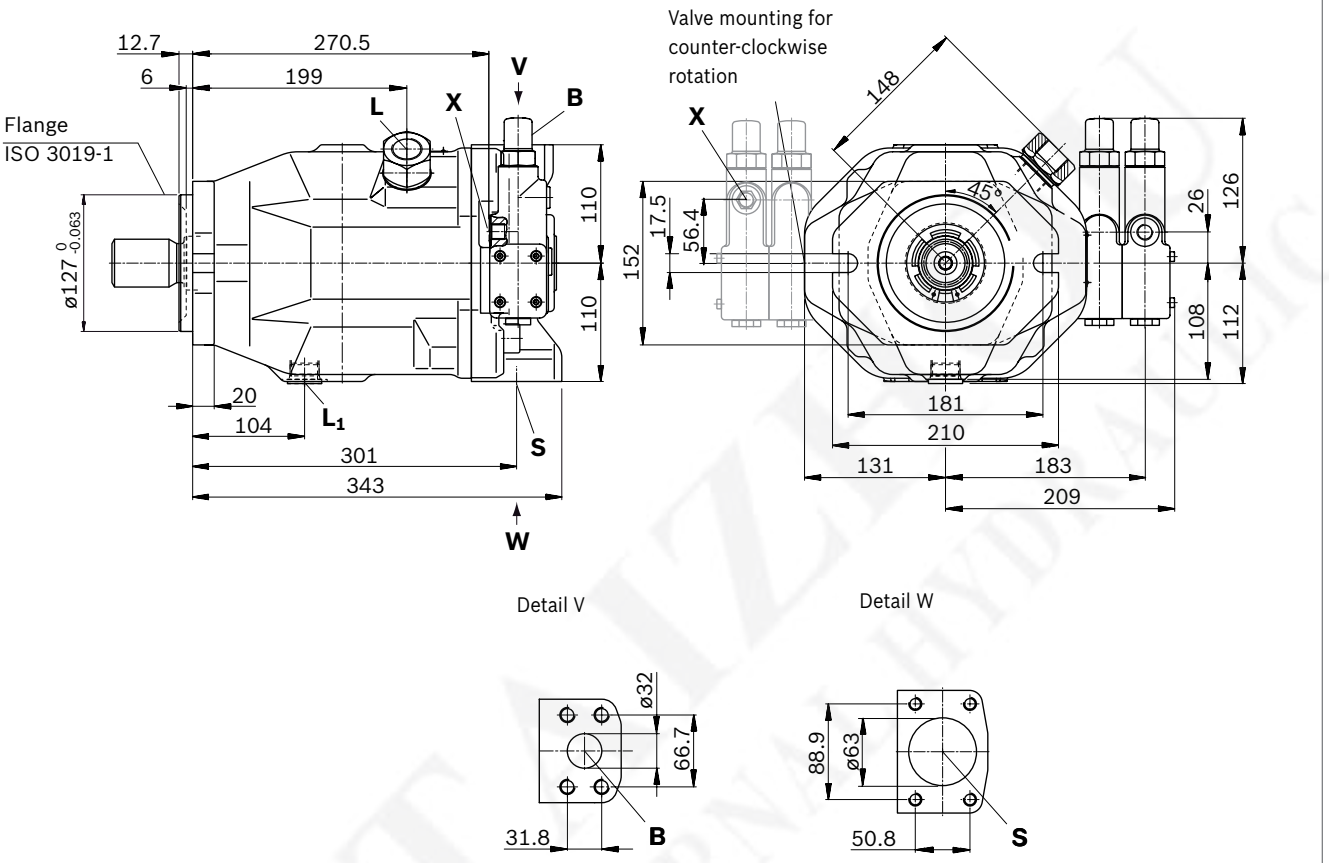




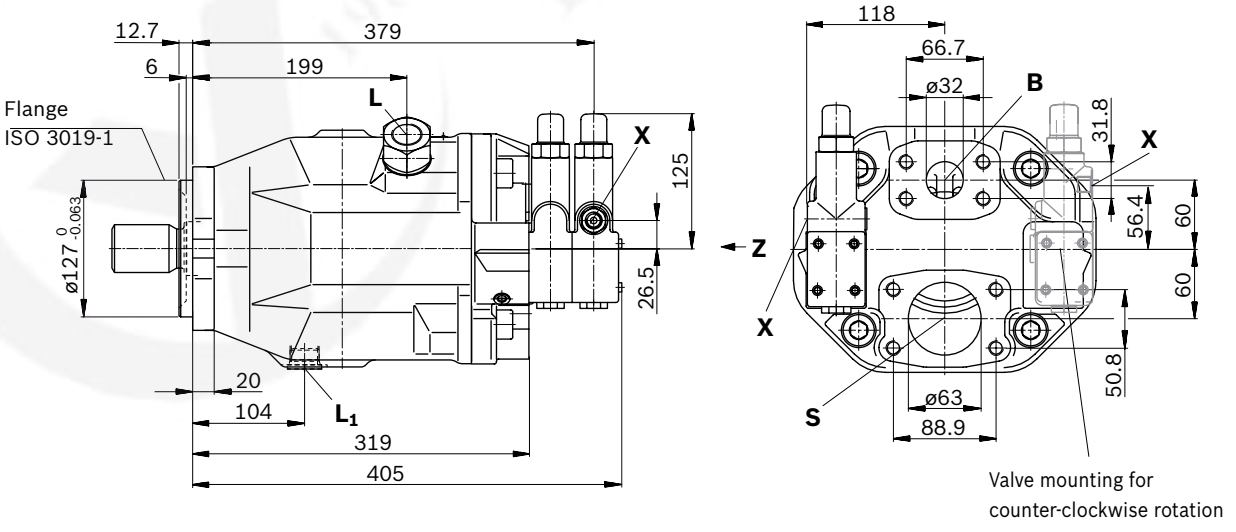
Valve mounting for counter-clockwise rotation

DFR / DFR1 / DRSC – Pressure and flow control, hydraulic, clockwise rotation, mounting flange C, version metric

▼ **Port plate 12**

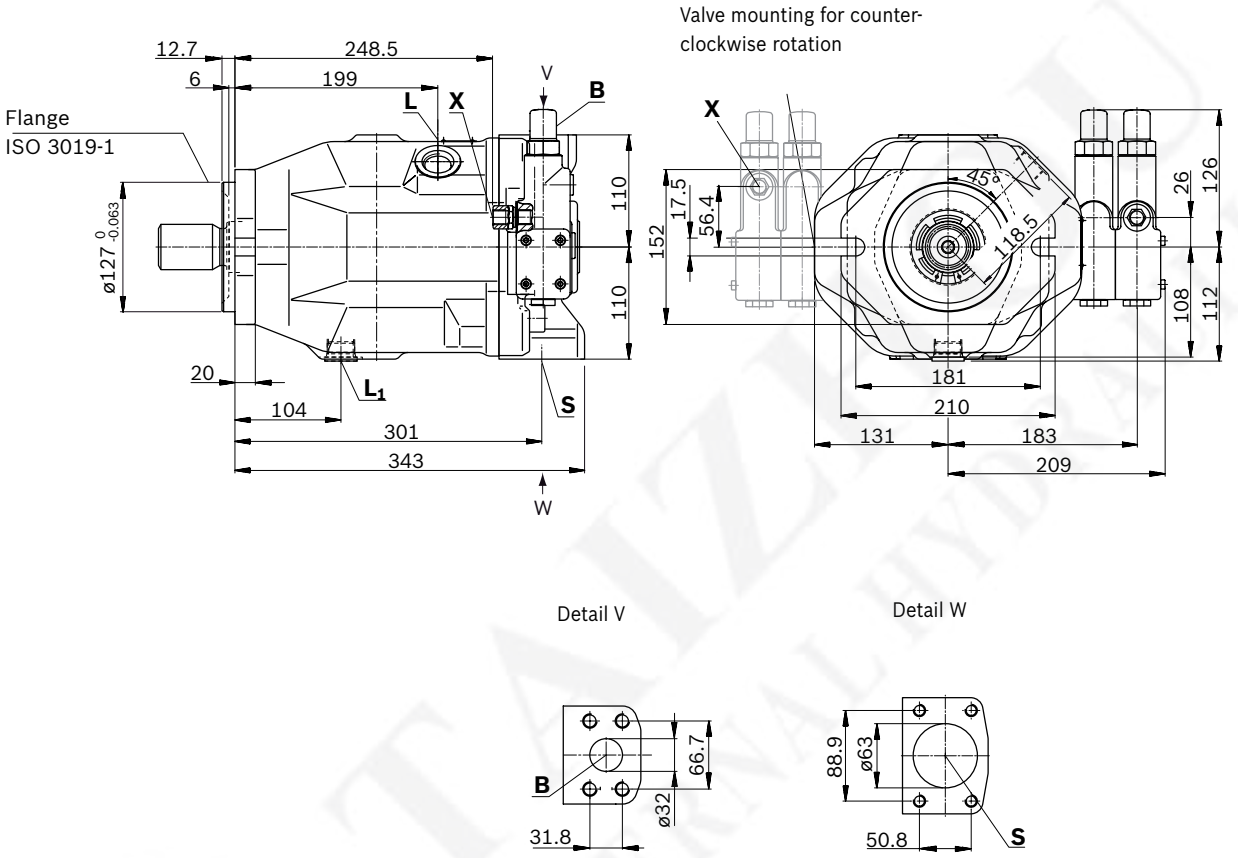


▼ **Port plate 11**

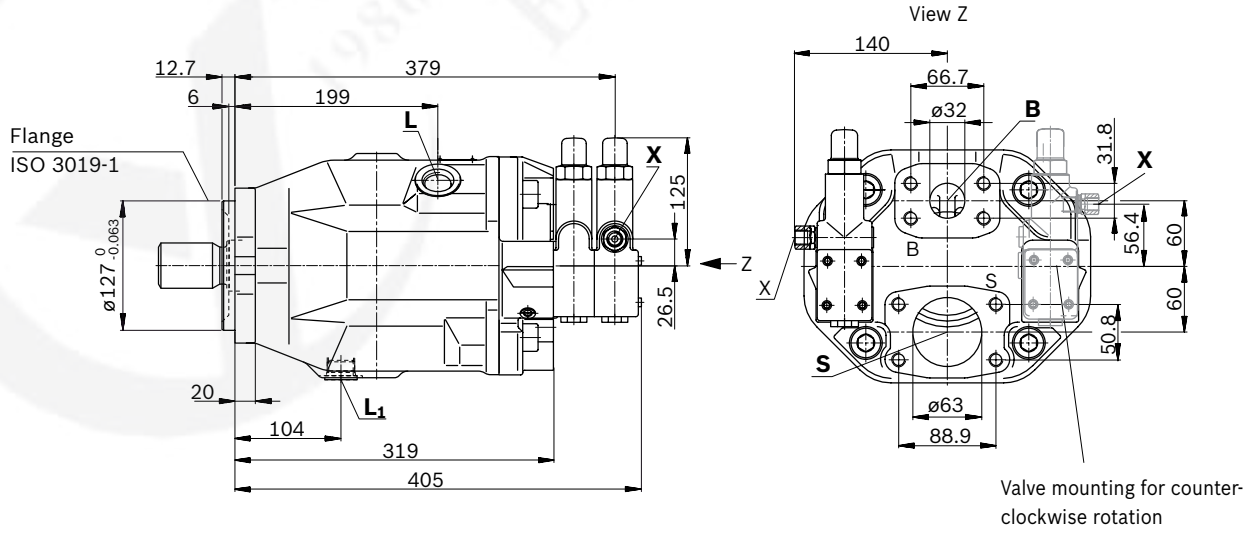


DFR / DFR1 / DRSC – Pressure and flow control, hydraulic, clockwise rotation, mounting flange C, version SAE

▼ **Port plate 62**

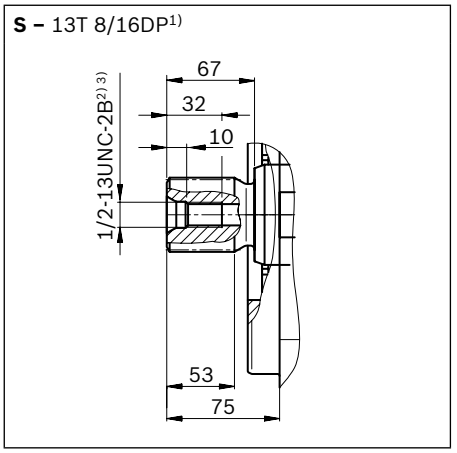


▼ **Port plate 61**



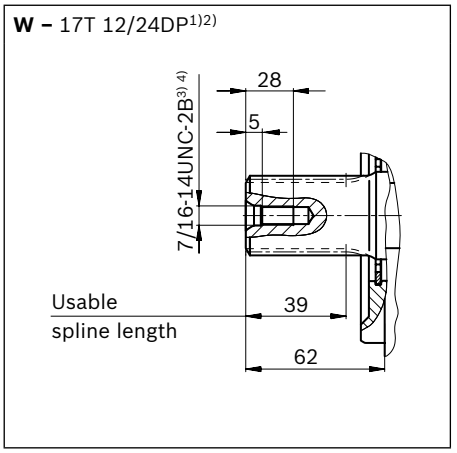
▼ **Splined shaft 1 3/4 in (SAE J744)**

S – 13T 8/16DP[1)]



▼ **Splined shaft 1 1/2 in (SAE J744)**

W – 17T 12/24DP[1)2)]



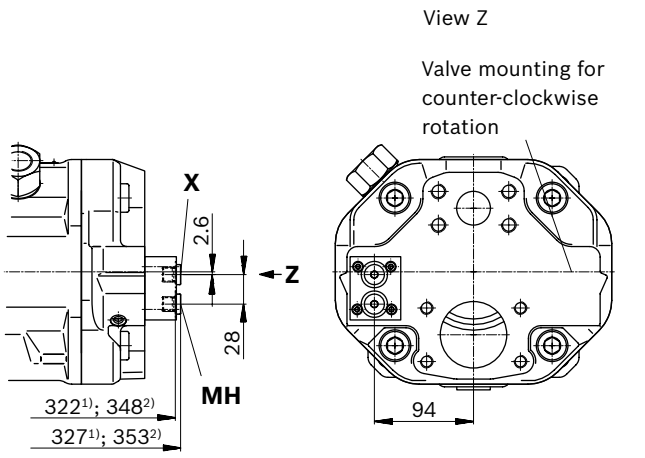
Ports - version metric port plate 11/12		Standard	Size[3)]	$p_{max\ abs}$ [bar][4)]	State[8)]
B	Working port (high-pressure series) Fastening thread	SAE J518[5)] DIN 13	1 1/4 in M14 × 2; 19 deep	350	O
S	Suction port (standard pressure series) Fastening thread	SAE J518[5)] DIN 13	2 1/2 in M12 × 1.75; 17 deep	10	O
L	Drain port	DIN 3852[6)]	M27 × 2; 16 deep	2	O[7)]
L_1	Drain port	ISO 11926[6)]	1 1/16-12 UNF-2B; 18 deep	2	X[7)]
X	Pilot pressure	DIN 3852[6)]	M14 × 1.5; 12 deep	350	O
X	Pilot pressure with DG-control	DIN 3852	M14 × 1.5; 12 deep	350	O
M_H	High pressure measurement (only with control DG)	DIN 3852	M14 × 1.5; 12 deep	350	X

Ports - version SAE port plate 61/62		Standard	Size[3)]	$p_{max\ abs}$ [bar][4)]	State[8)]
B	Working port (high-pressure series) Fastening thread	SAE J518 ASME B1.1	1 1/4 in 1/2-13 UNC-2B; 24 deep	350	O
S	Suction port (standard pressure series) Fastening thread	SAE J518 ASME B1.1	2 1/2 in 1/2-13 UNC-2B; 24 deep	10	O
L	Drain port	ISO 11926[6)]	1 1/16-12 UNF-2B; 18 deep	2	O[7)]
L_1	Drain port	ISO 11926[6)]	1 1/16-12 UNF-2B; 18 deep	2	X[7)]
X	Pilot pressure	ISO 11926	9/16-18 UNF-2B; 13 deep	350	O
X	Pilot pressure with DG-control	DIN 3852	M14 × 1.5; 12 deep	350	O
M_H	High pressure measurement (only with control DG)	DIN 3852	M14 × 1.5; 12 deep	350	X

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) For notes on tightening torques, see the instruction manual
4) Depending on the application, momentary pressure peaks can occur. Keep this in mind when selecting measuring devices and fittings.
5) Metric fastening thread is a deviation from standard.
6) The countersink can be deeper than as specified in the standard.
7) Depending on the installation position, L or L_1 must be connected (also see installation instructions starting on page 56).
8) O = Must be connected (plugged when delivered)
X = Plugged (in normal operation)

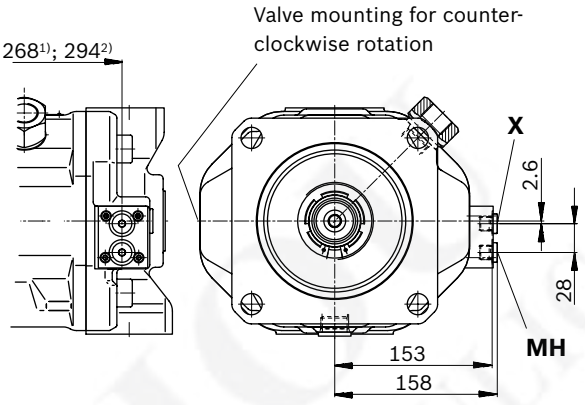
▼ **DG – Two-point control, direct operated**

Port plate 11 (61)



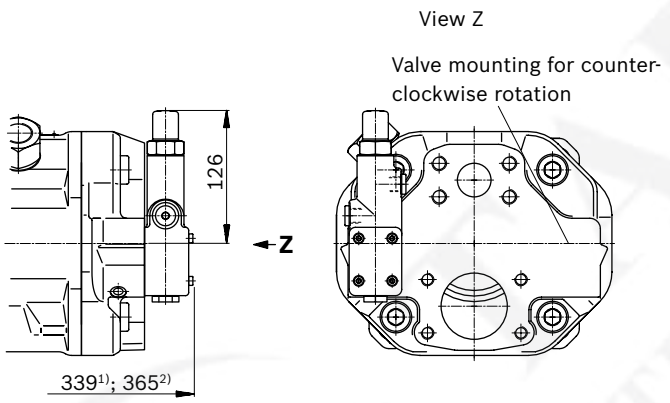
▼ **DG – Two-point control, direct operated**

Port plate 12 (62)



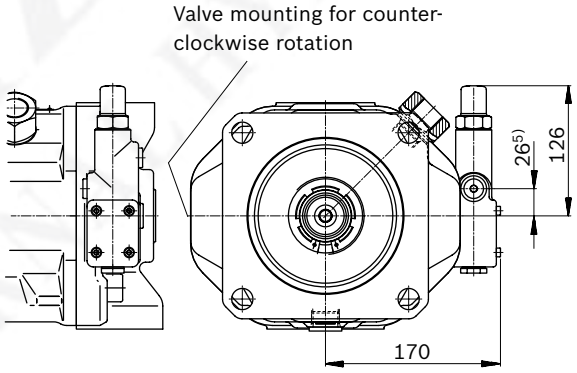
▼ **DR – Pressure controller**

Port plate 11 (61)



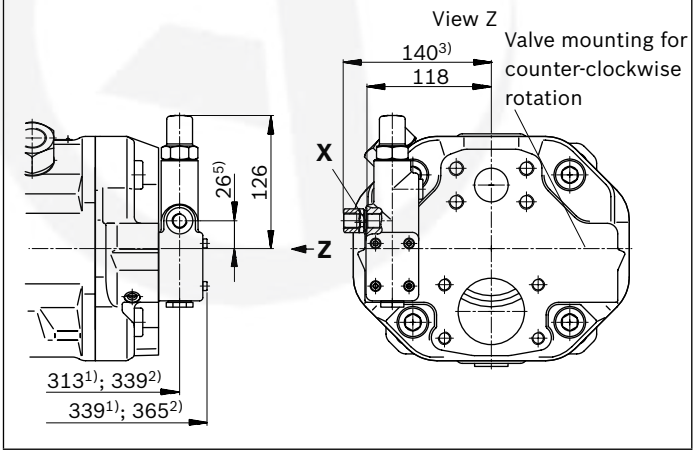
▼ **DR – Pressure controller**

Port plate 12 (62)



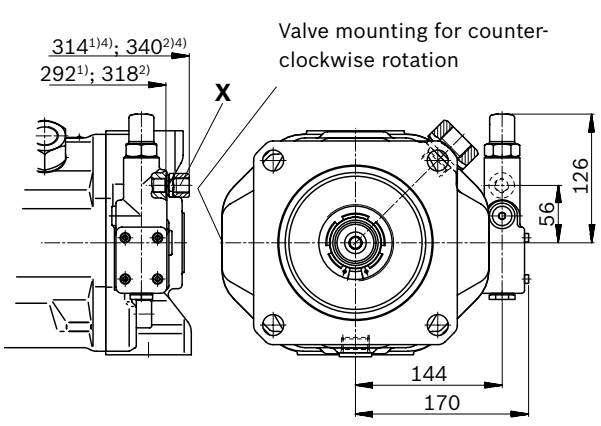
▼ **DRG – Pressure controller, remote controlled**

Port plate 11 (61)



▼ **DRG – Pressure controller, remote controlled**

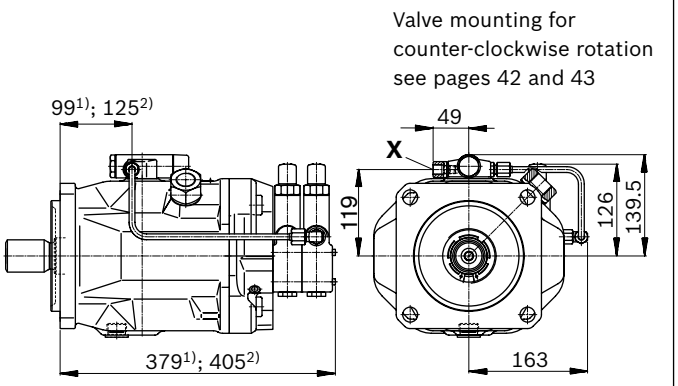
Port plate 12 (62)



1) To flange surface and housing with D flange
2) To flange surface and housing with C flange
3) For version port plate 61
4) For version port plate 62
5) 56 mm with counter-clockwise rotation

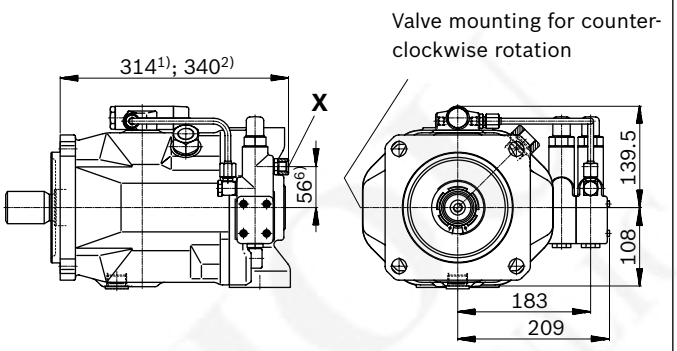
▼ **DFLR – Pressure, flow and power controller**

Port plate 11 (61)



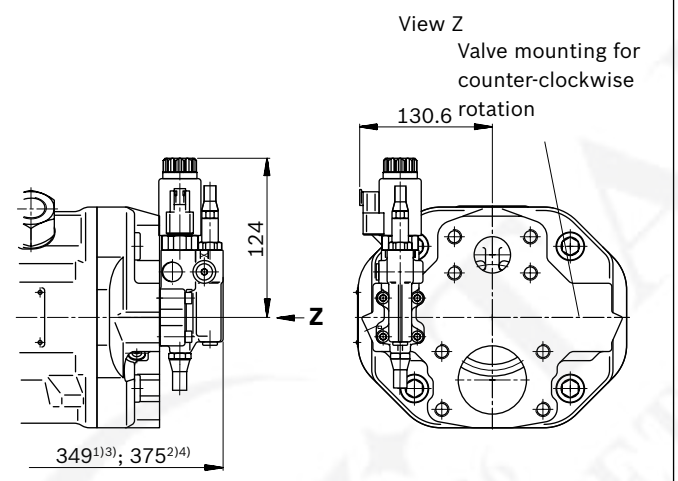
▼ **DFLR – Pressure, flow and power controller**

Port plate 12 (62)



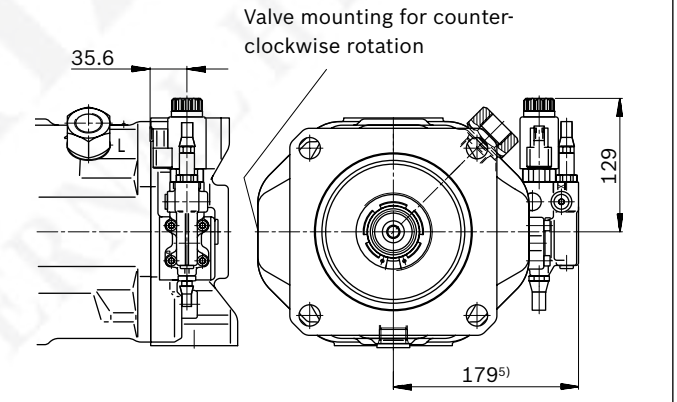
▼ **ED7. / ER7. – Electro-hydraulic pressure control**

Port plate 11 (61)



▼ **ED7. / ER7. – Electro-hydraulic pressure control**

Port plate 12 (62)



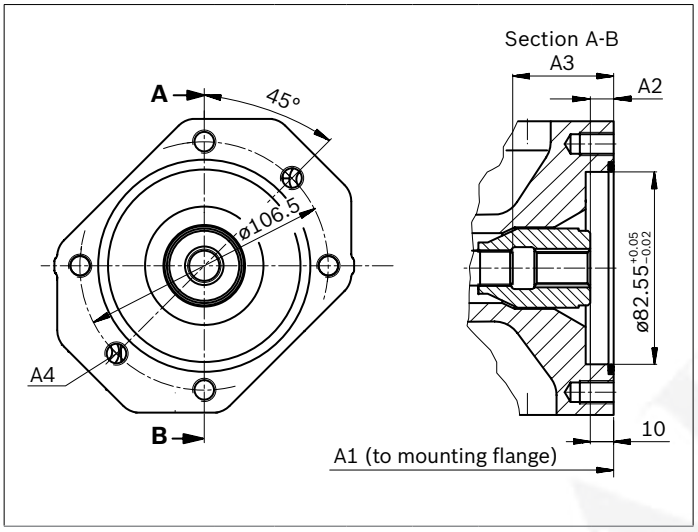
1) To flange surface and housing with D flange
2) To flange surface and housing with C flange
3) ER7.: 384 mm if using an intermediate plate pressure controller
4) ER7.: 410 mm if using an intermediate plate pressure controller
5) ER7.: 214 mm if using an intermediate plate pressure controller
6) 26 mm with counter-clockwise rotation

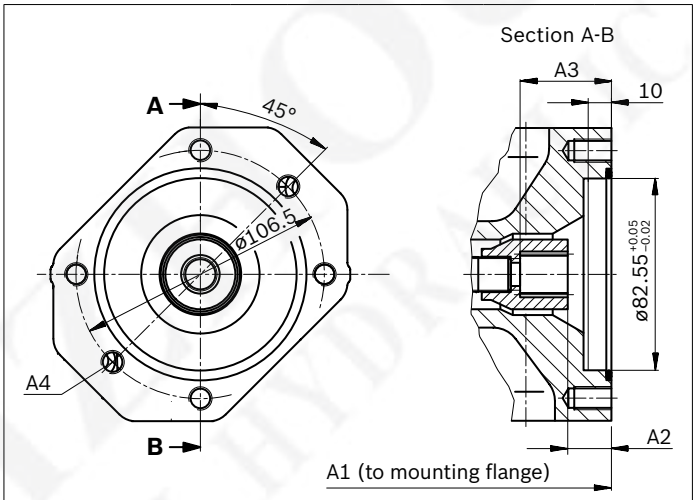
Dimensions, through drive

Flange ISO 3019-1 (SAE)		Hub for splined shaft[1]		Availability over sizes							Code
Diameter	Symbol	Diameter		18	28	45	71	88	100	140	
82-2 (A)		5/8 in	9T 16/32DP	●	●	●	●	●	●	●	K01
		3/4 in	11T 16/32DP	●	●	●	●	●	●	●	K52

● = Available – = Not available

▼ **82-2**





K01 (SAE J744 16-4 (A))	NG	A1	A2	A3	A4[2]
	18	182	10	43.3	M10×1.5; 14.5 deep
	28	204	10	33.7	M10×1.5; 16 deep
	45	229	10.7	53.4	M10×1.5; 16 deep
	71	267	11.8	61.3	M10×1.5; 20 deep
	88	267	11.8	61.3	M10×1.5; 20 deep
	100	338	10.5	65	M10×1.5; 16 deep
	140	350[3] 376[4]	10.8	77.3	M10×1.5; 16 deep

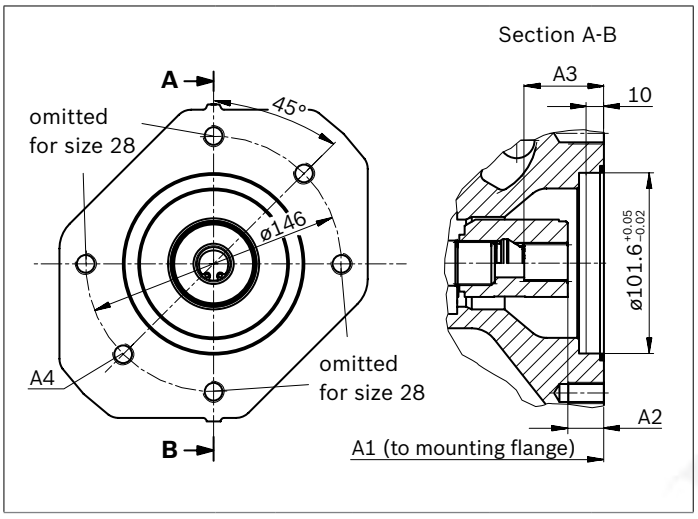
K52 (SAE J744 19-4 (A-B))	NG	A1	A2	A3	A4[2]
	18	182	18.8	38.7	M10×1.5; 14.5 deep
	28	204	18.8	38.7	M10×1.5; 16 deep
	45	229	18.9	38.7	M10×1.5; 16 deep
	71	267	21.3	41.4	M10×1.5; 20 deep
	88	267	21.3	41.4	M10×1.5; 20 deep
	100	338	19	38.9	M10×1.5; 16 deep
	140	350[3] 376[4]	18.9	38.6	M10×1.5; 16 deep

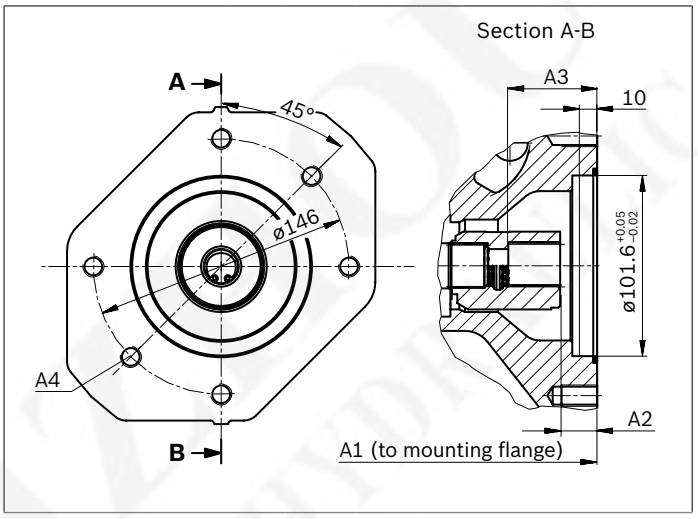
1) According to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
2) Thread according to DIN 13, see instruction manual for maximum tightening torques.
3) Housing with D flange
4) Housing with C flange

Flange ISO 3019-1 (SAE)		Hub for splined shaft[1]		Availability over sizes							Code
Diameter	Symbol	Diameter		18	28	45	71	88	100	140	
101-2 (B)		7/8 in	13T 16/32DP	–	●	●	●	●	●	●	K68
		1 in	15T 16/32DP	–	–	●	●	●	●	●	K04

● = Available – = Not available

▼ **101-2**





K68 (SAE J744 22-4 (B))	NG	A1	A2	A3	A4[2]
	28	204	17.8	41.7	M12×1.75;[3]
	45	229	17.9	41.7	M12×1.75; 18 deep
	71	267	20.3	44.7	M12×1.75; 20 deep
	88	267	20.3	44.7	M12×1.75; 20 deep
	100	338	18	41.9	M12×1.75; 20 deep
	140	350[4] 376[5]	17.8	41.6	M12×1.75; 20 deep

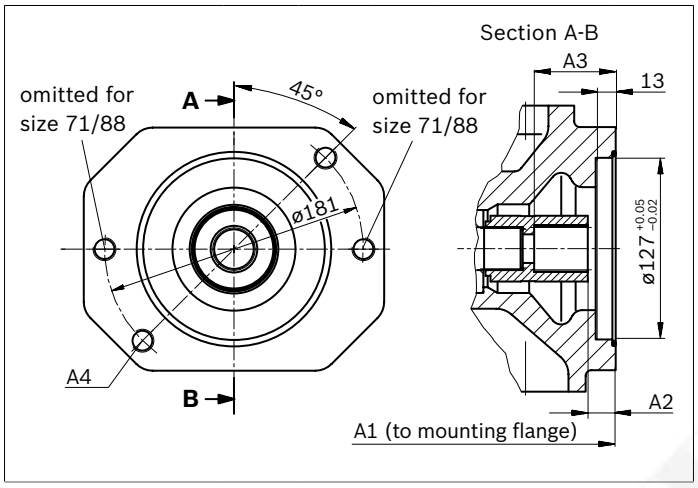
K04 (SAE J744 25-4 (B-B))	NG	A1	A2	A3	A4[2]
	45	229	18.4	46.7	M12×1.75; 18 deep
	71	267	20.8	49.1	M12×1.75; 20 deep
	88	267	20.8	49.1	M12×1.75; 20 deep
	100	338	18.2	46.6	M12×1.75; 20 deep
	140	350[4] 376[5]	18.3	45.9	M12×1.75; 20 deep

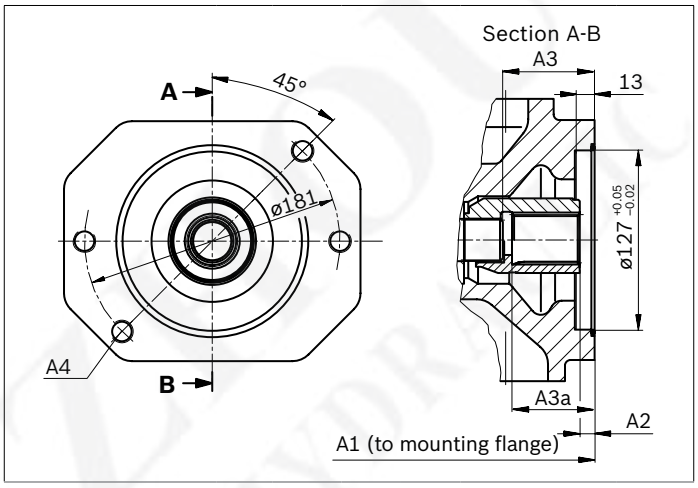
1) According to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
2) Thread according to DIN 13, see instruction manual for maximum tightening torques.
3) Continuous
4) Housing with D flange
5) Housing with C flange

Flange ISO 3019-1 (SAE)		Hub for splined shaft[1]	Availability over sizes							Code
Diameter	Symbol	Diameter	18	28	45	71	88	100	140	
127-2 (C)	☍, ⚮	1 1/4 in 14T 12/24DP	–	–	–	●	●	●	●	K07
		1 1/2 in 17T 12/24DP	–	–	–	–	–	●	●	K24

● = Available – = Not available

▼ **127-2**





K07 (SAE J744 32-4 (C))	NG	A1	A2	A3	A4[2]
	71	267	21.8	58.6	M16×2;[3]
	88	267	21.8	58.6	M16×2;[3]
	100	338	19.5	56.4	M16×2;[3]
	140	350[4] 376[5]	19.3	56.1	M16×2; 24 deep

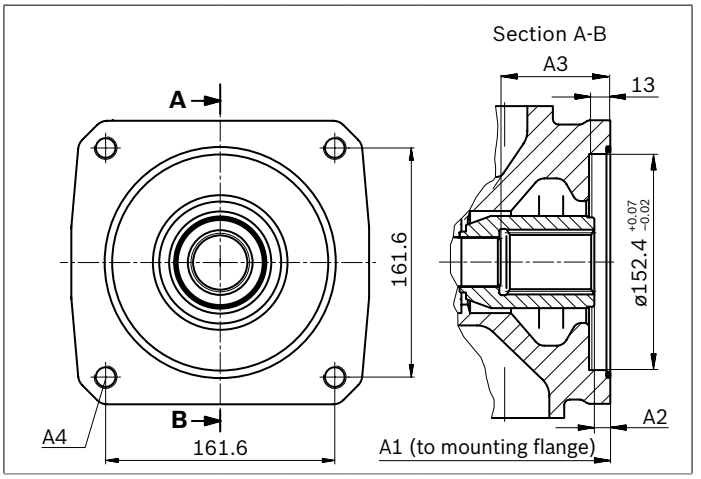
K24 (SAE J744 38-4 (C-C))	NG	A1	A2	A3	A3a	A4[2]
	100	338	9.9	65	–	M16×2;[3]
	140	350[4] 376[5]	9.7	–	69.1	M16×2; 24 deep

1) According to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
2) Thread according to DIN 13, see instruction manual for maximum tightening torques.
3) Continuous
4) Housing with D flange
5) Housing with C flange

Flange ISO 3019-1 (SAE)		Hub for splined shaft[1]	Availability over sizes						Code
Diameter	Symbol	Diameter	18	28	45	71 /88	100	140	
152-4 (D)	⌘	1 3/4 in 13T 8/16DP	–	–	–	–	–	●	K17

● = Available – = Not available

▼ **152-4**



K17 (SAE J744 44-4 (D))	NG	A1	A2	A3	A4[2]
	140	350	11	77.3	M16×2;[3]

Only available with housing with mounting flange D.

1) According to ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
2) Thread according to DIN 13, see instruction manual for maximum tightening torques.
3) Continuous

Overview of mounting options

SAE – mounting flange

Through drive[4]			Mounting options – 2nd pump			
Flange ISO 3019-1	**Hub for splined shaft**	**Code**	**A10V(S)O/31 NG (shaft)**	**A10V(S)O/5x NG (shaft)**	**External gear pump design (size)**	**Through drive available for size**
82-2 (A)	5/8 in	K01	18 (U)	10 (U), 18 (U)	Series F	18 to 140
	3/4 in	K52	18 (S, R)	10 (S) 18 (S, R)	–	18 to 140
101-2 (B)	7/8 in	K68	28 (S, R) 45 (U, W)[1]	28 (S, R) 45 (U, W)[1]	Series N/G	28 to 140
	1 in	K04	45 (S, R) –	45 (S, R) 60, 63, 72 (U, W)[2]	–	45 to 140
127-2 (C)	1 1/4 in	K07	71 (S, R) 88 (S, R) 100 (U, W)[3]	85 (U, W)[3] 100 (U,W)	–	71 to 140
	1 1/2 in	K24	100 (S)	85 (S) 100 (S)	–	100 to 140
152-4 (4-hole D)	1 3/4 in	K17	140 (S)	–	–	140

1) Not for main pump NG28 with K68
2) Not for main pump NG45 with K04
3) Not for main pump NG71 and NG88 with K07

Combination pumps A10VO + A10VO

By using combination pumps, it is possible to have independent circuits without the need for splitter gearboxes. When ordering combination pumps, the type designations of the 1st and 2nd pumps must be linked by a "**+**".

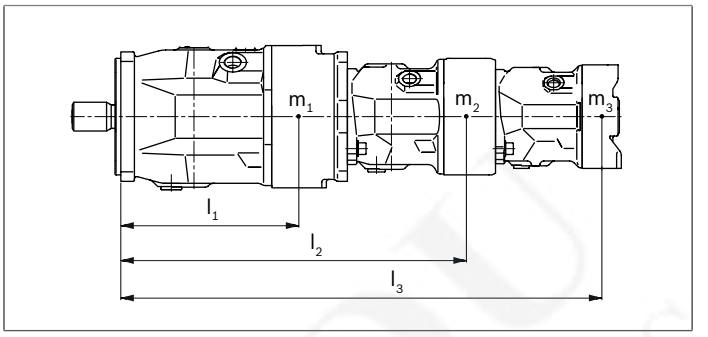
Order example:
A10VO100DFR1/31R-VSC12K04+
A10VO45DFR/31R-VSC12N00

If no further pumps are to be mounted at the factory, the simple type designation is sufficient.

It is permissible to use a combination of two single pumps of the same nominal size (tandem pump) considering a dynamic mass acceleration of maximum 10 g (= 98.1 m/s²) without additional support brackets.

Each through drive is plugged with a **non-pressure-resistant** cover. Before commissioning the units, they must therefore be equipped with a pressure-resistant cover. Through drives can also be ordered with pressure-resistant covers. Please specify in plain text.

For combination pumps consisting of more than two pumps, the mounting flange must be rated for the permissible mass torque (please contact us).



m_1, m_2, m_3	Weight of pump	[kg]
l_1, l_2, l_3	Distance, center of gravity	[mm]
$T_m = (m_1 \times l_1 + m_2 \times l_2 + m_3 \times l_3) \times \frac{1}{102}$		[Nm]

Permissible mass moment of inertia

Size			18	28	45	71	88	100	140	
static	T_m	Nm	500	880	1370	2160	2160	3000	4500[1]	3000[2]
dynamic at 10 g (98.1 m/s²)	T_m	Nm	50	88	137	216	216	300	450[1]	300[2]
Weight **without** through drive and N00	m	kg	12.9	18	23.5	35.2	35.2	49.5	65.4	
Weight **with** through drive and K..			13.8	19.3	25.1	38	38	55.4	74.4	
Distance, center of gravity **without** through drive N00	l_1	mm	92	100	113	127	127	161	159	
Distance, center of gravity **with** through drive K..	l_1	mm	98	107	120	137	137	178	180	

1) 4-hole flange (D)
2) 2-hole flange (C)