

SpaceLogic M700



Product Description

The **SpaceLogic** M700 is a spring return electro-mechanical actuator for the control of two-way and three-way plug valves in:

- domestic hot water systems
- heating systems
- air handling systems

The **SpaceLogic** M700 is either controlled by an increase/decrease signal or by a modulating 0...10 V control signal. Modulating control allows for faster positioning of the actuator. The electronic circuitry of the actuator ensures that the running time is the same, regardless of the stroke of the valve in question.

Specifications

Supply voltage	24 Vac +25%/-30%, 50...60 Hz 24 Vdc +/- 20%
Power consumption	Average 30 VA
Transformer sizing	50 VA
Stroke	9...52 mm
Factory set stroke	20 mm
Thrust	700 N
Duty cycle	max. 20%/60 min.
Running time - motor	
Modulating 10-25 mm	15 sec
Modulating 25-32 mm	20 sec
Modulating 32-52 mm	30 sec
Increase/decrease	300 sec/600 sec
Running time - spring return	
20 mm stroke	Less than 35 seconds
45 mm stroke	Less than 65 seconds
Proportional / Modulating, Analog input , X1-MX	
Voltage Range	0...10 V
Selectable Input Signals	0...10V, 2...10V, 0...5V, 2...6V, 5...10V, 6...10V min. 100 k Ohm
Impedance	
Floating Digital inputs VH-VC	
Voltage across open input	24 Vac
Current through closed input	5 mA
Pulse time	min. 20 ms

These actuators are easy to mount and connect. They can be mounted directly onto 20 mm stroke Venta control valves, without any mounting kit.

For Satchwell valves, a linkage is included (see Available Products, next page).

The working range of the actuator is adjusted automatically depending on the stroke of the valve. The electronic circuitry of the actuator then takes care of the adjustment of the valve end positions.

The actuator requires 24 Vac supply voltage to operate. It can provide 16 Vdc voltage supply for older TAC controllers.

Output, G1	
Voltage	16 Vdc +/- 0.3 V
Load	25 mA, short circuit proof
Output, Y (position feedback)	
Voltage	2...10 V (0...100%)
Load	2 mA
Environment	
Operating temperature	-10...+50°C
Storage temperature	-10...+50°C
Humidity	max. 90% RH
Sound power level	max. 50 dBA
Enclosure rating	IP54
Main Construction Materials	
Housing	Aluminum
Cover	ABS plastic
Color	Black/Grey
Weight	4.0 kg
Electrical connection	
Entry design	2 x PG13.5 capped hole
Standards/Directives	
ElectroMagnetic Compatibility [EMC]	2014/30/EU
Low voltage directive [LVD]	2014/35/EU
Restriction of Hazardous Substances [RoHS2]	2011/65/EC
Heat	IEC 60068-2-2
Humidity	IEC 60068-2-3
Cold	IEC 60068-2-1
Vibration	IEC 60068-2-6

Available Products

Part Number	Designation	Description
880 0430 000	M700-SRSU	SpaceLogic M700 SR Multi-signal "Stem Up" spring action (the stem is pulled up when power off)
880 0431 000	M700-S2-SRSU	SpaceLogic M700 SR Multi-signal "Stem Up" spring action (the stem is pulled up when power off) and end point switches
880 0440 000	M700-SRSD	SpaceLogic M700 SR Multi-signal "StemDown" spring action (the stem is pushed down when power off)
880 0441 000	M700-S2-SRSD	Modulating control signal or increase/decrease signal, "Stem Down" spring action (the stem is pushed down when power off) and end point switches
880 0630 000	M700-SRSU+L7SV	SpaceLogic M700 SR Multi-signal "Stem Up" spring action (the stem is pulled up when power off), including a linkage for Satchwell valves
880 0631 000	M700-S2-SRSU+L7SV	SpaceLogic M700 SR Multi-signal "Stem Up" spring action (the stem is pulled up when power off) and end point switches, including a linkage for Satchwell valves
880 0641 000	M700-SRSD+L7SV	SpaceLogic M700 SR Multi-signal "Stem Down" spring action (the stem is pushed down when power off), including a linkage for Satchwell valves
880 0641 000	M700-S2-SRSD+L7SV	SpaceLogic M700 SR Multi-signal "Stem Down" spring action (the stem is pushed down when power off), and end point switches, including a linkage for Satchwell valves

Function

The actuator utilizes a brushless DC motor to accurately position the main spindle, via a gearbox in accordance to the control signal received from the controller. Upon initial start up and self-stroking activation, the actuator performs a full stroke cycle to learn the valve end stop positions and to calibrate the motor speed and actuator full stroke running time. End switch point adjustment is also calibrated during this process. In case of power loss, the spring will bring the actuator totally up ("SRSU" models) or totally down ("SRSD" models).

Control Signal

The **SpaceLogic** M700 can either be controlled by an increase/decrease signal (3 wire floating) or by a modulating (proportional) analogue signal. The actuator would normally retract inwards on an decrease signal and extend outwards on an increase signal, see DIP Switch Settings.

Position Feedback

SpaceLogic M700 actuators are equipped with a 2–10 Vdc or 0...5 Vdc position feedback signal, where 2 V (0 V) always corresponds to the closed position and 10 V (5 V) to the open position.

End Point Switches

When actuators are controlled in sequence, it is possible to use the end point switches that have set positions. They will toggle

Manual Override Operation

Due to the safety function implemented, manually operating the actuator is only possible when the power is disconnected. A 10 mm spanner or wrench is required (Figure 2).

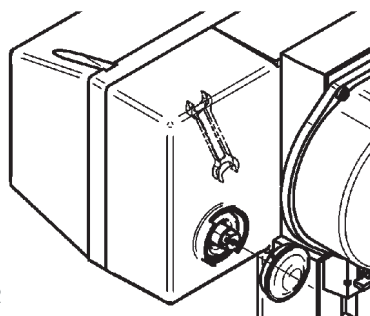


Fig 2

Dimensions (mm)

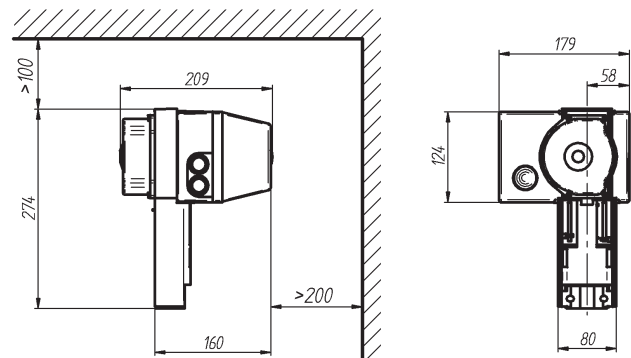


Fig 1

when the valve is fully open or fully closed, respectively.

Mounting

The actuator may be mounted horizontally, vertically and in any position in between, but not upside down, see figure 3. Do not use the actuator for the DN15 valves V298, V282, V294, V384, V386 and V394.

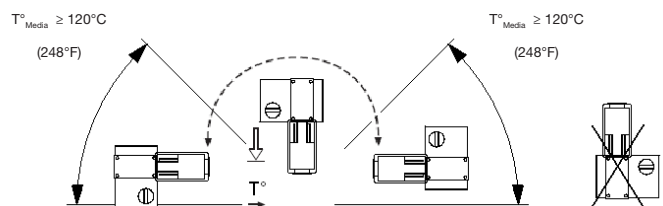


Fig 3

To mount the actuator onto a valve, position the actuator over the valve bonnet and connect the U brace through the groove on the valve neck into the mounting holes on the actuator. Secure with the flanged nuts.

Couple the valve stem to the actuator spindle using the stem linkage/extension. It may be necessary to operate the manual override to position the actuator spindle to the stroke limit. Ensure the valve is able to fully stroke and the actuator provides a small spring pre-load against the closing limit of the valve.

Electrical Connections

Block	Function	Description
G	24 Vac/dc	Supply voltage
G0	24 Vac/dc rtn	Supply voltage
X1	Input	Control signals (VH, VC short-circuited to G0 Supply for RC feedback signal)
MX	Input, neutral	
VH	Increase	
VC	Decrease	
G1	16 Vdc	
Y	0...100%	

When installed with three conductors, where the control signal reference is connected to G0, the motor current of the actuator causes varying voltage loss in the cable and thus in the reference level.

SpaceLogic, which has a highly sensitive control signal input, detects the varying signal and follows it, making it difficult for the actuator to find a stable position. This variation may be accepted in simplified installations on the following conditions: the cables between the controller and actuator are shorter than 100 m (328 ft.), the cross-sectional area is larger than 1.5 mm² (AWG 16) and the cables are only connected to one actuator.

Cable lengths

For cables to G, G0 and G1 use a maximum of 100 m (328 ft.) with a cross-sectional area of minimum 1.5 mm² (AWG 16). For other cables, use a maximum of 200 m (656 ft.) with a cross-sectional area of min. 0.5 mm² (AWG 20).

Connections/PCB Layout

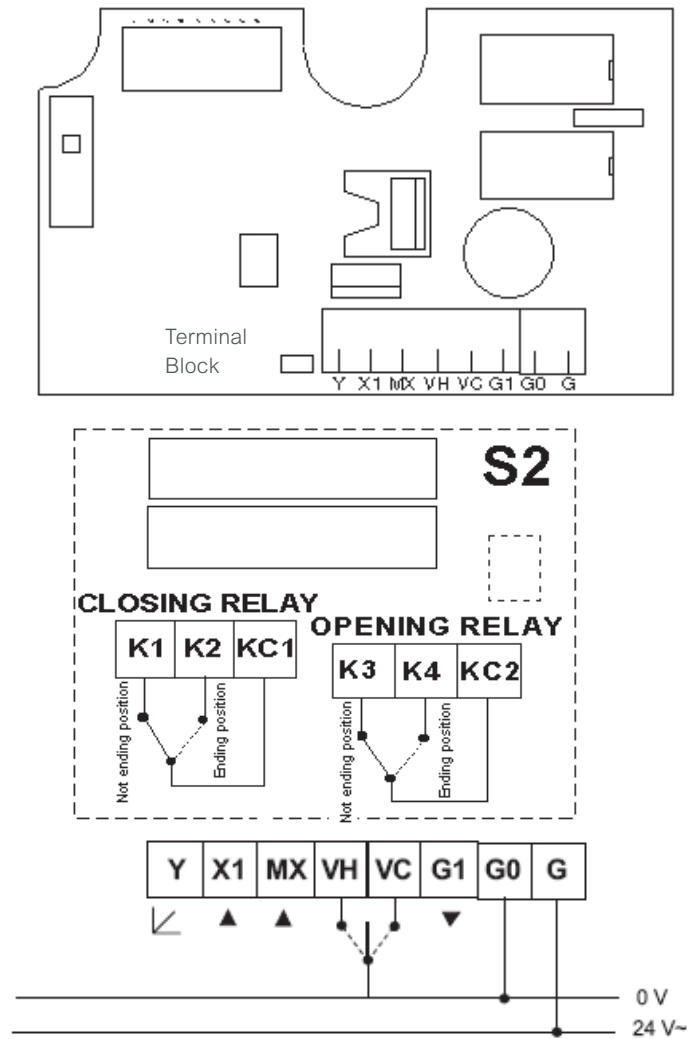
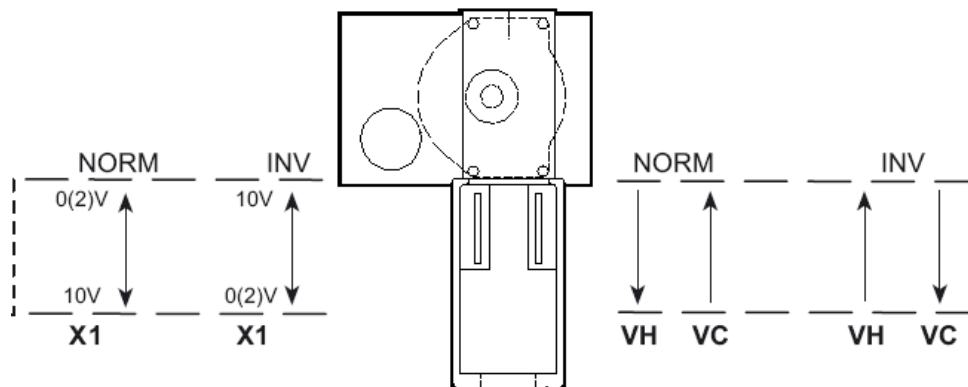


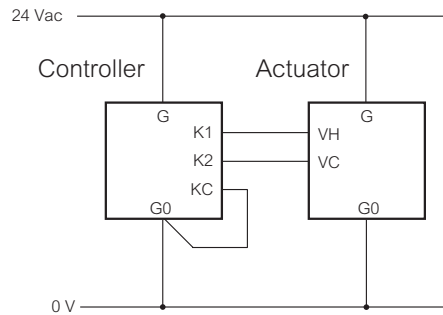
Fig 4



Wiring Examples

Typical wiring

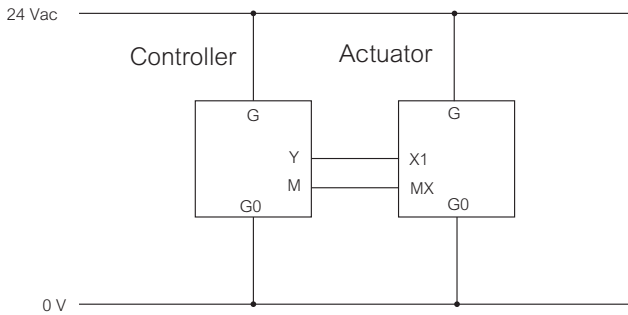
Increase/decrease control



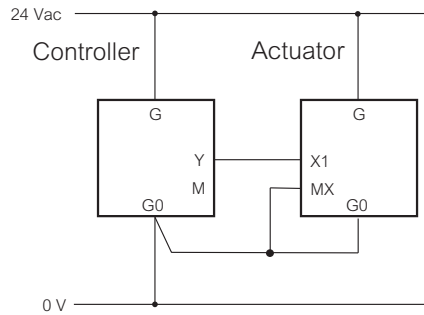
Modulating control, 24 Vac supply to the controller

Modulating control

Normal installation (4 wires to the actuator)

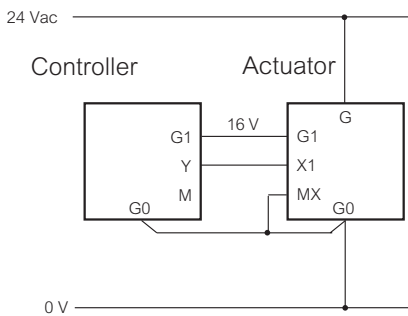


Short cable installation (3 wires to the actuator)

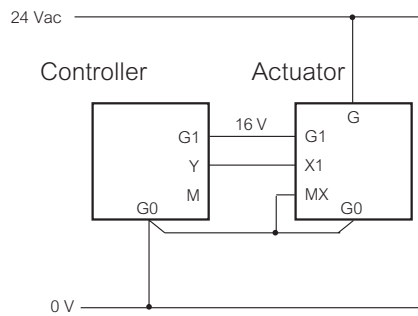


Modulating control, 16 Vdc supply to the controller

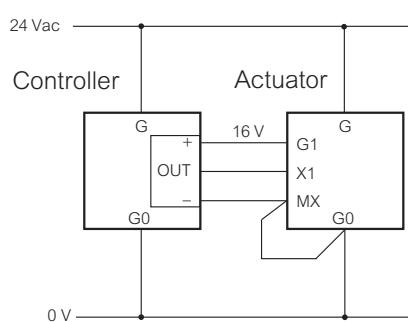
Normal installation (5 wires to the actuator)



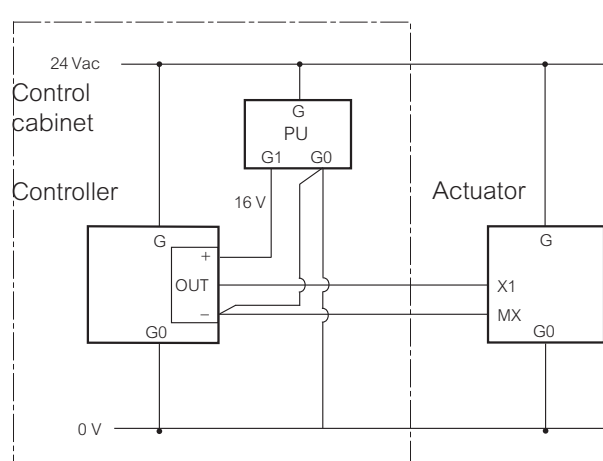
Short cable installation (4 wires to the actuator)



Normal installation (5 wires to the actuator)



PU unit installation (4 wires to the actuator)



Modulating control, galvanically isolated output in the controller

Fig 5

DIP Switch Settings

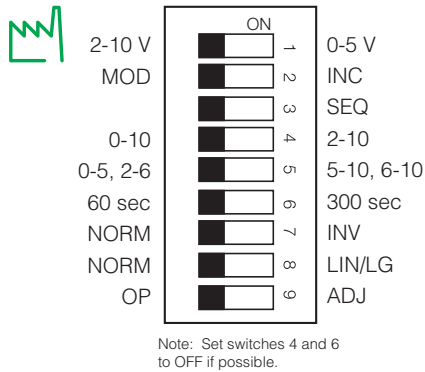


Fig 6 ■ = switch position

Sw.	Function in the "OFF" pos.	"ON" position	Description
1	2...10 V	0...5 V	Feedback signal
2	Modulating	Increase/decrease	Control (not at Sequence)
3	–	Sequence	Sequence control
4	0...10 V	2...10 V	Voltage range
5	0...5 V, 2...6 V	5-10 V, 6...10 V	Sequence voltage (higher range with Sw.4 ON)
6	60 sec	300 sec	Running time (Floating Control only)
7	Normal	Inverted	Direction of movement
8	Normal (EQ)	Linear/Logarithmic	Flow characteristic (EQ Valve)
9	Operation	End position adjust (mom.)	Operation/End position adjustment

There are nine DIP switches in a row on the circuit board. On delivery ('Factory'), all switches are in the "OFF" position.

1 Feedback signal selection

Select between 2...10 Vdc and 0...5 Vdc feedback voltage output.

2 Control signal—MOD / INC

SpaceLogic can either be controlled by a variable direct voltage, a modulating signal (MOD), or by an increase/decrease signal (INC).

3 Sequence or parallel control— — — — / SEQ

With sequence (or parallel) control (SEQ), two actuators/valves can be controlled with a single control signal.

For each of these, choose which part of the voltage range to use, the upper range, 5...10 V (6...10 V) or the lower one, 0...5 V (2...6 V).

Note: If sequence or parallel control is not used, the switch — — — — / SEQ must be in the OFF position, as the switch MOD / INC is not valid during sequence or parallel control.

4 Voltage range—0...10 / 2...10

Choose the control signal voltage range (either 0...10 V or 2...10 V).

5 Part of voltage range—0...5, 2...6 / 5...10. 6...10

Under sequence control (switch 3 ON). Choose which part of a voltage range to use, the lower one 0...5 V (2...6 V) or the upper one 5...10 V (6...10 V). The voltages within brackets are operational with switch 4 ON.

If switch 7 is in the NORM position, the higher voltage corresponds to 100% flow and the lower one to 0%. The INV position reverses this function.

6 Running time—60 s / 300 s

With increase/decrease control, you can choose a running time between 60 sec or 300 sec.

With modulating control, the running time is always 15 sec / 20 sec / 30 sec. depending on the valve stroke.

7 Direction of movement—NORM / INV

When normal direction of movement is used, the screw of the actuator moves inwards as the control voltage decreases or if the actuator gets a decrease signal.

With the switch NORM / INV, the direction of movement can be changed. (see Fig. 4)

8 Linearization—NORM / LIN/LG

The motorized valve characteristics can be modified. Use the LIN/LG setting to make the characteristics of an equally modified percentage (EQM) valve almost linear.

On the other hand, with LIN/LG a motorized valve equipped with a linear valve operates with "Quick open characteristics." This means that with a small control signal, the valve is almost completely open.

9 End position adjustment—OP / ADJ

This switch is only used to adjust the end positions when the actuator is commissioned.

Momentarily put the switch in the ON position. The actuator automatically finds the end positions of the valve.

At the end of the adjustment all the other DIP switch settings (1 to 8) are read again.

Register New DIP Switch Settings

For the actuator to register new DIP switch settings, turn off the power supply, adjust the switches, and restore power. (This does not apply to the switch OP/ADJ).

