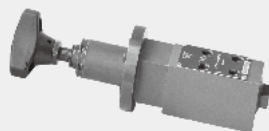


3.10

# Pressure reducing valve direct operated

## Type DR5DP...10

Size 5  
up to 315 bar  
up to 15 L/min



### Contents

Function and configuration	02
Symbols	02
Ordering code	03
Technical data	03
Characteristic curves	04
Unit dimensions	05

### Features

- Direct operated structure
- Porting pattern to DIN 24 340 form A and ISO4401
- 5 pressure ratings
- 3 adjustment elements:
  - Rotary knob
  - Adjustable bolt with protective cap,
  - Lockable adjustable handle
- Check valve, optional

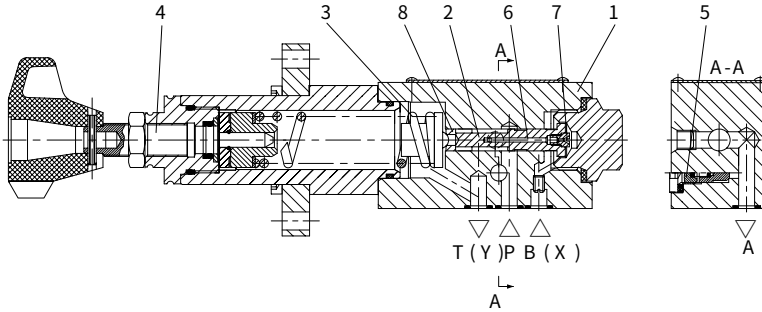
## Function and configuration

The valve type DR5DP is a 3-way direct operated pressure reducing valve with a pressure relief function on the secondary side.

It is used to reduce the system pressure. The secondary pressure is set by the pressure adjustment element (4).

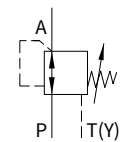
At static position, the valve is normally open and the pressure fluid flows unhindered from port P to port A. The pressure in port A acts at the spool area opposite to the compression spring (3) via the control line (6) and the spray nozzle(7). When the pressure in port A get the value setting at compression spring (3), the control spool (2) moves into the control position and keeps the setting pressure in port A constant. The internal control oil is taken from port A, or from external by port X. If the pressure in port A still increases due to external forces on the actuator, the control spool (2) moves still further towards the compression spring (3). This causes a flow path to be opened via control land(8) on the control spool (2). Sufficient fluid then flows back to tank to prevent any further pressure rise.

Fluid in spring chamber always drained to tank externally via port Y. For free return flow from port A to port P an optional check valve(5) can be fitted.

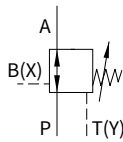


## Symbols

Without check valve

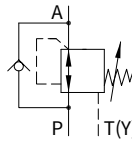


Version YM  
Pilot oil supply  
internal and  
drain external

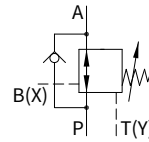


Version XYM  
Pilot oil supply  
external and  
drain external

With check valve

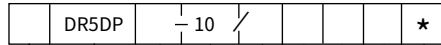


Version Y  
Pilot oil supply  
internal and  
drain external



Version XY  
Pilot oil supply  
external and  
drain external

## Ordering code



Without plate fixing flange  
(Standard version)=No code  
With plate fixing flange =F

Direct operated pressure  
reducing valve nominal size 5

Rotary knob =1  
Adjustable bolt with protective cap =2  
Lockable adjustable handle =3

Series 10 = 10

Further details in  
clear text

No code = NBR seals  
V = FKM seals

No code = With check valve  
M = Without check valve

Y = Pilot oil supply internal  
Oil drain external  
XY = Pilot oil supply external  
Oil drain external

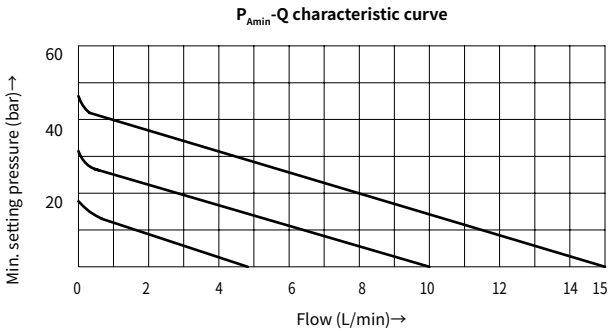
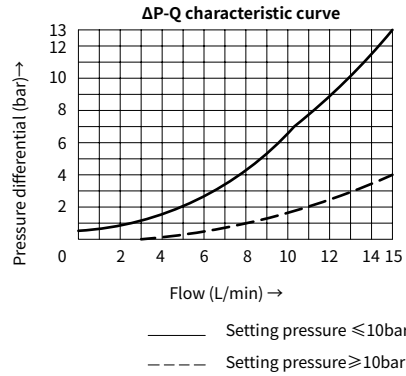
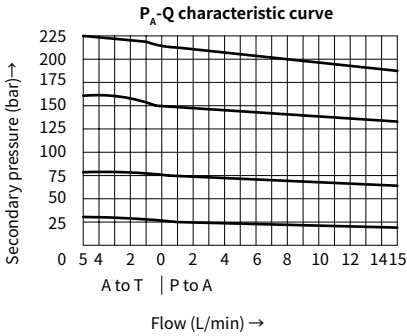
2.5 = Max. secondary pressure 25 bar  
7.5 = Max. secondary pressure 75 bar  
15 = Max. secondary pressure 150 bar  
21 = Max. secondary pressure 210 bar  
31.5 = Max. secondary pressure 315 bar

**Notes** :315bar only for version without check valve

## Technical data

Fluid			Mineral oil suitable for NBR and FKM seal
			Phosphate ester for FKM seal
Fluid temperature range		°C	-30 to +80 ( NBR seal )
			-20 to +80 ( FKM seal)
Viscosity range		mm <sup>2</sup> /s	10 to 800
Degree of contamination			Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15, ISO4406
Max.operating pressure	Port P	bar	315
Max.secondary pressure	Port A	bar	25; 75; 150; 210; 315(without check valve)
Max.backing pressure	PortT(Y)	bar	60
Max. flow-rate		L/min	15
Weight		kg	Approx.1.4

## Characteristic curves ( Measured at $\vartheta_{oil} = 40^{\circ}\text{C} \pm 5^{\circ}\text{C}$ , using HLP46)



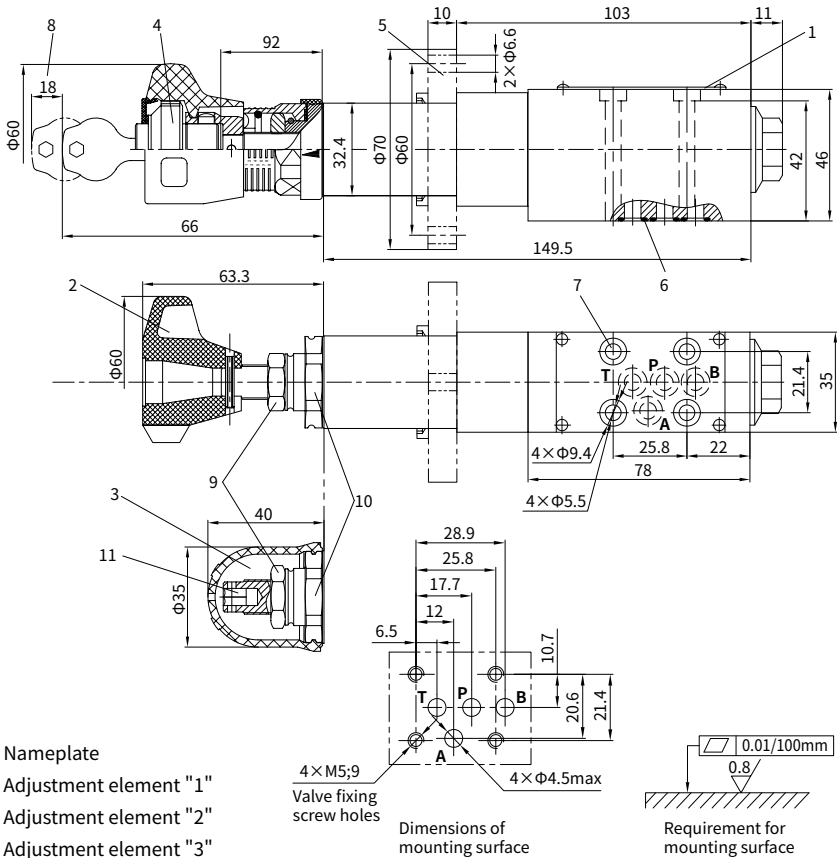
**$P_{Amin}$ -Q Characteristic curve shows the flow-rate in relation to the adjustable min. pressure rating from P to A.**

For instance:

pressure is 25 bar and flow-rate is 10L/min,  
 adjusts the pressure of port A to 20bar,  
 when the secondary pressure increases to 23bar,  
 the flow-rate trends to zero.

# Unit dimensions

(Dimensions in mm)



- 1 Nameplate
- 2 Adjustment element "1"
- 3 Adjustment element "2"
- 4 Adjustment element "3"
- 5 Plate fixing flange
- 6 O-ring 7  $\times$  1.5 (P, T, A, B)
- 7 Valve fixing holes
- 8 Space required to remove the key
- 9 Lockable nut S=19
- 10 External hexagon screw S=30
- 11 Internal hexagon screw S=6

**It must be ordered separately, if connection plate is needed**

**Type:** G 115/01A (G1/4)    G 115/02A (M14  $\times$  1.5)

**Valve fixing screws:**

GB/T 70.1-M5  $\times$  50 -10.9, internal hexagon screw

Tightening torque  $M_A = 9\text{Nm}$

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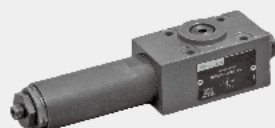


3.11

# Pressure reducing valve direct operated

## Type DR6DP...L5X

Size 6  
up to 315 bar  
up to 60 L/min



### Contents

Function and configuration	02
Symbols	02
Ordering code	03
Technical data	03
Characteristic curves	04
Unit dimensions	05

### Features

- Direct operated structure
- Porting pattern to DIN 24 340 form A, ISO4401
- 5 pressure ratings
- 2 adjustment elements:
  - Rotary knob
  - Adjustable bolt with protective cap
- With pressure gauge connection
- Check valve, optional

## Function and configuration

The valve type DR6DP is a 3-way direct operated pressure reducing valve with a pressure relief function on the secondary side, to insure the secondary pressure steady. It is used to reduce the system pressure.

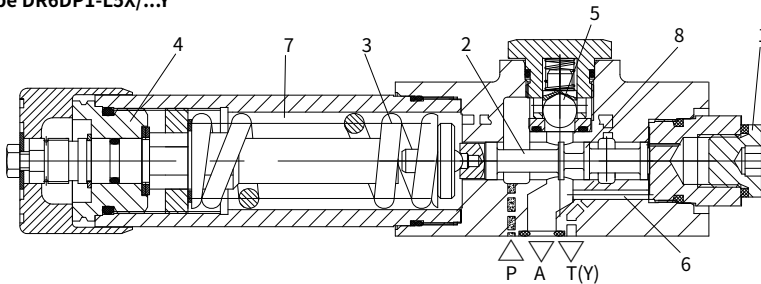
The secondary pressure is set by the pressure adjustment element (4).

At static position, the valve is normally open and the pressure fluid flows unhindered from port P to port A. The pressure in port A acts at the spool (2) area opposite to the compression spring (3) via the control line (6). When the pressure in port A get the value setting at compression spring (3), the control spool (2) moves into the control position and keeps the setting pressure in port A constant. The internal control oil is taken from port A via the control line (6). If the pressure in port A still increases due to external forces on the actuator, the control spool (2) moves still further towards the compression spring (3). This causes a flow path to be opened via control land (8) on the control spool (2). Sufficient fluid then flows back to tank to prevent any further pressure rise.

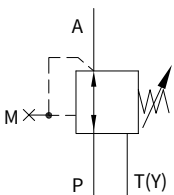
Fluid in spring chamber always drained to tank externally via port T(Y).

For free return flow from port A to port P an optional check valve (5) can be fitted. One pressure gauge connection (1) used for monitoring the secondary pressure at the valve.

### Type DR6DP1-L5X/...Y



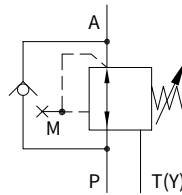
## Symbols



### Version "YM"

Pilot oil supply internal  
oil drain external

Without check valve



### Version "Y"

Pilot oil supply internal  
oil drain external

With check valve



## Ordering code

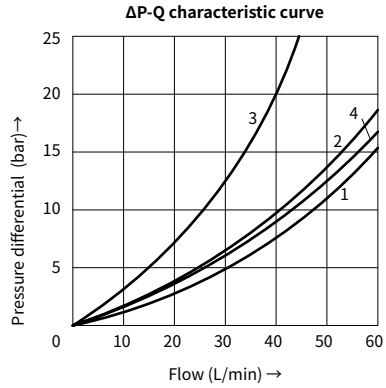
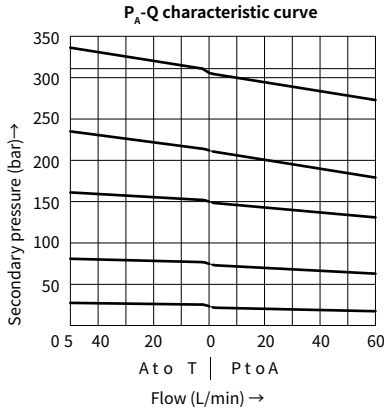
		DR6DP	-	L5X	/	Y	/		*	Further details in clear text
Direct operated pressure reducing valve nominal size 6										
Rotary knob	=1								No code =	NBR seals
Adjustable bolt with protective cap	=2								V =	FKM seals
Lockable rotary knob with scale	=3								Pressure tapping thread	
Rotary knob with scale	=7								No code =	Inch G1/4
Series L50 to L59	= L5X								2 =	Metric M14×1.5
(L50 to L59: unchanged installation and connection dimensions)									No code =	With check valve
Max. secondary pressure 25 bar	=	2.5							M =	Without check valve
Max. secondary pressure 75 bar	=	7.5							Y = Pilot oil supply internal	
Max. secondary pressure 150 bar	=	15							Oil drain external	
Max. secondary pressure 210 bar	=	21								
Max. secondary pressure 315 bar	=	31.5 (Note1)								

**Notes 1:** Only for adjustment form "2" and without check valve

## Technical data

Fluid		Mineral oil suitable for NBR and FKM seal
		Phosphate ester for FKM seal
Fluid temperature range	°C	-30 to +80 ( NBR seal )
		-20 to +80 ( FKM seal)
Viscosity range	mm <sup>2</sup> /s	10 to 800
Degree of contamination		Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15 , ISO4406
Max.operating pressure	Port P	315
Max.secondary pressure	Port A bar	25; 75; 150; 210; 315(without check valve)
Max.backing pressure	PortT(Y)	16
Max. flow-rate	L/min	60
Weight	kg	Approx.1.6

## Characteristic curves ( Measured at $\theta_{oil} = 40^{\circ}\text{C} \pm 5^{\circ}\text{C}$ , using HLP46)



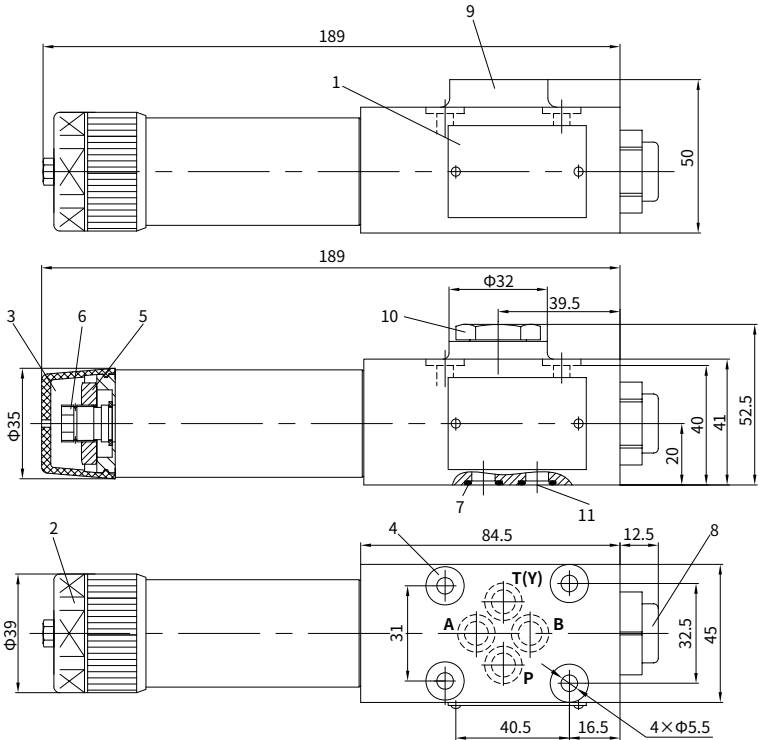
### Notes:

The curve characteristics remain in a certain pressure range, with a low setting pressure. The characteristic curves for the pressure relief function are valid when the back pressure is zero !

- 1 P to A (min. pressure differential)
- 2 A to T (Y) (min. pressure differential)
- 3 Pressure differential only over the check valve
- 4 Pressure differential over the check valve and fully opened cross section

# Unit dimensions

(Dimensions in mm)



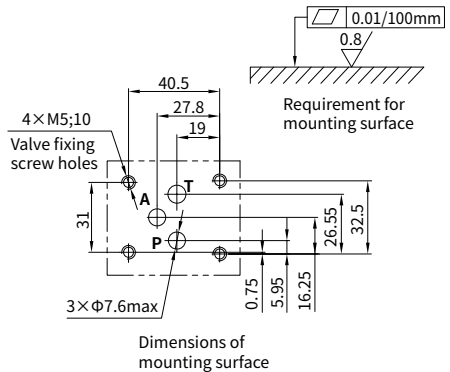
- 1 Nameplate
- 2 Adjustment element "1"
- 3 Adjustment element "2"
- 4 Valve fixing holes
- 5 Lockable nut S=24
- 6 Internal hexagon screw S=10
- 7 O-ring 9.25×1.78 (A, B, P, T)
- 8 Pressure gauge connection:  
G1/4 or M14×1.5; 12 deep  
Hex wrench S=6
- 9 Without check valve
- 10 With check valve
- 11 Port B blocked, has no function

**It must be ordered separately,  
if connection plate is needed**

**Type:** G341/01(G1/4), G341/02(M14×1.5) G342/01(G3/8), G342/02(M18×1.5)  
G502/01(G1/2), G502/02(M22×1.5)

**Valve fixing screws:**

M5×50 internal hexagon screw GB/T 70.1-10.9, Tightening torque  $M_t=8.9\text{Nm}$



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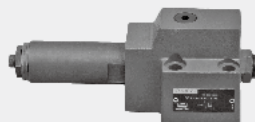


3.12

# Pressure reducing valve direct operated

## Type DR10DP...L4X

Size 10  
up to 210 bar  
up to 80 L/min



### Contents

Function and configuration	02
Symbols	02
Ordering code	03
Technical data	03
Characteristic curves	04
Unit dimensions	05

### Features

- Direct operated structure
- Porting pattern conforms to DIN 24 340 form D and ISO5781
- 4 pressure ratings
- 2 adjustment elements:
  - Rotary knob
  - Adjustable bolt with protective cap
- With pressure gauge connection
- Check valve, optional

## Function and configurations

The valve type DR10DP is a 3-way direct operated pressure reducing valve with a pressure relief function on the secondary side. It is used to reduce the system pressure.

The secondary pressure is set by the pressure adjustment element (1).

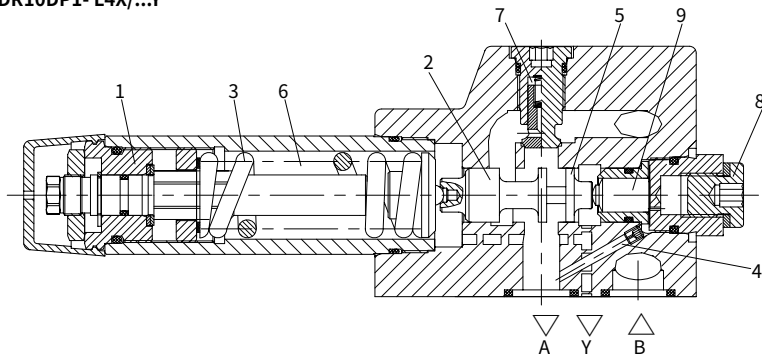
At static position, the valve is normally open and the pressure fluid flows unhindered from port B to port A. The pressure in port A acts at the small spool(9) area opposite to the compression spring (3) via the control line (4). When the pressure in port A get the value setting at the compression spring (3), the small spool(9) pushes the control spool (2) into the control position and keeps the setting pressure in port A constant. The internal control oil is taken from port A via the control line (4). If the pressure in port A still increases due to external forces on the actuator, a flow path is to be opened via control land(5) on the control spool (2) . Port Y is open and sufficient fluid then flows back to tank to prevent any further pressure rise.

Fluid in spring chamber (6) always drained to tank externally via port Y.

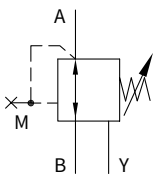
For free return flow from port A to port B an optional check valve(7) can be fitted.

One pressure gauge connection (8) used for monitoring the secondary pressure at the valve.

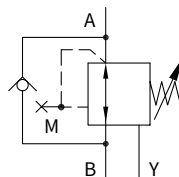
### Type DR10DP1- L4X/...Y



## Symbols



**Version "YM"**  
Pilot oil supply internal  
oil drain external  
  
Without check valve



**Version "Y"**  
Pilot oil supply internal  
oil drain external  
  
With check valve

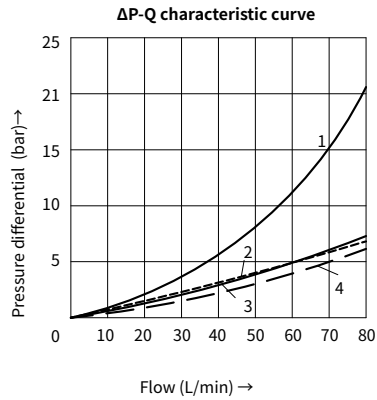
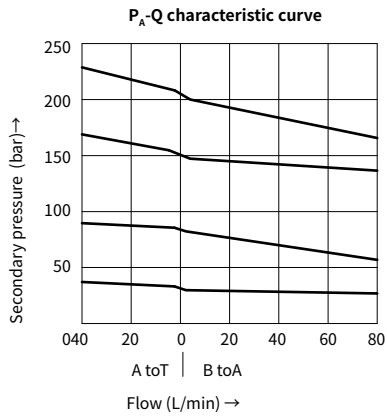
## Ordering code

DR10DP		-L4X		Y	*	Further details in clear text
Direct operated pressure reducing valve nominal size 10						
Rotary knob	=1				No code =	NBR seals
Adjustable bolt with protective cap	=2				V =	FKM seals
Lockable rotary knob with scale	=3				Pressure tapping thread	
Rotary knob with scale	=7				No code =	Inch G1/4
Series L40 to L49 (=L4X (L40 to L49 series: unchanged installation and connection dimensions))					2 =	Metric M14×1.5
Max. secondary pressure 25bar	=2.5				No code =	With check valve
Max. secondary pressure 75bar	=7.5				M =	Without check valve
Max. secondary pressure 150bar	=15			Y =	Pilot oil supply internal	
Max. secondary pressure 210bar	=21				Oil drain external	

## Technical data

Fluid		Mineral oil suitable for NBR and FKM seal	
		Phosphate ester for FKM seal	
Fluid temperature range		°C	-30 to +80 ( NBR seal )
			-20 to +80 ( FKM seal )
Viscosity range		mm <sup>2</sup> /s	10 to 800
Degree of contamination		Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15 , ISO4406	
Max.operating pressure	Port P	315	
Max.secondary pressure	Port A	bar	25; 75; 150; 210
Max.backing pressure	Port Y	16	
Max. flow-rate	L/min	80	
Weight	kg	Approx.3.3	

## Characteristic curves ( Measured at $\vartheta_{oil} = 40^{\circ}\text{C} \pm 5^{\circ}\text{C}$ , using HLP46)



### Notes:

The curve characteristics remain in a certain pressure range, with a low setting pressure.

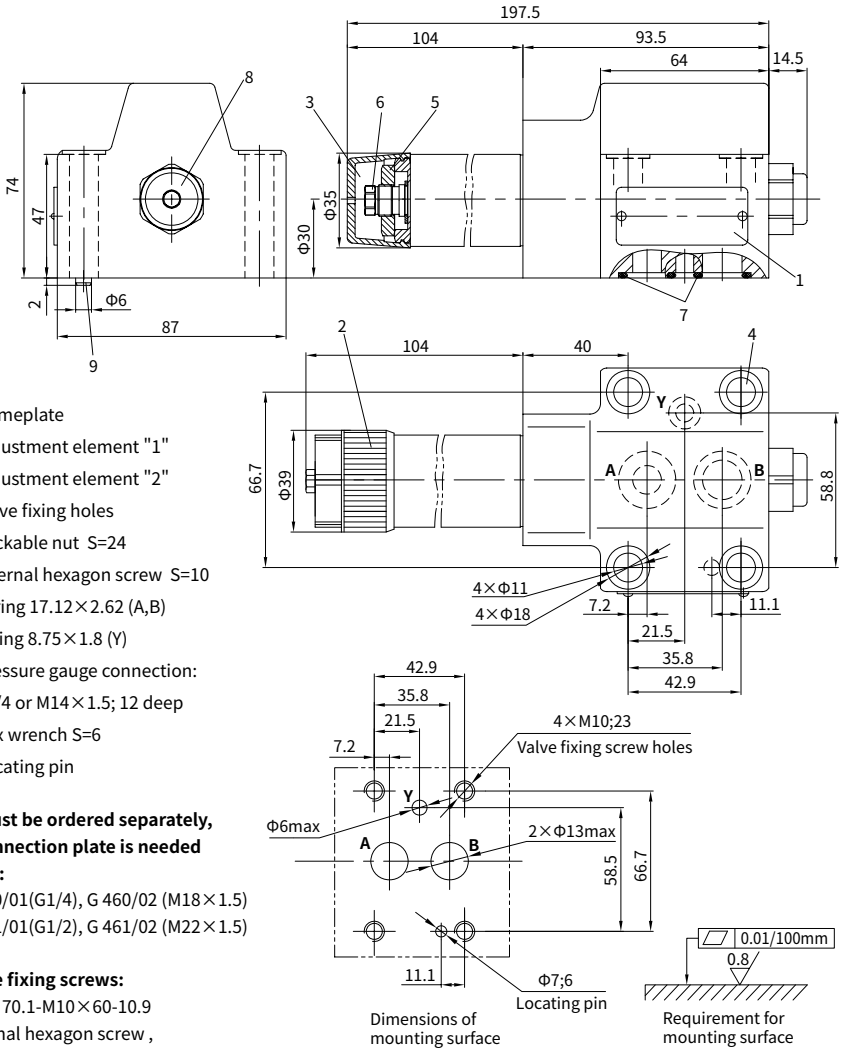
The characteristic curves for the pressure relief function are valid when the back pressure is zero!

- 1 A to Y ( pressure differential)
- 2 B to A (Y (min. pressure differential)
- 3 Pressure differential) only over the check valve
- 4 Pressure differential) over the check valve and fully opened control cross section



# Unit dimensions

(Dimensions in mm)



- 1 Nameplate
- 2 Adjustment element "1"
- 3 Adjustment element "2"
- 4 Valve fixing holes
- 5 Lockable nut S=24
- 6 Internal hexagon screw S=10
- 7 O-ring 17.12×2.62 (A,B)  
O-ring 8.75×1.8 (Y)
- 8 Pressure gauge connection:  
G1/4 or M14×1.5; 12 deep  
Hex wrench S=6
- 9 Locating pin

**It must be ordered separately, if connection plate is needed**

**Type:**

- G 460/01(G1/4), G 460/02 (M18×1.5)
- G 461/01(G1/2), G 461/02 (M22×1.5)

**Valve fixing screws:**

- GB/T 70.1-M10×60-10.9
- internal hexagon screw ,
- Tightening torque  $M_A = 75\text{Nm}$

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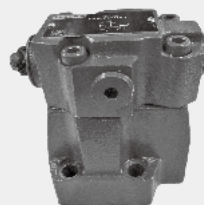
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3.13

# Pilot operated pressure reducing valves

## Type DR...L5X

Sizes 10 to 32  
up to 350 bar  
up to 400L/min



### Contents

Function and configurations	02
Symbols	02
Ordering code	03
Technical data	04
Characteristic curves	05
Unit dimensions	06-08

### Features

- Sub-plate mounting
- Porting pattern conforms to DIN 24 340, form D and ISO 5781
- Threaded connections
- Installation in manifolds
- 5 pressure ratings
- 4 adjustment elements
  - Rotary knob
  - Adjustable bolt with protective cap
  - Lockable rotary knob with scale
  - Rotary knob with scale
- Check valve ,optional  
(only for sub-plate mounting)

## Function and configurations

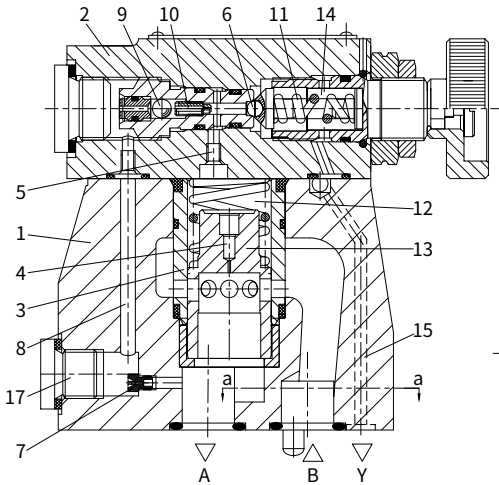
Pressure control valves type DR series L5X are pilot operated pressure reducing valves. They are used to control secondary circuit in a system. They consist mainly of the main valve (1) with main spool assembly (3) and pilot valve (2) with pressure adjustment element.

At static state, the valves are normally open, fluid flows free from port B to port A via the main spool (3). Pressure at port A acts on the underside of main spool (3) and its spring-loaded side via throttle orifice (4). Fluid also acts on the ball valve (6) of the pilot valve (2) via the channel (5). Meanwhile, pressure fluid flows via throttle orifice (7), control line (8), check valve (9) and throttle orifice (10) to the ball valve (6). Based on the

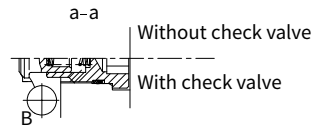
setting value of the spring (11), control piston (13) keeps open, then fluid can flow free from port B to port A, until pressure at port A exceeds the setting value of spring (11), and then ball valve (6) is opened. Control piston (13) moves to close position. When pressure at port A is balanced with setting value at spring, pressure reducing is achieved as expected. Control oil returns from spring chamber (14) to tank via channel (15).

A check valve (16) can be fitted optionally to give free return flow from line A to B.

Pressure gauge connection (17), used for monitoring the reduced pressure at the port A.

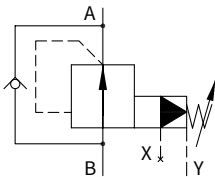


Type DR...-4-L5X/...Y

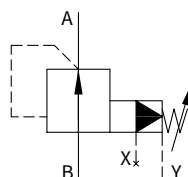


## Symbols

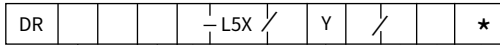
DR...L5X/...Y



DR...L5X/...YM



## Ordering code



Pressure reducing valve,  
pilot operated =No code  
Pilot operated valve  
Without main spool assembly  
(No mark for size) =C  
Pilot operated valve  
With main spool assembly  
(Marked with size 30) =C

Size	Connection	
	sub-plate mounting	threaded connection
10	=10	=10
15		=15
20	=20	=20
25		=25
32	=30	=30

Sub-plate mounting = -  
Threaded connection =G

Regulating element:  
Rotary knob =4  
Adjustable bolt with protective cap =5  
Lockable rotary knob with scale =6  
Rotary knob with scale =7

Further details  
in clear text

No code = NBR seals  
V = FKM seals

Only for Port X1 and Y1 of threaded  
connection valves and  
sub-plate mounting valves

No code = Inch thread  
2 = Metric thread

No code = With check valve  
( only for sub-plate mounting )  
M = Without check valve

Y = Pilot oil drain external

5 = Max. secondary pressure 50bar  
10 = Max. secondary pressure 100bar  
20 = Max. secondary pressure 200bar  
31.5 = Max. secondary pressure 315bar  
35 = Max. secondary pressure 350bar  
(350bar only for the version without check valve)

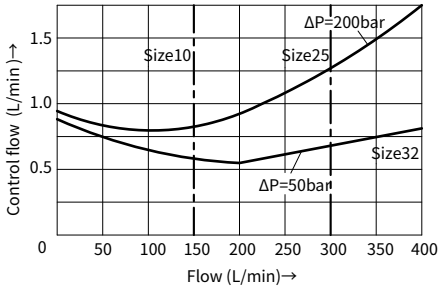
L5X= Series L50 to L59  
(L50 to L59 series: unchanged installation  
andconnection dimensions)

## Technical data

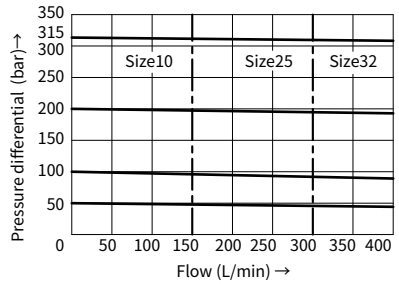
Fluid			Mineral oil suitable for NBR and FKM seal					
			Phosphate ester for FKM seal					
Fluid temperature range		°C	-30 to +80 (NBR seal)			-20 to +80 (FKM seal)		
			-20 to +80 (FKM seal)					
Viscosity range		mm <sup>2</sup> /s	10 to 800					
Degree of contamination			Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15, ISO4406					
Max.operating pressure	Port B	bar	350					
Operating pressure range	Port A	bar	10 to 350					
Max.backing pressure	Port Y	bar	350(only for without check valve); 315(with check valve)					
Adjustable pressure	Max.	bar	50;100;200;315;350					
	Min.	bar	Related with flow-rate ( refer to the curves)					
Size			DR10	DR15	DR20	DR25	DR30	
Max. flow-rate	Sub-plate mounting	L/min	150	-	300	-	400	
	Threaded connection	L/min	150	300	300	400	400	
Fixing position			Optional					
Size			DR10	DR15	DR20	DR25	DR30	
Weight	Sub-plate mounting	DR	kg	Approx.3.6	-	Approx.5.3	-	Approx.8.2
		DR...G	kg	Approx.5.3	Approx.5.5	Approx.5.1	Approx.5.0	Approx.5.0
	Threaded connection	DRC	kg	Approx.1.2				
		DRC30	kg	Approx.1.5				

## Characteristic curves (Measured at $\vartheta_{oil} = 40^{\circ}C \pm 5^{\circ}C$ , using HLP46)

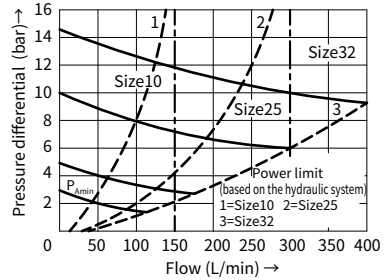
**Control oil flow related with flow (B → A) and pressure differential**



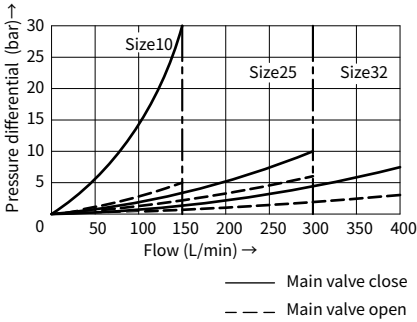
**Outlet pressure PA and in relation to (B → A)**



**Min. setting pressure PA min in relation to flow (B → A)**

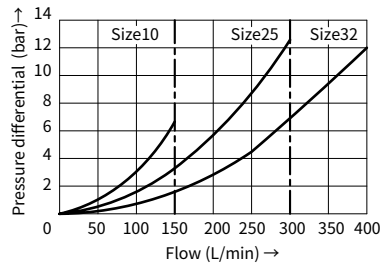


**$\Delta P$ -Q curve, via check valve (A → B)**



**P-Q curve(B → A)**

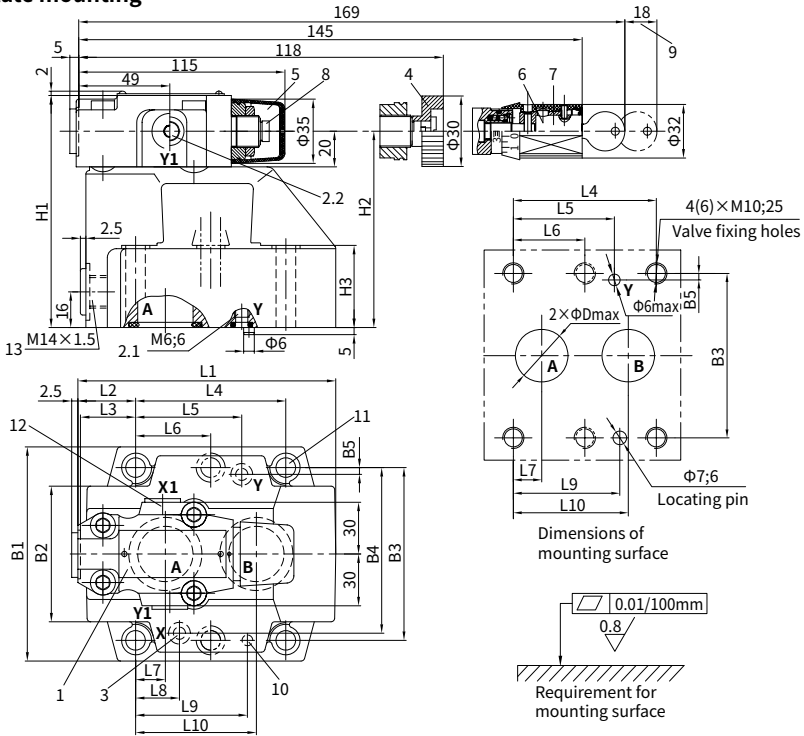
**(Min. setting pressure differential )**



# Unit dimensions

(Dimensions in mm)

## Sub-plate mounting



- 1 Nameplate
- 2.1 Port Y used for control oil external drain
- 2.2 Port Y1 optional for control oil external drain (G1/4 or M14×1.5)
- 3 Port X no function
- 4 Adjustment element "4"
- 5 Adjustment element "5"
- 6 Adjustment element "6"
- 7 Adjustment element "7"
- 8 Internal hexagon screw S=10
- 9 Space required to remove the key
- 10 Locating pin
- 11 Valve fixing holes 4pcs(DR10,DR20) , 6pcs(DR30)
- 12 Port X1 for control external(G1/4or M14×1.5)
- 13 Pressure gauge connection

**The sub-plate must be ordered separately.**

**Type:**

**DR10:** G460/01 (G3/8) G460/02 (M18×1.5)  
G461/01 (G1/2) G461/02 (M22×1.5)

**DR20:** G412/01 (G3/4) G412/02 (M27×2)  
G413/01 (G1) G413/02 (M33×2)

**DR30:** G414/01 (G1 1/4) G414/02 (M42×2)  
G415/01 (G1 1/2) G415/02 (M48×2)

**Valve fixing screws:**

Internal hexagon screw

**DR10:** GB/T 70.1-M10×50-10.9

**DR20:** GB/T 70.1-M10×60-10.9

**DR30:** GB/T 70.1-M10×70-10.9

Tightening torque  $M_A = 75 \text{ Nm}$

Type	B1	B2	B3	B4	B5	O-ring (PortA,B)					O-ring (PortX,Y)			D
DR10	85	50	66.7	58.8	7.9	17.12×2.62					9.25×1.78			13
DR20	102	59.5	79.4	73	6.4	28.17×3.53					9.25×1.78			22
DR30	120	76	96.8	92.8	3.8	34.52×3.53					9.25×1.78			30
Type	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	H1	H2	H3	
DR10	96	35.5	33	42.9	21.5	-	7.2	21.5	31.8	35.8	112	92	28	
DR20	116	37.5	35.4	60.3	39.7	-	11.1	20.6	44.5	49.2	122	102	38	
DR30	145	33	29.8	84.2	59.5	42.1	16.7	24.6	62.7	67.5	130	110	46	

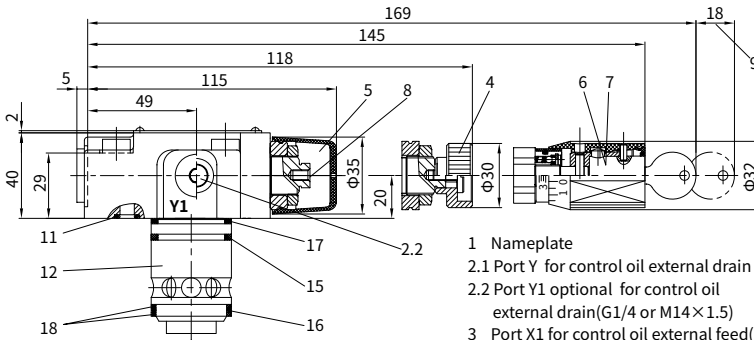




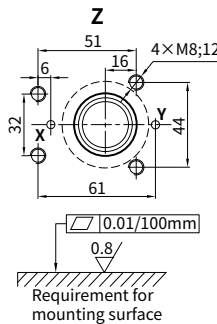
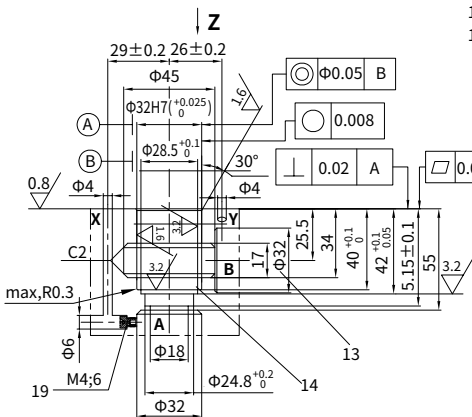
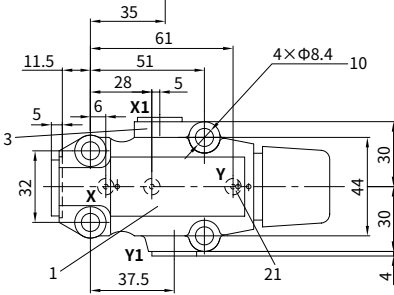
# Unit dimensions

(Dimensions in mm)

## (DRC30) pilot valve with or (DRC30) without main spool assembly



- 1 Nameplate
- 2.1 Port Y for control oil external drain
- 2.2 Port Y1 optional for control oil external drain(G1/4 or M14×1.5)
- 3 Port X1 for control oil external feed(G1/4 or M14×1.5)
- 4 Adjustment element "4"
- 5 Adjustment element "5"
- 6 Adjustment element "6"
- 7 Adjustment element "7"
- 8 Internal hexagon screw S=10
- 9 Space required to remove the key
- 10 Valve fixing holes(Valve fixing screw GB/T70.1-M8×40-10.9 M<sub>A</sub>=37Nm)
- 11 O-ring 8.75×1.8(X,Y)
- 12 Main spool
- 13 Ø32 and Ø45 holes can meet each other at any position, but it can't damage the port X and the fixing holes
- 14 It must fix the O-ring and back-up ring into this hole before assembling the main spool
- 15 O-ring 28×1.8
- 16 O-ring 27.3×2.4
- 17 O-ring 28×2.65
- 18 O-ring 28.4×32×0.6
- 19 Flow controller(must be ordered separately)



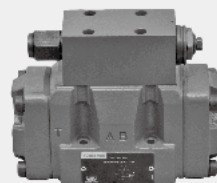


3.14

# Pressure reducing valve pilot operated

## Type 3DR10P...L6X

Size 10  
up to 315 bar  
up to 120 L/min



### Contents

Function and configuration	02
Ordering code	03
Technical data	03
Characteristic curves	04
Unit dimensions	05

### Features

- Porting pattern conforms to DIN 24 340 form A and ISO 4401
- 4 pressure ratings
- 2 adjustment elements
  - Rotary knob
  - Adjustable bolt with protective cap
- Pressure gauge fitting

## Function and configurations

The pressure valve type 3DR10P is a pilot operated 3-way pressure reducing valve with pressure limitation in the secondary circuit. It is used for reducing pressure in a hydraulic system.

The pressure reducing valve consists mainly of main valve (1), control spool (2) and pilot control valve (3) with pressure adjustment element (10).

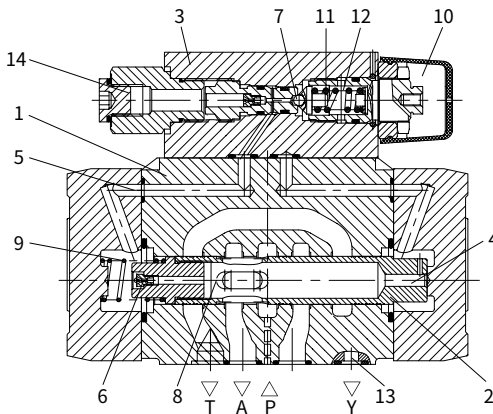
At static state, the valves are normally open, fluid flows free from port P to port A. The pressure in port A is applied via the channel (4) to the spool area opposite to the compression spring (9). Fluid also acts on the ball valve (7) of the pilot valve (3) via the throttle orifice (6) and channel (5). Based on the setting value of the spring (11), control piston keeps open, then fluid can flow free from port P to port A, until pressure at port A exceed the setting value of spring(11), and then ball valve (7) is opened. Control piston (2) moves to close

position. When pressure at port A is balanced with setting value at spring (11), pressure reducing is achieved as expected.

If the pressure in port A continuously increases due to external forces, the control spool (2) is moved still further against the compression spring (9). Thus port A is connected to port T via the control lands (8) at the control spool (2). Enough fluid flows to tank to ensure that the pressure does not rise any further.

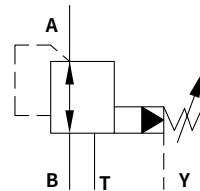
The pilot oil returns from spring chamber (12) to tank without back pressure via control line (13) to port Y.

A pressure gauge connection (14) makes it possible to monitor the reduced pressure in port A.



Type 3DR10P5-L6X/...

Symbol:



## Ordering code

3DR	10	P	-L6X	/	Y	/	*
-----	----	---	------	---	---	---	---

3-way pressure reducing valve

Nominal size 10 =10

Sub-plate mounting = P

Rotary knob =4

Adjustable bolt with protective cap =5

Series L60 to L69 (L60 to L69 series: unchanged installation and connection dimensions) = L6X

Further details in clear text

No code = NBR seals

V = FKM seals

Y= Pilot oil drain external

5 = Max. secondary pressure 50 bar

10 = Max. secondary pressure 100 bar

20 = Max. secondary pressure 200 bar

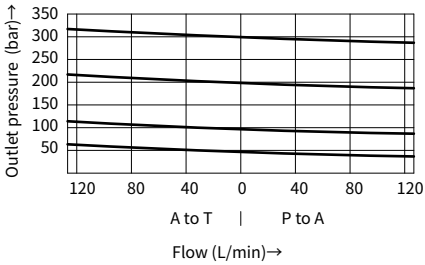
31.5 = Max. secondary pressure 315 bar

## Technical data

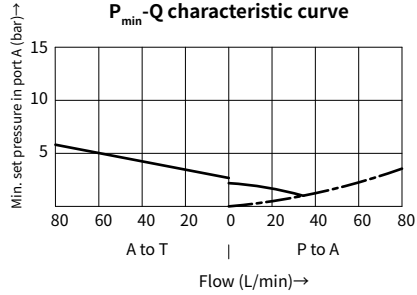
Fluid	Mineral oil suitable for NBR and FKM seal Phosphate ester for FKM seal		
Fluid temperature range	°C	-30 to +80 (NBR seal) -20 to +80 (FKM seal)	
Viscosity range	mm <sup>2</sup> /s	10 to 800	
Degree of contamination	Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15, ISO4406		
Nominal pressure	bar	315	
Max.operating pressure	port P	bar	315
Max.operating pressure	port A	bar	315
Max.operating pressure	port Y	bar	Separate and at zero pressure to tank
Setting pressure	Min.	bar	Dependent on the flow (see curves)
	Max.	bar	50;100;200;315
Max. flow-rate	L/min	120	
Weight	kg	Approx.6.5	

**Characteristic curves** (Measured at  $\vartheta_{oil} = 40^{\circ}\text{C} \pm 5^{\circ}\text{C}$ , using HLP46)

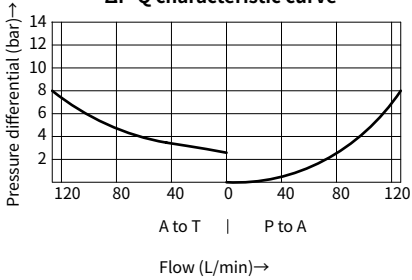
**$P_A$ -Q Characteristic curve**



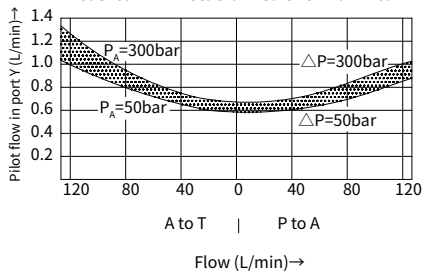
**$P_{min}$ -Q characteristic curve**



**$\Delta P$ -Q characteristic curve**

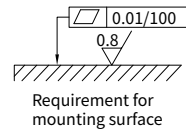
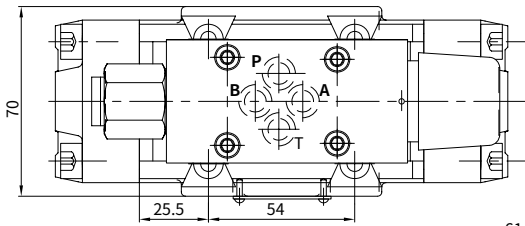
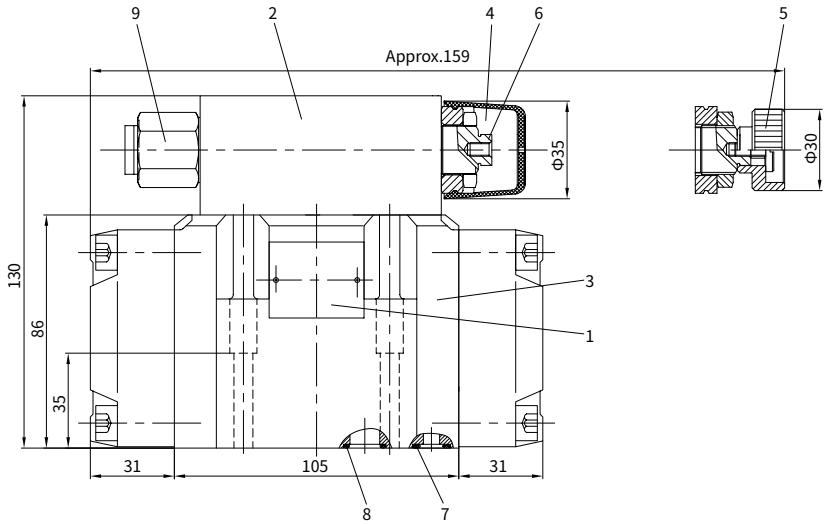


**Pilot flow in relation to the main flow**

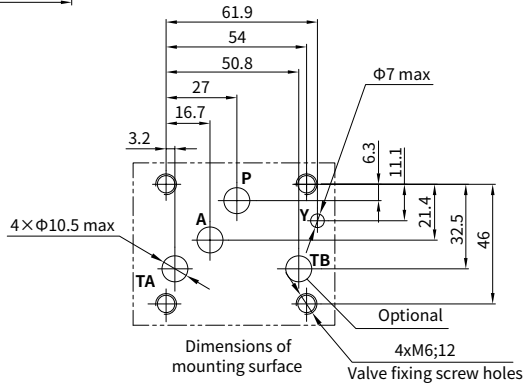


# Unit dimensions

(Dimensions in mm)



- 1 Name plate
- 2 Pilot control valve
- 3 Main valve
- 4 Adjustment element "5"
- 5 Adjustment element "4"
- 6 Internal hexagon screw S=10
- 7 O-rings 10.82×1.78 (Port X and Y)
- 8 O-rings 12×2 (Ports A2, B2, P2, TA2 and TB2)
- 9 Pressure gauge connection G1/4



**It must be ordered separately, if connection plate is needed.**

**Type:** G535/01(G3/4) G535/02(M27×2)  
G536/01(G1) G536/02(M33×2)

**Valve fixing screws:**

4 pcs GB/T -10.9,  
internal hexagon screw  
Tightening torque  $M_A=15.5$  Nm

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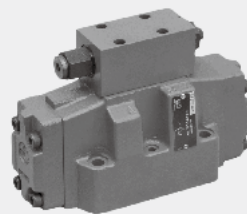


3.15

# Pressure Reducing Valve Pilot Operated

## Type 3DR16P...L7X

Size 16  
up to 250bar  
up to 220 L/min



### Contents

Function and configuration	02
Ordering code	03
Technical data	03
Characteristic curves	04
Unit dimensions	05

### Features

- Porting pattern to DIN 24 340 form A and ISO 4401
- 4 pressure ratings
- 2 adjustment elements
  - Rotary knob
  - Adjustable bolt with protective cap
- Pressure gauge fitting

## Function and configuration

The pressure valve type 3DR16P is a pilot operated 3-way pressure reducing valve with pressure limitation in the secondary circuit. It is used for reducing pressure in a hydraulic system.

The pressure reducing valve consists mainly of main valve (1), control spool (2) and pilot control valve (3) with pressure adjustment element (10).

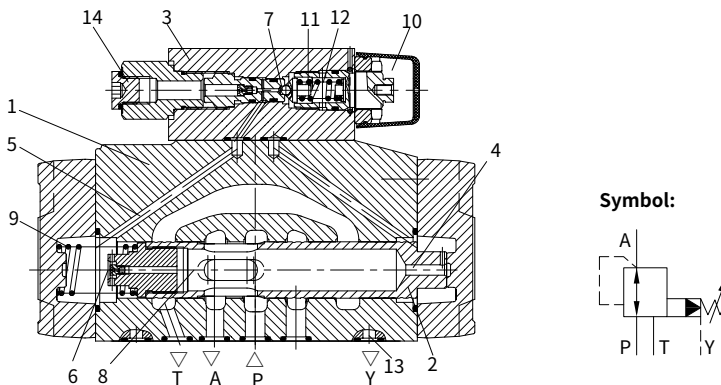
At static state, the valves are normally open, oil can flow free from port P to port A. The pressure in port A is applied through the channel (4) to the spool area opposite to the compression spring (9). At the same time pressure acts at the ball valve (7) within the pilot valve (3), via throttle orifice (6) and the channel (5). According to the setting value at the spring (11), pressure build up in front of the ball valve (7) and channel (5) which holds the control spool (2) in an open position. Oil freely flows from port P to A through control spool (2), until the pressure of port A exceeds the setting value at the spring (11), and then opens the ball valve (7), meanwhile the control spool (2) moves to the close position. The expected reducing pressure is achieved when a balance between the pressure in port A and the pressure setting value at the compression spring (11) is reached.

If the pressure in port A continuously increases due to external forces, the control spool (2) moves still further against the compression spring (9). Thus port A is connected to port T through the control lands (8) at the control spool (2). Enough pressure fluid flows to the tank to ensure that the pressure does not rise any further.

The pilot oil from the spring chamber (12) is always external through the control line (13) and port Y to the tank without back pressure.

A pressure gauge connection (14) makes it possible to monitor the reduced pressure in port A.

### Type 3DR16P5-L7X/...



## Ordering code

	3DR	16	P	-L7X	/	Y	/	*	
3-way pressure reducing valve									
Nominal size 16		=16							Further details in clear text
Sub-plate mounting			= P						No code = NBR seals V = FKM seals
Rotary knob								=4	Y= Pilot oil drain external
Adjustable bolt with protective cap								=5	
Series L70 to L79 (L70 to L79 series: unchanged installation and connection dimensions)								= L7X	
									5 = Max. secondary pressure 50 bar 10 = Max. secondary pressure 100 bar 20 = Max. secondary pressure 200 bar 25 = Max. secondary pressure 250 bar

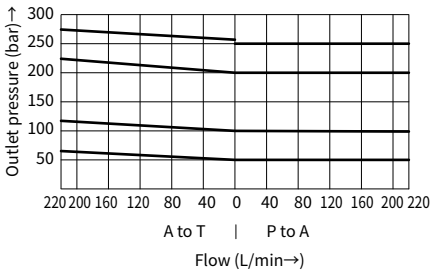
03

## Technical data

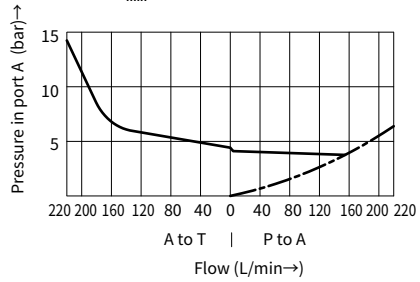
Fluid	Mineral oil suitable for NBR and FKM seal Phosphate ester for FKM seal	
Fluid temperature range	°C	-30 to +80 (NBR seal) -20 to +80 (FKM seal)
Viscosity range	mm <sup>2</sup> /s	10 to 800
Degree of contamination	Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15, ISO4406	
Nominal pressure	bar	315
Max. operating pressure	port P bar	315
Max. operating pressure	port A bar	250
Max. operating pressure	port Y bar	Separate and at zero pressure to tank
Setting pressure	Min. bar	Dependent on the flow (see curves on page 04/06)
	Max. bar	50;100;200;250
Max. flow-rate	L/min	220
Weight	kg	Approx.8.8

**Characteristic curves** (Measured at  $\theta_{oil} = 40^{\circ}C \pm 5^{\circ}C$ , using HLP46)

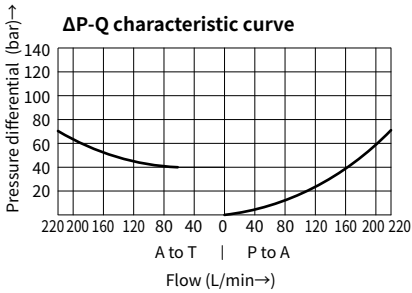
**$P_A$ -Q Characteristic curve**



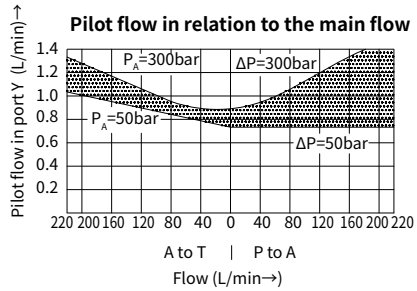
**$P_{min}$ -Q characteristic curve**



**$\Delta P$ -Q characteristic curve**

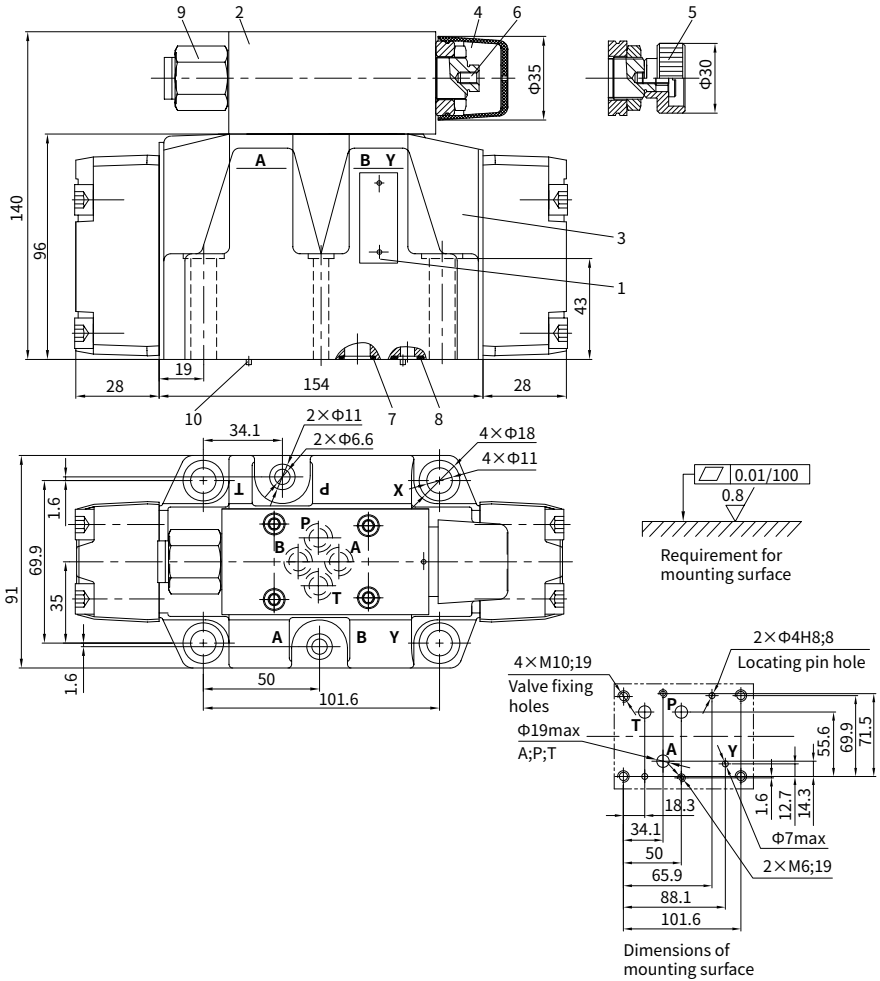


**Pilot flow in relation to the main flow**



# Unit dimensions

(Dimensions in mm)



- 1 Name plate
- 2 Pilot control valve
- 3 Main valve
- 4 Adjustment element "5"
- 5 Adjustment element "4"
- 6 Internal hexagon screw S=10
- 7 O-rings 22×2.5  
(Ports A, B, P and T)
- 8 O-rings 10×2 (Port X, Y and L)
- 9 Pressure gauge connection G1/4
- 10 Locating pin

**It must be ordered separately,  
if connection plate is needed.**

**Type:** G172/01(G3/4) G172/02(M27×2)  
G174/01(G1) G174/02(M33×2)

**Valve fixing screws:**

2 pcs GB/T 70.1-M6×55-10.9 internal hexagon screw  
(Tightening torque  $M_A = 15.5\text{Nm}$ ) and  
4 pcs GB/T 70.1-M10×60-10.9 internal hexagon screw  
(Tightening torque  $M_A = 75\text{Nm}$ )

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3.16

# Pressure Reducing Valve Pilot Operated

## Type DR10K...L3X

Sizes 10  
up to 315 bar  
up to 100L/min



### Contents

Function and configuration	02
Ordering code	02
Technical data	03
Characteristic curves	03
Unit dimensions	04

### Features

- Cartridge valve
- 4 pressure ratings
- 4 adjustment elements:
  - Rotary knob
  - Adjustable bolt with protective cap
  - Lockable rotary knob with scale
  - Rotary knob with scale

## Function and configuration

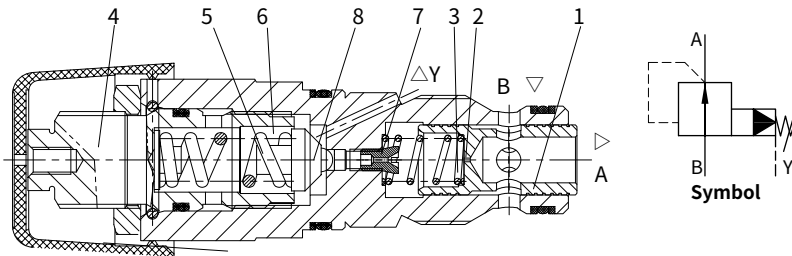
Pressure control valves of type DR 10 K.. are pilot operated pressure reducing valves for installation into manifolds. They are used to reduce a system pressure. The secondary pressure is adjusted by means of adjustment element (4).

In the initial position, the valves are open. Hydraulic fluid can flow from service port B to A without any restrictions. The pressure in service port A simultaneously acts on main spool (1) and through the orifice (2) on the spring-loaded inner side of main spool (1). In addition, it acts on pilot poppet (8) through the orifice (7).

When the pressure in service port A rises above the value set on spring (5), pilot poppet (8) opens. Hydraulic fluid flows from Function, section, symbol the chamber of spring (3) through the orifice (7), pilot poppet (8) and spring chamber (6) to service port 3. Main spool (1) moves to the control position and keeps the pressure value set on spring (5) constant in service port A.

The pilot oil is always externally drained from spring chamber (6) through the service port Y.

### 03 Type DR10K2-L3X/...YM



## Ordering code

DR		10		K		- L3X /		Y		M		*												
Pressure reducing valve	=DR	Nominal size 10	=10	Cartridge	=K	Rotary knob	=4	Sleeve with hexagon and protective cap	=5	Lockable rotary knob with scale	=6	Rotary knob with scale	=7	Series L30 to L39 (L30 to L39: unchanged installation and connection dimensions)	= L3X	5 = Pressure adjustable up to 50bar	10 = Pressure adjustable up to 100bar	20 = Pressure adjustable up to 200bar	31.5 = Pressure adjustable up to 315bar	Further details in clear text	No code = NBR seals	V = FKM seals	M = Without check valve	Y = Pilot oil supply internal Pilot oil drain external

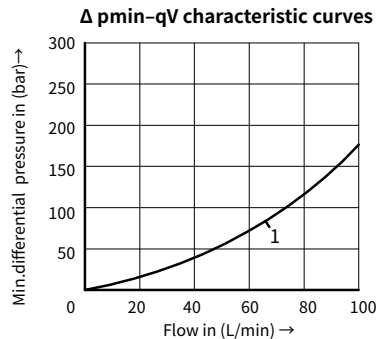
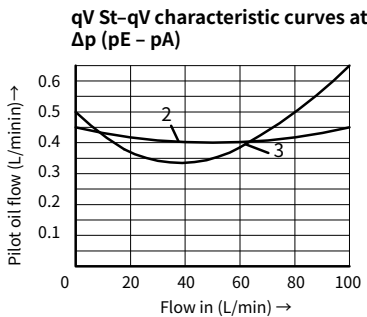
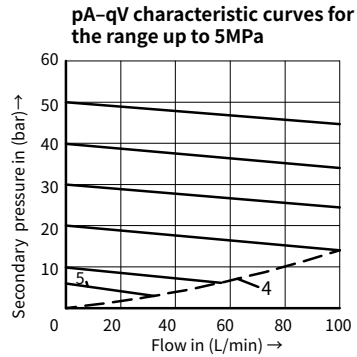
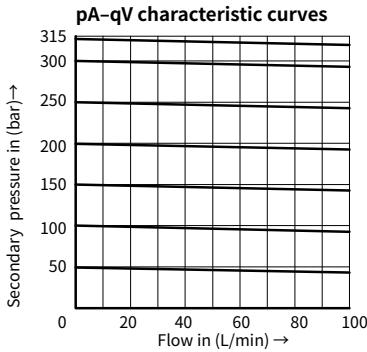


## Technical data

Fluid		Mineral oil suitable for NBR and FKM seal Phosphate ester for FKM seal
Fluid temperature range	°C	-30 to +80 (NBR seal) -20 to +80 (FKM seal)
Viscosity range	mm <sup>2</sup> /s	10 to 800
Degree of contamination		Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15, ISO4406
Max. operating pressure	bar	315
Max. setting pressure	bar	up to 50; up to 100; up to 200; up to 315
Max. flow-rate	L/min	to 100
Weight	kg	Approx. 0.2

## Characteristic curves ( Measured at $\vartheta_{oil} = 40^{\circ}C \pm 5^{\circ}C$ , using HLP46)

03

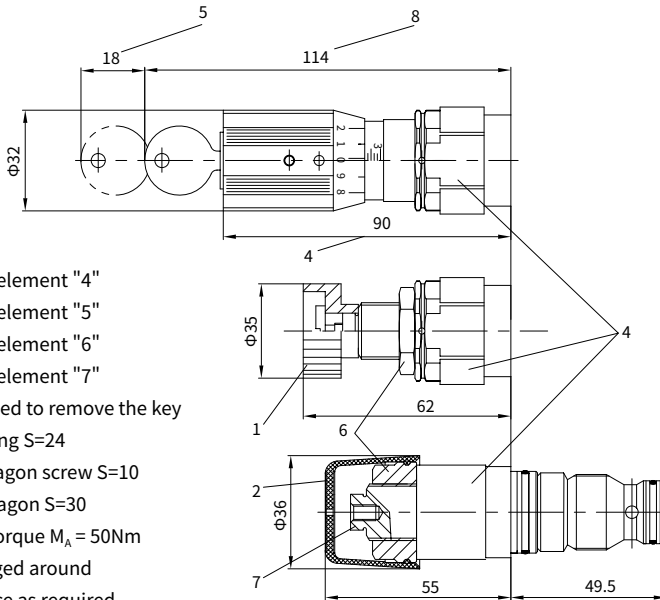


- 1 B to A
- 2  $\Delta p = 50\text{bar}$
- 3  $\Delta p = 250\text{bar}$
- 4 User resistance, system related
- 5 Lowest settable secondary pressure pA for all pressure ratings

## Unit dimensions

(Dimensions in mm)

### Type DR10K...-L3X/...



- 1 Adjustment element "4"
- 2 Adjustment element "5"
- 3 Adjustment element "6"
- 4 Adjustment element "7"
- 5 Space required to remove the key
- 6 Nut for locking S=24
- 7 Internal hexagon screw S=10
- 8 External hexagon S=30  
Tightening torque  $M_A = 50Nm$
- 9 Port Y arranged around circumference as required
- 10 Port B arranged around circumference as required

