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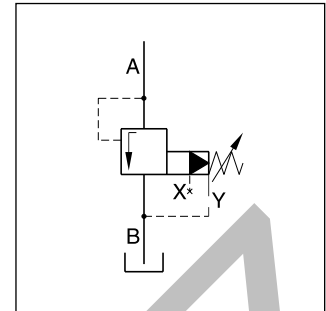
**Characteristics**

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.



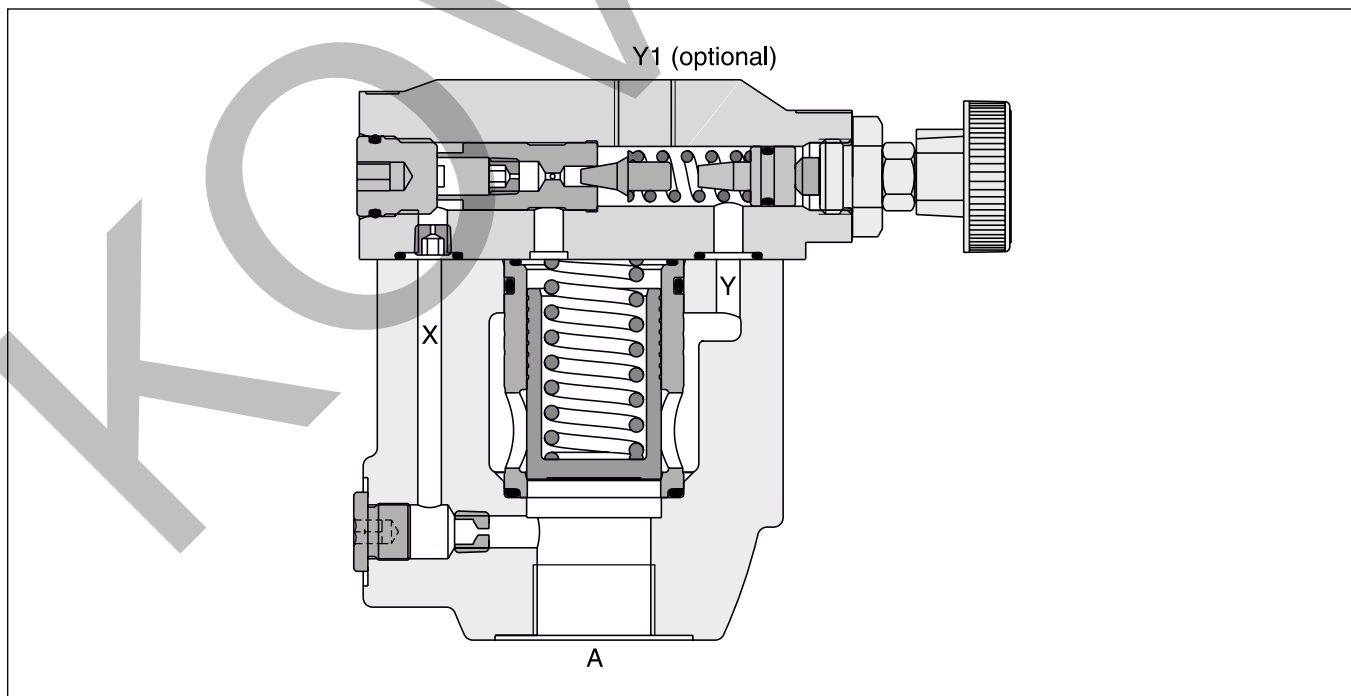
R4V10 L-body



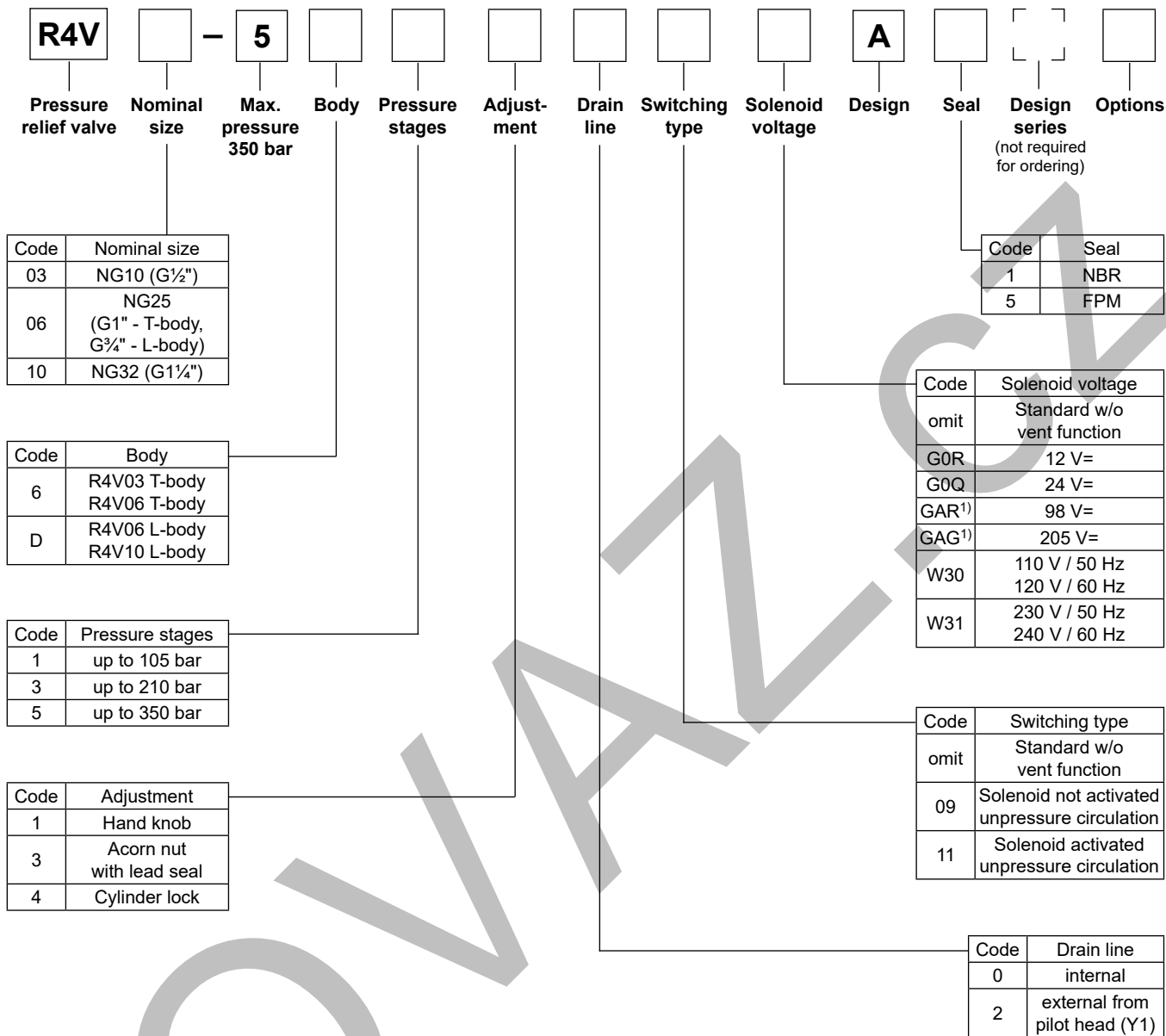
**Features**

- Pilot operated with manual adjustment
- 2 interfaces:
  - L-body (R4V06-G $\frac{3}{4}$ "", R4V10-G1 $\frac{1}{4}$ "")
  - T-body (R4V03-G $\frac{1}{2}$ "", R4V06-G1"")
- 3 pressure stages
- 3 adjustment modes
  - Hand knob
  - Acorn nut with lead seal
  - Cylinder lock
- With optional vent function

**R4V06 L-body**



Ordering Code



<sup>1)</sup> To be used in combination with rectifier plugs at 120 VAC / 230 VAC power supply.

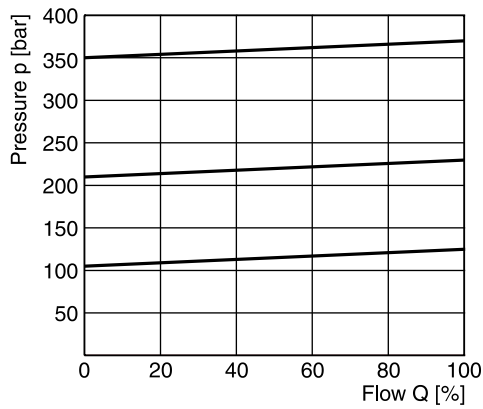
**R4V**

General				
Design	T-body		L-body	
Size	03 (½")	06 (1")	06 (¾")	10 (1¼")
Mounting	Threaded body			
Mounting position	unrestricted			
Ambient temperature [°C]	-20...+60			
MTTF <sub>D</sub> value [years]	75			
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 according to DIN 51524			
Fluid temperature [°C]	-20...+70 (NBR: -25...+70)			
Viscosity permitted [cSt] / [mm²/s]	20...400			
Viscosity recommended [cSt] / [mm²/s]	30...80			
Filtration	ISO 4406 (1999); 18/16/13			

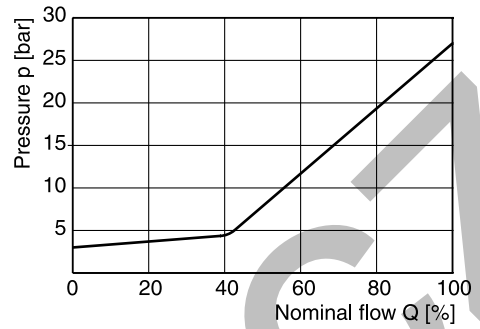
**R4V with vent function**

General							
Design	T-body		L-body				
Size	03 (½")	06 (1")	06 (¾")	10 (1¼")			
Mounting	Threaded body						
Mounting position	unrestricted						
Ambient temperature [°C]	-20...+60						
MTTF <sub>D</sub> value [years]	75						
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 according to DIN 51524						
Fluid temperature [°C]	-20...+70 (NBR: -25...+70)						
Viscosity permitted [cSt] / [mm²/s]	20...400						
Viscosity recommended [cSt] / [mm²/s]	30...80						
Filtration	ISO 4406 (1999); 18/16/13						
Electrical (solenoid)							
Duty ratio	100 % ED; CAUTION: coil temperature up to 150 °C possible						
Protection class	IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)						
	Code	G0R	G0Q	GAR	GAG	W30	W31
Supply voltage [V]		12 V =	24 V =	98 V =	205 V =	110 at 50 Hz 120 at 60 Hz	230 at 50 Hz 240 at 60 Hz
Tolerance supply voltage [%]		±10	±10	±10	±10	±5	±5
Current consumption hold [A]		2.72	1.29	0.33	0.13	0.6 / 0.55	0.3 / 0.27
Current consumption in rush [A]		2.72	1.29	0.33	0.13	2.5 / 2.4	1.25 / 1.2
Power consumption hold [W]		32.7	31	31.9	28.2	70/70 VA	70/70 VA
Power consumption in rush [W]		32.7	31	31.9	28.2	280/290 VA	280/290 VA
Solenoid connection	Connector as per EN175301-803, solenoid identification as per ISO 9461						
Wiring min. [mm²]	3 x 1.5 recommended						
Wiring length max. [m]	50 recommended						

**p/Q performance curve <sup>1)</sup>**

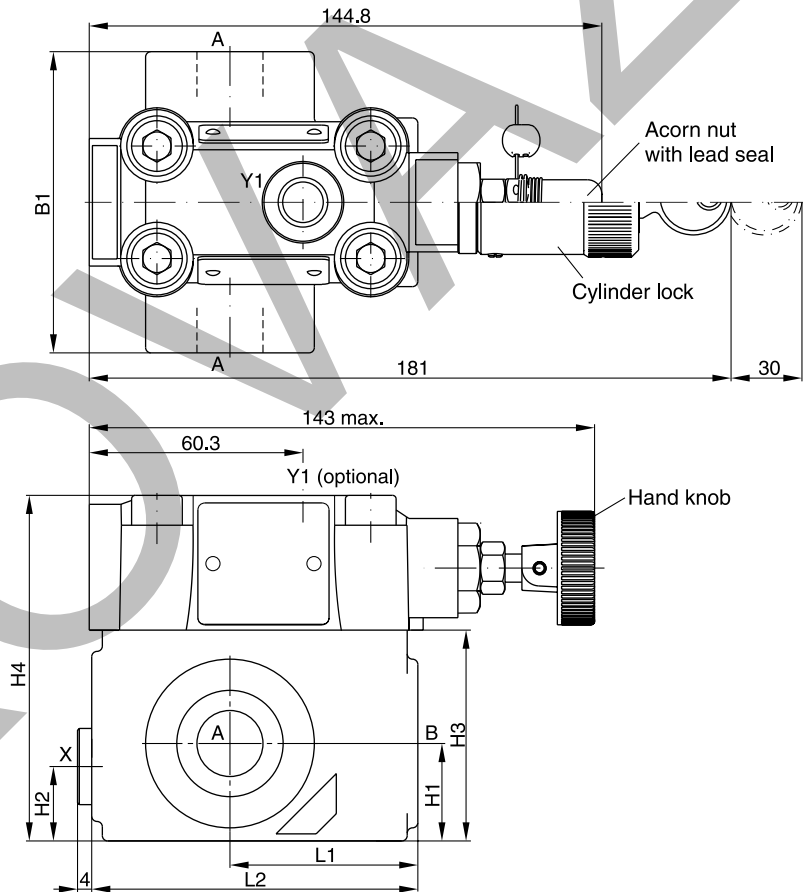


**Minimum pressure curve**



All characteristic curves measured with HLP46 at 50 °C.

**Dimensions  
 T-body**

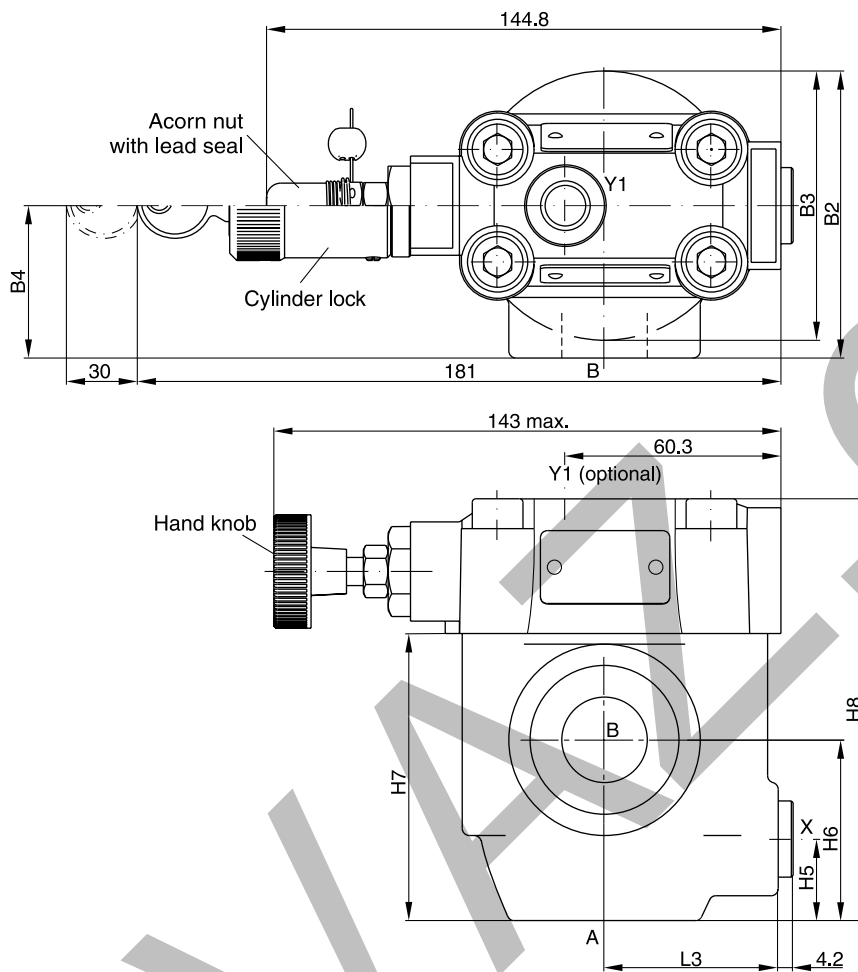


**10**

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

**Dimensions**

**L-body**



10

Seal kits		
NG	NBR	FPM
03	S26-58507-0	S26-58507-5
06	S26-58475-0	S26-58475-5
10	S26-58508-0	S26-58508-5

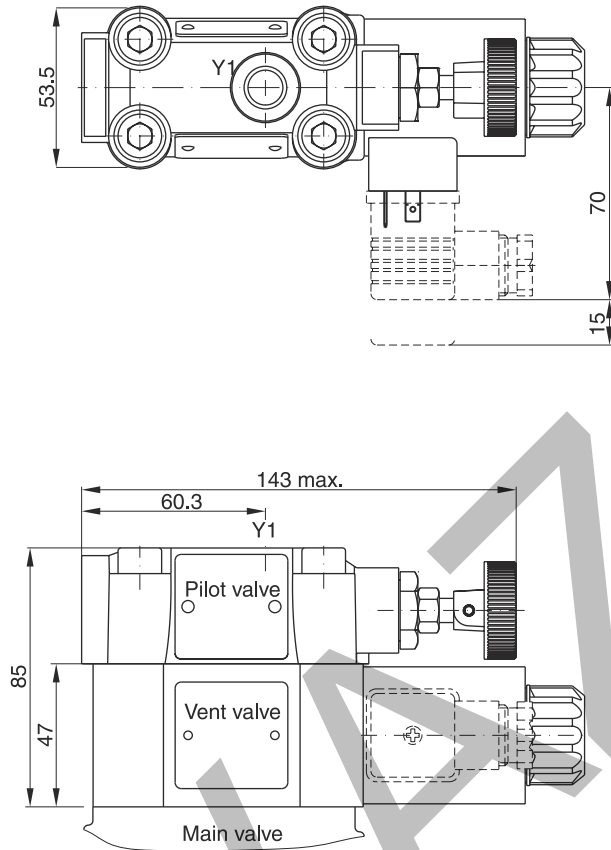
NG	Body	B1	B2	B3	B4	H1	H2	H3	H4	H5	H6	H7	H8	L1	L2	L3
03	T-body	85	-	-	-	27.5	21	59.5	97.5	-	-	-	-	53	92	-
06	T-body	136	-	-	-	38	28	93	131	-	-	-	-	66.5	117.5	-
06	L-body	-	81	76	43	-	-	-	-	23	51	81	119	-	-	49
10	L-body	-	120.7	85.8	77.8	-	-	-	-	38.1	50.8	96	134	-	-	49.8

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 <sup>1)</sup>	external remote control or vent connection	G¼"	G¼"	G¼"	G¼"
Y1 <sup>2)</sup>	external drain	G¼"	G¼"	G¼"	G¼"

<sup>1)</sup> Closed when supplied.

<sup>2)</sup> Port Y1 is only available at drain line (code 2) external from the pilot head.

**R4V with vent function**



Seal kits	
NBR	FPM
<b>DC solenoid</b>	
S56-40609-0	S56-40609-5
<b>AC solenoid</b>	
S26-35237-0	S26-35237-5

Code	Internal drain	External drain
11		
09		

**10**

**Characteristics**

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.

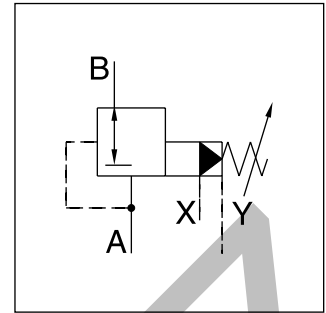
The valves are available with 2 ports (L-body) or with 3 ports (T-body).

**Features**

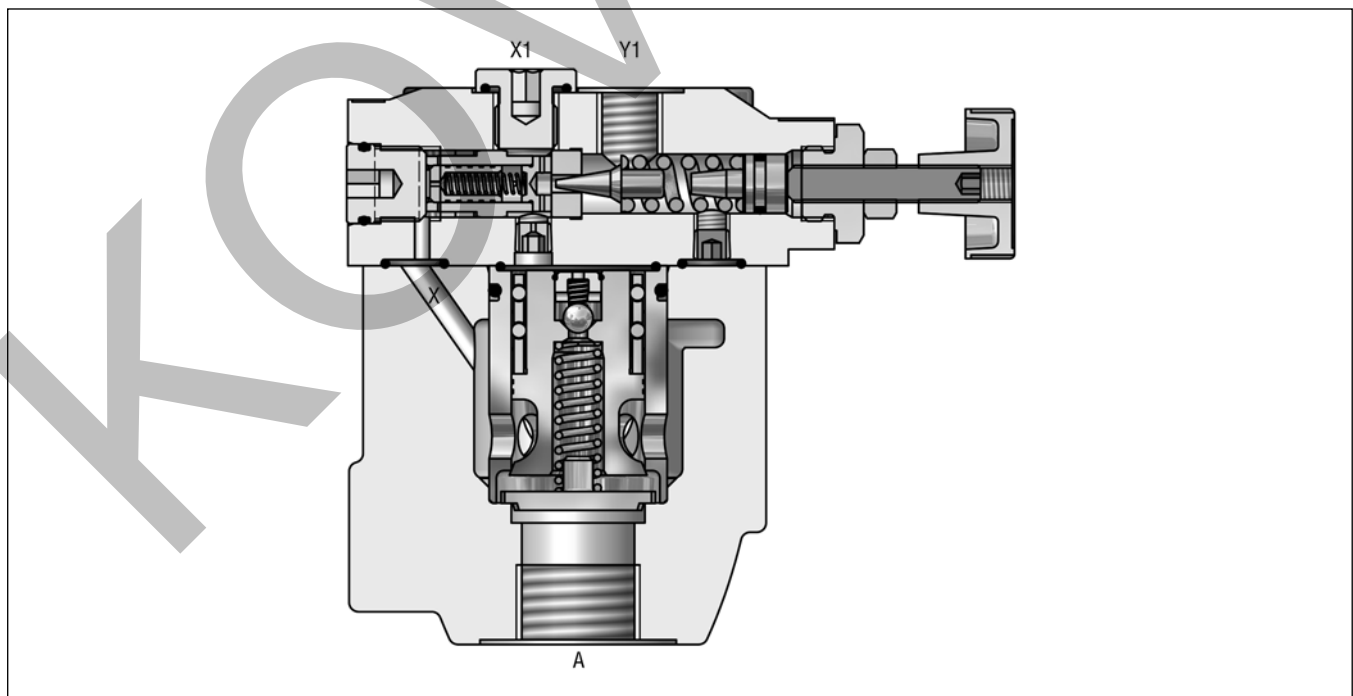
- Pilot operated with manual adjustment
- Normally closed to avoid undesired motion
- 2 interfaces
  - L-body (R4R06-G $\frac{3}{4}$ ", R4R10-G1 $\frac{1}{4}$ " )
  - T-body (R4R03-G $\frac{1}{2}$ ", R4R06-G1" )
- 3 pressure stages
- 3 adjustment modes
  - Hand knob
  - Acorn nut with lead seal
  - Cylinder lock
- With optional vent function



R4R10 L-body



R4R06 L-body





Ordering Code

<b>R4R</b>		<b>5</b>				<b>2</b>			<b>B</b>		
Pressure reducing valve	Nominal size	Max. pressure 350 bar	Body	Pressure stages	Adjustment	Drain line ext. from pilot head (Y1)	Switching type	Solenoid voltage	Design series	Seal	Options

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 105 bar
3	up to 210 bar
5	up to 350 bar

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

Code	Seal
1	NBR
5	FPM

Code	Solenoid voltage
omit	Standard w/o vent function
G0R	12 V=
G0Q	24 V=
GAR <sup>1)</sup>	98 V=
GAG <sup>1)</sup>	205 V=
W30	110 V / 50 Hz 120 V / 60 Hz
W31	230 V / 50 Hz 240 V / 60 Hz

Code	Switching type
omit	Standard w/o vent function
09	Solenoid not activated, pressure reducer non-active
11	Solenoid activated pressure reducer non-active

<sup>1)</sup> To be used in combination with rectifier plugs at 120 VAC / 230 VAC power supply.

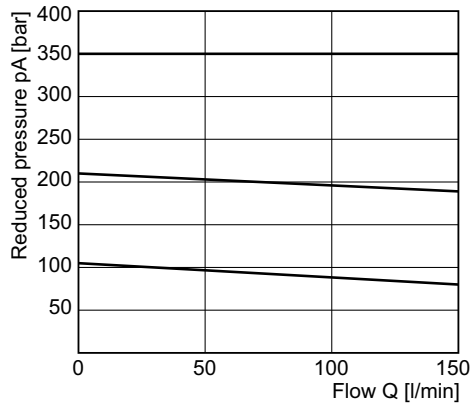
**R4R**

General					
Design	T-body		L-body		
Size	03 (1/2")	06 (1")	06 (3/4")	10 (1 1/4")	
Mounting	Threaded body				
Mounting position	unrestricted				
Ambient temperature	[°C]	-20...+60			
MTTF <sub>D</sub> value	[years]	75			
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 according to DIN 51524				
Fluid temperature	[°C]	-20...+70 (NBR: -25...+70)			
Viscosity permitted	[cSt]/[mm <sup>2</sup> /s]	20...400			
Viscosity recommended	[cSt]/[mm <sup>2</sup> /s]	30...80			
Filtration	ISO 4406 (1999); 18/16/13				

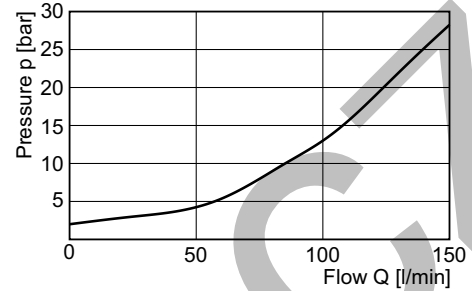
**R4R with vent function**

General								
Design	T-body			L-body				
Size	03 (1/2")	06 (3/4")	06 (1")	10 (1 1/4")				
Mounting	Threaded body							
Mounting position	unrestricted							
Ambient temperature	[°C]	-20...+60						
MTTF <sub>D</sub> value	[years]	75						
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 according to DIN 51524							
Fluid temperature	[°C]	-20...+70 (NBR: -25...+70)						
Viscosity permitted	[cSt] / [mm <sup>2</sup> /s]	20...400						
Viscosity recommended	[cSt] / [mm <sup>2</sup> /s]	30...80						
Filtration	ISO 4406 (1999); 18/16/13							
Electrical (solenoid)								
Duty ratio	100 % ED; CAUTION: coil temperature up to 150 °C possible							
Protection class	IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)							
	Code	G0R	G0Q	GAR	GAG	W30	W31	
Supply voltage	[V]	12 V =	24 V =	98 V =	205 V =	110 at 50 Hz 120 at 60 Hz	230 at 50 Hz 240 at 60 Hz	
Tolerance supply voltage	[%]	±10	±10	±10	±10	±5	±5	
Current consumption	hold	[A]	2.72	1.29	0.33	0.13	0.6 / 0.55	0.3 / 0.27
	in rush	[A]	2.72	1.29	0.33	0.13	2.5 / 2.4	1.25 / 1.2
Power consumption	hold	[W]	32.7	31	31.9	28.2	70 / 70 VA	70 / 70 VA
	in rush	[W]	32.7	31	31.9	28.2	280 / 290 VA	280 / 290 VA
Solenoid connection	Connector as per EN175301-803, solenoid identification as per ISO 9461							
Wiring min.	[mm <sup>2</sup> ]	3 x 1.5 recommended						
Wiring length max.	[m]	50 recommended						

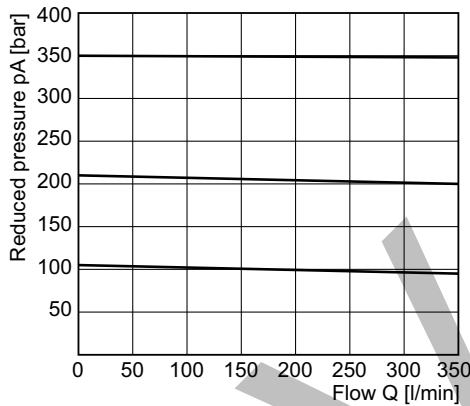
**Reduced pressure pA versus flow Q**  
**R4R03 <sup>1)</sup>**



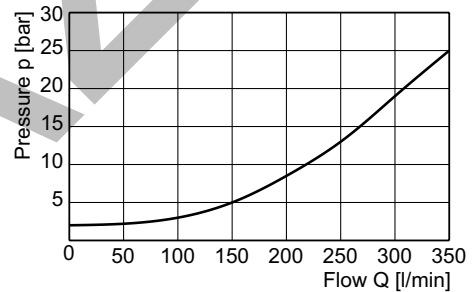
**Minimum pressure curve**



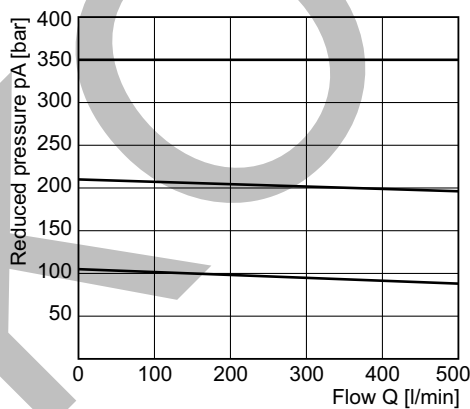
**Reduced pressure pA versus flow Q**  
**R4R06 <sup>1)</sup>**



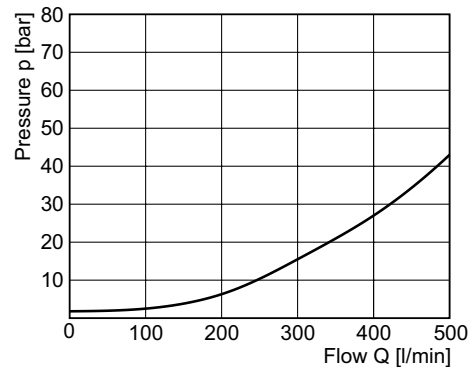
**Minimum pressure curve**



**Reduced pressure pA versus flow Q**  
**R4R10 <sup>1)</sup>**



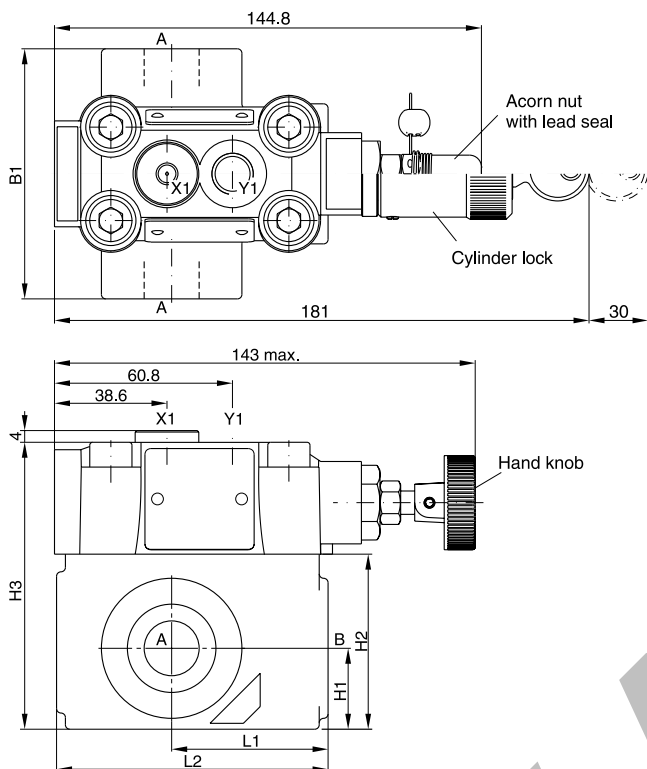
**Minimum pressure curve**



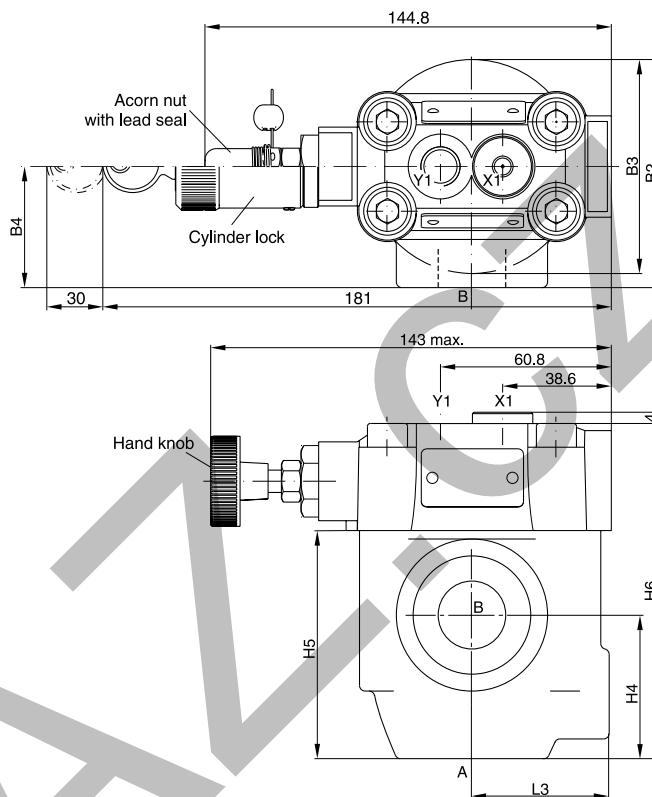
All characteristic curves measured with HLP46 at 50 °C.

<sup>1)</sup> Measured at 350 bar primary pressure pB.

**T-body**



**L-body**



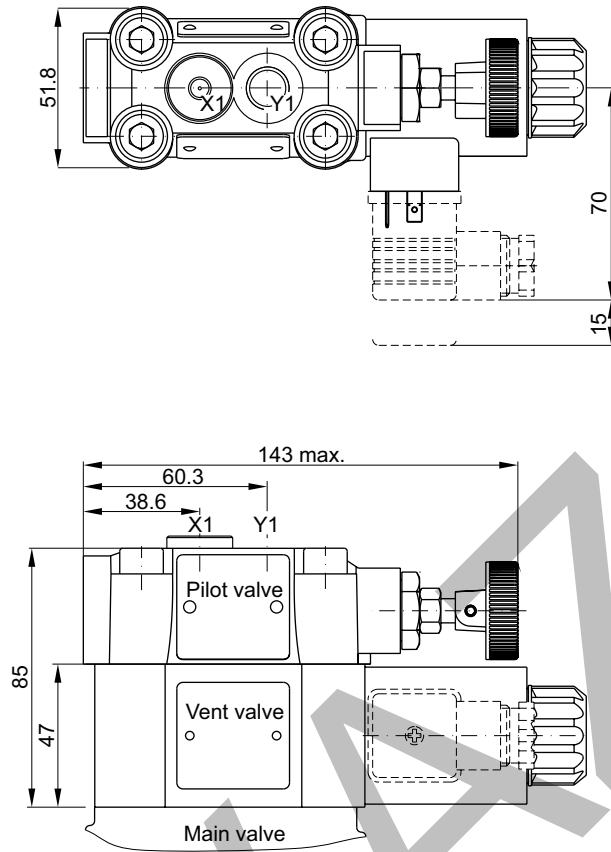
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Seal kits		
NG	NBR	FPM
03	S26-58507-0	S26-58507-5
06	S26-58475-0	S26-58475-5
10	S26-58508-0	S26-58508-5

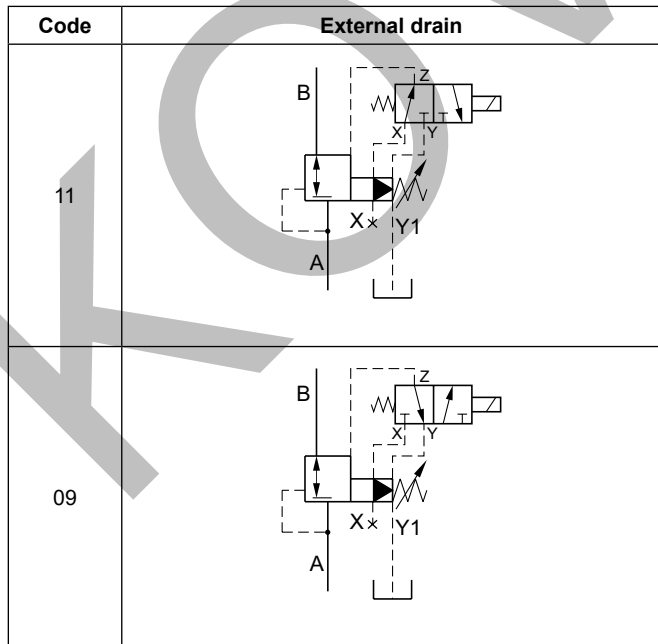
NG	Body	B1	B2	B3	B4	H1	H2	H3	H4	H5	H6	L1	L2	L3
03	T-body	85	-	-	-	27.5	59.5	97.5	-	-	-	53	92	-
06	T-body	136	-	-	-	38	93	131	-	-	-	66.5	117.5	-
06	L-body	-	81	76	43	-	-	-	51	81	119	-	-	49
10	L-body	-	120.7	85.8	77.8	-	-	-	50.8	96	134	-	-	49.8

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	external remote control or vent connection	G¼ "	G¼ "	G¼ "	G¼ "
Y1	external drain	G¼ "	G¼ "	G¼ "	G¼ "

**R4R with vent function**



Seal kits	
NBR	FPM
<b>DC solenoid</b>	
S56-40609-0	S56-40609-5
<b>AC solenoid</b>	
S26-35237-0	S26-35237-5



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**Characteristics**

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.

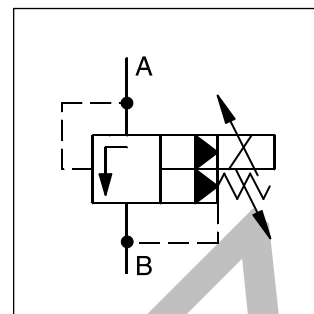
The optimum performance can be achieved in combination with the digital amplifier module PCD00A-400.

**Features**

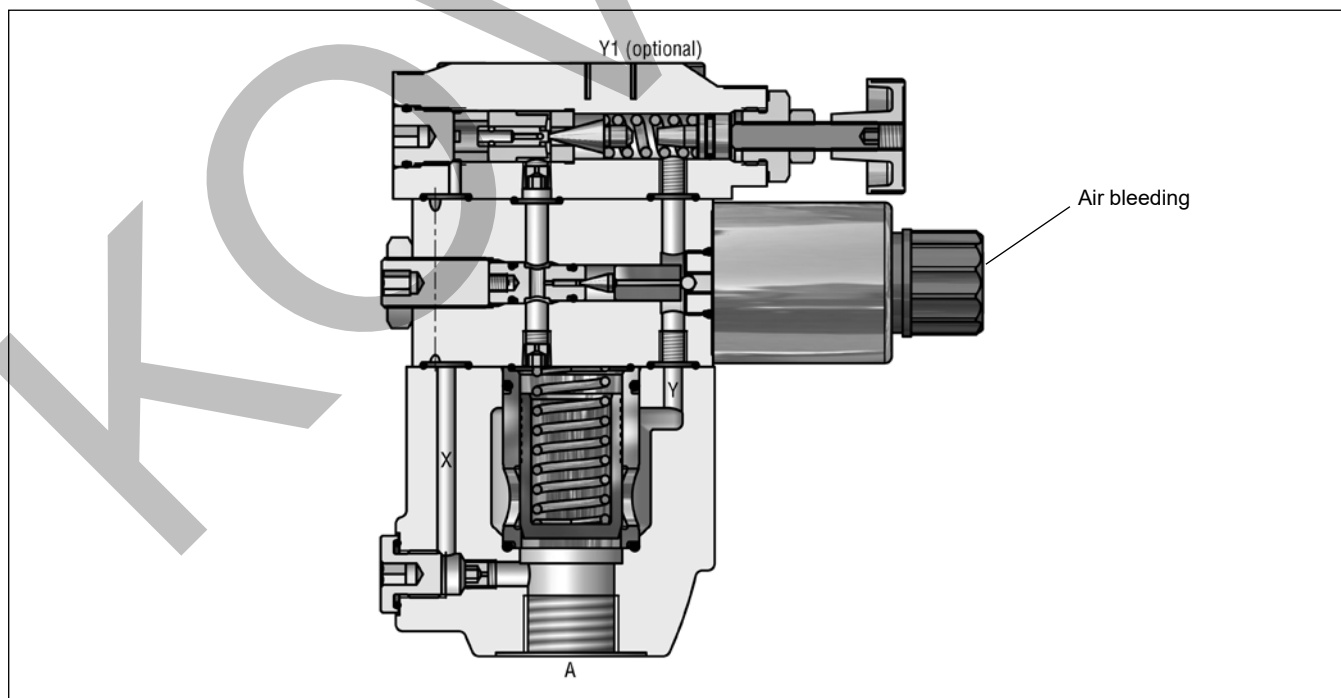
- Continuous adjustment by proportional solenoid
- 2 interfaces
  - L-body (R4V06-G $\frac{3}{4}$ ", R4V10-G1 $\frac{1}{4}$ " )
  - T-body (R4V03-G $\frac{1}{2}$ ", R4V06-G1" )
- 3 pressure stages
- With mechanical maximum pressure adjustment



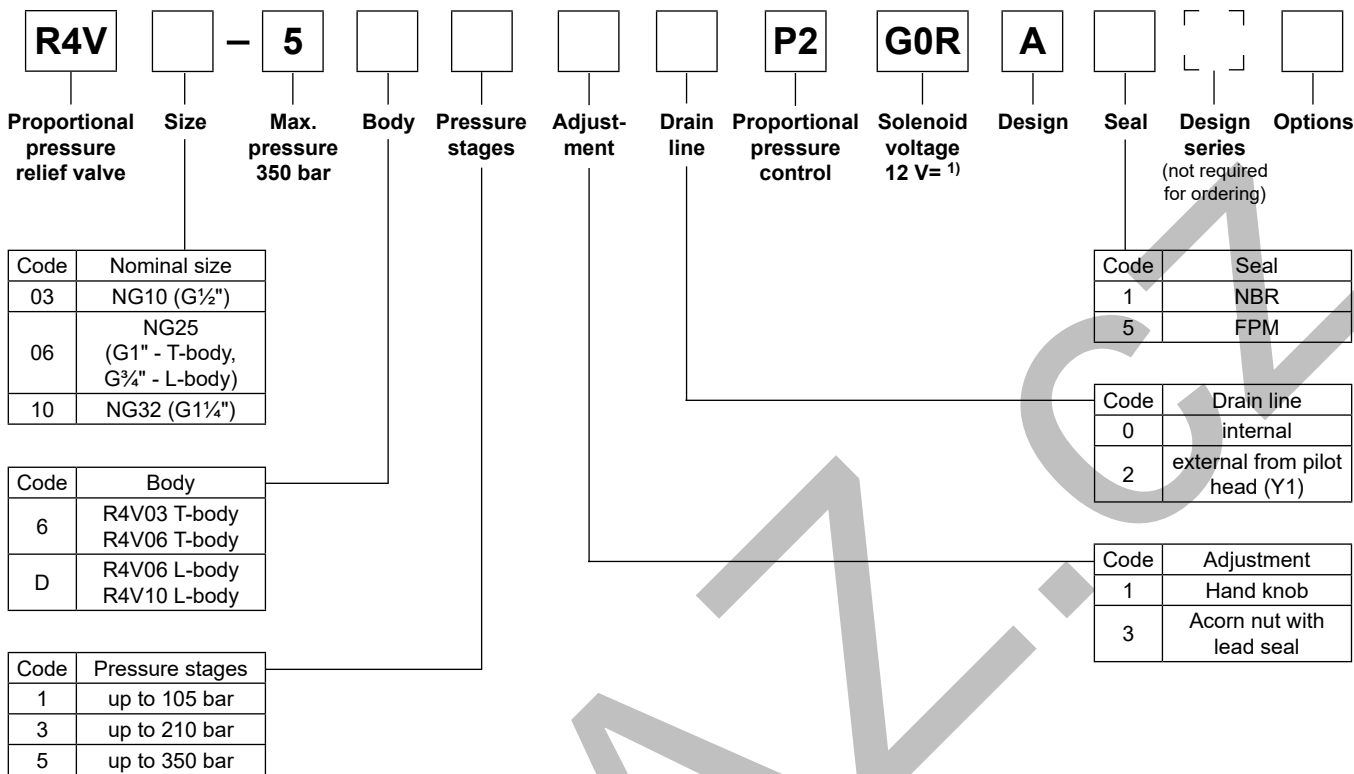
R4V10\*P2 L-body



**R4V06\*P2 L-body**



**Ordering code**



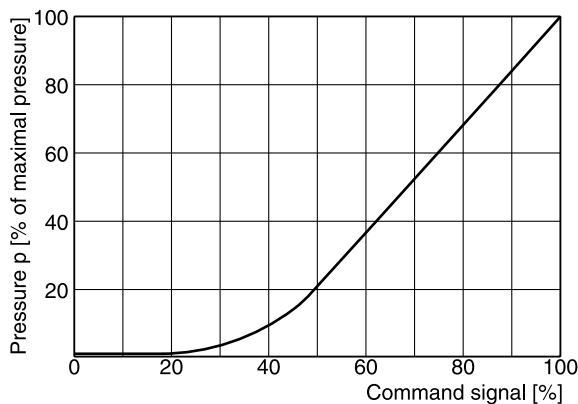
<sup>1)</sup> Onboard electronics on request

**Technical data R4V\*P2**

General				
Design	T-body		L-body	
Size	03 (1/2")	06 (1")	06 (3/4")	10 (1 1/4")
Mounting	Threaded body			
Mounting position	unrestricted			
Ambient temperature	[°C] -20...+60			
MTTF <sub>D</sub> value	[years] 75			
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 according to DIN 51524			
Fluid temperature	[°C] -20...+70 (NBR: -25...+70)			
Viscosity permitted	[cSt] / [mm <sup>2</sup> /s] 20...400			
Viscosity recommended	[cSt] / [mm <sup>2</sup> /s] 30...80			
Filtration	ISO 4406 (1999), 18/16/13			
Electrical (prop. solenoid)				
Duty ratio	[%] 100			
Protection class	IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)			
Nominal voltage	[V] 12 =			
Max. current	[A] 2.3			
Coil resistance	[Ohm] 4 at 20 °C			
Solenoid connection	Connector as per EN175301-803			
Power amplifier	PCD00A-400			

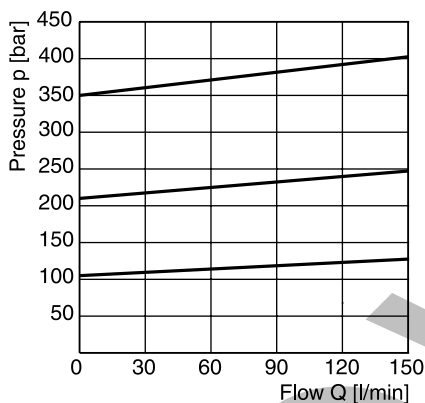
**10**

**Signal/pressure curve R4V**

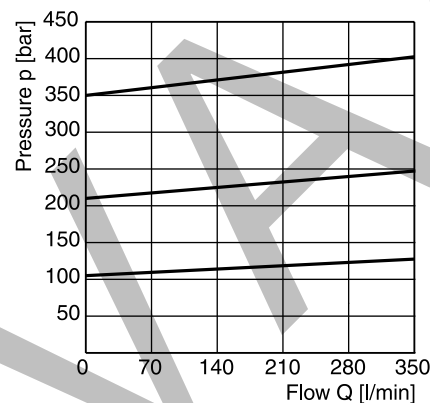


**p/Q performance curves <sup>1)</sup>**

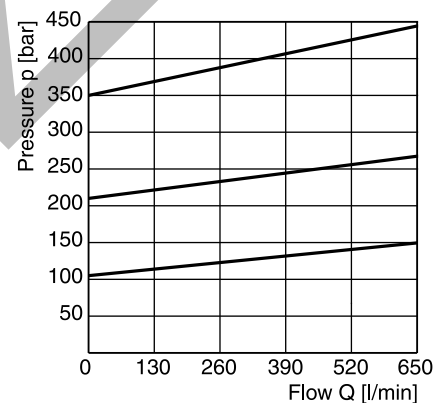
**R4V03**



**R4V06**

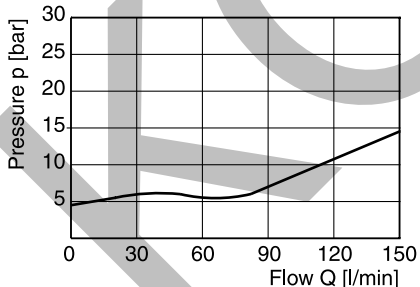


**R4V10**

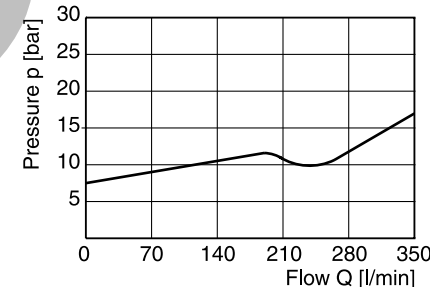


**10 Minimum pressure curve <sup>1)</sup>**

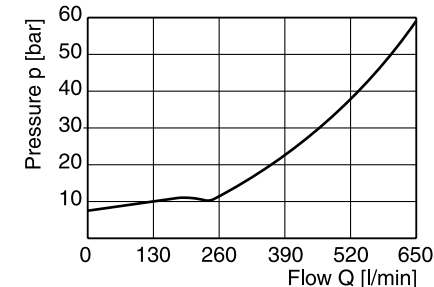
**R4V03**



**R4V06**



**R4V10**

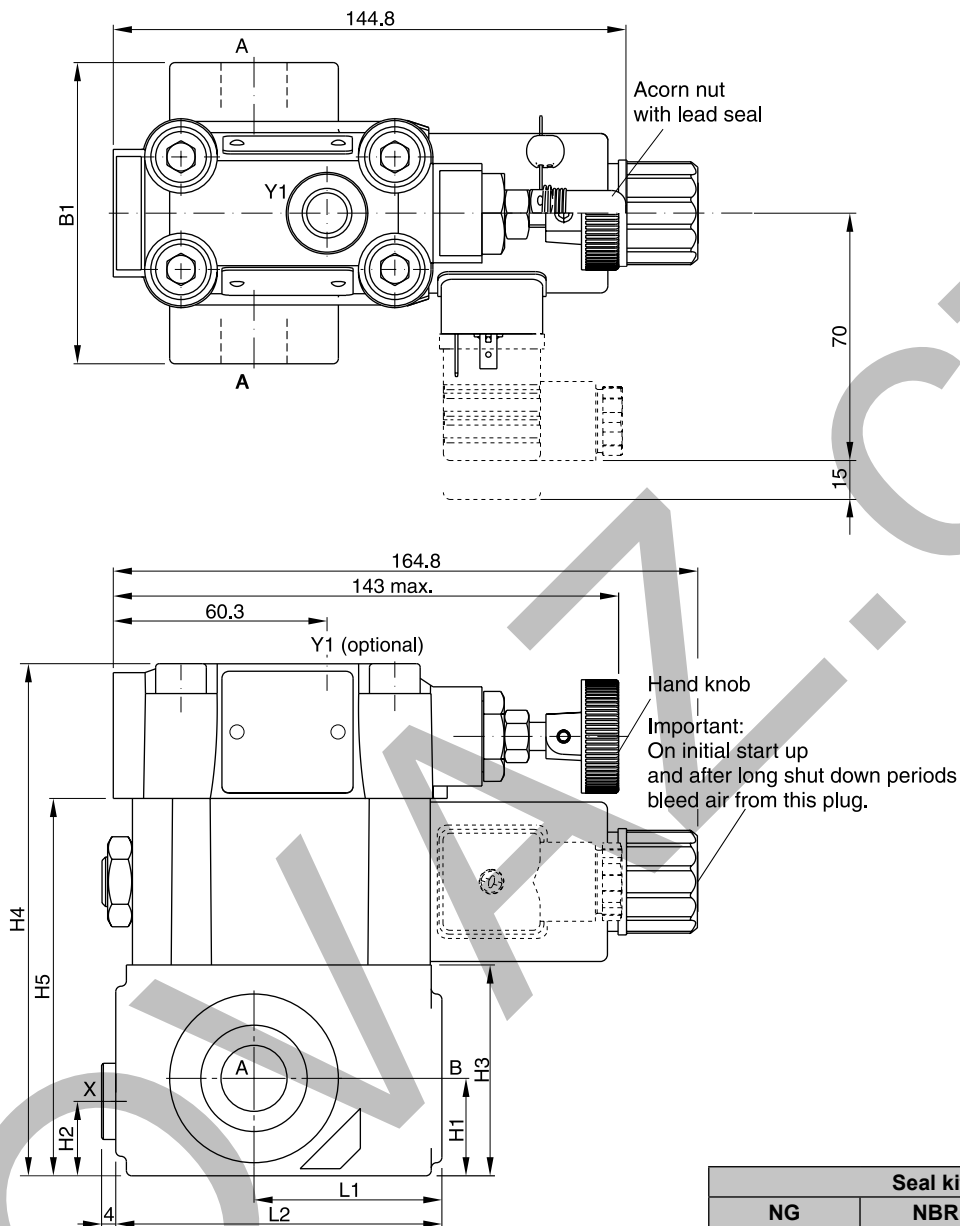


All characteristic curves measured with HLP46 at 50 °C.

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



**T-body**



Seal kits		
NG	NBR	FPM
03	S26-58507-0	S26-58507-5
06	S26-58475-0	S26-58475-5
Prop. section P2*	S26-58473-0	S26-58473-5

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

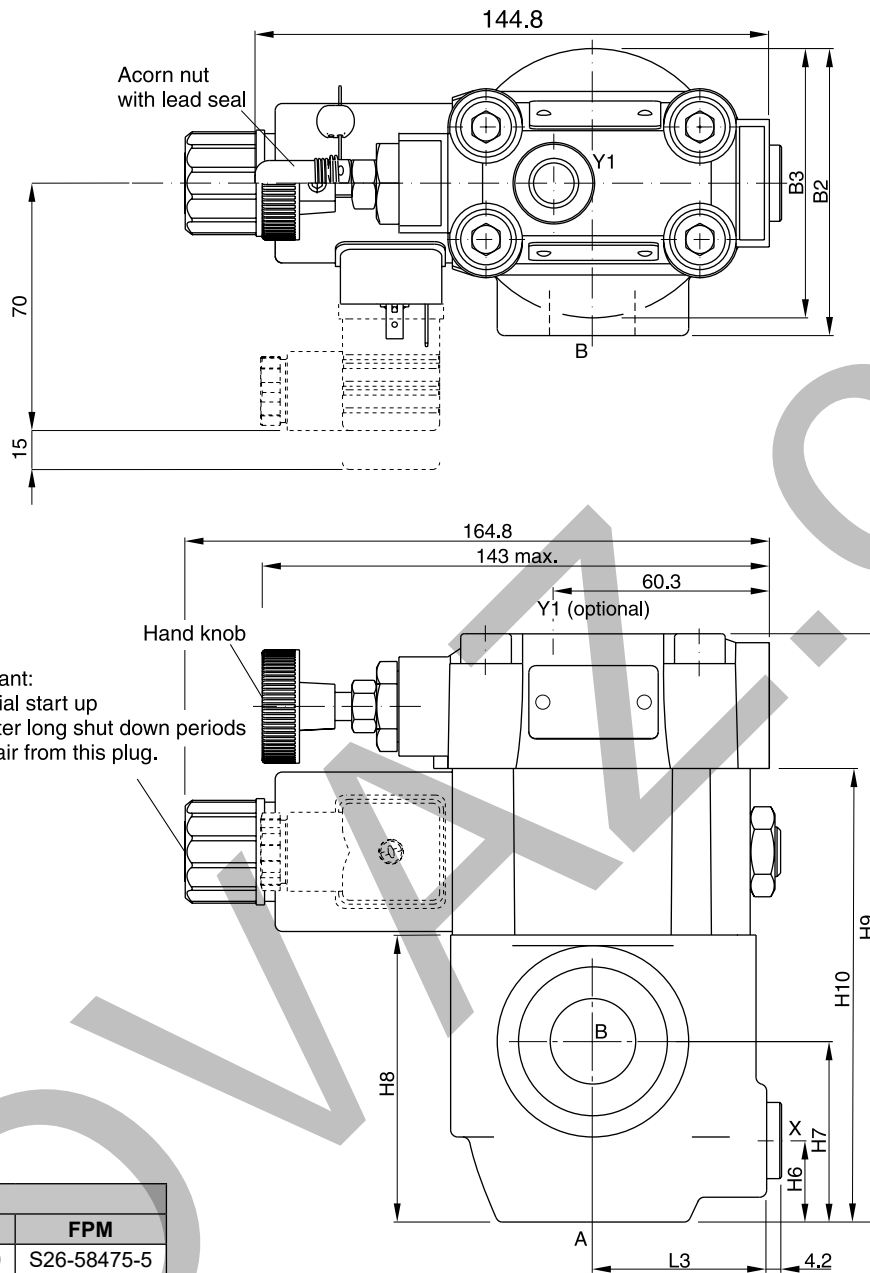
Ports	Function	Port size	
		R4V03*P2 T-body	R4V06*P2 T-body
A	pressure (inlet)	G½ "	G1 "
B	tank (outlet)	G½ "	G1 "
X <sup>1)</sup>	ext. remote control or vent connection	G¼ "	G¼ "
Y1 <sup>2)</sup>	external drain	G¼ "	G¼ "

\* Please combine seal kit of one size with seal kit of prop. section for complete seal kit.

<sup>1)</sup> Closed when supplied.

<sup>2)</sup> Port Y1 is only available at drain line (code 2) external from the pilot head.

**L-body**



Important:  
 On initial start up  
 and after long shut down periods  
 bleed air from this plug.

10

Seal kits		
NG	NBR	FPM
06	S26-58475-0	S26-58475-5
10	S26-58508-0	S26-58508-5
Prop. section P2*	S26-58473-0	S26-58473-5

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	38.1	50.8	96	181	143	49.8

Ports	Function	Port size	
		R4V06 L-body	R4V10 L-body
A	pressure (inlet)	G $\frac{3}{4}$ "	G $1\frac{1}{4}$ "
B	tank (outlet)	G $\frac{3}{4}$ "	G $1\frac{1}{4}$ "
X <sup>1)</sup>	ext. remote control or vent connection	G $\frac{1}{4}$ "	G $\frac{1}{4}$ "
Y1 <sup>2)</sup>	external drain	G $\frac{1}{4}$ "	G $\frac{1}{4}$ "

\* Please combine seal kit of one size with seal kit of prop. section for complete seal kit.

<sup>1)</sup> Closed when supplied.

<sup>2)</sup> Port Y1 is only available at drain line (code 2) external from the pilot head.

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.

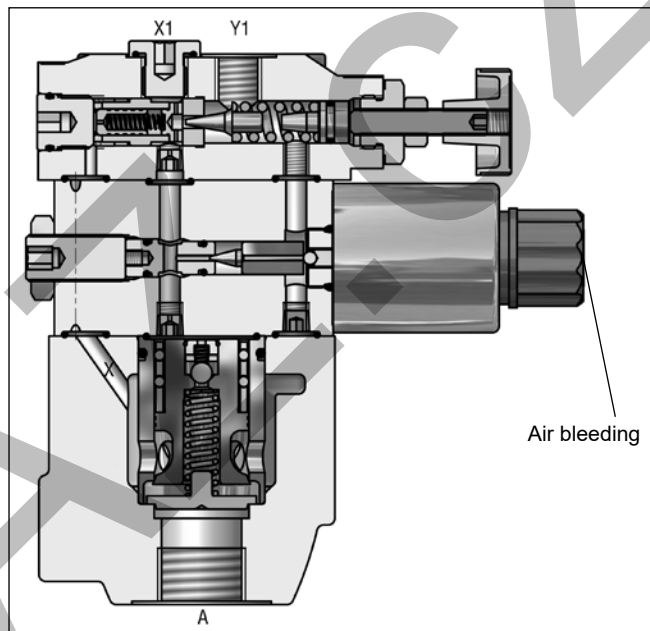
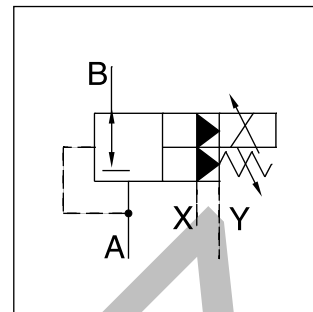
The optimum performance can be achieved in combination with the digital amplifier module PCD00A-400.

**Features**

- Continuous adjustment by proportional solenoid
- Normally closed to avoid undesired motion
- 2 interfaces
  - L-body (R4R06-G $\frac{3}{4}$ ", R4R10-G1 $\frac{1}{4}$ ")
  - T-body (R4R03-G $\frac{1}{2}$ ", R4R06-G1")
- 3 pressure stages
- With mechanical maximum pressure adjustment

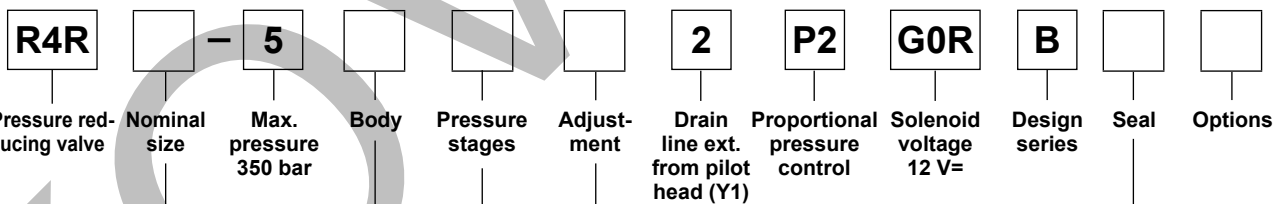


R4R10\*P2 L-body



R4R06\*P2 L-body

**Ordering code**



Code	Nominal size
03	NG10 (G $\frac{1}{2}$ " )
06	NG25 (G1" - T-body, G $\frac{3}{4}$ " - L-body)
10	NG32 (G1 $\frac{1}{4}$ " )

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

Code	Seal
1	NBR
5	FPM

Code	Adjustment
1	Hand knob
3	Acorn nut with lead seal

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

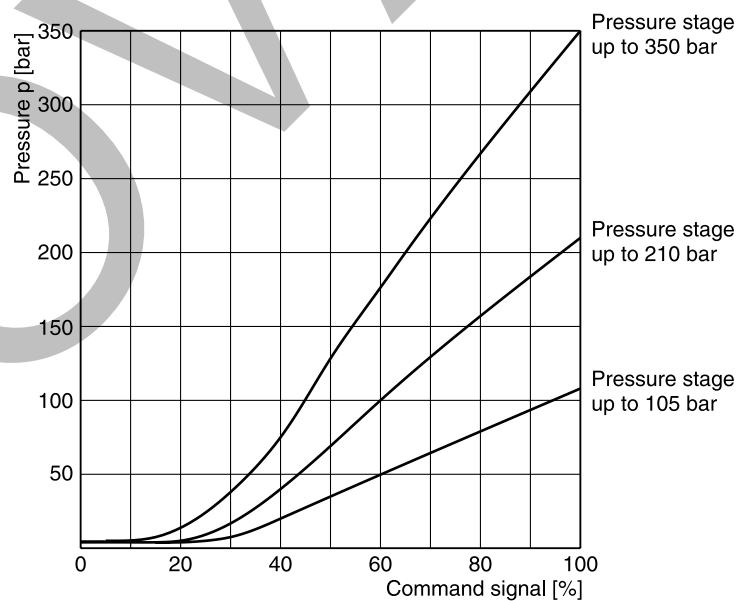
**10**

**Technical Data / Characteristic Curves**

**Technical data**

General			
Design	T-body		L-body
Size	03 (1/2")	06 (1")	06 (3/4") 10 (1 1/4")
Mounting	Threaded body		
Mounting position	unrestricted		
Ambient temperature	[°C]	-20...+60	
MTTF <sub>D</sub> value	[years]	75	
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 according to DIN 51524		
Fluid temperature	[°C]	-20...+70 (NBR: -25...+70)	
Viscosity, permitted	[cSt]/[mm <sup>2</sup> /s]	20...400	
Viscosity, recommended	[cSt]/[mm <sup>2</sup> /s]	30...80	
Filtration	ISO 4406 (1999) 18/16/13		
Electrical (prop. solenoid)			
Duty ratio	[%]	100	
Protection class	IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)		
Nominal voltage	[V]	12 =	
Max. current	[A]	2.3	
Coil resistance	[Ohm]	4 at 20 °C	
Solenoid connection	Connector as per EN175301-803		
Power amplifier	PCD00A-400		

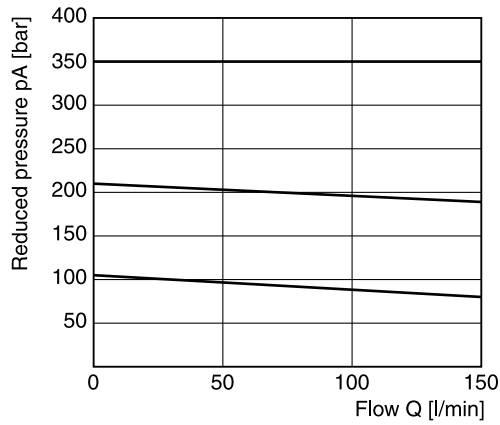
**Command/pressure curve**



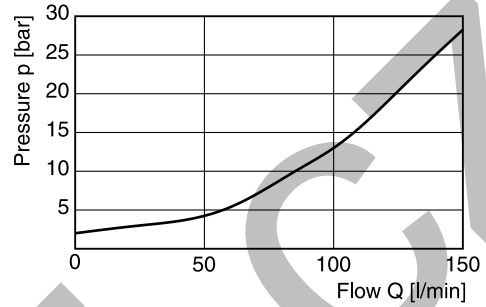
All characteristic curves measured with HLP46 at 50 °C.

**Reduced pressure pA versus flow Q**

**R4R03** <sup>1)</sup>

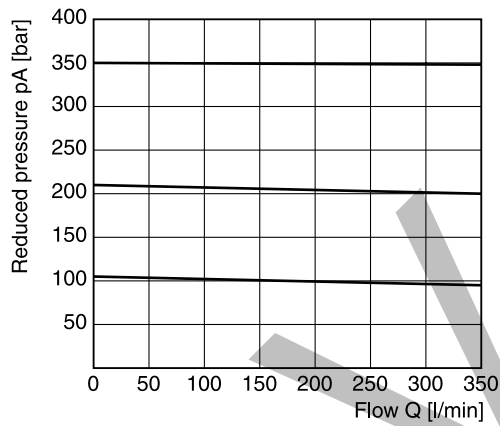


**Minimum pressure curve**

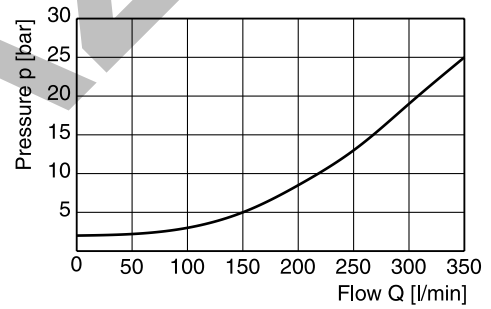


**Reduced pressure pA versus flow Q**

**R4R06** <sup>1)</sup>

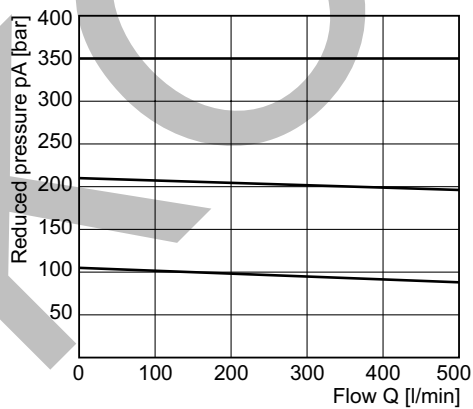


**Minimum pressure curve**

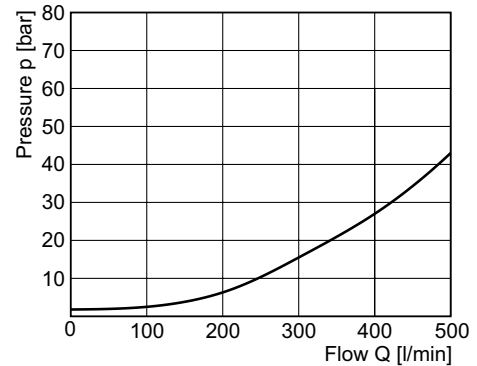


**Reduced pressure pA versus flow Q**

**R4R10** <sup>1)</sup>



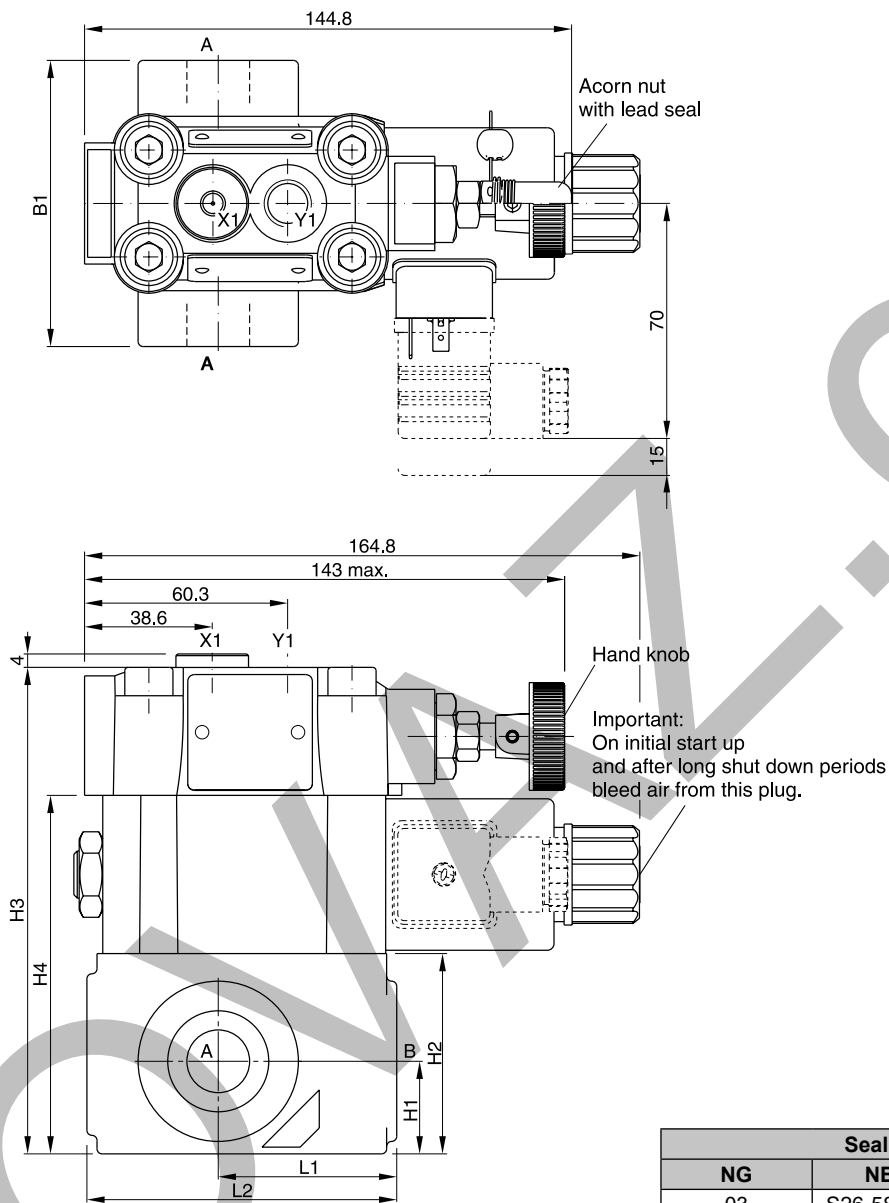
**Minimum pressure curve**



All characteristic curves measured with HLP46 at 50 °C.

<sup>1)</sup> Measured at 350 bar primary pressure pB.

**T-body**



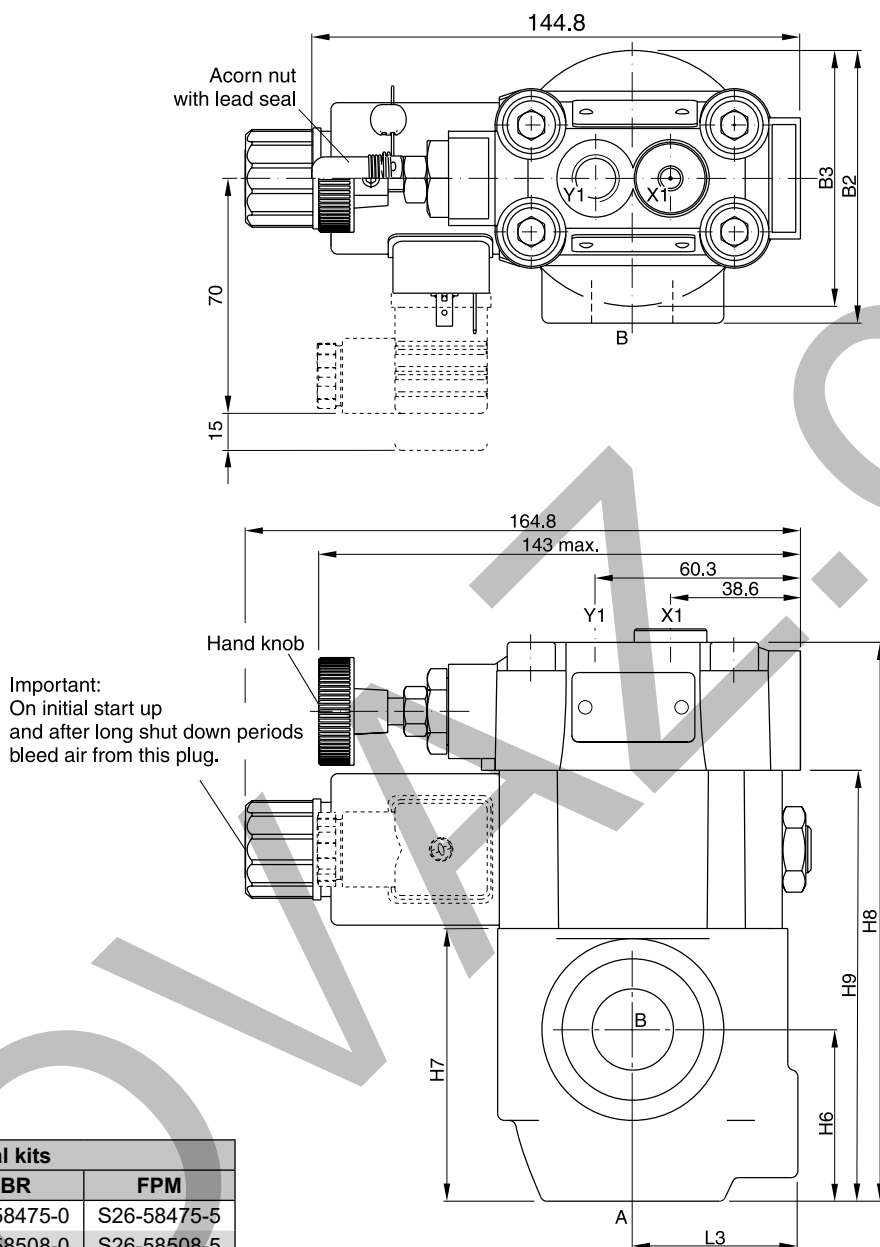
Seal kits		
NG	NBR	FPM
03	S26-58507-0	S26-58507-5
06	S26-58475-0	S26-58475-5
Prop. section P2*	S26-58473-0	S26-58473-5

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)	G $\frac{1}{2}$ "	G1 "
A	pressure (outlet)	G $\frac{1}{2}$ "	G1 "
X1 <sup>1)</sup>	ext. remote control or vent connection	G $\frac{1}{4}$ "	G $\frac{1}{4}$ "
Y1	external drain	G $\frac{1}{4}$ "	G $\frac{1}{4}$ "

\* Please combine seal kit of one size with seal kit of prop. section for complete seal kit.  
<sup>1)</sup> Closed when supplied.

**L-body**



NG	Seal kits	
	NBR	FPM
06	S26-58475-0	S26-58475-5
10	S26-58508-0	S26-58508-5
Prop. section P2*	S26-58473-0	S26-58473-5

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)	G $\frac{3}{4}$ "	G $1\frac{1}{4}$ "
A	pressure (outlet)	G $\frac{3}{4}$ "	G $1\frac{1}{4}$ "
X1 <sup>1)</sup>	ext. remote control or vent connection	G $\frac{1}{4}$ "	G $\frac{1}{4}$ "
Y1	external drain	G $\frac{1}{4}$ "	G $\frac{1}{4}$ "

\* Please combine seal kit of one size with seal kit of prop. section for complete seal kit.  
<sup>1)</sup> Closed when supplied.

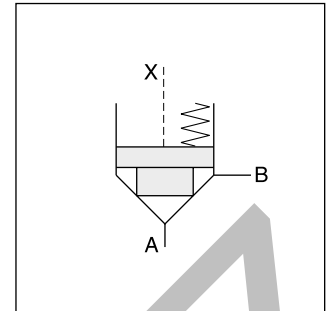
**Characteristics**

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 – allows to design individual hydraulic solutions for nominal flow up to 600 l/min.

A complete program is offered under the Parker 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).



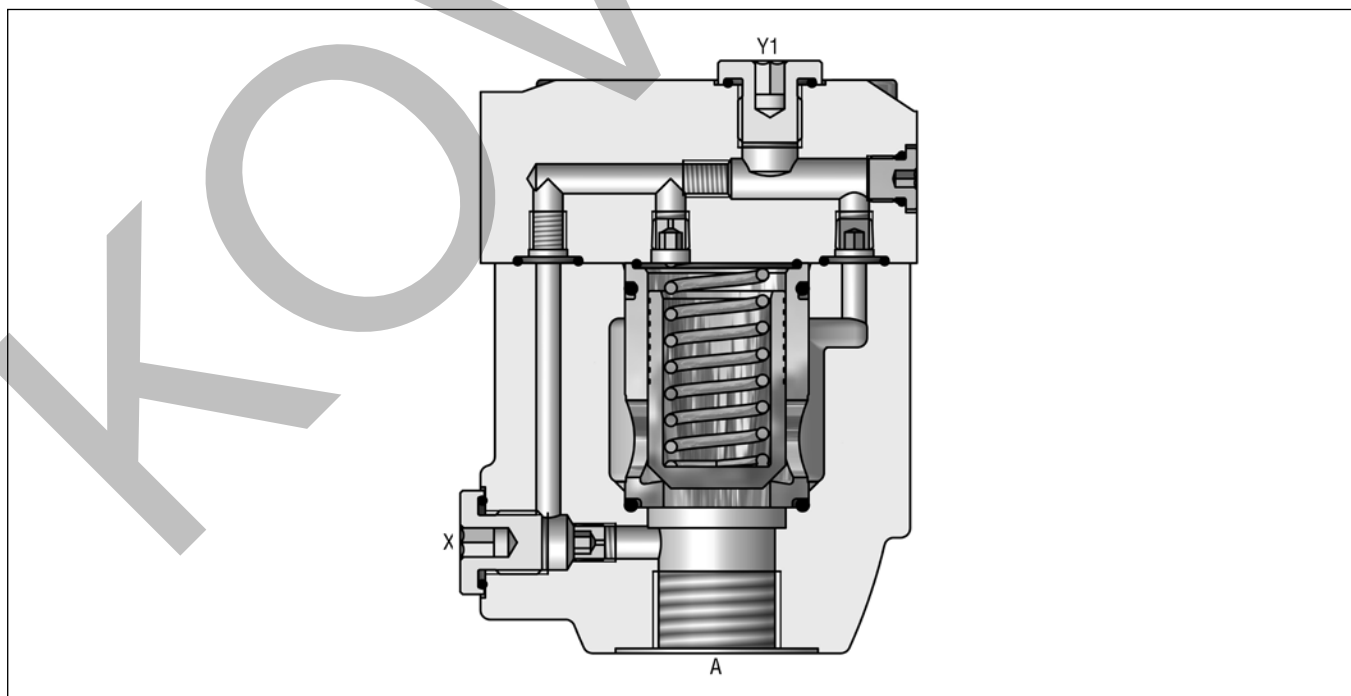
D4S10 L-body



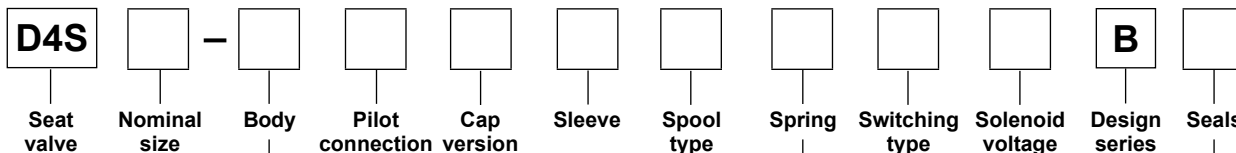
**Features**

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

**D4S06 L-body**







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 = G $\frac{1}{2}$ "; X, Y1 = G $\frac{1}{4}$ " A, B = G1"; X, Y1 = G $\frac{1}{4}$ "
D	D4S06 L-body D4S10 L-body	A, B = G $\frac{3}{4}$ "; X, Y1 = G $\frac{1}{4}$ " A, B = G1 $\frac{1}{4}$ "; X, Y1 = G $\frac{1}{4}$ "

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

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 +20 bar)	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 <sup>1)</sup>	06, 10	Safety spool (for position control only)	3
B <sup>1)</sup>	06, 10	Throttle spool, 10° chamfer	3
C <sup>1)</sup>	06, 10	Throttle spool, 3° chamfer	3

Code	Seals
1	NBR
5	FPM

Code	Solenoid voltage
omit	Standard w/o vent function
G0R	12 V=
G0Q	24 V=
GAR <sup>3)</sup>	98 V=
GAG <sup>3)</sup>	205 V=
W30	110 V / 50 Hz; 120 V / 60 Hz
W31	230 V / 50 Hz; 240 V / 60 Hz

Code	Switching type	
omit	Standard w/o vent function	
09	VV01 with manual override	de-energized: open
10	VV01 without manual override	
11	VV01 with manual override	de-energized: 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	
EH	VV01 code 10 and shuttle valve code CA and position control <sup>2)</sup> with amplifier	
EK	VV01 code 12 and shuttle valve code CA and position control <sup>2)</sup> with amplifier	
EN	VV01 code 10 and shuttle valve code DA and position control <sup>2)</sup> with amplifier	
EQ	VV01 code 12 and shuttle valve code DA and position control <sup>2)</sup> with amplifier	
EC	VV01 code 10 and position control <sup>2)</sup> with amplifier	
EE	VV01 code 12 and position control <sup>2)</sup> with amplifier	
EA	Position control <sup>2)</sup> with amplifier	
EF	Position control <sup>2)</sup> with amplifier and shuttle valve code CA	
EL	Position control <sup>2)</sup> with amplifier and shuttle valve code DA	

Examples see end of chapter

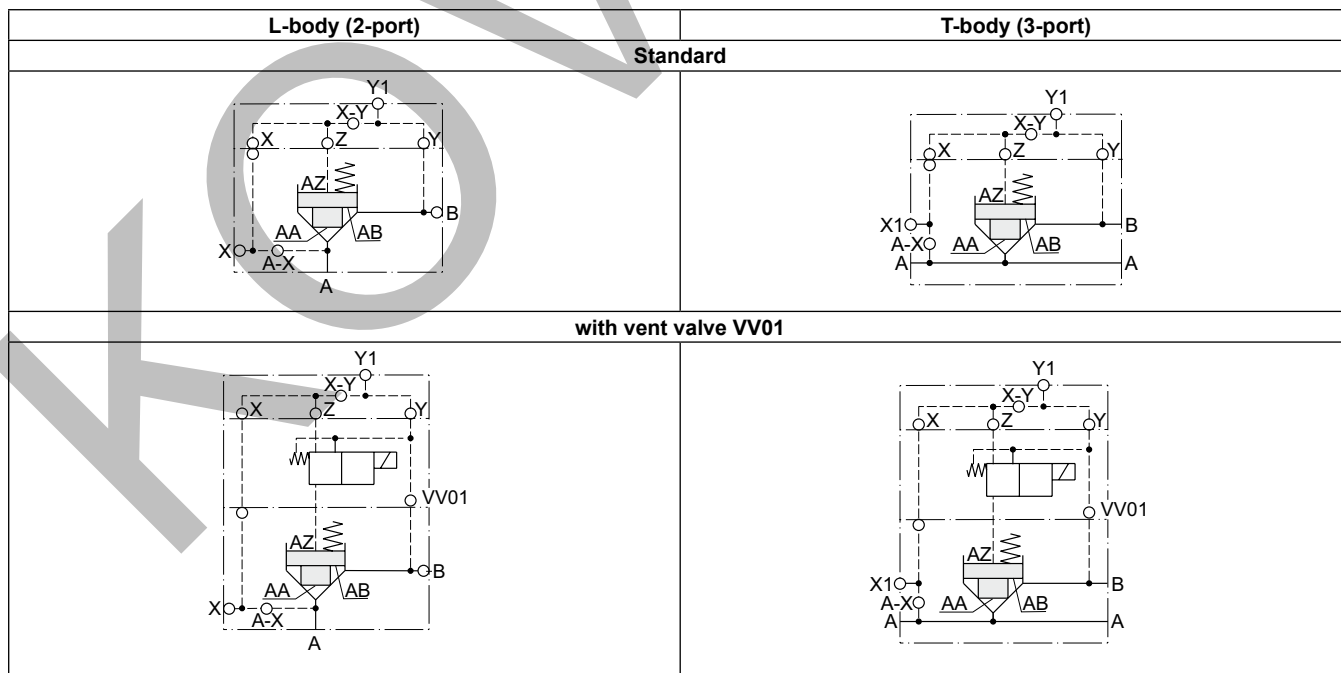
<sup>1)</sup> Springs 2, 3 and 6 only.  
<sup>2)</sup> Position control for D4S06/10 only. Spring 2 or 4.  
 Spool A and sleeve 3. Valve open: proximity switch damped.  
<sup>3)</sup> To be used in combination with rectifier plugs at 120 VAC / 230 VAC power supply.

Code	Spring (approx. cracking pressure [bar])					
	Sleeve Code 1		Sleeve Code 3			
	A -> B		A -> B		B -> A	
	D4S03	D4S06/10	D4S03	D4S06/10	D4S03	D4S06/10
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	—

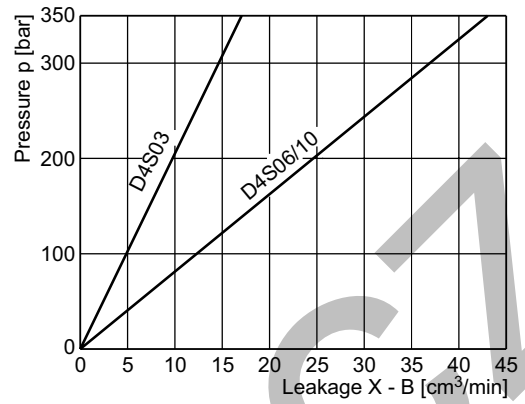
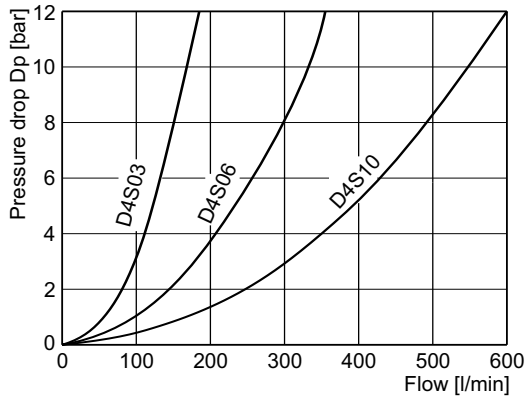
**Technical data**

General			T-body		L-body			
Design								
Size			<b>03 (1/2")</b>	<b>06 (1")</b>	<b>06 (3/4")</b>	<b>10 (1 1/4")</b>		
Mounting			Threaded body					
Mounting position			unrestricted					
Ambient temperature	[°C]		-20...+60					
MTTF <sub>D</sub> value	[years]		150					
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 according to DIN 51524					
Fluid temperature	[°C]		-20...+70 (NBR: -25...+70)					
Viscosity,	permitted	[cSt]/[mm <sup>2</sup> /s]	20...400					
	recommended	[cSt]/[mm <sup>2</sup> /s]	30...80					
Filtration			ISO 4406 (1999); 18/16/13					
Electrical (solenoid)								
Duty ratio			100 % ED; CAUTION: coil temperature up to 150 °C possible					
Protection class			IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)					
	Code		G0R	G0Q	GAR	GAG	W30	W31
Supply voltage	[V]		12 V =	24 V =	98 V =	205 V =	110 at 50 Hz 120 at 60 Hz	230 at 50 Hz 240 at 60 Hz
Tolerance supply voltage	[%]		±10	±10	±10	±10	±5	±5
Current consumption	hold	[A]	2.72	1.29	0.33	0.13	0.6 / 0.55	0.3 / 0.27
	in rush	[A]	2.72	1.29	0.33	0.13	2.5 / 2.4	1.25 / 1.2
Power consumption	hold	[W]	32.7	31	31.9	28.2	70/70 VA	70/70 VA
	in rush	[W]	32.7	31	31.9	28.2	280/290 VA	280/290 VA
Solenoid connection			Connector as per EN175301-803, solenoid identification as per ISO 9461					
Wiring min.	[mm <sup>2</sup> ]		3 x 1.5 recommended					
Wiring length max.	[m]		50 recommended					

**D4S pilot configuration**

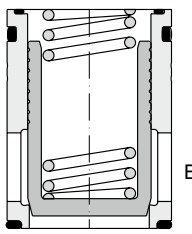
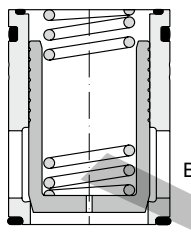
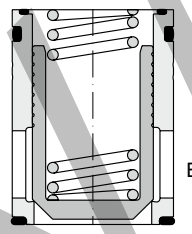
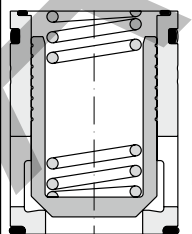
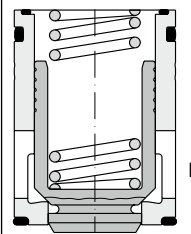
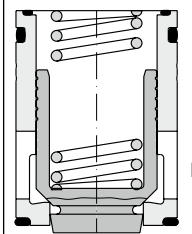


**$\Delta p/Q$  performance curves**



All characteristic curves measured with HLP46 at 50 °C.

**Selection of cartridges**

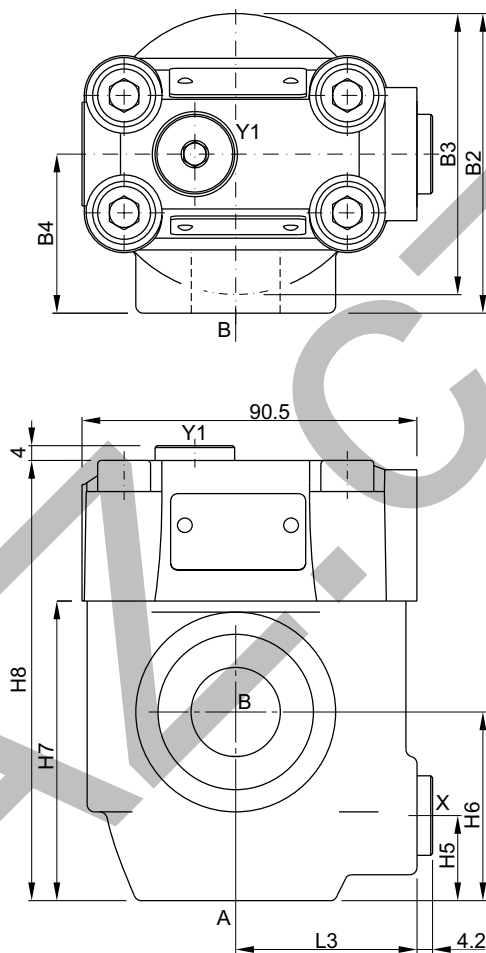
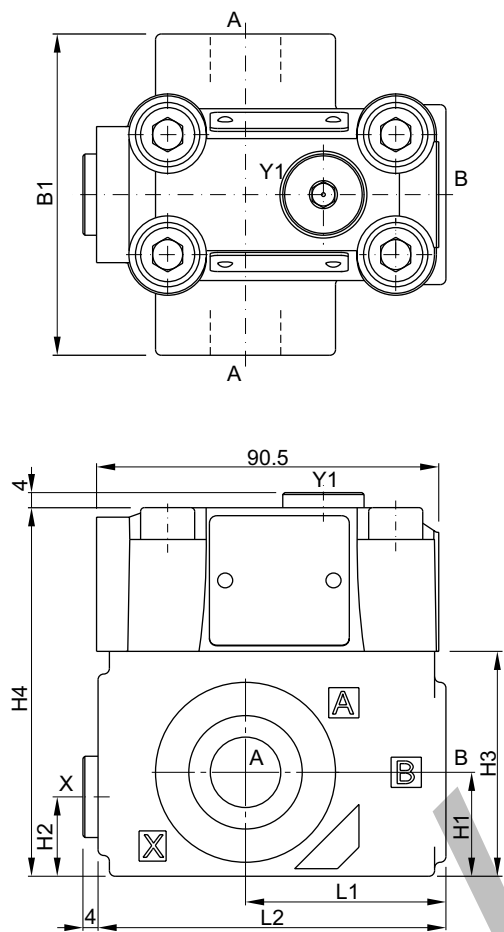
Sleeve 1, poppet 1	Sleeve 1, poppet 2	Sleeve 1, poppet 4	Sleeve 3, poppet 4	Sleeve 3, poppet A	Sleeve 3, poppet B/C
Z  A	Z  A	Z  A	Z  A	Z  A	Z  A
1 : 1.05 $A_A = 0.95 A_C$ $A_B = 0.05 A_C$ 15° chamfer	1 : 1.05 $A_A = 0.95 A_C$ $A_B = 0.05 A_C$ 15° chamfer orifice	1 : 1.05 $A_A = 0.95 A_C$ $A_B = 0.05 A_C$ 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

**10**

Dimensions

D4S 03/06 T-body

D4S 06/10 L-body



Seal kits		
NG	NBR	FPM
03	S26-58507-0	S26-58507-5
06	S26-58475-0	S26-58475-5
10	S26-58508-0	S26-58508-5

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

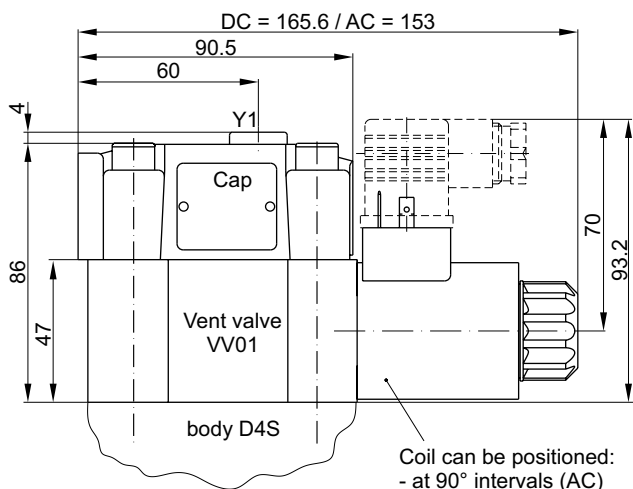
Size	L3	B2	B3	B4	H5	H6	H7	H8
06 (L-body)	49	81	76	43	23	51	81	119
10 (L-body)	49.8	120.7	85.6	77.8	38.1	50.8	96	134

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 <sup>1)</sup>			G¼"	

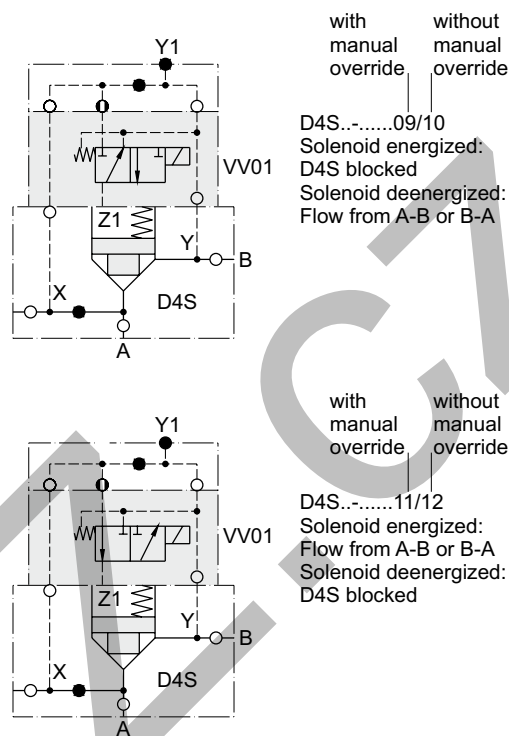
<sup>1)</sup> With VV01 only

10

**D4S with VV01**

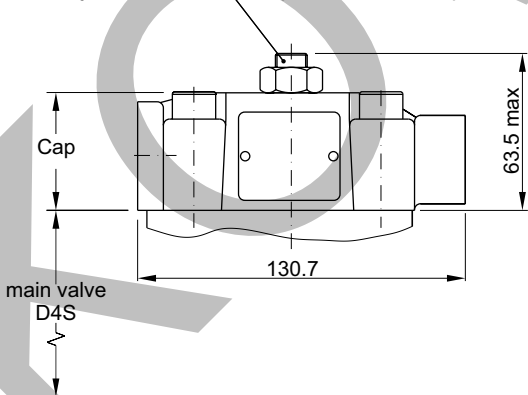


Seal kits	
NBR	FPM
DC solenoid	
S56-40609-0	S56-40609-5
AC solenoid	
S26-35237-0	S26-35237-5

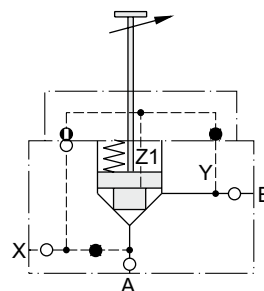


**D4S stroke limiter**

Adjustment should take place at minimum pressure



Example: D4S<sub>10</sub><sup>06</sup>-.233B.



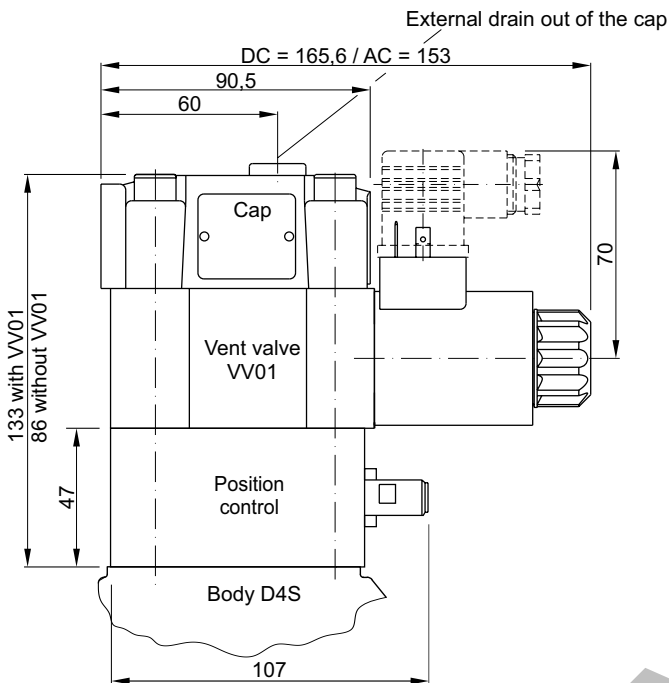
**Note:**

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

**Dimensions**

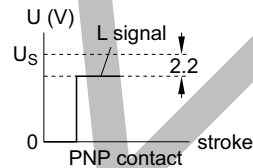
**Directional Seat Valve  
Series D4S**

**D4S position control**



**Position control as per IEC 61076-2-101 (M12x1)**

Protection class	IP65 in accordance with EN 60529
Ambient temperature	[°C] -20...+60
Supply voltage $U_s$ / ripple	[V] 10...30 / $\pm 10\%$
Current consumption without load	[mA] $\leq 10$
Max. output current per channel, ohmic	[mA] 200
Min. output load per channel, ohmic	[kOhm] 100
Max. output drop at 0.2 A	[V] $\leq 2$
EMC	EN61000-6-4 / EN61000-6-2
Min. distance to next AC solenoid	[m] $> 0.1$
Interface	M12x1 acc. to IEC 61076-2-101
Wiring min.	[mm <sup>2</sup> ] 3 x 0.14 braided shield recommended
Wiring length max.	[m] 50 recommended



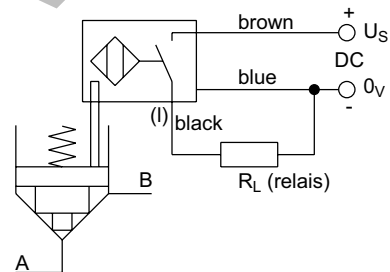
**Position control by proximity switch (incl. amplifier)**

Valve open: proximity switch activated.

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

**Note**

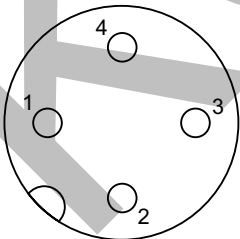
Position control for D4S06 and D4S10 only.



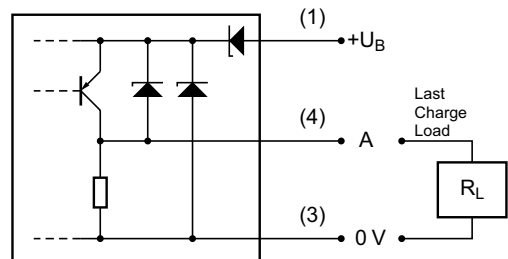
**10**

Please order plug M12 x 1 separately. Straight plug recommended – no defined position possible for angled plug.

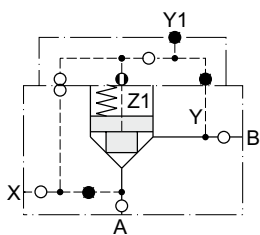
**M12 pin assignment**



- 1  $U_s$  10...30 V
- 2 not connected
- 3 0 V
- 4 Out A: normally open

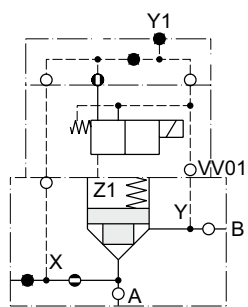


**D4S direct operated**

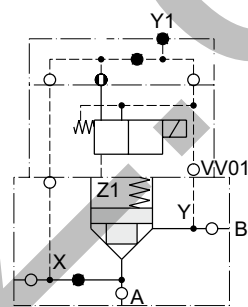


D4S...-21  
 Pilot oil X = external

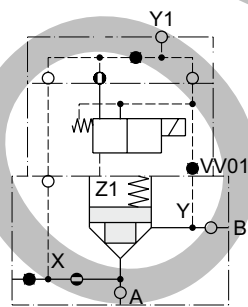
**D4S with solenoid valve VV01**



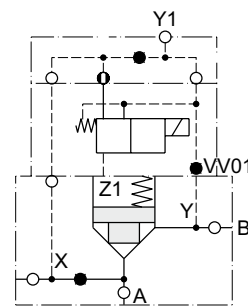
D4S...-16... } with VV01  
 09  
 10  
 11  
 12  
 Pilot oil X = internal from A  
 Drain Y = internal to B



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



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

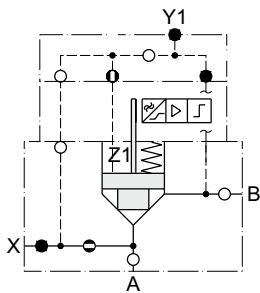


D4S...-22... } with VV01  
 09  
 10  
 11  
 12  
 Pilot oil X = external  
 Drain Y1 = external out of cap

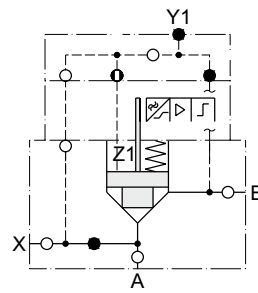
10

Ordering Code Explanation (Examples)

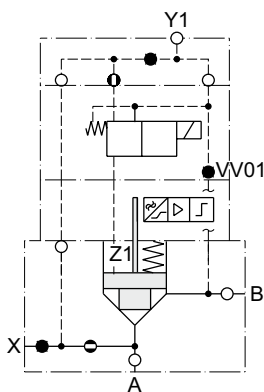
D4S with position control



D4S...-113A.EA  
(with position control)  
Pilot oil X = intern from A

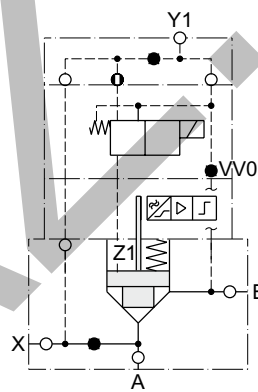


D4S...-213A.EA  
(with position control)  
Pilot oil X = external



D4S...-123A. EC } with position control  
EE } and VV01

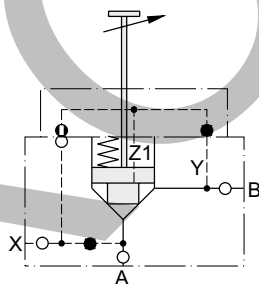
Pilot oil X = intern from A  
Drain Y1 = external out of cap



D4S...-223A. EC } with position control  
EE } and VV01

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

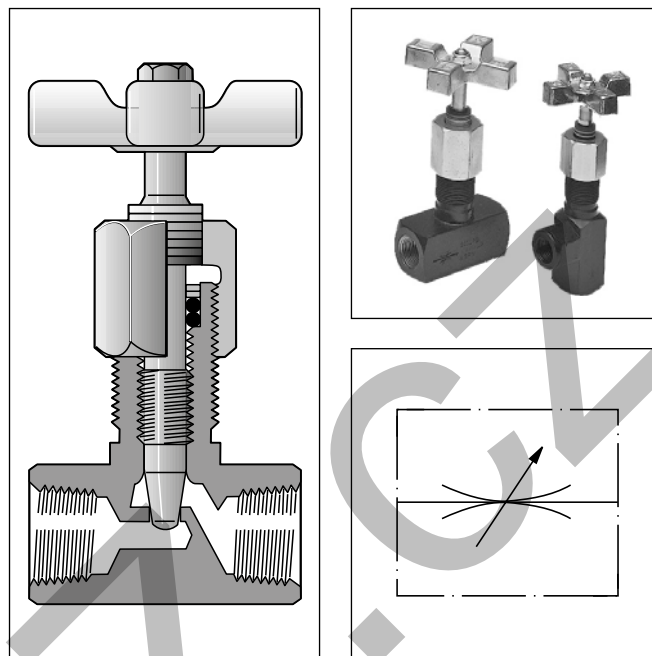
10 D4S with stroke limiter



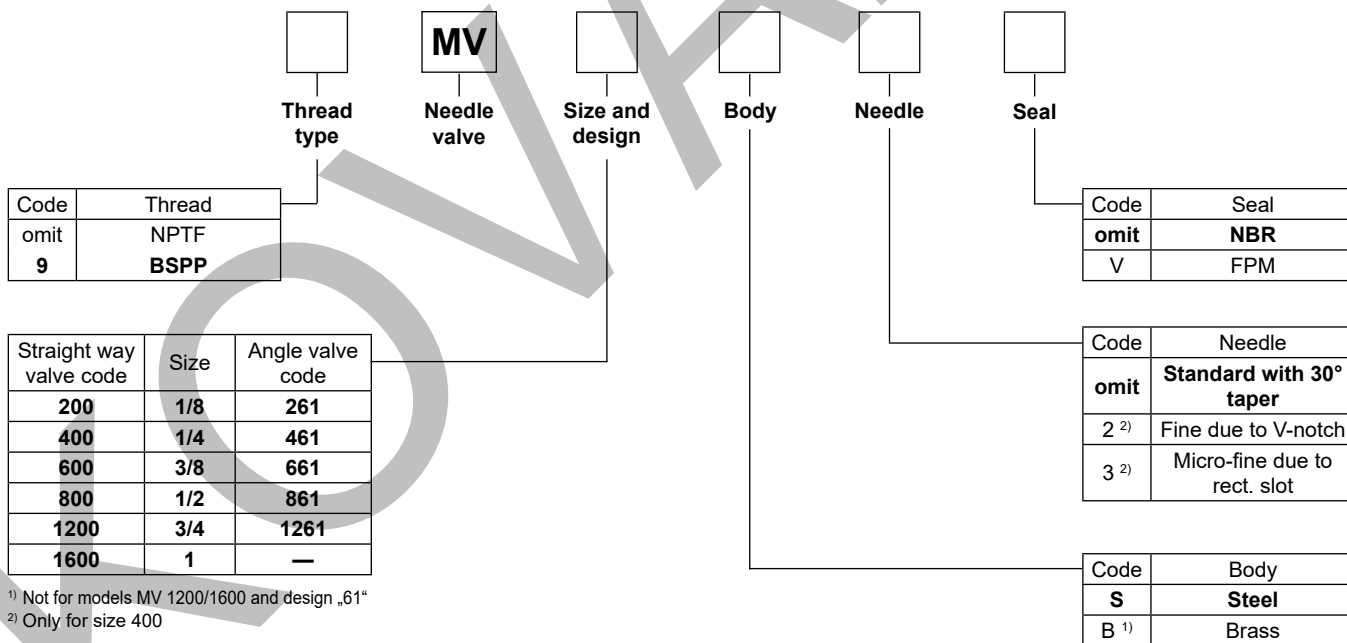
D4S...-233B. with stroke limiter  
Pilot oil X = external  
(Note: for D4S06 and D4S10 only)



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 pressure and viscosity. The needle is made of stainless steel and corresponds to a ring gap in the valve body.



**Ordering code**



<sup>1)</sup> Not for models MV 1200/1600 and design „61“

<sup>2)</sup> Only for size 400

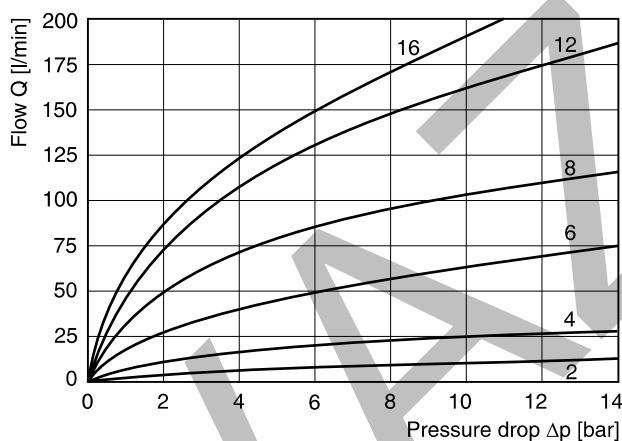
**Bold letters =  
Short-term availability**

**10**

**Technical data**

Size	Max. pressure [bar]		Flow [l/min] Δp 10 bar	Max. cross.sect. [cm²] Δp 10 bar	Kv factor valve open	Weight [kg]
	steel	brass				
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**



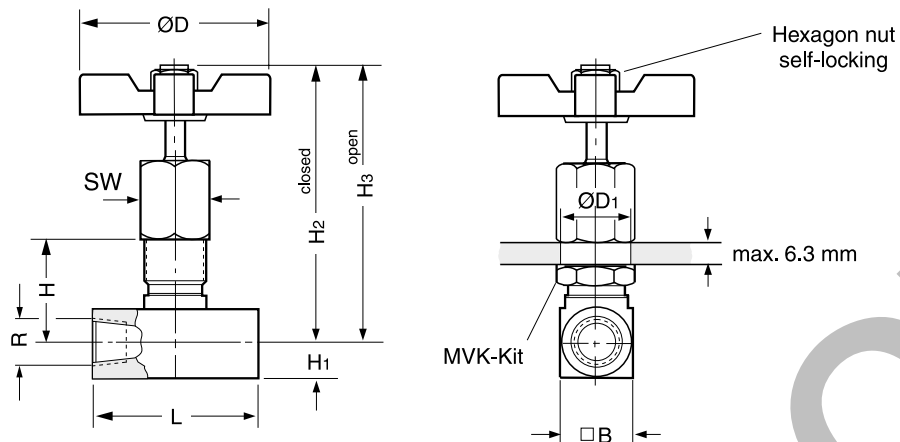
All characteristic curves measured with HLP46 at 50 °C.

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

$K_v$  from the table  
 $\Delta p$  [bar]  
 $\gamma$  [kg/dm³] = specific weight of the medium  
 (γ for mineral oil = 0.85 - 0.9)

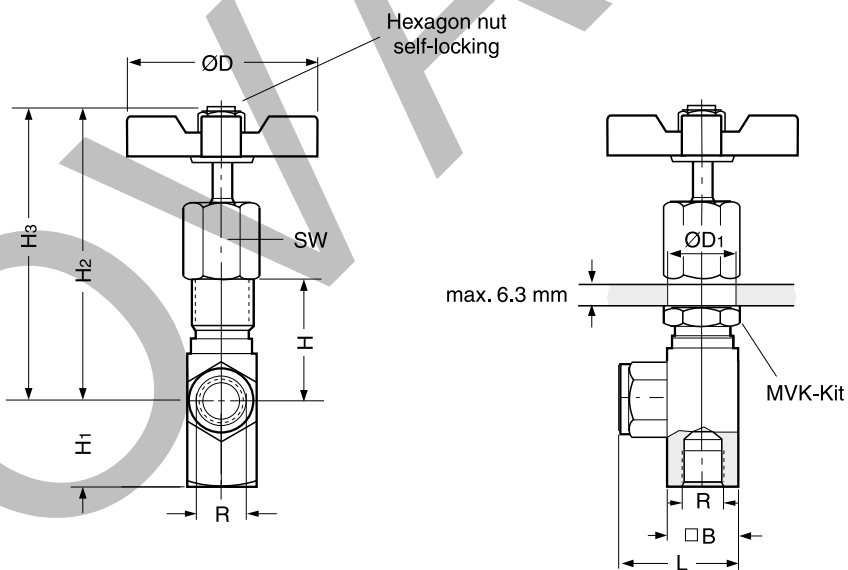
10

**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 16

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

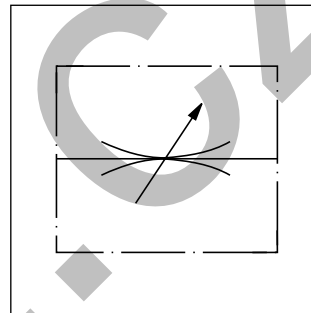
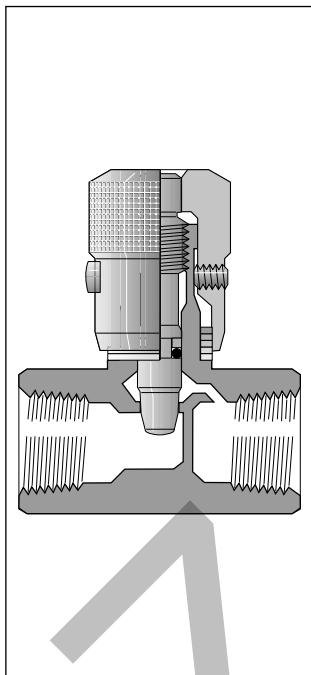


Size	R*	H	H3	H2	H1	B	ØD1	L	ØD	SW
2	1/8	27	72	67	20.6	16	15	27	45	15.7
4	1/4	36	90	85	27.7	21	20	38	51	22.1
6	3/8	42	111	103	34.8	26	23	45	64	25.4
8	1/2	55	134	121	42.7	32	29	53	83	31.8
12	3/4	59	147	133	41.1	38	36	64	98	41.2

\* Pipe thread G or NPTF

Characteristics / Ordering Code

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.



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

$K_v$  from the table  
 $\Delta p$  [bar]  
 $\gamma$  [kg/dm<sup>3</sup>] = specific weight of the medium  
 ( $\gamma$  for mineral oil = 0.85 - 0.9)

Specifications

Operating temperature	-40 °C to +121 °C
-----------------------	-------------------

Ordering code

<input type="checkbox"/>	<b>N</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Thread type	Needle valve	Thread size	Body	Needle	Clamping screw	Seal

Code	Thread
omit	NPTF
<b>9</b>	<b>BSPP</b>

Code	Size
<b>200</b>	<b>1/8</b>
<b>400</b>	<b>1/4</b>
<b>600</b>	<b>3/8</b>
<b>800</b>	<b>1/2</b>
<b>1200</b>	<b>3/4</b>
1600	1

Code	Body
<b>S</b>	<b>Steel</b>
B	Brass

Code	Seal
omit	<b>NBR</b>
V	FPM

Code	Clamping screw
omit	<b>Hexagon socket</b>
F	With knurled knob
T	Tamper-proof

Code	Needle
omit	<b>Standard 2-stage needle</b>
4 <sup>1)</sup>	Micro-fine hollow needle with slot

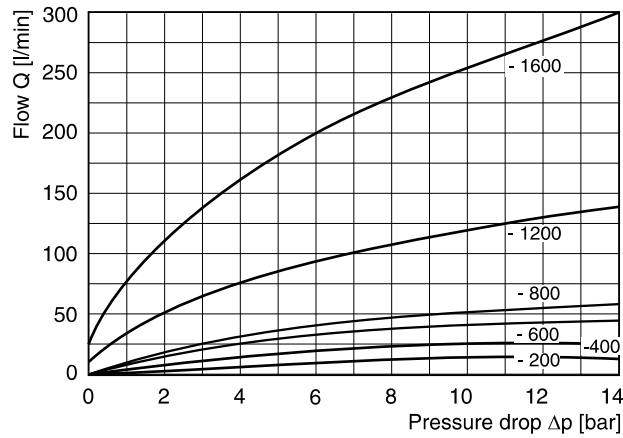
**Bold letters = Short-term availability**

<sup>1)</sup> Only for sizes 200 to 600

Technical data (only for standard 2 stage needle)

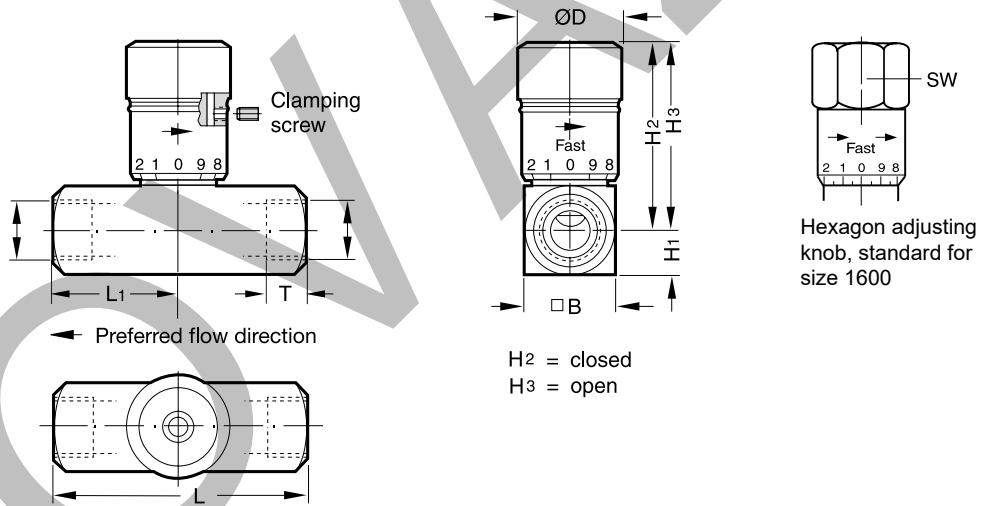
Size	Pressure [bar]		Flow [l/min]	Max. cross section	Kv factor valve	Weight [kg]
	Steel	Brass				
200	350	140	11	0.066	3.3	0.15
400	350	140	25	0.13	6.3	0.22
600	350	140	40	0.22	11.2	0.6
800	350	140	50	0.28	13.9	0.63
1200	350	140	120	0.70	35.4	1.04
1600	210	35	250	1.48	75	2.13

**p/Q curves**



All characteristic curves measured with HLP46 at 50 °C.

**Dimensions**



**10**

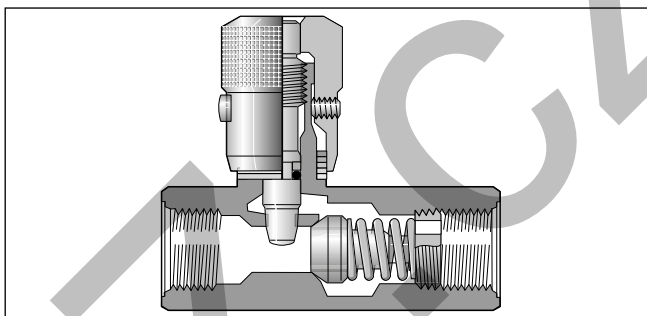
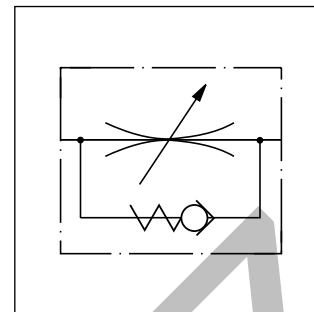
Size	R* Threads	H3	H2	H1	B	L1	L	ØD	SW
200	1/8	39	35	8	16	16	38	19	-
400	1/4	46	40	10.5	21	25	51	21	-
600	3/8	55	49	13	26	32	64	25	-
800	1/2	69	61	16	32	33	67	30	-
1200	3/4	86	71	19	38	41	83	35	-
1600	1	124	107	22.5	45	54	108	-	47.8

\* G or NPTF

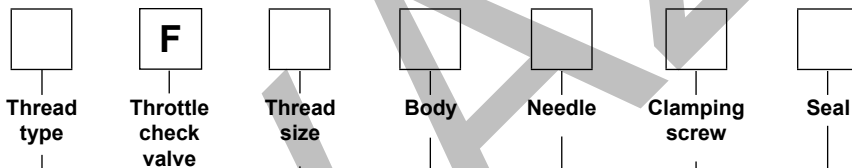
N-9N UK.indd 04.08.22

Characteristics / Ordering Code

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 low 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 with the locking screw.



Ordering code



Code	Thread
omit	NPTF
<b>9</b> <sup>1)</sup>	<b>BSPP</b>

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

<sup>1)</sup> Not for size 3200.  
<sup>2)</sup> Only for sizes 200 to 1600.  
<sup>3)</sup> Only for sizes 200 to 600.

Code	Body
<b>S</b>	<b>Steel</b>
B <sup>2)</sup>	Brass

Code	Seal
omit	<b>NBR</b>
V	FPM

Code	Clamping screw
omit	<b>Hexagon socket</b>
F	With knurled knob
T	Tamper-proof

Code	Needle
omit	<b>Standard 2-stage needle</b>
4 <sup>3)</sup>	Micro-fine hollow needle with slot

**Bold letters = Short-term availability**

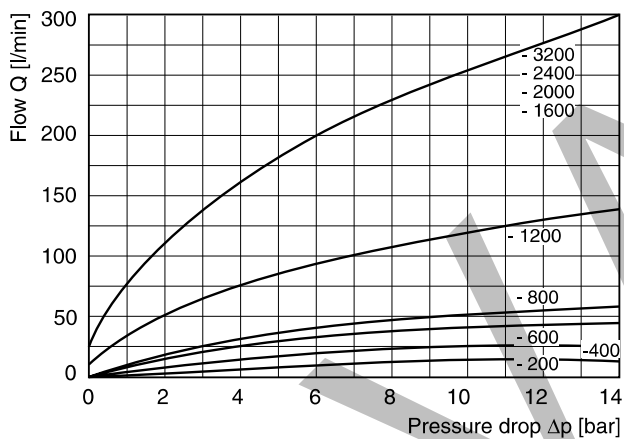
10

**Technical data**

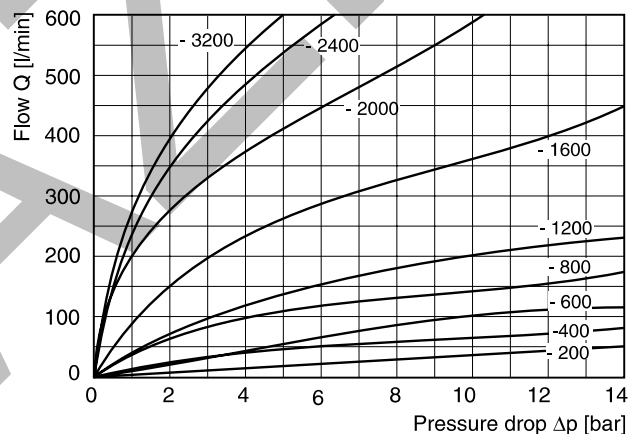
Return check poppet	0.4 bar
Nominal cracking pressure	
Operating temperature	-40 °C to +121 °C

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	-

**Controlled flow vs. pressure drop needle fully open**



**Free flow vs. pressure drop needle fully open**



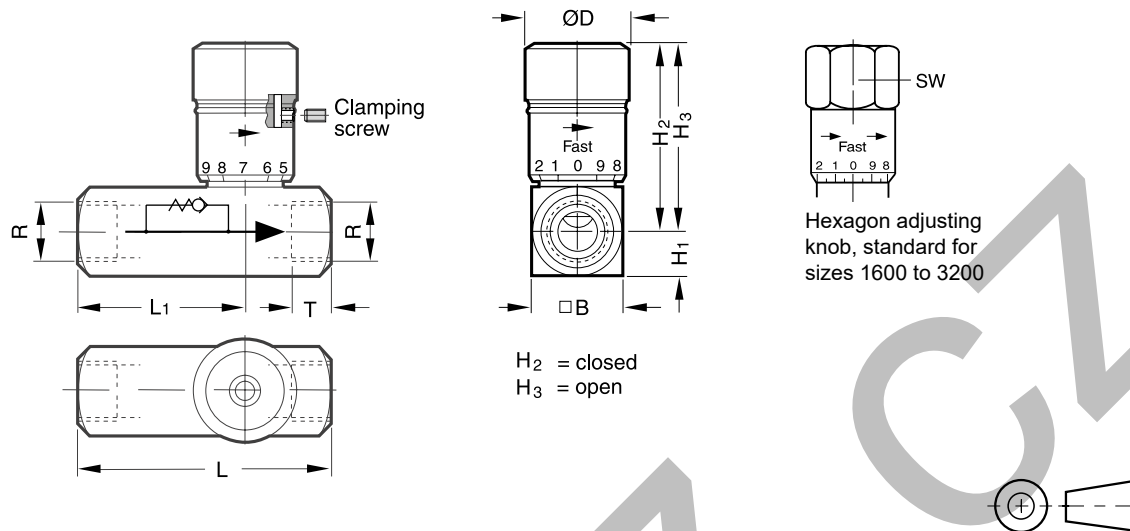
All characteristic curves measured with HLP46 at 50 °C.

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

$K_v$  from the table  
 $\Delta p$  [bar]  
 $\gamma$  [kg/dm³] = specific weight of the medium  
 (γ for mineral oil = 0.85 - 0.9)

**10**

Dimensions

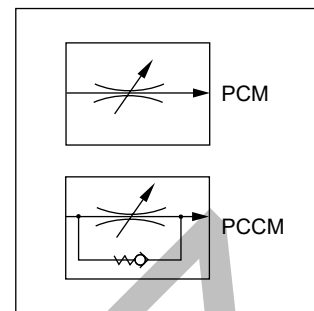


Size	R*	H3	H2	H1	B	L1	L	ØD	SW	T
200	1/8	39	35	8	16	36	51	19	-	9
400	1/4	46	40	10.5	21	43	67	21	-	13
600	3/8	55	49	13	26	45	70	25	-	13
800	1/2	69	61	16	32	57	87	30	-	16
1200	3/4	86	71	19	38	65	99	35	-	17
1600	1	124	107	22.5	45	83	127	-	47.8	20
2000	1 1/4	130	114	29	58	99	143	-	-	21.5
2400	1 1/2	137	120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

\* Pipe thread G or NPTF

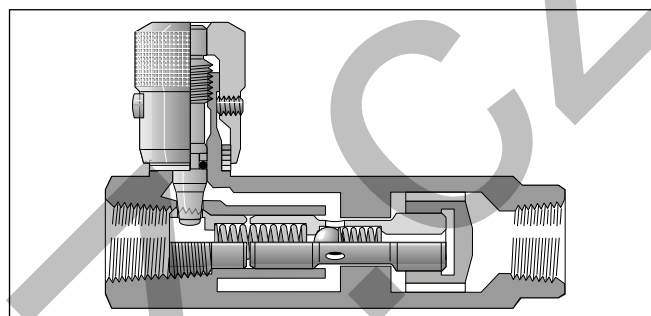


Manatrol 2 way flow control valves for pressure compensated regulation of the flow rate. As a consequence of pressure changes, the set value can vary by  $\pm 5\%$  within the tolerance range. Viscosity changes have the same effect and must be observed.



**Technical data**

Size	Max. press. [bar]	Flow control		Check valve		Weight [kg]
		Q* [l/min]	$\Delta p$ [bar]	Q <sub>max</sub> [l/min]	$\Delta p$ [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



**Ordering code**

	<b>PC</b>		<b>M</b>		<b>S</b>			
Thread type	Press. comp. flow control valve	Design		Thread size	Steel body	Clamping screw	Seal	Design series (not required for ordering)

Code	Thread						
omit	NPTF						Code Seal
<b>9</b>	<b>BSP</b>						<b>omit NBR</b>
							V FPM

Code	Design				
omit	<b>Without check valve</b>				
C	With check valve				

Code	Size				
<b>400</b>	<b>1/4</b>				
<b>600</b>	<b>3/8</b>				
<b>800</b>	<b>1/2</b>				
<b>1200</b>	<b>3/4</b>				
<b>1600</b>	<b>1</b>				

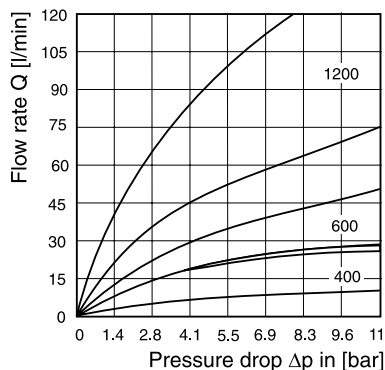
  

Code	Clamping screw				
omit	<b>Hexagon socket</b>				
F	With knurled knob				
T <sup>1)</sup>	Tamper-proof				

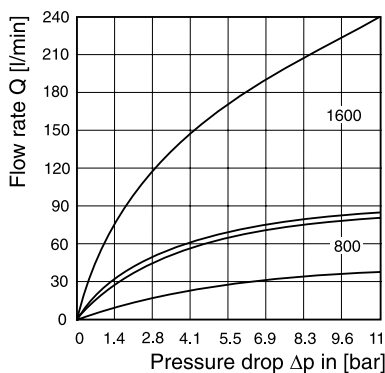
**Bold letters = Short-term availability**

\* Min. and max. flow rate  
<sup>1)</sup> Only for size 400 to 1200

**Δp/Q curves**

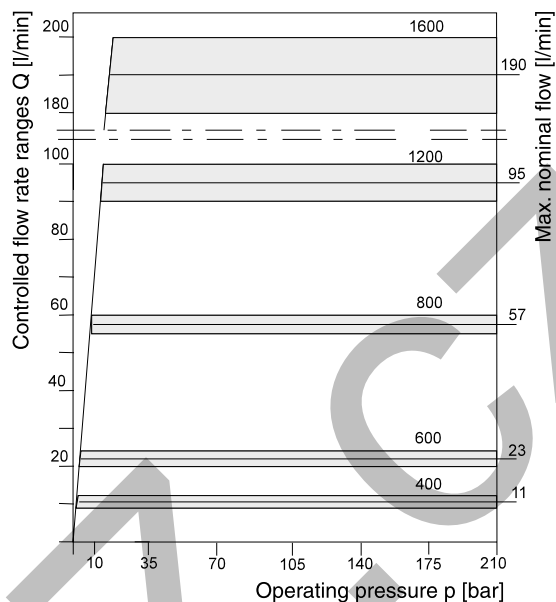


Sizes 400, 600 and 1200:  
 Pressure drop  $\Delta p$  for flow through check valve in range  $Q_{max} / Q_{min}$  with each size



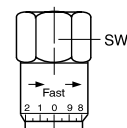
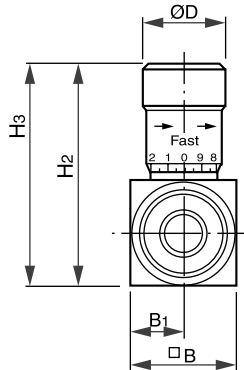
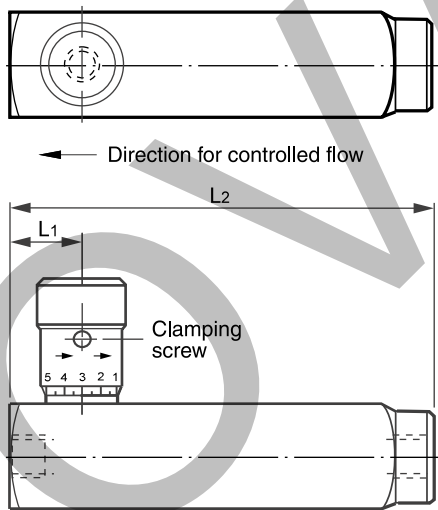
Sizes 800 and 1600:  
 Pressure drop  $\Delta p$  for flow through check valve in range  $Q_{max} / Q_{min}$  with each size

**Size 400 - 1600 p/Q control characteristic**



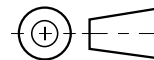
All characteristic curves measured with HLP46 at 50 °C.

**Dimensions**



Hexagon adjusting knob, standard for size 1600

H2 = closed  
 H3 = open

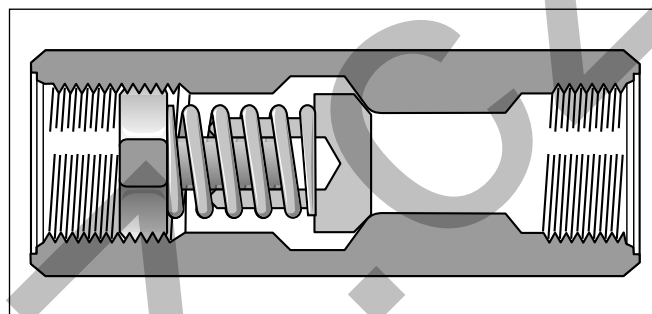
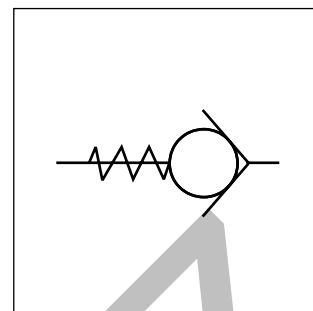


Size	R*	H3	H2	B	L1	B1	L2	ØD	SW
400	¼	69	64	35	16	18	92	21	-
600	⅜	80	74	38	18	19	106	25	-
800	½	103	95	44	22	22	125	30	-
1200	¾	128	116	57	28	29	149	35	-
1600	1	175	158	70	33	35	176	-	47.8

\* 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**

Thread type

Code	Thread
omit	NPTF
<b>9</b>	<b>BSP</b>

C

Pipe mounting

Port size

Code	Size
200	1/8
<b>400</b>	<b>1/4</b>
<b>600</b>	<b>3/8</b>
<b>800</b>	<b>1/2</b>
<b>1200</b>	<b>3/4</b>
<b>1600</b>	<b>1</b>

Body

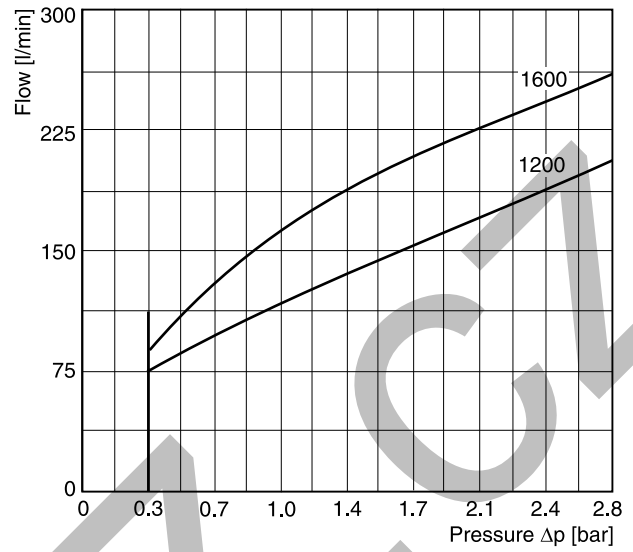
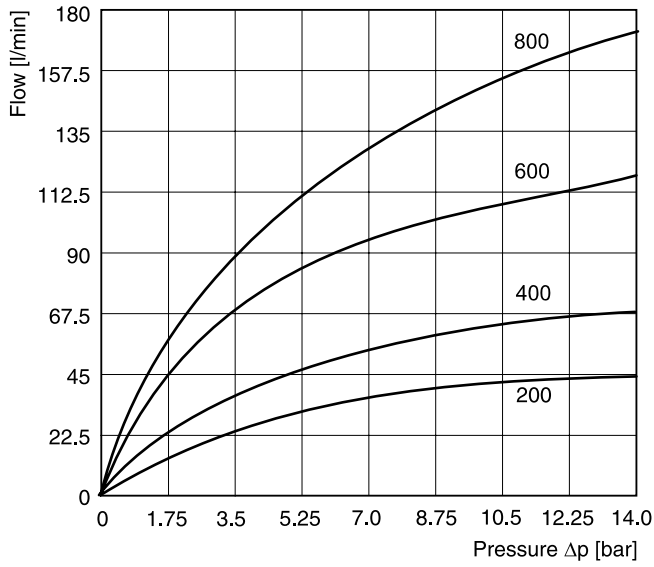
Code	Body
<b>S</b>	<b>Steel</b>
B	Brass

Opening pressure

Code	Pressure [bar]
omit	<b>0.35</b>
65	4.5

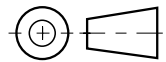
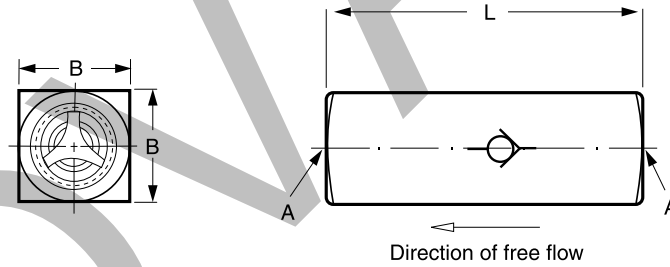
**Bold letters =  
Short-term availability**

**Δp/Q performance curves**



All characteristic curves measured with HLP46 at 50 °C.

**Dimensions**



**10**

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

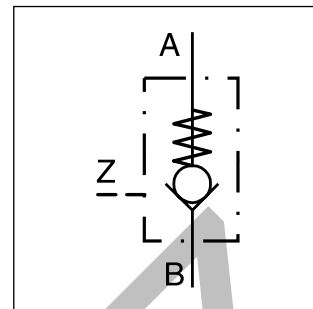
\* For alternative thread design, see ordering code.

Pilot operated check valves 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.

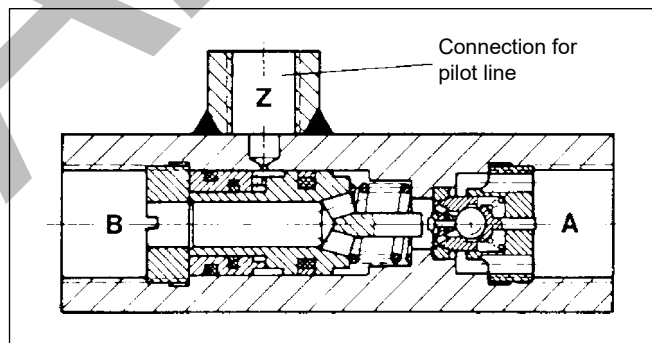
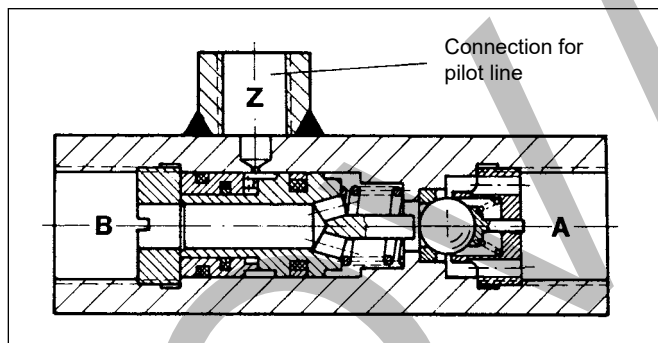


**Without pre-discharging**

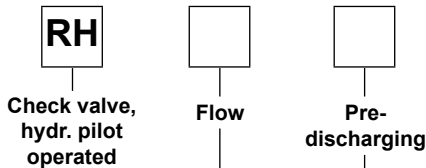
These valves have a ball as valve element, which quickly enables the full flow cross-section proportionally during pilot operation. A metering position in the pilot port dampens the control movement of the pilot spool so that pressure shocks (unloading shocks) are mostly suppressed.

**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.



**Ordering code**



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

Code	Pre-discharging
<b>v</b> <sup>1)</sup>	<b>with</b>
omit	<b>without</b>

**Bold letters = Short-term availability**

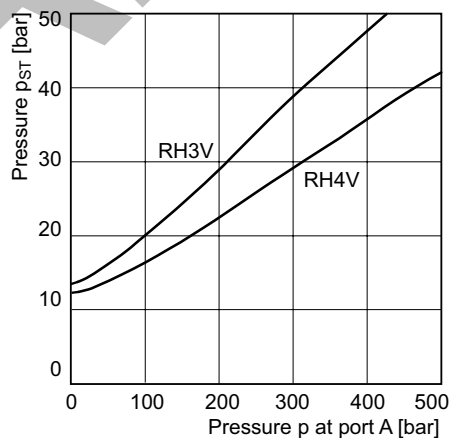
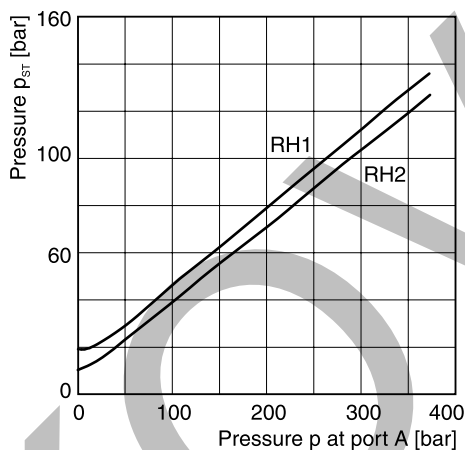
<sup>1)</sup> Only for sizes 3 and 4

**Technical data**

General						
Code		RH	<b>1</b>	<b>2</b>	<b>3 / 3V</b>	<b>4 / 4V</b>
Pipe connections	DIN ISO 228/1 A, B DIN ISO 228/1 Z		G 1/4 G 1/4	G 3/8 G 1/4	G 1/2 G 1/4	G 3/4 G 1/4
Mounting	Freely suspended in the pipeline					
Mounting position	unrestricted					
Ambient temperature	[°C]	-20 ... +60				
MTTF <sub>D</sub> value	[years]	150				
Weight	[kg]		0.4	0.4	0.6	1.3
Hydraulic						
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
Fluid	Hydraulic oil according to DIN 51524					
Fluid temperature	[°C]	-20...+70				
Viscosity	permitted	[cSt]/[mm²/s]	20...400			
	recommended	[cSt]/[mm²/s]	30...80			

**Pilot pressure  $p_{St}$  for pilot operation of the main valve**  
 ( $p_B = 0$  bar)

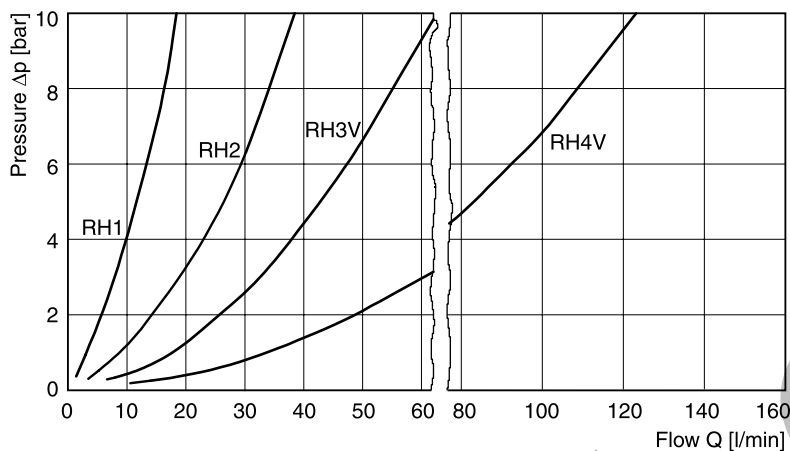
**Pilot pressure  $p_{St}$  for pilot operation of pre-discharging**



**10**

for keeping open	
$p_{St}$	$p_B + \Delta p + k$
$p_B$ [bar]	pressure on side B
$\Delta p$ [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

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

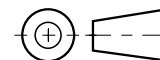
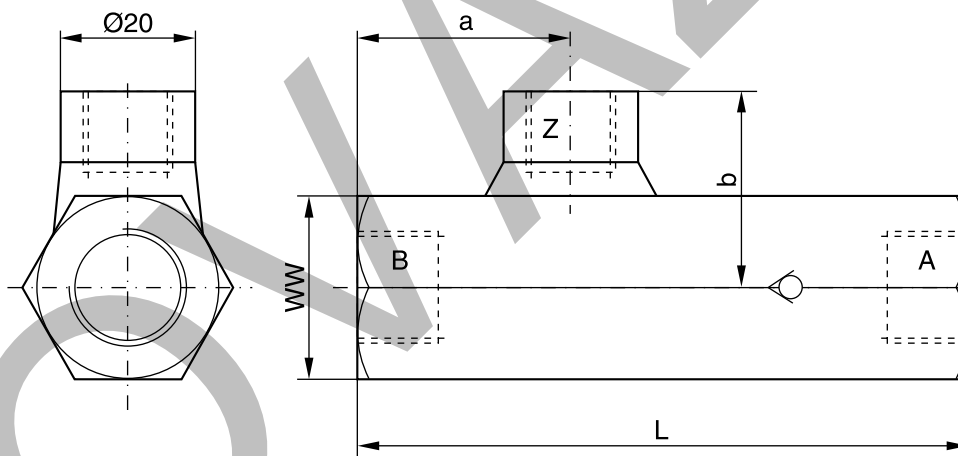


Opening pressure B to A 0.2...0.3 bar

Oil viscosity during the measurement, 60 mm<sup>2</sup>/s

For viscosities over approx. 500 mm<sup>2</sup>/s, a strong  $\Delta p$ -increase is to be expected for smaller types (RH1...RH3).

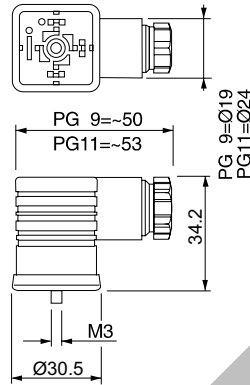
**Dimensions**



Type	Port <sup>1)</sup>		L	a	b	SW
	A, B	Z				
RH 1	G ¼	G ¼	84	31.5	27	24
RH 2	G ⅜	G ¼	90	32	28.5	27
RH 3 V	G ½	G ¼	100	36.5	31	32
RH 4 V	G ¾	G ¼	126	45	35.5	41

<sup>1)</sup> As per DIN 228/1, suitable for pipe connections with thread studs form B as per DIN 3852 page 2.

Description	Threaded cable joint	Body colour coding	Order no.
Plug EN 175301-803 <sup>1)</sup> , design type AF, protection class IP65 Voltages up to 250 V	PG 9	black, B	<b>5001710</b>
		grey, A	<b>5001711</b>
	PG11	black, B	<b>5001716</b>
		grey, A	<b>5001717</b>



<sup>1)</sup> EN 175301-803 (new) corresponding with DIN 43650 (old).

Other plugs on request

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