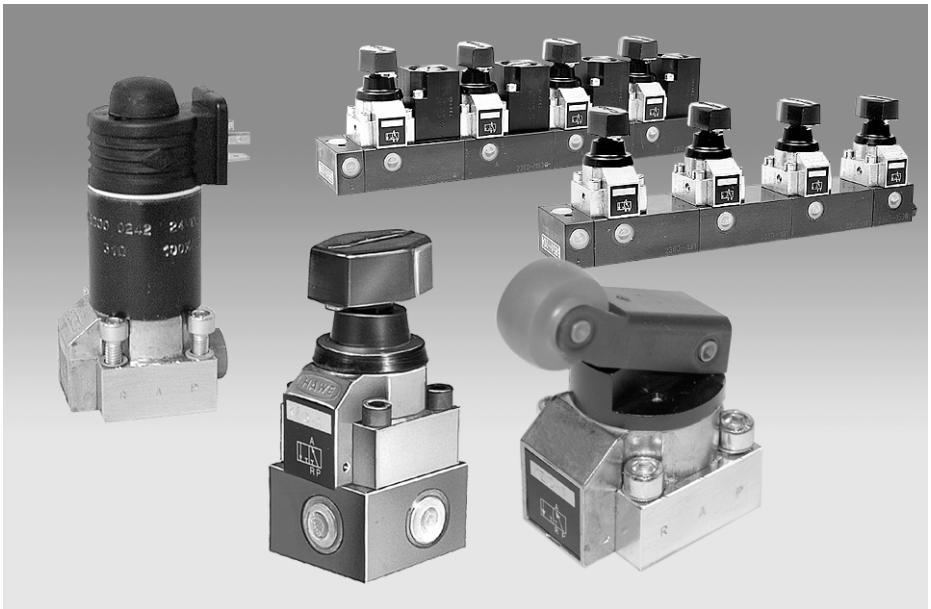
Operating Instructions

Directional Control Valves ND4



Directional control valves

- **leakage-free**
- **manually, mechanically or electro-magnetically operated**
- **with the switching functions 2/2, 3/2, 4/2 or 4/3 or as directional control valve combination**
- **with or without check valve**

These operating instructions are available for the following types:

2321-xxx	**2362-xxx**
2341-xxx	**2365-xxx**
2361-xxx	**6851-xxx**

Target group of this document

Fitters and setters of machine tools. They have to be familiar with the handling and mounting of hydraulic components.
All electrical works must only be realized by electricians.

Provided use

Directional control valves are used for leakage-free control of cylinders (e. g. clamping cylinders).
The switching function of the valve can be recognized by the put up switching symbol.

Safety

Danger to life by electric current
Before starting with electric works switch to voltage-free mode.

Instructions for safe operation

Troubles of functioning
Protect the valve against penetration of swarf, otherwise the clamping force of a connected clamping cylinder is possibly no longer guaranteed.

- Swarf or contamination in the hydraulic oil lead to increased wear or damage at the guides, running surfaces and seals.
- The maximum operating pressure and the admissible flow rate of the valve must not be exceeded.
- Use hydraulic oil as per Roemheld data sheet A 0.100.

Note
Flow passage of the directional control valve must only be effected in the direction of the arrow (see switching symbol)!

Function

The directional control valves are designed as spring-loaded ball-type poppet valves. The closed directions of flow are hermetically tight.
The types marked with "R" are equipped with a check valve. This valve can be retrofitted in the remaining types.

Installation

Any mounting position of the valves is possible.

Flange-mounted type

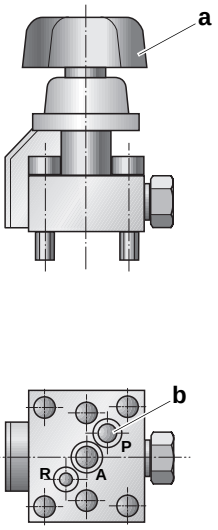
- Drill holes for hydraulic oil supply and return in the fixture.
- Grind flange surface.
- Clean the support surfaces.
- Fasten the valve with inserted O-rings on the fixture.

Hydraulic connection by tubes

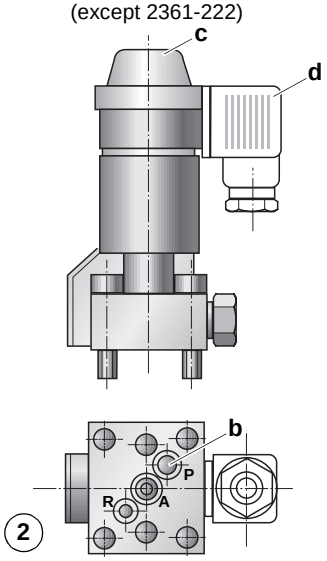
For connection by tubes different mounting plates are available. Valve combinations can be realised with series mounting plates. It is also possible to use individual mounting plates.
Also complete valve combinations with machine tool interlock (6851-x1x) are available, the pressure switch switches as soon as there will be pressure at the outlet port A.

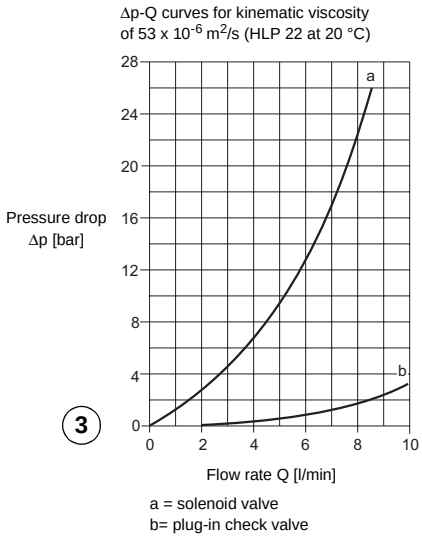
- Clean the support surfaces.
- Fasten the valve at the flange.

2321



2361 and 2362
(except 2361-222)





a *Handle*
b *Bore hole for plug-in check valve*
c *Emergency stop*
d *Single plug connection (accessory)*

All figures are schematic figures.

Hydraulic connection

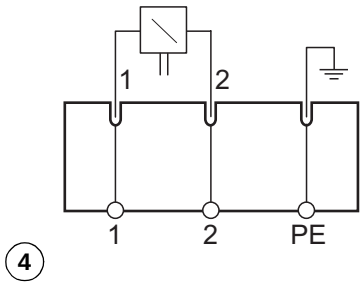
- Connect hydraulic lines to qualifying standards, pay attention to scrupulous cleanness! See also Roemheld data sheets A0.100, F9.300, F9.310 and F9.360.
- Use only fittings "screwed plug B" as per DIN 3852 (ISO 1179).
- Do not use sealing tape, copper rings or coned fittings.
- Check sealing of the hydraulic connections!

Port	Function
A, B	Outlet port A, B (switching function)
P	Pressure supply
R or T	Oil return

Electric connection

⚠ ***Danger to life by electric current***
Before starting with electric works switch to voltage-free mode.
Only electricians may open the door of the control box.

- Connect the directional control valve as per electric circuit diagram.



Circuit diagram: Socket adapter

Operation

Check perfect functioning by repeated operation.

Manual operation
- By turning the knob (**1a**) by 90° the valve will be moved from off-position to switching position.
- By further clockwise or counterclockwise turning of the knob, the off-position will be obtained.

Operation by roller
- The switching function will be triggered, as long as the the roller lever is operated (spring-loaded return).

Electro-magnetical operation
- By applying the voltage, the switching function will be changed (spring-loaded return).

Emergency stop
- By pushing the emergency stop (**2c**) electro-magnetical valves can be moved manually to the switching function.

Accessory

Interference luminous plug
The LED is lit, if the voltage for the switching function is available. A RC-network is used for electro-magnetical screening.

Plug-in check valve ER 11
The ER 11 can also be retrofitted in port P to avoid oil return through the pump line. The valves marked with "R" are already equipped with a plug-in check valve.

Maintenance

Check if the hydraulic ports are tight (visual control). The valves theirselves are maintenance free.

Data sheets

Types	Corresponding data sheets
2321-xxx	C2.320
2341-xxx	C2.340
236x-xxx	C2.360
6851-xxx	C2.345

Trouble shooting

Trouble	Cause / Remedy
Switching function is not correctly effected	In the case of electro-magnetical valves: - check 24V
	Valve defect - Exchange
Pressure at outlet port is not maintained	Plug-in check valve contaminated or leaky - Dismount valve from mounting plate and check, clean or exchange plug-in check valve in port P

General characteristics

Part-no.		**2321**	**2341**	**2361 2362**	**2365**	**6851-x0x**	**6851-x1x**
Operating specification		Manual	Roller lever	Electro-magnetical	Manual (without maschine tool interlock)		Manual (with machine tool interlock)
Max. operating pressure	bar	500					
Port R		without pressure to oil reservoir					
Passage		only in direction of arrow					
Max. flow rate	l/min	8					
Hydraulic oil		HLP22, after consulting other oils are possible					
Nominal voltage	V			24 V DC			
Contact rating	W			20			

Subject to changes without notice.