



Braukmann V5001P Kombi-Auto

Differential Pressure Control Valve

APPLICATION

The V5001P Kombi-Auto differential pressure control valve is used to maintain automatically a hydronic balance in residential or commercial hydronic heating and cooling systems. It shall be installed in the return pipeline.

It is used in systems with variable volume flows, for example two-pipe heating systems, and creates a hydronic balance by keeping differential pressure over consumers at a constant preset level even under changing flow or pump pressure conditions, for example in part load states.

Hydronic balance is a significant requirement for efficient operation of a hydronic system. In an unbalanced system under- or oversupply of energy to individual circuits or heat exchangers can occur.

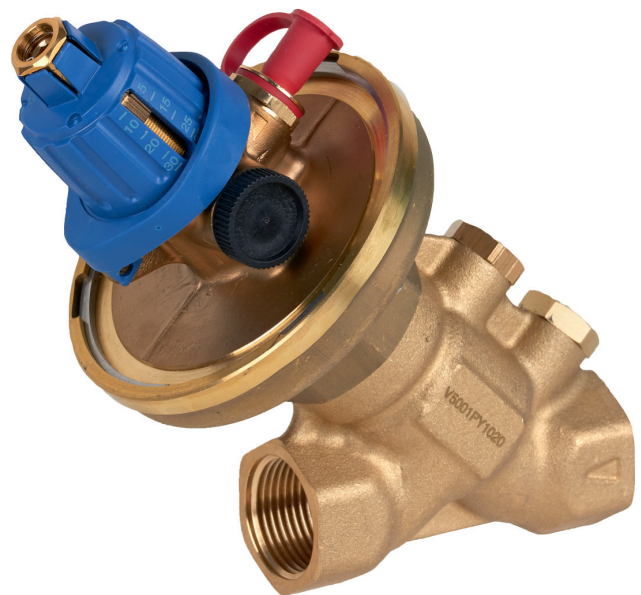
Apart from correct selection of radiator valves, regulation of individual circuits is necessary and in some countries required by national standards or regulations.

SPECIAL FEATURES

- Automatic balancing of differential pressure
 - Highest energy saving potential due to efficient energy transfer and minimised pump speed
 - Lower noise emission on control valves
 - High authority over the control valves
 - Dividing systems into pressure independent zones
 - No complex calculation needed for selection
 - No balancing method needed for commissioning
- Wide range of application
 - Sizes DN15 up to DN50
 - Wide presetting ranges
 - Very high flow rates
- Easy commissioning
 - Presetting with visual Δp -scale in kPa
 - Presetting by hand without the need of tools
 - Presetting lead sealable
 - Removable insert for installation in tight spaces
 - Insulation shells included
- Maintenance friendly
 - Concealed shut-off function
 - Various measuring possibilities for problematic applications

Valve Efficiency

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

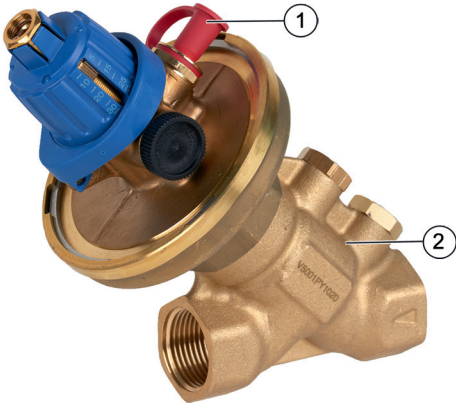


TECHNICAL DATA

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:	max. 16 bar (232 psi)
Pump pressure:	min.: $\Delta p_c + 10 \text{ kPa g } Q_{\max L}$ min.: $\Delta p_c + 20 \text{ kPa g } Q_{\max H}$ max.: $6 \times \Delta p_c$
Differential pressure presetting range:	5 - 35 kPa or 30 - 60 kPa
Operating temperatures	
Max. operating temperature medium:	-20 - 130 °C (-4 - 266 °F)*
Connections/Sizes	
Nominal size:	DN15 - DN50
Specifications	
Housing:	Dezincification-resistant brass
Factory setting:	5 kPa or 30 kPa
Impulse tube:	0.8 m
Flow values:	see table on page Ordering Information
Control characteristic:	see page Technical Characteristic

* for water glycol mixtures to VDI 2035 max. temperature 20 - 110°

CONSTRUCTION

Overview		Components	Materials
	1	SafeCon™ pressure test valve at the membrane with colour marked dust cap	Brass
	2	Valve housing DN15 to DN50 with internal threads to DIN EN 10226-1 for threaded pipe and two G ¹ / ₄ " internal threads for installation of pressure test valves, equipped with blind stops	Dezincification-resistant brass and blind stops made of brass
	Not depicted components:		
		Valve insert with diaphragm assembly and impulse tube connection	Brass and stainless steel
		Handwheel assembly with digital display of presetting value, locking ring and shut-off screw	Brass and plastic
		Impulse tube with compression fittings and adapter for connection to V5001S Kombi-S shut-off valve in the supply	Brass and copper
		Insulation shell with DN size	-
		Installation and setup instructions	-

METHOD OF OPERATION

The V5001P Kombi-Auto is installed in the return pipeline. Based on required differential pressure at full load. The valve is preset to a certain value by turning handwheel or presetting lever clockwise (increase of differential pressure) or anticlockwise (decrease of differential pressure).

Required preset value can be determined by using tables further below, by using a sizing tool, by measuring or directly from design documentation. Required flow at full load is normally calculated in advance by a consultant or similar specialist and must be known for system balancing.

Cautions during installation, commissioning, testing and maintenance

- 1) The membrane must have the equal pressure across both sides during pressure testing to prevent dislocation or damage to the membrane. It can be achieved by having the impulse tube connected between the flow valve and correctly installed membrane on the return valve
- 2) Kindly ensure that any isolation valves on the impulse tube or on flow and return pipework are open beforehand
- 3) At no time should the pressure on one side of the membrane be higher or lower than the other, please take special care about this when isolating the valves during installation, commissioning, testing or maintenance

Normal operation

- V5001PY: Max. allowable differential pressure: $6 \times \Delta p_c$
 Δp_c = controlled differential pressure (e.g. 10 kPa)

Valve Identification

Each valve is marked as follows:

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

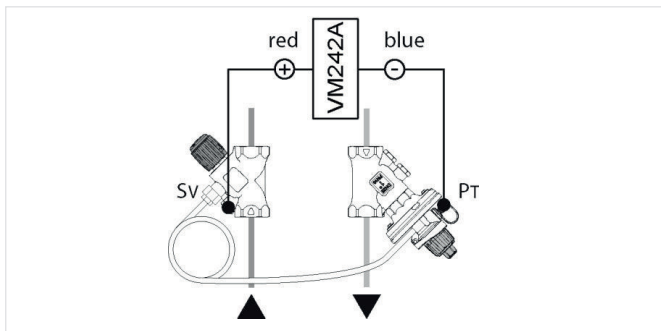
INSTALLATION GUIDELINES

Setup requirements

The Kombi-Auto is equipped with a SafeCon™ quick connect pressure test valve on the diaphragm housing and has two additional ports on the valve housing which can be retrofitted with SafeCon™ pressure test valves to allow measurements with a differential pressure measuring computer, for example VM242 BasicMes-2. The following measurements are possible:

Installation Example

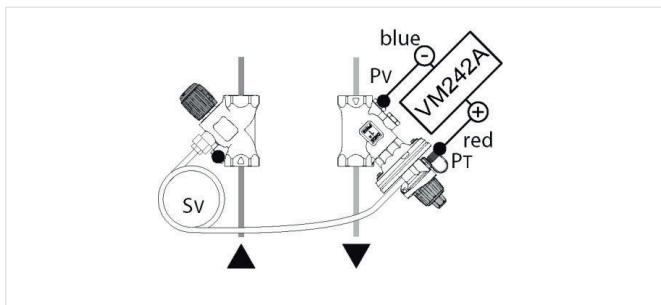
Flow



Requires a valve with defined kvs value with the pressure test ports in the supply, the pressure test ports must be designed across the valve seat for flow measurement e.g. Kombi-S with SafeCon pressure test connections.

- Blue hose: connected to Kombi-Auto (PT)
- Red hose: connected to Kombi-S (SV)
- Use the k_{VS} -value of the valve in supply for flow calculation

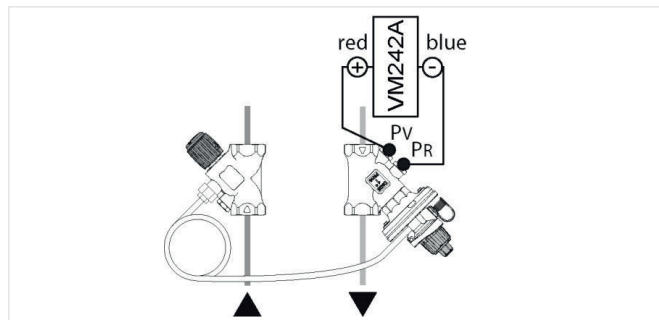
Δp loop



Requires SafeCon™ pressure test valve on lower connection of Kombi-Auto valve housing

- Red hose: connected to lower SafeCon™ pressure test valve (PV)
- Blue hose: connected to Kombi Auto (PV)

Δ valve

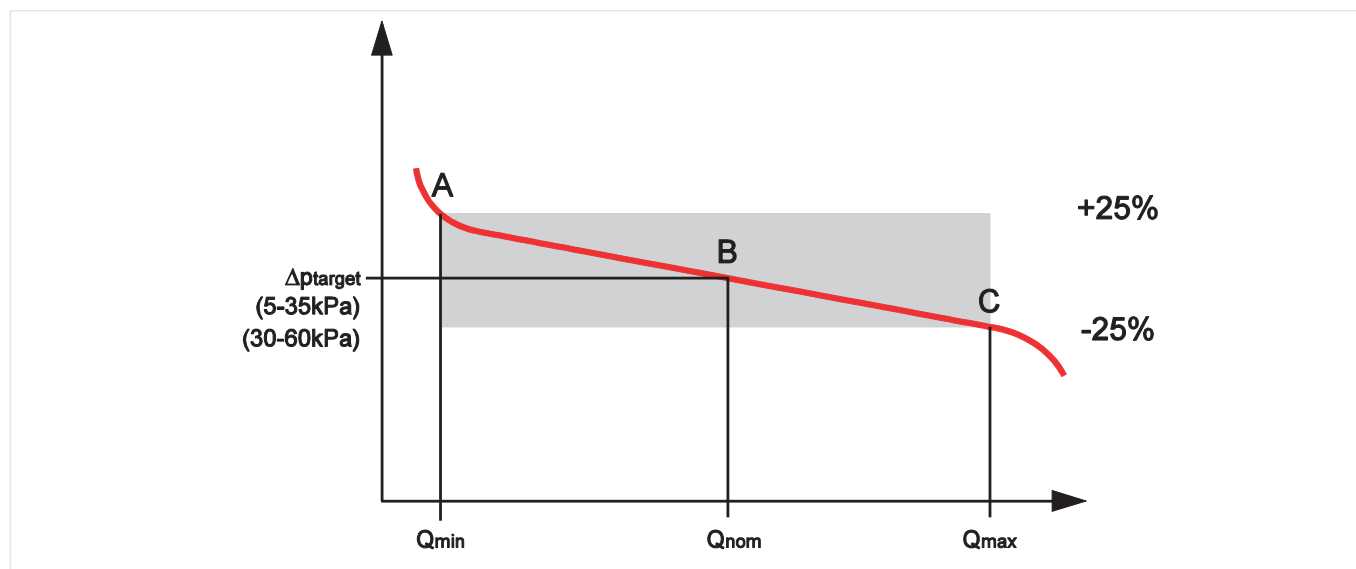


Requires SafeCon™ pressure test valves on both ports of Kombi-Auto

- Blue hose: connected to upper SafeCon™ pressure test valve (PR)
- Red hose: connected to lower SafeCon™ pressure test valve (PV)

SafeCon™ quick connect pressure test valves are available as accessory – see chapter 'Accessories' below. Depending on type of measurement desired they have to be fitted to the Kombi-Auto and/or Kombi-S respec. Kombi-2-Plus supply valve (if used). If no Kombi-S or kombi-2-Plus is used other means for pressure testing an impulse tube connection must be provide. The BasicMes-2 can directly connect to SafeCon™ pressure test valves for leakage free and quick measuring operations.

TECHNICAL CHARACTERISTICS



Legend

- A – Q_{min} Minimum flow where valve starts to control (Lowest control point)
 B – Q_{nom} Value where set Δp is in middle of hysteresis (Optimal control point)
 C – Q_{max} Maximum flow before flow curve drops off (Highest control point)

Flow Data

Standard Range for Kombi-Auto with Δp range 5 – 35 kPa

Preset Δp	5 kPa					10 kPa					15 kPa				
Pump pressure (l/h)		Flow Δp_c + 10 kPa		Flow Δp_c + 20 kPa			Flow Δp_c + 10 kPa		Flow Δp_c + 20 kPa			Flow Δp_c + 10 kPa		Flow Δp_c + 20 kPa	
Flow	Q_{min}	Q_{nom}	Q_{max}	Q_{nom}	Q_{max}	Q_{min}	Q_{nom}	Q_{max}	Q_{nom}	Q_{max}	Q_{min}	Q_{nom}	Q_{max}	Q_{nom}	Q_{max}
DN15	40	550	1000	750	1600	40	550	1000	750	1600	40	570	1000	780	1600
DN20	60	850	1500	1200	2100	60	870	1500	1250	2150	60	900	1700	1300	2400
DN25	100	1000	1700	1400	2500	100	1000	1800	1400	2650	100	1100	1900	1450	2800
DN32	150	1200	2500	1700	3600	150	1700	2900	2500	4200	150	2100	3500	3000	5500
DN40	200	2500	4000	3900	7500	200	2600	4500	3900	7700	200	2700	5000	4000	7900
DN50	450	3000	5000	5000	10500	450	3000	6000	5000	11000	500	3000	7000	5000	13000

Preset Δp	20 kPa					25 kPa				
Pump pressure (l/h)		Flow Δp_c + 10 kPa		Flow Δp_c + 20 kPa			Flow Δp_c + 10 kPa		Flow Δp_c + 20 kPa	
Flow	Q_{min}	Q_{nom}	Q_{max}	Q_{nom}	Q_{max}	Q_{min}	Q_{nom}	Q_{max}	Q_{nom}	Q_{max}
DN15	40	600	1100	800	1600	40	600	1100	800	1600
DN20	60	900	1700	1300	2450	60	900	1750	1300	2500
DN25	100	1100	2000	1470	2850	100	1200	2000	1500	2900
DN32	150	2200	4000	3200	5700	150	2400	4100	3600	5900
DN40	200	2800	5500	4000	8250	200	3000	5700	4300	8500
DN50	500	4500	9000	6500	14000	500	5500	9500	8000	15000

Preset Δp	30 kPa					35 kPa				
Pump pressure (l/h)		Flow $\Delta p_c + 10$ kPa		Flow $\Delta p_c + 20$ kPa			Flow $\Delta p_c + 10$ kPa		Flow $\Delta p_c + 20$ kPa	
Flow	Q_{min}	Q_{nom}	Q_{max}	Q_{nom}	Q_{max}	Q_{min}	Q_{nom}	Q_{max}	Q_{nom}	Q_{max}
DN15	40	600	1100	800	1650	40	650	1200	850	1700
DN20	60	900	1800	1300	2550	60	950	1850	1350	2600
DN25	100	1200	2100	1500	2950	100	1300	2100	1800	3000
DN32	150	2600	4300	3800	6100	150	2700	4500	4000	6500
DN40	200	3300	5800	4700	8750	200	3500	6000	5000	9000
DN50	500	7000	9500	9000	16000	500	8500	10000	9500	17000

Extended Range for Kombi-Auto with Δp range 30 – 60 kPa

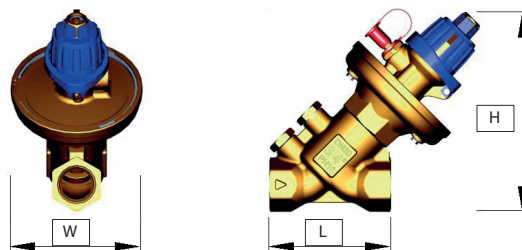
Preset Δp	30 kPa			35 kPa			40 kPa			45 kPa		
Pump pressure (l/h)	Flow $\Delta p_c + 20$ kPa			Flow $\Delta p_c + 20$ kPa			Flow $\Delta p_c + 20$ kPa			Flow $\Delta p_c + 20$ kPa		
Flow	Q_{min}	Q_{nom}	Q_{max}	Q_{min}	Q_{nom}	Q_{max}	Q_{min}	Q_{nom}	Q_{max}	Q_{min}	Q_{nom}	Q_{max}
DN15	50	1000	1900	50	1000	1900	50	975	1900	75	1000	1900
DN20	50	1300	2600	50	1350	2650	50	1400	2700	75	1450	2750
DN25	100	1550	3000	100	1600	3100	100	1650	3200	100	1675	3250
DN32	200	3100	6000	200	3350	6500	200	3600	7000	200	3850	7500
DN40	250	5100	10000	250	5375	10500	250	5625	11000	250	5875	11500
DN50	500	6250	12000	500	6750	13000	500	7250	14000	500	7750	15000

Preset Δp	50 kPa			55 kPa			60 kPa		
Pump pressure (l/h)	Flow $\Delta p_c + 20$ kPa			Flow $\Delta p_c + 20$ kPa			Flow $\Delta p_c + 20$ kPa		
Flow	Q_{min}	Q_{nom}	Q_{max}	Q_{min}	Q_{nom}	Q_{max}	Q_{min}	Q_{nom}	Q_{max}
DN15	100	1000	1900	125	1000	1900	150	1000	1900
DN20	100	1500	2800	125	1550	2900	150	1600	3000
DN25	100	1700	3300	125	1750	3400	150	1825	3500
DN32	200	4100	8000	200	4600	9000	200	5100	10000
DN40	250	6125	12000	250	6375	12500	250	6625	13000
DN50	500	8250	16000	500	9000	17000	500	9500	18000

Note: Pump pressure: max. $6 \times \Delta p_c$
 Δp_c =controlled differential pressure (e.g. 10 kPa)

DIMENSIONS

Overview



Parameter		Values					
Connection sizes:	inch	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
Nominal sizes:	DN	15	20	25	32	40	50
Thread:	inch	Rp1 1/2"	Rp3/4"	Rp1"	Rp1 1/4"	Rp1 1/2"	Rp2"
Dimensions: without insulation shell	L	140	140	143	188	194	206
	W	87	87	87	117	117	117
	H	129	136	140	190	195	208
Dimensions: with insulation shell	L	170	167	173	225	231	243
	W	87	93	104	117	126	147
	H	155	163	168	218	227	243
Weight:	kg	1.1	1.2	1.4	3.0	3.3	4.0

Note: All dimensions in mm unless stated otherwise.

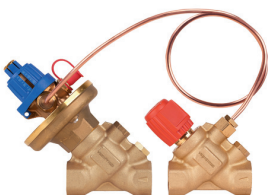
ORDERING INFORMATION

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.

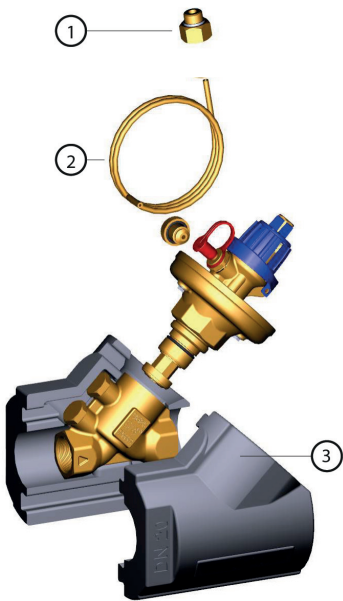
Options

Order text:	DN:	Thread:	P Bereich:	k _{VS} -value (m ³ /h):	OS-No.:
V5001P Kombi-Auto with internal threads to DIN EN 10226-1 (ISO 7)	DN15	Rp 1/2"	5 - 35 kPa	4.1	V5001PY1015
	DN20	Rp 3/4"		7.5	V5001PY1020
	DN25	Rp 1"		8.7	V5001PY1025
	DN32	Rp 1 1/4"		17.6	V5001PY1032
	DN40	Rp 1 1/2"		24.5	V5001PY1040
	DN50	Rp 2"		30.0	V5001PY1050
	DN15	Rp 1/2"	30 - 60 kPa	4.1	V5001PY2015
	DN20	Rp 3/4"		7.5	V5001PY2020
	DN25	Rp 1"		8.7	V5001PY2025
	DN32	Rp 1 1/4"		17.6	V5001PY2032
	DN40	Rp 1 1/2"		24.5	V5001PY2040
	DN50	Rp 2"		30.0	V5001PY2050

Accessories

	Description	Dimension	Part No.
	VM242A BasicMes-2 handheld measuring computer Note: To connect the VM241 BasicMes to SafeCon™ pressure test cocks please order measuring adapter VA3600C001 separately.		
	Computer is supplied with case and accessories	for all sizes	VM242A0101
	VS5501 Shut-off valve for impulse tube		
		for all sizes	VS5501A008
	VS2600 Spare set of 2 pressure test cocks G¹/₄"		
	Set of SafeCon connections	for all sizes	VS2600C001
	V5001SY Kombi-S Stop Valve Partner valve for connection of included impulse tube and to extend measuring possibilities		
		DN15	V5001SY2015
		DN20	V5001SY2020
		DN25	V5001SY2025
		DN32	V5001SY2032
		DN40	V5001SY2040
	VA3401A Draining valve		
		for all sizes	VA3401A008
	VA5001 Measuring adapter for low volume flow section To increase the measuring signal at low flow rates Note: For low flow rate measurement we recommend to use the VA5001A measuring adapter. It is to close the partner valve V5001SY.... to a defined low flow measuring position B on the V5001S valve, please refer to the data sheet for the V5001S valve for further details.		
		DN15 - DN25	VA5001A001
		DN32 - DN50	VA5001A002
	VA5032A Draining adapter for SafeCon™ connections Can be used to drain the water from a SafeCon connection provided on the balancing valve families as shown below		
		for all dimensions	VA5032A001

Spare Parts

Overview	Description	Dimension	Part No.
	1 Replacement connector (5pcs.)		
	Brass connector for the impulse tube with sealing ring		VS5001A005
	2 Compression and impulse tube fitting		
	Copper pipe	4 x 1mm	VS5001A006
	3 Insulation shells		
		DN15	VA2510D015
		DN20	VA2510D020
		DN25	VA2510D025
		DN32	VA2510D032
		DN40	VA2510D040
		DN50	VA2510D050



Manufactured for
and on behalf of
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