

M3P..G/A , M3P..F/A Modulating control valves (PN16) for chilled and hot water systems

Three-way or straight-through valves with magnetic actuators for modulating control of chilled and hot water systems.

- Short positioning time
- High resolution
- High rangeability
- Low friction
- 1 → 3 closed when de-energised
- Versatile electrical interface
- Robust and maintenance-free



M3P..G/A



M3P..F/A

Types

M3P..G../A	Screwed valves	DN8 ... DN50
M3P..F../A	Flanged valves	DN8 ... DN100

Technical data

Standard electrical interface:	ZM100/A (up to DN65) or ZM200/A (from DN80)
Control signals	DC 0 ... 10 V or 0 ... 20 V phase cut
Supply voltage 1)	AC 24 V +15/-10 % (only with DC 0...10V signal)
Other electrical interfaces on request:	ZM120/A, ZM220/A (see ordering information)
Control signals	DC 4 ... 20 mA or DC 0 ... 20 V phase cut
Supply voltage 1)	AC 24 V +15/-10% (only with DC 4...20 mA signal)
Nominal power	See table on page 2
Nominal pressure	PN16
Operating pressure $p_{e,max}$	1 MPa (10 bar)
Admissible pressure differential $\Delta p_{v,max}$	See table on page 2
Leakage at $\Delta p_v = 0.1$ MPa (1bar)	1 → 3 max. 0.05 % k_{vs} (to VDI/VDE2174) 2 → 3 depending on operating data (approx. 2 % k_{vs})
Water temperature	2 ... 120 °C
Valve characteristic (stroke, k_v)	Linear, optimised in low opening range
Resolution $\Delta H / H_{100}$	> 1 : 200 (H = stroke)
Type of operation	Modulating
Manual adjustment	Up to max. 90 % depending on DN
Position when de-energised	1 → 3 closed
Orientation	Any (Affects protection standard – see below)
Positioning time	Approx. 1 s
Materials (valve body):	
Housing	Cast iron
Control disc	Chrome nickel steel
Seat	Brass
Spindle seal	EPDM (O ring)
Connection terminals	Screw terminals for 4 mm ² wire
Protection standard:	
Horizontal to vertical mounting	IP31 to EN60529
Below horizontal*	IP30 to EN60529
Ambient temperature	2 ... 50 °C
Weight	See 'Dimensions and weight' tables
Conforms to	CE requirements

1) Only admissible with extra-low voltage (SELV, PELV)

Caution

This valve is suitable for straight-through or three-way applications and may be installed ONLY in a mixing arrangement.

* Note:

Mounting below the horizontal is NOT recommended in the UK.

Ordering information

The valves are supplied complete with a ZM100/A or ZM200/A terminal housing. A separate order is required for terminal housings ZM120/A or ZM220/A. See sheet 4591.

Blank flanges or screwed plugs must be ordered separately, see page 3.

Ordering example

M3P40F/A (Control valve)
Z155/40 (Blank flange)

See sheet 4021 for a summary of valves for water and steam applications.

Types and operating data

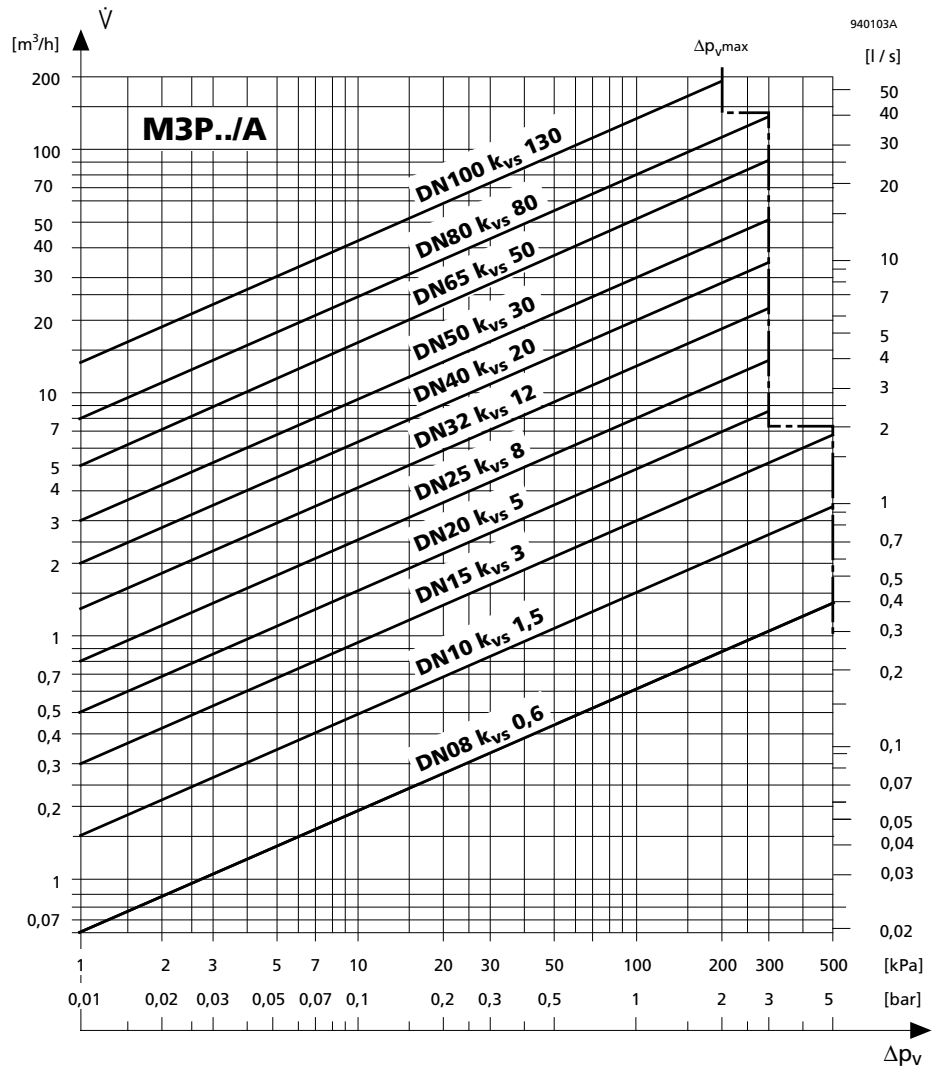
	Valve type	DN [mm]	k_{vs} [m ³ /h]	Δp_{Vmax}		P_N [VA]	P_{med} [VA]	q [mm ²]		
				[kPa]	[bar]			1.5	2.5	4.0
Δp_{Vmax} = Max. admissible pressure differential P_N = Nominal power P_{med} = Mean operating power k_{vs} = Flow rate to VDI/VDE2173, tolerance $\pm 10\%$ L = Max. cable length. With 4-wire connections, the maximum permissible length of the separate 1.5 mm ² Cu signal cable is 200 m. q = Cross-section of cable (Cu)	M3P08../A	08/15	0.6	500	5	13	3	60	100	170
	M3P10../A	10/15	1.5	500	5	13	3	60	100	170
	M3P15../A	15	3.0	500	5	13	3	60	100	170
	M3P20../A	20	5.0	300	3	13	3	60	100	170
	M3P25../A	25	8.0	300	3	16	4	50	80	135
	M3P32../A	32	12.0	300	3	20	5	40	65	110
	M3P40../A	40	20	300	3	26	6	30	50	80
	M3P50../A	50	30	300	3	40	10	20	30	50
	M3P65F/A	65	50	300	3	40	10	20	30	50
	M3P80F/A	80	80	300	3	80	20	10	15	25
	M3P100F/A	100	130	200	2	120	30	6	10	18

Water flow chart

Flow / pressure-differential relationship.

k_{vs} signifies the volume of water \dot{V} in m³/h which flows through the open valve at a pressure differential Δp_v of 100 kPa (1 bar).

See sheet 4023 for notes on calculating the value of k_{vs} .



Principle of operation / Construction

The control signal is converted in the ZM../A terminal housing into a phase cut signal, which generates a magnetic field in the coil. This causes the only moving part, the armature, to change its position in accordance with the interacting forces (magnetic field, counterspring, hydraulics etc). The armature responds rapidly to any change in signal, transferring the corresponding movement directly to the control disc, enabling fast changes in load to be corrected quickly and accurately.

The spring force closes the valve automatically (control path ports 1 → 3) in the event of a power failure or if the power is switched off.

The valve stem is sealed externally by a maintenance-free O-ring gland.

See sheet 4028 for a detailed description of operation.

Manual adjustment

The valve can be opened manually up to 90 % (control path ports 1 → 3) by turning the handwheel clockwise.

The manual adjustment facility can also be used as a mechanical method of low limit control, i.e. normal control is possible between the manually adjusted position and the 100 % open position. For full-stroke automatic control, the handwheel must be set to 0 (i.e. to the anticlockwise end-stop).

Warning

Always disconnect the power supply before connecting or disconnecting the ZM../A terminal housing.

* Note:

Mounting below the horizontal is NOT recommended in the UK.

Mounting

Mounting instructions: Ref. 35541 (ZM.. terminal housing) and Ref. 35542 (valve), are enclosed with the valve.

The valve is suitable for straight-through or three-way applications and may be installed ONLY in a mixing arrangement.

Vertical to horizontal mounting: Protection standard IP31

Below horizontal * : Protection standard IP30

The screwed valves are flat-faced to facilitate sealing with the gaskets supplied. The use of sealing compounds, tape or hemp thread is not recommended.

The actuator housing can be rotated through 360° for convenient mounting.

The actuator must not be lagged.

Only three-way valves are supplied. These may, however, be used as straight-through valves by sealing port 2, as described below.

Recommendation

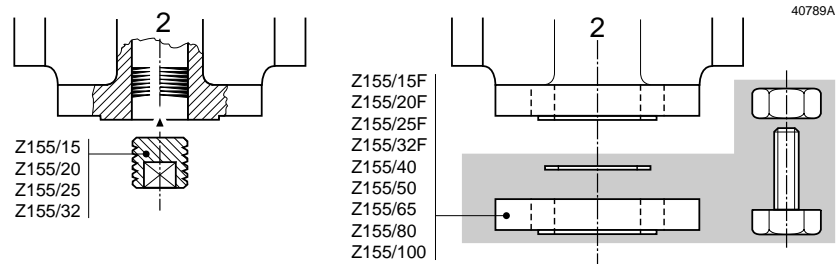
Water systems should be cleaned, flushed and treated in accordance with current good practice, as described, for example, in the *BSRIA Application Guides* AG 8/91 and AG 2/93.

For other relevant information, see also CIBSE Guide B (Section 7).

Flanged valves in straight-through applications

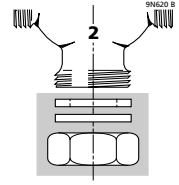
Port "2" can be sealed with part Z155../ (screwed plug or blank flange). These Z155.. parts must be ordered separately where required (the blank flanges come complete with seal, screws, spring washer and nuts) .

DN15 ... DN32	Screwed tap	(Z155/15 ... Z155/32)
	or blank flange	(Z155/15F ... Z155/32F)
DN40 ... DN100	Blank flange	(Z155/40 ... Z155/100)



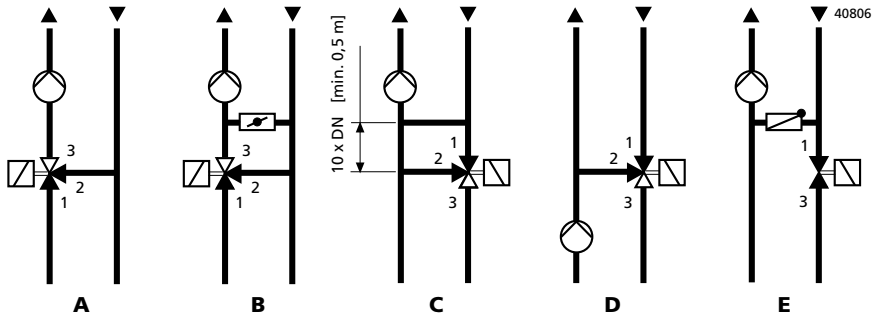
Screw valves in straight-through applications

Port "2" can be sealed with the accessories supplied (nut, cover and gasket). Screw valves are flat-faced to facilitate sealing with the gaskets originally supplied. The use of sealing compounds, tape or hemp thread is not recommended.



Hydraulic circuits

(Principles only, without installation-specific details)



- A Mixing circuit
- B Mixing circuit with bypass (Underfloor heating)
- C Injection circuit
- D Diverting circuit
- E Injection circuit with straight-through valve

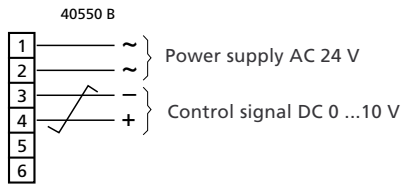
Terminal layout

⚠ Caution

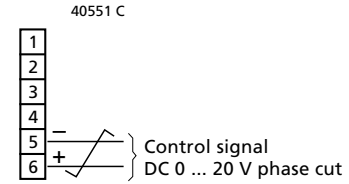
For use with a DC 0 ... 20 V phase cut signal, do NOT connect the AC 24 V supply to terminals 1 & 2.

- Connect Terminal 5 (marked "-")
- to the appropriate Y output terminal on UNICO, KLIMO and MULTIREG (type 9 controllers)
- to Terminal 2 on type NKO A terminal modules.

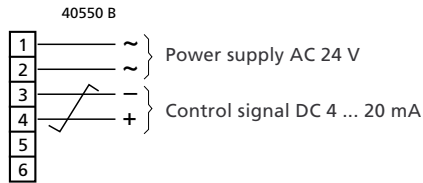
ZM100/A, ZM200/A (DC 0 ... 10 V)



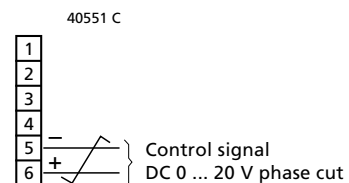
ZM100/A, ZM200/A (DC 0...20V phase cut)



ZM120/A, ZM220/A (DC 4 ... 20 mA)



ZM120/A, ZM220/A (DC 0...20V phase cut)



Twisted pairs

ZM120/A or ZM220/A must be ordered separately, see page 1.

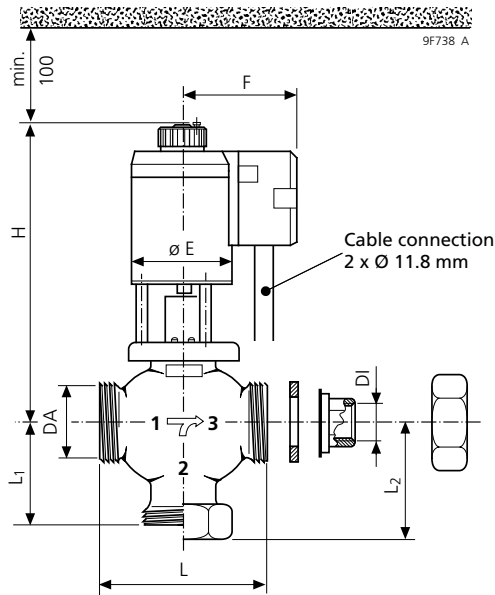
See sheet 4591 for connection diagrams for the ZM../A terminal housing

Dimensions [mm] and weight [kg]

M3P..G/A,

Screwed valves with terminal housing

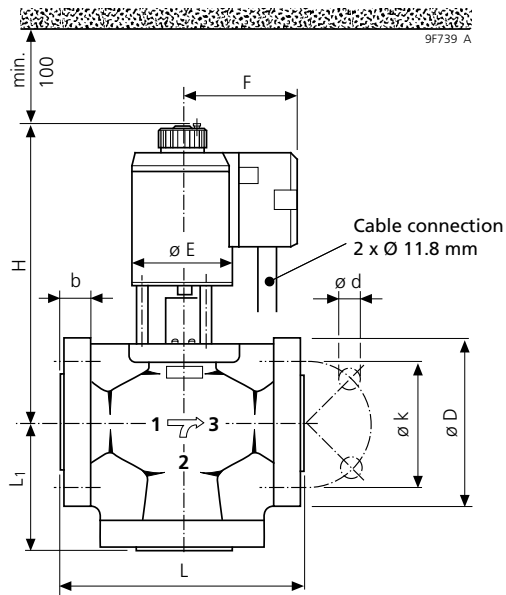
DN15 ... DN50



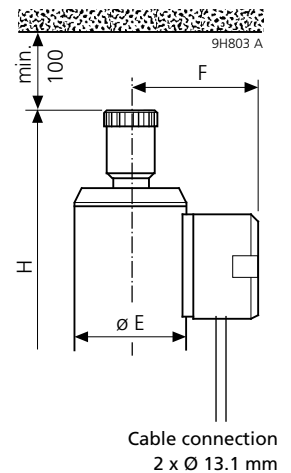
M3P..F/A,

Flanged valves with terminal housing

DN15 ... DN65



DN80 and DN100



M3P..G/A Screwed valves

Valve type	DI	DA	L	L ₁	L ₂ *	H	E	F	W
	[Inches]								
M3P08G/A	Rp 1/2	G 1	80	42.5	51	211	60	73	3.1
M3P10G/A	Rp 1/2	G 1	80	42.5	51	211	60	73	3.1
M3P15G/A	RP 1/2	G 1	80	42.5	51	211	60	73	3.1
M3P20G/A	Rp 3/4	G 1 1/4	95	52.5	61	213	60	73	3.8
M3P25G/A	Rp 1	G 1 1/2	110	56.5	65	231	70	78	5.0
M3P32G/A	Rp 1 1/4	G 2	125	67.5	76	251	80	84	8.0
M3P40G/A	Rp 1 1/2	G 2 1/4	140	80.5	94	294	100	94	12.1
M3P50G/A	Rp 2	G 2 3/4	170	93.5	109	313	100	94	16.3

External thread G to ISO 228/1

Internal thread Rp to ISO 7/1

Screwed fittings to ISO49 / DIN2950

Screwed valves are supplied complete with fittings and gaskets.

M3P..F/A Flanged valves

Valve type	L	L ₁	D	b	k	d	H	E	F	W
M3P08F/A	130	65	95	14	65	4x14	211	60	73	5.2
M3P10F/A	130	65	95	14	65	4x14	211	60	73	4.9
M3P15F/A	130	65	95	14	95	4x14	211	60	73	4.9
M3P20F/A	150	75	105	16	75	4x14	213	60	73	6.1
M3P25F/A	160	80	115	16	85	4x14	231	70	78	7.8
M3P32F/A	180	90	140	18	100	4x18	251	80	84	11.6
M3P40F/A	200	100	150	18	110	4x18	294	100	94	16.9
M3P50F/A	230	105	165	20	125	4x18	313	100	94	21.3
M3P65F/A	290	125	185	20	145	4x18	470	125	108	37.6
M3P80F/A	310	140	200	22	160	8x18	505	145	124	48.5
M3P100F/A	350	160	220	24	180	8x18	568	145	124	64.5

Flange dimensions to DIN 2533, PN16. Counter-flanges are not supplied with the valves.

* Dimensions when used as a straight-through valve

W Weight in kg (including packaging)

