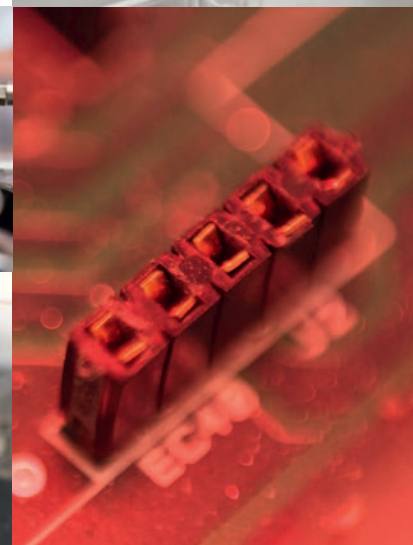
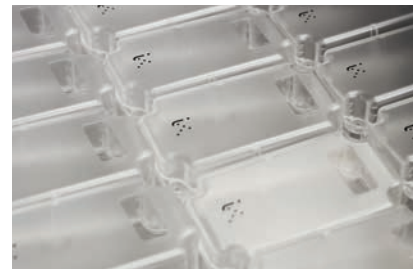


# 7 Damper actuators

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## DAMPER ACTUATORS WITHOUT SPRING RETURN, 2 NM

Designed for applications with small dampers (0.5 m<sup>2</sup>) of ventilation and air handling units.



DAK-DMK

Technical data	
Max. damper size	0.5 m <sup>2</sup>
Torque	2 Nm
Frequency	50...60 Hz
Rotation angle	95°
Ambient temperature	-20...+50 °C
Ambient humidity	5...95% UR
Noise level	Max 45 dB
Mounting	Directly on jack shaft
For jack shaft	6...16 mm Ø (round shaft), 5...11 mm (square shaft)
Weight	600 g
Protection class	IP54
Isolation class	III (DAK230: class II)
Certification	CE

Article	Supply voltage	Control signal	Power consumption	Auxiliary switch	Stroke time
DAK24	24 V AC / DC	On/off or 3 point	2,0 W	-	35...45 s
DAK24S	24 V AC / DC	On/off or 3 point	2.0 W	1 fixed SPDT 3 (1.5) A / AC 230 V positioned on 10°	35...45 s
DAK230	230 V AC	On/off or 3 point	1,5 W	-	35...45 s
DAK230S	230 V AC	On/off or 3 point	1.5 W	1 fixed SPDT 3 (1.5) A / AC 230 V positioned on 10°	35...45 s
DMK24	24 V AC / DC	2...10 V DC	2,5 W	-	45...55 s

## DAMPER ACTUATORS WITHOUT SPRING RETURN, 4 NM

Well-suited for applications with small dampers (up to 1 m<sup>2</sup>) in ventilation and air handling units.



DAN-DMN

Technical data	
Max. damper size	1 m <sup>2</sup>
Torque	4 Nm
Frequency	50...60 Hz
Stroke time	35 s
Rotation angle	90°. Limitation: 5...85° in 5° steps
Ambient temperature	-20...+50 °C
Ambient humidity	5...95 % RH
Noise level	Max 45 dB
Mounting	Directly on jack shaft
For jack shaft	10...16 mm Ø (round shaft), 10...12 mm (square shaft)
Protection class	IP44 or IP54 with cable glands
Isolation class	III (DAN230: class II)
Certification	CE

Article	Supply voltage	Control signal	Power consumption	Auxiliary switch	Weight
DAN24	24 V AC / DC	On/off or 3 point	Operating: 2.5 W Maintenance: 0.85 W	-	900 g
DAN24S	24 V AC / DC	On/off or 3 point	Operating: 2.5 W Maintenance: 0.85 W	2 x 3 (1.5) A / AC 230 V	900 g
DAN230	230 V AC	On/off or 3 point	Operating: 4.0 W Maintenance: 3.0 W	-	1000 g
DAN230S	230 V AC	On/off or 3 point	Operating: 4.0 W Maintenance: 3.0 W	2 x 3 (1.5) A / AC 230 V	1000 g
DMN24	24 V AC / DC	0...10 V DC	Operating: 2.5 W Maintenance: 0.85 W	-	900 g

## DAMPER ACTUATORS WITHOUT SPRING RETURN, 8 NM

Well-suited for applications with dampers (2 m<sup>2</sup>) in ventilation and air handling units.



DAS-DMS

Technical data	
Max. damper size	2 m <sup>2</sup>
Torque	8 Nm
Frequency	50...60 Hz
Stroke time	30 s
Rotation angle	Operating: 90° (93° mechanical) Limitation: 5...85° in 5° steps
Ambient temperature	-20...+50 °C
Ambient humidity	5...95 % RH
Noise level	Max 45 dB
Mounting	Directly on jack shaft
For jack shaft	10...20 mm Ø (round shaft), 10...20 mm (square shaft)
Weight	1200 g
Protection class	IP44 or IP54 with cable glands
Isolation class	III (DAS230, DMS230: class II)
Certification	CE

Article	Supply voltage	Control signal	Power consumption	Auxiliary switch
DAS24	24 V AC / DC	on/off or 3 point	Operating: 3.9 W Maintenance: 0.4 W	-
DAS24S	24 V AC / DC	on/off or 3 point	Operating: 3.9 W Maintenance: 0.4 W	2 x 3 (1.5) A / AC 230 V
DAS230	230 V AC	on/off or 3 point	Operating: 4.8 W Maintenance: 1.2 W	-
DAS230S	230 V AC	on/off or 3 point	Operating: 4.8 W Maintenance: 1.2 W	2 x 3 (1.5) A / AC 230 V
DMS24	24 V AC / DC	Y1: 0(2)...10 V DC Y2: 0(4)...20 mA U: 0(2)...10 V DC (feedback signal)	Operating: 4.0 W Maintenance: 0.7 W	-
DMS24S	24 V AC / DC	Y1: 0(2)...10 V DC Y2: 0(4)...20 mA U: 0(2)...10 V DC (feedback signal)	Operating: 4.0 W Maintenance: 0.7 W	2 x 3 (1.5) A / AC 230 V
DMS230	230 V AC	Y1: 0(2)...10 V DC Y2: - U: 0(2)...10 V DC (feedback signal)	Operating: 4.8 W Maintenance: 1.0 W	-
DMS230S	230 V AC	Y1: 0(2)...10 V DC Y2: - U: 0(2)...10 V DC (feedback signal)	Operating: 4.8 W Maintenance: 1.0 W	2 x 3 (1.5) A / AC 230 V

## DAMPER ACTUATORS WITHOUT SPRING RETURN, 16 NM

Well-suited for applications with dampers (4 m<sup>2</sup>) in ventilation and air handling units.



DA-DM

Technical data	
Max. damper size	4 m <sup>2</sup>
Torque	16 Nm
Frequency	50...60 Hz
Stroke time	80 s
Rotation angle	90° Limitation: 5...85° in 5° steps
Ambient temperature	-20...+50 °C
Ambient humidity	5...95 % RH
Noise level	Max 45 dB
Mounting	Directly on jack shaft
For jack shaft	10...20 mm Ø (round shaft), 10...20 mm (square shaft)
Weight	1200 g
Protection class	IP44 or IP54 with cable glands
Isolation class	III (DA230, DM230: class II)
Certification	CE

Article	Supply voltage	Control signal	Power consumption	Auxiliary switch
DA24	24 V AC / DC	on/off or 3 point	Operating: 3.9 W Maintenance: 0.4 W	-
DA24S	24 V AC / DC	on/off or 3 point	Operating: 3.9 W Maintenance: 0.4 W	2 x 3 (1.5) A / AC 230 V
DA230	230 V AC	on/off or 3 point	Operating: 4.8 W Maintenance: 1.2 W	-
DA230S	230 V AC	on/off or 3 point	Operating: 4.8 W Maintenance: 1.2 W	2 x 3 (1.5) A / AC 230 V
DM24	24 V AC / DC	Y1: 0(2)...10 V DC Y2: 0(4)...20 mA U: 0(2)...10 V DC (feedback signal)	Operating: 4.0 W Maintenance: 0.7 W	-
DM24S	24 V AC / DC	Y1: 0(2)...10 V DC Y2: 0(4)...20 mA U: 0(2)...10 V DC (feedback signal)	Operating: 4.0 W Maintenance: 0.7 W	2 x 3 (1.5) A / AC 230 V
DM230	230 V AC	Y1: 0(2)...10 V DC Y2: - U: 0(2)...10 V DC (feedback signal)	Operating: 4.8 W Maintenance: 1.0 W	-
DM230S	230 V AC	Y1: 0(2)...10 V DC Y2: - U: 0(2)...10 V DC (feedback signal)	Operating: 4.8 W Maintenance: 1.0 W	2 x 3 (1.5) A / AC 230 V

## DAMPER ACTUATORS WITHOUT SPRING RETURN, 24 NM

Well-suited for applications with dampers (6 m<sup>2</sup>) in ventilation and air handling units.



DAL-DML

Technical data	
Max. damper size	6 m <sup>2</sup>
Torque	24 Nm
Frequency	50...60 Hz
Stroke time	125 s
Rotation angle	90° Limitation: 5...85° in 5° steps
Ambient temperature	-20...+50 °C
Ambient humidity	5...95 % RH
Noise level	Max 45 dB
Mounting	Directly on jack shaft
For jack shaft	10...20 mm Ø (round shaft), 10...20 mm (square shaft)
Weight	1200 g
Protection class	IP44 or IP54 with cable glands
Isolation class	III (DAL230, DML230: class II)
Certification	CE

Article	Supply voltage	Control signal	Power consumption	Auxiliary switch
DAL24	24 V AC / DC	on/off or 3 point	Operating: 3.9 W Maintenance: 0.4 W	-
DAL24S	24 V AC / DC	on/off or 3 point	Operating: 3.9 W Maintenance: 0.4 W	2 x 3 (1.5) A / AC 230 V
DAL230	230 V AC	on/off or 3 point	Operating: 4.8 W Maintenance: 1.2 W	-
DAL230S	230 V AC	on/off or 3 point	Operating: 4.8 W Maintenance: 1.2 W	2 x 3 (1.5) A / AC 230 V
DML24	24 V AC / DC	Y1: 0(2)...10 V DC Y2: 0(4)...20 mA U: 0(2)...10 V DC (feedback signal)	Operating: 4.0 W Maintenance: 0.7 W	-
DML24S	24 V AC / DC	Y1: 0(2)...10 V DC Y2: 0(4)...20 mA U: 0(2)...10 V DC (feedback signal)	Operating: 4.0 W Maintenance: 0.7 W	2 x 3 (1.5) A / AC 230 V
DML230	230 V AC	Y1: 0(2)...10 V DC Y2: - U: 0(2)...10 V DC (feedback signal)	Operating: 4.8 W Maintenance: 1.0 W	-
DML230S	230 V AC	Y1: 0(2)...10 V DC Y2: - U: 0(2)...10 V DC (feedback signal)	Operating: 4.8 W Maintenance: 1.0 W	2 x 3 (1.5) A / AC 230 V

## DAMPER ACTUATORS WITHOUT SPRING RETURN, 32 NM

Well-suited for applications with medium or large dampers (8 m<sup>2</sup>) in ventilation and air handling units.



DAG-DMG

Technical data	
Max. damper size	8 m <sup>2</sup>
Torque	32 Nm
Frequency	50...60 Hz
Rotation angle	90° Limitation: 5...85° in 5° steps
Ambient temperature	-20...+50 °C
Ambient humidity	5...95 % RH
Noise level	Max 45 dB
Mounting	Directly on jack shaft
For jack shaft	10...20 mm Ø (round shaft), 10...16 mm (square shaft)
Protection class	IP44 or IP54 with cable glands
Isolation class	III (DAG230: class II)
Certification	CE

Article	Supply voltage	Control signal	Power consumption	Auxiliary switch	Stroke time	Weight
DAG24	24 V AC / DC	on/off or 3 point	Operating: 4.0 W Maintenance: 0.5 W	-	160 s	1100 g
DAG24S	24 V AC / DC	on/off or 3 point	Operating: 4.0 W Maintenance: 0.5 W	2 x 3 (1.5) A / AC 230 V	160 s	1100 g
DAG230	230 V AC	on/off or 3 point	Operating: 4.8 W Maintenance: 1.2 W	-	160 s	1200 g
DAG230S	230 V AC	on/off or 3 point	Operating: 4.8 W Maintenance: 1.2 W	2 x 3 (1.5) A / AC 230 V	160 s	1200 g
DMG24	24 V AC / DC	Y1: 0(2)...10 V DC Y2: 0(4)...20 mA U: 0(2)...10 V DC (feedback signal)	Operating: 2.5 W Maintenance: 0.3 W	-	240 s	1200 g
DMG24S	24 V AC / DC	Y1: 0(2)...10 V DC Y2: 0(4)...20 mA U: 0(2)...10 V DC (feedback signal)	Operating: 2.5 W Maintenance: 0.3 W	2 x 3 (1.5) A / AC 230 V	240 s	1200 g

## DAMPER ACTUATORS WITH SPRING RETURN, 5 NM

Well-suited for applications with security dampers used as antifreeze, antismoke or for sealing in the hygienic-sanitary field.



DAN230F

Technical data	
Max. damper size	1 m <sup>2</sup>
Torque	5 Nm
Frequency	50...60 Hz
Running time, actuator	50...70 s
Running time, spring return	< 20 s
Rotation angle	Operating: 90° Limitation: 5...85° in 5° steps
Ambient temperature	-20...+50 °C
Ambient humidity	5...95 % RH
Noise level	Max 45 dB
Mounting	Directly on jack shaft
For jack shaft	10...16 mm Ø (round shaft), 7...11 mm (square shaft)
Protection class	IP54
Isolation class	II
Certification	CE

Article	Supply voltage	Power consumption	Auxiliary switch	Weight
DAN24F	24 V AC / DC	Operating: 7.2 W Maintenance: 2.5 W	-	1800 g
DAN24FS	24 V AC / DC	Operating: 7.2 W Maintenance: 2.5 W	2 x SPDT 3 (1.5) A / AC 230 V	1800 g
DAN230F	230 V AC	Operating: 4.2 W Maintenance: 2.5 W	-	1900 g
DAN230FS	230 V AC	Operating: 4.2 W Maintenance: 2.5 W	2 x SPDT 3 (1.5) A / AC 230 V	1900 g

## DAMPER ACTUATORS WITH SPRING RETURN, 10 NM

Well-suited for applications with security dampers used as antifreeze, antismoke or for sealing in the hygienic-sanitary field.



DAT230F

Technical data	
Max. damper size	2 m <sup>2</sup>
Torque	10 Nm
Frequency	50...60 Hz
Running time, actuator	100 s
Running time, spring return	25 s
Rotation angle	-5°...+95°
Ambient temperature	-20...+50 °C
Ambient humidity	5...95 % RH
Noise level	Max 45 dB
Mounting	Directly on jack shaft
For jack shaft	10...19 mm Ø (round shaft), 10...16 mm (square shaft)
Weight	2300 g
Protection class	IP54
Isolation class	III (DAT230F: class II)
Certification	CE

Article	Supply voltage	Power consumption	Auxiliary switch
DAT24F	24 V AC / DC	Operating: 5.0 W Maintenance: 2.5 W	-
DAT24FS	24 V AC / DC	Operating: 5.0 W Maintenance: 2.5 W	2 x 3 (1,5) A / AC 230 V
DAT230F	230 V AC	Operating: 6.5 W Maintenance: 2.5 W	-
DAT230FS	230 V AC	Operating: 6.5 W Maintenance: 2.5 W	2 x 3 (1,5) A / AC 230 V

## DAMPER ACTUATORS WITH SPRING RETURN FOR FIRE DAMPERS, 5 NM

Well-suited for applications with security / fire dampers used as antifreeze, antismoke or for sealing in the hygienic-sanitary field.



AF230SE

Technical data	
Max. damper size	1 m <sup>2</sup>
Torque	5 Nm
Frequency	50...60 Hz
Thermal sensor	Duct 72°C
Running time, actuator	50...70 s
Running time, spring return	< 20 s
Rotation angle	90°
Ambient temperature	-20...+50 °C
Ambient humidity	5...95 % RH
Noise level	Max < 45 dB
Mounting	Directly on jack shaft
For jack shaft	12 mm (square shaft)
Protection class	IP54
Isolation class	II
Certification	CE

Article	Supply voltage	Power consumption	Auxiliary switch	Weight
AF24SE	24 V AC / DC	Operating: 7.2 W Maintenance: 2.5 W	2 x SPDT fixed 3 (1.5) A / AC 230 V	1800 g
AF230SE	230 V AC	Operating: 4.2 W Maintenance: 2.5 W	2 x SPDT fixed 3 (1.5) A / AC 230 V	1900 g



## DAMPER ACTUATORS WITH SPRING RETURN FOR FIRE DAMPERS, 8 NM

Well-suited for applications with security / fire dampers used as antifreeze, antismoke or for sealing in the hygienic-sanitary field.



NF24SE

Technical data	
Max. damper size	1.5 m <sup>2</sup>
Torque	8 Nm
Frequency	50...60 Hz
Thermal sensor	Duct 72°C
Running time, actuator	75...95 s
Running time, spring return	< 25 s
Rotation angle	90°
Ambient temperature	-20...+50 °C
Ambient humidity	5...95 % RH
Noise level	Max < 45 dB
Mounting	Directly on jack shaft
For jack shaft	12 mm (square shaft)
Protection class	IP54
Isolation class	II
Certification	CE

Article	Supply voltage	Power consumption	Auxiliary switch	Weight
NF24SE	24 V AC / DC	Operating: 7.0 W Maintenance: 2.0 W	2 SPDT fixed 3 (1.5) A / AC 230 V	2200 g
NF230SE	230 V AC	Operating: 8.0 W Maintenance: 5.5	2 SPDT fixed 3 (1.5) A / AC 230 V	2300 g

## POSITION TRANSDUCER

Article	Supply voltage	Output signal	Control signal	Mounting
DB-PA	24 V AC/DC	0(2)...10 V DC ( $R_{load} > 6K\Omega$ ) (control override)	0(2)...10 V DC	Wall
DB-PF	24 V AC/DC	0(2)...10 V DC ( $R_{load} > 6K\Omega$ ) (control override)	0(2)...10 V DC	Front-end



DB-PA

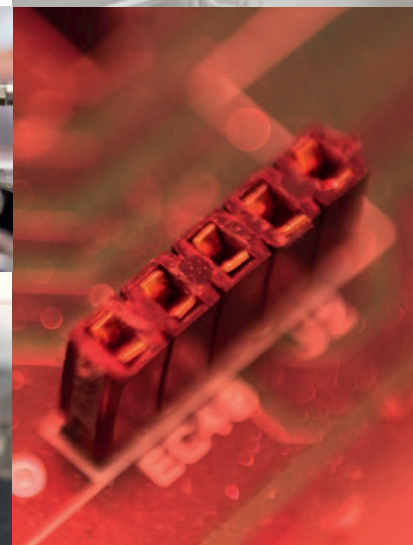
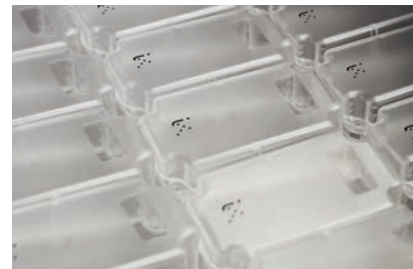


DB-PF



# 8 Valves and actuators

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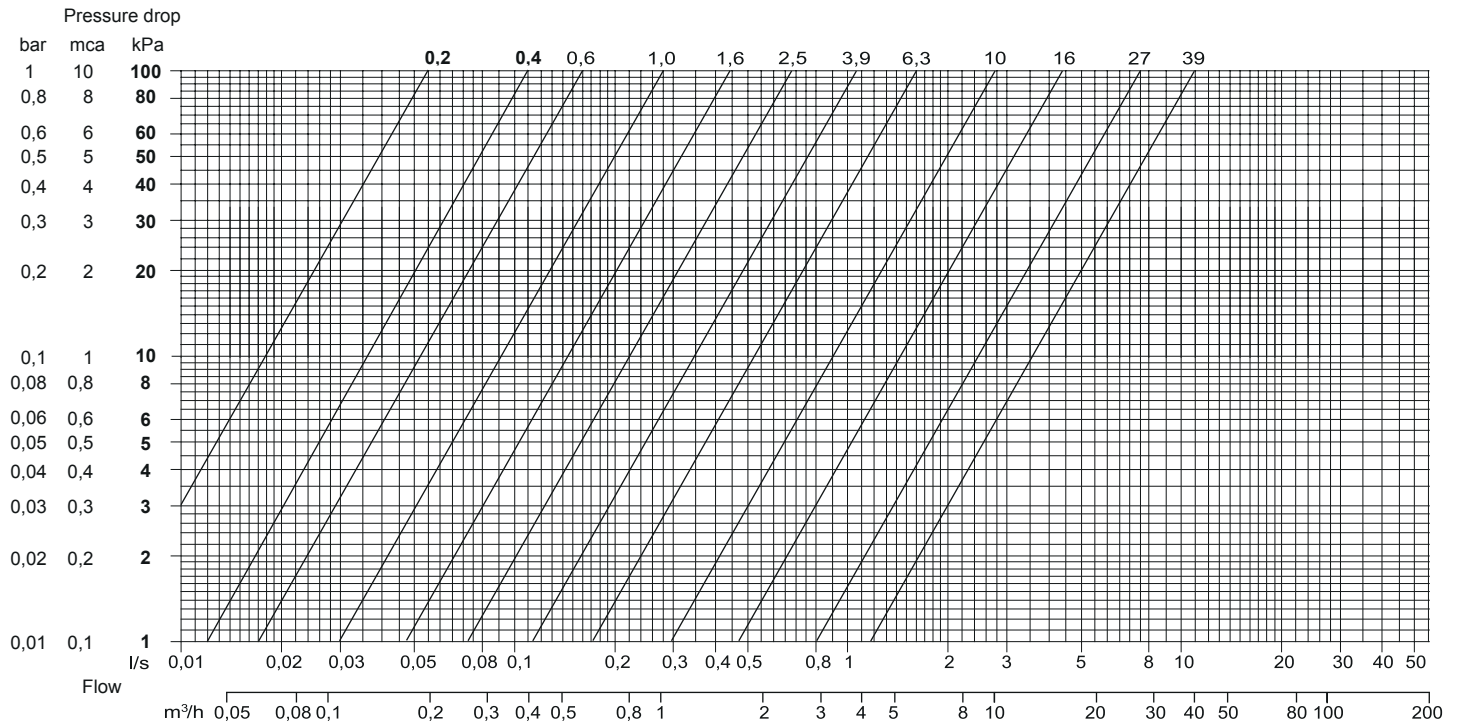
- x** Recommended choice
- ◆ Other possible alternative

### ACTUATORS AND VALVE BODIES COUPLING

					SM	FCA	SEB	
					synchronous, spring return 24 V AC/230 V AC	synchronous, spring return 230 V AC	On/off (3-wire), 24/230 V AC 0...10 V, 24 V AC	
							4 Nm	5Nm
	DB-VZ	Internally threaded 2-, 3-way		DN 15–25	<b>x</b>			
	FCV	Internally threaded 2-, 3-way		DN 15–32		<b>x</b>		
	VFBV	Internally threaded 2-, 3-way	90°	DN 15–50			<b>x</b>	
				DN 32–50				<b>x</b>
	VFX2	Externally threaded 2-way	stroke 2.5 mm	DN 15–20				
	VFX3	Externally threaded 3-way						
	VFX4	Externally threaded 3-way, 4 port						
	VFPI VPIM VFPI	Pressure independent valves	stroke 2.7mm	DN 15–25				
	VFMD2 VFMD3	Externally threaded 2-, 3-way	stroke 5.5 mm	DN 15–40				
	VFTR2 VFTR3	Externally threaded 2-, 3-way	stroke 5.5 mm	DN 15–25				
	VFBF2 VFBF3	Internally threaded 2-, 3-way	stroke 20 mm	DN 15–50				
	VFG2 VFG2...N VFG3	Internally threaded 2-, 3-way	stroke 20 mm	DN 15–50				
	VFD2 VFD3	Externally threaded 2-, 3-way	stroke 20 mm	DN 15–50				
	VFFG2 VFFG3	Flanged, 2-way 3-way	stroke 20 mm	DN 25–40				
			stroke 20 mm	DN 50–65				
			stroke 40 mm	DN 80–200				
	VFL2 VFL3	Flanged, 2-way 3-way	stroke 20 mm	DN 65–80				
			stroke 40 mm	DN 100–150				
			stroke 20 mm	DN 65–80				
			stroke 40 mm	DN 100–150				
	VFDH	Flanged, 2-way	stroke 20 mm	DN 15–50				
			stroke 20 mm	DN 65–80				
			stroke 38 mm	DN 100				
			stroke 40 mm	DN 125–150				
	VF	2-way, butterfly valve		DN 32–80				



## CALCULATION OF $K_{vs}$ VALUE

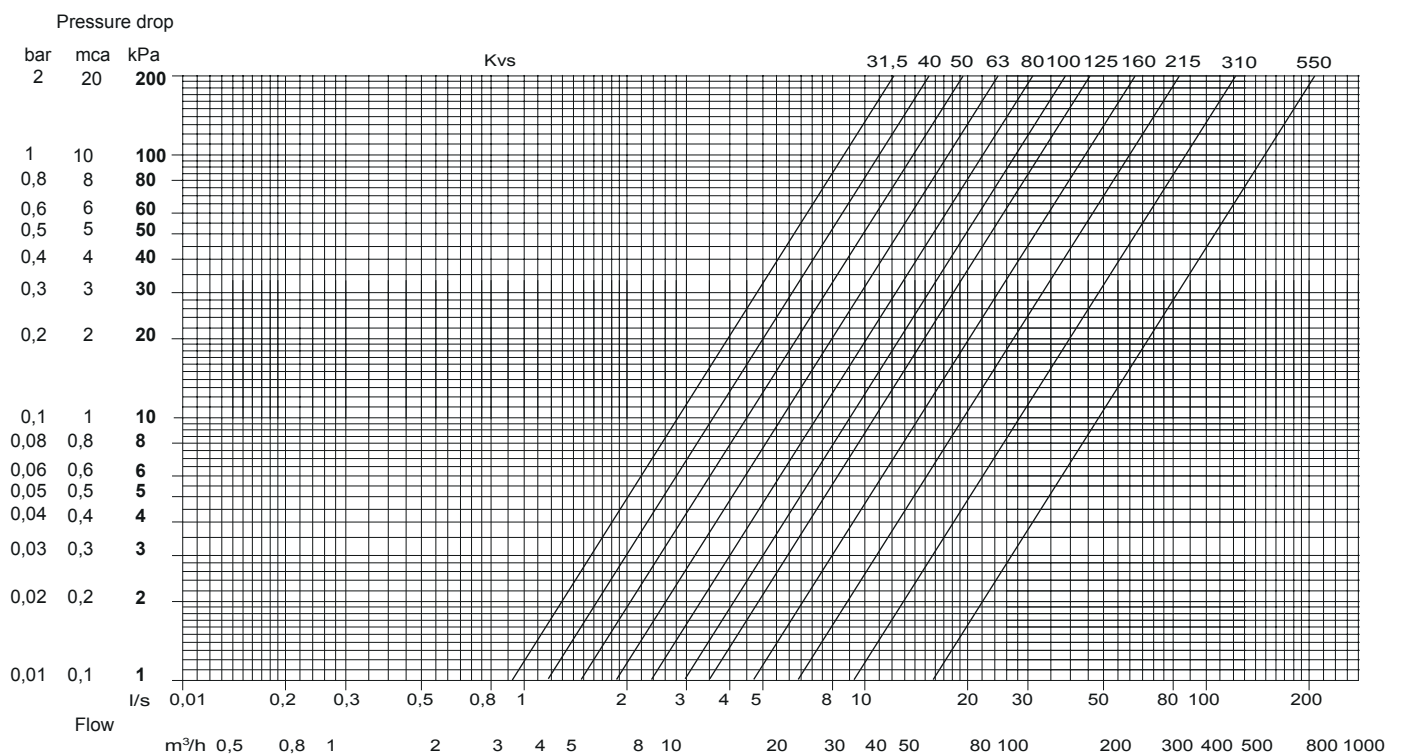


The **pressure drop diagram** allows the Calculation of  $K_{vs}$  for a regulation valve. It correlates the flow rate with the pressure drop. The axes use a logarithmic scale so that you can represent any of  $K_{vs}$  value with a straight line.

Example:

**TO CHOOSE A  $K_{vs}$  VALUE FOR A VALVE HAVING A PRESSURE DROP OF 80 KPA AND A FLOW RATE OF 0,2 L/S:**

- Draw a horizontal line corresponding to the pressure drop value (DP = 80 kPa)
- Draw a vertical line in correspondance of the flow rate value (0.2 l / s)
- Then draw a straight line from the intersection formed up to the nearest  $K_{vs}$  line
- Read the value of the corresponding  $K_{vs}$
- Result: 1.0  $K_{vs}$



## THERMAL ACTUATORS FOR MANIFOLDS AND VALVES

Thermal actuator to be used on manifolds

Technical data	
Sensor element	Special wax
Power consumption	3 VA
Ambient temperature	0...50 °C
Ambient humidity	10...90 % RH (non-condensing)
Storage temperature	-10...+60 °C Humidity: < 95 % RH
Peak current	SE1C24, SE1C24S < 0.25 A SE1C230, SE1C230S < 1 A
Auxiliary switch	3 A 230 V AC
Cable	PVC, section 2(4) x 0.50 mm <sup>2</sup> , length 1 m
Connection, actuator	Metal ring M30 x 1.5
Material, casing	Matt polycarbonate, self extinguishing V0 - V1 according to UL94
Weight	150 g
Dimensions	Ø 48.5 x h 65 mm
Protection class	IP40 if mounted vertically: IP44 class II (SE1C230, SE1C230S) class III (SE1C24, SE1C24S)
Control signal	On/Off

Article	Supply voltage	Auxiliary switch	Stroke time
SE1C24	24 V AC ± 10%, 50/60 Hz	-	
SE1C230	230 V AC ± 10%, 50/60 Hz	-	
SE1C24S	24 V AC ± 10%, 50/60 Hz	X	
SE1C230S	230 V AC ± 10%, 50/60 Hz	X	



SE1C

### ACCESSORIES

Article	Actuator	Description
ADVFX	SE1C...	Adapter for SE1C/VFX coupling up to Kvs 2.5 to allow the valve to be normally open on direct way
ADV11	SE22.../SE1C...	Adapter for valve with 2.7 mm stroke



Articles available in multipack /M: SE1C.../M (72 pcs.)  
Adapters must be ordered separately.



ADVFX



ADV11

## DB-VZ – ON/OFF ZONE VALVES

On/off control of heat or cool water flow. The valves must be combined with the SM actuator.



DB-VZ2-20

### Technical data valve

Storage temperature	-20...+70 °C
Humidity	< 95 % RH
Media temperature	0...105 °C
Nominal pressure (PN)	16 bar
Weight	270...750 g

### Material

Body	Forged brass
Stem	Stainless steel AISI 302
Packing	NBR

### 2-WAY VALVES

Article	Nominal diameter	Connection	Kvs	Max. diff. pressure
DB-VZ2-15	DN15	G 1/2"	1.6 m <sup>3</sup> /h	250 kPa (2,5 bar)
DB-VZ2-20	DN20	G 3/4"	3.5 m <sup>3</sup> /h	100 kPa (1 bar)
DB-VZ2-25	DN25	G 1"	5.5 m <sup>3</sup> /h	60 kPa (0,6 bar)

### 3-WAY VALVES

Article	Nominal diameter	Connection	Kvs	Max. diff. pressure
DB-VZ3-15	DN15	G 1/2"	1.6 m <sup>3</sup> /h	250 kPa (2,5 bar)
DB-VZ3-20	DN20	G 3/4"	3.5 m <sup>3</sup> /h	100 kPa (1 bar)
DB-VZ3-25	DN25	G 1"	5.5 m <sup>3</sup> /h	60 kPa (0,6 bar)