resideo

Optimal heating control.

Rotary & Linear Valves and Actuators –
Reliable solutions for precision heating control.

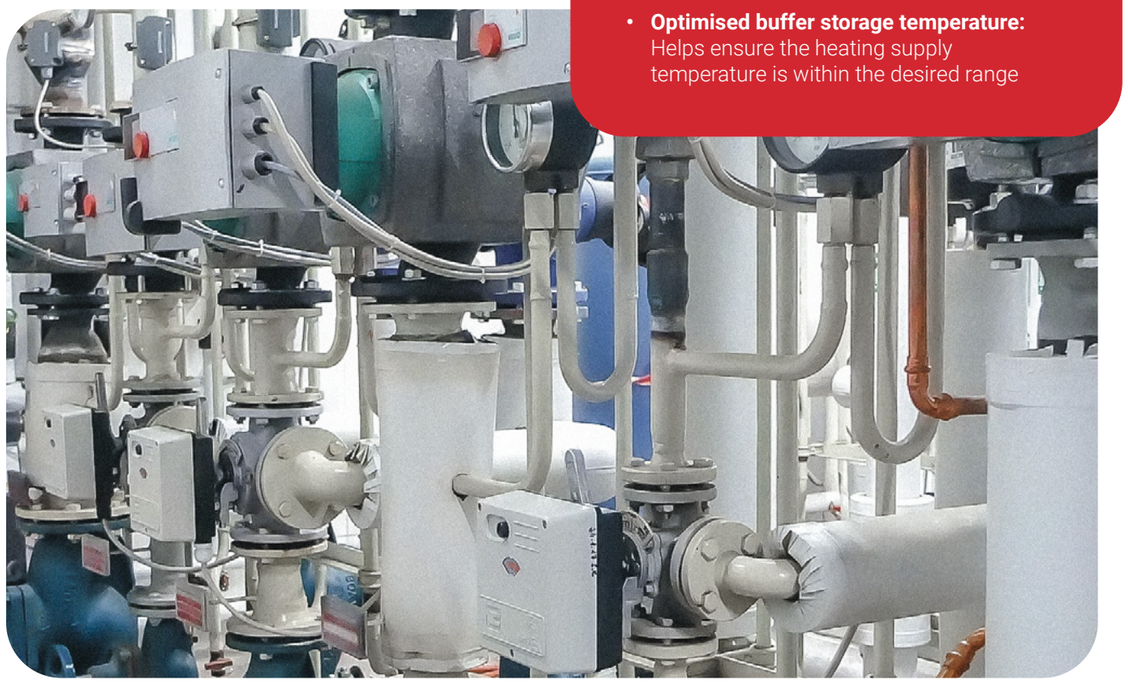
Advantages of mixed circuits

A mixed circuit is the perfect solution for adapted supply temperatures and low return temperatures. As a connecting link between building systems and control technology, it helps ensure consumers receive the appropriate supply temperatures at all times, and can be tailored to their requirements.

To achieve this, a three-way valve with actuator is used to blend hot water from the heat source supply line with cooled water from the heating circuit return. In systems with multiple circuits, a mixed circuit ensures each sub-circuit receives the required supply temperature for its individual consumers. For complex systems with buffer storage, the mixed circuit reduces the buffer temperature to the necessary value.

Benefits at a glance

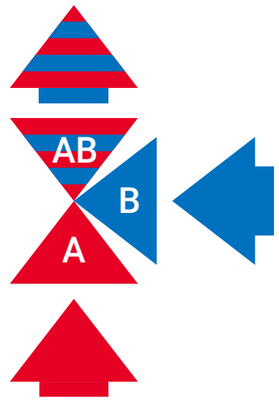
- **Control of partial load states:**
  Efficiently manages varying load conditions
- **Reduction of distribution loss:**
  Helps reduce energy loss during distribution
- **Optimised buffer storage temperature:**
  Helps ensure the heating supply temperature is within the desired range



Expert insight

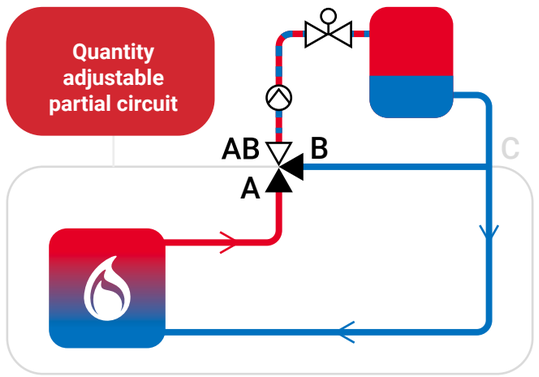
System hydraulics: The key to achieving optimal control

The system hydraulics determine the control quality and effectiveness. A controlled system begins with the controller, which is the basis for calculations, configuration, and sizing. Proper configuration of hydraulics and selection of actuators are critical for achieving optimal control results.



Using the three-way valve with actuator, hot supply water from the primary circuit (A) is combined with the cooler return flow from the sub-circuit (B) to form a common heating supply flow (AB). The resulting heating supply temperature depends on the mixing ratio.

Partial flow gate A + partial flow gate B = total flow gate AB



Rule to remember: Sizing actuators

The valve resistance should be equal to the pressure drop of the sub-circuit in which the position water is mixed due to the valve position.

The schematic at the left-hand side shows the change in the amount of water from point C via the heat quantity element to point A.

Overview of rotary valve programme

Resideo rotary valves are primarily used as the central supply temperature control system for heating systems.

For both heat sources and buffer storage systems, the advantages of a control system that ensures a supply temperature continuously adapted to requirements are clear:

- **Degree-accurate supply temperatures:** Adapted to the outside temperature
- **Constant preferred temperature:** Maintained even during buffering

Resideo universal 3-way rotary valve (DRU / DRR)

DRU

Grey cast iron housing		
Nominal size DN	**Kvs value**	**Part no.**
25	2.5	DRU25-2,5
	4	DRU25-4,0
	6.3	DRU25-6,3
	10	DRU25-10
	16	DRU25-16
32	10	DRU32-10
	16	DRU32-16
	25	DRU32-25

DRR

Red brass housing		
Nominal size DN	**Kvs value**	**Part no.**
25	2.5	DRR25-2,5
	4	DRR25-4,0
	6.3	DRR25-6,3
	10	DRR25-10
	16	DRR25-16

Resideo 3-way rotary valve with straight through passage (DRG...LA)

DR...GMLA

Threaded version		
Nominal size DN	**Kvs value**	**Part no.**
15	2	DR15-2GMLA
15	4	DR15GMLA
20	6.3	DR20GMLA
25	10	DR25GMLA
32	16	DR32GMLA
40	25	DR40GMLA

DR...GFLA

Flanged version		
Nominal size DN	**Kvs value**	**Part no.**
20	6.3	DR20GFLA
25	10	DR25GFLA
32	16	DR32GFLA
40	25	DR40GFLA
50	40	DR50GFLA
65	63	DR65GFLA
80	100	DR80GFLA
100	160	DR100GFLA
125	250	DR125GFLA
150	630	DR150GFLA
200	1000	DR200GFLA-1
200	1600	DR200GFLA

Resideo 3-way rotary valve with angled passage (DR...A)

DR...MA

Threaded version		
Nominal size DN	**Kvs value**	**Part no.**
15	4	DR15MA
20	6.3	DR20MA
25	10	DR25MA
32	16	DR32MA
40	25	DR40MA

DR...FA

Flanged version		
Nominal size DN	**Kvs value**	**Part no.**
40	25	DR40FA
50	40	DR50FA
65	63	DR65FA
80	100	DR80FA
100	160	DR100FA
125	250	DR125FA
150	400	DR150FA
200	630	DR200FA

Resideo 4-way rotary valve (ZR...A)

ZR...MA

Threaded version		
Nominal size DN	**Kvs value**	**Part no.**
15	4	ZR15MA
20	6.3	ZR20MA
25	10	ZR25MA
32	16	ZR32MA
40	25	ZR40MA

ZR...FA

Flanged version		
Nominal size DN	**Kvs value**	**Part no.**
25	10	ZR25FA
32	16	ZR32FA
40	25	ZR40FA
50	40	ZR50FA
65	63	ZR65FA
80	100	ZR80FA
100	160	ZR100FA
125	250	ZR125FA
150	400	ZR150FA
200	630	ZR200FA

Resideo 4-way compact rotary valve (ZRK)

ZRK

Threaded version		
Nominal size DN	**Kvs value**	**Part no.**
20	6.3	ZRK20
25	10	ZRK25
32	16	ZRK32
40	25	ZRK40

Technical data

Material: Housing: grey cast iron, GG 20
Red brass, RG 5, for DRR type
Rotary plug: GG 20, chrome plated
Colour: Signal grey (RAL 7004)
Nominal sizes: DN 15 to DN 200
Nominal pressure: PN 6 DR, DRG, ZR and ZRK type
PN 10 DRU/DRR type
Medium: Heating water with a glycol mix ratio of up to 50% according to VDI 2035
Temperature range: +2 to 130 °C (DN 15 to 150)
+2 to 110 °C (DN 200 and ZRK)
Leakage rate: <1 % of Kvs value at max. permissible differential pressure
Rotary valve seal: Double O-ring seal;
The system does not need to be drained to replace the outer O-ring.
Range of control: 90°
Characteristic: Roughly equal percentage; achieved due to special formed rotary valve

Max. permissible differential pressure

Nominal size DN	15	20	25	32	40	50	65	80	100	125	150	200
Δp (kPa)*	100	100	100	100	100	100	100	100	80	50	30	20
Actuator	VMM10/ VRM10N**				VMM20/ VRM20N***			VMM30/ VRM30N				VMM40/ VRM40N

* 100 kPa = 1 bar
**only for DR and ZRK
*** ZRK up to DN40

Matching Resideo rotary actuators

VMM

VRM-N

Nominal size DN	Item number	Supply voltage	Running time min	Control signal
15–32*	VMM10*	230 V AC	1.6	3-point
	VMM10-24*	24 V AC	1.6	3-point
	VRM10N*	24 V AC/DC	2	0-10V, 3-point or 2-point
15–65	VMM20	230 V AC	1.6	3-point
	VMM20-24	24 V AC	1.6	3-point
	VRM20N	24 V AC/DC	2	0-10V, 3-point or 2-point
80–150	VMM30	230 V AC	2.3	3-point
	VMM30-24	24 V AC	2.3	3-point
	VRM30N	24 V AC/DC	2	0-10V, 3-point or 2-point
200	VMM40	230 V AC	3.5	3-point
	VMM40-24	24 V AC	3.5	3-point
	VRM40N	24 V AC/DC	2	0-10V, 3-point or 2-point

*only for DR DN15-32 and ZRK DN20-40

Butterfly valve

Used to separate individual boilers from the water side in the case of boilers connected in series or similar applications. Butterfly valves should not be used as an actuator for a continuous control system. Suitable for heating water with antifreeze and corrosion protection water mixture (max. 50%) according to VDI 2035.

Butterfly valve V6001

V6001

Nominal size DN	Kvs value	Max. diff pressure bar	Torque for max. dP Nm	Medium temp. °C	Part no.	Actuator compatibility	Manual handle	Gearbox
25	14.2	16	3.4	−10 ... 130	V60010025		X	
32	22.5	16	5.7	−10 ... 130	V60010032		X	
40	79	16	9.2	−10 ... 130	V60010040	X	X	
50	99	16	13	−10 ... 130	V60010050	X	X	
65	108	16	21	−10 ... 130	V60010065	X	X	
80	261	16	28	−10 ... 130	V60010080	X	X	
100	518	16	44	−10 ... 130	V60010100	X*	X	
125	883	16	68	−10 ... 130	V60010125			X
125	883	16	68	−10 ... 130	V60011125		X	
150	1364	16	99	−10 ... 130	V60010150			X
150	1364	16	99	−10 ... 130	V60011150		X	
200	2716	16	162	−10 ... 130	V60010200			X
200	2716	16	162	−10 ... 130	V60011200		X	
250	4611	16	257	−10 ... 130	V60010250			X
250	4611	16	257	−10 ... 130	V60011250		X	
300	7124	16	367	−10 ... 130	V60010300			X
450	14152	16	850	−10 ... 130	V60010450			X

* for dP max 10 bar

Technical data

Valve type: Motor-actuated shut-off valve. Available also with manual handle (DN125-DN250)
Medium: Heating water with a glycol mix ratio of up to 50% according to VDI 2035
Material: Housing from ductile iron with fusion boned epoxy paint
Stat. pressure: PN 16
Pipe connection: According norms EN 1092, ISO 7005
Rotation angle: 90°

Matching Resideo rotary actuators for V6001

VMM

VRM-N

Nominal size DN	Item number	Supply voltage	Running time min	Control signal
40–100	VMM40	230 V AC	3.5	3-point
	VMM40-24	24 V AC	3.5	3-point
	VRM40N	24 V AC/DC	2	0–10 V, 3-point or 2-point

Overview of control valve programme

Resideo control valves and pressure-independent control valves (PICVs) are suitable for many hydraulic applications relevant to district heating systems and HVAC systems.

All valves can be combined with drives for three-point control and a 230 V or 24 V supply, or modulating 0 to 10 V control with a 24 V supply. The most suitable combination of valve and actuator is shown in the table 'Valves with matching actuator.'

Resideo 2-way valves

VDE

- PN 16
- Dezincification resistant brass
- Nominal size: DN 15 to DN 25
- Kvs values: 0.16 m³/h to 8 m³/h
- Medium temperature: 2 °C to 120 °C
- Also suitable for systems with oxygen-rich water

VDE...M

- PN 16
- Dezincification resistant brass
- Nominal size: DN 25 to DN 40
- Kvs values: 4 m³/h to 25 m³/h
- Medium temperature: 2 °C to 130 °C
- Also suitable for systems with oxygen-rich water

VDE...C

- PN 25
- Red brass
- Nominal size: DN 15 to DN 32
- Kvs values: 0.25 m³/h to 10 m³/h
- Medium temperature: 2 °C to 130 °C
- Also suitable for systems with oxygen-rich water

DE / DI

- PN 16
- Dezincification resistant brass
- Nominal size: DN 15 to DN 50
- Kvs values: 0.63 m³/h to 40 m³/h
- Medium temperature: 2 °C to 170 °C
- Also suitable for systems with oxygen-rich water

V5007

- PICV valve
- PN 25
- Dezincification resistant brass
- Nominal size: DN 15 to DN50
- Kvs values: 1.03m³/h to 30.98m³/h
- Medium temperature: −10 to 120 °C

DF...B...CI

- PN 16
- Cast iron
- Nominal size: DN 15 to DN 150
- Kvs values: 0.4 m³/h to 360 m³/h
- Medium temperature: 2 °C to 170 °C
- Valve for standard HVAC systems

DF...B...NI

- PN 16
- Nodular iron
- Pressure balanced
- Nominal size: DN 15 to DN 150
- Kvs values: 0,4 m³/h to 360 m³/h
- Medium temperature: 2 °C to 180 °C
- For district heating systems and for systems with high differential pressures

DF...C

- PN 25
- Spheroidal graphite
- Pressure balanced
- Nominal size: DN 15 to DN 150
- Kvs values: 0.4 m³/h to 360 m³/h
- Medium temperature: 2 °C to 200 °C
- For district heating systems and for systems with high differential pressures

DF...D

- PN 40
- Cast steel
- Nominal size: DN 15 to DN 100
- Kvs values: 0.25 m³/h to 160 m³/h
- Medium temperature: 2 °C to 220 °C
- For district heating systems

Resideo 3-way valves

VXE / VYE

- PN 16
- Dezincification resistant brass
- Nominal size: DN 15 to DN 25
- Kvs values: 0.16 m³/h to 8 m³/h
- Medium temperature: 2 °C to 120 °C
- Also suitable for systems with oxygen-rich water

VXE...M

- PN 16
- Dezincification resistant brass
- Nominal size: DN 25 to DN 40
- Kvs values: 4 m³/h to 25 m³/h
- Medium temperature: 2 °C to 130 °C
- Also suitable for systems with oxygen-rich water

XE / XI

- PN 16
- Dezincification resistant brass
- Nominal size: DN 15 to DN 50
- Kvs values: 2.5 m³/h to 40 m³/h
- Medium temperature: 2 °C to 170 °C
- Also suitable for systems with oxygen-rich water

XF...A

- PN 6
- Cast iron
- Nominal size: DN 15 to DN 150
- Kvs values: 2.5 m³/h to 310 m³/h
- Medium temperature: 2 °C to 120 °C
- Mixing valve for standard HVAC systems

XF...B

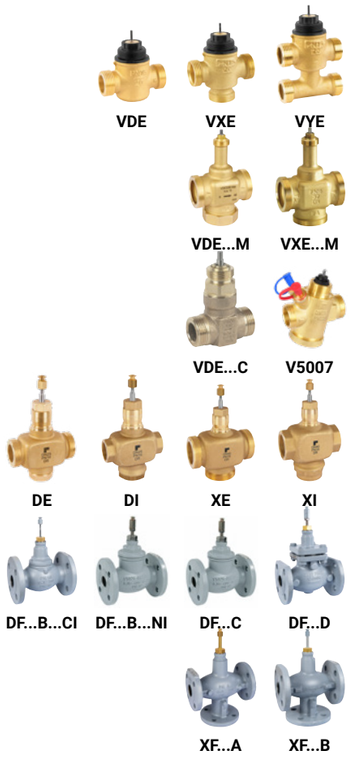
- PN 16
- Cast iron
- Nominal size: DN 15 to DN 150
- Kvs values: 2.5 m³/h to 360 m³/h
- Medium temperature: 2 °C to 170 °C
- Mixing valve for standard HVAC systems

Valves with matching actuators

Linear actuators

Actuators			Thermo electric	Motorized								
Electrical data												
Power supply	Input signal											
24 V	DC 0–10 V	modulating			MSLM...		MSLM...		ML7430E.../ ML7435E...	ML7420A... / ML7425A, B...	ML7421A...	ML7421B...
		3-point			MSLF...		MSLF...					
		on/off	MT4/MT8	M5410C...								
230 V AC	DC 0–10 V	modulating										
		3-point				MSHF...		MSHF...	ML6435B...	ML6420A... / ML6425A,B...	ML6421A3013	ML6421B3012
		on/off	MT4 /MT8	M5410L...								
Stroke (mm)			4/8	6.5	6.5	6.5	6.5	6.5	6.5	20	20	38
Adjusting force (N)			90	100	180	180	300	300	400	600	1800	1800

Resideo linear valves



Valves	Type	PN	Fitting type	Kvs	Nominal sizes (DN)								
VDE	2-way	16	External thread	0.16 to 8	15 / 25	15 / 25	15 / 25	15 / 25					
VXE	3-way	16	External thread	0.25 to 4.8	15 / 25	15 / 25	15 / 25	15 / 25					
VYE	3-way + bypass	16	External thread	0.4 to 8	15 / 25	15 / 25	15 / 25	15 / 25					
VDE...M	2-way	16	External thread	4 to 25					25 to 40	25 to 40	25 to 40		
VXE...M	3-way	16	External thread	4 to 25					25 to 32	25 to 32	25 to 40		
VDE...C	2-way	25	External thread	0.25 to 10					25 to 32	25 to 32	25 to 32		
V5007	PICV	25	Internal + external thread	1.03 to 30.98	15 / 25	15 / 25	15 / 40	15 / 40	50	50			
DE	2-way	16	External thread	0.63 to 40								15 to 50	25 to 50
DI	2-way	16	Internal thread	0.63 to 40								15 to 50	25 to 50
XE	3-way	16	External thread	0.2 to 40								15 to 50	25 to 50
XI	3-way	16	Internal thread	0.2 to 40								15 to 50	25 to 50
DF...B...CI	2-way	16	Flange	0.25 to 360								15 to 50	15 to 80	100 to 150
DF...B...NI	2-way	16	Flange	0.4 to 360								15 to 80		100 to 150
DF...C	2-way	25	Flange	0.4 to 360								15 to 80		100 to 125
DF...D	2-way	40	Flange	2.5 to 160								15 to 25	32 to 65	80 to 100
XF...A	3-way	6	Flange	2.5 to 310								15 to 40	32 to 80	100 to 150
XF...B	3-way	16	Flange	2.5 to 360								15 to 40	32 to 80	100 to 150

Ademco 1 GmbH
Hardhofweg 40
74821 Mosbach
GERMANY

For more information
resideo.com

EN3H-0379GE23R0725