

## 9.1 ELECTRIC STROKE LENGTH LIMIT DEVICE FCE

The ELECTRIC STROKE LENGTH LIMIT DEVICE FCE allows the actuator to stop before reaching the extreme position (mechanical stop) and preventing damage. It is simple, strong and reliable, suitable for indoor and outdoor environments; it is available for all standard stroke lengths and for special stroke lengths up to 1 meter length on request.

The FCE device consists of 2 normally closed electric switches installed inside a sealed aluminum alloy box. A brass collar allows, with its special shape, activation of the electric switches. It is balanced by 2 opposite preloaded helical springs, which reset the position when the actuator starts moving again in the opposite direction. Sealing scrapers between the axial travelling collar and the housing. The activation of the collar, and consequently of the limit switches, in one or in the opposite direction is done by a stainless steel rod moving with the push rod. The stainless steel rod slides inside the collar activating it when the adjustable ring #1 or #2 pushes the collar.

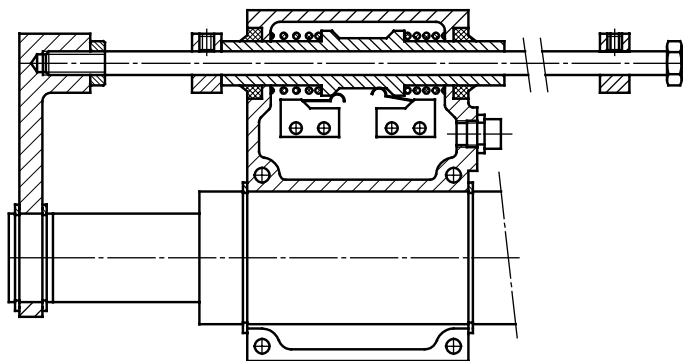
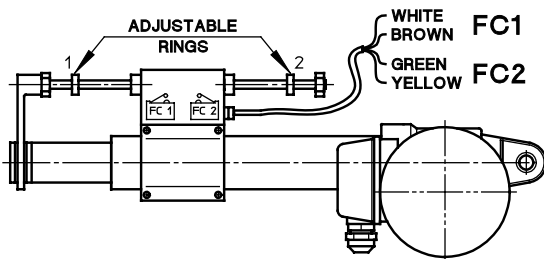
The stop position is easy to adjust: ring #1 fixes the actuator retracted stop position, ring #2 fixes the actuator extended stop position. The adjustments of rings #1 and #2 refer directly to the actuator cylinder axis, so it is very easy to set the actuator stop position.

The total actuator stroke length can be performed fixing the rings #1 and #2 in their extreme positions. Even in this condition there is an extra safety stroke length on both sides before reaching the mechanical stops.

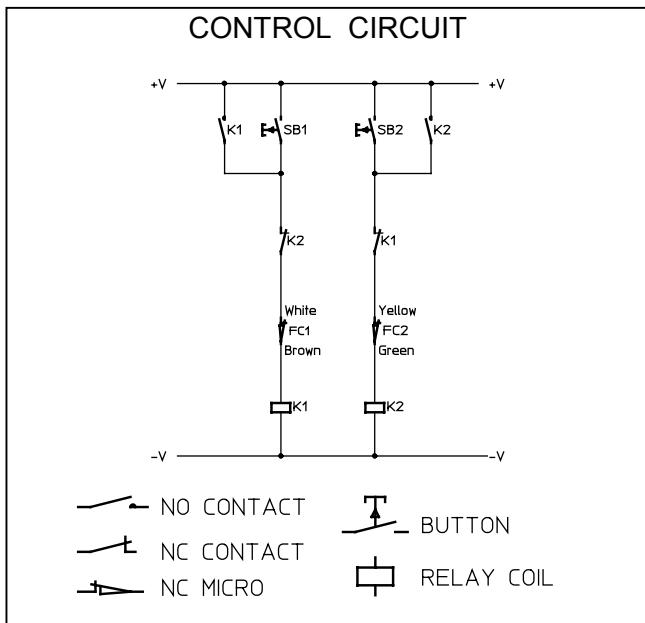
**NOTE:** The given extra safety stroke length cannot be used! If the application requires an extra stroke length to stop the actuator, it should be agreed with SERVOMECH Technical Dpt.

**WARNING:** Compare the stroke length required by the application to the actuator dimensions (refer to TECHNICAL CHECK SHEET supplied with the actuator). The FCE device controls only the actuator stroke length, so the stroke length required by the application must fit with it and cannot be longer!

The FCE device must be connected to the electric control circuit as shown in the following WIRING DIAGRAM to guarantee the motor switch off and to prevent damage to the actuator and the application equipment.



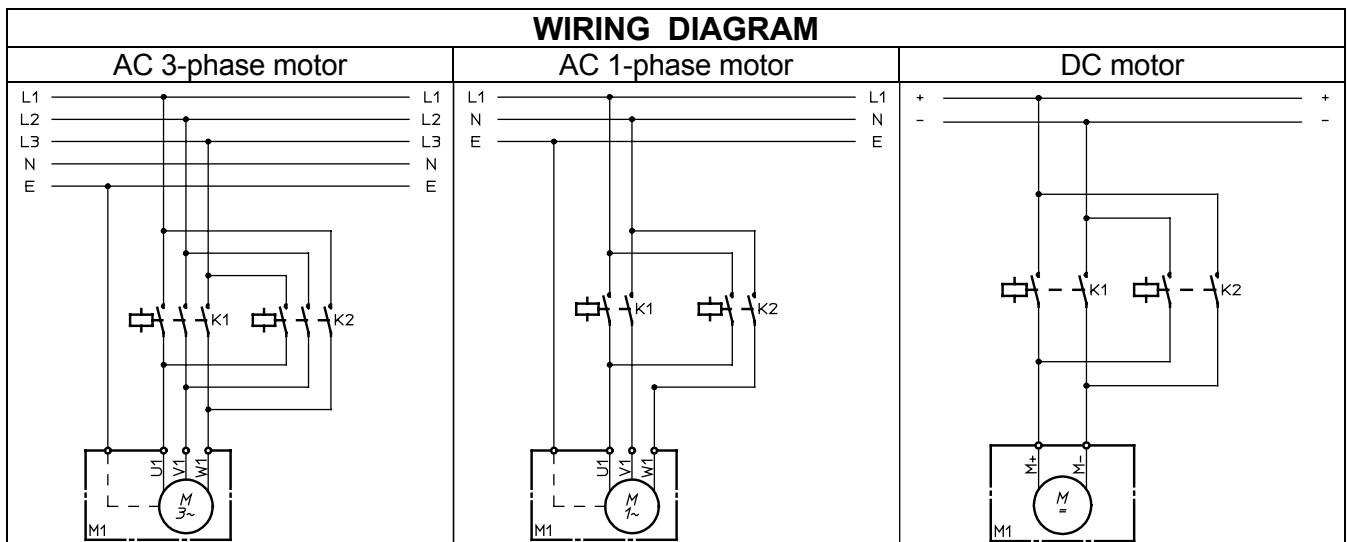
Referring to the FCE box position with cable towards the actuator housing:  
**MINIMUM RETRACTED LENGTH** is adjusted by RING 1 and controlled by SWITCH FC1  
**MAXIMUM EXTENDED LENGTH** is adjusted by RING 2 and controlled by SWITCH FC2



The FCE device is recommended for linear speeds up to about 30 mm/sec. For higher speeds it is better to use magnetic or inductive proximity switches because when switching off the motor, due to inertial reasons, the actuator could travel over and damage the FCE device breaking the front lever. The stop can be ensured by a brake motor.

RATED VALUES		
Voltage	Resistive load	Inductive load
250 V AC	5 A	3 A
30 V DC	5 A	0.1 A
125 V DC	1.4 A	—

The FCE device is equipped with cable standard length 1.5 m and wires 4 × 0.75 mm<sup>2</sup>. On request longer cables and 10 Amps electric switches available.



## 9.2

### MAGNETIC STROKE LIMIT DEVICE "FCM"

The MAGNETIC STROKE LENGTH LIMIT DEVICE FCM allows the actuator to stop before reaching the extreme positions (mechanical stops) and avoiding damage. More reed-switches can be used to give more intermediate positions along the stroke length. These reed-switches can be used to stop the actuator or just to know its position during the linear travelling.

A magnetic ring fixed on the travelling push rod creates around the outer protective tube a toroidal magnetic field with value 100 Gauß.

The reed-switches fixed with clamps on the outer tube are activated by the toroidal magnetic field independently from their angular fixing position.

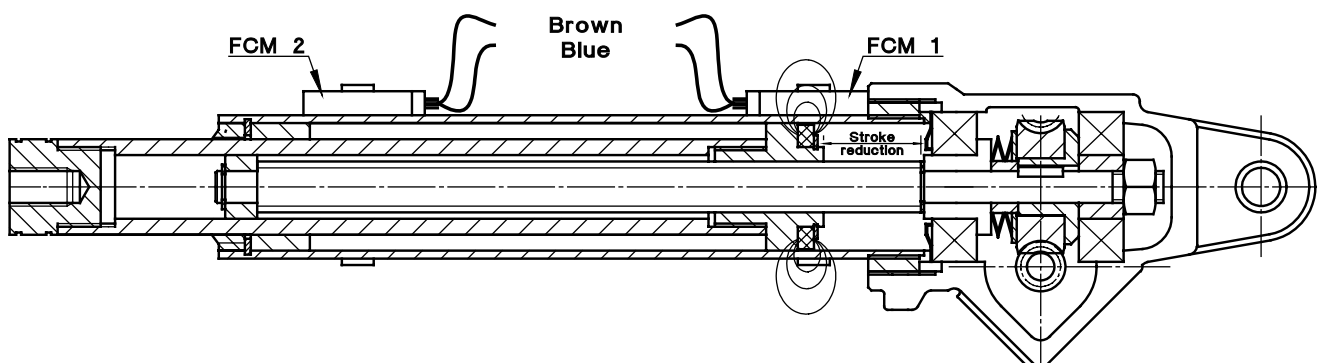
Outer tubes in non-magnetic material, such as aluminium alloy or stainless steel, are used to enable the magnetic field to activate the reed-switches.

The actuator standard equipment with FCM is with outer tube in anodized aluminium alloy; on request stainless steel tubes are available.

The reed-switches shall be fixed with clamps in non-magnetic material and, to be activated, they have to be mounted with the side where the code number is written in up position (the code number must be visible).

**WARNING:** Do not exceed the max. performances stated in this catalogue and on the technical sheet supplied with the actuator to avoid damages and wrong functioning!

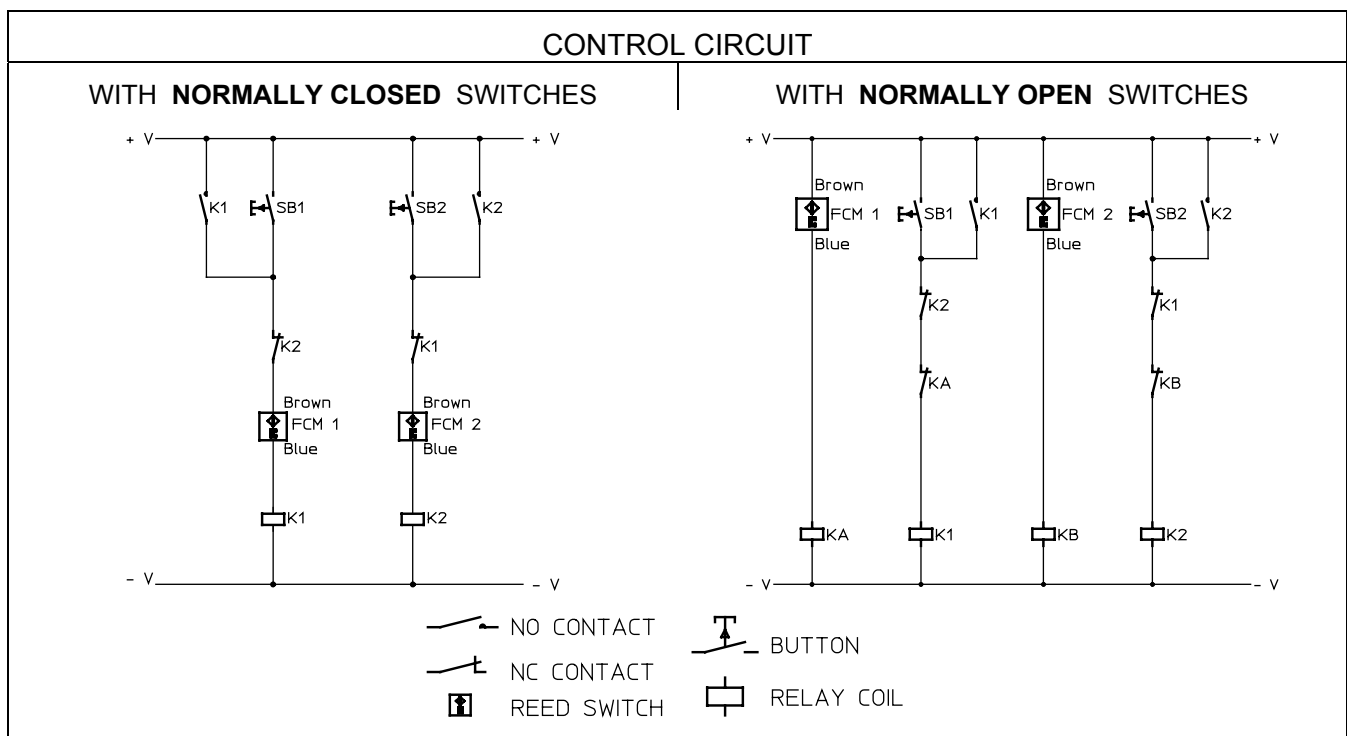
The reed-switches can work only if connected to wiring control circuits to activate electric relay. Do not connect them in series between the power supply and the electric motor!



Actuators equipped with reed-switches FCM perform a linear travel shorter than their stroke length code. The performed travel is shorter than the stroke length stated with the stroke code because the reed switch FCM1 gives the stopping signal to the actuator before the actuator has travelled the total stroke length. To know the difference refer to the tables of STROKE LENGTHS AVAILABLE IN STOCK WITH FCM on OVER-ALL DIMENSIONS pages.

The toroidal magnetic field created by the internal magnetic ring has an arch-like form referred to the reed-switch main axis. When using more contact reeds to have intermediate positions, consider that the same reed switch can give the signal in 2 different positions depending on the actuator motion which can be retracting or extending. To know the difference between these 2 positions contact SERVOMECH Technical Dpt.

The reed switches position is easily adjustable changing the clamps position on the outer tube.



The reed-switches position limits are the following:

- **MIN. RETRACTED POSITION:** the reed switch can be fixed on the tube up to the actuator housing.
- **MAX. EXTENDED POSITION:** the reed-switch cannot exceed the limit marked on the outer tube.

This limit position is stated on actuators "Over-all dimensions" pages for stroke lengths up to 800 mm.

For special stroke lengths longer than 800 mm, the limit position can be known in advance: ask SERVOMECH Technical Dpt. (also in this case it is marked on the actuator).

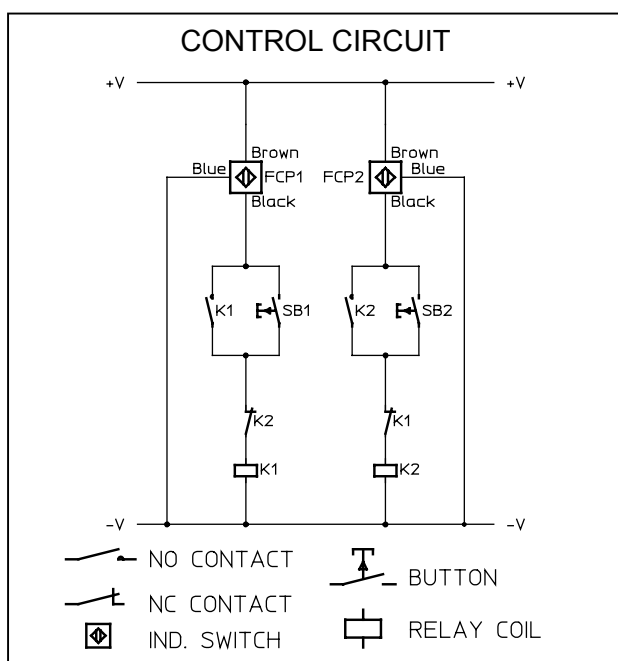
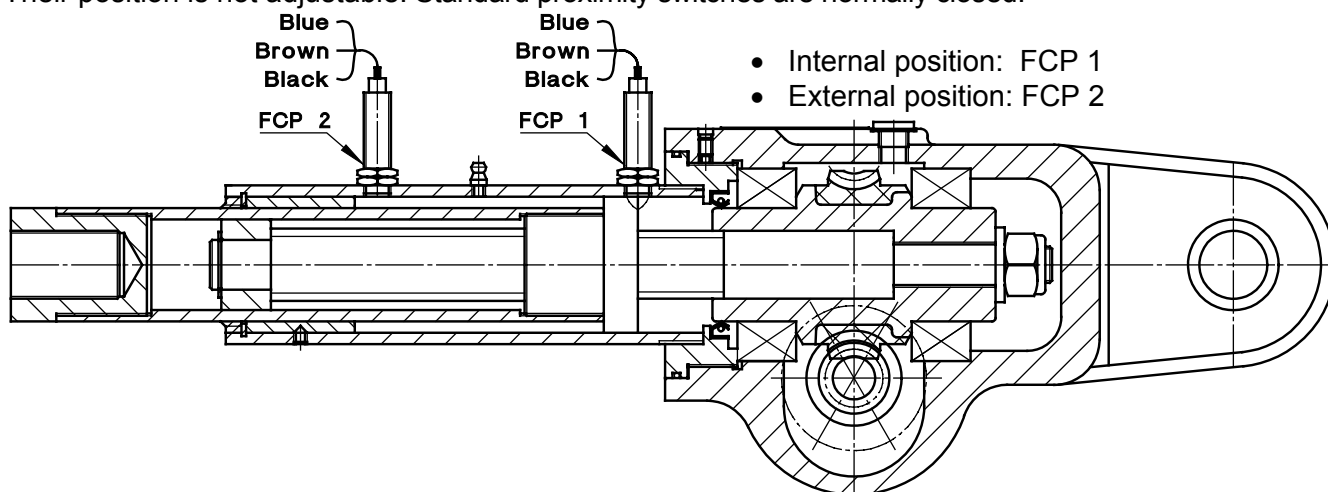
**NOTE:** Anti-turn device AR is not available when the actuator is equipped with FCM.

RATED VALUES		
	DC	AC
Rated voltage	3 ... 130 Vdc	3 ... 130 Vac
Max. Power	20 W	20 VA
Max. Current	300 mA (resistive load)	
Max. inductive load	3 W	

The reed-switches are supplied with cable standard length 2 m and wires 2 × 0.25 mm<sup>2</sup>.

### 9.3 INDUCTIVE PROXIMITY STROKE LENGTH LIMIT DEVICE "FCP"

The INDUCTIVE PROXIMITY STROKE LIMIT DEVICE FCP allows the actuator to stop before reaching the extreme positions (mechanical stops) and avoiding damage. It also allows to fix intermediate positions along the actuator stroke length. The INDUCTIVE PROXIMITY SWITCHES are fixed directly on the actuator outer tube in the required position. Their position is not adjustable. Standard proximity switches are normally closed.



Rated voltage	10 ... 30 Vdc
Max. output current	200 mA
Voltage drop	< 1.8 V

The proximity switches are supplied with cable standard length 2 m and wires 3 x 0.2 mm<sup>2</sup>.

