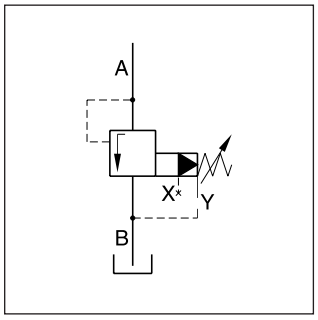
10

Notes

Pilot operated pressure relief valves for in-line mounting series R4V have a similar design to the subplate mounted R4V series. For single functions - where no manifold blocks are used - the valves can be directly placed in the pipework.
The R4V valves are available with 2 ports (L-body) for in-line relief function or with 3 ports (T-body) for relief functions in the bypass.

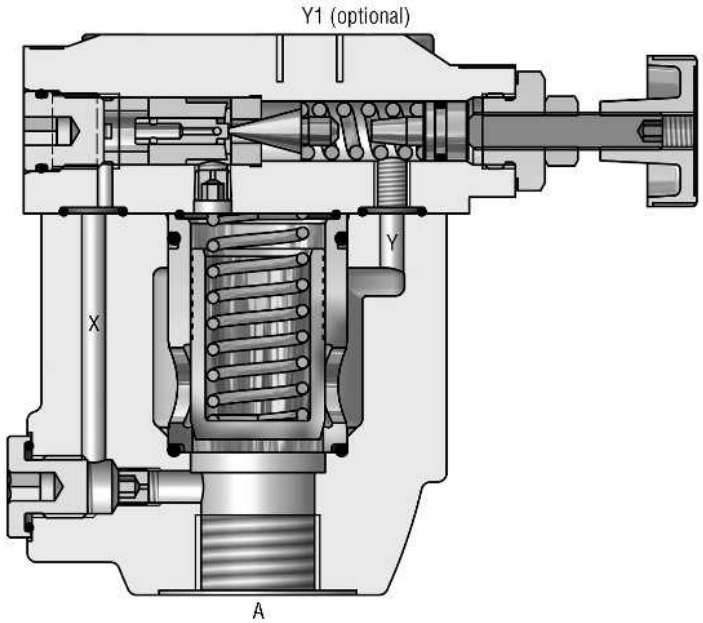
R4V10 L-body



Features

- Pilot operated with manual adjustment
- 2 interfaces
  - L-body (R4V06-G¾", R4V10-G1¼")
  - T-body (R4V03-G½", R4V06-G1")
- 3 pressure stages
- 3 adjustment modes
  - Hand knob
  - Acorn nut with lead seal
  - Key lock
- With optional vent function

R4V06 L-body



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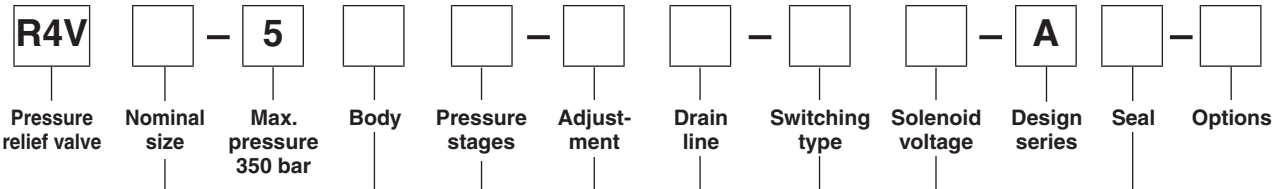
Ordering code



Code	Nominal size
03	NG10 (G½")
06	NG25 (G1" - T-body, G¾" - L-body)
10	NG32 (G1¼")

Code	Body
6	R4V03 T-body R4V06 T-body
D	R4V06 L-body R4V10 L-body

Code	Pressure stages
1	up to 105bar
3	up to 210bar
5	up to 350bar

Code	Adjustment
1	Hand knob
3	Acorn nut with lead seal
4	Key lock

Code	Seal
1	NBR
5	FPM

Code	Solenoid voltage
omit	Standard w/o vent function
G0R	12V=
G0Q	24V=
GAR	98V=
GAG	205V=
W30	110V / 50Hz 120V / 60Hz
W31	230V / 50Hz 240V / 60Hz

Code	Switching type
omit	Standard w/o vent function
09	Solenoid not activ. unpress. circulation
11	Solenoid activated unpress. circulation

Code	Drain line
0	internal
2	external from pilot head (Y1)

10

R4V

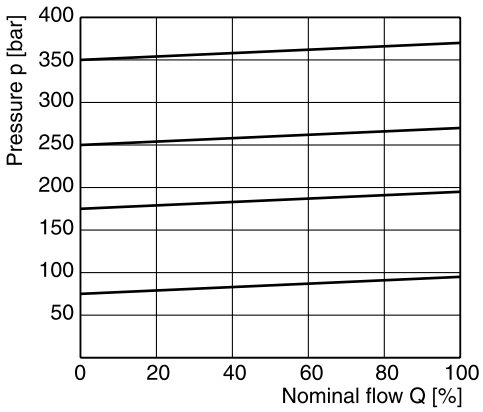
General		T-body		L-body	
Size		**03 (½")**	**06 (1")**	**06 (¾")**	**10 (1¼")**
Mounting		Threaded body			
Mounting position		unrestricted			
Ambient temperature	[°C]	-20...+50			
Weight	[kg]	3.2	6.6	3.3	5.6
Hydraulic					
Max. operating pressure	[bar]	Ports A and X up to 350; Ports B and Y 30 bar			
Pressure stages	[bar]	105, 210, 350			
Nominal flow	[l/min]	60	200	200	450
Fluid		Hydraulic oil as per DIN 51524...525			
Fluid temperature	[°C]	-20...+80			
Viscosity permitted	[cSt]/[mm²/s]	10...650			
Viscosity recommended	[cSt]/[mm²/s]	30			
Filtration		ISO 4406 (1999) 18/16/13 (acc. NAS 1638: 7)			

R4V with vent function

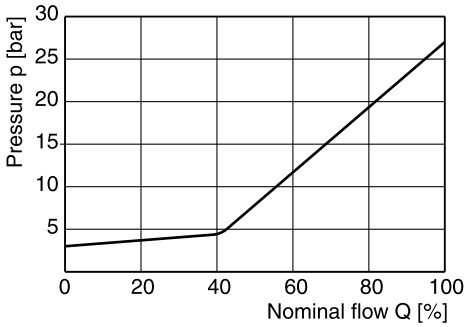
General		T-body		L-body	
Size		**03 (½")**	**06 (1")**	**06 (¾")**	**10 (1¼")**
Mounting		Threaded body			
Mounting position		unrestricted			
Ambient temperature	[°C]	-20...+50			
Weight	[kg]	4.9	8.3	5.0	7.3
Hydraulic					
Max. operating pressure	[bar]	Ports A and X up to 350; Ports B and Y 30			
Pressure stages	[bar]	105, 210, 350			
Nominal flow	[l/min]	60	200	200	450
Fluid		Hydraulic oil as per DIN 51524...525			
Fluid temperature	[°C]	-20...+80			
Viscosity permitted	[cSt]/[mm²/s]	10...650			
Viscosity recommended	[cSt]/[mm²/s]	30			
Filtration		ISO 4406 (1999) 18/16/13 (acc. NAS 1638: 7)			

Electrical (solenoid)							
Duty ratio	[%]	100					
Response time	[ms]	Energized / de-energized AC: 20/18 , DC: 46/27					
	Code	G0R	G0Q	GAR	GAG	W30	W31
Supply voltage	[V]	12V =	24V =	98V =	205V =	110 at 50Hz 120 at 60Hz	230 at 50Hz 240 at 60Hz
Tolerance supply voltage	[%]	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10
Power consumption hold	[W]	31	31	31	31	78	78
in rush	[W]	31	31	31	31	264	264
Max. switching frequency		AC: up to7.200, DC: up to 16.000 switchings/hour					
Solenoid connection		Connector as per EN175301-803					
Protection class		IP65 in accordance with EN 60529 (plugged and mounted)					
Coil insulation class		H (180 °C)					

p/Q performance curve Series R4V [1)]



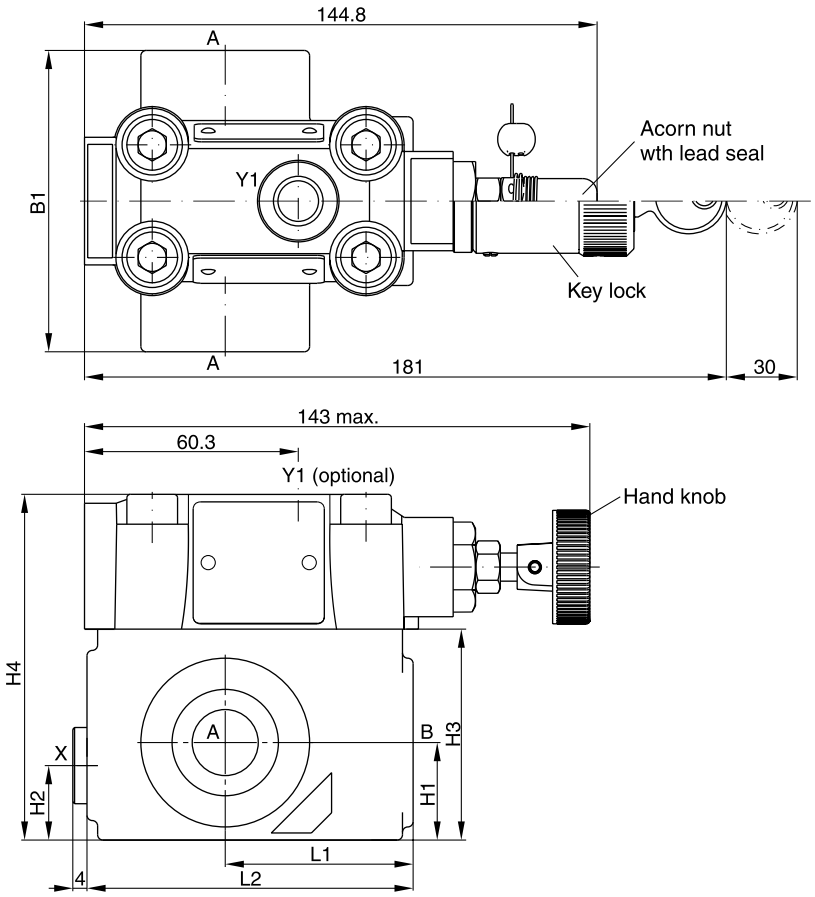
Minimum pressure curve



1) The performance curves are measured with external drain. For internal drain the tank pressure has to be added to curve.

Dimensions R4V*06

T-body



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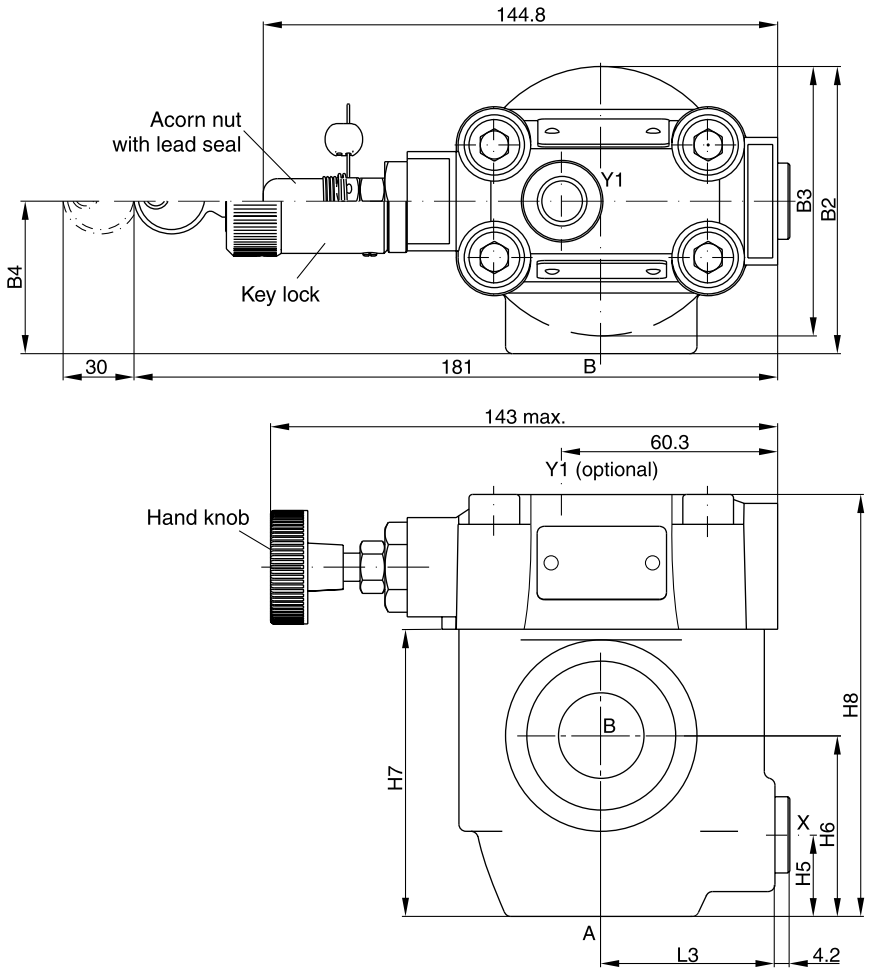
Dimensions R4V*06

L-body



NG	Body	B1	B2	B3	B4	H1	H2	H3	H4	H5	H6	H7	H8	L1	L2	L3
03	T-body	85	-	-	-	27.5	21	59.5	97.5	-	-	-	-	53	92	-
06	T-body	136	-	-	-	38	28	93	131	-	-	-	-	66.5	117.5	-
06	L-body	-	81	76	43	-	-	-	-	23	51	81	119	-	-	49
10	L-body	-	120.7	85.8	77.8	-	-	-	-	31.8	50.8	96	134	-	-	49.8

Ports	Function	Port size			
		R4V03 T-body	R4V06 L-body	R4V06 T-body	R4V10 L-body
A	pressure (inlet)	G½ "	G¾ "	G1 "	G1¼ "
B	tank (outlet)	G½ "	G¾ "	G1 "	G1¼ "
X[1)]	ext. remote control or vent connection	G¼ "			
Y1[2)]	external drain				

[1)] closed when supplied

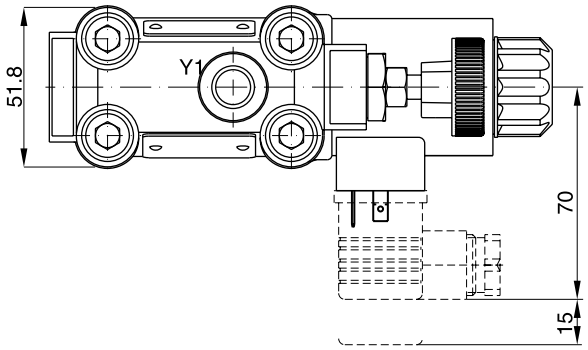
[2)] port Y1 is only available at drain line (code2) external from the pilot head

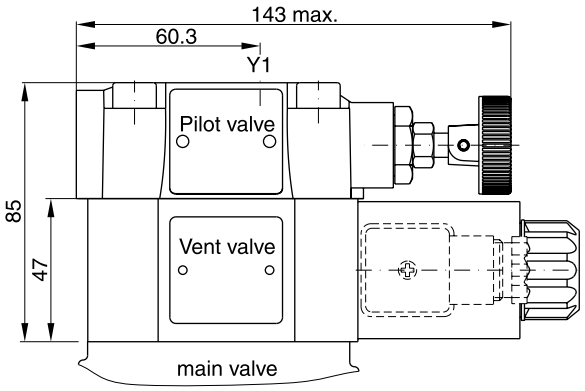
R4V_UK.INDD RH_19.12.07

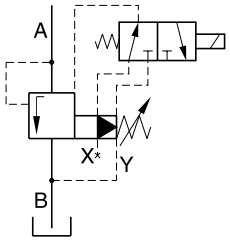
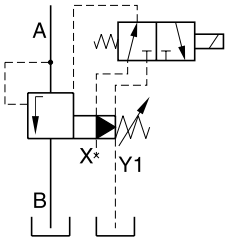
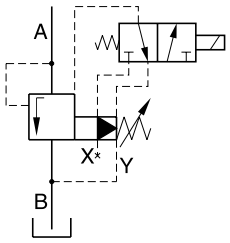
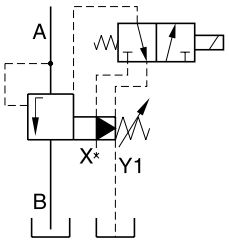
Parker Hannifin GmbH & Co. KG
Hydraulic Controls Division
Kaarst, Germany

Start | Content catalogue | Content chapter | Ordering Code | Index

Dimensions R4V with vent function

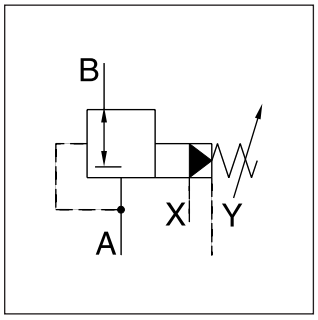




Code	Internal drain	External drain
11		
09		

Pilot operated pressure reducing valves for in-line mounting series R4R have a similar design to the subplate mounted R4R series. For single functions - where no manifold blocks are used - the valves can be directly placed in the pipework.
The valves are available with 2 ports (L-body) or with 3 ports (T-body).

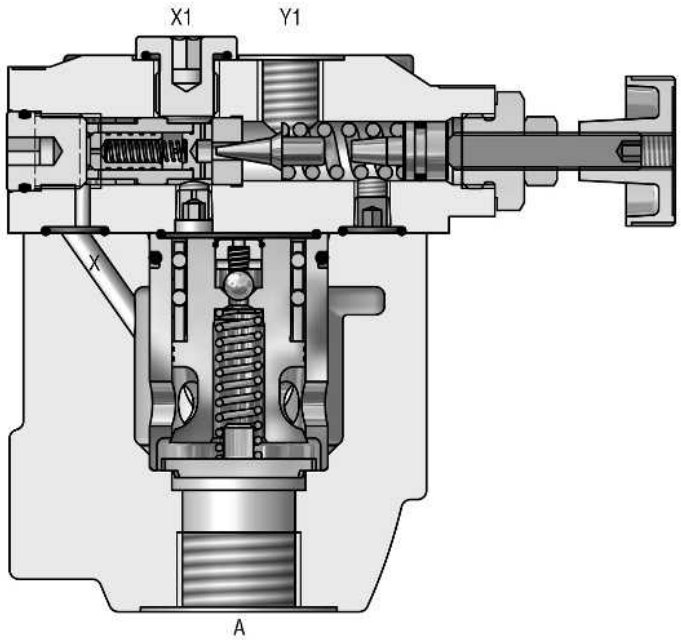
R4R10 L-body



Features

- Pilot operated with manual adjustment
- Normally closed to avoid undesired motion
- 2 interfaces
  - L-body (R4R06-G¾", R4R10-G1¼")
  - T-body (R4R03-G½", R4R06-G1")
- 3 pressure stages
- 3 adjustment modes
  - Hand knob
  - Acorn nut with lead seal
  - Key lock
- With optional vent function

R4R06 L-body



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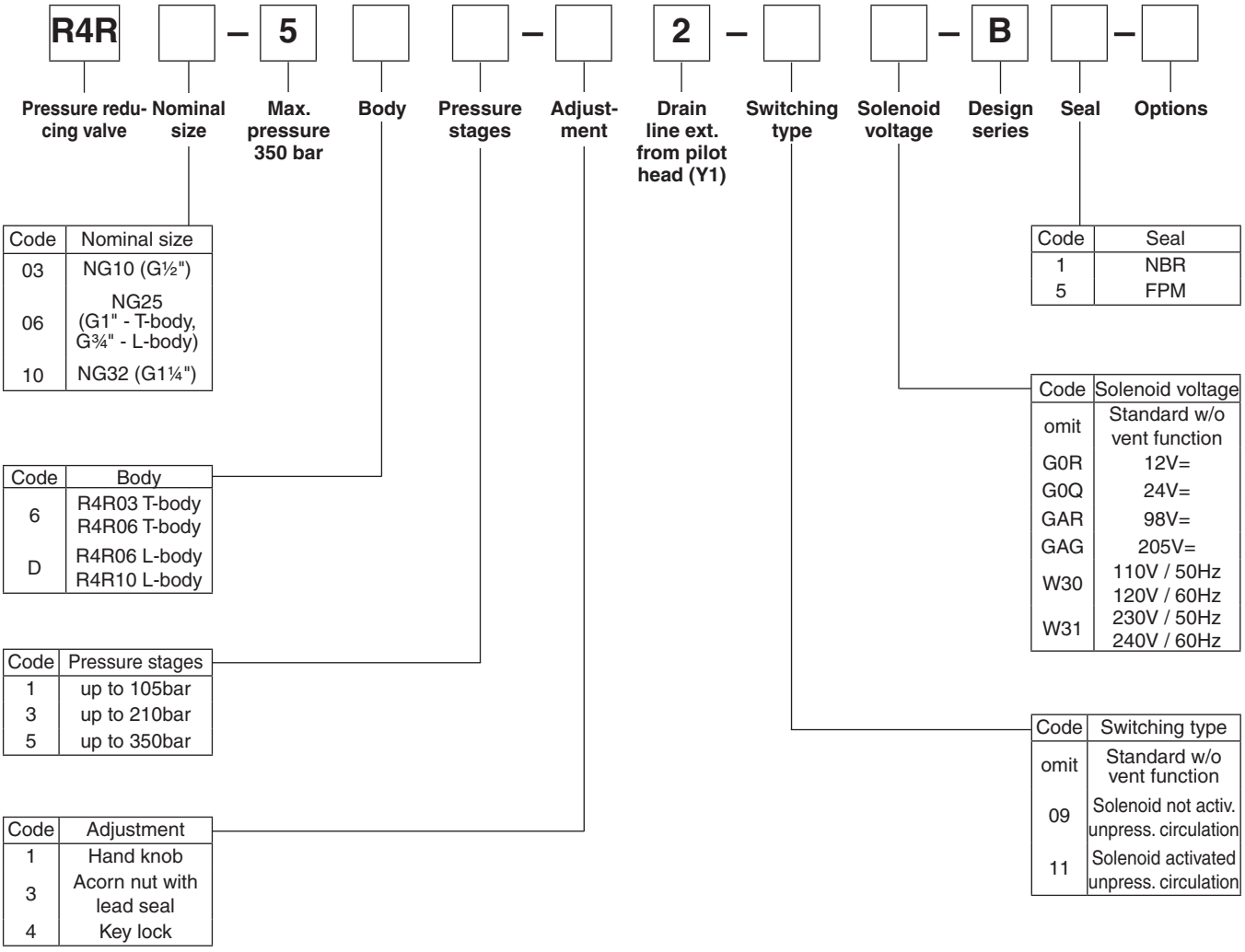
Ordering code



Code	Nominal size
03	NG10 (G½")
06	NG25 (G1" - T-body, G¾" - L-body)
10	NG32 (G1¼")

Code	Body
6	R4R03 T-body R4R06 T-body
D	R4R06 L-body R4R10 L-body

Code	Pressure stages
1	up to 105bar
3	up to 210bar
5	up to 350bar

Code	Adjustment
1	Hand knob
3	Acorn nut with lead seal
4	Key lock

Code	Seal
1	NBR
5	FPM

Code	Solenoid voltage
omit	Standard w/o vent function
G0R	12V=
G0Q	24V=
GAR	98V=
GAG	205V=
W30	110V / 50Hz 120V / 60Hz
W31	230V / 50Hz 240V / 60Hz

Code	Switching type
omit	Standard w/o vent function
09	Solenoid not activ. unpress. circulation
11	Solenoid activated unpress. circulation

Parker Hannifin GmbH & Co. KG
Hydraulic Controls Division
Kaarst, Germany

R4R

General		T-body		L-body	
Size		**03 (½")**	**06 (1")**	**06 (¾")**	**10 (1¼")**
Mounting		Threaded body			
Mounting position		unrestricted			
Ambient temperature	[°C]	-20...+50			
Weight	[kg]	3.2	3.3	5.6	6.6
Hydraulic					
Max. operating pressure	[bar]	Ports A, B and X: 350; Port Y depressurized			
Pressure stages	[bar]	105, 210, 350			
Nominal flow	[l/min]	60	200	200	450
Fluid		Hydraulic oil as per DIN 51524...525			
Fluid temperature	[°C]	-20...+80			
Viscosity permitted	[cSt]/[mm²/s]	10...650			
Viscosity recommended	[cSt]/[mm²/s]	30			
Filtration		ISO 4406 (1999) 18/16/13 (acc. NAS 1638: 7)			

R4R with vent function

General					
Size		**03 (½")**	**06 (¾")**	**06 (1")**	**10 (1¼")**
Mounting		Threaded body			
Mounting position		unrestricted			
Ambient temperature	[°C]	-20...+50			
Weight	[kg]	4.9	5.0	7.3	8.3
Hydraulic					
Max. operating pressure	[bar]	Ports A and X up to 350; Ports B and Y depressurized			
Pressure stages	[bar]	105, 210, 350			
Nominal flow	[l/min]	60	200	200	450
Fluid		Hydraulic oil as per DIN 51524...525			
Fluid temperature	[°C]	-20...+80			
Viscosity permitted	[cSt]/[mm²/s]	10...650			
Viscosity recommended	[cSt]/[mm²/s]	30			
Filtration		ISO 4406 (1999) 18/16/13 (acc. NAS 1638: 7)			

Electrical (solenoid)							
Duty ratio	[%]	100					
Response time	[ms]	Energized / de-energized AC: 20/18 , DC: 46/27					
	Code	G0R	G0Q	GAR	GAG	W30	W31
Supply voltage	[V]	12V =	24V =	98V =	205V =	110 at 50Hz 120 at 60Hz	230 at 50Hz 240 at 60Hz
Tolerance supply voltage	[%]	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10
Power consumption hold	[W]	31	31	31	31	78	78
in rush	[W]	31	31	31	31	264	264
Max. switching frequency		AC: up to7.200, DC: up to 16.000 switchings/hour					
Solenoid connection		Connector as per EN175301-803					
Protection class		IP65 in accordance with EN 60529 (plugged and mounted)					
Coil insulation class		H (180 °C)					

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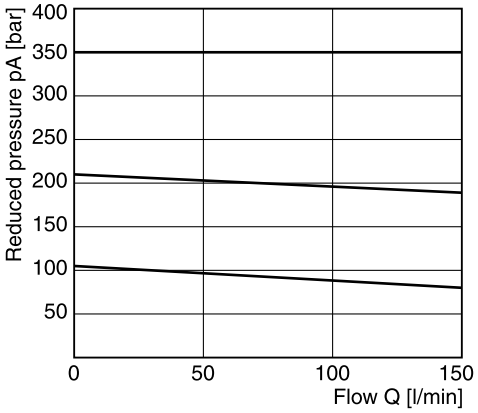
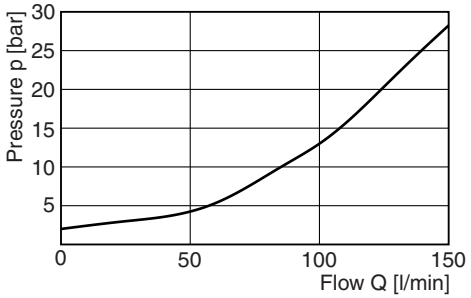
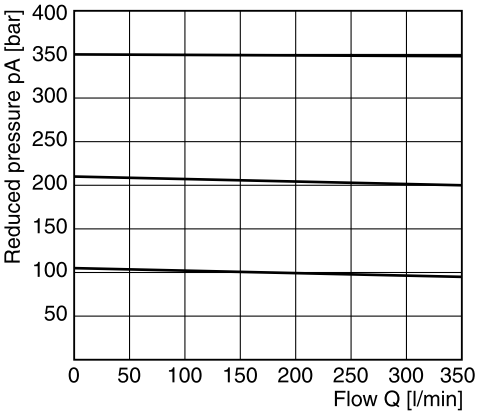
Reduced pressure pA versus flow Q
Series R4R03 [1)]



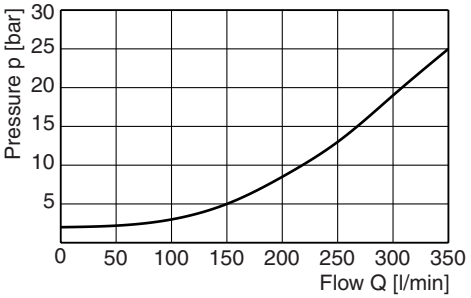
Minimum pressure curve



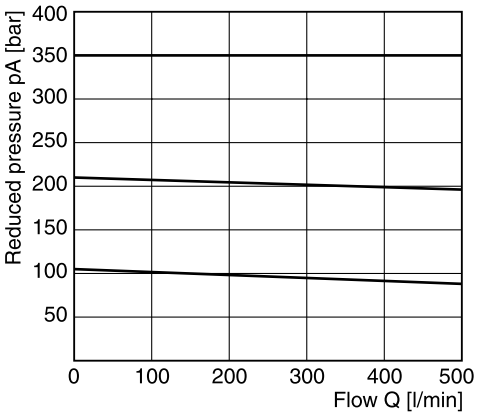
Reduced pressure pA versus flow Q
Series R4R06 [1)]



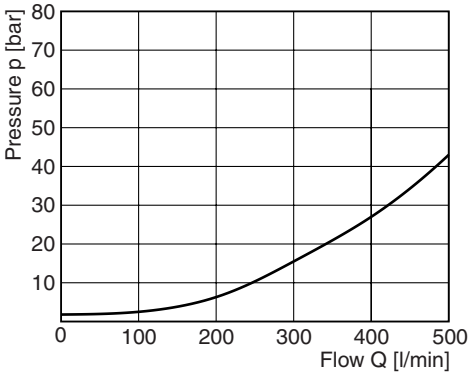
Minimum pressure curve



Reduced pressure pA versus flow Q
Series R4R10 [1)]

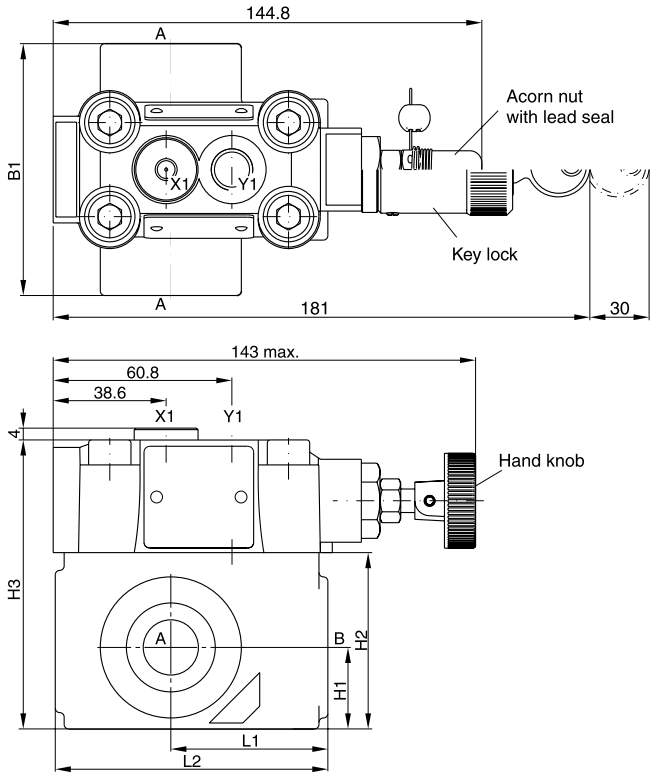


Minimum pressure curve

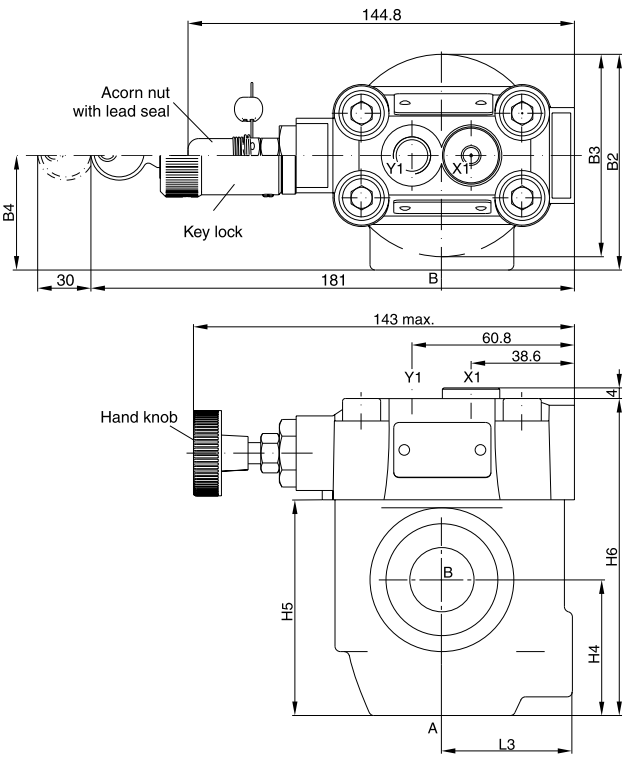


[1)] Measured at 350 bar primary pressure pB.

T-body



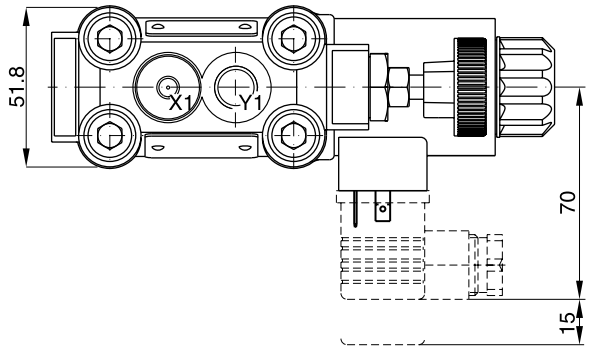
L-body

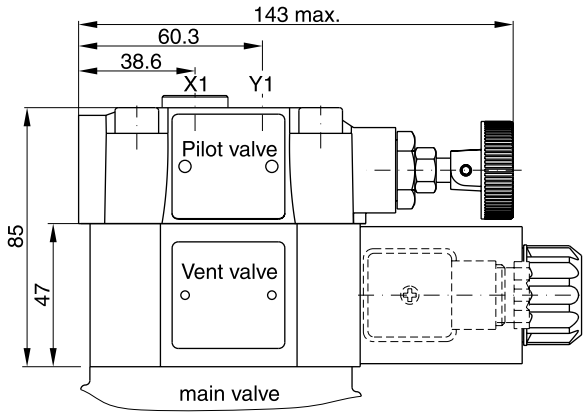


NG	Body	B1	B2	B3	B4	H1	H2	H3	H4	H5	H6	L1	L2	L3
03	T-body	85	-	-	-	27.5	59.5	97.5	-	-	-	53	92	-
06	T-body	136	-	-	-	38	93	131	-	-	-	66.5	117.5	-
06	L-body	-	81	76	43	-	-	-	51	81	119	-	-	49
10	L-body	-	120.7	85.8	77.8	-	-	-	50.8	96	134	-	-	49.8

Ports	Function	Port size			
		R4V03 T-body	R4V06 L-body	R4V06 T-body	R4V10 L-body
B	pressure (inlet)	G½ "	G¾ "	G1 "	G1¼ "
A	pressure (outlet)	G½ "	G¾ "	G1 "	G1¼ "
X1	ext. remote control or vent connection	G¼ "			
Y1	external drain				

Dimensions R4R with vent function





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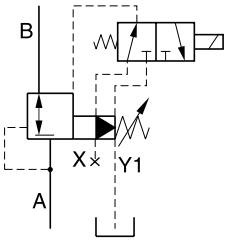
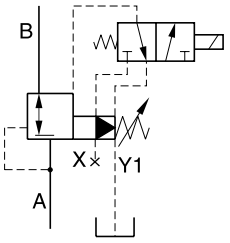
11	
09	

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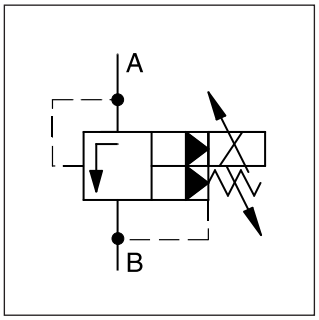
Proportional pressure relief valves series R4V*P2 are based on the mechanically adjusted series R4V. The additional proportional unit between the mechanical pilot valve and the main stage allows continuous pressure adjustment.
The optimum performance can be achieved in combination with the digital amplifier module PCD00A-400.

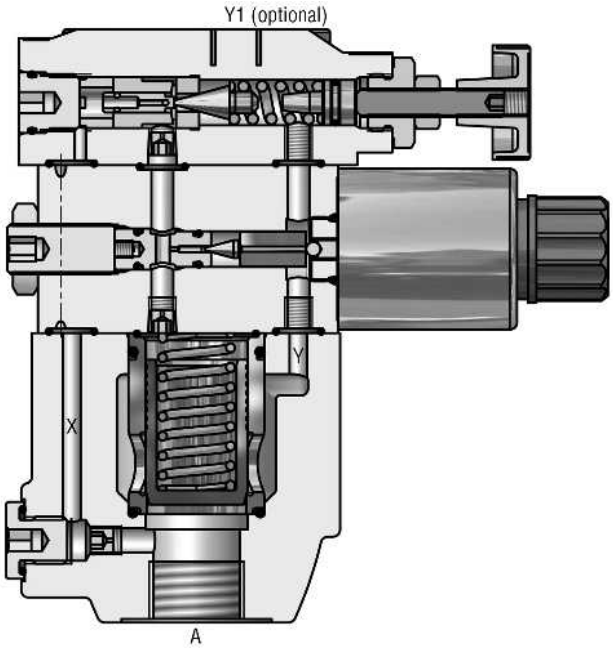
R4V10*P2 L-body



Features

- Pilot operated with manual adjustment
- Continuous adjustment by proportional solenoid
- 2 interfaces
  - L-body (R4V06-G¾", R4V10-G1¼")
  - T-body (R4V03-G½", R4V06-G1")
- 3 pressure stages
- With mechanical maximum pressure adjustment

R4V06*P2 L-body



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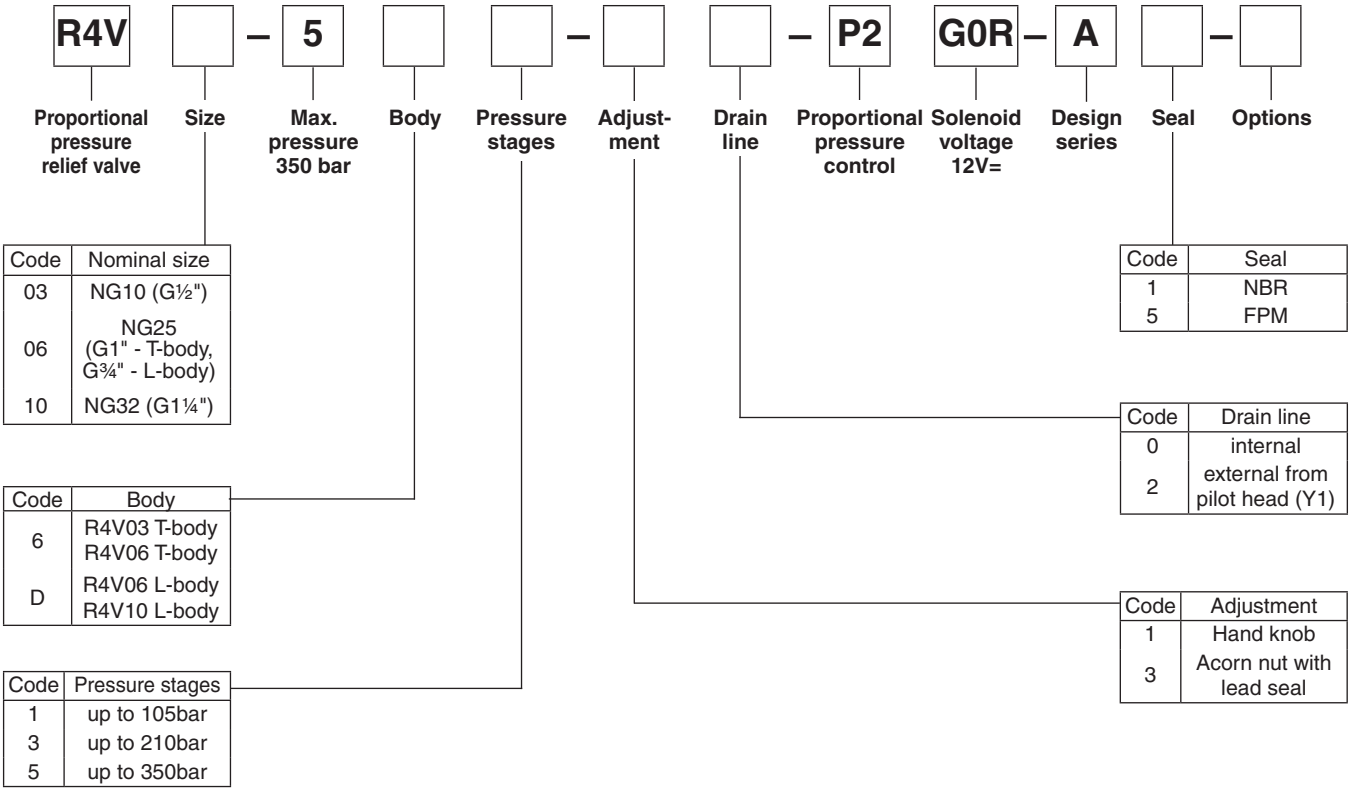
Ordering code



Code	Nominal size
03	NG10 (G½")
06	NG25 (G1" - T-body, G¾" - L-body)
10	NG32 (G1¼")

Code	Body
6	R4V03 T-body R4V06 T-body
D	R4V06 L-body R4V10 L-body

Code	Pressure stages
1	up to 105bar
3	up to 210bar
5	up to 350bar

Code	Seal
1	NBR
5	FPM

Code	Drain line
0	internal
2	external from pilot head (Y1)

Code	Adjustment
1	Hand knob
3	Acorn nut with lead seal

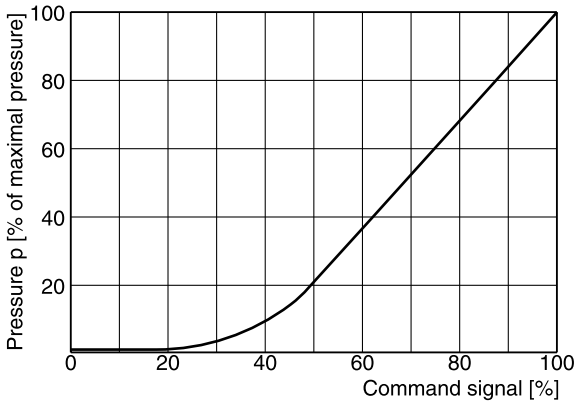
Technical data R4V*P2

General		T-body		L-body	
Size		**03 (½")**	**06 (1")**	**06 (¾")**	**10 (1¼")**
Mounting		Threaded body			
Mounting position		unrestricted			
Ambient temperature	[°C]	-20...+50			
Weight	[kg]	5.0	5.1	7.4	8.4
Hydraulic					
Max. operating pressure	[bar]	Ports A and X up to 350; Ports B and Y 30 bar			
Pressure stages	[bar]	105, 210, 350			
Nominal flow	[l/min]	60	200	200	450
Fluid		Hydraulic oil as per DIN 51524...525			
Fluid temperature	[°C]	-20...+80			
Viscosity permitted	[cSt]/[mm²/s]	20...380			
Viscosity recommended	[cSt]/[mm²/s]	30			
Filtration		ISO 4406 (1999) 18/16/13 (acc. NAS 1638: 7)			

Electrical (prop. solenoid)		
Duty ratio	[%]	100
Nominal voltage	[V]	12=
Max. current	[A]	2.3
Coil resistance	[Ohm]	4 at 20°C
Solenoid connection		Connector as per EN175301-803
Protection class		IP65 in accordance with EN 60529 (plugged and mounted)
Power amplifier		PCD00A-400

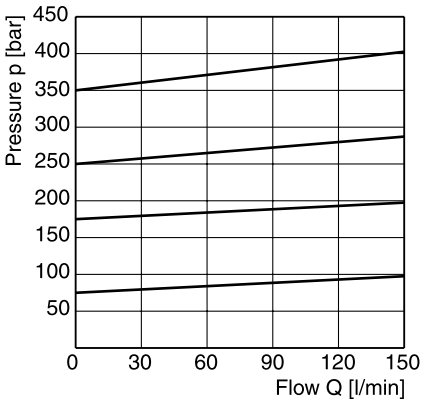
Parker Hannifin GmbH & Co. KG
Hydraulic Controls Division
Kaarst, Germany

Signal/pressure curve R4V

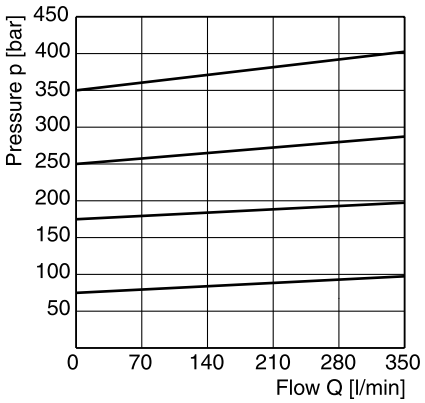


p/Q performance curves [1)]

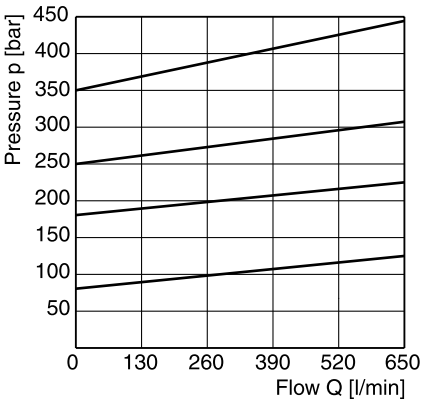
R4V03



R4V06

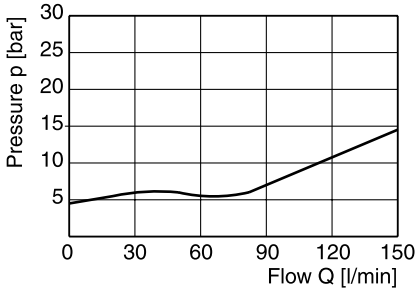


R4V10

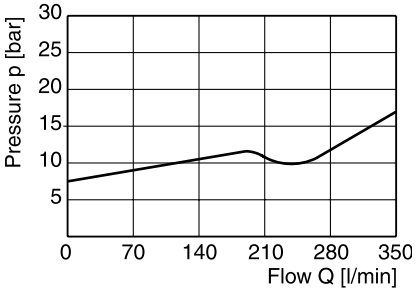


Minimum pressure curve [1)]

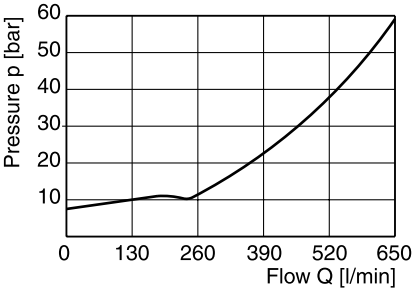
R4V03



R4V06



R4V10



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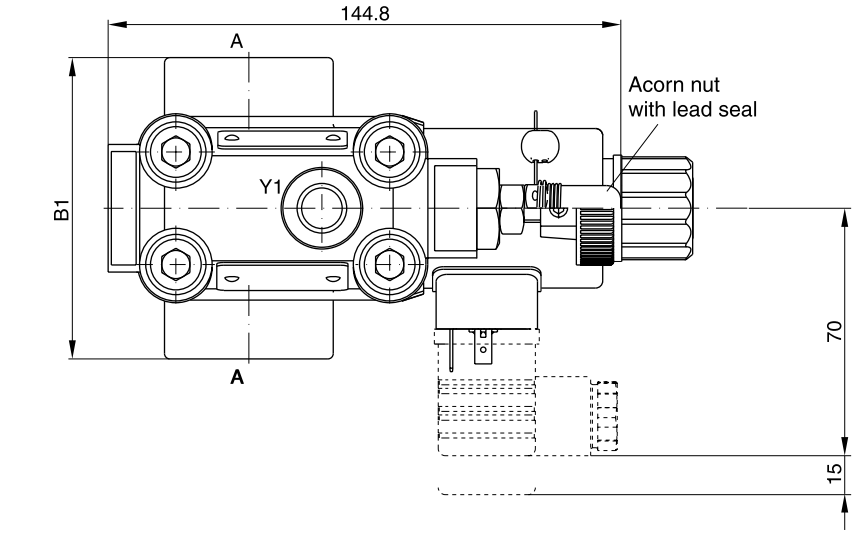
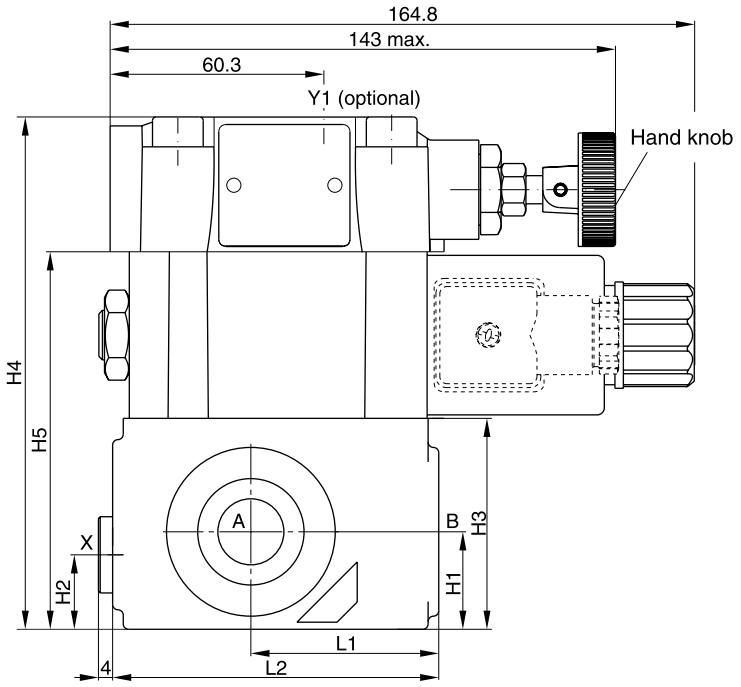
[1)] The performance curves are measured with external drain. For internal drain the tank pressure has to be added to curve.

T-body



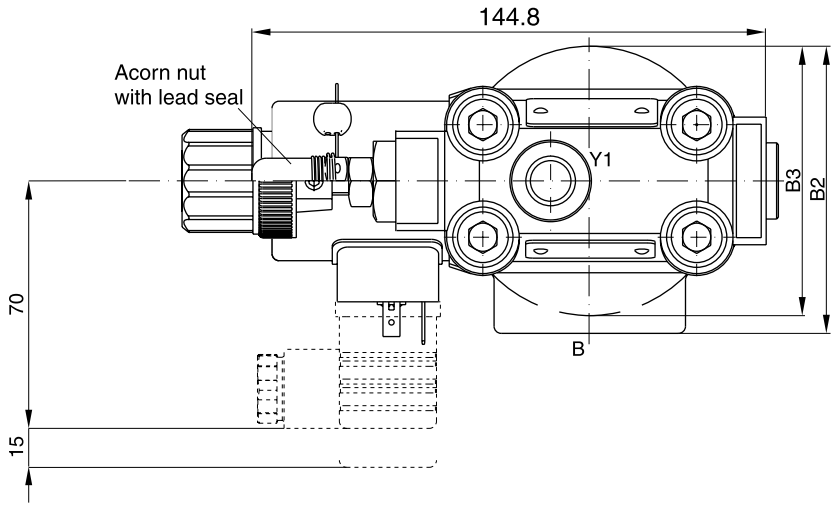


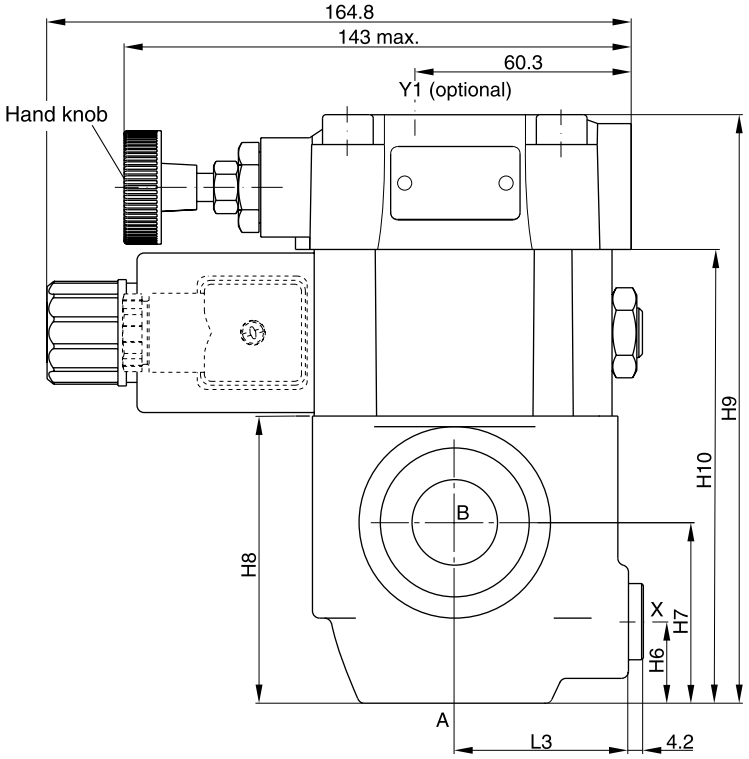
NG	Body	B1	H1	H2	H3	H4	H5	L1	L2
03	T-body	85	27.5	21	59.5	144.5	106.5	53	92
06	T-body	136	38	28	93	178	140	66.5	117.5

Ports	Function	Port size	
		R4V03*P2 T-body	R4V06*P2 T-body
A	pressure (inlet)	G½ "	G1 "
B	tank (outlet)	G½ "	G1 "
X[1)]	ext. remote control or vent connection	G¼ "	
Y1[2)]	external drain		

[1)] closed when supplied
[2)] port Y1 is only available at drain line (code2) external from the pilot head

L-body





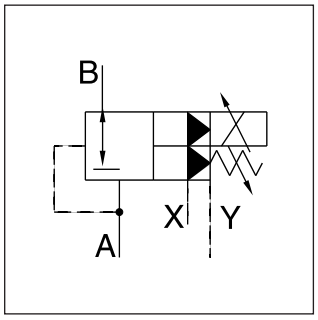
NG	Body	B2	B3	H6	H7	H8	H9	H10	L3
06	L-body	81	76	23	51	81	166	128	49
10	L-body	120.7	85.8	31.8	50.8	96	181	143	49.8

Ports	Function	Port size	
		R4V06 L-body	R4V10 L-body
A	pressure (inlet)	G¾ "	G1¼ "
B	tank (outlet)	G¾ "	G1¼ "
X[1)]	ext. remote control or vent connection	G¼ "	
Y1[2)]	external drain		

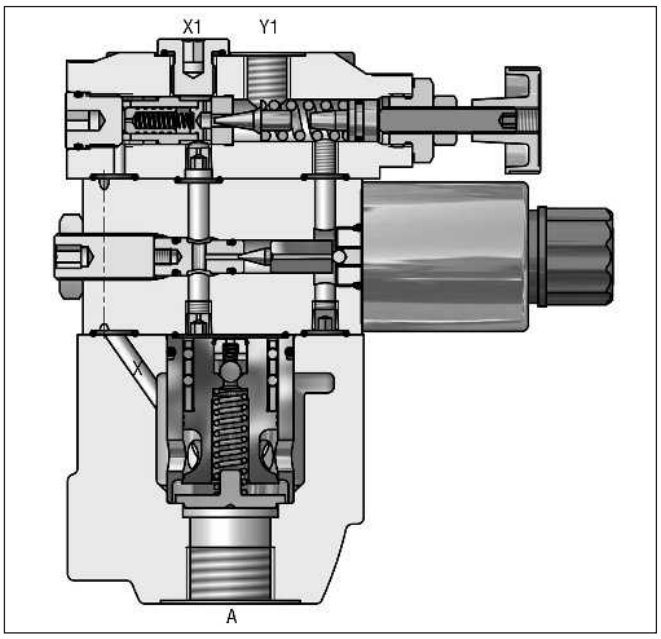
[1)] closed when supplied
[2)] port Y1 is only available at drain line (code2) external from the pilot head

Notes

Proportional pressure reducing valves series R4R*P2 are based on the mechanically adjusted series R4R. The additional proportional unit between the mechanical pilot valve and the main stage allows continuous pressure adjustment.
The optimum performance can be achieved in combination with the digital amplifier module PCD00A-400.



R4R10*P2 L-body



R4R06*P2 L-body

Features

- Pilot operated with proportional solenoid
- Normally closed to avoid undesired motion
- Continuous adjustment by proportional solenoid
- 2 interfaces
  - L-body (R4R06-G¾", R4R10-G1¼")
  - T-body (R4R03-G½", R4R06-G1")
- 3 pressure stages
- With mechanical maximum pressure adjustment

Ordering code

R4R		–	5			–		2	–	P2	G0R	–	B		–	
Pressure reducing valve	Nominal size		Max. pressure 350 bar	Body	Pressure stages		Adjustment	Drain line ext. from pilot head (Y1)		Proportional pressure control	Solenoid voltage 12V=		Design series	Seal		Options

Code	Nominal size
03	NG10 (G½")
06	NG25 (G1" - T-body, G¾" - L-body)
10	NG32 (G1¼")

Code	Seal
1	NBR
5	FPM

Code	Adjustment
1	Hand knob
3	Acorn nut with lead seal

Code	Body
6	R4R03 T-body R4R06 T-body
D	R4R06 L-body R4R10 L-body

Code	Pressure stages
1	up to 105bar
3	up to 210bar
5	up to 350bar

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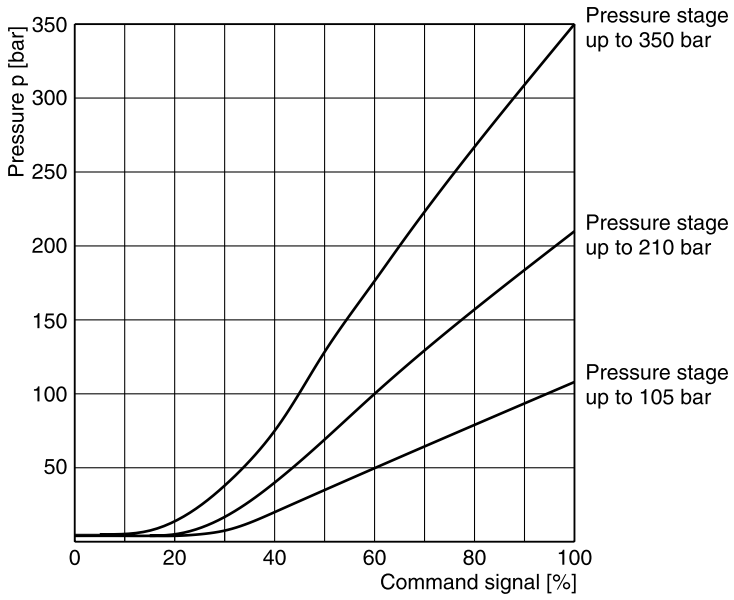
Technical data R4R

General		T-body		L-body	
Size		**03 (½")**	**06 (1")**	**06 (¾")**	**10 (1¼")**
Mounting		Threaded body			
Mounting position		unrestricted			
Ambient temperature	[°C]	-20...+50			
Weight	[kg]	5.0	5.1	7.4	8.4
Hydraulic					
Max. operating pressure	[bar]	Ports A, B and X up to 350; Port Y depressurized			
Pressure stages	[bar]	105, 210, 350			
Nominal flow	[l/min]	60	200	200	450
Fluid		Hydraulic oil as per DIN 51524...525			
Fluid temperature	[°C]	-20...+80			
Viscosity permitted	[cSt]/[mm²/s]	20...380			
Viscosity recommended	[cSt]/[mm²/s]	30			
Filtration		ISO 4406 (1999) 18/16/13 (acc. NAS 1638: 7)			

Electrical (prop. solenoid)		
Duty ratio	[%]	100
Nominal voltage	[V]	12=
Max. current	[A]	2.3
Coil resistance	[Ohm]	4 at 20°C
Solenoid connection		Connector as per EN175301-803
Protection class		IP65 in accordance with EN 60529 (plugged and mounted)
Power amplifier		PCD00A-400

Command/pressure curve



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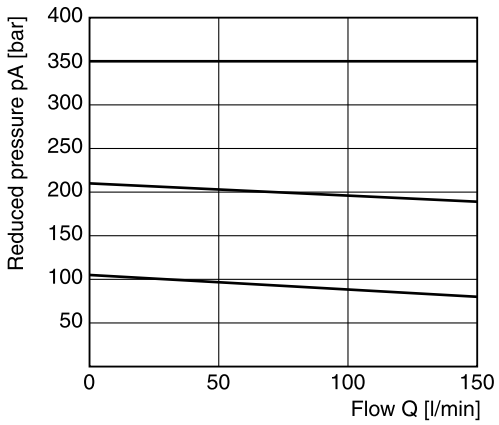
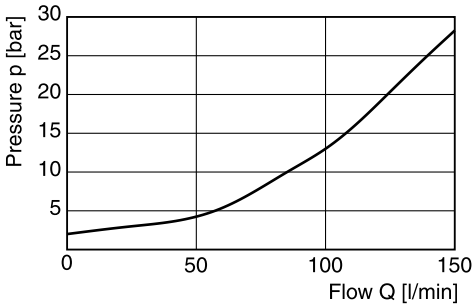
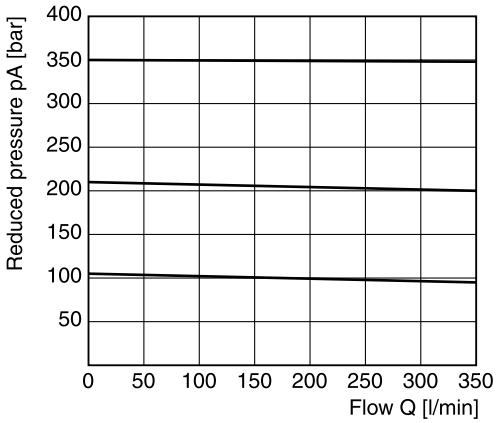
Reduced pressure pA versus flow Q
Series R4R03 [1)]



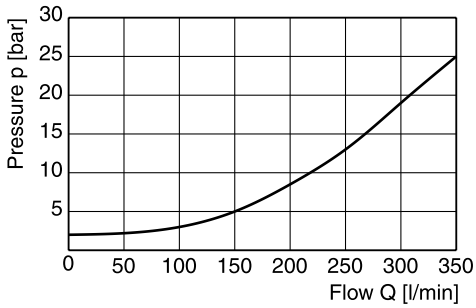
Minimum pressure curve



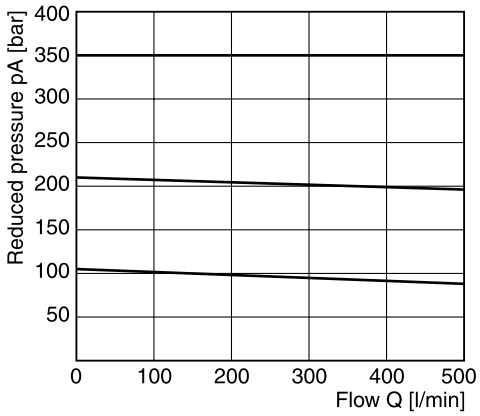
Reduced pressure pA versus flow Q
Series R4R06 [1)]



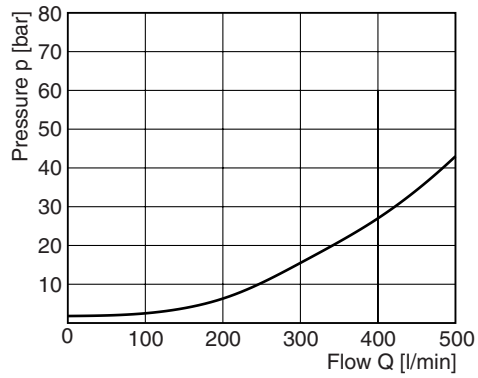
Minimum pressure curve



Reduced pressure pA versus flow Q
Series R4R10 [1)]

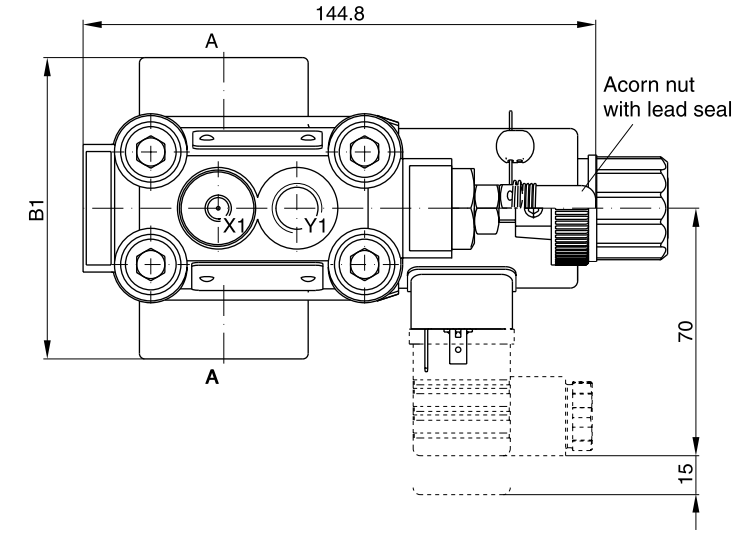


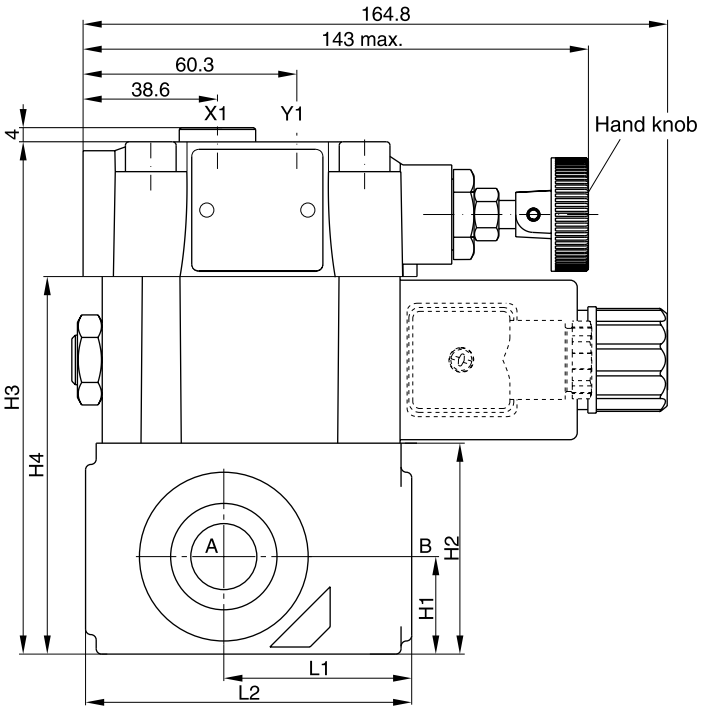
Minimum pressure curve



[1)] Measured at 350 bar primary pressure pB.

T-body

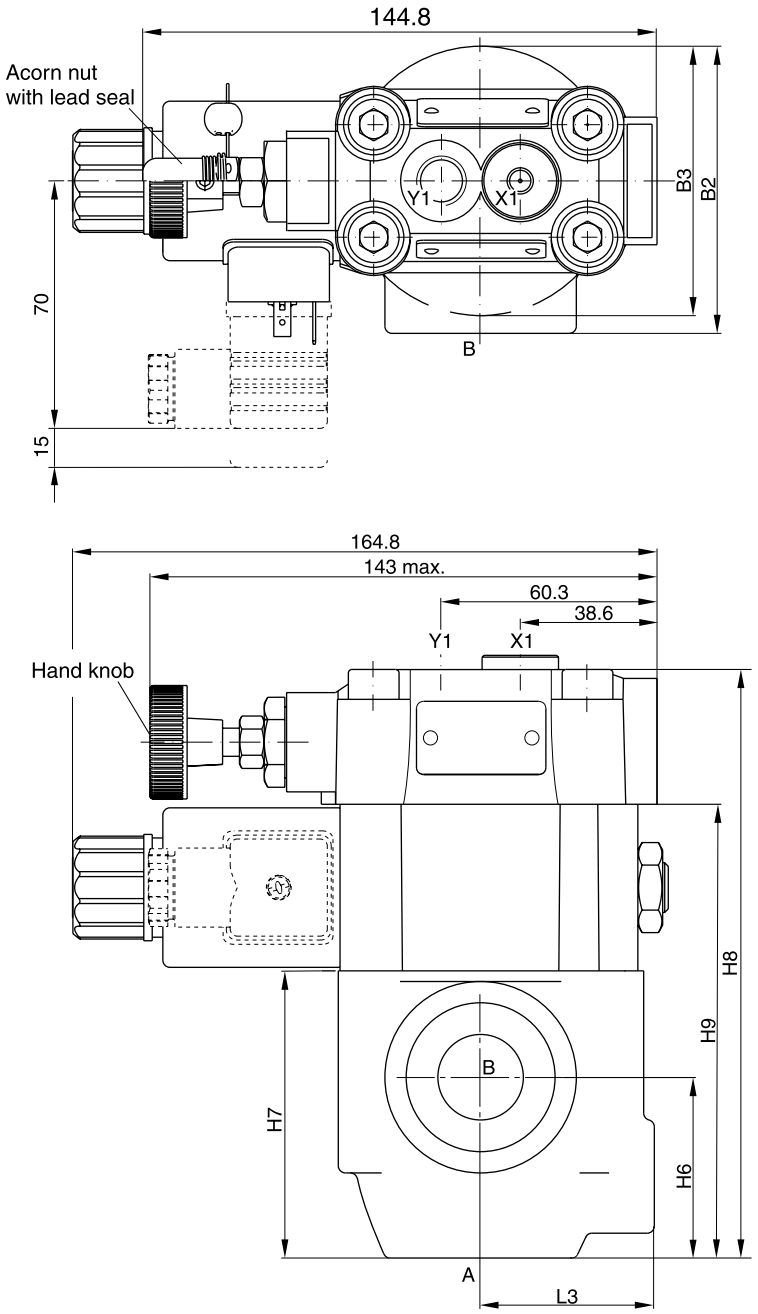




NG	Body	B1	H1	H2	H3	H4	L1	L2
03	T-body	85	27.5	59.5	144.5	106.5	53	92
06	T-body	136	38	93	178	140	66.5	117.5

Ports	Function	Port size	
		R4V03*P2 T-body	R4V06*P2 T-body
B	pressure (inlet)	G½ "	G1 "
A	pressure (outlet)	G½ "	G1 "
X1	ext. remote control or vent connection	G¼ "	
Y1	external drain		

L-body



NG	Body	B2	B3	H6	H7	H8	H9	L3
06	L-body	81	76	51	81	166	128	49
10	L-body	120.7	85.8	50.8	96	181	143	49.8

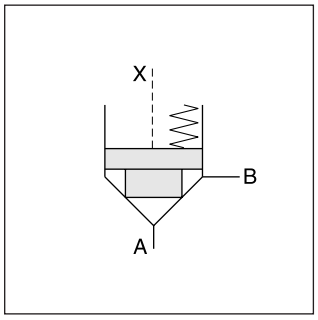
Ports	Function	Port size	
		R4V06*P2 L-body	R4V10*P2 L-body
B	pressure (inlet)	G¾ "	G1¼ "
A	pressure (outlet)	G¾ "	G1¼ "
X1	ext. remote control or vent connection	G¼ "	
Y1	external drain		

Notes

Seat valves series D4S are designed for directional control functions. A large variety of poppets, springs and covers - including shuttle valves, stroke limiters, solenoid valves (VV01) and position control - allow to design individual hydraulic solutions for nominal flow up-to 600 l/min.

A complete program is offered under the Denison brand:
subplate mounted valves (D4S - chapter 6),
SAE flange valves (D5S - chapter 9),
pipe mounted valves (D4S - chapter 10),
slip-in cartridges (CAR - on request).

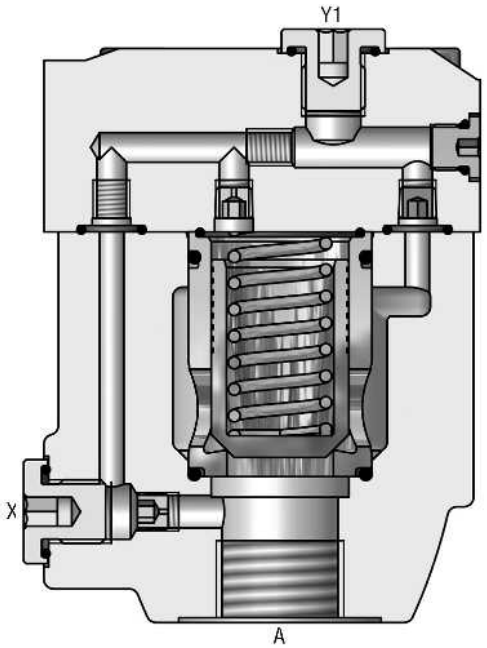
D4S10 L-body



Features

- Leak-free seat valve design
- 2 body designs
  - L-body (2-port)
  - T-body (3-port)
- Numerous pilot options
- 6 poppet types
- 4 port sizes
  - G 1/2“, G1“ for T-body
  - G 3/4“, G 1 1/4“ for L-body

D4S06 L-body



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D4S □ – □ □ □ – □ □ □ □ – **B** □ – □

Seat valve | **Nominal size** | **Body** | **Pilot connection** | **Cap version** | **Sleeve** | **Spool type** | **Spring** | **Switching type** | **Solenoid voltage** | **Design series** | **Seals** | **Options**

Code	Port size
03	NG10 (CAR4 build-in)
06	NG25 (CAR2 build-in)
10	NG32 (CAR2 build-in)

Code	Body	Ports
6	D4S03 T-body D4S06 T-body	A, B = G½"; X, Y1 = G¼" A, B = G1"; X, Y1 = G¼"
D	D4S06 L-body D4S10 L-body	A, B = G¾"; X, Y1 = G¼" A, B = G1¼"; X, Y1 = G¼"

Code	Pilot oil line in body	A-X	B-Y
1	internal from A	⊖	○
2	internal from X	●	○

Code	Ports	X	Y	Z	X-Y	Y1	VV01
	Standard						
1	Pilot oil = pilot drain	—	●	⊖	○	●	—
C	Pilot oil = pilot drain	●	○	⊖	○	●	—
	With solenoid valve (VV01)						
2	Ext. PD from cap	—	○	⊖	●	○	●
6	Internal pilot drain	—	○	⊖	●	●	—
	With stroke limiter (not for D4S03)						
3	Pilot oil = pilot drain	⊖	●	—	—	—	—
4	Pilot oil = pilot drain	●	⊖	—	—	—	—

○ open bore ● closed bore ⊖ orifice Ø 1.2

Note: Combination examples at the end of chapter

Code	Sleeve
1	AA=95%, AB=5%
3	AA=60%, AB=40%

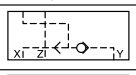
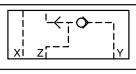
Code	Size	Poppet type	Sleeve
1	03, 06,10	With closed bottom and 15° chamfer (pZ max. = pA +20bar	1
2	03	With 0.8 dia. orifice at the bottom and 15° chamfer	1
	06, 10	With 1.2 dia. orifice at the bottom and 15° chamfer	1
4	03, 06,10	With closed bottom and 45° chamfer	1, 3
A[1)]	06, 10	Safety spool (for position control only)	3
B[1)]	06, 10	Throttle spool, 10° chamfer	3
C[1)]	06, 10	Throttle spool, 3° chamfer	3

[1)] Springs 2, 3, 4 and 6 only

Code	Options
omit	Standard
013	Cover for position control

Code	Seals
1	NBR
5	FPM

Code	Solenoid voltage
omit	Standard w/o vent function
G0R	12V=
G0Q	24V=
GAR	98V=
GAG	205V=
W30	110V / 50Hz ; 120V / 60Hz
W31	230V / 50Hz ; 240V / 60Hz

Code	Switching type	
omit	Standard w/o vent function	
09	VV01 with manual override	de-energized: power comp. open
10	VV01 without manual override	
11	VV01 with manual override	de-energized: power comp. closed
12	VV01 without manual override	
CA	Shuttle valve	
DA	Shuttle valve	
CB	VV01 code 09 and shuttle valve code CA	
CD	VV01 code 11 and shuttle valve code CA	
DB	VV01 code 09 and shuttle valve code DA	
DD	VV01 code 11 and shuttle valve code DA	
BH	VV01 code 10 and shuttle valve code CA and position control [2)] with amplifier	
BK	VV01 code 12 and shuttle valve code CA and position control [2)] with amplifier	
BN	VV01 code 10 and shuttle valve code DA and position control [2)] with amplifier	
BQ	VV01 code 12 and shuttle valve code DA and position control [2)] with amplifier	
BC	VV01 code 10 and position control [2)] with amplifier	
BE	VV01 code 12 and position control [2)] with amplifier	
BA	Position control [2)] with amplifier	
BF	Position control [2)] with amplifier and shuttle valve code CA	
BL	Position control [2)] with amplifier and shuttle valve code DA	

[2)] Position control for D4S06/10 only.
Spring 2 or 4. Spool A and sleeve 3.
Valve open: proximity switch damped

Code	Spring (approx. cracking pressure [bar]					
	Sleeve Code 1		Sleeve Code 3			
	A -> B		A -> B		B -> A	
	D5S03	D5S06/10	D5S03	D5S06/10	D5S03	D5S06/10
1	2.8	3.5	6.5	6.5	9.5	11.0
2	0.5	0.5	1.0	1.0	1.5	1.7
3	0.3	0.3	0.6	0.6	0.9	1.0
4	2.2	2.2	4.0	3.5	5.5	6.0
5	—	9.0	—	16.0	—	28.0
6	1.2	1.2	2.0	2.2	3.0	3.8
7	3.0	—	8.0	—	12.0	—

Technical data

General			T-body		L-body	
Size			**03 (½")**	**06 (1")**	**06 (¾")**	**10 (1¼")**
Mounting			Threaded body			
Mounting position			unrestricted			
Ambient temperature		[°C]	-20...+50			
Weight	D4S T-body	[kg]	3.2	6.6	—	—
	D4S L-body	[kg]	—	—	3.3	5.6
Hydraulic						
Max. operating pressure		[bar]	Ports A, B up to 350; Port Y 140 (with VV01)			
Nominal flow		[l/min]	180	360	360	600
Fluid			Hydraulic oil as per DIN 51524...525			
Fluid temperature		[°C]	-20...+80			
Viscosity permitted		[cSt]/[mm²/s]	10...650			
Viscosity recommended		[cSt]/[mm²/s]	30			
Filtration			ISO 4406 (1999) 18/16/13 (acc. NAS 1638: 7)			

Electrical (solenoid)							
Duty ratio	[%]	100					
Response time	[ms]	Energized / de-energized AC: 20/18 , DC: 46/27					
	Code	G0R	G0Q	GAR	GAG	W30	W31
Supply voltage	[V]	12V =	24V =	98V =	205V =	110 at 50Hz 120 at 60Hz	230 at 50Hz 240 at 60Hz
Tolerance supply voltage	[%]	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10	+5...-10
Power consumption, hold	[W]	31	31	31	31	78	78
Power consumption, in rush	[W]	31	31	31	31	264	264
Max. switching frequency	[1/h]	AC: up to 7.200, DC: up to 16.000 switchings/hour					
Solenoid connection		Connector as per EN175301-803					
Protection class		IP65 in accordance with EN 60529 (plugged and mounted)					
Coil insulation class		H (180 °C)					

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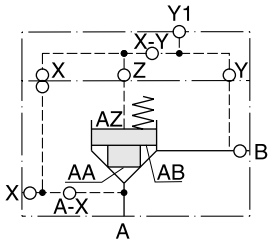
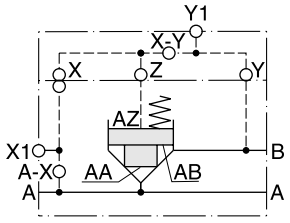
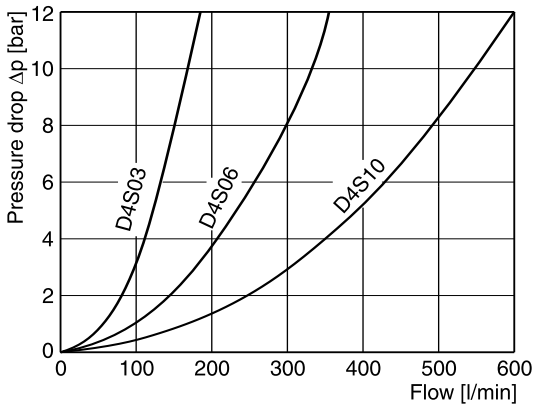
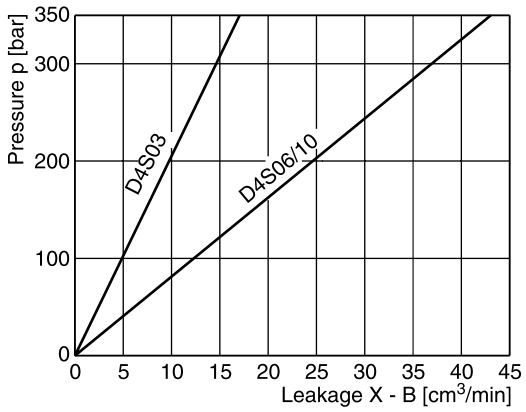
D4S pilot configuration

L-body (2-port)	**T-body (3-port)**
	

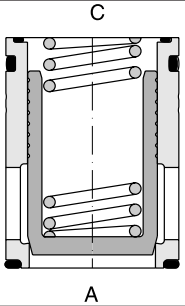
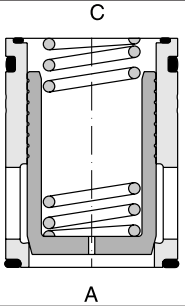
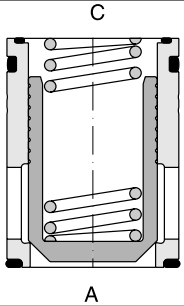
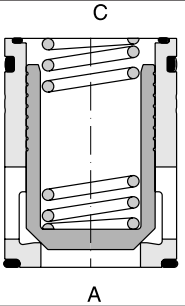
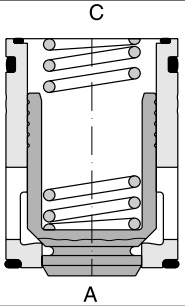
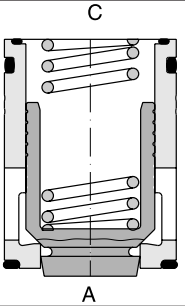
Δp/Q performance curves



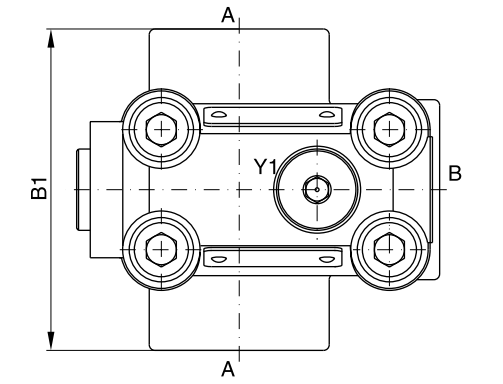


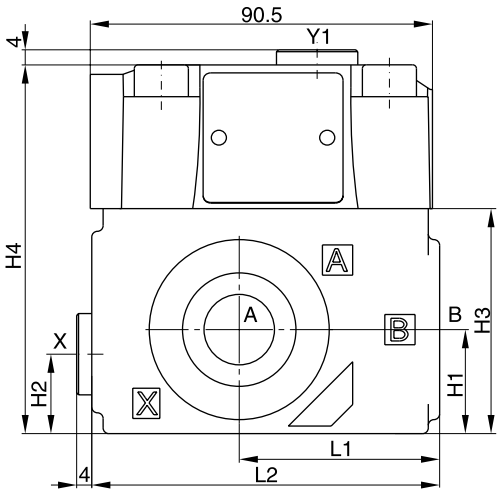
10

Selection of Cartridges

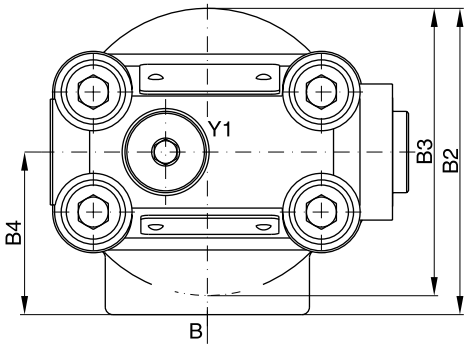
Sleeve 1, poppet 1	Sleeve 1, poppet 2	Sleeve 1, poppet 4	Sleeve 3, poppet 4	Sleeve 3, poppet A	Sleeve 3, poppet B/C
					
1 : 1.05 $A_A = 0.95\ A_C$ $A_B = 0.05\ A_C$ 15° chamfer	1 : 1.05 $A_A = 0.95\ A_C$ $A_B = 0.05\ A_C$ 15° chamfer orifice	1 : 1.05 $A_A = 0.95\ A_C$ $A_B = 0.05\ A_C$ 45° chamfer	1 : 1.67 $A_A = 0.6\ A_C$ $A_B = 0.4\ A_C$ 45° chamfer	1 : 1.67 $A_A = 0.6\ A_C$ $A_B = 0.4\ A_C$ 45° chamfer safety spool	1 : 1.67 $A_A = 0.6\ A_C$ $A_B = 0.4\ A_C$ 45° chamfer throttle spool

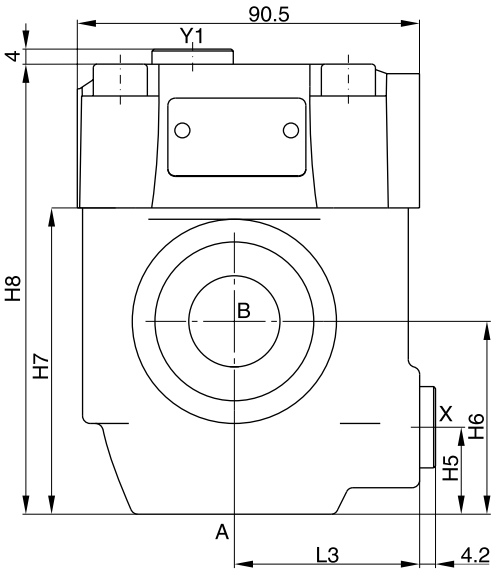
D4S 03/06 T-body





D4S 06/10 L-body





10

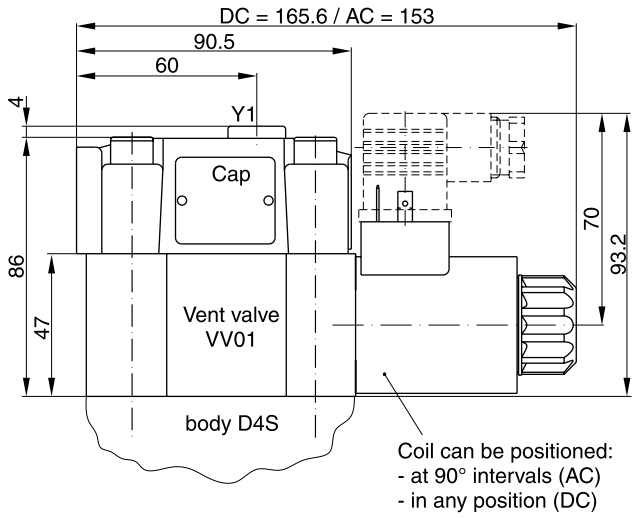
Ports	Function	Port size			
		D4S03 T-body	D4S06 L-body	D4S06 T-body	D4S10 L-body
A	inlet or outlet	G½"	G¾"	G1"	G1¼"
B	outlet or inlet	G½"	G¾"	G1"	G1¼"
X1	external pilot port	G¼"			
Y1	external drain [1]				

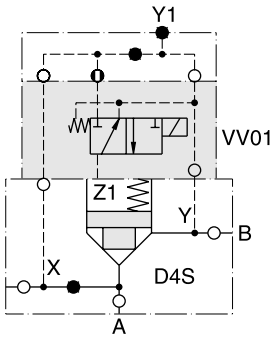
[1] With VV01 only

Size	L1	L2	B1	H1	H2	H3	H4
03 (T-body)	53	92	85	27.5	21	59.5	97.5
06 (T-body)	66.5	117.5	136	38	28	93	131

Size	L3	B2	B3	B4	H5	H6	H7	H8
06 (L-body)	49	81	76	43	23	51	81	119
10 (L-body)	49.8	120.7	85.6	77.8	38.1	50.8	96	134

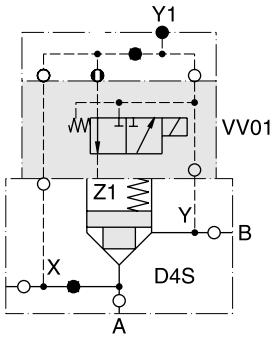
Dimensions D4S with VV01





with manual override | without manual override

D4S..-...-...-09/10-
Solenoid energized:
D4S blocked
Solenoid deenergized:
Flow from A-B or B-A

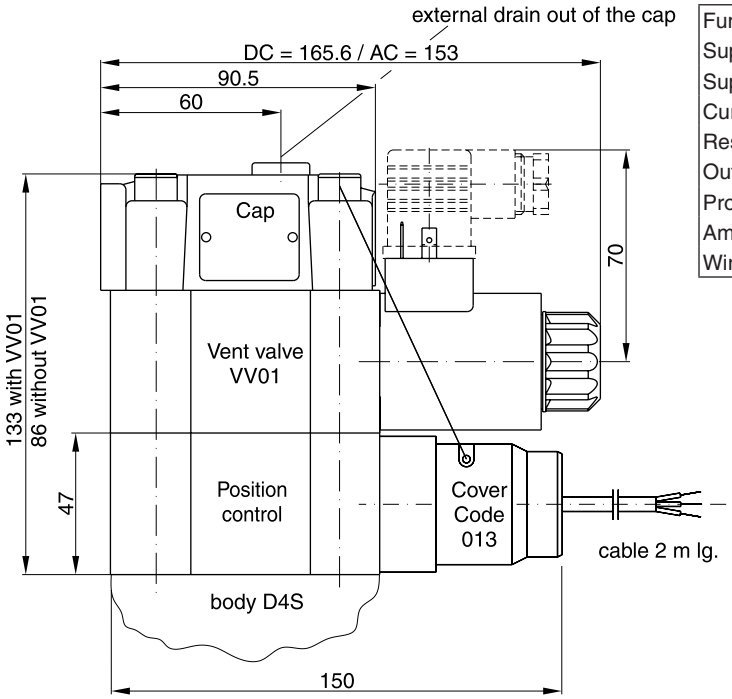


with manual override | without manual override

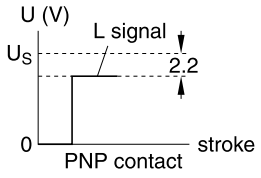
D4S..-...-...-11/12-
Solenoid energized:
Flow from A-B or B-A
Solenoid deenergized:
D4S Blocked

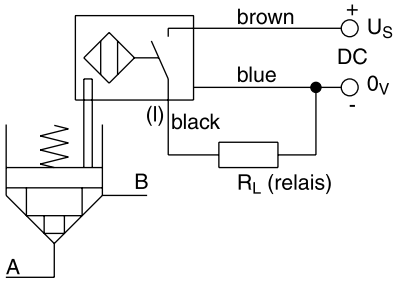
10

Dimensions D4S position control



Function		PNP, contact
Supply voltage (Us)	[VDC]	10...30
Supply voltage ripple	[%]	≤ 10
Current consumption	[mA]	max. 8
Residual voltage L-signal	[V]	Us - 2.2 at I_{max}
Output current (I)	[mA]	≤ 200
Protection class		IP67
Ambient temperature	[C°]	-25...+70
Wire cross section	[mm²]	3 x 0.5





Position control by proximity switch (incl. amplifier)

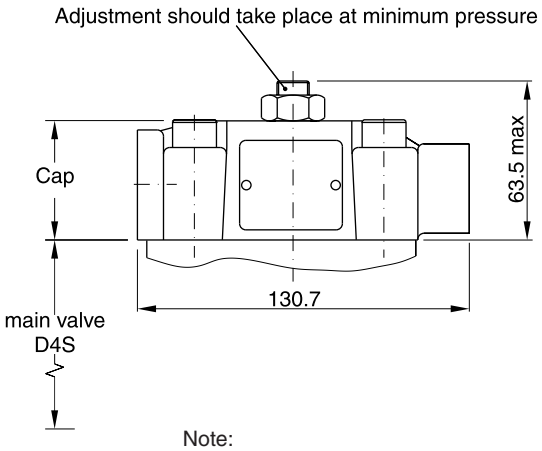
Valve open: proximity switch activated.

This proximity switch is pressure proof and has no wearing parts.

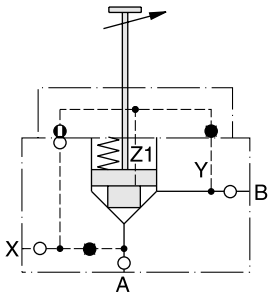
Note

Position control for D4S06 and D4S10 only.

Dimensions D4S stroke limiter



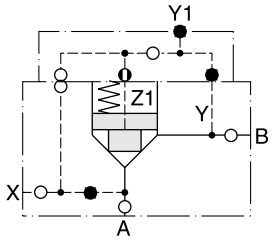
Example: D4S$^{06}_{10}$-.23-3B.



Note:
Stroke limiter not for use with D4S03, VV01, shuttle valve and positon control.

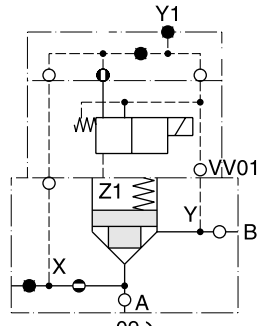
10

D4S direct operated

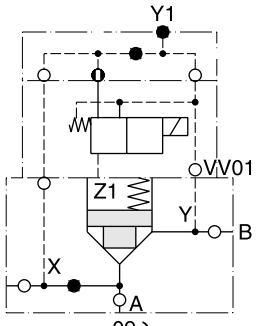


D4S..-.21
Pilot oil X = exrernal

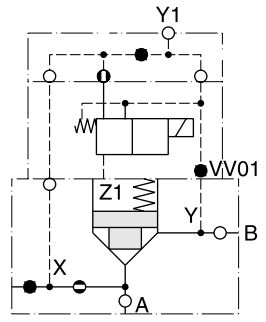
D4S with solenoid valve VV01



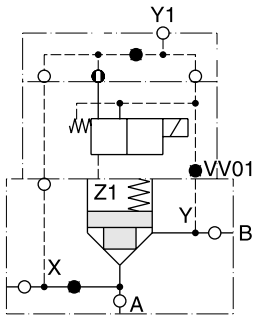
D4S..-.16-...- 09 10 11 12 } with VV01
Pilot oil X = internal from A
Drain Y = internal to B



D4S..-.26-...- 09 10 11 12 } with VV01
Pilot oil X = external
Drain Y = internal to B



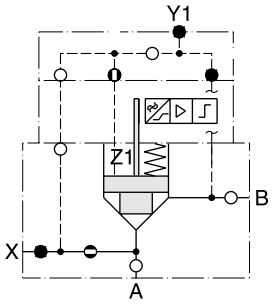
D4S..-.12-...- 09 10 11 12 } with VV01
Pilot oil X = internal from A
Drain Y1 = external out of the cap



D4S..-.22-...- 09 10 11 12 } with VV01
Pilot oil X = external
Drain Y1 = external out of the cap

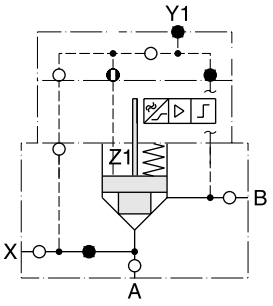
10

D4S with position control



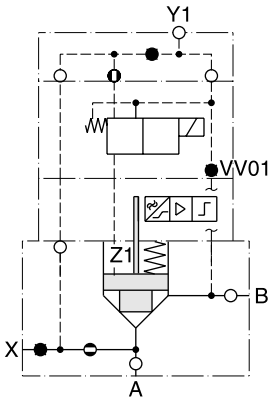
D4S..-.11-3A.-BA
(with postion control)

Pilot oil X = internal from A



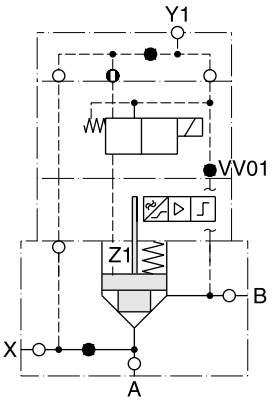
D4S..-.21-3A.-BA
(with postion control)

Pilot oil X = external



D4S..-.12-3A.- BC / BE } with postion control and VV01

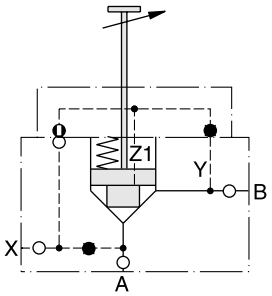
Pilot oil X = internal from A
Drain Y1 = external out of the cap



D4S..-.22-3A.- BC / BE } with postion control and Vv01

Pilot oil X = external
Drain Y1 = external out of the cap

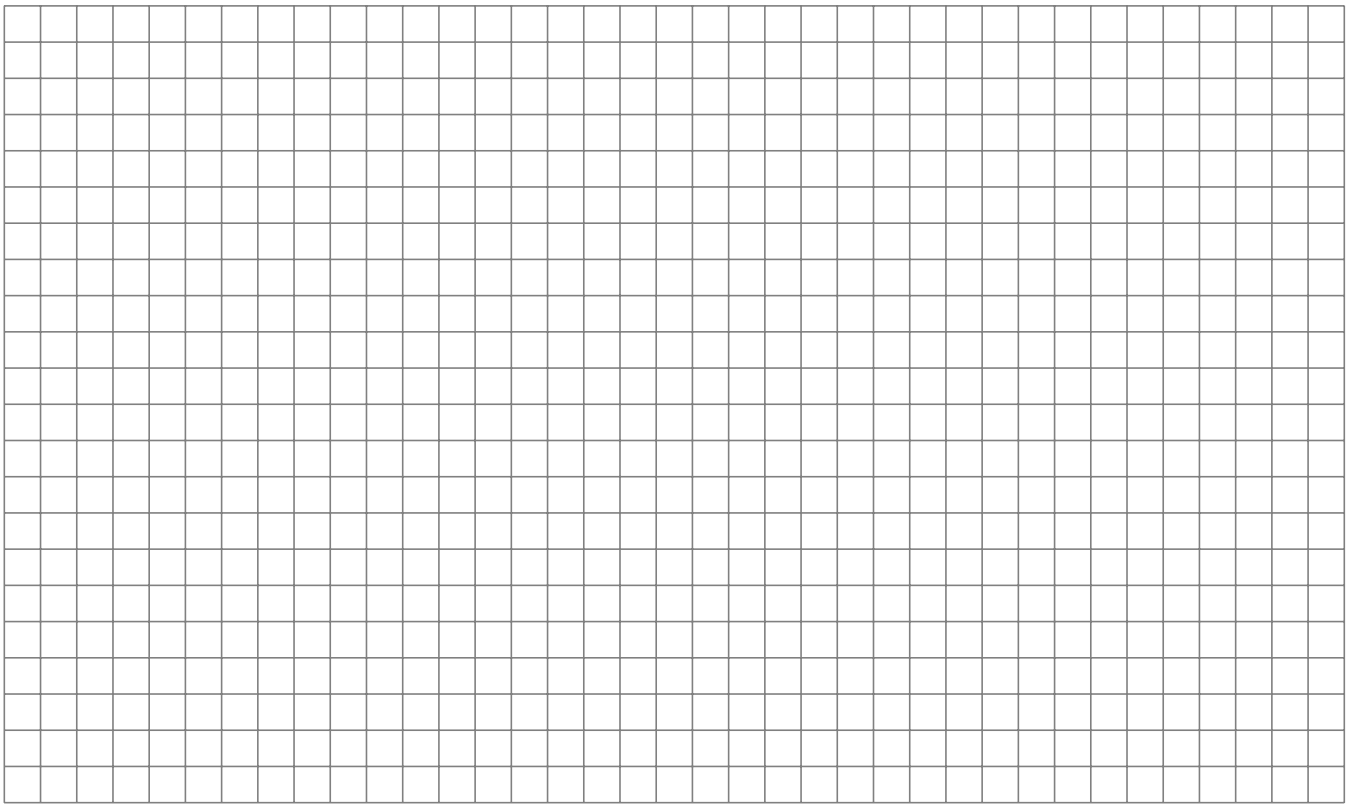
D4S with stroke limiter



D4S..-.23-3B. with stroke limiter
Pilot oil X = external
(Note: for D4S06 and D4S10 only)

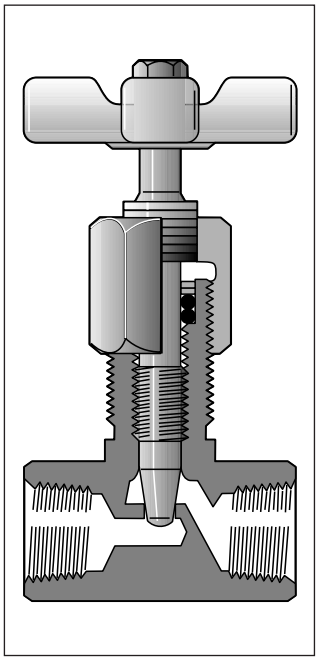
10

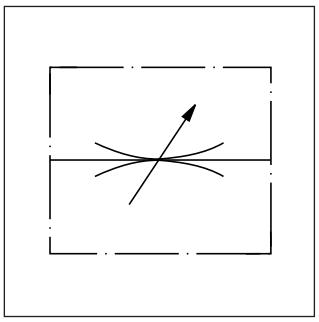
Notes



Parker Hannifin GmbH & Co. KG
Hydraulic Controls Division
Kaarst, Germany

Manatrol needle valve, optional with 30° poppet, V-notch, or rectangular slot. The form of the throttle opening influences the accuracy of the flow setting, which depends on the pressure and viscosity. The needle is made of stainless steel and corresponds to a ring gap in the valve body.





Flow rate Q [l/min] = Kv • $\sqrt{\frac{\Delta p}{\gamma}}$

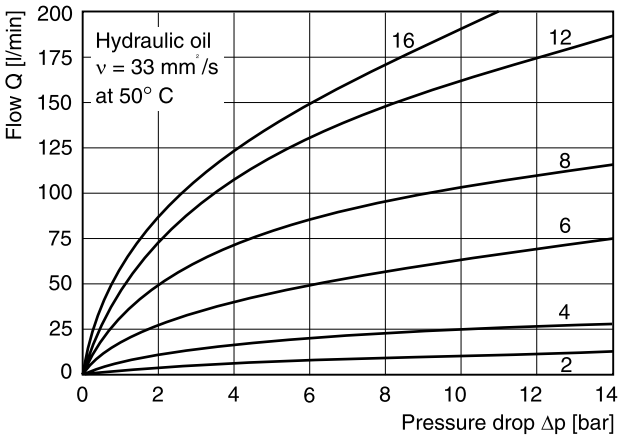
Kv	from the table
Δp [bar]	
γ [kg/dm³]	= spezific weight of the medium
(γ for mineral oil	= 0.85 - 0.9)

Technical data

Size	Max.pressure [bar]		Flow [l/min]	Max. cross. sect. [cm²] Δp	Kv factor valve	Weight
	steel	brass	Δp 10bar	10bar	open	[kg]
200	350	140	11	0.07	3.5	0.13
400	350	140	25	0.14	6.3	0.31
600	350	140	65	0.37	18.5	0.54
800	350	140	105	0.55	27.5	0.95
1200	350	-	160	0.90	45.7	1.58
1600	210	-	190	1.10	54.6	1.9

Size and needle type	
200-2	7
200-3	2
400-2	11

Δp/Q curves



Ordering code

☐	**MV**	☐	☐	☐	☐	
Thread type	Needle valve	Size and design	Body	Needle	Seal	

Code	Thread
omit	NPTF
9	**BSPP**

Straight way valve code	Size	Angle valve code
200	1/8	261
400	1/4	461
600	3/8	661
800	1/2	861
1200	3/4	1261
1600	1	—

Code	Body
S	**Steel**
B [1]	Brass

[1] not for models MV 1200/1600 and design „61“

Code	Seal
omit	**NBR**
V	FPM

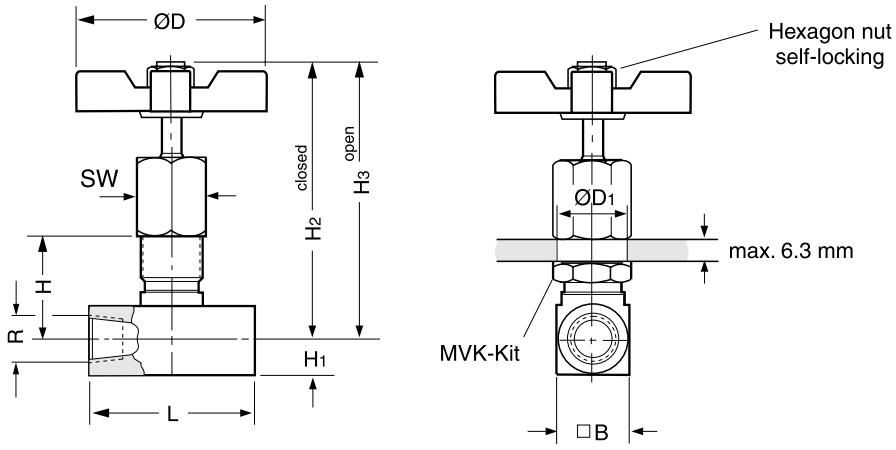
Code	Needle
omit	**Standard with 30° taper**
2 [2]	Fine due to V-notch
3 [2]	Micro-fine due to rect. slot

[2] only for size 400

Bold letters =
Short-term availability

10

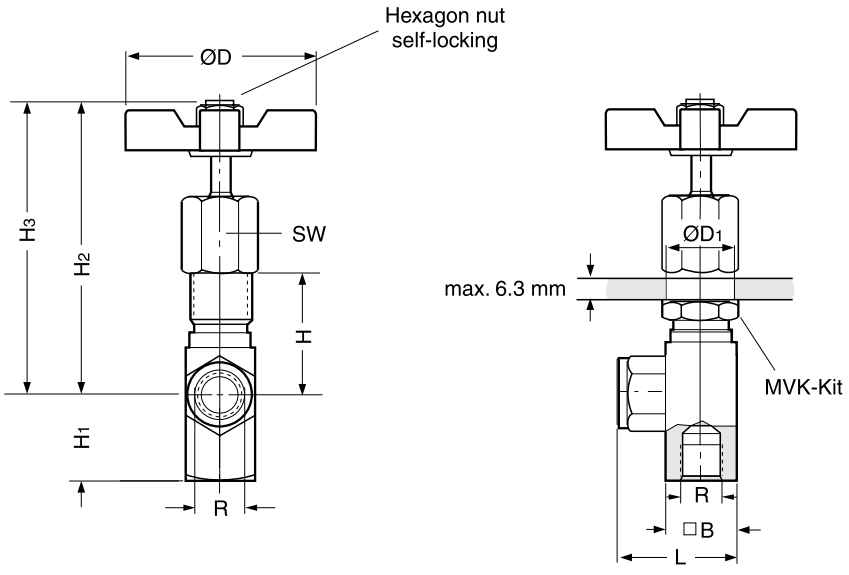
Series MV*00 valve with connecting thread in-line



Size	R*	H	H3	H2	H1	B	ØD1	L	ØD	SW	MVK sets
2	1/8	24	69	64	8	16	15	38	45	15.7	MVK 2
4	1/4	33	86	81	10.5	21	20	51	51	22.1	MVK 4
6	3/8	38	108	100	13	26	23	64	64	25.4	MVK 6
8	1/2	51	130	117	16	32	29	67	83	31.8	MVK 8
12	3/4	54	142	128	19	38	36	83	98	41.2	MVK 12
16	1	60	147	133	22.5	45	36	108	98	41.2	MVK 12

* Pipe thread G or NPTF

Series MV*61 angle valve with connections at 90° angle



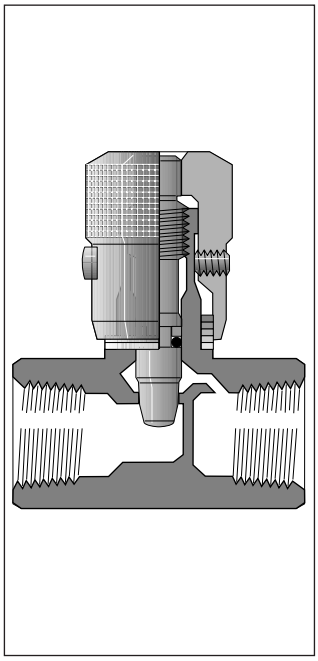
Size	R*	H	H3	H2	H1	B	ØD1	L	ØD	SW
2	1/8	27	72	67	20.6	16	15	27	45	15.7
4	1/4	36	90	85	27.7	21	20	38	51	22.1
6	3/8	42	111	103	34.8	26	23	45	64	25.4
8	1/2	55	134	121	42.7	32	29	53	83	31.8
12	3/4	59	147	133	41.1	38	36	64	98	41.2

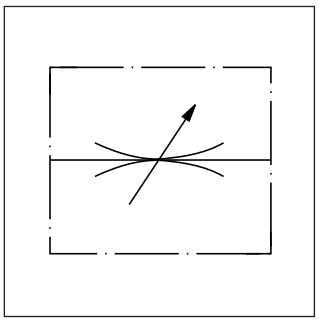
* Pipe thread G or NPTF

Manatrol stop and throttle valves with 2-stage needle cone. Fine adjustment for the first stage can be achieved with 3 rotations of the adjustment knob. The second stage with normal throttle characteristics is achieved with 3 further rotations. A cylindrical needle with a rectangular slot is provided to reduce the viscosity effect for sizes 200 up to 600. The flow is dependent on pressure and viscosity.

$$\text{Flow rate } Q\ [\text{l/min}] = Kv \cdot \sqrt{\frac{\Delta p}{\gamma}}$$

Kv	from the table
Δp [bar]	
γ [kg/dm³]	= spezific weight of the medium
(γ for mineral oil	= 0.85 - 0.9)





Specifications

Return check poppet Nominal cracking pressure	0.4 bar
Operating temperature	-40°C to +121°C

Technical data (only for standard 2 stage needle)

Size	Steel	Brass	Flow [l/min]	Max. cross section	Kv factor valve	Weight [kg]
200	350	140	11	0.066	3.3	0.15
400	350	140	25	0.13	6.3	0.22
600	350	140	40	0.22	11.2	0.6
800	350	140	50	0.28	13.9	0.63
1200	350	140	120	0.70	35.4	1.04
1600	210	35	250	1.48	75	2.13

Ordering code

	N					
Thread type	Needle valve	Thread size	Body	Needle	Clamping screw	Seal

Code	Thread
omit	NPTF
9	**BSPP**

Code	Size
200	**1/8**
400	**1/4**
600	**3/8**
800	**1/2**
1200	**3/4**
1600	1

Code	Body
S	**Steel**
B	Brass

Code	Seal
omit	**NBR**
V	FPM

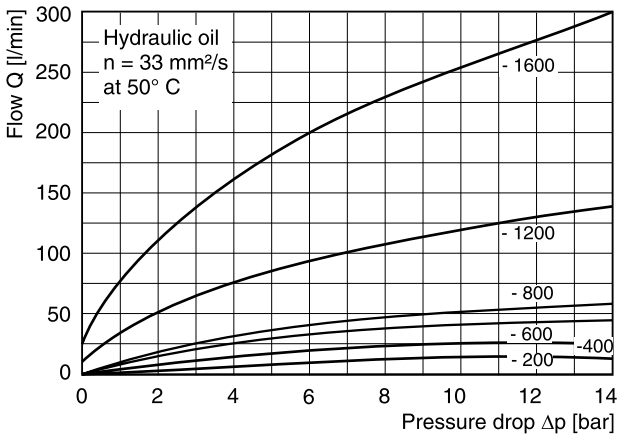
Code	Clamping screw
omit	**Hexagon socket**
F	With knurled knob
T	Tamper-proof

Code	Needle
omit	**Standard 2-stage needle**
4 [2]	Micro-fine hollow needle with slot

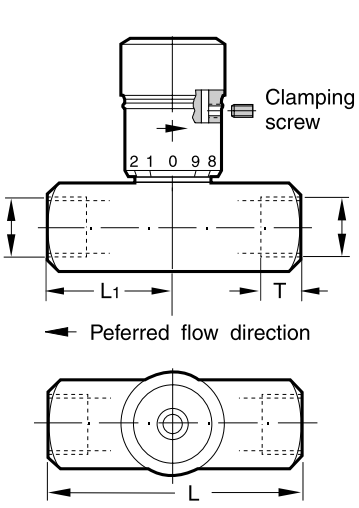
[2] only for sizes 200 to 600

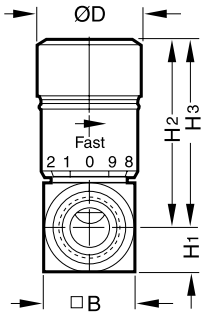
Bold letters =
Short-term availability

p/Q curves

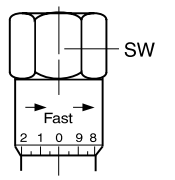


Dimensions

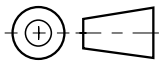




H2 = closed
H3 = open



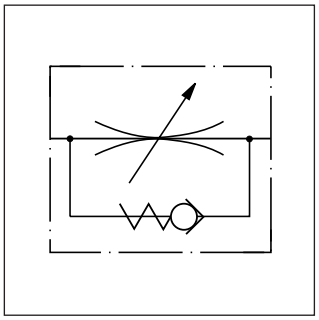
Hexagon adjusting knob, standard for size 1600



Size	R* Threads	H3	H2	H1	B	L1	L	ØD	SW
200	1/8	39	35	8	16	16	38	19	-
400	1/4	46	40	10.5	21	25	51	21	-
600	3/8	55	49	13	26	32	64	25	-
800	1/2	69	61	16	32	33	67	30	-
1200	3/4	86	71	19	38	41	83	35	-
1600	1	124	107	22.5	45	54	108	-	47.8

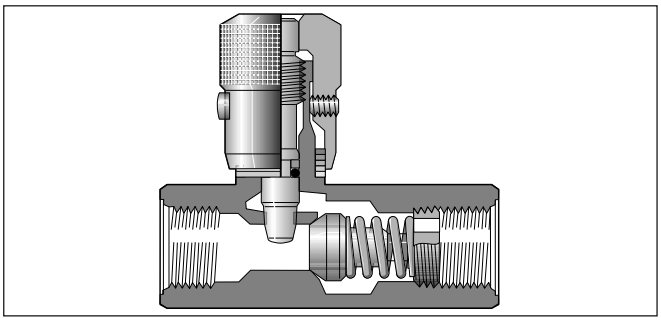
* G or NPTF

Manatrol throttle check valves of series F with fine adjustment of the flow rate for a defined flow direction. The built-in check valve allows free flow in the counter direction with little flow resistance. A 2-stage needle provides very exact setting of smaller flow rates with the first three rotations of the adjustment knob. After 3 more rotations, the valve is completely open. The valve setting can be locked using a locking screw.



$$\text{Flow rate Q [l/min]} = Kv \cdot \sqrt{\frac{\Delta p}{\gamma}}$$

Kv	from the table
Δp [bar]	
γ [kg/dm³]	= spezific weight of the medium
(γ for mineral oil	= 0.85 - 0.9)



Specifications

Return check poppet Nominal cracking pressure	0.4 bar
Operating temperature	-40°C to +121°C

Technical data

Size	Pressure [bar]		Max. flow [l/min Δp10bar]	Throttle surface [cm²]	Throttle v. open Kv factor	Weight [kg]	
	Steel	Brass				Steel	Brass
200	350	140	11	0.066	3.3	0.13	0.13
400	350	140	25	0.13	6.3	0.23	0.23
600	350	140	40	0.22	11.2	0.31	0.31
800	350	140	50	0.28	14	0.67	0.68
1200	210	140	120	0.70	35.4	1.17	1.18
1600	210	35	250	1.48	75	2.31	2.32
2000	210	–	250	1.48	75	3.67	–
2400	210	–	250	1.48	75	4.62	–
3200	210	–	250	1.48	75	7.78	–

Ordering code

		F					
Thread type		Throttle check valve	Thread size	Body	Needle	Clamping screw	Seal

Code	Thread
omit	NPTF
9	**BSPP**

Code	Size
200	**1/8**
400	**1/4**
600	**3/8**
800	**1/2**
1200	**3/4**
1600	**1**
2000	1¼
2400	1½
3200	2

Code	Body
S	**Steel**
B [1]	Brass

Code	Seal
omit	**NBR**
V	FPM

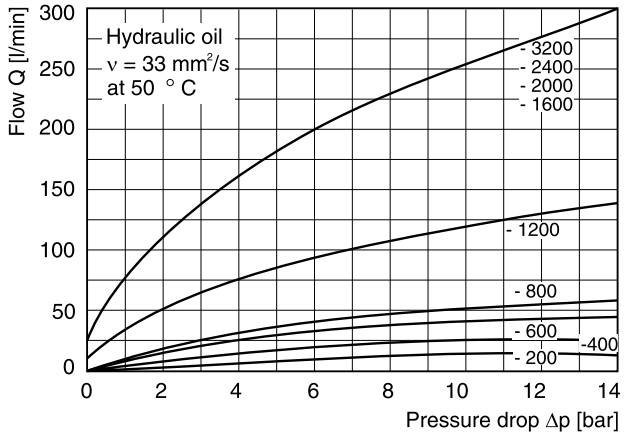
Code	Clamping screw
omit	**Hexagon socket**
F	With knurled knob
T	Tamper-proof

Code	Needle
omit	**Standard 2-stage needle**
4 [3]	Micro-fine hollow needle with slot

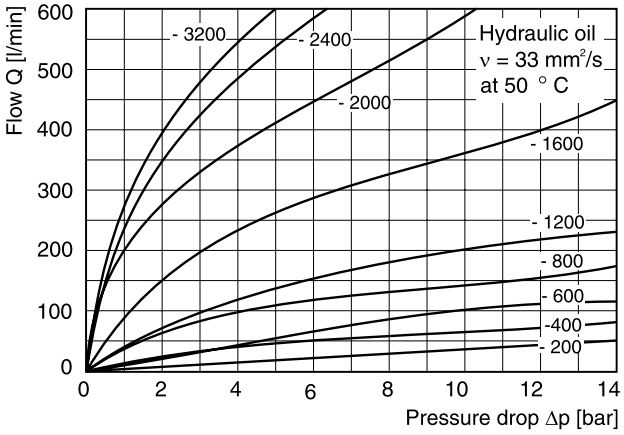
[3] only for sizes 200 to 600

Bold letters =
Short-term availability

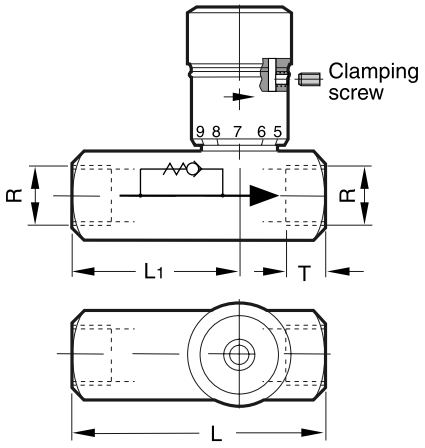
Controlled flow vs. pressure drop needle fully open

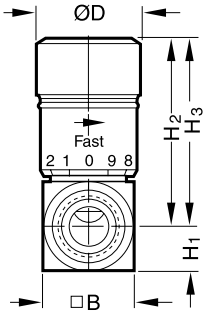


Free flow vs. pressure drop needle fully open

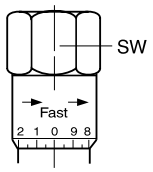


Dimensions

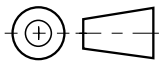




H_2 = closed
H_3 = open



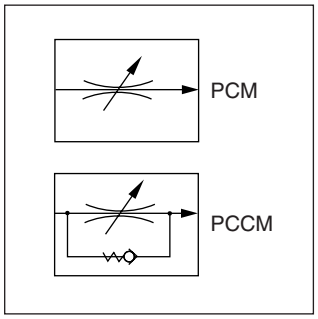
Hexagon adjusting knob, standard for sizes 1600 to 3200



Size	R*	H3	H2	H1	B	L1	L	ØD	SW	T
200	1/8	39	35	8	16	36	51	19	-	9
400	1/4	46	40	10.5	21	43	67	21	-	13
600	3/8	55	49	13	26	45	70	25	-	13
800	1/2	69	61	16	32	57	87	30	-	16
1200	3/4	86	71	19	38	65	99	35	-	17
1600	1	124	107	22.5	45	83	127	-	47.8	20
2000	1 1/4	130	114	29	58	99	143	-	-	21.5
2400	1 1/2	137	120	35	70	114	143	-	-	23.5
3200	2	146	130	44.5	89	134	165	-	-	25

* Pipe thread G or NPTF

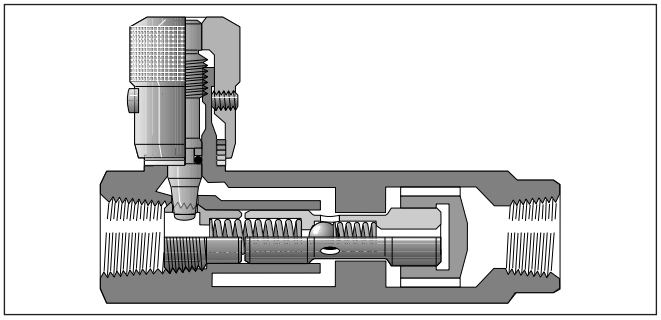
Manatrol 2 way flow control valves for pressure compensated regulation of the flow rate. As a consequence of pressure changes, the set value can vary by ± 5% within the tolerance range. Viscosity changes have the same effect and are to be observed.



Technical data

Size	Max. press. [bar]	Flow control		Check valve		Weight [kg]
		Q* [l/min]	Δp [bar]	Q_{max} [l/min]	Δp [bar]	
400	210	1 - 10	7	20	3	0.82
600	210	2 - 25	7	30	3	1.05
800	210	6 - 60	11	75	8	1.68
1200	210	10 - 100	11	130	8	3.64
1600	210	19 - 190	11	250	10	6.59

* Min. and max. flow rate



Ordering code

☐	**PC**	☐	**M**	☐	**S**	☐	☐	☐	
Thread type	**Press. comp. flow control valve**	**Design**		**Thread size**	**Steel body**	**Clamping screw**	**Seal**	**Design series** (is determined by factory)	

Code	Thread
omit	NPTF
9	**BSPP**

Code	Design
omit	**Without check valve**
C	With check valve

Code	Size
400	**1/4**
600	**3/8**
800	**1/2**
1200	**3/4**
1600	**1**

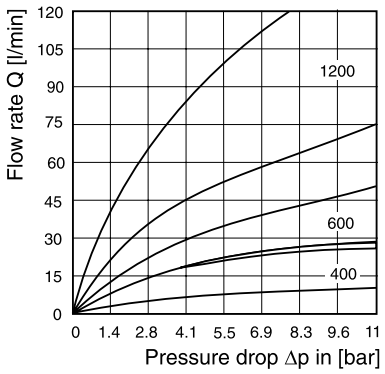
Code	Seal
omit	**NBR**
V	FPM

Code	Clamping screw
omit	**Hexagon socket**
F	With knurled knob
T [2]	Tamper-proof

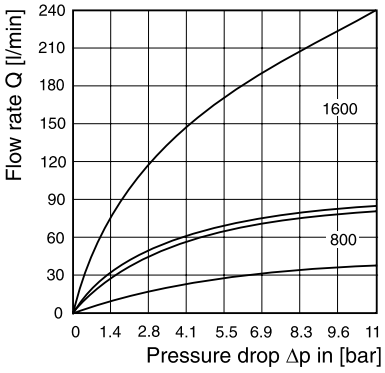
[2] not available above size 1200

Bold letters =
Short-term availability

Δp/Q curves

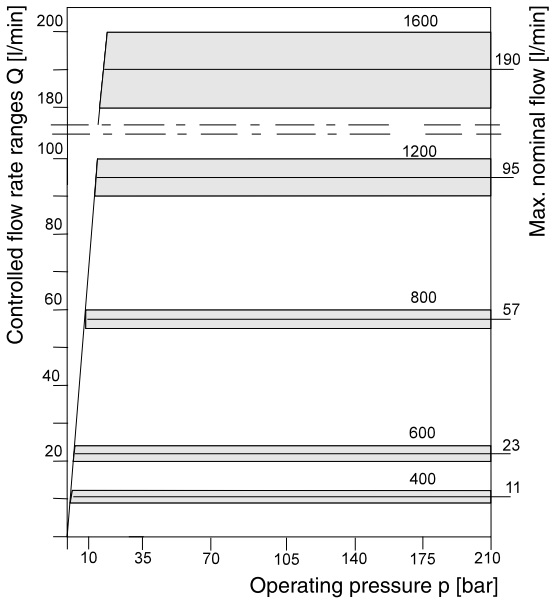


Sizes 400, 600 and 1200: Pressure drop Δp for flow through check valve in range Q_{max} / Q_{min} with each size



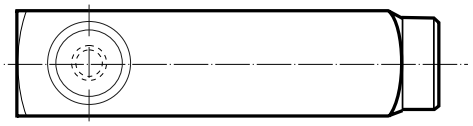
Sizes 800 and 1600: Pressure drop Δp for flow through check valve in range Q_{max} / Q_{min} with each size

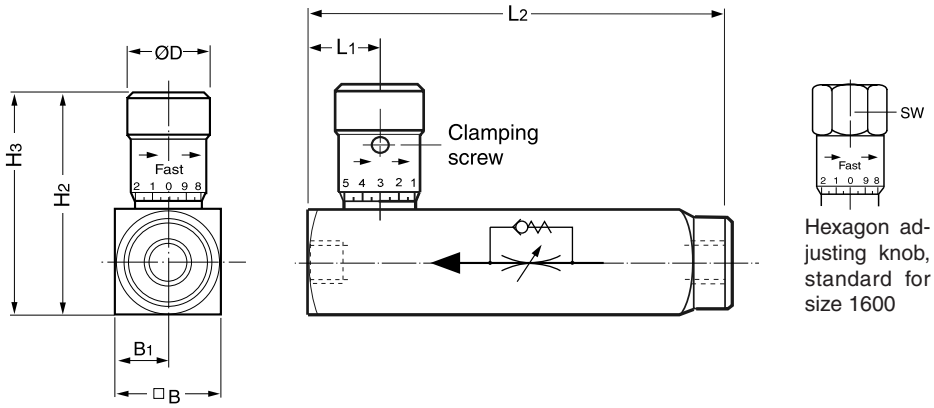
Size 400 - 1600 p/Q control characteristic



The curves refer to hydraulic oil of 33 cSt / 50°C.

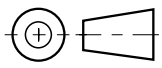
Dimensions





Hexagon adjusting knob, standard for size 1600

H_2 = closed
H_3 = open

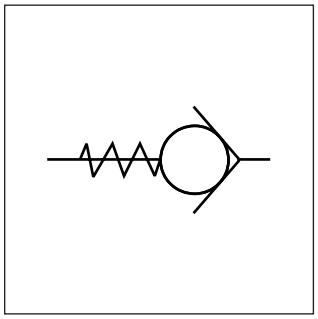


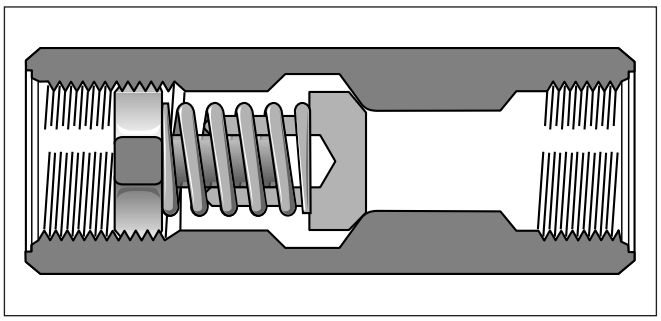
Size	R*	H3	H2	B	L1	B1	L2	ØD	SW
400	1/4	69	64	35	16	18	92	21	-
600	3/8	80	74	38	18	19	106	25	-
800	1/2	103	95	44	22	22	125	30	-
1200	3/4	128	116	57	28	29	149	35	-
1600	1	175	158	70	33	35	176	-	47.8

* Pipe thread G or NPTF

Manatrol check valves of series C for pipe mounting provide free flow in one direction and block flow in the counter direction. Depending on material specification, these valves are suited for use in hydraulic and pneumatic systems.

Specific poppets and poppet guides ensure reliable functional integrity even at high flow rates and/or pulsations.





Technical data

Size			200	400	600	800	1200	1600
Max. operating pressure	steel	[bar]	350	350	350	350	350	210
	brass	[bar]	140	140	140	140	140	34
Pressure drop Δp		[bar]	10	10	10	10	1	1
Flow Q		[l/min]	40	65	110	155	112	160

Ordering code

		C			
Thread type		Pipe mounting	Port size	Body	Opening pressure

Code	Thread
omit	NPTF
9	**BSPP**

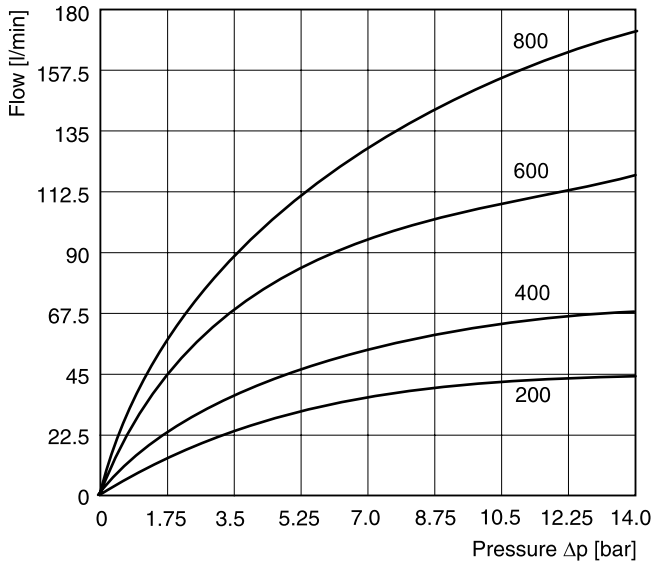
Code	Size
200	1/8
400	**1/4**
600	**3/8**
800	**1/2**
1200	**3/4**
1600	**1**

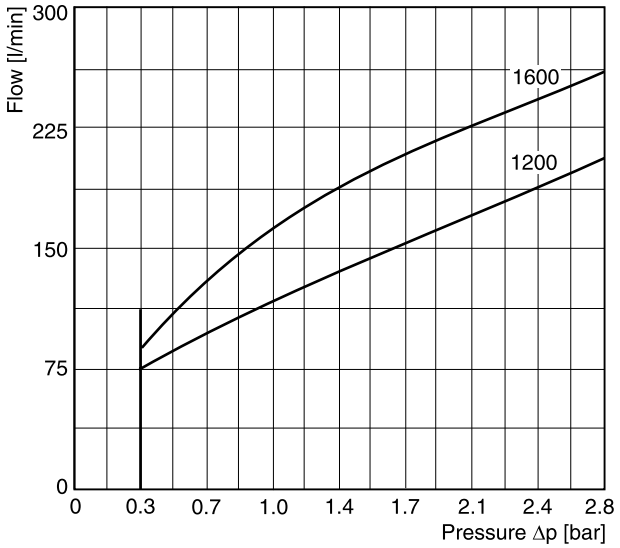
Code	Pressure [bar]
omit	**0.35**
65	4.5

Code	Body
S	**Steel**
B	Brass

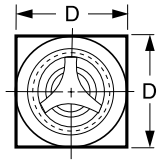
Bold letters =
Short-term availability

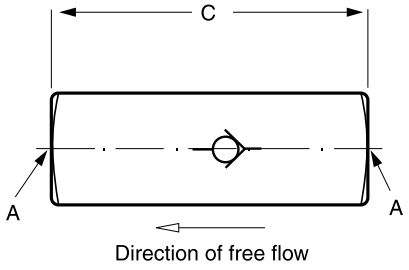
Δp/Q performance curves

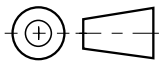




Dimensions





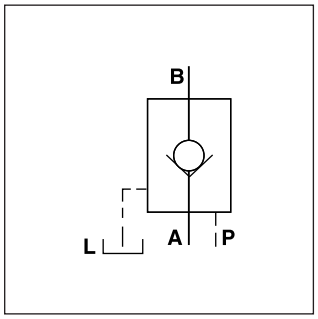


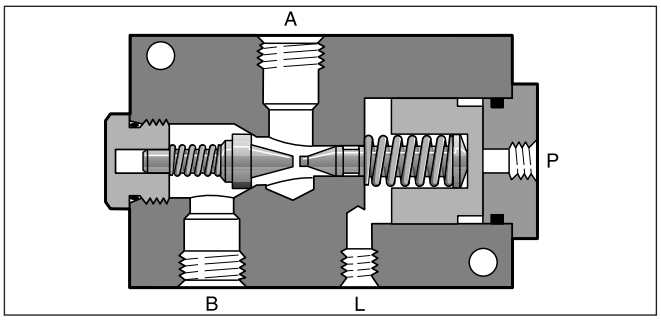
Size	Threaded connection R*		Dimensions [mm]		Weight [kg]
	G thread	NPTF thread	B	L	
C 200	R 1/8"	1/8-27 NPTF	16	51	0.05
C 400	R 1/4"	1/4-18 NPTF	21	66	0.2
C 600	R 3/8"	3/8-18 NPTF	25	70	0.2
C 800	R 1/2"	1/2-14 NPTF	32	87	0.6
C 1200	R 3/4"	3/4-14 NPTF	38	99	0.9
C 1600	R 1"	1-11-1/2 NPTF	45	127	1.5

* For alternative thread design, see ordering code.

Pilot operated check valves of the series CP allow free flow in one direction (A to B).

The counter direction (B to A) is blocked. By applying pilot pressure, the poppet can be lifted from its seat against the pressure in port B. Thus flow in the counter direction is also possible. There are 1 and 2 stage poppets available with pilot ratios of 1 : 5 and 1 : 40, to suit different operating conditions.



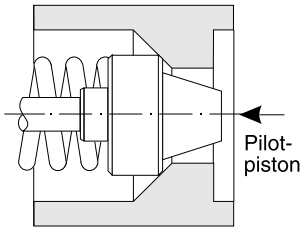


Technical data

Size		600	1200
Max. operating pressure	[bar]	210	210
Max. pilot pressure	[bar]	210	70
Flow Q_{max} at Δp 2.7bar	[l/min]	30	95
Nominal size		3/8	3/4
Weight	[kg]	4	7

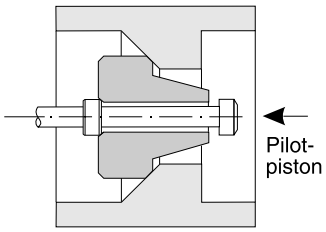
Pilot ratios

Poppet 1 stage



Surface ratio 5 : 1 (pilot spool-poppet surface) for quick response time without decompression.

Poppet 2 stage



Surface ratio 40 : 1 (pilot spool decompression pin surface) for low shock or oscillation performance from decompression.

Ordering code

	CP		S		M	
Thread type	Check valve, pilot operated	Port size	Steel body	Pilot ratio	Steel poppet	Seal

Code	Thread
omit	NPTF
9	**BSPP**

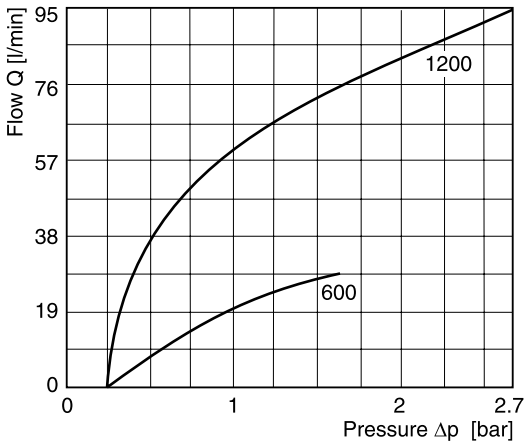
Code	Size
600	**3/8**
1200	**3/4**

Code	Seal
omit	**NBR**
V	FPM

Code	Pilot ratio	Stage
5	**5 : 1**	**1**
40	40 : 1	2

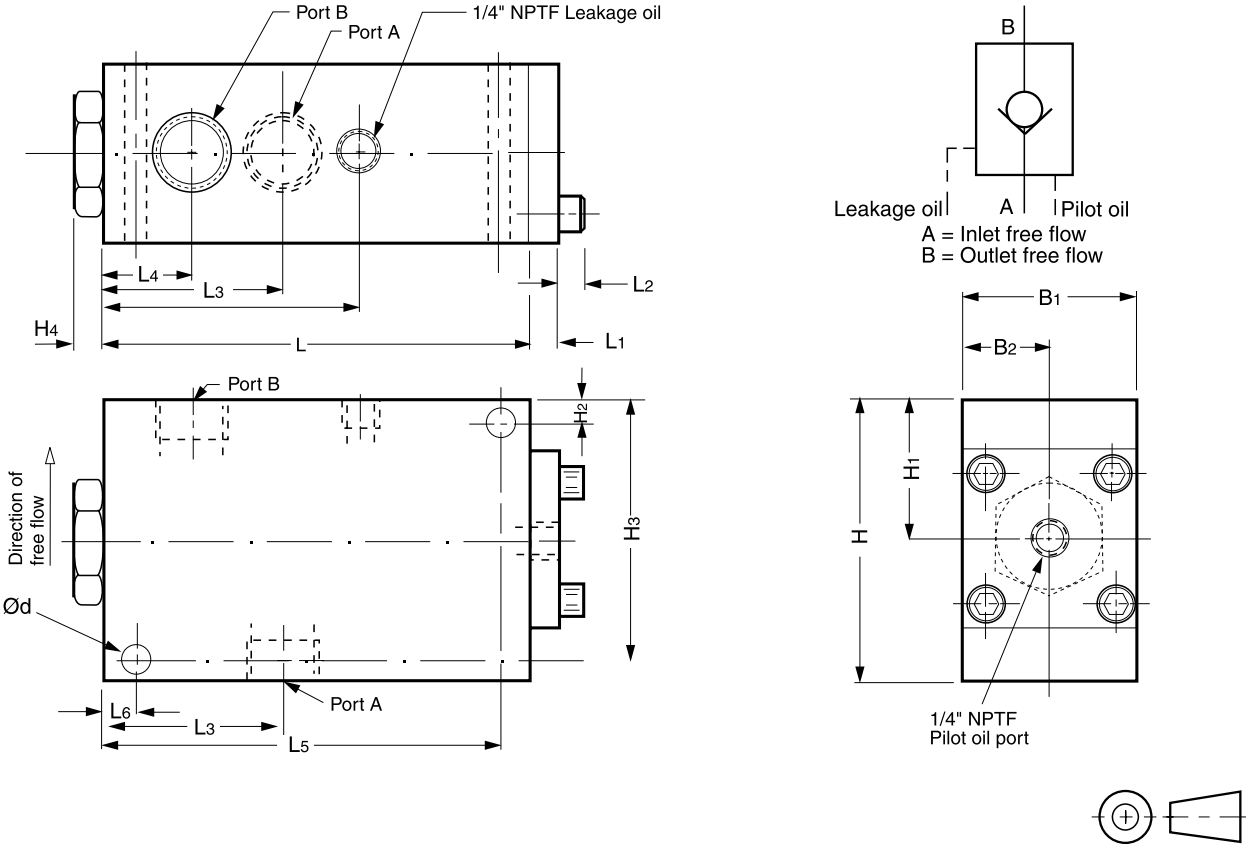
Bold letters =
Short-term availability

Δp/Q performance curves



The curves refer to hydraulic oil of 33 cSt and 50°C.

Dimensions



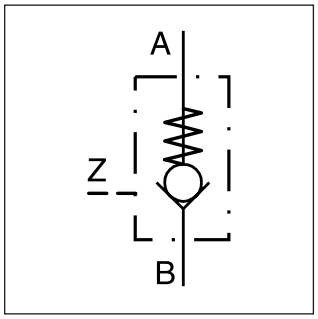
Size	A, B	L_3	B_1	B_2	H_1	H	L_4	L_7	H_4	L	L_1	H_2	H_3	L_6	L_5	Ød	W
9CP600S	G3/8	53.3	50.8	25.4	38.1	76.2	25.4	76.2	10.4	120.7	10.7	9.4	66.5	9.4	111	9.1	-
9CP1200S	G3/4	63.5	63.5	31.8	50.8	101.6	31.8	91.2	10.7	152.4	11.43	11.2	90.4	11.2	141.2	10.7	7.9

Pilot operated check valves series RH allow free flow in one direction (B to A). The counter flow is blocked (A to B). By applying pilot pressure the ball can be lifted from its seat and allow flow from A to B.

Most common use:

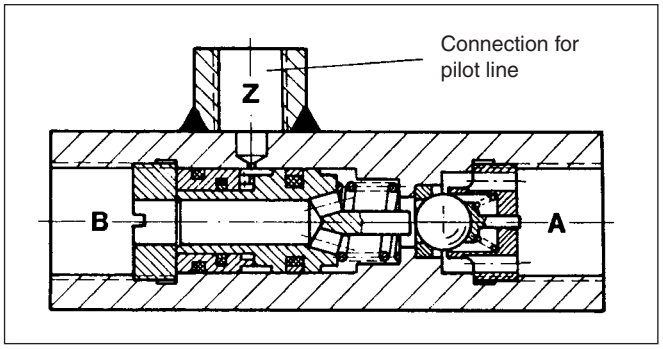
- Keeping cylinders leak-free in position, when spool type directional control valves are used
- Return line discharge, when return flow exceeds functional limits of directional control valve at differential cylinders
- As hydraulically activated drain or circulation valve

The valves are available without and with hydraulic pre-discharging.



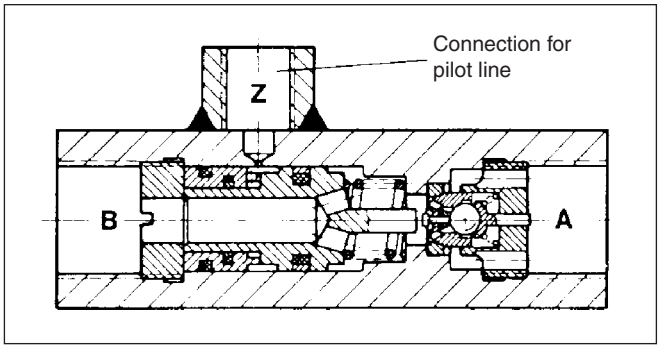
Without pre-discharging

These valves have a ball as valve element, which quickly enables the full flow cross-section proportionally during pilot operation. A metering position in the pilot port dampens the control movement of the pilot spool so that pressure shocks (unloading shocks) are mostly suppressed.



With pre-discharging

For valves with pre-discharging a spherical polished valve spool (seat valve function) is built-in instead of a ball. The additional check valve achieves a pre-opening which provides shock-free unloading of the fluid, especially at high working pressure and large volumes.



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Technical data

Code	RH	1	2	3V	4V
Max. operating pressure	[bar]	700	700	500	500
Flow approx.	[l/min]	15	35	55	100
Pilot flow volume	[cm³]	0.15	0.22	0.4	1
Pipe connections DIN ISO 228/1 A, B		G 1/4	G 3/8	G 1/2	G 3/4
Pipe connections DIN ISO 228/1 Z		G 1/4	G 1/4	G 1/4	G 1/4
Weight	[kg]	0.4	0.4	0.6	1.3
Mounting		Freely suspended in the pipeline			
Mounting position		unrestricted			
Fluid		Hydraulic oil 10...68 mm²/s (ISO VG 10 to 68 as per DIN 51 519)			
Viscosity recommended	[cSt]/[mm²/s]	10...500			
Viscosity permitted	[cSt]/[mm²/s]	4...1500			
Temperatures	[°C]	Fluid and ambient: -40...+80; observe viscosity range!			

Ordering code

RH — Check valve, hydr. pilot operated

□ — Flow

□ — Pre-discharging

Code	Flow [l/min]
1	15
2	**35**
3	**55**
4	100

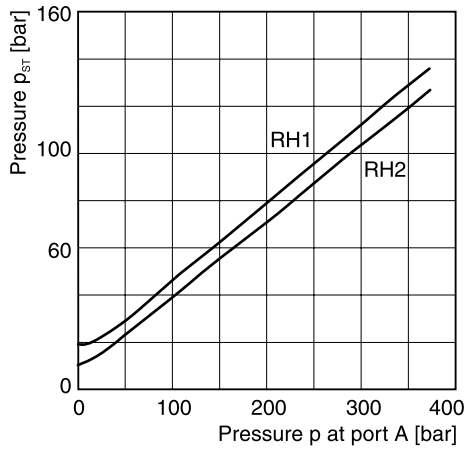
Code	Pre-discharging
V*	**with**
omit	**without**

* only for sizes 3 and 4

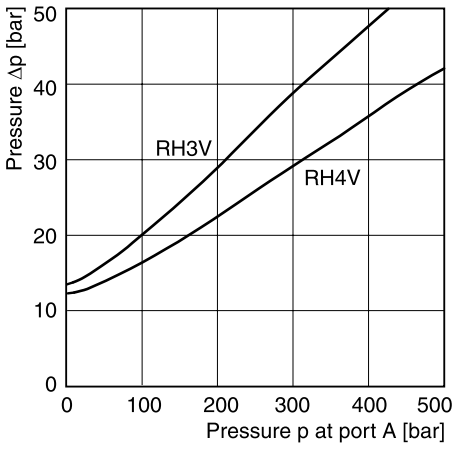
Bold letters =
Short-term availability

Pilot pressure p_{St} for pilot operation of the main valve

(p_B = 0 bar)



Pilot pressure p_{St} for pilot operation of pre-discharging



for keeping open		
p_{St}		$p_B + \Delta p + k$
p_B	[bar]	pressure on side B
Δp	[bar]	flow resistance A to B as per $\Delta p/Q$ performance curve
k		10 at RH 1 and RH 2
		7 at RH 3 V
		8 at RH 4 V

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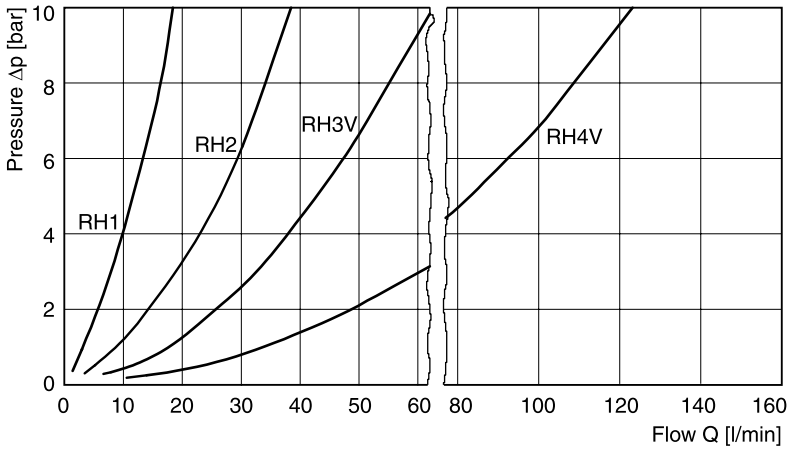
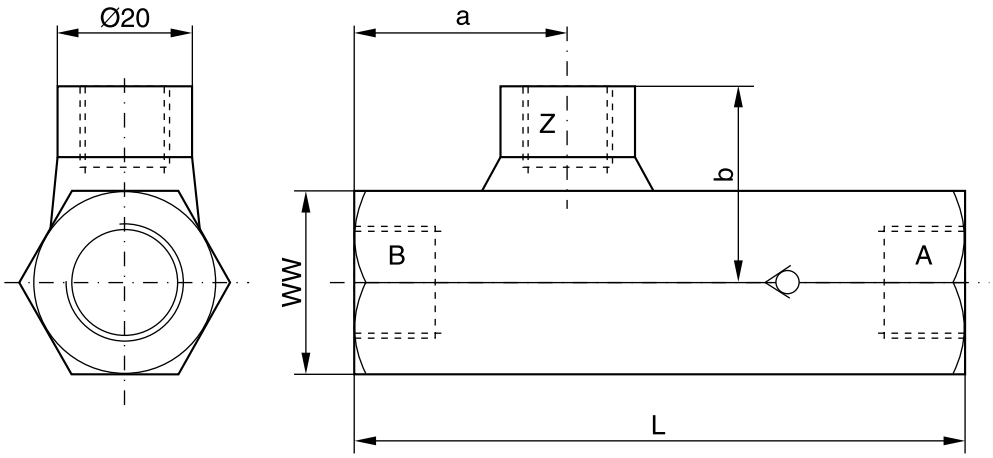
Performance curves $\Delta p/Q$ (valid for flow polarity B to A and pilot operated direction A to B)



Opening pressure B to A 0.2...0.3 bar

Oil viscosity during the measurement, 60 mm²/s

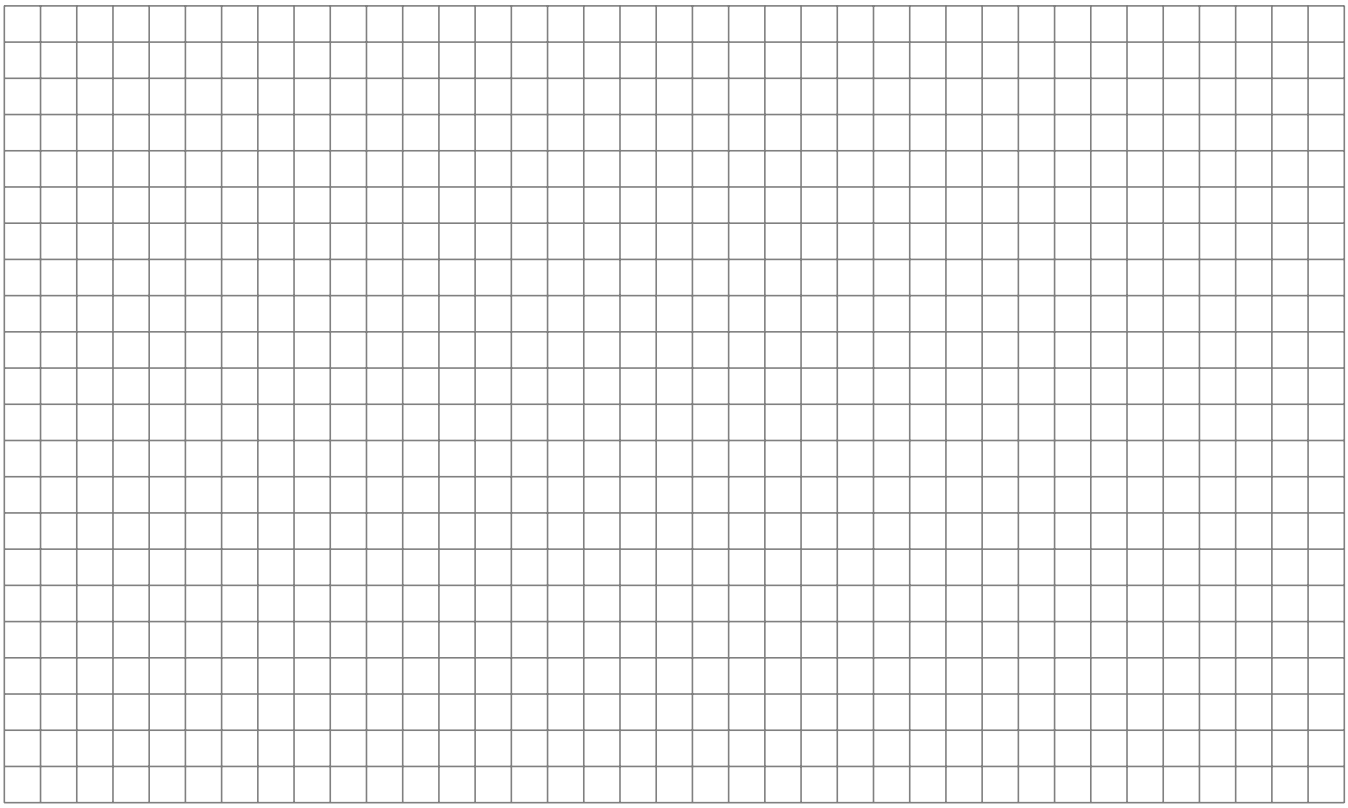
For viscosities over approx. 500 mm²/s, a strong Δp-increase is to be expected for smaller types (RH1...RH3).



Type	Port *		L	a	b	SW
	A, B	Z				
RH 1	G 1/4	G 1/4	84	31.5	27	24
RH 2	G 3/8	G 1/4	90	32	28.5	27
RH 3 V	G 1/2	G 1/4	100	36.5	31	32
RH 4 V	G 3/4	G 1/4	126	45	35.5	41

* as per DIN 228/1, suitable for pipe connections with thread studs form B as per DIN 3852 page 2.

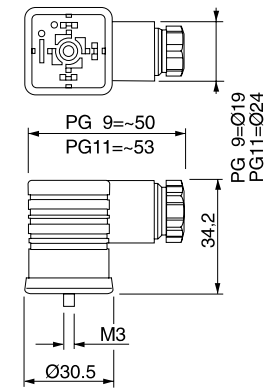
Notes



Parker Hannifin GmbH & Co. KG
Hydraulic Controls Division
Kaarst, Germany

Description	Threaded cable joint	Body colour coding	Figures switching	Order no.
Plug DIN 43650, design type AF, protection class IP 65 Voltages up to 250 V	PG 9	black, B grey, A	Fig. 1	**5001710** **5001711**
	PG11	black, B grey, A	Fig. 1	**5001716** **5001717**

Fig. 1



Other plugs on request

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Notes