Valves and Actuators

EMEA-APAC Catalog 2026

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Pressure Independent Balancing Control Valves and Actuators

Pressure Independent Balancing Control Valves provide the optimum control of fluid flow, unaffected by changes in system pressure. With inherent hydronic system balancing characteristics, PIBCV products provide the ultimate solution for the most energy efficient room temperature control.

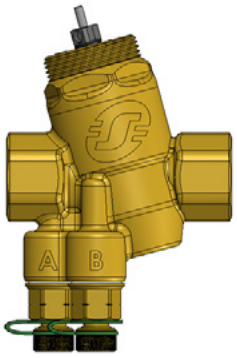
Additional benefits of PIBCV include reducing the time taken for system balancing and commissioning.

VP225, VP226, VP227

The **EasyLogic** VP225, VP226, and VP227 are internally threaded pressure independent control valves (PIBCV). It is a range of automatic balancing control valves that provide energy-efficient hydronic control in wet HVAC systems.

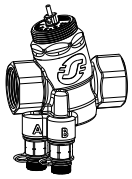
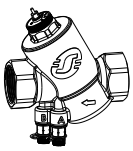
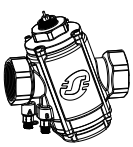
Features

- Enhanced Energy Efficiency
  - Pressure independence prevents water/glycol overflow through the valve, maintaining optimal flow for the coil design. This ensures a high Delta T in the return loop, promoting the most efficient operation of all plant equipment.
- Improved Comfort
  - The PIBCV valves are not influenced by upstream changes in system pressure, and are able to control very low flows without hunting, as such they can provide a more constant and comfortable room temperature.
- Reduced Pumping Costs
  - A reduction in overflows through the network reduces pumping costs. A smaller pump head and equipment is required compared to non-pressure dependent systems.
- Reduced Installation Costs
  - Only one valve needs to be installed rather than two or three since the PIBCV incorporates pressure balancing, flow limitation and control modulation.



Product	Without T/P Plugs	With T/P Plugs	Suitable Actuator
DN15 (½")	VP225R15BQSNT	VP225R15BQS	MP121E24M MP150E24MP
DN20 (¾")	VP225R20BQSNT	VP225R20BQS	
DN20 (¾")	VP225R20BQHNT		
DN25 (1")		VP225R25BQS	
DN40 (1 ½")		VP227R40BQS	MP525E24MP MP525EER24MP
DN50 (2")		VP227R50BQS	

Product Selection: Threaded and Flanged Valves

Valve	Size	Differential pressure (ΔP) range (kPa)	Q min 1.0 setting (l/s)	Q max 5.0 setting (l/s)	Q min 1.0 setting (l/h)	Q max 5.0 setting (l/h)	Connection	Commercial Reference (Part No.)		Compatible Actuator
							Internal Thread (ISO 228/1)	Without T/P Plugs	With T/P Plugs	
 VP225	DN15	14-600	0.010	0.132	35	525	Rp 1/2	VP225R15BQSNT	VP225R15BQS	MP121E24M MP150E24MP
	DN20	20-600	0.031	0.306	110	995	Rp 3/4	VP225R20BQSNT	VP225R20BQS	
 VP225 (plugs)	DN20	42-600	0.043	0.528	155	1685	Rp 3/4	VP225R20BQHNT		
	DN25	42-600	0.043	0.528	155	1685	Rp 1		VP225R25BQS	
 VP226R	DN32	45-600	0.25	1.278	890	4300	Rp 1-1/4		VP226R32BQS	
 VP227R	DN40	28-600	0.51	3.54	2000	13600	Rp 1-1/2		VP227R40CQS	MP525E24MP MP525EER24MP
	DN50	28-600	0.56	3.78	2000	13600	Rp 2		VP227R50CQS	

VP228E, VP229E, VP220E

The **SpaceLogic** VP228E, VP229E, and VP220E are threaded pressure independent balance and control valves for use in heating and cooling circuits.

- Stable hydronic flow, independent of any change in system pressure
- Without an actuator, the valve can be operated on an automatic balancing valve for flow limiting applications
- Simple to calculate and adjust to the needed flow setting.

DN10-32

DN40-50

Specifications

Pressure class	PN16
Function	Normally open/Stem up
End connection	External Thread, ISO228/1
Media temperature	-10 to 120°C
Leakage (ISO 5208)	
DN10 to DN32	Tight - no visible leakage
DN40 to DN50	Max. 0.05% of Q_{nom}
Stroke	
VP228E	2.25 mm
VP229E (DN15 to DN20)	4.0 mm
VP229E (DN25 to DN32)	4.5 mm
VP220E	10 mm

Materials

	DN10 to 32	DN40 to 50
Valve body	DZR brass	GG 25
Control valve, cone	Brass CW 614N	Brass CW 614N
Seat	DZR brass	SS 1.4305
Seals	EPDM	EPDM

Size	Part Number	Differential Pressure (P1 to P3)			P2 Test Point (Valve Balance Port)	P3 Test Point (Valve Outlet)	ΔPcv Differential Pressure over Control Valve (P2 to P3)	Qmin Flow Rate (l/s)	Qnom Flow Rate (100%) (l/s)	Qmax Flow Rate (l/s)
		Min. ΔP at Qnom (kPa)	Min. ΔP at Qmax (kPa)	Max. (kPa)*						
DN10	VP228E-10BQLNTA	16	18	600				0.01	0.04	0.05
DN10	VP228E-10BQSNTA	16	18					0.02	0.08	0.09
DN15	VP228E-15BQLNTA	16	18					0.02	0.08	0.09
DN15	VP228E-15BQSNTA	16	18					0.03	0.13	0.15
DN15	VP229E-15BQHNTA	35	40					0.06	0.32	0.35
DN20	VP228E-20BQSNTA	16	18					0.05	0.25	0.30
DN20	VP229E-20BQHNTA	35	40					0.09	0.47	0.52
DN25	VP229E-25BQSNTA	20	25					0.09	0.47	0.52
DN25	VP229E-25BQHNTA	35	40					0.15	0.76	0.83
DN32	VP229E-32BQSNTA	20	25					0.18	0.89	0.98
DN32	VP229E-32BQHNTA	35	40					0.22	1.10	1.21
DN10	VP228E-10BQLA	16	18		Red	Blue	P2-P3	0.01	0.04	0.05
DN10	VP228E-10BQSA	16	18					0.02	0.08	0.09
DN15	VP228E-15BQLA	16	18					0.02	0.08	0.09
DN15	VP228E-15BQSA	16	18					0.03	0.13	0.15
DN20	VP228E-20BQSA	16	18					0.05	0.25	0.30
DN25	VP229E-25BQSA	20	25					0.09	0.47	0.52
DN32	VP229E-32BQSA	20	25					0.18	0.89	0.98

* 400 kPa is recommended for normal duty. Operation between 400 and 600 kPa is possible if consideration has been made to the flow velocity, cavitation and noise. For application usage, please consult product support.
Note: Valves ending with Part Numbers 'NT' have no test points for differential pressure measurement

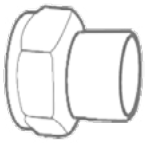
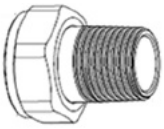
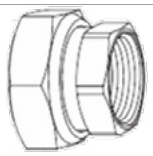
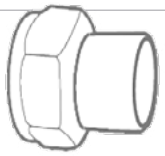
Note: A Higher flow (Q max) is achievable on some sizes by increasing the pressure drop through the valve; please refer to specific technical data sheets.
ΔP : Differential Pressure Operating range. The differential pressure across the valve must be within the range specified for predictable, stable and fully adjustable flow to the limits detailed within.

Pipe Connections

The VP228E, VP229E and VP220E have externally threaded end connections for the attachment of various types of pipe connections.

Pipe connections are supplied in pairs and are typically a two piece and a gasket separable design allowing the valve to be removed with minimal disruption to the pipework. On some sizes a one piece and a gasket inseparable design is necessary and additional couplings may be required for practical disassembly.

Two end connection sets per pack. Order one pack per valve.

Valve DN	Pipe connection type	Part number	Valve connection	End fitting connection
DN10	 Solder	9112113010	G1/2	15 mm*
DN15		9112113015	G3/4	15 mm*
DN20		9112113115		22 mm *
DN25		9112113020	G1	15 mm
DN32		9112113120		22 mm
DN40		9112113025	G1 1/4	28 mm
DN50		9112113032	G1 1/2	35 mm
DN10	 R taper External thread	9112113040	G2	42 mm
DN15		9112113050	G2 1/2	54 mm
DN20		9112112010	G1/2	R 3/8
DN25		9112112015	G3/4	R 1/2
DN32		9112112020	G1	R 3/4
DN40		9112112025	G1 1/4	R 1
DN50		9112112032	G1 1/2	R 1. 1/4
DN10	 Internal thread	9112112040	G2	R 1.1/2
DN15		9112112050	G2 1/2	R 2
DN20		9112111010	G1/2	Rp 1/2*
DN25		9112111015	G3/4	Rp 1/2*
DN32		9112111020	G1	Rp 1/2*
DN40		9112111025	G1 1/4	Rp 3/4
DN50		9112111032	G1 1/2	Rp 1
DN10	 Weld	9112111040	G2	Rp 1.1/4
DN15		9112111050	G2 1/2	Rp 1.1/2
DN20		9112115020	G1	26.9 mm
DN25		9112115025	G1 1/4	33.7 mm
DN32		9112115032	G1 1/2	42.4 mm
DN40		9112115040	G2	48.3 mm
DN50		9112115050	G2 1/2	60.3 mm

* One-piece compact design (inseparable); additional coupler may be needed to ease assembly/disassembly.

VP220F, VP221F, VP222F

The **SpaceLogic** VP220F, VP221F, and VP222F are flanged pressure independent balance and control valves for large flows in heating and cooling circuits.

- Stable Hydronic flow is independent of any change in system pressure
- Without an actuator, the valve can be operated as an automatic balancing valve for flow limiting applications.

Specifications

Pressure class	PN16
Function	Stem up valve open
End connection	Flanged PN16, ISO7005-2
Media temperature	-20 to 120°C
Leakage (ISO 5208)	
DN50 to DN100	0.05 % of Q_{nom}
DN125 to DN250	0.01 % of Q_{nom}

Materials

	DN50 to 100	DN125	DN150 to 250
Valve body	GG25	GG 25	GG 25
Seals		EPDM	
Membranes	EPDM	1.4571	EPDM
Cone	CW 614N	1 (W.Nr.1.4404NC)	1.4021
Seat	1.4305	1.4305	1.4027
Springs	1.4568/1.4310	1.4401	1.4310
Gaskets	NBR	Graphite	Non-asbestos

DN	Litres/hour		Litres/second		Cubic meters/hour		$\Delta P (Q_{nom})$ (kPa)	Part number	Suitable actuator
	Q_{min}	Q_{nom} (100%)	Q_{min}	Q_{nom} (100%)	Qmin	Q_{nom} (100%)			
DN50	5,000	12,500	1.4	0.04	5.0	12.5	30-600	VP220F-50CQS	MP500C MP500C-SR
DN65	8,000	20,000	2.2		8.0	20.0	30-600	VP220F-65CQS	
	10,000	25,000	2.8	0.13	10.0	25.0	60-600	VP220F-65CQH	
DN80	11,200	28,000	3.1	0.25	11.2	28.0	30-600	VP220F-80CQS	
	16,000	40,000	4.4	0.47	16.0	40.0	60-600	VP220F-80CQH	
DN100	15,200	38,000	4.2	0.47	15.2	38.0	30-600	VP220F-100CQS	
	23,600	59,000	6.6	0.76	23.6	59.0	60-600	VP220F-100CQH	
DN125	36,000	90,000	10.0	0.89	36.0	90.0	60-600	VP221F-125CQS	MP2000 MP2000-SR
	44,000	110,000	12	1.1	44	110	60-600	VP221F-125CQH	
DN150	58,000	145,000	16	2.08	58	145	40-600	VP221F-150CQS	
	76,000	190,000	21		76	190	60-600	VP221F-150CQH	
DN200	76,000	200,000	21	3.47	76	200	40-600	VP222F-200CQS	MP4000
	100,000	270,000	28		100	270	60-600	VP222F-200CQH	
DN250	112,000	300,000	31		112	300	40-600	VP222F-250CQS	
	148,000	370,000	41		148	370	60-600	VP222F-250CQH	

MP121

Product Description

The **EasyLogic** MP121 is a high-accuracy modulating non-spring return actuator for proportional control is designed specifically for the VP225R and VP226R Pressure Independent Balancing and Control Valves (PIBCV), suitable for sizes DN15 to 32. This actuator modulates flow through the valve to prevent overflow and enhance the efficiency of boilers and chillers.

The MP121, in combination with the valve, effectively manages the water supply in applications like fan coil units, chilled beams, induction units, small re-heaters, re-coolers, air handling units, and other terminal units for zone control, where heated or chilled water is the controlled medium. Its precision and LED indicators streamline the commissioning process, simplify maintenance, improve indoor comfort, and boost energy savings. Control is achieved through a voltage or current input signal sent to the actuator.

General Features

- Compact design
- IP54-rated
- Modulating control with low hysteresis
- Automatic switch-off upon valve closure prevents overload of actuator and valve
- No tools required for mounting
- Maintenance-free lifetime
- Low-noise operation
- Self-stroke calibration process
- LED status indicator

Part Number	Valve Type	Valve Size	Cable Length
MP121E24M	VP225R, VP226R	DN15 to 32	1.5 m (4.9 ft)

Specifications	
Power supply	24 Vac/24 Vdc, +/- 10%
Frequency	50/60 Hz
Power consumption **running** **standby**	 3.6 VA / 1.2 W 0.5 W
Control signal input	0 to 10 Vdc1
Close off force	120 N (minimum)
Stroke	Maximum 6 mm (0.24 in)
Speed	0.1 mm/s
Relative humidity	max. 95 %
Max. medium temperature	120 °C (248 °F)
Ambient temperature	0 to 50 °C (32 to 122 °F)
Storage and transport temp.	–20 to 60 °C (-4 to 140 °F)
Protection class	III safety extra-low voltage
IP rating	IP54
Housing material	PC + ABS
Weight	190 g (0.42 lb)
Cable	3 x 0.5 mm2 (20 AWG)
Noise level	Max. 40 dB(A) (under normal operation)
EMC Directives	2014/30/EU
LVD Directives	2014/35/EU EN 60730-1 & EN 60730-2-14
RoHS Directives	2011/65/EU
REACH & CE Directives	1907/2006

1. 0 Vdc will command a closed valve.

MP125

Product Description

The **EasyLogic** MP125 is a proportional thermoelectric valve actuator for continuous control of heating and cooling systems.
The actuator's position is directed by a 0-10 Vdc signal from the controller or thermostat.
The MP125 has valve stroke calibration, allowing it to be used on:

- VP228E and VP229E PIBCV Valves
- VZ22, VZ32, VZ42 Zone Valves
- TRV-4 Radiator Valves from Drayton

The MP125 is silent in operation allowing for use in quiet applications, such as hotel guest rooms.

Features

- Modern sleek design suitable for living spaces
- 1.0 to 6.5 mm (0.04 to 0.3 in) adjustable stroke length
- Normally Closed (NC) and Normally Open (NO) variants
- Only 1.2 watts of power input
- Control by a 0 – 10 Vdc signal
- Automatic stroke calibration on the first power up
- Short response times, for improved control response
- 360° installation position
- IP 54 protection in case of leaky valves
- Plug-in connecting cable
- Compact size, small dimensions
- Visible stroke position indicator
- Noiseless and maintenance-free
- High functional safety and long expected service life
- 24 Vdc Normally Closed (NC) variant

Specifications

Operating voltage, AC	24 Vac, -10% to +20 %, 50-60 Hz
Operating voltage, DC[1]	24 Vdc +/- 15%
Control voltage range (according to model)	0 to 10 V (reverse polarity protected)
Max. inrush current	< 320 mA for max. 2 min.
Operating power	1.2 W
Resistance of control voltage input	100 kΩ
Max. stroke	6.5 mm (0.3 in)
Calibrated stroke range	1.0 to 6.5 mm (0.04 to 0.3 in)
Actuating force	125 N
Fluid temperature	0 to 100°C (32 to 212°F)
Storage temperature	-25 to 60°C (-13 to 140°F)
Ambient temperature	0 to 60°C (32 to 140°F)
Degree of protection	IP 54[2]
Protection class	III
Electrical conformity	EN/UL 60730
Casing	Material: Polyamide
	Color: White
Connection	Type: 3 x 0.22 mm² PVC
	Color: White
	Length: 1 m
Weight	With connection cable (1 m): 111 g

1. Any switch power supply must be in accordance with EN 61558-2-16 with a maximum output power of 100 VA.

2. In all installation positions with cable fully inserted.

Available models

Product Number	Operating Voltage	Control Voltage	Closing Force	Control Direction	Average Actuation Delay
MP125NC24M[a]	24 Vac	0-10 V	125 N	NC	30 s/mm
MP125NO24M[a]	24 Vac	0-10 V	125 N	NO	30 s/mm
MP125NC24DCM[a]	24 Vdc	0-10 V	125 N	NC	30 s/mm

a. Includes adapter for the VP228E/VP229E/TRV-4 valves, 1 m cable, and installation instructions.

Accessories

Product Number	Description
MP125ADZ80	Adaptor for VZ22, VZ32, VZ42 – 20 pcs
MPCAB10M	10 m cable – 5 pcs

MP130 Actuators

The MP130 is a family of compact and low power motoric actuators that drive the DN10 to 32 **SpaceLogic** PIBCV in various hydronic HVAC applications.

The modulating actuators have fine positional control and are self calibrating to the adjustable stroke/ flow setting in the VP228E and VP229E valves which provide optimal hydronic control.

- Low noise operation
- Overload protection
- Manual override in all models.

Specifications	
Close off force	130 N
Stroke	5 mm
Max medium temperature	120°C
Media temperature	-20 to 120°C
Environment Operating temperature Storage/transportation	 0 to 55°C –40 to 70°C
Sound power level	Max 35 dB(A)
Relative humidity	max. 95 %
Enclosure rating	IP 42
Weight	0.3 kg

Part number	Control signal (Y)	Speed (s/mm)	Position feedback (U)	Cable length (m)	Voltage (50/60 Hz)	Power consumption running (standby)
MP130-24M	0 (2) to 10Vdc	24	-	1.5	24 Vac	2 VA (.5 w)
MP130-24M-10M				10		
MP130-24MP			0 (2) to 10Vdc	1.5		1.5 VA (.4 W)
MP130-24T	Two-position	12	-	1.5		1 VA
MP130-230T					230 Vac	8 VA
MP130-24F	Floating	24			24 Vac	1 VA (0W)
MP130-230F				1.5	230 Vac	8 VA (0W)

Note: Actuators with 5m and 10m cable length are produced on request. Please note this increases lead time.

MP120/MP140

MP120NC and MP140NO are small thermo-electric valve actuators for time ontrolled two-point and pulse-width-modulated (PWM) regulation of the DN10–32 SpaceLogic PIBCV valves. The MP120 has a manual override operation for easy flushing. The MP140 is designed to provide two position on/off control with short stroke pressure independent control valves. It is silent in operation and ideal for noise sensitive applicators like hotel guest rooms or quiet offices. The MP140 provides an automatic flow limiting and balancing function.

- Water-protected housing design in all mounting positions
- Pluggable cable for easy installation and servicing (MP120)
- Low power consumption – allowing many actuators to be driven from the same controller
- Visual position indication
- Silent operation.

MP120 NC

MP140 NO

Specifications	
Power supply	
24 V Models	
MP120NC-24T, MP140NO-24T	24 Vac/Vdc ± 20%, 50/60 Hz
230 V Models	
MP120NC-230T	230 Vac + 10% to -15%
Power consumption	2 W
Environment	
Operating temperature	Max. 50°C
Enclosure rating	IP44 (MP120) IP44 (MP140NC) IP44/IP41 (MP140NO)
Cable length (standard)	1.5 m
Cable size	2 x 0.5 mm^2
Medium temperature	Max. 120°C
Nominal Force	
MP120	120N
MP140	140N
Stroke range	
MP120NC	8 mm
MP140NO	4 mm

Part number	Valve size	Voltage	Operational Flow Range	
			VP228E	VP229E
MP120NC-24T	Normally closed (Stem down)	24 Vac/Vdc	20 to 120%	20 to 110%
MP120NC-230T		230 Vac		
MP140NO-24T	Normally open (Stem up)	24 Vac/Vdc	20 to 100%	DN15 to 20: 20 to 65% DN25 to 32: 20 to 50%

MP150E

Product Description

The VP225R is a high-accuracy multi-signal (universal control signal) (0(2)-10 V or 0(4)-20 mA modulating, 3-point floating, and 2-position) non-spring return actuator designed specifically for the VP225R and VP226R Pressure Independent Balancing and Control Valves (PIBCV), suitable for sizes DN15 to DN32. This actuator modulates flow through the valve to prevent overflow and enhance the efficiency of boilers and chillers.

The VP225R, in combination with the valve, effectively manages the water supply in applications like fan coil units, chilled beams, induction units, small re-heaters, re-coolers, air handling units, and other terminal units for zone control, where heated or chilled water is the controlled medium. Its precision and LED indicators streamline the commissioning process, simplify maintenance, improve indoor comfort, and boost energy savings. Control is achieved through a voltage or current input signal sent to the actuator.

General Features

- LED status indication
- Easy configuration with the set button
- IP54-rated
- Multi-signal (universal control signal)
- No tools required for mounting
- Maintenance-free lifetime
- Low-noise operation (Max. 35 dB(A))
- Self-calibration process
- Manual override

Specifications	
Power supply	24 Vac/dc
Frequency	50/60 Hz
Power consumption **running** **standby**	 3.6 VA / 1.2 W 0.5 W
Control input Y	0 (2) ~10 V, 0 (4) ~ 20 mA (Input Impedance = 500 Ω), 3-point floating or two position
Feedback signal	0 (2) ~10 V
Close off force	120 N (minimum)
Max stroke	7 mm (0.3 in)
Speed	0.18 mm/s
Relative humidity	max. 95 % (no condensation)
Max. medium temperature	120 °C (248 °F)
Ambient temperature	0 to 50 °C (32 to 122 °F)
Storage and transport temperature	–30 to 60 °C (–22 to 140 °F)
Protection class	III safety extra-low voltage
IP rating	IP54
Cover material	PC + ABS
Housing material	PC + GF10
Weight	0.25 kg (0.55 lb)
Cable	4 x 0.205 mm² (24 AWG)
Sound power level	Max. 35 dB(A)
EMC Directives	2014/30/EU
LVD Directives	2014/35/EU EN 60730-1 & EN 60730-2-14
RoHS Directives	2011/65/EU
REACH & CE Directives	1907/2006

Part Number	Valve Type	Valve Size	Cable Length
MP150E24MP	VP225R, VP226R	DN15 to 32	1.5 m (4.9 ft)

MP300-SR

MP300-SR actuators with Floating and Proportional control are low voltage motoric actuators for the Smart X PIBCV DN10-32 Valves. These actuators have a spring return safety function that provides for an open or close valve in the event of power loss.

The Spring return safety function should not be used for two-position control. The MP300-SR actuator is not suitable for use in very quiet applications like hotel guest rooms.

Specifications	
Power supply Frequency	24 V; +10 to –15 %; AC 50/60 Hz
Power consumption	9 VA
Control input Y	0 to 10 (2 to 10) V 0 to 20 (4 to 20) mA
Output signal U	0 to 10 (2 to 10) V
Speed	11.75 (50 hz) s/mm
Max. medium temperature	120°C
Nominal Force	300 N
Environment Operating temperature	 0 to 55°C
Sound power level	40 dB(A)
Enclosure rating	IP 54
Weight	0.8 kg

Part number	Spring return direction	Linkage type (included with actuator)
MP300-SRU	Up - normally open	Adapter
MP300-SRD	Down - normally closed	Spacer

SP90

Schneider Electric **SpaceLogic** SP90A PIBCV Actuators are high accuracy multi-function field bus actuators, specifically designed for use in combination with SpaceLogic PIBCV in sizes from DN 10…32 (3/8"…1¼") (not available in all regions). The SpaceLogic SP90A Actuator will control hot or chilled water for numerous HVAC equipment.

The high positional accuracy of the actuator, together with the accurate linear flow characteristic of the pressure independent SpaceLogic PIBCV valve, allow the SP90A Actuator to be used as a flow indicator. When the SP90A Actuator is connected to temperature sensors across a coil, the heat consumption will also be calculated.

Due to its fine accuracy, high functionality and field bus connectivity, this intelligent device combined with Schneider Electric EcoStruXure platform provides powerful engineering efficiency in the install and commissioning process.

Features

- Remote commissioning/Pre-set/Flush features
- Flow indication
- LED status
- Auto MAC addressing for and intrinsic alarm reporting for BACnet
- Auto baud rate detection
- Valve blockage alarm
- Broken wire detection on analog control and ground signal
- Mis-wiring protection on any wire up to 30 V
- BACnet MS/TP and Modbus RTU in the same product

Part number	Description
SP90-24BMM	Fieldbus PIBCV Actuator

Specifications

Power supply range	24 V ac/dc, ± 25%, 50/60 Hz
Power consumption	Running: 3.9 VA Standby: 0.9 W
Protection class	III safety extra-low voltage
Electrical connection	Pre-molded plug connector
Control signals	BACnet MS/TP, Modbus 0 to 10Vdc, 4 to 20 mA
Actuator speed selections (sec/mm)	3, 6, 12, 24, Constant Time
Stroke	7 mm
Force	90 N
Positional accuracy	± 0.05 mm
Accuracy, calculated energy usage	+/- 10%
Working ambient temp.	−10° C to 50°C
Max. medium temp.	120°C
Storage temp. range	–40 to 70°C
Sound power level	Max. 30 dB(A)
Enclosure rating	IP54 (IP40 upside-down)
Weight	0.4 kg (0.88 lb)

Cable accessories

Type	Length (m)	Connections	Part number
Digital	1.5	bus/power	9114401500
	10.0	bus/power	9114410000
Daisy chain	0.5	actuator/actuator	9114500500
	1.5		9114501500
	5.0		9114505000
	10.0		9114510000
Analogue + I/O	1.5	Actuator/free wires	9114601500
Energy		PT1000 surface mount temp sensors	9114701500
		PT1000 Immersed temp sensors	9114801500

Note: Cables are not included with actuators and must be ordered separately

Accessory Pockets/Wells for Insertion Probe Sensors

Description	Brass Part no.	Stainless steel part no.
Immersion pocket, 50 mm, G1/2	9121040000	9121050000
Immersion pocket, 100 mm, G1/2	9121041000	9121051000
Immersion pocket, 150 mm, G1/2	9121042000	9121052000
Immersion pocket, 200 mm, G1/2	9121043000	9121053000

Note: 2 x Immersion Pockets/Wells required per device

Modbus RTU Data

Supported baud rates	Auto baud rate detection/9600 bps/19200 bps/38400 bps/56700 bps/76800 bps/115200bps
Supported transmission modes	Parity: None (1-8-N-2)/Odd (1-8-O-1)/Even (1-8-E-1)/ None (1-8-N-1) Data format: Parity (Start bit - Data bits - Parity - Stop bits)

BACnet data

BACnet device profile	DZR M
BACnet protocol	BACnet Master Slave/Token Passing (MS/TP)
BACnet baud rates supported	Auto baud rate detection/9600 bps/19200 bps/38400 bps/56700 bps/76800 bps/115200bps

MP130S

Product Description

The MP130S is a high-accuracy modulating non-spring return actuator designed specifically for the VP228E and VP229E PIBCV (Pressure Independent Balancing and Control Valves), suitable for sizes DN10 to DN32. This actuator modulates flow through the valve to prevent overflow and enhance the efficiency of boilers and chillers.

The MP130S actuator, in combination with the valve, effectively manages the water supply to fan coil units, chilled beams, induction units, small re-heaters, re-coolers, air handling units, and other terminal units for zone control, where hot or cold water is the controlled medium. Its accuracy and LED indicators streamline the commissioning process, simplify maintenance, improve indoor comfort, and boost energy savings. Control is achieved through a voltage or current input signal sent to the actuator.

General Features

- High position resolution and accuracy
- Power supply AC or DC
- Equal percentage to linear flow characteristic changes with dip switch (default is set to equal percentage flow)
- LED bar displaying information on position, status and alarms
- Automatic calibration process with valve stroke detection
- No tools required for mounting
- Maintenance-free lifetime
- Broken wire and missing control signal detection, when using 2-10V/4-20mA mode
- Low-noise operation at 12 s/mm
- Harmonized halogen free cables
- IP54 in all orientations
- Selectable speed 12 and 3 s/mm (for fast acting applications)
- LED warnings indicating possible issues for on-field problem solving
- QR code as a web page link containing all product documentation
- Mis-wiring protection on any wire up to 30 V
- Dip switch selectable anti-blocking/sticking function (default is set to off)
- Manual override feature available

Specifications

Power supply	24 Vac/dc
Frequency	50/60 Hz
Power consumption **running** **standby**	 1.2 W (DC) / 2.9 VA (AC) @ 12 s/mm 1.4 W (DC) / 3.4 VA (AC) @ 3 s/mm 0.4 W (DC) / 1.1 VA (AC) @ 12 and 3 s/mm
Control signal input **Voltage** **Current**	 0(2)-10 V Ri = 110 kΩ 0(4)-20 mA Ri = 500 Ω
Feedback signal (MP Version)	0(2)-10 V ± 0.1 V
Force	150 N[1]
Stroke resolution range	500 to 4000 steps @ 0-10 V control signal based on valve flow setting
Position accuracy	± 0.1 mm (0.004 in)
Maximum stroke	7.5 mm (0.30 in)
Speed	Default 12 s/mm, selectable 3 s/mm
Relative humidity	95 %, non-condensing (according to EN 60730-1)
Max. medium temperature	95 °C (203°F)
Ambient temperature	-10 to 55°C (14 to 131°F)[2]
Storage and transport temp.	-40 to 70°C (-40 to 158°F)
Protection class	II
Grade of enclosure	IP54 (all positions)
Weight	300 g (0.66 lb)
Sound power level	Below 30 dB(A) at 12 s/mm[3]
EMC Directives	2014/30/EU
LVD Directives	2014/35/EU EN 60730-1 & EN 60730-2-14
RoHS Directives	2011/65/EU
REACH & CE Directives	1907/2006

1. When used at temperatures below 0 °C (32 °F), the closing force may, in some cases, drop to minimum 120 N.
2. Can be used below 2°C (36 °F) of medium or ambient temperature, if the spindle is protected from ice formation. The valve and actuator neck must therefore be insulated with vapor-tight insulation, or condensation must be prevented using a stem heater.
3. At 3 s/mm, the sound power level is estimated to be louder than 30 dB(A).

Part Number	Valve Type	Cable Length
MP130S24M	VP228E, VP229E	1.5 m (4.9 ft)
MP130S24M5M	VP228E, VP229E	5 m (16.4 ft)
MP130S24MP	VP228E, VP229E	1.5 m (4.9 ft)
MP130S24MP5M	VP228E, VP229E	5 m (16.4 ft)

MP500C

MP500C linear electro-mechanical actuator for the control of the VP220 **SpaceLogic** PIBCV, DN40 to 100.

MP500C is controlled either by an increase/decrease floating signal or by a range of modulating control signals between the span of 0 to 10V.

- High resolution control for precise fluid control.
- Working range and end point switches calibrate to any stroke and flow setting of the valve.
- Proportional running time is 15s regardless of valve stroke.
- Multi-signal control for either 3-point increase/decrease signal or various modulating control signals including sequencing.
- Stroke indicators on the yoke provide clear visual indication to the valves opening position.

Specifications	
MP500C	Non-Spring Retturn
Supply voltage	24 Vac +/- 20%, 50 to 60Hz 24 Vdc +/- 20%
Power consumption	average 15 VA
Transformer sizing	50 VA
Running time **modulating** **Increase/decrease**	 15 s 300 s/60 s
Duty cycle	max. 20% / 60 minutes
Analog input (Y-M) **Voltage Range** **Selectable Input signals**	0 to 10Vdc 2 to 10V, 0 to 5 V, 2 to 6 V, 5 to 10V, 6 to 10V
Impedance	minimum 100 k Ohm
Digital input (Y2-Y1) **Voltage across open input** **Current through closed input** **Minimum pulse time**	 24 Vac 5 mA 20 ms
Output U (position feedback signal)	2 to 10V
Load	2 mA
Wiring entry **Conduit connection** **Cable gland**	 2 x M20 knockout 1 x 6–12 mm O/D
Environment **Operating temperature** **Storage temperature** **Humidity**	 –10 to +50°C –25 to +65°C max. 90% RH non-condensing
Enclosure rating	IP 54 (NEMA 2)
Sound power level	max. 32 dBA
Material **Housing** **Cover** **Color** **Weight**	 Aluminum ABS/PC plastic aluminum/grey 1.8 kg (3.96 lb.)

Part number	Description	Valve size
MP500C	**SpaceLogic** Multi-Signal Control Actuator	DN40 to 100
8800104000	S2 (Aux End switch)	

MP500C-SR

The MP500C-SR is a spring return linear electro-mechanical actuator for the control of the VP220 **SpaceLogic** PIBCV, DN40-100.

- Features universal control input and self-calibration to any valve setting.
- High resolution control board allows precise fluid control.
- Working range and end point switches calibrate to any stroke and flow setting of the valve.
- Proportional running time is 15s regardless of valve stroke.
- Stroke indicators on the yoke provide clear visual indication to the valves opening position.

Specifications	
MP500C-SRU **MP500C-SRD**	Stem up (retract) Stem down (extend)
Voltage supply	24 Vac ±10% 50-60Hz
Power consumption **Running** **Rest**	 30 VA (21 W) 7 W
Running time **Modulating** **Increase/decrease** **Spring return**	 15 sec. 60/300 sec. (selectable) 13 sec.
Transformer sizing	50 VA
Stroke range	2 to 35 mm
Force, nominal	500 N
Analog input voltage range	0 to 10Vdc
Selectable input signals	0 to 10, 2 to 10, 0 to 5, 2 to 6, 5 to 10, 6 to 10Vdc
Digital inputs, Y1, Y2 **Voltage across open input** **Current through closed input** **Minimum pulse time**	 24 Vac 5 mA 20 ms
Output, Y (Feedback)	2 to 10Vdc or 0 to 5 Vdc (0-100%) - Load 2 mA
Wiring entry **Conduit connection** **Cable gland**	 4 x M20 capped holes 1 x 6–12 mm O/D, IP68
Environment **Operating and Storage Temperature** **Humidity**	 -10/+50°C max 90% RH
Enclosure rating	IP54
Sound power lever	43 dBa
Max cable core diameter	2.5 mm²
S2 Auxiliary Switch Relay (optional accessory)	SPDT, 24 Vac 4A AC1 (contacts made at 5% and 95% of end stroke)
Weight	3.2 Kg

Part number	Description	Function on power failure	Valve size
MP500C-SRU	Spring return (stem up)	Valve open	DN40 to 100
MP500C-SRD	Spring return (stem down)	Valve closed	
880 0104 000	S2 auxiliary end point switches		

MP525E, MP525EER

Product Description

The MP525 is a high-accuracy universal control actuator designed specifically for the VP227R Pressure Independent Balancing and Control Valve (PIBCV), suitable for sizes DN40 and DN50. This actuator modulates flow through the valve to prevent overflow and enhance the efficiency of boilers and chillers. MP525E24MP offers 0(2)-10 V modulating, 3-point floating, and 2-position control signals, while MP525EER24MP offers 0(2)-10 V modulating and 2-position control signals.

The MP525, in combination with the valve, effectively manages the water supply in applications like fan coil units, chilled beams, induction units, small re-heaters, re-coolers, air handling units, and other terminal units for zone control, where heated or chilled water is the controlled medium. Its precision and LED indicators streamline the commissioning process, simplify maintenance, improve indoor comfort, and boost energy savings. Control is achieved through a voltage input signal sent to the actuator.

General Features

- Compact design
- IP54-rated
- No tools required for mounting
- Maintenance-free lifetime
- Low-noise operation
- LED status indicator
- Auto calibration process
- Remote stroke calibration
- Universal control signal
- Auto-cycle
- MP525E24MP has manual override
- MP525EER24MP has electronic return (also known as fail safe in the industry) and electrical override

Specifications MP525E24MP	
Power supply	24 V AC/DC +/- 10%
Frequency	50/60 Hz
Power consumption **24 V AC** **24 V DC**	 1.5 VA standby, 6 VA running, 8.5 VA max. 0.6 W standby, 2.6 W running, 4.1 W max.
Control signal input	Analog 0(2) - 10 V DC[1], 3-point floating or 2-position
Force	Minimum 350 N
Maximum stroke	7 mm (0.3 in)
Speed	22 s/mm
Relative humidity	max. 85 % (no condensation)
Max. medium temperature	120 °C (248 °F)
Ambient temperature	0 to 50 °C (32 to 122 °F)
Storage and transport temp.	0 to 50 °C (32 to 122 °F)
Protection class	III safety extra-low voltage
Grade of enclosure	IP54
Weight	0.3 kg (0.67 lb)
Cable	5 x 0.5 mm² (20 AWG)
Sound power level	Max. 35 dB(A)
EMC Directives	2014/30/EU
LVD Directives	2014/35/EU EN 60730-1 & EN 60730-2-14
RoHS Directives	2011/65/EU
REACH & CE Directives	1907/2006

1. By default, 0 V DC will command the valve to close.

Specifications MP525EE24MP	
Power supply	24 V AC/DC +/- 10%
Frequency	50/60 Hz
Power consumption **24 V AC** **24 V DC**	 2.6 VA standby, 7.9 VA running, 9 VA max 1.2 W standby, 3.7 W running, 4.5 W max.
Control signal input	Analog 0(2) - 10 V DC[1] or 2-position
Force	Minimum 350 N
Maximum stroke	7 mm (0.3 in)
Speed	22 mm/s (electronic return: 5 mm/s)
Relative humidity	max. 85% (no condensation)
Max. medium temperature	120 °C (248 °F)
Ambient temperature	0 to 50 °C (32 to 122 °F)
Storage and transport temp.	0 to 50 °C (32 to 122 °F)
Protection class	III safety extra-low voltage
Grade of enclosure	IP54
Weight	0.34 kg (0.75 lb)
Cable	5 x 0.5 mm² (20 AWG)
Sound power level	Max. 35 dB(A)
EMC Directives	2014/30/EU
LVD Directives	2014/35/EU EN 60730-1 & EN 60730-2-14
RoHS Directives	2011/65/EU
REACH & CE Directives	1907/2006

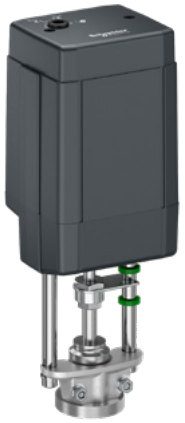
1. By default, 0 V DC will command the valve to close.

Part Number	Valve	Cable Length
MP525E24MP	VP227R, DN40 and DN50	1.5 m (4.9 ft)
MP525EE24MP	VP227R, DN40 and DN50	1.5 m (4.9 ft)

MP2000

MP2000 actuator is used with pressure independent balancing and control large valve type **SpaceLogic** PIBCV DN125 and DN150. The actuator has universal control inputs and is self-calibrating.

- Overload protected
- Diagnostic LED for operational data capture and self-stroking feature
- Manual override.



Specifications	
Power supply	24 Vac, +10 to –15%
Power consumption	9 VA
Frequency	50/60 Hz
Control signal input	Modulating and 3 Point floating
Control input Y	0 to 10V (2 to 10) Ri = 24 kΩ 0 to 20 mA (4 to 20) Ri = 500 Ω
Output signal X	0 to 10V (2 to 10)
Speed	8 s/mm
Max. medium temperature	200 °C
Environment **Operating** **Storage/transp. temp**	 0 to 55°C –40 to +70°C
Protection class	III safety extra-low voltage
Enclosure rating	IP 54
Weight	7.5 kg

Part number	Description	Valve size
MP2000	Multi-Signal Actuator, Fail in Place	DN125 to 150

MP2000-SR

The MP2000-SR is a spring return actuator used with the DN125 to 150 **SpaceLogic** PIBCV.

The actuator has universal control inputs and is self-calibrating.

- Manual operation mechanical and/or electrical
- Position indication, LED signalization
- Selectable speed 4 or 6 s/mm
- Integrated external switch
- Linear to EQ% Curve Adaptation
- Anti-oscillation function
- 3-point floating or modulating control selection
- Thermal and overload protection
- Precise regulation and fast response on 3-point signal (0.01s).

Specifications	
Nominal voltage	24 Vac/Vdc, 50 Hz/60 Hz
Power consumption	15 VA
Control input signal	Modulating or 3-point floating
Control input Y	0 to 10V (2 to 10V) Ri = 24 kΩ 0 to 20 mA (4 to 20 mA) Ri = 500 Ω
Position feedback U	0 to 10V (2 to 10V)
Speed (selectable)	4 or 6 s/mm
Environment Operating temperature	0 to + 55°C
Enclosure rating	IP 54
Weight	8.6 kg
Safety function runtime/50 mm stroke	120 s
Manual operation	Electrical and Mechanical

Part number	Description	Valve size
MP2000-SRU	Stem up, retracts (valve open)	DN125 to 150
MP2000-SRD	Stem down, extends (valve closed)	

MP4000

The MP4000 is a powerful universal control actuator for the DN200 and DN250 **SpaceLogic** PIBCV.

The MP4000 is designed to regulate valves in response to the demand of a controller in HVAC systems. It can be controlled by electronic controllers with modulating or 3-point control output.

- Universal input control and self-calibrating
- Manual operation mechanical and/or electrical
- Position indication, LED signalization
- Integrated external switch
- Characteristic optimization
- 3-point floating or modulating control selection
- Thermic and overload protection
- Precise regulation and fast response on 3-point signal (0.01 s).

Specifications	
Power supply	24 Vac/Vdc (+10, -15%)
Power consumption	15 VA (24 V)
Signal	10 mA
Frequency	50/60 Hz
Control input Y	0 to 10Vdc (2 to 10Vdc); 0 to 20 mA (4 to 20 mA)
Control output U	0 to 10Vdc (2 to 10Vdc); 0 to 20 mA (4 to 20 mA)
Speed (selectable)	3 s/mm or 6 s/mm
Max. spindle travel	80 mm
Max. medium temperature	200°C
Environment **Ambient Temperature** **Storage/transport Temperature**	 0 to + 55°C −40 to +70°C
Humidity	5 to 95%
Protection class	II
Enclosure rating	IP 54, Type 2
Electrical connection	conduit
Weight	7.5 Kg
Manual operation	Electrical and mechanical
Power failure response	Stem remains in last position

Part number	Description	Valve size
MP4000	Multi-signal control, Fail in place	DN200-250

Zone Valves and Actuators

Zone valves provide hydronic flow control in terminal units such as fan coils. A comprehensive range of products is provided with a large selection of capacities, connection types and choice in electrical actuator control.

VZ*08*

The VZ*08* short stroke (2.5 mm) zone valves are small linear valves designed for control of hot and chilled water in fan coils or other terminal unit applications.

These particular valves are designed to be used with thermo-electric actuators type MZ140, which is available in an on/off or a modulating variant.

Specifications	
Valve types	2-way, 3-way, 3-way with bypass
Pressure class	PN16
Stroke	2.5 mm
Max fluid speed	3 m/s
Media	Water, water+glycol (30% max)
Temperature range	5 to 95 °C
Leakage	0% tight close-off
Main construction materials	
Valve body	Brass (CW617N)
Trim	Glass reinforced PPS
Stem	Stainless steel (AISI 303)
Stem packing	Double EPDM O-ring
Plug sealing	EPDM

VZ*08E

VZ*08C

		Flat face		Max close-off (kPa) MZ140	
2-way valves					
Size	**Kvs**	**Part number**	**Connection**	**A-AB**	
DN15	0.25	VZ208E-15BP01	G1/2A	400	
	0.4	VZ208E-15BP02			
	0.6	VZ208E-15BP03			
	1	VZ208E-15BP04		350	
	1.6	VZ208E-15BP05			
DN20	2.5	VZ208E-20BP07	G3/4A	250	
	4	VZ208E-20BP08		150	
	6	VZ208E-20BP09			
3-way valves					
	Kvs				
	A-AB	**B-AB**	**Part number**	**Connection**	**A-AB**	**B-AB**
DN15	0.25	0.25	VZ308E-15BP01	G1/2A	400	400
	0.4	0.4	VZ308E-15BP02			
	0.6	0.6	VZ308E-15BP03			
	1	0.8	VZ308E-15BP04		350	
	1.6	1	VZ308E-15BP05			
DN20	2.5	1.6	VZ308E-20BP07	G3/4A	100	40
	4	2.5	VZ308E-20BP08			
	6	4	VZ308E-20BP09			
3-way valves with integral by-pass (4 ports)						
DN15	0.25	0.25	VZ408E-15BP01	G1/2A	400	400
	0.4	0.4	VZ408E-15BP02			
	0.6	0.6	VZ408E-15BP03			
	1	0.8	VZ408E-15BP04		350	
	1.6	1	VZ408E-15BP05			
DN20	2.5	1.6	VZ408E-20BP07	G3/4A	100	40
	4	2.5	VZ408E-20BP08			
	6	4	VZ408E-20BP09			

* Nuts and Olives supplied with Valve

MZ140

MZ140 thermo-electric actuators are wax filled actuators that are silent in operation, providing either on/off or modulating control for the VZ*08* zone valves.

Specifications

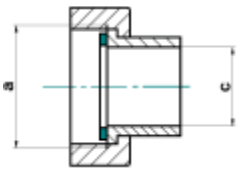
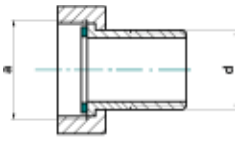
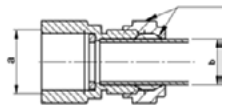
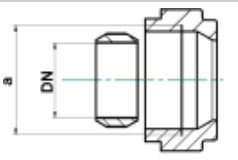
Environment	
Operating temperature	2 to 50 °C
Storage temperature	-10 to 60 °C
Stem force	140N
Max stroke	
MZ140-24T/230T	4 mm
MZ140-24M	2.5 mm
Coupling ring	-M30 x 1.5
Power cable	2m bipolar (0.75 mm²)
Main construction materials	
Fire-resistant case	Class V0
Protection class	IP 44 (for vertical mounting)

MZ140-24M

MZ140-24T

Part number	Full type designation	Cable Length	Control signal	Power	Power consumption	Initial consumption
					VA	A
MZ140-230T	MZ140-110/230T 2M44 00	2m	On/Off	110-230 Vac	1.8	0.25
MZ140-24T	MZ140-24T 2M44 00			24 Vac/Vdc		0.17
MZ140-24T-5M	MZ140-24T 5M44 00	5m				
MZ140-24M	MZ140-24M 2M44 00	2m	0 to 10V modulating	24 Vac		0.2

Connections for VZ*08 Series Zone Valves

	Connection type	Pipe size	DN	a	c (mm)	d	e	Part number	Pack quantity
	Flat Face External thread to Solder *	15 mm	20	G 3/4	15	-	-	9112113015	2
	External Thread	R 3/8" R 1/2"	15 20	G 1/2 G 3/4	-	R 3/8 R 1/2	-	9112078 010 9112079 010	10
	Flat face external thread to compression*	15 mm 22 mm	15 20	G 1/2 G 3/4	-	-	15 22	9112080000 9112081000	1
	Compression Capnut and olive	15 mm 20 mm	15 20	G1/2A Whitworth 1 1/8" - 14	-	-	15 22	9112082000 9112083000	10

*One fitting required per valve port.

VZ*19*

These long stroke (5.5 mm) small linear zone valves are designed for the regulation in flow of hot and chilled water in fan coils or other terminal unit applications.

These particular valves are designed to be used with the compact electro-mechanical actuators type MZ20.

Specifications	
Pressure class	PN16
Stroke	5.5 mm
Max fluid speed	3 m/s
Media temperature range	2 to 95 °C
Max. glycol concentration	30%
Flow characteristics On direct (A-AB) way On by-pass (B-AB) way	 Equal percentage Linear
Leakage	0% tight close-off
Rangeability	50:1
Main construction materials	
Valve body	Brass (CW617N)
Trim	Glass reinforced PPE
Stem	Stainless steel (AISI 303)
Stem packing	Double EPDM O-ring
Plug sealing	EPDM

VZ*19C

VZ*19E

		Flat face external thread		Max close-off (kPa) MZ20	
2-way valves					
Size	Kv	Part number	Connection	A-AB	
DN15	0.25	VZ219E-15BP01	G1/2A	400	
DN15	0.4	VZ219E-15BP02			
DN15	0.6	VZ219E-15BP03		350	
DN15	1	VZ219E-15BP04			
DN15	1.6	VZ219E-15BP05			
DN15	2	VZ219E-15BP06			
DN20	2.5	VZ219E-20BP07	G3/4A	250	
DN20	4	VZ219E-20BP08		150	
DN20	6	VZ219E-20BP09			
3-way valves					
	Kvs	Part number	Connection	A-AB	B-AB
	A-AB B-AB				
DN15	0.25 0.25	VZ319E-15BP01	G1/2A	400	400
DN15	0.4 0.25	VZ319E-15BP02			
DN15	0.6 0.4	VZ319E-15BP03		350	
DN15	1 0.6	VZ319E-15BP04			
DN15	1.6 1	VZ319E-15BP05			
DN15	2 1.6	VZ319E-15BP06			
DN20	2.5 1.6	VZ319E-20BP07	G3/4A		
DN20	4 2.5	VZ319E-20BP08		100	40
DN20	6 4	VZ319E-20BP09			
3-way valves with integral by-pass (4 ports)					
DN15	0.25 0.25	VZ419E-15BP01	G1/2A	400	400
DN15	0.4 0.25	VZ419E-15BP02			
DN15	0.6 0.4	VZ419E-15BP03		350	
DN15	1 0.6	VZ419E-15BP04			
DN15	1.6 1	VZ419E-15BP05			
DN15	2 1.6	VZ419E-15BP06			
DN20	2.5 1.6	VZ419E-20BP07	G3/4A		
DN20	4 2.5	VZ419E-20BP08		100	40
DN20	6 4	VZ419E-20BP09			

Nuts and olives supplied with the compression end connection valve.

MZ20

The long stroke MZ20 is an electro-mechanical zone valve actuator designed for use with the VZ*19* valves.

The actuator provides precise valve position and flow for good hydronic control.

Reliable long term operation is provided by the optimal design without feedback potentiometer or end switches.

Specifications

Input voltage	
MZ20A	24 Vac, 50/60 Hz
MZ20B	24 Vac
Power consumption	
MZ20A	1 VA
MZ20B-24	0.7 VA
MZ20B-230	5 VA
Speed	18 s/mm (50 Hz) to 15 s/mm (60 Hz)
Temperature	
Working	-5 to +55 °C
Storage	-25 to +65 °C
Stem force	200 N
Max stroke	5.5 mm
Connection cable	3 wires 1.5 m
Protection class	IP 43 (for vertical mounting)
Sound power level	35 dB(A)

MZ20A/B zone valve actuator for VZ*19 valves

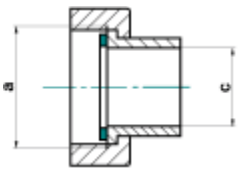
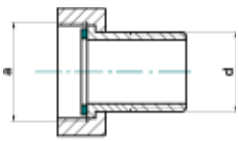
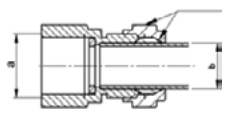
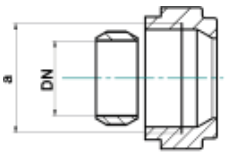
Part number	Description	Control
8455051000	MZ20A	Selectable*
8455052000	MZ20A-R	0 to 10V
8455001000	MZ20B-24	3P-24 Vac

* 0 to 10V, 6 to 9 V, 1 to 5 V, 2 to 10V, 4 to 7 V , 6 to 10V, 8 to 11 V

Accessory

Part number	Description
9116006000	6m 24V pluggable cable pack, 10 pieces

Connections for VZ*19 Series Zone Valves

	Connection type	Pipe size	DN	a	c (mm)	d	e	Part number	Pack quantity
	Flat face external thread to solder *	15 mm	20	G 3/4	15	-	-	9112013015	2
	External thread	R 3/8" R 1/2"	15 20	G 1/2 G 3/4	-	R 3/8 R 1/2	-	9112078 010 9112079 010	10
	Flat face external thread to com-pression*	15 mm 22 mm	15 20	G 1/2 G 3/4	-	-	15 22	9112080000 9112081000	1
	Compression capnut and olive	15 mm 20 mm	15 20	G1/2A Whitworth 1 1/8" - 14	-	-	15 22	9112082000 9112083000	10

*One fitting required per valve port.

Erie VT Zone Valve

The industry-leading Erie Zone Valve is suitable for on/off control of hot and chilled water in terminal unit applications.

High flow capacity paddle design and the unique ‘pop-top’ actuator connection allows for a quick and simple installation.

Specifications	
Media	Hot and chilled water
Media temperature	0 to 93 °C
Glycol concentration	50%
Pressure class	300 psi (PN20)
Seat leakage	0.01% (ANSI class IV)
ΔPm	100kPa
Main construction materials	
Valve body	Forged Brass Nickel-plated Brass
Stem	Brass
Seat	Buna-N/EPDM
Paddle/stem o-rings	

2-way valves

Thread	Kvs	Part number	Max ΔP (kPa) AG–Actuators	Max ΔP (kPa) AH–Actuators
Rp 1/2	2.2	VT2232	275	340
	3.0	VT2233	170	205
Rp 3/4	2.2	VT2332	275	340
	3.0	VT2333	170	205
	4.3	VT2335	135	170
	6.5	VT2337	115	135
Rp 1	6.9	VT2437		
3-way valves				
Rp 1/2	2.6	VT3232	275	340
Rp 3/4	2.6	VT3332	275	340
	4.3	VT3335	135	170
	6.5	VT3337	115	135
Rp 1	6.9	VT3437		

Erie AG/AH Zone Actuator

The AG (General Closeoff) and AH (High Closeoff) actuators are spring return, two-position actuators for coupling to the VT Series Valves.

The pop-top connection allows for quick and simple assembly, all normally closed actuators feature a manual override lever.

Specifications		
Supply voltage		24 Vac @ 50/60 Hz 230 Vac @ 50 Hz
Power consumption		6.5 watts, 7.5 VA
End switch	24 to 240 Vac (101 mA min. to 5 A)	9-30 Vdc (100 mA max.)
Control signal		On/Off, 2 position, spring return
Full running time		30 Sec (50 Hz) 9 Sec (S.R. function)
Enclosure		IP31
Main construction materials		
Base plate		Stainless steel
Cover		Aluminium
Environment		
Shipping and storage		-40 to 71 °C
Operating temperature		40°
Humidity		5 to 95% RH, non-condensing

General Close-Off Actuator

Part number	Voltage	End switch	Control	Spring return valve function	Cable
AG13U230	230 Vac	-	On/Off	Normally closed	910 mm (36")
AG13U23A		yes			
AG23A23A	24 Vac	yes		Normally open	
AG23U230	230 Vac	-			

High Close-Off Actuator

Part number	Voltage	End switch	Control	Spring return valve function	Cable
AH13A230	24 Vac	-	On/Off	Normally closed	910 mm (36")
AH13U230	230 Vac	-			
AH13U23A		yes			

Radiator Valves Actuators

Our selection of short stroke valve actuators is designed for BMS automation of fluid control in radiators and under floor heating manifolds. The Schneider Electric range provides a dependable discreet design in every variant.

MR95

The MR95 is a small thermo-electric linear radiator valve actuator used in room applications for time-controlled two-point (On/Off) and pulse-width-modulated (PWM) regulation radiators or underfloor heating manifolds.

The MR95 is a discreet design silent operating actuator suitable for living space installations.

Specifications	
Max. stroke	4mm
Supply voltage	MR95xx-24T: 24 Vac/Vdc ± 20% MR95xx-230T: 230 Vac +10%-15%
Stem force	95 N
Temperature range	Max. 50 °C
Power consumption	2 W
Protection standard	IP44 in all mounting positions
Cable length (standard)	1.0 m
Cable size	2 x 0.5 mm^2
Medium temperature	Max. 120 °C
Radiator connection	M30 x 1.5

Part number	Type designation	Action1	Voltage
MR95NC-24T	MR95-NCD-24T 1.0M44 00	Normally closed (stem down)	24 Vac/Vdc
MR95NO-24T	MR95-NOU-24T 1.0M44 00	Normally open (stem up)	
MR95NC-230T	MR95-NCD-230T 1.0M44 00	Normally closed (stem down)	230 Vac

1- Without power, in combination with standard radiator valve.
"Normally closed" = Actuator stem extends downward without power closing the valve, retracts when powered to open the valve.
"Normally open" = Actuator stem retracts upward without power opening the valve, extending when powered to close the valve.

Compatible radiator valves	
Manufacturer	**Type**
Drayton	TRV 4
Honeywell	M30x1.5, all
Empur	M30x1.5
Heimeier	
Junkers	
Oventrop	
Siemens	Duogyr, M30x1.5
TA	M30x1.5[2]

2 - Some older TA valves are M28 and not suitable for the MR95.

Accessories	
Part number	**Description**
9114205000	Additional cable set 5M, 10 pcs
9114210000	Additional cable set 10M, 10 pcs

MZ09L

The MZ09L LON® actuator is designed for decentralised building structures and gives customers an effective new capability in energy management and product flexibility. The actuator works with standard SNVTs to provide interoperability with controllers based on LonWorks® technology.

The MZ09L small linear actuator is specifically designed to provide LonMark® capabilities together with radiator valves and is used in fan coil units, induction units, small reheaters and recoolers, and for zone control applications. The MZ09L actuator is suitable for LonWorks technology. Using standard Echelon configuration tools, the actuator can be configured with job specific settings.

Specifications	
Power supply	24 Vac, ± 20%, 50/60 Hz
Power consumption	1.4 VA
Control signal	SNVT_lev_percent 0 to 100%
Network protocol	LonTalk®
Channel	FTT10A
Stroke	2.5 mm
Running time	53s at 50 Hz 44s at 60 Hz
Stem force	90 N (for valves DN15 to 20)
Insulation class	III
Connection cables	1.5 m, three leads 1.5 m, two leads
Coupling ring	M 30 x 1.5
Environment Operating temperature	0 to 55 °C
Enclosure rating	IP 42

MZ09L Actuator for Radiator Valves

Part number	Description
8455112000	MZ 09L(LON) 2.5 mm

Suitable Valves

Manufacturer	Valve type	Adapter
Honeywell	V100, V200	Not required
Heimeier		Not required
Siemens LandS	Duogyr	Not required
Danfoss	Series RA2000, RA-PN, RA-N, RA-U, RA-G	9112075000
Danfoss	Series RAVL	9112074000

MZ09B

The MZ09B actuator is designed to provide 3-point control together with radiator valves. The MZ09B actuator is used for radiator valves in fan coil units, induction units, small reheaters and recoolers, and for zone control applications. The absence of end switches and feedback potentiometer provides a long time reliability.

Specifications	
Power supply	24 Vac, ± 20%, 50/60 Hz
Power consumption	1.4 VA
Control signal	SNVT_lev_percent 0 to 100%
Network protocol	LonTalk®
Channel	FTT10A
Stroke	2.5 mm
Running time	53s at 50 Hz 44s at 60 Hz
Stem force	90 N (for valves DN15 to 20)
Insulation class	III
Connection cables	1.5 m, three leads 1.5 m, two leads
Coupling ring	M 30 x 1.5
Environment Operating temperature	0 to 55 °C
Enclosure rating	IP 42

MZ09B actuator for radiator valves

Part number	Description
8455111000	MZ 09B 2.5 mm

Suitable Valves

Manufacturer	Valve type	Adapter
Honeywell	V100, V200	Not required
Heimeier		Not required
Siemens LandS	Duogyr	Not required
Danfoss	Series RA2000, RA-PN, RA-N, RA-U, RA-G, RA-UR, RA-KE, RA-K	911-2075-000
Danfoss	Series RAVL	911-2074-000

Globe Valves and Actuators

Fine hydronic control in a globe valve is achieved from precise positioning actuators.

Globe valves provide the finest level of fluid control. The Schneider Electric portfolio covers an extensive range of products for almost any working pressure and flow capacity. Globe valves can be serviced to provide a very long and reliable working life to any plant they are installed within.

SpaceLogic actuators such as the M400, M800, M1500 provide superb positioning accuracy across a broad range of valves and also accept multiple modulating input signals, as well as 3-position floating control. Running speed is fast and fixed to a set value based on the valve stroke limits, enabling simple tuning of control loops. Position feedback, manual override and the ability to add auxiliary switches are other features possible on globe valves actuators.

V241

The V241 is a high quality general purpose valve. Polished stainless seats provide high differential pressure capability and low leakage.

Suitable for a wide range of applications such as heating, cooling, air handling, domestic hot water, and district heating applications. The valve can handle hot and cold water with phosphate, hydrazine and antifreeze additives.

If the valve is used for media at temperatures below 0°C (32°F), it should be equipped with a heater to prevent ice formation on the valve stem.

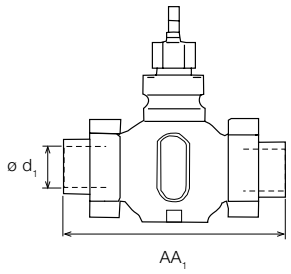
Specifications	
Design	2-way plug valve, stem up closed
Pressure class	PN 16
Flow characteristic	Equal percentage modified
Stroke	20 mm
Rangeability ($Kvs/Kv_{min.}$)	(refer to table)
Leakage	up to 0.02% of Kv
ΔPm	600 kPa, water
Max. temperature of medium	150 °C
Min. temperature of medium	-20 °C
Max. glycol/concentration	50%
Connection	External pipe thread according to ISO 228/1
Main construction materials	
Body	Bronze Rg5
Plug and seat	Stainless steel SS 2346
Stem	Stainless steel SS 2346
Stem packing	EPDM

V241					Max close-off pressure (kPa)							
					Non-spring return actuators						Spring return actuators	
Part number	DN	Connection	Kvs	Rangeability	M310	MG350	M400	M800	M1500	MV15B (1500N)	M700	MG900 SR
7214106000	15	G1B	0.25	>50	800	800	1000	1600	1600	1600	1600	1600
7214110000			0.40									
7214114000			0.63									
7214118000			1.0									
7214122000			1.6				800				1400	
7214126000			2.5									
7214130000			4.0									
7214134000	20	G1¼B	6.3	>100	650	650	650	1500			1100	1510
7214138000	25	G1½B	10		400	400	500	1150			850	1160
7214142000	32	G2B	16		300	300	350	850	1350	1350	650	855
7214146000	40	G2¼B	25		150	150	250	600	950	950	450	605
7214150000	50	G2¾B	38		50	50	150	400	650	650	300	415

Service kit:
Replacement stem packing box: 100108000

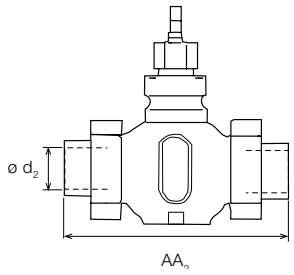
Connections V241

Valve		Ød[1]	AA[1]	Part number for connection, one pkg/port
DN	End Conn.	Int. thread (ISO 7/1)	mm	Packing, std
15	G1B	Rp ½	146	9112100015
20	G1¼B	Rp ¾	146	9112100020
25	G1½B	Rp 1	159	9112100025
32	G2B	Rp 1¼	169	9112100032
40	G2¼B	Rp 1½	197	9112100040
50	G2¾B	Rp 2	222	9112100050



Internal thread connection	
Main construction materials	
Union nut	malleable iron casting, galv.
Union end	malleable iron casting, galv.
Packing, standard	Fibre Gasket (Klingersil C4400)

Valve		Ød[2]	AA[2]	Part number for connection, one pkg/port
DN	End Conn.	mm	mm	Packing, std
15	G1B	15	136	9112101015
20	G1¼B	22	146	9112101020
25	G1½B	28	155	9112101025
32	G2B	35	163	9112101032
40	G2¼B	42	200	9112101040
50	G2¾B	54	232	9112101050

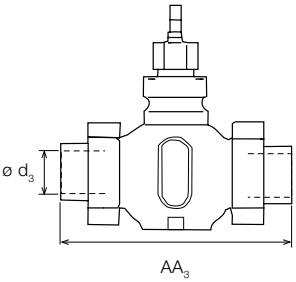


Soldering Type Connection	
Main construction materials	
Union nut	malleable iron casting, galv
Union end	Bronze, SS 5204
Packing, standard	Fibre Gasket (Klingersil C4400))

Valve		Ød[3]	AA[3]	Part number for connection, one pkg/port
DN	End Conn.	mm	mm	Packing, std
15	G1B	21.8	182	9112102015
20	G1¼B	26.9	182	9112102020
25	G1½B	33.7	187	9112102025
32	G2B	42.4	197	9112102032
40	G2¼B	48.3	232	9112102040
50	G2¾B	60.3	262	9112102050

(1) Material Union nut: brass SS 5252

2 sets of connections required for 2-way valves



Welded Type Connection	
Main construction materials	
Union nut Packing, standard	Malleable iron casting, galv
Packing, standard	Fibre Gasket (Klingersil C4400)

V211T

The V211T is an internally threaded valve with a soft seat for tight shut off.

Suitable for a wide range of applications such as heating, cooling and air handling systems with hot or chilled water.

If the valve is used for media at temperatures below 0 °C, it should be equipped with a heater to prevent ice formation on the valve stem.

Specifications	
Design	2-way plug valve, stem up closed
Pressure class	PN 16
Flow characteristic	Equal percentage modified
Stroke	20 mm
Rangeability ($Kvs/Kv_{min.}$)	>50
Leakage	Tight sealing
ΔPm	400 kPa, water
Max. temperature of medium	120 °C
Min. temperature of medium	-20 °C
Max. glycol concentration	50%
Connections	Internal pipe thread Rp
Main construction materials	
Body	Nodular iron EN-JS 1030
Stem	Stainless steel SS 2346
Plug	Brass CW602N
Seat sealing	EPDM
Seat	Nodular iron EN-JS 1030
Stem packing	EPDM

V211T					Max close-off pressure (kPa)							
					Non-spring return actuators						Spring return	
Part number	DN	Connection	Kvs	Rangeability	M310	MG350	M400	M800	M1500	MV15B (1500N)	M700	MG900 SR
7211720000	15	Rp 1/2	2.5	>50	800	800	800	1600	1600	1600	1400	1600
7211724000			4.0									
7211728000	20	Rp 3/4	6.3		650	650	650	1500			1100	1510
7211732000	25	Rp 1	10		400	400	500	1150			850	1160
7211736000	32	Rp 1¼	16		300	300	350	850	1350	1350	650	855
7211740000	40	Rp 1½	25		150	150	250	600	950	950	450	605
7211744000	50	Rp 2	38		50	50	150	400	650	650	300	415

Service Kit: Replacement stem packing box: 100108000

V211

The V211 is a flanged valve with a soft seat for tight shut off.

Suitable for a wide range of applications such as heating, cooling and air handling systems with hot or chilled water.

If the valve is used for media at temperatures below 0°C, it should be equipped with a heater to prevent ice formation on the valve stem.

Specifications	
Design	2-way plug valve, stem up closed
Pressure class	PN 16
Flow characteristic	Equal percentage modified
Stroke	20 mm
Rangeability ($Kvs/Kv_{min.}$)	>50
Leakage	Tight sealing
ΔPm	400 kPa, water
Max. temperature of medium	120 °C
Min. temperature of medium	-20 °C
Max. glycol/concentration	50%
Connections	Flange according to ISO 7005-2
Main construction materials	
Body	Nodular iron EN-JS 1030
Stem	Stainless steel SS 2346
Plug	Brass CW602N
Plug sealing	EPDM
Seat	Nodular iron EN-JS 1030
Stem packing	EPDM

V211				Max close-off pressure (kPa)						
				Non-spring return actuators						Spring return
Part number	**DN**	**Kvs**	**Rangeability**	**M310**	**MG350**	**M400**	**M800**	**M1500**	**MV15B (1500N)**	**MG900 SR**
7211116000	15	1.6	>50	800	800	800	1600	1600	1600	1600
7211120000		2.5								
7211124000		4.0								
7211128000	20	6.3		650	650	650	1500			1510
7211132000	25	10		400	400	500	1150			1160
7211136000	32	16		300	300	350	850	1350	1350	855
7211140000	40	25		150	150	250	600	950	950	605
7211144000	50	38		50	50	150	400	650	650	415

Service kit:

Replacement stem packing box: 100108000

VGS211F 15-100CS

The VGS211F–CS is a flanged high temperature valve for media temperatures up to 200ºC. Primarily designed for steam but also suitable for a wide range of applications such as heating, cooling and air handling systems with hot or chilled water and steam.

If the valve is used for media at temperatures below 0°C, it should be equipped with a stem heater to prevent ice formation on the valve stem.

Specifications	
Design	2-way plug valve, stem up open
Pressure class	PN 16
Flow characteristic	Equal Percentage
Rangeability ($Kvs/Kv_{min.}$)	
DN15 to 20	>50
DN25 to 100	>35
Leakage	0.02% of Kvs
ΔPm	600 kPa
Max. temperature of medium	200 °C
Min. temperature of medium	-10 °C
Max. glycol/concentration	50%
Connections	Flange according to ISO 7005-2
Main construction materials	
Body	Cast iron, EN-GJL 250
Stem	Stainless steel (AISI 303)
Plug	Stainless steel (AISI 303)
Seat	Stainless steel (AISI 303)
Stem packing	Spring Loaded PTFE V-Ring
Stroke	
DN15 to DN25	16.5 mm
DN32 to DN65	25 mm
DN80 to DN100	45 mm

VGS211F–CS					Max close-off pressure (kPa)						
					Non-spring return actuators					Spring return	
Part number	Type designation	DN	Kvs	Rangeability	M400	M800	M1500	MV15B (1500N)	M3000	M700	MG900 SR
VGS211F-15CS03	VGS211F-15CS 0.63M SD00	15	0.6	>50	1600	1600	1600	1600	-	32 40 50	1600
VGS211F-15CS04	VGS211F-15CS 1M SD00		1.0								
VGS211F-15CS05	VGS211F-15CS 1.6M SD00		1.6								
VGS211F-15CS07	VGS211F-15CS 2.5M SD00		2.5		1300						
VGS211F-15CS08	VGS211F-15CS 4M SD00		4.0								
VGS211F-20CS	VGS211F-20CS 6.3 M SD00	20	6.3		750					1500	
VGS211F-25CS	VGS211F-25CS 10M SD00	25	10	>35	450	1300				900	1300
VGS211F-32CS	VGS211F-32CS 16M SD00	32	16								
VGS211F-40CS	VGS211F-40CS 24M SD00	40	24		250	800	1350	1350		550	800
VGS211F-50CS	VGS211F-50CS 32M SD00	50	32		150	500	900	900		350	500
VGS211F-65CS	VGS211F-65CS 63M SD00	65	63		-	210	350	350	720	150	210
VGS211F-80CS	VGS211F-80CS 110M SD00	80	110			150	250	250	550	100	-
VGS211F-100CS	VGS211F-100CS 140M SD00	100	140			90	150	150	350	60	

Service kit:
Replacement stem packing box: 100108110.

VG221F 65-150C

The VG221F–C is a large flanged balanced valve suitable for large hydronic flows in heating and air conditioning circuits. The balanced plug enables a low actuating force to control the valve.

Suitable for a wide range of applications using hot water or de-aerated cooling water with cooling media at temperatures below 0°C; a heater must be fitted to protect against stem seizure due to freezing.

Specifications	
Design	2-way pressure balanced plug valve, stem up closed
Pressure class	PN 16
Flow characteristics	Equal percentage
Rangeability ($Kvs/Kv_{min.}$)	>50
Stroke DN65 DN80 to DN150	 25 mm 45 mm
Leakage	<0.03% of Kvs
ΔPm	200 kPa, water
Max. temperature of medium Min. temperature of medium	150 °C -10 °C
Connection	Flange according ISO 7005-2
Main construction materials Body Stem Plug Seat, integrated Stem packing	 Grey cast iron (EN-GJL 250) stainless steel (AISI 303) Brass (CW614N) Grey cast iron (EN-GJL 250) EPDM

VG221F–C						Max close-off pressure (kPa)					
						Non-spring return actuators				Spring return	
Part number	Type designation	Stroke	DN	Kvs	Rangeability	M800	M1500	MV15B (1500N)	M3000	M700	MG900 SR
VG221F-65C	VG221F-65C 63M SU00	25	65	63	>50	1600	1600	1600	1600	1300	1600
VG221F-80C	VG221F-80C 100M SU00	45	80	100		1450				1000	-
VG221F-100C	VG221F-100C 130M SU00		100	130		1000				700	
VG221F-125C	VG221F-125C 200M SU00		125	200		750				470	
VG221F-150C	VG221F-150C 300M SU00		150	300		550	1450	1450		300	

Service kit:
Replacement stem packing box: 100108100

V231

The V231 is a flanged PN25 valve with a very high rangeability.

The valve is suitable for primary district heating circuits as well as hot and chilled water applications where high pressure or where a very fine resolution of flow control is required.

If the valve is used for media at temperatures below 0°C, it should be equipped with a heater to prevent ice formation on the valve stem.

Specifications	
Design	2-way plug valve, stem up closed
Pressure class	PN 25
Flow characteristic	Equal percentage modified
Stroke	20 mm
Rangeability ($Kvs/Kv_{min.}$)	(refer to table)
Leakage	Up to 0.02% of Kvs
ΔPm	Max. 800 kPa, water
Max. temperature, water Max. temperature, saturated steam Min. temperature of medium	150 °C 120 °C -20 °C
Max. glycol concentration	50%
Flanges drilling	According to SS 335 and ISO 2084
Main construction materials Body Plug and seat Stem Stem packing	 Nodular iron SS 0727 (GGG40.3) Stainless steel SS 2346 Stainless steel SS 2346 EPDM

V231				Max close-off pressure (kPa)					
				Non-spring return actuators					Spring return
Part number	DN	Kvs	Rangeability	M310	M400	M800	M1500	MV15B (1500N)	MG900 SR
7213106000	15	0.25	>50	1000	1000	1600	1600	1600	1600
7213110000		.40							
7213114000		.63							
7213118000		1.0							
7213122000		1.6		800	800				
7213126000		2.5							
7213130000		4.0							
7213134000	20	6.3	>200	650	650	1500			1500
7213138000	25	10		400	500	1150			1150
7213142000	32	16		300	350	850	1350	1350	850
7213146000	40	25		150	250	600	950	950	600
7213150000	50	38		50	150	400	650	650	400

Service kit:
Replacement stem packing box: 100108000

V232

The V232 is a pressure balanced flanged PN25 valve with high rangeability and a high differential pressure capability. The balanced plug enables a low actuating force to control the valve.

The valve is suitable for primary district heating circuits as well as hot and chilled water applications where high pressure or a very fine resolution of controllable flow is required.

If the valve is used for media at temperatures below 0°C, it should be equipped with a heater to prevent ice formation on the valve stem.

Specifications	
Design	2-way pressure balanced plug valve, stem up closed
Pressure class	PN 25
Flow characteristic	Equal percentage modified
Stroke	20 mm
Rangeability ($Kvs/Kv_{min.}$)	(refer to table)
Leakage	Up to 0.02% of Kvs
ΔPm	Max. 800 kPa, water
Max. temperature of medium	150 °C
Min. temperature of medium	-20 °C
Flanges drilling	According to SS 335 and ISO 2084
Main construction materials	
Body	Nodular iron SS 0727 (GGG40.3)
Plug and seat	Stainless steel SS 2346
Stem	Stainless steel SS 2346
Stem packing	EPDM

V232				Max close-off pressure (kPa)				
				Non-spring return actuators				Spring return
Part number	DN	Kvs	Rangeability	M400	M800	M1500	MV15B (1500N)	MG900 SR
7213238000	25	10	>200	800	1600	1600	1600	1600
7213242000	32	16		750				
7213246000	40	25		700				
7213250000	50	38		600				

Service kit:
Replacement stem packing box: 100108000

V292

The V292 is a large pressure balanced flanged valve to PN25. The balanced plug enables a low actuating force to control the valve.

The valve is suitable for primary district heating circuits as well as high pressure hot and chilled water applications.

Specifications	
Design	2-way pressure balanced plug valve, stem up closed
Pressure class	PN 25
Flow characteristics	Equal percentage
Stroke DN65 to DN100 DN125 to DN150	 30 mm 50 mm
Rangeability ($Kvs/Kv_{min.}$)	> 50
Leakage	<0.05% of Kvs
Max. temperature of medium Min. temperature of medium	150 °C -10 °C
Max. glycol concentration	50%
Connection	Flange according ISO 7005-2
Main construction materials Body Stem Plug Seat Packing box	 Nodular iron GGG40.3 Stainless steel SS 1.4021 Stainless steel SS 1.4021 Stainless steel SS 1.4021 Spring-loaded PTFE-V-ring

V292				Max close-off pressure (kPa)						
				Non-spring return actuators						Spring return
Part number	DN	Kvs	Rangeability	M800	M1500	M15B	M3000	MV22 (2200N)	M50 (5000N)	M700
7219254010	65	63		1500	2500	2500	2500	-	-	1200
7219258010	80	85								
7219262010	100	130	>50	1100	1600	1600				800
7219266000	125	250		-	-	-	-	1800	2500	-
7219270000	150	350						1400	2500	

Service Kit: Replacement stem packing box
DN65 to DN100: 100108201
DN125 to DN150: 100108210

Replacement stem adaptor/hex bush:
DN125 to DN150: 8800134000

V341

The V341 is a high quality general purpose valve. Polished stainless seats provide high differential pressure capability and low leakage.

The valve is suitable for a wide range of applications such as heating, cooling, air handling and domestic hot water systems. The valve can handle hot and cold water with phosphate, hydrazine and antifreeze additives.

If the valve is used for media at temperatures below 0°C, it should be equipped with a heater to prevent ice formation on the valve stem.

Specifications	
Design	3-way plug valve Stem up closed, A port (B-AB open)
Pressure class	PN 16
Flow characteristics A-AB **Flow characteristics B-AB**	Equal percentage modified Complementary
Stroke	20 mm
Rangeability (Kvs/$Kv_{min.}$)	(refer to table)
Leakage A-AB **Leakage B-AB**	up to 0.02% of Kvs up to 0.05% of Kvs
ΔPm (mixing) **ΔPm (diverting)**	600 kPa, water 60 kPa,water
Max. temperature of medium **Min. temperature of medium**	150 °C -20 °C
Connection	External pipe thread according to ISO 228/1
Glycol concentration	50%
Main construction materials	
Body	Bronze Rg5
Plug and seat	Stainless steel SS 2346
Stem	Stainless steel SS 2346
Stem packing	EPDM

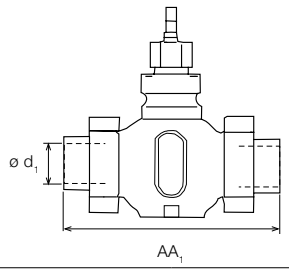
V341				Max close-off pressure (kPa)							
				Non-spring return actuators						Spring return	
Part number	**DN**	**Kvs**	**Rangeability**	**M310**	**M350**	**M400**	**M800**	**M1500**	**MV15B (1500N)**	**M700**	**MG900 SR**
7314121000	15	G1B	>50	800	800	800	1600	1600	1600	1400	1600
7314125000											
7314129000											
7314133000	20	G1¼B	>100	650	650	650	1500			1100	1510
7314137000	25	G1½B		400	400	500	1150			850	1160
7314141000	32	G2B		300	300	350	850	1350	1350	650	855
7314145000	40	G2¼B		150	150	250	600	950	950	450	605
7314149000	50	G2¾B		50	50	150	400	650	650	300	415

Service kit:
Replacement stem packing box: 100108000

Connections V341

Valve		Ød1	AA1	Part number for connection, one pkg/port
DN	End Conn.	Int. thread (ISO 7/1)	mm	Packing, std
15	G1B	Rp ½	146	9112100015
20	G1¼B	Rp ¾	146	9112100020
25	G1½B	Rp 1	159	9112100025
32	G2B	Rp 1¼	169	9112100032
40	G2¼B	Rp 1½	197	9112100040
50	G2¾B	Rp 2	222	9112100050

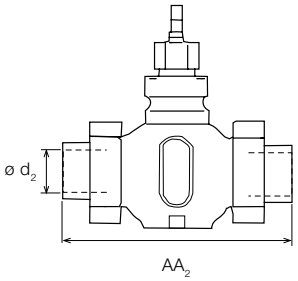
* The accessory intended for the primary circuit of district heating connections.



Internal thread connection	
Main construction materials	
Union nut	malleable iron casting, galv.
Union end	malleable iron casting, galv.
Packing, standard	Fibre Gasket (Klingersil C4400)
or Packing, spec	PTFE Gasket (Kingersil Top Chem 1.5 mm)

Valve		Ød2	AA2	Part number for connection, one pkg/port
DN	End Conn.	mm	mm	Packing, std
15	G1B	15	136	9112101015
20	G1¼B	22	146	9112101020
25	G1½B	28	155	9112101025
32	G2B	35	163	9112101032
40	G2¼B	42	200	9112101040
50	G2¾B	54	232	9112101050

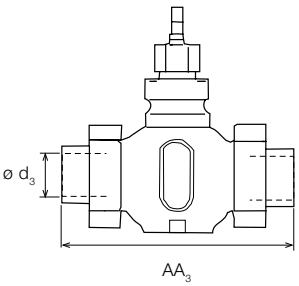
* The accessory combination intended for the primary circuit of district heating connections.



Soldering Type Connection	
Main construction materials	
Union nut	malleable iron casting, galv
Union end	Bronze, SS 5204
Packing, standard	Fibre Gasket (Klingersil C4400)
or Packing, spec	PTFE Gasket (Kingersil Top Chem 1.5 mm)

Valve		Ød3	AA3	Part number for connection, one pkg/port
DN	End Conn.	mm	mm	Packing, std
15	G1B	21.8	182	9112102015
20	G1¼B	26.9	182	9112102020
25	G1½B	33.7	187	9112102025
32	G2B	42.4	197	9112102032
40	G2¼B	48.3	232	9112102040
50	G2¾B	60.3	262	9112102050

1 - Material Union nut: brass SS 5252.
* The accessory Combination intended for the primary circuit of district heating connections.
3 sets of connections required for 3-way valves.



Welded Type Connection	
Main construction materials	
Union nut Packing, standard	Malleable iron casting, galv
or packing, spec	Brass
Union end	Stainless steel SS2172
Packing, standard	Fibre Gasket (Klingersil C4400)
or Packing, spec	PTFE Gasket (Kingersil Top Chem 1.5 mm)

VG310R 15-50B

The VG310R 15-50B is a range of compact precision bronze globe valves, suitable for a wide range of fluid control applications, including heating, cooling, air handling and domestic hot water systems. The VG310R 15-50B series works reliably under a wide variety of conditions, including fluids with high glycol concentrations and very high temperature bands.

The valve utilizes precision plugs for improved rangeability and fine fluid control on small opening degrees. Soft seating provides an ultra tight close off performance against energy seepage.

Specifications	
Design	3-way plug valve, stem up closed
Pressure class	PN 16
Flow characteristic	Equal percentage modified
Stroke	11 mm
Rangeability (Kvs/$Kv_{min.}$)	>100
ΔPm	400 kPa, water
Max. temperature of medium	138 °C
Min. temperature of medium	-7 °C
Max. glycol concentration	60%
Connections	Internal pipe thread Rp
Main construction materials	
Body	Bronze
Stem	Stainless steel 316
Plug	Brass CW602N
Sealing	PTFE for 15 and 20 mm units. EPDM for others.
Seat	Bronze
Standard packing box	Brass with PTFE and EPDM Chevrons
Slotted stem adapter	RoHS compliant Zinc-plated Steel

VG310R 15-50B						Max close-off pressure (kPa)			
						with MG350C		with MG600C (-SR) Actuator	
Part number	**Type designation**	**DN**	**Connection**	**Kvs**	**Rangeability**	**Class IV-S1 ≤0.005%**	**IV1 ≤0.01%**	**Class IV-S1 ≤0.005%**	**Class IV ≤0.01%**
VG310R-15B05	VG310R-15B 1.6T SU00	15	Rp 1/2	1.6	>100	1000	1500	1600	1600
VG310R-15B07	VG310R-15B 2.5T SU00			2.5					
VG310R-15B08	VG310R-15B 4T SU00			4.0					
VG310R-20B	VG310R-20B 6.3T SU00	20	Rp 3/4	6.3		800	930		1600
VG310R-25B	VG310R-25B 10E SU00	25	Rp 1	10		380	460	1100	1200
VG310R-32B	VG310R-32B 17E SU00	32	Rp 1¼	17		250	290	600	700
VG310R-40B	VG310R-40B 24E SU00	40	Rp 1½	24		100	170	350	450
VG310R-50B	VG310R-50B 35E SU00	50	Rp 2	35		55	69	90	240

a. Valves designed for direct connection onto compact SpaceLogic actuators, type MG350, MG600C, MG600C-SR. For M310, M400, M800, M1500 actuators, stem extention code AV-823 is required. It is not possible to drive this valve with the M700 or MV15B actuator. Replacement Bonnet, Packing Gland: YBA-689-C

V311T

The V311T is an internally threaded valve with a soft seat for tight shut off.
If the valve is used for media at temperatures below 0°C, it should be equipped with a heater to prevent ice formation on the valve stem.

Specifications	
Design	3-way plug valve, stem up closed, A port (B-AB) open)
Pressure class	PN 16
Flow characteristic A-AB Flow characteristic B-AB	Equal percentage modified Complementary
Stroke	20 mm
Rangeability ($Kvs/Kv_{min.}$)	>50
Leakage A-AB and B-AB	Tight sealing
ΔPm (mixing) ΔPm (diverting)	400 kPa, water 60 kPa, water
Max. temperature of medium Min. temperature of medium	120 °C -20 °C
Max. glycol concentration	50%
Connections	Internal pipe thread Rp
Main construction materials	
Body	Nodular iron EN-JS 1030
Stem	Stainless steel SS 2346
Plug	Brass CW602N
Sealing	EPDM
Seat	Nodular iron EN-JS 1030
Stem packing	EPDM

V311T					Max close-off pressure (kPa)							
					Non-spring return actuators						Spring return	
Part number	DN	Connection	Kvs	Rangeability	M310	MG350	M400	M800	M1500	MV15B (1500N)	M700	MG900SR
7311717000	15	Rp 1/2	1.6	>50	800	800	800	1600	1600	1600	1400	1600
7311721000			2.5									
7311725000			4.0									
7311729000	20	Rp 3/4	6.3		650	650	650	1500			1100	1510
7311733000	25	Rp 1	10		400	400	500	1150			850	1160
7311737000	32	Rp 1¼	16		300	300	350	850	1350	1350	650	605
7311741000	40	Rp 1½	25		150	150	250	600	950	950	450	604
7311745000	50	Rp 2	38		50	50	150	400	650	650	300	415

Service kit:
Replacement stem packing box: 100108000

V311

The V311 is a flanged valve with a soft seat for tight shut off.

The valve is suitable for a wide range of mixing applications with hot or chilled water in heating cooling and air handling systems.

If the valve is used for media at temperatures below 0 °C, it should be equipped with a stem heater to prevent ice formation on the valve stem.

Specifications	
Design	3-way plug valve, stem up closed, A port (B-AB) open)
Pressure class	PN 16
Flow characteristic A-AB **Flow characteristic B-AB**	Equal percentage modified Complementary
Stroke	20 mm
Rangeability ($Kvs/Kv_{min.}$)	>50
Leakage A-AB and B-AB	Tight sealing
ΔPm (mixing) **ΔPm (diverting)**	400 kPa, water 60 kPa, water
Max. temperature of medium **Min. temperature of medium**	120 °C -20 °C
Max. glycol concentration	25%
Connections	Flange according to ISO 7005-2
Main construction materials	
Body	Nodular iron EN-JS 1030
Stem	Stainless steel SS 2346
Plug	Brass CW602N
Sealing	EPDM
Seat	Nodular iron EN-JS 1030
Stem packing	EPDM

V311				Max close-off pressure (kPa)							
				Non-spring return actuators						Spring return	
Part number	**DN**	**Kvs**	**Rangeability**	**M310**	**MG350**	**M400**	**M800**	**M1500**	**MV15B (1500N)**	**M700**	**MG900 SR**
7311117000	15	1.6	>50	800	800	800	1600	1600	1600	1400	1600
7311121000		2.5									
7311125000		4.0									
7311129000	20	6.3		650	650	650	1500			1100	1510
7311133000	25	10		400	400	500	1150			850	1160
7311137000	32	16		300	300	350	850	1350	1350	650	855
7311141000	40	25		150	150	250	600	950	950	450	605
7311145000	50	38		50	50	150	400	650	650	300	415

Service kit:
Replacement stem packing box: 100108000

VG311F 65-150C

The VG311F–C is a large flanged general purpose valve suitable for a wide range of mixing applications with hot or chilled water in heating, cooling, and air handling systems.

If the valve is used for media at temperatures below 0°C, it should be equipped with a stem heater to prevent ice formation on the valve stem.

Specifications

Design	3-way plug mixing valve stem up closed (A port/B-AB open)
Pressure class	PN 16
Flow characteristic A-AB	Equal percentage
Flow characteristic B-AB	Linear
Stroke	
DN65	25 mm
DN80 t0 150	45 mm
Rangeability ($Kvs/Kv_{min.}$)	>50
Leakage A-AB	< 0.03% of Kvs
Leakage B-AB	< 2% of Kvs
ΔPm (mixing)	200 kPa, water
ΔPm (diverting)	60 kPa, water
Max. temperature of medium	150 °C
Min. temperature of medium	-10 °C
Max. glycol concentration	50%
Connections	Flange according to ISO 7005-2
Main construction materials	
Body	Grey Cast iron (GJL 250)
Stem	Stainless steel (AISI 303)
Plug (DN65 to DN100)	Brass (CW614)
Plug (DN125 to DN150)	Bronze (CB491K UNI EN 1982)
Seat	Grey Cast iron (EN JL 1040)
Stem packing	EPDM

Mixing Applications

VG311F–C					Max Close-off Pressure ΔPC (kPa)				
					Non-spring return actuators			Spring return	
Part number	**Type designation**	**DN**	**Kvs**	**Rangeability**	**M800**	**M1500/MV15B (1500N)**	**M3000**	**M700**	**MG900 SR**
VG311F-65C	VG311F-65C 63M SU00	65	63	>50	240	400	850	220	290
VG311F-80C	VG311F-80C 100M SU00	80	100		160	240	570	140	-
VG311F-100C	VG311F-100C 130M SU00	100	130		100	150	370	80	
VG311F-125C	VG311F-125C 200M SU00	125	200		60	90	230	50	
VG311F-150C	VG311F-150C 300M SU00	150	300		40	50	160	35	

Diverting Applications

0VG311F–C					Max Close-off Pressure ΔPC (kPa)				
					Non-spring return actuators			Spring return	
Part number	**Type designation**	**DN**	**Kvs**	**Rangeability**	**M800**	**M1500/MV15B (1500N)**	**M3000**	**M700**	**MG900 SR**
VG311F-65C	VG311F-65C 63M SU00	65	63	>50	80	135	285	75	85
VG311F-80C	VG311F-80C 100M SU00	80	100		53	80	190	45	-
VG311F-100C	VG311F-100C 130M SU00	100	130		33	50	125	25	
VG311F-125C	VG311F-125C 200M SU00	125	200		20	30	76	16	
VG311F-150C	VG311F-150C 300M SU00	150	300		13	16	55	12	

ΔPC = Maximum allowed pressure drop across a closed valve (that the nominal force of the actuator will open or close against).

SpaceLogic MG350

The **SpaceLogic** MG350 is a compact electro-mechanical actuator for controlling 2-way and 3-way globe valves V241/V341, V211, V211T, V311, and V311T. The MG350 actuators are primarily designed for applications where the demands on speed and thrust are relatively small.

- Stable force control with stall protection.
- Dual 3-Point floating and 2-position control.
- Sink or source floating control.
- High Resolution PCBA and motor transmission for fine valve plug position and excellent flow control.
- LED status indication.
- Tri-color LED for operation, calibration, and alarm notification.
- Removable terminal block and cable gland for ease of installation.

Specifications	
Supply voltage	24 Vac/Vdc ±20% 50/60 Hz
Power consumption (50Hz) **Running: MG350-24 (F)** **MG350-24 (M/MP/FP)** **Holding (M/MP/FP)**	 5.2 VA (3.5 W) 7.2 VA (3.5 W) 1.2 VA
Transformer sizing	(same as power consumption)
Running time	4 s/mm (Full stroke time = 80 sec)
Max. stroke	21.5 mm
Force	350 N
Control (Floating/Digital) **Dependant upon wiring** **3 Wire Floating** **2 Position on/off** **Minimum input pulse**	 24 Vac/Vdc or 0 V NO or NC 100 msec
Control (modulating) **Selectable input signals** **MG350-24M** **MG350-24MP** **Impedance**	 0 to 10Vdc, 2 to 10Vdc 0 to 10Vdc, 2 to 10Vdc, 4 to 20mA min. 100 kΩ
Environment **Operating temperature** **Storage**	 –5 to +55 °C (for valve fluid temperatures up to 130 °C) –40 to +70 °C
Humidity	max. 95%
Position feedback **MG350-(24MP/-24FP)**	 0 to 5 Vdc/2 to 10Vdc
Enclosure rating	IP 53 (vertically mounted)
Sound power level	max. 30 dBA
Weight (shipping)	0.36 kg
Material **Yoke** **Housing**	 Aluminum PBT/PC
Manual override	3 mm Hex
Position indication	Red and blue position markers for hot and cold pipe indication (green position indicator for closed valve)
Wiring entry **Cable Gland wire size**	 min. 2.4 mm to max. 6.6 mm

Part number	Control
MG350-24M	Modulating
MG350-24MP	Modulating with feedback and alarms
MG350-24F	Floating
MG350-24FP	Floating with feedback and alarms

SpaceLogic MG350C

The **SpaceLogic** MG350C is a compact electro-mechanical actuator for controlling the VG210 and VG310 2-way and 3-way linear globe valves. The MG350C actuators are primarily designed for applications where the demands on speed and thrust are relatively small.

- Stable force control with stall protection.
- Hysteresis Control - intelligent response to fluctuating control signals, extending actuator life and better plant regulation.
- High Resolution PCBA and motor transmission for fine valve plug position and excellent flow control.
- Low power holding.
- Auto adaptation to valve end stroke limits upon first power up.
- LED status indication.
- Tri-color LED for operation, calibration, and alarm notification.
- Removable terminal block and cable gland for ease installation.

Specifications	
Supply voltage	24 Vac/Vdc ±20% 50/60 Hz
Power consumption (50Hz)	
Running: MG350C-24F	5 VA (3.5 W)
MG350C-24M	7.2 VA (3.5 W)
Holding (modulating only)	1.2 VA
Transformer sizing	(same as power consumption)
Running time	8 s/mm (Full stroke time = 88 sec)
Max. stroke	16.5 mm
Nominal Force	350 N
Control (Floating/Digital)	
Dependant upon wiring	
3 wire Floating	24 Vac/Vdc or 0 V
2 Position on/off	NO or NC
Minimum input pulse	100 msec
Control (modulating)	
Selectable input signals	0 to 10Vdc, 2 to 10Vdc
Impedance	min. 100 kΩ
Environment	
Operating temperature	–5 to +55 °C (for valve fluid temperatures up to 130 °C)
Storage	–40 to +70 °C
Humidity	max . 95% RH (NC)
Enclosure rating	IP 53 (vertically mounted)
Sound power level	max. 30 dBA
Weight (shipping)	0.36 kg
Material	
Yoke	Aluminum
Housing	PBT/PC
Mechanical	
Manual override	3 mm Hex
Position indication	Red and blue position markers for hot and cold pipe indication (green position indicator for closed valve)
Wiring entry	
Cable Gland wire size	min. 2.4 mm to max. 6.6 mm
Conduit hole	M20

Part number	Control
MG350C-24M	Modulating
MG350C-24F	Floating

SpaceLogic M310, M400, M800, M1500 and M3000

The **SpaceLogic** M310, M400, M800, M1500 and M3000 are a family of actuators for the control of 2-way and 3-way globe valves.

A very fine resolution PCBA board provides good rangeability of the valve. The software in the actuator calibrates the running time and S2 switch points to the valve stroke limits. It may also be configured for different flow characteristics, inverse signal or sequence control.

The U-bolt mounting makes for a very easy and quick installation. The manual override allows the actuator to be overridden and valve position adjusted without disconnecting the power supply.

Specifications	
Supply voltage	
AC	24 Vac +25%/-35%, 50/60 Hz
DC	24 Vdc ±10%
Duty cycle	Max. 20%/60 minutes
Full Stroke Runtime	
Modulating	(refer to table)
Increase/decrease	300s/60s
Analog control input	
Selectable voltages	0 to 10V/ 2 to 10V/ 0 to 5 V/ 5 to 10/2 to 6/6 to 10
Impedance	Min. 100 kΩ
Digital inputs VH-HC	
Voltage across open input	24 Vac
Current through closed input	5 mA
S2 output – auxiliary end point switch (optional)	
Type	2 x SPDT
Voltage	24 Vac
Load	4A (resistive)/1A (inductive)
Regulated voltage output, G1	
Voltage	16 Vdc ±0.3 V
Load	25 mA, short-circuit proof
Position feedback, Y	
Voltage	2 to 10V (0 to 100%)
Load	2 mA
Environment	
Operating temperature	-10 to +50 °C
Storage temperature	-10 to +50 °C
Humidity	Max. 90% RH
Enclosure rating	
M310, M400, M800, M1500	IP54
M3000	IP55
Wiring entry	
Conduit connection	3 x M20 screwed
Cable gland	1 x 6–12 mm O/D, IP68
Main construction materials	
Housing	Aluminium
Cover	ABS/PC plastic
Color (M310, M400, M800, M1500)	Aluminium/Grey
Color (M3000)	Black/Grey

M310, M400, M800, M1500

M3000

SpaceLogic Actuators		Force	Modulating control Running time/stroke			Avg. power consumption	Transformer sizing
Part number	**Description**	**N**	**9-25 mm**	**25-32 mm**	**32-51 mm**	**VA**	
8800210030	M310	300	15s	20s	-	6	30
8800211030	M310 S2						
8800230030	M400	400	60s	60s		7	
8800231030	M400 S2						
8800310030	M800	800	15s	20s	30s	10	50
8800311030	M800 S2						
8800450000	M1500	1500				15	
8800451000	M1500 S2						
8800500000	M3000	3000	14-40s	40-50s	50-80s	25	

SpaceLogic MG900 SR

The **SpaceLogic** MG900 SR is a spring return actuator for the control of linear globe valves.

The Manual Override is operated by a hex key and can be locked into position for commissioning.

Regenerative Braking is used to control the actuator closing speed when the actuator is driven under the spring return force.

Specifications	
Supply voltage	24 Vac +25%/-30%, 50/60 Hz
Power consumption	Average 30 VA
Transformer sizing	50 VA
Spring return close off time at power failure	
20 mm stroke	Less than 50 seconds
32 mm stroke	Less than 95 seconds
Stroke range	9 to 30 mm
Thrust	900 N
Duty cycle	Max. 20%/60 minutes (and 80%/ 60 min.) for half load/amb. temp
Running time	
Modulating 10 to 25 mm (0.39 to 1 in.)	15s
Modulating 25 to 32 mm (1 to 1.26 in.)	20s
Increase/decrease	300s/60s
Analog input	
Voltage	0 to 10V/2 to 10V/0 to 5V/ 5 to 10/2 to 6/6 to 10
Digital inputs VH–VC	
Voltage across open input	24 Vac
Current through closed input	5 mA
Pulse time	Min. 20 ms
Output, G1	
Voltage	16 Vdc/20 Vdc ±0.3 V
Load	25 mA, short-circuit proof
Output, Y	
Voltage	2 to 10V (0 to 100%)
Load	2 mA
Wiring entry	
Conduit connection	4 x M20 capped holes
Cable gland	1 x 6–12 mm O/D, IP68
Environment	
Operating temperature	-10 to 50 °C
Storage temperature	-10 to 50 °C
Humidity	Max. 90% RH
Main construction materials	
Housing	Aluminium
Cover	Aluminium

Part number	Spring return Function	Type designation	IP Rating
MG900-SU	Stem up	MG900 SRU-24FM T54 00	54
MG900-SD	Stem down	MG900 SRD-24FM T54 00	

Part number	Description
8800104000	S2 auxiliary end point switches
AV-821	Linkage kit to VB-7000 valves
AV-822	Linkage kit to VB-8000 valves
8800109000	Yoke heater
MG900-SU-PCB	Circuit board for MG900 SRU
MG900-SD-PCB	Circuit board for MG900 SRD
8800124000	L2SV linkage kit to VZ and MZ Satchwell Valves.
8800129000	Linkage - M30 x 1.5, Spirax Sarco KE, KL, KF, DN15 to 100

SpaceLogic MG600C, MG600C-SR

The MG600C and MG600C-SRU/SRD are short yoke actuators designed for use with the VG210R and VG310R valves. Spring return and Non-spring return versions with Flexible control configuration (floating or modulating, sequencing), position feedback and flow curve adaptation (EQ to Lin).

- Brushless DC motors and a high resolution control board allow a very fine fluid control.
- Working range and end point switches adjust automatically to valve stroke.
- Firmware calibrates consistent running time regardless of valve stroke.
- On power loss the spring return mechanism drives the motor, generating power to control braking speed, avoiding mechanical stress and system water hammer.
- Available in spring return stem up or spring return stem down and either IP54 or rooftop IP65 enclosures.
- Configurable for either a 3-point increase/decrease signal or various modulating control signals including sequencing.
- U-Bolt connection allows direct mounting without any mounting kit or special tools.

Specifications	
Supply voltage	24 Vac +25%/-35%, 50/60 Hz
Duty cycle	Max. 20%/60 minutes
Analog control input Selectable voltages	 0 to 10V/2 to 10V/0 to 5V/5 to 10/2 to 6/6 to 10
Impedance	Min. 100 kΩ
Digital inputs (3-point floating) Voltage across open input	 24 Vac
Current through closed input	5 mA
Minimum pulse time	20 ms
S2 output – auxiliary end point switch (optional) Type Voltage Load	 2 x SPDT 24 Vac 4A (resistive)/1A (inductive)
Position feedback, Y Voltage Load	 2 to 10V (0 to 100%) 2 mA
Environment Operating temperature Storage temperature Humidity	 -10 to +50 °C -10 to +50 °C Max. 90% RH
Enclosure rating	IP54
Wiring entry Conduit connection 600C 600C-SR Cable gland	 3 x M20 screwed 4 x M20 screwed 1 x 6–12 mm O/D, IP68
Main construction materials Housing Cover Color	 Aluminium ABS/PC plastic Aluminium/Grey

MG600C

MG600C-SR

Part number	Designation	SR function	VG210R/ VG310R function on SR operation	Running time		Transf. sizing	Power consumption	
				Modulating	Increase/ decrease		(running)	(rest)
MG600C	MG600C-24FM T54 00	-	-	60s	300s/60s	30 VA	4W	3W
MG600C-SRU	MG600C SRU-24FM T54 00	Stem up	A-AB Closed	15s		50 VA	21W	7W

The MG600C (-SR) will not connect on to Satchwell or the 20 mm stroked valves. e.g. V211, V241.

MV15B

The MV15B is a powerful 3-point floating actuator for the control of 2-way and 3-way globe valves, available in both 24 Vac and 230 Vac versions. The actuator self adjusts to the stroke of whatever valve it is connected to. The U-bolt mounting makes for a very easy and quick installation. A manual override is standard on all models.

Specifications	
Supply voltage	24 Vac ±10%, 50/60 Hz 230 Vac ±10%, 50/60 Hz
Power consumption	12 VA
Transformer sizing	15 VA
Running speed	0.75 mm/s
Stroke range	9 to 52 mm
Thrust	1500 N
Running time for 20 mm	27s
Enclosure rating	IP 55
Wiring entry	
Conduit connection	2 x PG13.5 capped hole
Cable gland	1 x 6–12 mm O/D
Environment	
Operating temperature	15 to 50 °C
Storage temperature	-25 to 65 °C
Main construction materials	
Housing	Aluminium
Cover	ABS plastic
Color	Aluminium
Optional auxiliary travel switch	S2-MV15B
Type	SPDT 10A (resistive), 3A (inductive)
Capacity	250 V

MV15B actuators

Part number	Description	Power supply
		Vac +10%/ -10%
8800460000	MV15B-230	230
8800462000	MV15B-24	24

MV15B accessories and linkage kits

Part number	Description
8800126000	Linkage M700-Satchwell L7SV
8800469000	Switch S2-MV15B
8800109000	Yoke Heater for amb. temp -10 °C, media temp -8 °C

SpaceLogic M700 - Spring Return

The **SpaceLogic** M700 is a spring return actuator for control of longer stroked and larger size globe valves. It utilizes the same flexible platform functionality as in the M310, M400, M800, M1500, M3000 Non-spring return actuators so it has the same capability for self-adapting to the valve stroke, and the same flexibility in set-up configuration. The U-bolt mounting makes for quick installation. Manual override is standard on all models.

Specifications	
Supply voltage	24 Vac +25%/-30%, 50/60 Hz
Power consumption	Average 30 VA
Transformer sizing	50 VA
Spring return close off time at power failure 20 mm stroke 45 mm stroke	 Less than 50 seconds Less than 95 seconds
Stroke range	9 to 52 mm
Thrust	700 N
Duty cycle	Max. 20%/60 minutes
Running time Modulating 10 to 25 mm Modulating 25 to 32 mm Modulating 10 to 52 mm Increase/decrease	 15s 20s 30s 300s/60s
Enclosure rating	IP 54
Wiring entry Conduit connection Cable gland	 2 x PG13.5 capped hole 1 x 6–12 mm O/D
Environment Operating temperature Storage temperature Humidity	 -10 to 50 °C -10 to 50 °C Max. 90% RH
Analog input Voltage Impedance	 0 to 10V/2 to 10V/0 to 5V/5 to 10V/2 to 6V/6 to 10V Min. 100 kΩ
Digital inputs VH–VC Voltage across open input Current through closed input	 24 Vac 5 mA
Pulse time	Min. 20 ms
Position feedback Voltage Load	 2 to 10V (0 to 100%) 2mA

Part number	Description
8800430000	M700-SRSU
8800431000	M700-S2-SRSU
8800440000	M700-SRSD

Accessories

Part number	Description
8800126000	Linkage M700-Satchwell L7SV
8800109000	Yoke Heater for amb. temp -10 °C, media temp -8 °C

S2- Auxiliary end point switch
SRSU - Spring return stem up
SRSD - Spring return stem down
L7SV - Satchwell linkage to VZ and MZ valves

SpaceLogic M400, M800, M1500, MG600C

Electrical accessories

Part number	Description
8800104000	S2 – 2 x SPDT Axillary End Point Switches (24 Vac 4A AC-1)
8800109000	Yoke Heater for amb. temp -10 °C, media temp -8 °C

SpaceLogic M400, M800, M1500

Linkage Kits to other valves

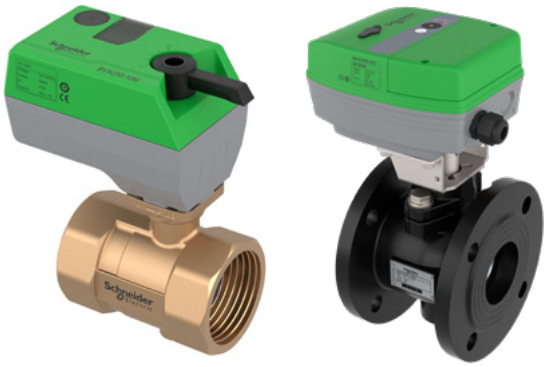
Part number	Description
8800124000	Linkage Satchwell L2SV: VSF-MJF-MZ, VZ-MZF- VZF
8800116000	Linkage Honeywell M6 and 6.25 mm (1/4") stem
8800118000	Linkage Siemens
8800125000	Linkage Danfoss
8800129000	Linkage Spirax Sarco (M30 x1.5 :KE, KF, and KL; DN15 to 100)
	Linkage – Controlli threaded valves with M30 bonnet types: VSB, VMB, VSB_F, VMB_F
8800128000	Linkage – Controlli Flanged Valves with M40 threaded bonnet VBG, SS, DS, VSS, VBA, 3V, VMS VSG, VMB16, SSGA
8800135000	Linkage Satchwell VZ 7*** and MZ 7*** series
	Regin/Osby: NTVS/GTRS/GTVS, 2SAS/2SBS, MTVS/MTRS, MRT and FRS
8800252000	Linkage TAC V298, DN15
8800253000	Linkage kit for old TAC DN15 valves -V282/ V294/ V384/ V386/ V394
8800130000	V321 DN65 to DN100 to M800/M1500/M3000 (convert from M16 actuator)
AV-821	Linkage to VB-7000 valves (Siebe/TAC)
AV-822	Linkage to VB-8000/VB-9000 valves (Siebe/TAC)
AV-823	Stem extension for VG210R/VG310R

Ball Valves and Actuators

The **SpaceLogic** Ball Valve and Actuator Program gives users the freedom and flexibility to easily optimize and precisely control a wide variety of applications in demanding environments.

Designed to be interchangeable and easily configured in the field, SpaceLogic Ball Valves and Actuators deliver the best of both worlds for a solution that speaks to your needs. The motorized control ball valves ensure stable, accurate floating and proportional control with a unique, low-force valve design and a compact actuator. This powerful duo offers the easiest installation and configuration.

BVA2...15...150 Control Ball Valves



Product Description

Schneider Electric's Control Ball Valves are a new generation of characterized control valves. The V-shaped ball core design provides a perfect equal percentage flow curve. Coupled with high precision valve actuators, CBVs ensure precise control at high flow capacity, often eliminating the need of a pipe reducer.

Applications include:
Hot and Chilled water coils in air handling units, unit ventilators and VAV boxes.

Features

- V-shaped ball core design creates a perfect equal percentage flow characteristic with exceptional stability.
- No pressure surge when the valve is opened or closed.
- High rangeability (>100:1) and close-off pressure.
- DIP switch selectable control functions addressing many different application requirements.

Actuator Specifications

Rated torque	3, 5, 10, 20, 50 N-m
Operating Voltage	24 Vac ± 15%, 24 Vdc ± 15%
Control	Modulating/3-position
Frequency	50 Hz or 60 Hz
Power Requirements (24 V)	
3, 5, 10 N-m Running	24V AC: 25 VA; 24V DC: 10 VA
20 N-m Running	24V AC: 30 VA; 24V DC: 12 VA
50 N-m Running	24V AC: 42 VA; 24V DC: 20 VA
Timing (90°)	30s
Sensitivity (proportional control only)	1.00%
Dead zone	3%
Actuator location protection class	IP54 for 3/5/10 N-m IP65 for 20/50 N-m
Impedance (proportional control only)	
Voltage input impedance	> 100 K
Current input impedance	< 0.2 K
Load requirement (proportional control only)	
Voltage output load	> 2 K
Current output load	< 0.4 K for 3/5/10 N-m < 0.5 K for 20/50 N-m
Control signal	0(2)-10 V, 0(4)-20 mA
Feedback signal	0(2)-10 V, 0(4)-20 mA
Environmental	
Operational Temperature	-15…+ 55 °C
Shipping Temperature	-25…+ 70 °C
Storage Temperature	-15…+ 55 °C
Humidity	≤95% RH
Main Construction Materials	
Actuator Cover	PC
Actuator Housing	PC for 3, 5, 10 N-m ASTM B85 Pressure die-cast aluminum, anti-corrosion coating for 20/50N-m
Agency Approvals and CE	PED directive 2014/68 / EU EMC directive 2014/30 / EU Low voltage directive 2014/35 / EU Machinery directive 2006/42 / EC

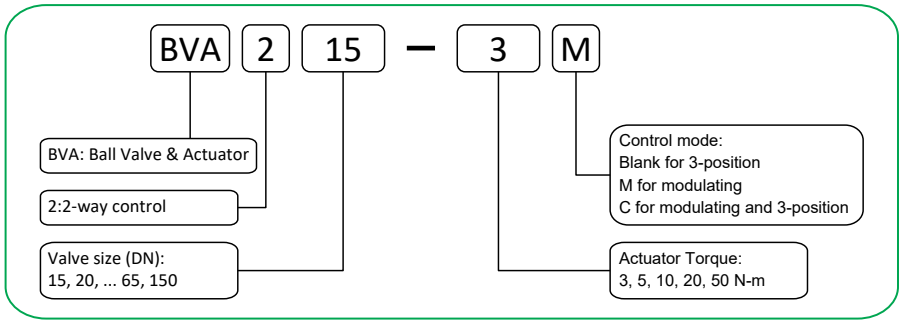
Valve Specifications

Size	DN15…DN150
Pressure	
DN15…DN50	PN25
DN65…DN150	PN16
Flow Characteristic	Equal Percentage
Rangeability	> 100:1
Leakage Rate	0...0.01% Kvs, no leakage on Pre-Delivery Inspection
ΔPm	Refer to the table on the next page
Media Compatibility	
Chilled or hot water	50% glycol concentration
Medium Temperature	-15…+120 °C
Connection Standard	
DN15…DN50	Female threaded connection ISO 7/1
DN65…DN150	Flanged connection ISO 7005-2
Main Construction Materials	
Valve Body	
DN15…DN50	Brass
DN65…DN150	Ductile Iron
Valve Core and Stem	Stainless Steel
Sealing Ring	FKM

Available Part Numbers

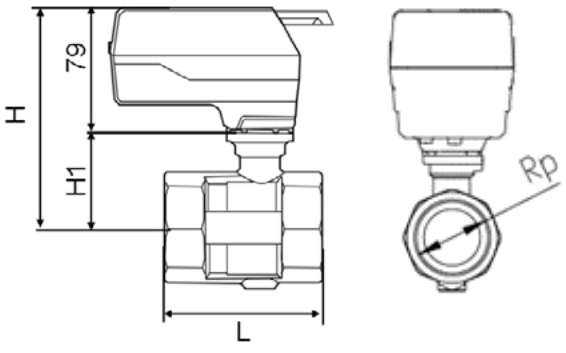
Size	Assembly Part No. (Recommended Order No.)	Control Signal	Actuator Torque	Maximum Close-off Pressure	Kvs (m^3/H)
DN15	BVA215-3M	0(2)~10V DC, 0(4)~20 mA	3	1400 kPa	5.5
	BVA215-3	3-position			
DN20	BVA220-3M	0(2)~10V DC, 0(4)~20 mA			10
	BVA220-3	3-position			
DN25	BVA225-3M	0(2)~10V DC, 0(4)~20 mA			18
	BVA225-3	3-position			
DN32	BVA232-5M	0(2)~10V DC, 0(4)~20 mA	5		23
	BVA232-5	3-position			
DN40	BVA240-5M	0(2)~10V DC, 0(4)~20 mA			35
	BVA240-5	3-position			
DN50	BVA250-5M	0(2)~10V DC, 0(4)~20 mA		500 kPa	60
	BVA250-5	3-position			
	BVA250-10M	0(2)~10V DC, 0(4)~20 mA	10	1400 kPa	
	BVA250-10	3-position			
DN65	BVA2065-20C	0(2)~10 V DC, 0(4)~20 mA, 3-position	20	800 kPa	120
DN80	BVA2080-20C				192
DN100	BVA2100-20C				279
DN125	BVA2125-50C		50		398
DN150	BVA2150-50C				540

Assembly Ordering



Dimensions

Size	G thread	L (mm)	H1 (mm)	H (mm)	kg
DN15	1/2	55	38	117	0.9
DN20	3/4	60	42	121	0.9
DN25	1	65	45	124	1
DN32	1 1/4	80	50	129	1.2
DN40	1 1/2	85	48	127	1.3
DN50	2	100	60	139	1.9



VB601R Valves and MB10 Series Actuators

The VB601R is a 6-port motorized ball valve that performs a diverting function between two water circuits in 4-pipe changeover system. The VB601R Valve will switch between heating and cooling with the addition of the **SpaceLogic** MB10 Two-Position Rotary Actuator.

Flow regulation is provided from an additional **SpaceLogic** PIBCV Valve and Actuator. This provides the additional benefit of having a balanced energy efficient solution with superb proportional control.

The control signal to the 6-port diverting valve actuator determines the direction of flow through the valve. Changing the control signal will rotate the actuator and switch the supply ports between heating and cooling or vice versa. During the 6-port valve motorization, the valve rotates through a mid point with all ports isolated and with no possibility to cross connect and mix the heating and cooling circuits.

Models exist for use with PIBCV SP90 Actuators: MB10-24T-PLUG, MB10-24T-ENGY and MB10-24T-FLEX.

Other features include:
- No cross-flow between supply circuits
- Single on/off control signal to change over supply circuits
- Visual indication of actual valve position
- Silent and reliable operation
- Maintenance free
- Teflon seal and polished chrome valve ball to prevent valve sticking
- Manual override

Specifications

Valve		
DN	15	20
Diff Pressure	3.6 kPa at Q_{nom} of 450 l/h DN15-STD Flow PIBCV	14 kPa Q_{nom} of 900 l/h DN20-STD Flow PIBCV
Kvs	2.4 m3/h	4.0 m3/h
Pressure class, PN	16 16	
Medium Temp.		0 – 90 °C
Shut off		800 kPa
Valve neck		Quick fix connection
Connection		Internal thread Rp 1/2 ISO 7/1
Weight		1140 g
Main construction materials:		
Body and connection		CW 602 N (DZR Brass)
Ball		CW 614 N Chrome plated
Stem		CW 614 N Nickel plated
Seals		P.T.F.E. (TEFLON)
O-ring		70 EPDM 281
Actuator		
Power supply		24 AC ± 20% V
Operating power consumption		5 VA (only when running)
Frequency		50/60 Hz
Running speed		80 sec/90°
Control input		2-point
Operating torque		10 Nm
Rotation angle		90 °
Environment		
Operating temperature		0 to 55 °C
Storage/transp. temp		−10 to 80 °C
Protection class (EN 60730-1)		II according
Enclosure rating		IP42
Weight		405 g
Connection cable (halogen free)		1.5 m 3×0.5 mm²

MB10 Actuators

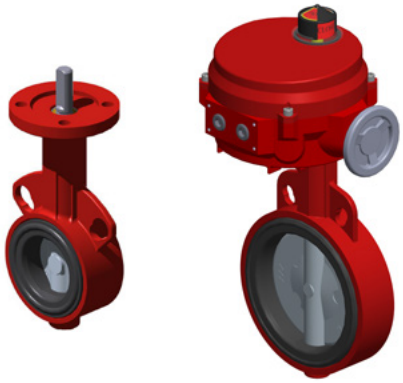
Cable length (m)	Part number	Associated Control Valve Actuators (fitted to PIBCV)
1.5	MB10-24T	MP130
10	MB10-24T-10M	
1.5	MB10-24T-PLUG	SP90
	MB10-24T-ENGY	
	MB10-24T-FLEX	

VB601R Valve bodies

DN	Kvs (m3/h)	Connection	Part number
15	2.4	Rp 1/2	VB601R-15B
20	4.0	Rp 3/4	VB601R-20B

Butterfly Valves and Actuators

Butterfly Valves are the ideal choice of product for isolation (on/off control) where needed within a plants heating system. The full range of Schneider Electric products can be electrically or manually operated.



VF208W 25-200NS and 100-200NZ

The VF208W is a new generation butterfly valve for the isolation and control of water for HVAC systems such as boiler isolation or heat pump change over from cooling to heating. The butterfly valves have elongated wafer type eyelets for fitment between flanges.

- Energy saving: EPDM soft seats provide tight shut off and zero leakage (complete insulation possible according to German energy saving order, EnEV).
- Approved for use with drinking water DN25-80 (DVGW).
- Maintenance free, double sealing of stem, centrical disc bearing.
- Good flow control characteristics.
- Integrated dew point barrier.
- No linkage kits required.

Specifications	
Pressure class	PN16
Leakage (EN 12266-1)	Tight, (Leakage Rate A)
Temperature range	-10 °C to +100 °C
Max glycol	50%
Main construction materials	
Body	Nodular Iron (EN-JS1030)
Lining	EPDM
Disc	DN25-200 (AISI316)
With zinc-lamella coating	DN100-200: (EN-JS1030)
Stem	1.4021-QT

Size	Kv	Stainless Steel Disc		Max ΔP (kPa)	Actuator
		Part number	Full type designation		
DN25	26	VF208W-25NS	VF208W-25NS 26E B00	600	MF20
DN32	26.5	VF208W-32NS	VF208W-32NS 26E B00	600	MF20
DN40	50	VF208W-40NS	VF208W-40NS 50E B00	600	MF20
DN50	115	VF208W-50NS	VF208W-50NS 115E B00	600	MF20
DN65	260	VF208W-65NS	VF208W-65NS 260E B00	600	MF20
DN80	375	VF208W-80NS	VF208W-80NS 375E B00	600	MF20
DN100	760	VF208W-100NS	VF208W-100NS 760E B00	600	MF20
DN125	1,025	VF208W-125NS	VF208W-125NS 1025E B00	600	MF40
DN150	1,790	VF208W-150NS	VF208W-150NS 1790E B00	300	MF40
DN200	3450	VF208W-200NS	VF208W 200NS 3450E B00	300	MF40

Size	Kv	Nodular Iron Disc		Max ΔP (kPa)	Actuator
		Part number	Full type designation		
DN100	760	VF208W-100NZ	VF208W 100NZ 760E B00	600	MF20
DN125	1,025	VF208W-125NZ	VF208W 125NZ 1025E B00	600	MF40
DN150	1,790	VF208W-150NZ	VF208W 150NZ 1790E B00	300	MF40
DN200	3450	VF208W-200NZ	VF208W 200NZ 3450E B00	300	MF40

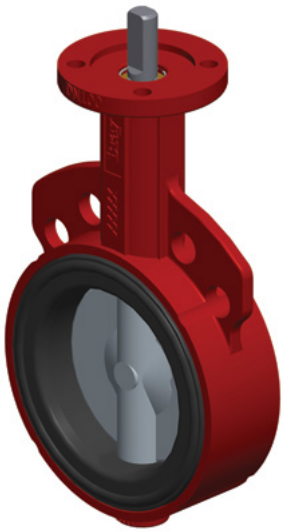
Contact Product Management for larger sizes.

VF299W-250 to 400CN

The VF299W is a general purpose, large butterfly valve with an undercut disc for low actuator torque.

- Wafer lugs for PN6, PN10 and PN16 pattern flanges.
- The EPDM soft-seat provides a tight close off with low torque actuator.
- Nylon 11 disc for compatibility with many media types including sea water.
- Manual adjustment through gearbox.

Specifications	
Pressure class	PN16
Leakage (EN 12266-1)	Tight, (Leakage Rate A)
Temperature range	-29 °C to 121 °C
Fluids	Hot and cold water with 50% Glycol vol. max. Well water, salt water
Main construction materials	
Body	ASTM A 126 ≈ GG25
Primary and secondary seal, seat	EPDM
Disc	GGG40 Nylon11 coated
Stem	1.4405-QT



Size	Kvs	Part number	Max ΔP (kPa)	Actuator	Gear operator
DN250	4670	VF299W-250CN	350	MF200	917 0300000
DN300	6946	VF299W-300CN		MF550/700	
DN350	9063	VF299W-350CN			917 0400000
DN400	12004	VF299W-400CN			

VF209W-50 to 500CN

The VF209W is a high pressure butterfly valve for heavy duty HVAC and industrial applications.

The VF209W can be used as a manual isolation valves or be controlled from a choice of Two-position on/off, 3-point floating and modulating actuators.

Wafer type connection for fitting between flanges. PN6 (DN50 to DN400), PN10, and PN16 (DN50-500).

- EPDM soft-seat provides a tight closing of the butterfly valve with the maximum close-off pressure.
- Suitable for cooling with salt, brackish and drinking water media from the Nylon 11 disc coating.
- Manual adjustment through a ten-position hand lever, gearbox or the handwheel on the actuators.

Specifications	
Pressure class	PN16
Leakage (EN 12266-1)	Gas tight, (Leakage Rate A)
Temperature range	-29 °C to 121 °C
Fluids	Hot and cold water with 50% Glycol vol. max. Well water, salt water
Main construction materials	
Body	Grey cast iron GG25
Primary and secondary seal, seat	EPDM
Disc	GGG40 Nylon11 coated
Stem	1.4405-QT

DN	Kvs[a]	Valve type/part no.	ΔP	Actuator type	Gear Operator
50	124	VF209W-50CN	1200	MF68	
65	243	VF209W-65CN			
80	397	VF209W-80CN			
100	723	VF209W-100CN			
125	1.083	VF209W-125CN			
150	1.591	VF209W-150CN			
200	2.852	VF209W-200CN		MF200	
250	4.67	VF209W-250CN		MF550/700	917 0300000
300	6.946	VF209W-300CN			
350	9.063	VF209W-350CN	1000	MF700	917 0400000
400	12.004	VF209W-400CN		MF1450	
450	14.804	VF209W-450CN			
500	19.212	VF209W-500CN		MF700	917 0500000

a - The recommended angle of rotation range for modulating control is between 15º and 70º. At a disc angle of 70º, the KV is 55% of the stated Kvs value.

MF20 (SR), MF20-R, MF40 (ER)

The MF20 and MF40 are robust reliable actuators for the control of the VF208W Butterfly Valves. These actuators mount to the VF208W Series Valves without linkage kits and connect using terminal blocks to simplify and reduce installation time.

- Models for floating/modulating/on-off control
- 2 to 10V Positional feedback on modulating models
- Latching manual override
- Direct handlever/position indicator
- Auxiliary switch available as an accessory
- Standard and Spring return/electronic return variants.

Actuators for VF208W Butterfly Valves

Suitable VF208W Valve	Loss of power function	Torque	Control	Part number	Supply Voltage	Power consumption			Operating time, 90°
						Rest	Operation	Transformer/ wire sizing	
DN25 to 100	Stop in place	20Nm	On-Off/3P	MF20-230F	230 Vac	0.4 W	3 W	7 VA	90 sec
				MF20-24F	24 Vac/Vdc	0.2 W	2.5 W	5.5 VA	
			2 to 10V	MF20-24M		0.4 W	2.5 W	5 VA	
	Spring return		On-Off	MF20SR-TS	24-230 Vac	3 W	7 W	18 VA	75 sec
			2 to 10V	MF20SR-24M	24 Vac/Vdc	3 W	5.5 W	8.5 VA	90 sec
DN125 to 200	Stop in place	40Nm	On-Off/3P	MF40-230F	230 Vac	2.5 W	5 W	9 VA	150 sec
				MF40-24F	24 Vac/ Vdc	2 W	4 W	6 VA	
			2 to 10V	MF40-24M		2 W	4.5 W	6.5 VA	
	Electronic return		On-Off	MF40ER-24T	24 Vac/ Vdc	3 W	11 W	21 VA	150 sec
			2 to 10V	MF40ER-24M					

The MF40 and MF40-ER will connect without linkage kit to the TRV-S valves DN150-200.
Note: Max ΔP Pressure for the valve remains (Max Valve ΔP is a function of construction, not the actuator).

MF20

MF40ER

MF40

Accessories

MD-S1, 1 x SPDT Auxiliary Switch	9141060000
MD-S2, 2 x SPDT Auxiliary Switch	9141061000

MF20SR

Hand Levers

DN25…65	9150065000
DN80…100	9150100000
DN125…200	9150200000

MF68, MF200, MF550, MF700, MF1450, MF2050

The direct-coupled IP65 rotary actuators are heavy duty dedicated actuators for VF209W and VF299W butterfly valves.

- Hand wheel for manual operation as standard
- Adjustable start/end point switch
- 2 additional auxiliary switches as standard
- Terminal connection
- Direct fit without any linkage kits
- Optical position display
- Suitable for outdoor and industrial environments (IP65)
- Very low maintenance
- Self-regulating heater to prevent condensation buildup within the actuator
- Adjustable positioning speed, 60 sec to 360 sec (modulating models)
- Control signal sensitivity adjustment (modulation models)

Suitable VF209W Valve	Suitable VF299W Valve	Control	Part number	Torque	Supply voltage	Power consumption			Operating Time 90°
						Rest	Operation	Wire Sizing	
DN50 to 150	-	Floating and On/Off	MF68-24F	68 Nm	24 Vac	5 W	43 VA	48 VA	60 sec.
DN200	DN250		MF200-24F	226 Nm			48 VA	53 VA	
DN250 to 300	DN300 to 400		MF550-24F	565 Nm			69 VA	77 VA	
DN50 to 150	-	0(2)-10V Modulating	MF68-24M	68 Nm		7 W	45 VA	50 VA	
DN200	DN250		MF200-24M	226 Nm			50 VA	55 VA	
DN250 to 300	DN300 to 400		MF550-24M	565 Nm			71 VA	79 VA	
DN50 to 150	-	Floating and On/Off	MF68-230F	68 Nm	230 Vac	5 W	140 VA	155 VA	36 sec.
DN200	DN250		MF200-230F	226 Nm			108 VA	120 VA	
DN250 to 350	DN300 to 400		MF700-230F	735 Nm			232 VA	258 VA	
DN400 to 450	-		MF1450-230F	1470 Nm			275 VA	305 VA	132 sec.
DN500	-		MF2050-230F	2034 Nm			315 VA	350 VA	

Damper Actuators

A wide program of damper actuator products are available from Schneider Electric, enabling the control of air movement from the smallest to the very largest air handling equipment.

Intelligent torque control is used in the motors for stall protection and low power holding providing a dependable range of products for the facility manager.

MD5A, MD10A, MD20A, MD40A

The MD–A are 2 to 10V modulating damper actuators designed for operating air control dampers in ventilation and air conditioning systems for building services installations.

As an accessory, these modulating actuators have a fully adjustable auxiliary switch unit.

Damper actuators can be used with mounting kits to drive selected butterfly valves.

Specifications	
Power supply	24 Vac ±20%, 50/60 Hz, 24 Vdc ±20%
Connection cable	1 m, 4×0.75 mm² (AWG 18)
Effective control signal range	2 to 10Vdc
Input signal range X	0 to 10Vdc
Input resistance	100 k Ohm
Operating range	2 to 10Vdc (for set angle of rotation)
Synchronisation tolerance	±5%
Position feedback Y	2 to 10Vdc (max. 1 mA)
Direction of rotation	Reversible with switch 0/1 at switch position 0 resp 1
Angle of rotation	Max. 95° (adjustable by mechanical stops)
Running time	150 s
Position indication	Mechanical
Manual override	Gearing latch disengaged with push-button, self-resetting, manual locking
Enclosure rating	IP 54
Humidity	95% RH, non-condensing
Environment Operating temperature Storage temperature	 -30 to +50 °C -40 to +80 °C
Maintenance	Maintenance free

Part number	Description	Torque	Power consumption		
		Nm	In operation	At rest	For transformer sizing
8751009000	MD5A-24	5	1 W	0.4 W	2 VA
8751019000	MD10A-24	10	2 W		4 VA
8751029000	MD20A-24	20			
8751039000	MD40A-24	40	4.5 W	2 W	6.5 VA

Description	For air control dampers area	Damper spindle	Spindle length, mm	Spindle diameter, mm
MD5	approx. 1 m²		min. 37	6 to 20
MD10	approx. 2 m²	Clamp on top	min. 40	8 to 26.7
		Clamp on bottom*	min. 20	8 to 20
MD20	approx. 4 m²	Clamp on top	min. 48	10 to 20
		Clamp on bottom	min. 20	
MD40	approx. 8 m²	Clamp on top	min. 52	12 to 26.7
		Clamp on bottom	min. 20	

* Optional accessory K-MD10 Part number 9141062000. For damper actuator accessories see “Damper Actuator Accessories” on page 75.

MD5B, MD10B, MD20B, MD40B

The MD–B are on/off damper actuators designed for operating air control dampers in ventilation and air conditioning systems for building services installations. The actuators are available in 24 Vac/Vdc or 230 Vac versions and versions with an integrated end point switch (-S types). The Auxiliary switch is also available as an accessory.

Damper actuators can be used with mounting kits to drive selected butterfly valves.

Specifications	
Connection cable	
Actuator	1 m, 3×0.75 mm2 (AWG 18)
Auxiliary switches (-S)	1 m, 3×0.75 mm2 (AWG 18)
Angle of rotation	max. 95° (adjustable by mechanical stops)
Running time	150 s
Direction of rotation	Reversible with switch 0/1 at switch position 0 resp 1
Position indication	Mechanical
Auxiliary switch	1 mA to 3 (0.5) A, 250 Vac
Switching point	(adjustable 0 to 100%)
Protection class	
MD–B-24(-S)	III Safety extra-low voltage
MD–B-230(-S)	II Totally insulated
Enclosure rating	IP 54
Humidity	95% RH, non-condensing
Environment	
Operating temperature	-30 to +50 °C
Storage temperature	-40 to +80 °C
Maintenance	Maintenance free

Part number	Description	Torque Nm	Power supply	Power consumption		
				In operation	At rest	For transformer sizing
8751001000	MD5B-230	5	230 Vac -60%/+15%	1.5 W	0.4 W	3.5 VA
8751003000	MD5B-230-S					
8751005000	MD5B-24		24 Vac/Vdc ± 20%	1 W	0.2 W	1.5 VA
8751007000	MD5B-24-S					
8751011000	MD10B-230	10	230 Vac -60%/+15%	2.5 W	0.6 W	5.5 VA
8751015000	MD10B-24		24 Vac/Vdc ± 20%	1.5 W	0.2 W	3.5 VA
8751021000	MD20B-230	20	230 Vac -60%/+15%	2.5 W	0.6 W	6 VA
8751025000	MD20B-24		24 Vac/Vdc ± 20%	2 W	0.2 W	4 VA
8751035000	MD40B-24	40		4 W	2 W	6 VA

Description	For air control dampers area	Damper spindle	Spindle length mm	Spindle diameter mm
MD5	approx. 1 m²		min. 37	6 to 20
MD10	approx. 2 m²	Clamp on top	min. 40	8 to 26.7
		Clamp on bottom*	min. 20	8 to 20
MD20	approx. 4 m²	Clamp on top	min. 42	10 to 20
		Clamp on bottom	min. 20	
MD40	approx. 8 m²	Clamp on top	min. 42	14 to 26
		Clamp on bottom	min. 20	

* Optional accessory K-MD10 part number 9141062000.

For damper actuator accessories see “Damper Actuator Accessories” on page 75.

LF24, LF230, LF24-SR

The LF series are compact, low-torque, spring return damper actuators suitable for controlling air dampers up to 0.8m² cross sectional area.

The LF24 and LF230 versions are on/off controlled. The LF24-SR version is for 0 to 10V modulating control with 2 to 10V position feedback.

Specifications	
Connection cable	2×0.75 mm² (AWG 18)
Angle of rotation	Max. 95° (adjustable 37 to 100% with additional limit stop ZDB-LF)
Torque Spring return	Min. 4 Nm (3 ft-lbf)
Running time Actuator	40 to 75 s (0 to 4 Nm (0 to 3 ft-lbf))
Spring return	Approx. 20 s (at -20 to +50 °C) max. 60 s (at -30 °C)
Direction of rotation	Selected by mounting L/R
Position indication	Mechanical
Enclosure rating	IP 54
Humidity	95% RH, non-condensing
Environment Operating temperature Storage temperature	 -30 to +50 °C -40 to +80 °C
Service life	min. 60,000 operations
Maintenance	Maintenance free

Part number	Description	Torque Nm	Control signal	Power supply	Power consumption		
					In operation	At rest	For transformer sizing
8740003000	LF24	4	on/off	24 Vac±20%	5 W	2.5 W	7 VA
8750003000	LF230			230 Vac±14%		3 W	
8770003000	LF24-SR		0 to 10V	24 Vac±20%	2.5 W	1 W	5 VA

For damper actuator accessories see “Damper Actuator Accessories” on page 75.

MD10 SR

The MD10 SR is a compact spring return damper actuator for the operation of ventilation dampers up to 2m² in building service installations.

Specifications

Motor Torque	Min. 10 Nm@ Nominal Voltage
Spring Return	Min. 10Nm
Running Time, Motor Modulating On/off Spring Return	 ≤150 s ≤75 s ≤20 s
Input Control signal range (X)	0...10 Vdc
Input Resistance	100 kΩ
Operational control signal range (modulating)	2...10 Vdc
Position Feedback (Y)	2...10 Vdc, max. 0.5mA
Position accuracy	+/- 5%
Cable Size -24M, -T, -24T S2 versions	1m 4 x 0.75 mm² 2 x 0.75 mm² 2+6 x 0.75 mm²
Direction of Rotation Motor Spring return	 Reversible with Switch I/O via mounting orientation, L / R
Manual Override	5 mm Hex key, supplied plus interlocking switch
Adjustable angle of rotation	0...Max 95°
Position indication	Mechanical
Protection Class 24 V versions 230 V versions	 III Extra low Voltage II Totally insulated

Enclosure rating	IP54
Humidity	95% r.h. Non-condensing
Environment Operating Temperature Storage Temperature	 -30 °C...+ 50 °C -40 °C...+ 80 °C
Sound power level Motor Spring return	 ≤40 dB (mod.) 45dB (on/off) ≤62 dB
Service Life	Min.60,000 emergency positions
Maintenance	Maintenance free
Weight	2.1Kg

Part number	Type Designation	Torque Nm	Power Supply	Power Consumption			Control Signal
				In Operation	At Rest	For wire sizing	
MD10SR-T	MD10 SR-24/230T 1M54 00	10	24...240 Vac / 24...125 Vdc	6W	2.5W	9.5VA	On/Off
MD10SR-TS	MD10 SR-24/230FTS 1M54 00						
MD10SR-24T	MD10 SR-24T 1M54 00		24 Vac/Vdc			8.5VA	
MD10SR-24TS	MD10 SR-24TS 1M54 00						
MD10SR-24M	MD10 SR-24M 1M54 00			3.5W		5.5VA	2...10 V Mod.

Spindle Clamp

Damper Spindle Attachment		Spindle length	Spindle diameter ●	Spindle diameter ■	Spindle diameter ◆
Clamp on Top	With Insert	≥85 mm	10...22 mm	10 mm	14...25.4 mm
	Without Insert		19...25.4 mm	12...18 mm	
Clamp on Bottom	With Insert	≥15 mm	10...22 mm	10 mm	14...25.4 mm
	Without Insert		12...18 mm	19...25.4 mm	

For damper actuator accessories see “Damper Actuator Accessories” on page 75.

MD20 SR

The MD20 SR is a compact spring return damper actuator for the operation of ventilation dampers up to 4m² in building service installations.

Specifications

Motor Torque	Min. 20 Nm@ Nominal Voltage
Spring Return	Min. 20Nm
Running Time, Motor Modulating On/off Spring Return	 ≤150 s ≤75 s ≤20 s
Input signal range, modulating (X)	0…10 Vdc
Effective Control Signal range, modulating	2…10 Vdc
Input Resistance	100 kΩ
Position Feedback (Y)	2…10 Vdc, max. 0.5mA
Position accuracy	+/- 5%
Cable Size -24M, -T, -24T S2 versions	1m, 0.75 mm² 4 x 0.75 mm² 2 x 0.75 mm² 2+6 x 0.75 mm²
Direction of Rotation Motor Spring return	 Reversible with Switch I/O via mounting orientation, L / R
Manual Override	5 mm Hex key, supplied plus interlocking switch
Adjustable angle of rotation	0…Max 95°
Position indication	Mechanical
Protection Class 24 V versions 230 V versions	 III Extra low Voltage II Totally insulated

Enclosure rating	IP54
Environment Operating Temperature Storage Temperature	 -30 °C…+ 50 °C -40 °C…+ 80 °C
Humidity	95% r.h. Non-condensing
Sound power level Motor Spring return	 ≤40 dB (mod.) 45dB (on/off) ≤62 dB
Service Life	Min.60,000 emergency positions
Maintenance	Maintenance free
Weight	2.1Kg

Part number	Type Designation	Torque Nm	Power Supply	Power Consumption			Control Signal
				In Operation	At Rest	For wire sizing	
MD20SR-T	MD20 SR-24/240T 1M54 00	20	24…240 Vac / 24…125 Vdc	6.5W	3.3W	18VA	On/Off
MD20SR-TS	MD20 SR-24/240TS 1M54 00						
MD20SR-24T	MD20 SR-24T 1M54 00		24 Vac/Vdc	5W	2.5W	7.5VA	
MD20SR-24TS	MD20 SR-24TS 1M54 00						
MD20SR-24M	MD20 SR-24M 1M54 00				3W	7VA	2…10 V Mod.

Spindle Clamp

Damper Spindle Attachment		Spindle length	Spindle diameter ●	Spindle diameter ■	Spindle diameter ◆
Clamp on Top	With Insert	≥85 mm	10…22 mm	10 mm	14…25.4 mm
	Without Insert		19…25.4 mm	12…18 mm	
Clamp on Bottom	With Insert	≥15 mm	10…22 mm	10 mm	14…25.4 mm
	Without Insert		12…18 mm	19…25.4 mm	

For damper actuator accessories see “Damper Actuator Accessories” on page 75.

MD40 ER

The MD40 Electronic Return (SuperCap) Damper Actuator is a powerful rotary damper actuator with super capacitor technology for positional electronic drive return in the event of a power failure.

- Air dampers up to 8m^2
- 24 Vac/Vdc
- 2 to 10V position feedback
- Long life supercaps.

Specifications	
Power supply	AC: 19.2 to 28.8V; 50/60 Hz DC: 21.6 to 28.8V
Running time Motor driven Capacitor driven	 150 s/90° 35 s/90°
Control signal Range of operation (X)	 2 to 10Vdc
Input resistance	100 kΩ
Position feedback (Y)	2 to 10Vdc, max. 0.5 mA
Position accuracy	+/- 5%
Functional data Electronic return position	 0 to 100% of max. angle or rotation (POP dial)
Direction of rotation Motor (mod.)	 Reversible with Switch 0/1
Electronic Return (SuperCap) Position	0 to 100% (any position between, as set by POP dial)
Angle of Rotation	Max. 95°, limited both ends, adjustable end stops
Position Indication	Mechanical
Environment Operating temperature Storage temperature	 -30 to +50 °C -40 to +80 °C
Humidity	95% r.h. Non-condensing
Weight	approx. 1.8 kg
Safety Protection class Enclosure rating	 III Safety Extra Low Voltage/ UL Class 2 Supply IP54 NEMA2, UL Enclosure Type 2

Part number	Control	Torque	Power consumption		
		Nm	In operation	At rest	For transformer sizing
MD40ER-24M	Modulating	Min. 40 Nm	11 W @ nominal torque	<3 W	≤21 VA
MD40ER-24T	Two-Position				

Description	For air control dampers area	Damper spindle	Spindle length, mm	Spindle diameter, mm
MD40	approx. 8 m²	Clamp on top	min. 52	12 to 26.7
		Clamp on bottom	min. 20	

For damper actuator accessories see “Damper Actuator Accessories” on page 75.

Damper Actuator Accessories

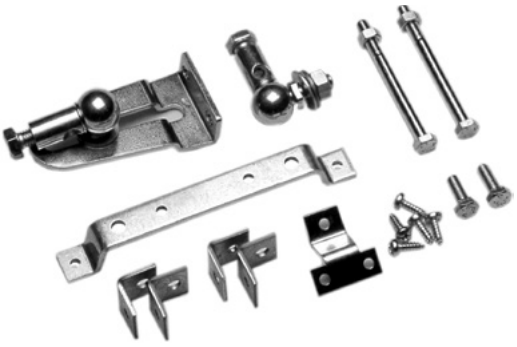
KH8

ZDB-AF

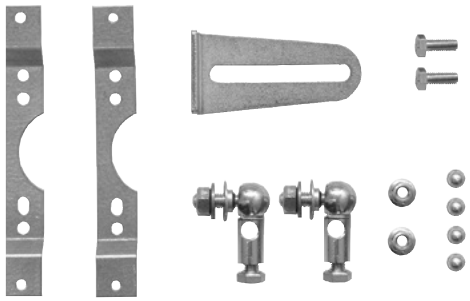
ZDB-LF

K-MD10

AV8-25



ZG-AF



ZG-MD20

Mechanical Accessories

Name	Description	Part number	MD5	MD10	MD20	MD40	LF	MD10 SR	MD20 SR
AV8-25	Shaft extension Length approx. 250 mm For damper spindles 8 to 25 mm dia. or 10 to 25 mm square	914-1023-010		●	●		●	●	●
K-MD10	Reversible spindle clamp	914-1062-000		●					
ZDB-LF	Angle of rotation limiter and pointer	914-1045-000					●		
ZG-MD20	Parallel lever linkage kit	914-1063-000			●				
Z-AF	Mounting plate adaptor for anti-rotation strap-- Retrofitting MD20 SR or MD10 SR from AF installation	914-1047-000						●	●

Electrical Accessories

Name	Description	Part number	MD5	MD10	MD20	MD40	LF	MD10 SR/MD20 SR
MD-S1	Auxiliary switch, add-on 1×SPDT 1 mA to 3(0.5) A, 250 Vac	914-1060-000						Actuators only available with integrated switches
MD-S2	Auxiliary switch, add-on ×SPDT1 mA to 3(0.5) A, 250 Vac	914-1061-000	●	●	●	●		

Auxiliary Switch
MD-S2

Specialist Products

Specialist products provide solutions for our wide installation base or the more demanding hydronic applications, such as globe and zone valves capable of handling higher pressure drops typically experienced in high rise buildings.

MZ18A, MZ18B

The MZ18 is a compact electro-mechanical zone valve actuator designed for use with the legacy VZ*2 valves.

These actuators feature reliable long term operation ensured from a simple design without the need for end switches. Visual position indication on all models.

Specifications	
Supply voltage	24 Vac
Running time (full stroke, 50 Hz)	150 s
Stroke	6.5 mm
Force	180 N
Connection cable	1.5 m
Coupling ring	M 30 x 1.5
Enclosure rating	IP 42

Part number	Description	Control	Power consumption	Ambient temperature
8455100000	MZ18A-24	0 to 10V, 2 to 10V, Direct/ Reverse	1.4 VA	0 to 55 °C
8455101000	MZ18B	3 Point Floating	0.7 VA	0 to 60 °C

MZ95

The MZ95 is a thermal zone valve actuator designed for use with the VZ*2 Valves.

Normally used for on/off two-position control but PWM is possible with the appropriate controller.

A discreet design with high IP rating in any orientation, clear position indication and alternative cable lengths.

Specifications	
Supply voltage	24 Vac
Power consumption	2 W
Stroke	8 mm
Force	95 N
Connection cable	2.5 m
Coupling ring	M 30 x 1.5
Ambient operating temperature	0 to 55 °C
Enclosure rating	IP 44

Part number	Voltage	Actuator stem action (2-way valve function)
MZ95NO-230T	230 Vac	Stem up (normally open)
MZ95NC-230T	230 cac	Stem down (normally closed)
MZ95NC-24T	24 Vac/Vdc	Stem down (normally closed)
MZ95NO-24T	24 Vac/Vdc	Stem up (normally open)

V222

The V222 is a large flanged balanced globe valve, suitable for control of large flows in heating and air conditioning systems. The balanced plug enables a low actuating force to control the valve. A stainless steel seat allows a large pressure drop across the valve.

Suitable for a wide range of applications using hot water or de-aerated cooling water.

Specifications	
Design	2-way pressure balanced plug valve, stem down, closed
Pressure class	PN16
Flow characteristic	Equal Percentage
Stroke	
DN65 to DN100	30 mm
DN125 to DN150	50 mm
Rangeability (Kvs/Kvmin.)	>50
Leakage	<0.5% (%of Kvs)
Stem	
DN 65 to 100	M8
DN 125 to 150	M16 (fitted with Hex Bush for M22/M50 actuators)
Max. temperature of medium	150 °C
Min. temperature of medium	-10 °C
Connection	Flange according ISO 7005-2
Max. glycol/concentration	50%
Main construction materials	
Body	Grey Cast Iron GG25
Stem	Stainless steel SS 1.4021
Plug	Stainless steel SS 1.4021
Seat	Stainless steel SS 1.4021
Packing box	Spring-loaded PTFE-V-ring

Part number	DN	Kvs	ΔPm (kPa)	Rangeability	Max close-off pressure (kPa)						
					Non-spring return actuators						Spring return
					M800	M1500	MV15B (1500N)	M3000	M22 (2200N)	M50 (5000N)	M700
7212254010	65	63	800	>50	1500	1600	1600	1600	-	-	1200
7212258010	80	85	400								
7212270000	150	350	100		-				1400	1600	-

Service kit:
Replacement stem packing box:
DN65 to DN100: 100108201
DN125 to DN150: 100108210

Replacement stem adaptor/hex bush:
DN125 to DN150: 8800134000

V321

The V321 is a large flanged valve with a stainless steel seat for high pressure drops.

The valve is suitable for a wide range of mixing applications with hot or chilled water in heating cooling and air handling systems.

If the valve is used for media at temperatures below 0 °C , it should be equipped with a heater to prevent ice formation on the valve stem.

Specifications

Design	3-way plug mixing valve stem up closed (A port/B-AB open)
Pressure class	PN16
Flow characteristics	
A – AB	Equal Percentage
B – AB	Linear
DN 65 to 100	30 mm
DN 125 to 150	40 mm
Leakage	
A – AB	<0.5% (%of Kvs)
B – AB	<0.5% (%of Kvs)
Stem	
DN 65 to 100	Ø10 mm, M10 thread connection (fitted with **SpaceLogic** stem adaptor to M8)
DN 125 to 150	Ø10 mm, M10 thread connection (fitted with Hex Bush for M22/M50)
Max. temperature of medium	130 °C
Min. temperature of medium	-10 °C
Max. glycol/concentration	50%
Main construction materials	
Body	Grey Cast Iron GG25
Stem	
DN 65 to 100	Stainless steel SS 1.4571
DN 125 to 150	Stainless steel SS 1.4021
Plug	Stainless steel SS 1.4021
Seat	Stainless steel SS 1.4021
Stem packing	EPDM

Mixing Application

V321					Max close-off pressure (kPa)						
					Non-spring return actuators						Spring return
Part number	**DN**	**Kvs**	**ΔPm**	**Rangeability**	**M800**	**M1500**	**MV15B (1500N)**	**M3000**	**M22 (2200N)**	**M50 (5000N)**	**M700**
7312153020	65	63	100	>30	140	290	290	700	-	-	80
7312157020	80	100	80		80	180	180	440			40
7312161020	100	160	60		40	110	110	280			-
7312165010	125	220			-				60	240	
7312169010	150	320									

Service kit: Replacement stem packing box:
DN65 to DN150: 100108220
Pre 2007, DN125 to DN150 with 18 mm stem dia: 100108210
Conversion kit V321 with old M16 actuator to SpaceLogic connection: 8800130000

Replacement Stem adaptors
DN65 to DN100: 8800133000
DN125 to DN150: 100108240

Diverting Application

Size		Kvs	ΔPm	Max close pressure, ΔPC (kPa)					
DN	**In.**	**m3/h**	**kPa**	**SpaceLogic M800**	**SpaceLogic M1500/ MV15B**	**SpaceLogic M3000**	**SpaceLogic M700 SR**	**M22****	**M50****
65	2½"	63	100	70	145	350	40	-	-
80	3"	100	80	45	60	220	20	-	-
100	4"	160	60	25	55	140	-	-	-
125	5"	220	60	-	-	-	-	-	-
150	6"	320	60				-	35	110

M22, M50

The M22 and M50 Actuators are powerful actuators suitable for driving DN125 and DN150 sizes of valve types V222, V292 and V321. Position feedback is not available with this actuator.

Specifications

Supply voltage	24 Vac +10%/-15%, 50/60 Hz
Power consumption	Average 15 VA
Running time	0 to 50 mm 50Hz, 132s 60Hz,112s
Duty cycle	Max. 80%/60 minutes
Analog input	
Voltage	0 (2) to 10V
Impedance	30 kOhm
Current	0 (4) to 20 mA
Impedance	125 Ohm
Environment	
Operating temperature	-20 to +70 °C
Storage temperature	-20 to +70 °C
Humidity	<95 %RH
Enclosure rating	IP 65
Standards	EN 50081-1: 03.1993
Emission	EN 50082-1: 11.1997
Immunity	EN 50082-2:02.1996
Material	
Housing	CoPA – Grivory GV-4H
Cover	PC – Polycarbonate
Weight	5
M22A	.4 kg
M50A	6.0 kg
Optional travel switch S2	
Type	Zero potential
Capacity	10A, 250 V

Modulating Actuators

Part number	Description	Force (N)
8900104000	M22A-24 V	2200
8900204000	M50A-24 V	5000

MB

The MB is a 3-port screwed rotary shoe valve.

Specifications	
Design	3-way rotary shoe valve
Pressure class	PN10
Flow characteristic	Port 2 Modified parabolic
Operating angle	90°
Rangeability (Kvs/Kvmin.)	>50
Leakage	0.5% (%of Kvs)
Max. temperature of medium Min. temperature of medium	120 °C 2 °C
Connection	Screwed Parallel (female) BSP to BS21
Main construction materials	
Body 12.7 to 25.4 mm (½" to 1") valves Body 31.75 to 50.8 mm (1¼" to 2" valves)	Close Grained Cast Iron BS1452 Grade 260
Body 65 mm to 100 mm	Close Grained Cast Iron BS1452 Grade 260 or 220High
Spindle	Tensile Brass to BS2874 CZ114
O rings	EPDM

MB					Max close-off pressure kPa	
Valve Part number	Size mm (inches)	Reconditioning Kit Part number	Kvs	Rangeability	RM XRM	MD10B MD10A
					2Nm	10Nm
MB1402	Rp 1/2	0617-9-410	2.0	>50	70	
MB1452	Rp 3/4	0617-9-410	4.0			
MB1502	Rp 1	0617-9-410	8.3			
MB1552	Rp 1¼	0617-9-411	12.5		35	
MB1602	RP 1½	0617-9-412	21			
MB1652	Rp 2	0617-9-413	33			

The MD10 is a damper actuator requiring a linkage kit for use with the MB shoe valves. (LMD/MB linkage kit Part number 9141071000).
Order auxiliary switches separately, type MD-S2 Part number 9141061000, type MD-S1, Part number 9141060000.

MBF

The MBF is a 3-port flanged rotary shoe valve suitable for both mixing and diverting circuits. The Valve is operated with a linkage kit and the MD20 Damper Actuator.

Specifications	
Design	3-way rotary shoe valve
Pressure class	PN6
Flow characteristics	Port 3 Linear
Operating angle	90°
Rangeability (Kvs/Kvmin.)	>50
Leakage	0.5% (%of Kvs)
Max. temperature of medium	110 °C
Min. temperature of medium	2 °C
Connection	
MBF	Flanged BS4504, Table 6/11
Main construction materials	
Body 12.7 to 25.4 mm (½" to 1") valves	Hot Pressed Brass to BS218
Body 31.75 to 50.8 (1¼" to 2") valves	Close Grained Cast Iron BS1452 Grade 260
Body 65 mm to 100 mm	Close Grained Cast Iron BS1452 Grade 260 or 220
Spindle	High Tensile Brass to BS2874 CZ114
O Rings	EPDM

MBF					Max close-off pressure kPa
Valve number	DN	Spares Reconditioning Kit	Kvs	Rangeability	MD20B MD20A
					20Nm
MBF4732	65	0618 9 510	65	>50	35
MBF4782	80	0618 9 511	83		25
MBF4857	100	0618 9 512	125		

The MD20A/B is a damper actuator requiring linkage kit (LMD/MBF Part number 9141070000).
Order auxiliary switches separately:
Type MD-S2 Part number: 9141061000
Type MD-S1 Part number: 9141060000.

MG350S

The MG350S is a compact electro-mechanical actuator for controlling the VZX and MZX 2-Way and 3-Way Linear Globe Valves. The MG350S actuators are primarily designed for applications where the demands on speed and thrust are relatively small.

- Stable force control with stall protection
- Hysteresis control - intelligent response to fluctuating control signals, extending actuator life and better plant regulation
- High resolution PCBA and motor transmission for fine valve plug position and excellent flow control.
- Low power holding
- Auto adaptation to valve end stroke limits upon first power up
  - LED status indication
- Tri-color LED for operation, calibration, and alarm notification
- Removable terminal block and cable gland for ease installation.

Specifications	
Supply voltage	24 Vac/Vdc ±20% 50/60 Hz
Power consumption (50Hz) Running: MG350S-24M MG350S-24F Holding (modulating only)	 7.2 VA (3.5 W) 5 VA (3.5 W) 1.2 VA
Transformer sizing	(same as Power consumption)
Running time	8 s/mm (Full stroke time = 102 sec)
Max. stroke	16.5 mm
Nominal Force	350 N
Control (Floating/Digital) Dependant upon wiring 3 wire Floating 2 Position on/off Minimum input pulse	 24 Vac/Vdc or 0 V NO or NC 100 msec
Control (modulating) Selectable input signals Impedance	 0 to 10Vdc, 2 to 10Vdc min. 100 kΩ
Environment Operating temperature Storage	 –5 to +55 °C (for valve fluid temperatures up to 130 °C) –40 to +70 °C
Humidity	max . 95% RH (NC)
Enclosure rating	IP 53 (vertically mounted)
Sound power level	max. 30 dBA
Weight (shipping)	0.36 kg
Material Yoke Material Housing (Covers)	 Aluminum PBT/PC
Mechanical Manual override	 3 mm Hex
Position indication	Red and blue position markers for hot and cold pipe indication (green position indicator for closed valve)
Cable Gland wire size	6 to 12 mm
Conduit hole	M20

Part number	Control
MG350S-24M	Modulating
MG350S-24F	Floating

MZ300S

The MZ300S Actuator is a universal actuator that can drive many valves with an M30 Bonnet. It is supplied with an adapter to drive the Satchwell VUE, MEU and FEU Zone Valves, the VP224R PICV Valve and for a specific 230 Vac model, the VZX and MZX Globe Valve.

Proportional models are equipped with 3 operation and alarm LED's.

Specifications	
Power supply	
MZ300S-24x	24 Vac ±10%
MZ300S-230F	230 Vac ±10%
Power consumption	
MZ300S-24F	2.2 VA/2,2 W
MZ300S-24M	3.6 VA/3 W
MZ300S-230F	16.2 VA/1.1 W
Frequency	50/60Hz
Speed	11.5s/mm at 50Hz - 9.4s/mm at 60Hz
Force	300 N
Environment	
Operating temperature	-5 to 55 °C
Storage temperature	-25 to 65 °C
Protection class	II
Connection cable	
MZ300-24F/MZ300-230F	3-wire 1.5m
for MZ300S-24M	5-wire 1.5m
(CEI20-22/II)	
Protection degree	IP43
Weight	0.250 kg
Feedback signal (MZ300-24M)	2 to 10V reversible (according to dip switch configuration)

Part number	Control signal	Power supply	Max. stroke
MZ300S-230F	3 point - ON/OFF	230 Vac	16 mm
MZ300S-24F		24Vac	
MZ300S-24M	0 to 10V Modulating		

MC52

MC52 is an zone actuator designed to provide modulating control together with the old V354 valves using an adapter. Due to an automatic synchronization function the close-off point is self-adjusting. Based on a running time of 155 s, valve positioning and flow adjustment is very exact.

MC52 Actuator Adapter

Specifications	
Range	7 different command fields to be selected with embedded dip-switches and direct/reverse action
Input voltage	24 Vac 50/60 Hz
Power consumption	1 VA
Speed	18 s/mm (50 Hz) - 15 s/mm (60 Hz)
Environment	
Operating temperature	-5 to 55 °C
Storage temperature	-25 to 65 °C
Stem force	200 N (45 lbf)
Max stroke	8.5 mm
Connection cable	3 wires 1.5 m (5 ft)
Protection class	IP43 (for vertical mounting)
Suitable valve	V354 - PN 731-5425-000

Part number	Description	Control	Input voltage
8532221010	MC52A-24	Modulating	24 Vac 50/60 Hz
8531320000	MC52B-230	Floating	230 Vc 50/60 Hz
8532320000	MC52B-24		24 Vac 50/60 Hz

MP200

MP200 is an compact linear actuator for driving the 5 mm Frese Optima Compact PIBCV and the former VP223R Short Stroke Pressure Independent Control Valve. Versions available as either 3 point floating or 0 to 10Vdc modulating control. A full stroke run time of 60 seconds provides very precise flow control. Stroke indication and manual override on all models.

Specifications	
Force	200 N
Stroke range	3.5 mm to 5 mm
Speed	18s/mm (50Hz), 15s/mm (60Hz)
Connection cable	3 wire 1.5 m
Full stroke time on VP223R valve	63s (50Hz), 52s (60Hz)
Recommended controller 'time out' function	120% of full stroke time (floating modules)
Supply voltage **MP200-24F/MP200-24M** **MP200-230F**	 21.6 to 26.4 Vac (50/60Hz) 207 to 253 Vac (50/60Hz)
Power consumption **MP200-24F** **MP200-230F** **MP200-24M**	 0.6W (0.7VA) 1W (5VA) 1.0W (1VA)
Environmental **Working temperature** **Storage temperature** **Protection class**	 -5 to 55 °C -25 to 65 °C IP43/IP41 dependant on mounting orientation)
Sound power level	35 dBa
Weight	162g
Humidity	Max 95% non-condens-ing

Part number	Control	Voltage
MP200-24M	Modulating Control	0 to 10V
MP200-24F	3 Point Floating	24 V

Note: The floating actuators (MP200-24F/MP200-230F) have no end switches for automatic shut off when the valve is fully open or closed. These floating actuators are intended for use with controllers with a time out facility. If the floating actuators are to be used with an on/off thermostat, a separate delay off timer should be used to cut the driven power to the actuator.

MR90

The MR90 is a range of low cost and simple thermal actuators that are available in all voltages and Normally Open (NO) or Normally Closed (NC) functions.

Specifications	
Part number	
MR90 NC	MR90NC-230 MR90NC-24T
MR90 NO	MR90NO-230T MR90NO-24T
Type designation	
MR90 NC	MR90 NCD-230T 2M43 00 MR90 NCD-24T 2M43 00
MR90 NO	MR90 NOU-230T 2M44 00 MR90 NOU-24T 2M44 00
Normal stem position (without power)	
MR90 NC	Down (Extended)
MR90 NO	Up (Retracted)
Input voltage	
MR90NC/NO-230T	110 to 230 Vac 50/60 Hz
MR90NC/NO-24T	24 Vac/dc 50/60 Hz
Power consumption	1.8 W
Power consumption at start up	
MR90NC/NO-230T	50 VA
MR90NC/NO-24T	4 VA
Opening/closing time	Refer to specification sheet 03-00247
Max. stroke	4 mm
Force, nominal	90 N
Environment	
Operating temperature	2 to 50 °C
Storage temperature	-45 to 50 °C
Enclosure rating	
MR90NC	IP43 (Vertical mount) IP41 (Horizontal mount) IP40 (Upside down)
MR90NO	IP44
Connection thread	M30 x 1.5
Main construction materials	
Fire-resistant case	Class V0
Cable	
MR90NC	2 m bipolar (0.35 mm²), white
MR90NO	2 m bipolar (0.75 mm²), white
Cable diameter	
MR90NC	4.5 mm
MR90NO	6 mm
Weight	
MR90NC	118 gr
MR90NO	188 gr

MR90 NC

MR90 NO

Part number	Type designation	Voltage	Function - without power
MR90NC-230T	MR90 NCD-230T-2M43 00	110-230 V ac	Stem down - normally closed
MR90NC-24T	MR90 NCD-24T-2M43 00	24 Vac/dc	
MR90NO-230T	MR90 NOU-230T-2M44 00	110-230 V ac	Stem up - normally open
MR90NO-24T	MR90 NOU-24T-2M44 00	24 Vac/dc	

TR32/TR60 Transformer

Accessories and spare parts

Description	Part no.
Circuit board M400 Spare	100106730
Circuit board M800 Spare	100106740
Circuit board M315 Spare	100106750
Circuit board M310 Spare	100106760
Circuit board M1500 Spare	100106770
Circuit board M700-SRSU Spare	100106780
Circuit board M700-SRSD Spare	100106790
Adapter DN15-V298	8800252000
Adapter DN15-V2XX/V3XX	8800253000
Stuffing box VXZ/MZX	0626-9-204
Stuffing box Type S Spare (V241, V341, V211, V211T, V311, V311T, V231, V232)	100108000
Stuffing box VG222/VG321 Spare	100108100
Stuffing box VG211 Spare	100108110

EM9, M9B

The EM9/M9B are electronic actuators for motorizing legacy VTRE rotary shoe valves. EM9 operates on 24 V and is controlled by selectable 0 to 10Vdc, 2 to 10Vdc, 0 to 20 mA or 4 to 20 mA control signal. The running time can be programmed. EM9/M9B can be operated manually and has a valve position indicator on the front of the unit.

Specifications	
Power consumption	3 VA
Duty cycle	10%
Torque	15 Nm
Environment Operating temperature	-15 to +55 °C
Protection class	IP 54
Material Enclosure material Color	 Reinforced plastic PA66 Black/Red

M9B, EM9 Linkage Kits for other valves

Part number	Description
8600990000	Linkage E/M9-VTRA
8600991000	Linkage E/M9-TRV[2]

2 - NOTE: Not suitable for TRV-S

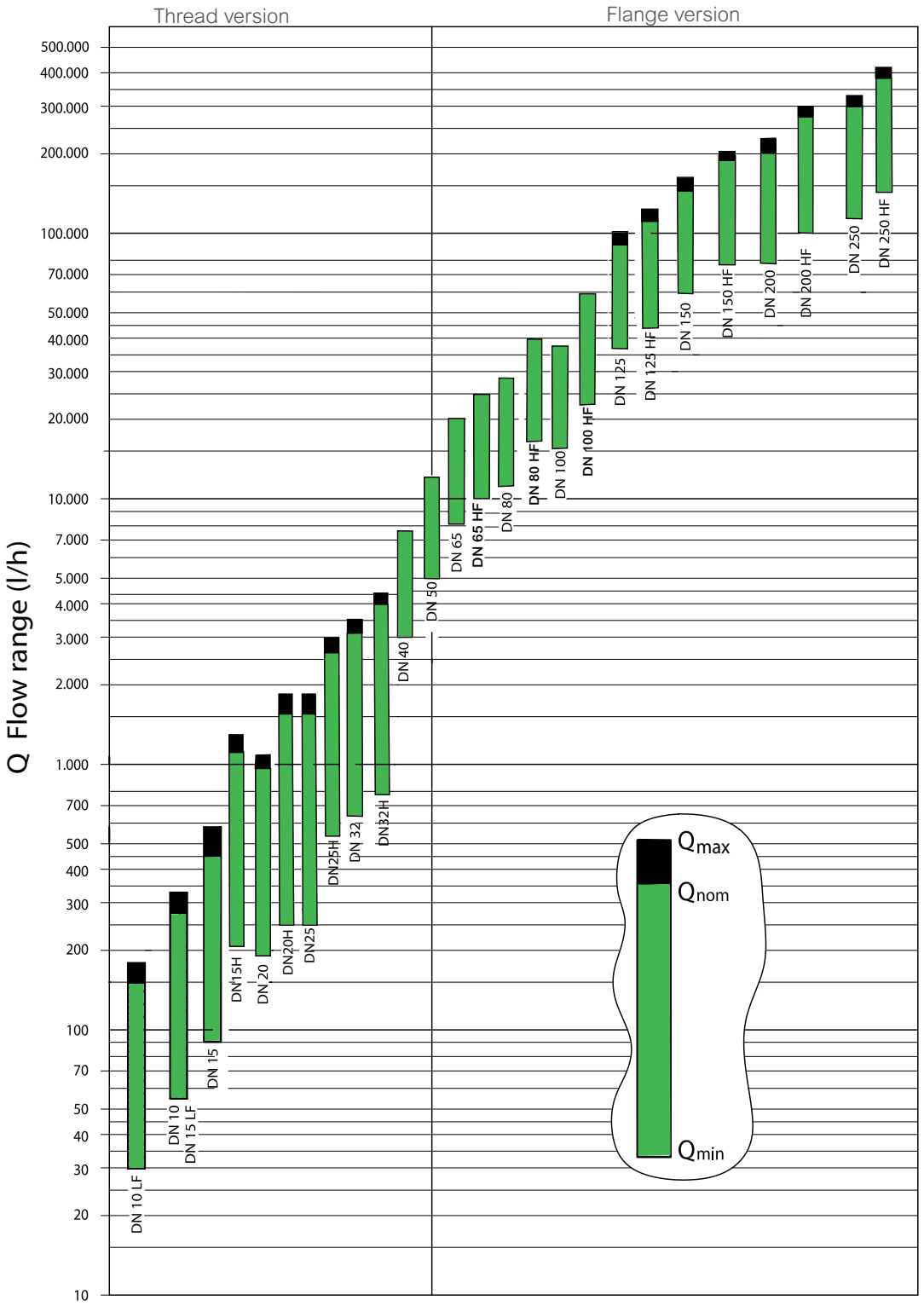
M9B, EM9 Actuators for Valves VTRE		Control signal	Working range	Running time	Power
Part number	Description				Vac ±10%
8601010000	M9B/24	3-point	30-180°	90° 4 min	24
8601020000	M9B/230				230
8601110000	EM9/90/180	modulating[1]	90° or 180°	60/90/120s (90°) or 120/180/240s (180°)	24

1 - Selectable 0 to 10V, 2 to 10V, 0 to 20 mA, 4 to 20 mA

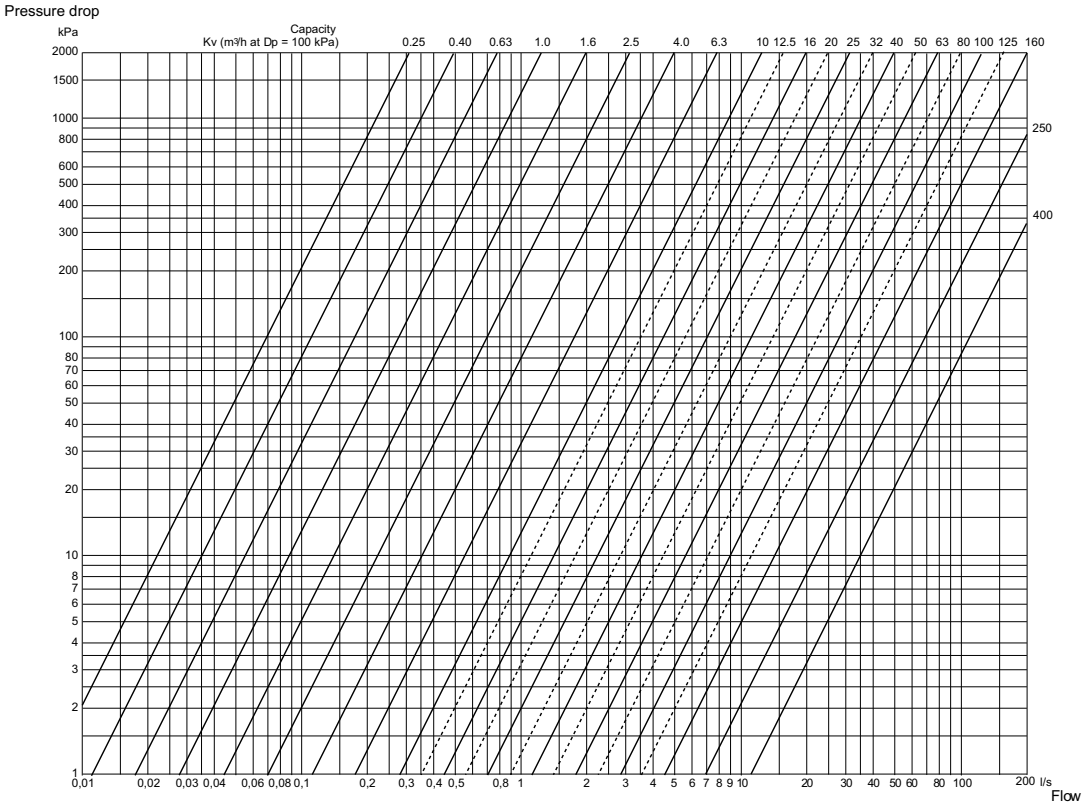
Supporting Information

Specialist products provide solutions for our wide installation base or the more demanding hydronic applications, such as globe and zone valves capable of handling higher pressure drops typically experienced in high rise buildings.

PIBCV Flow Selection Chart



Water Valve Sizing Chart, Traditional Pressure Dependant Valves



1 litre per second = 3.6m³/h

100 kPa = 1 Bar. = 14.5psi

Valve sizing formula for water service.
To size a valve, the following must be known: The volumetric flow rate through the valve, Q.
The differential pressure across the valve, ΔP.

Calculation of valve flow coefficient, Kv

$$Kv = Q \times \sqrt{\frac{p}{\Delta P}}$$

Calculation of valve flow rate, Q

$$Q = Kv \times \sqrt{\frac{\Delta P}{p}}$$

Calculation of Pressure drop, ΔP

$$\Delta P = p \times \left(\frac{Q}{Kv}\right)^2$$

Kv = Valve Capacity (m3/h)
Q - Volume flow (m3/h)
ΔP = Pressure drop across valve (bar)
ρ = Specific gravity of fluid (kg/m3)

Steam Valve Sizing Chart

Example for saturated steam:
Flow rate, (G) 4700 Kg/h
Abs. pressure upstream (p1) 850 kPa
Load pressure (ΔPv) 160 kPa

Mark the point of intersection [3] between the line originating from the absolute upstream pressure [1] and the inclined line corresponding to the load pressure (valve pressure drop)[2].
Identify the point of intersection between point [3] found above and the flow rate of Saturated steam [4].
The last found point would corresponds to a valve with a Kvs of 63 [5].

$$P_2 > \frac{P_1}{2}$$

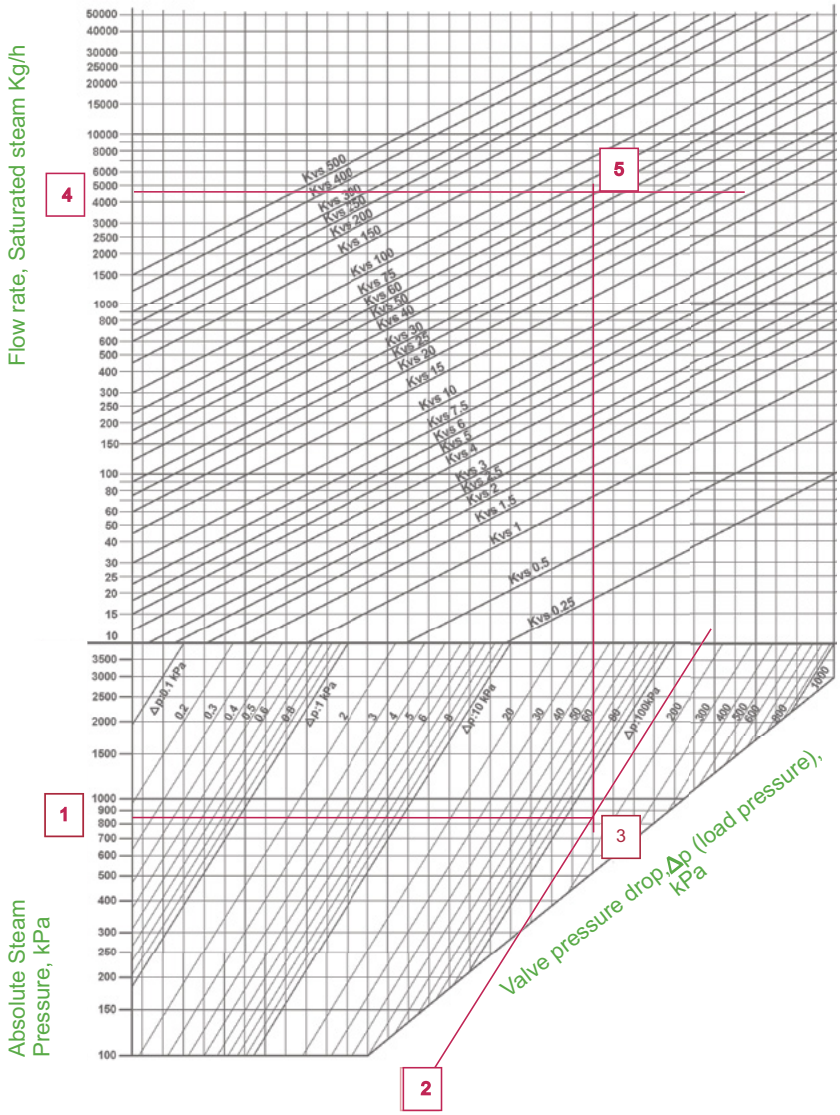
$$\Delta P > \frac{P_1}{2}$$

$$P2 < \frac{P_1}{2}$$

$$\Delta P > \frac{P_1}{2}$$

$$K_{vs} = \frac{G}{31.6} \times \sqrt{\frac{v_2}{\Delta p}}$$

$$K_{vs} = \frac{G}{31.6} \times \sqrt{\frac{2 \times v^*}{p_1}}$$



Key:

Kvs = Valve flow co-efficient, (Control valve fully open).

G = Mass flow rate (Kg/h).

v2 = Specific volume (from steam table) for p2 and t1 condition.

V* = Specific volume (from steam table) for $\frac{P_1}{2}$ and t1 condition.

p1 = pressure before valve.

p2 = pressure after valve.

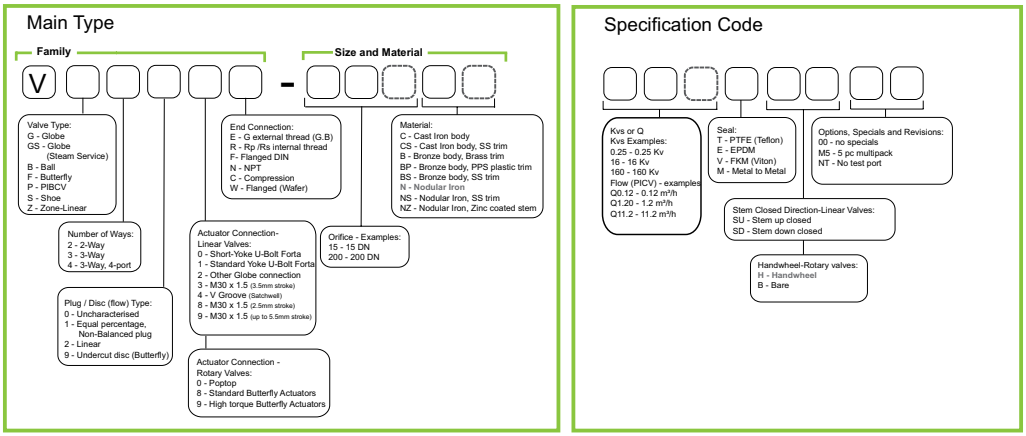
Δp = Valve Pressure drop (bar).

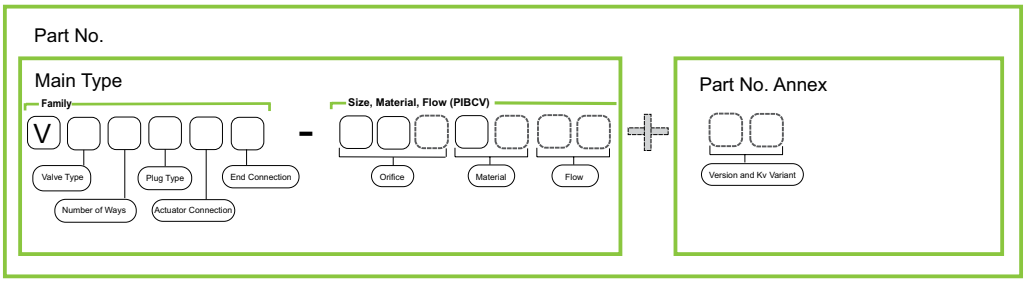
Type Designation Guide

This guide details the type designation coding applicable on all new products launched from June 2009.

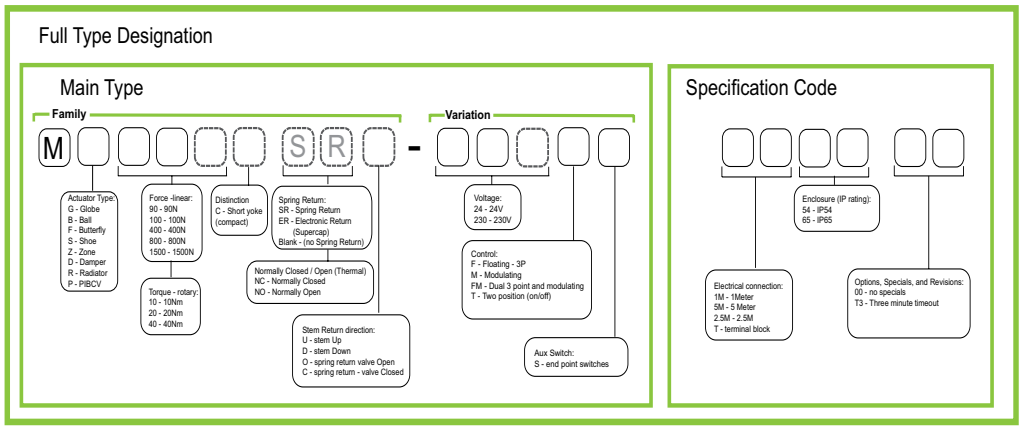
Build Up Code - Valve Body Type Designation

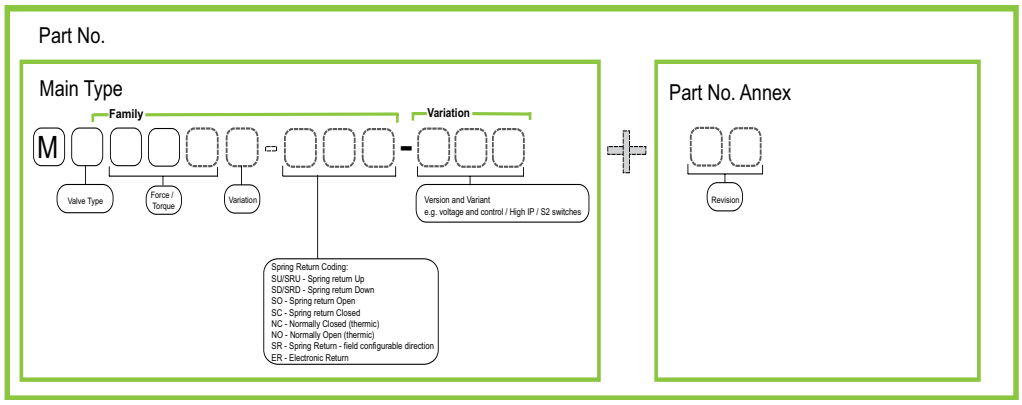
Full Type Designation





Build Up Code - Valve Actuators Type Designation





Guide Specification Text

INSTRUMENTATION AND CONTROL FOR HVAC

ACTUATORS

A. Electronic Direct Couple Damper (and Valve) Actuators
[Schneider Electric SmartX Actuators]

1. Manufactured, brand labeled or distributed by Schneider Electric.
2. Direct-coupled type non-hydraulic designed for minimum 100,000 full-stroke cycles at rated torque.
3. Direct-coupled damper actuators must have a five-year warranty.
4. Size for torque required for damper seal at maximum design conditions and valve close-off pressure for system design.
5. Direct-coupled damper actuators should accommodate 3/8", ½" 1.05" round or 3/8"–½" and ¾" square damper shafts.
6. Actuator operating temperature minimum requirements: 44, 88 and 133lb.-in. are –25°F–130°F (–32°C–55°C). The 30, 35, 60, 150 and 300lb. -in. are -25°F–140°F (-30°C–60°C). The 270lb. -in. are -22 °F–122°F (-30 °C–50°C).
7. Overload protected electronically throughout rotation except for selected Floating actuators - they have a mechanical clutch.
8. Spring Return Actuators: Mechanical fail safe shall incorporate a spring return mechanism.
9. Non-Spring Return Actuators shall stay in the position last commanded by the controller.
10. Power Requirements: 24Vac/dc [120Vac] [230Vac].
11. Proportional Actuator controller input range from 0–10Vdc, 2–10Vdc or 4–20mA models.
12. Housing: Minimum requirement NEMA type 2.
13. Actuators with a microprocessor should not be able to be modified by an outside source (cracked or hacked).
14. Actuators of 133 and 270lb.-in. of torque or more should be able to be tandem mount or "gang" mount.
15. Agency Listings: ISO9001, cULus, CE and CSA.

B. ½"–¾" Ball Valve Electronic Actuators
[Schneider Electric VBB/VBS ball valves actuators]

1. Manufactured, brand labeled or distributed by Schneider Electric.
2. Size for torque required for valve close-off pressure for system design.
3. Coupling: Direct coupled to the valve body without the use of external devices or tools (snap-on).
4. Auxiliary End Switch (optional) is to be SPST 24Vac/Vdc, 101mA to 5mA maximum on selected two-position models.
5. Controller Signal Two-position, Floating or Proportional (0–5 Vdc, 0–10 Vdc, 5–10 Vdc, or 4–20mA dc). The design allows for changing selections via DIP switches without removal of cover.
6. Manual operating lever and position indicator must be and are on all models.
7. Power Requirements: 24 Vac for floating, proportional, and 110–230 Vac for two position multi-voltage types.
8. Actuators must be available with either Spring Return (SR) or Non-Spring Return (NSR) models.
9. Operating Temperature Limit Floating is to be 32–140°F (0–60°C) Proportional 32–140°F (0–60°C) Two-Position 32–169°F (0–76°C).
10. Wiring (depending on model) Removable Terminal Block, 10 ft. (3.05 m) Plenum Cable, 18 in. (45cm) Appliance Wire.
11. Locations must be rated NEMA 2, IEC IP31 (Indoor Use Only). Actuators with terminal block or plenum cable leads are plenum rated per UL file number E9429.
12. Agency Listings: ISO9001, cULus, and CE.
13. Schneider Electric shall warrant all components for a period of 5 years from the date of production.

C. 2-Way (½"–3") and 3-Way (½"–2") Ball Valve Actuators
[Schneider Electric VB-2000 ball valves actuators]

1. Manufactured, brand labeled or distributed by Schneider Electric.
2. Size for torque required for valve close-off pressure for system design.
3. Actuators are to be available in spring return (SR) and non-spring return (NSR) models. Spring Return (SR) actuators are to provide a choice to return direction.
4. Actuators are to be available in models for two-position, floating and proportional control.
5. All actuator models are to be equipped with pigtail leads.
6. Actuators must be available in models with manual override.
7. Actuators must be available in models with auxiliary switch(es).
8. Operating temperatures: Non-Spring Return (NSR) actuators with 44 and 88 lb.-in. of torque must be -25 to 130°F (-32 to 55°C). All other actuators are -22 to 140°F (-30 to 60°C).
9. Actuators must be NEMA 2 rated.
10. All actuators are to have a five-year warranty.
11. Agency Listings: ISO9001, cULus, and CE.

D. Zone Valve Actuators - Two-position Spring Return (SR)
[Schneider Electric Erie Zone Valve PopTop™ Two-position valve actuators]

1. Manufactured, brand labeled or distributed by Schneider Electric.
2. Valves are to be two-position (On-Off), spring return (SR) with general or high close off models.
3. Actuator Voltage Models are 24Vac@ 50/60Hz, 110Vac@ 50Hz and 120Vac@ 60Hz, 230Vac@ 50Hz, 240Vac@ 60Hz, 208Vac@ 50/60Hz, 277Vac@50/60Hz.
4. End (auxiliary) Switch, 24 -240 Vac Models: 24–250 Vac/101 mA min. to 5 A max. and 9–30 Vdc @100 mA max. 277Vac.
5. Actuators are to have manual override on normally closed (NC) models and assembles to valves without the use of tools, linkages or calibration.
6. Actuators are to have a hysteresis synchronous motor.
7. North America Agency Listings: UL873: Underwriters laboratories (Category Temperature Indicating and Regulating Equipment). CUL: UL Listed for use in Canada by Underwriters Laboratory. Canadian Standards C22.2 No. 24.

E. 2”–18” 2-Way and 2”–16” 3-Way Butterfly Valve Non-Spring Return (NSR) Linear Electronic Valve Actuators with Linkage Butterfly Valve Actuators
[Schneider Electric S70 red w/ handwheel, w/ heater actuators]

1. Manufactured, brand labeled or distributed by Schneider Electric.
2. The butterfly valve actuators are to be Non-Spring Return (NSR) two-position and proportional taking 0–10 Vdc or 4–20 mA models. All actuators are to be NEMA 4, manual override (handwheel) two auxiliary switches, and built-in heater.
3. Actuator close-offs and CVs must be appropriate for the valve size in a typical HVAC application.
4. Actuators must be available in 24 Vac and 120 Vac models.
5. Actuators must have internal wiring isolation for parallel wiring multiple units that eliminates the risk of feedback from one actuator to another.
6. Proportional models must have feedback of 0–10 Vdc or 4–20 mA.
7. Actuator operating temperature shall be -40–150°F (-40–60°C).
8. Actuator agency listings (North America) UL, CSA and CE.

F. 2”–4” 2-Way and 3-Way Butterfly Valve Spring Return (SR) Electronic Valve Actuators
[Schneider Electric SmartXMx41-7153 actuators]

1. Manufactured, brand labeled or distributed by Schneider Electric.
2. The butterfly valve actuators are to be Spring Return (SR) two-position and proportional taking 2–10 Vdc or 4–20 mA models. All actuators are to be NEMA 2.
3. Actuator close-offs and CVs must be appropriate for the valve size in a typical HVAC application.
4. Actuators must be available in 24 Vac models.
5. Actuators shall have two SPDT auxiliary switch models.
6. Actuators must have internal wiring isolation for parallel wiring multiple units that eliminates the risk of feedback from one actuator to another.
7. Proportional models must have feedback of 2–10 Vdc or 4–20 mA.
8. Actuator operating temperature shall be -22–140°F (-12–60°C).
9. Actuators are to have a 5-year warranty.
10. Actuator agency listings (North America) UL, CSA and CE.

G. 2”–6” 2-Way and 3-Way Butterfly Valve Non-Spring Return (NSR) Electronic Valve Actuators
[Schneider Electric SmartXNR-22xx-5xx actuators]

1. Manufactured, brand labeled or distributed by Schneider Electric.
2. The butterfly valve actuators are to be Non-Spring Return (NSR) two-position and proportional taking 0–10Vdc or 4–20mA models. All actuators are to be NEMA 2.
3. Actuator close-offs and CVs must be appropriate for the valve size in a typical HVAC application.
4. Actuators must be available in 24Vac models.
5. Actuators shall have two SPDT auxiliary switch actuators must have internal wiring isolation for parallel wiring multiple units that eliminates the risk of feedback from one actuator to another.
6. Proportional models must have feedback of 2–10 Vdc or 4–20 mA.
7. Actuator operating temperature shall be -22–140°F (-12–60°C).
8. Actuators are to have a 5-year warranty.
9. Actuator agency listings (North America): UL, CSA and CE.

H. ½”–2” Bronze Body, Linear Electronic Valve Actuators with 67 or 78lbs. of force Globe Valve Actuators

[Schneider Electric MG350V]

1. Manufactured, brand labeled and distributed by Schneider Electric.
2. Actuator must have bi-color LED status indication for motion indication, autocalibration and alarm notification.
3. When the actuator is properly mounted, it must have a minimum of a NEMA 2 (IP53) rating.
4. Actuators are to be non-spring return.
5. Actuators are to be floating (used for two-position) or proportional models.
6. Proportional models will have optional models with a position output signal with field selectable 2–10 Vdc and 0–10 Vdc input signals and selectable input signal director reverse acting.
7. Actuator must have autocalibration which provides precise control by scaling the input signal to match the exact travel of the valve stem.
8. Actuators must come in models with Pulse Width Modulated (PWM) with field-selectable 0.59 to 2.93 sec and 0.1 to 25.5 sec input signal ranges with a position output signal.
9. Actuators must have manual override with automatic release.
10. Models with position feedback output signal include field selectable 2–10Vdc or 0–5 Vdc output signal
11. Removable wiring screw terminal with ½" conduit opening.
12. Actuator operating temperature ranges:
    a. When controlling fluid up to 266°F (130°C) = ambient air temperature is to be 23–131°F (-5–55°C).
    b. Fluid up to 281°F (138°C) = 23–127°F (-5–53°C).
    c. Fluid up to 340°F (171°C) = 23–115°F (-5–46°C).
    d. Fluid up to 400°F (204°C) = 23–102°F (-5–39°C).
13. Actuator agency Listings (North America).
    a. cUL-us LISTED mark, per UL 60730-1 and -2-14 and CAN/CSA E60730-1 and -2-14 Automatic Electric Controls.
    b. NEMA 2.
    c. NEC class 2 FCC part-15 class B.
    d. Canadian ICES-003.
    e. ESA registered.
    f. Plenum rated per UL2043.

I. ½"–2" Bronze Body, Linear Electronic Valve Actuators with 105lbs. of force Globe Valve Actuators

[Schneider Electric SmartXMx51-7103 Series Linear SR Valve Actuator]

1. Manufactured, brand labeled and distributed by Schneider Electric.
2. Actuators must have Two-Position, Floating, and Proportional models.
3. Proportional models with a controller input signal of either 0–10Vdc, 2–10Vdc, 4–20mAdc, 0–3 Vdc, or 6–9 Vdc. Control function direct/reverse action is switch selectable on most models.
4. Actuator force is to be 105lb (467 newton) with ½" (13 mm) nominal linear stroke.
5. Power requirements 24 Vac, 120 Vac or 230 Vac depending on model.
6. Actuator housings rated for up to NEMA2/IP54.
7. Actuator is to have overload protection throughout stroke.
8. Actuator operating temperature -22–140°F (-30–60°C).
9. Actuator must automatically set input span to match valve travel.
10. Actuator must have manual override to allow positioning of valve and preload.
11. Actuator is to be spring return.
12. Actuator is to mount directly to valves without separate linkage.
13. Actuator is to have a 5-year warranty.
14. Actuator agency Listings (North America):
    a. UL873: Underwriters Laboratories (File# E9429 Category Temperature-Indicating and Regulating Equipment).
    b. CUL: UL Listed for use in Canada by Underwriters Laboratories. Canadian Standards C22.2 No.24-93.

J. ½"–2" Bronze Body and other valves Linear Electronic Valve Actuators with 220 of force Globe Valve Actuators

[Schneider Electric SmartXMx51-720x Series Linear SR Valve Actuator]

1. Manufactured, brand labeled and distributed by Schneider Electric.
2. Actuators must have Two-Position for a SPST controller, floating for a SPST controller, and proportional models with a controller input signal of either a 0–10 Vdc, 2–10 Vdc, 4–20 mAdc, or 6–9Vdc. Control function direct/reverse action is jumper selectable.
3. Actuator is to be spring return.
4. Actuator will have 220 lb. force (979 newton) with ½" (13 mm) or 1" (25mm) nominal linear stroke.
5. Feedback on proportional model with 2–10 Vdc (max. 0.5 mA) output signal or to operate up to four additional slave actuators.
6. Actuator operating temperature is 0–140°F (-18–60°C).
7. Actuator must automatically set input span to match valve travel.
8. Actuator is to have a 24 Vac power supply on two-position and proportional models and 120 Vac on two-position models.
9. Actuator housings rated for up to NEMA2/IP54.
10. Actuator must have manual override to allow positioning of valve and preload.
11. Actuator is to mount directly to valves without separate linkage.
12. Actuator is to have a 5-year warranty.
13. Actuator agency Listings (North America):

a. UL873: Underwriters Laboratories (File #E9429 Category Temperature-Indicating and Regulating Equipment).
b. CUL: UL Listed for use in Canada by Underwriters Laboratories. Canadian Standards C22.2 No.24-93.

K. ½"–2" Bronze Body, Spring Return (SR) Linear Electronic Valve Actuators with Linkage Globe Valve Actuators
[Schneider Electric SmartX Actuators]

1. Manufactured, brand labeled or distributed by Schneider Electric.
2. Actuators with 35, 60, 133, or 150lb.-in of force depending on model.
3. Actuator housings rated for up to NEMA 2/IP54 with a 150lb.-in. rated a NEMA 4.
4. Actuators are to be spring return.
5. Actuators are to have Two-position, Floating and Proportional models.
6. Actuators must have overload protection throughout rotation.
7. Actuator are to have an optional built-in auxiliary switch to provide for interfacing or signaling on selected models.
8. Actuators are to have a 5-year warranty.
9. Actuator agency listings (North America):
    a. UL-873 Underwriters Laboratories.
    b. Canadian Standards C22- 2No.24-83, CUL.

L. ½"–2" Bronze Body, Spring Return (SR) Linear Electronic Globe Valve Actuators with Linkage. Non-Spring Return (NSR) Linear Valve Actuator with Linkage.
[Schneider Electric Forta M400A-VB, M800A-VB, M900A and M1500x-VB Screw Mounted on VentaVB-7000s]

1. Manufactured, brand labeled or distributed by Schneider Electric.
2. Actuators are to be either floating SPDT control or proportional control 0–10, 2–10 Vdc or 4–20mA with a 500-ohm resistor included.
3. Actuators are to be direct/reverse with selectable DIP switches.
4. Actuators are to have 90 lb. (400N), 180 lb. (800N), or 337 lb. (1500N) of force on Non-Spring Return (NSR) models. Note: Not every actuator is for every valve.
5. Actuators are to be powered with 24 Vac or 24 Vdc.
6. All Non-Spring Return (NSR) actuators are to be NEMA 2, vertical mount only. Spring Return (SR) actuators are to have NEMA 4 models.
7. Actuators must have manual override to allow positioning of the valve.
8. Actuators must have selectable valve sequencing and flow curves of either equal percentage or linear.
9. Actuators must have feedback.
10. Actuators must have internal torque protection throughout stroke.
11. The operating temperature is to be:
    a. 122°F (50°C) for chilled water applications.
    b. 113°F (45°C) ambient at 281°F (138°C) fluid temperature.
    c. 107°F (42°C) ambient at 300°F (149°C) fluid temperature.
    d. 100°F (38°C) ambient at 340°F (171°C) fluid temperature.
12. 90°F (32°C) ambient at 366°F (186°C) fluid temperature.
13. Actuator agency listings (North America): UL873, cULus, RCM,CE.

M. 2½"–6" Cast Iron Flanged Globe Valve Body (and other valves) Non-Spring Return (NSR) Linear Electronic Valve Actuators with Linkage
[Schneider Electric Forta M800A and M1500A Tall U-Bolt Actuators]

1. Manufactured, brand labeled or distributed by Schneider Electric.
2. Actuators are to be either floating SPDT control or proportional control 0–10, 2–10 Vdc or 4–20mA with a 500-ohm resistor included.
3. Actuators are to be direct/reverse acting with selectable DIP switch.
4. Actuators are to have 180 lb.(800N) or 337 lb .(1500N) of force.
5. Actuators will need a 24 Vac or Vdc power supply.
6. Actuators are to be rated NEMA 2, vertical mount only.
7. Actuators must have manual override to allow positioning of the valve.
8. Actuators must have selectable valve sequencing and flow curves of either equal percentage to linear. A 2–10 Vac feedback.
9. Actuators must have internal torque protection throughout stroke.
10. The operating temperature is to be:
    a. 122°F (50°C)For chilled water applications.
    b. 113°F (45°C) ambient at 281°F (138°C) fluid temperature.
    c. 107°F (42°C) ambient at 300°F (149°C) fluid temperature.
    d. 100°F (38°C) ambient at 340°F (171°C) fluid temperature.
11. 90°F (32°C) ambient at 366°F (186°C) fluid temperature.
12. Actuator agency listings (North America) UL873, cULus, RCM, CE.

N. 2½"–6" Cast Iron Flanged Globe Valve Actuators 220lbs. force

1. Actuators must have Two-Position for a SPST controller, Floating for a SPST controller, and Proportional models with a controller input signal of either a 0–10 Vdc, 2–10 Vdc, 4–20 mAdc, or 6–9Vdc. Control function direct/reverse action is jumper selectable.
2. Actuator is to be Spring Return.
3. Actuator will have 220 lb. force (979 newton) with ½" (13mm) or 1" (25 mm) nominal linear stroke.
4. Feedback on proportional model with 2–10 Vdc (max. 0.5 mA) output signal or to operate up to four additional slave actuators.
5. Actuator must automatically set input span to match valve travel.
6. Actuator operating temperature 0–140°F (-18–60°C) up to a maximum valve fluid temperature of 300°F (149°C).
7. Actuator is to have a 24 Vac power supply on two-position and Proportional models and 120 Vac on two-position models.
8. Actuator housings rated for up to NEMA2/IP54.
9. Actuator must have manual override to allow positioning of valve and preload.
10. Actuator is to mount directly to valves without separate linkage.
11. Actuator agency Listings: UL873, CUL: UL.

O. 2½"–6" Cast Iron Flanged Globe Valve Actuators with Linkage SR.

1. Actuators with 60, 133, or 150lb.-in of force depending on model.
2. Actuator housings rated for up to NEMA 2/ IP54 with a 150lb.-in. rated a NEMA 4.
3. Actuators are to be spring return.
4. Actuators are to have two-position, Floating and Proportional models.
5. Actuators must have overload protection throughout rotation.
6. Actuator have an optional built-in auxiliary switch to provide for interfacing or signaling on selected models.
7. Actuator agency listings: UL-873, C22-2 No.24-83, CUL.

P. Pneumatic Globe Valve Actuators

[Schneider Electric MK Series die-cast aluminum housing actuators]

1. Manufactured, brand labeled or distributed by Schneider Electric.
2. Pneumatic actuators must have field replaceable neoprene diaphragms.
3. All actuators shall be Spring Return (SR) with the spring retracting actuator shaft and raising the valve stem on loss of pressure.
4. Actuators must have an operating temperature of -20–220°F (-29–104°C).
5. Actuators shall be models with 6 sq.in. 11, 50 and 100sq. ineffective area for the psi to push against.
6. Actuators may not "spark" under normal conditions.
7. Actuators must accept an optional positive pilot positioning relay.
8. Actuators will have a maximum air pressure of 30 psig.
9. Actuators must have models with spring ranges for typical HVAC applications.

Q. Pneumatic Damper Actuators

[Schneider Electric MK-0000 die-cast aluminum housing actuators]

1. Manufactured, brand labeled or distributed by Schneider Electric.
2. Pneumatic actuators must have field replaceable neoprene diaphragms.
3. All actuators shall be Spring Return (SR) with the spring retracting actuator shaft on loss of pressure.
4. Actuators must have an operating temperature of -20–160°F (-29–71°C).
5. Actuators shall be models with 8 sq.in. 11, 20 and 40 sq.in. (dual mounted) effective area for the psi to push against.
6. Actuators may not "spark" under normal conditions.
7. Actuators must accept an optional positive pilot positioning relay. Relay is to be standard on 20 sq.in. models.
8. Actuators will have a maximum air pressure of 30 psig.
9. Actuators must have models with spring ranges for typical HVAC applications.

CONTROL VALVES

A. Zone Valves, Two-Position, Control Valves

[Schneider Electric Erie zone valves]

1. Manufactured, brand labeled or distributed by Schneider Electric.
2. Valve application are for hot and chilled water models, up to 50% glycol. Steam models up to 15 psi.
3. Valve seat leakage is to ANSI class IV (0.01%) with pressure at inlet (B-port/A-port, if 3-Way).
4. Valves are to be with Body 300 psi rated forged brass, Stem-nickel plated, Seat-brass, Paddle-BunaN or highly saturated nitrile.
5. Valves are to be 2-Way or 3-Way with connections options of NPT (threaded female), Sweat (SW), Inverted flare (IFL), Society Automotive Engineers male (SAE) Rp Metric threaded female, depending on models, with end switch option on general temperature models.
6. Actuators are to be Spring Return (SR) normally open (NO) and normally closed (NC) models. Actuators are to

have “High Close-off” models.
7. Valve line sizes are ¾”, ½”, ¾”, 1”, and 1¼” depending on model.
8. Valve CVs are from 1 to 8 depending on model.
9. Actuators are to be UL listed.

B. Bronze½”–2” Globe Control Valves
[Schneider Electric Venta VB-7000valves]

1. Control Valves: Factory fabricated, with body material, and pressure class based on maximum pressure and temperature rating of piping system with a body rating of not less than 400 psig at 150°F, 321 psig at 281°F per ANSI B16.15.
2. Valve Manufacturer: Must have at least 25 years of valve manufacturing and must meet the provisions of Section 1605 of the American Recovery and Reinvestment Act Buy American Requirements. Manufacturer shall water test all valves prior to shipment.
3. Valves 2-Way NPS 2” and Smaller: Operator, stem and plug assembly, and spring-loaded PTFE/EPDM valve stem packing cartridge must be removable for future replacement to restore the valves back to their original condition. Material grade properties must meet the fluid temperature and pressure requirements:
    a. Standard duty bronze body, 316 stainless steel vertical stem, brass plug, soft seal, and bronze seat, renewable packing cartridge, and screwed/sweat/flared ends. Valves shall have allowable media temperature of 20°F – 281°F to assure reliability with dual temperature applications.
    b. Heavy duty bronze body, 316 stainless steel vertical stem, 316 stainless steel plug, soft seal, and 316 stainless steel seat, renewable packing cartridge, and screwed ends. Valves shall have allowable media temperature of 20°F – 340°F to assure reliability with dual temperature applications.
    c. High temperature bronze body, 316 stainless steel vertical stem, 316 stainless steel plug, and 316 stainless steel seat, renewable packing cartridge,and screwed ends. Valves shall have allowable media temperature of 20°F – 400°F.
4. 2-Way fluid system globe valves shall have the following characteristics:
    a. Rangeability: Greater than 100:1 for all valves with flow coefficients of 0.4 and higher to provide stable control under light load conditions.
    b. Maximum Allowable Seat Leakage: Standard and heavy duty valves must be designed to meet ANSI Class V (0.0005 ml per minute per orifice diameter per psi differential) up to 35 psi close off differential pressure and ANSI Class IV seat leakage (maximum 0.01% of full open valve capacity) above 35 psi with appropriate actuator. High temperature valves must meet ANSI Class III seat leakage (maximum 0.1% of full open valve capacity).
    c. The valve must be able to operate with a full-open operating differential of no less than 87 psi.
    d. Flow Characteristics: Modified equal percentage characteristics for standard duty water applications and modified linear for heavy duty and high temperatures team applications with gradual opening for light loads.
    e. Sizing:
        - Two Position Water: Line size or size using a differential pressure of 1 psi.
        - Modulating Water: 5PSI or twice the load pressure drop.
        - Pressure drop across steam valve at a maximum flow of 80 percent of inlet pressure up to 15psig and 42% of absolute (gage pressure +14.7) inlet pressure above 15 psig inlet.
        - 100 psi saturated steam maximum inlet pressure for heavy duty bronze body globe valves ½”–2”.
        - 150 psi saturated steam maximum inlet pressure for high temperature bronze body globe valves ½”–2”.
        - 35 psi saturated steam maximum inlet pressure for standard duty bronze body globe valves ½”–2”.
5. Valves 3-Way mixing (two inlets and one outlet) NPS2” and smaller:
    a. Operator, stem and plug assembly, and spring-loaded PTFE/EPDM valve stem packing cartridge must be removable for future replacement to restore the valves back to their original condition. Material grade properties must meet the fluid temperature and pressure requirements:
        - Standard duty bronze body, 316 stainless steel vertical stem, brass plug,and bronze seat, renewable packing cartridge, and screwed or sweat ends. Valves shall have allowable media temperature of 20°F – 281°F to assure reliability with dual temperature applications.
        - Heavy duty bronze body, 316 stainless steel vertical stem, 316 stainless steel plug, and 316 stainless steel seat, renewable disc and packing cartridge, and screwed ends. Valves shall have allowable media temperature of 20°F – 340°F to assure reliability with dual temperature applications.
6. 3-Way mixing hydronic system globe valves shall have the following characteristics:
    - Rangeability: Greater than 100:1 for all valves to provide stability.
    - Maximum Allowable Seat Leakage: A port must be designed to meet ANSI Class V (0.0005ml per minute per orifice diameter per psi differential) up to 35 psi close off differential pressure and ANSI IV seat leakage (maximum 0.01% of full open valve capacity) above 35 psi with appropriate actuator. B port must meet ANSI Class III seat leakage (maximum 0.1% of full open valve capacity).
    - The valve must be able to operate with a full-open operating differential of 87 psi.
    - Flow Characteristics: Modified linear characteristics with gradual opening for light loads.
    - Sizing: Modulating Water: Minimum 5 psi or at least equal to the load pressure drop.
7. Valves 3-Way diverting (one inlet and two outlets) NPS2 and smaller:
    - Operator, stem and plug assembly, and spring-loaded PTFE/EPDM valve stem packing cartridge must be removable for future replacement to restore the valves back to their original condition. Valves must

be designed specifically for diverting service and mixing valves designed for mixing service must not be used for diverting applications. Material grade properties must meet the fluid temperature and pressure requirements: Standard duty bronze body, 316 stainless steel vertical stem, brass plug, and bronze seat, renewable disc and packing cartridge, and screwed ends. Valves shall have allowable media temperature of 20°F – 281°F to assure reliability with dual temperature applications.

8. 3-Way diverting hydronic system globe valves shall have the following characteristics:
   - Rangeability: Greater than 100:1 for all valves to provide stable control under light load conditions.
   - Maximum Allowable Seat Leakage: ANSI Class III seat leakage (maximum 0.1% of full open valve capacity).
   - Maximum Allowable Pressure Differential: 35 psi in. an open position.
   - Flow Characteristics: Modified linear characteristics with gradual opening for light loads.
   - Sizing: Modulating Water: Minimum 5 psi or at least equal to the load pressure drop.
9. Required Certifications:
   - Pressure Equipment Directive (PED97/23/EC), RoHS (Restriction of Hazardous Substances) and REACH (Regulation, Evaluation, Authorization, and Restriction of Chemicals), Canadian Registration Number.
10. Valve and Operator:
    - To assure maximum performance and operation of the valve assembly, both the valve and the actuator must be tested and approved by the valve manufacturer to assure compatibility of all components and performance to the specifications.

C. 2”–6” Cast Iron Flanged Valves

[Schneider Electric VB-8000 and VB-9000 valves]

1. Bodies
   - Shall be American Factory fabricated with ASTMA 126 Class B cast iron body material with the pressure class within the maximum pressure and temperature rating of the piping system (125 body rating with not less than 200 psig at 150°F, decreasing to 169 psig at 281F per ANSA B16.1).
2. Manufacturer
   - Shall have at least 25 years of valve manufacturing and meet the provisions of Section 1605 of the American Recovery and Reinvestment Act, buy American, requirements. All valves shall be water tested by manufacturer prior to shipment.
3. Serviceability
   - 2-Way valve operators, stem and plug assemblies, and spring-loaded PTFE/EPDM valve stem packing cartridges must be removable for future replacement to restore the valves back to their original condition.
4. Construction
   a. Material grades must meet the fluid temperature and pressure requirement temperatures of 20°F – 281°F to assure reliability throughout all application temperature ranges.
5. Packings
   - Shall be cartridges suitable for replacement as units with standing the full operating temperature ranges, including daily and seasonal fluctuations of water, 60% glycol and steam fluids.
6. Characteristics
   - Rangeability: 2-Way, 100:1 and greater for stable control under light load.
   - Shutoff, 2-Way: Leakage allowed: ANSI Class IV (0.01% of max flow).
   - 3-Way: Leakage allowed: ANSI Class III (0.1%of max flow).
   - Flow curves: 2-Way modified equal percentage characteristic.
   - Mixing and Diverting: Linear, modified with gradual opening for light loads.
7. Piping
   - Diverting valves with the common port at the bottom can be used for mixing.
   - Mixing valves with the common port at the end must not be used for diverting applications.
8. Sizing
   - Two Position Water: Line size or size using a differential pressure of 1 psi.
   - Modulating Water: 5PSI or twice the load pressure drop.
   - Steam, 2-Way: maximum pressure drop across the valve at a maximum flow of 80 percent of inlet pressure up to 15 psig. Above 15 psig inlet, 42% of absolute (gage pressure +14.7) inlet pressure.
9. Certifications for All Models
   - Pressure Equipment Directive (PED97/23/EC), RoHS (Restriction of Hazardous Substances) and REACH (Regulation, Evaluation, Authorization, and Restriction of Chemicals.

D. Steam Control Valves

1. ½”…2” Steam Service Designed Globe Valves
   a. Body material, and pressure class based on maximum pressure and temperature rating of piping system with a body rating of not less than 400 psig at 150°F, 321 psig at 281°F per ANSI B16.15.

b. High temperature spring-loaded PTFE/EPDM valve stem packing cartridge must be removable for future replacement to restore the valves back to their original condition. Material grade properties must meet the fluid temperature and pressure requirements:
   - Standard duty bronze body, 316 stainless steel vertical stem, brass plug, soft seal, and bronze seat, renewable packing cartridge, and screwed/sweat/flared ends. Valves shall have allowable media temperature of 20°F …281°F to assure reliability with dual temperature applications.
   - Heavy duty bronze body, 316 stainless steel vertical stem, 316 stainless steel plug, soft seal, and 316 stainless steel seat, renewable packing cartridge, and screwed ends. Valves shall have allowable media temperature of 20°F …340°F to assure reliability with dual temperature applications.
   - High temperature bronze body, 316 stainless steel vertical stem, 316 stainless steel plug, and 316 stainless steel seat, renewable packing cartridge, and screwed ends. Valves shall have allowable media temperature of 20°F …400°F.

c. 2-Way fluid system globe valves shall have the following characteristics:
   - Rangeability: Greater than 100:1 for all valves with flow coefficients of 0.4 and higher to provide stable control under light load conditions.
   - Maximum Allowable Seat Leakage: Standard and heavy duty valves must be designed to meet ANSI Class V (0.0005 ml per minute per orifice diameter per psi differential) up to 35 psi close off differential pressure and ANSI Class IV seat leakage (maximum 0.01% of full open valve capacity) above 35 psi with appropriate actuator. High temperature valves must meet ANSI Class III seat leakage (maximum 0.1% of full open valve capacity).
   - The valve must be able to operate with a full-open operating differential of no less than 87 psi.
   - Flow Characteristics: Modified equal percentage characteristics for standard duty water applications and modified linear for heavy duty and high temperature steam applications with gradual opening for light loads.
   - Sizing:
     a. Pressure drop across steam valve at a maximum flow of 80 percent of inlet pressure up to 15 psig and 42% of absolute (gage pressure + 14.7) inlet pressure above 15 psig inlet.
     b. 100 psi saturated steam maximum inlet pressure for heavy duty bronze body globe valves ½"…2".
     c. 150 psi saturated steam maximum inlet pressure for high temperature bronze body globe valves ½"…2".
     d. 35 psi saturated steam maximum inlet pressure for standard duty bronze body globe valves ½"…2".
   - Certifications for all models: Pressure Equipment Directive (PED 97/23/EC), RoHS (Restriction of Hazardous Substances) and REACH (Regulation, Evaluation, Authorization, and Restriction of Chemicals

2. 2½"…6" Steam Service Designed Globe Valves
   a. Bodies: Shall be American Factory fabricated with ASTM A 126 Class B cast iron body material with the pressure class within the maximum pressure and temperature rating of the piping system. (125 body rating with not less than 200 psig at 150°F, decreasing to 169 psig at 281°F per ANSA B16.1)
   b. Serviceability: 2-Way valve operators, stem and plug assemblies and spring-loaded PTFE/EPDM valve stem packing cartridges must be removable for future replacement to restore the valves back to their original condition.
   c. Construction: Material grades must meet the fluid temperature and pressure requirement temperatures of 20 °F …281 °F to assure reliability throughout all application temperature ranges.
   d. Packings: Shall be cartridges suitable for replacement as units withstanding the full operating temperature ranges, including daily and seasonal fluctuations of water, 60% glycol and steam fluids.
   e. Characteristics:
      - Rangeability: 2-Way, 100:1 and greater for stable control under light load.
      - Shutoff, 2-Way: Leakage allowed: ANSI Class IV (0.01% of max flow)
      - Flow curves: 2-Way modified equal percentage characteristic.
      - Sizing
        a. Steam, 2-Way: Maximum pressure drop across the valve at a maximum flow of 80 percent of inlet pressure up to 15 psig. Above 15 psig inlet, 42% of absolute (gage pressure + 14.7) inlet pressure.
        b. Certifications for All Models: Pressure Equipment Directive (PED 97/23/EC), RoHS (Restriction of Hazardous Substances) and REACH (Regulation, Evaluation, Authorization, and Restriction of Chemicals).

E. ½"–¾" Ball Valve

[Schneider Electric VBB/VBS Ball Valves]

1. Manufactured, brand labeled or distributed by Schneider Electric.
2. ½" and ¾" Ball Valves: Forged brass body rated at no less than 600 psi, chrome plated brass ball with blowout

proof stem or optional stainless steel ball with blow out proof stem.
3. Valves are to be in 2-Way and 3-Way configurations.
4. Connection: Female NPT end fittings, Teflon® PTFE seat, characterizing disc glass-filled PEEK providing equal percentage flow curve on 2-Way valve.
5. Operating Temperature 20–250°F chilled or hot water with up to 60% glycol solution.
6. 2-Way and Bypass port should be ANSI Class IV (0.01%of Cv) seat leakage.
7. Rangeability must be at least 300:1.
8. Tool-free actuator connection.
9. System Static Pressure Limit should be 600 psig (4137Pa).
10. The manufacturer shall warrant all components for a period of 2 years from the date of production.

F. 2-Way (½"–3") and 3-Way (½"–2") Ball Valves
[Schneider Electric VB-2000 series]
1. Manufactured, brand labeled or distributed by Schneider Electric.
2. Valves must be for control of hot or chilled water, or solutions of up to 50% glycol.
3. Ball valves must have close-offs of 40–130psi depending on size.
4. Valves will provide Cvs from 0.33–266 depending on size.
5. Valve characterizing insert is to be made of glass-filled Noryl™ and provide equal percentage flow.
6. Valve body is to be made of forged brass ASTM B283-06 and rated for static pressure of 360 psi at fluid temperatures of 20–250 °F (-7–121 °C).
7. All valves are to have balls made of nickel/chromium plated brass with 2-Way valves having stainless steel balls as an option. All valve stems are to be stainless steel with reinforce Teflon® EPDMO-ring seals.
8. 2-Way valves are to be ANSI Class IV (0.01%of Cv) shutoff. 3-Way valves are to be ANSI Class IV (0.01% of Cv piped coil-side outlet to the port A only.
9. Fluid (water) temperature are a minimum 20°F (-7°C) and a maximum of 250°F (121 °C).
10. Valves will have a two year warranty.

G. Pressure Independent Balancing Control Valves ½"–10"
[Schneider Electric SmartX PIBCV]
When selecting pressure independent valves the specifier should also revise section 232113 to NOT include balancing valves and also modify section 230593 to NOT require the individual balancing of each coil/valve combination.
1. Manufactured, brand labeled or distributed by Schneider Electric.
2. NPS2 and Smaller: PN16, stainless steel components.
3. NPS 2½ through 10: Class 125 cast iron body per ASME B16.1-2010, Material class B per ASTM A126-04 (2014), stainless steel components.
4. Accuracy NPS¾" and Smaller: The control valves shall accurately control the flow from 0–100% rated flow with a differential pressure range of 2.32–58 psi for low and standard flow units, 5–58 psi for high flow units within 5% offset flow value.
5. Accuracy NPS 1 through 1¼: The control valves shall accurately control the flow from 0–100% rated flow with a differential pressure range of 2.9–58 psi for standard flow units, 5–58 psi for high flow units within 5% of set flow value.
6. Accuracy NPS 1½ through 4: The control valves shall accurately control the flow from 0–100% rated flow with a differential pressure range of 4.35–58 psi for standard flow units, 8.7 psi to 58 psi for high flow units within 5% of set flow value.
7. Accuracy NPS 5 through 10: The control valves shall accurately control the flow from 0–100% rated flow with a differential pressure range of 5.8–58 psi for standard flow units, 8.7–58 psi for high flow units within 5% of set flow value.
8. Flow Characteristics: Linear Control, selectable to equal percentage at the proportional valve actuator.
9. Field adjustable flow by means of a percentage of rated valve flow.
10. Position feedback output signal integrated into all proportional actuators.
11. 100% authority with modulating below 1% regardless of flow settings.
12. No cartridges requiring replace mentor maintenance.
13. Close off ratings shall be 232 psi for all valve sizes.

H. Butterfly Valves
1. Manufactured, brand labeled or distributed by Schneider Electric.
2. Valve body are to be polyester coated iron ASTMA 126 lug mating with ANSI class 125/150 flanges.
3. Disc Type: Ductile iron nylon 11 coated.
4. Valve Stem:
    a. 2–8" 416 stainless steel double D stem.
    b. 10–12" 316 stainless steel double D stem.
    c. 14" and larger: stainless steel round shaft woodruff key slot.
5. Valve Seat:
    a. EPDM tongue and groove seat and molded O-ring flange seat.
6. Flow Characteristics: Modified equal percentage.
7. Close-Off Pressure Rating: Bubble-tight shutoff (no leakage).
8. Valve Fluid Temperature Rating: -40–250°F (-40–121°C).
9. Valve will have two (2) inch extended neck (because of heat).
10. Valve must accept pneumatic or electric/electronic actuators.

11. Valves must have a minimum of a two (2) year warranty.

I. High Performance Butterfly Valves

1. Manufactured, brand labeled or distributed by Schneider Electric.
2. Valve body are to be in carbon steel with ANSI class 150 flanges.
3. Disc Type: 316 stainless steel.
    a. Valve Stem: 17-4PH stainless steel.
    b. One-piece design.
    c. Blowout proof design.
4. Valve Seat:
    a. Resilient energizer totally encapsulated by the PTFE seat.
    b. Seat assembly locked in the body recess by full-faced seat retainer.
    c. Self adjusting for temperature changes and wear.
5. Flow Characteristics: Modified equal percentage.
6. Close-Off Pressure Rating: Bubble-tight shut off (no leakage) at rated maximum differential pressure.
7. Valve Fluid Temperature:
    a. 40–500°F (-40–250°C).
    b. On/Off steam application max.150 psi pressure.
    c. Proportional steam application max.50 psi pressure.
8. Valve will have extended neck (because of heat).
9. Valve must accept pneumatic or electric/electronic actuators.
10. Valve must have a minimum two (2) year warranty.

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