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 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 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.

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/F04/F05 - star 11	

ELECTRICAL FEATURES

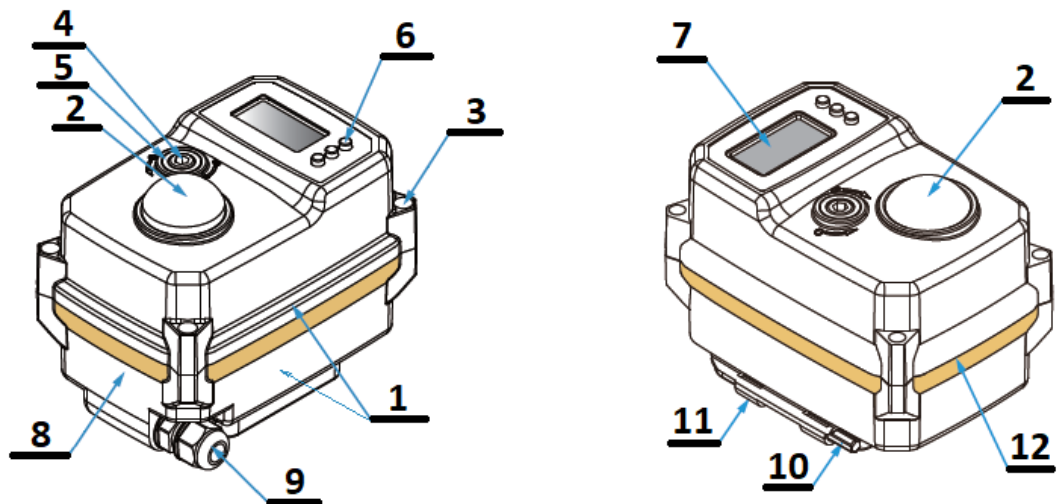| Actuator	TCR 02T
Motor protection	Thermal switch
Limit switches	2 adjustable switches
Anti-condensation	integrated
Electrical connection	PE M10 + 1.5m cable

Actuator	TCR 02T	
Voltage	24V AC - DC	95-265V AC-DC
Power (W)	15	15
Current (A)	2	1
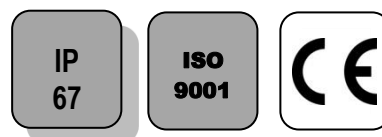
TCR-02T CONTROL ELECTRICAL ACTUATOR

CONSTRUCTION (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)
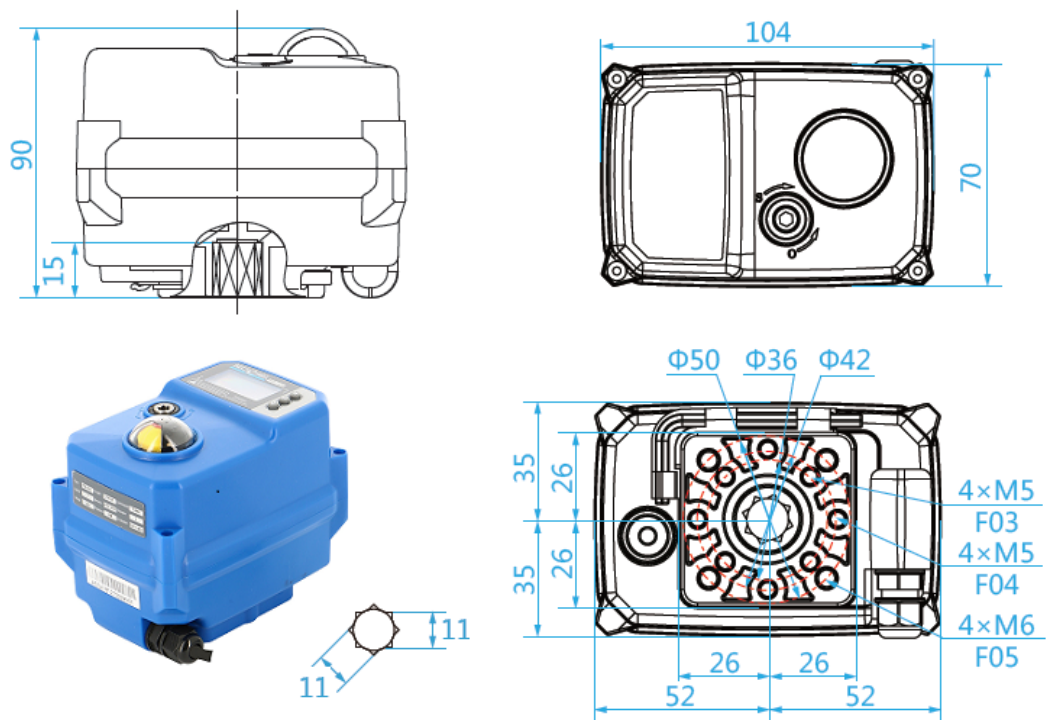
WIRING DIAGRAM (TCR 02T)

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)

Pink --> (Not used) PK
Black --> BK
Red --> RD
Blue --> BU
Grey --> GY
White --> WT
Brown --> BR
Purple --> PL
Yellow/Green --> Y/G

DESCRIPTION OF THE 1.3'' LCD SCREEN

Command: ON
Angle: XX.X%

M Key MENU

K2 Value setting key

K3 Value setting key
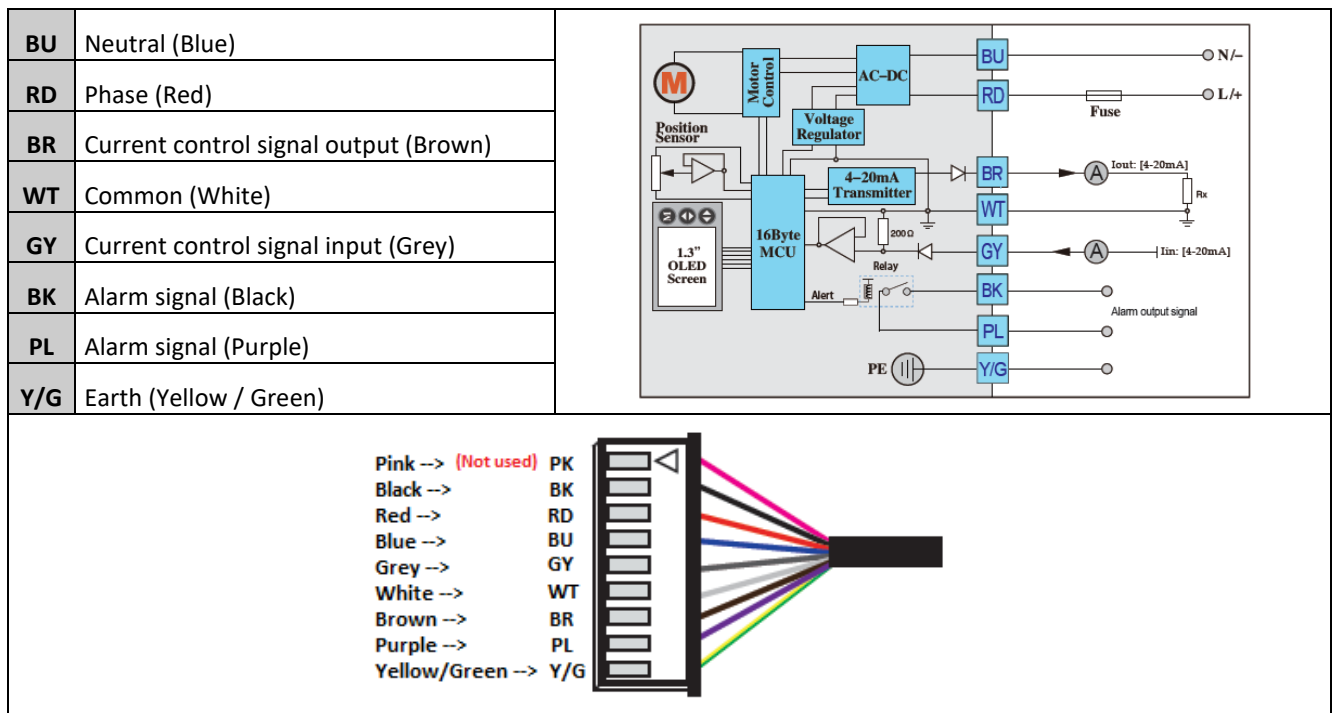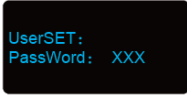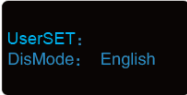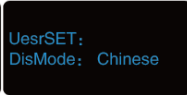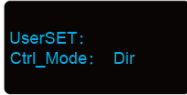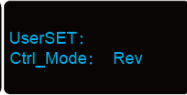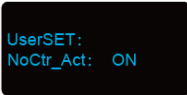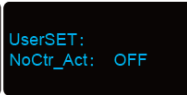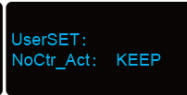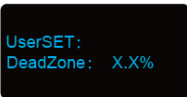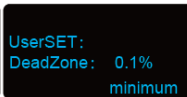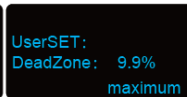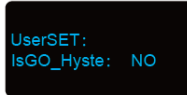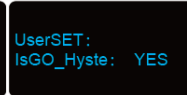
LCD 1.3" LCD screen :
blue text on black background 128x64
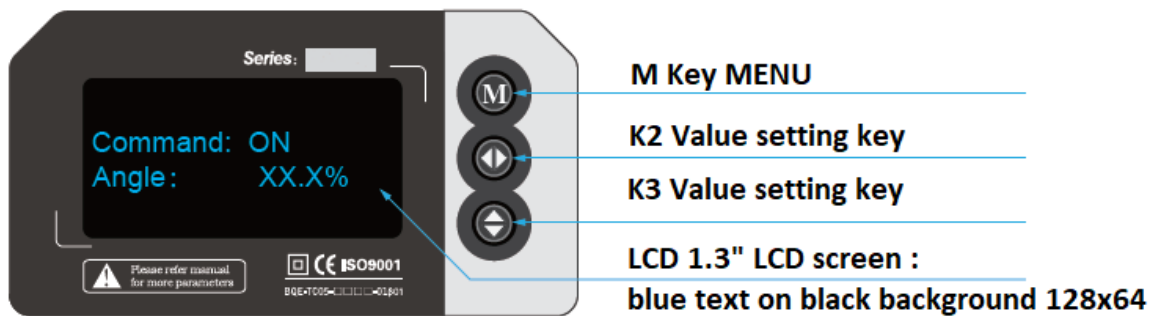
ACTUATOR SETTINGS

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" UserSET: PassWord: XXX
3	Choice of language	English or Mandarin UserSET: DisMode: English UesrSET: DisMode: Chinese
4	Choosing the direction of rotation of the actuator	**Direct**: 4mA = valve closed / 20 mA = valve open UserSET: Ctrl_Mode: Dir UserSET: Ctrl_Mode: Rev **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 UserSET: NoCtr_Act: ON UserSET: NoCtr_Act: OFF UserSET: NoCtr_Act: 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% UserSET: DeadZone: X.X% UserSET: DeadZone: 0.1% UserSET: DeadZone: 9.9% minimum maximum
7	Hysteresis adjustment	This parameter setting is a prerequisite for the next. YES = adjustment is possible NO = no adjustment is possible (value by default) UserSET: IsGO_Hyste: NO UserSET: IsGO_Hyste: YES

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. UserSET: Hysteres: X.X% UserSET: Hysteres: 0.1% UserSET: Hysteres: 9.0%
9	Manual adjustment of the speed of rotation	This function is used for slowing down the motor. **Range**: 20-100% - Value by default = 100% UserSET: Manu_spd: XX% UserSET: Manu_spd: 20 UserSET: Manu_spd: 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 UserSET: Brk_Delay: XX% UserSET: Brk_Delay: 0 Ms UserSET: Brk_Delay: 95Ms
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% UserSET: Speed_Max: XX% UserSET: Speed_Max: 20 UserSET: Speed_Max: 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% UserSET: Speed_Min: XX% UserSET: Speed_Min: 20% UserSET: Speed_Min: 95%
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% UserSET: RangeADJ: XX.X% UserSET: RangeADJ: 0.1% UserSET: RangeADJ: 20.0%
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% UserSET: Posi4mA: X.X% UserSET: Posi4mA: -50.0% minimum UserSET: Posi4mA: 80.0% maximum

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%

		UserSET:
		Pos20mA: X.X% UserSET:
		Pos20mA: 20.0% UserSET:
		                     minimum Pos20mA: 220.0%
		                                      maximum

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

		UserSET:
		Out_4mA: XXX_A UserSET:
		Out_4mA: 000_A UserSET:
		              minimum Out_4mA: 481_A
		                                maximum

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

		UserSET:
		Out_20mA: XXX_A UserSET:
		Out_20mA: 191_A UserSET:
		               minimum Out_20mA: 1000_A
		                             maximum

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

		UserSET:
		StallTime： 3X UserSET:
		StallTime： 1X UserSET:
		             minimum StallTime： 20X
		                           maximum

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.
		UserSET: PDChk_Time: 100%
20	Power supply position by default	This setting is not available on this version (see version T-KT) **Value by default**: KEEP
		UserSET: PDAction: KEEP UserSET: PDAction: OFF UserSET: PDAction: ON

21	Capacitor charge	This setting is not available on this version (see version T-KT) **Value by default**: 95% UserSET： CapCharge： XX% UserSET： CapCharge： 60% UserSET： CapCharge： 99%
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 UserSET： Test Alarm： ON
23	Exiting the menu	Press K3 to exit the menu The system will switch back in the automatic checking mode. UserSET： ExitSET： Push K3

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.

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)	4	2	10	2

CONSTRUCTION (TCR-05T)

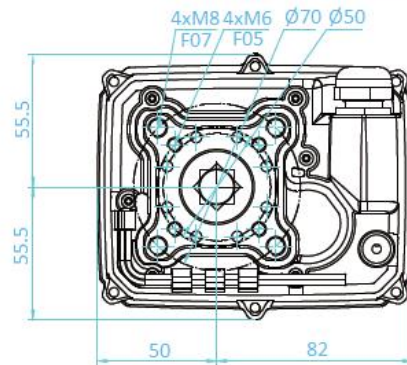| TCR-05T					
No.	Name	Material	No.	Name	Material
1	Casing + lid	Plastic (ABS)	7	1.3" LCD display	OLED
2	Position indicator	Polycarbonate plastic	8	Rating plate	PVC
3	Screw x 6	Ansi 304	9	Packing gland	Nylon
4	Backup control stem	Ansi 304	10	Hex key	Steel
5	Gasket	NBR	11	Key support	Plastic (ABS)
6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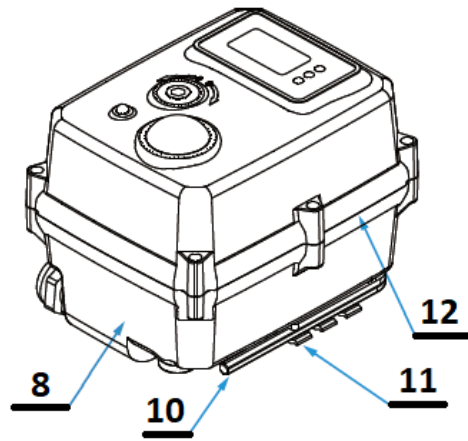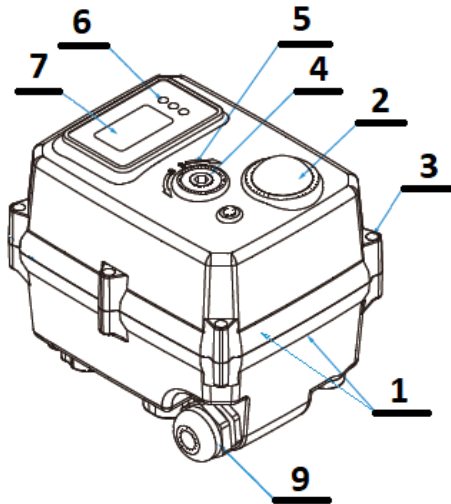
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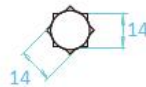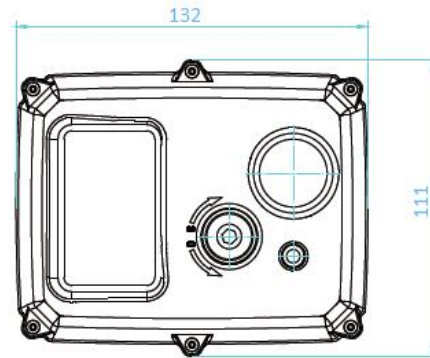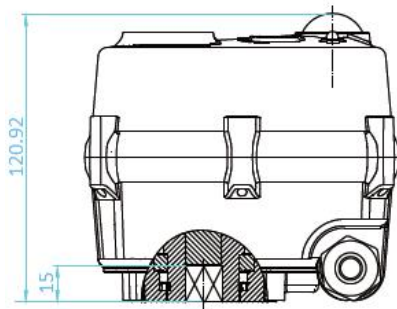
TCR-05-11T CONTROL ELECTRICAL ACTUATOR

CONSTRUCTION (TCR-11T)

No.	Name	Material	No.	Name	Material
			TCR-11T		
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)
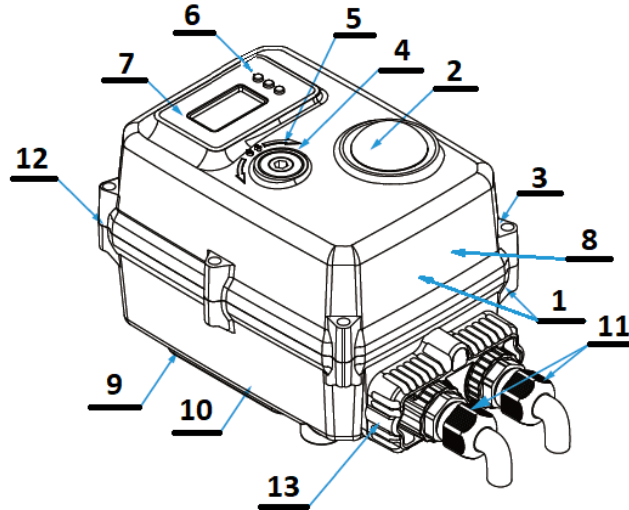
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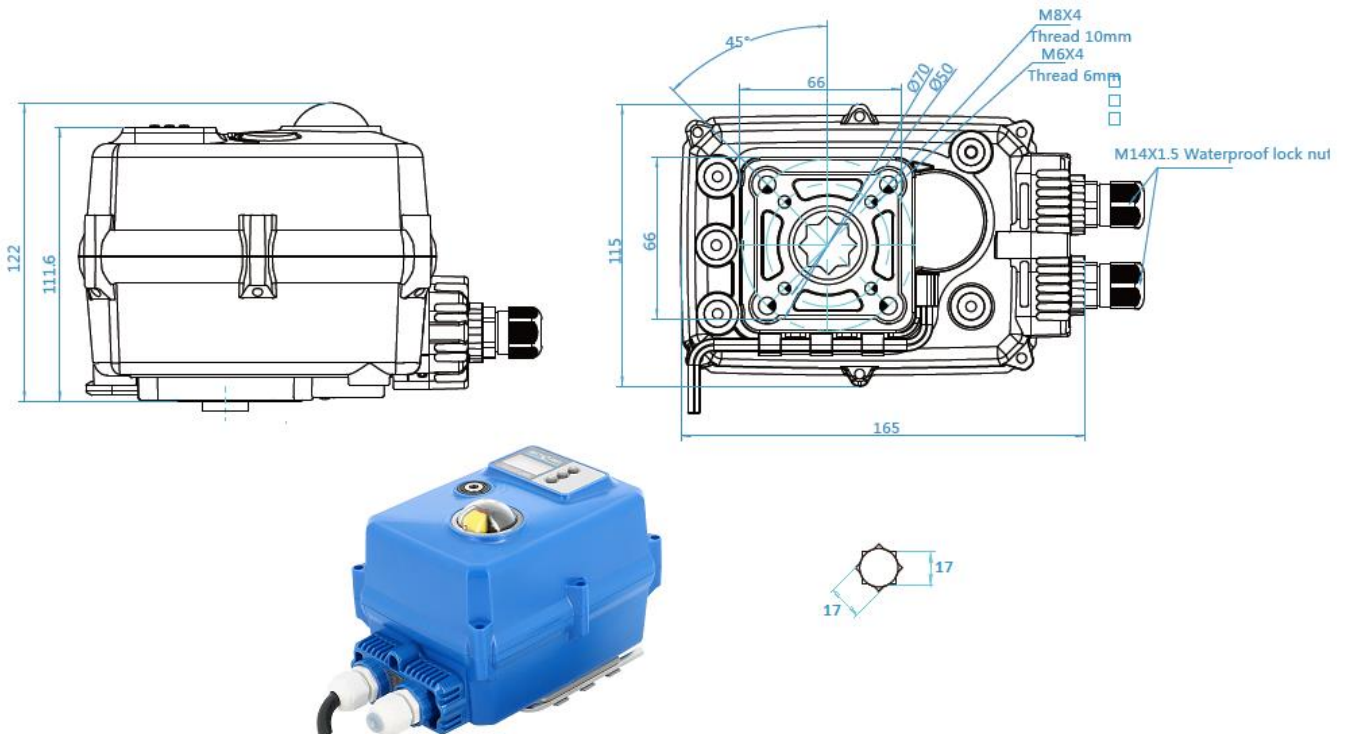
TCR-05-11T CONTROL ELECTRICAL ACTUATOR

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)

Orange -->	OG
Black -->	BK
Red -->	RD
Blue -->	BU
Grey -->	GY
White -->	WT
Brown -->	BR
Purple -->	PL
Green -->	GR
Yellow/Green -->	Y/G

DESCRIPTION OF THE 1.3'' LCD SCREEN

Command: ON
Angle: XX.X%

M Key MENU

K2 Value setting key

K3 Value setting key

LCD 1.3" LCD screen :
blue text on black background 128x64

TCR-05-11T CONTROL ELECTRICAL ACTUATOR

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" UserSET: PassWord: XXX
3	Choice of language	English or Mandarin UserSET: UesrSET: DisMode: English DisMode: Chinese
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 UserSET: UserSET: UserSET: UserSET: Channel:4–20mA Channel:0–20mA Channel:2–10V Channel:0–10V
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 UserSET: UserSET: Ctrl_Mode: Dir Ctrl_Mode: Rev
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 UserSET: UserSET: UserSET: NoCtr_Act: ON NoCtr_Act: OFF NoCtr_Act: 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% UserSET: UserSET: UserSET: DeadZone: X.X% DeadZone: 0.1% DeadZone: 9.9% This is minimum This is maximum

8	Hysteresis adjustment	This parameter setting is a prerequisite for the next.
		YES = adjustment is possible
		NO = no adjustment is possible (value by default)
		
		`UserSET:`
		`IsGo_Hyste:Yes` `UserSET:`
		`IsGo_Hyste:No`

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.
		
		`UserSET:`
		`Hysteres:    X.X%` `UserSET:`
		`Hysteres:    0%`

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%
		
		`UserSET:`
		`Posi4mA:   XX.X%` `UserSET:`
		`Posi4mA:   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%
		
		`UserSET:`
		`Posi20mA:   XX.X%` `UserSET:`
		`Posi20mA:   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%
		
		`UserSET:`
		`Manu_spd:   XX%` `UserSET:`
		`Manu_spd:   20%` `UserSET:`
		`Manu_spd:   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%
		
		`UserSET:`
		`SpeedMax:      XX%` `UserSET:`
		`SpeedMax:      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%
		
		`UserSET:`
		`SpeedMin:      XX%` `UserSET:`
		`SpeedMin:      XX%`

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% UserSET: RangeAdj: XX.X%
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 UserSET: UserSET: UserSET: Brk_Delay: XX% Brk_Delay: 0 Ms Brk_Delay: 50Ms
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 UserSET: UserSET: Out_4mA: XX.X% Out_4mA: 177_A
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 UserSET: UserSET: Out_20mA: XX.X% Out_20mA: 899_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 UserSET: UserSET: UserSET: StallTime: 3X StallTime: 1X StallTime: 20X minimum maximum
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. UserSET: PDChk_Time: 100%
21	Power supply position by default	This parameter setting is not available on this version (see version T-KT) **Value by default**: KEEP UserSET: UserSET: UserSET: PDAction: KEEP PDAction: OFF PDAction: ON

22	Super-capacitor charge	This setting is not available on this version (see version T-KT) **Value by default**: 95% UserSET: BatCharge: XX% ｜ UserSET: BatCharge: 60% Mininum ｜ UserSET: BatCharge: 99% Maxinum
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 UserSET: MotLock: LOCK ｜ UserSET: MotLock: 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 UserSET: Test Alarm: ON
25	Exiting the menu	Press K3 to exit the menu The system will switch back in the automatic checking mode. UserSET: ExitSET: Push K3

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.