Braukmann V5006T

Kombi-QM

Pressure Independent Balancing and Control Valve

APPLICATION

The V5006T Kombi-QM is a Pressure Independent Control Valve (PICV). It combines a flow controller and a full stroke, full authority temperature controller in one valve.

Equipped with an actuator Kombi-QM provides a full stroke modulating temperature control.

It is suitable for use in variable and constant flow systems.

They may be used as constant flow limiter in constant flow systems (without an actuator) or as a Pressure Independent Control Valve in variable flow systems.

V5006T Kombi-QM is typically used for balancing and temperature control of fan coil units, air handling units, chilled ceilings and one-pipe heating systems.

SPECIAL FEATURES

- Automatic balancing of differential pressure
  - Precise pressure independent flow performance
  - Highest energy saving potential due to efficient energy transfer and minimised pump speed
  - Integrated measuring possibility to find the optimal setpoint for the pump
  - Reduced movements of actuators as pressure fluctuation do not influence the required temperature
  - No complex calculation needed for selection
  - No balancing method needed for commissioning
- Wide range of application
  - Sizes DN15 up to DN250
  - Various versions to support standard flow rates as well as low flow and high flow needs
  - Covers two functions in one valve which reduces mounting costs
- Easy commissioning
  - Presetting with visual flow scale at the valve
  - Presetting by hand without the need of tools
  - Presetting possible even when the system is running and an actuator is already mounted
  - Can balance a system even if only some parts of a building are in operation
- Maintenance friendly
  - Emergency shut-off function with plastic cap – not for permanent use
  - Measuring possibility for problematic applications

Valve Efficiency

	low				high
Energy efficiency	●	●	●	●	●
Commissioning effort	●	●	○	○	○
Calculation effort	●	●	●	○	○

TECHNICAL DATA

Media	
Medium:	Water or water-glycol mixture, quality to VDI 2035 (up to 50 % Glycol)
pH-value:	8 - 9.5
Pressure values	
Max. operating pressure:	DN15-32: max. 25 bar (363 psi) DN32-250: max. 16 bar (232psi)
Differential pressure range: Δ_{pmin} Δ_{pmax}	 see table on page 6 400 kPa (4 bar) - up to 600** kPa for some valves, please check the ordering information

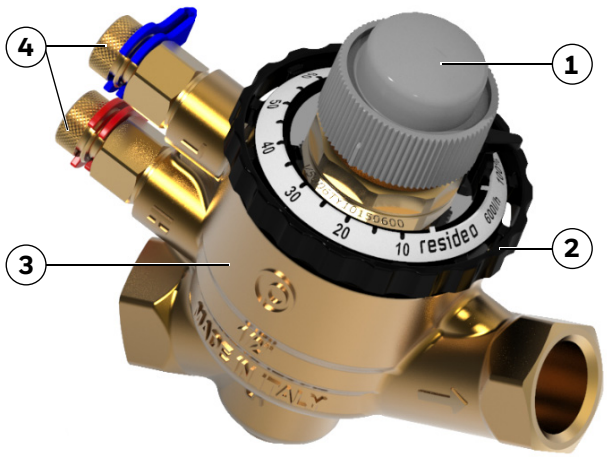
Operating temperatures	
Max. operating temperature medium:	-10 - 120 °C (25 - 248°F)*
Connections/Sizes	
Nominal size:	DN15 - DN250
Specifications	
Housing:	DN15- 32: Dezincification-resistant brass DN32-250: Ductile iron
Flow values:	see table on page 6
Leakage:	According to Class IV IEC 60534-4

* For DN200 and DN250 Max. operating temperature -10°C to 105°C, water quality compliance to VDI 2035

CONSTRUCTION

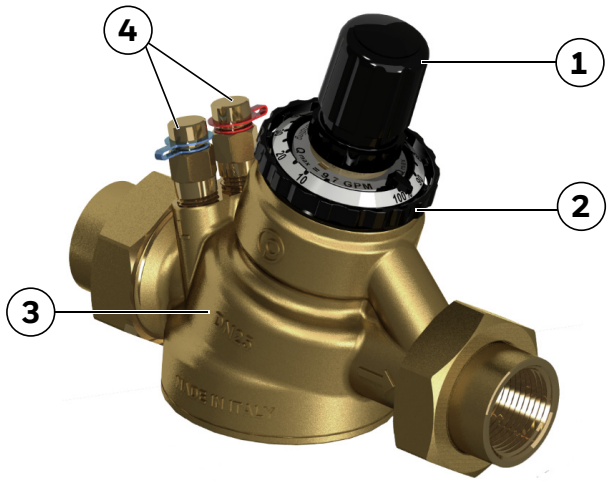
V5006TY, DN15 - DN25

Overview

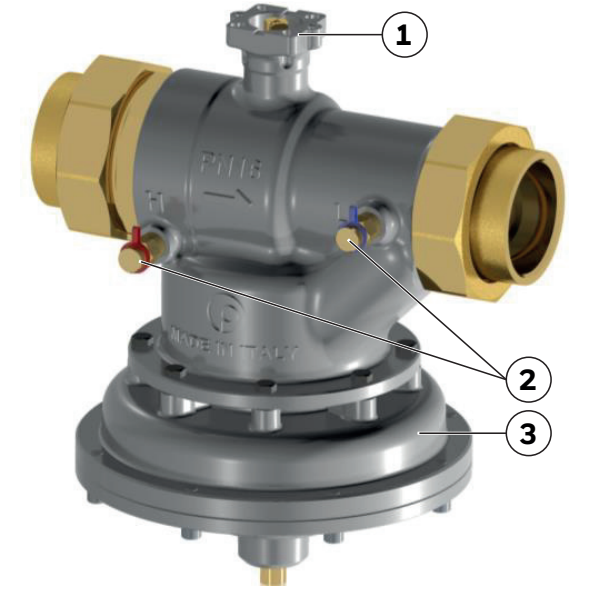


	Components	Materials
1	Cover cap to protect actuator connection. Can be used as emergency shut-off function (not permanent)	Plastic
2	Handwheel with scale for presetting the valve	Plastic
3	Valve housing with internal threads to DIN EN 10226-1 for threaded pipe and two $G^1/_4$" equipped with SafeCon™ pressure test valves	Dezincification-resistant brass
4	Pressure test valves - needle type	Brass
	Not depicted components:	
	Sealings	EPDM
	Installation and setup instructions	Paper
	Inner parts	Brass, stainless steel, high resistant polymer and EPDM

V5006TY, DN20 - DN32

Overview		Components	Materials
	**1**	Cover cap to protect actuator connection. Can be used as emergency shut-off function (not permanent)	Plastic
	2	Handwheel with scale for presetting the valve	Plastic
	3	Valve housing with internal threaded connection sets to DIN EN 10226-1 for threaded pipe and two G1/4" equipped with SafeCon™ pressure test valves	Dezincification-resistant brass
	4	Pressure test valves - needle type	Brass
		Not depicted components:	
		Sealings	EPDM
		Installation and setup instructions	Paper
		Inner parts	Brass, stainless steel, high resistant polymer and EPDM

V5006TY, DN32 - DN50

Overview		Components	Materials
	**1**	Threaded connection set	Dezincification-resistant brass
	2	Pressure test valves - needle type	Brass
	3	Valve housing with internal threaded connection sets to DIN EN 10226-1 for threaded pipe and two G1/4" equipped with SafeCon™ pressure test valves	Ductile iron
		Not depicted components:	
		Installation and setup instructions	Paper
		Sealings	EPDM
		Inner parts	Brass, stainless steel, high resistant polymer and EPDM

V5006TF, DN50 - DN250

Overview		Components	Materials
	**1**	Actuator included in the delivery • Presetting of the valve can be done at the actuator	
	2	Valve housing with flanges to EN 1092-2	Ductile iron
		Not depicted components:	
		Sealings	EPDM
		Installation and setup instructions	Paper
		Inner parts	Brass, stainless steel, high resistant polymer and EPDM

METHOD OF OPERATION

The V5006T Kombi-QM combines the functionality of a dynamic balancing valve and a control valve in one product.

The dynamic balancing function maintains a constant differential pressure over the control valve.

The control valve regulates the flow by means of a variable orifice which is controlled by the actuator.

The constant differential pressure across the control valve ensures accurate control and full valve authority, independent of the pressure conditions in the system.

Valve Identification

Each valve is marked as follows:

- OS - Number
- DN size
- PN rating
- Flow arrows
- Serial number/date code

TRANSPORTATION AND STORAGE

Keep parts in their original packaging and unpack them shortly before use.

The following parameters apply during transportation and storage:

Parameter	Value
Environment:	clean, dry and dust free

TECHNICAL CHARACTERISTICS

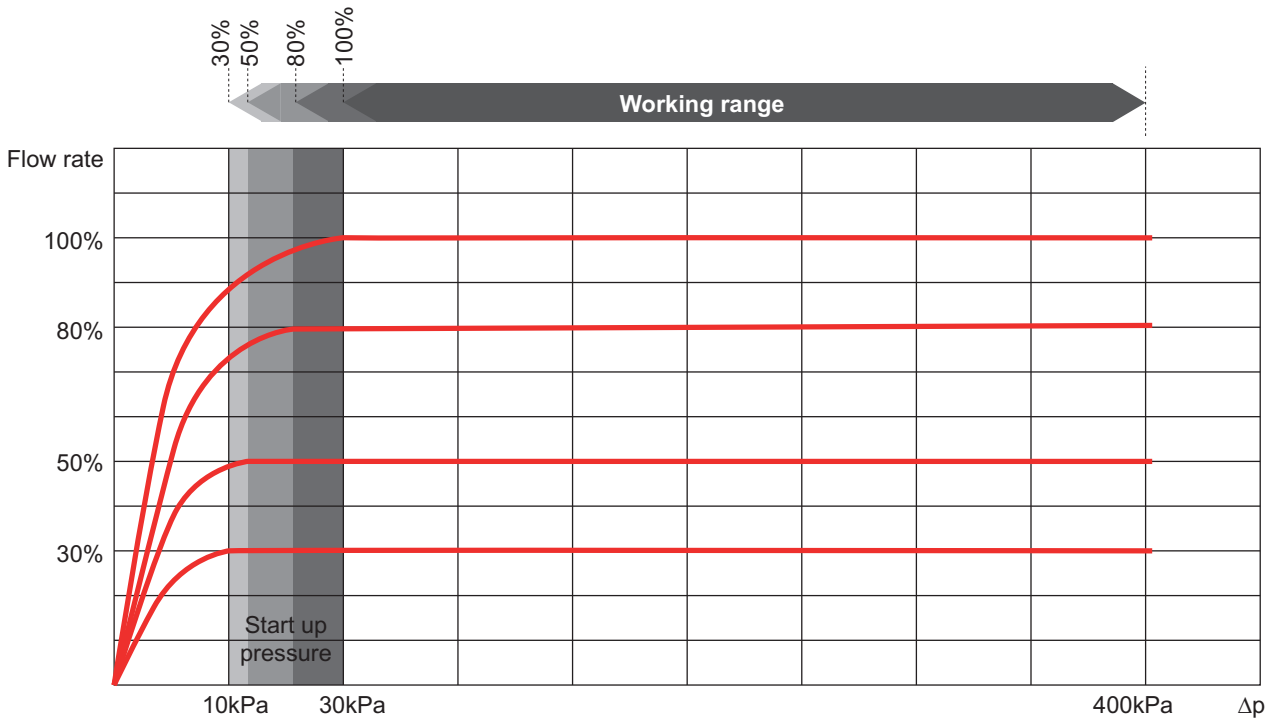
Pressure values

Limits of flows and differential pressures

			Startup Pressure				
OS-No.	**Flow [l/h]**	**Valve stroke [mm]**	**Δ [kPa] at 30% flow**	**Δ[kPa] at 50% flow**	**Δ[kPa] at 80% flow**	**Δ[kPa] at 100% flow**	**Δ[kPa]**
V5006TY10150150	45 - 150	2.9	8	11	16	20	400
V5006TY10150600	60 - 600	2.9	17	18	21	25	400
V5006TY10150780	78 - 780	2.9	23	25	30	35	400
V5006TY10201000	100 - 1000	2.9	10	14	24	30	400
V5006TY10201500	450 - 1500	2.9	14	17	25	35	400
V5006TY10251500	450 - 1500	2.9	14	17	25	35	400
V5006TY10202200	220 - 2200	6.0	16	17	22	25	400
V5006TY10202700	270 - 2700	6.0	17	20	22	25	400
V5006TY10252200	220 - 2200	6.0	16	17	22	25	400
V5006TY10252700	270 - 2700	6.0	17	20	22	25	400
V5006TY10322700	270 - 2700	6.0	17	20	22	25	400
V5006TY10323000	300 - 3000	6.0	18	25	30	35	400
V5006TY10326000	1800 - 6000	90°	20	20	30	30	400
V5006TY10409000	2700 - 9000	90°	21	25	31	35	400
V5006TY10501200	3300 - 11000	90°	20	21	32	40	400
V5006TY10501700	5400 - 18000	90°	15	19	30	35	400
V5006TF1050	2000 - 20000	n.a.	21	25	31	40	600
V5006TF1065	3000 - 30000	n.a.	26	29	30	30	600
V5006TF1080	3000 - 30000	n.a.	23	25	30	30	600
V5006TF1100	5500 - 55000	n.a.	16	20	24	30	600
V5006TF1125	9000 - 90000	n.a.	21	25	31	35	600
V5006TF1150	15000 - 150000	n.a.	31	35	41	50	600
V5006TF1200LF	20000 - 200000	n.a.	31	35	36	40	400
V5006TF1200HF	30000 - 300000	n.a.	32	37	38	40	400
V5006TF1250LF	30000 - 300000	n.a.	30	30	33	40	400
V5006TF1250HF	50000 - 500000	n.a.	38	49	58	65	400

Flow Data

Example of valve's behaviour for different adjustment (30 %, 50 %, 80 %, 100 %)



Example for V5006TY10201000:

When the valve is set to 100 % of nominal flow, the curve begins to remain constant at 30 kPa, therefore the working range at 100 % setting is 30 - 400 kPa.

When the valve is set to 30 % of nominal flow, the curve begins to remain constant at 10 kPa, therefore the working range at 30 % setting is 10 - 400 kPa.

Flow Rate

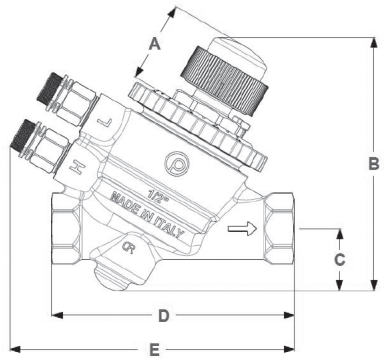
Limits of flows and differential pressures

	Pre-set-ting	100 %	90 %	80 %	70 %	60 %	50 %	40 %	30 %	20 %	10 %
OS -No.	**Flow rate**										
V5006TY10150150	[l/h]	150	135	120	105	90	75	60	45	-	-
V5006TY10150600	[l/h]	600	540	480	420	360	300	240	180	120	60
V5006TY10150780	[l/h]	780	702	624	546	468	390	312	234	156	78
V5006TY10201000	[l/h]	1000	900	800	700	600	500	400	300	200	100
V5006TY10201500	[l/h]	1500	1350	1200	1050	900	750	600	450	-	-
V5006TY10251500	[l/h]	1500	1350	1200	1050	900	750	600	450	-	-
V5006TY10202200	[l/h]	2200	1980	1760	1540	1320	1100	880	660	440	220
V5006TY10202700	[l/h]	2700	2430	2160	1890	1620	1350	1080	810	540	270
V5006TY10252200	[l/h]	2200	1980	1760	1540	1320	1100	880	660	440	220
V5006TY10252700	[l/h]	2700	2430	2160	1890	1620	1350	1080	810	540	270
V5006TY10322700	[l/h]	2700	2430	2160	1890	1620	1350	1080	810	540	270
V5006TY10323000	[l/h]	3000	2700	2400	2100	1800	1500	1200	900	600	300
V5006TY10326000	[l/h]	6000	5400	4800	4200	3600	3000	2400	1800	-	-
V5006TY10409000	[l/h]	9000	8100	7200	6300	5400	4500	3600	2700	-	-
V5006TY10501200	[l/h]	11000	9900	8800	7700	6600	5500	4400	3300	-	-
V5006TY10501700	[l/h]	18000	16200	14400	12600	10800	9000	7200	5400	-	-
V5006TF1050	[l/h]	20000	18000	16000	14000	12000	10000	8000	6000	4000	2000
V5006TF1065	[l/h]	30000	27000	24000	21000	18000	15000	12000	9000	6000	3000
V5006TF1080	[l/h]	30000	27000	24000	21000	18000	15000	12000	9000	6000	3000
V5006TF1100	[l/h]	55000	49500	44000	38500	33000	27500	22000	16500	11000	5500
V5006TF1125	[l/h]	90000	81000	72000	63000	54000	45000	36000	27000	18000	9000
V5006TF1150	[l/h]	150000	135000	120000	105000	90000	75000	60000	45000	30000	15000
V5006TF1200LF	[l/h]	200000	180000	160000	140000	120000	100000	80000	60000	40000	20000
V5006TF1200HF	[l/h]	300000	270000	240000	210000	180000	150000	120000	90000	60000	30000
V5006TF1250LF	[l/h]	300000	270000	240000	210000	180000	150000	120000	90000	60000	30000
V5006TF1250HF	[l/h]	500000	450000	400000	350000	300000	250000	200000	150000	100000	50000

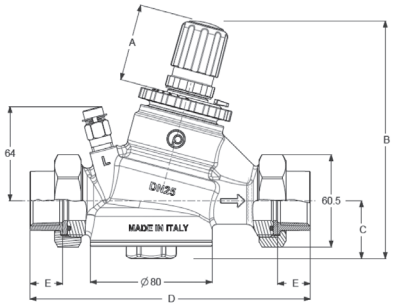
DIMENSIONS

V5006TY, DN15 - DN50

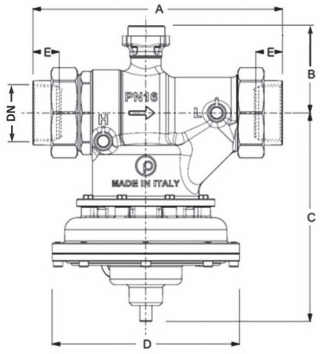
Overview



DN15 - DN25



DN20 - DN32



DN32 -DN50

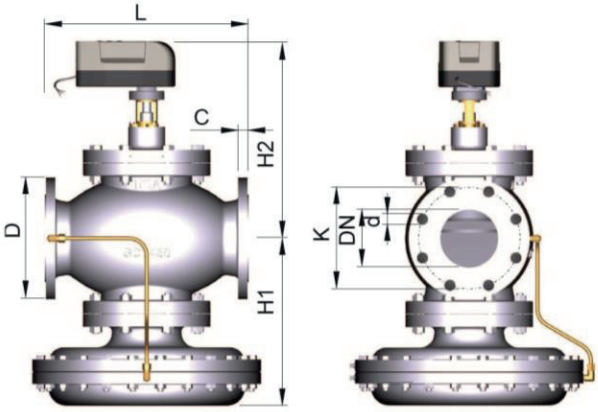
Parameter		Value									
Nominal size diameter:	DN	15	20	25	20*1	25	32*1	32*2	40	50*2	50
Dimensions:	A	32	32	32	50.5	50.5	50.5	232	231	278	267
	B	98	98	98	156	156	156	85	85	85	93
	C	25	25	25	38	38	38	176	176	176	221
	D	99	108	130	176	184	209	158	158	158	198
	E	120	127	134	17	21.5	22	23.6	23.6	23.6	28
Thread:		Rp 1/2"	Rp 3/4"	Rp 1"	Rc 3/4"	Rc 1"	Rc 1 1/4"	Rc 1 1/4"	Rc 1 1/2"	Rc 2"	Rc 2"

*1 Valve with DN25 valve body

*2 Valve with DN40 valve body

V5006TF, DN50 - DN250

Overview



Parameter		Values							
Nominal size diameter:	DN	50	65	80	100	125	150	200	250
Dimensions:	H1	190	183	183	247	264	348	393	421
	H2	291	300	300	318	347	397	440	508
	L	254	272	272	352	400	451	543	730
	D	165	185	200	220	250	285	340	405
	K	125	145	160	180	210	240	295	355
	d	18	18	18	18	18	22	22	26
	C	16	18	18	18	20	22	22	24
Flange size:		2"	2 1/2"	3"	4"	5"	6"	8"	10"

Note: All dimensions in mm unless stated otherwise.

ORDERING INFORMATION

The following tables contain all the information you need to make an order of an item of your choice. When ordering, please always state the type, the ordering or the part number.

Options

Order text:	DN size:	Flow range:		Differential pressure range:		Weight: kg	OS-No.:
		Min. flow (l/h)	= Max. flow (l/h)	Δp (kPa)	Δp (kPa)		
Linear valve V5006 Kombi-QM with internal threads to DIN EN 10226-1 (ISO 7)*1	DN15	45	150	20	400	0.88	V5006TY10150150
	DN15	60	600	25		0.88	V5006TY10150600
	DN15	78	780	35		0.88	V5006TY10150780
	DN20	100	1000	30		0.95	V5006TY10201000
	DN20	450	1500	35		0.95	V5006TY10201500
	DN25	450	1500	35		0.95	V5006TY10251500
Linear valve V5006 Kombi-QM with internal threads to DIN EN 10226-1 (ISO 7)*1	DN20	220	2200	25	400	2.3	V5006TY10202200
	DN20	270	2700	25		2.3	V5006TY10202700
	DN25	220	2200	25		2.4	V5006TY10252200
	DN25	270	2700	25		2.4	V5006TY10252700
	DN32	270	2700	25		2.6	V5006TY10322700
	DN32	300	3000	35		2.6	V5006TY10323000
Rotating valve V5006 Kombi-QM with internal threads to DIN EN 10226-1 (ISO 7)	DN32	1800	6000	30	400	8.5	V5006TY10326000
	DN40	2700	9000	35		8.6	V5006TY10409000
	DN50	3300	11000	40		8.7	V5006TY10501200
	DN50	5400	18000	35		15.5	V5006TY10501700
Flanged valves V5006TF... DN50 to DN250, come together with an actuator as one unit.	DN50	2000	20000	40	600*2	33.0	V5006TF1050
	DN65	3000	30000	30		40.0	V5006TF1065
	DN80	3000	30000	30		43.0	V5006TF1080
	DN100	5500	55000	30		74.0	V5006TF1100
	DN125	9000	90000	35		93.0	V5006TF1125
	DN150	15000	150000	50		140.0	V5006TF1150
	DN200	20000	200000	40	400	280	V5006TF1200LF
	DN200	30000	300000	40		280	V5006TF1200HF
	DN250	30000	300000	40		385	V5006TF1250LF
	DN250	50000	500000	65		385	V5006TF1250HF

Note: *1 Valve is fully open / without actuator
Flanged valves V5006TF... DN50 to DN250 come together with an actuator as one unit.
Check the actuator section below referring to Kombi-QM (DN50-DN250) actuator.

Note: *2 400 for normal operation, 600 only to be used as max shut-off pressure

Accessories

For valves with 2.9 mm stroke, DN15-25

	Description		Dimension	Part No.
	**MT4**	**Actuator thermoelectric**		
		4.0 mm effective stroke, 90N, on/off		MT4-024-NO
				MT4-024-NO-2.5M
				MT4-024S-NO
				MT4-024-NC
				MT4-024-NC-2.5M
				MT4-024S-NC
				MT4-230-NO
				MT4-230-NO-2.5M
				MT4-230S-NO
				MT4-230-NC
				MT4-230-NC-2.5M
				MT4-230S-NC
	**M100**	**Actuator thermoelectric**		
		4.0 mm effective stroke, 90N, on/off		M100-BO
				M100-BG
				M100-AO
				M100-AG
	**M7410A**	**Actuator 3-point** Note: By use of this actuator series the max. flow of the valve is reduced by 15 %		
		4.0 mm effective stroke, 90N, on/off		M7410A1001
				M7410A1001-3M
	**M4410**	**Actuator thermoelectric 0 - 10 V** Note: Closes when power fails		
		4.0 mm effective stroke, 100N, modulating		M4410E1510
				M4410K1515
		Cable for M4410 actuator, 1 m, 10 pcs		M44-MOD-1M
	**M7410E**	**Actuator 0/2 - 10 V**		
		2.9 mm effective stroke, 90N, modulating		M7410E5001
	**T750120**	**Radiator Thermostat Thera-2080WL**		
		With remote sensor for water and air		T750120

For valves with 6.0 mm stroke, DN20-32

	**MT8**	**Actuator thermoelectric**		
		6.0 mm effective stroke, 90N, on/off		MT8-024-NO
				MT8-024-NO-2.5M
				MT8-024S-NO
				MT8-024-NC
				MT8-024-NC-2.5M
				MT8-024S-NC
				MT8-230-NO
				MT8-230-NO-2.5M
				MT8-230S-NO
				MT8-230-NC
				MT8-230-NC-2.5M
				MT8-230S-NC
	**M5410**	**Actuator fast motorized** Note: Closes when power fails		
		6.5 mm effective stroke, 100N, on/off		M5410C1001
				M5410L1001
	**M7410C**	**Actuator 3-point**		
		6.5 mm effective stroke, 180N, floating		M7410C1007
				M7410C1007-10M
				M6410C2023
				M6410C4029
				M6410L2023
				M6410L4029
	**M7410E**	**Actuator 0/2 - 10 V**		
		6.5 mm effective stroke, 180N, modulating		M7410E1002
				M7410E2026
				M7410E4022

For valves with 90° rotation, DN32-50

	**M7061E**	**Actuator 0/2 - 10 V**		
		90°, 10 Nm, rotating, modulating		M7061E1012
	**M6061**	**Actuator 3-point**		
		90°, 10 Nm, rotating, floating		M6061A1013
				M6061L1019

Spare Parts

Overview


	Description	Dimension	Part No.
1	**Actuator**		
	Actuator for V5006TF1050		M5006F1050
	Actuator for V5006TF1065		M5006F1065
	Actuator for V5006TF1080		M5006F1080
	Actuator for V5006TF1100		M5006F1100
	Actuator for V5006TF1125		M5006F1125
	Actuator for V5006TF1150		M5006F1150
	Actuator for V5006TF1200LF		M5006F1200LF
	Actuator for V5006TF1200HF		M5006TF1200HF
	Actuator for V5006TF1250LF		M5006F1250LF
	Actuator for V5006TF1250HF		M5006F1250HF

M5006

Application

Electromotive actuators M5006 - 24V are used with many kind of control systems used for HVAC applications, including ON/OFF, floating, proportional managed by thermostat or BMS handling analogue signals or PWM digital, of HVAC installations where V5006TF PICV balancing valves are used; in order to properly set the presetting, see the specific section devoted to actuator setting.

For further information about electrical connections, see the specific section.

APPROVALS

- CE

TECHNICAL DATA

Operating temperatures	
Ambient temperature range:	-20°C...+60 °C*[1]
Storage temperature range:	-20°C...+80 °C*[1]
Specifications	
Weight:	0.975 kg
Power supply:	24 V AC/DC ±15% – 50/60 Hz
Connecting cable:	18 AWG
Connection to valve:	8 mm square. Easy fitting gear
Operating life:	50.000 cycles
Control signal:	0(2)-10 V 0(4)-20 mA ON/OFF3 points floating PWM
Power consumption:	5 W; 2.5 W stand-by
Nominal torque:	10 Nm Max, self-limited at 7 Nm
Current absorption:	80 mA, Load max 380 mA
Feedback:	0(4) - 20 mA and 0(2) – 10 V
Manual Override:	Through release button and 6 mm Allen key
Protection class / IP Rating:	II / IP54
Motor:	Brushless DC motor
Running speed:	Selectable: 1 RPM or 1.5 RPM
Fail safe:	Through additional battery

Note: *[1]no condensation

METHOD OF OPERATION

24V electromotive actuator to drive Pressure Independent Control Valve V5006TF series.

Managed control signals: analogue (voltage and current), PWM, 3 point floating and ON/OFF.

It can be completely configurable through the on board display and controlling buttons.

Manual override, after actuator removal.

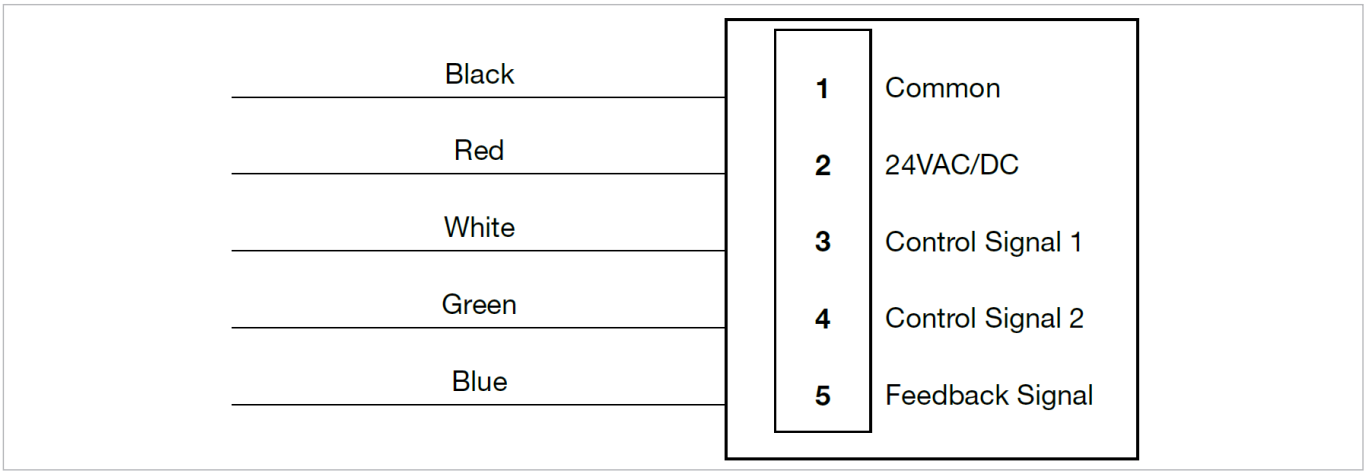
Actuator supplied with valve V5006TF as standard or available as spare part (in this case, please tell the valve reference that the actuator is going to be installed on to allow technicians its configuration).

Fail safe functionality available on demand (additional battery pack VA5006TF0001).

INSTALLATION GUIDELINES

Connection schemes

Wires indication

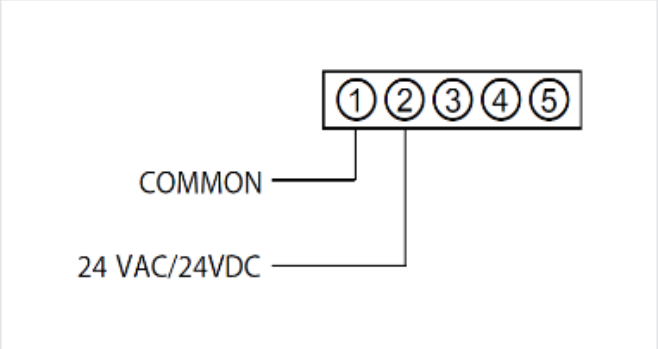


Wire guidelines

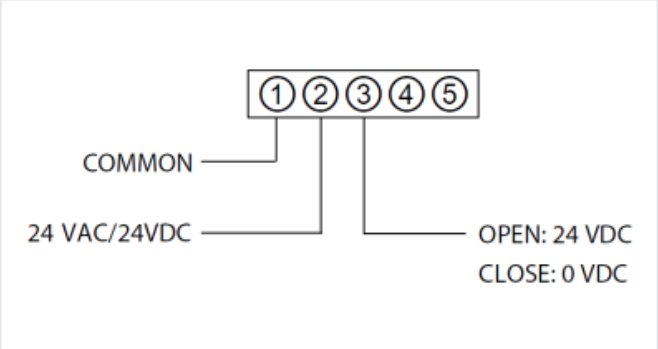
Input	Number	1	2	3	4	5	Remarks
	Colour	Black	Red	White	Green	Blue	
Internal control		Common	24 AC/DC			Feedback: 0(2) - 10 V 0(4) - 20 mA	Power: cable 1 - 2
Voltage signal		Common	24 AC/DC	0 - 10 V DC 2 - 10 V DC		Feedback: 0(2) - 10 V 0(4) - 20 mA	Power: cable 1 - 2 Voltage signal: cable 1 - 3
Current signal		Common	24 AC/DC	0 - 20 mA 4 - 20 mA		Feedback: 0(2) - 10 V 0(4) - 20 mA	Power: cable 1 - 2 Current signal: cable 1 - 3
ON/OFF signal		Common	24 AC/DC	24 V DC (open) 0 V (close)		Feedback: 0(2) - 10 V 0(4) - 20 mA	Power: cable 1 - 2 ON/OFF signal: cable 1 - 3
3 points floating		Common	24 AC/DC	Opening 24 V AC/DC	Closing 24 V AC/DC	Feedback: 0(2) - 10 V 0(4) - 20 mA	Power: cable 1 - 2 Floating 3 points: cable 3 - 4
PWM control		Common	24 AC/DC	PWM signal		Feedback: 0(2) - 10 V 0(4) - 20 mA	Power: cable 1 - 2 PWM control: cable 1 - 3

Connections

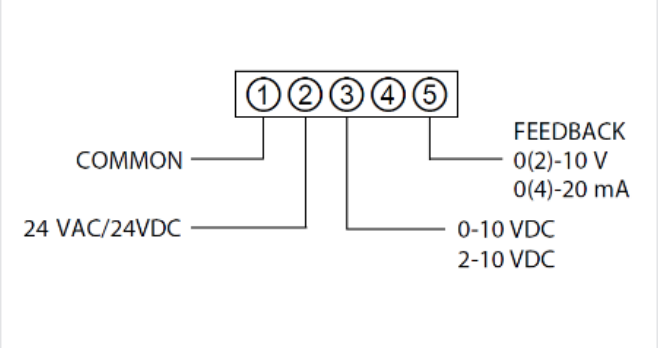
1) Internal control*



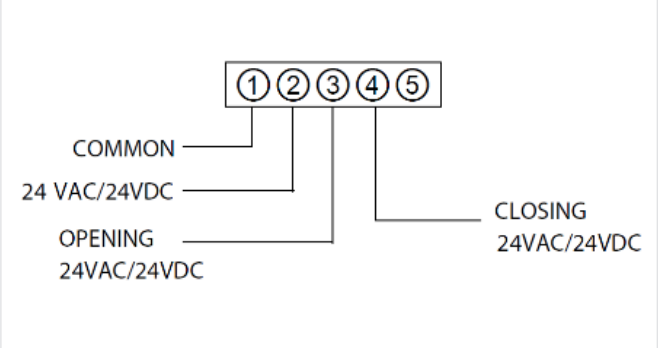
4) ON/OFF



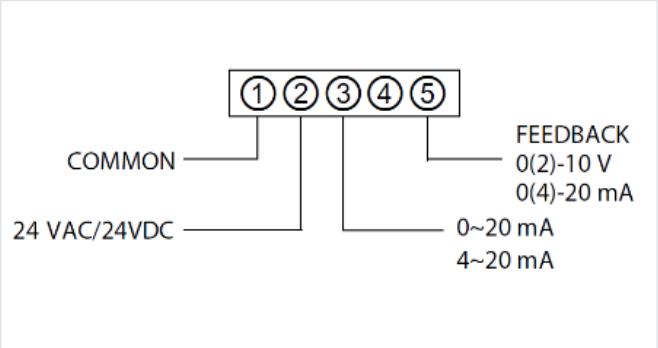
2) Voltage signal



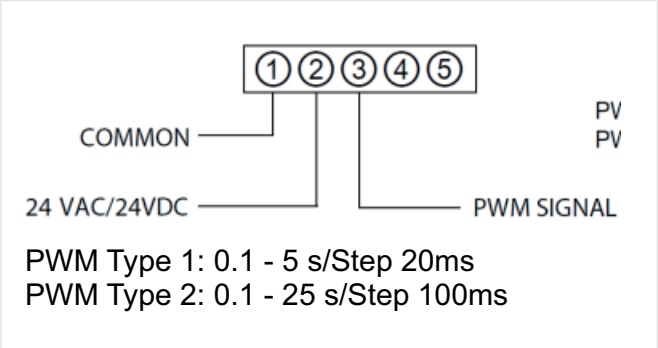
5) 3 points signal



3) Current signal



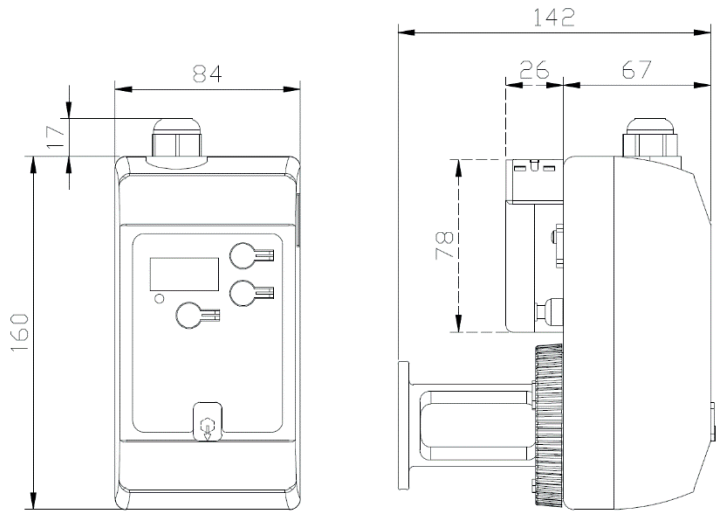
6) PWM signal



Note: * Flow rate can be set by buttons on the actuator and read on the 4 digits display.

DIMENSIONS

Overview



Note: Dimensions in mm

Manufactured for
and on behalf of
Pittway Sàrl, Z.A., La Pièce 4,
1180 Rolle, Switzerland

For more information
homecomfort.resideo.com/europe
Ademco 1 GmbH, Hardhofweg 40,
74821 MOSBACH, GERMANY
Phone: +49 6261 810
Fax: +49 6261 81309

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