SIEMENS

4731

ACVATIX™

Modulating pilot valve, PN 32 — M2FP03GX

to control main valves

- **Short positioning time (approx 1 s)**
- **High resolution**
- **Hermetically sealed**
- **Versatile electrical interface with terminal housing ZM..**
- **Friction free**
- **Robust and maintenance-free**

Use

Modulating pilot valve with magnetic actuator as the controlling element for 2…5“ main valves for modulating control of chillers, or for direct control of low k_{vs} values. Suitable for use with safety refrigerants such as R22, R134a, R404A, R407C, R507 and for ammonia R717. Unsuitable for applications with gas/liquid mixtures.

Type summary

Product number	k_{vs} [m^3/h]	Δp_{max} [MPa]
M2FP03GX	0.3	1.8

Δp_{max} = Maximum permissible differential pressure across the valve's control path 1 → 3 valid for the entire actuating range

k_{vs} = Nominal flow rate of cold water through the fully open valve (H_{100}) by a differential pressure of 100 kPa (1 bar), to VDI 2173

Accessories / terminal housing ZM..

Product number	Operating voltage	Positioning signal	Working range	Data sheet
ZM101/A	AC 24 V	DC 0…10 V	DC 4…8 V	N4591
ZM121/A	AC 24 V	DC 4…20 mA	DC 8…16 mA	
ZM111		DC 0…20 V Phs	DC 10…15 V Phs	

For the ZM101/A and ZM121/A types also the DC 0…20 V Phs positioning signal is possible without operating voltage.

Ordering

The M2FP03GX pilot valve and the ZM.. or ZM../A terminal housing must be ordered separately.

When placing an order, please specify the quantity, product description and type code.

Product number	*Stock number*	*Description*
M2FP03GX	M2FP03GX	Pilot valve
ZM101/A	ZM101/A	Terminal housing

Delivery

Pilot valve and terminal housings are packed separately.

Technical and mechanical design

The armature or magnetic core is designed as a floating component within the pressure system, so that no external shaft gland is required. The leakage losses common with moving parts are thus avoided.

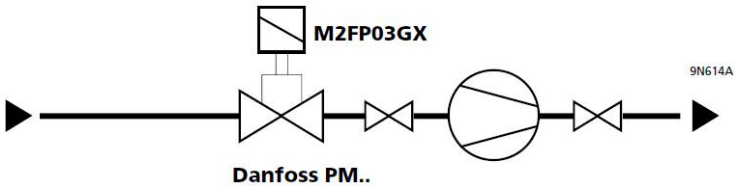
The control signal is converted in the ZM.../A terminal housing into a phase cut signal, which generates a magnetic field in the coil. This causes the only moving part, the armature, to change its position in accordance with the interacting forces (magnetic field, counter-spring, hydraulics etc.). The 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 force of the counter-spring automatically retracts the valve stem if the power is switched off or fails (valve control path closes).

Application examples

The diagrams shown here are principles only, without installation-specific details.

Suction throttle control

Screw-in valve application such as Danfoss PM.. main valve.



Engineering notes

Caution The characteristics of the main valve and the manufacturer's recommendations must be observed.

Mounting notes

Mounting instructions are enclosed with the valve:
- Nr. 35552 (pilot valve)

The pilot valve can be mounted in any orientation, but upright mounting is preferable.

To protect the valve from dirt, a mesh filter should be fitted on the supply side (mesh gauge 0.1...0.2 mm).

The pilot valve can be fitted directly to various commercially available main valves, with the M24 x 1.5 screwed spigot.

Attention ⚠ Note, however, that it must not be screwed into the valve body until welding or soldering work is complete.

To prevent damage to the O-ring and to protect the pilot valve from dirt and metal fillings, the protective cap on the spigot should not be removed until immediately before the valve is fitted.

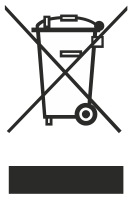
Attention ⚠ Always switch off the power supply before connecting or disconnecting the ZM.. terminal housing.

Maintenance notes

The M2FP03GX pilot valve is maintenance-free.

Repair The pilot valve cannot be repaired. It has to be replaced as a complete unit.

Disposal



The valve is considered an electronics device for disposal in terms of European Directive 2012/19/EU and may not be disposed of as domestic garbage.
- Dispose of the device through channels provided for this purpose.
- Comply with all local and currently applicable laws and regulations.

Warranty

Application-specific technical data must be observed.
If specified limits are not observed, Siemens Switzerland Ltd / HVAC Products will nor assume any responsibility.

Technical data

Functional actuator data

Power supply	Extra low-voltage only (SELV, PELV)		
	Operating voltage [1]		AC 24 V + 15 % / -10 %
	Frequency		50…60 Hz
	Typical power consumption P_{med}		5 W
	Rated apparent power S_{NA}		13 VA
	Required fuse I_F		1 A, slow
	External supply line protection		Fuse slow max. 10 A or Circuit breaker max. 13 A Characteristic B, C, D according to EN 60898 or Power source with current limitation of max. 10 A
Signal inputs	Positioning signal	ZM101/A	DC 0…10 V or DC 0…20 V Phs
		ZM121/A	DC 4…20 mA or DC 0…20 V Phs
		ZM111	DC 0…20 V Phs
	Input resistance	DC 0…10 V	> 100 kΩ
	Input resistance	DC 4…20 mA	< 150 Ω
Positioning time	Positioning time		approx. 1 s
Electrical connections	Cable entry		2 x Pg11 (ZM101/A, ZM121/A)
	Connection terminals		max. 4 mm^2 wire cross-section
	Min. wire cross-section		0.75 mm^2
Functional data valve	Permissible operating pressure		3.2 MPa (32 bar)
	Max. differential pressure Δp_{max} 1 → 3		1.8 MPa (18 bar)
	Leakage at Δp = 100 kPa (1 bar) 1 → 3		approx. 0.25 % k_{vs} (to VDI/VDE 2174)
	Valve characteristic		linear (to VDI / VDE 2173)
	Permissible media		for safety refrigerants (R22, R134a, R404A, R407C, R507 etc.), ammonia (R717)
	Medium temperature		-40...100 °C
	Position when de-energized		Valve stem retracted (valve control path closed)
	Orientation		any
	Mode of operation		modulating
Materials	Body		steel
	Seat / inner valve		CrNi steel
Dimensions and weight	Dimensions		refer to «Dimensions»
	Weight		1.64 kg (including packaging)
Connection to main valve	Threaded connection		M24 x 1.5 mm
Norms and directives	Electromagnetic compatibility (Application)		For residential, commercial and industrial environments
	Product standard		EN 60730-x
	EU Conformity (CE)		CA2T4731xx [2]
	EAC conformity		Eurasia conformity
	Electrical safety		EN 60730-1
	Housing protection	Upright to horizontal	IP54 to EN 60529

[1] No operating voltage is required for the DC 0…20 V Phs power positioning signal.
[2] The documents can be downloaded from http://siemens.com/bt/download
S_{NA} = Rated apparent power for transformer selection
P_{med} = Typical power consumption

Pressure Equipment Directive Pressure Accessories Fluid group 2: DN 40…50	PED 2014/68/EU Scope: Article 1, section 1 Definitions: Article 2, section 5 without CE-marking as per article 4, section 3 (sound engineering practice) [1)]
Environmental compatibility	Environmental Declaration contains data on environmental-compatible product design and assessment (RoHS compliance, compositions, packaging, environmental benefits and disposal).

1) Valves where PS x DN < 1000, do not require special testing and cannot carry the CE label.

General environmental conditions

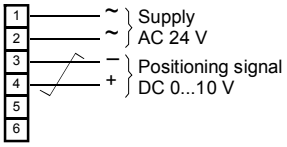
	Operation EN 60721-3-3	**Transport** EN 60721-3-2	**Storage** EN 60721-3-1
Climatic conditions	Class 3K6	Class 2K3	Class 1K3
Temperature	-40…50 °C	–25...70 °C	–5...45 °C
Humidity	10...100 % r. h.	< 95 % r. h.	5...95 % r. h.

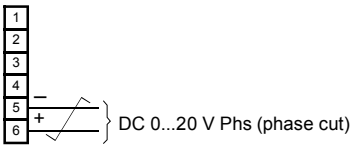
Connection terminals

Attention ⚠ If a ZM../A terminal housing is used with DC 0...20 V Phs (phase cut), AC 24 V must not be connected!

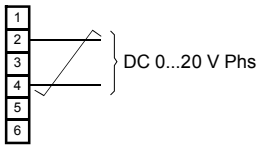
Always switch off the power supply before connecting or disconnecting the ZM... terminal housing.

ZM101/A (DC 0...10 V or DC 0...20 V Phs)

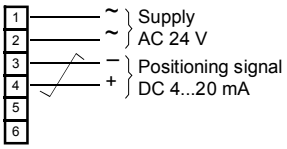


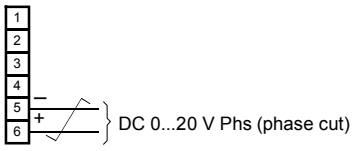


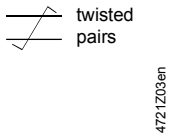
ZM111 (DC 0...20 V Phs)



ZM121/A (DC 4...20 mA oder DC 0...20 V Phs)





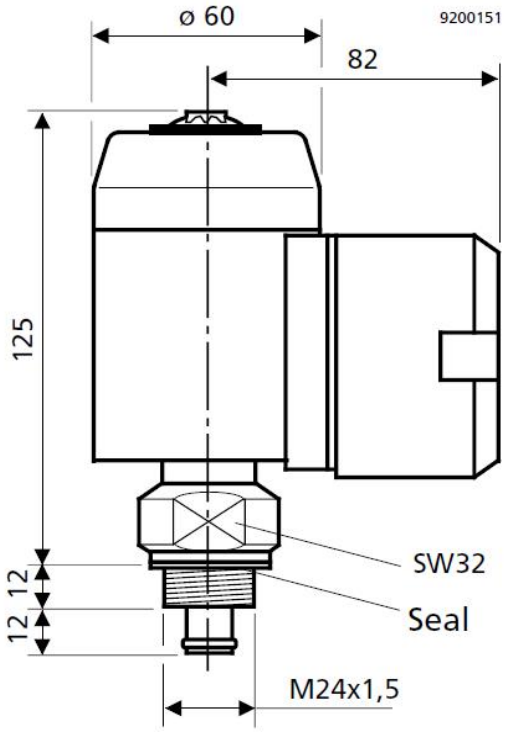


Connection diagrams

Refer to data sheet N4591 for the ZM.. terminal housings

Dimensions

Dimensions in mm



Revision number

Type reference	Valid up to rev. No.
M2FP03GX	..F

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