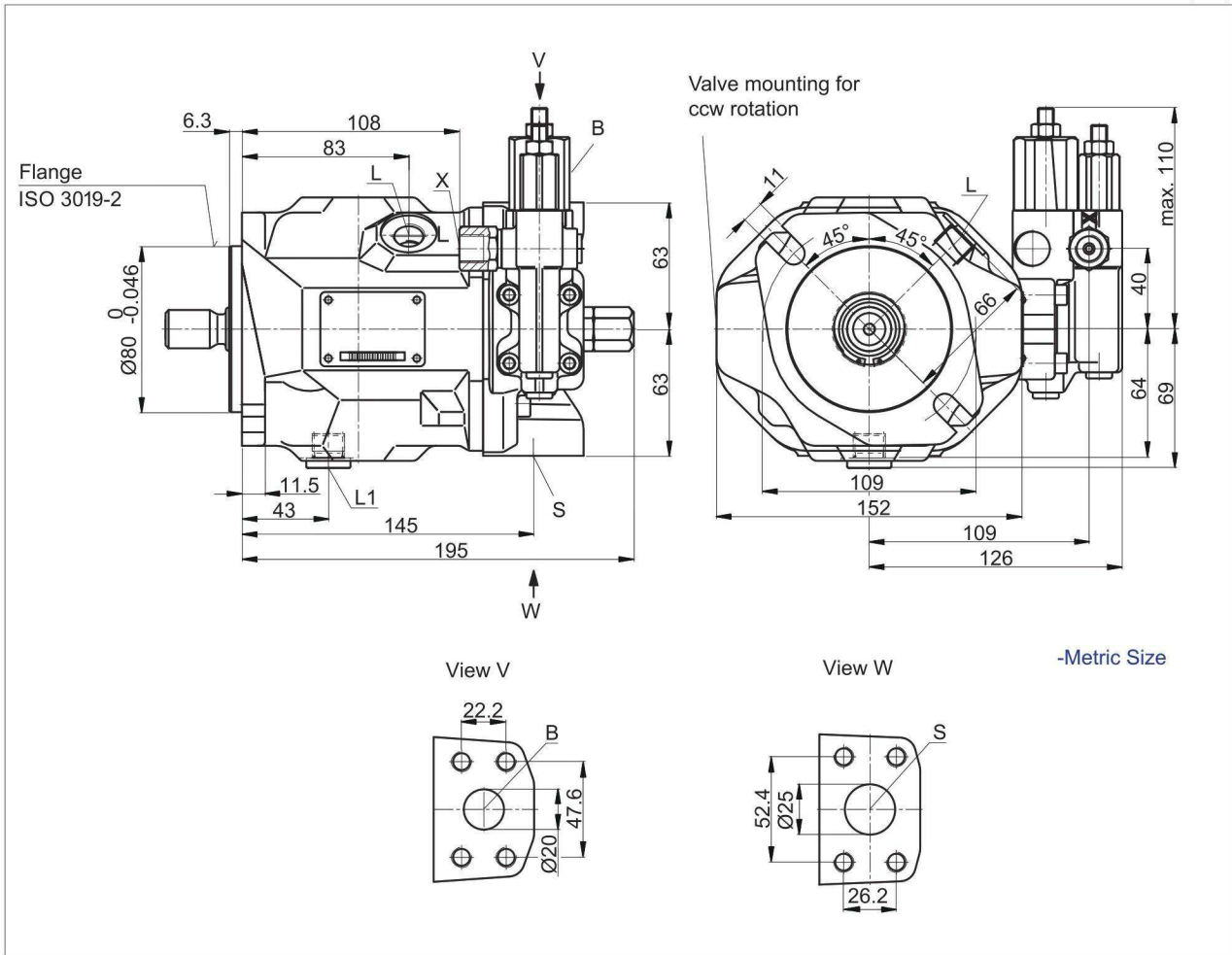


Dimensions size 18

DFR, DFR1 – Pressure and flow control, hydraulic

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

Clockwise rotation



Ports

Designation	Port for	Standard	Size ¹⁾	Maximum pressure[psi(bar)] ²⁾	State
B	Service line, fastening thread	SAE J518 ³⁾ DIN 13	3/4 in M10 x 1.5 : 17 (deep)	5100(350)	O
S	Suction line, fastening thread	SAE J518 ³⁾ DIN 13	1 in M10 x 1.5 : 17 (deep)	145(10)	O
L	Case drain fluid	DIN 3852 ⁴⁾	M16 x 1.5 : 12 (deep)	30(2)	O ⁵⁾
L ₁	Case drain fluid	DIN 3852 ⁴⁾	M16 x 1.5 : 12 (deep)	30(2)	X ⁵⁾
X	Pilot pressure	DIN 3852 ⁴⁾	M14 x 1.5 : 12 (deep)	5100(350)	O
X	Pilot press. with DG-control	DIN ISO 228 ⁴⁾	G 1/4 in	5100(350)	O

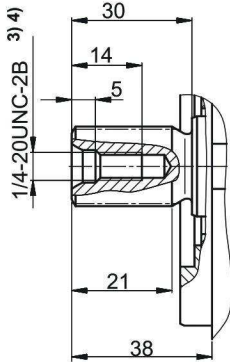
- 1) For the maximum tightening torques the general instructions on page A-64 must be observed.
- 2) Depending on the application, short-term pressure spikes can occur. Keep this in mind when selecting measuring equipment and fittings. Pressure values in bar absolute.
- 3) The dimension follow SAE J518, Metric fastening thread and standard thread are different.
- 4) The spot face can be deeper than as specified in the standard.
- 5) Depending on the installation position, L or L₁ must be connected (the following page A-62 \ A-63, please check assembling instruction.)
O = Must be connected (plugged on delivery)
X = Plugged (in normal operation)

Dimensions size 18

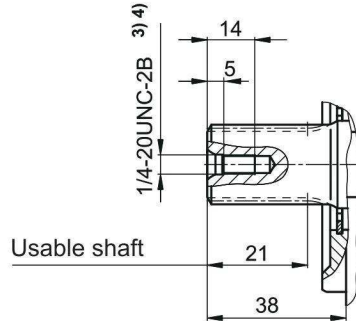
Before finalizing your design request a certified installation drawing.
Dimensions in (mm).

Drive shaft

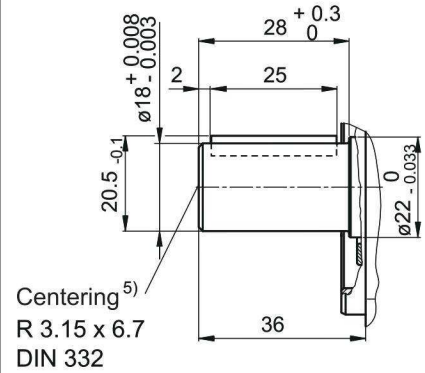
S Splined shaft 3/4 in
11T 16/32DP¹⁾ (SAE J744)



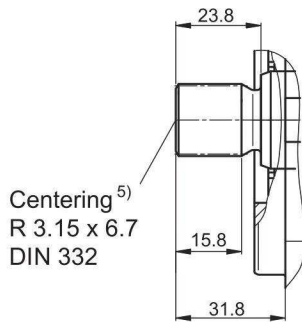
R Splined shaft 3/4 in
11T 16/32DP¹⁾²⁾ (SAE J744)



P Parallel shaft key
DIN 6885 · A6x6x25



U Splined shaft 5/8 in
9T 16/32DP¹⁾²⁾ (SAE J744)



¹⁾ 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

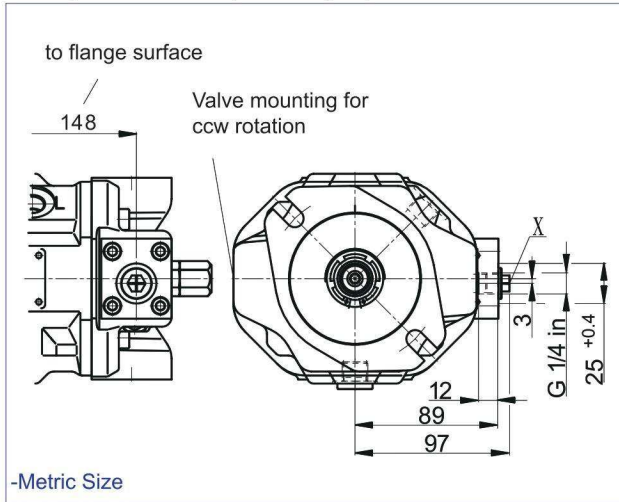
⁴⁾ For the maximum tightening torques the general instructions on page A-64 must be observed

⁵⁾ Coupling axially secured, e.g. with a clamp coupling or radially mounted clamping screw

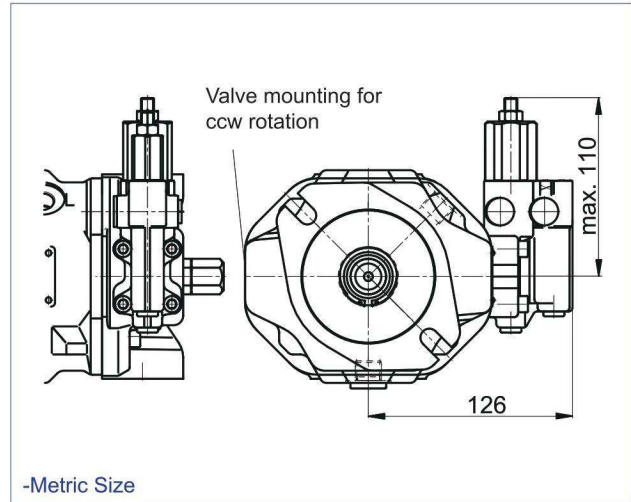
Dimensions size 18

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

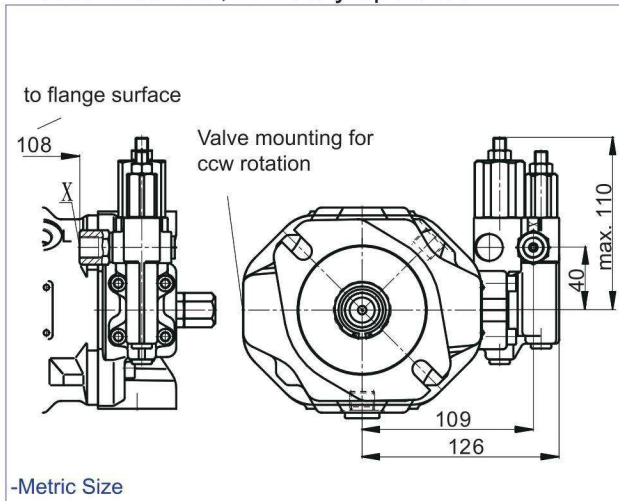
DG
Two-point control, directly operated



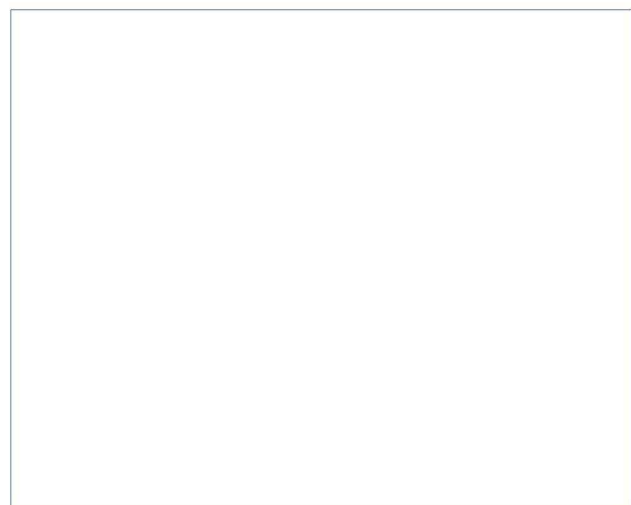
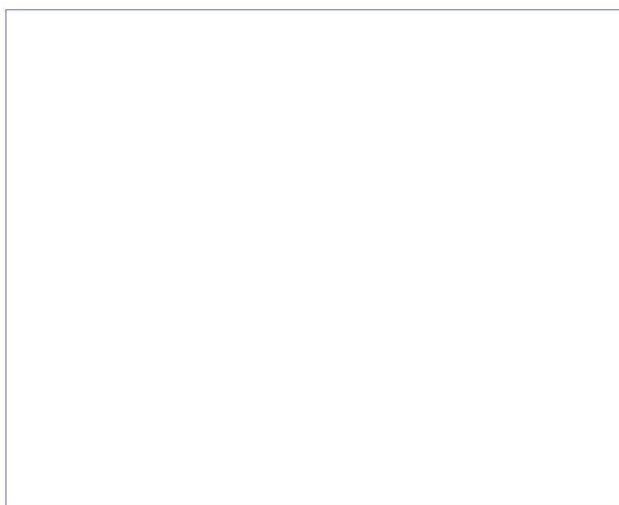
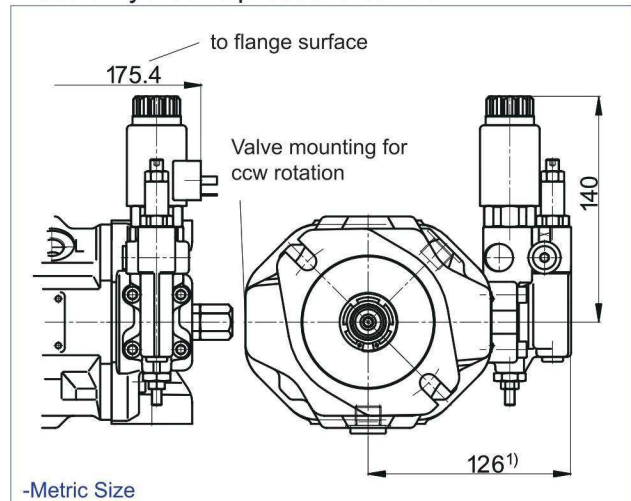
DR
Pressure control



DRG
Pressure control, remotely operated



ED7., ER7.
Electro-hydraulic pressure control



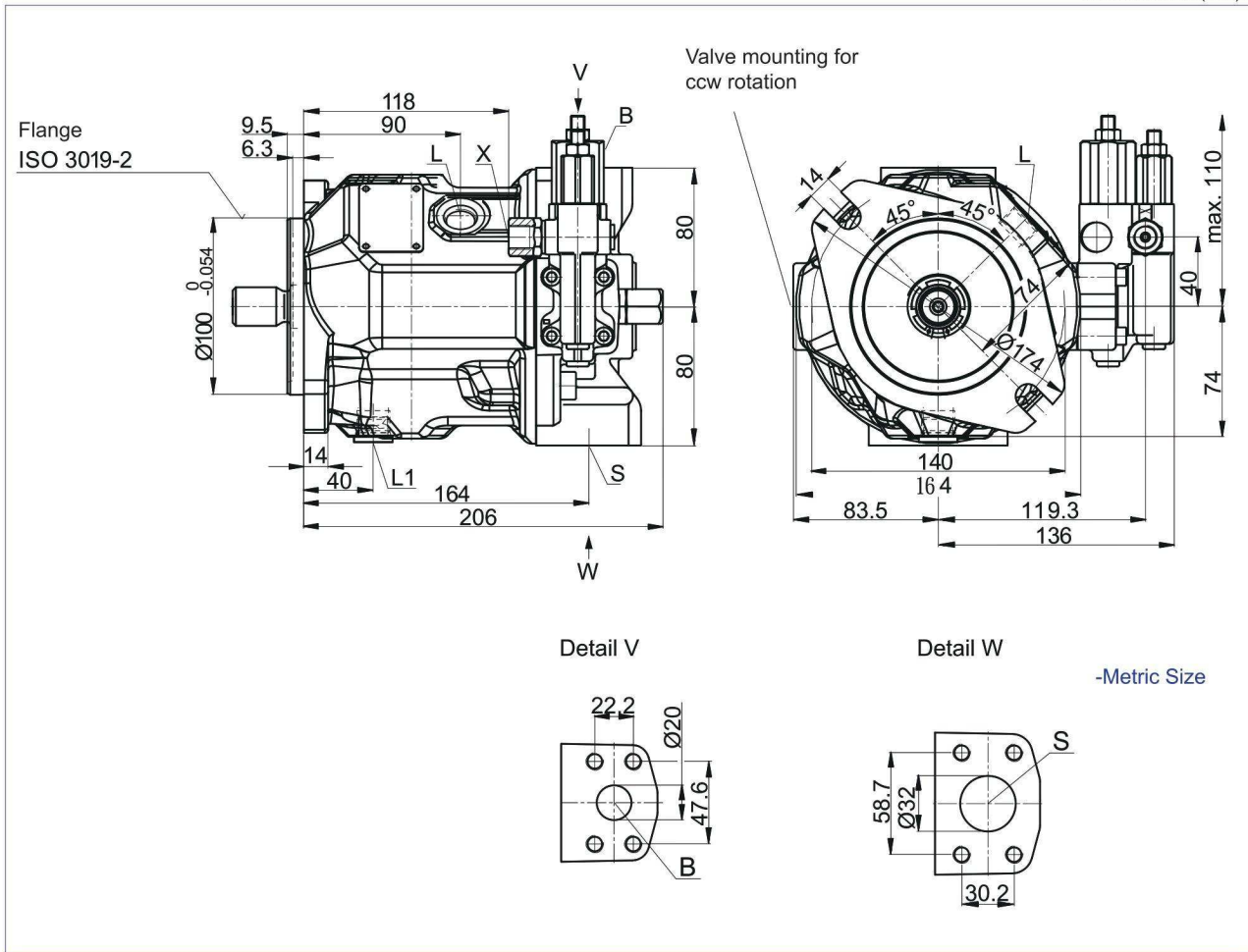
¹⁾ ER7.: 161 mm if using a sandwich plate pressure reducing valve.

Dimensions size 28

DFR/DFR1 – Pressure and flow control, hydraulic

Clockwise rotation

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



Ports

Designation	Port for	Standard	Size ¹⁾	Maximum pressure[psi(bar)] ²⁾	State
B	Service line, fastening thread	SAE J518 ³⁾ DIN 13	3/4 in M10 x 1.5 : 17 (deep)	5100(350)	O
S	Suction line, fastening thread	SAE J518 ³⁾ DIN 13	1 1/4in M10 x 1.5 : 17 (deep)	145(10)	O
L	Case drain fluid	DIN 3852 ⁴⁾	M18 x 1.5 : 12 (deep)	30(2)	O ⁵⁾
L ₁	Case drain fluid	DIN 3852 ⁴⁾	M18 x 1.5 : 12 (deep)	30(2)	X ⁵⁾
X	Pilot pressure	DIN 3852 ⁴⁾	M14 x 1.5 : 12 (deep)	5100(350)	O
X	Pilot press. with DG-control	DIN ISO 228 ⁴⁾	G 1/4 in : 12 (deep)	5100(350)	O

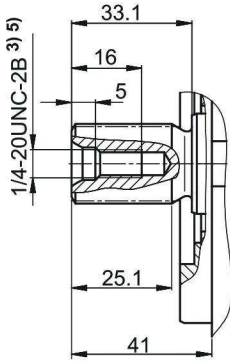
- 1) For the maximum tightening torques the general instructions on page A-64 must be observed.
- 2) Depending on the application, short-term pressure spikes can occur. Keep this in mind when selecting measuring equipment and fittings. Pressure values in bar absolute.
- 3) The dimension follow SAE J518, Metric fastening thread and standard thread are different.
- 4) The spot face can be deeper than as specified in the standard.
- 5) Depending on the installation position, L or L₁ must be connected (the following page A-62、A-63, please check assembling instruction.)
 O = Must be connected (plugged on delivery)
 X = Plugged (in normal operation)

Dimensions size 28

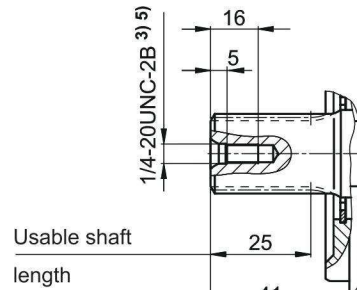
Before finalizing your design request a certified installation drawing.
Dimensions in (mm).

Drive shaft

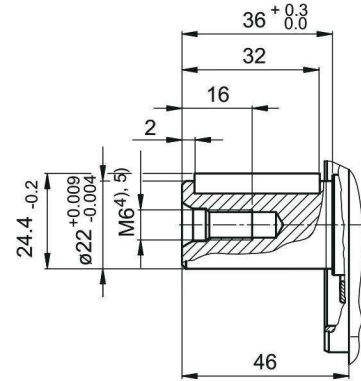
S Splined shaft 7/8 in
13T 16/32DP¹⁾ (SAE J744)



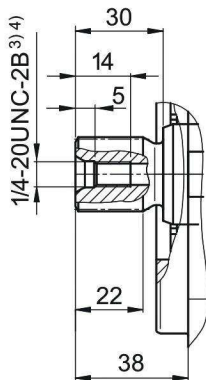
R Splined shaft 7/8 in
13T 16/32DP¹⁾²⁾ (SAE J744)



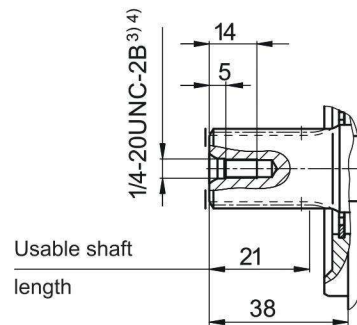
P Parallel shaft key
DIN 6885, A6x6x32



U Splined shaft 3/4 in
11T 16/32DP¹⁾ (SAE J744)



W Splined shaft 3/4 in
11T 16/32DP¹⁾²⁾ (SAE J744)

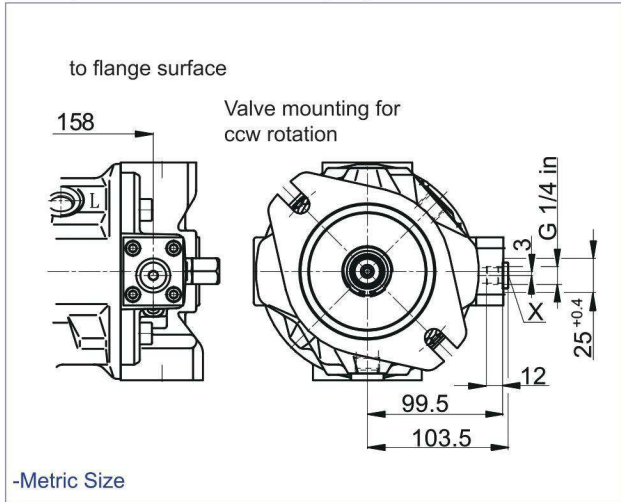


- 1) ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
- 2) Splines according to ANSI B92.1a, run out of spline is a deviation from standard
- 3) Thread according to ASME B1.1
- 4) Thread according to DIN 13
- 5) For the maximum tightening torques the general instructions on page A-64 must be observed.

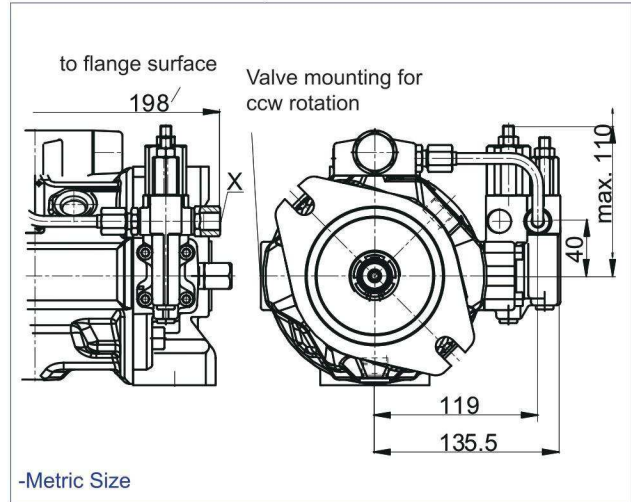
Dimensions size 28

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

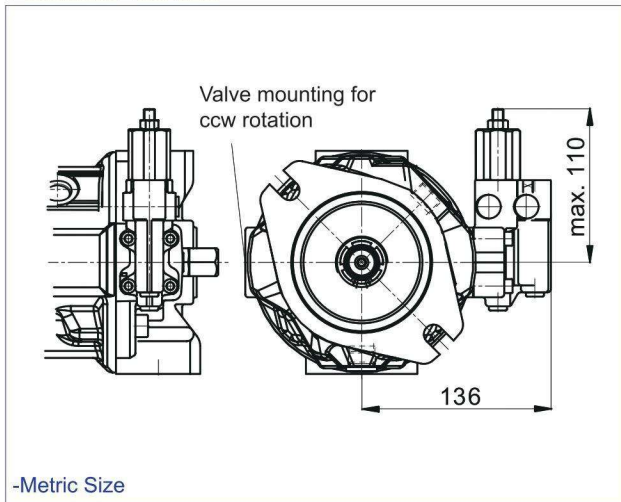
DG
Two-point control, directly operated



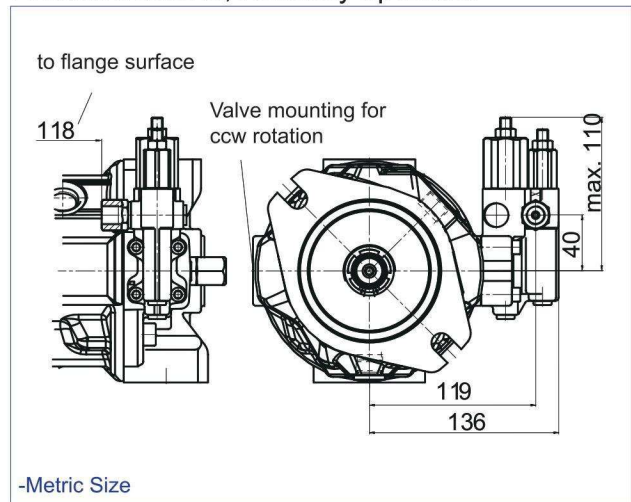
DFLR
Pressure, flow and power control



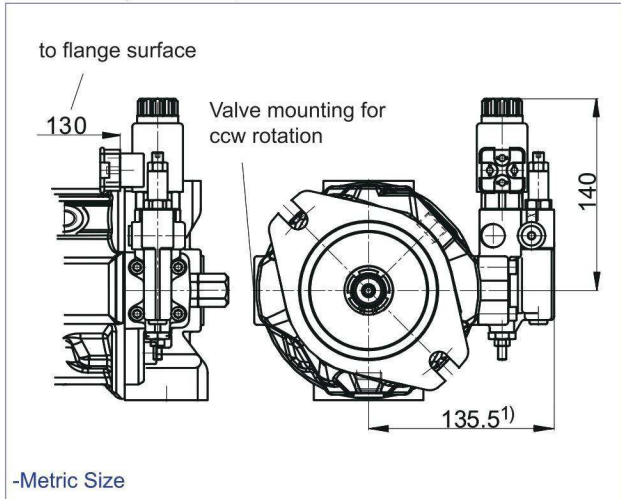
DR
Pressure control



DRG
Pressure control, remotely operated



ED7. / ER7.
Electro-hydraulic pressure control



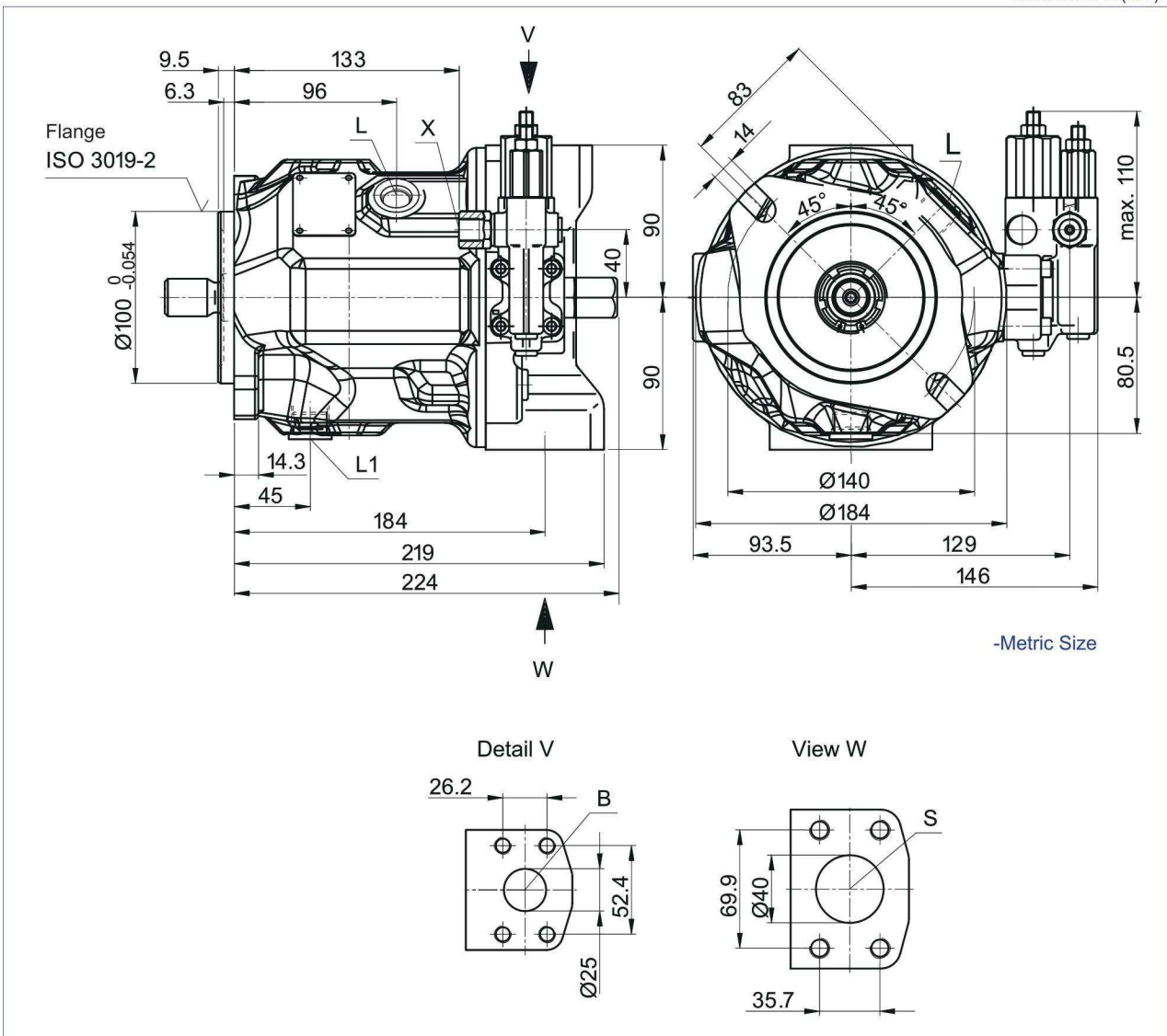
¹⁾ ER7.: 170.5 mm when using a sandwich plate pressure reducing valve.
For details of connection options and drive shafts, see also page A-19 and A-20.

Dimensions size 45

DFR/DFR1 – Pressure and flow control, hydraulic

Clockwise rotation

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



Ports

Designation	Port for	Standard	Size ¹⁾	Maximum pressure[psi(bar)] ²⁾	State
B	Service line, fastening thread	SAE J518 ³⁾ DIN 13	1 in M10 x 1.5 : 17 (deep)	5100(350)	O
S	Suction line, fastening thread	SAE J518 ³⁾ DIN 13	1 1/2in M12 x 1.75 : 20 (deep)	145(10)	O
L	Case drain fluid	DIN 3852 ⁴⁾	M22 x 1.5 : 14 (deep)	30(2)	O ⁵⁾
L1	Case drain fluid	DIN 3852 ⁴⁾	M22 x 1.5 : 14 (deep)	30(2)	X ⁵⁾
X	Pilot pressure	DIN 3852 ⁴⁾	M14 x 1.5 : 12 (deep)	5100(350)	O
X	Pilot press. with DG-control	DIN ISO 228 ⁴⁾	G 1/4 in	5100(350)	O

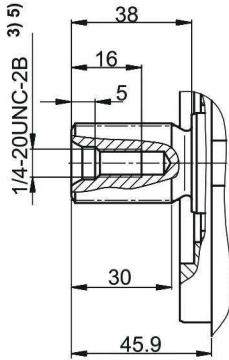
- 1) For the maximum tightening torques the general instructions on page A-64 must be observed.
- 2) Depending on the application, short-term pressure spikes can occur. Keep this in mind when selecting measuring equipment and fittings. Pressure values in bar absolute.
- 3) The dimension follow SAE J518, Metric fastening thread and standard thread are different.
- 4) The spot face can be deeper than as specified in the standard
- 5) Depending on the installation position, L or L1 must be connected (the following page A-62 \ A-63, please check assembling instruction.)
O = Must be connected (plugged on delivery)
X = Plugged (in normal operation)

Dimensions size 45

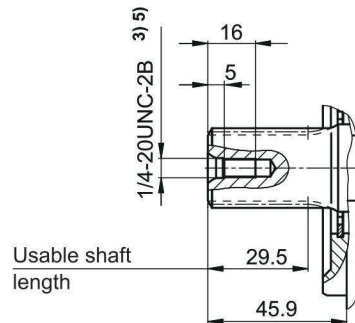
Before finalizing your design request a certified installation drawing.
Dimensions in (mm).

Drive shaft

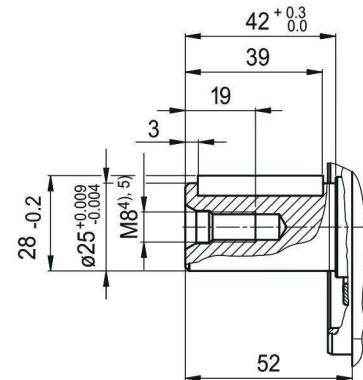
S Splined shaft 1 in
15T 16/32DP¹⁾ (SAE J744)



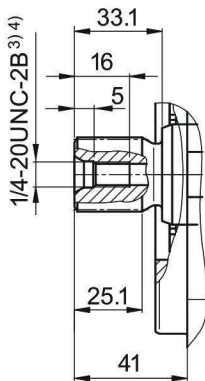
R Splined shaft 1 in
15T 16/32DP¹⁾²⁾ (SAE J744)



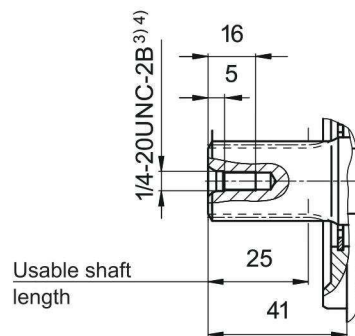
P Parallel shaft key
DIN 6885 · A8x7x36



U Splined shaft 7/8 in
13T 16/32DP¹⁾ (SAE J744)



W Splined shaft 7/8 in
13T 16/32DP¹⁾²⁾ (SAE J744)

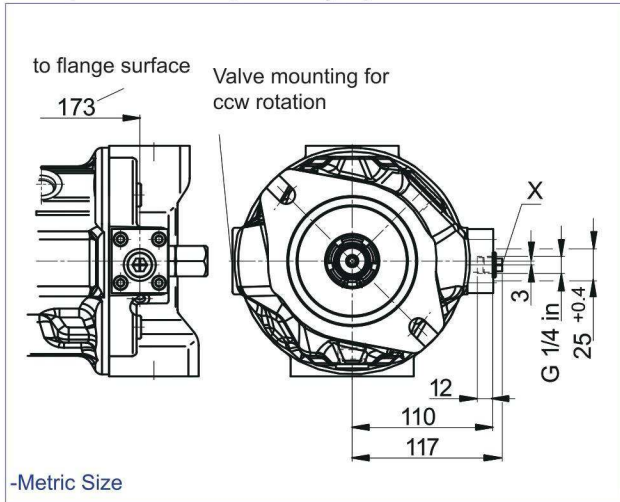


- 1) ANSI B92.1a · 30° pressure angle, flat root, side fit, tolerance class 5
- 2) Splines according to ANSI B92.1a, run out of spline is a deviation from standard
- 3) Thread according to ASME B1.1
- 4) Thread according to DIN 13
- 5) For the maximum tightening torques the general instructions on page A-64 must be observed.

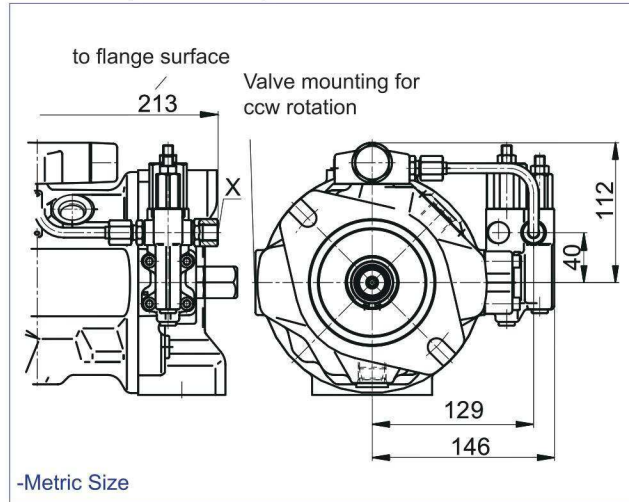
Dimensions size 45

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

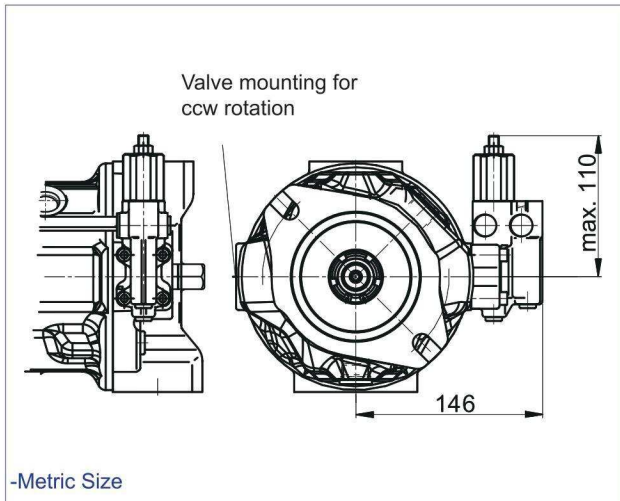
DG
Two-point control, directly operated



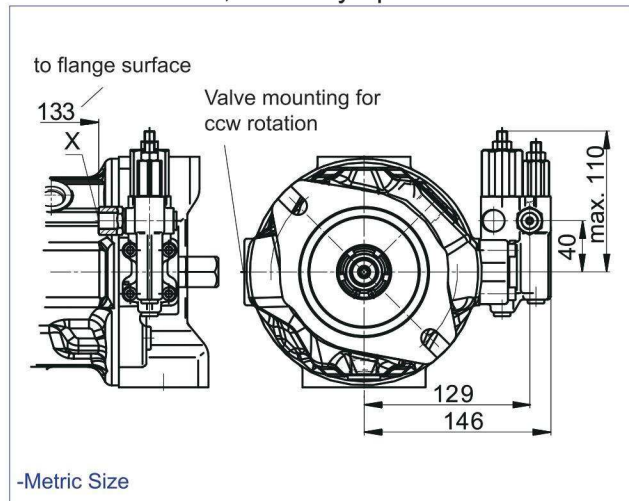
DFLR
Pressure, flow and power control



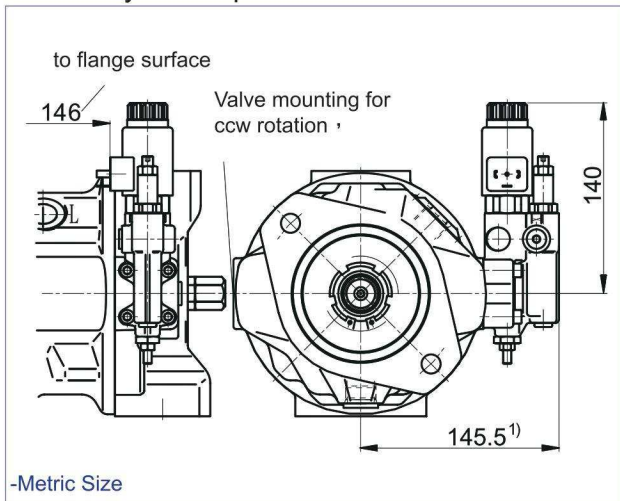
DR
Pressure control



DRG
Pressure control, remotely operated



ED7. / ER7.
Electro-hydraulic pressure control



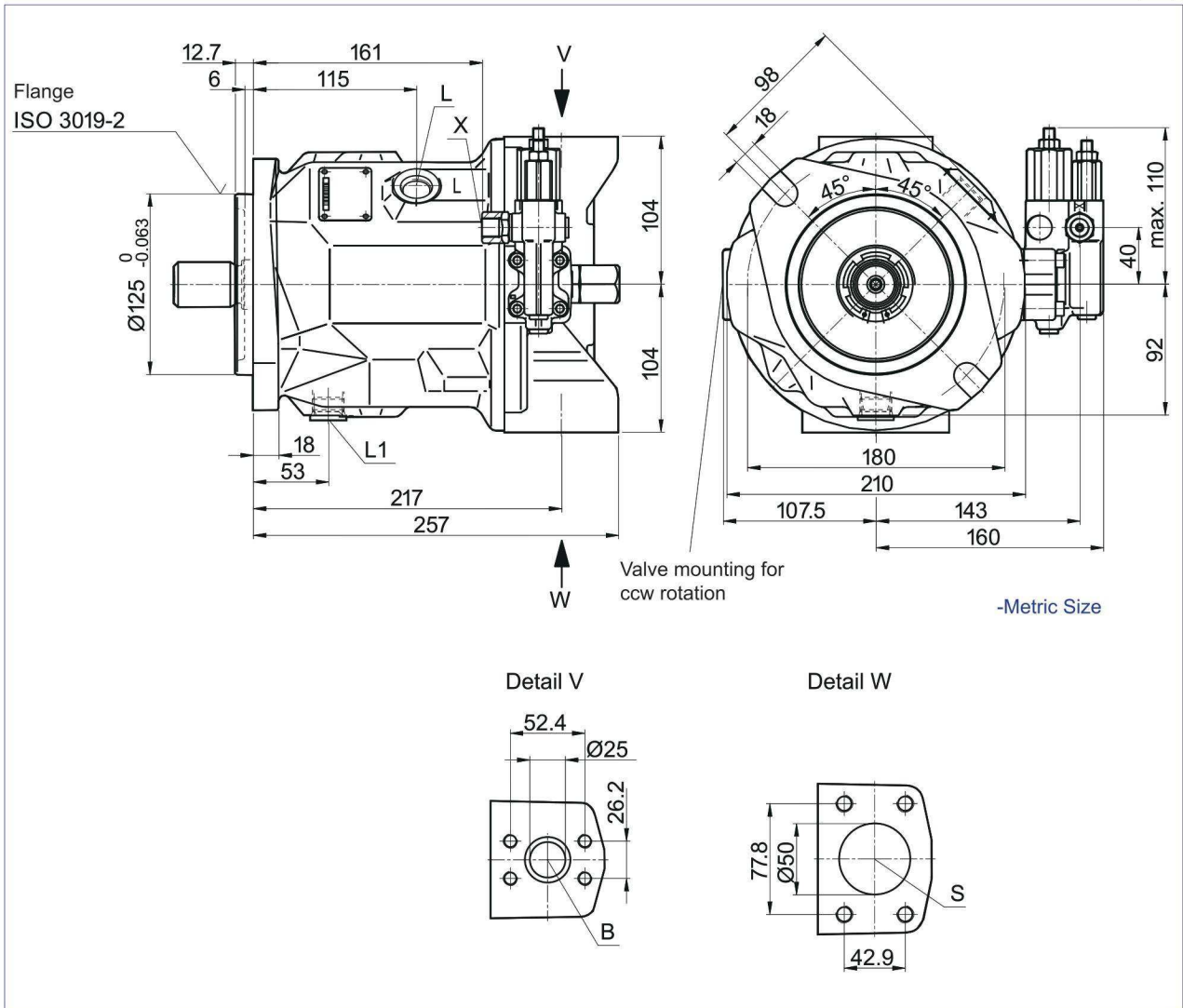
¹⁾ ER7.: 180.5 mm if using a sandwich plate pressure reducing valve.

Dimensions size 71

DFR/DFR1 – Pressure and flow control, hydraulic

Clockwise rotation

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



Ports

Designation	Port for	Standard	Size ¹⁾	Maximum pressure[psi(bar)] ²⁾	State
B	Service line, fastening thread	SAE J518 ³⁾ DIN 13	1 in M10 x 1.5 : 17 (deep)	500(350)	O
S	Suction line, fastening thread	SAE J518 ³⁾ DIN 13	2 in M12 x 1.75 : 20 (deep)	145(10)	O
L	Case drain fluid	DIN 3852 ⁴⁾	M22 x 1.5 : 14 (deep)	30(2)	O ⁵⁾
L ₁	Case drain fluid	DIN 3852 ⁴⁾	M22 x 1.5 : 14 (deep)	30(2)	X ⁵⁾
X	Pilot pressure	DIN 3852 ⁴⁾	M14 x 1.5 : 12 (deep)	5100(350)	O
X	Pilot press. with DG-control	DIN ISO 228 ⁴⁾	G 1/4 in	5100(350)	O

1) For the maximum tightening torques the general instructions on page A-64 must be observed.

2) Depending on the application, short-term pressure spikes can occur. Keep this in mind when selecting measuring equipment and fittings. Pressure values in bar absolute.

3) The dimension follow SAE J518, Metric fastening thread and standard thread are different.

4) The spot face can be deeper than as specified in the standard.

5) Depending on the installation position, L or L₁ must be connected (the following page A-62、A-63, please check assembling instruction.)

O = Must be connected (plugged on delivery)

X = Plugged (in normal operation)

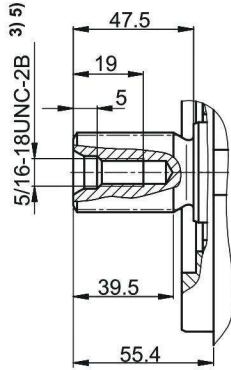
Dimensions size 71

Drive shaft

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

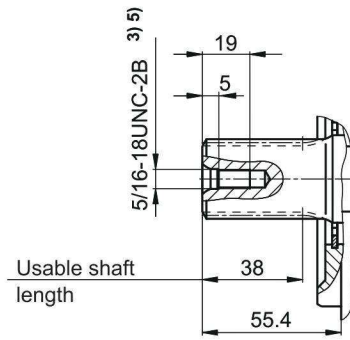
S

Splined shaft 1 1/4 in
14T 12/24DP¹⁾(SAE J744)



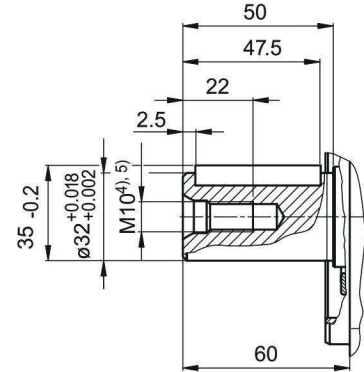
R

Splined shaft 1 1/4 in
14T 12/24DP¹⁾²⁾(SAE J744)



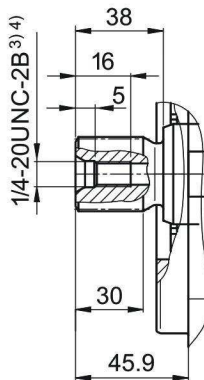
P

Parallel shaft key
DIN 6885 · A10x8x45



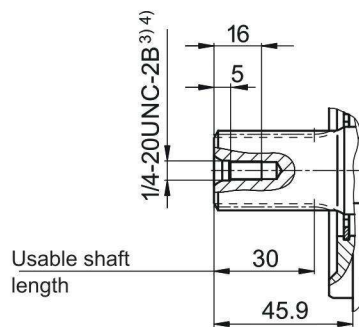
U

Splined shaft 1 in
15T 16/32DP¹⁾(SAE J744)



W

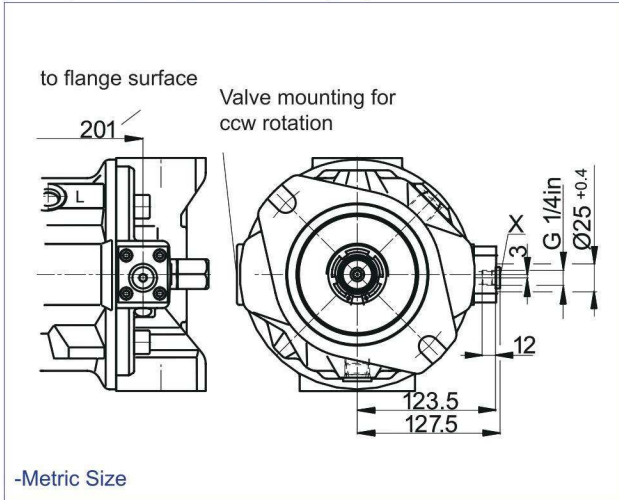
Splined shaft 1 in
15T 16/32DP¹⁾²⁾(SAE J744)



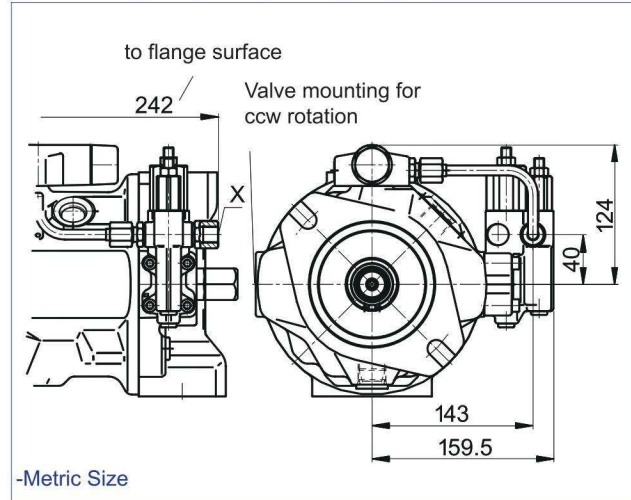
- 1) ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
- 2) Splines according to ANSI B92.1a, run out of spline is a deviation from standard
- 3) Thread according to ASME B1.1
- 4) Thread according to DIN 13
- 5) For the maximum tightening torques the general instructions on page A-64 must be observed.

Dimensions size 71

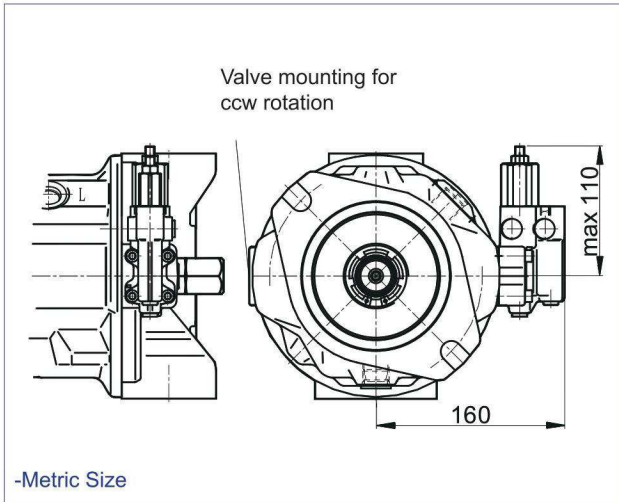
DG
Two-point control, directly operated



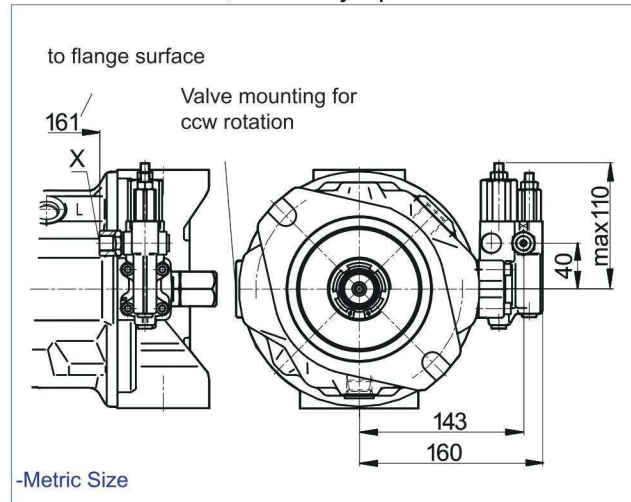
DFLR
Pressure, flow and power control



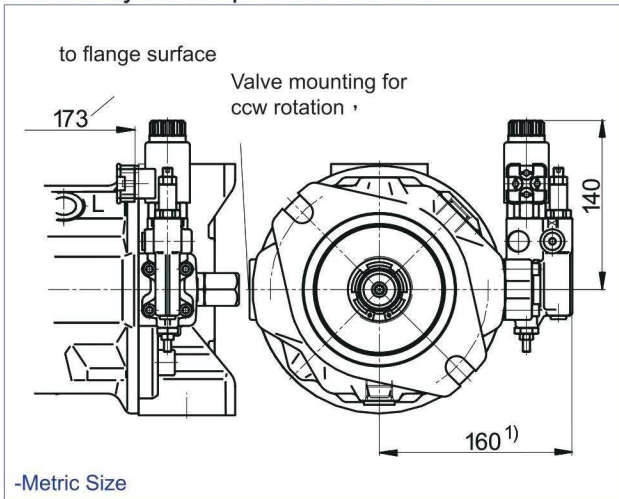
DR
Pressure control



DRG
Pressure control, remotely operated



ED7. / ER7.
Electro-hydraulic pressure control



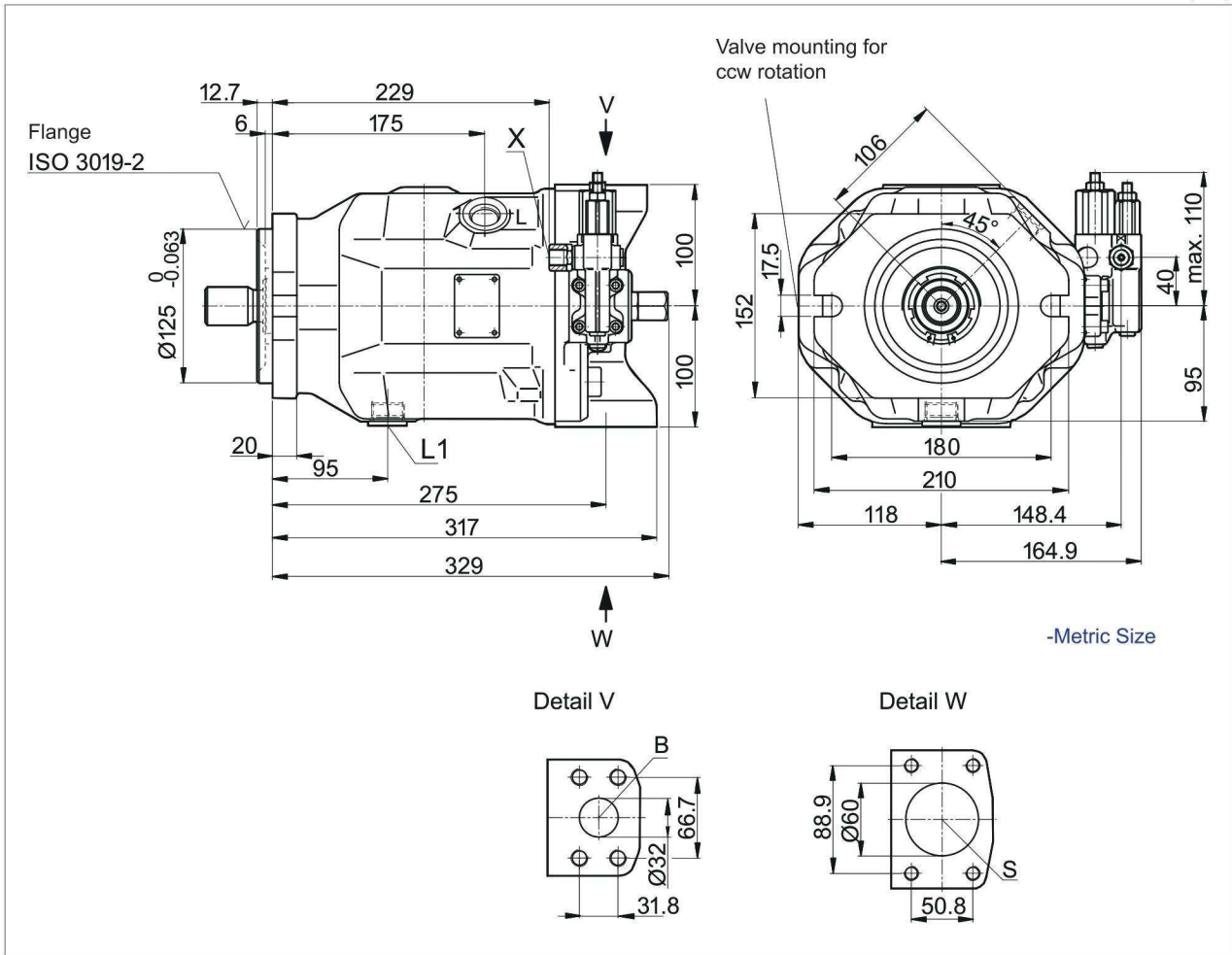
¹⁾ ER7.: 195 mm if using a sandwich plate pressure reducing valve.

Dimensions size 100

DFR/DFR1 – Pressure and flow control, hydraulic

Clockwise rotation

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



Ports

Designation	Port for	Standard	Size ¹⁾	Maximum pressure[psi(bar)] ²⁾	State
B	Service line, fastening thread	SAE J518 ³⁾ DIN 13	1 1/4 in M14 x 2 : 19 (deep)	5100(350)	O
S	Suction line, fastening thread	SAE J518 ³⁾ DIN 13	2 1/2in M12 x 1.75 : 17 (deep)	145(10)	O
L	Case drain fluid	DIN 3852 ⁴⁾	M27 x 2 : 16 (deep)	30(2)	O ⁵⁾
L ₁	Case drain fluid	DIN 3852 ⁴⁾	M27 x 2 : 16 (deep)	30(2)	X ⁵⁾
X	Pilot pressure	DIN 3852 ⁴⁾	M14 x 1.5 : 12 (deep)	5100(350)	O
X	Pilot press. with DG-control	DIN ISO 228 ⁴⁾	G 1/4 in	5100(350)	O

1) For the maximum tightening torques the general instructions on page A-64 must be observed.

2) Depending on the application, short-term pressure spikes can occur. Keep this in mind when selecting measuring equipment and fittings. Pressure values in bar absolute.

3) The dimension follow SAE J518, Metric fastening thread and standard thread are different.

4) The spot face can be deeper than as specified in the standard

5) Depending on the installation position, L or L₁ must be connected (the following page A-62 \ A-63, please check assembling instruction.)

O = Must be connected (plugged on delivery)

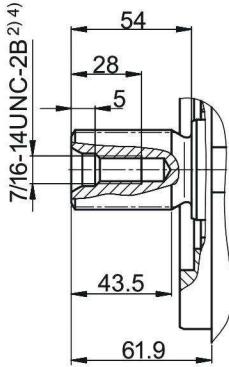
X = Plugged (in normal operation)

Dimensions size 100

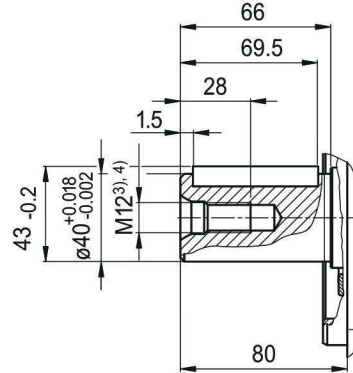
Before finalizing your design request a certified installation drawing.
Dimensions in (mm).

Drive shaft

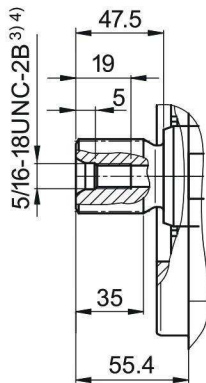
S Splined shaft 1 1/2 in
17T 12/24DP¹⁾ (SAE J744)



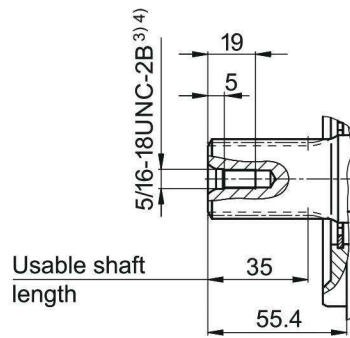
P Parallel shaft key
DIN 6885 · A12x8x68



U Splined shaft 1 1/4 in
14T 12/24DP1¹⁾ (SAE J744)



W Splined shaft 1 1/4 in
14T 12/24DP¹⁾²⁾ (SAE J744)

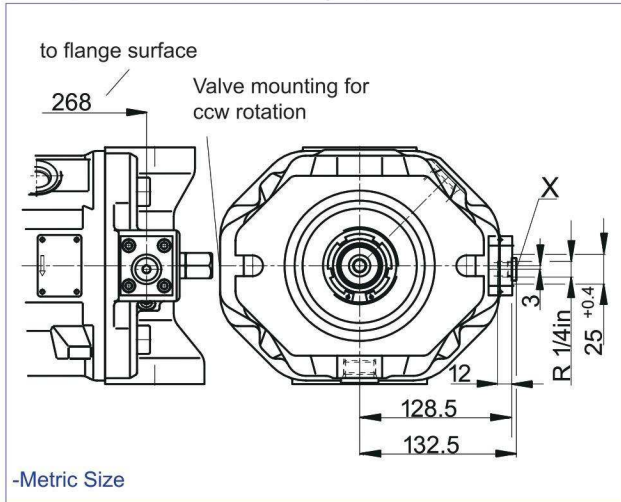


- 1) ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
- 2) Splines according to ANSI B92.1a, run out of spline is a deviation from standard
- 3) Thread according to ASME B1.1
- 4) Thread according to DIN 13
- 5) For the maximum tightening torques the general instructions on page A-64 must be observed.

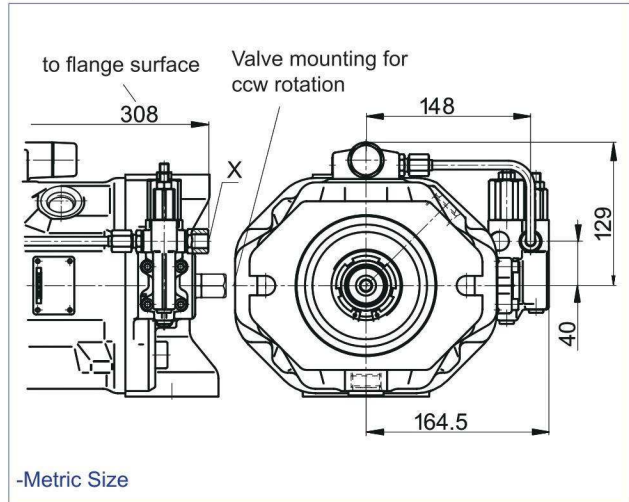
Dimensions size 100

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

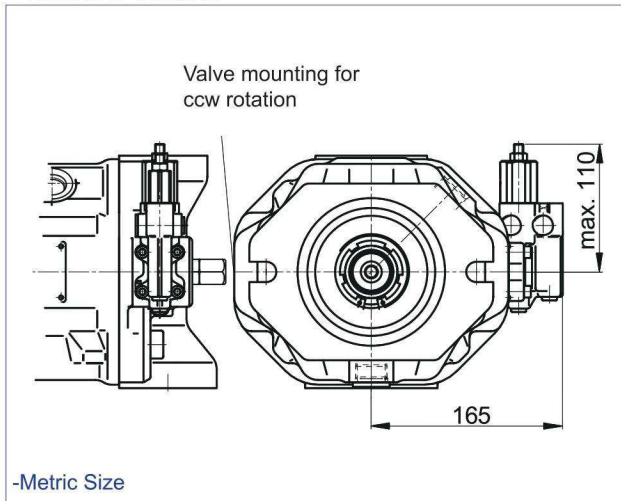
DG
Two-point control, directly operated



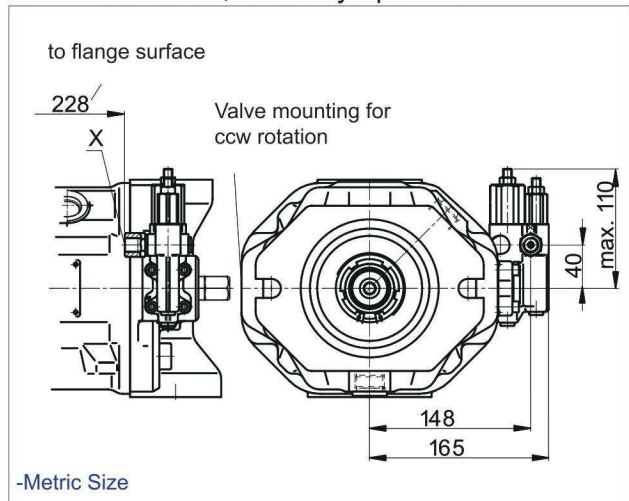
DFLR
Pressure, flow and power control



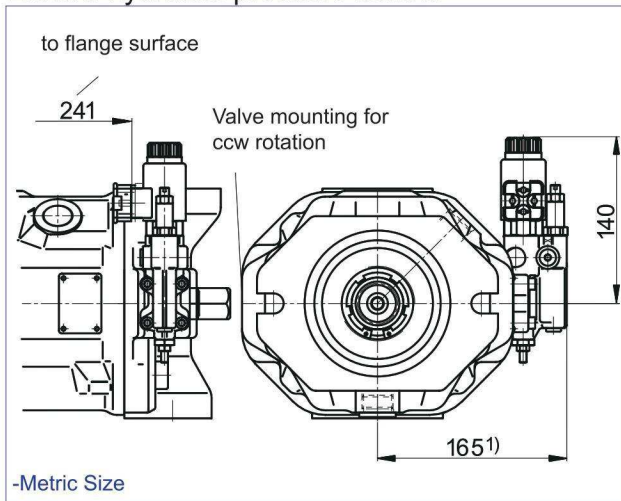
DR
Pressure control



DRG
Pressure control, remotely operated



ED7. / ER7.
Electro-hydraulic pressure control



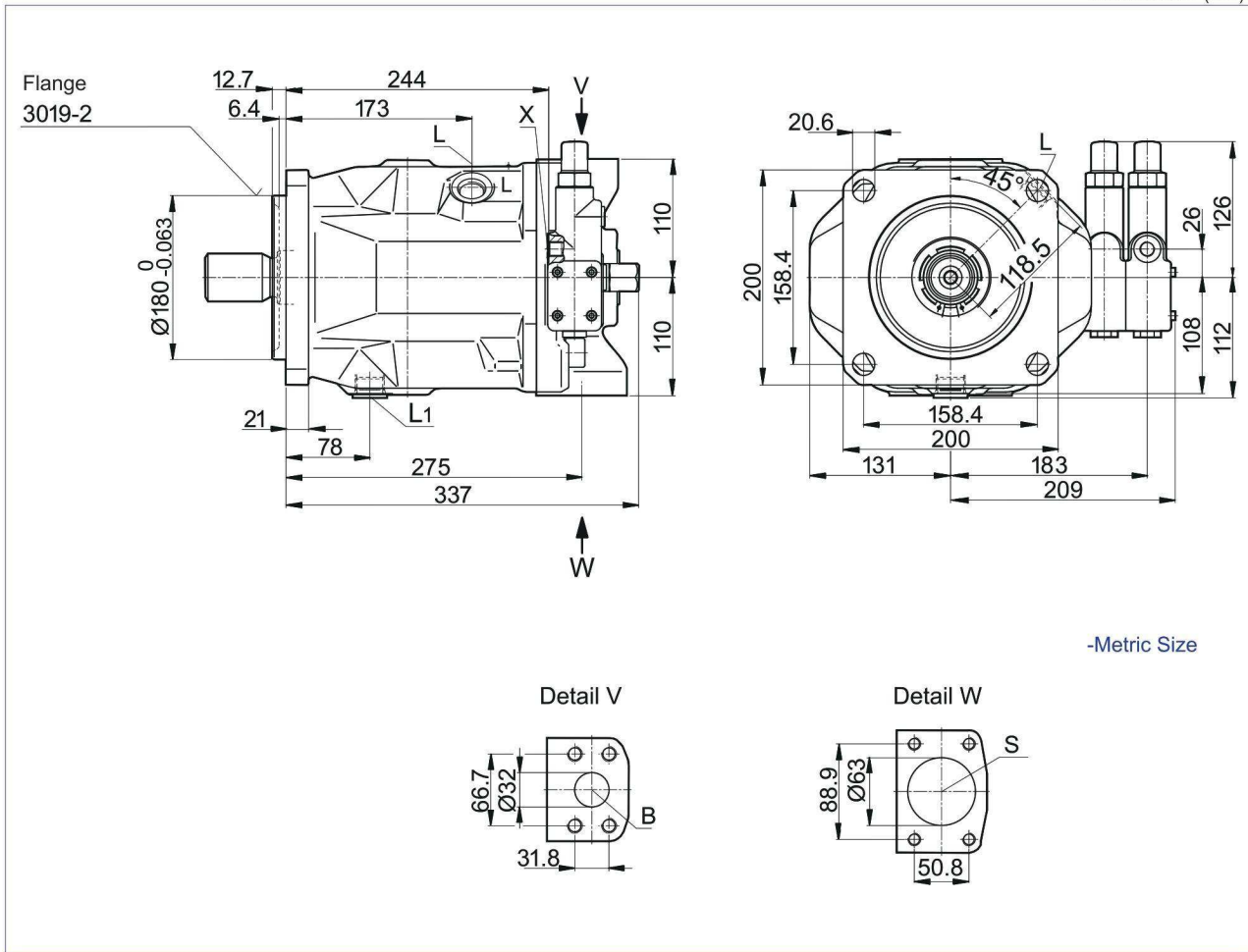
¹⁾ ER7.: 200 mm when using a sandwich plate pressure reducing valve.

Dimensions size 140

DFR/DFR1 — Pressure and flow control, hydraulic

Clockwise rotation

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



Ports

Designation	Port for	Standard	Size ¹⁾	Maximum pressure[psi(bar)] ²⁾	State
B	Service line, fastening thread	SAE J518 ³⁾ DIN 13	1 1/4 in M14 x 2 : 19 (deep)	5100(350)	O
S	Suction line, fastening thread	SAE J518 ³⁾ DIN 13	2 1/2 in M12 x 1.75 : 17 (deep)	145(10)	O
L	Case drain fluid	DIN 3852 ⁴⁾	M27 x 2 : 16 (deep)	30(2)	O ⁵⁾
L ₁	Case drain fluid	DIN 3852 ⁴⁾	M27 x 2 : 16 (deep)	30(2)	X ⁵⁾
X	Pilot pressure	DIN 3852 ⁴⁾	M14 x 1.5 : 12 (deep)	5100(350)	O
X	Pilot press. with DG-control	DIN 3852 ⁴⁾	M14 x 1.5 : 12 (deep)	5100(350)	O
MH	Gauge port, high pressure	DIN 3852	M14 x 1.5 : 12 deep	5100(350)	X

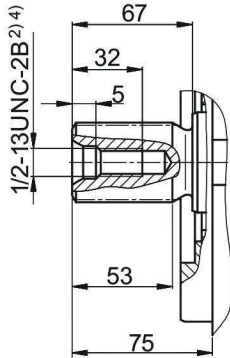
- 1) For the maximum tightening torques the general instructions on page A-64 must be observed.
- 2) Depending on the application, short-term pressure spikes can occur. Keep this in mind when selecting measuring equipment and fittings. Pressure values in bar absolute.
- 3) The dimension follow SAE J518, Metric fastening thread and standard thread are different.
- 4) The spot face can be deeper than as specified in the standard
- 5) Depending on the installation position, L or L₁ must be connected (the following page A-62、A-63, please check assembling instruction.)
O = Must be connected (plugged on delivery)
X = Plugged (in normal operation)

Dimensions size 140

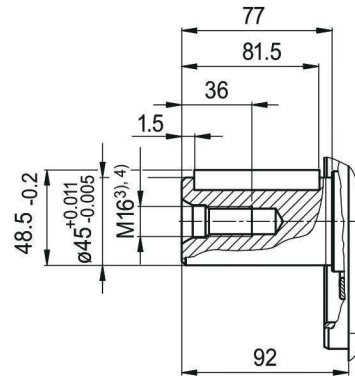
Before finalizing your design request a certified installation drawing.
Dimensions in (mm).

Drive

S Splined shaft 1 3/4 in
13T 8/16DP ¹⁾ (SAE J744)



P Parallel shaft key
DIN 6885 · A14x9x80



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

²⁾ Thread according to ASME B1.1

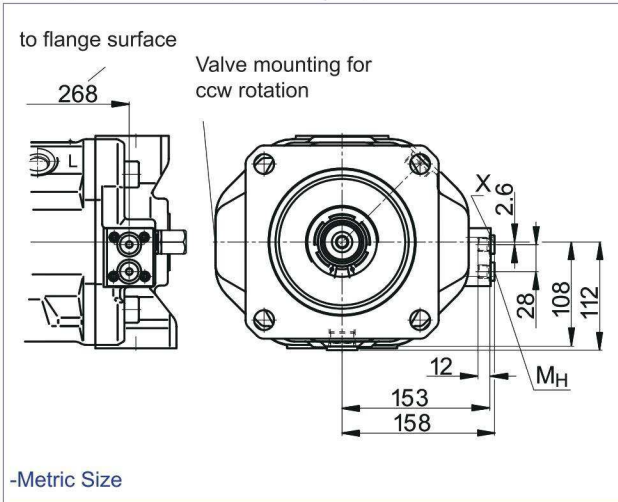
³⁾ Thread according to DIN 13

⁴⁾ For the maximum tightening torques the general instructions on page A-64 must be observed.

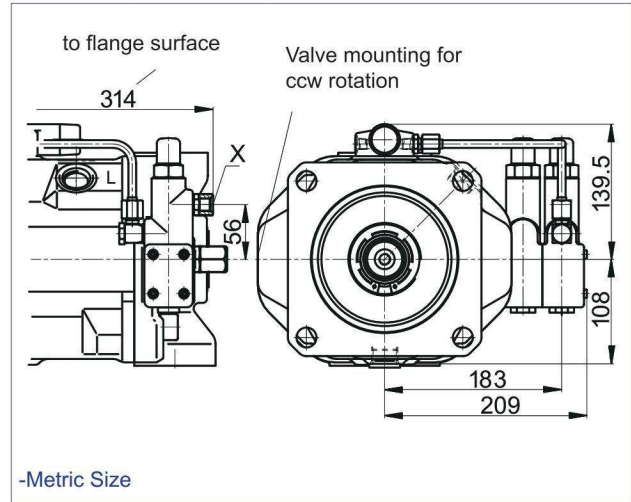
Dimensions size 140

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

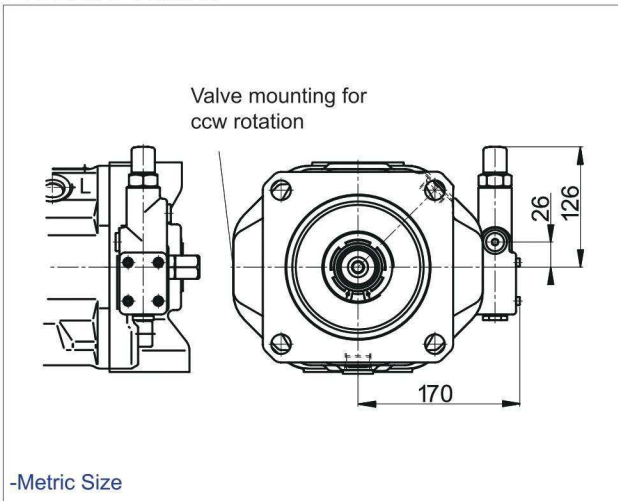
DG
Two-point control, directly operated



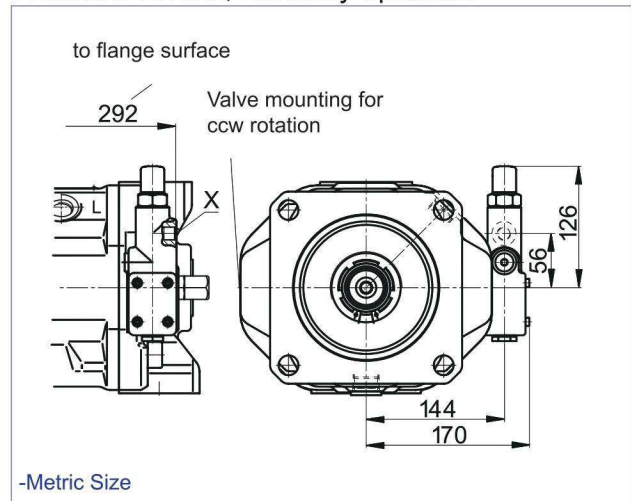
DFLR
Pressure, flow and power control



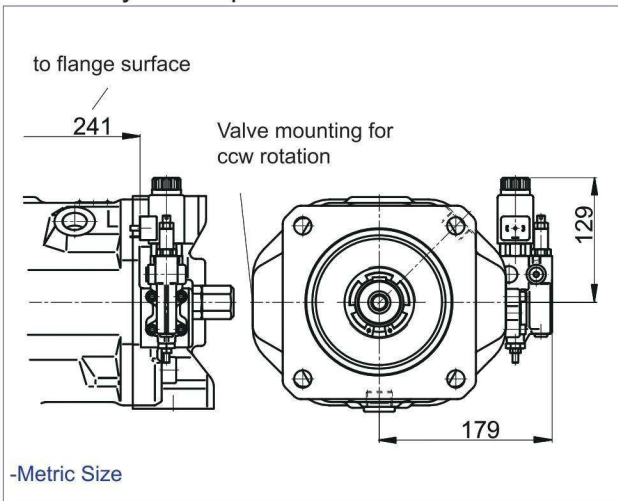
DR
Pressure control



DRG
Pressure control, remotely operated



ED7. / ER7.
Electro-hydraulic pressure control

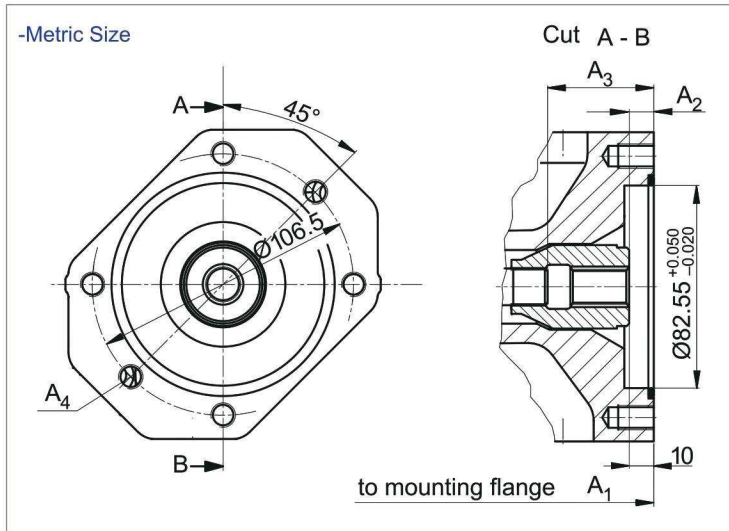


1) ER7.: 214 mm when using a sandwich plate pressure reducing valve.

Dimensions through drive

K01 flange ISO 3019-1 (SAE J744 - 82-2 (A))
Coupling for splined shaft according to ANSI B92.1a-1996

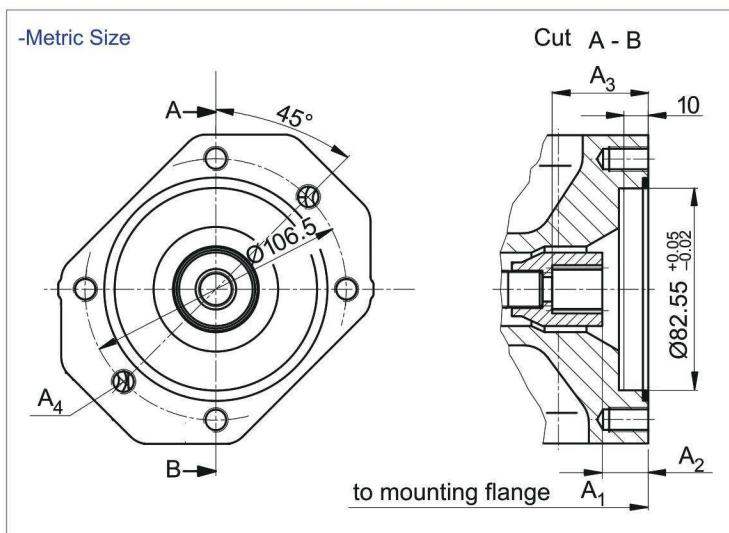
Before finalizing your design request a certified installation drawing.
Dimensions in (mm).



5/8 in 9T 16/32 DP¹⁾ (SAE J744 - 16-4 (A))

Inch (mm)				
NG	A ₁	A ₂	A ₃	A ₄ ²⁾
18	7.16 (182)	0.39 (10)	1.70 (43.3)	M10 x 1.5, 0.57(14.5) deep
28	8.03 (204)	0.39 (10)	1.33 (33.7)	M10 x 1.5, 0.62(16) deep
45	9.02 (229)	0.42 (10.7)	2.10 (53.4)	M10 x 1.5, 0.62(16) deep
71	10.51 (267)	0.46 (11.8)	2.41 (61.3)	M10 x 1.5, 0.78(20) deep
100	13.31 (338)	0.41 (10.5)	2.56 (65)	M10 x 1.5, 0.62(16) deep
140	13.78 (350)	0.43 (10.8)	3.04 (77.3)	M10 x 1.5, 0.62(16) deep

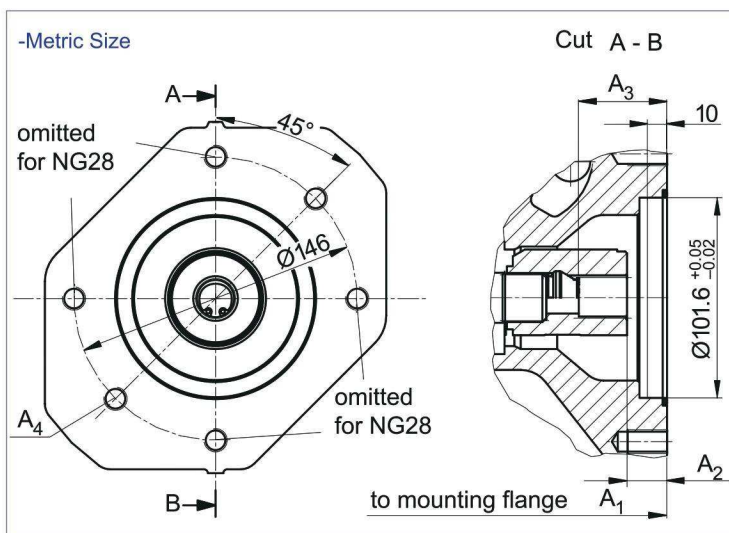
K52 flange ISO 3019-2 (SAE J744 - 82-2 (A))
Coupling for splined shaft according to ANSI B92.1a-1996



3/4 in 11T 16/32 DP¹⁾(SAE J744 - 19-4 (A-B))

Inch (mm)				
NG	A ₁	A ₂	A ₃	A ₄ ²⁾
18	7.16 (182)	0.74 (18.8)	1.52 (38.7)	M10 x 1.5, 0.57(14.5) deep
28	8.03 (204)	0.74 (18.8)	1.52 (38.7)	M10 x 1.5, 0.62(16) deep
45	9.02 (229)	0.744 (18.9)	1.52 (38.7)	M10 x 1.5, 0.62(16) deep
71	10.51 (267)	0.84 (21.3)	1.63 (41.4)	M10 x 1.5, 0.78(20) deep
100	13.31 (338)	0.75 (19)	1.53 (38.9)	M10 x 1.5, 0.62(16) deep
140	13.78 (350)	0.744 (18.9)	1.52 (38.6)	M10 x 1.5, 0.62(16) deep

K68 flange ISO 3019-2 (SAE J744 - 101-2 (B))
Coupling for splined shaft according to ANSI B92.1a-1996



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

Inch (mm)				
NG	A ₁	A ₂	A ₃	A ₄ ²⁾
28	8.03 (204)	0.70 (17.8)	1.64 (41.7)	M12x 1.75, continuous
45	9.02 (229)	0.704 (17.9)	1.64 (41.7)	M12 x 1.75, 0.71(18) deep
71	10.51 (267)	0.80 (20.3)	1.74 (44.1)	M12 x 1.75, 0.78(20) deep
100	13.31 (338)	0.71 (18)	1.65 (41.9)	M12 x 1.75, 0.78(20) deep
140	13.78 (350)	0.70 (17.8)	1.64 (41.6)	M12 x 1.75, 0.78(20) deep

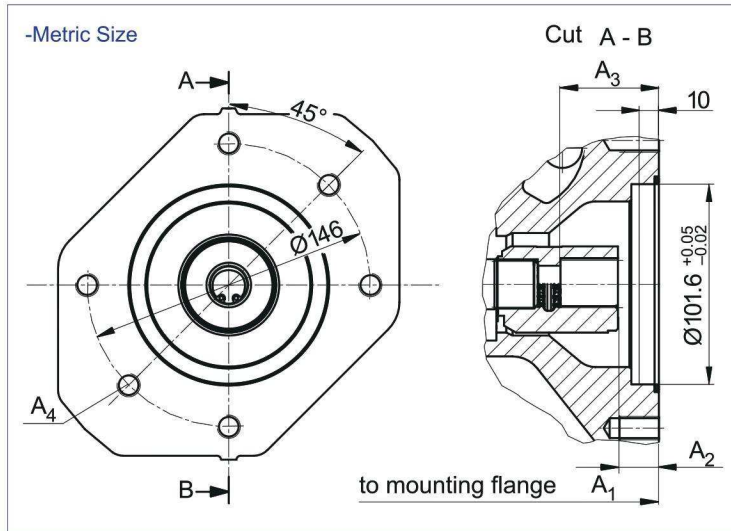
1) 30° pressure angle, flat root, side fit, tolerance class 5

2) Thread according to DIN 13, observe the general instructions on page A-64 for the maximum tightening torques.

Dimensions through drive

K04 flange ISO 3019-2 (SAE J744 - 101-2 (B))
Coupling for splined shaft according to ANSI B92.1a-1996

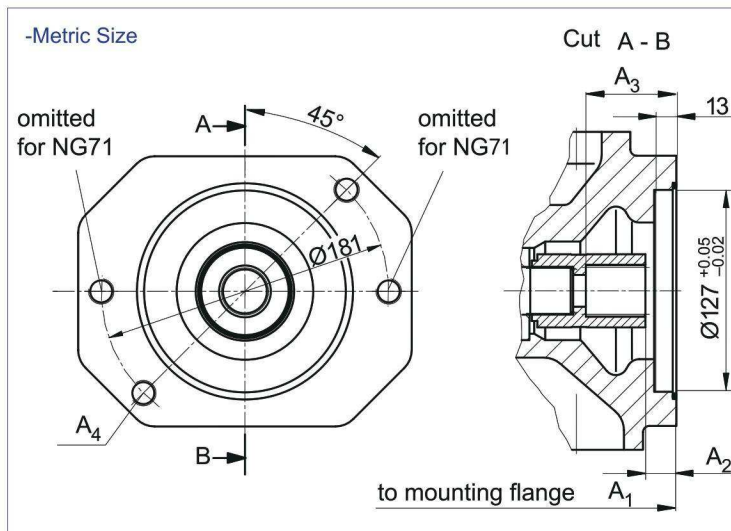
Before finalizing your design request a certified installation drawing.
Dimensions in (mm).



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

NG	A ₁	A ₂	A ₃	A ₄ ²⁾
45	9.02 (229)	0.724 (18.4)	1.84 (46.7)	M12 x 1.75, 0.71(18) deep
71	10.51 (267)	0.82 (20.8)	1.93 (49.1)	M12 x 1.75, 0.78(20) deep
100	13.31 (338)	0.716 (18.2)	1.83 (46.6)	M12 x 1.75, 0.78(20) deep
140	13.78 (350)	0.72 (18.3)	1.81 (45.9)	M12 x 1.75, 0.78(20) deep

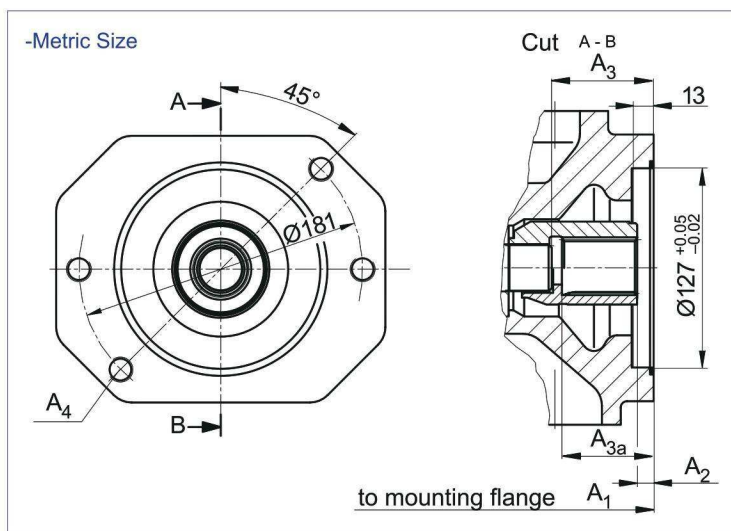
K07 flange ISO 3019-2 (SAE J744 - 127-2 (C))
Coupling for splined shaft according to ANSI B92.1a-1996



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

NG	A ₁	A ₂	A ₃	A ₄ ²⁾
71	10.51 (267)	0.86 (21.8)	2.31 (58.6)	M16 x 2, continuous
100	13.31 (338)	0.77 (19.5)	2.22 (56.4)	M6 x 2, continuous
140	13.78 (350)	0.76 (19.3)	2.21 (56.1)	M16 x 2, 0.94(24) deep

K24 flange ISO 3019-2 (SAE J744 - 127-2 (C))
Coupling for splined shaft according to ANSI B92.1a-1996



1 1/2 in 17T 12/24 DP¹⁾(SAE J744 - 38-4 (C-C))
Inch (mm)

NG	A ₁	A ₂	A ₃ ³⁾	A _{3a} ⁴⁾	A ₄ ²⁾
100	13.31 (338)	0.41 (10.5)	2.56 (65)	-	M16 x 2, continuous
140	13.78 (350)	0.42 (10.8)	2.95 (75)	-	M16 x 2, 0.94 (24) deep
	13.78 (350)	0.40 (10.3)	-	2.72 (69.1)	M16 x 2, 0.94 (24) deep

- 3) Coupling without stop
- 4) Coupling with stop

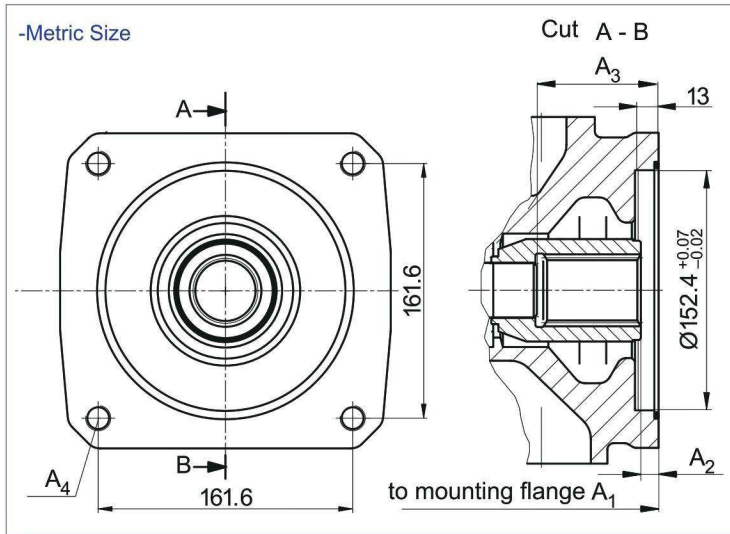
1) 30° pressure angle, flat root, side fit, tolerance class 5

2) Thread according to DIN 13, observe the general instructions on page A-64 for the maximum tightening torques.

Dimensions through drive

K17 flange ISO 3019-2 (SAE J744 - 152-4 (A))
Coupling for splined shaft according to ANSI B92.1a-1996

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

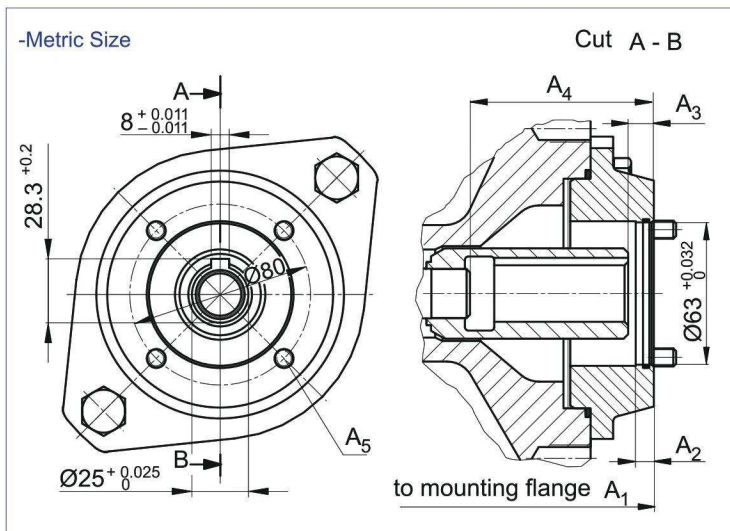


1 3/4 in 13T 8/16 DP ¹⁾ (SAE J744 - 44-4 (D))

Inch (mm)

NG	A ₁	A ₂	A ₃	A ₄ ²⁾
140	13.78 (350)	0.43 (11)	3.04 (77.3)	M6 x 2, continuous

K57 flange for mounting R4 radial piston pump of metric 4 hole
flange coupling for metric parallel shaft key.



mm

NG	A ₁	A ₂	A ₃	A ₄	A ₅ ³⁾
28	232	8	10.6	58.4	M8
45	257	8	11	81	M8
71	283	8	12.5	77	M10
100	354	8	10.5	81	M10
140	366	8	11	93	M8

1) 30° pressure angle, flat root, side fit, tolerance class 5°

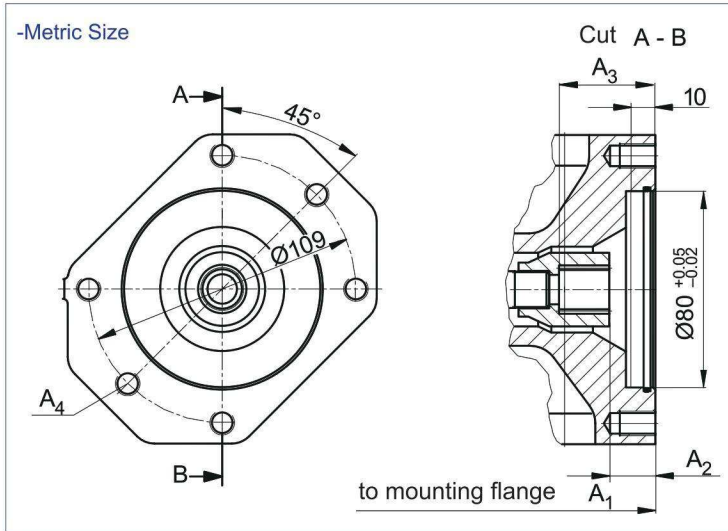
2) Thread according to DIN 13, observe the general instructions on page A-64 for the maximum tightening torques.

3) Screws for mounting the radial piston motor are included in the delivery contents.

Dimensions through drive

KB2 flange ISO 3019-2 - 80A2SW
Coupling for splined shaft according to ANSI B92.1a-1996

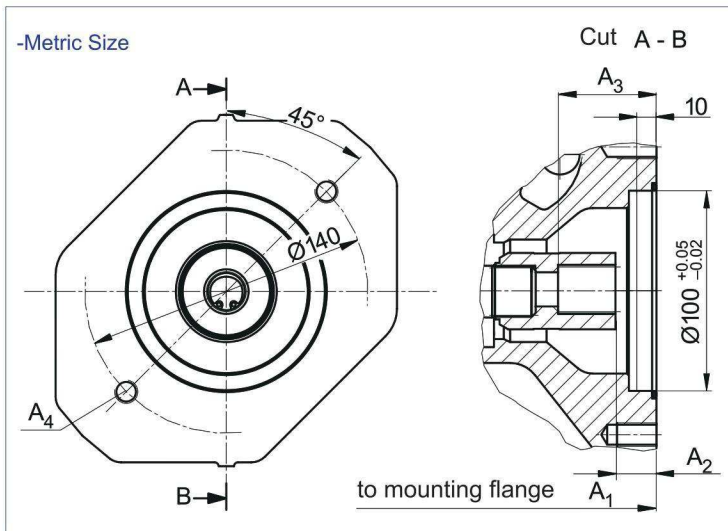
Before finalizing your design request a certified installation drawing.
Dimensions in (mm).



3/4 in 11T 16/32 DP ¹⁾ (SAE J744 - 19-4 (A-B))
mm

NG	A ₁	A ₂	A ₃	A ₄ ²⁾
18	182	18.8	38.7	M10 x 1.5 14.5 deep
28	204	18.8	38.7	M10 x 1.5 16 deep
45	229	18.9	38.7	M10 x 1.5 16 deep
71	267	21.3	41.4	M10 x 1.5 20 deep
100	338	19	38.9	M10 x 1.5 20 deep
140	350	18.9	38.6	M10 x 1.5 20 deep

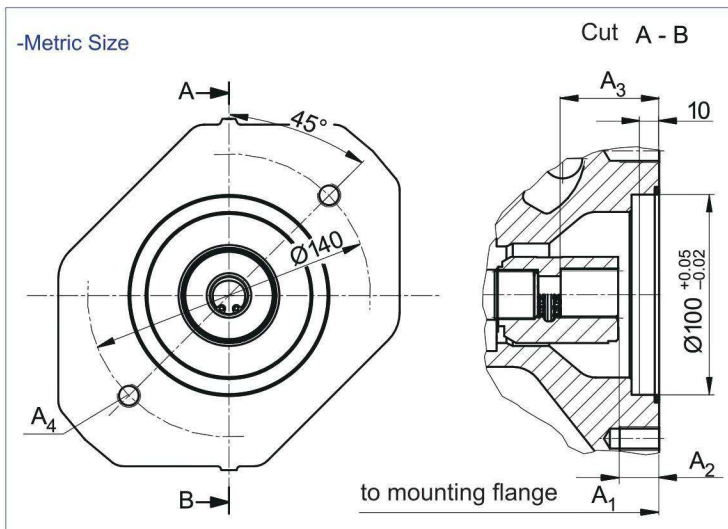
KB3 flange ISO 3019-2 - 100A2SW
Coupling for splined shaft according to ANSI B92.1a-1996



7/8 in 13T 16/32 DP ¹⁾ (SAE J744 - 22-4 (B))
mm

NG	A ₁	A ₂	A ₃	A ₄ ²⁾
28	204	17.8	41.7	M12 x 1.5 , continuous
45	229	17.9	41.7	M12 x 1.5 , continuous
71	267	20.3	44.1	M12 x 1.5 , 20 deep
100	338	18	41.9	M12 x 1.5 , 20 deep
140	350	17.8	41.6	M12 x 1.5 , 20 deep

KB4 flange ISO 3019-2 - 100A2SW
Coupling for splined shaft according to ANSI B92.1a-1996



1 in 15T 16/32 DP ¹⁾ (SAE J744 - 25-4 (B-B))
mm

NG	A ₁	A ₂	A ₃	A ₄ ²⁾
45	229	18.4	46.7	M12 x 1.75 , continuous
71	267	20.8	49.1	M12 x 1.75 , 20 deep
100	338	18.2	46.6	M12 x 1.75 , 20 deep
140	350	18.3	45.9	M12 x 1.75 , 20 deep

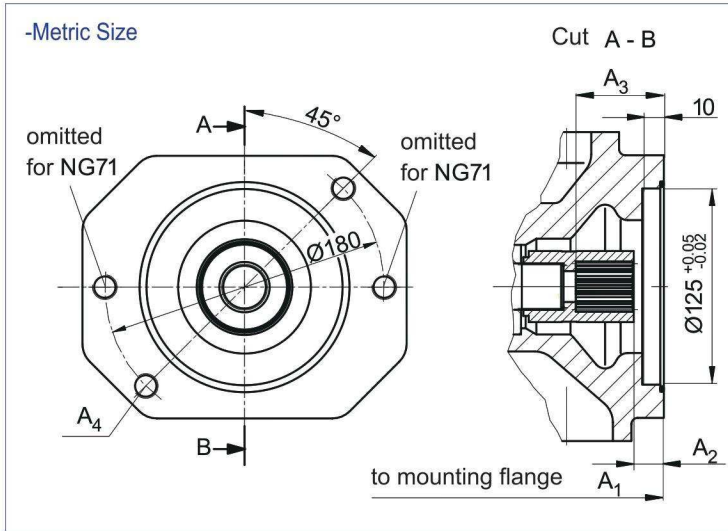
1) 30° pressure angle, flat root, side fit, tolerance class 5

2) Thread according to DIN 13, observe the general instructions on page A-64 for the maximum tightening torques.

Dimensions through drive

KB5 flange ISO 3019-2 - 125A2SW
Coupling for splined shaft according to ANSI B92.1a-1996

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

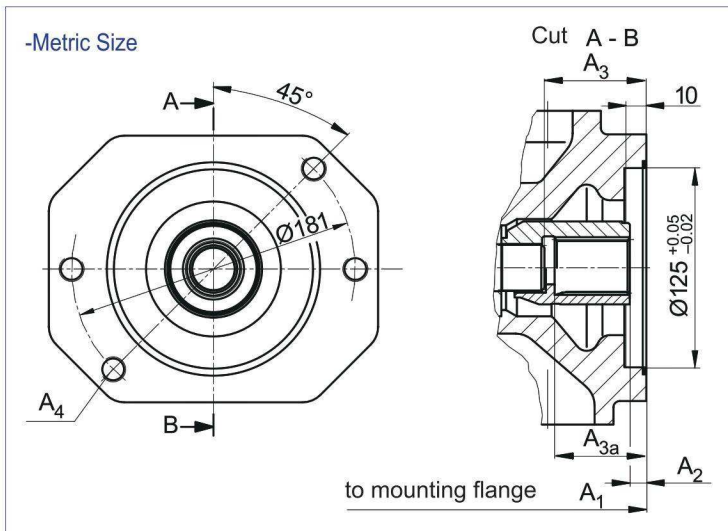


1 1/4 in 14T 12/24 DP ¹⁾ (SAE J744 - 32-4 (C))

mm

NG	A ₁	A ₂	A ₃	A ₄ ²⁾
71	267	21.8	58.6	M16 x 2 , continuous
100	338	19.5	56.4	M16 x 2 , continuous
140	350	19.3	56.1	M16 x 2 , 24 deep

KB6 flange ISO 3019-2 - 125A2SW
Coupling for splined shaft according to ANSI B92.1a-1996

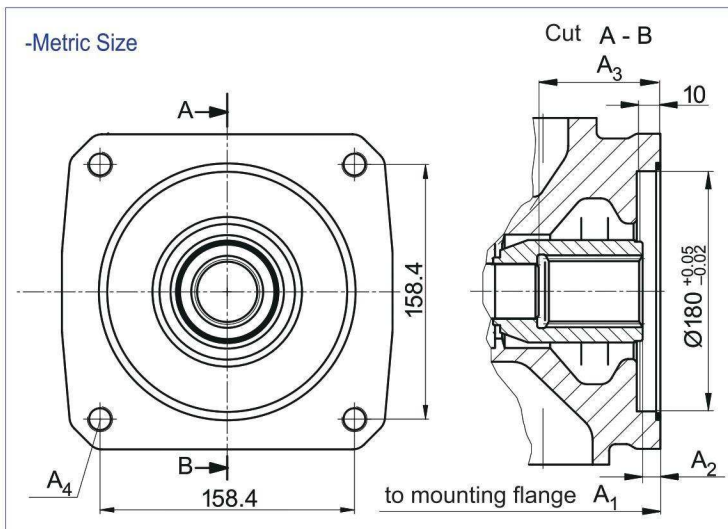


1 1/2 in 17T 12/24 DP ¹⁾ (SAE J744 - 38-4 (C-C))

mm

NG	A ₁	A ₂	A ₃ ³⁾	A _{3a} ⁴⁾	A ₄ ²⁾
100	338	10.5	65	-	M16 x 2 , continuous
140	350	10.8	75	-	M16 x 2 , 24 deep
	350	10.3	-	69.1	M16 x 2 , 24 deep

KB7 flange ISO 3019-2 - 180B4HW
Coupling for splined shaft according to ANSI B92.1a-1996



1 3/4 in 13T 8/16 DP ¹⁾ (SAE J744 - 44-4 (D))

mm

NG	A ₁	A ₂	A ₃	A ₄ ²⁾
140	350	11.3	77.3	M16 x 2 , continuous

3) Coupling without stop

4) Coupling with stop

1) 30° pressure angle, flat root, side fit, tolerance class 5

2) Thread according to DIN 13, observe the general instructions on page A-64 for the maximum tightening torques.

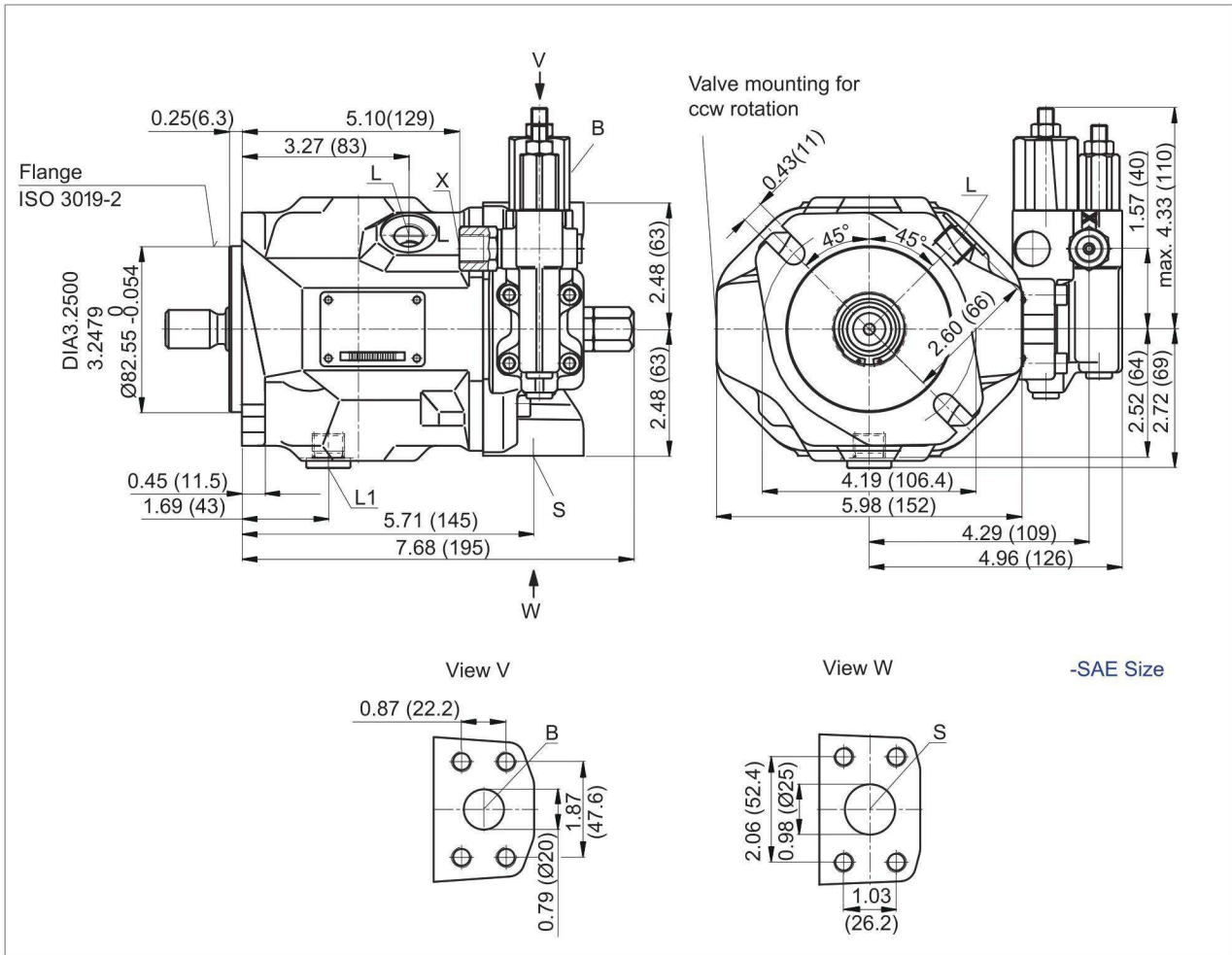
Dimensions size 18

DFR, DFR1 – Pressure and flow control, hydraulic

Before finalizing your design request a certified installation drawing.

Clockwise rotation

Dimensions in inches and (mm).



Ports

Designation	Port for	Standard	Size ¹⁾	Maximum pressure[psi(bar)] ²⁾	State
B	Service line, fastening thread	SAE J518 ASME B1.1	3/4 in 3/8-16 UNC-2B; 0.79 (20) deep	5100(350)	O
S	Suction line, fastening thread	SAE J518 ASME B1.1	1 in 3/8-16 UNC-2B; 0.79 (20) deep	145(10)	O
L	Case drain fluid	ISO 11926 ³⁾	9/16-18 UNF-2B; 0.47 (12) deep	30(2)	O ⁴⁾
L1	Case drain fluid	ISO 11926 ³⁾	9/16-18 UNF-2B; 0.47 (12) deep	30(2)	X ⁴⁾
X	Pilot pressure	ISO 11926 ³⁾	7/16-20 UNF-2B; 0.45 (12) deep	5100(350)	O
X	Pilot press. with DG-control	DIN ISO 228 ³⁾	G 1/4 in; 0.47 (12) deep	5100(350)	O

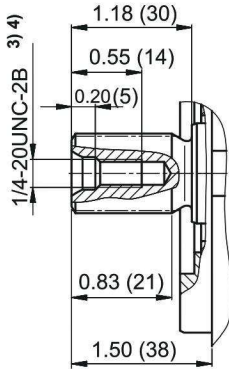
- 1) For the maximum tightening torques the general instructions on page A-64 must be observed.
- 2) Depending on the application, short-term pressure spikes can occur. Keep this in mind when selecting measuring equipment and fittings. Pressure values in bar absolute.
- 3) The spot face can be deeper than as specified in the standard.
- 4) Depending on the installation position, L or L1 must be connected (the following page A-62 \ A-63, please check assembling instruction.)
O = Must be connected (plugged on delivery)
X = Plugged (in normal operation)

Dimensions size 18

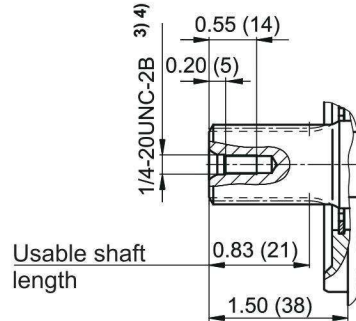
Before finalizing your design request a certified installation drawing.
Dimensions in inches and (mm).

Drive shaft

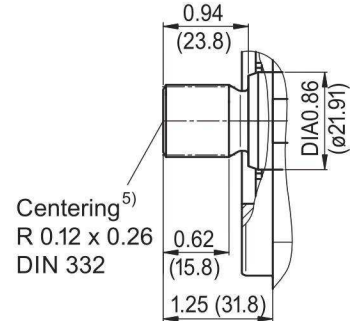
S Splined shaft 3/4 in
11T 16/32DP¹⁾ (SAE J744)



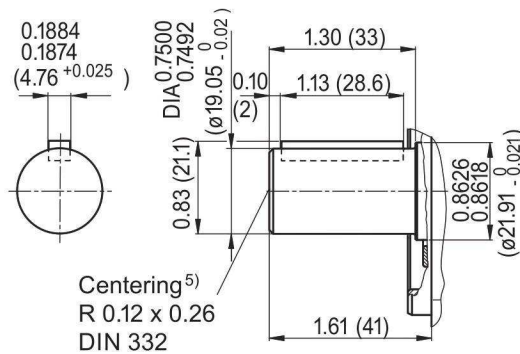
R Splined shaft 3/4 in
11T 16/32DP¹⁾²⁾ (SAE J744)



U Splined shaft 5/8 in
9T 16/32DP¹⁾ (SAE J744)



K Parallel shaft key
ISO 3019-1, 19-1

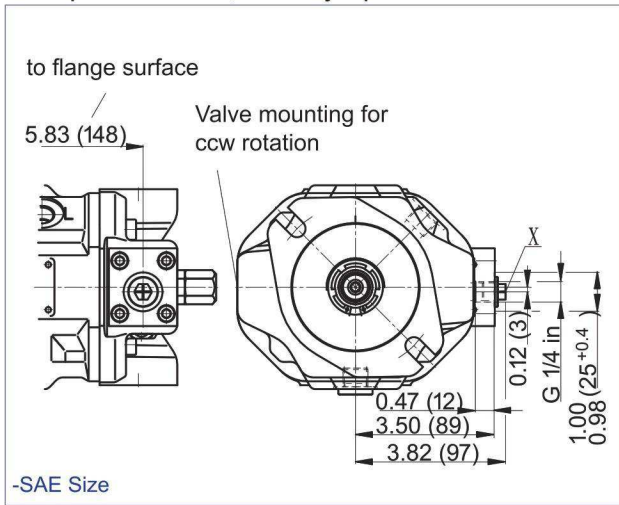


- 1) ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
- 2) Splines according to ANSI B92.1a, run out of spline is a deviation from standard
- 3) Thread according to ASME B1.1
- 4) For the maximum tightening torques the general instructions on page A-64 must be observed
- 5) Coupling axially secured, e.g. with a clamp coupling or radially mounted clamping screw

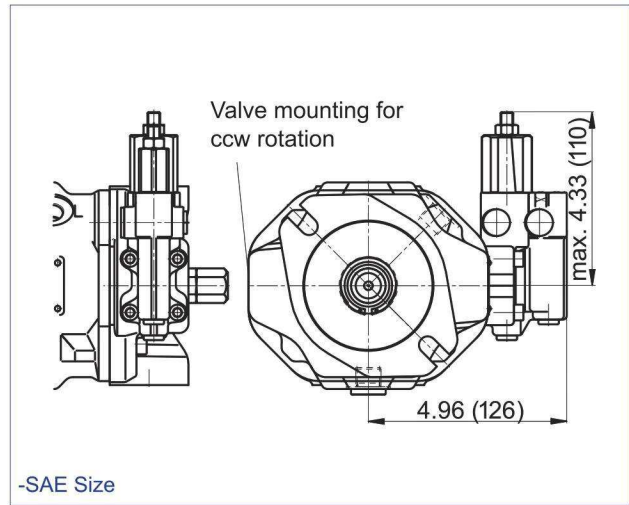
Dimensions size 18

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

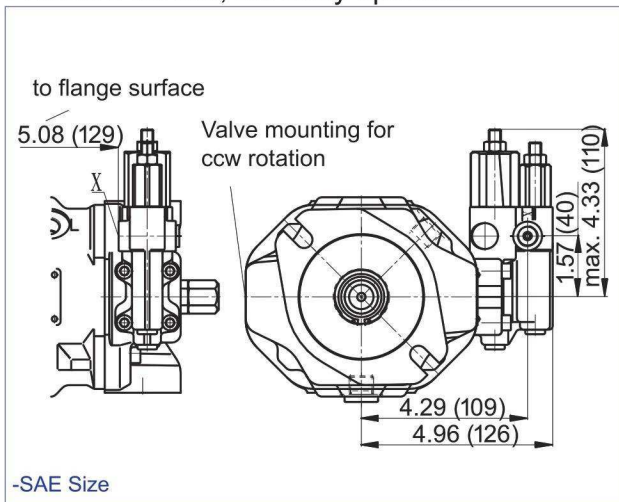
DG
Two-point control, directly operated



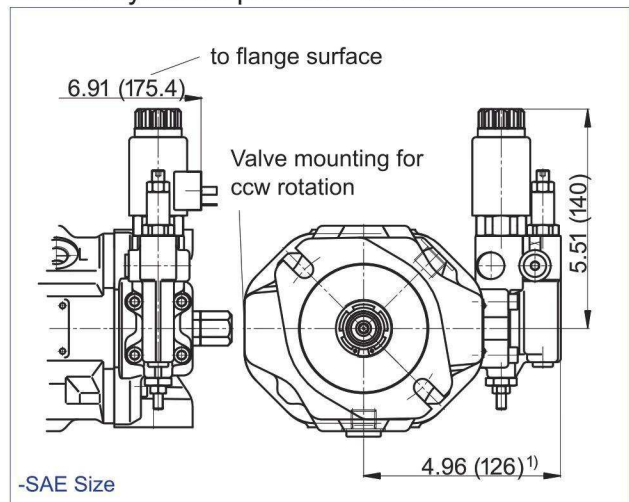
DR
Pressure control



DRG
Pressure control, remotely operated



ED7., ER7.
Electro-hydraulic pressure control



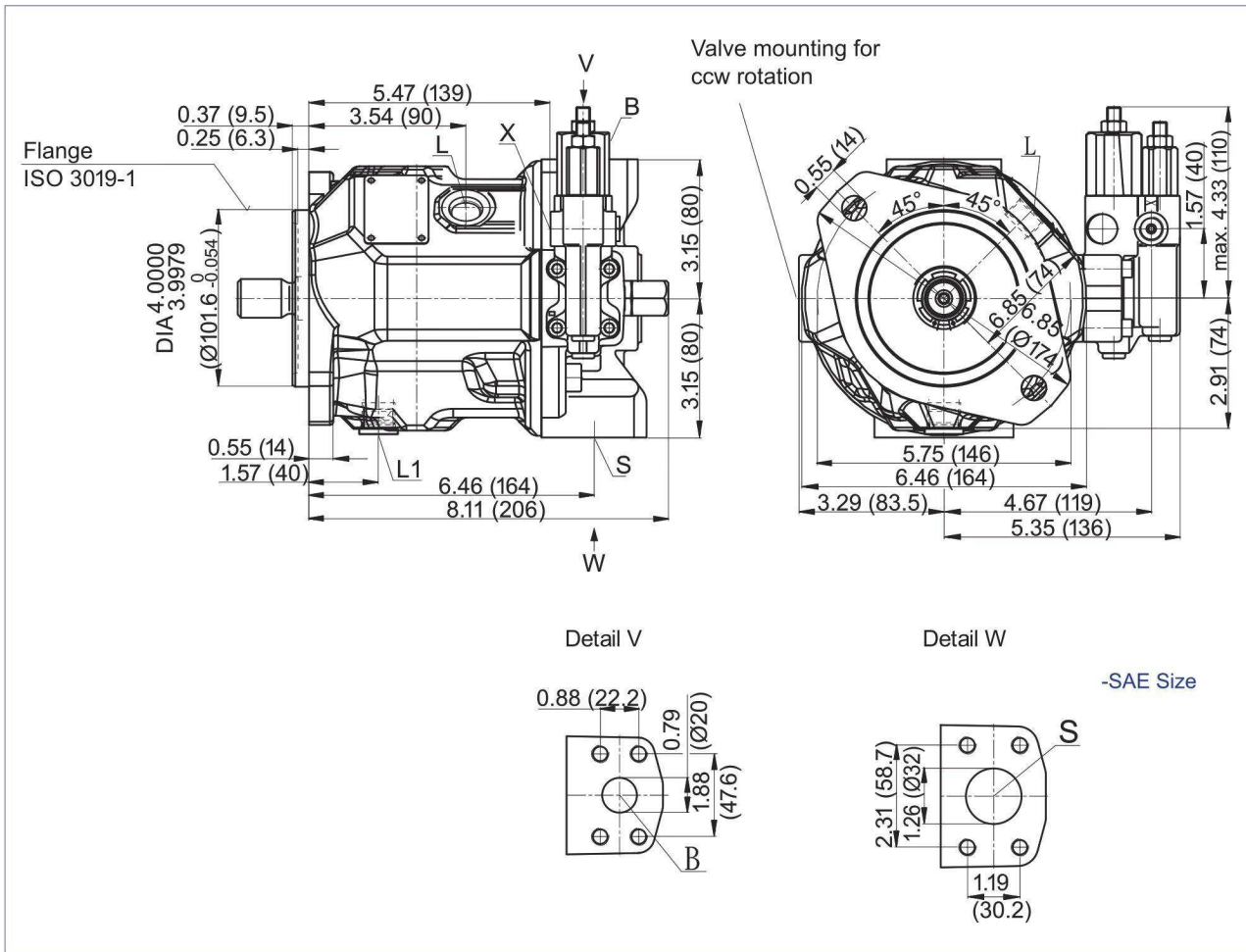
Dimensions size 28

DFR/DFR1 – Pressure and flow control, hydraulic

Before finalizing your design request a certified installation drawing.

Clockwise rotation

Dimensions in inches and (mm).



Ports

Designation	Port for	Standard	Size ¹⁾	Maximum pressure[psi(bar)] ²⁾	State
B	Service line, fastening thread	SAE J518 ASME B1.1	3/4 in 3/8-16 UNC-2B; 0.79 (20) deep	5100(350)	O
S	Suction line, fastening thread	SAE J518 ASME B1.1	1 1/4 in 7/16-14 UNC-2B; 0.94 (24) deep	145(10)	O
L	Case drain fluid	ISO 11926 ³⁾	3/4-16 UNF-2B; 0.47 (12) deep	30(2)	O ⁴⁾
L1	Case drain fluid	ISO 11926 ³⁾	3/4-16 UNF-2B; 0.47 (12) deep	30(2)	X ⁴⁾
X	Pilot pressure	ISO 11926 ³⁾	7/16-14 UNC-12B; 0.47 (12) deep	5100(350)	O
X	Pilot press. with DG-control	DIN ISO 228 ³⁾	G 1/4in; 0.47 (12) deep	5100(350)	O

- For the maximum tightening torques the general instructions on page A-64 must be observed.
- Depending on the application, short-term pressure spikes can occur. Keep this in mind when selecting measuring equipment and fittings. Pressure values in bar absolute.
- The spot face can be deeper than as specified in the standard.
- Depending on the installation position, L or L1 must be connected (the following page A-62、A-63, please check assembling instruction.)
 O = Must be connected (plugged on delivery)
 X = Plugged (in normal operation)

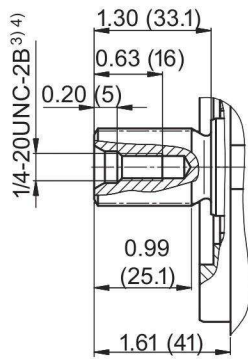
Dimensions size 28

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

Drive shaft

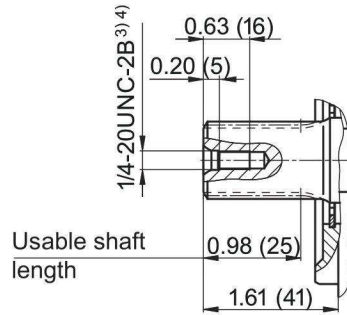
S

Splined shaft 7/8 in
13T 16/32DP ¹⁾(SAE J744)



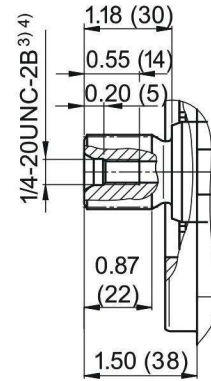
R

Splined shaft 7/8 in
13T 16/32DP ¹⁾²⁾(SAE J744)



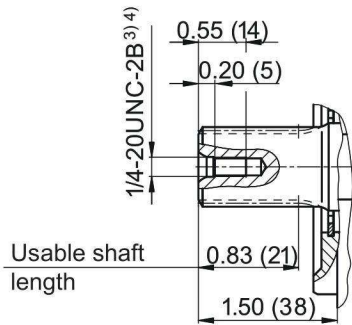
U

Splined shaft 3/4 in
11T 16/32DP ¹⁾(SAE J744)



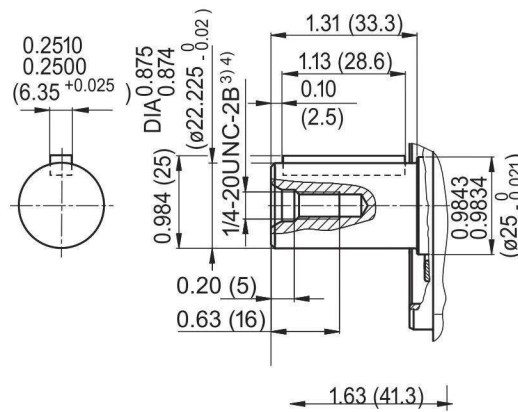
W

Splined shaft 3/4 in
11T 16/32DP ¹⁾²⁾(SAE J744)



K

Parallel shaft key
ISO 3019-1, 22-1

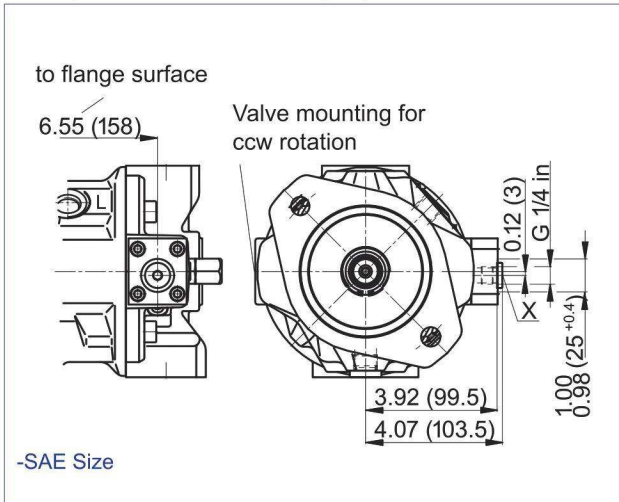


- 1) ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
- 2) Splines according to ANSI B92.1a, run out of spline is a deviation from standard
- 3) Thread according to ASME B1.1
- 4) For the maximum tightening torques the general instructions on page A-64 must be observed.

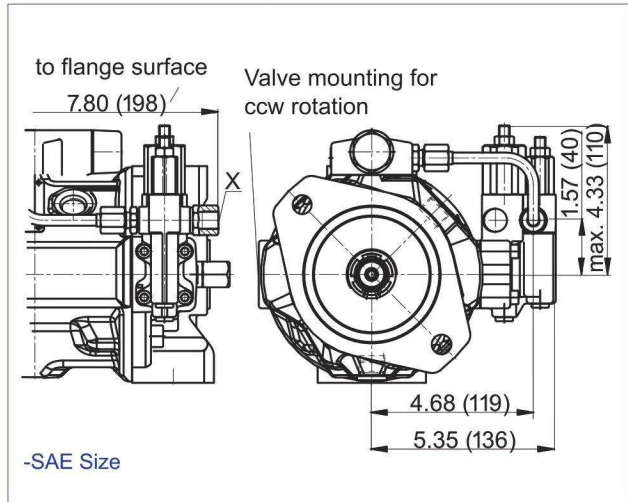
Dimensions size 28

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

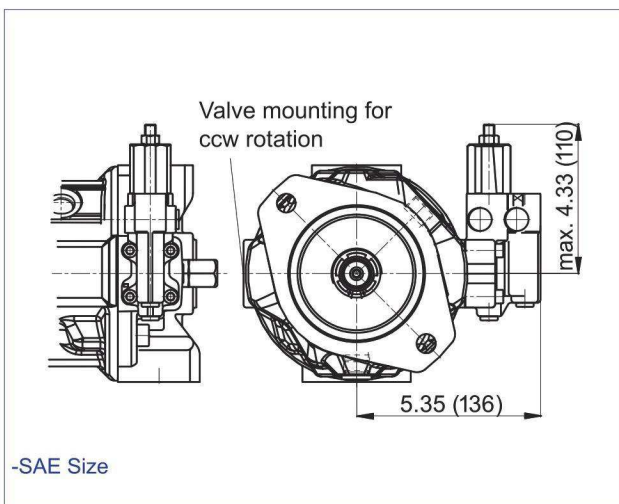
DG
Two-point control, directly operated



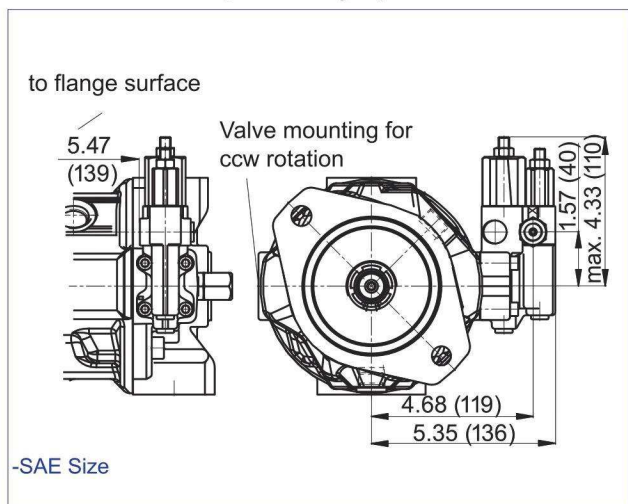
DFLR
Pressure, flow and power control



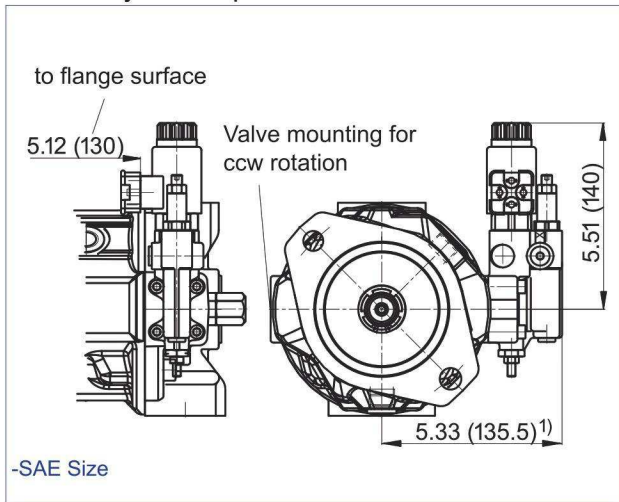
DR
Pressure control



DRG
Pressure control, remotely operated



ED7. / ER7.
Electro-hydraulic pressure control



¹⁾ ER7.: 170.5 mm when using a sandwich plate pressure reducing valve.
For details of connection options and drive shafts, see also page A-42 and A-43.

Dimensions size 45

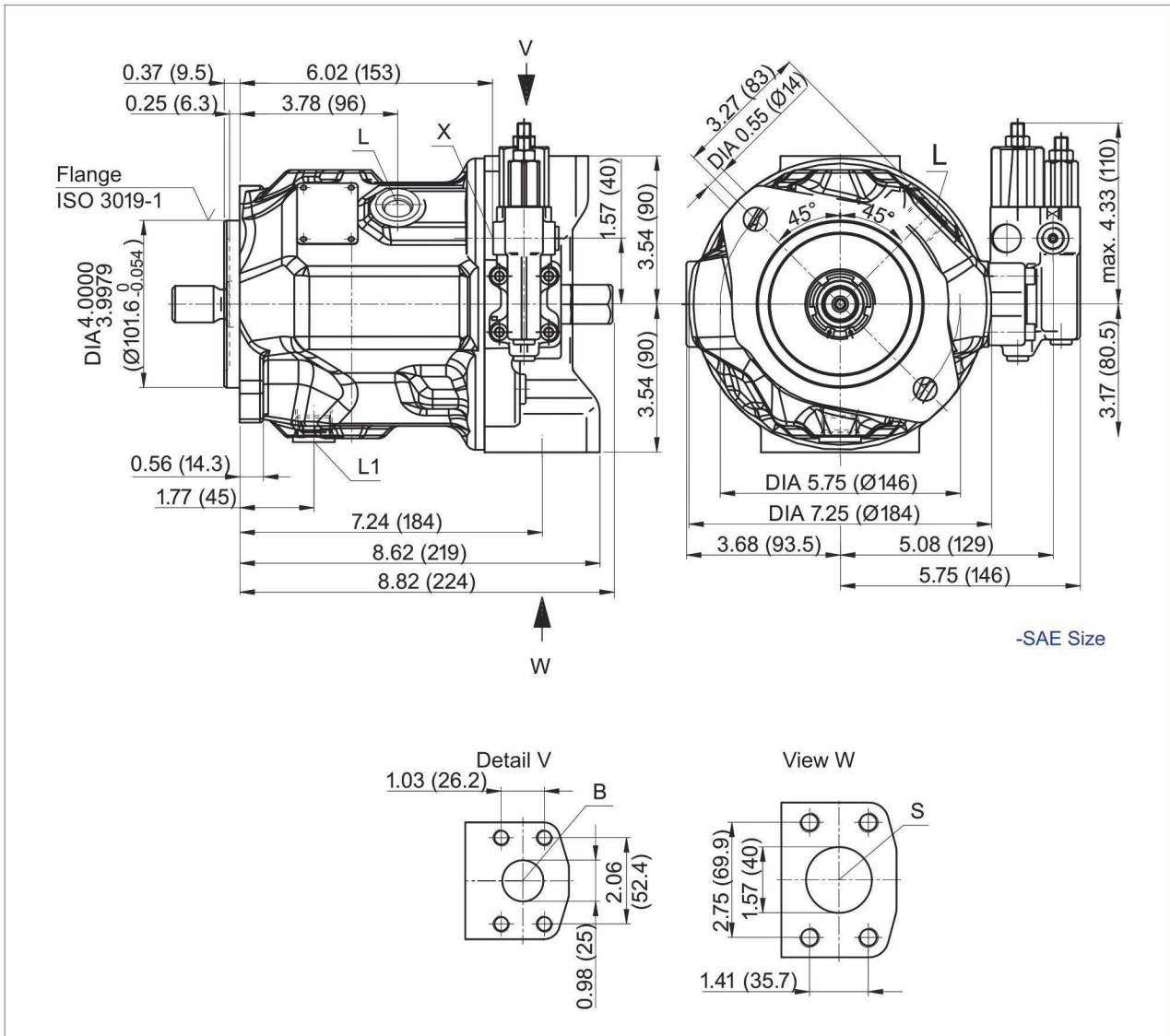
DFR/DFR1 – Pressure and flow control, hydraulic

Before finalizing your design request a certified

installation drawing.

Clockwise rotation

Dimensions in inches and (mm).



Ports

Designation	Port for	Standard	Size ¹⁾	Maximum pressure[psi(bar)] ²⁾	State
B	Service line, fastening thread	SAE J518 ASME B1.1	1 in 3/8-16 UNC-2B; 0.71 (18) deep	5100(350)	O
S	Suction line, fastening thread	SAE J518 ASME B1.1	1 1/2 in 1/2-13 UNC-2B; 0.87 (22) deep	145(10)	O
L	Case drain fluid	ISO 11926 ³⁾	7/8-14 UNF-2B; 0.55 (14) deep	30(2)	O ⁴⁾
L1	Case drain fluid	ISO 11926 ³⁾	7/8-14 UNF-2B; 0.55 (14) deep	30(2)	X ⁴⁾
X	Pilot pressure	ISO 11926 ³⁾	7/16-20 UNF-2B; 0.45 (12) deep	5100(350)	O
X	Pilot press. with DG-control	DIN ISO 228 ³⁾	G 1/4 in	5100(350)	O

1) For the maximum tightening torques the general instructions on page A-64 must be observed.

2) Depending on the application, short-term pressure spikes can occur. Keep this in mind when selecting measuring equipment and fittings. Pressure values in bar absolute.

3) The spot face can be deeper than as specified in the standard.

4) Depending on the installation position, L or L1 must be connected (the following page A-62 \ A-63, please check assembling instruction.)

O = Must be connected (plugged on delivery)

X = Plugged (in normal operation)

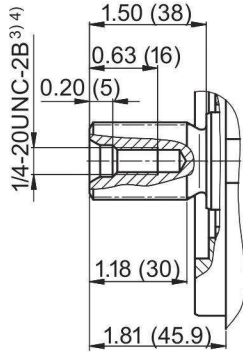
Dimensions size 45

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

Drive shaft

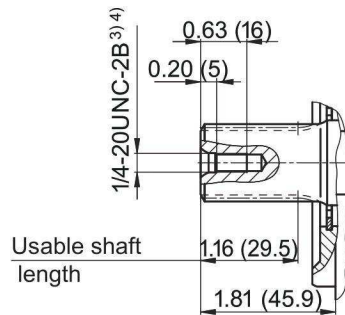
S

Splined shaft 1 in
15T 16/32DP¹⁾ (SAE J744)



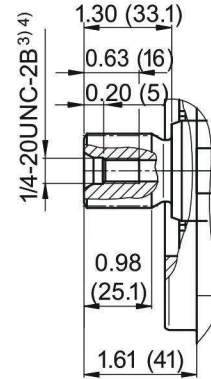
R

Splined shaft 1 in
15T 16/32DP¹⁾²⁾ (SAE J744)



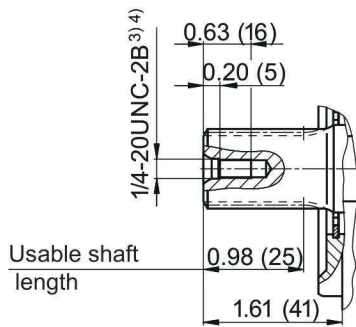
U

Splined shaft 7/8 in
13T 16/32DP¹⁾ (SAE J744)



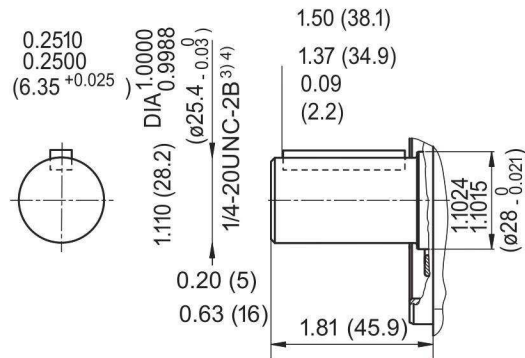
W

Splined shaft 7/8 in
13T 16/32DP¹⁾²⁾ (SAE J744)



K

Parallel shaft key
ISO 3019-1, 25-1

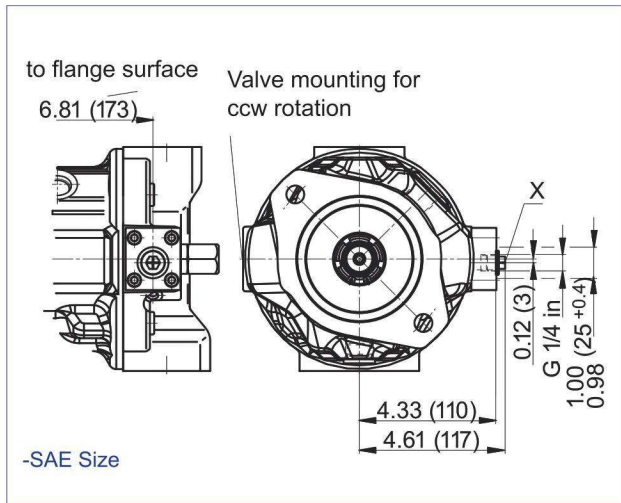


- 1) ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
- 2) Splines according to ANSI B92.1a, run out of spline is a deviation from standard
- 3) Thread according to ASME B1.1
- 4) For the maximum tightening torques the general instructions on page A-64 must be observed.

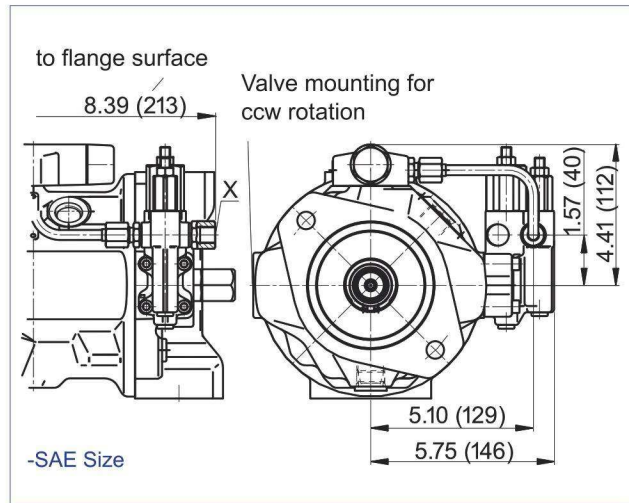
Dimensions size 45

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

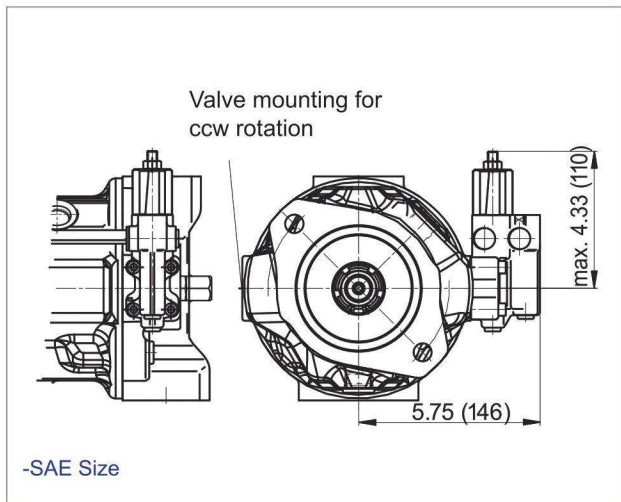
DG
Two-point control, directly operated



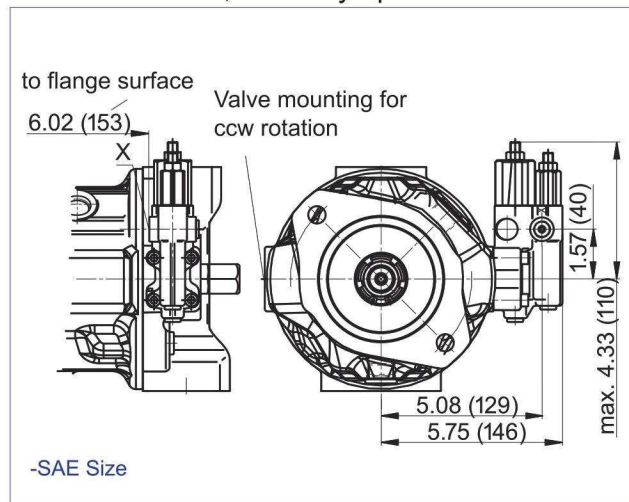
DFLR
Pressure, flow and power control



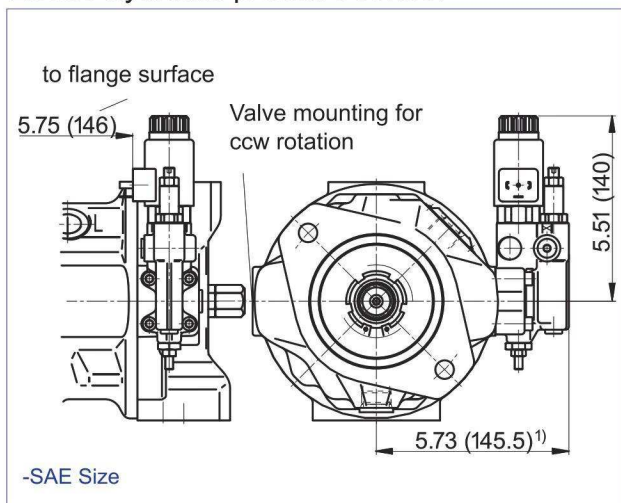
DR
Pressure control



DRG
Pressure control, remotely operated



ED7. / ER7.
Electro-hydraulic pressure control



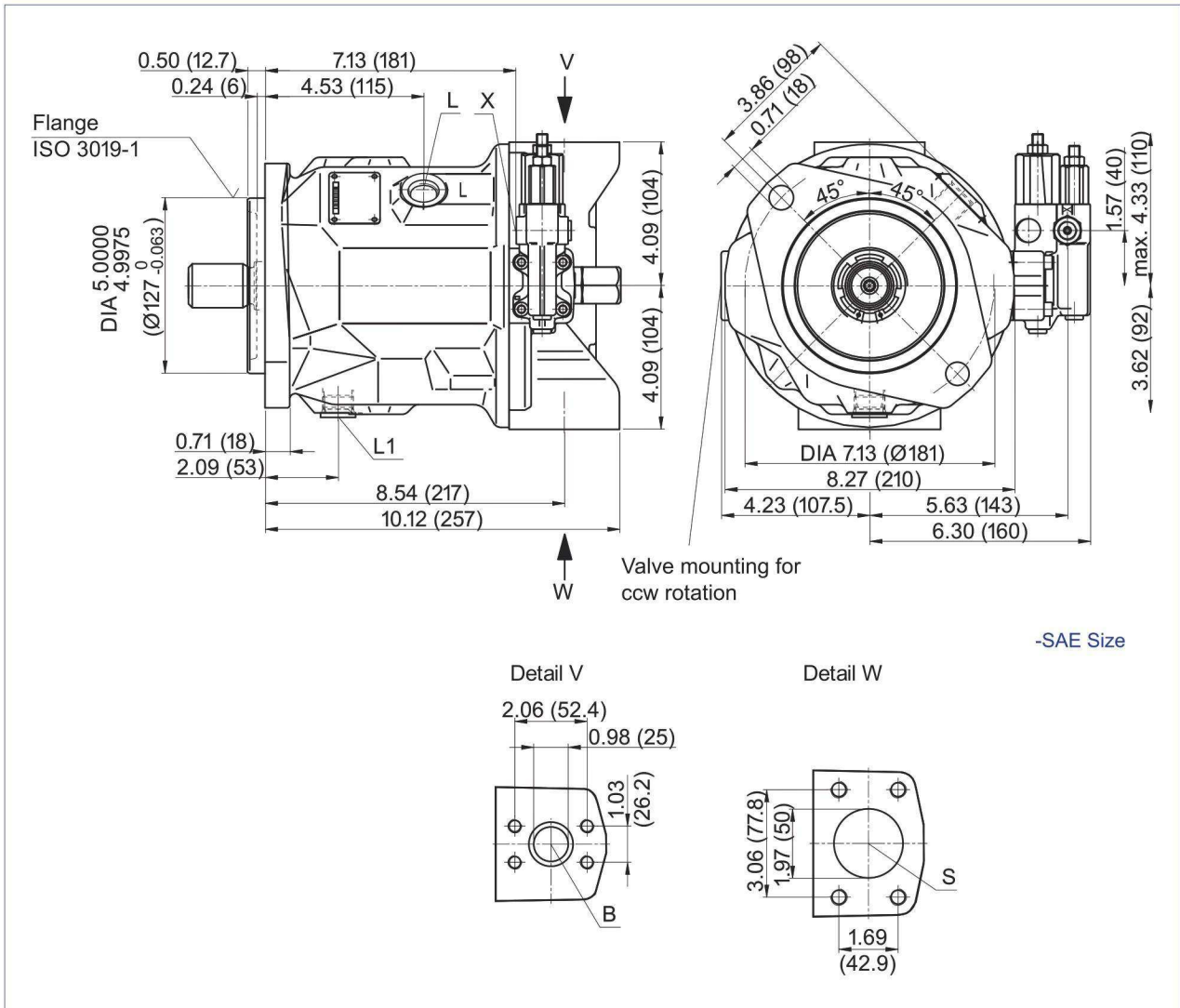
¹⁾ ER7.: 180.5 mm if using a sandwich plate pressure reducing valve.

Dimensions size 71

DFR/DFR1 – Pressure and flow control, hydraulic

Clockwise rotation

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



Ports

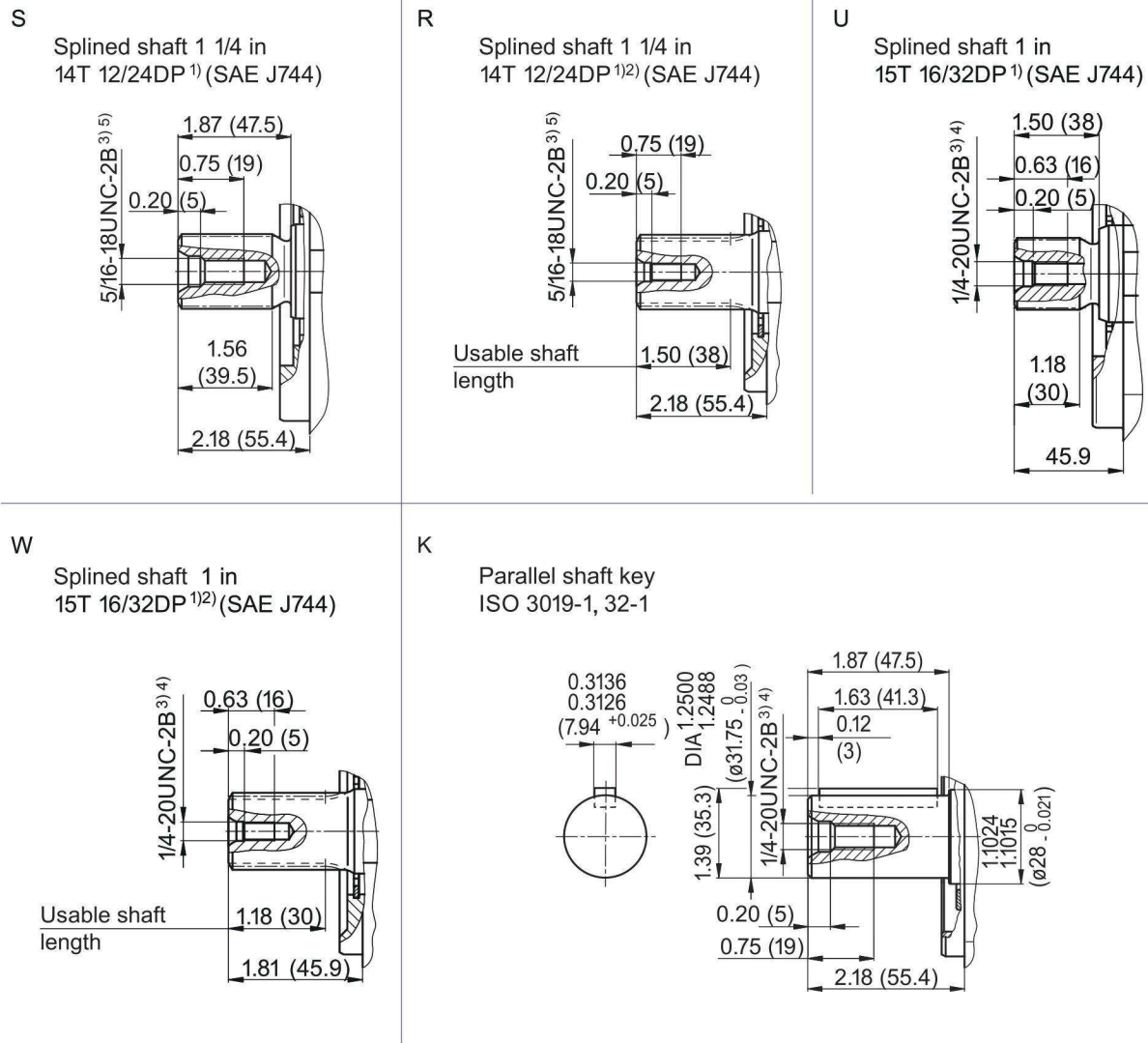
Designation	Port for	Standard	Size ¹⁾	Maximum pressure[psi(bar)] ²⁾	State
B	Service line, fastening thread	SAE J518 ASME B1.1	1 in 3/8-16 UNC-2B; 0.71 (18) deep	5100(350)	O
S	Suction line, fastening thread	SAE J518 ASME B1.1	2 in 1/2-13 UNC-2B; 0.87 (22) deep	145(10)	O
L	Case drain fluid	ISO 11926 ³⁾	7/8-14 UNF-2B; 0.55 (14) deep	30(2)	O ⁴⁾
L1	Case drain fluid	ISO 11926 ³⁾	7/8-14 UNF-2B; 0.55 (14) deep	30(2)	X ⁴⁾
X	Pilot pressure	ISO 11926 ³⁾	7/16-20 UNF-2B; 0.45 (12) deep	5100(350)	O
X	Pilot press. with DG-control	DIN ISO 228 ³⁾	G 1/4 in	5100(350)	O

- 1) For the maximum tightening torques the general instructions on page A-64 must be observed.
- 2) Depending on the application, short-term pressure spikes can occur. Keep this in mind when selecting measuring equipment and fittings. Pressure values in bar absolute.
- 3) The spot face can be deeper than as specified in the standard.
- 4) Depending on the installation position, L or L1 must be connected (the following page A-62、A-63, please check assembling instruction.)
O = Must be connected (plugged on delivery)
X = Plugged (in normal operation)

Dimensions size 71

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

Drive shaft

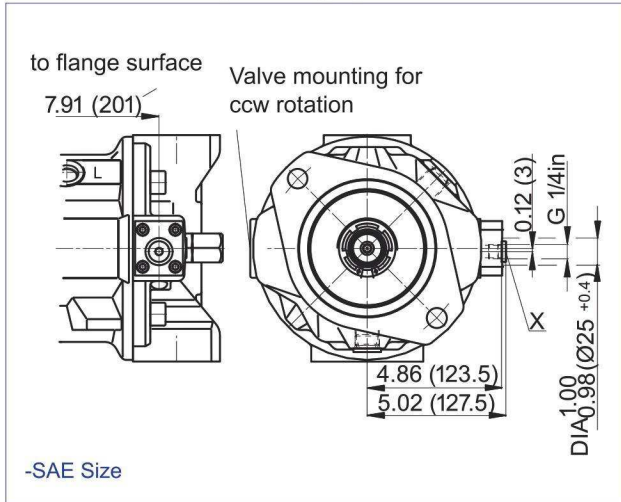


- 1) ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
- 2) Splines according to ANSI B92.1a, run out of spline is a deviation from standard
- 3) Thread according to ASME B1.1
- 4) For the maximum tightening torques the general instructions on page A-64 must be observed.

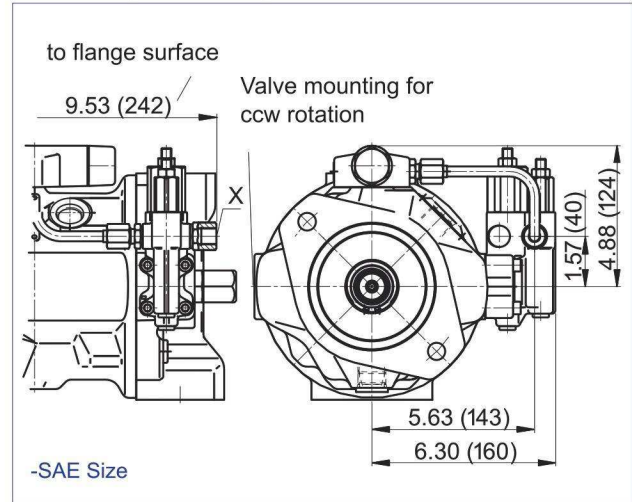
Dimensions size 71

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

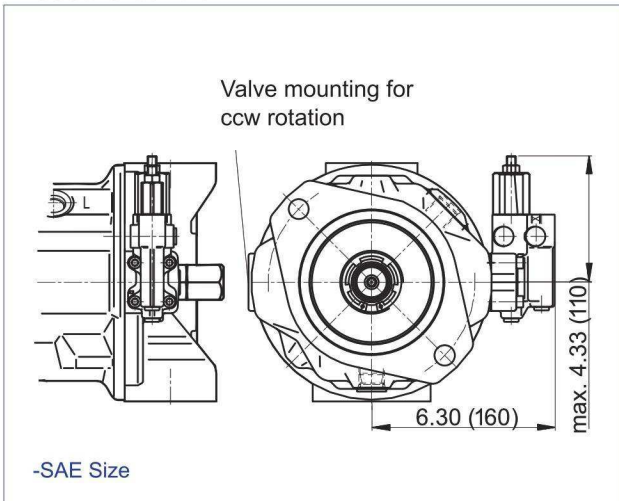
DG
Two-point control, directly operated



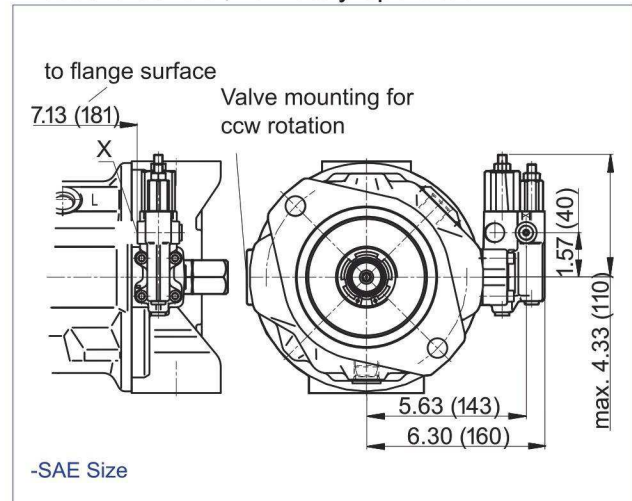
DFLR
Pressure, flow and power control



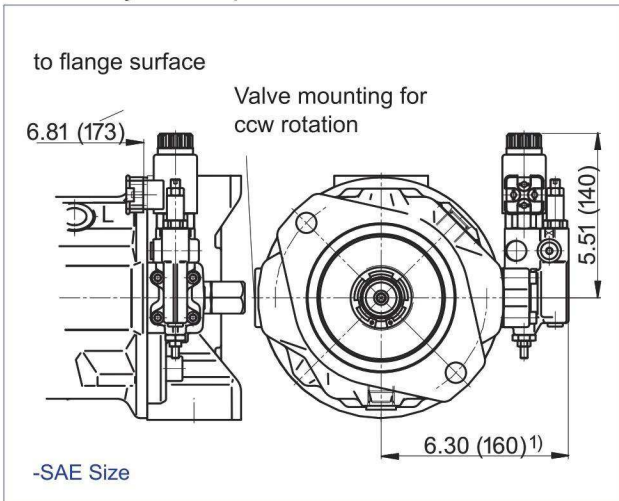
DR
Pressure control



DRG
Pressure control, remotely operated



ED7. / ER7.
Electro-hydraulic pressure control



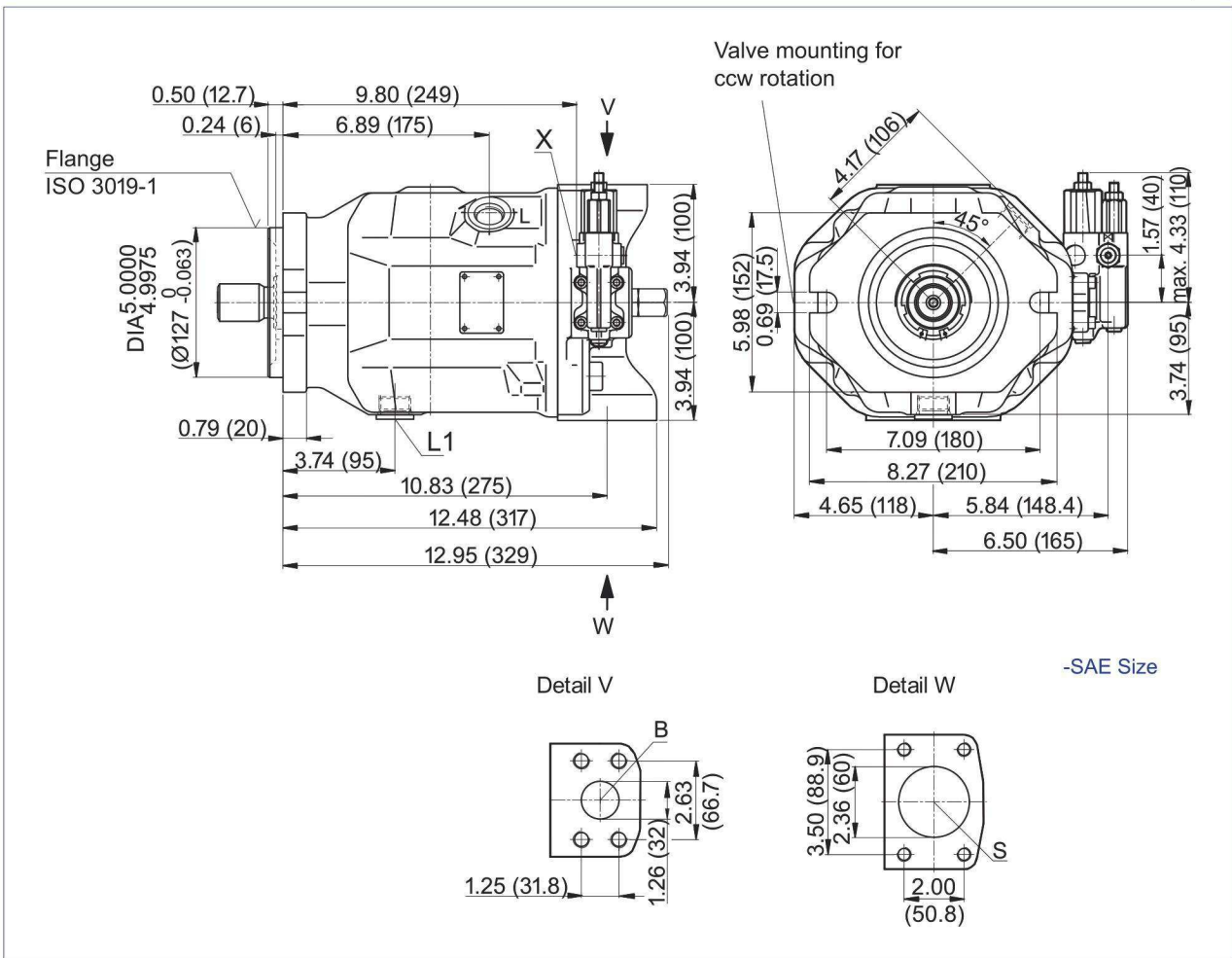
1) ER7.: 195 mm if using a sandwich plate pressure reducing valve.

Dimensions size 100

DFR/DFR1 – Pressure and flow control, hydraulic

Clockwise rotation

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



Ports

Designation	Port for	Standard	Size ¹⁾	Maximum pressure[psi(bar)] ²⁾	State
B	Service line, fastening thread	SAE J518 ASME B1.1	1 1/4 in 1/2-13 UNC-2B; 0.75 (19) deep	5100(350)	O
S	Suction line, fastening thread	SAE J518 ASME B1.1	2 1/2 in 1/2-13 UNC-2B; 1.06 (27) deep	145(10)	O
L	Case drain fluid	ISO 11926 ³⁾	1 1/16-12 UNF-2B; 0.63 (16) deep	30(2)	O ⁴⁾
L1	Case drain fluid	ISO 11926 ³⁾	1 1/16-12 UNF-2B; 0.63 (16) deep	30(2)	X ⁴⁾
X	Pilot pressure	ISO 11926 ³⁾	7/16-20 UNF-2B; 0.45 (12) deep	5100(350)	O
X	Pilot press. with DG-control	DIN ISO 228 ³⁾	G 1/4 in	5100(350)	O

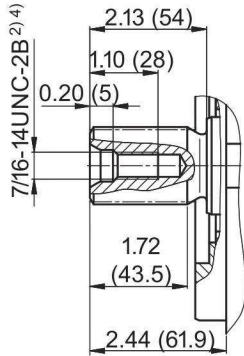
- 1) For the maximum tightening torques the general instructions on page A-64 must be observed.
- 2) Depending on the application, short-term pressure spikes can occur. Keep this in mind when selecting measuring equipment and fittings. Pressure values in bar absolute.
- 3) The spot face can be deeper than as specified in the standard.
- 4) Depending on the installation position, L or L1 must be connected (the following page A-62、A-63, please check assembling instruction.)
O = Must be connected (plugged on delivery)
X = Plugged (in normal operation)

Dimensions size 100

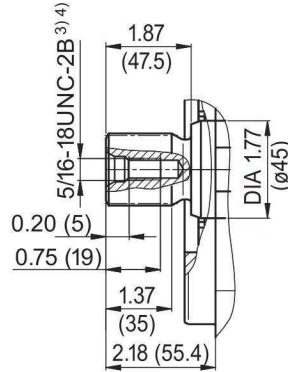
Before finalizing your design request a certified installation drawing.
Dimensions in inches and (mm).

Drive shaft

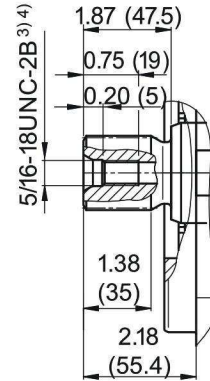
S
Splined shaft 1 1/2 in
17T 12/24DP ¹⁾(SAE J744)



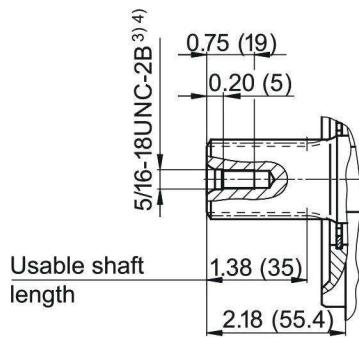
R
Splined shaft 1 1/4 in
14T 12/24DP ¹⁾²⁾(SAE J744)



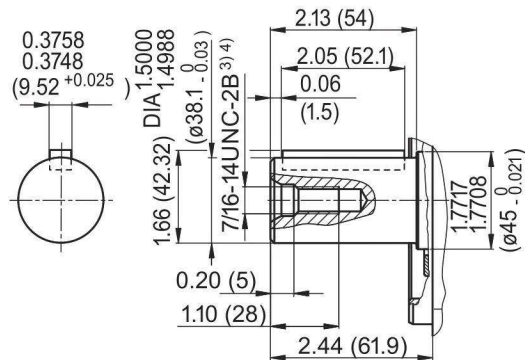
U
Splined shaft 1 1/4 in
14T 12/24DP ¹⁾(SAE J744)



W
Splined shaft 1 1/4 in
14T 12/24DP ¹⁾²⁾(SAE J744)



K
Parallel shaft key
ISO 3019-1, 38-1

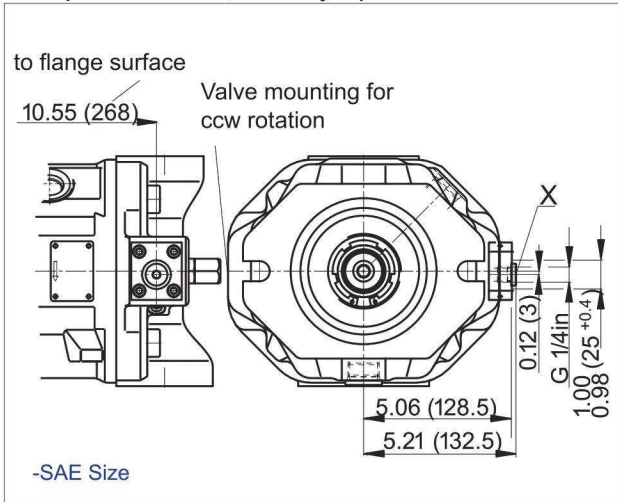


- 1) ANSI B92.1a, 30° pressure angle, flat root, side fit, tolerance class 5
- 2) Splines according to ANSI B92.1a, run out of spline is a deviation from standard
- 3) Thread according to ASME B1.1
- 4) For the maximum tightening torques the general instructions on page A-64 must be observed.

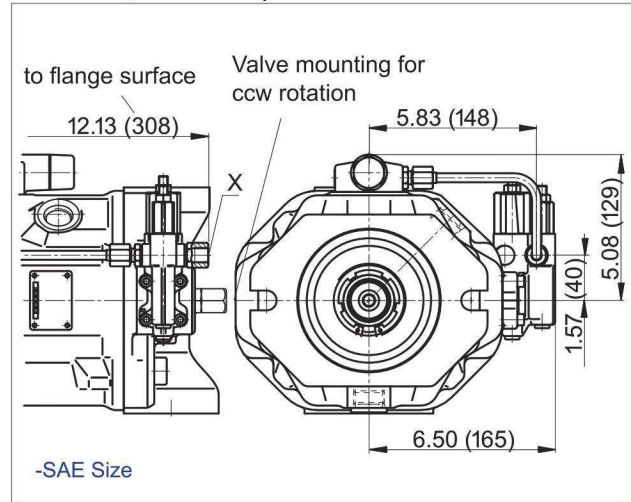
Dimensions size 100

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

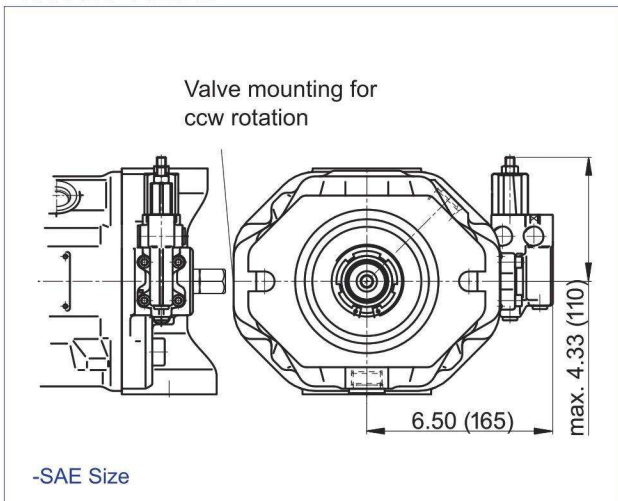
DG
Two-point control, directly operated



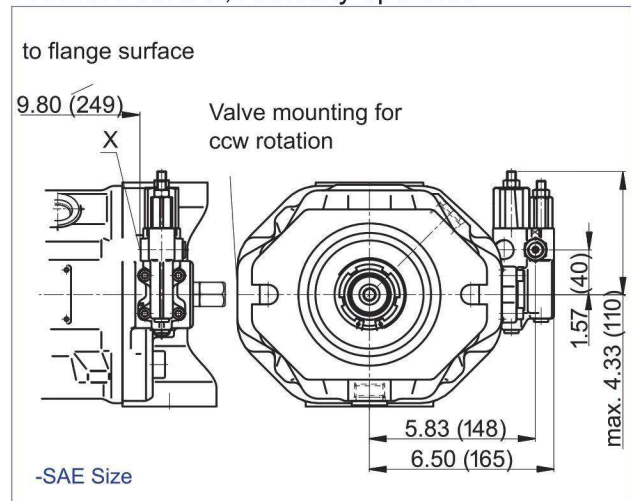
DFLR
Pressure, flow and power control



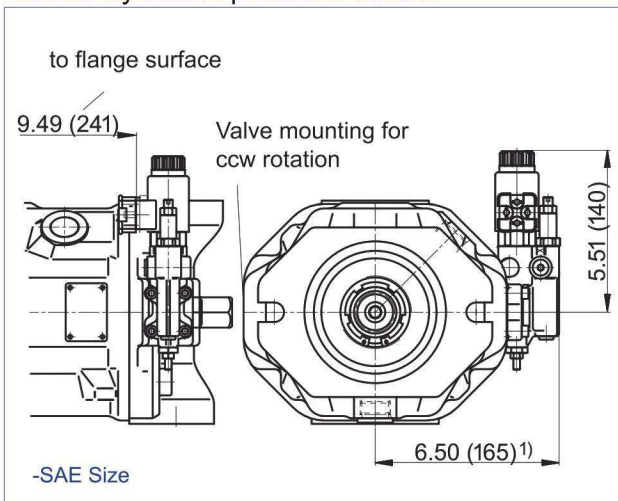
DR
Pressure control



DRG
Pressure control, remotely operated



ED7. / ER7.
Electro-hydraulic pressure control



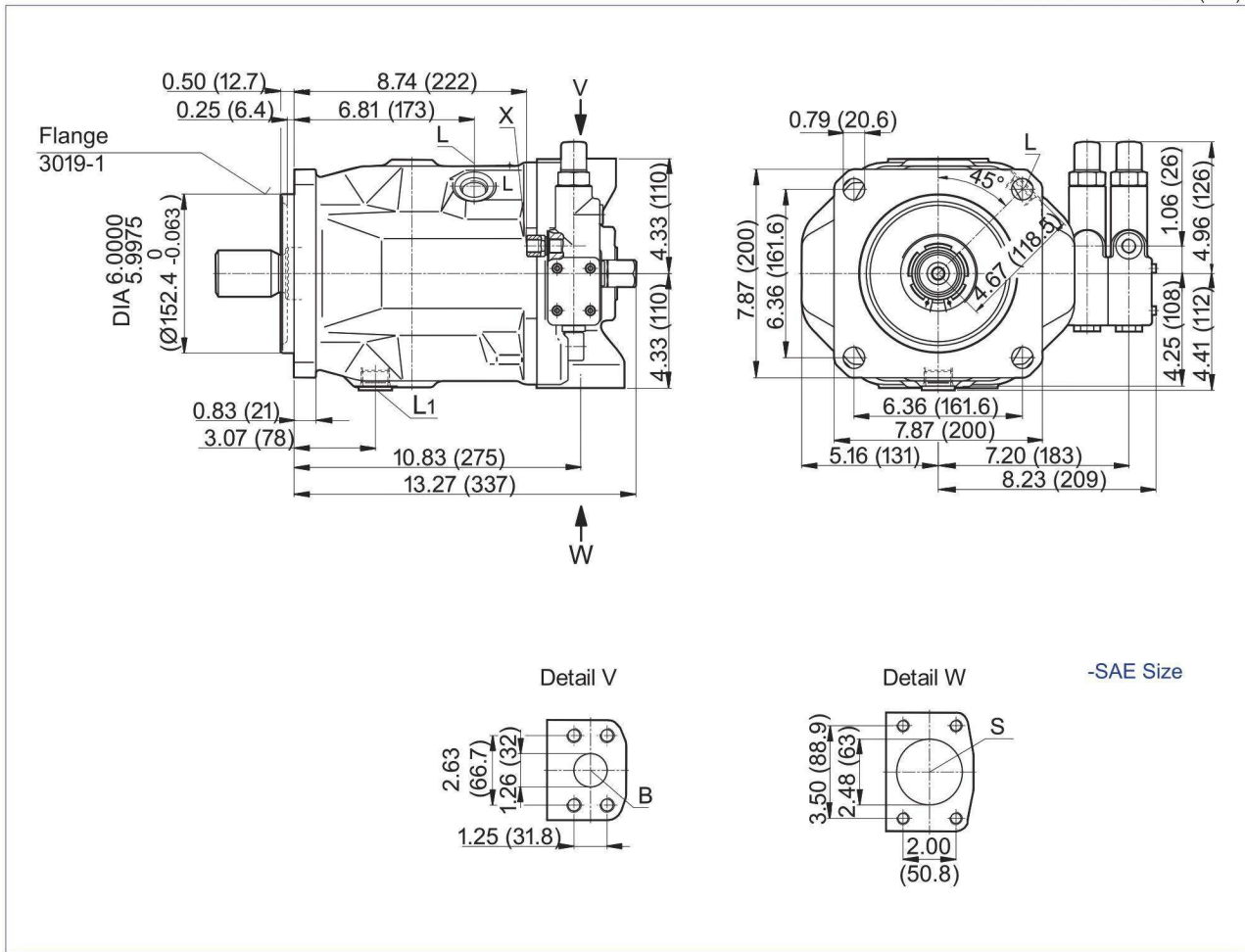
¹⁾ ER7.: 200 mm when using a sandwich plate pressure reducing valve.

Dimensions size 140

DFR/DFR1 — Pressure and flow control, hydraulic

Clockwise rotation

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



Ports

Designation	Port for	Standard	Size ¹⁾	Maximum pressure[psi(bar)] ²⁾	State
B	Service line, fastening thread	SAE J518 ASME B1.1	1 1/4 in 1/2-13 UNC-2B; 0.94 (24) deep	5100(350)	O
S	Suction line, fastening thread	SAE J518 ASME B1.1	2 1/2 in 1/2-13 UNC-2B; 0.94 (24) deep	145(10)	O
L	Case drain fluid	ISO 11926 ³⁾	1 1/16-12 UNF-2B; 0.63 (16) deep 30(2)		O ⁴⁾
L1	Case drain fluid	ISO 11926 ³⁾	1 1/16-12 UNF-2B; 0.63 (16) deep 30(2)		X ⁴⁾
X	Pilot pressure	ISO 11926 ³⁾	9/16-18 UNF-2B; 0.51 (13) deep	5100(350)	O
X	Pilot press. with DG-control	DIN ISO 228 ³⁾	M14 x 1.5; 0.47 (12) deep	5100(350)	O
M _H	Gauge port, high pressure	DIN 3852	M14 x 1.5, 0.47 (12) deep	5100(350)	X

- 1) For the maximum tightening torques the general instructions on page A-64 must be observed.
- 2) Depending on the application, short-term pressure spikes can occur. Keep this in mind when selecting measuring equipment and fittings. Pressure values in bar absolute.
- 3) The spot face can be deeper than as specified in the standard.
- 4) Depending on the installation position, L or L1 must be connected (the following page A-62、A-63, please check assembling instruction.)
O = Must be connected (plugged on delivery)
X = Plugged (in normal operation)

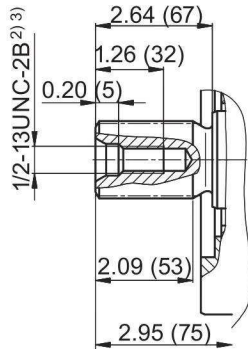
Dimensions size 140

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

Drive

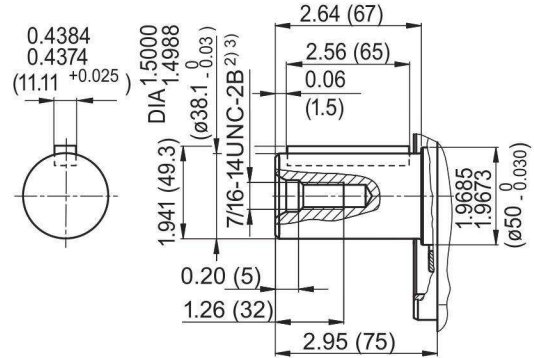
S

Splined shaft 1 3/4 in
13T 8/16DP¹⁾ (SAE J744)



K

Parallel shaft key
ISO 3019-1, 44-1



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

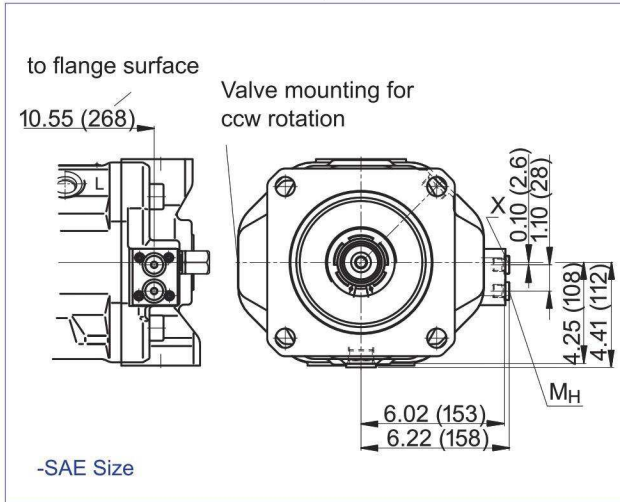
²⁾ Thread according to ASME B1.1

³⁾ For the maximum tightening torques the general instructions on page A-64 must be observed.

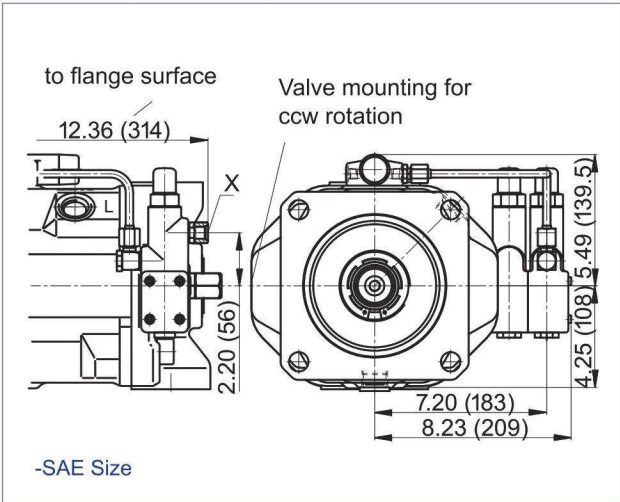
Dimensions size 140

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

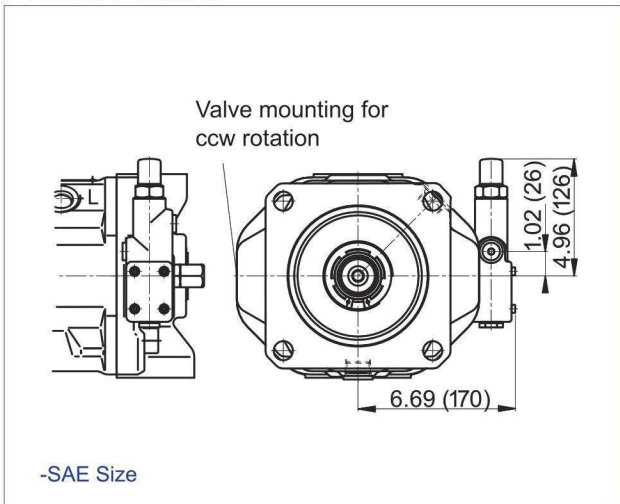
DG
Two-point control, directly operated



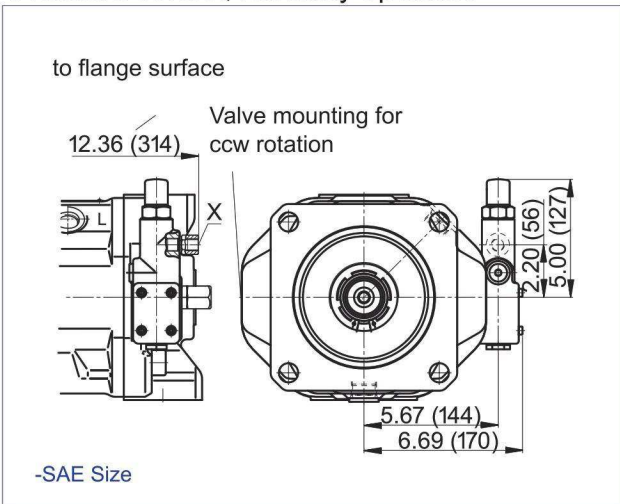
DFLR
Pressure, flow and power control



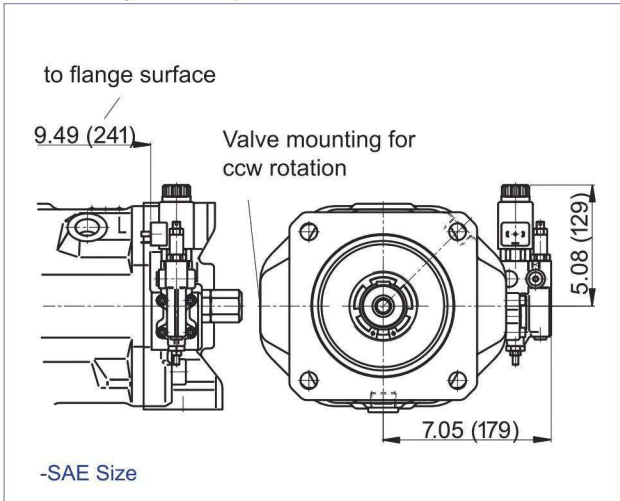
DR
Pressure control



DRG
Pressure control, remotely operated



ED7. / ER7.
Electro-hydraulic pressure control

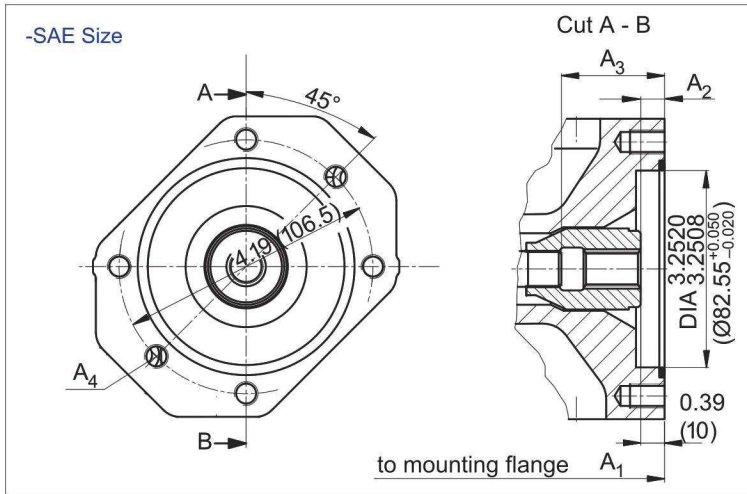


1) ER7.: 214 mm when using a sandwich plate pressure reducing valve.

Dimensions through drive

K01 flange ISO 3019-1 (SAE J744 - 82-2 (A))
Coupling for splined shaft according to ANSI B92.1a

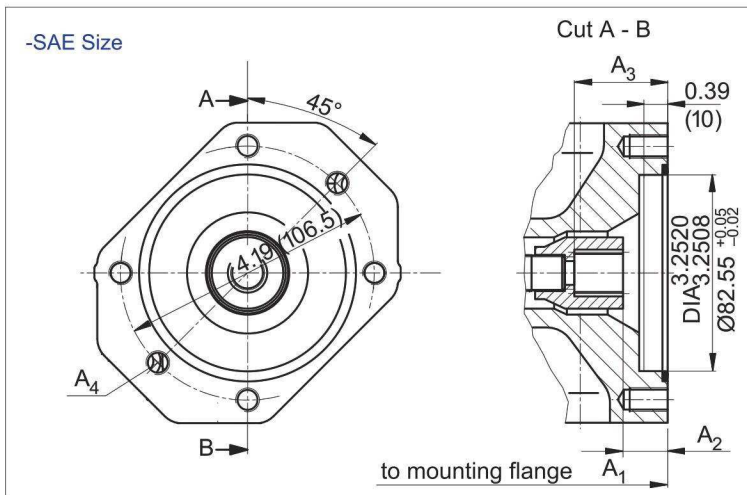
Before finalizing your design request a certified installation drawing.
Dimensions in inches and (mm).



5/8 in 9T 16/32 DP¹⁾(SAE J744 - 16-4 (A))

NG	A ₁	A ₂	A ₃	A ₄ ²⁾
18	7.16 (182)	0.39 (10)	1.70 (43.3)	M10 x 1.5, 0.57 (14.5) deep
28	8.03 (204)	0.39 (10)	1.33 (33.7)	M10 x 1.5, 0.62 (16) deep
45	9.02 (229)	0.42 (10.7)	2.10 (53.4)	M10 x 1.5, 0.62 (16) deep
71	10.51 (267)	0.46 (11.8)	2.41 (61.3)	M10 x 1.5, 0.78 (20) deep
100	13.31 (338)	0.41 (10.5)	2.56 (65)	M10 x 1.5, 0.62 (16) deep
140	13.78 (350)	0.43 (10.8)	3.04 (77.3)	M10 x 1.5, 0.62 (16) deep

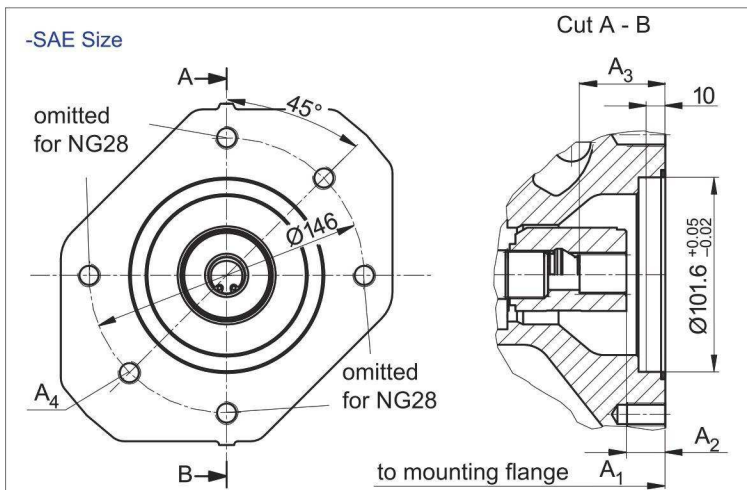
K52 flange ISO 3019-1 (SAE J744 - 82-2 (A))
Coupling for splined shaft according to ANSI B92.1a



3/4 in 11T 16/32 DP¹⁾(SAE J744 - 19-4 (A-B))

NG	A ₁	A ₂	A ₃	A ₄ ²⁾
18	7.16 (182)	0.74 (18.8)	1.52 (38.7)	M10 x 1.5, 0.57 (14.5) deep
28	8.03 (204)	0.74 (18.8)	1.52 (38.7)	M10 x 1.5, 0.62 (16) deep
45	9.02 (229)	0.744 (18.9)	1.52 (38.7)	M10 x 1.5, 0.62 (16) deep
71	10.51 (267)	0.84 (21.3)	1.63 (41.4)	M10 x 1.5, 0.78 (20) deep
100	13.31 (338)	0.75 (19)	1.53 (38.9)	M10 x 1.5, 0.62 (16) deep
140	13.78 (350)	0.744 (18.9)	1.52 (38.6)	M10 x 1.5, 0.62 (16) deep

K68 flange ISO 3019-1 (SAE J744 - 101-2 (B))
Coupling for splined shaft according to ANSI B92.1a



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

NG	A ₁	A ₂	A ₃	A ₄ ²⁾
28	8.03 (204)	0.70 (17.8)	1.64 (41.7)	M12 x 1.75, continuous
45	9.02 (229)	0.704 (17.9)	1.64 (41.7)	M12 x 1.75, 0.71 (18) deep
71	10.51 (267)	0.80 (20.3)	1.74 (44.1)	M12 x 1.75, 0.78 (20) deep
100	13.31 (338)	0.71 (18)	1.65 (41.9)	M12 x 1.75, 0.78 (20) deep
140	13.78 (350)	0.70 (17.8)	1.64 (41.6)	M12 x 1.75, 0.78 (20) deep

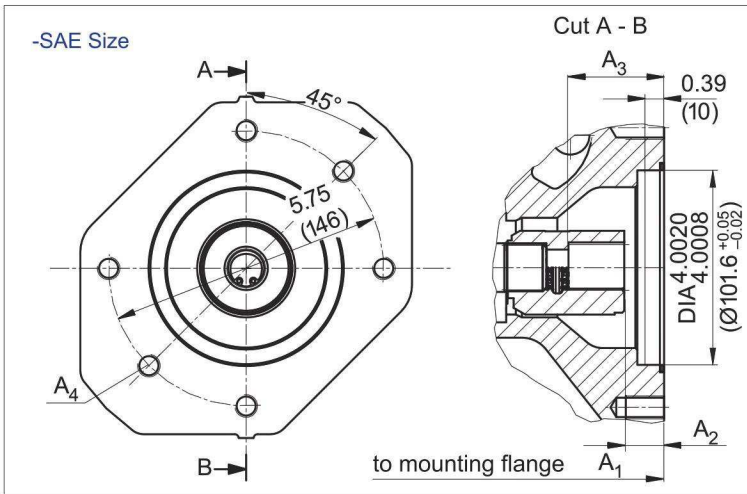
1) 30° pressure angle, flat root, side fit, tolerance class 5

2) Thread according to DIN 13, observe the general instructions on page A-64 for the maximum tightening torques.

Dimensions through drive

K04 flange ISO 3019-1 (SAE J744 - 101-2 (B))
Coupling for splined shaft according to ANSI B92.1a

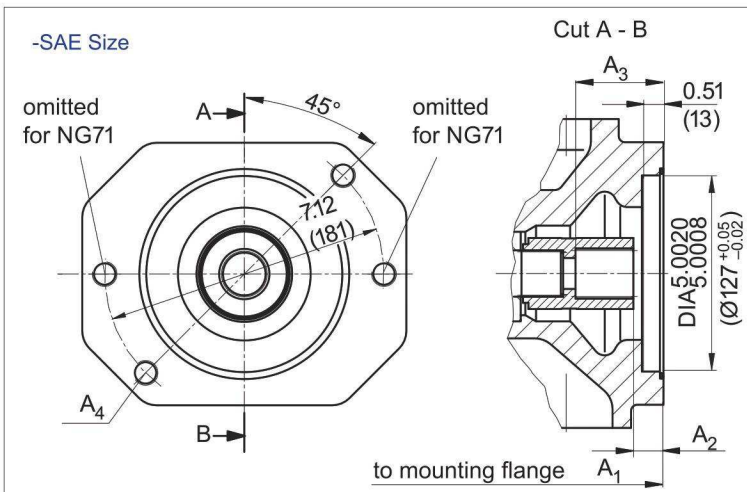
Before finalizing your design request a certified installation drawing.
Dimensions in inches and (mm).



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

NG	A ₁	A ₂	A ₃	A ₄ ²⁾
45	9.02 (229)	0.724 (18.4)	1.84 (46.7)	M12 x 1.75, 0.71 (18) deep
71	10.51 (267)	0.82 (20.8)	1.93 (49.1)	M12 x 1.75, 0.78 (20) deep
100	13.31 (338)	0.716 (18.2)	1.83 (46.6)	M12 x 1.75, 0.78 (20) deep
140	13.78 (350)	0.72 (18.3)	1.81 (45.9)	M12 x 1.75, 0.78 (20) deep

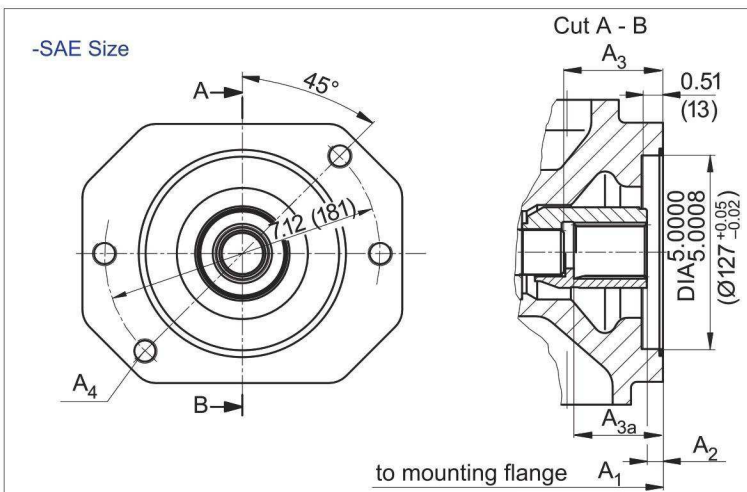
K07 flange ISO 3019-1 (SAE J744 - 127-2 (C))
Coupling for splined shaft according to ANSI B92.1a



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

NG	A ₁	A ₂	A ₃	A ₄ ²⁾
71	10.51 (267)	0.86 (21.8)	2.31 (58.6)	M16 x 2, continuous
100	13.31 (338)	0.77 (19.5)	2.22 (56.4)	M16 x 2, continuous
140	13.78 (350)	0.76 (19.3)	2.21 (56.1)	M16 x 2, 0.94 (24) deep

K24 flange ISO 3019-1 (SAE J744 - 127-2 (C))
Coupling for splined shaft according to ANSI B92.1a



1 1/2 in 17T 12/24 DP¹⁾(SAE J744 - 38-4 (C-C))

NG	A ₁	A ₂	A ₃ ³⁾	A _{3a} ⁴⁾	A ₄ ²⁾
100	13.31 (338)	0.41 (10.5)	2.56 (65)	–	M16 x 2, continuous
140	13.78 (350)	0.42 (10.8)	2.95 (75)	–	M16 x 2, 0.94 (24) deep
	13.78 (350)	0.40 (10.3)	–	2.72 (69.1)	M16 x 2, 0.94 (24) deep

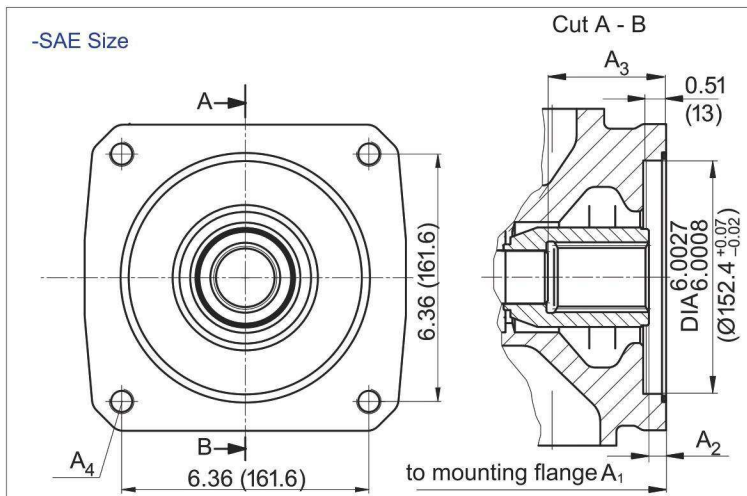
- 3) Coupling without stop
- 4) Coupling with stop

1) 30° pressure angle, flat root, side fit, tolerance class 5
2) Thread according to DIN 13, observe the general instructions on page A-64 for the maximum tightening torques.

Dimensions through drive

K17 flange ISO 3019-1 (SAE J744 - 152-4 (A))
Coupling for splined shaft according to ANSI B92.1a

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



1 3/4 in 13T 8/16 DP¹⁾(SAE J744 - 44-4 (D))

NG	A ₁	A ₂	A ₃	A ₄ ²⁾
140	13.78 (350)	0.43 (11)	3.04 (77.3)	M6 x 2, continuous

- 1) 30° pressure angle, flat root, side fit, tolerance class 5
- 2) Thread according to DIN 13, observe the general instructions on page A-64 for the maximum tightening torques.

Summary mounting options

ISO (Metric) — mounting flange

Through-drive ¹⁾ Flange ISO 3019-2	Coupling for splined shaft	Short des.	Mounting option – 2nd pump			Through drive available for NG
			PA10VO/31 NG (shaft)	PA10V(S)O/5x NG (shaft)	Gear pump design(NG)	
80-2	3/4 in	KB2	18 (S ∨ R)	10 (S)	–	18 to 140
100-2	7/8 in	KB3	28 (S ∨ R)	–	–	28 to 140
	1 in	KB4	45 (S ∨ R)	–	–	45 to 140
125-2	1 1/4 in	KB5	71 (S ∨ R)	–	–	71 to 140
	1 1/2 in	KB6	100 (S)	–	–	100 to 140
180-4 (4-holeB)	1 3/4 in	KB7	140 (S)	–	–	140

Parallel shaft key

Through-drive ¹⁾ Flange ISO 3019-2	Coupling for splined shaft	Short des.	Mounting option – 2nd pump			Through drive available for NG
			PA10VO/31 NG (shaft)	PA10V(S)O/5x NG (shaft)	Radial piston pump	
80-2	3/4 in	K57	–	–	R4	28 to 140

SAE — mounting flange

Through-drive ¹⁾ Flange ISO 3019-1	Coupling for splined shaft	Short des.	Mounting option – 2nd pump			Through drive available for NG
			PA10VO/31 NG (shaft)	PA10V(S)O/5x NG (shaft)	Gear pump design(NG)	
82-2 (A)	5/8 in	K01	18 (U)	10 (U)	F (5 to 22)	18 to 140
	3/4 in	K52	18 (S ∨ R)	10 (S) 18 (U) 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⁾	N/G (26 to 49)	28 to 140
	1 in	K04	45 (S ∨ R) –	45 (S ∨ R) 60 ∨ 63 (U ∨ W) ²⁾	–	45 to 140
127-2 (C)	1 1/4 in	K07	71 (S ∨ R) 100 (U) 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 with K07

Combination pumps PA10VO + PA10VO

When using combination pumps it is possible to have multiple, mutually independent circuits without the need for a splitter gearbox.

When ordering combination pumps the model codes for the first and the second pump must be joined by a "+".

Order example :

PA10VSO100DFR1/31R-VSB12K04+

PA10VSO45DFR/31R-VSA12N00

If no further pumps are to be factory-mounted, the simple type code is sufficient. Included in the delivery contents of the pump with through drive are then: coupling and seal, with plastic cover to prevent penetration by dust and dirt.

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

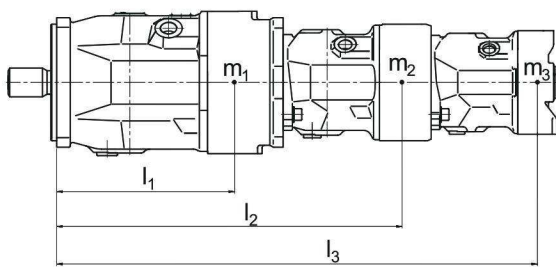
Each through drive is plugged with a non-pressure-resistant cover. Before commissioning the units, they must therefore be equipped with a pressure-resistant cover.

Through drives can also be ordered with pressure-resistant covers. Please specify in clear text.

For combination pumps comprising more than two pumps, the mounting flange must be calculated for the permissible moment of inertia.

Permissible mass moment of inertia

NG			18	28	45	71	100	140
Permissible mass moment of inertia	static	T _m lb-ft (Nm)	369 (500)	649 (880)	1010 (1370)	1593 (2160)	2213 (3000)	3319 (4500)
			dynamic at 10g (98.1 m/s ²)	T _m lb-ft (Nm)	37 (50)	65 (88)	101 (137)	159 (216)
Mass with through-drive plate	m	lbs (kg)	30.8 (14)	41.9 (19)	55 (25)	86 (39)	119 (54)	150 (68)
Mass without through drive (e.g. 2nd pump)	m	lbs (kg)	26.6 (12)	33 (15)	46 (21)	73 (33)	99 (45)	132 (60)
Distance center of gravity	l	in (mm)	3.54 (90)	4.33 (110)	5.12 (130)	5.91 (150)	6.30 (160)	6.30 (160)



$m_1 \cdot m_2 \cdot m_3$ Mass of pumps [lbs (kg)]

$l_1 \cdot l_2 \cdot l_3$ Distance center of gravity [in (mm)]

$$T_m = (m_1 \cdot l_1 + m_2 \cdot l_2 + m_3 \cdot l_3) \cdot \frac{1}{12(102)} \text{ [lb-ft (Nm)]}$$

Tightening torques

– Fittings:

Observe the manufacturer's instruction regarding the tightening torques of the used fittings.

– Mounting bolts:

For mounting bolts with metric ISO thread according to DIN 13 or thread according to ASME B1.1

– Female threads in axial piston unit :

The maximum permissible tightening torques $M_{G \max}$ are maximum values for the female threads and must not be exceeded. For values, see the following table.

– Threaded plugs :

For the metal threaded plugs supplied with the axial piston unit, the required tightening torques of the threaded plugs M_V apply. For values, see the following table.

Metric Ports Standard	Thread size	Maximum permissible tightening torque for female threads $M_{G \max}$	Required tightening torque for threaded plugs M_V	Size of hexagon socket of threaded plugs
DIN 385	M14 x 1.5	80 Nm	45 Nm	6 mm
	M16 x 1.5	100 Nm	50 Nm	8 mm
	M18 x 1.5	140 Nm	60 Nm	8 mm
	M22 x 1.5	210 Nm	80 Nm	10 mm
	M27 x 2	330 Nm	135 Nm	12 mm
DIN ISO 228	G 1/4 in	70 Nm	–	–

SAE Ports Standard	Thread size	Maximum permissible tightening torque for female threads $M_{G \max}$	Required tightening torque for threaded plugs M	Size of hexagon socket of threaded plugs
DIN 3852 ¹⁾	G1/4	52 lb-ft	–	–
		70 Nm	–	–
	M14 x 1.5	59 lb-ft	26 lb-ft	0.24 inch
		80 Nm	35 Nm	6 mm
DIN ISO 228	G1/4	52 lb-ft	22 lb-ft	0.24 inch
		70 Nm	30 Nm	6 mm
ISO 11926	7/16-20UNF-2B	29 lb-ft	13 lb-ft	3/16 in
		40 Nm	18 Nm	
	9/16-18UNF-2B	59 lb-ft	26 lb-ft	1/4 in
		80 Nm	35 Nm	
	3/4-16UNF-2B	118 lb-ft	52 lb-ft	5/16 in
		160 Nm	70 Nm	
	7/8-14UNF-2B	177 lb-ft	81 lb-ft	3/8 in
		240 Nm	110 Nm	
1 1/16-12UN-2B	266 lb-f	125 lb-f	9/16 in	
	360 Nm	170 Nm		

¹⁾The tightening torques of the threaded plugs M_V apply for screws in the „dry“ state as received on delivery and in the „lightly oiled“ state for installation