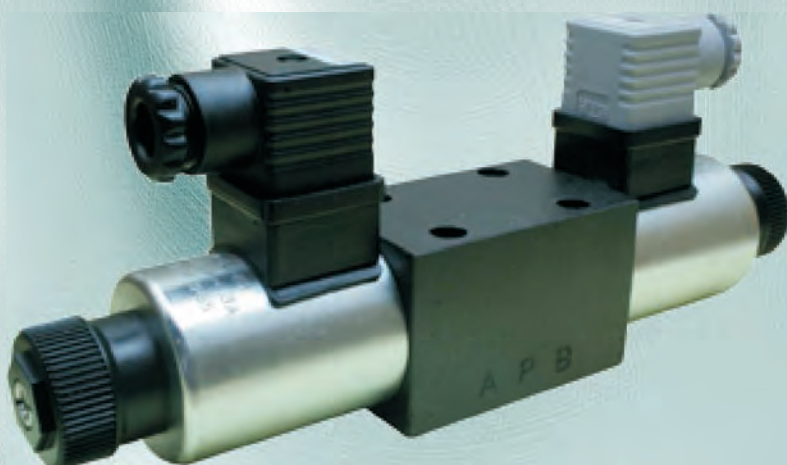


Bulmach



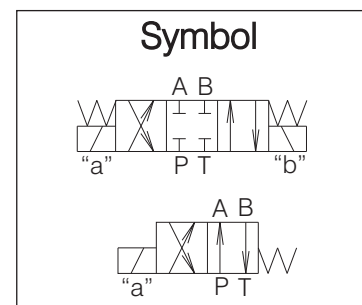
DIRECTIONAL CONTROL VALVES CETOP3

GENERAL DESCRIPTION

Document: DCVC3-1-Aug 2013

RH06...1-...F...

- ✓ 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 (push button)
- ✓ Maximum control of hydraulic power
- ✓ Reliability and long life
- ✓ Mounting surface CETOP3 (NG6)



The RH06...1-...F... valves are solenoid operated directional spool valves. They used to control the start , stop and direction of flow.

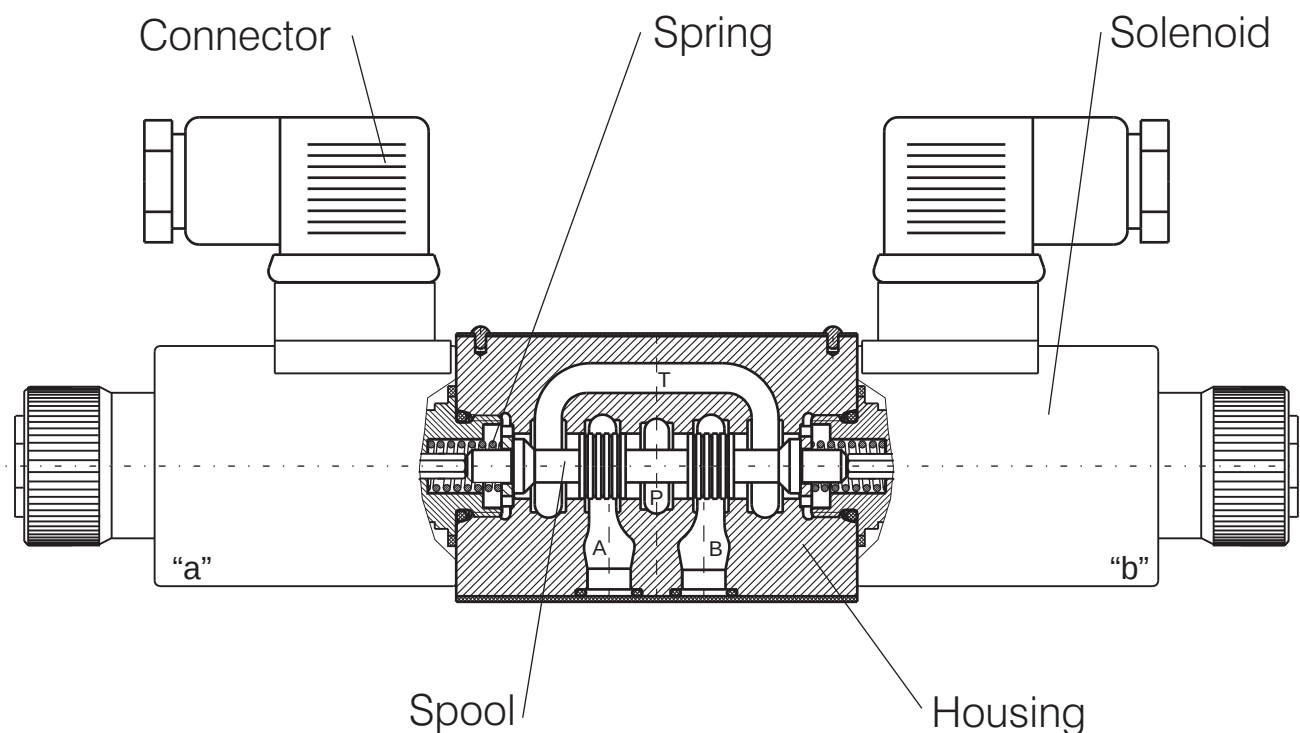
The RH06...1-...F... valves consist of a spool , housing , springs and solenoids.

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 override is provided.

GENERAL DESCRIPTION



ORDERING CODE

RH	06	1	-	.../...	F					
----	----	---	---	---------	---	--	--	--	--	--

Directional control valve

Nominal size

Functional symbol
see page 3/17

Type of control: -electrical

Supply voltage/current frequency
see page 7/17

Modification

Connector

see page 7/17

012/00
024/00
048/00
110/50
220/50

C1
C2
C3
C4
C5

Orifice in P line

Omit - without orifice**K1** - orifice $\varnothing 0,8\text{mm}$.**K2** - orifice $\varnothing 1\text{mm}$.**K3** - orifice $\varnothing 1,2\text{mm}$.**K4** - orifice $\varnothing 1,5\text{mm}$.**K5** - orifice $\varnothing 2\text{mm}$.

see page 5/17

Screw cap

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

see page 5/17

Spacers

Omit - without spacers**S** - With spacers

see page 5/17

N - normal**T** - tropical

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			✓	✓		✓	✓	34			✓	✓	✓	✓	✓
05			✓	✓		✓	✓	36			✓	✓	✓	✓	✓
06			✓	✓		✓	✓	39			✓	✓	✓	✓	✓
08			✓	✓		✓		40			✓	✓		✓	✓
10			✓	✓	✓	✓	✓	41			✓	✓		✓	✓
11			✓	✓		✓	✓	42			✓	✓		✓	✓
12			✓	✓	✓	✓	✓	45			✓	✓	✓	✓	✓
13			✓	✓	✓	✓	✓	52			✓	✓		✓	✓
14			✓	✓		✓	✓	61			✓	✓		✓	✓
16			✓	✓	✓	✓	✓	62			✓	✓		✓	✓
17			✓	✓	✓	✓	✓	64			✓	✓	✓	✓	✓
18			✓	✓		✓	✓	68			✓	✓	✓	✓	✓
19*			✓	✓		✓		70			✓	✓	✓	✓	✓
20*			✓	✓		✓		78			✓	✓	✓	✓	✓
21			✓	✓		✓	✓	82*			✓	✓		✓	
24			✓	✓	✓	✓	✓	83			✓	✓	✓	✓	✓
26			✓	✓		✓	✓	98			✓	✓		✓	✓
27			✓	✓	✓	✓	✓	99			✓	✓		✓	✓

* Symbols 19, 20 and 82 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", "20" and "82"-horizontal
Max. ambient temperature	°C	-20...+50
Weight	kg	1,600
single solenoid valve	kg	2,200
double solenoid valve		

HYDRAULIC

Max. pressure	port P , A & B port T	MPa MPa	32 16
Rated flow	(at Δp 0,1MPa.)	l/min	11...20
Max. flow (depend of symbol-see page 6/17)		l/min	80
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 24/00 48/00	110/50(60) 220/50(60)
Voltage tolerance	%	±10	
Current consumption	A	2,4 1,3 0,58	0,5 0,25
12VDC 24VDC 48VDC 110V RAC 220V RAC			
Max. switching frequencies	cycle/h	15000	
Switching time at p=17,5MPa , Q=40l/min (measured for control valve symbol "01")	on ms off ms	50 25	

DIMENSIONS

All dimensions are shown in mm.

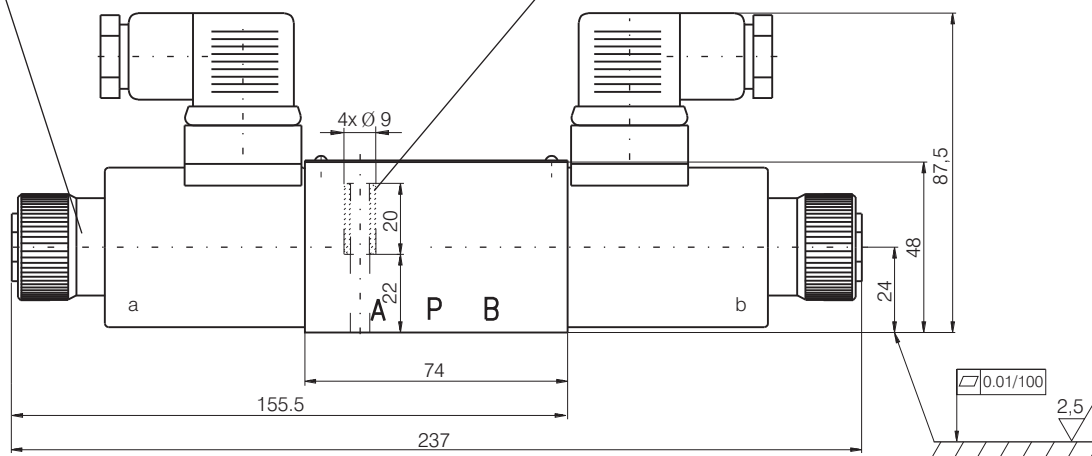
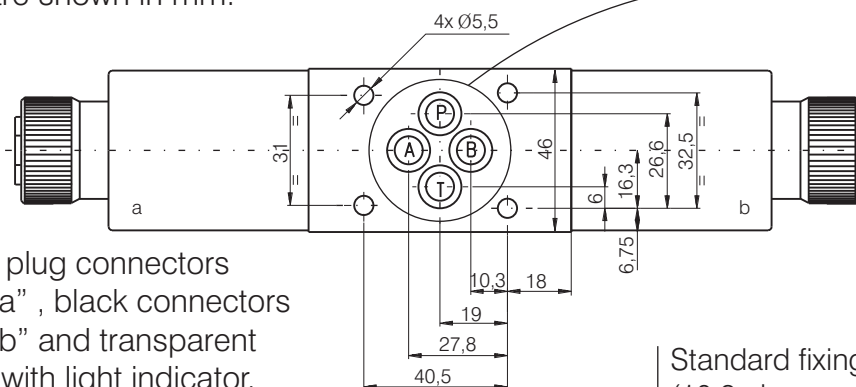
Gray or white plug connectors for solenoid "a", black connectors for solenoid "b" and transparent for solenoids with light indicator.

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

Standard fixing bolts M5x30 (10,9 class recommended). Torque 6...8 Nm.

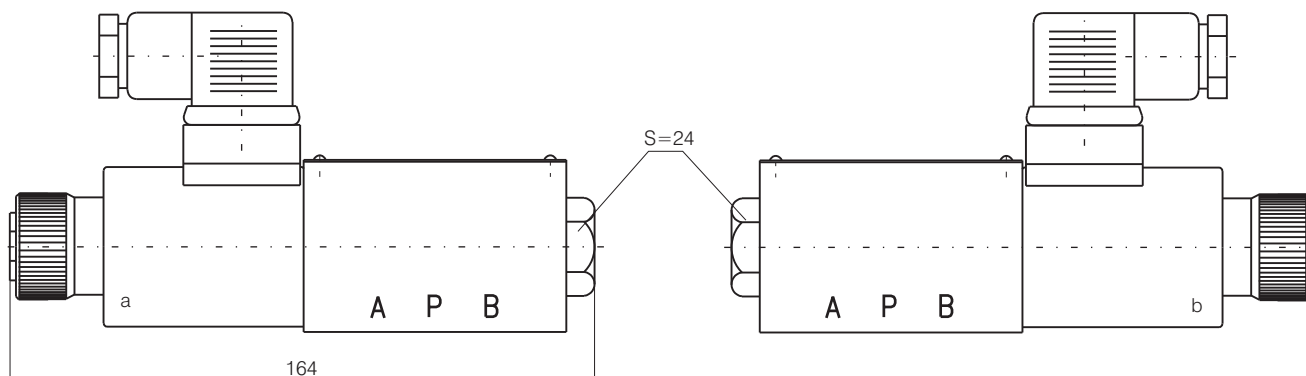
In case of modular mounting spacers are available in order - see "ORDERING CODE" - code S.

Use orifice in P line when inlet flow exceeds the operating limit of valve from "CHARACTERISTICS" see "ORDERING CODE" - code K...



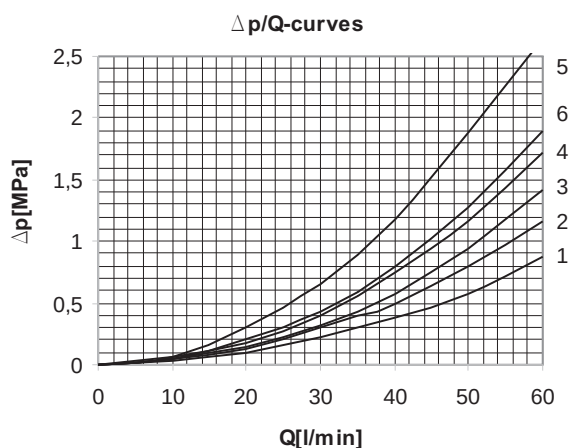
with solenoid "a"
for symbol: 11, 12, 14, 17, 24, 27, 33, 34, 39, 45, 68, 70 and 83

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



The other dimensions are the same as double solenoid valve.

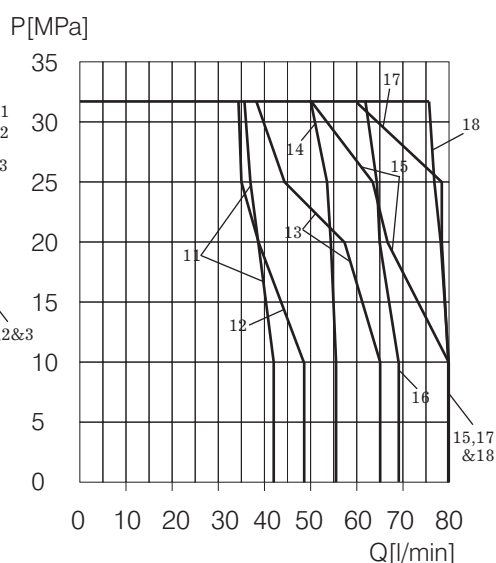
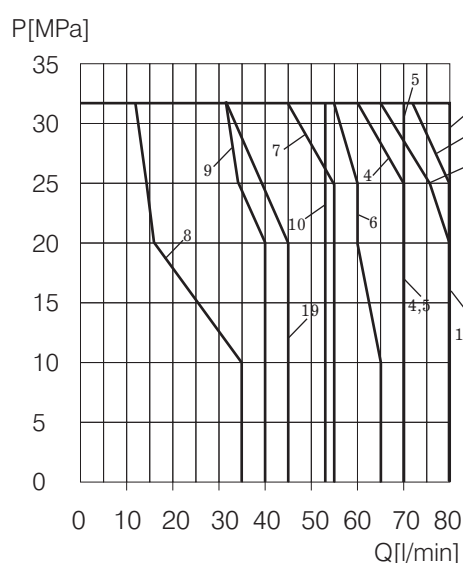
CHARACTERISTICS

 $\Delta p/Q$ 

SYMBOL	CURVE					SYMBOL	CURVE				
	P>A	P>B	A>T	B>T	P>T		P>A	P>B	A>T	B>T	P>T
00	2	2	1	1	3	28	3	3		1	
01	2	2	1	1		32	3	3			
02	5	5	5	5	4	33		2	1		3
04	3	3	1	1		34	1				
05	2	2	2	2		36	1	1	2	3	
06	3	3	3	3	4	39	1	1	3	2	
08	2	2	1	1		40		4	6		
10	3	4	3	2		41		4	1		
11	2	2	1	1		42	3	2	1	2	
12	4	3	2	3		45		2	1		
13	2	2				52	1	1			
14	5			5	4	61	4			1	
16	2			1		62	4			6	
17		2	2			64	2			1	
18	2	2	1	1		68	3	3			
19	2	2	2	2		70	3	2	1	2	
20	3	3	2	2		78	1			2	4
21 (mid./end)	2/1	3	3	3		83		2	1		
24		3	1			99	2			2	4
26	3	2	1	2							
27	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 $0,9U_N$.

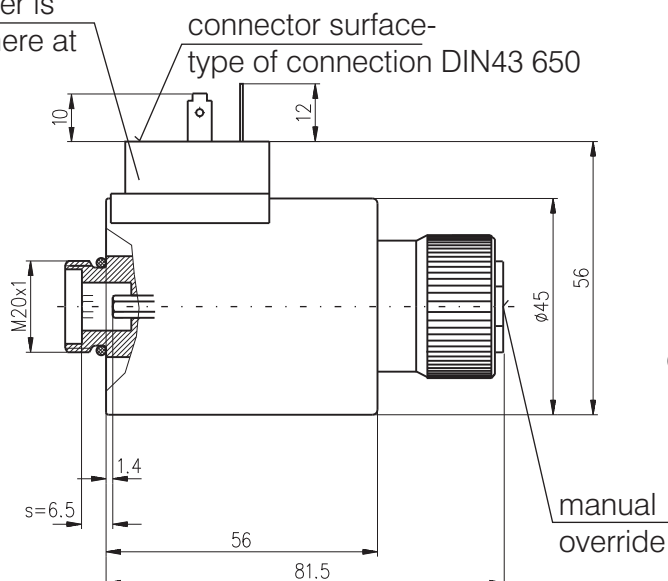


SYMBOL	CURVE	SYMBOL	CURVE
00	1	28	3
01	1	32	8
02	19	33	1
04	3	34	1
05	4	36	9
06	7	39	9
08	5	40	18
10	5	41	17
11	14	42	15
12	5	45	1
13	6	52	12
14	19	61	17
16	1	62	18
17	4	64	1
18	1	68	8
19	16	70	15
20	2	78	11
21	10	82	
24	3	83	1
26	15	98	
27	1	99	13

SOLENOIDS

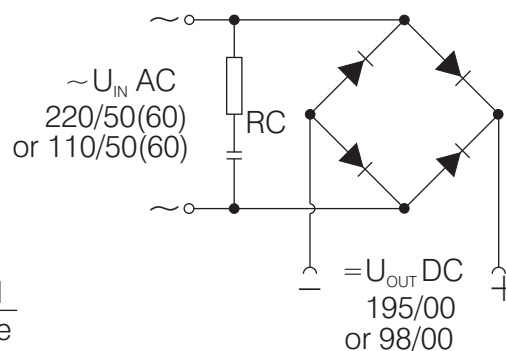
AC & DC

the rectifier is
build-in here at
AC type



All dimensions are shown in mm.

rectifier scheme

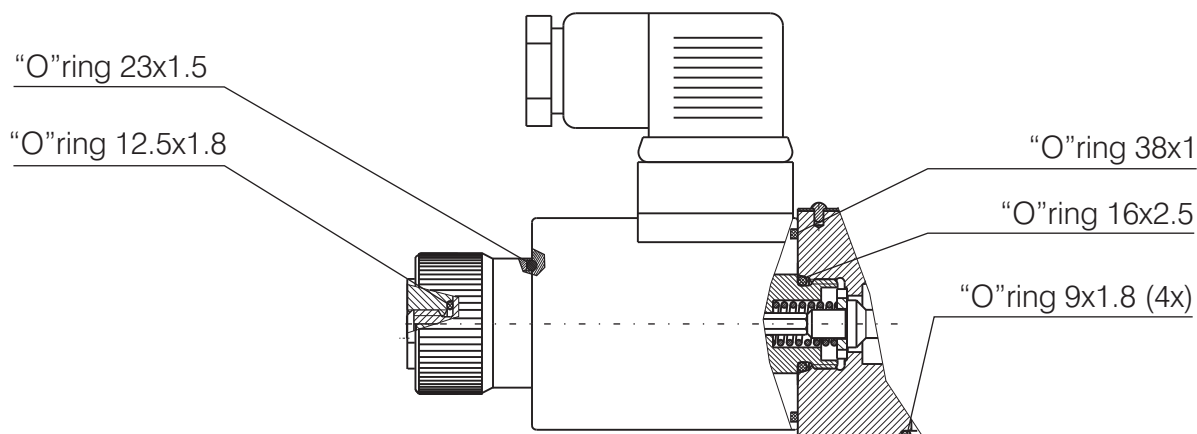


AC and DC solenoids have one and the same dimensions, connections and characteristics. The difference between AC and DC solenoids is in the integrated rectifier into the AC type - see "rectifier scheme". The solenoids can be used for 50Hz and 60Hz. The supply voltages are as follows: 12V DC, 24V DC,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

✓ 4/3- and 4/2- way directional control valves with hydraulic operation

✓ Reliability and long life

✓ Mounting surface CETOP3 (NG6)

The RH06...2F... valves consist of a spool, housing, springs and hydraulic control unit. They 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 about 4/3- and 4/2- valves.

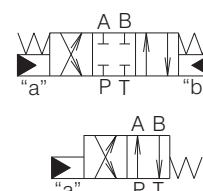
The housing has 5-chambers.

The valve location during assembly is of minor importance, but the horizontal position is generally recommended. For functional symbols "08", "19", "20" and "82", the horizontal position is obligatory.

RH06...2F...



Symbol



ORDERING CODE

RH		06				F									
Directional control valve														Spacers	
Nominal size														Omit-Without spacers S-with spacers	
Functional symbol														see page 5/17	
Type of control		hydraulic		- 2		mechanical		- 4		pneumatic		- 6		manual	
Modification														M - M14x1,5 G - G1/4"	
														Connection threads** see page 9/17 ,13/17	
														Backing of the housing	
														N - normal T - tropical	
														Detent*	
														Omit - without detent D - with detent	

* Only for type of control-7

** Only for type of control-2 & 6

FUNCTIONAL SYMBOLS

See page 3/17.

TECHNICAL DATA

DATA	UNIT	VALUE/RANGE
Weight	-three positional -two positional	kg 2,2 1,6
Max. Pressure	port P, A & B port T	MPa 32 16
Rated flow	(at $\Delta p=0,1\text{MPa.}$)	l/min 11...20
Pilot pressure	-P _{min} -P _{max}	MPa 1...1,5+P _T 21 P _T - pressure in "T" chanal

We reserve the right to change specifications without notice.

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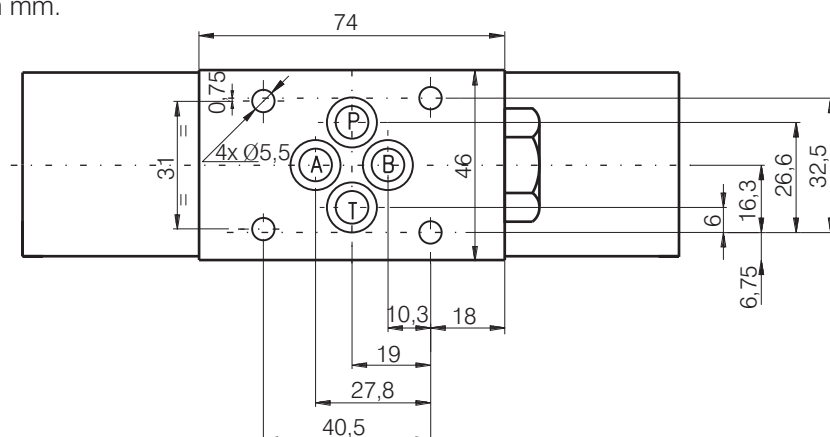
DCVC3-1-Aug 2013

CHARACTERISTICS

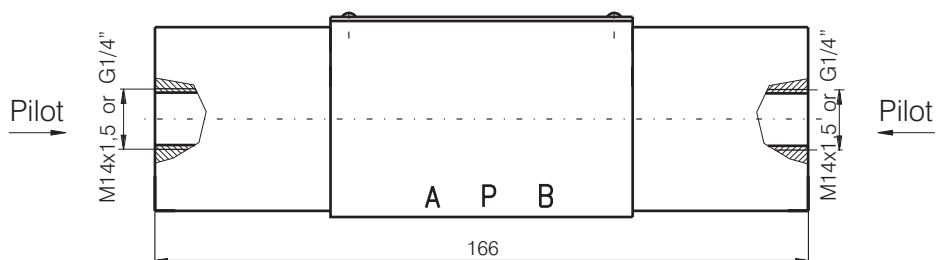
See page 6/18

DIMENSIONS

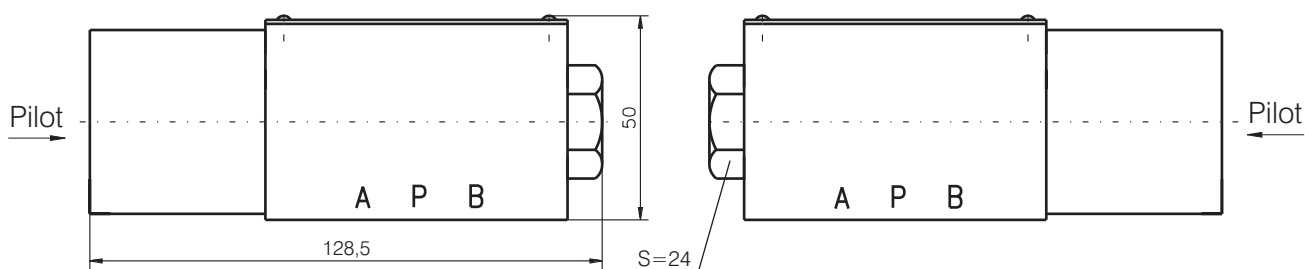
All dimensions are shown in mm.



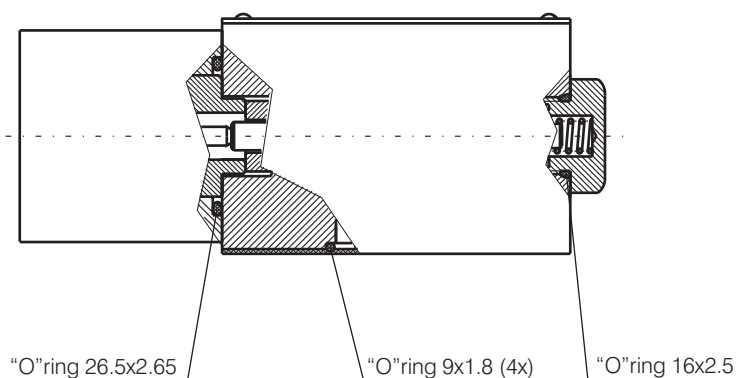
Symbols 00 , 01 , 02 , 04 , 05 , 06 , 08 , 18 , 19 , 20 , 21 , 26 , 40 , 41 , 42 , 52 , 61 , 62 , 82 , 98 , 99

Symbols 11 , 12 , 14 , 17 , 24 , 27 , 33 ,
34 , 39 , 45 , 68 , 70 , 83

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



SEALS



GENERAL DESCRIPTION

RH06...4F...

- ✓ 4/2- way directional control valves with mechanical operation
- ✓ Reliability and long life
- ✓ Mounting surface CETOP3 (NG6)



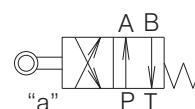
These RH06...4F... valves consist of a spool, housing, springs and mechanical control unit. They are used to control the start, stop and direction of flow.

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

See page 8/17.

FUNCTIONAL SYMBOLS

See page 3/17.

TECHNICAL DATA

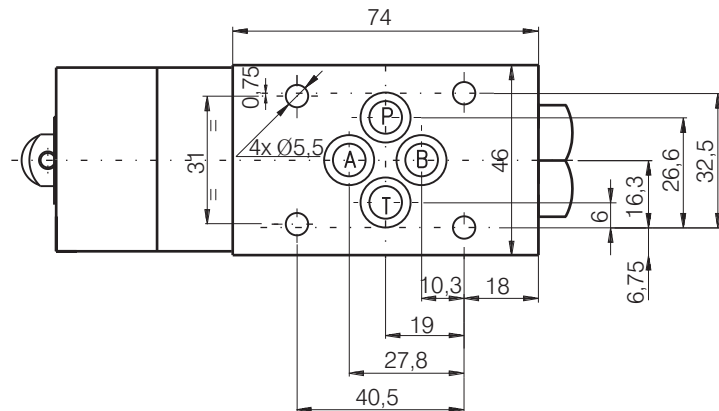
DATA		UNIT	VALUE/RANGE
Weight		kg	1,420
Max. Pressure	port P, A & B port T	MPa	32 16
Rated flow	(at $\Delta p=0,1\text{MPa.}$)	l/min	11...20
Actuating force	$-F_{\min}$ $-F_{\max}$	N	30 130

CHARACTERISTICS

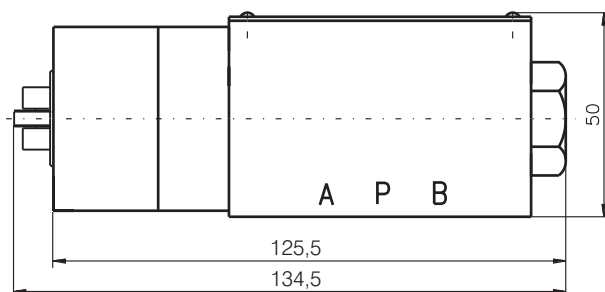
See page 6/17

DIMENSIONS

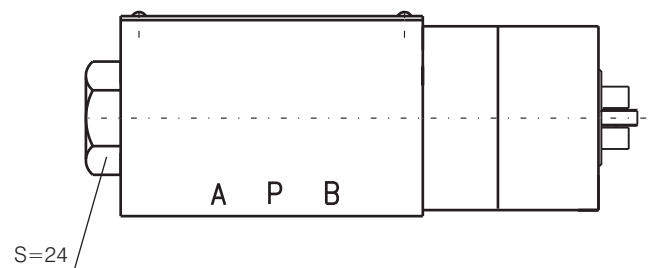
All dimensions are shown in mm.



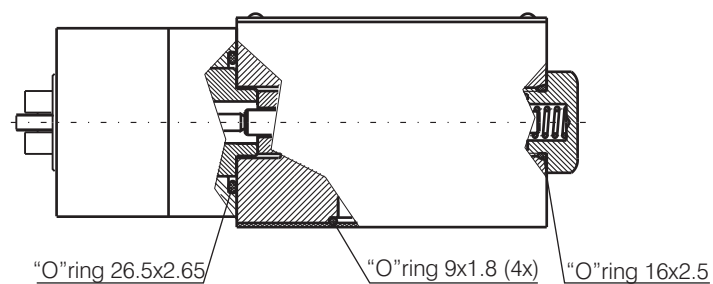
Symbols 12, 17, 24, 27, 34, 39, 45, 68, 70, 83



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



SEALS



GENERAL DESCRIPTION

RH06...6F...

- ✓ 4/3- and 4/2- way directional control valves with pneumatic operation
- ✓ Reliability and long life
- ✓ Mounting surface CETOP3 (NG6)



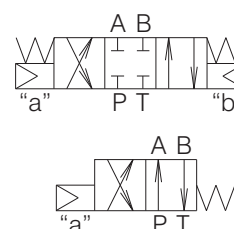
The RH06...6F... valves consist of a spool, housing, springs and pneumatic control unit.

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", "20" and "82", the horizontal position is obligatory.

Symbol



ORDERING CODE

See page 8/17.

FUNCTIONAL SYMBOLS

See page 3/17.

TECHNICAL DATA

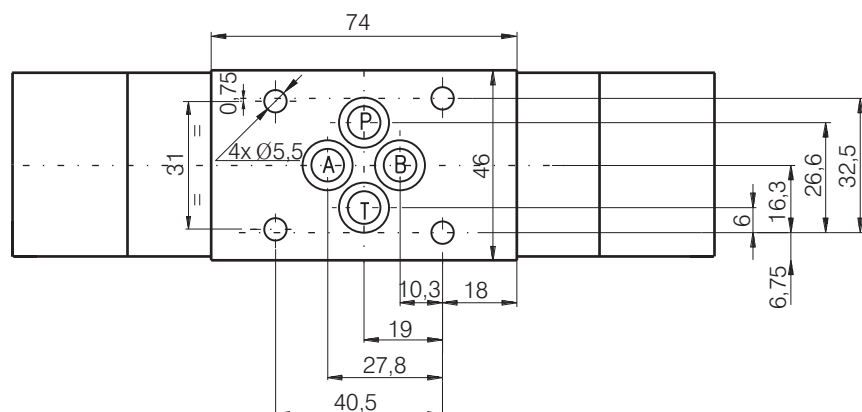
DATA	UNIT	VALUE/RANGE
Weight	-three positional -two positional	kg 1,950 1,450
Max. Pressure	port P, A & B port T	MPa 32 16
Rated flow	(at $\Delta p=0,1\text{MPa}$)	l/min 11...20
Pilot pressure	-P _{min} -P _{max}	MPa 0, 2 1

CHARACTERISTICS

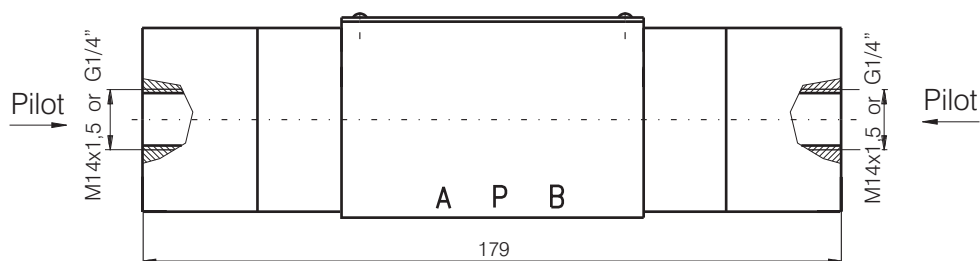
See page 6/17

DIMENSIONS

All dimensions are shown in mm.

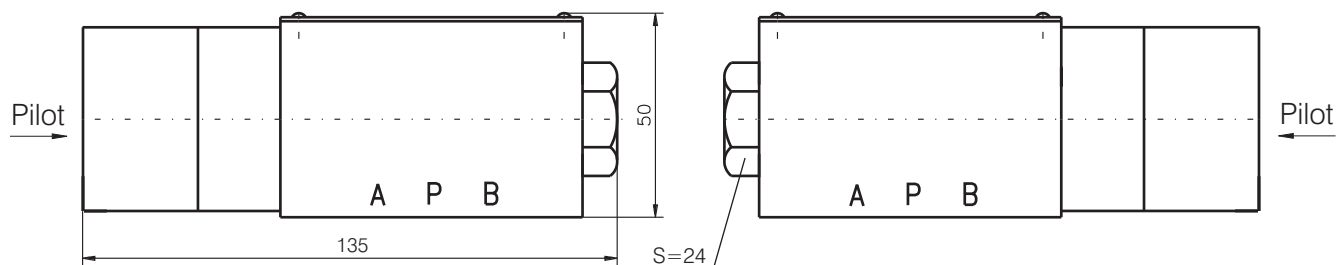


Symbols 00 , 01 , 02 , 04 , 05 , 06 , 08 , 18 , 19 , 20 , 21 , 26 , 40 , 41 , 42 , 52 , 61 , 62 , 82 , 98 , 99

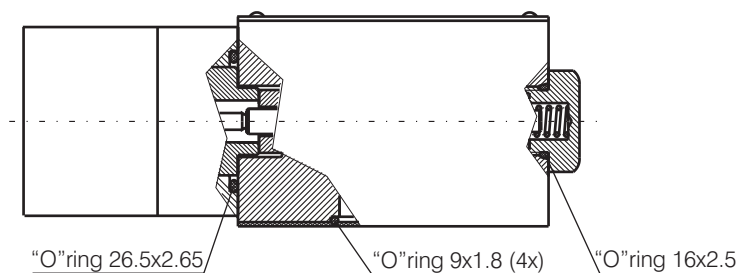


Symbols 11 , 12 , 14 , 17 , 24 , 27 , 33 ,
34 , 39 , 45 , 68 , 70 , 83

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



SEALS



GENERAL DESCRIPTION

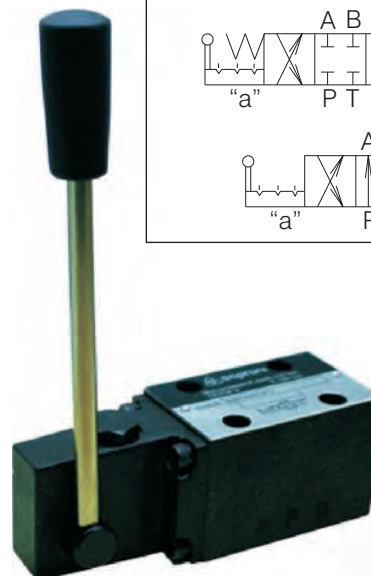
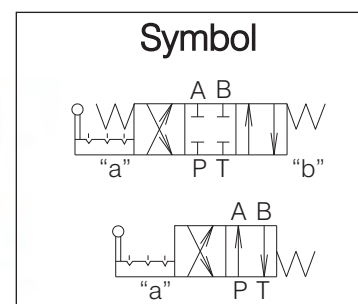
RH06...7F...

- ✓ 4/3- and 4/2- way directional control valves with manual operation
- ✓ Reliability and long life
- ✓ Mounting surface CETOP3 (NG6)

The RH06...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.



ORDERING CODE

See page 8/17.

FUNCTIONAL SYMBOLS

See page 3/17.

TECHNICAL DATA

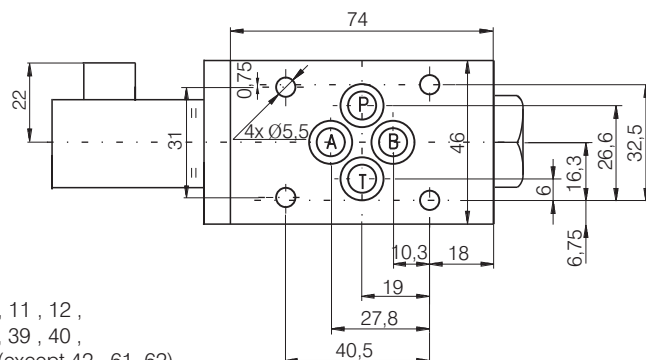
DATA	UNIT	VALUE/RANGE
Weight	kg	2,2
Max. pressure port P, A & B port T	MPa	32 16
Rated flow (at $\Delta p=0,1\text{MPa}$)	l/min	11...20
Lever angular movement	°	± 32
Actuating force	N	30

CHARACTERISTICS

See page 6/17

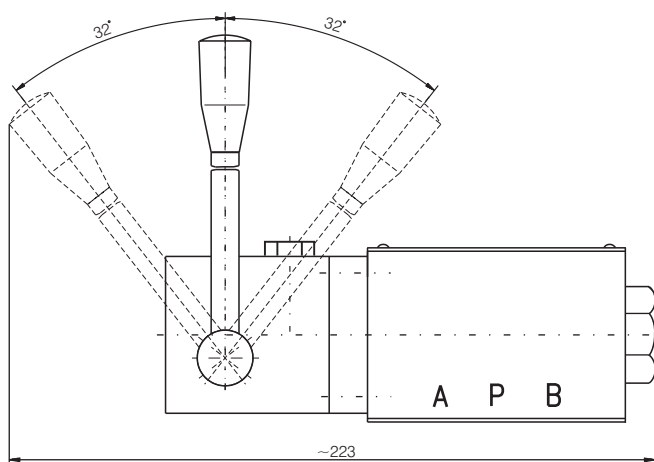
DIMENSIONS

All dimensions are shown in mm.



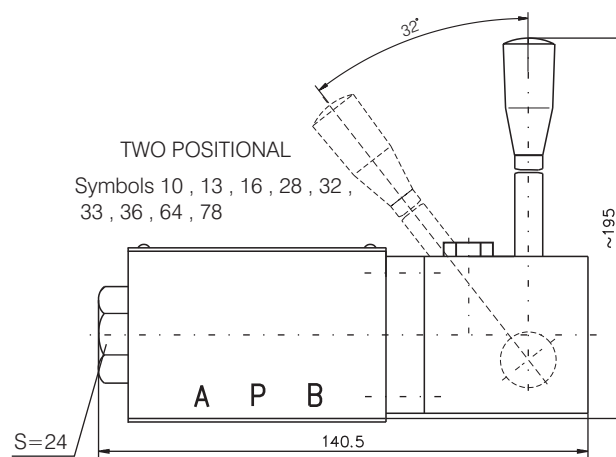
THREE POSITIONAL

Symbols 00, 01, 02, 04, 05, 06, 11, 12, 14, 17, 18, 21, 24, 26, 27, 34, 39, 40, 41, 45, 52, 68, 70, 83, 98, 99(except 42, 61, 62)



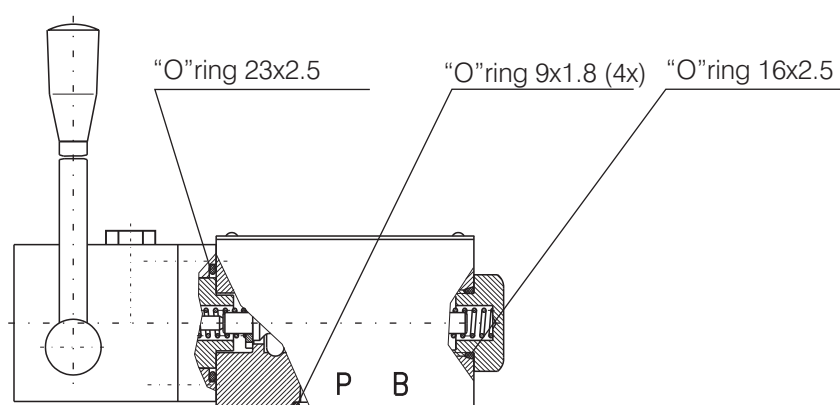
TWO POSITIONAL

Symbols 10, 13, 16, 28, 32, 33, 36, 64, 78



For three positional valves symbols 42, 61 and 62 the operator is at side "b".

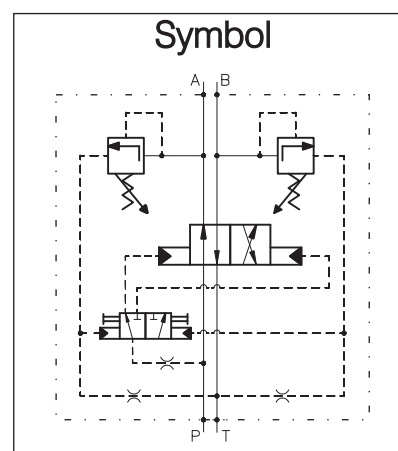
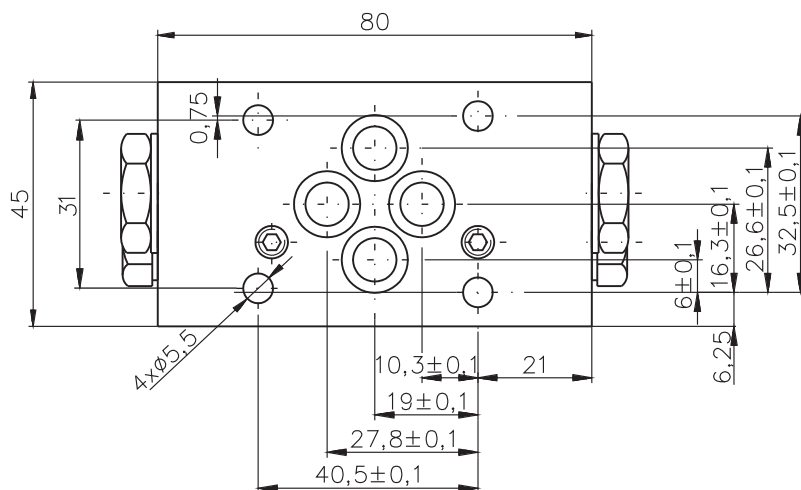
SEALS



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 CETOP3 (NG6)



ORDERING CODE

DVAS 06 - 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	1,400

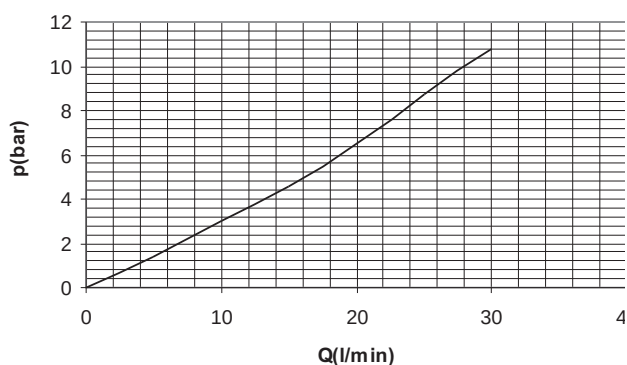
HYDRAULIC

Max. pressure	MPa	21
Maximum flow	l/min	30
Minimum flow	l/min	4
Hydraulic fluid - mineral oil: -viscosity -filtration degree -temperature	mm ² /s mm °C	10...800 0.025 -20...80

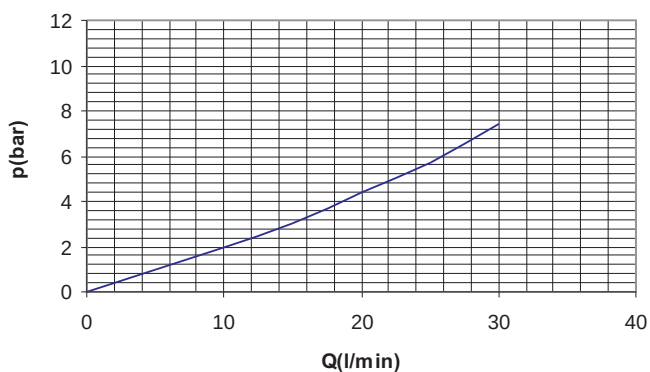
CHARACTERISTICS

$\Delta p/Q$

A(B) to T



P to A(B)



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