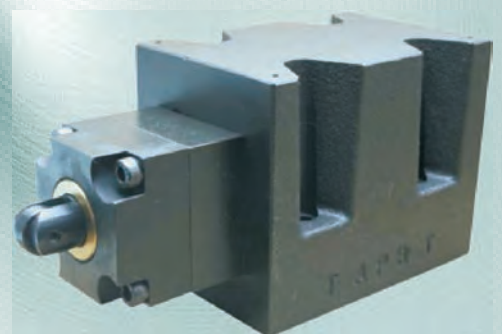
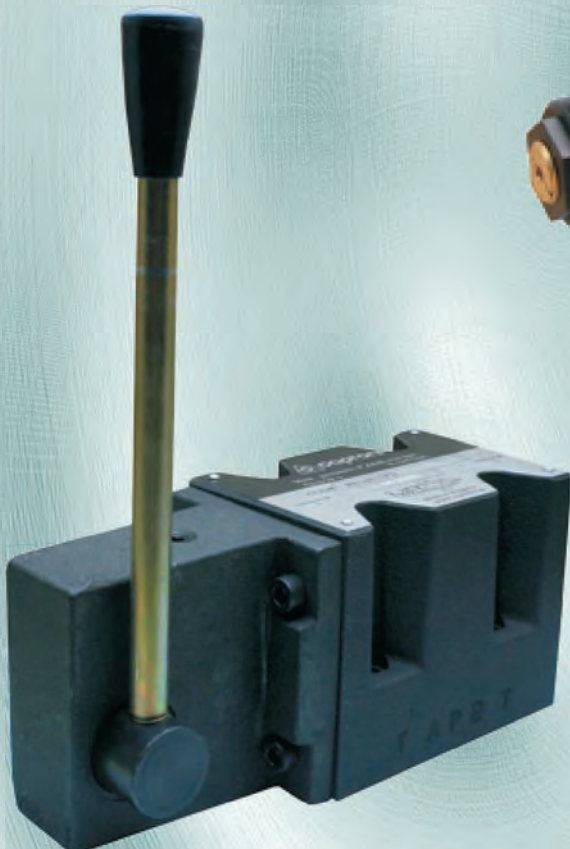


Bulmach



DIRECTIONAL CONTROL VALVES CETOP5

GENERAL DESCRIPTION

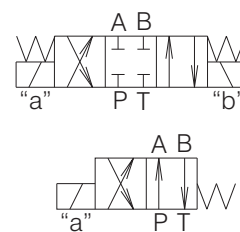
Document: DCVC5-1-Aug 2013

- ✓ 4/3- and 4/2- way directional control valves with solenoid operation , heavy duty construction
- ✓ Removable AC and DC voltage coils-quick replacement and rotation in any directions without leakage from the system
- ✓ Wet pin core tubes connect to tank with high pressure capacity
- ✓ Manual override option
- ✓ Maximum control of hydraulic power
- ✓ Reliability and long life
- ✓ Mounting surface CETOP5 (NG10)

RH10...1-...F...



Symbol



The RH10...1-...F... valves are solenoid operated directional spool valves. They control the start , stop and direction of flow.

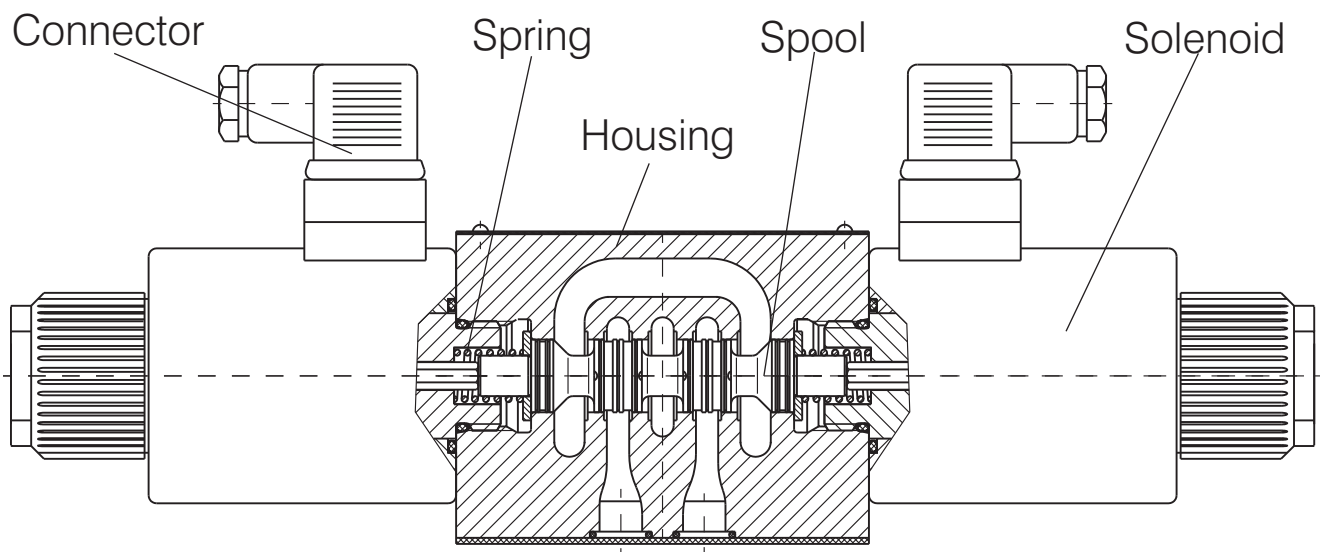
The RH10...1-...F... valves consist of a spool , housing , springs and solenoids.

This model is designed with two-spring centered spool for 4/3- and 4/2- valves. The housing has 5-chambers.

The operating solenoids are DC type. For AC supply the solenoids are provided with rectifier , which is integrated into the installation ground of the connectors. Standard supply voltages are 12V DC , 24V DC , 48V DC , 110V AC(RAC) and 220V AC(RAC). Electrical connectors conform to DIN 43 650 standard.

In case of problem with the electric supply , an option for manual spool operation is provided.

GENERAL DESCRIPTION



ORDERING CODE

RH	10		1	-	.../...	F					
----	----	--	---	---	---------	---	--	--	--	--	--

Directional control valve

Nominal size

Functional symbol

see the page below

Type of control-electrical

Supply voltage/current frequency

see page 7/13

Modification

012/00

024/00

048/00

110/50

220/50

Switching time speed control of spool

Omit -without throttle**R1**- with fixed throttle**R2**- with adj. throttle
see page 5/13

Screw cap

Omit-with plastic cap**M**-with metal cap

see page 5/13

N - normal**T** - tropical**C1****C2****C3****C4****C5**

Connectors

see page 7/13

FUNCTIONAL SYMBOLS

DESIG- NATION	SYMBOL	INTERMEDIATE	Type of control					DESIG- NATION	SYMBOL	INTERMEDIATE	Type of control				
			1	2	4	6	7				1	2	4	6	7
00			✓			✓	✓	28			✓			✓	✓
01			✓			✓	✓	32			✓			✓	✓
02			✓			✓	✓	33			✓			✓	✓
04			✓			✓	✓	35			✓			✓	✓
05			✓			✓	✓	36			✓			✓	✓
06			✓			✓	✓	39			✓			✓	✓
08			✓			✓		40			✓			✓	✓
10			✓		✓	✓	✓	41			✓			✓	✓
11			✓			✓	✓	42			✓			✓	✓
12			✓		✓	✓	✓	45			✓		✓	✓	✓
13			✓		✓	✓	✓	61			✓			✓	✓
14			✓			✓	✓	62			✓			✓	✓
16			✓		✓	✓	✓	64			✓		✓	✓	✓
17			✓		✓	✓	✓	68			✓		✓	✓	✓
18			✓			✓	✓	70			✓		✓	✓	✓
19*			✓			✓		83			✓		✓	✓	✓
20*			✓			✓									
21			✓			✓	✓								
24			✓		✓	✓	✓								
26			✓			✓	✓								
27			✓		✓	✓	✓								

* Symbols 19 and 20 are with detent. Both switched positions are alternately fixed and there is no need to energize the solenoid continually. For three positional valves (code 7-manually) the operator is at side "a" except symbols 42, 61 and 62, which operator is at side "b". For two positional valves see the table above. Other symbols on request.

TECHNICAL DATA

GENERAL

DATA

UNIT

VALUE/RANGE

Installation position		optional except symb."08" , "19" and "20"-horizontal
Max. ambient temperature	°C	-20...+50
Weight	single solenoid valve double solenoid valve	5 6,6

HYDRAULIC

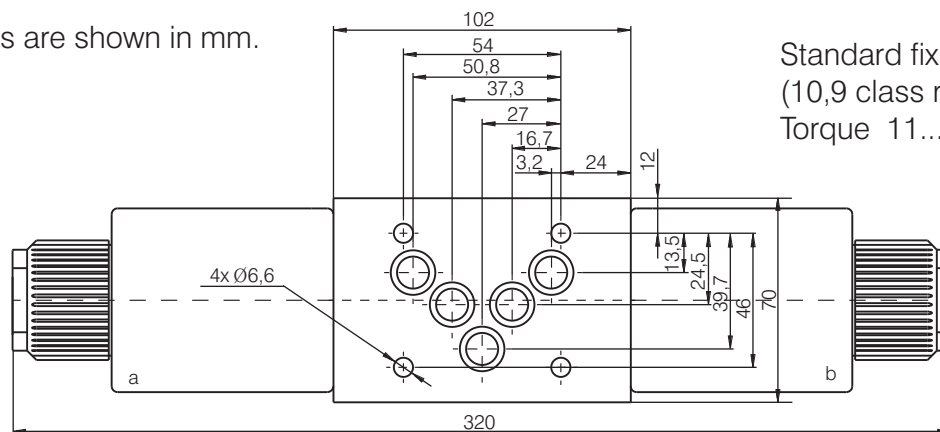
Max. pressure	port P , A & B port T	MPa MPa	32 16
Rated flow	(at Δp 0,1MPa.)	l/min	15...45
Max. flow (depend of symbol-see page 6/13)		l/min	140
Hydraulic fluid-mineral oil: -viscosity -filtration degree -temperature		mm ² /s mm °C	10...800 0.025 -20...80

ELECTRICAL

Cyclic duration		%	100
Waterproof			IP65
Heat insulation			H
Type of voltage		DC	AC
Available voltage /frequency		V/Hz	12/00 24/00 48/00
Voltage tolerance		%	±10
Current consumption	12VDC 24VDC 48VDC 110V RAC 220V RAC	A	2,9 1,6 0,75
			0,5 0,25
Max. switching frequencies		cycle/h	15000
Switching time at p=15MPa , Q=63,5l/min (measured for control valve symbol "01")	on off	ms ms	94 32

DIMENSIONS

All dimensions are shown in mm.

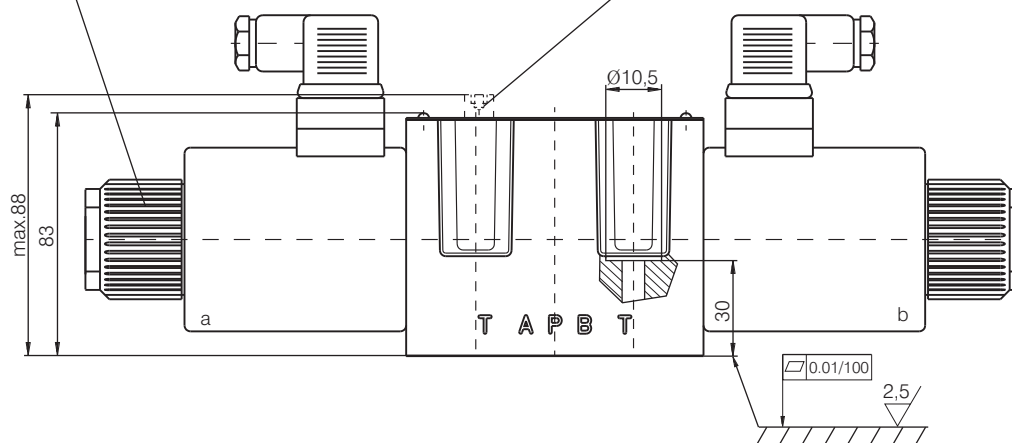


Standard fixing bolts M6x40
(10,9 class recommended).
Torque 11...14 Nm.

Gray or white plug connectors for solenoid "a",
black connectors for solenoid "b" and
transparent for solenoids with light indicator.

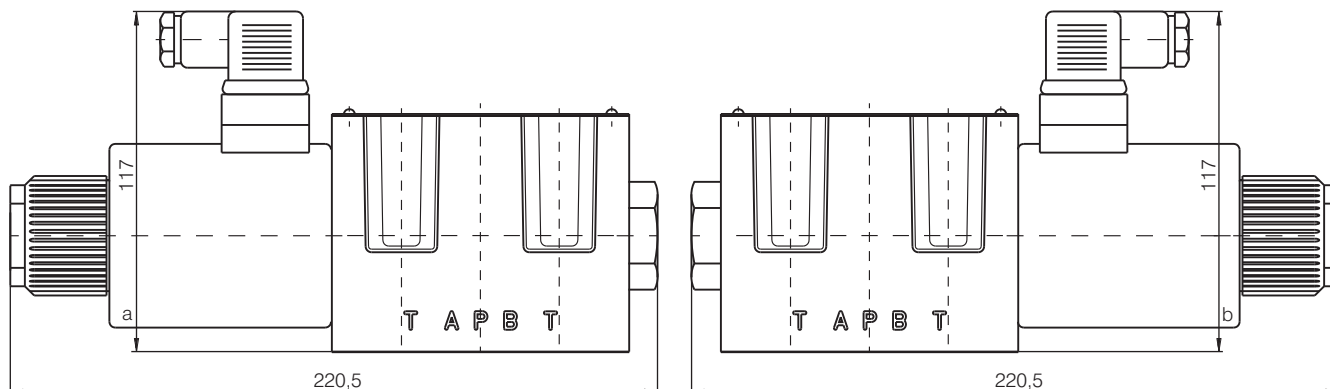
For one-lead supply scheme, the
metal screw cap should be used
see "ORDERING CODE" - code M

Variant with adjustable throttle
for switching over speed control
With fixed throttle Ø0,6mm.-
code R1, with adjustable
throttle-R2(internal hexagon S=3)
see "ORDERING CODE" - code R....



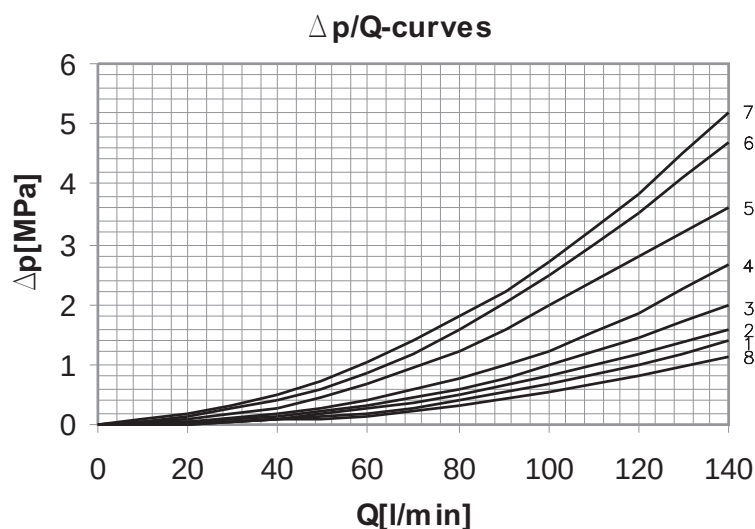
with solenoid "a"
for symbol: 11, 12, 14, 17, 24, 27,
33, 34, 39, 45, 68, 70 and 83

with solenoid "b"
for symbols: 10, 13, 16, 28, 32, 36,
64 and 78



The other dimensions are the same as double solenoid valve.

CHARACTERISTICS

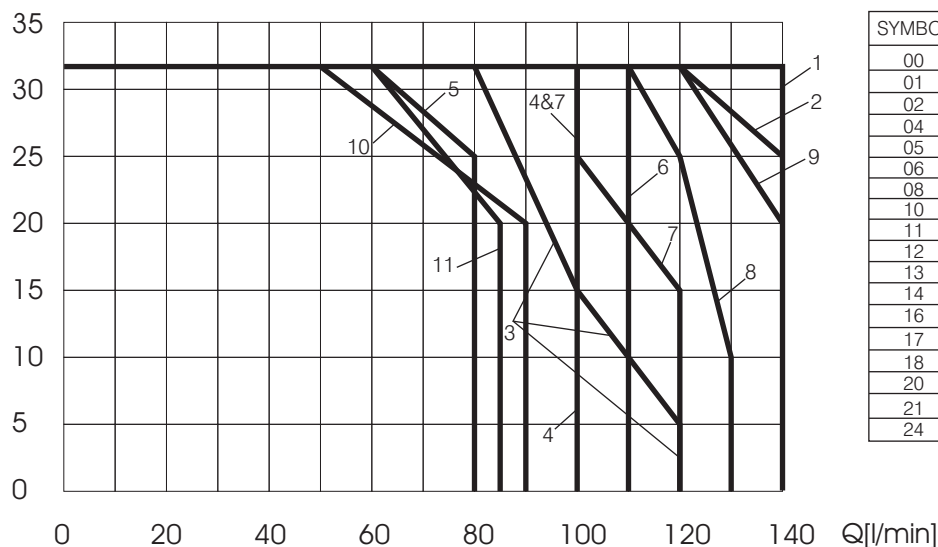
 $\Delta p/Q$ 

SYMBOL	CURVE				
	P>A	P>B	A>T	B>T	P>T
00	3	3	8	8	4
01	3	3	1	1	
02	6	6	5	5	4
04	3	3	2	2	
05	1	1	1	8	
06	2	2	7	5	2
08	2	2	1	1	
10	2	2	1	1	
11	2	2	1	1	
12	2	2	1	1	
13	2	2			
14	6			5	4
16	2			1	
17		1	1		
18	2	2	1	1	
20	3	3	2	2	
21	2	2	1	1	
24	3	3	2	2	
26	3	3	2	1	
27	3			1	
28	3	3	2	2	
32	4	4			
33		3	8		4
36	4	4	2	2	
39	4	4	2	2	
40		4	1		
41		4	8		
42	3	3	2	1	
45		2	1		
61	4			8	
62	4			1	
64	2			1	
68	4	4			
70	3	3	2	1	
83		2	1		

 p/Q

The operating limit of hydraulic power shown here is for applications with two directions of flow (e.g. from P to B and simultaneously from A to T). If the valve is with one direction passage only (e.g. from P to B and with blocked port A), the operating limit may considerably be reduced. The performance limits are measured with hydraulic oil 35 ± 5 cSt, temperature 50°C and supply voltage $0,9U_N$.

P[MPa]

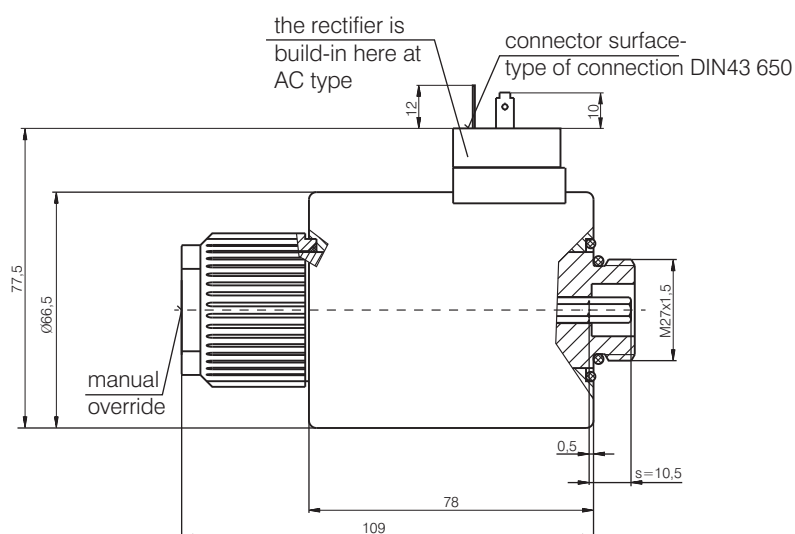


SYMBOL	CURVE	SYMBOL	CURVE
00	1	26	8
01	2	27	1
02	11	28	9
04	9	32	3
05	1	33	1
06	2	36	5
08	2	39	5
10	1	40	6
11	1	41	7
12	1	42	8
13	2	45	2
14	11	61	7
16	2	62	6
17	1	64	2
18	2	68	3
20	2	70	8
21	4	83	2
24	9		

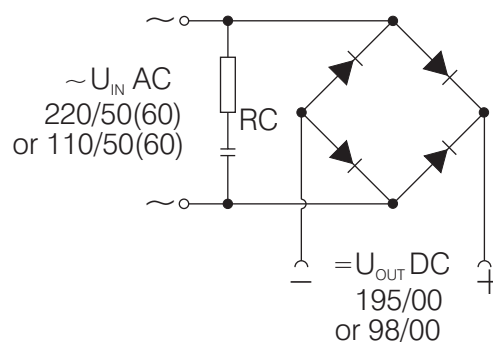
SOLENOIDS

AC & DC

All dimensions are shown in mm.



rectifier scheme

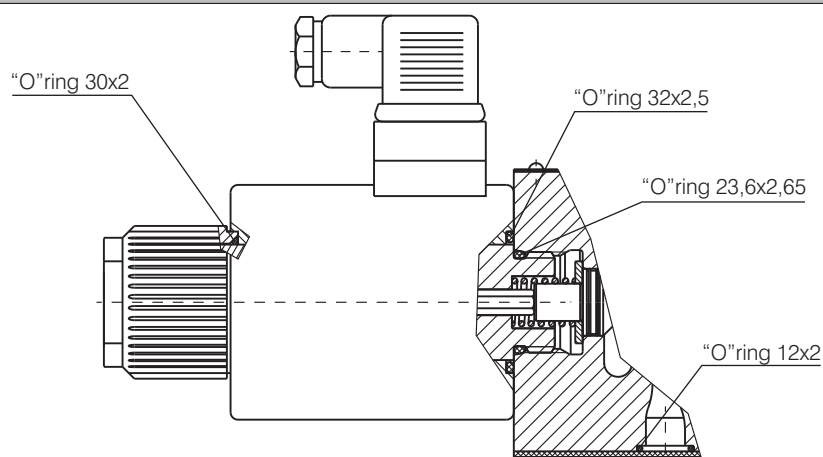


AC and DC solenoids have one and the same dimensions, connections and characteristics. The difference between AC and DC solenoids is in the integrated rectifier into the AC type - see "rectifier scheme". The solenoids can be used for 50Hz and 60Hz. The supply voltages are as follows: 12V DC, 24V DC, 48V DC, 110V AC/50(60)Hz and 220V AC/50(60)Hz.

CONNECTORS

CODE/TYPE				
C1	C2 (for DC type)	C3 (for DC type)	C4 (for AC type)	C5 (for AC type)
Without connector				
	With standard connector - DIN 43 650	Connector with light indicator (transparent)	Connector with integrated "RC" filter	Connector with light indicator and "RC" filter (transparent)

SEALS



GENERAL DESCRIPTION

- ✓ 4/2- way directional control valves with mechanical operation
- ✓ Reliability and long life
- ✓ Mounting surface CETOP5 (NG10)

RH10...4F...



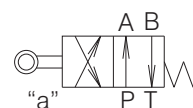
These RH10...4F... valves consist of a spool, housing, springs and mechanical control unit. They are used to control the start, stop and direction of flow.

The valves are used for hydraulic power control. This model is designed with two-spring centered spool.

The housing has 5-chambers and vertical "T" duct.

The valve location during assembly is of minor importance, but the horizontal position is generally recommended.

Symbol



ORDERING CODE

RH	10			F			
----	----	--	--	---	--	--	--

Directional control valve

Nominal size

Functional symbol

see page 3/13

Connection threads**

M - M14x1,5
G - G1/4"

N - normal
T - tropical

Detent*

Omit - without detent
D - with detent

Modification

Type of control

4 - mechanical
6 - pneumatic
7 - manual

* Only for type of control 7-manual

** Only for type of control 6-pneumatic

FUNCTIONAL SYMBOLS

see page 3/13

TECHNICAL DATA

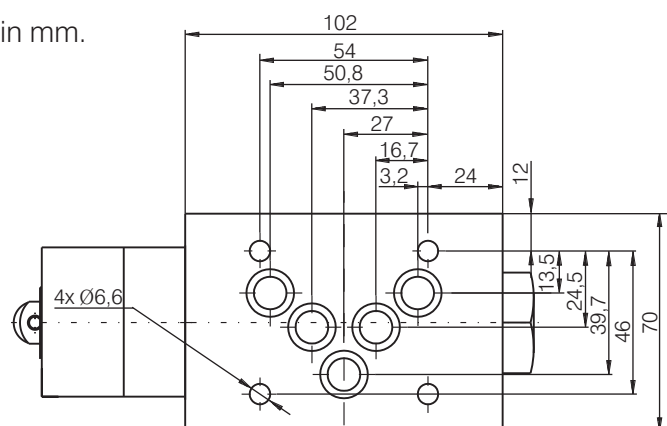
DATA	UNIT	VALUE/RANGE
Weight	kg	4
Max. Pressure	port P , A & B port T	32 16
Rated flow	(at $\Delta p=0,1\text{MPa.}$)	l/min
Actuating force	$-F_{\min}$ $-F_{\max}$	50 150

CHARACTERISTICS

See page 6/13

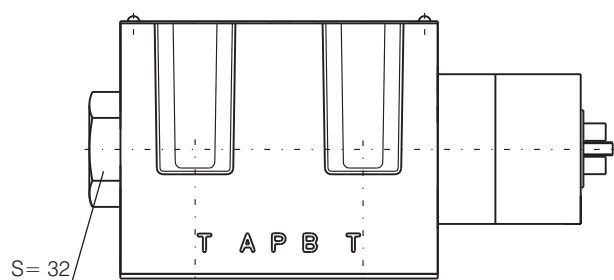
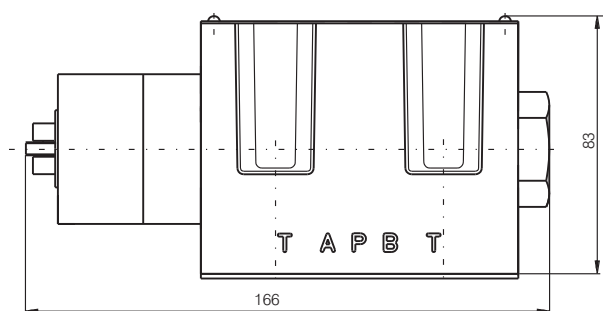
DIMENSION

All dimensions are shown in mm.

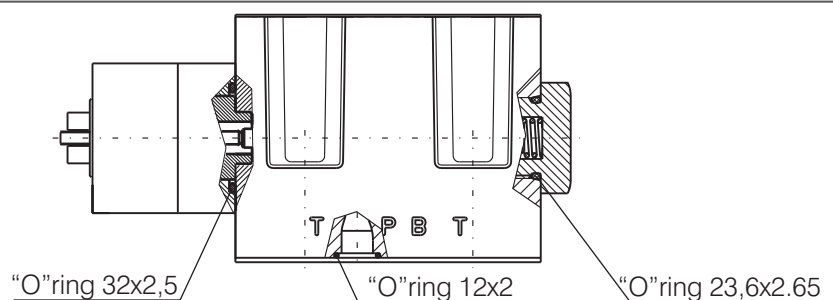


Symbols 12 , 17 , 24 , 27 , 34 , 39 , 45 , 68 , 70 , 83

Symbols 10 , 13 , 16 , 28 , 32 , 36 , 64 , 78



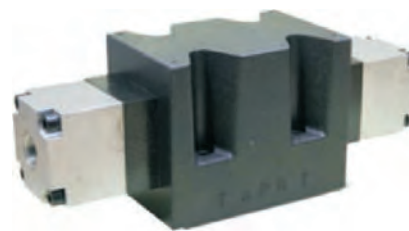
SEALS



GENERAL DESCRIPTION

- ✓ 4/3 and 4/2- way directional control valves with pneumatic operation
- ✓ Reliability and long life
- ✓ Mounting surface CETOP5 (NG10)

RH10...6F...



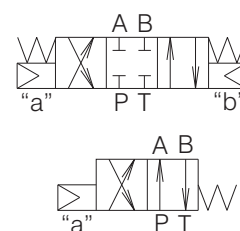
The RH10...6F... valves consist of a spool, housing, springs and pneumatic control unit.

They are used to control the start, stop and direction of flow.

This model is designed with two-spring centered spool about 4/3- and 4/2- valves. The housing has 5-chambers.

The valve location during assembly is of minor importance, but the horizontal position is generally recommended. For functional symbols "08", "19" and "20", the horizontal position is obligatory.

Symbol



ORDERING CODE

see page 8/13

FUNCTIONAL SYMBOLS

see page 3/13

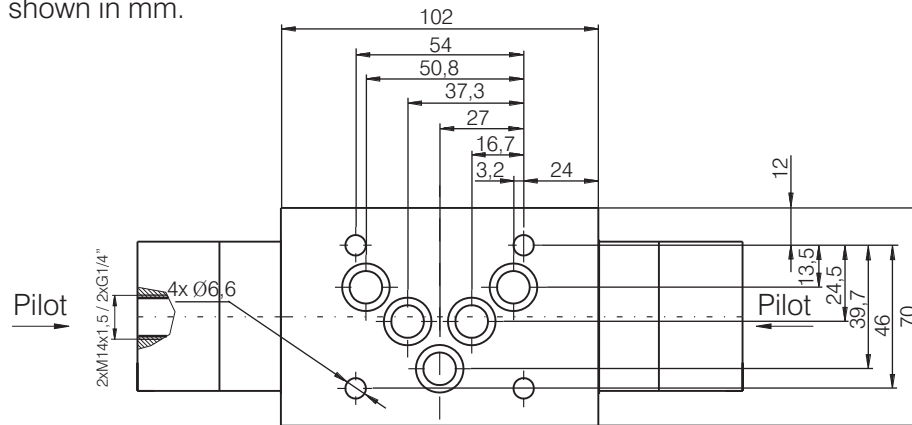
TECHNICAL DATA

DATA	UNIT	VALUE/RANGE
Weight	-three positional -two positional	kg 4,250 3,800
Max. Pressure	port P, A & B port T	MPa 32 16
Rated flow	(at $\Delta p=0,1\text{MPa.}$)	l/min 15...45
Pilot pressure	$-P_{\min}$ $-P_{\max}$	MPa 0,3 1

CHARACTERISTICS

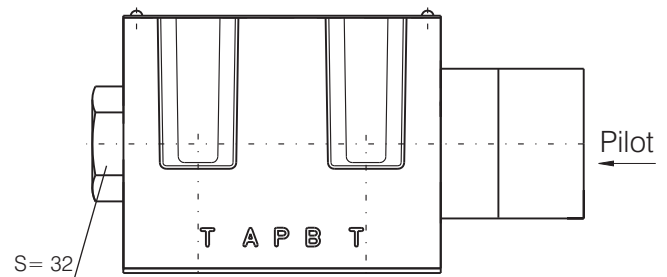
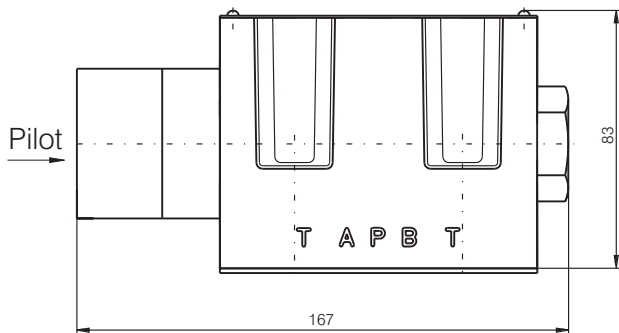
See page 6/13

All dimensions are shown in mm.

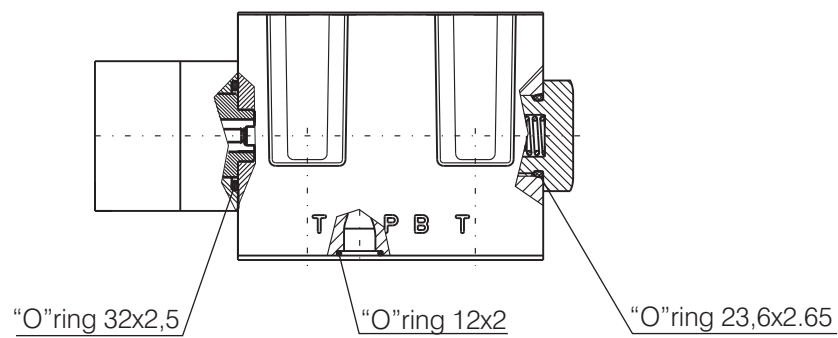


Symbols 12 , 17 , 24 , 27 , 34 , 39 , 45 , 68 , 70 , 83

Symbols 10 , 13 , 16 , 28 , 32 , 36 , 64 , 78



SEALS



GENERAL DESCRIPTION

- ✓ 4/3- and 4/2- way directional control valves with manual operation
- ✓ Reliability and long life
- ✓ Mounting surface CETOP5 (NG10)

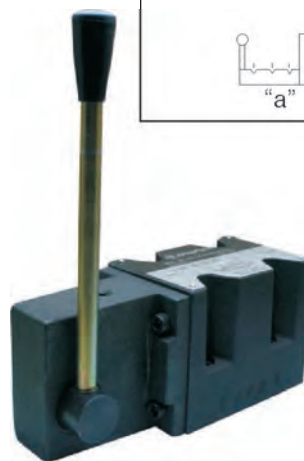
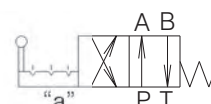
The RH10...7F... valves consist of a spool, housing, springs and manual control unit. They used to control the start, stop and direction of flow.

This model is designed with two-spring centered spool about 4/3- and 4/2- valves. The housing has 5-chambers. There are two possible versions of valve - with detent and without detent.

The valve location during assembly is of minor importance, but the horizontal position is generally recommended.

RH10...7F...

Symbol



ORDERING CODE

see page 8/13

FUNCTIONAL SYMBOLS

see page 3/13

TECHNICAL DATA

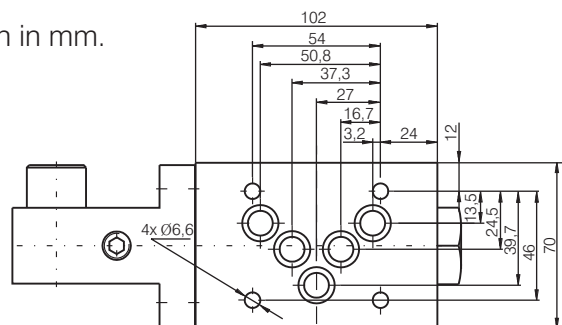
DATA	UNIT	VALUE/RANGE
Weight	kg	5,1
Max. pressure port P, A & B port T	MPa	32 16
Rated flow (at $\Delta p=0,1\text{MPa}$)	l/min	15...45
Angular movement	°	± 29
Actuating force	N	30

CHARACTERISTICS

see page 6/13

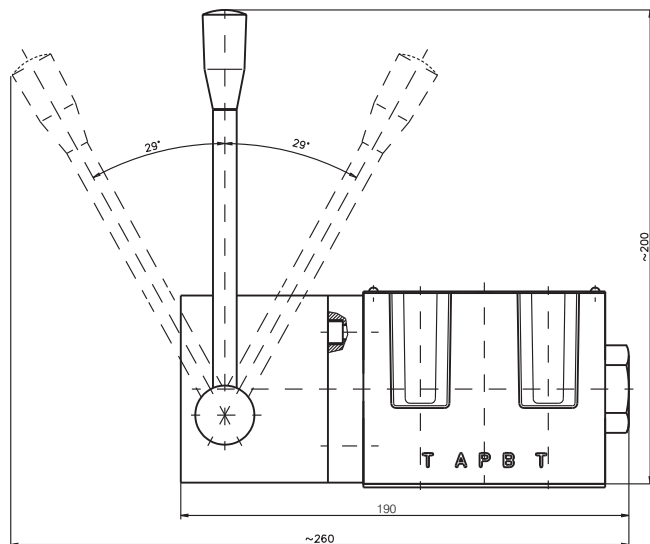
DIMENSIONS

All dimensions are shown in mm.

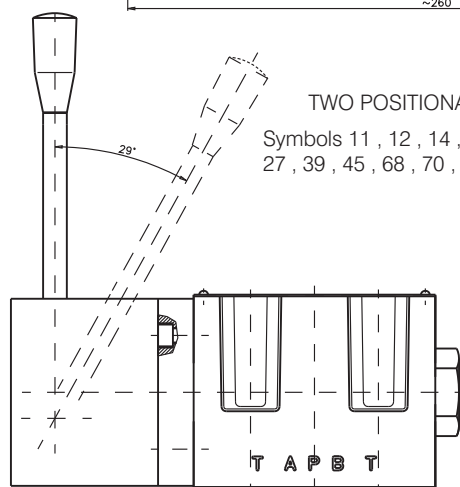
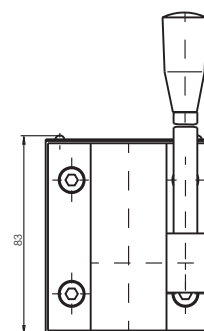


THREE POSITIONAL

Symbols 00, 01, 02, 04, 05, 06, 11, 12, 14, 17, 18, 21, 24, 26, 27, 39, 40, 41, 45, 68, 70, 83(except 61 & 62)



For three positional valves symbols 61 and 62 the operator is at side "b".

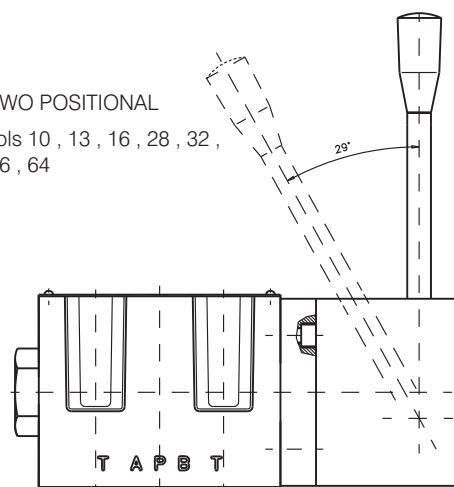


TWO POSITIONAL

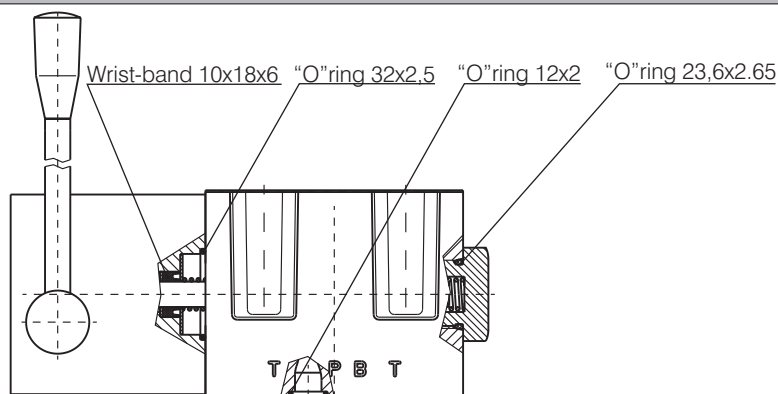
Symbols 11, 12, 14, 17, 24, 27, 39, 45, 68, 70, 83

TWO POSITIONAL

Symbols 10, 13, 16, 28, 32, 33, 36, 64



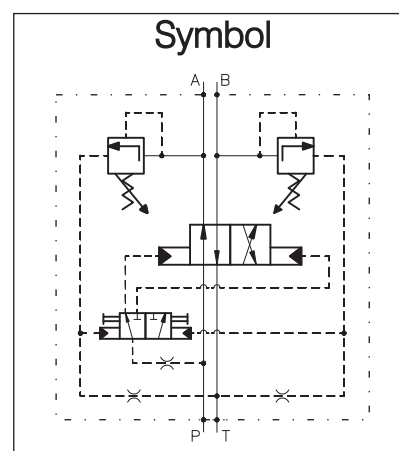
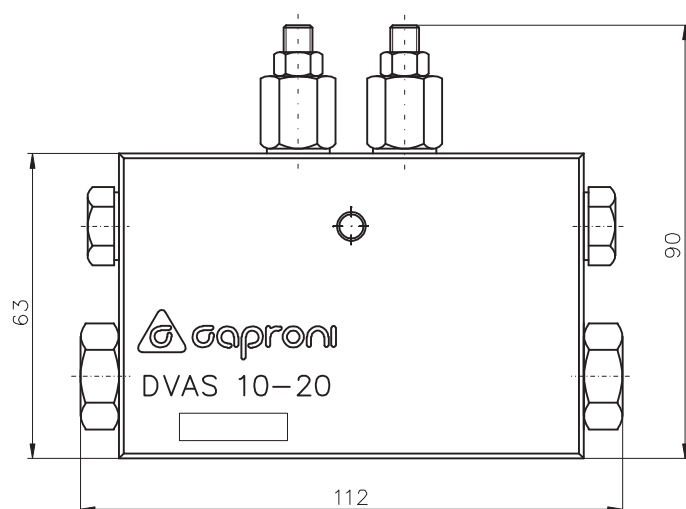
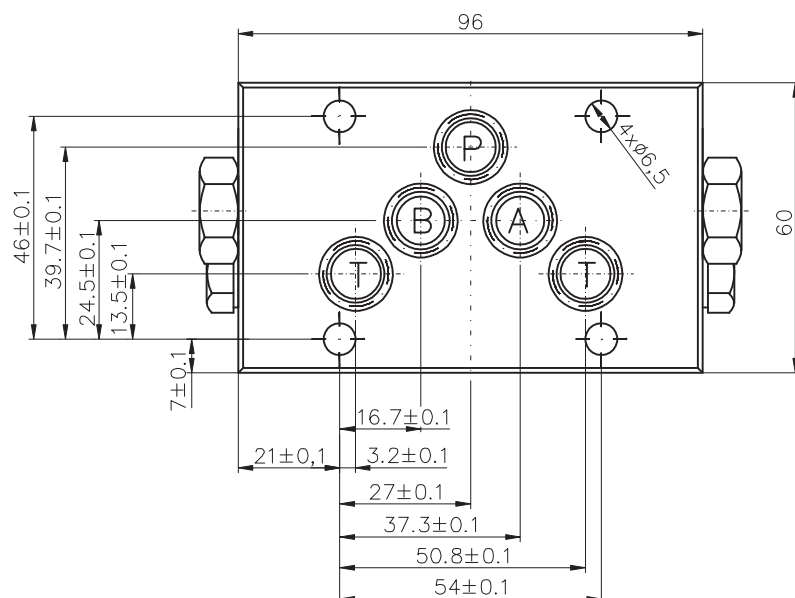
SEALS



GENERAL DESCRIPTION

Flow automatically reverses direction from P-A to P-B when the setting value of pressure relief valves is reached.

- ✓ 4/2- way directional control valves with hydraulic pilot operation
- ✓ Manual override option
- ✓ Reliability and long life
- ✓ Mounting surface CETOP5 (NG10)



ORDERING CODE

DVAS 10 - 20 ...

Automatic switch
directional control
valve

Nominal size

Pressure range:

Omit- 50...200bar.

V1 - 0...100bar.

Direction of flow(symbol 20)

TECHNICAL DATA

GENERAL

DATA	UNIT	VALUE/RANGE
Installation position		preferably horizontal
Max. ambient temperature	°C	-20...+50
Weight	kg	2,400

HYDRAULIC

Max. pressure	MPa	21
Maximum flow	l/min	80
Minimum flow	l/min	4
Hydraulic fluid - mineral oil: -viscosity -filtration degree -temperature	mm ² /s mm °C	10...800 0.025 -20...80

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