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FEATURES

The TCR-02T electric actuator is intended for motorising ¼ turn valves with a torque of 20 Nm. <u>Control function</u>: 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

<u>Supply voltages</u>: 230V AC, 24V AC/DC. <u>Control</u>: 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/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



IP 67	ISO 9001	CE
67		

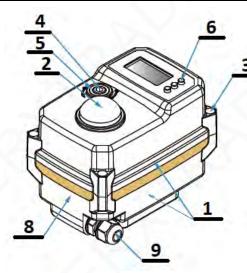
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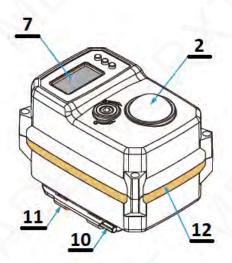
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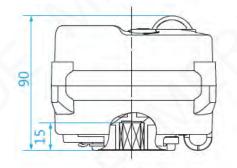
CONSTRUCTION (TCR-02T)

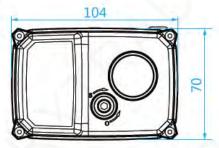
	Material Plastic (ABS)	No. 7	Name 1.3" LCD display	Material OLED
		7	1.3" LCD display	OLED
cator				0
	Polycarbonate plastic	8	Rating plate	PVC
	Ansi 304	9	Packing gland	Nylon
rol stem	Ansi 304	10	Hex key	Steel
	NBR	11	Key support	Plastic (ABS)
button	Rubber	12	Cover gasket	NBR
		NBR button Rubber	NBR11buttonRubber12	NBR 11 Key support

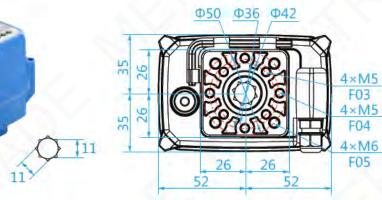




DIMENSIONS (mm)





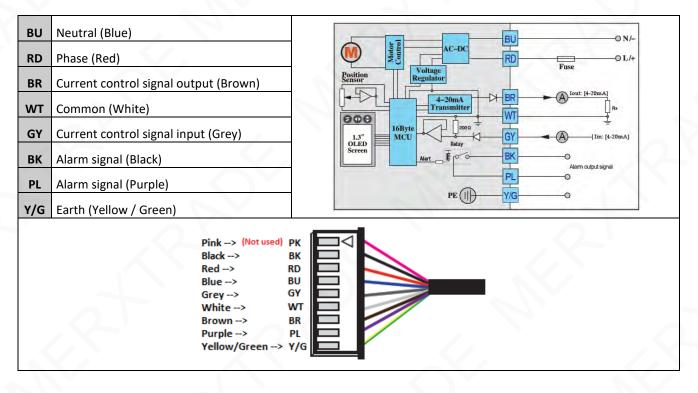


M

TCR-02T CONTROL ELECTRICAL ACTUATOR

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WIRING DIAGRAM (TCR 02T)



DESCRIPTION OF THE 1.3" LCD SCREEN



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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ACTUATOR SETTINGS

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

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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
		English or Mandarin
3	Choice of language	UserSET: DisMode: English UesrSET: DisMode: Chinese
		<u>Direct</u> : 4mA = valve closed / 20 mA = valve open
4	4 Choosing the direction of rotation of the actuator	UserSET: UserSET: Ctrl_Mode: Dir Ctrl_Mode: Rev
		Inverted: 4 mA = valve closed / 20 mA = valve open
		In the absence of a control signal, the valve can take 3 positions: ON, OFF or KEEP
5	Position by absence of any control signal	UserSET: UserSET: UserSET: NoCtr_Act: OFF 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. <u>Setting range:</u> 0.1 to 9.9% - <u>Setting by default</u> : 0.8%
•		UserSET: DeadZone: X.X% UserSET: DeadZone: 0.1% minimum UserSET: DeadZone: 9.9% maximum
		This parameter setting is a prerequisite for the next. YES = adjustment is possible NO = no adjustment is possible (value by default)
7	Hysteresis adjustment	UserSET: UserSET: IsGO_Hyste: NO IsGO_Hyste: YES

4 van 15 Information provided as an indication and subject to possible modification.Colours and details can be different then shown in data sheets or pictures. Merxtrade BV has no liability for any damages by use off any information displayed on these pages.

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TCR-02T CONTROL ELECTRICAL ACTUATOR

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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. <u>Range</u> : 20-100% - Value by default = 100% UserSET: UserSET: UserSET:
10	Braking time	Manu_spd: XX% Manu_spd: 20 Manu_spd: 100 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: UserSET: Brk_Delay: 0 Ms
11	Setting the maximum speed	This setting affects the available torque. Without a special need, do not change it. <u>Range</u> : 20-100% - Value by default = 100% UserSET: Speed_Max: XX% UserSET: Speed_Max: 20%
12	Setting the minimum speed	This setting affects the available torque. Without a special need, do not change it. <u>Range</u> : 20-95% - Value by default = 75% UserSET: Speed_Min: XX% UserSET: Speed_Min: 20%
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%

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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°. <u>Range</u> : 20% +220% - Value by default = 100.0%
		UserSET: Pos20mA: X.X% UserSET: Pos20mA: 20.0% minimum 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. <u>Range</u> : 000_481_A – Value by default 191_A <u>NB</u> : always limit the lower value to 20 mA
		UserSET: Out_4mA: XXX_A UserSET: Out_4mA: 000_A minimum 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. <u>Range</u> : 191_1000_A – Value by default 909_A
	UserSET: Out_20mA: XXX_A Out_20mA: 191_A minimum UserSET: 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. <u>Setting range:</u> 1x20x – Value by default 3x
		UserSET: StallTime: 3X UserSET: StallTime: 1X minimum UserSET: 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	This setting is not available on this version (see version T-KT) Value by default: KEEP
20	default	UserSET: UserSET: UserSET: PDAction: KEEP PDAction: OFF PDAction: ON

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TCR-02T CONTROL ELECTRICAL ACTUATOR

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

TROUBLESHOOTING

Defect met	Cause of defect	Method of solving
	Non-connected electrical grid.	Connect to the electrical grid.
	Wrong voltage.	Check the actuator's voltage.
Inactive actuator	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 Valve that is not fully closed	Faulty connection.	Check the connections.
	Damaged microswitch	Change the microswitch
	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.
Dresence of humidity or	Unsuitable cable cross-section being used.	
	The cable connection is not leak-tight.	Contact the supplier for repair.
Presence of humidity or water in the actuator	Worn sealing gaskets.	
	Loose cover screws.	Dry the internal parts and tighten the cover screws.



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FEATURES

The TCR-05-11T electric actuator is intended for motorising ¼ turn valves with a torque of 50 or 110 Nm. <u>Control function</u>: 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

<u>Supply voltages</u> : 230V AC, 24V AC/DC. <u>Control</u> : 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

treated steel pinions
50 - 110 Nm
90° +/- 2°
without
By key



Actuator	тс	R 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, 0-20	mA, 2-10V, 0-10V		
Manoeuvring time (s)	12 12		euvring time (s) 12 12 10 1		10
ISO 5211:	F05/F07 - star 14		F05/F0	07 - 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

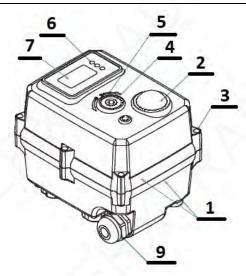
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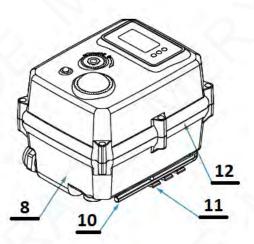
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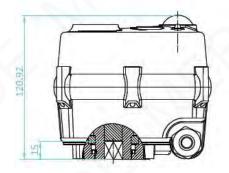
CONSTRUCTION (TCR-05T)

	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	5 Gasket NBR 11 Key support Plastic (ABS)				
6	Adjustment button	Rubber	12	Cover gasket	NBR
		Weight	(kg): 1.8	300	

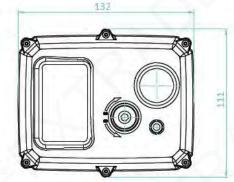




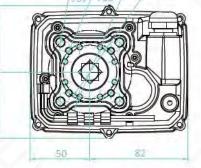
DIMENSIONS (mm)







4xM84xM6 Ø70 Ø50



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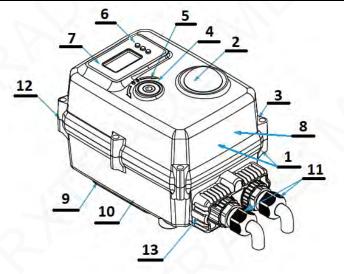


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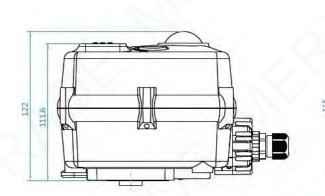
CONSTRUCTION (TCR-11T)

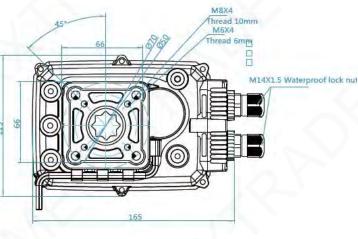
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	TCR-11T				
No.	Name	Material	No.	Name	Material
1	Casing + lid	Plastic (ABS)	7	1.3" LCD display	OLED
2	Position indicator	Polycarbonate plastic	8	Rating plate	PVC
3	Screw x 6	Ansi 304	9	Key support	Plastic (ABS)
4	Backup control stem	Ansi 304	10	Hex 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)

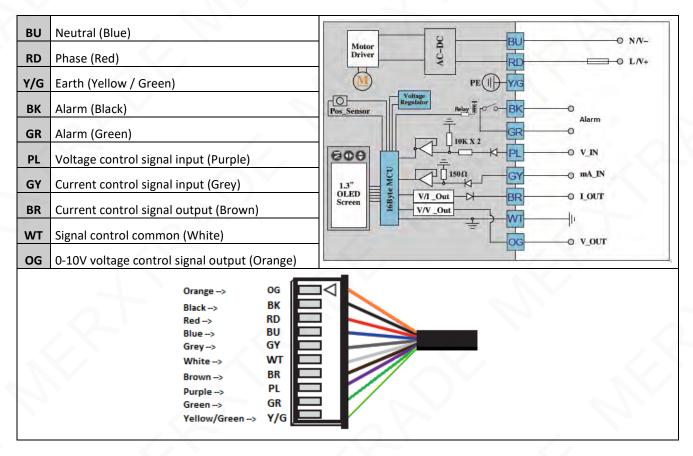






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WIRING DIAGRAM



DESCRIPTION OF THE 1.3" LCD SCREEN



N/I	Kow	MENU
	Nev	IVILINO

K2 Value setting key

K3 Value setting key

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



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		Press the "M" button for more than 5 s. Enter the code "333" (use the keys K2 and K3) Press again the button "M"
E	Enter the password	UserSET: PassWord: XXX
		English or Mandarin
3	Choice of language	UserSET: DisMode: English UesrSET: 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: UserSET: Channel:4-20mA Channel:0-20mA Channel:2-10V Channel:0-10V
_	Choosing the direction of rotation	Direct 4mA = valve closed / 20 mA = valve open Inverted 4 mA = valve closed / 20 mA = valve open
5	of the actuator	UserSET: UserSET: Ctrl_Mode: Dir Ctrl_Mode: Rev
6	Position by absence of any	In the absence of a control signal, the valve can take 3 positions: ON, OFF or KEEP
O	control signal	UserSET: UserSET: UserSET: NoCtr_Act: OFF NoCtr_Act: KEEP
	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.
7		Setting range: 0.1 to 9.9% - Setting by default: 0.8%
		UserSET: DeadZone: X.X% UserSET: DeadZone: 0.1% This is minimum UserSET: DeadZone: 9.9% This is maximum

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TCR-05-11T CONTROL ELECTRICAL ACTUATOR

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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)
0		UserSET: UserSET: IsGo_Hyste:Yes 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		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°. <u>Range</u> : -50% +80% - <u>Value by default</u> = 0.0%
10	Redefining the 4 mA position	UserSET: UserSET: Posi4mA: XX.X% 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: XX.X%
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: 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: UserSET:

15	Catting the speed for the studie	This setting is used for setting a % of the actuator stroke during which it will slow down before reaching the setpoint value position. <u>Range</u> : 1-20% - Value by default = 10%
15 Setting the speed	Setting the speed for the stroke	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. <u>Range</u> : 0-50 ms – <u>Value by default</u> = 1 ms
		UserSET: Brk_Delay: XX% UserSET: Brk_Delay: 0 Ms UserSET: 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. <u>Range</u> : 000_481_A – <u>Value by default</u> 191_A <u>NB</u> : always limit the lower value to 20 mA
		UserSET: Out_4mA: XX.X% UserSET: 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. <u>Range</u> : 191_1000_A – <u>Value by default</u> 909_A
		UserSET: Out_20mA: XX.X% UserSET: Out_20mA: 899_A
19	Response time	Used to set the response speed of the value. 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. <u>Setting range:</u> $1x20x - Value$ by default $3x$
		UserSET: UserSET: UserSET: StallTime: 3X StallTime: 1X StallTime: 20X minimum maximum
		The actuator periodically tests its electrical power supply. A change of a value will change the interval between two tests. In current use, there i no need to change this parameter.
20	Checking the feed signal	UserSET: PDChk_Time: 100%
		This parameter setting is not available on this version (see version T-KT Value by default: KEEP
21	Power supply position by default	UserSET: UserSET: UserSET: PDAction: KEEP PDAction: OFF PDAction: ON

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$\mathbf{\nabla}$		This setting is not available on this version (see version T-KT) <u>Value by default</u> : 95%
22	Super-capacitor charge	UserSET: UserSET: UserSET: BatCharge: XX% BatCharge: 60% Mininum Maxinum
	Actuator locking after the	This parameter setting is not available on this version (see version T-KT) <u>Value by default</u> : UNLOCK
23	intervention of the super- capacitor	UserSET: MotLock: LOCK 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
	T.	Press K3 to exit the menu The system will switch back in the automatic checking mode.
25	Exiting the menu	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.