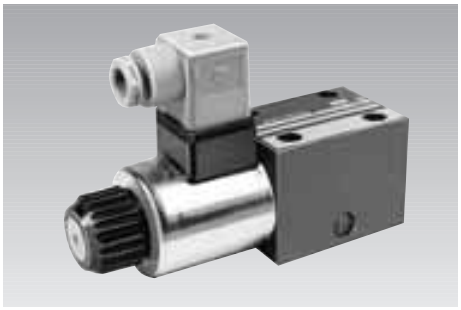
Directional Control Valves ND 6
max. operating pressure 350 bar



General characteristics

Type	Direct-acting spool valve
Oper. specification	DC solenoid, submersed in oil with emergency hand actuation
Connecting dimensions	Pinhole image as per DIN 24340 type A, CETOP 4.2-4.3, ISO 4401
Type of connection	Subplate mounted
Sealing	4 O-rings 9.25 x 1.78 NBR **Part-no. 3000-077** (are supplied)
Type of mounting	4 socket head cap screws M 5x50 DIN 912-10.9 **Part-no. 3300-466**
Seating torque	8,9 Nm
Mounting position	any

Hydraulic characteristics

Fluid	Hydraulic oil as per DIN 51524
Viscosity range	(2,8 ... 500) x 10^{-6} m^2/s
Temperature	–30 ... +80 °C
Operating pressure	Ports A, B, P ... 350 bar
Return pressure	Port T ... 210 bar
Leakage rate	... 20 cm^3/min at 100 bar ν = 36x10^{-6} m^2/s and t = 50 °C
Flow rate	... 80 l/min
Flow curve	measured at ν = 36x10^{-6} m^2/s and t = 50 °C

Electric characteristics

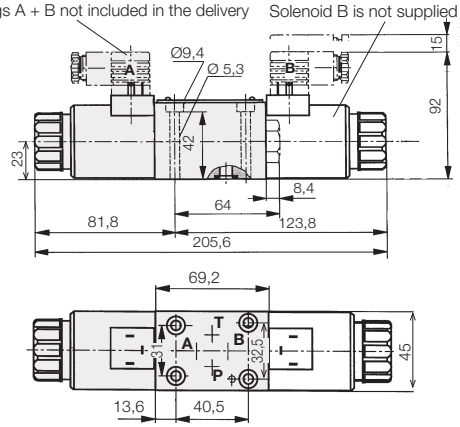
Supply voltage	24 V DC ±10%
Power input	30 W
Duty cycle	100%
Switching time	on: 20-45 ms off: 10-25 ms
Max. cycles	... 15000 Sch/h
Ambient temperature	–30 ... +50 °C
Code class	IP 65 as per DIN 40050
Connection	single plug connection as per DIN EN 175 301-803 and ISO 4400

Other voltages and actuations available on request.

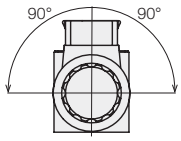
4/2 and 4/3 directional control valve with 2 solenoids

Plugs A + B not included in the delivery

Solenoid B is not supplied with 2452-220



Magnet coils can be rotated by 90°

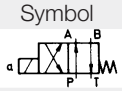
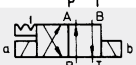
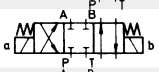
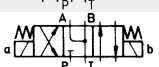
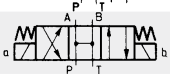


Accessory

Plug A (grey)
Part-no. 3141-573

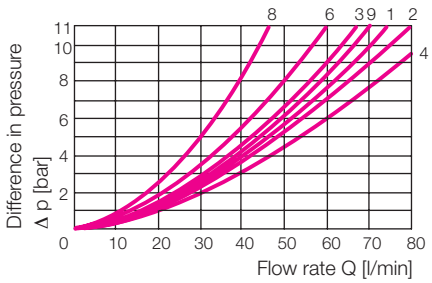
Plug B (black)
Part-no. 3141-574

Interference luminous plug
Part-no. 3141-477

Description	Symbol N°	Symbol	Weight [kg]	Part-no.
4/2 directional control valve	C		1,2	**2452-220**
4/2 directional control valve	C		1,4	**2459-220**
4/3 directional control valve	E		1,4	**2453-220**
4/3 directional control valve	G		1,4	**2455-220**
4/3 directional control valve	J		1,4	**2457-220**
4/3 directional control valve	H		1,4	**2458-220**

Δ p/Q-characteristic curves
ν = 35 mm^2/s for standard version

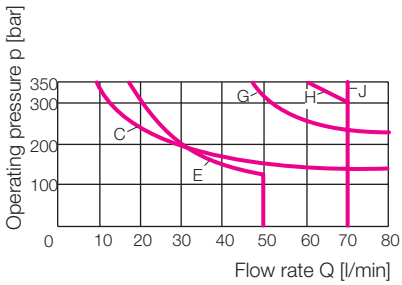
	PA	BT	PB	AT	PT
Symbol N°	**Curve N°**				
C	1	1	1	3	–
E	3	1	3	1	–
G	6	9	6	9	8
J	1	1	1	2	–
H	2	2	4	2	9



When determining pressure drop it should be noted that for double-acting cylinders with a piston surface ratio of e.g. φ = 1.6 a return flow rate 1.6 times the flow rate of the power unit must be used.
Application limit: Function limit with warm solenoids and 10% undervoltage.

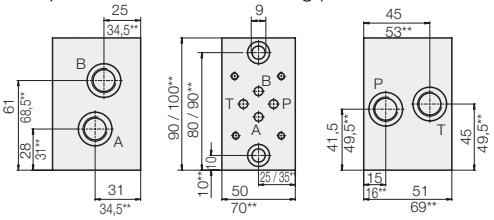
Switching limits
for valves in standard version

The curves refer to applications with symmetrical flow of the valve. In the case of unsymmetrical flow (e.g. one passage is not used) reduced values can result.

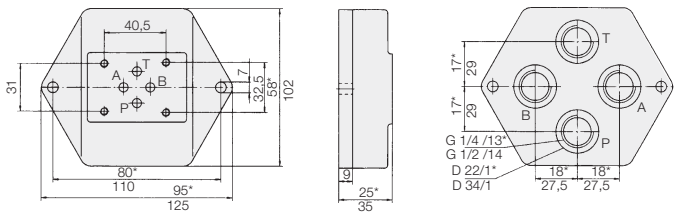


Note: The switching function of the valves depends on the filtering, due to the sticking effect. If the indicated, admissible flow values are to be used to the maximum, full flow filtering to 25 µm is recommended. Besides this, the values are only valid for standard use with 2 flow directions, e.g. from P to A with simultaneous return flow from B to T.

Representation 1: Connecting ports at the side



Representation 2: Connecting ports at the back



Single mounting plate	Repres.	Part-no.
Connecting plate G 1/2	1	**2450-004**
Connecting plate G 3/8	1	**2450-005**
Connecting plate G 1/4	2	**2450-003**
Connecting plate G 1/2	2	**2450-002**

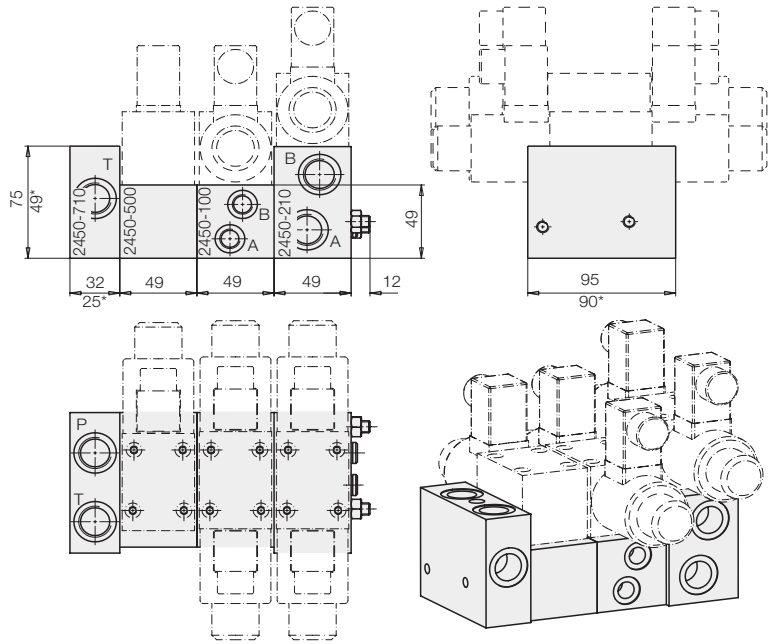
***** Dimensions for plates G 1/4

****** Dimensions for plates G 1/2

Series mounting plate	Part-no.
Connecting plate G 1/4	**2450-600**
Connecting plate G 1/2	**2450-710**
Mounting plate for un-pressurised cycles	**2450-500**
Series mounting plate G 1/4	**2450-100**
Series mounting plate G 1/2	**2450-210**

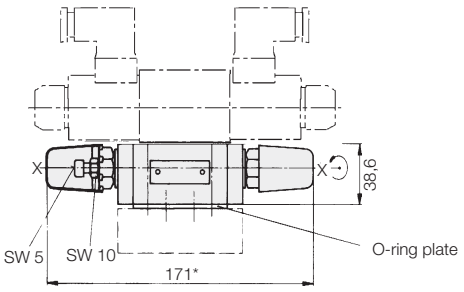
Nuts M8, safety washers, plugs and O-rings are supplied with the connecting plates. Threaded bolts M8 x 1000 have to be ordered separately. **Part-no. 3300-343**
The length of the threaded studs results from the number of series mounting plates + 20 mm.

***** Dimensions for plates G 1/4

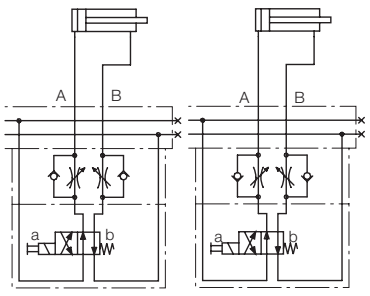


Twin flow control non-return valve
Part-no. 2957-403

This valve regulates the flow rate in both port connections. It is flanged between directional control valve and mounting plate. For this longer fixing screws are necessary: 4 off M 5x90 DIN 912-10.9. **Part-no. 3300-469**.
Through the separate O-ring plate, which always has to lie on the mounting plate, it is possible to control either the inflow or return flow by turning the valve round the x-x axis (see hydraulic circuit diagram).



Presentation in the hydraulic circuit diagram



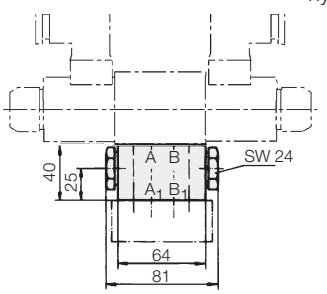
Inflow control Return-flow control

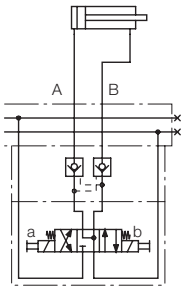
Twin non-return valve
Part-no. 2951-591

This valve provides a leakage-free oil seal of one or two port connections. It is flanged between directional control valve and mounting plate. For this longer fixing screws are necessary: 4 off M 5x90 DIN 912-10.9.
Part-no. 3300-469.
The surface ratio is 1:2.97. A leakage-free oil seal of both connections is only guaranteed when 4/3 directional control valves are used 2453-320, 2455-320 (see hydraulic circuit diagram).

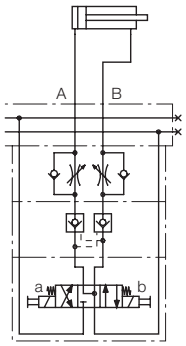
Further accessories
For building on of complete hydraulic controls to power units as per data sheet D 8.031, further interlinking elements are available. We would be pleased to submit a quotation tailored to your particular application.

Presentation in the hydraulic circuit diagram





Presentation of twin non-return valve and twin flow control non-return valve



For the installation of twin non-return valve and twin flow control non-return valve in combination with a spool valve longer fixing screws are necessary:
M 5 x 130 DIN 912 – 12.9.
Part-no. 3301-320