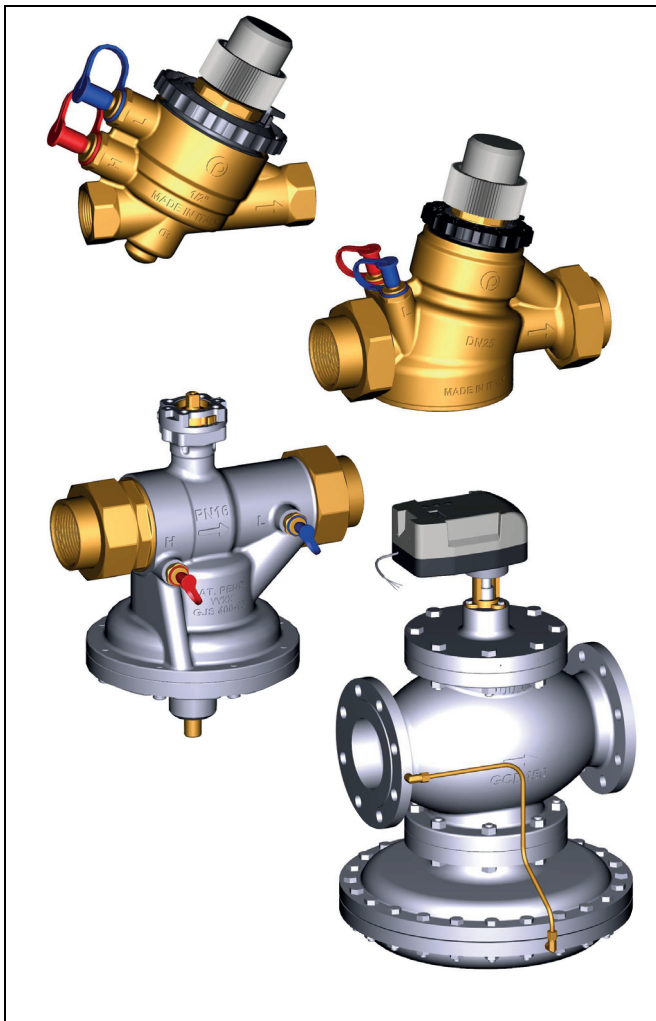


V5004T

Kombi-QM

Pressure Independent Balancing and Control Valve

Product Specification Sheet



Application

The V5004T 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.

V5004T 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 pressure independent balancing and control
 - Precise pressure independent flow performance
 - Highest energy saving potential due to efficient energy transfer and minimized pump speed
 - Integrated measuring possibility to find the optimal setpoint for the pump
 - Reduced movements of actuators as pressure fluctuations 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 DN150
 - 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
 - Pre-setting with visual flow scale at the valve
 - Pre-setting by hand without the need of tools
 - Pre-setting possible even when the system is running and an actuator is already mounted
 - Can balance a system even if only parts of a building are in operation
- Maintenance friendly
 - Emergency shutoff function with plastic cap – not for permanent use
 - Measuring possibility for problematic applications

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Valve Efficiency

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

Technical Data

Nominal size	DN15 – DN25	DN20 – DN32	DN32 – DN65	DN50 – DN150
Housing	Dezincification-resis- tant brass	Dezincification-resis- tant brass	Ductile iron	Ductile iron
Medium	Water or water-glycol mixture, quality to VDI 2035 (up to 50 % Glycol)			
pH-value	8...9.5			
Operating temperature	-10...120 °C (25...248 °F)			
k_{vs} (c_{vs})-value	see table on page 6			
Operating pressure (PN)	max. 25 bar (363 psi)		max. 16 bar (232 psi)	
Differential pressure range				
Δp _{min}	see table on page 6			
Δp _{max}	400 kPa (4 bar)			
Flow values	see table on page 6			
Leakage	According to Class IV IEC 60534-2-3			

Construction

The V5004TY Kombi-QM (DN15 - DN25) consists of:

- Valve housing with internal threads to DIN EN 10226-1 for threaded pipe and two G1/4" equipped with SafeCon™ pressure test valves
- Hand wheel with scale for pre-setting the valve
- Valve insert with diaphragm assembly
- Plastic cover cap to protect actuator connection. Can be used as emergency shutoff function (not permanent)
- Installation and setup instructions

The V5004TY Kombi-QM (DN32 - DN65) consists of:

- Valve housing with internal threaded connection sets up to DN50, DN65 being external threaded, all to DIN EN 10226-1 for threaded pipe and two G1/4" equipped with SafeCon™ pressure test valves
- Valve insert with diaphragm assembly
- Installation and setup instructions

The V5004TY Kombi-QM (DN20 - DN32) consists of:

- 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
- Hand wheel with scale for pre-setting the valve
- Valve insert with diaphragm assembly
- Plastic cover cap to protect actuator connection. Can be used as emergency shutoff function (not permanent)
- Installation and setup instructions

The V5004TF Kombi-QM (DN50 - DN150) consists of:

- Valve housing with flanges to EN 1092-2
- Actuator included in the delivery
 - Pre-setting of the valve can be done at the actuator
- Installation and setup instructions

Materials

V5004TY Kombi-QM (DN15 - DN25)

- Valve housing made of dezincification-resistant brass
- Sealings made of EPDM
- Pre-setting parts made of high resistant polymer and brass
- Inner parts made of brass, stainless steel, high resistant polymer and EPDM

V5004TY Kombi-QM (DN32 - DN65)

- Valve housing made of ductile iron
- Sealings made of EPDM
- Pre-setting parts made of dezincification-resistant brass
- Inner parts made of brass, stainless steel, high resistant polymer and EPDM

V5004TY Kombi-QM (DN20 - DN32)

- Valve housing made of dezincification-resistant brass
- Sealings made of EPDM
- Pre-setting parts made of high resistant polymer and brass
- Inner parts made of brass, stainless steel, high resistant polymer and EPDM

V5004TF Kombi-QM (DN50 - DN150)

- Valve housing made of ductile iron
- Sealings made of EPDM
- Pre-setting parts made of high resistant polymer and dezincification-resistant brass
- Inner parts made of brass, stainless steel, high resistant polymer and EPDM

Method of Operation

The V5004T 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.

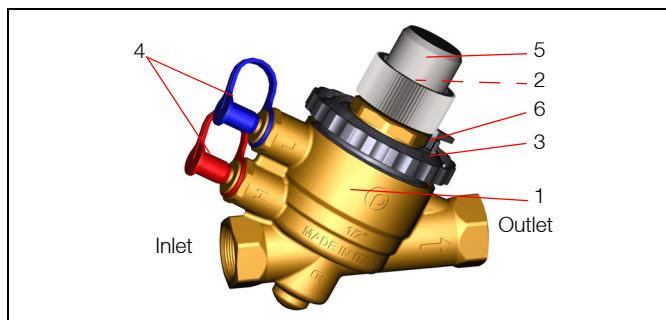
Valve Identification

Each valve is marked as follows:

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

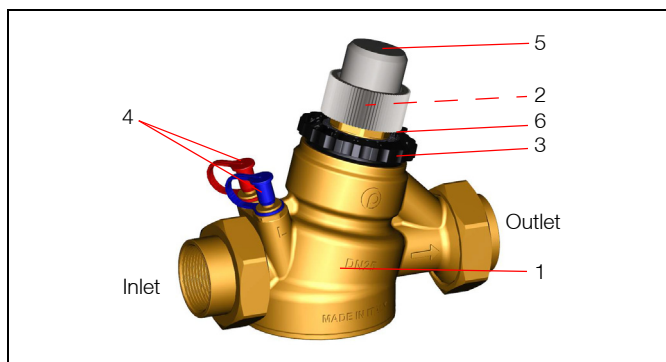
Overview

V5004TY Kombi-QM (DN15 - DN25)



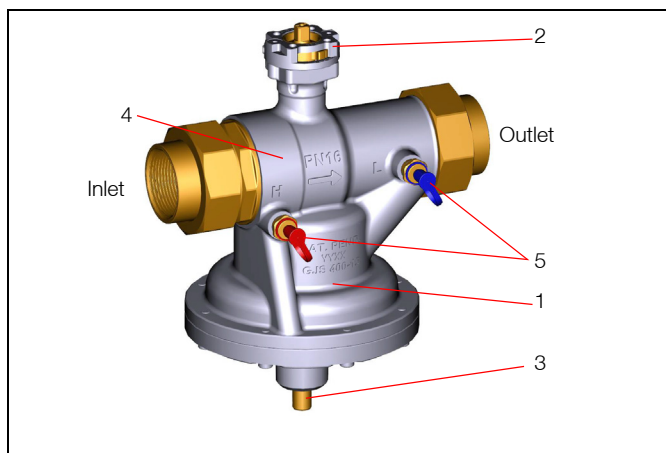
- 1 Constant pressure regulator
- 2 Interface for connection of Honeywell linear actuators
- 3 Flow pre-setting knob with scale from 0 % to 100 %
Pre-setting without tools possible
- 4 SafeCon™ pressure test valve with color marked protection cap
- 5 Grey protection cap - can be used as emergency shutoff knob
- 6 Lockable pre-setting

V5004TY Kombi-QM (DN20-DN32)



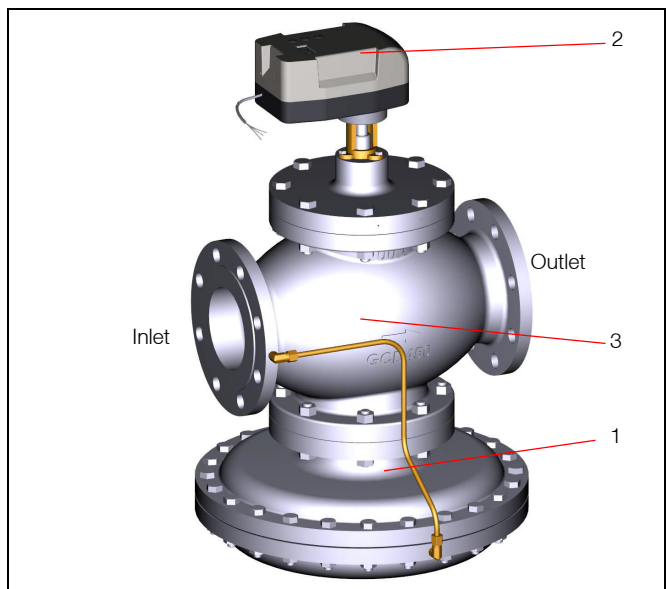
- 1 Constant pressure regulator
- 2 Interface for connection of Honeywell linear actuators
- 3 Flow pre-setting knob with scale from 0 % to 100 %
Pre-setting without tools possible
- 4 SafeCon™ pressure test valve with color marked protection cap
- 5 Grey protection cap - can be used as emergency shutoff knob
- 6 Lockable pre-setting

V5004TY Kombi-QM (DN32-DN65)



- 1 Constant pressure regulator
- 2 Interface for connection with rotating Honeywell actuators
- 3 Additional manual shut-off device
- 4 Regulating part
- 5 SafeCon™ pressure test valve with color marked protection cap

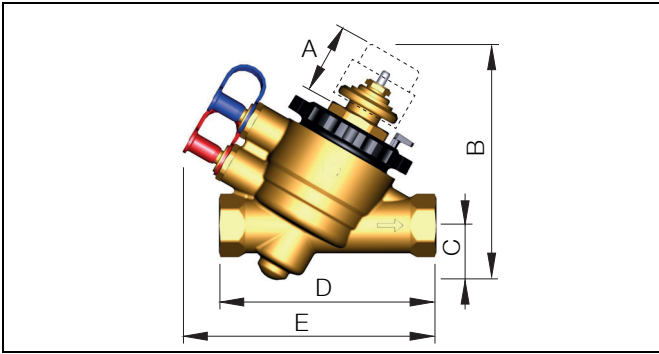
V5004TF Kombi-QM (DN50-DN150)



- 1 Constant pressure regulator
- 2 Regulating actuator
- 3 Regulating part
- 4 SafeCon™ pressure test valve with color marked protection cap

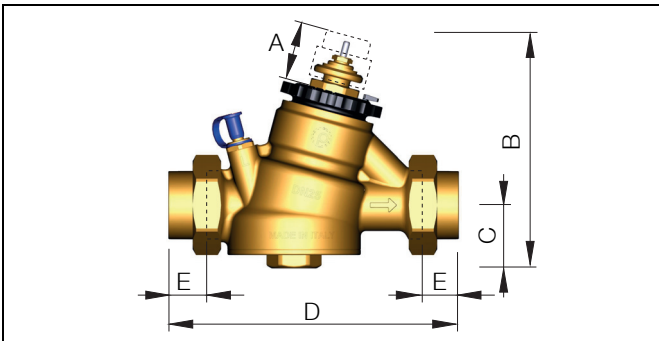
Dimensions

V5004TY Kombi-QM (DN15-DN25)



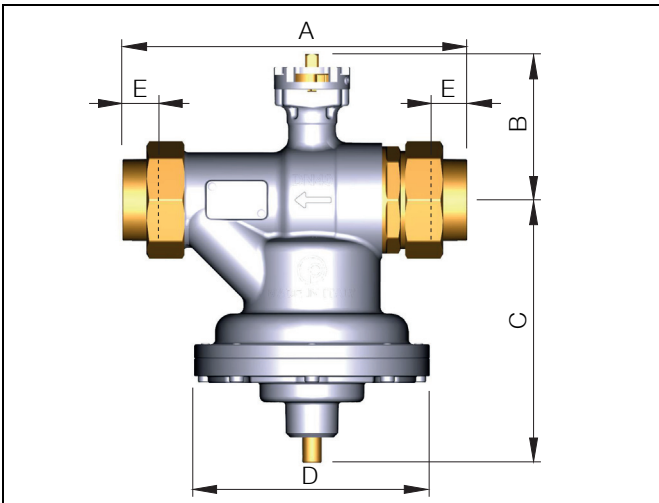
DN	Thread	A	B	C	D	E
15	Rp 1/2"	32	98	25	99	117
20	Rp 3/4"				108	124
25	Rp 1"				130	132

V5004TY Kombi-QM (DN20-DN32)



DN	Thread	A	B	C	D	E
20	Rc 3/4"	32	138	38	176	17
25	Rc 1"				184	21.5
32	Rc 1 1/4"				209	22

V5004TY Kombi-QM (DN32-DN65)

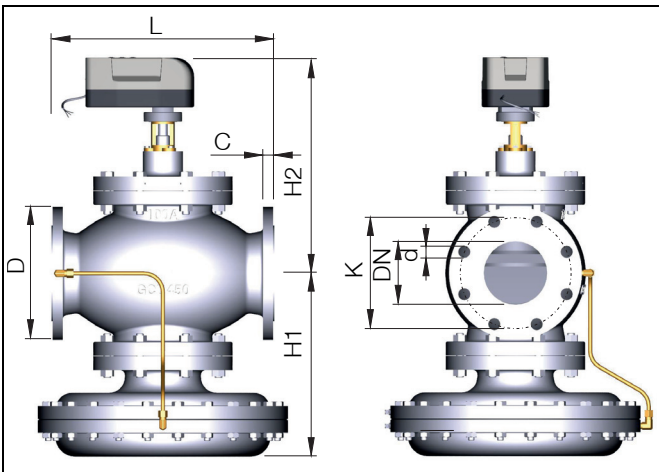


DN	Thread	A	B	C	D	E
32*	Rc 1 1/4"	232	85	176	158	23.6
40	Rc 1 1/2"	231	85	176	158	23.6
50*	Rc 2"	278	85	176	158	23.6
50	Rc 2"	267	93	221	198	28
65**	G 2 1/2"	205	93	221	198	19

* Valve with DN40 valve body

** External threaded valve with DN50 valve body

V5004TF Kombi-QM (DN50-DN150)



DN	Flange size	H1	H2	L	D	K	d	C
50	2"	191	291	254	165	125	18	18
65	2 1/2"	185	300	272	185	145	18	18
80	3"	185	300	272	200	160	18	20
100	4"	260	320	352	220	180	18	20
125	5"	266	346	400	250	210	18	22
150	6"	350	400	400	285	240	22	22

NOTE: All dimensions in mm unless stated otherwise.

Ordering Information

Available versions and OS-Nos (OS=Ordering Specification)

Order text	DN size	Flow range		Differential pressure range		Weight [kg]	OS-No.
		Min. flow* [l/h]	= Max. flow* [l/h]	Δp_{min} * [kPa]	Δp_{max} [kPa]		
Linear valve V5004 Kombi-QM with internal threads to DIN EN 10226-1 (ISO7)	DN15	45	150	20	400	0.88	V5004TY10150150
	DN15	60	600	25		0.88	V5004TY10150600
	DN15	78	780	35		0.88	V5004TY10150780
	DN20	100	1000	30		0.95	V5004TY10201000
	DN20	450	1500	35		0.95	V5004TY10201500
	DN25	450	1500	35		0.95	V5004TY10251500
Linear valve V5004 Kombi-QM with internal threads to DIN EN 10226-1 (ISO7)	DN20	220	2200	25	400	2.30	V5004TY10202200
	DN20	270	2700	25		2.30	V5004TY10202700
	DN25	220	2200	25		2.40	V5004TY10252200
	DN25	270	2700	25		2.40	V5004TY10252700
	DN32	270	2700	25		2.60	V5004TY10322700
	DN32	300	3000	35		2.60	V5004TY10323000
Rotating valve V5004 Kombi-QM with internal threads to DIN EN 10226-1 (ISO7)	DN32	1800	6000	30	400	8.50	V5004TY10326000
	DN40	2700	9000	35		8.60	V5004TY10409000
	DN50	3300	11000	40		8.70	V5004TY10501200
	DN50	5400	18000	35		15.50	V5004TY10501700
with external threads to DIN EN 10226-1 (ISO228) without union connection	DN65	5400	18000	35		13.2	V5004TY10651800
Flanged valves V5004TF**** DN50 to DN150, come together with an actuator as one unit.	DN50	2000	20000	40	400	33.00	V5004TF1050
	DN65	3000	30000	30		40.00	V5004TF1065
	DN80	3000	30000	30		43.00	V5004TF1080
	DN100	5500	55000	30		74.00	V5004TF1100
	DN125	9000	90000	35		93.00	V5004TF1125
	DN150	15000	150000	50		140.00	V5004TF1150

NOTE: * Valve is fully open / without actuator

Flanged valves V5004TF**** DN50 to DN150, come together with an actuator as one unit.

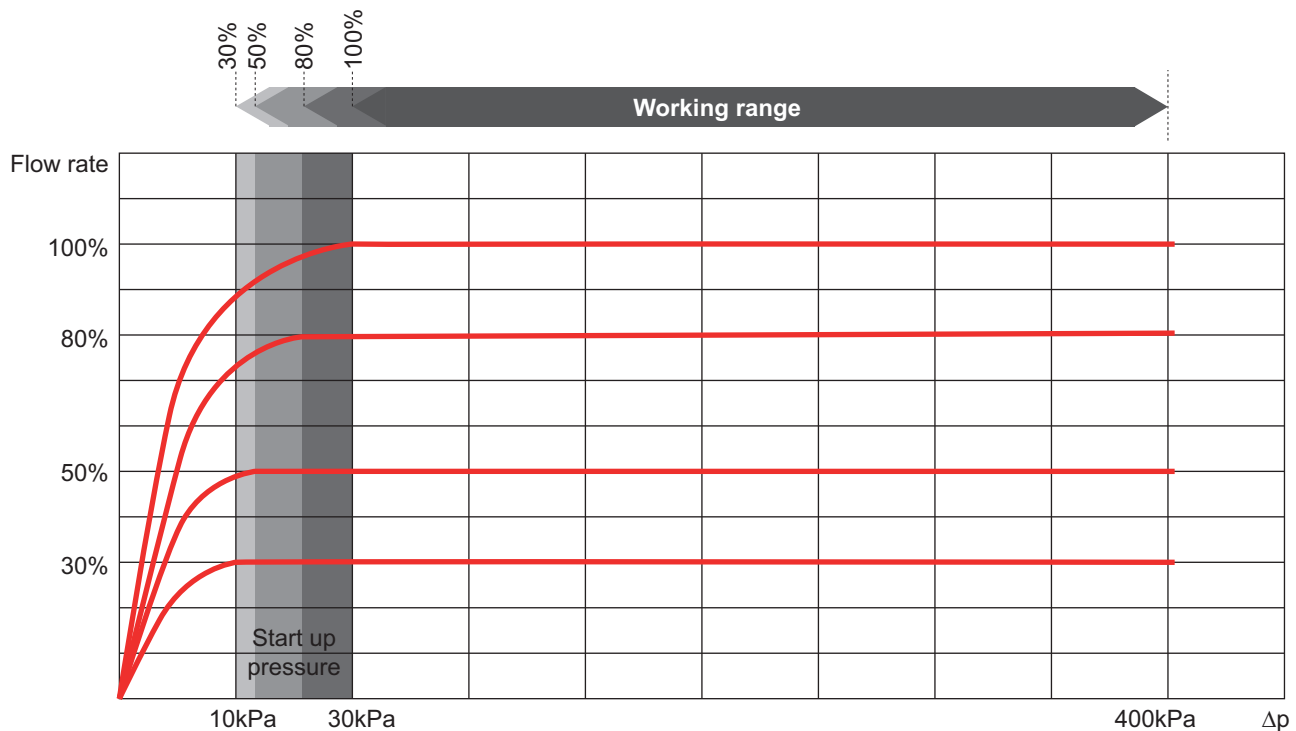
Check the actuator section below referring to Kombi-QM (DN50-DN150) actuator.

Flow Data

Limits of flows and differential pressures

OS-No.	Flow [l/h]	Valve stroke [mm]	Startup Pressure				Δp_{max} [kPa]
			Δp_{min} [kPa] at 30 % flow	Δp_{min} [kPa] at 50 % flow	Δp_{min} [kPa] at 80 % flow	Δp_{min} [kPa] at 100 % flow	
V5004TY10150150	45...150	2.7	8	11	16	20	400
V5004TY10150600	60...600	2.7	17	18	21	25	400
V5004TY10150780	78...780	2.7	23	25	30	35	400
V5004TY10201000	100...1000	2.7	10	14	24	30	400
V5004TY10201500	450...1500	2.7	14	17	25	35	400
V5004TY10251500	450...1500	2.7	14	17	25	35	400
V5004TY10202200	220...2200	6.0	16	17	22	25	400
V5004TY10202700	270...2700	6.0	17	20	22	25	400
V5004TY10252200	220...2200	6.0	16	17	22	25	400
V5004TY10252700	270...2700	6.0	17	20	22	25	400
V5004TY10322700	270...2700	6.0	17	20	22	25	400
V5004TY10323000	300...3000	6.0	18	25	30	35	400
V5004TY10326000	1800...6000	90°	20	20	30	30	400
V5004TY10409000	2700...9000	90°	21	25	31	35	400
V5004TY10501200	3300...11000	90°	20	21	32	40	400
V5004TY10501700	5400...18000	90°	15	19	30	35	400
V5004TY10651800	5400...18000	90°	15	19	30	35	400
V5004TF1050	2000...20000	n.a.	21	25	31	40	400
V5004TF1065	3000...30000	n.a.	26	29	30	30	400
V5004TF1080	3000...30000	n.a.	23	25	30	30	400
V5004TF1100	5500...55000	n.a.	16	20	24	30	400
V5004TF1125	9000...90000	n.a.	21	25	31	35	400
V5004TF1150	15000...150000	n.a.	31	35	41	50	400

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



Example for V5004TY10201000:

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.

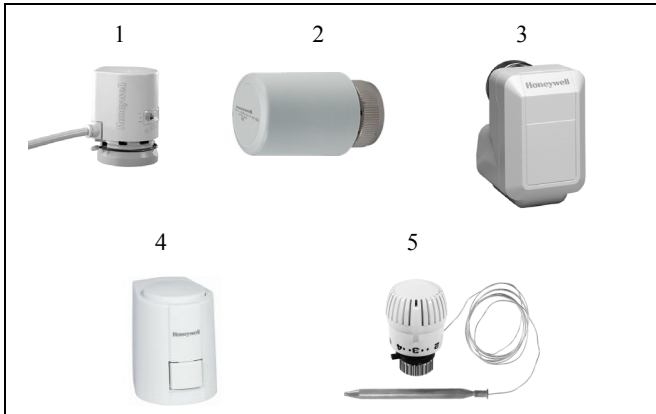
Flow Rate

OS-No.	Pre-setting	100 %	90 %	80 %	70 %	60 %	50 %	40 %	30 %	20 %	10 %
	Flow rate										
V5004TY10150150	[l/h]	150	135	120	105	90	75	60	45	-	-
	[l/s]	0.042	0.038	0.033	0.029	0.025	0.021	0.017	0.013	-	-
V5004TY10150600	[l/h]	600	540	480	420	360	300	240	180	120	60
	[l/s]	0.167	0.150	0.133	0.117	0.100	0.083	0.067	0.050	0.033	0.017
V5004TY10150780	[l/h]	780	702	624	546	468	390	312	234	156	78
	[l/s]	0.217	0.195	0.173	0.152	0.130	0.108	0.087	0.065	0.043	0.022
V5004TY10201000	[l/h]	1000	900	800	700	600	500	400	300	200	100
	[l/s]	0.278	0.250	0.222	0.194	0.167	0.139	0.111	0.083	0.056	0.028
V5004TY10201500	[l/h]	1500	1350	1200	1050	900	750	600	450	-	-
	[l/s]	0.417	0.375	0.333	0.292	0.250	0.208	0.167	0.125	-	-
V5004TY10251500	[l/h]	1500	1350	1200	1050	900	750	600	450	-	-
	[l/s]	0.417	0.375	0.333	0.292	0.250	0.208	0.167	0.125	-	-
V5004TY10202200	[l/h]	2200	1980	1760	1540	1320	1100	880	660	440	220
	[l/s]	0.611	0.550	0.489	0.428	0.367	0.306	0.244	0.183	0.122	0.061
V5004TY10202700	[l/h]	2700	2430	2160	1890	1620	1350	1080	810	540	270
	[l/s]	0.750	0.675	0.600	0.525	0.450	0.375	0.300	0.225	0.150	0.075
V5004TY10252200	[l/h]	2200	1980	1760	1540	1320	1100	880	660	440	220
	[l/s]	0.611	0.550	0.489	0.428	0.367	0.306	0.244	0.183	0.122	0.061
V5004TY10252700	[l/h]	2700	2430	2160	1890	1620	1350	1080	810	540	270
	[l/s]	0.750	0.675	0.600	0.525	0.450	0.375	0.300	0.225	0.150	0.075
V5004TY10322700	[l/h]	2700	2430	2160	1890	1620	1350	1080	810	540	270
	[l/s]	0.750	0.675	0.600	0.525	0.450	0.375	0.300	0.225	0.150	0.075
V5004TY10323000	[l/h]	3000	2700	2400	2100	1800	1500	1200	900	600	300
	[l/s]	0.833	0.750	0.667	0.583	0.500	0.417	0.333	0.250	0.167	0.083
V5004TY10326000	[l/h]	6000	5400	4800	4200	3600	3000	2400	1800	-	-
	[l/s]	1.667	1.500	1.333	1.167	1.000	0.833	0.667	0.500	-	-
V5004TY10409000	[l/h]	9000	8100	7200	6300	5400	4500	3600	2700	-	-
	[l/s]	2.500	2.250	2.000	1.750	1.500	1.250	1.000	0.750	-	-
V5004TY10501200	[l/h]	11000	9900	8800	7700	6600	5500	4400	3300	-	-
	[l/s]	3.056	2.750	2.444	2.139	1.833	1.528	1.222	0.917	-	-
V5004TY10501700	[l/h]	18000	16200	14400	12600	10800	9000	7200	5400	-	-
	[l/s]	5.000	4.500	4.000	3.500	3.000	2.500	2.000	1.500	-	-
V5004TY10651800	[l/h]	18000	16200	14400	12600	10800	9000	7200	5400	-	-
	[l/s]	5.000	4.500	4.000	3.500	3.000	2.500	2.000	1.500	-	-
V5004TF1050	[l/h]	20000	18000	16000	14000	12000	10000	8000	6000	4000	2000
	[l/s]	5.556	5.000	4.444	3.889	3.333	2.778	2.222	1.667	1.111	0.556
V5004TF1065	[l/h]	30000	27000	24000	21000	18000	15000	12000	9000	6000	3000
	[l/s]	8.333	7.500	6.667	5.833	5.000	4.167	3.333	2.500	1.667	0.833
V5004TF1080	[l/h]	30000	27000	24000	21000	18000	15000	12000	9000	6000	3000
	[l/s]	8.333	7.500	6.667	5.833	5.000	4.167	3.333	2.500	1.667	0.833
V5004TF1100	[l/h]	55000	49500	44000	38500	33000	27500	22000	16500	11000	5500
	[l/s]	15.278	13.750	12.222	10.694	9.167	7.639	6.111	4.583	3.056	1.528
V5004TF1125	[l/h]	90000	81000	72000	63000	54000	45000	36000	27000	18000	9000
	[l/s]	25.000	22.500	20.000	17.500	15.000	12.500	10.000	7.500	5.000	2.500
V5004TF1150	[l/h]	150000	135000	120000	105000	90000	75000	60000	45000	30000	15000
	[l/s]	41.667	37.500	33.333	29.167	25.000	20.833	16.667	12.500	8.333	4.167

Accessories

For valves with 2.7 mm stroke

V5004TY Kombi-QM (DN15-DN25)



No.	Description	Part No.
-----	-------------	----------

1	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
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2	Actuator thermoelectric 4.0 mm effective stroke, 90N, on/off	M100-BO M100-BG M100-AO M100-AG
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3	Actuator 3-point 4.0 mm effective stroke, 90N, floating	M7410A1001 M7410A1001-3M
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NOTE: By use of this actuator series the max. flow of the valve is reduced by 15 %

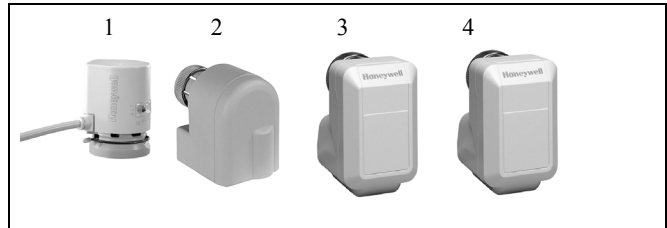
4	Actuator thermoelectric 0...10 V 4.0 mm effective stroke, 120N, modulating	M4410E1510 M4410K1515 Cable for M4410 actuator, 1m, 10 pcs M44-MOD-1M
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NOTE: Closes when power fails

5	Radiator Thermostat Thera-2080WL with remote sensor for water and air	T750120
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For valves with 6.0 mm stroke

V5004TY Kombi-QM (DN20-DN32)



No.	Description	Part No.
-----	-------------	----------

1	Actuator thermoelectric 6.5 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
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2	Actuator fast motorized 6.5 mm effective stroke, 100N, on/off	M5410C1001 M5410L1001
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3	Actuator 3-point 6.5 mm effective stroke, 180N, floating	M7410C1007 M7410C1007-10M M6410C2023 M6410C4029 M6410L2023 M6410L4029
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4	Actuator 0/2...10V 6.5 mm effective stroke, 180N, modulating	M7410E1002 M7410E2026 M7410E4022
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For valves with 90° rotation

V5004TY Kombi-QM (DN32-DN65)

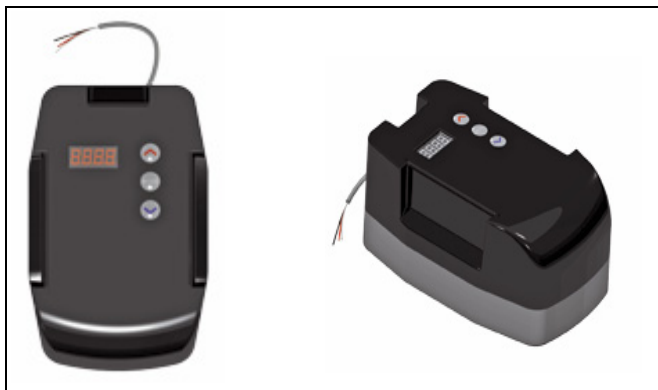


No.	Description	Part No.
-----	-------------	----------

1	Actuator 0/2...10V 90°, 10 Nm, rotating, modulating	M7061E1012
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2	Actuator 3-point 90°, 10 Nm, rotating, floating	M6061A1013 M6061L1019
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For flanged valves V5004TF Kombi-QM (DN50-DN150)



Flow rate can be easily set from the on-board user interface.

Compatible with most used control signals:

- Analogue (current or voltage control)
- PWM
- ON/OFF

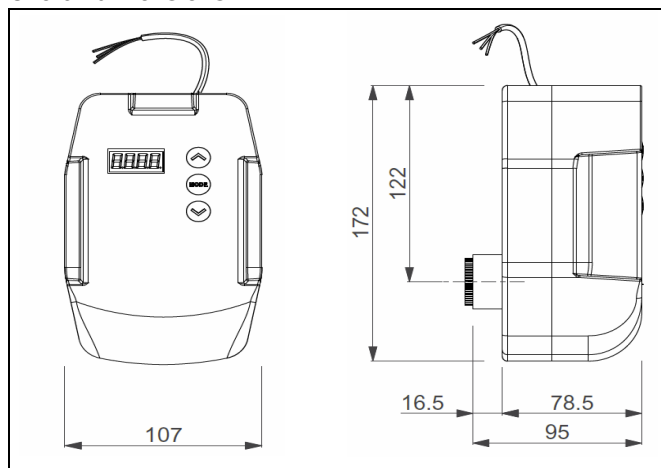
4–20 mA position feedback signal as default option, for a total remote management.

Manual override available.

Technical features

Operating duration	170 sec. (Full Open <-> Full Closed)
Emergency operation	Easy removable nut
Control input	PID Control (2-10 VDC: installed on external cable of 500 Ω resistor) 4 – 20 mA (installed on external cable of 500 Ω resistor) ON/OFF Control mode (e. g. Thermostat) PWM Control (0.1 ~ 5 sec/20 ms or 25 sec/100 ms depending on switch setting) Common switch – NPN transistor, SCR, triac or dry contact (max. current 50 mA)
Torque	5 Nm
Position feedback	4-20 mA or 2-10 VDC (installed on external cable of 500 Ω resistor)
Ambient temp.	-20 °C ~ 65 °C
Wire	18 AWG
Cover material	Aluminum + Plastic
Protection class	II - IP54

Overall dimensions



Actuator wiring

Black	①	Common
Red	②	24VAC/DC
White	③	Control Signal 1
Green	④	Control Signal 2
Blue	⑤	Feedback
Yellow	⑥	Remo.con. +
Brown	⑦	Remo.con. -

Function	No.	1	2	3	4	5	6	7	Remarks	
	Color	Black	Red	White	Green	Blue	Yellow	Brown		
Internal control		Common	24 V AC/DC			FEED BACK 4 ~ 20 mA			Power cable: ① ②	
Voltage control		Common	24 V AC/DC	2 ~ 10 VDC					Power cable: ① ② Voltage control cable: ① ③	
Current control		Common	24 V AC/DC	2 ~ 20 mA					Power cable: ① ② Current control cable: ① ③	
ON / OFF control		Common	24 V AC/DC	24 DCV (open) OV (close)					Power cable: ① ② ON/OFF control cable: ① ③	
External Remote control		Common	24 V AC/DC					REMO. CON.	REMO. CON.	Power cable: ① ② REMO.CON cable: ⑥ ⑦
3 POINT FLOATING control		Common	24 V AC/DC	drive cw(open) 24 V AC/ DC	drive ccw(close) 24 V AC/ DC					Power cable: ① ② 3 POINT control cable: ③ ④
PWM control		Common	24 V AC/DC	pwm control signal						Power cable: ① ② PWM control cable: ① ③

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