2.3

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

Pressure limiting valves, differential pressure regulators

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

Additional versions

Versions as assembly kit

see D 7000 E/1

Versions with component approval (TÜV inspected) see D 7000 TÜV











Type DMV **DMVN**

Type SV and SVC

Type MV and MVS **MVCS**

1. General

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

The pressure relief valves are not suited for safeguarding pressure devices acc. to Pressure Equipment Directive 97/23/EC. There are also versions available featuring unit approvals, see D 7000 TÜV, D 7710 TÜV, D 6905 TÜV.

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 reseat

2. Typical construction

Means of adjustment with adjustable version

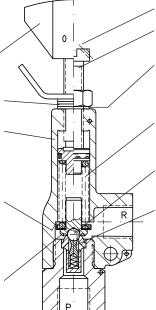
(Coding R = Wing screw Coding V and H= Turn knob, see section 3.1)

Washer to limit the adjustment distance (see section 5)

Valve housing (spring dome) in zinc die casting, spheroidal casting or in steel for maximum adaption to local installation conditions (inline or manifold mounting, cartridge version)

Stroke limitation prevents the valve ball 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 dampening plunger from blocking the flow passage.

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



Fixed design Setting spindle

Setting limit to prevent spring blockage

Valve spring depending on pressure range Lead seal provision (Lead sealing is available from HAWE when added in uncoded text to your order)

Seated ball valve insensitive to contamination

Spring-loaded dampening plunger with a long guide ensures chatter free operation throughout a wide viscosity range

For undampened valves, see section 1.

The valve ball and dampening 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 undampened valve design



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D 7000/1

3. Types available

3.1 Type code and main data

Order examples:

Table 1: Basic type and Size

Brief description Connection size and Spring dome thread material Port pressure Basic type ISO 228/1 rating Size (BSPP) G 1/4 41 Corner valve for pipe Pressure limiting Zinc die casting mounting 42 G 3/8 (tapped ports P and R) Perm. pressure ΜV 52 G 3/8 P = 700 bar5) 53 G 1/2 R = 20 barsee sect. 3.2 63 G 1/2 64 G 3/4 41 G 1/4 Spheroidal Corner valve for pipe casting 42 G 3/8 mounting Pressure limiting valve and sequence valves G 3/8 (tapped ports P and R) 52 Perm. pressure **MVS** 53 G 1/2 P = 700 barR = 500 bar63 G 1/2 8) see sect. 3.2 64 G 3/4 Steel: G 3/4 84 Perm. pressure P and R = 400 bar 85 G 1 4 Stepped Screw-in valve bore, see (for manifold mounting) **MVE** 5 Steel: dimension. 6 drawing Perm. pressure 8 P = 700 (400) bar 4 Valve for Manifold, R = 350 bar(manifold mounting) **MVP** 5 see dimensional 10) 6 drawing 8 42 G 3/8 For inline installation in a Steel: pipe system SV 53 G 1/2 Perm. pressure (tapped hole at P and R) 64 G 3/4 P = 700 (400) barR = 500 (400) bar85 G 1 41 G 1/4 Double valve for 42 G 3/8 Pressure limiting valve (as shock valve) hydraulic motor 52 G 3/8 Steel: (tapped hole at P and R) **DMV** 53 G 1/2 Perm. pressure 1) 3) 63 G 1/2 P and R 64 G 3/4 = 350 bar84 G 3/4 85 G 1 42 G 3/8 Steel: Perm. Double valve with suction pressure valve for cylinders, DMVN 53 G 1/2 $A, B = 350 \, bar$ (tapped hole at A, B, R) 1) 3) 5) 6) 64 G 3/4 = 20 barSteel: Perm. Single valve with thru-holes MVT 63 G 1/2 pressure P and (tapped hole at P and R) R = 315 bar1) 3) 5) 46 G 3/8 Tapped hole at pipe P and R **MVCS** 56 Spheroidal G 1/2 → P via a by-pass check Corner valve, Pressure limiting valve with free castina 3) 5) 66 G 3/4 mounting Perm. pressure Thread journal 47 G 3/8 (A) P and R at P, tapped 58 G 1/2 (A) = 500 bar hole at R G 3/4 (A) 69 46 G 3/8 For inline installa-tion in a pipe Tapped hole at Steel: SVC 56 G 1/2 P and R Perm. pressure 1) 3) 5) 66 G 3/4 P and R return R 47 G 3/8 (A) system Thread journal = 500 bar valve at P, tapped 58 G 1/2 (A) hole at R 69 G 3/4 (A)

MVP 4 A - 650 MV 53 B R X

DMV 4 B/C | | - 3

- 300/200 Desired pressure setting (bar) (without specification, see table 2)

X = Undampened version acc. to sect. 1

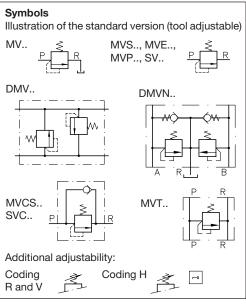
Table 3: Adjustment (during operation)

| 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 rar | nge | A 3) | В | С | E | F | | |
|--|-----------------|-------------|--------------------|-----|-----|----|--|--|
| (0) ⁴) p _{max} | Size 4, 5, 6 | 700 | 500 | 315 | 160 | 80 | | |
| (bar) | Size 8 | 700 | 400 ⁹) | 315 | 160 | | | |
| Pressure set HAWE (bar) | U | 450 | 400 | 315 | 160 | 80 | | |
| Corres- | Size 4 | 12 | 20 | | | | | |
| ponding | Size 5 | 20 | 40 | | | | | |
| Q _{max} (lpm) | Size 6 | 40 | 75 | | | | | |
| | Size 8 | 100 | 160 | | | | | |



- 1) Tool adjustable version only
- 2) When not specified in the order
- Pressure range coding A not avail. for type DMV, DMVN, MVT, MVCS, and SVC
- 4) A setting below 0.2 p_{max} is not effective. The min. pressure that can be achieved, when the spring is completely decommpressed depends on the valve related back pressure and the flow (sect. 3.2)
- 5) Not available as size 8
- 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 seated design

Intended application

Zinc die-casting: Standard model for normal production conditions

Spheroidal casting: For rough operation conditions; where mechanical shocks or vibrations

cannot be avoided (automative engineering).

Also when there are pressure surges in the return pipe.

Mounting and installet

position

Dep. on type, either freely suspended in the pipe work, secured via a thru-hole or screw-in or manifold mounting; arbitrary installation position

Line connection

Steel or spheroidal cast parts zinc galvanized; Spring domes made of zinc pressure die-casting are

untreated

Flow direction

 $P \rightarrow R$, with SVC and MVCS free return flow $R \rightarrow P$ (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 | | 0.3 | 0.3 | |
| 5 | 0.3 | 0.3 | 0.3 | 0.5 | 0.3 | 1.3 | 1.5 | | 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

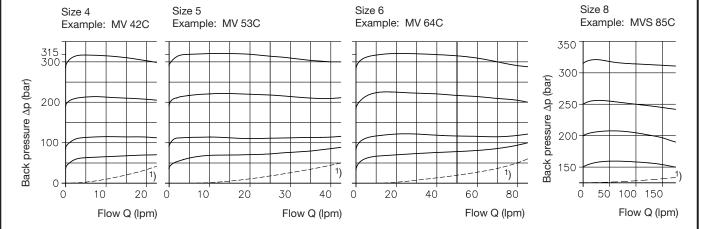
Ambient: approx. -40 ... +80°C

Fluid: -25 ... +80°C; Note the viscosity range!

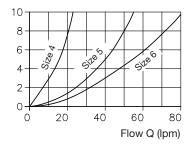
Permissible temperature during start: -40°C (Note start-viscosity!), as long as the service temperature is at least 20K higher for the following operation. Biological degradable pressure fluids: Note manufacturer's specifications. By consideration of the compatibility with seal material not over +70°C.

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.



Flow direction $R \rightarrow P$ with type MVC.. and SVC..



3ack pressure ∆p (bar)

Oil viscosity during testing 50 mm²/s

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

| Pre | essure range | Travel f_{max} (mm) / Δp (bar) per one turn 2) | | | | | | | | |
|-----|--------------|--|--------------------------|--------------------------|--------------------------|--|--|--|--|--|
| | (bar) | Size 4 | Size 5 | Size 6 | Size 8 | | | | | |
| Α | 0 700 | 4.5 / 195 (4.3 / 220) | 8.4 / 105 (9.1 / 140) | 7.4 / 120 (7 / 180) | | | | | | |
| В | 0 500 (400) | 6.3 / 100 (6.1 / 110) | 9.7 / 65 (10 / 90) | 7.9 / 80 (7 / 130) | 9 / 68 | | | | | |
| С | 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) | | | | | |
| Е | 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

Design related characteristic back pressure with spring relieved (static pressure value 0 bar). Pressure below this limit line cannot be achieved, see also footnote 4), sect. 3.1

²⁾ Figures in brackets apply to type SV and SVC

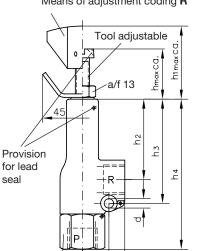


All dimensions are in mm, subject to change without notice!

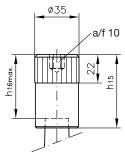
Type MVCS 4(5, 6)

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

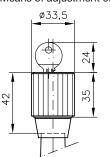
Means of adjustment coding R



Means of adjustment coding V



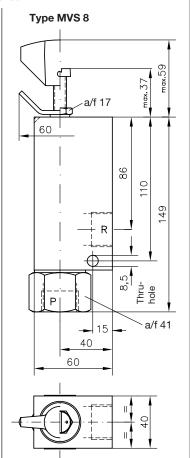
Means of adjustment coding **H**



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

similar to DIN 3852 page 2

| Size | а | a ₁ | b | d | h | h ₁ | h ₂ | h ₃ | h ₄ | h ₅ | h ₆ | h ₁₄ | h ₁₅ | h ₁₆ | a/f |
|------|----|----------------|----|-----|----|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----|
| 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 | 100.5 | 15 | 58 | 41 | 27 |
| 6 | 20 | 35 | 36 | 6.4 | 31 | 44 | 62 | 82 | 117 | 100 | 120 | 17 | 64 | 56 | 30 |



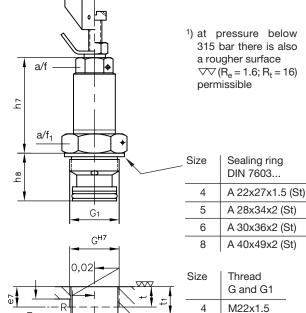
Type MVP 8 A

98

approx.

For port size, see section 3.1





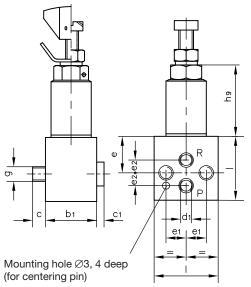
5

6

M28x1.5 M30x1.5

M40x1.5

Type MVP 4(5, 6, 8)

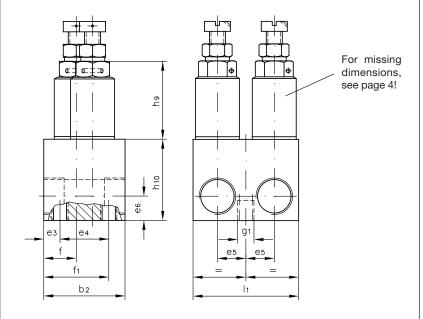


Sealing of ports P and R:

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

| Size | h ₇ | h ₈ | D | e ₇ | d₁ | t | l t₁ | a/f | a/f ₁ | Torque for steel (Nm) | Size | b ₁ | С | C ₁ | d ₁ | e | e ₁ | e ₂ | g | h ₉ | ı |
|------|----------------|----------------|------------------|----------------|-----|----|----------|-----|------------------|-----------------------|--------|----------------|----|----------------|----------------|----|----------------|----------------|-----|----------------|----|
| | <u> </u> | - | | · · | i i | | <u> </u> | | <u> </u> | | | <u> </u> | | | | | - | - | _ | | _ |
| 4 | 48 | 26 | 18 ^{H8} | 12 | 6 | 12 | 15 | 22 | 27 | 80 | 4 | 28 | 7 | 8 | 6 | 20 | 11 | 7 | M8 | 39 | 35 |
| 5 | 53.5 | 27 | 25 ^{H8} | 11.5 | 9 | 9 | 16 | 27 | 32 | 120 | 5 | 32 | 8 | 8 | 9 | 21 | 13.5 | 9 | M8 | 42 | 40 |
| 6 | 65.5 | 32 | 25 ^{H8} | 14 | 12 | 10 | 19 | 30 | 36 | 160 | 6 | 35 | 10 | 10 | 12 | 26 | 17 | 11 | M10 | 51.5 | 50 |
| 8 | 90 | 40 | 36 ^{H8} | 19 | 16 | 12 | 27 | 41 | 46 | 300 | 8, 8 A | 50 | 15 | 12 | 16 | 30 | 20 | 13 | M12 | 75 | 60 |

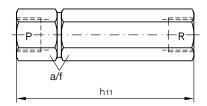
Type DMV 4(5, 6, 8)



| Size | b ₂ | e ₃ | e ₄ | e ₅ | e ₆ | f | f ₁ | 91 | h ₉ | h ₁₀ | l ₁ |
|------|----------------|----------------|----------------|----------------|----------------|------|----------------|---------------|----------------|-----------------|----------------|
| 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 |

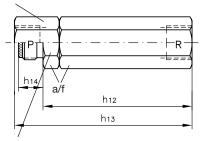
For port size, see section 3.1

Type SV 4(5, 6, 8)



Type SVC 4(5, 6)

SVC..6: Tapped holes 1) form X



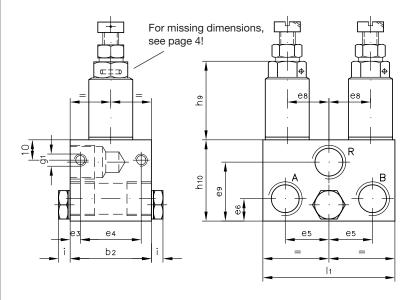
SVC..7(8, 9): Threaded stem 1) form B

| Size | h ₁₁ | h ₁₂ | h ₁₃ | h ₁₄ | a/f |
|------|-----------------|-----------------|-----------------|-----------------|-----|
| 4 | 87 | 73 | 87 | 13 | 22 |
| 5 | 104 | 90 | 109 | 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

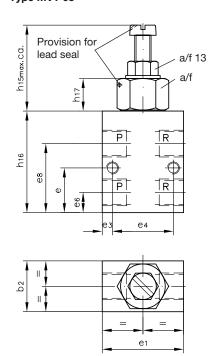
Type DMVN 42(53, 64)



| | Size | b ₂ | e ₃ | e ₄ | e ₅ | e ₆ | e ₈ | e ₉ | 91 | h ₉ | h ₁₀ | i | I ₁ |
|---|------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------|----------------|-----------------|---|----------------|
| | 4 | 40 | 5 | 30 | 21.5 | 11 | 20.5 | 29 | M6, 10 deep | 39 | 40 | 9 | 65 |
| Ī | 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 63



| Size | | | | | | | | | | | |
|------|----|----|----|---|----|----|----|----|----|----|----|
| 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 at adjustable valves. The pressure will be set acc. to they 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.

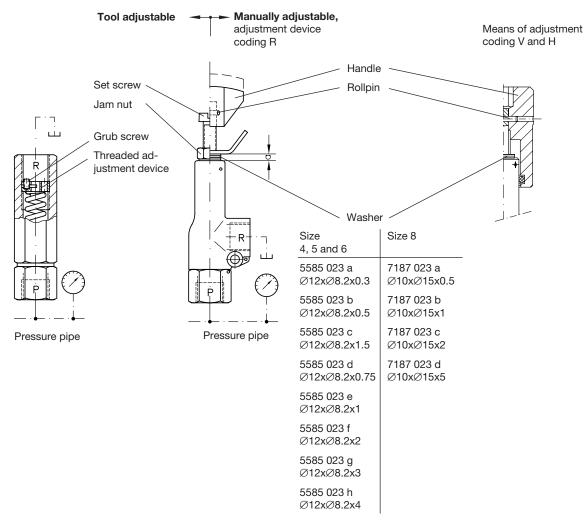
• Reduction of the setting

- 1. Pressure gauge connected to the pressure pipe (pressure gallery)
- 2. Type MV... and DMV(N): Loosen the lock nut (remove lead seal if necessary)
 - Type SV(C): Loosen grub screw
- 3. Turn the adjustment device counter 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. Pressure increase when turned 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 reading 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 ≈ 0 lpm.