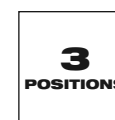
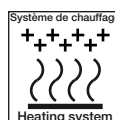


LT

Low Temperature Electric Actuators

Installation and Operation Manual



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INTRODUCTION

This manual has been made to guide you through the installation and use of our electric actuators for low temperatures. Please, read it carefully before using our products and be sure to keep it.

DESCRIPTION

These electric actuators have been designed to perform the control of a valve with 90° rotation (or 180° in case of 3-position version). We cannot be held responsible if the mentioned actuators are used in contradiction to this advice. Please consult us for any different application.

TRANSPORT AND STORAGE

- The forwarding agents being held as responsible for damages and delays of the delivered goods, the consignees are obliged to express if applicable their reserves, prior to accept the goods. The goods delivered directly ex works are subject to the same conditions.
- The transport to the place of destination is carried out by using rigid packing material.
- The products must be stored in clean, dry, and ventilated places preferably on appropriate palettes or shelves.

MAINTENANCE

- Maintenance is ensured by our factory. If the supplied unit does not work, please check the wiring according to the electric diagram as well as the power supply of the concerned electric actuator.
- For any question, please contact our after-sales service.
- To clean the outside of the actuator, use a lint and soapy water. **DO NOT USE CLEANING PRODUCT WITH SOLVENT OR ALCOHOL**

SAFETY INSTRUCTIONS



To be read prior to the installation of the product

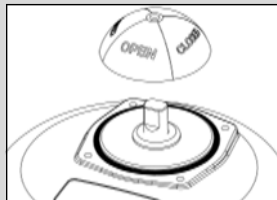
- The electric power supply must be switched-off before any intervention on the electric actuator (i.e. prior demounting its cover or manipulating the manual override knob).
- Any intervention must only be carried out by a qualified electrician or other person instructed in accordance with the regulations of electric engineering, safety, and all other applicable directives.
- Strictly observe the wiring and set-up instructions as described in the manual: otherwise, the proper working of the actuator can not be guaranteed anymore. Verify that the indications given on the identification label of the actuator fully correspond to the characteristics of the electric supply.
- Respect all safety rules during fitting, dismantling and porting of this apparatus.
- Lifting and carrying through strapping the hand wheel is not allowed.
- Do not mount the actuator « upside down ». Risk: declutching mechanism failure
- Do not mount the actuator less than 30 cm of a electromagnetic disturbances source.
- Do not position the equipment so that it is difficult to operate the disconnecting device.

Position indicator

Sense of window for standard mounting:



Mounting of the position indicator (appendix p. 5 mark 1) : mount the seal ring and the indicator then the window with the 4 screws M4.



Emergency manual override

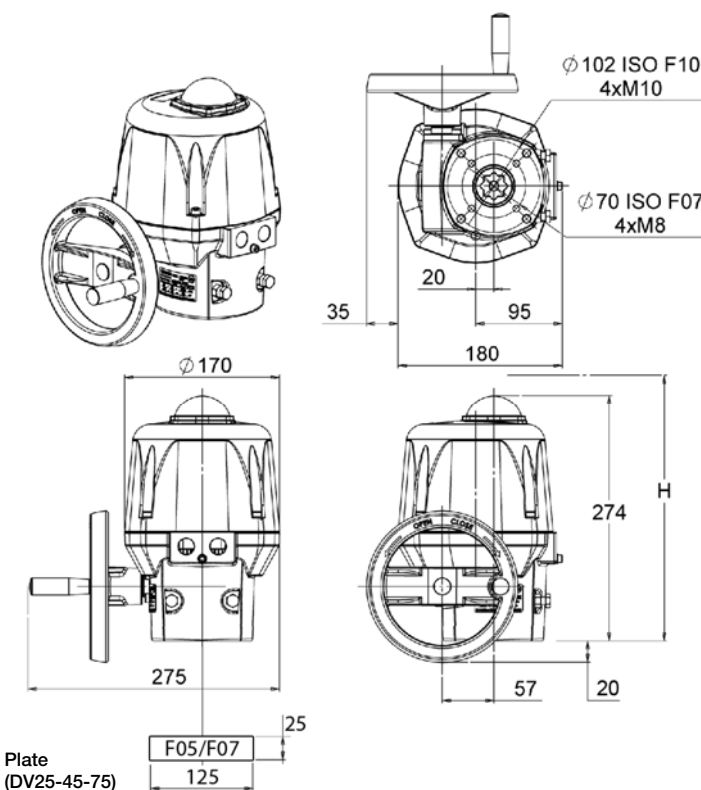
No declutching is required, the hand wheel has simply to be turned (appendix p. 5 mark 8).

The end mechanical stops are pre-set to 90° and stuck (Tubetanche Loctite 577 or equivalent). It is possible to adjust then by moving the 2 screws M8 (appendix p. 5 mark 17) but you need to stick them again in order to ensure a proper sealing.



The priority functioning mode of this actuator is electric. Be sure that the power supply is switched off before using the manual override

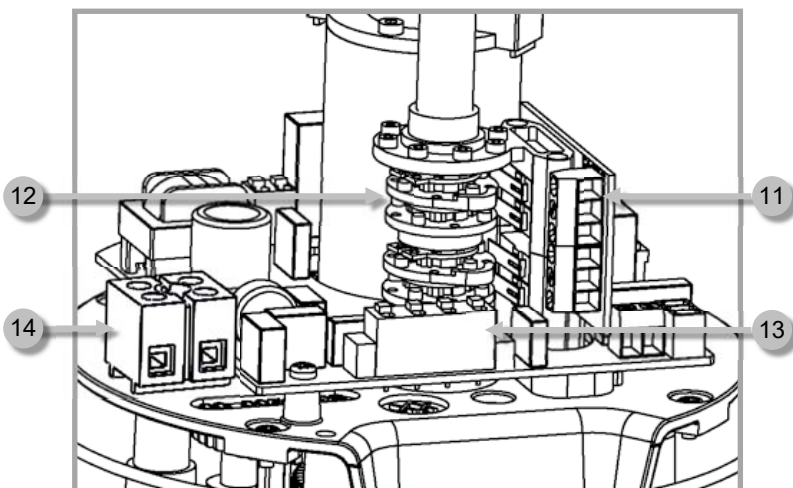
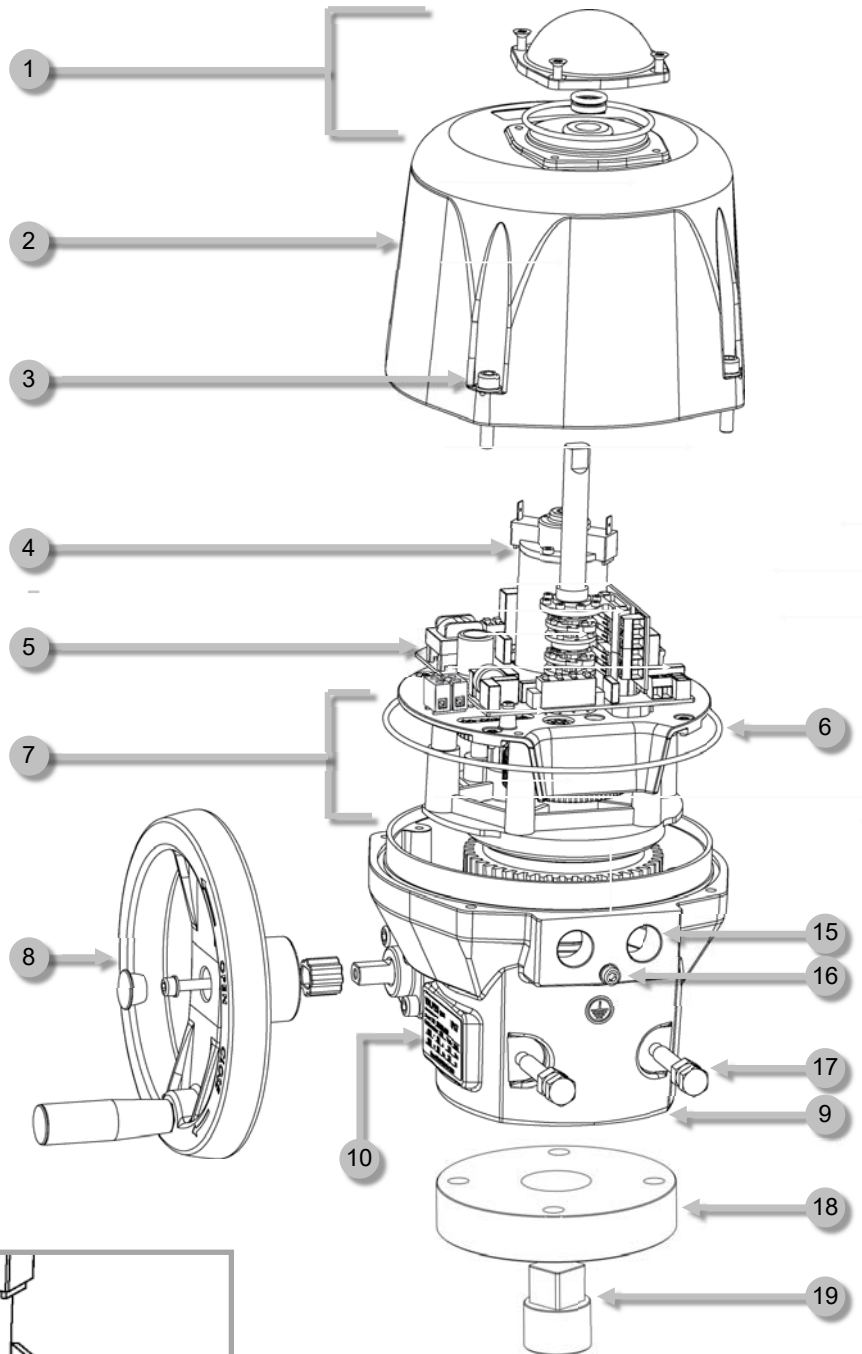
Dimensions



ISO5211 connection	F05	F07	F07	F10
	DV 25 to 75		DV 100 to 300	
Star	17 mm	17 mm	22 mm	22 mm
Drive depth	19 mm	19 mm	25 mm	25 mm
Diameter	50 mm	70 mm	70 mm	102 mm
Taraudé M	M6	M8	M8	M10
Screw number	4	4	4	4
Screws maximal length (+ valve connection plate height)	12 mm	12 mm	15 mm	19 mm
Minimum distance above the valve for actuator mounting	H = 400 mm		H = 375 mm	

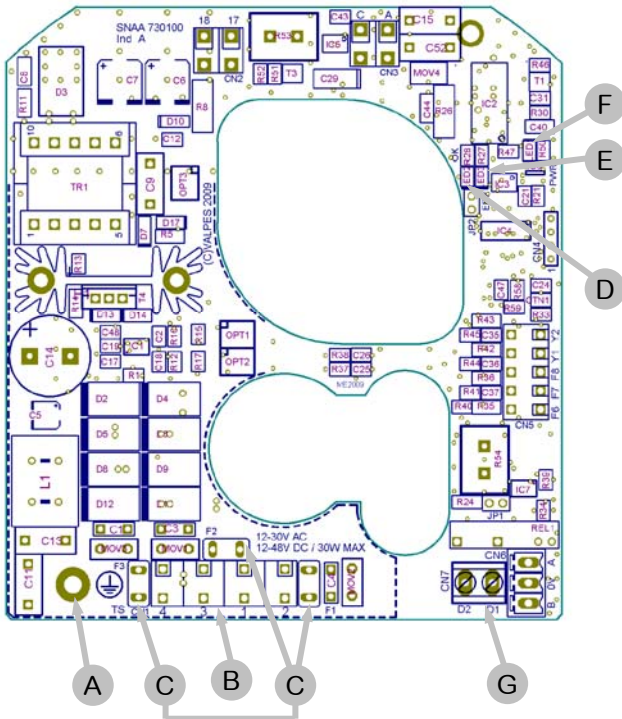
Exploded view

Rep.	Description
1	Visual position indicator
2	Cover
3	Stainless steel screws
4	Motor
5	Pilot and power supply card
6	O ring
7	Gear box
8	Hand wheel
9	Housing
10	Identification label
11	Auxiliary limit switch terminal
12	Cams
13	Pilot and power supply terminal
14	Heating system terminal
15	Threaded hole ISO M20
16	Earth screw
17	Mechanical end stops
18	F05/F07 plate (LT25-45-75)
19	17 mm star sleeve (LT25-45-75)

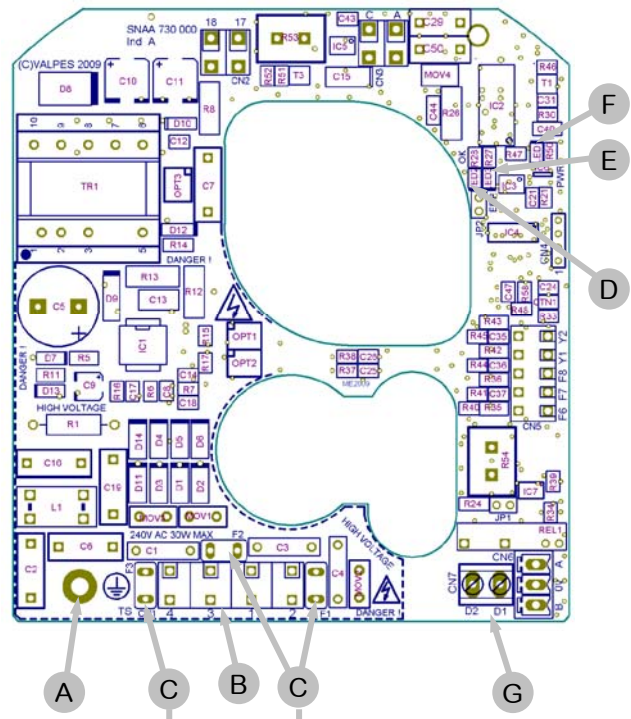


Electronic boards

SNA730100
15 V-30 V 50/60 Hz (12 V-48 V DC)



SNA730000
100 V-240 V 50/60 Hz (100 V-350 V DC)



Rep.	Description	Rep.	Description
A	Earth screw	E ²⁾	LED 3 : Detected failure
B	Pilot and power supply terminals	F	LED 1 : Power presence
C ¹⁾	Card protection fuses	G	Failure report terminal strip (24V DC / 3A max)
D	LED 2 : microprocessor ok		

1) Fuses for multivolt card :

- Card SNA730100 : 5A / T 125V (Littelfuse 39615000000)
- Card SNA730000 : 3,15A / T 250V (Multicomp MST 3,15A 250V)

2) Possible defects : limitation of current, thermic limitation or program error

- => check that the valve torque is not superior to the maximum torque stand by the actuator
- => check that the actuator do not exceed the duty cycle indicated (possible overhear)
- To re-start the actuator, reverse the sense of rotation or switch the power off and on.

Electric connection

Warnings



In case of low temperature (< -20 °C), the actuator must be powered 3 hours before using (terminals 1 -2-3-4 and 10-11). This time is necessary for the enclosure to reach functioning temperature.

Use only one relay for one actuator.

As stipulated in the applicable regulation, the connection to earth contact is compulsory for devices with working voltages exceeding 42V.

The actuator is being always under power, it must be connected to a disconnection system (switch, circuit breaker) to ensure the actuator's power cut. The latter must be closed to the actuator, easy to reach and marked as being the disconnecting device for the equipment.

The temperature of the terminal can reach 90°C.

To optimize the installation security, please connect the failure feedback signal (standard: D1 and D2).

In case of long cables, please note the induction current shall not exceed 1mA.

The actuator can tolerate temporary overvoltage of the electrical grid up to $\pm 10\%$ of its nominal system operating voltage.

The selection of the cables and cable glands: the maximal operating temperature of the cables and cable-glands must be at least 110°C.

It is necessary to connect all actuators to an electrical cabinet. The power supply cables must have the RATED di-amer for the maximum current supported by the actuator and comply with IEC 60227 or IEC 60245 standards.

Two IP68 and -50 °C approves cable glands must be screwed into the two M20 threaded holes (p.5 rep.15).

The auxiliary limit switches must be connected with rigid wires. If the applied voltage is higher than 42V, the user must foresee a fuse in the power supply line.

The feedback switches must be powered with the same voltage. The reinforced insulation of the motor control allows voltages up to 250V AC.

Connection to feedback microswitches:

- 4 to 24 V DC and 12 to 250 V AC
- minimum current 100 mA
- maximum current 5 A (resistive), 0.5 A (motor), 0.125 A (capacitive loads)

Electric connection (models without positioning)

SUPPLY AND CONTROL WIRING

- Ensure that the voltage indicated on the actuator ID label corresponds to the voltage supply.
- Connect the wires to the connector in accordance with the required control mode. (see diagram p. 9)

WIRING OF THE FEEDBACK SIGNAL

Our actuators are equipped with two simple limit switch contacts normally set either in open position, either in closed position (see DSBL0470 wiring diagram inside the cover). As per factory setting, the white cam is used to detect the open position (FC1) and the black cam is used to detect the closed position (FC2).

The auxiliary limit switches must be connect with rigid wires. If the applied voltage is higher than 42V, the user must foresee a fuse in the power supply line.

The voltages applied to each feedback switch (FC1 and FC2, SNAA690000 electronic board) must be exactly the same. The reinforced insulation between the feedback signal and the motor control authorizes voltages up to 250V AC.

- Unscrew the right cable gland and insert the cable.
- Remove 25mm of the cable sheath and strip each wire by 8mm.
- Connect the wires to the terminal strip in accordance with the diagram p. 25.
- Tighten the cable gland (Ensure that it's well mounted to guaranty the proofness).

HEATING SYSTEM WIRING

Power the terminals 10 and 11 (24 V, 110 V or 230 V according the version).

SETTING OF END LIMIT SWITCHES

The actuator is pre-set in our factory. Do not touch the two lower cams in order to avoid any malfunctioning or even damage to the actuator.

To adjust the position of the auxiliary contacts, make rotate the two superior cams by using the appropriate wrench.





To ensure the correct functioning, the power supply (1, 2, 3, 4) and heating system terminals must be permanently powered.

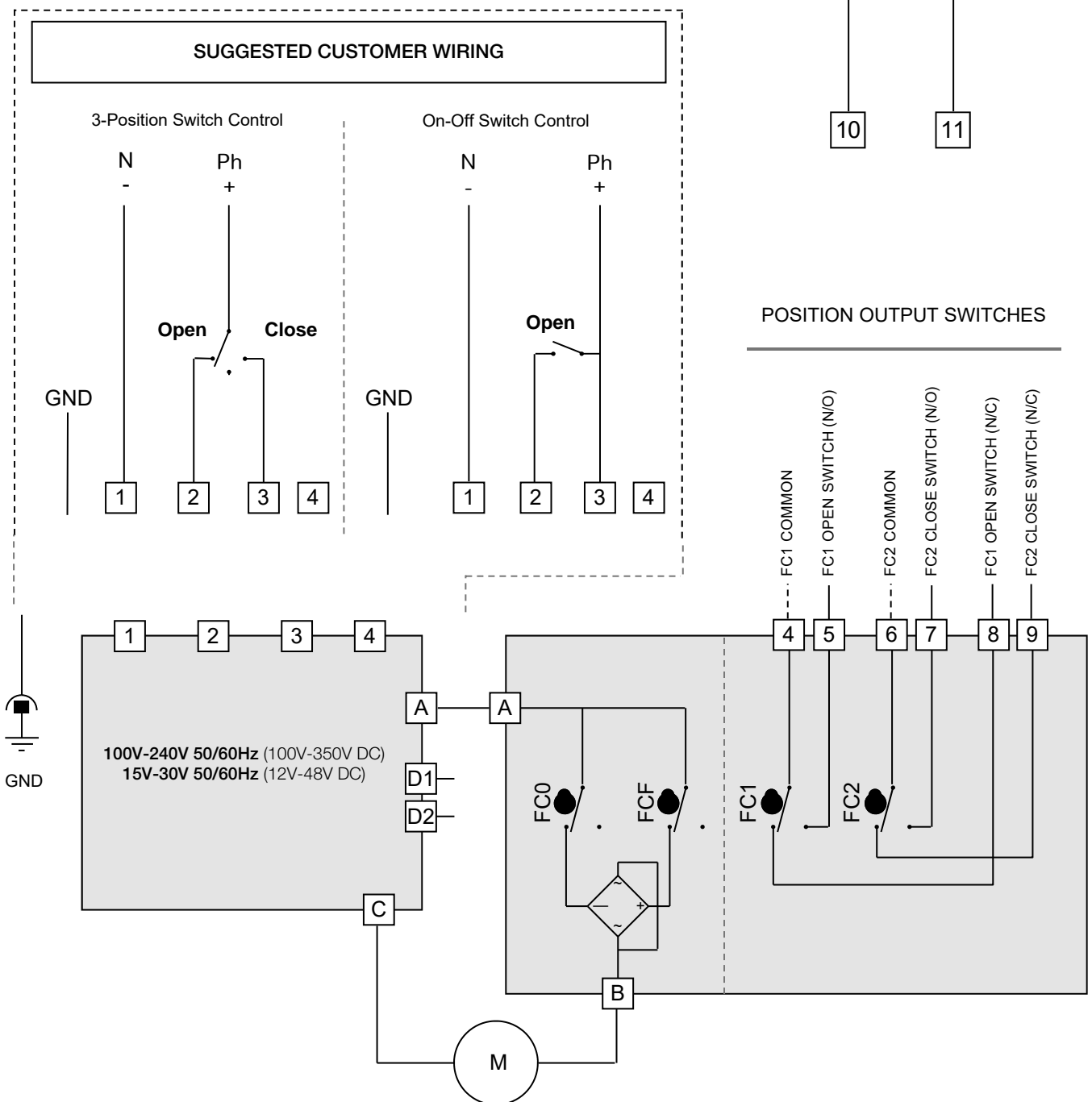


In case of low temperature (< -20 °C), the actuator must be powered 3 hours before using (terminals 1-2-3-4 and 10-11). This time is necessary for the enclosure to reach functioning temperature.

Multi-Volt Wiring Diagram

Rep.	Description	Rep.	Description
FCO	Open Position Limit Switch	FC1	Open Position Output Switch
FCF	Close Position Limit Switch	FC2	Close Position Output Switch
D1/D2	Failure report Terminal strip (24V DC / 3A max)		

-  Terminal temperature maximum 194°F / 90 °C
-  Use solid wires, 18 AWG maximum (250 VAC/VDC / 5A Max)



POSI: description

Various control types (control signal on terminals N°15 and N°16)

On request, our cards can be set in factory. The consign and the feedback signal can have different forms (current or voltage). As standard, the cards are set for current 4-20mA (control + feedback signal).

Control in 0-10V modes:

In case of outside event, absence of control signal (accidental wires cut for example) but in presence of power, the actuator will travel to defined position (open or closed valve).

As standard our actuators will close themselves in absence of control signal but there are other possibilities on request.

Control in 4-20mA mode:

In case of outside event, absence of control signal (accidental wires cut for example) but in presence of power, the actuator will stay in its position.

POSI: electric connection



Actuator pre-set in factory.

In order to avoid electromagnetic perturbations, it is compulsory to use shielded cables (cables longer than 3m).

SUPPLY AND CONTROL WIRING

- Ensure that the voltage indicated on the actuator ID label corresponds to the voltage supply.
- Connect the wires to the connector in accordance with the required control mode. (see diagram p. 11)

WIRING OF THE FEEDBACK SIGNAL

- Unscrew the right gland and pass the cable.
- Connect the input signal between terminals 15 and 16 (attached p.12 mark.B). Terminal 15 is the negative polarity (-) and terminal 16 is the positive polarity (+).
- Connect the output signal between terminals 13 and 14.(attached p.12 mark.C). Terminal 13 is the positive polarity (+) and terminal 14 is the negative polarity (-).
- Tighten the cable gland (Ensure that it's well mounted to guaranty the proofness).

Factory setting : by default, 4-20 mA input and output signals with normal rotation sense.

To proceed to a new setting of the card : please see page 13, "Parameter selection sequence".

To check the proper operation of the card : please see page 13, "Normal operating mode".

HEATING SYSTEM WIRING

Power the terminals 10 and 11 (24 V, 110 V or 230 V according the version).



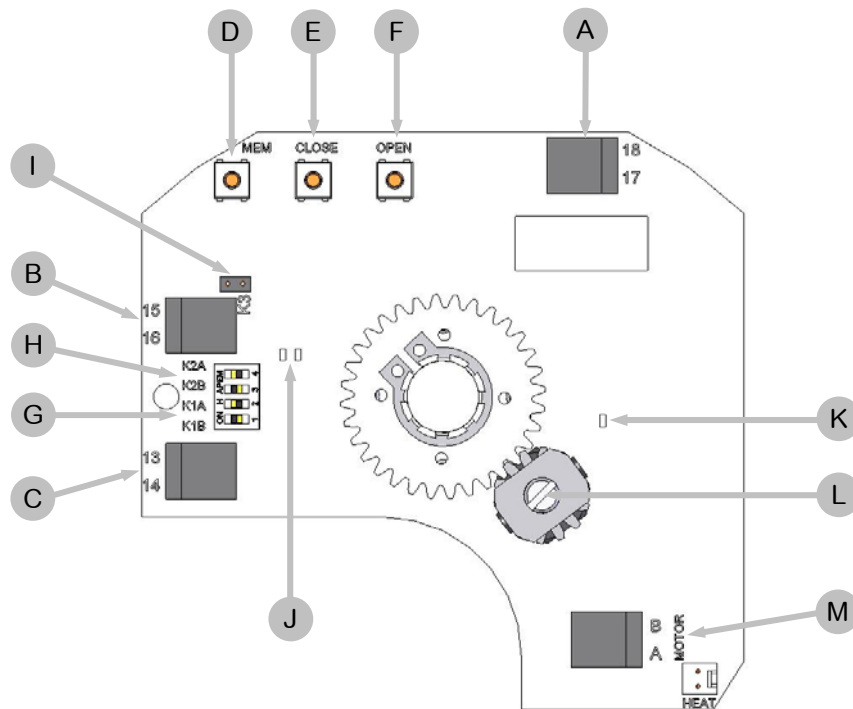
To ensure the correct functioning, the power supply (1, 2, 3, 4) and heating system terminals must be permanently powered.



In case of low temperature (< -20 °C), the actuator must be powered 3 hours before using (terminals 1-2-3-4 and 10-11). This time is necessary for the enclosure to reach functioning temperature.

POSI: Electronic board

P5 positioning board 4-20 mA / 0-10 V



Rep.	Description	Rep.	Description
A	24V AC/DC power supply terminal trip	H	K2 jumper
B	Instruction terminal block	I	K3 jumper
C	Feed back terminal block	J	Green and red LEDs
D	Adjustment button MEM	K	Yellow LED : power supply indication
E	Adjustment button CLOSE	L	Potentiometer
F	Adjustment button OPEN	M	Motor connexion
G	K1 jumper		

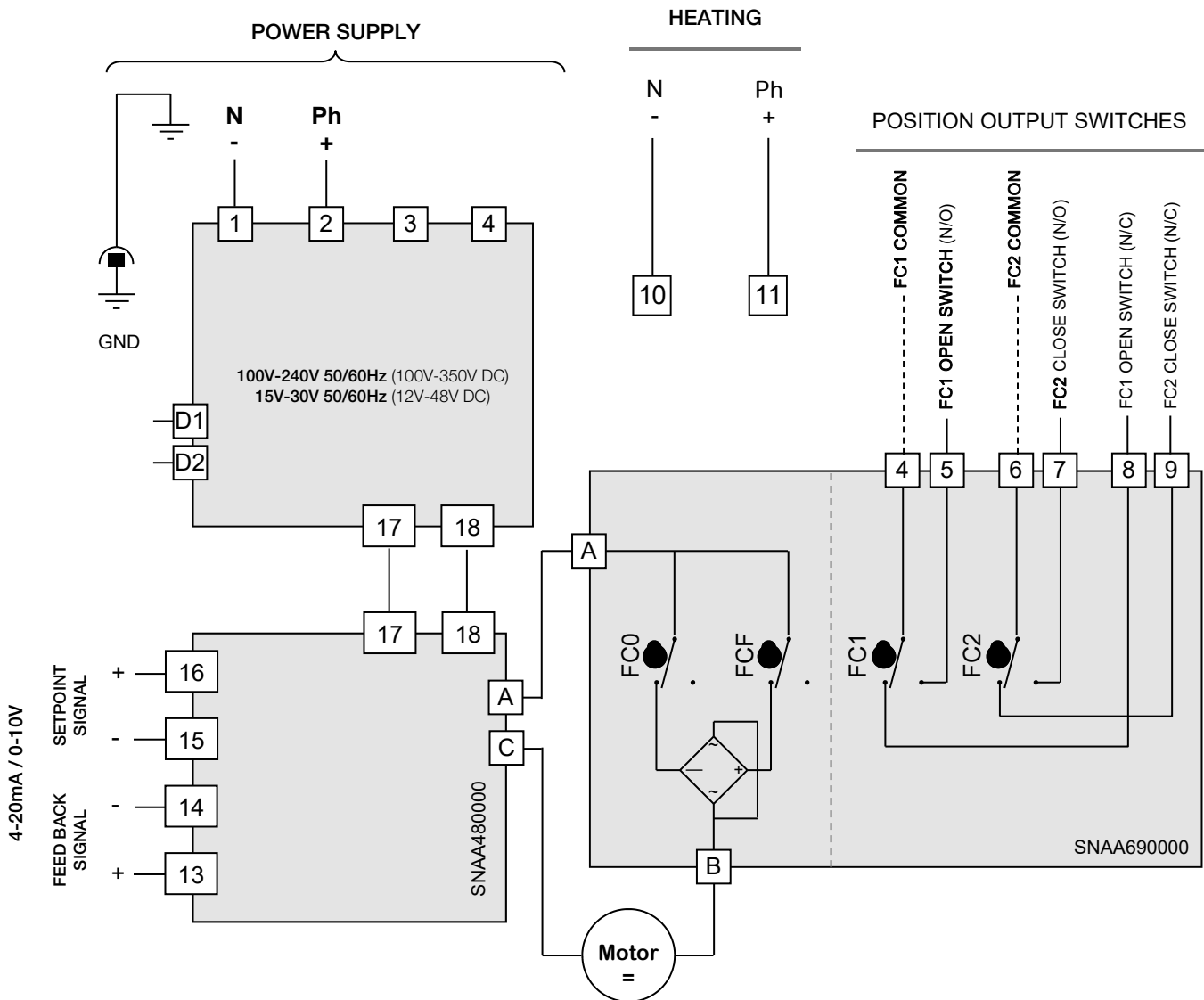
POSI: Wiring diagram

Rep.	Description	Rep.	Description
FCO	Open Position Limit Switch	FC1	Open Position Output Switch
FCF	Close Position Limit Switch	FC2	Close Position Output Switch
D1/D2	Failure report Terminal strip (24V DC / 3A max)		



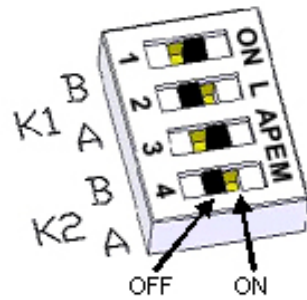
• : cf'; DG'a cXYgžfYZf'hc'dUj Yg'20/ '81"

- Terminal temperature maximum 194°F / 90 °C
- Use solid wires, 18 AWG maximum (250 VAC/VDC / 5A Max)
- For a use with a long power supply wiring, the induction current generated by the wires mustn't be higher than 1mA.
- The control voltage must be S.E.L.V. (Safety Extra Low Voltage).
- No common earth/ground connexion between the control (input and output signal) and the alimentation. (Type 0-20 or 4-20mA : 5V DC max.)



- The card resolution is 1°
- 10 kOhm input impedance if control with voltage (0-10 V) and 100 Ohm input impedance if control with current (0-20 mA or 4-20 mA)

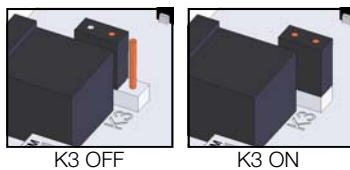
POSI: parameter selection sequence



1 K1, K2 and K3 shunts positioning

Position the shunts as follows (before modification, switch off the card):

Setpoint signal	Feedback signal	Schunt K1		Schunt K2		Schunt K3
		A	B	A	B	
0-10V	0-10V	ON	OFF	ON	OFF	OFF
0-10V	0-20mA	ON	OFF	OFF	ON	OFF
0-10V	4-20mA	ON	OFF	OFF	ON	ON
4-20mA	0-10v	OFF	ON	ON	OFF	OFF
4-20mA	0-20mA	OFF	ON	OFF	ON	OFF
4-20mA	4-20mA	OFF	ON	OFF	ON	ON
0-20mA	0-10V	OFF	ON	ON	OFF	OFF
0-20mA	0-20mA	OFF	ON	OFF	ON	OFF
0-20mA	4-20mA	OFF	ON	OFF	ON	ON



2.2 Selection of the flow direction of the valve

2.1 Normal flow direction (by default)

- Press the **OPEN** button and apply the operating voltage to the card while keeping this button pressed.
- The **green LED** lights up. Release the **OPEN** button.
- Disconnect the card.

2.2 Inverse flow direction

- Press the **CLOSE** button and apply the operating voltage to the card while keeping this button pressed.
- The **red LED** lights up. Release the **CLOSE** button.
- Disconnect the card.

3 Selection of the type of input control signal

3.1 Voltage control signal 0-10V

- Press the **MEM** button and apply the operating voltage to the card while keeping this button pressed.
- The **red LED** will light up 3 times. Release this button.
- Disconnect the card.

3.2 Current control signal 4-20mA (by default)

- Press the **MEM** and **CLOSE** buttons and apply the operating voltage to the card while keeping these buttons pressed.
- The **red LED** will light up 3 times. Release these buttons.
- Disconnect the card.

3.3 Current control signal 0-20mA

- Press the **MEM** and **OPEN** buttons and apply the operating voltage to the card while keeping these buttons pressed.
- The **red LED** will light up 3 times. Release these buttons.
- Disconnect the card.

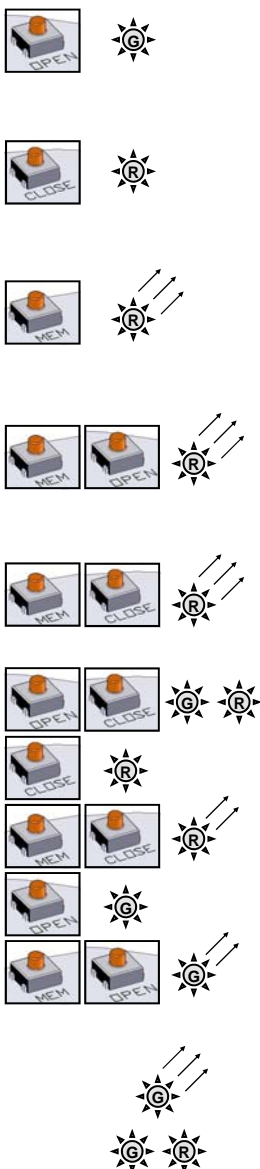
4 Learning mode

- Press the **OPEN** and **CLOSE** buttons and apply the operating voltage to the card while keeping these buttons pressed.
- The **2 LEDs** will light up. Release these buttons and the **2 LEDs** will run out. The card is now in the learning mode.
- Press the **CLOSE** button to put the valve in its closed position. The **red LED** will light up.
- Store this selected closed position by pushing **MEM + CLOSE**, the **red LED** will light up 2 times as a confirmation of acknowledgement.
- Press the **OPEN** button to put the valve in its open position. The **green LED** will light up.
- Store this selected open position by pushing **MEM + OPEN**, the **green LED** will light up 2 times as a confirmation of acknowledgement.
- Now, the positions selected have been stored. Disconnect the card.

NORMAL OPERATING MODE

- Apply the operating voltage to the card. The **green LED** will light up 3 times.
- Under normal operating conditions, the **green LED** will light up when the drive motor opens the valve, and the **red LED** will light up when the drive motor closes it.
- If **both LEDs** remain ran out, it means that the drive motor has not been triggered.

In the case of an over torque, the motor stops and the **2 LEDs** lights then together to indicate the action of the torque limiter. To re-start it, you must either reverse the sense of rotation, either switch the power off and on.



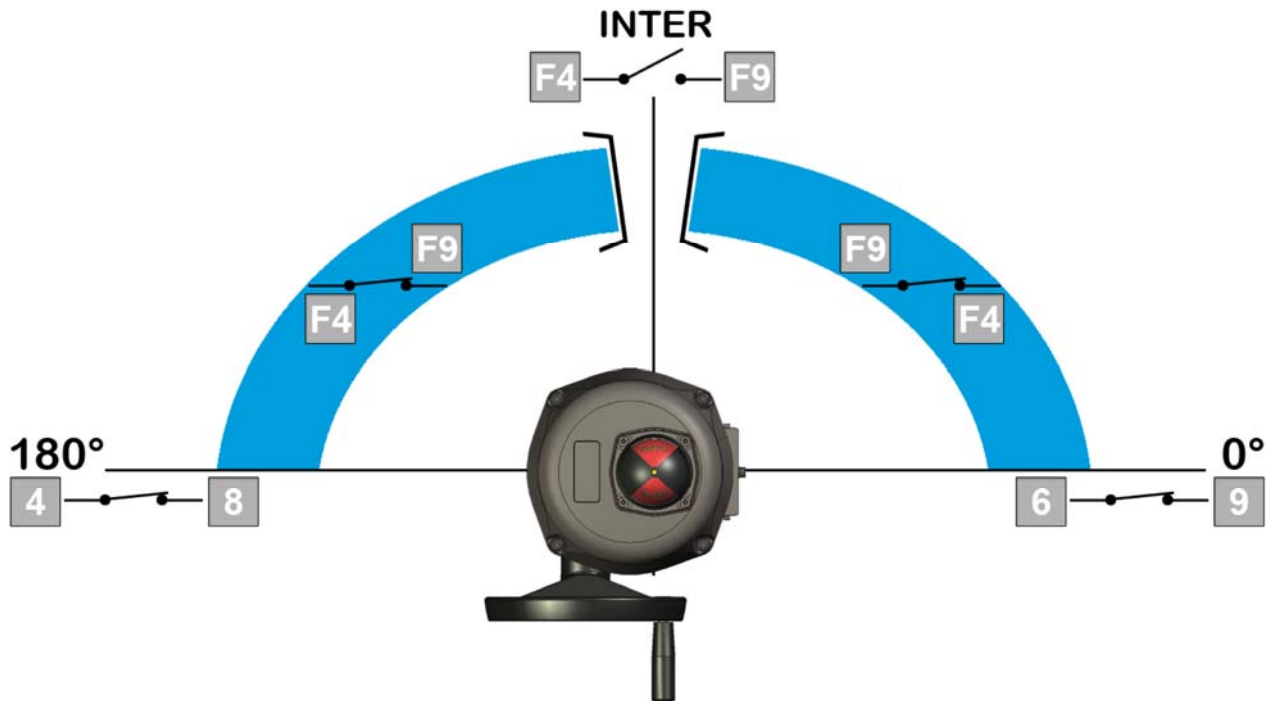
3 positions: description

Actuator with a third position

GF3 option allow actuator to be drive and stop in 3 positions. These 3 positions could be between 0° to 180°. In standard actuators are setting in our workshop at 0° 90° 180° that's fit with standard 3 ways ball valve. Others positions still available but customer have to price on the order witch position is request.

These 3 positions are controlled by 4 switches (FCO,FCF,FCIO and FCIF) and 3 switches for feed back signal. Switches FC1,FC2 are NO contact (close the circuit in extreme position) and FC3 is a NC contact (open the circuit in intermediate position).

3 positions: contacts state



	Terminals		
	6 & 9	4 & 8	F4 & F9
0°	Closed	Open	Closed
inter	Open	Open	Open
180°	Open	Closed	Closed





To ensure the correct functioning, the power supply (1, 2, 3, 4) and heating system terminals must be permanently powered.

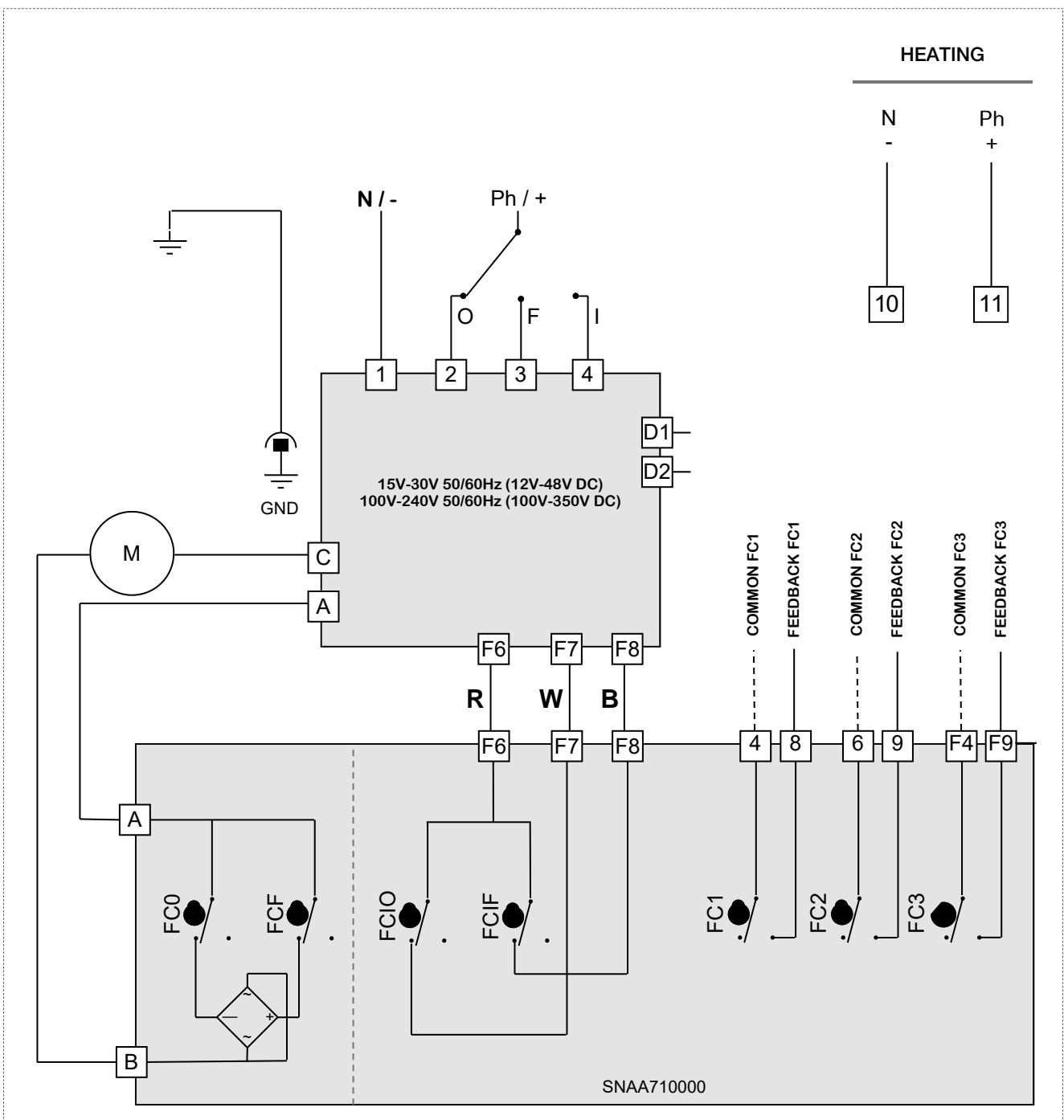


In case of low temperature (< -20 °C), the actuator must be powered 3 hours before using (terminals 1-2-3-4 and 10-11). This time is necessary for the enclosure to reach functioning temperature.

3 Positions: Wiring Diagram

Rep.	Description	Rep.	Description
FC0	Open Position Limit Switch	FC1	Open Position Output Switch
FCF	Close Position Limit Switch	FC2	Close Position Output Switch
FCIO	Intermediate Open Position Limit Switch	FC3	Intermediate Position Output Switch
FCIF	Intermediate Close Position Limit Switch	R	Red
W	White	B	Black
D1/D2	Failure report Terminal strip (24V DC / 3A max)		

-  Terminal temperature maximum 194°F / 90 °C
-  Use solid wires, 18 AWG maximum (250 VAC/VDC / 5A Max)



Technical data

LT 25 45 75 100 150 300

Installation

IP protection (EN60529)	IP68 (5m 72h)
Corrosion resistance (outdoor and indoor use)	Housing: aluminium + EPOXY coating Drive : Steel + Zn treatment / Shaft and screws : Stainless steel
Temperature	-50 °C to +70 °C
Hygrometry	maximum relative humidity 80 % for temperatures up to 31 °C decreasing linearly to 50 % relative humidity at 40 °C
Pollution degree	Applicable POLLUTION DEGREE of the intended environment is 2 (in most cases).
Altitude	altitude up to 2 000 m
Extended environmental conditions	Outdoor use and in WET LOCATION
Sound level	61 dB
Weight	6,2 Kg to 6,4 kg

Mechanical specifications

Nominal torque	20 Nm	35 Nm	60 Nm	75Nm	125Nm	250Nm
Maximum torque	25 Nm	45 Nm	75 Nm	100Nm	150Nm	300Nm
Operating time (90°)	15 s	15 s	15 s	15 s	30 s	60 s
Drive ISO5211	Star 17 F05-F07			Star 22 F07-F10		
Rotation angle	90° (others on request)					
Mechanical stops	90°					
Manual override	Hand wheel					
Direction of rotation	Anticlockwise to open					

Electrical specifications

Voltages (actuator) ¹⁾	100 V to 240 V AC 50/60 Hz and 100 V to 350 V DC 15 V to 30 V AC 50/60 Hz and 12 V to 48 V DC
Voltages (heating system) +/- 10	24 V AC/DC, 110 V AC and 230 V AC
Overvoltage category ²⁾	TRANSIENT OVERVOLTAGES up to the levels of OVERVOLTAGE CATEGORY II TEMPORARY OVERVOLTAGES occurring on the MAINS supply.
Power consumption	75 W
Insulation motor class	Class F
Torque limiter	Electronical
Duty cycle (CEI34)	50%
Limit switches voltage	12 to 250 V AC and 4 to 24 V DC
Limit switches current	Min. 100 mA Max. 5 A (resistive), 0.5 A (motor), 0.125 A (capacitive loads)
Power of anticondensation heaters	10 W
Power of heating system	30 W
Inrush current	Circuit breaker type D, nominal current according the number of actuators (max. 4 actuators) or use a inrush current limiter at the output of the circuit breaker.

¹⁾ The actuator tolerates voltage fluctuation of the electrical grid up to ± 10 % of its nominal system operating voltage

²⁾ The actuator tolerates temporary overvoltages of the electrical grid.

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