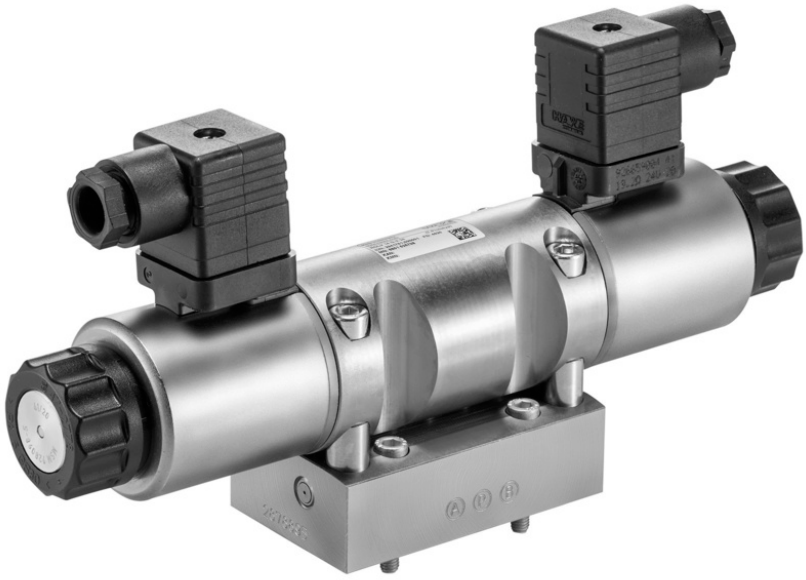
Directional seated valve type ROLV

Product documentation

Operating pressure p_{max}:	400 bar
Flow rate Q_{max}:	25 lpm



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HAWE HYDRAULIK

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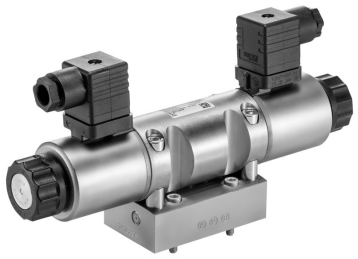
Table of Contents

1 Overview of directional seated valve type ROLV

Directional seated valves are a type of directional valve. As cone valves they are tightly sealed, with zero leakage in the closed state.

The directional seated valve type ROLV is available as a 3/2, 4/2 or 4/3-way directional seated valve with different plug types. The patented assembly consists of two parts: a round basic valve with the valve inserts, and an adapter plate which can be designed for manifold mounting with nominal size NG 6 as the standard connection pattern, or for direct pipe connection.

Additional elements such as a check valve, a restrictor (on the consumer side) and/or restrictor check valves can be integrated, depending on the functional requirement and adapter plate. The type ROLV can be combined in the valve bank type BA with other types of valves.



Directional seated valve type ROLV

Features and benefits

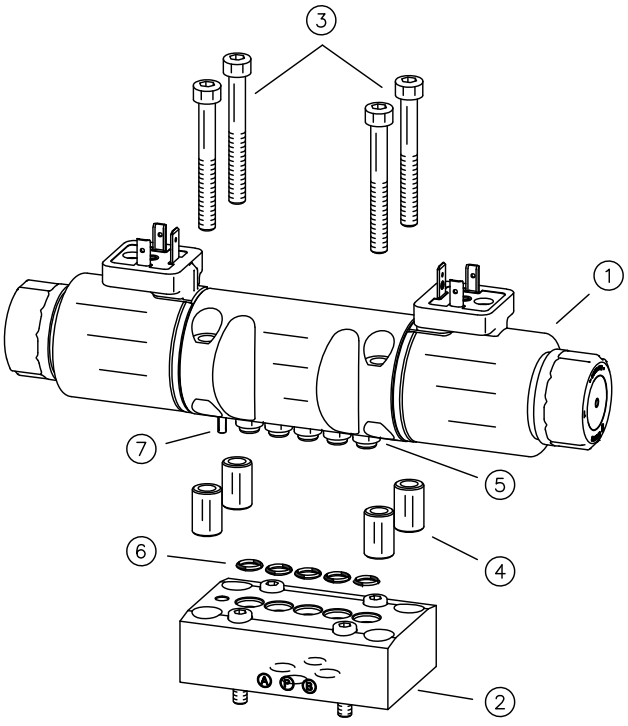
- Dirt-resistant design with high switching reliability
- Interchangeable solenoid for greater flexibility and easy servicing

Intended applications

- Machine tools (cutting and non-cutting)
- Clamping tools, punching tools, fixtures
- Testing machinery
- Wind turbines

1.1 Assembly

The directional seated valve type ROLV consists of a round basic valve and an adapter plate, which offer different connection options. The valve function see Chapter 2.2, "Circuit symbol" is derived from the combination of basic valve and sub-plate.



1 Basic valve
2 Adapter plate
3 Fastening screws
4 Sleeves
5 Plug-in sleeves
6 O-rings
7 Pin for correct alignment

2 Available versions

Ordering examples

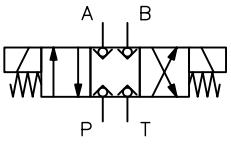
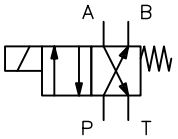
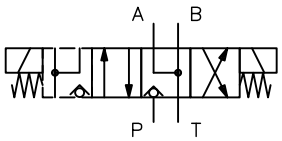
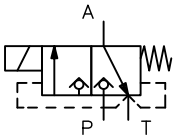
ROLV 14	Z	-N	/BO,8			-WG 110	-
ROLV 14	G	-3/8				-X 24	-
ROLV 14	W	-N	/BO,8R	/ABR2,0 BBR1,5	/S	-G 24	-

2.8 "Seals"
2.7 "Actuating solenoid"
2.6 "Additional elements at T"
2.5 "Additional elements at port A and/or B"
2.4 "Additional elements at port P"
2.3 "Single connection block"
2.2 "Circuit symbol"
2.1 "Basic type and size"

2.1 Basic type and size

Type	Description	Flow rate Q_{max} (l/min)	Pressure p_{max} (bar)
ROLV 14	Directional seated valve	25	400

2.2 Circuit symbol

Coding	Description	Circuit symbol
G	4/3-way directional valve	
W	4/2-way directional valve	
D	4/3-way directional valve	
Z	3/2-way directional valve	

NOTICE

The instructions for replacement with the directional seated valves type NBVP to D 7765 N must be observed
see Chapter 6.1, "Instructions for replacement with the directional seated valves type NBVP to D 7765 N"

2.3 Single connection block

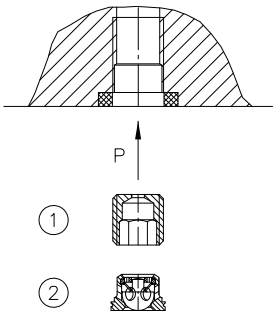
Coding	Description
- N	Manifold mounting with hole pattern NG 6 to ISO 4401-03 (CETOP 03) or DIN 24 340-A6
- 3/8	Pipe connection G 3/8

2.4 Additional elements at port P

Only in the case of adapter plate **- N**

Coding	Description	Circuit symbol
R	Check valve type ER 13 to D 7325	
B...	Orifice Orifice-∅: 0.4; 0.5; 0.6; 0.7; 0.8; 0.9; 1.0; 1.1; 1.2; 1.4; 1.5; 1.8; 2.0; 2.4; 2.5; 3.0; 3.5; 4.0	

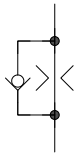
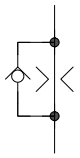
Pump connection P



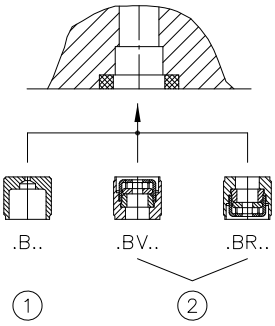
1 Orifice **B**
2 Check valve **R**

2.5 Additional elements at port A and/or B

Only adapter plate **- N**

Coding	Description	Circuit symbol
AB... **BB...**	Orifice at A and/or B Orifice-∅: 0.3; 0.4; 0.5; 0.6; 0.7; 0.8; 0.9; 1.0; 1.2; 1.5; 2.0; 2.5	
ABV... **BBV...**	Restrictor check valve type EBR 14 to SK 7966 300 in A and/or B to restrict consumers Orifice-∅: 0.6; 0.7; 0.8; 0.9; 1.0; 1.2; 1.5; 2.0	
ABR... **BBR...**	Restrictor check valve type EBR 14 to SK 7966 300 in A and/or B to open consumers Orifice-∅: 0.6; 0.7; 0.8; 0.9; 1.0; 1.2; 1.5; 2.0	

Consumer ports A and B



1 Orifice

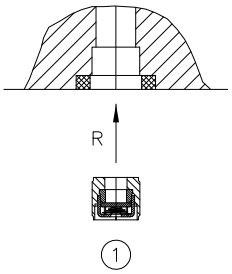
2 Restrictor check valves (installation position observed!)

2.6 Additional elements at T

Only in the case of adapter plate **- N**

Coding	Description	Opening pressure (bar)	Circuit symbol
S	Return pressure stop (check valve) type ER 14 to D 7325	approx. 0.07	
S 0.2		approx. 0.2	
S 1		approx. 1.0	

Return port T



1 Return pressure stop **S.**

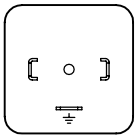
2.7 Actuating solenoid

Coding	Electrical connection	Nominal voltage		Protection class
		V AC	V DC	
X(G) 12	EN 175 301-803 A		12 V DC	IP 65
X(G) 24	▪ Coding G with line connector		24 V DC	
X(G) 48	▪ Coding L with LED plug		48 V DC	
X(G) 98	▪ Coding WG with rectifier in the line connector		98 V DC	
X(G) 205	▪ Coding 5K with cast-on cable 5 m long		205 V DC	
WG 24		24 V AC 50/60 Hz	24 V DC	
WG 110		110 V AC 50/60 Hz	98 V DC	
WG 230		230 V AC 50/60 Hz	205 V DC	
L 12			12 V DC	
L 24			24 V DC	
L5K 24			24 V DC	

NOTICE
The specifications regarding the IP protection class apply for versions featuring a properly assembled male connector.

Connection pattern

G .., X .., L .. (WG ..)



2.8 Seals

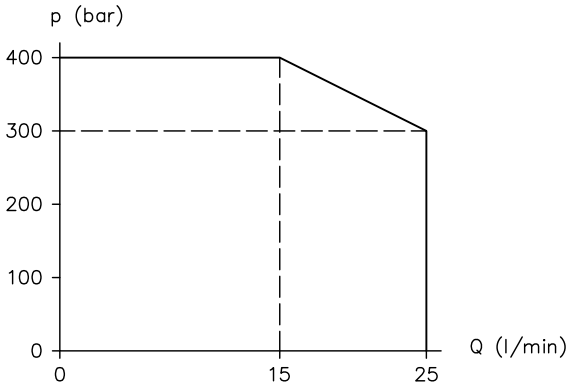
Coding	Description
Without coding	Series (TPU, NBR)
	Additional seal variants available on request

3 Parameters

3.1 General data

Designation	Directional seated valve type ROLV
Model	Cone-seated valve
Material	Steel, zinc-nickel coated
Installation position	As desired
Overlap for symbol Z, W, D	Negative. During switching, all passages are connected to each other.
Hydraulic fluid	Hydraulic fluid, according to DIN 51 524 Parts 1 to 3; ISO VG 10 to 68 according to DIN ISO 3448 Viscosity range: 4 - 800 mm²/s Optimal operating range: approx. 10 - 500 mm²/s Also suitable for biologically degradable hydraulic fluids type HEPG (polyalkylene glycol) and HEES (synthetic ester) at operating temperatures up to approx. +70°C.
Cleanliness level	**ISO 4406** 21/18/15...19/17/13
Temperatures	Environment: approx. -40 to +80 °C, hydraulic fluid: -25 to +80 °C, pay attention to the viscosity range. Start temperature: down to -40°C is permissible (observe start viscosities) as long as the steady-state temperature is at least 20K higher during subsequent operation. Biologically degradable hydraulic fluids: note manufacturer specifications. With consideration for the seal compatibility, not above +70°C.

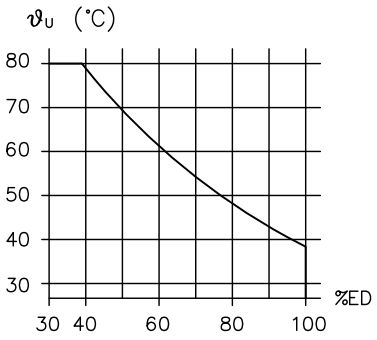
3.2 Pressure and volumetric flow

Operating pressure	p_{max} P = 400 bar p_{max} T = 50 bar
Flow rate	Q_{max} = 25 l/min
Power characteristics diagram	 *Q flow rate (l/min); p pressure (bar)*

3.3 Weight

	Circuit symbol Coding	
	G, D	= 2.7 kg
	W, Z	= 2.2 kg

3.4 Electrical data

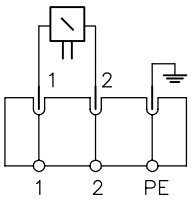
Coding	X 12	X 24	X 48	X 98	X 205
Nominal power U_N	12 V DC	24 V DC	48 V DC	98 V DC	205 V DC
Nominal power P_N	27 W	30 W	33 W	30 W	30 W
Switching times (reference value)	$I_{100\%}$ < 60 ms (direct current) $ED_{100\%}$ < 200 ms (direct current)				
Switching operations	Approx. 2000/h approximately evenly distributed				
Contact temperature	120 °C at 20 °C ambient temperature				
Insulation material class	F				
Relative duty cycle	 *%ED-5 min rel. duty cycle; ϑ_U ambient temperature (°C)*				
Protection class	Depending on the actuating solenoid see Chapter 2.7, "Actuating solenoid"				
Electrical connection	Depending on the actuating solenoid see Chapter 2.7, "Actuating solenoid"				

NOTICE
The thermal load of the coil can be reduced by means of an economy circuit, for example.

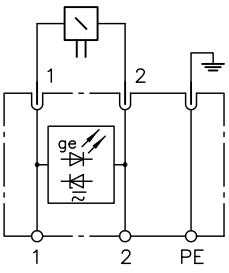
Circuit diagrams

DC voltage

G .., X ..

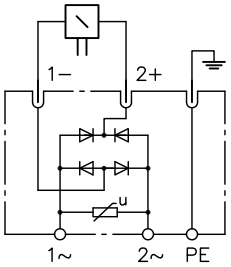


L ..



AC voltage

WG ..

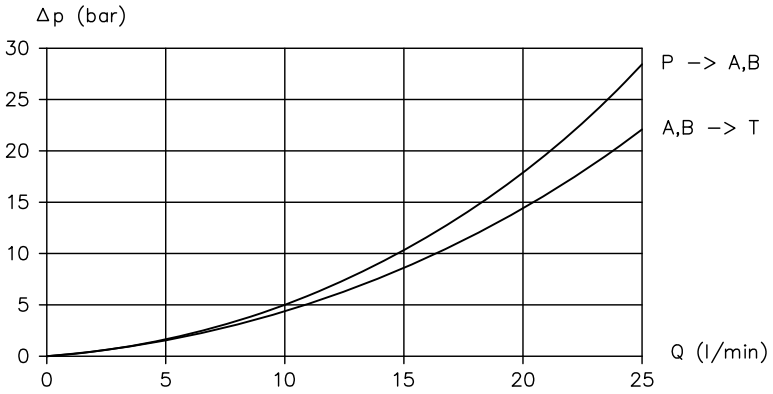


3.5 Characteristic lines

Viscosity of the hydraulic fluid approx. 60 mm²/s

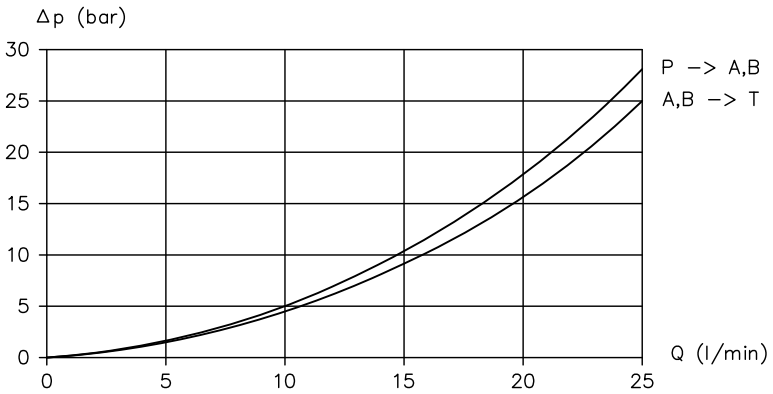
Dynamic pressure characteristic curve

ROLV 14 G



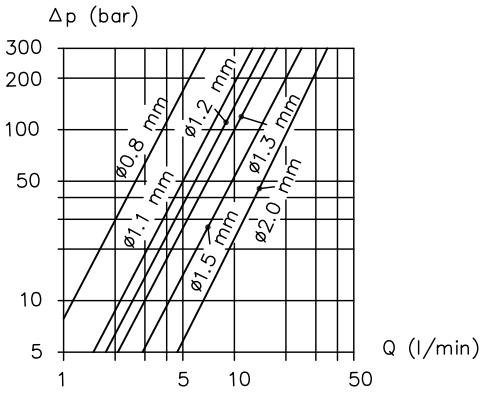
Q flow rate (lpm); Δp flow resistance (bar)

ROLV 14 W, ROLV 14 D, ROLV 14 Z



Q flow rate (lpm); Δp flow resistance (bar)

Additional orifices



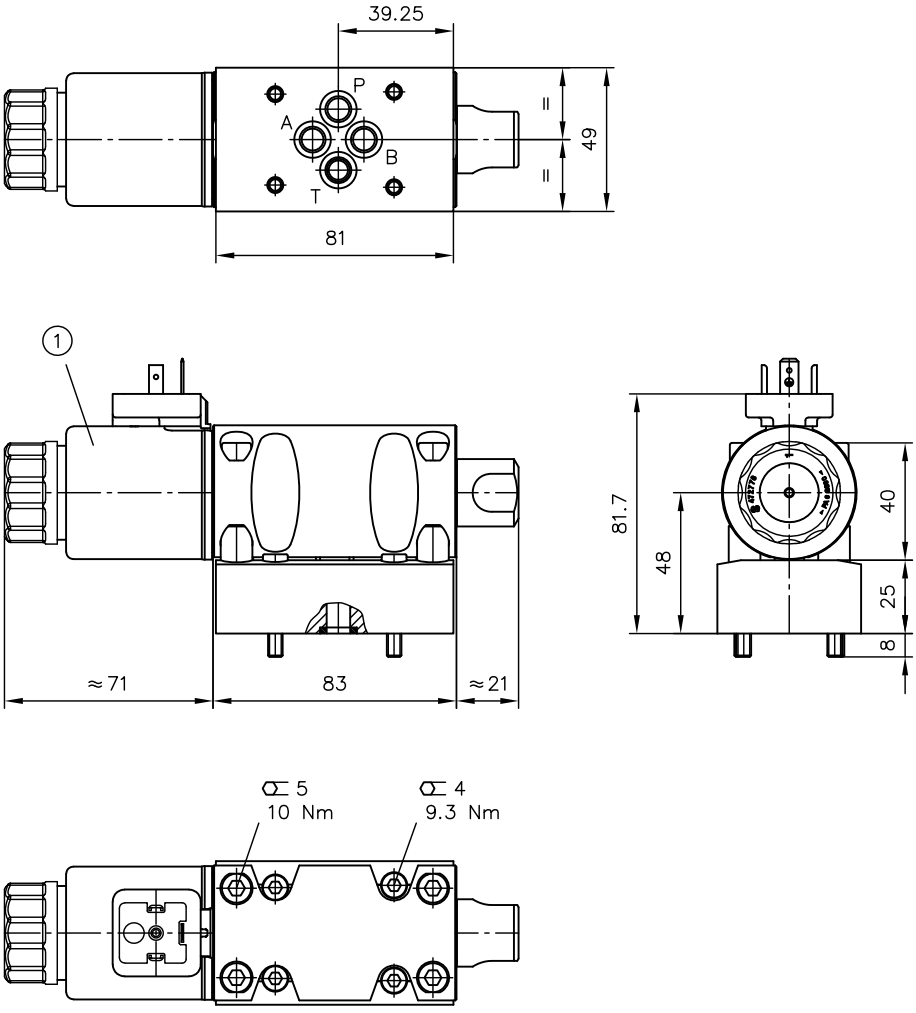
Q flow rate (lpm); Δp flow resistance (bar)

4 Dimensions

All dimensions in mm, subject to change.

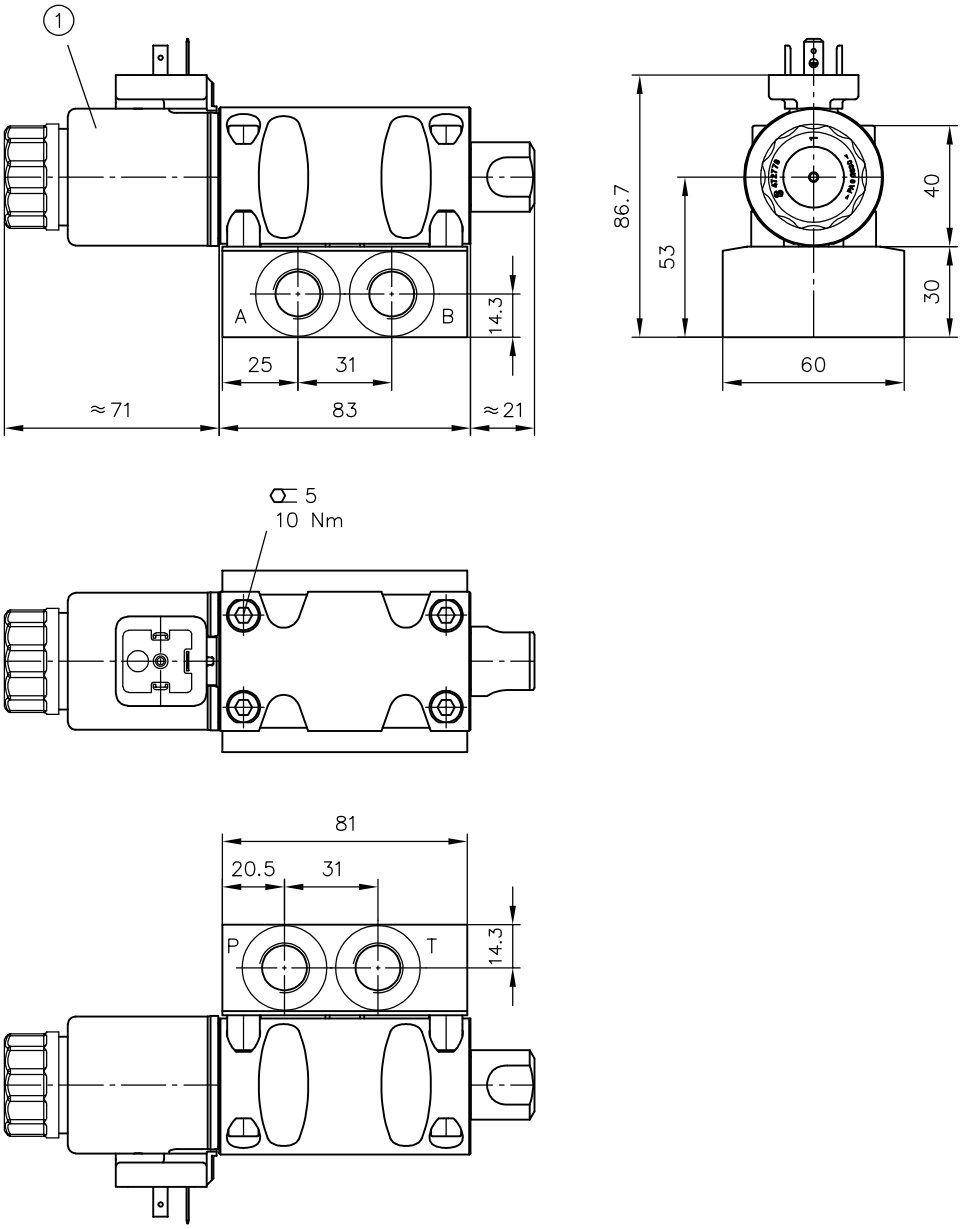
4.1 Valve

Circuit symbol **W, Z** with adapter plate - N



1 Solenoid turned in any direction

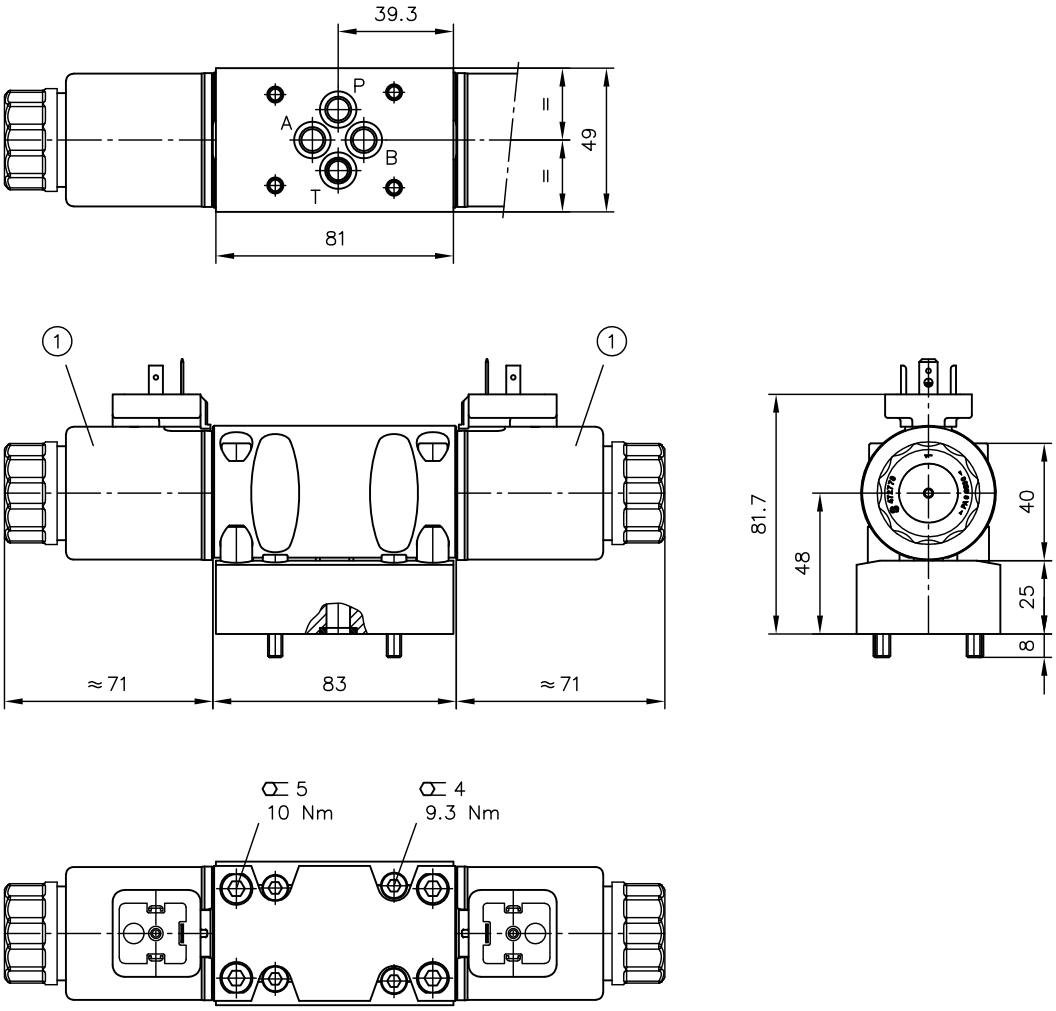
Circuit symbol **W, Z** with adapter plate - 3/8"



1 Solenoid turned in any direction

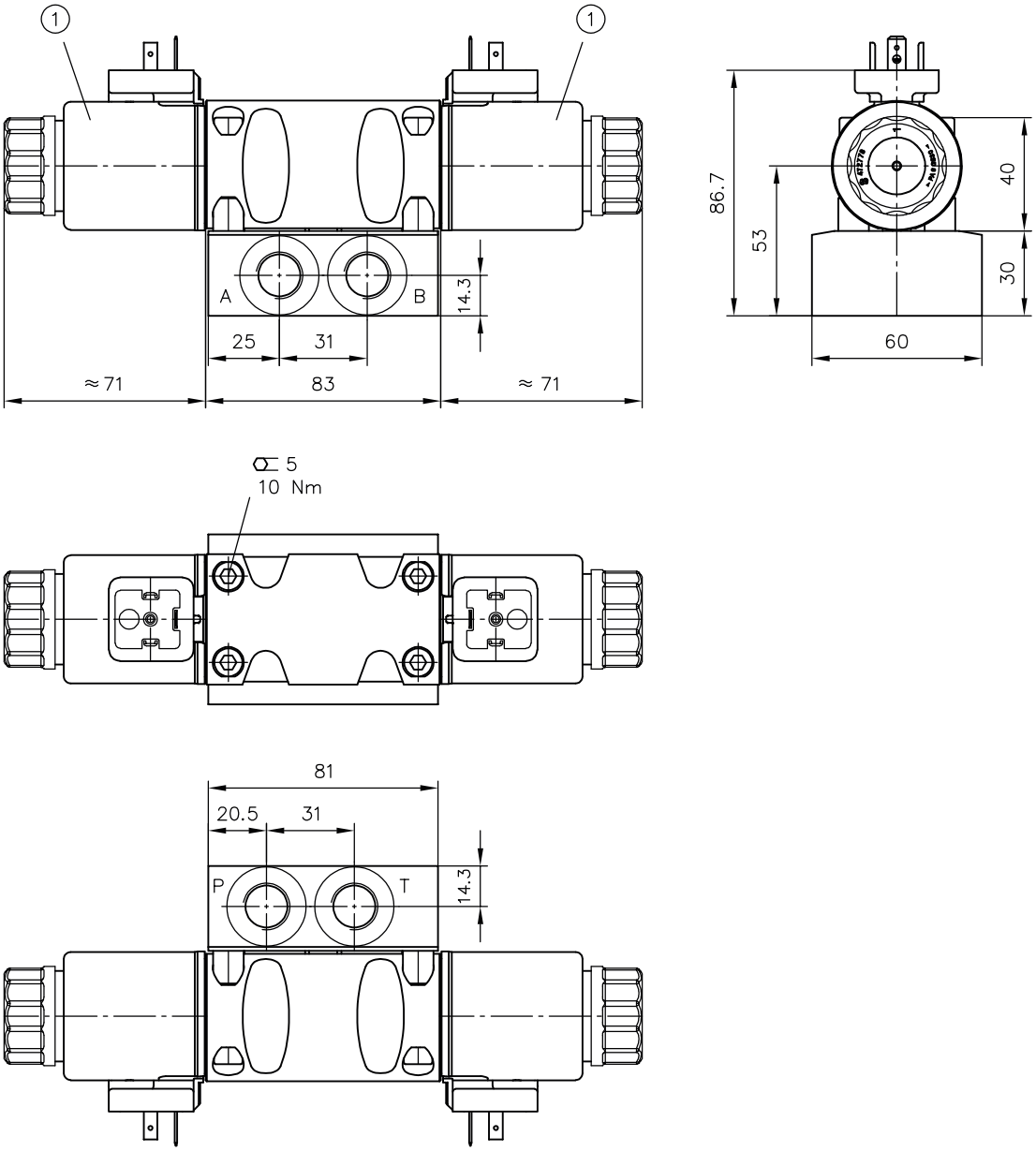
	Ports (ISO 228-1)
A, B, P, T	G 3/8

Circuit symbol **G, D** with adapter plate - N



1 Solenoid turned in any direction

Circuit symbol **G, D** with adapter plate - 3/8"

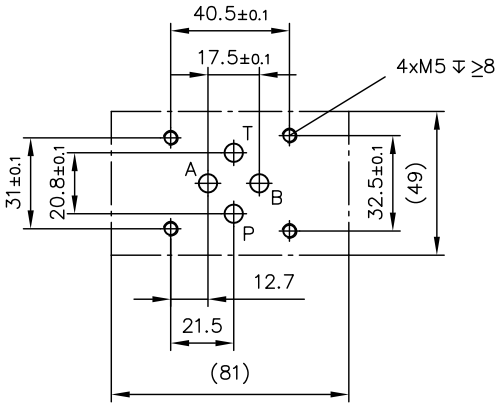


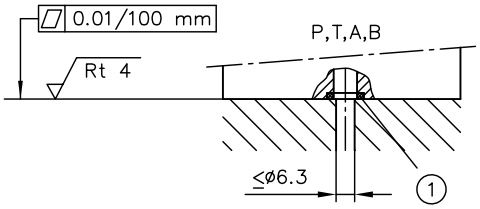
1 Solenoid turned in any direction

	Ports (ISO 228-1)
A, B, P, T	G 3/8

4.2 Hole pattern of the base plate

Base plate hole pattern for adapter plate - N
as per ISO 4401-03 (CETOP 03)



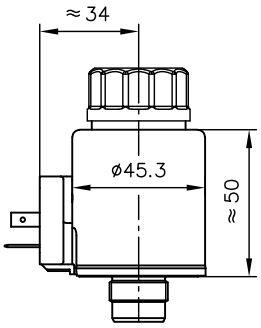


1 O-ring

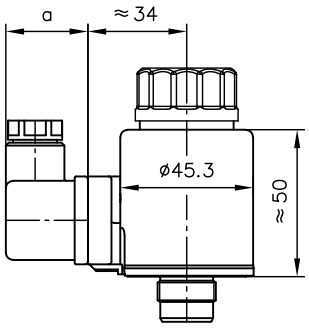
4.3 Actuating elements

Electrical actuation

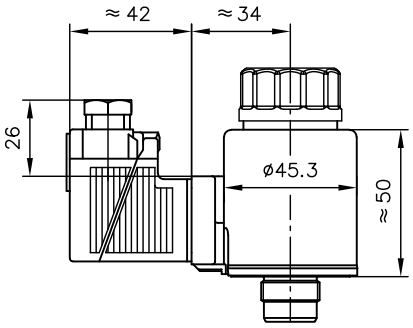
Coding **X**



Coding **G, WG**

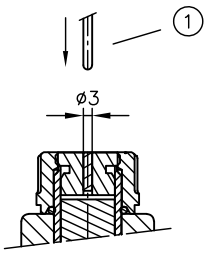


Coding **L**



	a
G	28
WG	≈ 35

Manual override



1 Auxiliary tool for actuation
(do not use any parts with sharp edges)

To actuate the valve:

► Use a steel pin or screwdriver etc. to depress the brass bolt (visible on the upper face).

NOTICE

The pressure at port T generates a load on the brass bolt acting on the area of ∅ 3 mm; at 50 bar this is approx. 40 N!

5 Installation, operation and maintenance information

Observe the document B 5488 “General operating instructions for assembly, commissioning, and maintenance.”

5.1 Intended use

This product is intended exclusively for hydraulic applications (fluid technology).

The user must observe the safety measures and warnings in this document.

Essential requirements for the product to function correctly and safely:

- ► All information in this documentation must be observed. This applies in particular to all safety measures and warnings.
- ► The product must only be assembled and put into operation by specialist personnel.
- ► The product must only be operated within the specified technical parameters described in detail in this document.
- ► All components must be suitable for the operating conditions when using an assembly.
- ► The operating instructions for the components, assemblies and the specific complete system must also always be observed.

If the product can no longer be operated safely:

1. Remove the product from operation and mark it accordingly.
   ✓ It is then not permitted to continue using or operating the product.

5.2 Assembly information

The product must only be installed in the complete system with standard and compliant connection components (screw fittings, hoses, pipes, fixtures etc.).

The product must be shut down correctly prior to disassembly (in particular in combination with hydraulic accumulators).

⚠ **DANGER**

Sudden movement of the hydraulic drives when disassembled incorrectly

Risk of serious injury or death

- ► Depressurise the hydraulic system.
- ► Perform safety measures in preparation for maintenance.

5.3 Operating instructions

Observe product configuration and pressure/flow rate.

The statements and technical parameters in this document must be strictly observed.
The instructions for the complete technical system must also always be followed.

NOTICE

- ► Read the documentation carefully before usage.
- ► The documentation must be accessible to the operating and maintenance staff at all times.
- ► Keep documentation up to date after every addition or update.

⚠ **CAUTION**

Overloading components due to incorrect pressure settings.

Risk of minor injury.

- Pay attention to the maximum operating pressure of the pump and the valves.
- Always monitor the pressure gauge when setting and changing the pressure.

Purity and filtering of the hydraulic fluid

Fine contamination can significantly impair the function of the product. Contamination can cause irreparable damage.

Examples of fine contamination include:

- Swarf
- Rubber particles from hoses and seals
- Dirt due to assembly and maintenance
- Mechanical debris
- Chemical ageing of the hydraulic fluid

NOTICE

New hydraulic fluid from the manufacturer may not have the required purity.

Damage to the product is possible.

- ► Filter new hydraulic fluid to a high quality when filling.
- ► Do not mix hydraulic fluids. Always use hydraulic fluid that is from the same manufacturer, of the same type, and with the same viscosity properties.

For smooth operation, pay attention to the cleanliness level of the hydraulic fluid (cleanliness level see Chapter 3, "Parameters").

Additionally applicable document: D 5488/1 Oil recommendations

5.4 Maintenance information

Check regularly (at least once a year) by visual inspection whether the hydraulic connections are damaged. If external leakages are found, shut down and repair the system.

Clean the surface of the device regularly (at least once a year) (dust deposits and dirt).

6 Other information

6.1 Instructions for replacement with the directional seated valves type NBVP to D 7765 N

Circuit symbol G:

Consumer ports A and B have been interchanged in comparison with the predecessor model type NBVP 16 G. An additional plate for exchanging the ports can be ordered as an additional item under part number 8144 030.

In contrast to type NBVP 16 G, type ROLV 14 G does not provide a 4th switching position. A de-energised pause is therefore necessary when switching over directly from solenoid a to solenoid b.

Circuit symbol W:

Consumer ports A and B have been interchanged in comparison with the predecessor model type NBVP 16 W. An additional plate for exchanging the ports can be ordered as an additional item under part number 8144 030.

References

Additional versions

- Directional seated valve type NBVP 16: D 7765 N
- Valve bank (nominal size 6) type BA: D 7788
- Intermediate plate type NZP: D 7788 Z
- Valve bank type BNG: D 7788 BNG
- Valve bank (directional seated valve) type BVH: D 7788 BV

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