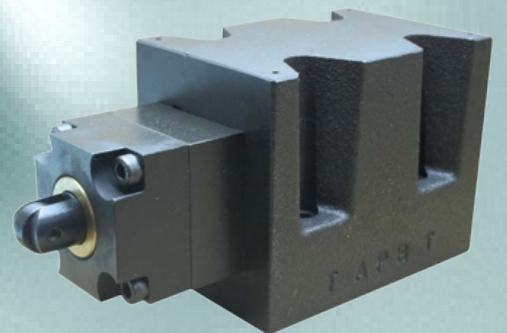
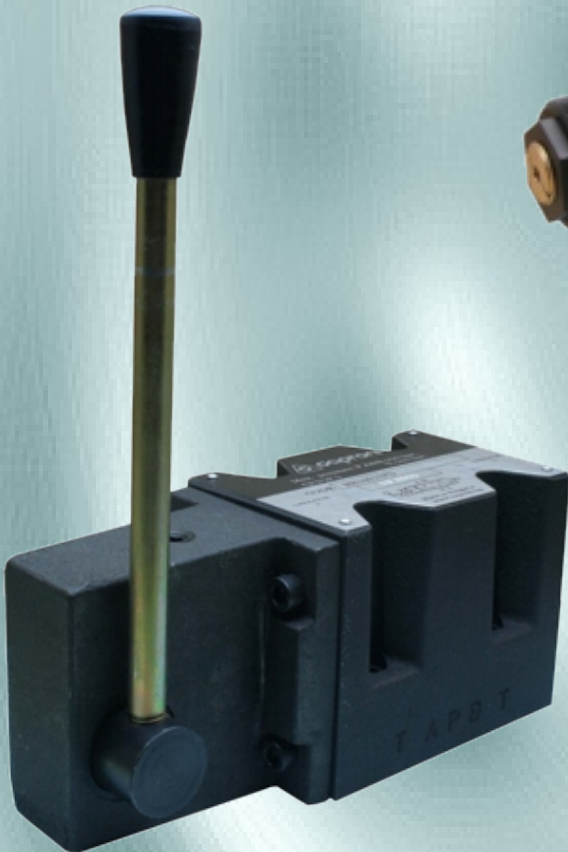
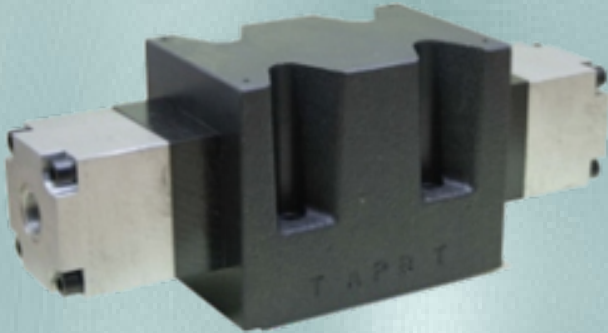




Gaproni



DIRECTIONAL CONTROL VALVES CETOP5

CONTENTS:

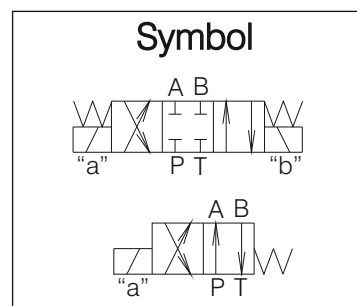
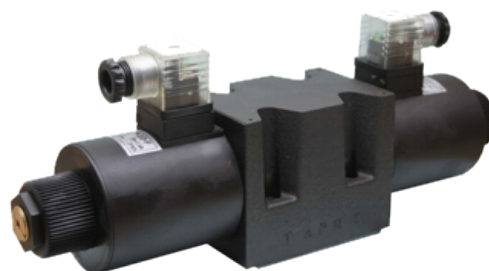
Page

RH10...1 - electrical control	1/15...7/15
RH10...4 - mechanical control	8/15...9/15
RH10...6 - pneumatic control	10/15...11/15
RH10...7 - manual control	12/15...13/15
DVAS10-20 - automatic switch	14/15...15/15

GENERAL DESCRIPTION

- ✓ 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 direction without leakage from the system
- ✓ Wet pin core tubes connected to a tank with high pressure capacity
- ✓ Manual override option
- ✓ Maximum control of hydraulic power
- ✓ Reliability and long life
- ✓ Mounting surface CETOP5 (NG10)

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



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

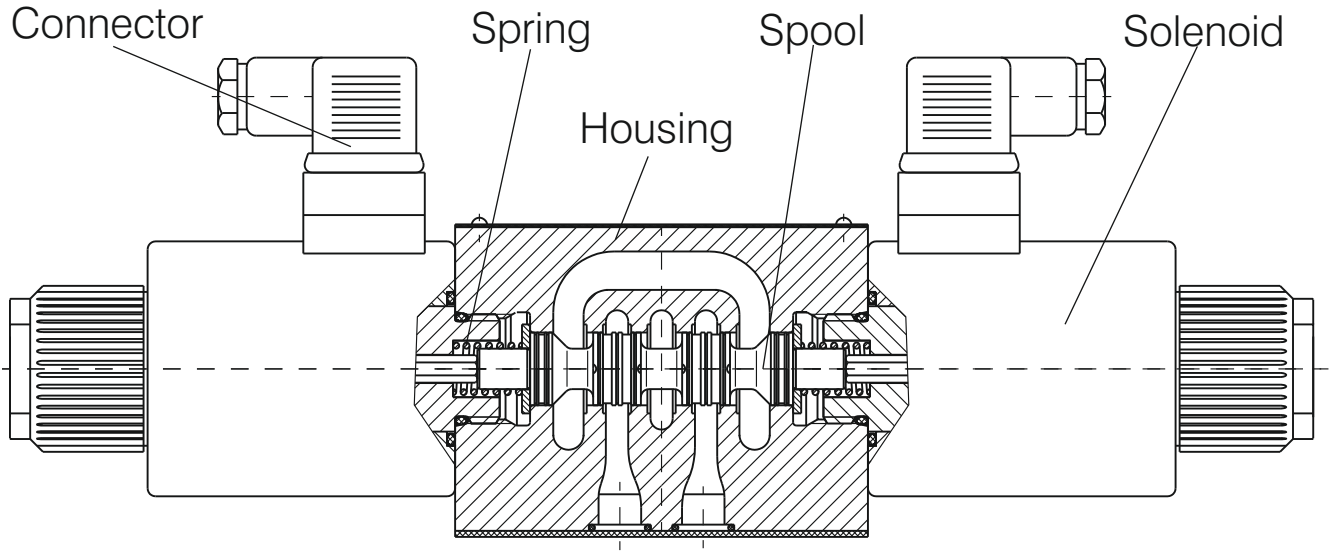
The RH10...1...-...F... valves consist of a spool , housing , springs and solenoids.

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. The 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
012/00
024/00

Supply voltage/current frequency
048/00
110/50
220/50

Modification

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 for symbols 42, 61 and 62, where the 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	kg	5
single solenoid valve	kg	6,6
double solenoid valve		

HYDRAULIC

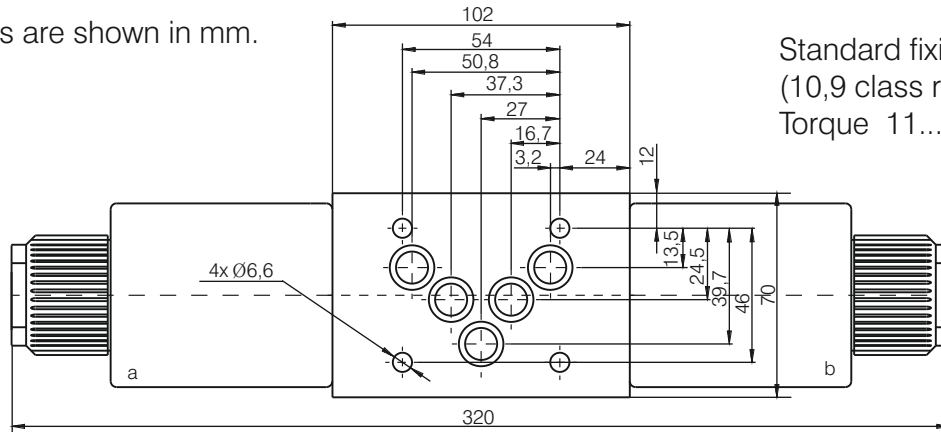
Max. pressure	port P , A & B port T	MPa MPa	32 21
Rated flow	(at Δp 0,1MPa.)	l/min	15...45
Max. flow (depend on symbol-see page 6/13)		l/min	140
Hydraulic fluid-mineral oil:			
-viscosity		mm ² /s	10...800
-filtration degree		mm	0.025
-temperature		°C	-20...80

ELECTRICAL

Cyclic duration		%	100
Waterproof			IP65
Heat insulation			H
Type of voltage			DC AC
Available voltage /frequency		V/Hz	12/00 110/50(60) 24/00 220/50(60) 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.

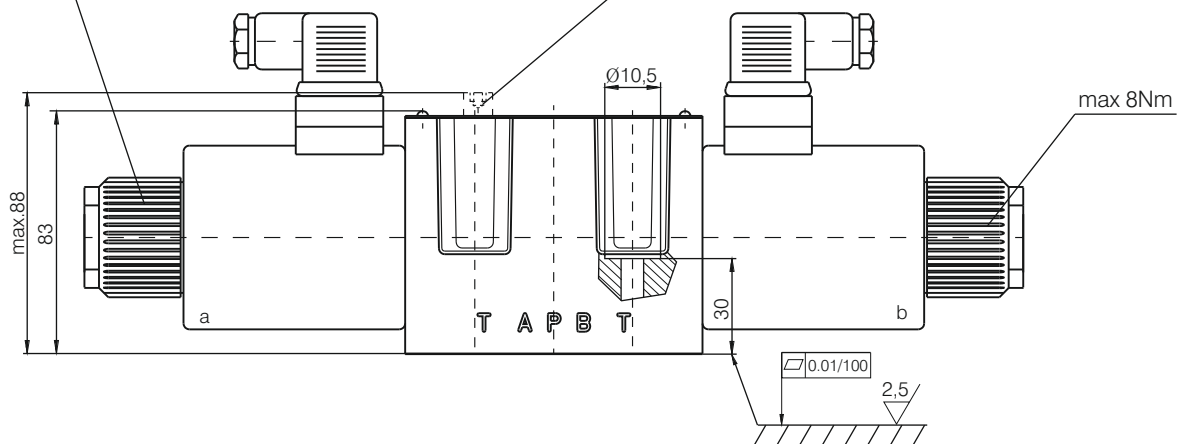


Standard fixing bolts M6x40 (10,9 class recommended). Torque 11...14 Nm.

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

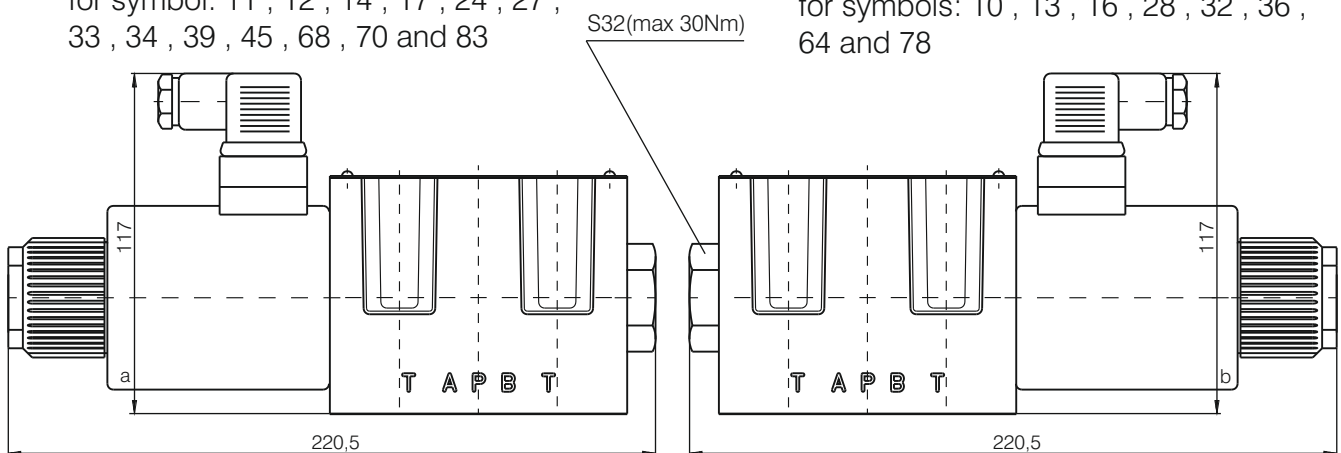
For one-lead supply scheme, the metal screw cap should be used see "ORDERING CODE" - code M

An option 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

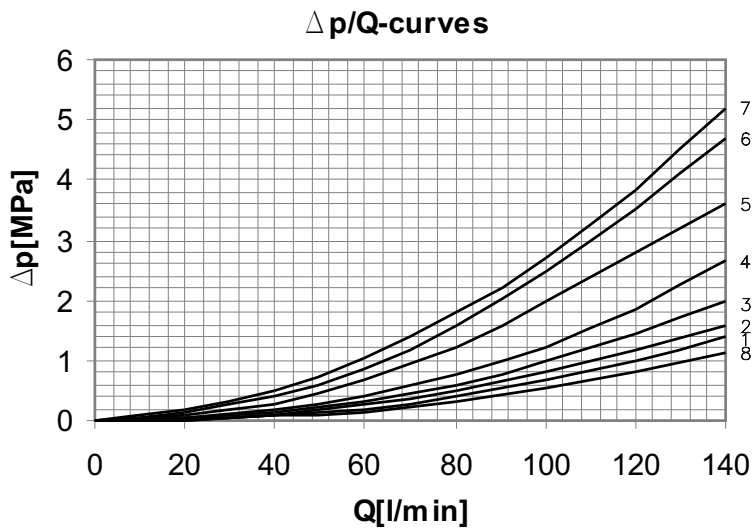
with solenoid "b"
for symbols: 10, 13, 16, 28, 32, 36, 64 and 78



The other dimensions are the same as double solenoid valve.

CHARACTERISTICS

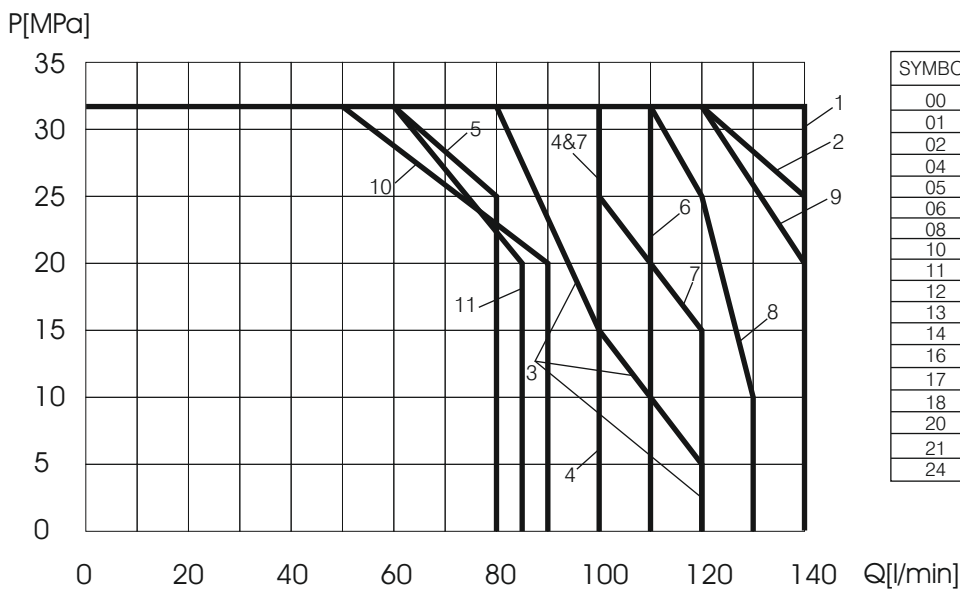
$\Delta p/Q$



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 $0,9U_N$

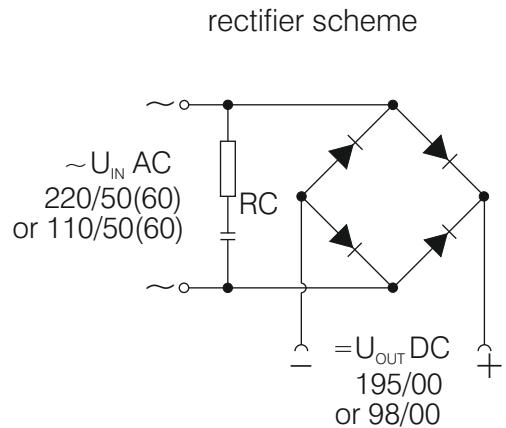
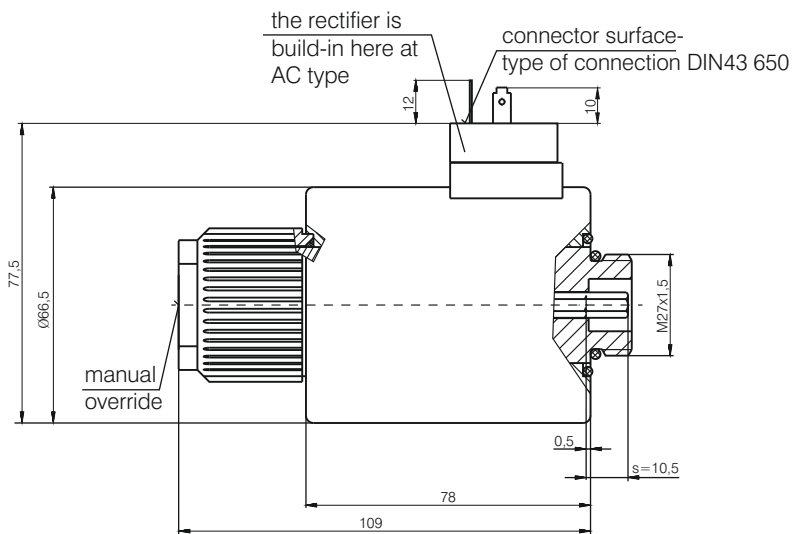


SYMBOL	CURVE	SYMBOL	CURVE
00	1	26	8
01	2	27	1
02	11	28	9
04	9	32	3
05	1	33	1
06	2	36	5
08	2	39	5
10	1	40	6
11	1	41	7
12	1	42	8
13	2	45	2
14	11	61	7
16	2	62	6
17	1	64	2
18	2	68	3
20	2	70	8
21	4	83	2
24	9		

SOLENOIDS

AC & DC

All dimensions are shown in mm.

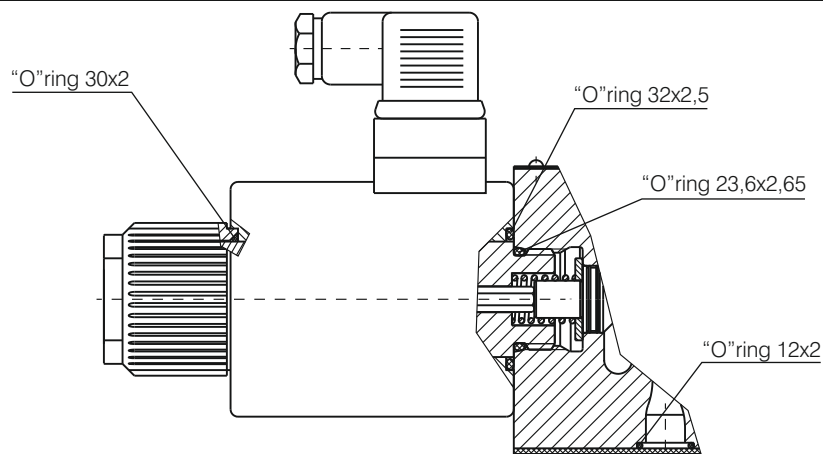


AC and DC solenoids have the same dimensions, connections and characteristics. The difference between AC and DC solenoids is in the integrated rectifier into the AC type - see "rectifier scheme". The solenoids can be used for 50Hz and 60Hz. The supply voltages are as follows: 12V DC, 24V DC, 48V DC,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



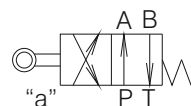
These RH10...4F... valves consist of a spool , housing , springs and mechanical control unit. They are used to control the start , stop and direction of flow.

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

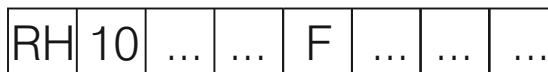
The housing has 5-chambers and vertical "T" duct.

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

Symbol



ORDERING CODE



Directional control valve

Nominal size

Functional symbol

see page 3/15

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

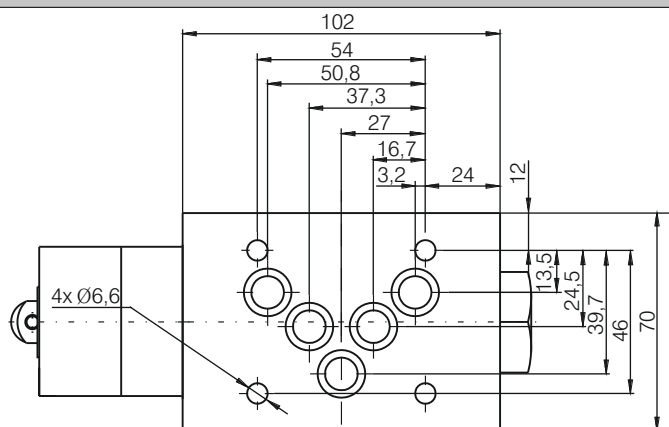
see page 3/15

TECHNICAL DATA

DATA	UNIT	VALUE/RANGE
Weight	kg	4
Max. Pressure	port P , A & B port T	32 16
Rated flow	(at $\Delta p=0,1\text{MPa.}$)	15...45
Actuating force	$-F_{\min}$ $-F_{\max}$	50 150

CHARACTERISTICS

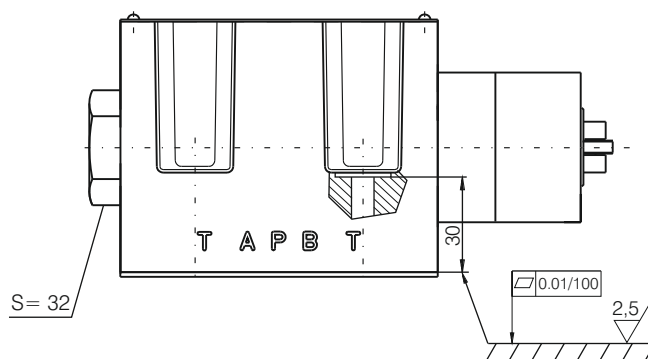
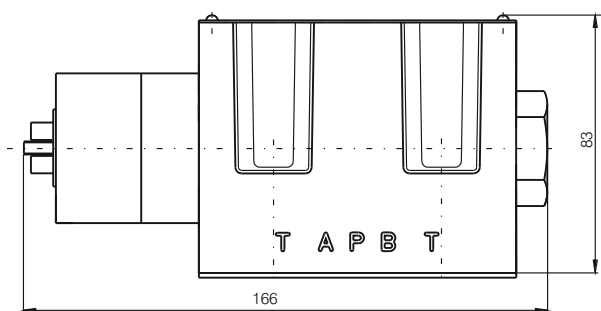
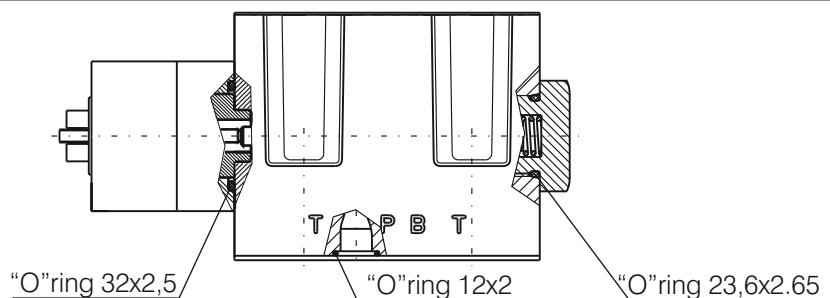
See page 6/13

DIMENSION


All dimensions are shown in mm.

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

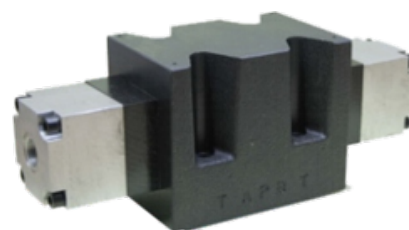
Symbols 10 , 13 , 16 , 28 , 32 , 36 , 64 , 78


SEALS


GENERAL DESCRIPTION

RH10...6F...

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

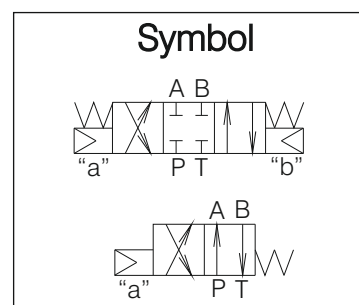


The RH10...6F... valves consist of a spool , housing , springs and pneumatic control unit.

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.


ORDERING CODE

see page 8/13

FUNCTIONAL SYMBOLS

see page 3/13

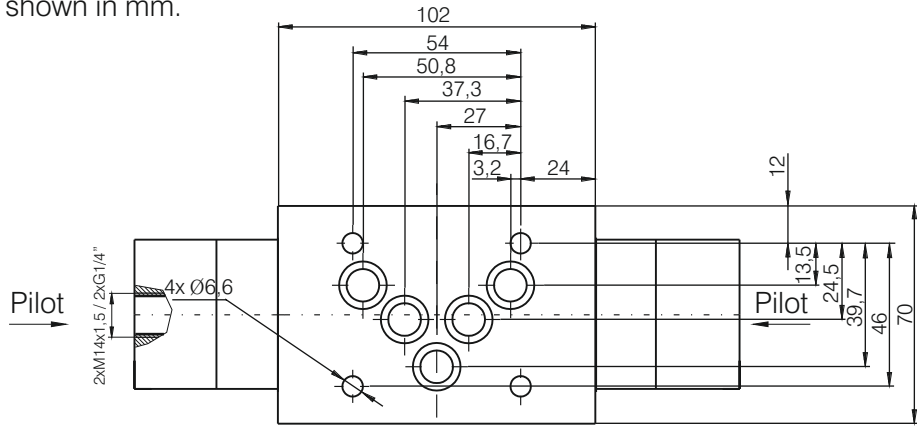
TECHNICAL DATA

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

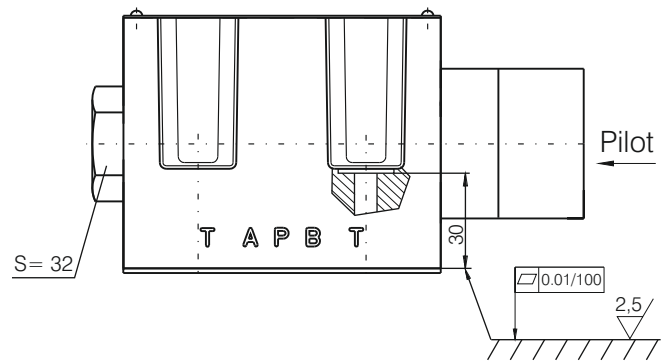
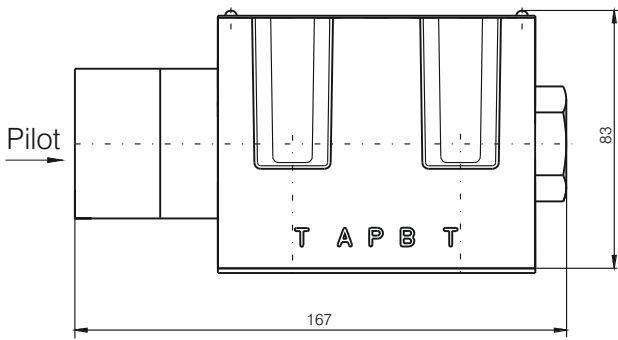
See page 6/13

All dimensions are shown in mm.

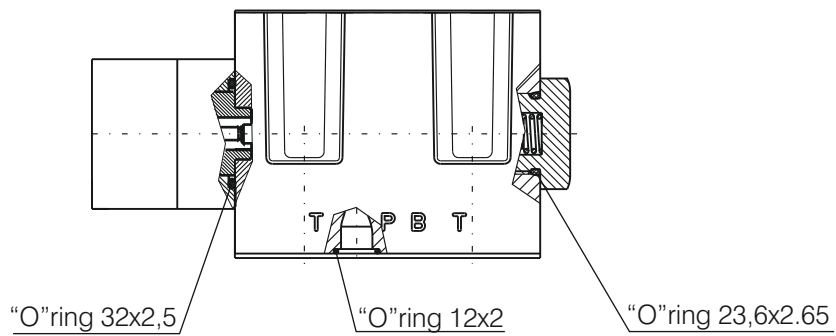


Symbols 12 , 17 , 24 , 27 , 34 , 39 , 45 , 68 , 70 , 83

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



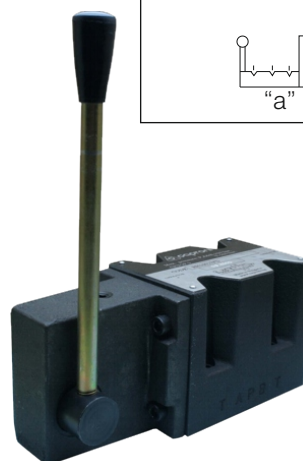
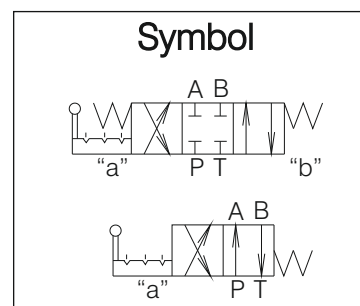
SEALS



GENERAL DESCRIPTION

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

RH10...7F...



The RH10...7F... valves consist of a spool , housing , springs and manual 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. 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.

ORDERING CODE

see page 8/13

FUNCTIONAL SYMBOLS

see page 3/13

TECHNICAL DATA

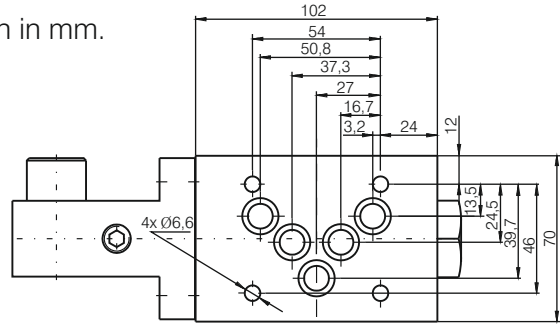
DATA	UNIT	VALUE/RANGE
Weight	kg	5,1
Max. pressure port P , A & B port T	MPa	32 2,5
Rated flow (at $\Delta p=0,1\text{MPa}$)	l/min	15...45
Angular movement	°	±29
Actuating force	N	30

CHARACTERISTICS

see page 6/13

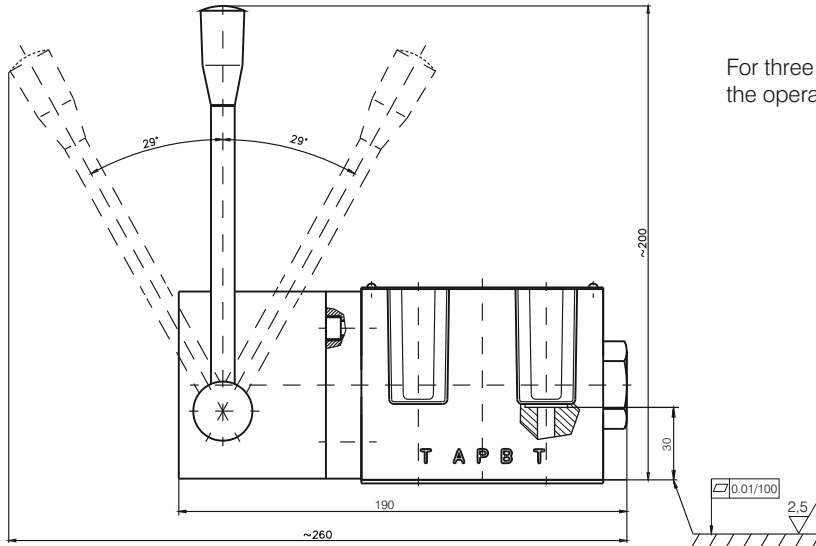
DIMENSIONS

All dimensions are shown in mm.

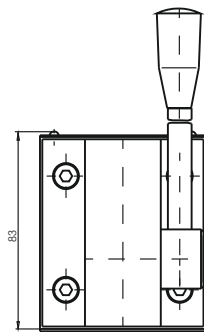


THREE POSITIONAL

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)

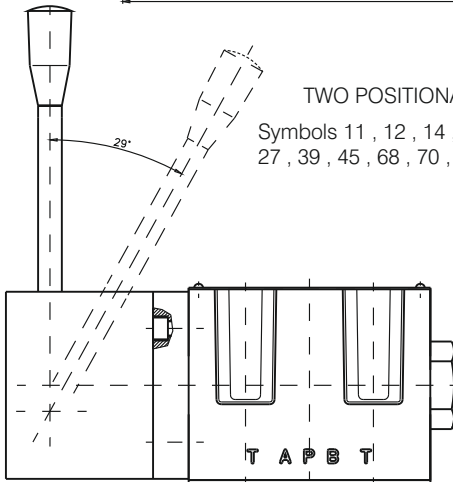


For three positional valves symbols 61 and 62 the operator is at side "b".



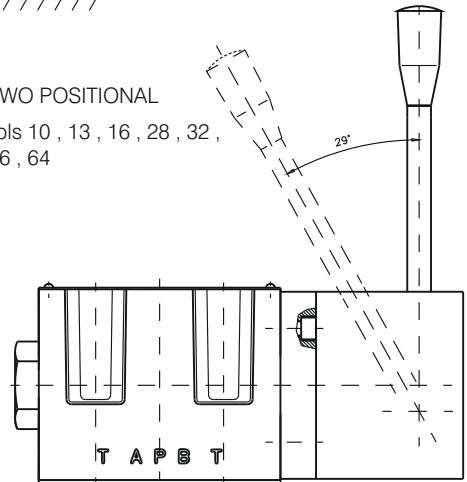
TWO POSITIONAL

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

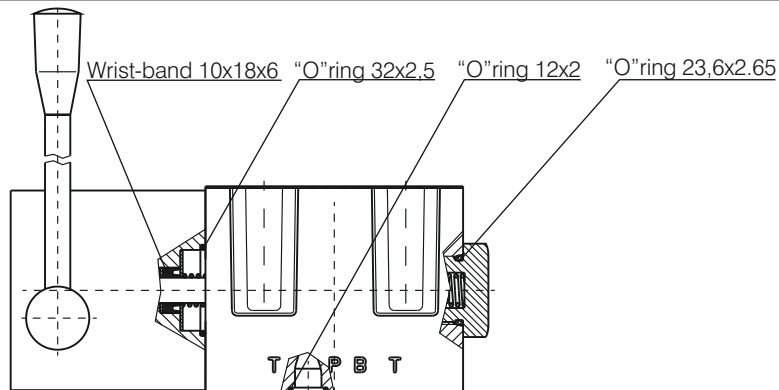


TWO POSITIONAL

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



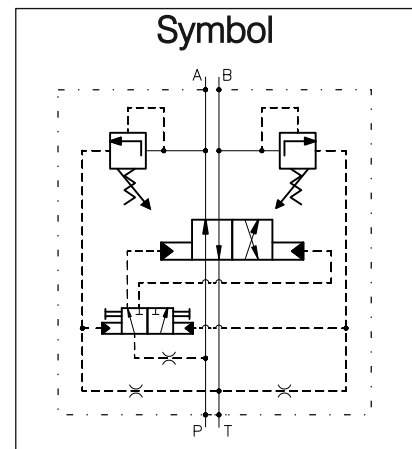
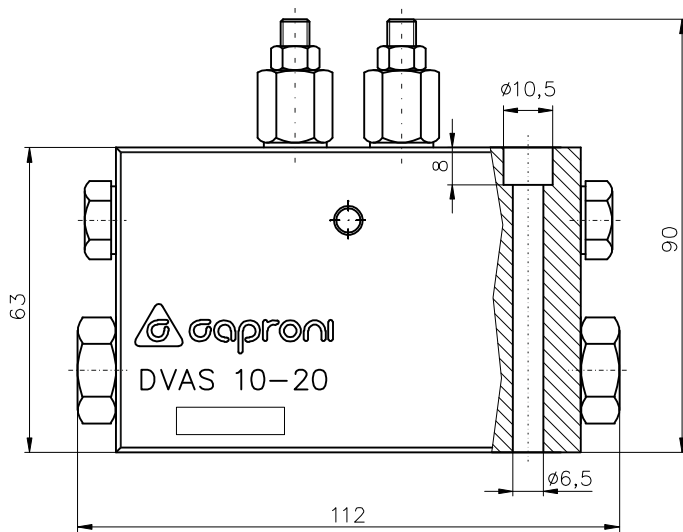
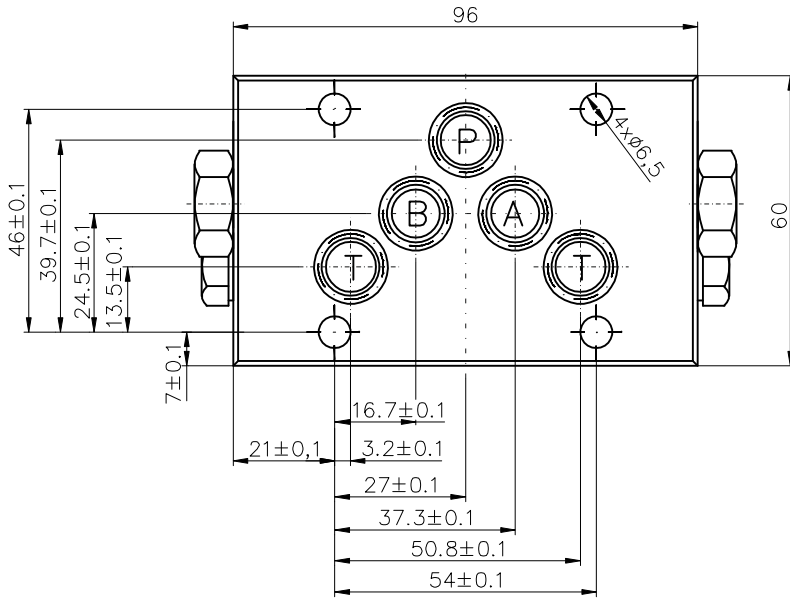
SEALS



GENERAL DESCRIPTION

Flow automatically reverses direction from P-A to P-B when the set 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

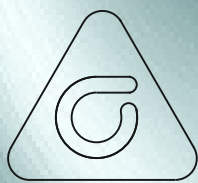
Pressure range:

Omit- 0...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



caproni

BULGARIA JOINT-STOCK COMPANY

**BULGARIA , 6100 KAZANLAK , 45 STOLETOV STR.
TEL.:+359/431/62 229 , +359/431/6132 ,
FAX:+359/431/62 230 , +359/431/63 134
E-MAIL:CAPRONI@CAPRONI.BG , WEB:HTTP://WWW.CAPRONI.BG**