

Axial piston variable pump A7VO Series 63



- ▶ Sizes 28 to 160
- ▶ Nominal pressure 350 bar
- ▶ Maximum pressure 400 bar
- ▶ Open circuit

Characteristics

- ▶ Variable pump with axial tapered piston rotary group of bent-axis design, for hydrostatic drives in open circuit
- ▶ For use in mobile and stationary applications
- ▶ Flow is proportional to the drive speed and displacement.
- ▶ The flow can be steplessly changed by adjusting the bent axis.
- ▶ Wide selection of control devices
- ▶ Compact, robust pump with a long service life

A7VO Series 63 | Axial piston variable pump

Ordering code



Ordering code

01	02	03	04	05	06	07	08	09	10	11	12	13
A7V	O		/	63	-	V		B	01			

Axial piston unit

01	Bent-axis design, variable, nominal pressure 350 bar, maximum pressure 400 bar	A7V
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Operating mode

02	Pump, open circuit	O
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Size (NG)

03	Geometric displacement V_g (cm ³), see "Technical data" on page 7	28	55	80	107	160
	For sizes 250, 355 and 500, see data sheet 92203					

Control device

		28	55	80	107	160		
04	Power controller without power override	•	•	•	•	•	LR	
	with pressure cut-off	•	•	•	•	•	LRD	
	with stroke limiter	-	•	•	•	•	LRH1	
	negative control $\Delta p = 25$ bar							
	with pressure cut-off and stroke limiter	-	•	•	•	•	LRDH1	
	negative control $\Delta p = 25$ bar							
	with pressure cut-off and load sensing	-	•	•	•	•	LRDS	
	Power controller with hydraulically proportional power override (only available for clockwise rotation and with port plate 02)							
	with load sensing	-	•	•	-	-	LA1S	
	with load sensing and hydraulically proportional LS-override	-	•	•	-	-	LA1S5	
Pressure controller								
remotely controlled	•	•	•	•	•	DRG		
with load sensing	-	•	•	•	•	DRS		
Proportional control hydraulic								
with pressure cut-off, remotely controlled	•	•	•	•	•	HD1G		
Positive control $\Delta p = 10$ bar								
Proportional control electrical								
Positive control U = 24 V	•	•	•	•	•	EP2		

Series

05	Series 6, index 3	63
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Direction of rotation

		28 to 160	
06	Viewed on drive shaft	clockwise	•
		counter-clockwise	•

Sealing material

07	FKM (fluoroelastomer)	V
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Drive shaft

		28 to 160
08	Splined shaft DIN 5480	•
	Parallel keyed shaft according to DIN 6885	•

Mounting flange

09	ISO 3019-2; 4-hole	B
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Port plate for working lines

10	SAE flange ports A and S at rear (metric fastening thread)	01
	SAE flange ports A and S at side (available for power controllers LA1S and LA1S5 only, metric fastening thread)	02

• = Available - = Not available = Preferred program

01	02	03	04	05	06	07	08	09	10	11	12	13
A7V	O			/	63	-	V		B	01		

Connector for solenoids¹⁾ (see page 40)

11	Without connector (without solenoid, with hydraulic control only; without code)	
	DEUTSCH molded connector, 2-pin – without suppressor diode	P

Standard / special version

12	Standard version (without code)	
	Special version	-S

• = Available - = Not available = Preferred program

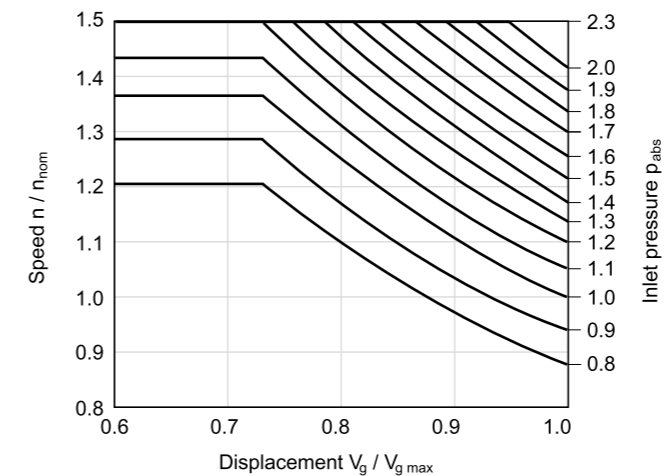
Notes

- ▶ Preselection:
 - Up to 12 months as standard
 - Up to 24 months long-term (state in plain text when ordering)

Technical data

Size	NG	28	55	80	107	160		
Displacement, geometric, per revolution	$V_{g \max}$	cm ³	28.1	54.8	80	107	160	
Maximum rotational speed ¹⁾	At $V_{g \max}$	n_{nom}	rpm	3150	2500	2240	2150	1900
	At $V_g < 0.74 \times V_{g \max}$	n_{max1}	rpm	4250	3400	3000	2900	2560
Maximum rotational speed ²⁾		n_{max2}	rpm	4750	3750	3350	3200	2850
Flow	At $V_{g \max}$ and n_{nom}	q_v	l/min	89	137	179	230	304
Power	At $V_{g \max}$, n_{nom} and $\Delta p = 350$ bar	P	kW	52	80	105	134	177
Torque	At $V_{g \max}$ and $\Delta p = 350$ bar	T	Nm	156	305	446	596	891
Rotary stiffness	$V_{g \max}$ to $V_g/2$	c_{min}	kNm/rad	5	10	16	21	36
	$V_g/2$ to 0 (interpolated)	c_{max}	kNm/rad	16	32	49	67	104
Moment of inertia rotary group		J_{GR}	kgm ²	0.0042	0.0042	0.0080	0.0127	0.0253
Maximum angular acceleration		α	rad/s ²	35900	31600	24200	19200	15300
Case volume		V	l	0.5	0.75	1.2	1.5	2.4
Weight (approx.)		m	kg	17	25	40	49	71

Maximum permissible speed (limit speed)



Determining operating characteristics		
Flow	$q_v = \frac{V_g \times n \times \eta_v}{1000}$	[l/min]
Torque	$T = \frac{V_g \times \Delta p}{20 \times \pi \times \eta_{mh}}$	[Nm]
Power	$P = \frac{2 \pi \times T \times n}{60000} = \frac{q_v \times \Delta p}{600 \times \eta_t}$	[kW]
Key		
V_g	=	Displacement per revolution [cm ³]
Δp	=	Differential pressure [bar]
n	=	Rotational speed [rpm]
η_v	=	Volumetric efficiency
η_{mh}	=	Mechanical-hydraulic efficiency
η_t	=	Total efficiency ($\eta_t = \eta_v \times \eta_{mh}$)

Notes

- ▶ Theoretical values, without efficiency and tolerances; values rounded
- ▶ Operation above the maximum values or below the minimum values may result in a loss of function, a reduced service life or in the destruction of the axial piston unit. Other permissible limit values, such as speed variation, reduced angular acceleration as a function of the frequency and the permissible angular acceleration at start (lower than the maximum angular acceleration) can be found in data sheet 90261.

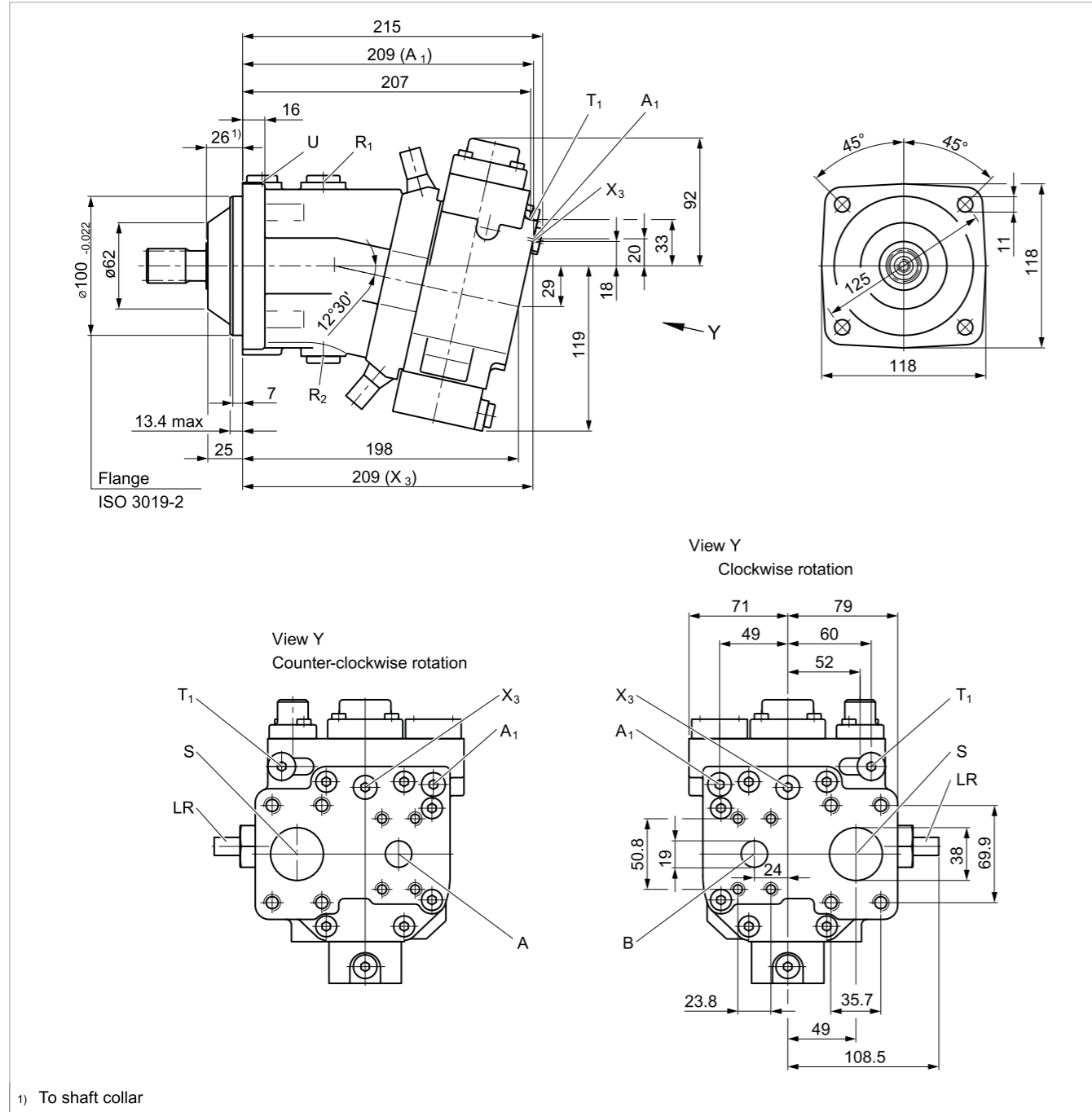
- 1) The values are valid:
 - At absolute pressure $p_{abs} = 1$ bar at suction port S
 - For the optimal viscosity range of $\nu_{opt} = 36$ to 16 mm²/s
 - For hydraulic fluid based on mineral oils.
- 2) Maximum rotational speed (speed limit) for increased inlet pressure p_{abs} at suction port S and $V_g < V_{g \max}$, see diagram.

Dimensions [mm]

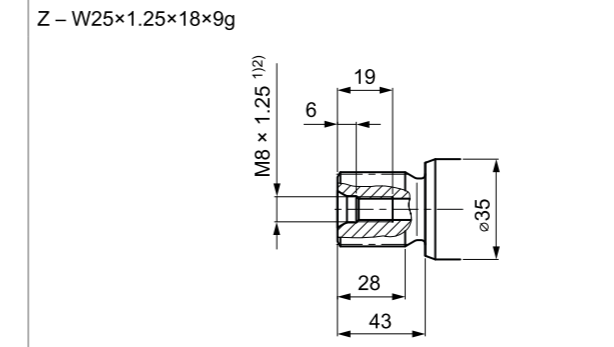
Dimensions, size 28

LR – Power controller without power override

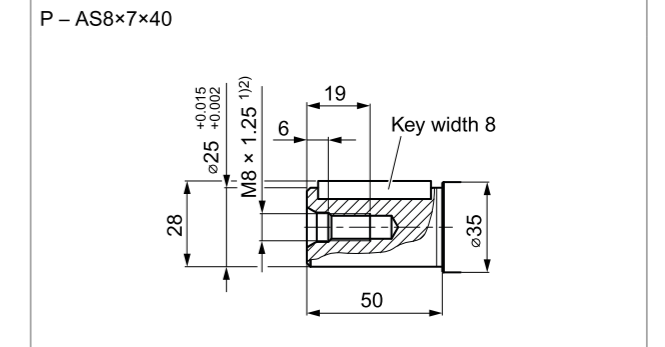
All of the variants of the controllers on page 23 are shown for the clockwise direction of input rotation (view Y)



▼ Splined shaft DIN 5480



▼ Parallel keyed shaft DIN 6885



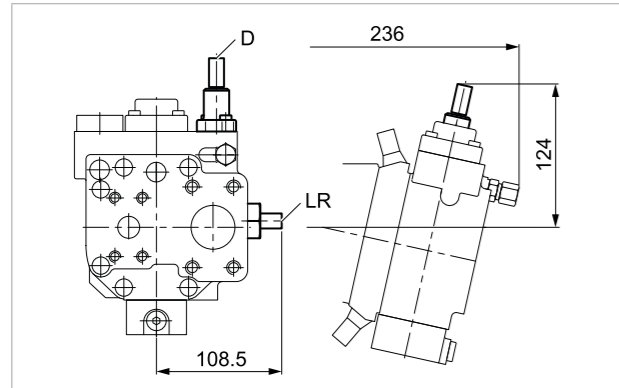
Ports	Standard	Size ²⁾	p _{max abs} [bar] ³⁾	Status
A (B)	Working port (high-pressure series) fastening thread	SAE J518 ⁴⁾ DIN 13	3/4 in M10 × 1.5; 17 deep	400 O
S	Suction port (standard series) fastening thread	SAE J518 ⁴⁾ DIN 13	1 1/2 in M12 × 1.75; 20 deep	2 O
U	Bearing flushing	DIN 3852 ⁵⁾	M16 × 1.5; 12 deep	2 X
R ₁ , R ₂	Air bleed	DIN 3852 ⁵⁾	M18 × 1.5; 12 deep	2 X
A ₁	Measuring high pressure	DIN 3852 ⁵⁾	M12 × 1.5; 12 deep	400 X
T ₁	Control fluid drain	DIN 3852 ⁵⁾	M12 × 1.5; 12 deep	400 X ⁶⁾
X ₃	Override	DIN 3852 ⁵⁾	M12 × 1.5; 12 deep	400 X
Y ₃	External control pressure	DIN 3852 ⁵⁾	M14 × 1.5; 12 deep	40 X
X ₁	Pilot pressure	DIN 3852 ⁵⁾	M14 × 1.5; 12 deep	40 O
M ₁	Control pressure measurement	DIN 3852 ⁵⁾	M12 × 1.5; 12 deep	400 X

- 1) Center bore according to DIN 332 (thread according to DIN 13)
- 2) For notes on tightening torques, see instruction manual.
- 3) Depending on the application, momentary pressure peaks can occur. Keep this in mind when selecting measuring devices and fittings.
- 4) Only dimensions according to SAE J518, metric fastening thread is a deviation from the standard.

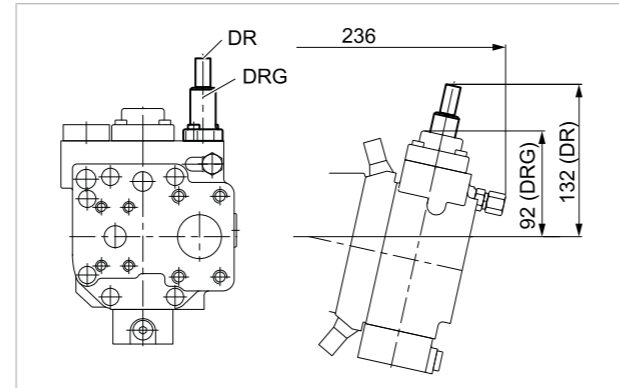
- 5) The spot face can be deeper than specified in the appropriate standard.
 - 6) For versions with a pressure controller or pressure cut-off, a drain line is needed to relieve port T₁ to the reservoir.
- O = Must be connected (plugged on delivery)
X = Plugged (in normal operation)

Dimensions [mm]

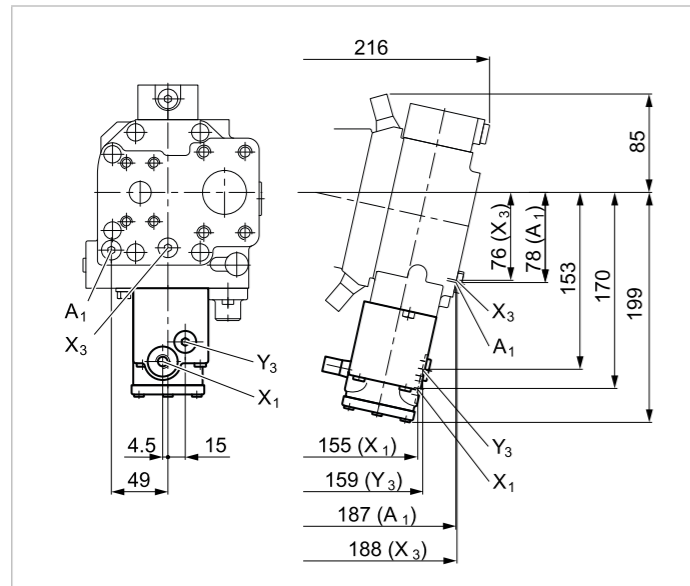
▼ LRD – Power controller with pressure cut-off



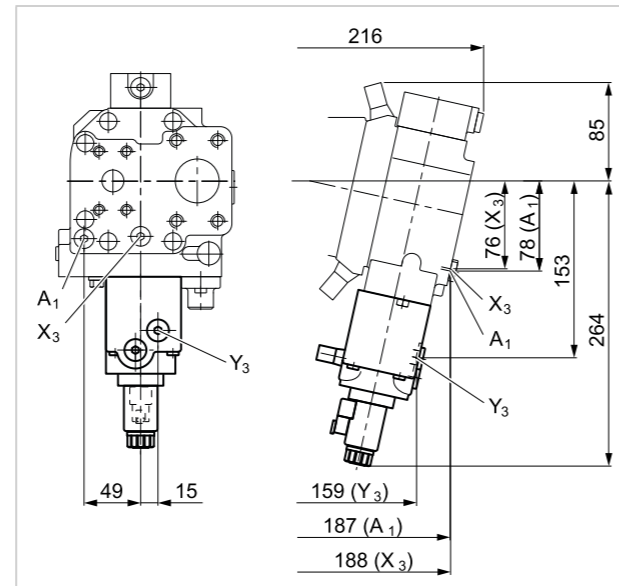
▼ DR/DRG – Pressure controller/pressure controller remotely controlled



▼ HD1, HD1G – Proportional hydraulic control, positive control, and variant with pressure cut-off, remotely controlled

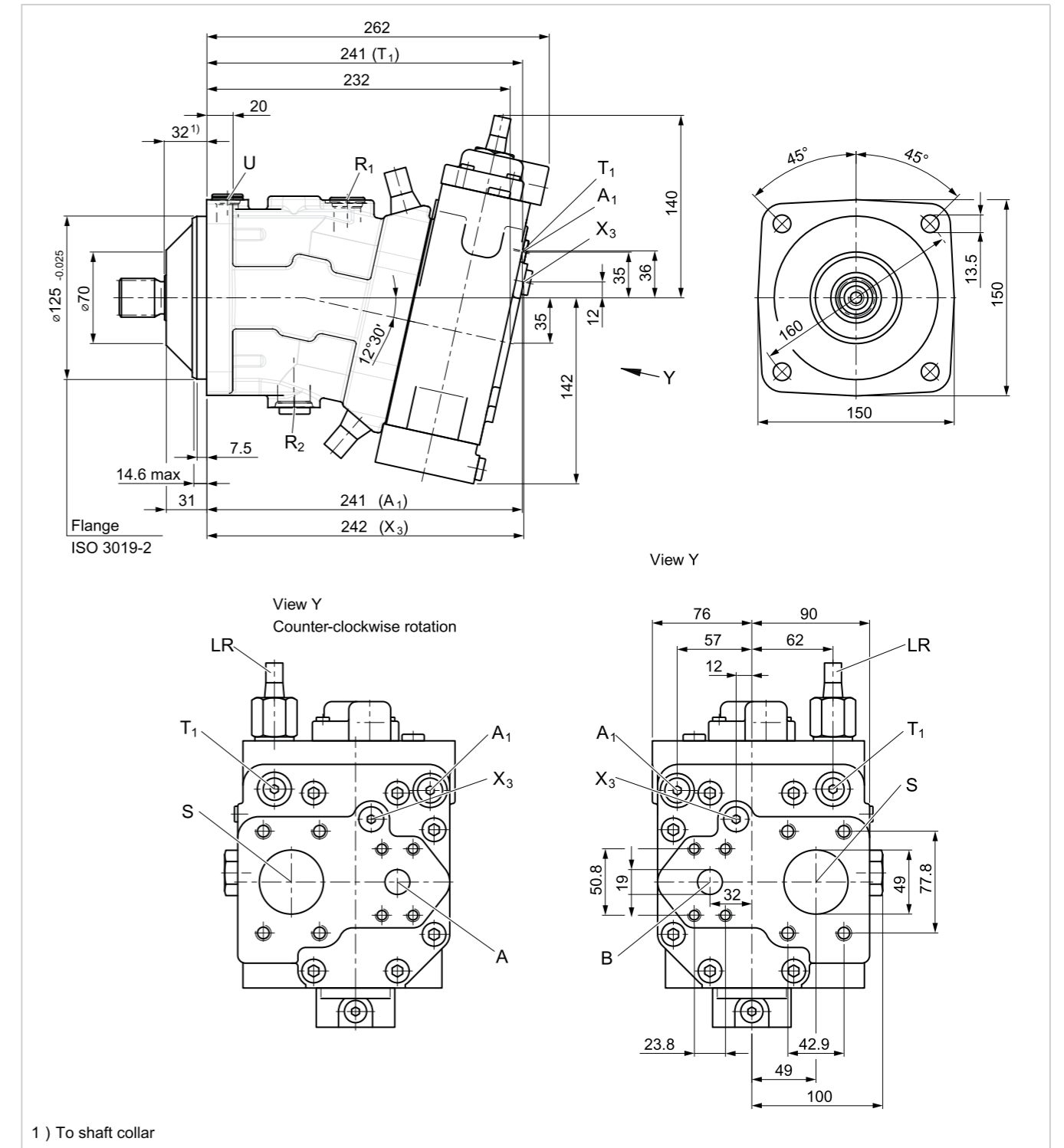


▼ EP2 – Proportional control electric, positive control



Dimensions, size 55

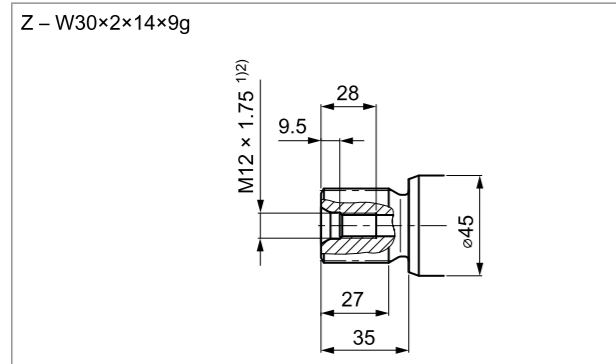
LR – Power controller without power override



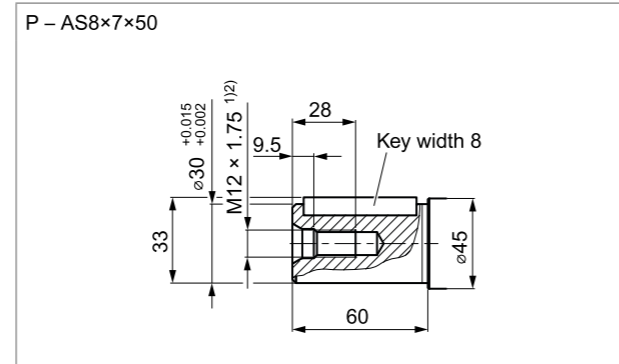
1) To shaft collar

Axial piston variable pump | A7VO Series 63 Dimensions, size 55

▼ Splined shaft DIN 5480



▼ Parallel keyed shaft DIN 6885



Ports	Standard	Size ²⁾	$p_{max\ abs}$ [bar] ³⁾	Status
A (B)	Working port (high-pressure series) fastening thread	SAE J518 ⁴⁾ DIN 13	3/4 in M10 x 1.5; 17 deep	400 O
S	Suction port (standard series) fastening thread	SAE J518 ⁴⁾ DIN 13	2 in M12 x 1.75; 20 deep ²⁾	2 O
U	Bearing flushing	DIN 3852 ⁵⁾	M18 x 1.5; 12 deep	2 X
R ₁ , R ₂	Air bleed	DIN 3852 ⁵⁾	M18 x 1.5; 12 deep	2 X
R ₁	Air bleed (LA1S only.)	DIN 3852 ⁵⁾	M22 x 1.5; 15.5 deep	2 X
R ₂	Air bleed (LA1S only.)	DIN 3852 ⁵⁾	M27 x 2; 19 deep	2 X
A ₁	Measuring high pressure	DIN 3852 ⁵⁾	M14 x 1.5; 12 deep	400 X
T ₁	Control fluid drain	DIN 3852 ⁵⁾	M12 x 1.5; 12 deep	400 X ⁶⁾
X ₃	Override	DIN 3852 ⁵⁾	M14 x 1.5; 12 deep	400 X
Y ₃	External control pressure	DIN 3852 ⁵⁾	M14 x 1.5; 12 deep	40 X
X ₁	Pilot pressure	DIN 3852 ⁵⁾	M14 x 1.5; 12 deep	40 O
X ₄	Load pressure	DIN 3852 ⁵⁾	M14 x 1.5; 12 deep	400 O
M ₁	Control pressure measurement	DIN 3852 ⁵⁾	M12 x 1.5; 12 deep	400 X

1) Center bore according to DIN 332 (thread according to DIN 13)

2) For notes on tightening torques, see instruction manual.

3) Depending on the application, momentary pressure peaks can occur. Keep this in mind when selecting measuring devices and fittings.

4) Only dimensions according to SAE J518, metric fastening thread is a deviation from the standard.

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

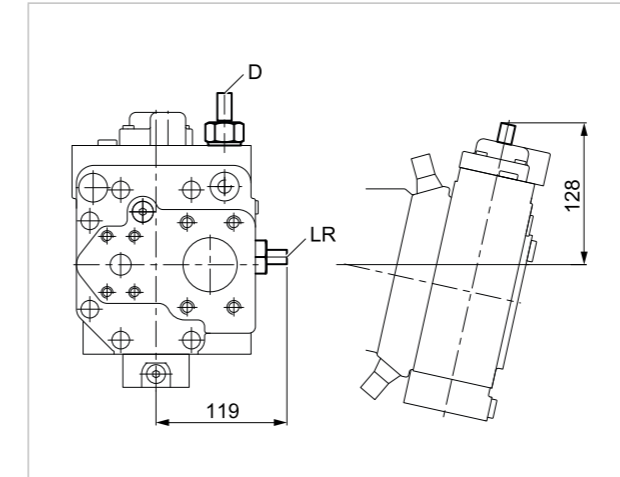
6) For versions with a pressure controller or pressure cut-off, a drain line is needed to relieve port T₁ to the reservoir.

O = Must be connected (plugged on delivery)

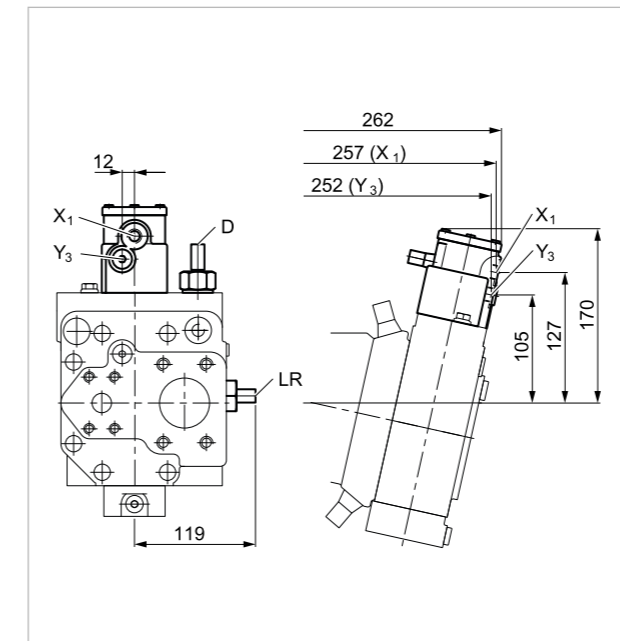
X = Plugged (in normal operation)

A7VO Series 63 | Axial piston variable pump Dimensions, size 55

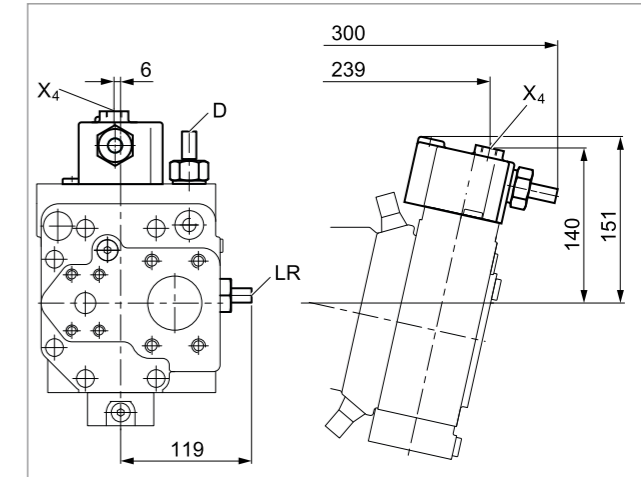
▼ LRD – Power controller with pressure cut-off



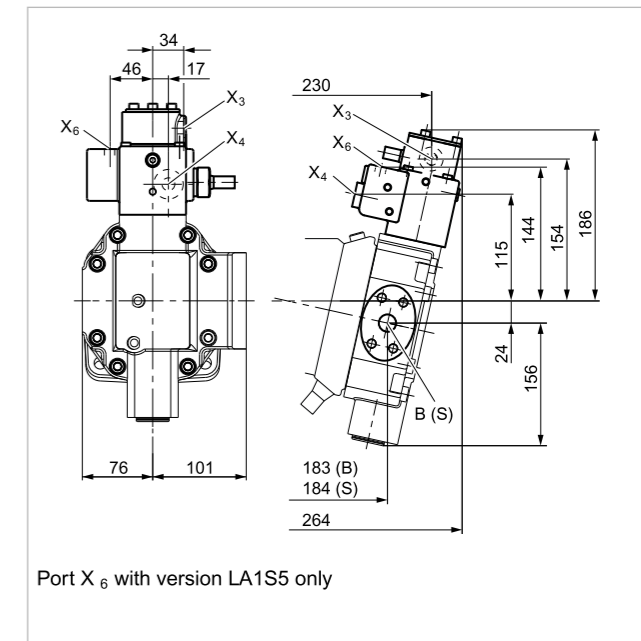
▼ LRDH1 – Power control with pressure cut-off and stroke limiter



▼ LRDS – Power control with pressure cut-off and load sensing



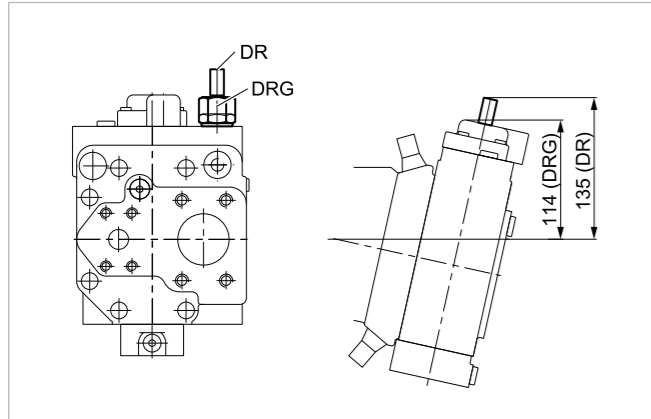
▼ LA1S – Power control with load sensing,
LA1S5 – Power control with load sensing and hydraulically
proportional LS-override



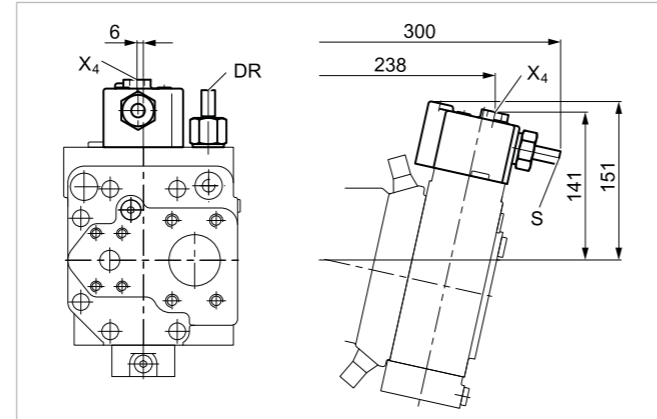
Port X₆ with version LA1S5 only

Axial piston variable pump | A7VO Series 63 Dimensions, size 55

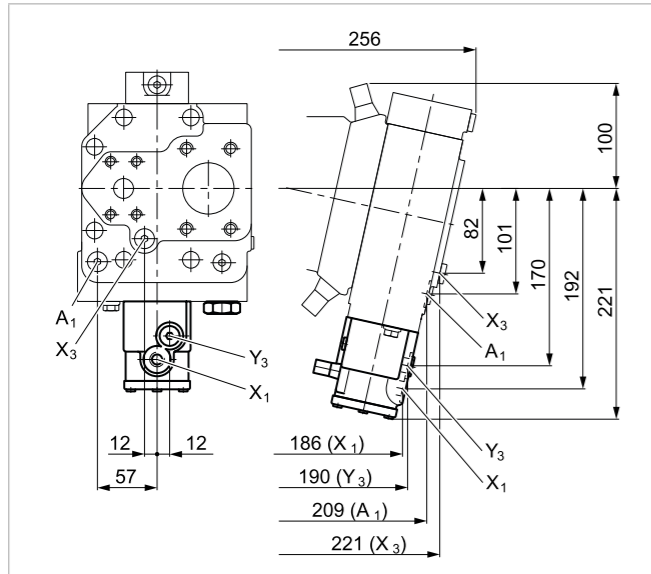
▼ DR/DRG – Pressure controller/pressure controller remotely controlled



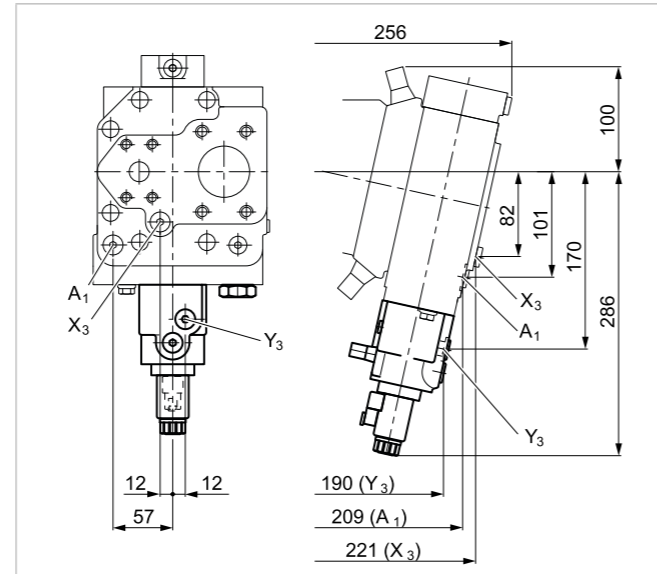
▼ DRS – Pressure controller with load sensing



▼ HD1, HD1G – Proportional hydraulic control, positive control, and variant with pressure cut-off, remotely controlled

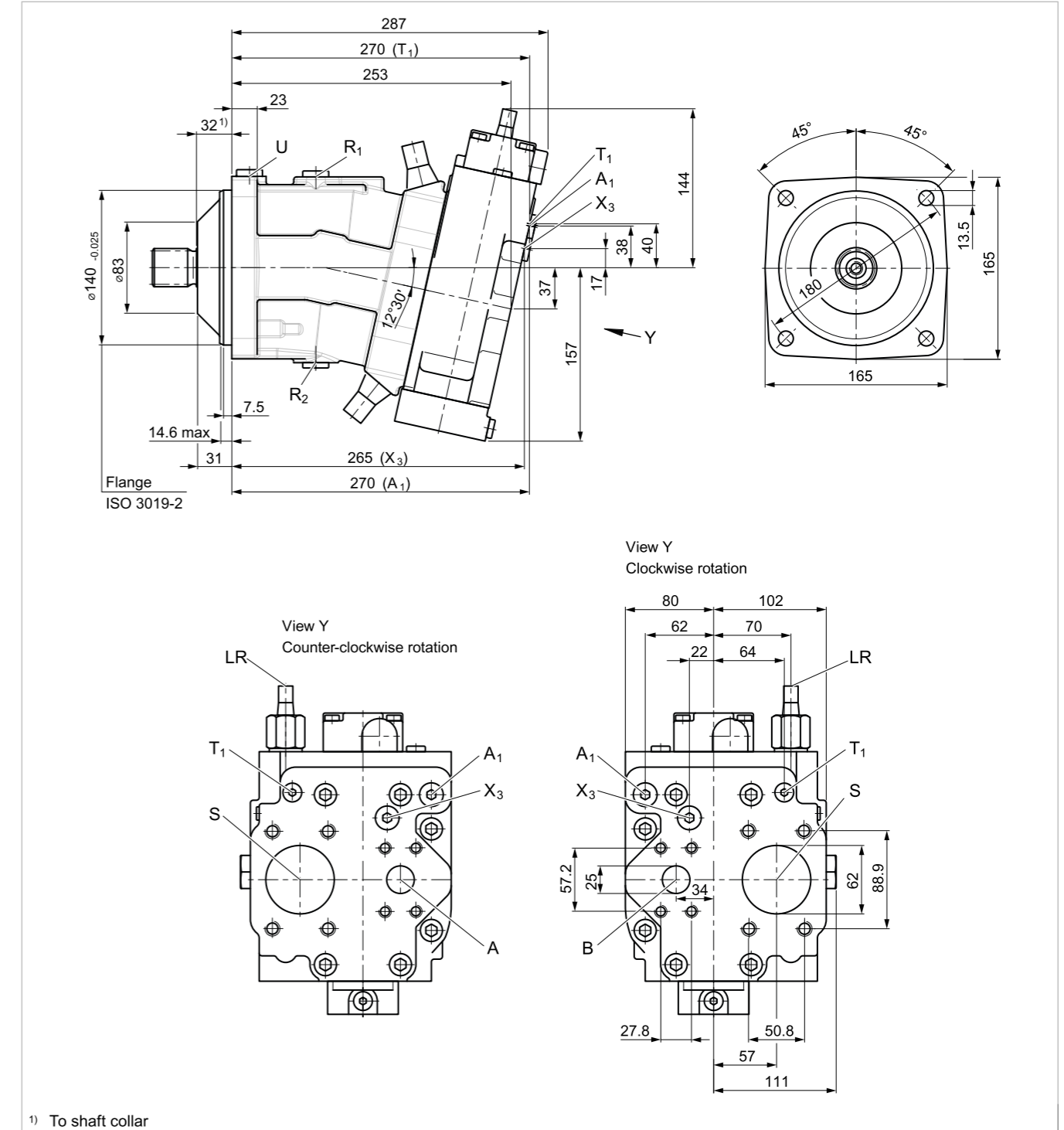


▼ EP2 – Proportional control electric, positive control



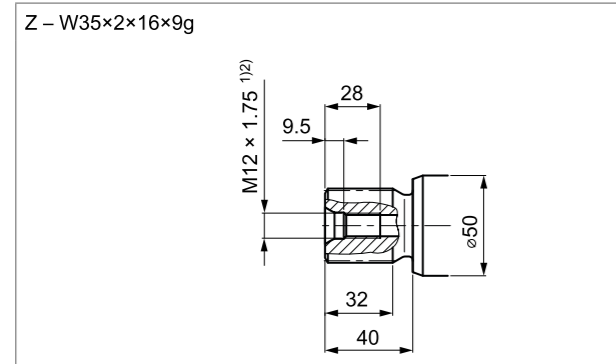
A7VO Series 63 | Axial piston variable pump Dimensions, size 80

LR - Power controller without power override

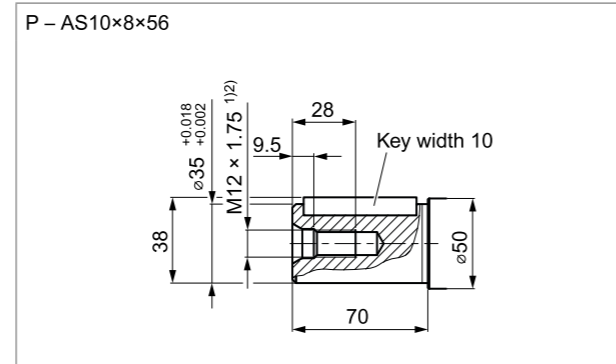


1) To shaft collar

▼ Splined shaft DIN 5480



▼ Parallel keyed shaft DIN 6885

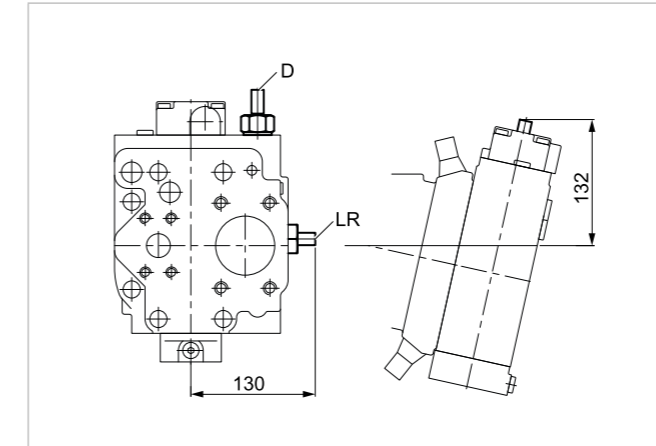


Ports	Standard	Size ²⁾	$p_{max abs}$ [bar] ³⁾	Status
A (B)	SAE J518 ⁴⁾ DIN 13	1 in M12 x 1.75; 17 deep	400	O
S	SAE J518 ⁴⁾ DIN 13	2 1/2 in M12 x 1.75; 17 deep	2	O
U	DIN 3852 ⁵⁾	M18 x 1.5; 12 deep	2	X
R ₁ , R ₂	DIN 3852 ⁵⁾	M18 x 1.5; 12 deep	2	X
R ₁	DIN 3852 ⁵⁾	M22 x 1.5; 15.5 deep	2	X
R ₂	DIN 3852 ⁵⁾	M27 x 2; 19 deep		X
A ₁	DIN 3852 ⁵⁾	M16 x 1.5; 12 deep	400	X
T ₁	DIN 3852 ⁵⁾	M12 x 1.5; 12 deep	400	X ⁶⁾
X ₃	DIN 3852 ⁵⁾	M16 x 1.5; 12 deep	400	X
Y ₃	DIN 3852 ⁵⁾	M14 x 1.5; 12 deep	40	X
X ₁	DIN 3852 ⁵⁾	M14 x 1.5; 12 deep	40	O
X ₄	DIN 3852 ⁵⁾	M14 x 1.5; 12 deep	400	O
M ₁	DIN 3852 ⁵⁾	M12 x 1.5; 12 deep	400	X

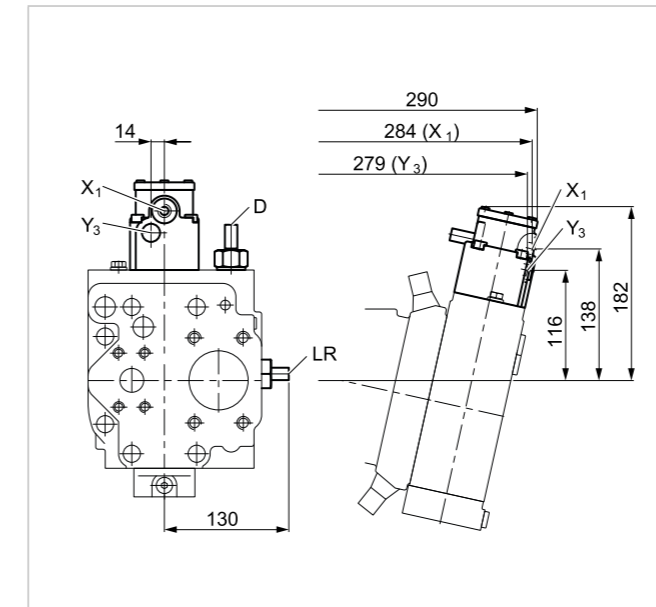
1) Center bore according to DIN 332 (thread according to DIN 13)
 2) For notes on tightening torques, see instruction manual.
 3) Depending on the application, momentary pressure peaks can occur. Keep this in mind when selecting measuring devices and fittings.
 4) Only dimensions according to SAE J518, metric fastening thread is a deviation from the standard.

5) The spot face can be deeper than specified in the appropriate standard.
 6) For versions with a pressure controller or pressure cut-off, a drain line is needed to relieve port T₁ to the reservoir.
 O = Must be connected (plugged on delivery)
 X = Plugged (in normal operation)

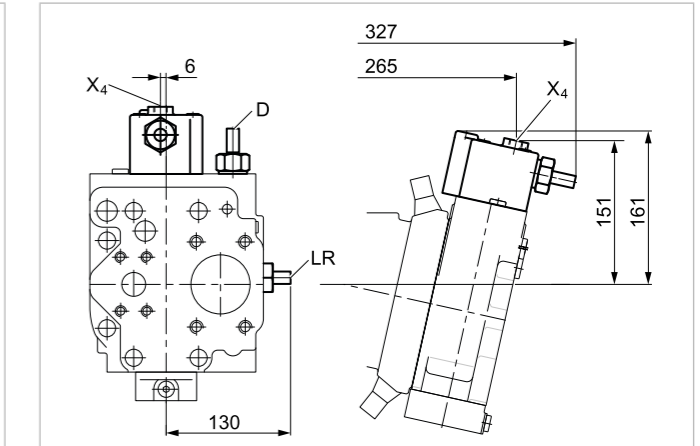
▼ LRD – Power controller with pressure cut-off



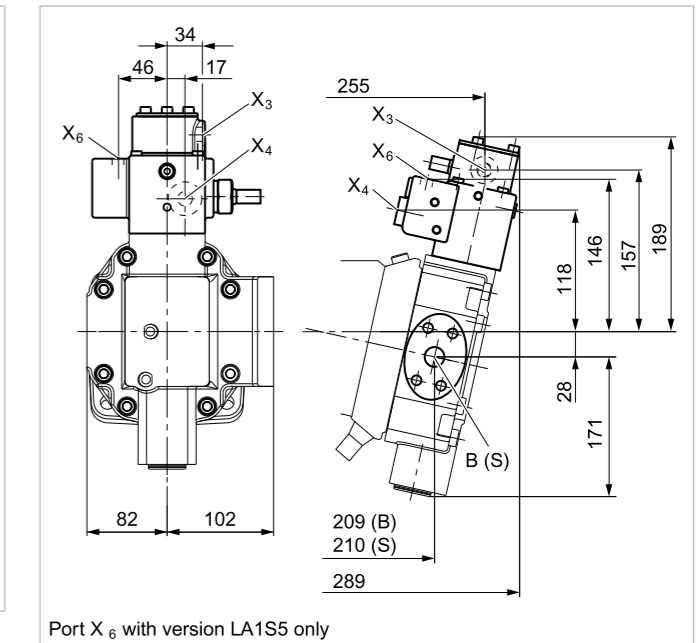
▼ LRDH1 – Power control with pressure cut-off and stroke limiter



▼ LRDS – Power control with pressure cut-off and load sensing



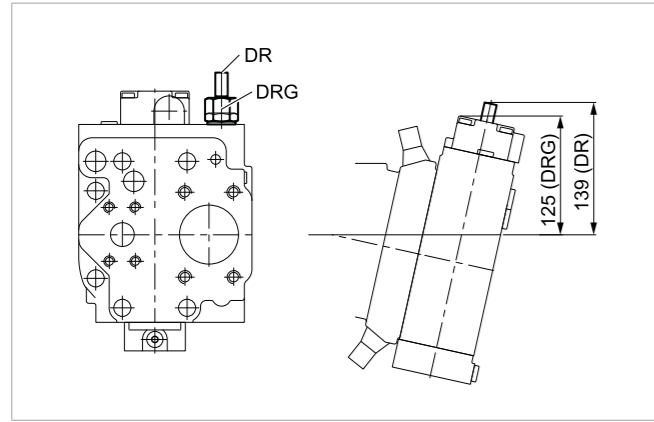
▼ LA1S – Power control with load sensing,
 LA1S5 – Power control with load sensing, can be overridden on a hydraulically proportional basis



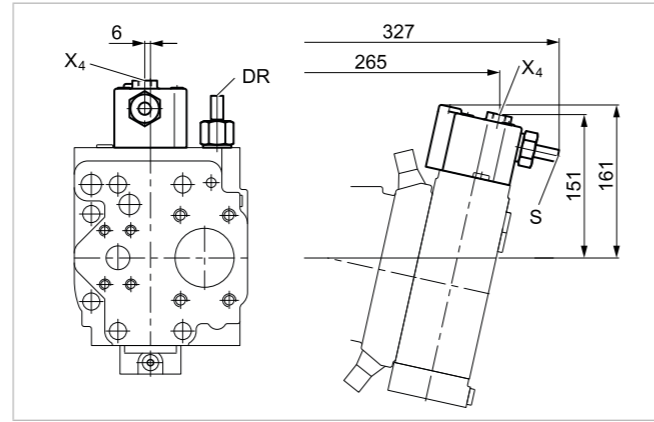
Port X₆ with version LA1S5 only

Dimensions [mm]

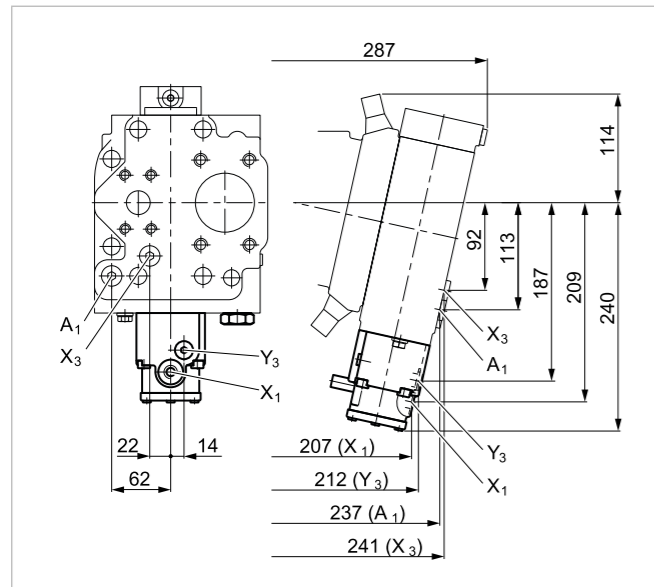
▼ DR/DRG – Pressure controller/pressure controller remotely controller



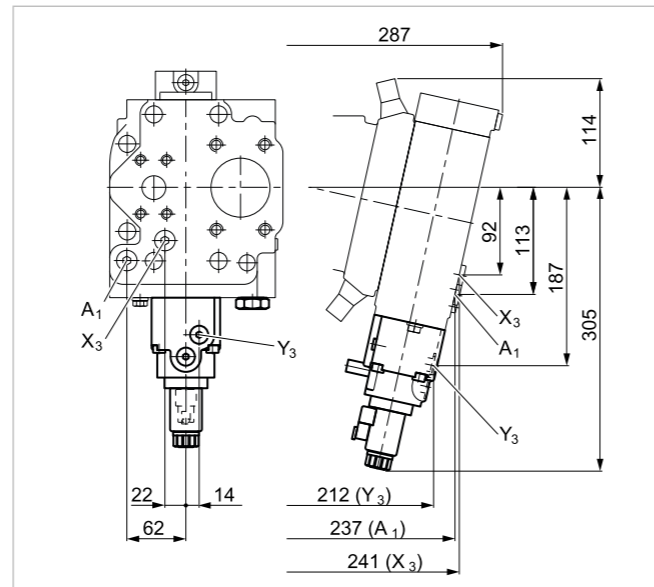
▼ DRS – Pressure controller with load sensing



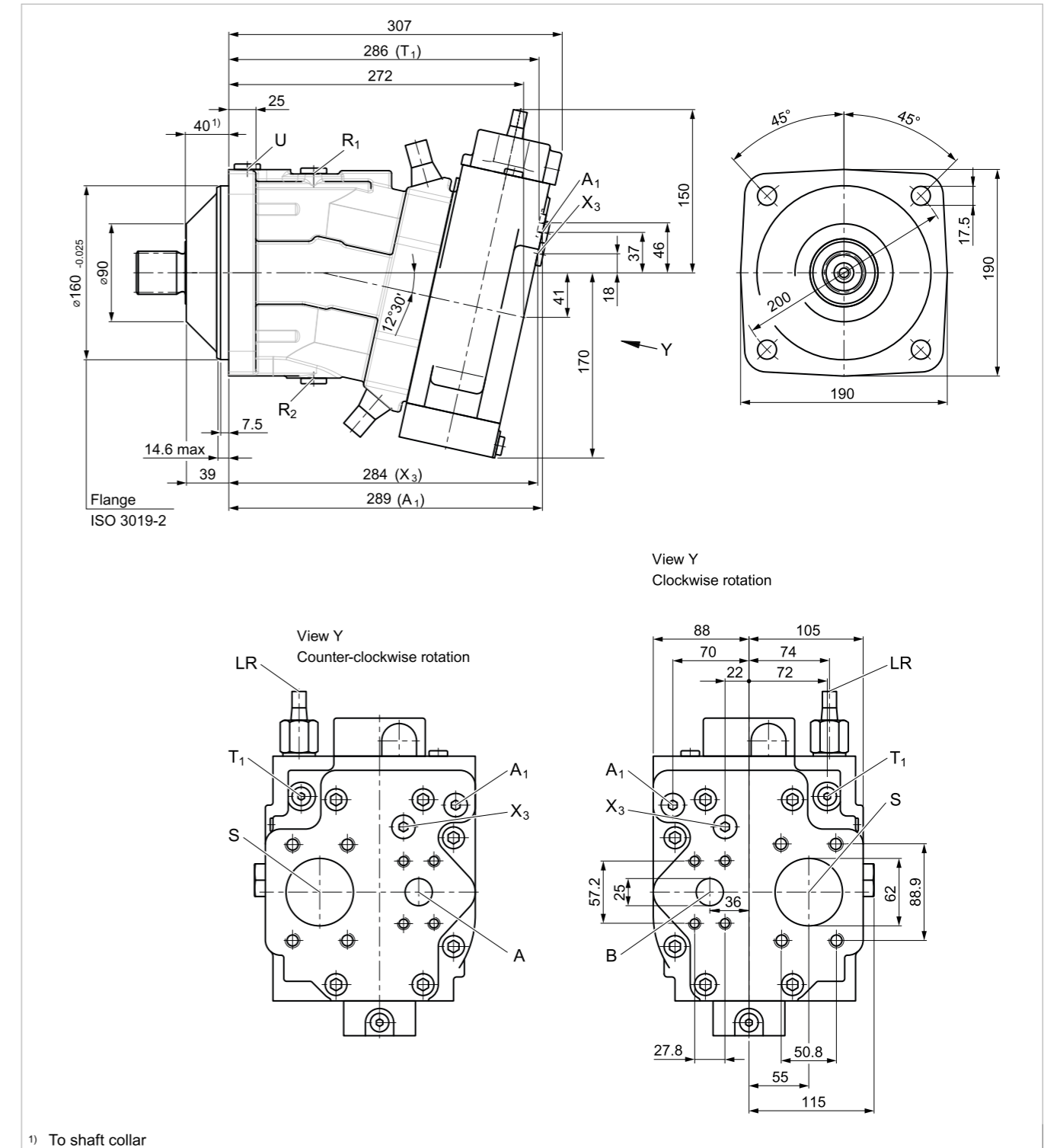
▼ HD1, HD1G – Proportional hydraulic control, positive control, and variant with pressure cut-off, remotely controlled



▼ EP2 – Proportional control electric, positive control

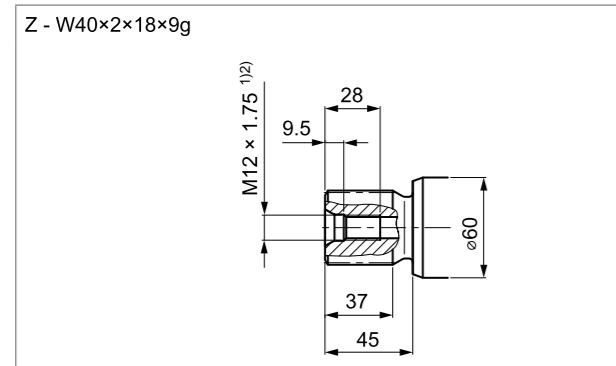


LR - Power controller without override

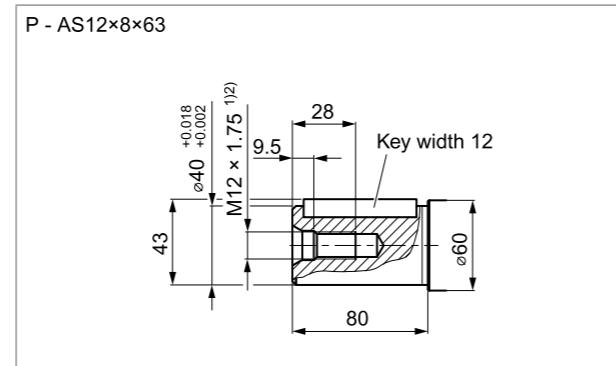


1) To shaft collar

▼ Splined shaft DIN 5480



▼ Parallel keyed shaft DIN 6885



Ports	Standard	Size ²⁾	$p_{max\ abs}$ [bar] ³⁾	Status
A (B)	SAE J518 ⁴⁾ DIN 13	1 in M12 × 1.75; 17 deep	400	O
S	SAE J518 ⁴⁾ DIN 13	2 1/2 in M12 × 1.75; 17 deep	2	O
U	DIN 3852 ⁵⁾	M18 × 1.5; 12 deep	2	X
R ₁ , R ₂	DIN 3852 ⁵⁾	M18 × 1.5; 12 deep	2	X
A ₁	DIN 3852 ⁵⁾	M16 × 1.5; 12 deep	400	X
T ₁	DIN 3852 ⁵⁾	M12 × 1.5; 12 deep	400	X ⁶⁾
X ₃	DIN 3852 ⁵⁾	M16 × 1.5; 12 deep	400	X
Y ₃	DIN 3852 ⁵⁾	M14 × 1.5; 12 deep	40	X
X ₁	DIN 3852 ⁵⁾	M14 × 1.5; 12 deep	40	O
X ₄	DIN 3852 ⁵⁾	M14 × 1.5; 12 deep	400	O
M ₁	DIN 3852 ⁵⁾	M12 × 1.5; 12 deep	400	X

1) Center bore according to DIN 332 (thread according to DIN 13)

2) For notes on tightening torques, see instruction manual.

3) Depending on the application, momentary pressure peaks can occur. Keep this in mind when selecting measuring devices and fittings.

4) Only dimensions according to SAE J518, metric fastening thread is a deviation from the standard.

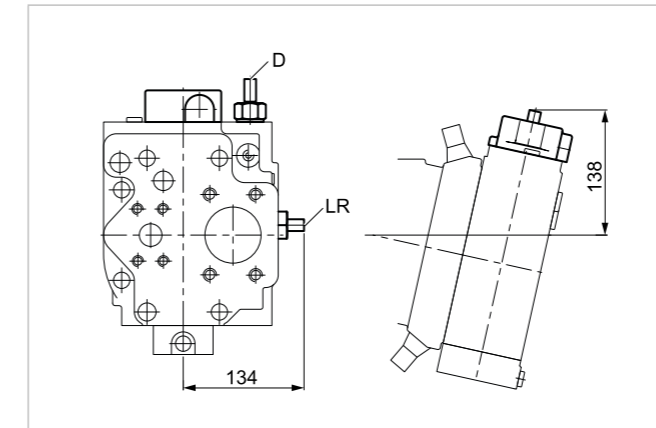
5) The spot face can be deeper than specified in the appropriate standard.

6) For versions with a pressure controller or pressure cut-off, a drain line is needed to relieve port T₁ to the reservoir.

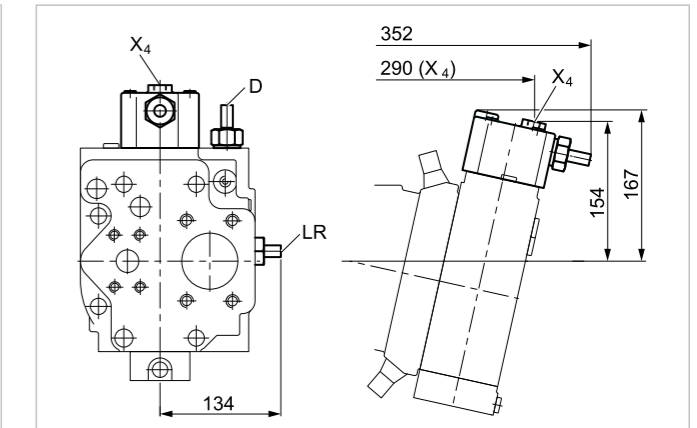
O = Must be connected (plugged on delivery)

X = Plugged (in normal operation)

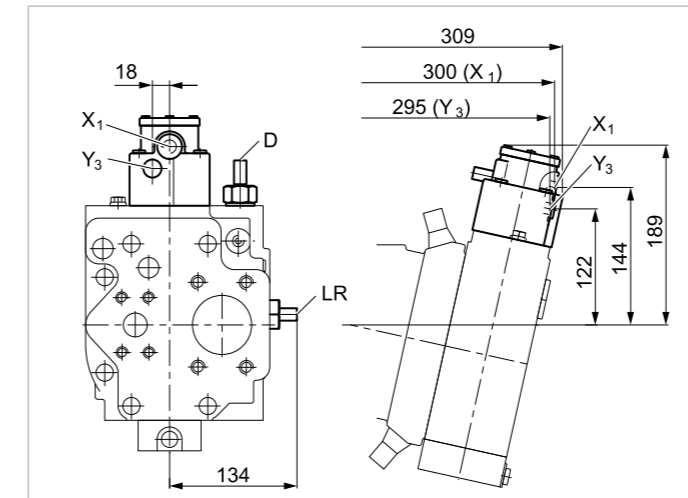
▼ LRD – Power controller with pressure cut-off



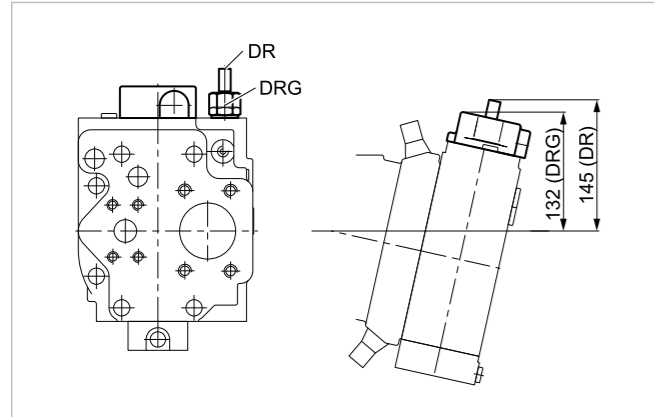
▼ LRDS – Power control with pressure cut-off and load sensing



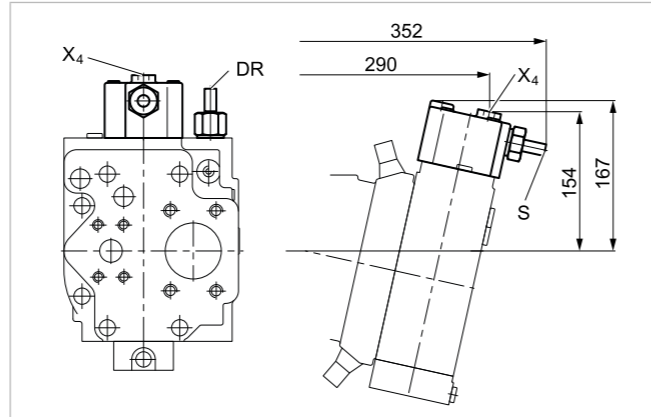
▼ LRDH1 – Power control with pressure cut-off and stroke limiter



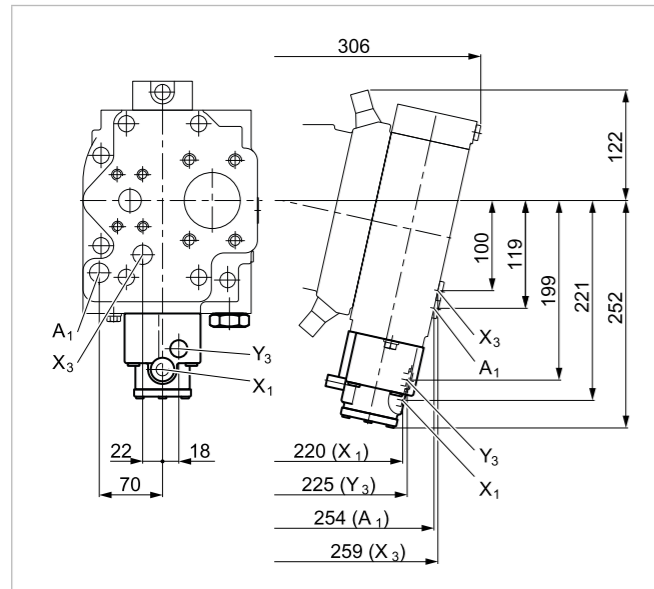
▼ DR/DRG – Pressure controller/pressure controller remotely controlled



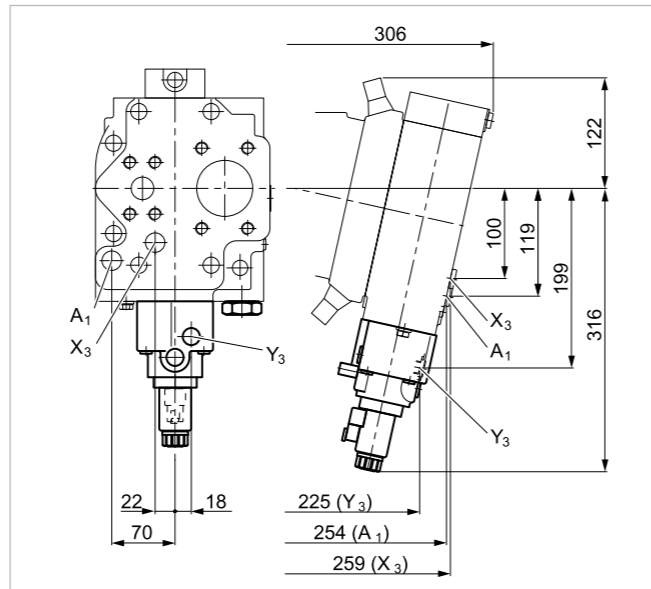
▼ DRS – Pressure controller with load sensing



▼ HD1, HD1G – Proportional hydraulic control, positive control, and variant with pressure cut-off, remotely controlled

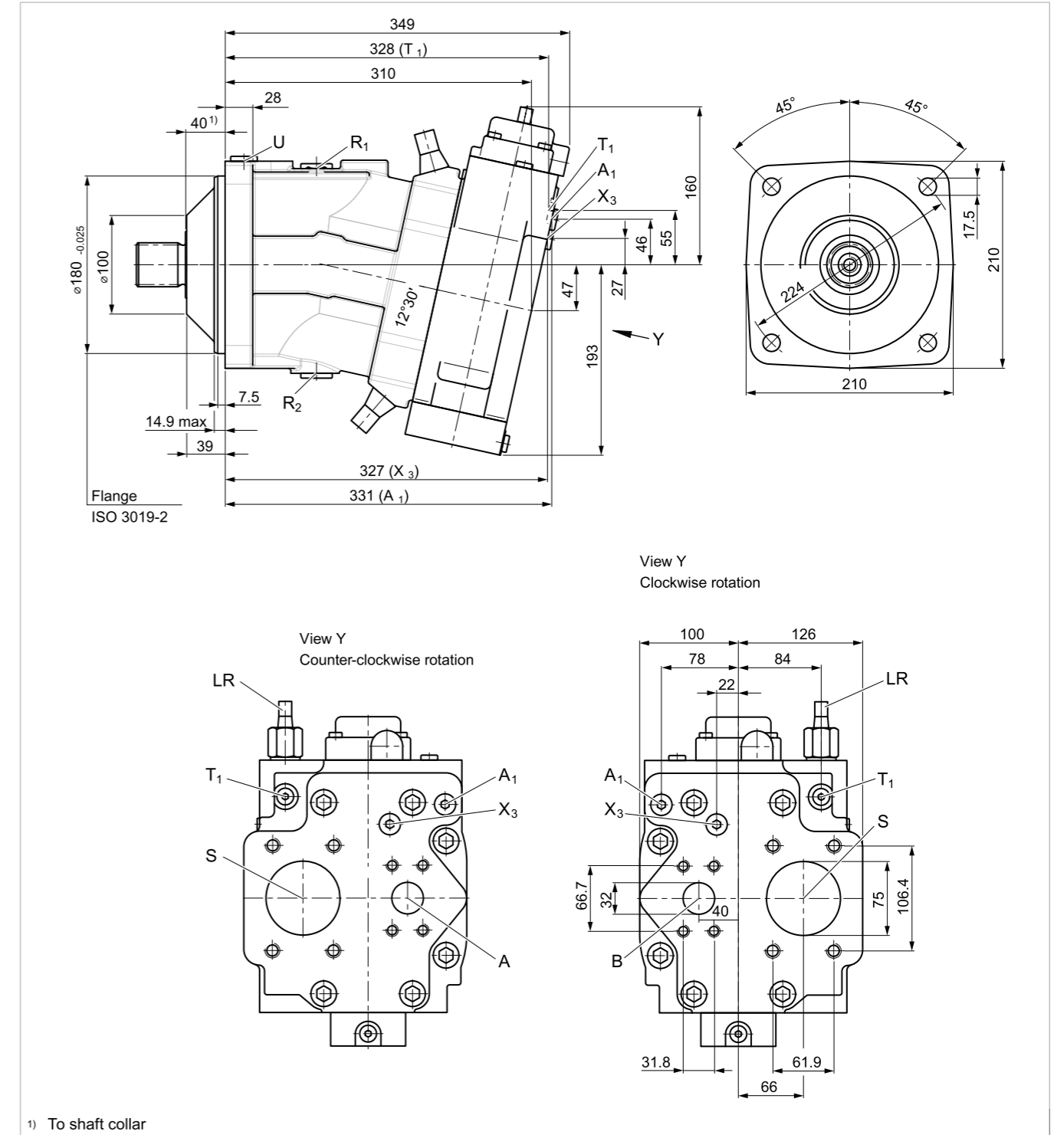


▼ EP2 – Proportional control electric, positive control



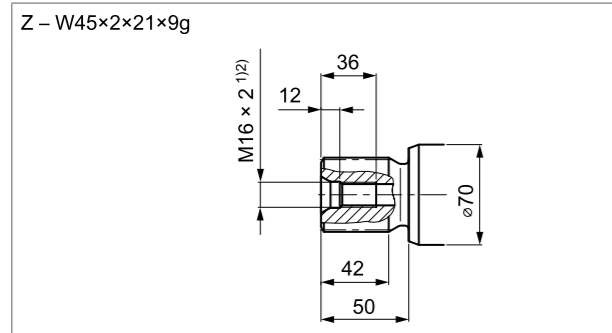
Dimensions, size 160

LR – Power controller without power override

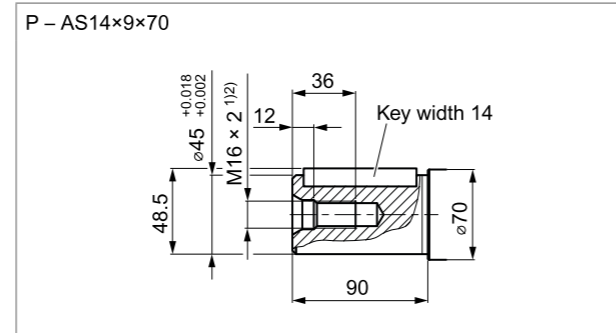


1) To shaft collar

▼ Splined shaft DIN 5480



▼ Parallel keyed shaft DIN 6885



Ports	Standard	Size ²⁾	$p_{max abs}$ [bar] ³⁾	Status
A (B)	SAE J518 ⁴⁾ DIN 13	1 1/4 in M14 X 2; 19 deep	400	O
S	SAE J518 ⁴⁾ DIN 13	3 in M16 X 2; 24 deep	2	O
U	DIN 3852 ⁵⁾	M22 x 1.5; 14 deep	2	X
R ₁ , R ₂	DIN 3852 ⁵⁾	M26 x 1.5; 16 deep	2	X
A ₁	DIN 3852 ⁵⁾	M16 x 1.5; 12 deep	400	X
T ₁	DIN 3852 ⁵⁾	M12 x 1.5; 12 deep	400	X ⁶⁾
X ₃	DIN 3852 ⁵⁾	M16 x 1.5; 12 deep	400	X
Y ₃	DIN 3852 ⁵⁾	M14 x 1.5; 12 deep	40	X
X ₁	DIN 3852 ⁵⁾	M14 x 1.5; 12 deep	40	O
X ₄	DIN 3852 ⁵⁾	M14 x 1.5; 12 deep	400	O
M ₁	DIN 3852 ⁵⁾	M12 x 1.5; 12 deep	400	X

1) Center bore according to DIN 332 (thread according to DIN 13)

2) For notes on tightening torques, see instruction manual.

3) Depending on the application, momentary pressure peaks can occur. Keep this in mind when selecting measuring devices and fittings.

4) Only dimensions according to SAE J518, metric fastening thread is a deviation from the standard.

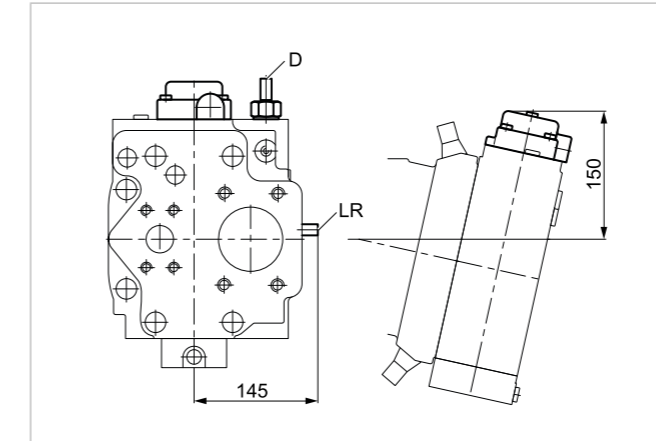
5) The spot face can be deeper than specified in the appropriate standard.

6) For versions with a pressure controller or pressure cut-off, a drain line is needed to relieve port T₁ to the reservoir.

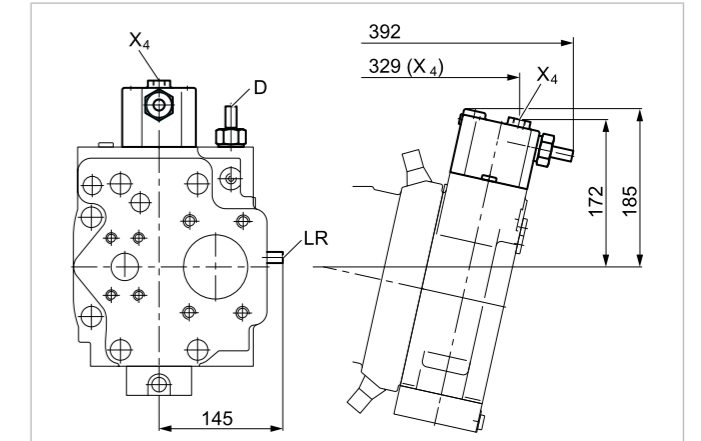
O = Must be connected (plugged on delivery)

X = Plugged (in normal operation)

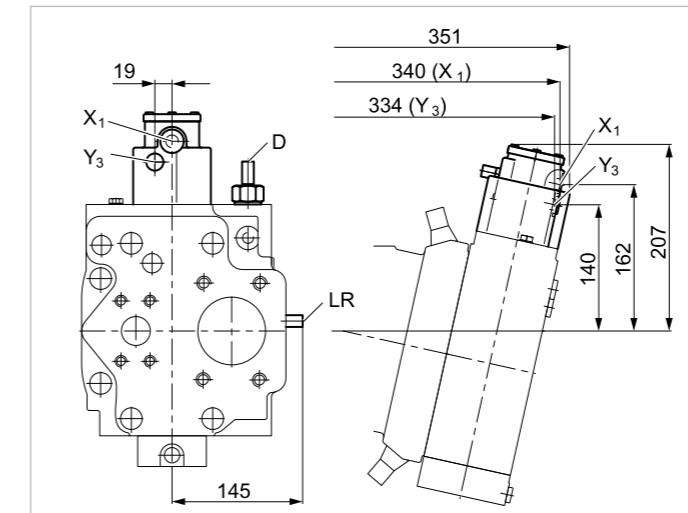
▼ LRD – Power controller with pressure cut-off



▼ LRDS – Power control with pressure cut-off and load sensing

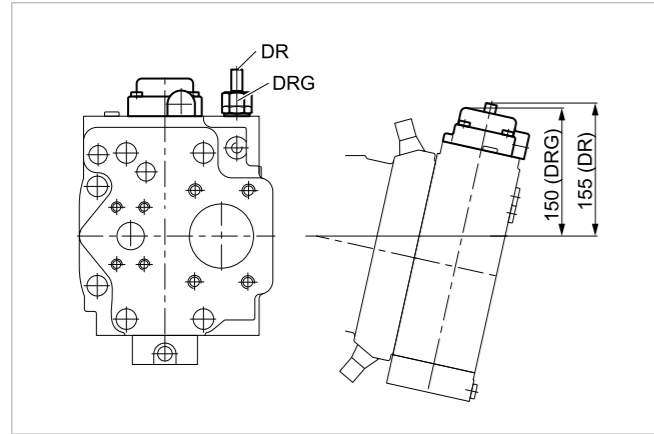


▼ LRDH1 – Power control with pressure cut-off and stroke limiter

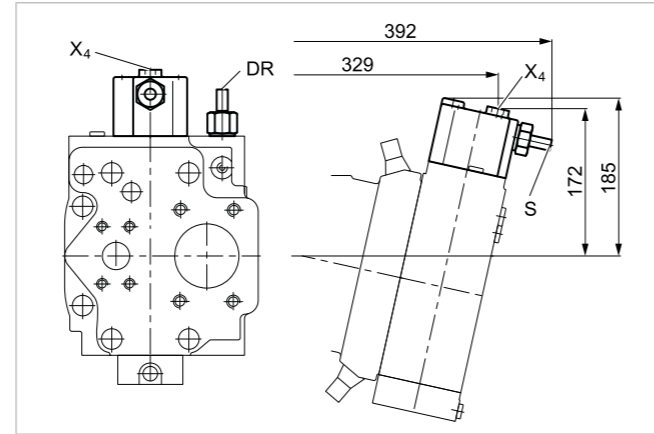


Dimensions [mm]

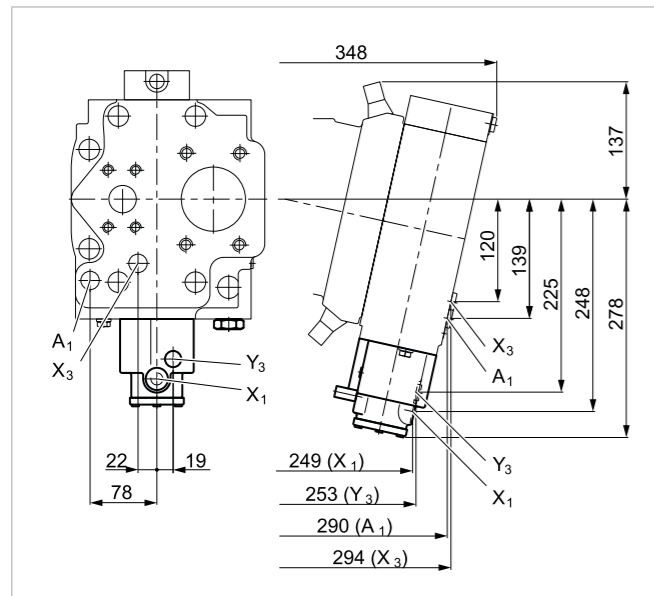
▼ DR/DRG – Pressure controller/pressure controller remotely controlled



▼ DRS – Pressure controller with load sensing



▼ HD1, HD1G – Proportional hydraulic control, positive control, and variant with pressure cut-off, remotely controlled



▼ EP2 – Proportional control electric, positive control

