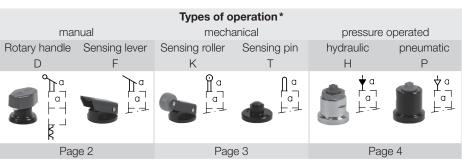


Directional Control Valves ND 4

manually, mechanically or pressure operated, max. operating pressure 500 bar



Valve without operation



_____ 0,01 / 100 mm

R tmax = 4

Tightening torque

9.5 Nm

*) Electrical operation see C 2.360

Counterbore of the fixing thread

Application

The directly operated directional control valves are used to control hydraulic elements when a power supply is not possible or reasonable.

These directional control valves can directly control hydraulic consumers or be used as pilot valves for hydraulically-operated switching devices.

The closed directions of flow are hermetically tight. The switching operation is smooth and shock-free.

A strainer insert in the pressure port protects the valve seats from coarse impurities.

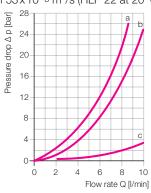
Technical data

Туре	Ball-type poppet valve hermetically sealed
Type of connection	Mounting plate (see accessories)
Port size	G 1/4
Mounting position	any vertical preferred

Hydraulic characteristics

,	-
Max. operating pressure	500 bar
Max. flow rate	8 I/min
Flow direction	only in the direction of the arrow, as in the symbol
Hydraulic oil	as per DIN 51524
Adm. oil temperature	-25+80°C
Adm. oil viscosity	ISO VG 10 to 68 as per DIN 51519
Recommendation for room temperature 1040°C	HLP 22

 Δ p-Q characteristic curve for kinematic viscosity of 53×10^{-6} m²/s (HLP 22 at 20 °C)



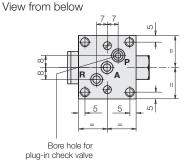
a = directional control valve P \rightarrow A and A \rightarrow R b = directional control valve P \rightarrow R

+ 1 636-386-8022

c = plug-in check valve

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 Sealing (spare part)
 Part no.

 at A:
 O-ring Ø 5x1.5
 3000 340

 at P:
 O-ring Ø 8x1.5
 3000 343

 at R:
 O-ring Ø 8x1.5
 3000 343

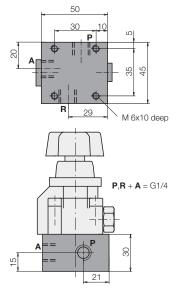
 Plug-in check valve (spare part)
 3815002

45

Connecting holes max. Ø4.5 mm

Accessory

Single mounting plate $3 \times G 1/4$ Weight 0.45 kg Part no. 3534039



Example with directional control valve "D"

info@roemheld-usa.com

Important notes!

The ports A (consumer port), P (pump) and R (return) are fixed by the ball seating principle and cannot be interchanged at will.

Due to the negative overlap, all ports are briefly connected to each other during the switching process.

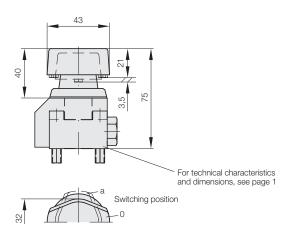
The built-in strainer insert in the P port protects against coarse impurities but is not a substitute for the usual hydraulic filters in the power unit. When using the Δp -Q diagram, it should be not-

When using the Δp -Q diagram, it should be noted that during the return stroke of double-acting differential cylinders, a much higher flow rate flows back through the valve than during the operating stroke.

Manual operating elements

Rotary handle D





Operation

Rotary handle latching Rotary angle 4 x 90° approx. 0.63 Nm Operating torque Weight approx. 0.4 kg

Note

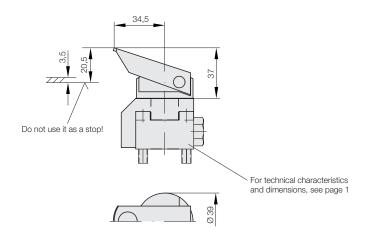
For valve combinations, single and double acting, see data sheet C 2.345.

Denomination	Switching symbol	Part no.
2/2 directional control valve DR 2-1	R R	2321 302
3/2 directional control valve DZ3-1	A P R	2321 201
3/2 directional control valve DZ3-1R	A TOTAL POPULATION OF THE POPU	2321 300

Other functions on request

Sensing lever F





Operation

Sensing lever not latching Switching stroke max. 20.5 mm Switching force 25...28 N Weight

with return spring approx. 0.4 kg

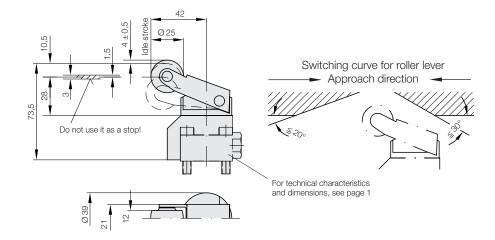
Denomination	Switching symbol	Part no.
2/2 directional control valve FR2-1	₩	2323302
3/2 directional control valve FZ3-1R	A P R	2323 301
3/2 directional control valve F3-1R	A A A A A A A A A A A A A A A A A A A	2323 201

Other functions on request

Mechanical operating elements

Sensing roller K





Operation

Roller lever Functional path Switching force Weight with return spring 10.5 mm 25...28 N approx. 0.4 kg

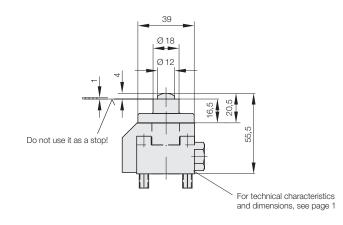
Denomination	Switching symbol	Part no.
2/2 directional control valve KR 2-1		2341 803
3/2 directional control valve KZ3-1	W P R P R	2341 101
3/2 directional control valve KZ3-1R	MATTE EO	2341 201
3/2 directional control valve K3-1	W T T	2341 102
3/2 directional control valve K3-1R	MA T	2341 301

Sensing pin T





Sensing pin Switching stroke Switching force Weight with return spring max. 4 mm 51...57 N approx. 0.4 kg

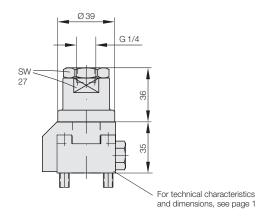


Denomination	Switching symbol	Part no.
2/2 directional control valve TR 2-1	W P	2322 302
3/2 directional control valve TZ3-1	MA TT	2322 203
3/2 directional control valve TZ3-1R	MA TITUE	2322 201
3/2 directional control valve T3-1	M P R	2322 200
3/2 directional control valve T3-1R	MA R	2322 301

Pressure operated elements

Hydraulics H





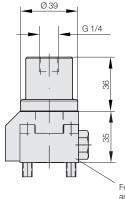
Operation

Hydraulic piston Operating volume Control pressure Weight Adm. temperature range (environment) with return spring approx. 0.4 cm³ 12... 500 bar approx. 0.5 kg -40...80 °C

Denomination	Switching symbol	Part no.
2/2 directional control valve HR 2-1	W P P	2331 401
3/2 directional control valve HZ3-1	A P R	2351 220
3/2 directional control valve HZ3-1R	A R	2351 320
3/2 directional control valve H3-1	A P R	2351 201
3/2 directional control valve H3-1R	A A A A A A A A A A A A A A A A A A A	2351 301

Pneumatics P





For technical characteristics and dimensions, see page 1

Operation

Pneumatic piston
Operating volume
Control pressure
Compressed air
Weight
Adm. temperature range
(environment and medium)

with return spring approx. 1 cm³ 4... 15 bar lubricated and filtered approx. 0.4 kg -20...+70°C

Denomination	Switching symbol	Part no.
2/2 directional control valve PR 2-1	M P P →	2331 301
3/2 directional control valve PZ3-1R		2331 100
3/2 directional control valve P3-1	A P R	2332 200
3/2 directional control valve P3-1R	M A T A A A A A A A A A A A A A A A A A	2332 300