TCR-02T CONTROL ELECTRICAL ACTUATOR

FEATURES

The TCR-02T electric actuator is intended for motorising ¼ turn valves with a torque of 20 Nm. **Control function**: this motor is used to control the position of the valve depending upon an a 4-20mA input signal. With a compact construction and plastic housing, they are especially well suited for motorising small size ball valves. IP67 leak-tightness: to be used indoors and, possibly, outdoors under a shelter. Possible installation in parallel. Manual control with a key. This actuator has many functions. Parameter setting is done directly on the screen.

AVAILABLE MODELS

Supply voltages: 230V AC, 24V AC/DC.

Control: 4-20mA, 0-20mA, 2-10V, 0-10V.

IP 67 ISO 9001 CE

LIMITS OF USE

IP Code	IP 67
Ambient temperature	- 20°C / +60°C
Service factor	S4-50%

MECHANICAL FEATURES

Gear box	treated steel pinions
Torques	20 Nm
Angle of rotation	90° +/- 2°
Declutching	without
Override control	By key

Actuator	**TCR 02T**	
Torques (Nm)	20	
Voltage	24V AC - DC	95-265V AC-DC
Adjustment signal	4-20mA	
Manoeuvring time (s)	10	10
ISO 5211:	F03/F05 - star 11	

ELECTRICAL FEATURES

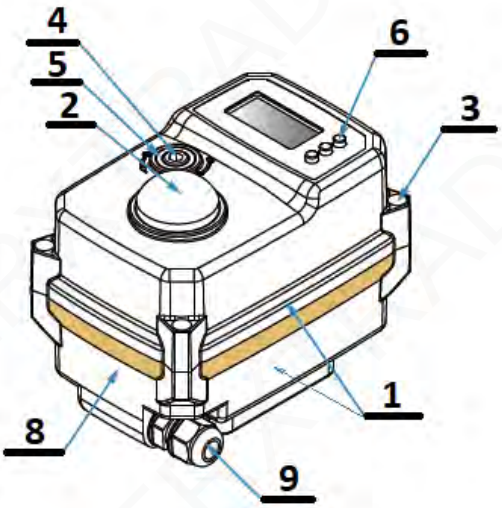
Actuator	**TCR 02T**
Motor protection	Thermal switch
Limit switches	2 adjustable switches
Anti-condensation	integrated
Electrical connection	PE M10 + 1.5m cable

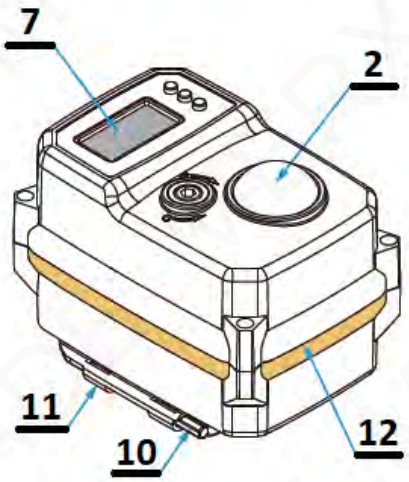
Actuator	**TCR 02T**	
Voltage	24V AC - DC	95-265V AC-DC
Power (W)	15	15
Current (A)	0,35	0,035 - 0,075
Fuse protection (A)	2	1

TCR-02T CONTROL ELECTRICAL ACTUATOR

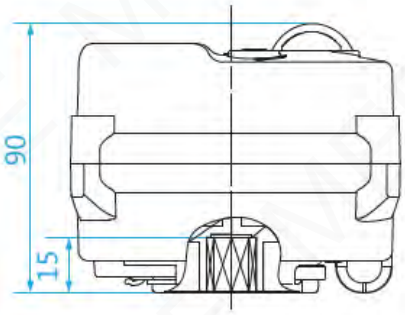
CONSTRUCTION (TCR-02T)

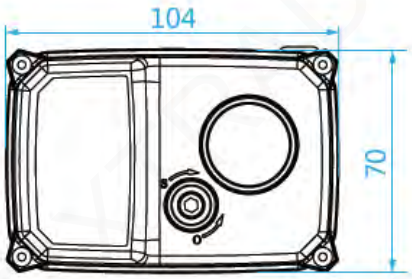
TCR-02T					
No.	**Name**	**Material**	**No.**	**Name**	**Material**
1	Casing + lid	Plastic (ABS)	**7**	1.3” LCD display	OLED
2	Position indicator	Polycarbonate plastic	**8**	Rating plate	PVC
3	Screw x 4	Ansi 304	**9**	Packing gland	Nylon
4	Backup control stem	Ansi 304	**10**	Hex key	Steel
5	Gasket	NBR	**11**	Key support	Plastic (ABS)
6	Adjustment button	Rubber	**12**	Cover gasket	NBR
Weight (kg): 0.620					

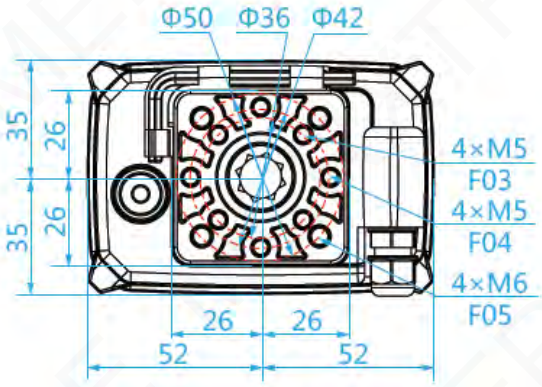




DIMENSIONS (mm)

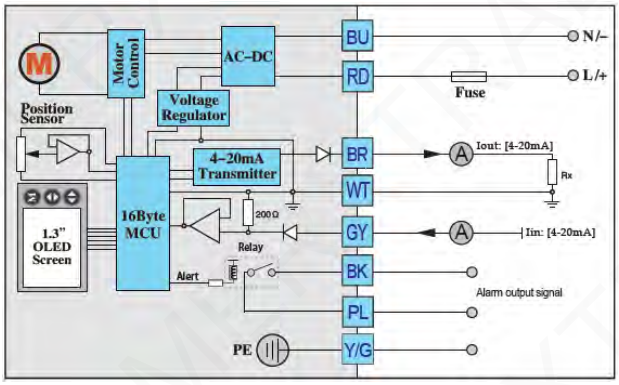


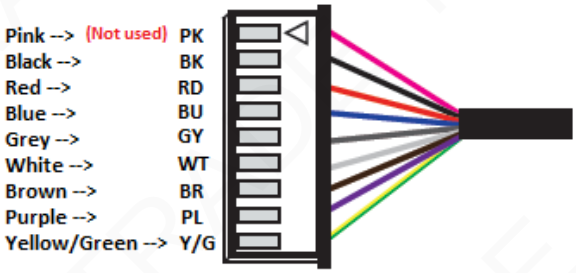




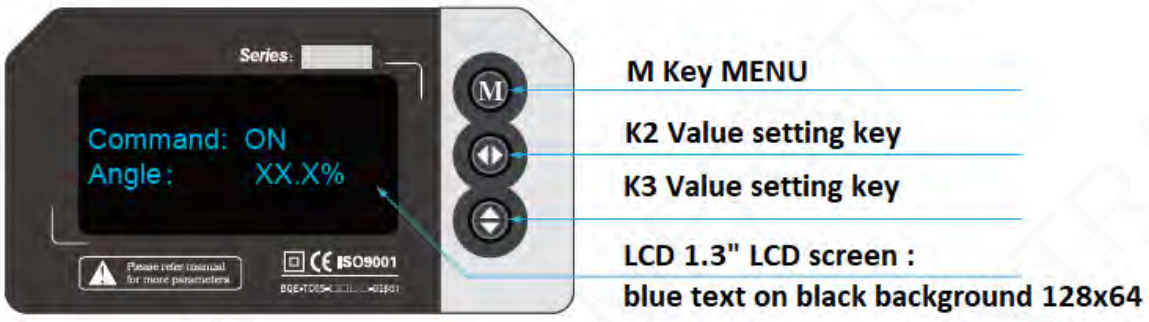
WIRING DIAGRAM (TCR 02T)

BU	Neutral (Blue)
RD	Phase (Red)
BR	Current control signal output (Brown)
WT	Common (White)
GY	Current control signal input (Grey)
BK	Alarm signal (Black)
PL	Alarm signal (Purple)
Y/G	Earth (Yellow / Green)



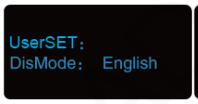
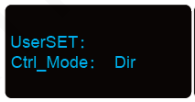
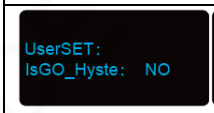


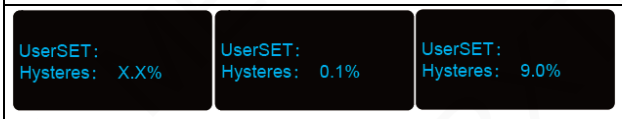
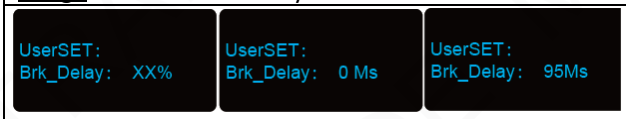
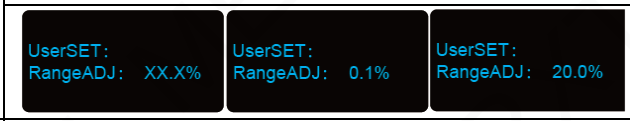
DESCRIPTION OF THE 1.3'' LCD SCREEN

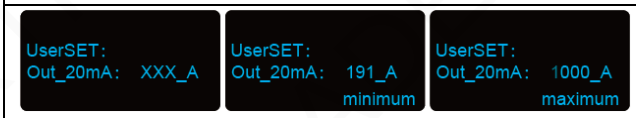
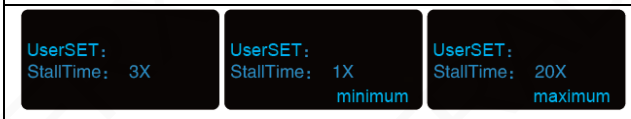


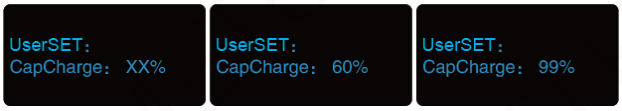
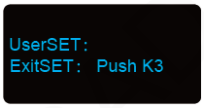
ACTUATOR SETTINGS

The following functions can have their parameters set from the menu accessible on the screen:

STEP	TITLE	FUNCTION AND VALUES
1	Entering the menu	Press the “M” button for more than 5 s.
2	Enter the password	Press the “M” button for more than 5 s. Enter the code “333” (use the keys K2 and K3) Press again the button “M” 
3	Choice of language	English or Mandarin  
4	Choosing the direction of rotation of the actuator	**Direct**: 4mA = valve closed / 20 mA = valve open   **Inverted**: 4 mA = valve closed / 20 mA = valve open
5	Position by absence of any control signal	In the absence of a control signal, the valve can take 3 positions: ON, OFF or KEEP   
6	Dead band	This function is used to set the accuracy and the sensitivity of the control: the larger the band, the lower the accuracy; the narrower the band, the more oscillating the system can be. **Setting range:** 0.1 to 9.9% - **Setting by default**: 0.8%   
7	Hysteresis adjustment	This parameter setting is a prerequisite for the next. YES = adjustment is possible NO = no adjustment is possible (value by default)  

8	Hysteresis value	If the previous parameter is “YES”, it is possible to set the hysteresis value between 0.1 and 9.9%. The value by default is 0.2%. Do not use the function if there is a play between the valve’s stem and the actuator’s square. 
9	Manual adjustment of the speed of rotation	This function is used for slowing down the motor. **Range**: 20-100% - Value by default = 100% 
10	Braking time	In order to increase the stability of the motor, the motor will slow down after a short time before reaching its setpoint value position. During current use, this function is not useful. **Range**: 0-95 ms – Value by default = 1 ms 
11	Setting the maximum speed	This setting affects the available torque. Without a special need, do not change it. **Range**: 20-100% - Value by default = 100% 
12	Setting the minimum speed	This setting affects the available torque. Without a special need, do not change it. **Range**: 20-95% - Value by default = 75% 
13	Setting the speed for the stroke	This setting is used for setting a % of the actuator stroke during which it will slow down before reaching the setpoint value position. **Range**: 0.1-20% - Value by default = 10% 
14	Redefining the 4 mA position	Used to set another position than 0% for the 4 mA value. This function is useful for valves with an opening angle different from 90°. **Range**: -50% +80% - Value by default = 0.0% 

15	Redefining the 20 mA position	Used to set another position than 100% for the 20 mA value. This function is useful for valves with an opening angle different from 90°. **Range**: 20% +220% - Value by default = 100.0% 
16	Modification of the 4 mA output signal	If a deviation is found on the 4mA output signal, this function is used to adjust it. If the number is increased, the current is higher. If the number is decreased, the current is lower. **Range**: 000_481_A – Value by default 191_A **NB**: always limit the lower value to 20 mA 
17	Modification of the 20mA output signal	If a deviation is found on the 20mA output signal, this function is used to adjust it. If the number is increased, the current is higher. If the number is decreased, the current is lower. **Range**: 191_1000_A – Value by default 909_A 
18	Response time	Used to set the response speed of the valve. The smaller the value, the less sensitive the control. The bigger the value, the more sensitive it is. Increase the value when the response speed is too low. **Setting range:** 1x20x – Value by default 3x 
19	Checking the feed signal	The actuator periodically tests its electrical power supply. A change of a value will change the interval between two tests. In current use, there is no need to change this parameter. 
20	Power supply position by default	This setting is not available on this version (see version T-KT) **Value by default**: KEEP 

21	Capacitor charge	This setting is not available on this version (see version T-KT) **Value by default**: 95% 
22	Alarm test	This function is used to control whether a defect alarm is broadcast or not. It is especially used for factory testing **Value by default**: ON 
23	Exiting the menu	Press K3 to exit the menu The system will switch back in the automatic checking mode. 

TROUBLESHOOTING

Defect met	Cause of defect	Method of solving
Inactive actuator	Non-connected electrical grid.	Connect to the electrical grid.
	Wrong voltage.	Check the actuator's voltage.
	Motor overheating.	Check the torque on the valve.
	Faulty connection.	Check the connection to the terminal box.
	Damaged start capacitor.	Contact the supplier for repair.
No switch signal	Faulty connection.	Check the connections.
	Damaged microswitch	Change the microswitch
Valve that is not fully closed	Use the return signal from the actuator check.	Receiving a return signal does not mean that the actuator is fully closed, hence do not cut the power supply.
	The hysteresis increases due to wear or between the actuator and the valve's stem.	Readjust the limit cams. Contact the supplier for repair.
Presence of humidity or water in the actuator	Unsuitable cable cross-section being used.	Contact the supplier for repair.
	The cable connection is not leak-tight.	
	Worn sealing gaskets.	
	Loose cover screws.	Dry the internal parts and tighten the cover screws.

TCR-05-11T CONTROL ELECTRICAL ACTUATOR

FEATURES

The TCR-05-11T electric actuator is intended for motorising ¼ turn valves with a torque of 50 or 110 Nm.
Control function: this motor is used to control the position of the valve depending upon an a 4-20mA or 0-10V input signal. With a compact construction and plastic housing, they are especially well suited for motorising small size ball valves. IP67 leak-tightness: to be used indoors and, possibly, outdoors under a shelter. Possible installation in parallel. Manual control with a key. This actuator offers many functions (see § parameter setting menu) Parameter setting is done directly on the screen.

AVAILABLE MODELS

Supply voltages : 230V AC, 24V AC/DC.
Control : 4-20mA, 0-20mA, 2-10V, 0-10V.

IP 67 ISO 9001 CE

LIMITS OF USE

IP Code	IP 67
Ambient temperature	- 20°C / +60°C
Service factor	S4-50%

MECHANICAL FEATURES

Gear box	treated steel pinions
Torques	50 - 110 Nm
Angle of rotation	90° +/- 2°
Declutching	without
Override control	By key

Actuator	**TCR 05T**		**TCR 11T**	
Torques (Nm)	50		110	
Voltage	24V AC - DC	95-265V AC-DC	24V AC - DC	95-265V AC-DC
Adjustment signal	4-20mA, 0-20mA, 2-10V, 0-10V			
Manoeuvring time (s)	12	12	10	10
ISO 5211:	F05/F07 - star 14		F05/F07 - star 17	

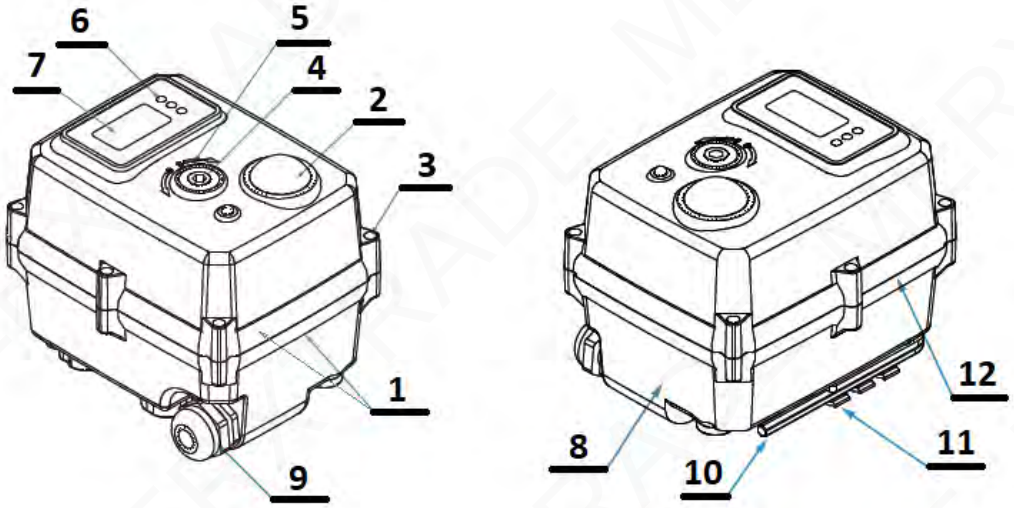
ELECTRICAL FEATURES

Actuator	**TCR 05T**	**TCR 11T**
Motor protection	Thermal switch	
Limit switches	2 adjustable switches	
Anti-condensation	integrated	
Electrical connection	PE M20 + 1.5m cable	2 x PE M14

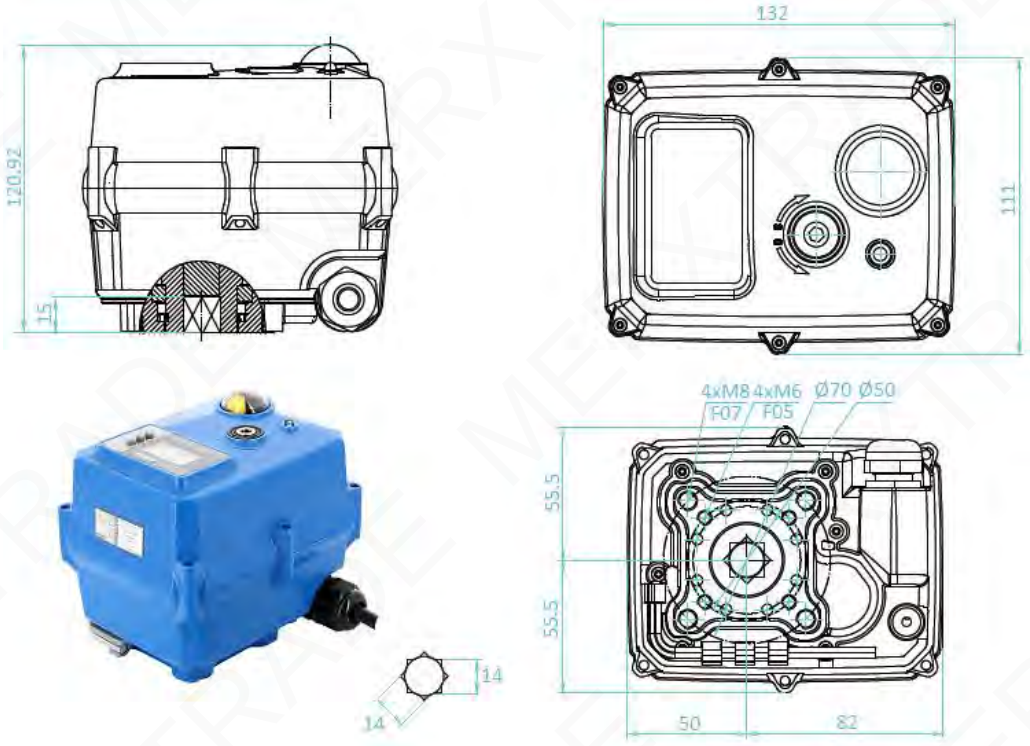
Actuator	**TCR 05T**		**TCR 11T**	
Voltage	24V AC - DC	95-265V AC-DC	24V AC - DC	95-265V AC-DC
Power (W)	25	25	100	100
Current (A)	0,83	0,18	2,2	0,26 - 0,52
Fuse protection (A)	4	2	10	2

CONSTRUCTION (TCR-05T)

TCR-05T					
No.	**Name**	**Material**	**No.**	**Name**	**Material**
1	Casing + lid	Plastic (ABS)	**7**	1.3” LCD display	OLED
2	Position indicator	Polycarbonate plastic	**8**	Rating plate	PVC
3	Screw x 6	Ansi 304	**9**	Packing gland	Nylon
4	Backup control stem	Ansi 304	**10**	Hex key	Steel
5	Gasket	NBR	**11**	Key support	Plastic (ABS)
6	Adjustment button	Rubber	**12**	Cover gasket	NBR
Weight (kg): 1.800					

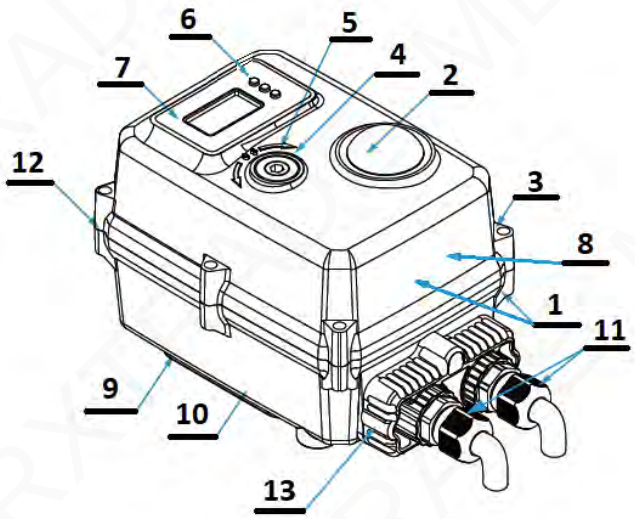


DIMENSIONS (mm)

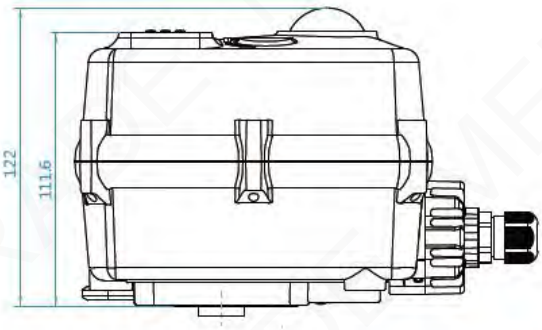


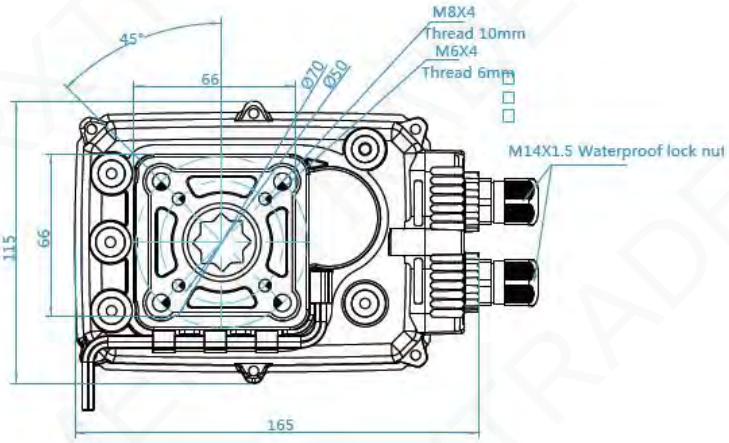
CONSTRUCTION (TCR-11T)

TCR-11T					
No.	**Name**	**Material**	**No.**	**Name**	**Material**
1	Casing + lid	Plastic (ABS)	**7**	1.3” LCD display	OLED
2	Position indicator	Polycarbonate plastic	**8**	Rating plate	PVC
3	Screw x 6	Ansi 304	**9**	Key support	Plastic (ABS)
4	Backup control stem	Ansi 304	**10**	Hex key	Steel
5	Gasket	NBR	**11**	X 2Packing gland	Nylon
6	Adjustment button	Rubber	**12**	Cover gasket	NBR
Weight (kg): 2.200			**13**	Cable gland unit	Plastic (ABS)



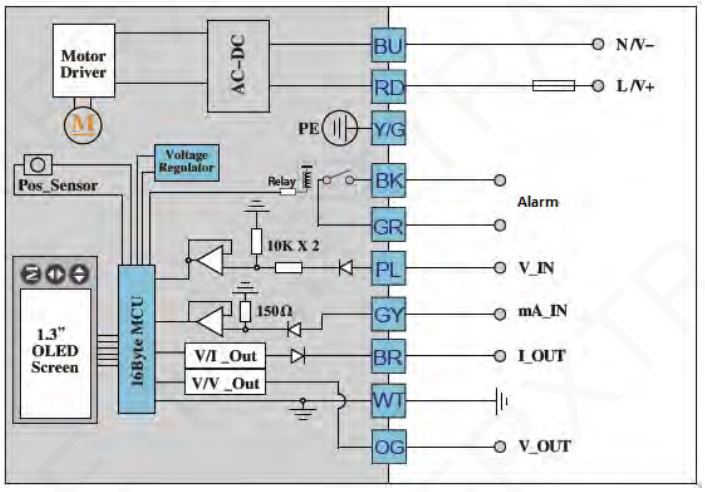
DIMENSIONS (mm)

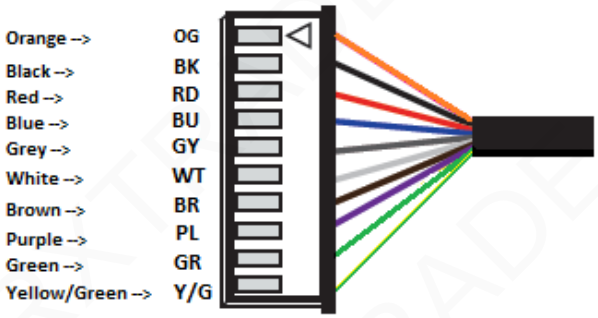




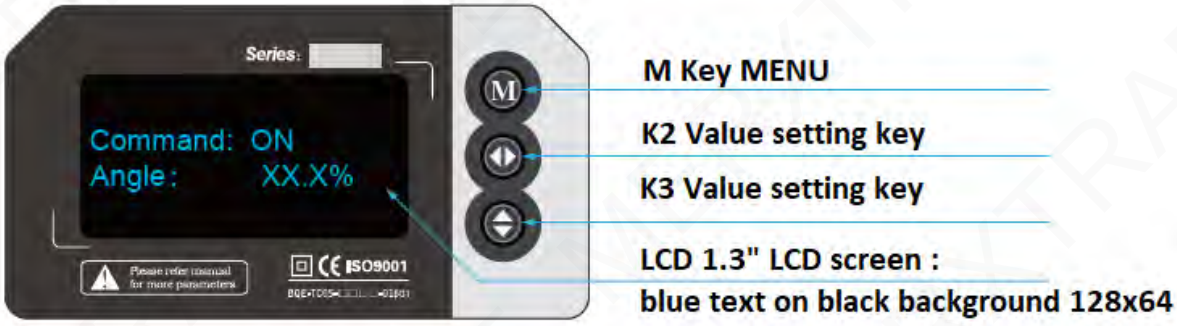
WIRING DIAGRAM

BU	Neutral (Blue)
RD	Phase (Red)
Y/G	Earth (Yellow / Green)
BK	Alarm (Black)
GR	Alarm (Green)
PL	Voltage control signal input (Purple)
GY	Current control signal input (Grey)
BR	Current control signal output (Brown)
WT	Signal control common (White)
OG	0-10V voltage control signal output (Orange)



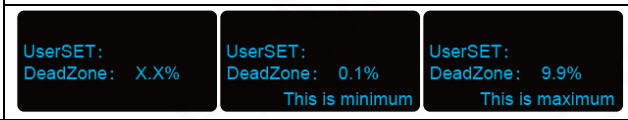


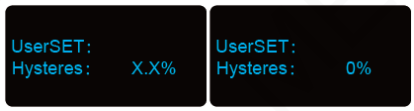
DESCRIPTION OF THE 1.3'' LCD SCREEN

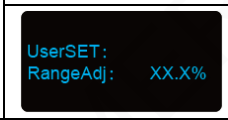
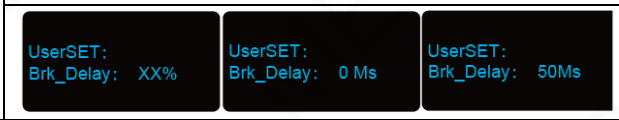


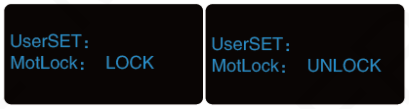
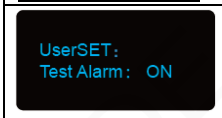
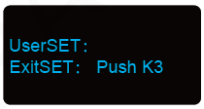
PARAMETER SETTING MENU OF THE ACTUATOR

The following functions can have their parameters set from the menu accessible on the screen:

STEP	TITLE	FUNCTION AND VALUES
1	Standby screen	If the actuator did not receive any signal in the last 5 minutes, the screen switches to standby. Press any button for 5 s. Then reactivate the screen.
2	Enter the password	Press the "M" button for more than 5 s. Enter the code "333" (use the keys K2 and K3) Press again the button "M" 
3	Choice of language	English or Mandarin 
4	Choosing the control signal	Press "K3" to chose the control signal Possible signals: 4-20mA, 0-20mA, 2-10V, 0-10V Press "M" again to continue 
5	Choosing the direction of rotation of the actuator	Direct 4mA = valve closed / 20 mA = valve open Inverted 4 mA = valve closed / 20 mA = valve open 
6	Position by absence of any control signal	In the absence of a control signal, the valve can take 3 positions: ON, OFF or KEEP 
7	Dead band	This function is used to set the accuracy and the sensitivity of the control: the larger the band, the lower the accuracy; the narrower the band, the more oscillating the system can be. **Setting range:** 0.1 to 9.9% - **Setting by default**: 0.8% 

8	Hysteresis adjustment	This parameter setting is a prerequisite for the next. YES = adjustment is possible NO = no adjustment is possible (value by default) 
9	Hysteresis value	If the previous parameter is "YES", it is possible to set the hysteresis value between 0.1 and 9.9%. The value by default is 0.2%. Do not use the function if there is a play between the valve's stem and the actuator's square. 
10	Redefining the 4 mA position	Used to set another position than 0% for the 4 mA value. This function is useful for valves with an opening angle different from 90°. **Range**: -50% +80% - **Value by default** = 0.0% 
11	Redefining the 20 mA position	Used to set another position than 100% for the 20 mA value. This function is useful for valves with an opening angle different from 90°. **Range**: +81% +220% - **Value by default** = 100.0% 
12	Manual adjustment of the speed of rotation	This function is used for slowing down the motor. **Range**: 20-100% - Value by default = 100% 
13	Setting the maximum speed	This setting affects the available torque. Without a special need, do not change it. **Range**: 20-100% - Value by default = 100% 
14	Setting the minimum speed	This setting affects the available torque. Without a special need, do not change it. **Range**: 20-95% - Value by default = 75% 

15	Setting the speed for the stroke	This setting is used for setting a % of the actuator stroke during which it will slow down before reaching the setpoint value position. **Range**: 1-20% - Value by default = 10% 
16	Braking time	In order to increase the stability of the motor, the motor will slow down after a short time before reaching its setpoint value position. During current use, this function is not useful. **Range**: 0-50 ms – **Value by default** = 1 ms 
17	Modification of the output signal 4 mA	If a deviation is found on the 4mA output signal, this function is used to adjust it. If the number is increased, the current is higher. If the number is decreased, the current is lower. **Range**: 000_481_A – **Value by default** 191_A **NB**: always limit the lower value to 20 mA 
18	Modification of the 20mA output signal	If a deviation is found on the 20mA output signal, this function is used to adjust it. If the number is increased, the current is higher. If the number is decreased, the current is lower. **Range**: 191_1000_A – **Value by default** 909_A 
19	Response time	Used to set the response speed of the valve. The smaller the value, the less sensitive the control. The bigger the value, the more sensitive it is. Increase the value when the response speed is too low. **Setting range:** 1x20x – Value by default 3x 
20	Checking the feed signal	The actuator periodically tests its electrical power supply. A change of a value will change the interval between two tests. In current use, there is no need to change this parameter. 
21	Power supply position by default	This parameter setting is not available on this version (see version T-KT) **Value by default**: KEEP 

22	Super-capacitor charge	This setting is not available on this version (see version T-KT) **Value by default**: 95% 
23	Actuator locking after the intervention of the super-capacitor	This parameter setting is not available on this version (see version T-KT) **Value by default**: UNLOCK 
24	Alarm test	This function is used to control whether a defect alarm is broadcast or not. It is especially used for factory testing **Value by default**: ON 
25	Exiting the menu	Press K3 to exit the menu The system will switch back in the automatic checking mode. 

TROUBLESHOOTING

Defect met	Cause of defect	Method of solving
Inactive actuator	Non-connected electrical grid.	Connect to the electrical grid.
	Wrong voltage.	Check the actuator's voltage.
	Motor overheating.	Check the torque on the valve.
	Faulty connection.	Check the connection to the terminal box.
	Damaged start capacitor.	Contact the supplier for repair.
No switch signal	Faulty connection.	Check the connections.
	Damaged microswitch	Change the microswitch
Valve that is not fully closed	Use the return signal from the actuator check.	Receiving a return signal does not mean that the actuator is fully closed, hence do not cut the power supply.
	The hysteresis increases due to wear or between the actuator and the valve's stem.	Readjust the limit cams. Contact the supplier for repair.
Presence of humidity or water in the actuator	Unsuitable cable cross-section being used.	Contact the supplier for repair.
	The cable connection is not leak-tight.	
	Worn sealing gaskets.	
	Loose cover screws.	Dry the internal parts and tighten the cover screws.