TCR-02D TIMER ELECTRICAL ACTUATOR

FEATURES

The TCR-02D electric actuator is intended for motorising ¼ turn valves with a torque of 20 Nm., including the ''**TIMER**'' function. With a compact construction and plastic housing, it is especially well suited for motorising small dimensions ball valves. The parameters of the TIMER function can be set via a menu. This function is used for programming periodic, automatic openings/closings of a valve (frequency and length of time) under two modes: ON and OFF cycle of lengths of time or clock. IP67 leak-tightness: to be used indoors and, possibly, outdoors under a shelter. Manual control with a key.

AVAILABLE MODELS

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

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 02D	
Torques (Nm)	20	20
Voltage	24V AC - DC	95-265V AC-DC
Manoeuvring time (s)	10	10
ISO 5211:	F03/F04/F05 - star 11	

ELECTRICAL FEATURES

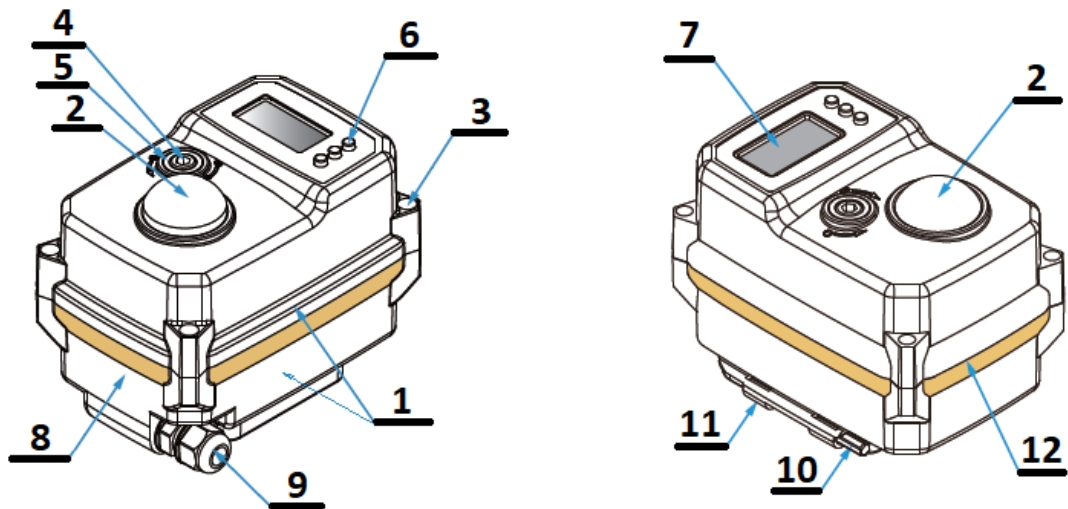| Actuator	TCR 02D
Motor protection	Thermal switch
Limit switches	2 adjustable switches
Auxiliary switches	2 adjustable dry switches
Anti-condensation	integrated
Electrical connection	PE M10 + 1.5m cable

Actuator	TCR 02D	
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

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CONSTRUCTION (TCR-02D)

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	Aisi 304	9	Packing gland	Nylon
4	Backup control stem	Aisi 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)

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WIRING DIAGRAM

RD	Phase or V+ (Red)	
BK	Neutral or V- (Black)	
Y/G	Earth (Yellow / Green)	

Red --> RD
Green --> GR
Black --> BK
White --> WT

DESCRIPTION OF THE 1.3'' LCD SCREEN

Series: TC–02

ClockSET
YYMD: 2015-07-28
HMS: 12:00:00

Please refer manual for more parameters

CE ISO9001

M Key MENU

K2 Value setting key

K3 Value setting key

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

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PARAMETER SETTING MENU OF THE TIMER

Ⓜ M Key: to switch menus
Ⓚ K2 Key: to switch Flash Item or adjust values
Ⓚ K3 Key: to modulate numerical value

Long press ⊕ button to enter Timer setting mode

Clock SET
YYMD: **20YY–MM–DD**   Set system time：Year Month Day
HMS: **HH:MM:SS**   Set system time：hr. min. sec.

Press Ⓜ

Timer_Mode:
Press K3 to select : PULSE   Select timer mode：PULSE mode or TIME mode

Press Ⓜ to swich time mode

MODE_PULSE   **MODE_TIME**   Press Ⓜ

Press M

MODE_PULSE   **01 00:01:00 ON**
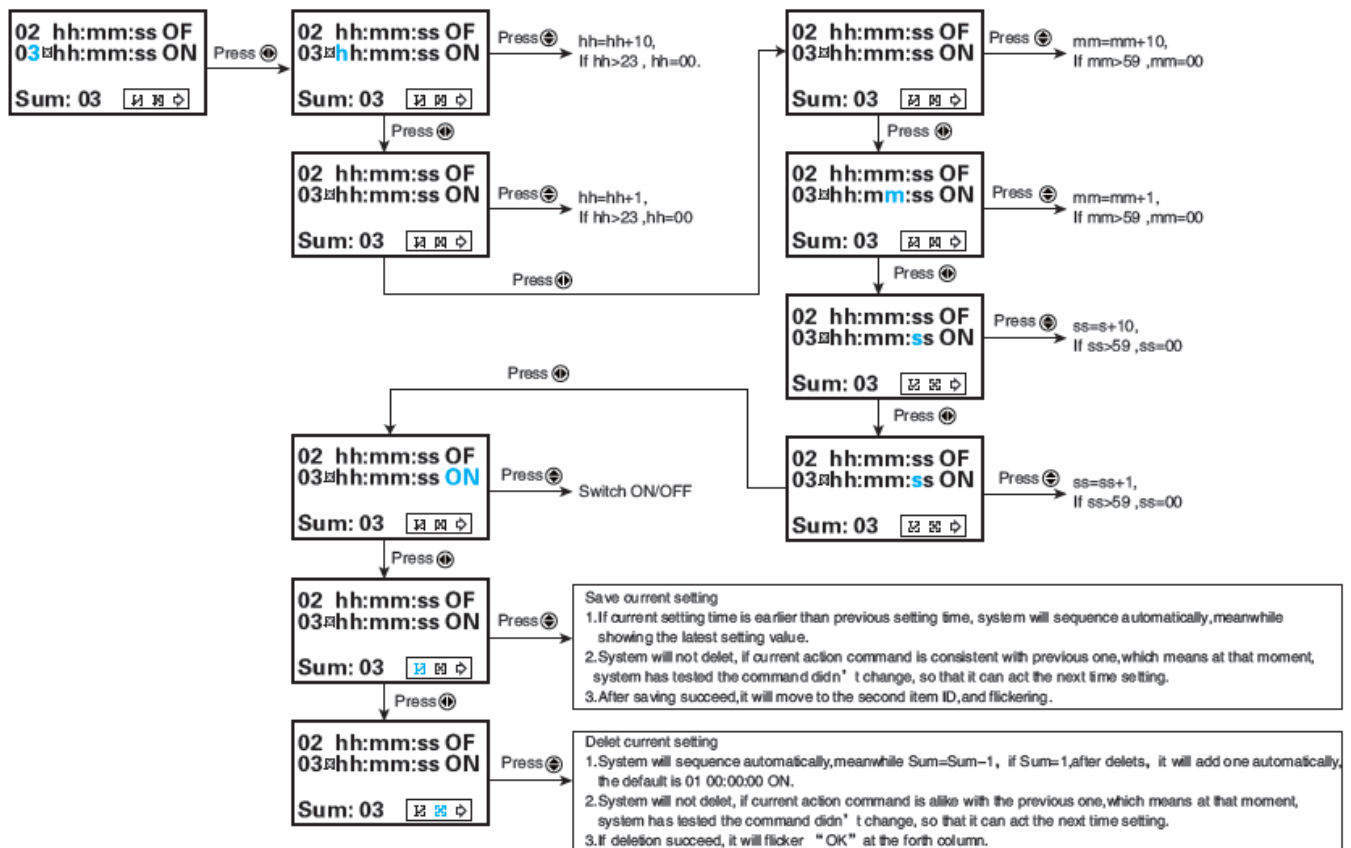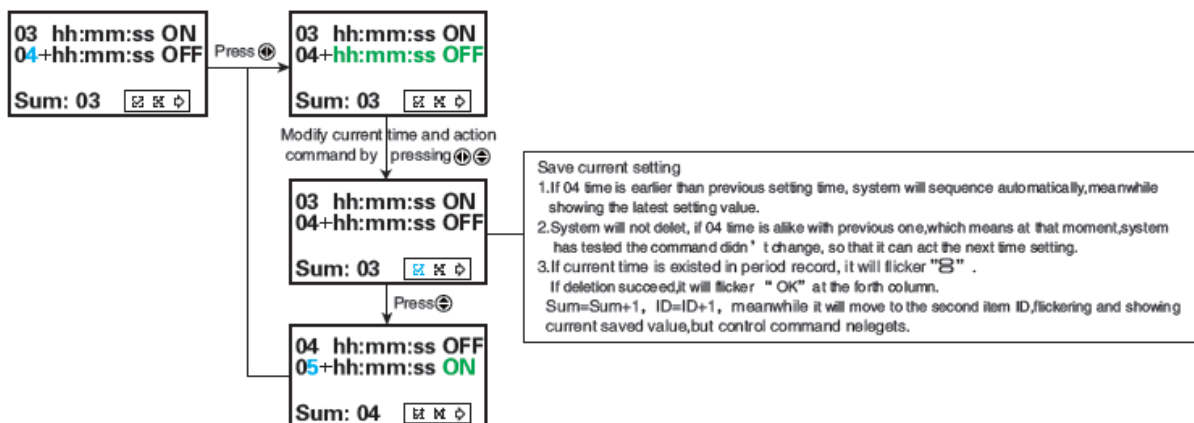TON：**HH:MM:SS**   TON: Set time of keeping actuator–on   **02 00:01:00 OFF**   Details refer to《Time mode Operation interface instructions》
TOF：**HH:MM:SS**   TOF: Set time of keeping actuator–off   **03 00:02:00 OFF**
                           Sum: 03 ⋈ ⋈ ◇

Press M

SET MODE_LOOP   Press K3   Press K3 to switch loop mode：DAY means loop by days, WEEK means loop by weeks

DAY: Loop by days. WEEK :Loop by weeks.
When Day or Week flickering,press ⊕ to switch loop mode.
Press Ⓚ to switch to the second row setting item,when flickering , press⊕ to switch current setting value.

Mode_Loop: DAY   XX: means to loop every XX days   **Mode_Loop: Week**   YES: Loop by time mode on that day.
Interval：XX   XX=0:means to loop everyday   【1⋈ 2⋈ 3⋈ 4⋈ 5⋈ 6⋈ 7⋈】   NO: No loop in current , means at idle mode.
                                    ⋈Yes ⊞No

Press Ⓜ

FirstCMD：ON/OFF   FirstCMD: First command after power–on.
                      Switch by press K3：ON/OFF

Press Ⓜ

IdleAction：ON/OFF   IdleAction：means command at timer idle action
                       Switch by K3：ON/OFF

Press Ⓜ

PDAction：ON/OFF   PDAction：means the command at external power cut.
                     Switch by K3：ON/OFF. Note this special signal: only 02D–KT has this function.

Press Ⓜ

Timer_Run：YES/NO   Press K3 to switch if run timer or not：YES/NO

Press Ⓜ

Press Ⓜ

EXITSET：Push K3

Press ⊕

GO BACK

PARAMETER SETTING SUBMENU IN THE CLOCK MODE

Creating and changing schedules


```
02 hh:mm:ss OF
03☒hh:mm:ss ON        Press ⓜ
Sum: 03  [▣ ▣ ⇨]
```

```
02 hh:mm:ss OF
03☒hh:mm:ss ON        Press ⓜ    →  hh=hh+10,
Sum: 03  [▣ ▣ ⇨]                     If hh>23 , hh=00.
```
Press ⓜ

```
02 hh:mm:ss OF
03☒hh:mm:ss ON        Press ⓜ    →  hh=hh+1,
Sum: 03  [▣ ▣ ⇨]                     If hh>23 ,hh=00
```
Press ⓜ

```
02 hh:mm:ss OF
03☒hh:mm:ss ON        Press ⓜ    →  mm=mm+10,
Sum: 03  [▣ ▣ ⇨]                     If mm>59 ,mm=00
```
Press ⓜ

```
02 hh:mm:ss OF
03☒hh:mm:ss ON        Press ⓜ    →  mm=mm+1,
Sum: 03  [▣ ▣ ⇨]                     If mm>59 ,mm=00
```
Press ⓜ

```
02 hh:mm:ss OF
03☒hh:mm:ss ON        Press ⓜ    →  ss=s+10,
Sum: 03  [▣ ▣ ⇨]                     If ss>59 ,ss=00
```
Press ⓜ

```
02 hh:mm:ss OF
03☒hh:mm:ss ON        Press ⓜ    →  ss=ss+1,
Sum: 03  [▣ ▣ ⇨]                     If ss>59 ,ss=00
```

Press ⓜ

```
02 hh:mm:ss OF
03☒hh:mm:ss ON        Press ⓜ
Sum: 03  [▣ ▣ ⇨]          →  Switch ON/OFF
```
Press ⓜ

```
02 hh:mm:ss OF
03☒hh:mm:ss ON        Press ⓜ
Sum: 03  [▣ ▣ ⇨]
```

Save current setting
1. If current setting time is earlier than previous setting time, system will sequence automatically, meanwhile showing the latest setting value.
2. System will not delet, if current action command is consistent with previous one, which means at that moment, system has tested the command didn't change, so that it can act the next time setting.
3. After saving succeed, it will move to the second item ID, and flickering.

Press ⓜ

```
02 hh:mm:ss OF
03☒hh:mm:ss ON        Press ⓜ
Sum: 03  [▣ ▣ ⇨]
```

Delet current setting
1. System will sequence automatically, meanwhile Sum=Sum−1, if Sum=1, after delets, it will add one automatically, the default is 01 00:00:00 ON.
2. System will not delet, if current action command is alike with the previous one, which means at that moment, system has tested the command didn't change, so that it can act the next time setting.
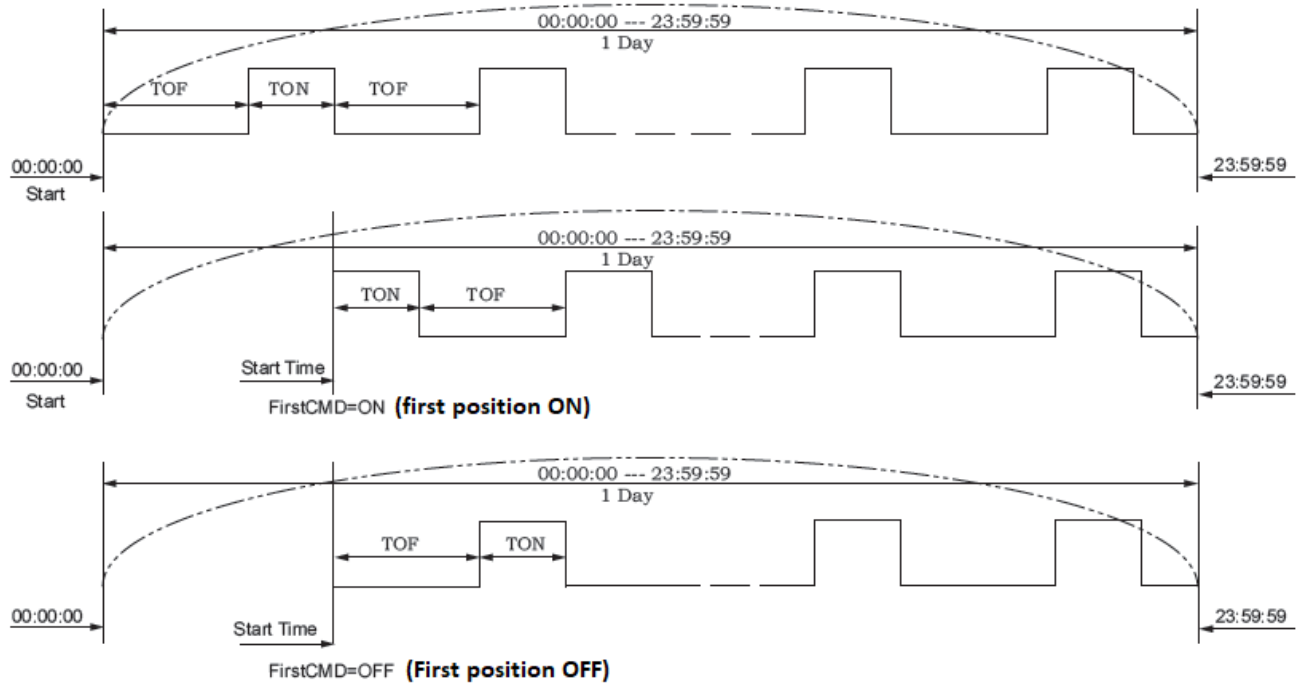3. If deletion succeed, it will flicker "OK" at the forth column.

Special Notes: Switch rapidly by flexibly pressing ⓜ in edition, in order to improve setting efficiency, since it could only move step by step in using ⓞ .
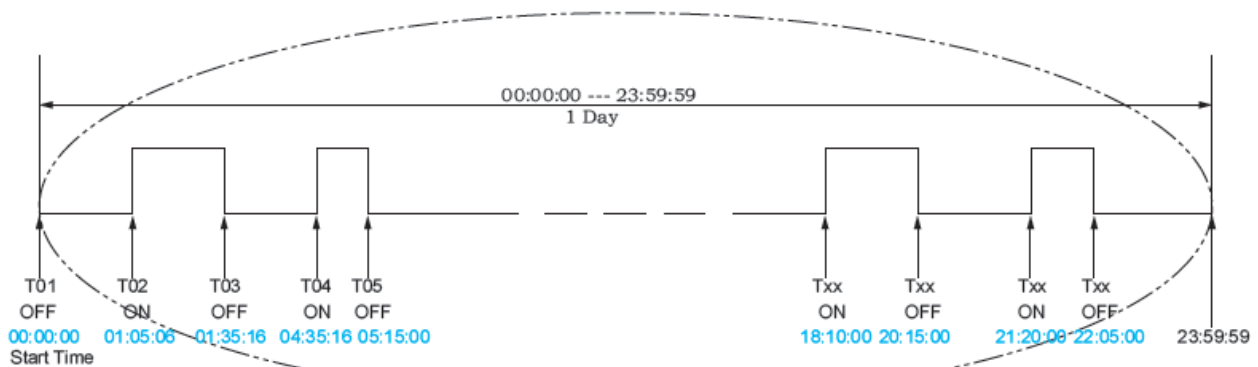
Inserting new schedules


```
03 hh:mm:ss ON
04+hh:mm:ss OFF       Press ⓞ
Sum: 03  [▣ ▣ ⇨]
```

```
03 hh:mm:ss ON
04+hh:mm:ss OFF
Sum: 03  [▣ ▣ ⇨]
```

Modify current time and action command by pressing ⓞⓜ

```
03 hh:mm:ss ON
04+hh:mm:ss OFF
Sum: 03  [▣ ▣ ⇨]
```
Press ⓜ

```
04 hh:mm:ss OFF
05+hh:mm:ss ON
Sum: 04  [▣ ▣ ⇨]
```

Save current setting
1. If 04 time is earlier than previous setting time, system will sequence automatically, meanwhile showing the latest setting value.
2. System will not delet, if 04 time is alike with previous one, which means at that moment, system has tested the command didn't change, so that it can act the next time setting.
3. If current time is existed in period record, it will flicker "8".
   If deletion succeed, it will flicker "OK" at the forth column.
   Sum=Sum+1, ID=ID+1, meanwhile it will move to the second item ID, flickering and showing current saved value, but control command nelegets.

Special Notes: Switch rapidly by flexibly pressing ⓜ in edition, in order to improve setting efficiency, since it could only move step by step in using ⓞ .

CHRONOGRAMS

Mode_ Pulse

FirstCMD=ON **(first position ON)**

FirstCMD=OFF **(First position OFF)**

Mode_Time

T01	T02	T03	T04	T05		Txx	Txx	Txx	Txx	
OFF	ON	OFF	ON	OFF		ON	OFF	ON	OFF	
00:00:00	01:05:06	01:35:16	04:35:16	05:15:00		18:10:00	20:15:00	21:20:08	22:05:00	23:59:59

Start Time

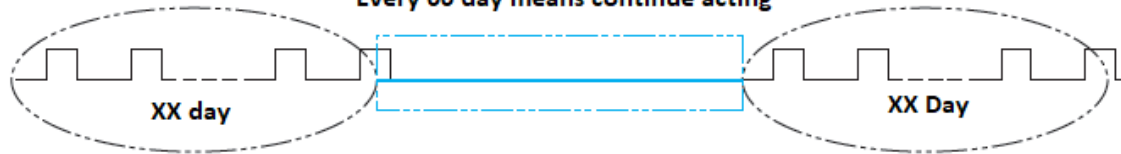Notice :Start at 00:00:00 , If T01=00：00：00 exists，actuators act T01 command, or it will act FirstCMD command.

T01	T02	T03	T04	T05			Txx	Txx	Txx	Txx	
OFF	ON	OFF	ON	OFF			ON	OFF	ON	OFF	
00:00:00	01:05:06	01:35:16	04:35:16	05:15:00			18:10:00	20:15:00	21:20:08	22:05:00	23:59:59

Start Time

Notice : If start time between TX and TX+1,
act TX command .

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■ **Loop_Day**

Ver: 20161015

First day Second day ....day

Every 00 day means continue acting

XX day XX Day

Every XX days : means timer do not loop in blue wireframe
IdleAction = ON

XX Day XX Day

Every XX days : means timer do not loop in blue wireframe
IdleAction = OFF

■ **Loop_Week :**

| Lu
Mon.
Loop | Ma
Tue.
Loop | Me
Wed.
Loop | Je
Thu.
Loop | Ve
Fri.
Loop | Sa
Sat.
Loop | Di
Sun.
Loop |

IdleAction=OFF IdleAction=OFF

| Lu
Mon.
Loop | Ma
Tue.
No-loop | Me
Wed.
Loop | Je
Thu.
No-loop | Ve
Fri.
Loop | Sa
Sat.
Loop | Di
Sun.
Loop |

IdleAction=ON IdleAction=ON

| Lu
Mon.
Loop | Ma
Tue.
No-loop | Me
Wed.
Loop | Je
Thu.
No-loop | Ve
Fri.
Loop | Sa
Sat.
Loop | Di
Sun.
Loop |

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ADVANCED PARAMETER SETTING MENU

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

STEP	TITLE	FUNCTION AND VALUES
1	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
2	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%. Press key M to move to the next parameter. UserSET: DeadZone: X.X% UserSET: DeadZone: 9.9% This is maximum UserSET: DeadZone: 0.1% This is minimum
3	Hysteresis value	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. Press key M to move to the next parameter. UserSET: Hysteres: X.X% UserSET: Hysteres: 0.0% Mininum UserSET: Hysteres: 12.0% Maximum
4	Slight adjustment of the closed position	It is possible to change the closed position of the automatic valve, by a few degrees. This function is interesting if a leak is found along the line. Press key K3 to decrease the opening angle 0.1° (down to -8.5° max) and K2 to (up to -8,5° max). Press key M to move to the next parameter. UserSET: ClPos_Adj: X.X° UserSET: ClPos_Adj: X.X° Offset-Open UserSET: ClPos_Adj: X.X° Offset-Close UserSET: ClPos_Adj: -X.X° This is minimum UserSET: ClPos_Adj: X.X° This is maximum

5	Opening/closing time setting	It is possible to set the opening/closing time of the actuator to 5 to 100% of the rated speed. The value by default, is 100%. Press key K3 to increase the manoeuvre time or K2 to decrease it. Press key M to move to the next parameter.
		UserSET: ClPos_Adj: X.X° — UserSET: ClPos_Adj: X.X° Offset-Open — UserSET: ClPos_Adj: X.X° Offset-Close — UserSET: ClPos_Adj: -X.X° This is minimum — UserSET: ClPos_Adj: X.X° This is maximum
6	Setting the operating speed	It is possible to set the operating speed of the actuator to 5 to 100% of the rated speed. The value by default, is 100%. Press key K3 to increase the speed (max 100%) or K2 to decrease it (min 5%). Press key M to move to the next parameter. **N** : it is not recommended to combine functions 5 and 6, the actuator could become overcharged.
		UserSET: Speed_PUL: XX% — UserSET: Speed_PUL: 100% This is maximum — UserSET: Speed_PUL: 5% This is minimum
7	Setting the angle of rotation	Parameter which is not used on the TCR-02D standard version
		UserSET: Speed_PWM: 100%
8	Response time	Used to set the response speed of the valve. The smaller the value, the less sensitive the rotation. The bigger the value, the more sensitive it is. Increase the value when the response speed of the valve is too low. **Setting range:** 1 x20x – Value by default 3x
		UserSET: StallTime: xx X — UserSET: StallTime: 1 X — UserSET: StallTime: 20X
9	Parameter setting for the 3rd position	This function is accessible only on an actuator with a "B33" option For the TRC-D standard model, the parameter setting is not available.
		UserSET: B33Posi: 50%

10	The charge of the battery	Parameter which is not used on the TCR-02D standard version
		UserSET: BatCharge: XX%	UserSET: BatCharge: 60% Mininum	UserSET: BatCharge: 99% Maxinum

11	Choice of language	English or Mandarin
		UserSET: DisMode: English	UesrSET: DisMode: Chinese

12	Exiting the menu	Press K3 to exit the menu The system will switch back in the automatic checking mode.
		UserSET: ExitSET: Push K3

IN-BUILT BATTERY

The TCR-02 has an in-built rechargeable Ni-MH (CR) battery which keeps the date and the time when the actuator is not powered. This battery is not used when the actuator is powered. The autonomy of the battery is about 3 months. Past this time, the date and the time have to be updates when switching on the actuator.

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.