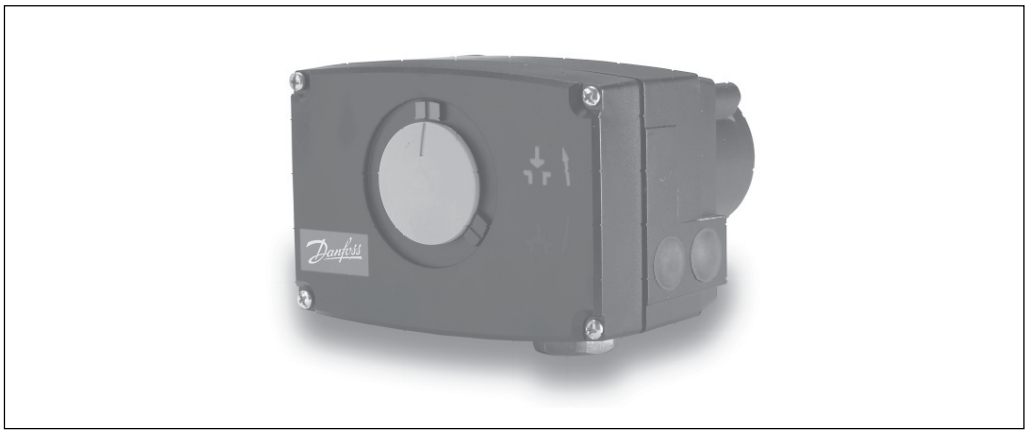
Refrigeration and Air Conditioning Controls

Technical leaflet

Motor types SMV/SMVE for MEV/MRV motorised valves

REFRIGERATION AND AIR CONDITIONING

Introduction



Motor types SMV/SMVE are dedicated for use with MEV/MRV motorised valves. Using the same motor size, they cover the complete MEV/MRV product series and its whole capacity range.

The SMV motor operates the MEV/MRV valve via an ordinary three-point control (open - neutral - closed) while the SMVE motor operates the MEV/MRV valve with a modulating signal (e.g. 4 - 20 mA).

Features

- Very compact motor
- Specially designed for industrial refrigeration installations
- Built-in heating element in motor housing
- Motor with spring return system; returns the valve to closed position in the event of power failure
- Degree of protection: IP 54
- Voltage supply: 24 V ac and 220 V ac, 50/60 Hz
- Feedback signal facility
- SMVE has an automatic calibration function
- The motors can be configured for direct or inverse operation
- Configurable input signal for SMVE
- Torque protection throughout the operating range of the motor gives protection against overload

Design

Types
SMV: Three-point control
SMVE: Modulating signal

Coupling to MEV/MRV
32 mm A/F (M30 × 1.5). Tightening torque max. 25 Nm.

Manual operation
The motors can be operated manually with a 5 mm hexagon key.

Cable connection
2-off ∅17 mm holes for PG 11 cable entries.

Materials
Cover: ABS plastic
Housing: Pressure die cast aluminium.

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Technical data

Motortype	**SMV**, three-point motor	**SMVE**, modulating motor
Control signal	3-point	Analog
Supply voltage	24 V a.c.; 230/240 V a.c. +10% - –15%	24 V a.c.; +10% - –15%
Power consumption, motor	12 W	14 W
Power consumption, spindle heating element	24 W	
Frequency	50/60 Hz	
Control signal input	3-point: open - neutral - closed	0 - 10 V / 2 - 10 V, R_i = 24 kΩ 0 - 20 mA / 4 - 20 mA, R_i = 500 Ω
Output signal	Contact Danfoss	0 - 10 V / 2 - 10 V
Nominal actuator force	600 N	
Spindle travel	Max. 21 mm	
Spindle speed	50 Hz: 3.0 s/mm, 60 Hz: 2.4 s/mm	
Ambient temperature	–20°C - + 60°C	
Storage and transport temperature	–40°C - + 70°C	
Enclosure	IP 54	
Weight	2.0 kg	
Spring return system	Yes	
CE marking in accordance with standard	EMC-Directive 89/336/EEC, 92/31/EEC, 93/68/EEC, EN 50081-1, EN 50082-1 Low-voltage directive 73/23/EEC, 93/68/EEC EN 60730/2/14	EMC-Directive 89/336/EEC, 92/31/EEC 93/68/EEC EN 50081-1, EN 50082-1

Operating settings SMVE

SMVE has three jumper settings:

D/I: Direct or inverse operation
D: Direct: Rising input signal, the motor actuator spindle extends.
I: Inverse: Rising input signal, the motor actuator spindle retracts.

2/0: Input signal range
2: 4 - 20 mA / 2 - 10V; depending on U/I
0: 0 - 20 mA / 0 - 10V; depending on U/I

U/I: Input signal voltage/current
U: Voltage
I: Current

Factory setting: D, 2, I

Function

The SMV/SMVE motor actuator spindle will always be fully retracted when when no power supply is applied. Therefore, when mounted as an assembly with a MEV/MRV, the valve will consequently be closed.

If power to the SMV/SMVE motor fails during operation and irrespective of the degree of opening of the MEV/MRV valve, the motor spring return system will automatically close the valve. Therefore, continuous voltage must be applied to the SMV/SMVE motor for the MEV/MRV valve to regulate.

Operation of spring return system (closing valve) is not designed to daily operation, but only in a emergency situation.

The SMV/SMVE motor is fitted with an internal heating element to prevent condensation in the motor terminal box. The heating element incorporates thermal protection to prevent the temperature becoming too high.

With the power supply isolated the SMV/SMVE motors can be operated manually with a 5 mm hexagon key. See SMV/SMVE instructions.

Manual operation can also be performed electrically. See *Applications.*

To prevent ice formation, a spindle heater is available as an accessory for use where the media temperature is less than 0°C.

The SMV motor must not be calibrated. It is controlled by two potential-free digital contacts. The motor spindle travels 0.6 - 1.0 mm before it acts on the MEV/MRV push pin.

The SMVE motor must be auto calibrated specifically for each MEV/MRV valve. Auto calibration is only necessary once. The SMVE motor thus adapts the electrical control signals to the actual lifting height of the MEV/MRV valve.
The motor spindle travels 0.6 - 1.0 mm before it acts on the MEV/MRV push pin.

The spring return system can be made inoperative with a bracket so that the SMV/SMVE motor does not close the MEV/MRV motorised valve when power fails (see *Ordering*).

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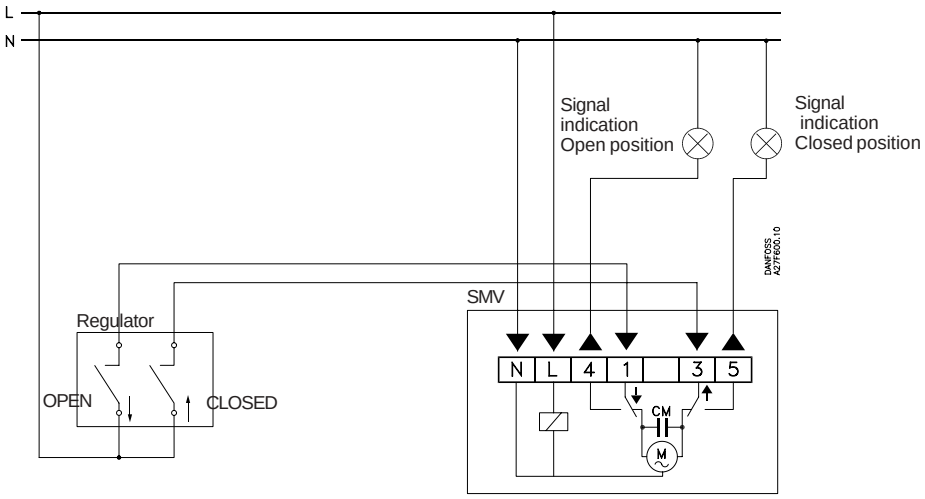
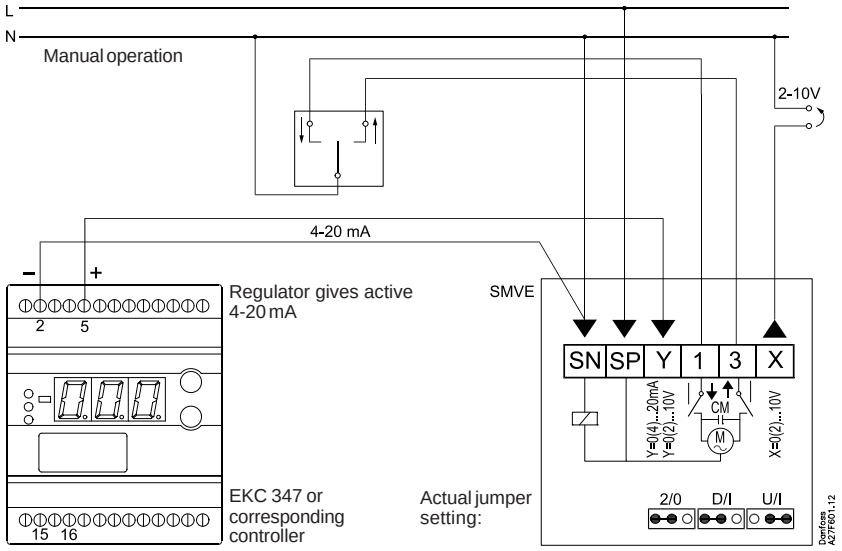
Applications

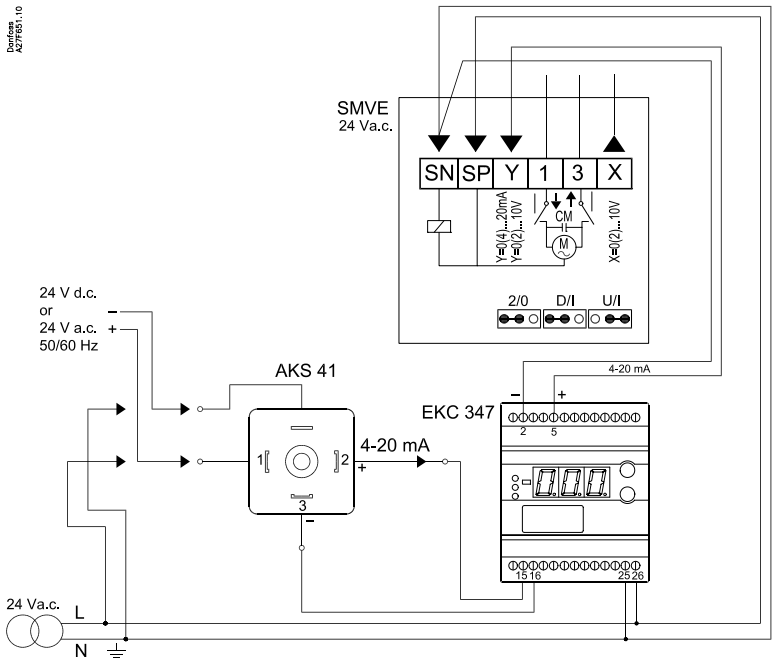
SMV motor



SMVE motor



Application example valid for EKC 347, AKS 41 and SMVE 24



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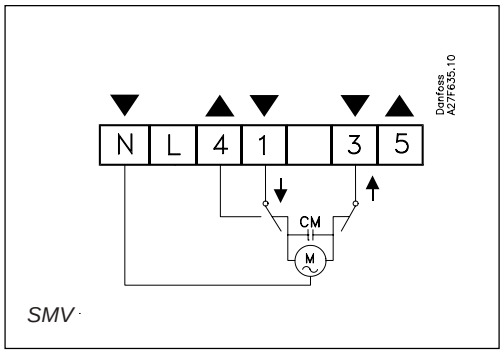
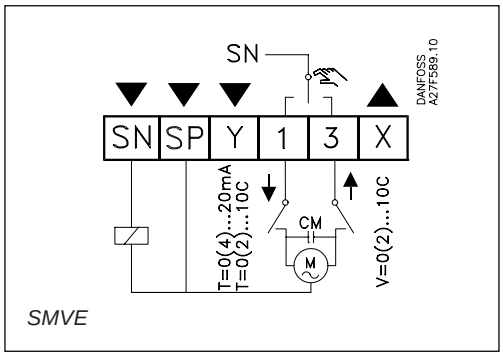
SMV connection



SMV

N: Neutral
L: Phase
4: Torque signal indication; lower position.
1: Input signal for motor actuator to extend.
3: Input signal for motor actuator to retract.
5: Torque signal indication; upper position.
N, L: Voltage: 24 V a.c., or 230/240 a.c. +10% –15%
4 & 5: Max. load: 250 V a.c : 6 A
24 V a.c : 4 A

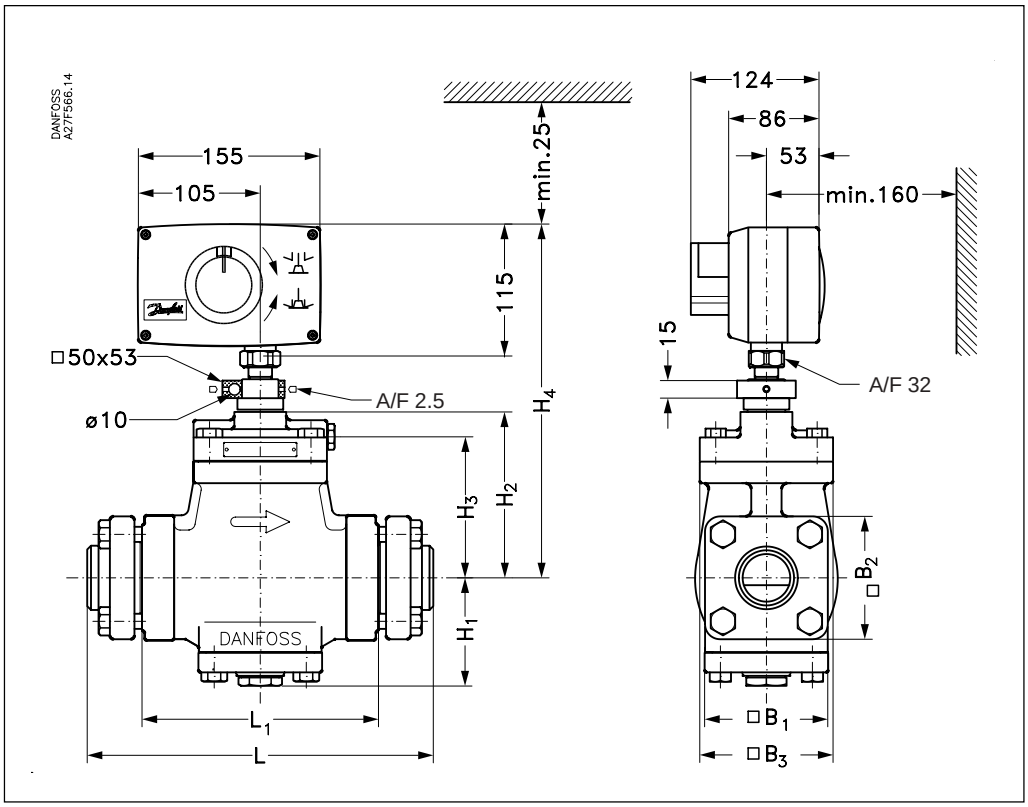
SMVE connection



SMVE

SN: Neutral
SP: Phase
Y: Input signal. Dependent on jumper D/I.
1: Manual operation. Input signal for motor actuator to extend.
3: Manual operation. Input signal for motor actuator to retract.
X: Output signal. Dependent on jumper 2/0.
SN, SP: Voltage: 24 V a.c. +10% –5%

Dimensions



Dimensions

Valve size		H_1	H_2	H_3	H_4	L	L_1	B_1	B_2	B_3
MRV 5 - 25 ($^{7}/_{32}$ - 1 in.)	mm in.	66 2.60	105 4.13	79 3.11	266 10.47	177 6.97	106 4.17	75 2.95	Oval flange	87 3.43
MRV 32 ($1^{1}/_{4}$ in.)	mm in.	72 2.83	121 4.76	96 3.78	282 11.10	240 9.45	170 6.69	84 3.31	82 3.23	94 3.70
MRV 40 ($1^{1}/_{2}$ in.)	mm in.	79 3.11	128 5.04	105 4.13	289 11.38	254 10.00	170 6.69	94 3.70	89 3.50	102 4.02
MRV 50 (2 in.)	mm in.	95 3.74	151 5.94	123 4.84	312 12.28	288 11.34	200 7.87	704 27.72	106 4.17	113 4.45
MRV 65 ($2^{1}/_{2}$ in.)	mm in.	109 4.29	167 6.57	146 5.75	352 13.86	342 13.46	250 9.84	127 5.00	113 4.45	135 5.31

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Ordering

Type	Description	Code no.
SMV 24	24 V a.c. three-point control	**82H3030**
SMV 230	230 V a.c. three-point control	**82H3031**
SMVE 24	24 V a.c. modulating input	**82H3032**

To prevent ice formation, a spindle heater is available as an accessory for use where the media temperature is less than 0°C.
The spindle heater must be fitted between SMV/SMVE motor and MEV/MRV valve.

Spindle heater (inclusive aluminium housing)

Description	Code no.
24 V a.c. , 18 W	**027F3180**
230 V a.c. , 18 W	**027F3181**

Accessories

The spring return system can be made inoperative with a bracket so that the SMV/SMVE motor does not close the MEV/MRV motorised valve when the power supply is isolated.

Operation without active spring return system

Description	Code no.
Bracket for type SMV 24	**027F1970**
Bracket for type SMV 230	**027F1970**
Bracket for type SMVE 24	**027F1970**

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