

Pressure valves type MV.., DMV.. and SV..

Pressure limiting valves, differential pressure regulators

- Versions as assembly kit see D 7000 E/1
- Versions with component approval (TÜV inspected) see D 7000 TÜV

Pressure p_{max} = 700 bar
Flow Q_{max} = 160 lpm



Type MV and MVS
MVCS



Type MVE



Type MVP



Type DMV
DMVN



Type SV and SVC

1. General

Pressure valves primarily influence the pressure in hydraulic installations (DIN ISO 1219-1). The types listed here are to complete following tasks:

- **Pressure limiting valve**

Protection against exceeding the maximum pressures approved for the system (relief valve) or limiting the working pressures. All valves listed in this leaflet can be used for this purpose.

- **Differential pressure regulator**

Generation of a constant pressure difference between the inlet and outlet of the flow. Valves with a housing in steel or spheroidal casting can be used for this purpose (see list of types on sect. 3.1).

- **Pressure limiting valve without damping**

For special operating conditions, e.g. to prevent creeping pressure rises in sealed cylinder chambers during temperature rise or compulsory creeping piston movement because of externally induced forces. Very low difference between opening and reseal pressure.

2. Typical construction

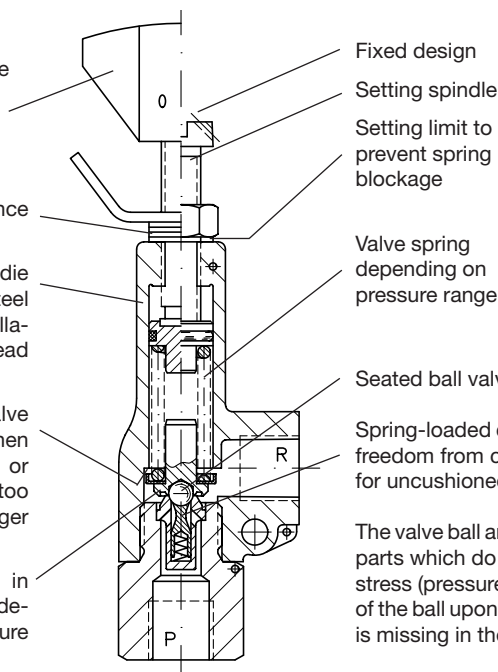
Means of adjustment with adjustable version
(Coding R = Wing screw
Coding V and H = Turn knob, see section 3.1)

Washer to limit the adjustment distance (see Section 5)

Valve housing (spring barrel) in zinc die casting, spheroidal casting or in steel for maximum adaption to local installation conditions (pipes plate or thread mounting)

Lift limiting stop prevents the valve cone from being lifted out too far when the spring is completely relieved or when the flow through the valve is too high, also prevents the cushion plunger from blocking the flow passages

Dynamically acting lift aid results in pressure setting which is rather independent of the flow (constant pressure characteristics)



Fixed design

Setting spindle

Setting limit to prevent spring blockage

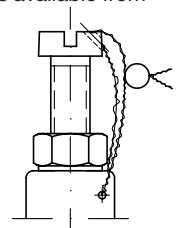
Valve spring depending on pressure range

Seated ball valve insensitive to dirt

Spring-loaded cushion plunger with a long guide ensures freedom from chatter throughout a wide viscosity range, for uncushioned valves, see section 1.

The valve ball and cushion plunger are separate functional parts which do not obstruct one another during dynamic stress (pressure peaks), thereby ensuring rapid response of the ball upon sudden pressure rise, the cushion plunger is missing in the unshushioned valve design

Lead seal provision (Lead sealing is available from HAWE when added in uncoded text to your order)



3. Types available

3.1. Type code and main data

Order examples:

MVP 4 A - 650
MV 53 B R X
DMV 4 B/C - 300/200

Desired pressure setting (bar)
 (without specification, see table 2)

X = Undamped version in accordance with sect. 1

Table 1: Basic type and Size

Brief description	Connection size and thread		Spring dome material Port pressure rating	
	Basic type Size	DIN ISO 228/1 (BSPP)		
Pressure limiting valve Corner valve for pipe installation (Tapped ports P and R)	MV ⁵⁾	41	G 1/4	Zinc die casting Perm. pressure P = 700 bar R = 20 bar see sect.3.2
		42	G 3/8	
		52	G 3/8	
		53	G 1/2	
		63	G 1/2	
Pressure limiting valve and sequence valves Corner valve for pipe installation (Tapped ports P and R)	MVS ⁸⁾	41	G 1/4	Spheroidal casting Perm. pressure P = 700 bar R = 500 bar see sect.3.2
		42	G 3/8	
		52	G 3/8	
		53	G 1/2	
		63	G 1/2	
		64	G 3/4	
Screw-in valve (for manifold installation)	MVE ¹⁰⁾	4	Stepped bore, see dimension. drawing	Steel: Perm. pressure P = 700 (400) bar R = 350 bar
		5		
		6		
		8		
Valve for plate installation (for manifold installation)	MVP ¹⁰⁾	4	Manifold, see dimensional drawing	Steel: Perm. pressure P = 700 (400) bar R = 350 bar
		5		
		6		
		8		
For inline installation in a pipe system (Tapped hole at P and R)	SV ¹⁾	42	G 3/8	Steel: Perm. pressure P = 700 (400) bar R = 500 (400) bar
		53	G 1/2	
		64	G 3/4	
		85	G 1	
Pressure limiting valve (as shock valve), Double valve for hydraulic motor (Tapped hole at P and R)	DMV ^{1) 3)}	41	G 1/4	Steel: Perm. pressure P and R = 350 bar
		42	G 3/8	
		52	G 3/8	
		53	G 1/2	
		63	G 1/2	
		64	G 3/4	
Pressure limiting valve Double valve with suction valve for cylinders, (tapped hole at A, B, R)	DMVN ¹⁾³⁾⁵⁾⁶⁾	42	G 3/8	Steel: Perm. pressure A, B = 350 bar R = 20 bar
		53	G 1/2	
		64	G 3/4	
Single valve with thru-holes (tapped hole at P and R)	MVT ^{1) 3) 5)}	41	G 1/4	Steel: Perm. pressure P and R = 500 bar
		52	G 3/8	
		63	G 1/2	
Pressure limiting valve with free return R→P via a by-pass check valve Corner valve, pipe mounting Tapped hole at P and R	MVCS ^{3) 5)}	46	G 3/8	Spheroidal casting Perm. pressure P and R = 500 bar
		56	G 1/2	
		66	G 3/4	
		47	G 3/8 (A)	
		58	G 1/2 (A)	
		69	G 3/4 (A)	
For inline installation in a pipe system Tapped hole at P and R	SVC ^{1) 3) 5)}	46	G 3/8	Steel: Perm. pressure P and R = 500 bar
		56	G 1/2	
		66	G 3/4	
		47	G 3/8 (A)	
		58	G 1/2 (A)	
		69	G 3/4 (A)	

Table 3: Adjustment (during operation)

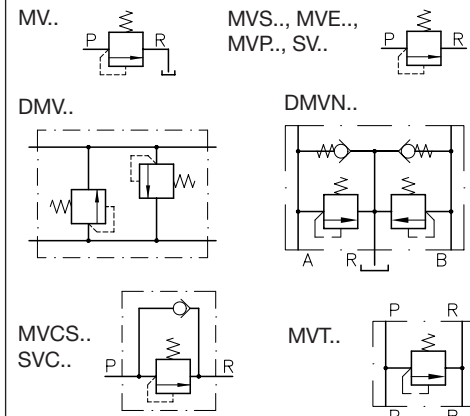
Without coding	Standard, tool adjustable
R	Manually adjustable (Wing screw+wing nut)
V ^{5) 8)}	Turn knob (self-locking)
H ^{5) 10)}	Turn knob lockable Keys conforming the regulations of the automotive industry; One key is scope of delivery (usually anyway in the possession of the authorized work staff)

Table 2: Pressure range and flow
 Attention: The pressure will be set acc. to the table below, if not ordered otherwise

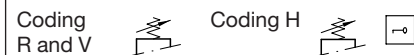
Pressure range	A ³⁾	B	C	E	F
(0) ⁴⁾ ...	700	500	315	160	80
... P _{max} (bar)	Size 4, 5, 6	---	400 ⁹⁾	315	160
(bar)	Size 8	---	---	---	---
Pressure setting from HAWE (bar) ²⁾	450	400	315	160	80
Corresponding flow Q _{max} (lpm)	Size 4	12	20		
	Size 5	20	40		
	Size 6	40	75		
	Size 8	--	160		

Symbols

Illustration of the standard version (tool adjustable)



Additional adjustability:



- 1) Tool adjustable version only
- 2) When not specified in the order
- 3) Pressure range coding A not avail. For type DMV, DMVN, MVT, MVCS, and SVC
- 4) A setting below 0.1 ... 0.15 p_{max} is not effective. The min. pressure that can be achieved, when the spring is completely decompressed depends on the valve related back pressure and the flow (sect. 3.2)
- 5) Not available as size 8
- 6) Suction valves serve for the volume compensation, preventing the formation of a vacuum within hydraulic cylinders
- 8) Coding V not available for type MVS 4
- 9) pressure range B not available for type SV 85
- 10) Coding H not available for type MVE 4 and MVP 4

3.2. Additional data

Nomenclature and design Pressure valve controlled directly, ball seat design

Conditions for application Zinc die-casting: Standard model for normal production conditions
Spheroidal casting: For through production conditions; for operational conditions in which mechanical shocks or vibrations cannot be avoided (vehicle construction). Also when there are pressure surges in the return pipe.

Mounting and installed position according to the type, either freely suspended in the pipe, secured via a through-hole or screw- in or plate assembly; installed position arbitrary

Line connection Steel or spherical cast parts zinc galvanized; Spring domes made of zinc pressure die-casting are untreated

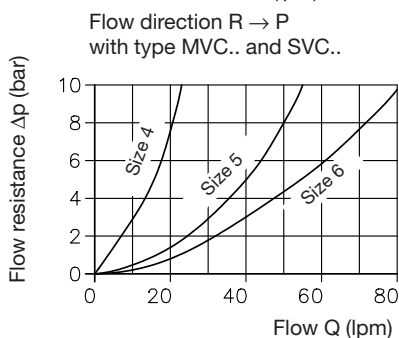
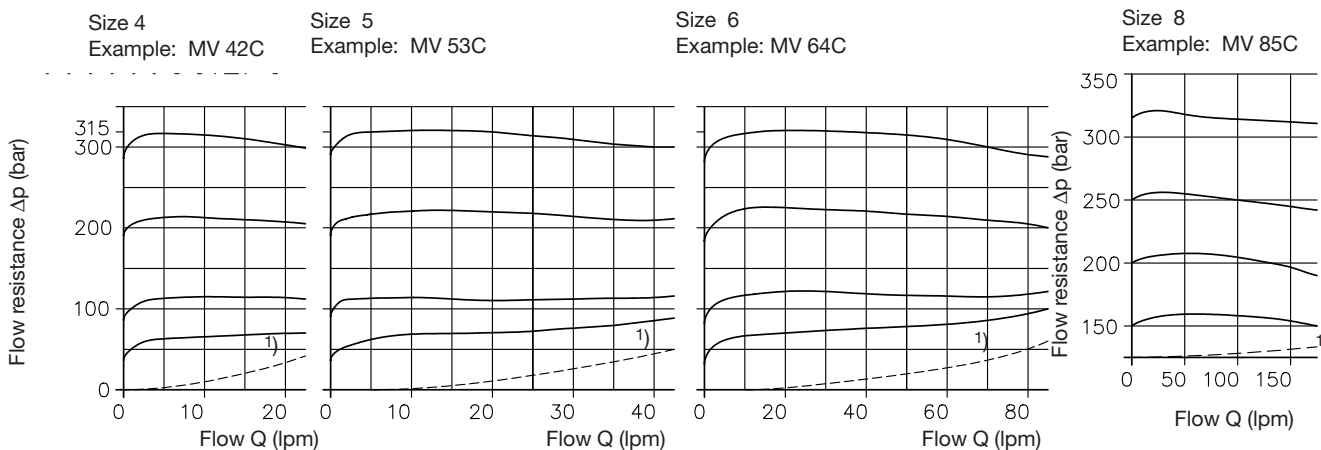
Flow direction P → R, with SVC and MVCS free return flow R → P (Attention: Observe Q_{max} sect. 3.1, table 2)

Mass (weight) approx. kg	Size	MV	MVS	MVE	MVP	SV	DMV	DMVN	MVT	MVCS	SVC
	4	0.2	0.2	0.2	0.3	0.2	0.7	0.8	0.5	0.3	0.3
	5	0.3	0.3	0.3	0.5	0.3	1.3	1.5	1.0	0.4	0.4
	6	0.5	0.5	0.4	0.8	0.7	1.8	2.4	1.3	0.7	0.9
	8	---	2.0	1.0	1.6	0.9	4.5	---	---	---	---

Pressure fluid Hydraulic oil conforming DIN 51524 part 1 to 3: ISO VG 10 to 68 conforming DIN 51519.
Viscosity limits: min. approx. 4, max. approx. 1500 mm²/s, opt. operation approx. 10... 500 mm²/s.
Also suitable for biological degradable pressure fluids types HEPG (Polyalkylenglycol) and HEES (Synth. Ester) at service temperatures up to approx. +70 °C.

Temperature Ambient: approx. -40 ... +80 °C
Fluid: -25 ... +80°C, Note the viscosity range !
Permissible temperature during start: -40°C (Note start-viscosity!), as long as the service temperature is at least 20K higher for the following operation. Biological degradable pressure fluids:
Note manufacturer's specifications. By consideration of the compatibility with seal material not over +70 °C.

Δp-Q-characteristics Characteristic curve shown with example MV..C (basic tendency, there are certain differences depending on the pressure range and the housing shape of the various basic types)
An increased return back pressure will transform the curves into positive Δp-figures.



Pressure variations (apply to all valves acc. to sect. 3.1). Rough guide line figures (valve idling) per one revolution of the set screw.

Pressure range (bar)	Travel f _{max} (mm) / Δp (bar) per one revolution 2)			
	Size 4	Size 5	Size 6	Size 8
A 0 ... 700	4.5 / 195 (4.3 / 220)	8.4 / 105 (9.1 / 140)	7.4 / 120 (7 / 180)	---
B 0 ... 500 (400)	6.3 / 100 (6.1 / 110)	9.7 / 65 (10 / 90)	7.9 / 80 (7 / 130)	9 / 68
C 0 ... 315	7.1 / 55 (6.5 / 65)	7.7 / 51 (7.2 / 80)	10.2 / 35 (9.3 / 62)	13 / 37 (12.8 / 57)
E 0 ... 160	10.5 / 19 (8 / 27)	12 / 17 (11.2 / 26)	11.5 / 17.5 (10 / 29)	12.5 / 20 (12.4 / 30)
F 0 ... 80	10.5 / 9.5 (7.2 / 15)	11.5 / 9 (7.3 / 20)	12.5 / 8 (9.7 / 15)	---

Attention: Any pressure re-adjustment should be monitored with a pressure gauge !
For adjustment instruction, see section 5

1) Design related characteristic flow resistance with spring relieved (static pressure value 0 bar). Pressures under this limit line are not obtainable, see also footnote 4), sect. 3.1

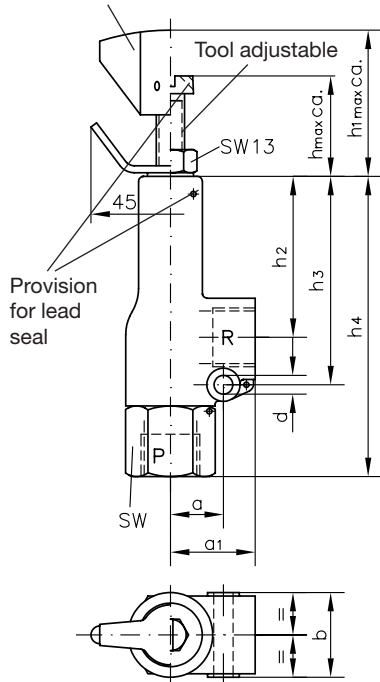
2) Figures in brackets apply to type SV and SVC

4. Dimensions of units

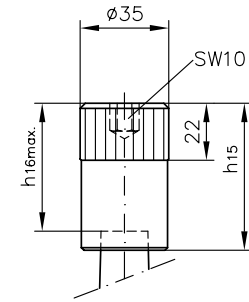
All dimensions are in mm, subject to change without notice)

Type MV 4(5, 6) and MVS 4(5, 6)

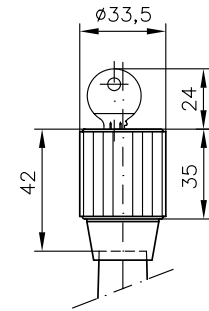
Means of adjustment coding R



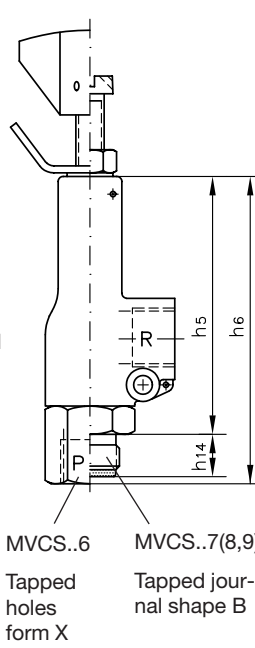
Means of adjustment coding V



Means of adjustment coding H



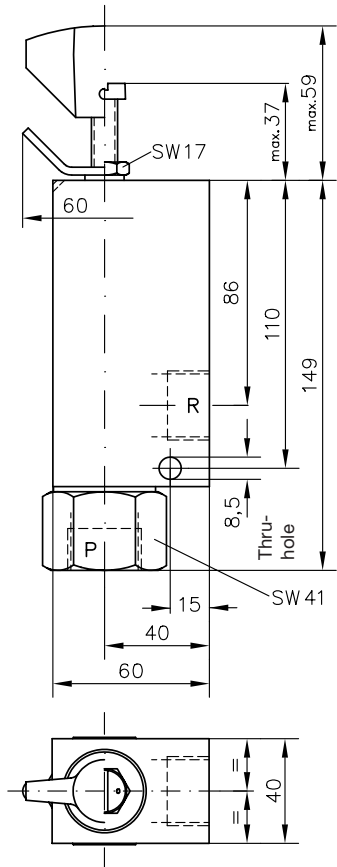
Type MVCS 4(5, 6)



MVCS..6 MVCS..7(8,9)
Tapped holes form X Tapped journal shape B

similar to DIN 3852 page 2

Type MVS 8

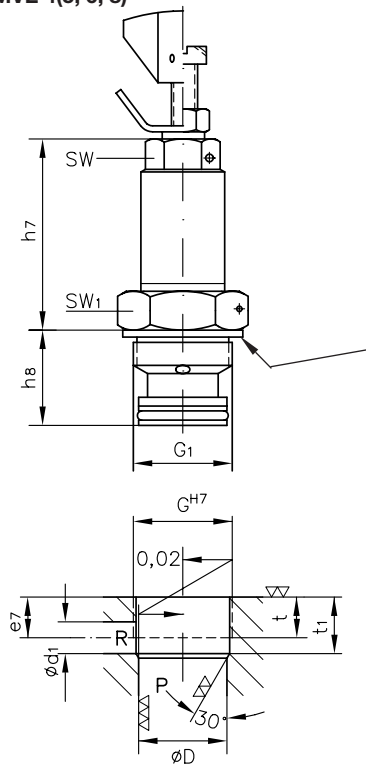


SW = a/f

Size	a	a1	b	d	h	h1	h2	h3	h4	h5	h6	h14	h15	h16	SW
4	15	24	24	5.3	28	40	46	61	86	72	85.5	13	58	41	22
5	18	30	29	6.4	31	42	49	66	95	82	99.5	15	58	41	27
6	20	35	36	6.4	31	44	62	82	117	100	120	17	64	56	30

For port size, see section 3.1

Type MVE 4(5, 6, 8)

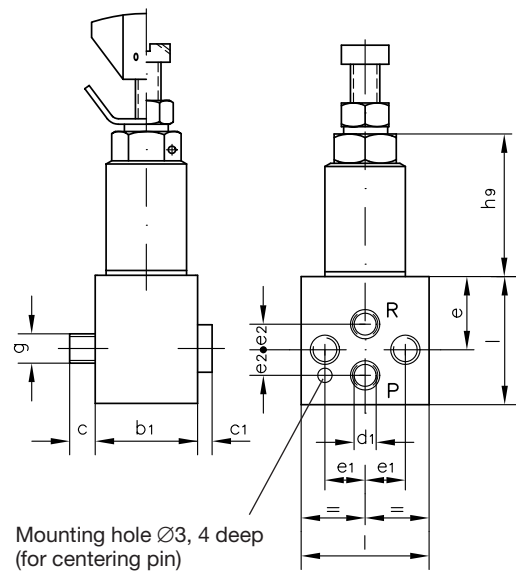


Size	Sealing ring DIN 7603...
4	A 22x27x1.5 (St)
5	A 28x34x2 (Cu)
6	A 30x36x2 (Cu)
8	A 40x49x2 (Cu)

Size	Thread G and G1
4	M 22x1.5
5	M 28x1.5
6	M 30x1.5
8	M 40x1.5

Size	h7	h8	D	e7	d1	t	t1	SW	SW1	Torque for steel (Nm)	b1	c	c1	d1	e	e1	e2	g	h9	l
4	48	26	18 ^{H8}	12	6	12	15	22	27	80	28	7	8	6	20	11	7	M 8	39	35
5	53.5	27	25 ^{H8}	11.5	9	9	16	27	32	120	32	8	8	9	21	13.5	9	M 8	42	40
6	65.5	32	25 ^{H8}	14	12	10	19	30	36	160	35	10	10	12	26	17	11	M 10	51.5	50
8	90	40	36 ^{H8}	19	16	12	27	41	46	300	50	15	12	16	30	20	13	M 12	75	60

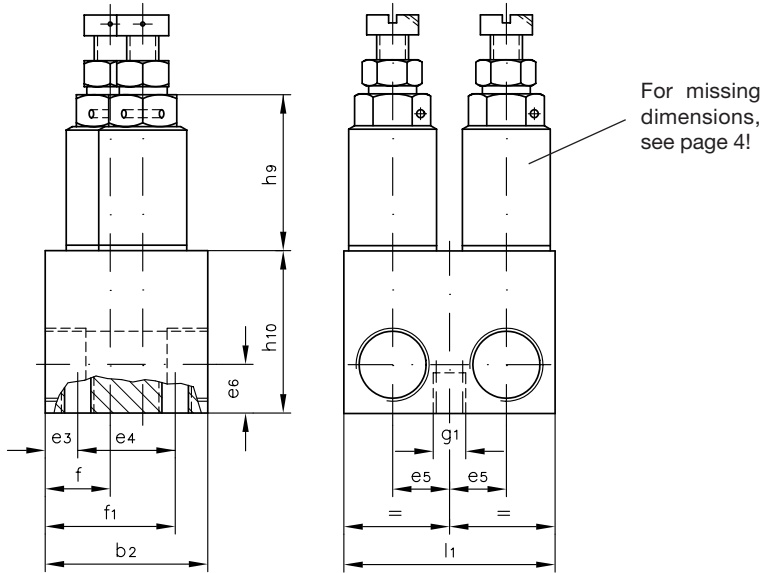
Type MVP 4(5, 6, 8)



Sealing of connections P and R:

Size	4	5	6	8
O-ring NBR 90 Sh	8x2	10x2	13.95x2.62	18.76x2.62

Type DMV 4(5, 6, 8)

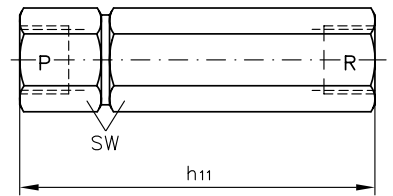


Size	b2	e3	e4	e5	e6	f	f1	g1	h9	h10	l1
4	40	8	24	14	12	16	24	M 8, 10 deep	39	40	52
5	50	10	30	18	15	19	31	M 8, 10 deep	42	50	65
6	60	10	40	21	18	23	37	M 10, 12 deep	51.5	60	75
8	80	10	60	27	25	30.5	49.5	M 10, 12 deep	75	80	96

For port size, see section 3.1

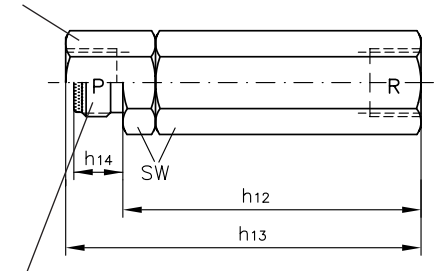
SW = a/f

Type SV 4(5, 6, 8)



Type SVC 4(5, 6)

SVC..6: Tapped holes 1) form X



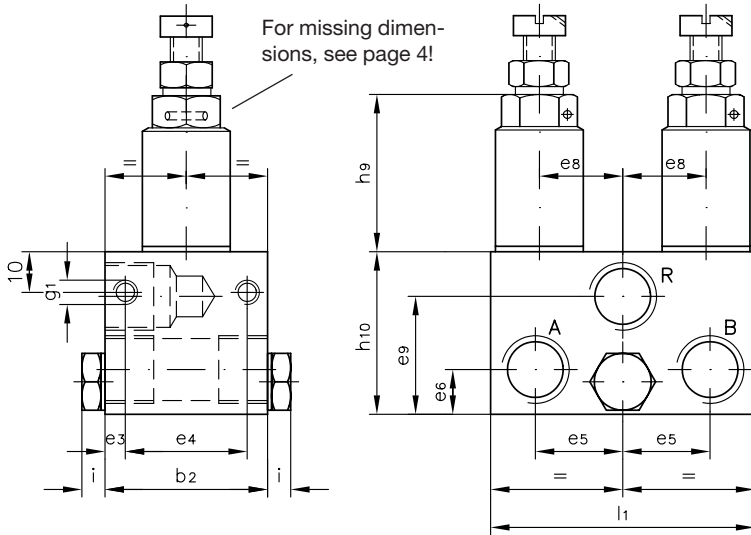
SVC..7(8,9): Threaded stem 1) form B

Size	h11	h12	h13	h14	SW
4	87	73	87	13	22
5	104	90	108	15	27
6	129	112	132	17	32
8	157	---	---	---	41

For port size, see section 3.1

1) similar to DIN 3852 page 2

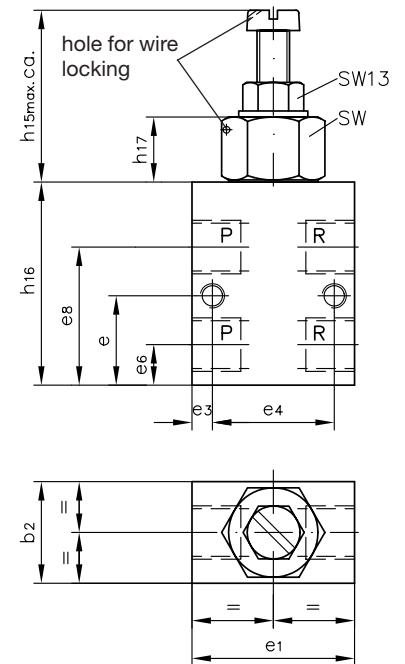
Type DMVN 42(53, 64)



Size	b2	e3	e4	e5	e6	e8	e9	g1	h9	h10	i	l1
4	40	5	30	21.5	11	20.5	29	M6, 10 deep	39	40	9	65
5	50	7.5	35	27	14	26.5	36	M8, 12 deep	42	50	9	82
6	60	9	42	32	16.5	32	44	M10, 12 deep	51.5	60	5	97

For port size, see section 3.1

Type MVT 41(52, 63)



Size	b2	e	e1	e3	e4	e6	e8	h15	h16	h17	SW
4	25	22	40	5	30	10	34	42	50	16	22
5	30	26	44	6	32	12	42	44	60	20	27
6	35	32	50	7	36	14	50	52	70	27	30

For port size, see section 3.1

5. Adjustment instruction

The valves are delivered with proper setting from HAWE, when specified in your order (e.g. MV 53C - 250 bar). Washers prevent unauthorized increasing of the set pressure for adjustable valves. The pressure will be set acc. to the table 2 in sect. 3.1, if not ordered otherwise. Any pressure adjustment should be monitored by a pressure gauge and while the pump is running.

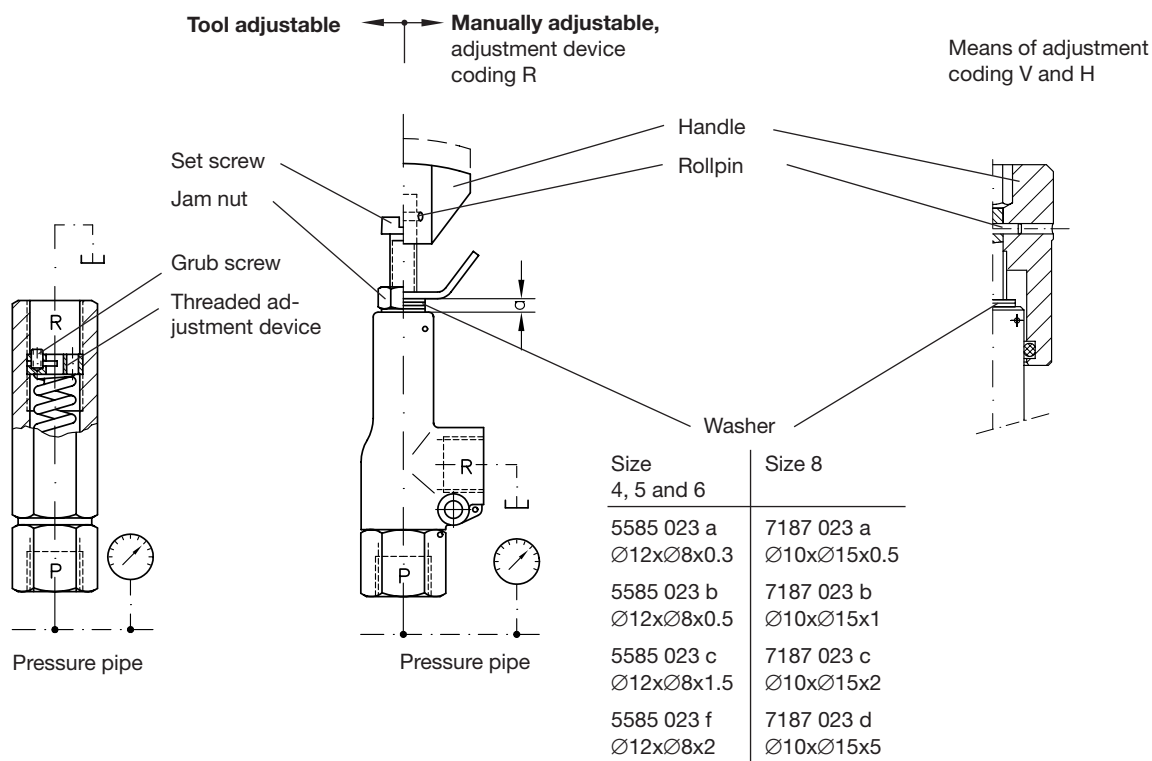
● Reduction of the setting

1. Pressure gauge connected to the pressure pipe (pressure gallery)
2. Type MV... and DMV(N): Slacken the lock nut (remove lead seal if necessary)
Type SV(C): Slacken grub screw
3. Turn the adjustment device anti clockwise (monitored by a pressure gauge)
4. Tighten the lock nut / grub screw after finished procedure. Renew the lead seal if required

● Raising of the setting

Observe the p_{max} figures stated in section 3.1 !

In principle proceed as above. The adjustment takes place clockwise. Washers usually prevent unauthorized increasing of the pressure with manually adjustable versions. It is therefore necessary to remove enough of them (after driving the rollpin out of the winged handle) before the increased pressure can be set. Again any pressure adjustment should be monitored by a pressure gauge. After finishing the setting procedure sufficient washers, the winged locknut, the winged handle and the rollpin must be reinstalled.



Note: The pressure read on the dial during adjustment, while the pump is running is always corresponding to this flow. Flow deviations will cause a slightly differing response pressure, depending on the design related back pressure of the valve housing (see sect. 3.2). Please add to your order coding in uncoded text „set at start of response“ when required e.g. for a pressure limiting valve intended for a hand pump $Q \approx 0$ lpm.