ELECTRIC ACTUATORS 400 N

APPLICATION

Electric actuator SE4 is suitable to drive VFZ valve body series in HVAC systems. Two action types are available:
- floating (3-point)
- modulating Vdc and mA.

Actuator is equipped with torque limit device, to power off when actuator reaches the end-strokes. The assembly actuator/valve body is done directly and easy by a metal ring nut, no tool is necessary.

The actuator is self-adjusting (SE4M24). When it is powered-on the stroke is automatically adapted to the valve, no calibration is required. Actuator is fitted with manual override by a hexagonal key. A LED indicates the current state of the actuator: adjustment, control, end stroke position, error condition.

TYPE	FORCE N	STROKE mm	POWER SUPPLY Vac 50/60 HZ	ACTION	POWER CONSUMPTION VA
SE4M24	400	5.5	24	modulating	7.5
SE4F24	400	5.5	24	2-, 3-point (floating)	7.0
SE4F230	400	5.5	110…240	2-, 3-point (floating)	7.0

TECHNICAL FEATURES

Power supply:
- SE4M24 24 Vac ± 10% 50/60 Hz
- SE4F24 24 Vac ± 10% 50/60 Hz
- SE4F230 110...240 Vac ± 10% 50/60 Hz
Running time: 70 sec.
Manual override: by 3 mm hexagonal key
Action: direct / reverse selectable by jumper
Working conditions: 0...50 °C, 10…90 r.h.% without condensing
Storage temp.: -20...70 °C
Cable: plug-in type in PVC, wire 3 x 0.50 mm^2, 1,5 m length
Connection: metal ring 3/4" (on request M30 x 1.5)
Housing: transparent
Protection class: IP54, classe II (SE4F230), classe III (SE4M24, SE4F24)
Self extinguishing: V0 - V1 according to UL94
Dimensions: see drawing
Weight: 360 g

NOTE
An indicator on the front of the unit indicates the current position.

ASSEMBLY / INSTALLATION

Actuator is factory supplied with the shaft in upper position. Otherwise, power off the unit and insert the hexagonal key into screw of manual override on the top of cover. Drive the shaft in upper position turning the key anticlockwise. Mount the actuator onto valve body and tighten the metal ring nut on the thread of bonnet valve body. Pay attention that the clearance around the unit is sufficient to mount correctly the actuator. Perform the electrical connections as per the wiring diagrams. Pay attention that power supply value corresponds to the value of actuator indicated on label stuck on unit.

SE4M24 has different Input signals as per below table (selectable by jumpers):

INPUT SIGNAL	IMPEDANCE (R_{in})
0...10 V	~ 65 kOhm
0...4 V	~ 65 kOhm
6...10 V	~ 65 kOhm
2...10 V	~ 65 kOhm
4...20 mA	= 500 Ohm

STATUS INDICATION BY LEDS

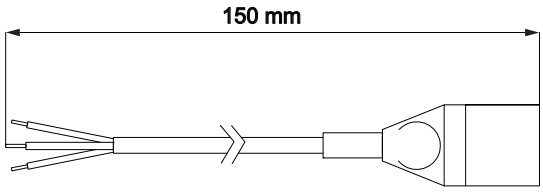
GREEN slowly blinking: self-adjust in upper position (SE4M24).
RED slowly blinking: self-adjusting in bottom position (SE4M24).
GREEN fast blinking: modulating to upper position.
RED fast blinking: modulating to bottom position.
GREEN lighted: upper end stroke (SE4M24).
RED lighted: bottom end stroke (SE4M24).

ORANGE lighted: error, try 3 times to unlock and then 3 times to self-adjust (SE4M24).
ORANGE blinking: permanent error (SE4M24).
RED and GREEN blinking: jumpers setting not correct (SE4M24)
All LEDS OFF: control position reached

Slow blinking: 2 flashing / second
Fast blinking: 8 flashing / second

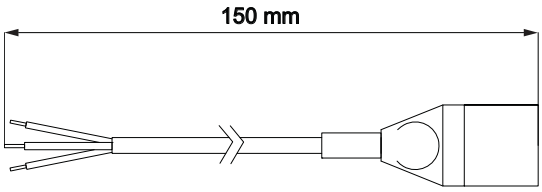
WIRING DIAGRAM

SE4F24 / SE4F230



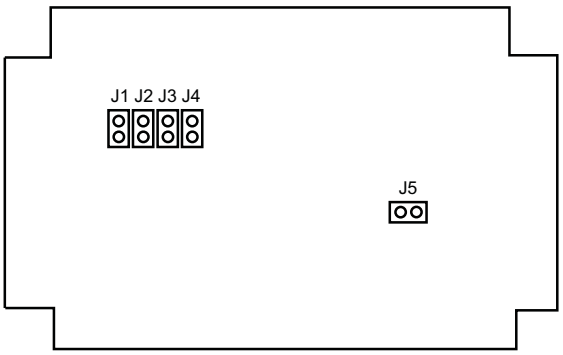
COM.	Blue
DOWN	Black
UP	Brown

SE4M24



COM	Blue
IN. (Y) 0...10 V	Black
24 Vca	Brown

JUMPERS POSITION ON PCB SE4M24



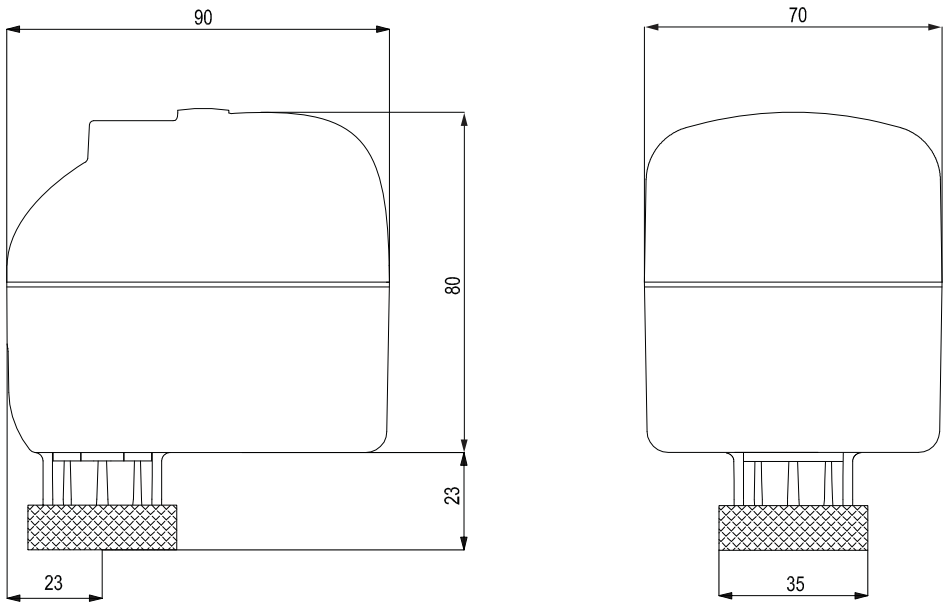
INPUT SIGNAL	J1	J2	J3	J5	J4
0...10 V	▯	▮	▯	▯	
0...4 V	▮	▯	▯	▯	
6...10 V	▮	▮	▯	▯	
2...10 V	▯	▯	▮	▯	
4...20 mA	▯	▯	▯	▮	
DIRECT ACTION					▯
REVERSE ACTION					▮

▯ Jumper unmounted
▮ Jumper mounted

DIRECT / REVERSE ACTION SE4M24

DA: 0 Vdc shaft in uppest position (A-AB valve port closed)
10 Vdc shaft in lowest position (A-AB valve port open)
RA: 0 Vdc shaft in lowest position (A-AB valve port open)
10 Vdc shaft in uppest position (A-AB valve port closed)
Factory setting: DA, input signal 0...10 Vdc

OVERALL DIMENSIONS (mm)



GLOBE VALVES BODIES - STROKE 5,5 mm

VFZ

APPLICATION AND USE

VFZ valve bodies are used in HVAC systems to control fluid in heating, cooling, refrigeration, ventilation in civil or industrial plants. Valves are fitted with female threaded connections in 2 and 3-way. 3-way valves are used in mixing mode, they can be used in diverting mode reducing the max differential pressure value by 50%. Do not use the bypass (angle way) as control port. VFZ valve bodies are motorized by SE4 series electric actuators.

WORKING

Stem up : direct way A -AB closed
(B-AB for 3 way valve open)

Stem down : direct way A-AB open
(B-AB for 3 way valve closed)

TYPE		CONNECTION	KVs m^3/h	MAX DIFF. PRESSURE (*) bar
2-WAY	3-WAY			
VFZ210	VFZ310	G 1/2	0.25	2.5 (10.0)
VFZ211	VFZ311	G 1/2	0.4	2.5 (10.0)
VFZ212	VFZ312	G 1/2	0.63	2.5 (10.0)
VFZ213	VFZ313	G 1/2	1.0	2.5 (10.0)
VFZ214	VFZ314	G 1/2	1.6	2.5 (10.0)
VFZ215	VFZ315	G 1/2	2.5	2.5 (10.0)
VFZ218	VFZ318	G 3/4	4.0	2.0 (5.0)
VFZ220	VFZ320	G 3/4	6.3	2.0 (5.0)
VFZ225	VFZ325	G 1	10.0	2.0 (2.5)
VFZ232	VFZ332	G 1 1/4	13.0	2.0 (2.5)
VFZ240	VFZ340	G 1 1/2	18.0	2.0 (2.0)

(*) the values in the brackets are the max diff. pressure when valve is fully closed and actuator is still able to open or close the valve with security.
the values outside the brackets are the suggested max pressure drop (valve fully open)

TECHNICAL FEATURES

Nominal pressure: PN16 (ISO7268/EN1333)
Connections: threaded female GAS
Valve body: cast-iron G25
Plug : brass OT58
Plug gasked: FKM O-ring
Stem: stainless steel AISI304
Stem packing: FKM O-ring
Stem packing nut: brass OT58
Spring: stainless steel AISI304
Control stroke: 5.5 mm

Control flow characteristics: linear
Leakage: direct way A-AB perfect sealing
angle way B-AB 0,2% KVs
Rangeability: 50:1
Fluid temperature: -10...+120 °C
Fluids type: water, water with glycol max. 50%
Dimensions/weight: see relevant table

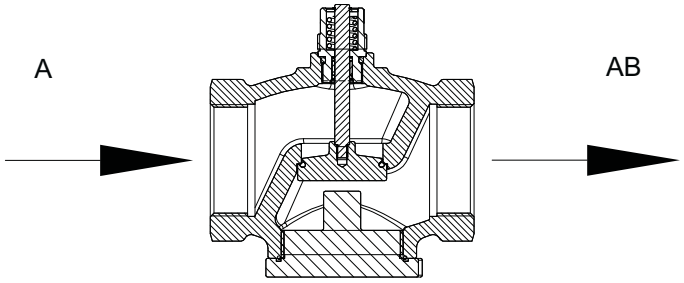
ACCESSORIES

RP1/2"...RP2" fitting for valve piping connections

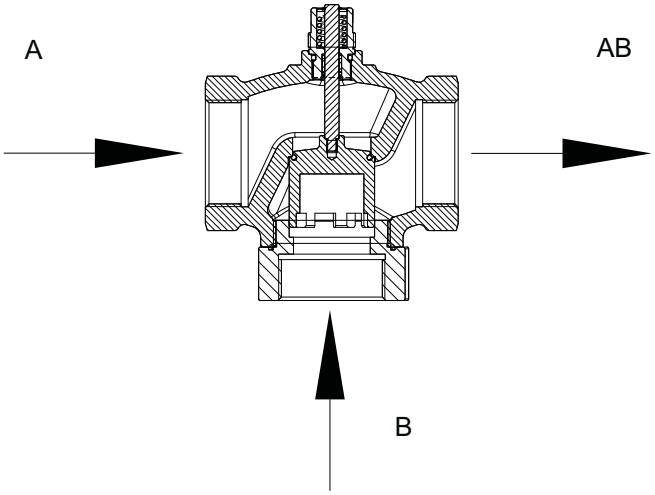
INSTALLATION

PIPING CONNECTIONS
Make the piping connections according to flow directions indicated on valve body as the following drawings.
AB is always the output. Input is A for 2-way valve, A and B for 3-way valve.

2-way valve



3-way valve



VALVE MOUNTING

Before mounting the valve body be sure that the pipes are clean and free of soldering scraps. Pipes must be lined up squarely with the valve at each connection and free of vibrations. Install the valve/actuator vertically or horizontaly but never upside down. Leave enough clearance to facilitate the dismounting of actuator from the valve body for maintenance purpose.

The valve must not be installed in explosive atmosphere or in ambient with temperature and humidity outside the ranges indicated on technical features part. Valve must not be subjected to water or steam jets or dripping liquid. 3-way valve must be used in mixing way (2 inlets 1 output). If the valve is used in diverting way (fig.3, 1 inlet 2 outputs), the max differential pressure allowed is reduced by 50%.

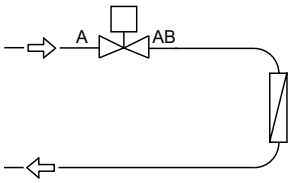


fig.1
2-way

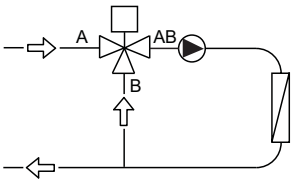


fig.2
3-way mixing used in mixing application toward user

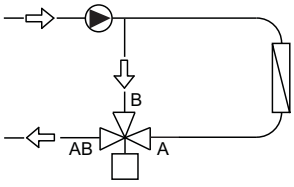
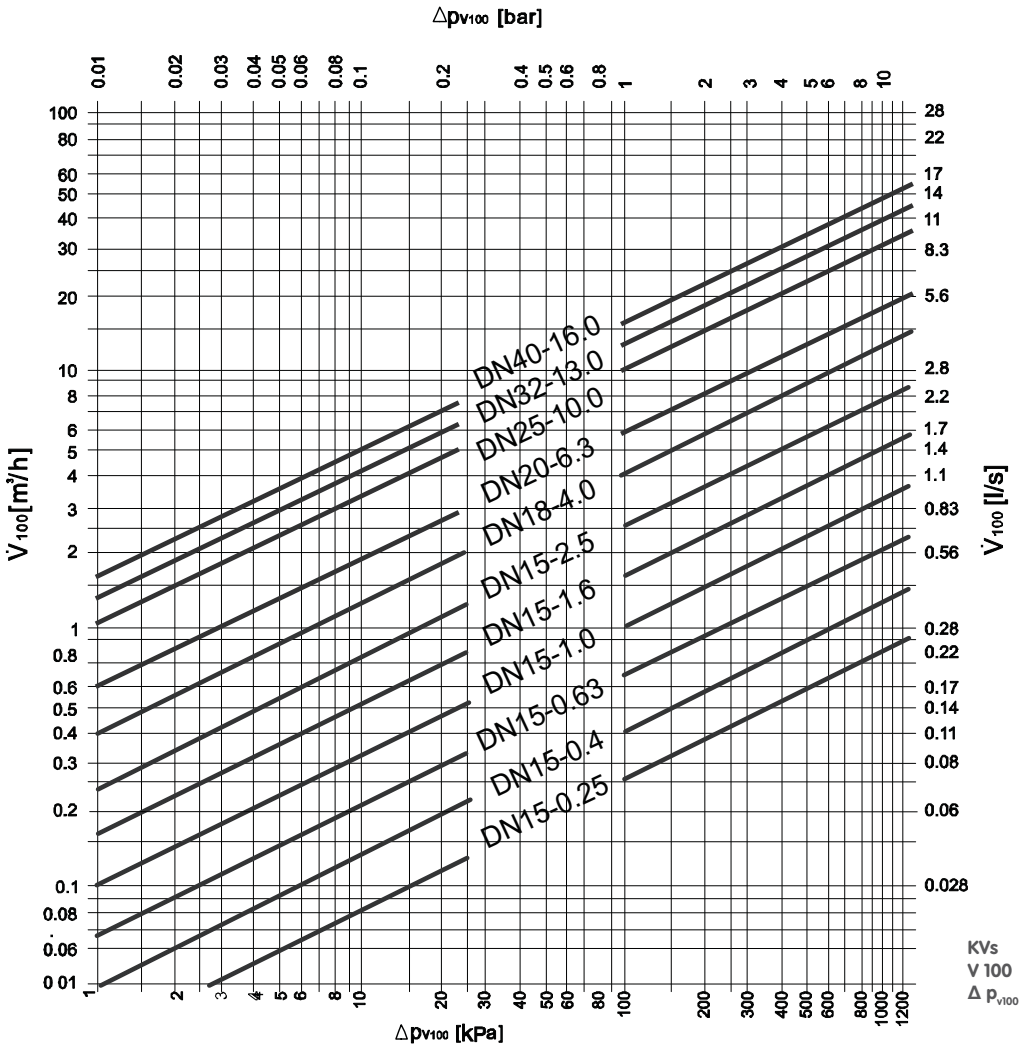


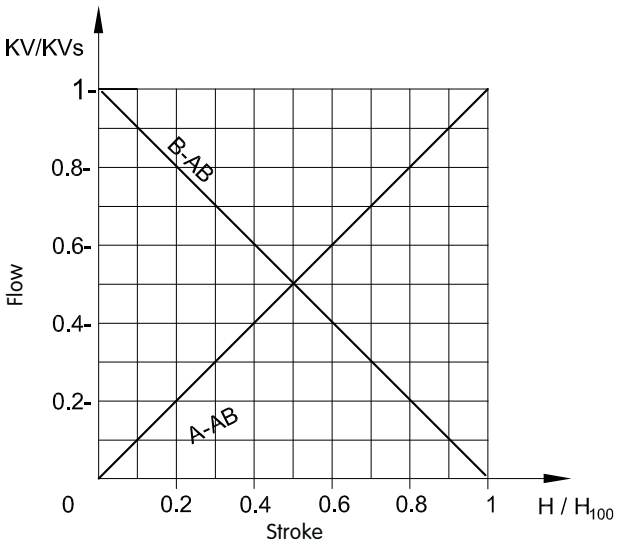
fig.3
3-way mixing used in diverting application toward user

CONTROL DROP DIAGRAM



KVs	nominal flow rate
V 100	nominal flow rate at Δp_{v100}
Δ p_{v100}	differential pressure drop across the valve fully open

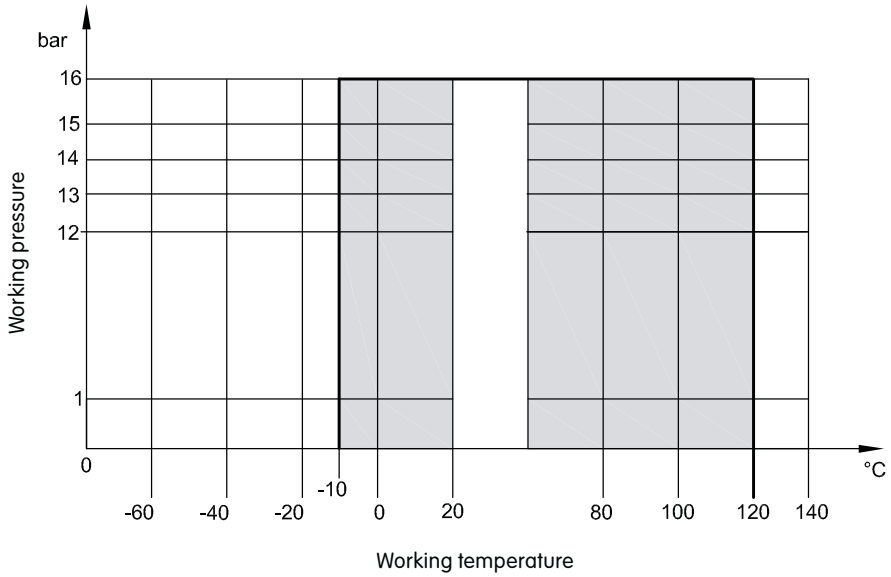
CONTROL FLOW CHARACTERISTICS



3-way used as mixing inlet in A and B, outlet AB
3-way used as diverting inlet in AB outlet from A and B

Via AB	constant flow
Via A	variable flow
Via B (bypass)	variable flow

DIAGRAM PRESSURE / TEMPERATURE



OVERALL DIMENSIONS (mm)

G	A	B	C	C1	D	H min.	WEIGHT (g)	
			VFZ3	VFZ2			VFZ2	VFZ3
G 1/2	66	55.3	40.5	32.5	33.0	205	600	620
G 3/4	90	60.8	56.0	42.0	45.0	210	1050	1150
G 1	96	68.3	59.2	40.5	48.0	220	1400	1150
G 1 1/4	109	71.3	67.2	47.5	54.5	225	1850	2000
G 1 1/2	122	75.8	72.0	55.0	61.0	230	2650	2700