

TEMPERATURE CONTROLLER
Model: TC10 - Quick Guide · IM 05C01E81-01EN
7th edition - December 2025



YOKOGAWA
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internet site: www.yokogawa.com
EU Declaration of conformity and Manual retrieval
TC10 is a panel mounting, Class II instrument. It has been designed with compliance to the European Directives. All information about the controller use can be found in the Engineering Manual: IM 05C01E81-02EN and the Communication Manual: IM 05C01E81-03EN and General Specification: GS 05C01E81-01EN.
The EU Declaration of Conformity and the manual of the controller can be downloaded (free of charge) from the web-site: www.yokogawa.com/ns/tc10/im/
In relation to CE marking, the authorized representative for this product in EEA:

Yokogawa Europe B.V.
Euroweg 2, 3825 HD Amersfoort, The Netherlands
and the importer for this product into the EU/EEA market via the YOKOGAWA sales channel is:
Yokogawa Europe B.V.
Euroweg 2, 3825HD Amersfoort, The Netherlands
In relation to UKCA marking, the importer for this product into the Great Britain market via the YOKOGAWA sales channel is:
Yokogawa United Kingdom Limited
Stuart Road Manor Park Runcorn, WA7 1TR, United Kingdom.

Safety Precautions
The following general safety precautions must be observed during all phases of operation, service and repair of this instrument. If this instrument is used in a manner not specified in this manual, the protection provided by this instrument may be impaired. Also, YOKOGAWA Electric Corporation assumes no liability for the customer's failure to comply with these requirements. The following symbol is used on the instrument.
This manual is an essential part of the product; keep it in a safe place for future reference. This manual is intended for the following personnel:
- Engineers responsible for installation, wiring, and maintenance of the equipment.
- Personnel responsible for normal daily operation of the equipment.

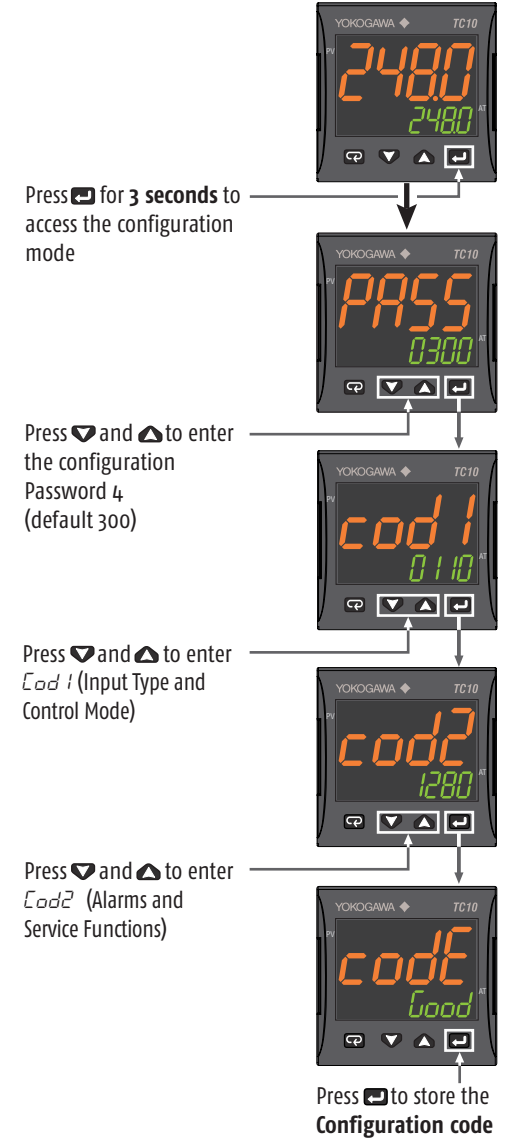
WARNING
Calls attention to actions or conditions that could cause serious or fatal injury to the user or damage to the instrument, and indicates precautions that should be taken to prevent such occurrences. The user must refer to the Engineering manual for special instructions.

AC/DC
The equipment wholly protected by double insulation or reinforced insulation.

WARNING
- Whenever a failure or a malfunction of the device may cause dangerous situations for persons, things or animals, please remember that the plant must be equipped with additional devices which will guarantee safety.
- We warrant that the products will be free from defects in material and workmanship for 18 months from the date of manufacturing. Products and components that are subject to wear due to conditions of use, service life and misuse are not covered by this warranty.

Safety, Protection, and Modification of the Product
- In order to protect the system controlled by this product and the product itself, and to ensure safe operation, observe the safety precautions described in the Engineering manual. Use of the instrument in a manner not prescribed herein may compromise the product's functions and the protection features inherent in the device. We assume no liability for safety, or responsibility for the product's quality, performance or functionality should users fail to observe these instructions when operating the product.
- Installation of protection and/or safety circuits with respect to a lightning protector; protective equipment for the system controlled by the product and the product itself; foolproof or failsafe design of a process or line using the system controlled by the product or

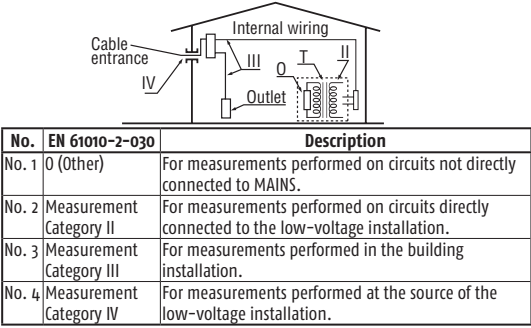
HOW TO SET THE CONFIGURATION CODE



Note: To leave the Configuration session without saving the settings made, press the stop button

the product itself; and/or the design and installation of other protective and safety circuits are to be appropriately implemented as the customer deems necessary.
- This product is not designed or manufactured to be used in critical applications that directly affect or threaten human lives. Such applications include nuclear power equipment, devices using radioactivity, railway facilities, aviation equipment, air navigation facilities, aviation facilities, and medical equipment. If so used, it is the user's responsibility to include in the system additional equipment and devices that ensure personnel safety.
- Modification of the product is strictly prohibited.
- This product is intended to be handled by skilled/trained personnel for electric devices.
- Overvoltage category: II.

WARNING
- This instrument is for Measurement Category No. 1. Do not use it for measurements in locations falling under Measurement Categories No. 2, No. 3 and No. 4.



How to Connect Wires

WARNING
- Wiring work must be carried out by a person with basic electrical knowledge and practical experience.
- Be sure to turn OFF the power supply to the controller before wiring to avoid an electric shock. Use a tester or similar device to ensure that no power is being supplied to a cable to be connected.
- As a safety measure, always install a circuit breaker (an IEC 60947 compatible product, 5 A, 100 V or 220 V AC) in an easily accessible location near the instrument. Moreover, provide indication that the switch is a device for turning off the power to the instrument.
- Install the power cable keeping a distance of more than 1 cm from other signal wires.
- The power cable is required to meet the IEC standards concerned or the requirements of the area in which the instrument is being installed.
- Wiring should be installed to conform to NEC (National Electrical Code: ANSI/NFPA-70) or the wiring construction standards in countries or regions where wiring will be installed.
- For control relay output, alarm relay output, and power terminal connections, use heat-resistant cables.
- Do not short-circuit the terminals of the SSR output.
- Recommended tightening torque: 0.5 Nm.

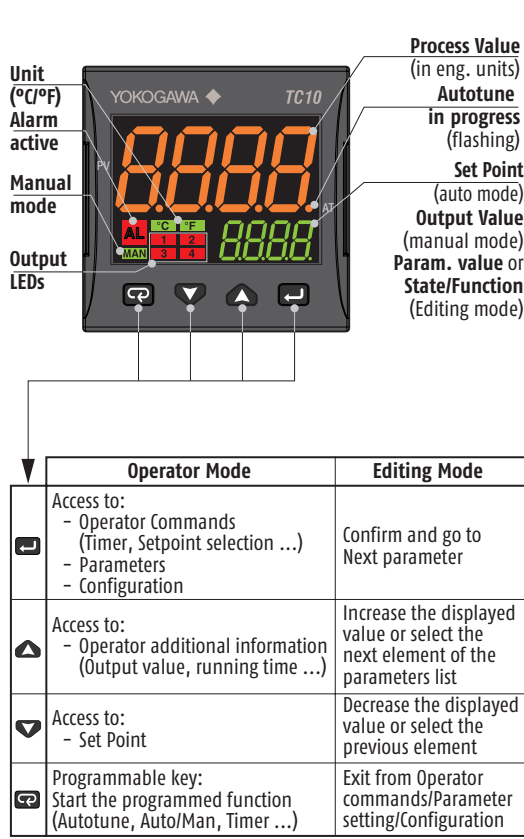
Model and suffix codes table with columns: Model Code, Suffix codes, Description. Rows include TC10, Fixed code, Power supply, Fixed code, OUT1-3, IN/OUT4, Serial communication, Fixed code, and Option Code.

CONFIGURATION CODE

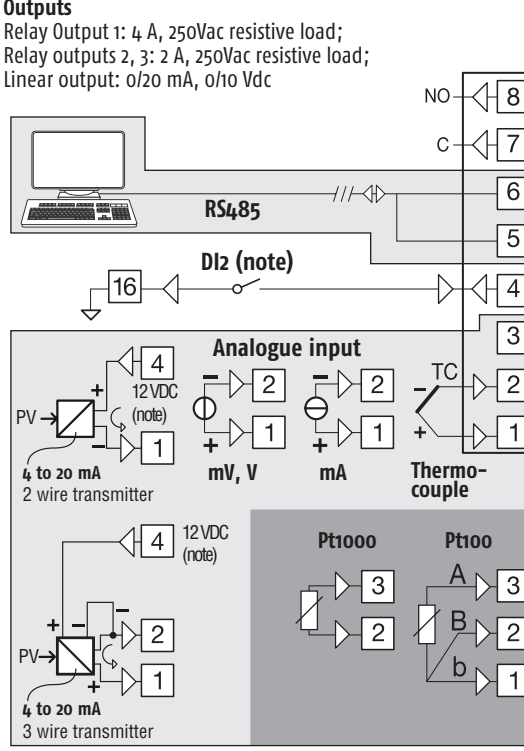
The TC10-N can be easily configured by the "Code Configuration" method for the most common requirements, just entering two 4-digit codes: Cod 1 [LMNO] for the Input Type and Control Mode selection and Cod 2 [PQRS] for the Alarms and the Service Functions. For complete controller configuration see the Engineering Manual. Note: Before starting the configuration code setting, please define and write down Cod 1 and Cod 2 as needed:

Configuration code tables. Table 1: User Cod 1 (L M N O) mapping to Input Type and Range, Control mode, and PID parameters. Table 2: User Cod 2 (P Q R S) mapping to Alarm settings and Service functions activation.

DISPLAY AND KEYS



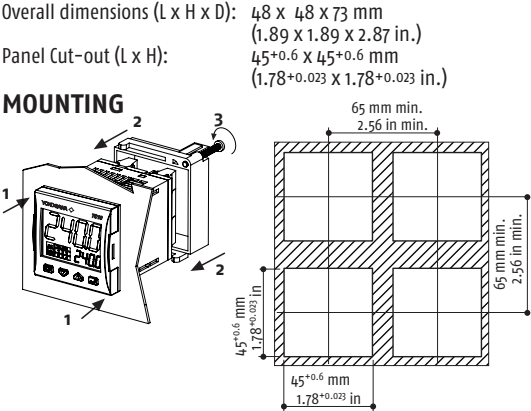
ELECTRICAL CONNECTIONS



ALARM TYPES (Cod 2 digits: P, Q, R)
Absolute Alarm
Absolute High-Low Alarm
Deviation Alarm
Band Alarm

Note: As default, when the alarms are active, only AL1 threshold is available at "Operator Command" level to perform non critical tasks. To protect the AL2 and AL3 thresholds against undesired changes, they are available only at "Parameters list" level (password: 20). For different configurations, see the Engineering Manual.
Notes: 1. Wattmeter Instantaneous power is continuously computed as multiplication of the Load Voltage, Load Current parameter values and the controller output instantaneous value. 2. Wattmeter power consumption is the estimated hourly energy consumption (using Load Voltage and Load Current parameter values), computed on the previous 15 minutes period. The readout is updated every 15 minutes. 3. Worked Time counter is continuously increased when the controller is turned ON.

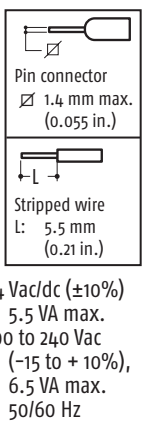
DIMENSIONS



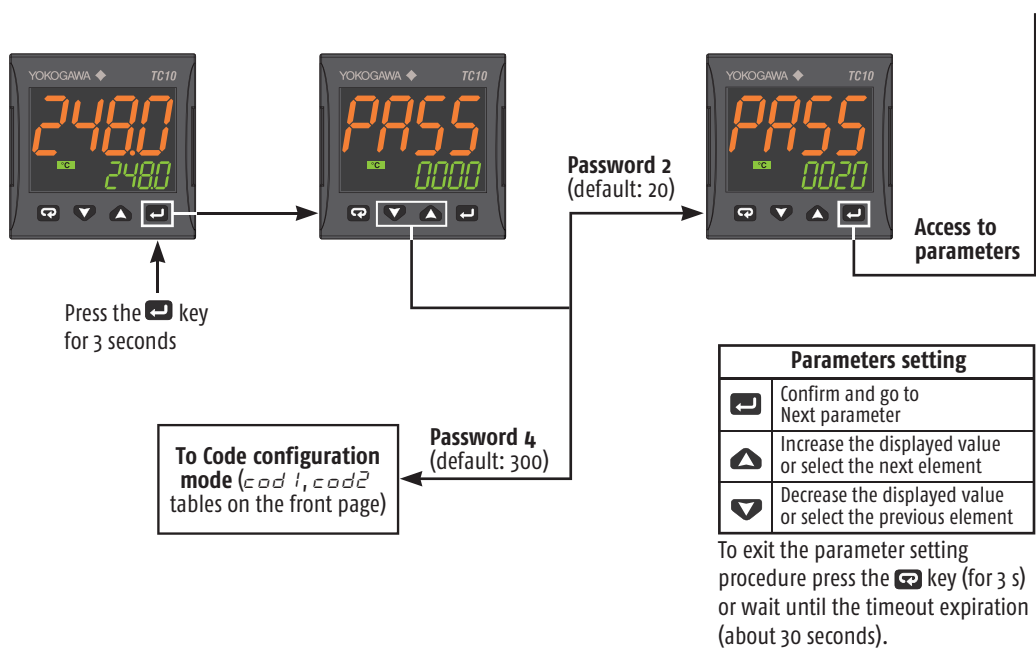
Mounting requirements

This instrument is intended for permanent installation, for indoor use only, in an electrical panel which encloses the rear housing, exposed terminals and wiring on the back. Select a mounting location having the following characteristics: 1. It should be easily accessible; 2. There is minimum vibrations and no impact; 3. There are no corrosive gases; 4. There are no water or other fluids (i.e. condensation); 5. The ambient temperature is in accordance with the operative temperature (0 to 50°C); 6. The relative humidity is in accordance with the instrument specifications (20 to 85%); 7. Installation altitude: less than 2000 m on sea level; 8. Pollution category 2. The instrument can be mounted on panel with a maximum thickness of 8 mm. When the maximum front protection (IP65) is desired, the optional gasket must be mounted.

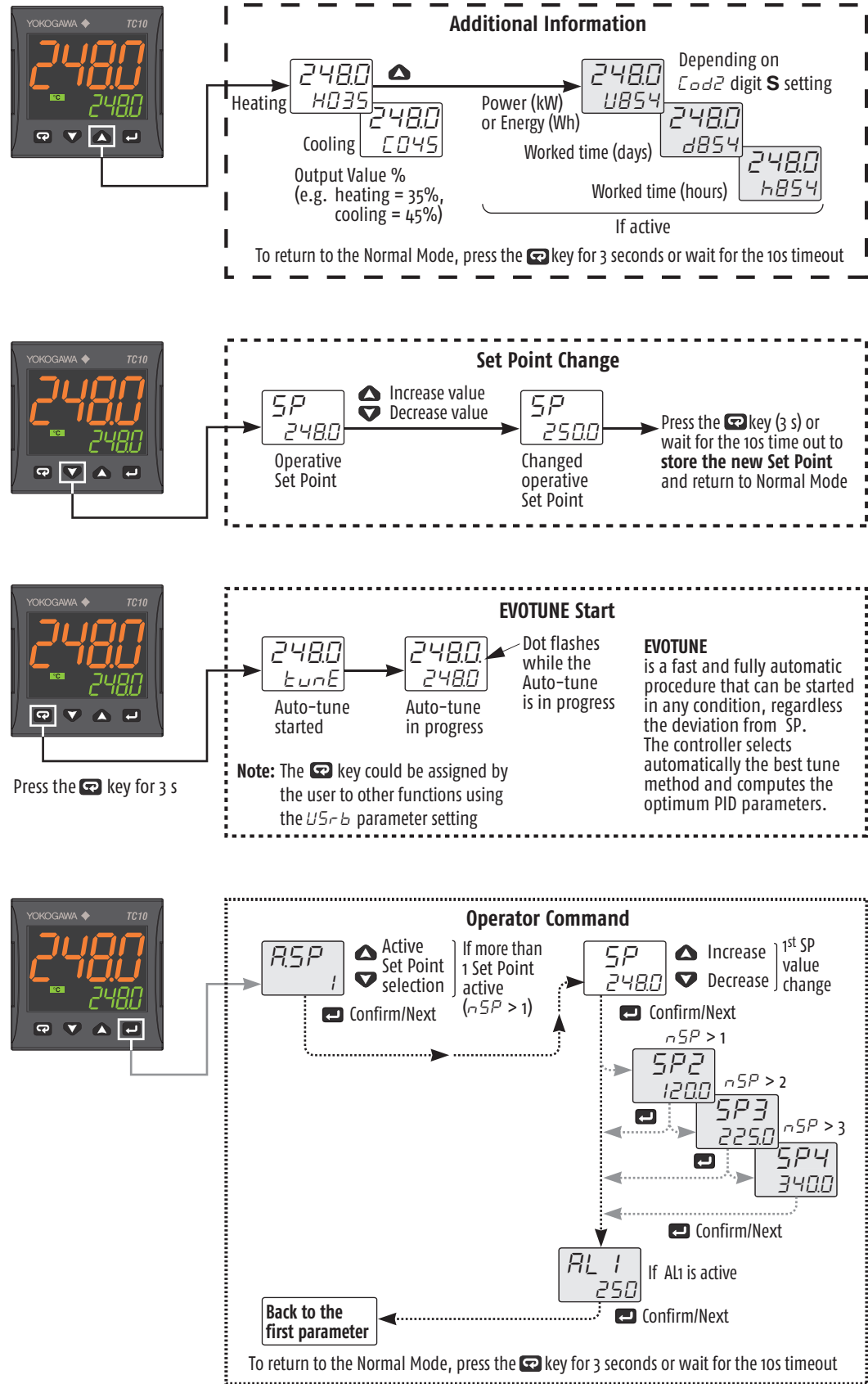
TERMINALS





## PARAMETERS SETTING



## CONTROLLER OPERATION



### Parameters List (*PASS: 20*) (Parameters of RS485 Modbus Serial Communications are shown in gray cells in the below table)

Group	Param.	Description	Range value or selection list elements	Default	User value	Note
Commands	<i>oP<u>E</u>r</i>	Operative Mode Selection	auto = Auto; oplo = Manual; stdy = Standby			
	<i>R<u>S</u>P</i>	Set Point Selection	0 = SP, 1 = SP2, 2 = SP3, 3 = SP4	0 = SP		
	<i>t<u>u</u>nE</i>	Start Auto Tune	0 = OFF, 1 = start	0 = OFF		evoTUNE
Control	<i>P<u>b</u></i>	Proportional Band	1 to 9999 (Engineering Units = E.U.)	50		<i>E<i>od</i></i> : Digit <b>N</b> = <b>1</b>
	<i>t<u>i</u></i>	Integral Time	0 to 10000 s	200		
	<i>t<u>d</u></i>	Derivative Time	0 to 9999 s	50		
	<i>H<u>S</u>E<u>t</u></i>	Hysteresis ON/OFF Control	0 to 9999 (E.U.)	1		<i>E<i>od</i></i> : Digit <b>N</b> = <b>0</b>
	<i>t<u>c</u>H</i>	Heating output cycle time	0.1 to 130 s	20.0		<i>E<i>od</i></i> : Digit <b>N</b> = <b>1</b>
	<i>r<u>c</u>G</i>	Relative Cooling Gain	0.01 to 99.99	1.00		<i>E<i>od</i></i> : Digit <b>N</b> = <b>1</b> <i>E<i>od</i></i> : Digit <b>O</b> > <b>4</b>
	<i>t<u>c</u>c</i>	Cooling output cycle time	0.1 to 130 s	20.0		<i>E<i>od</i></i> : Digit <b>N</b> = <b>1</b> <i>E<i>od</i></i> : Digit <b>O</b> > <b>1</b>
Set Point	<i>S<u>P</u></i>	Set Point 1	-1999 to +9999 (E.U.)			
	<i>S<u>P</u>2</i>	Set Point 2	-1999 to +9999 (E.U.)			If <i>nSP</i> > <b>1</b>
	<i>S<u>P</u>3</i>	Set Point 3				If <i>nSP</i> > <b>2</b>
	<i>S<u>P</u>4</i>	Set Point 4				If <i>nSP</i> > <b>3</b>
	<i>S<u>P</u>L</i>	Set Point min. Value	-1999 to SPHL (E.U.)			
	<i>S<u>P</u>HL</i>	Set Point max. Value	SPLL to 9999 (E.U.)			
	<i>nSP</i>	No. of Set Points	1 to 4	1		
Alarms	<i>AL 1</i>	Alarm 1 threshold	AL1L to AL1H			If digit <b>P</b> of <i>E<i>od</i></i> 2 is > <b>1</b>
	<i>AL 1L</i>	Alarm 1 low threshold/Low limit	-1999 to +9999 (E.U.)	-1999		
	<i>AL 1H</i>	Alarm 1 high threshold/High limit		9999		
	<i>HAL 1</i>	AL1 hysteresis	1 to 9999 (E.U.)	1		
	<i>AL 2</i>	Alarm 2 threshold	AL2L to AL2H			If digit <b>Q</b> of <i>E<i>od</i></i> 2 is > <b>1</b>
	<i>AL 2L</i>	Alarm 2 low threshold/Low limit	-1999 to +9999 (E.U.)	-1999		
	<i>AL 2H</i>	Alarm 2 high threshold/High limit		9999		
	<i>HAL 2</i>	AL2 hysteresis	1 to 9999 (E.U.)	1		
	<i>AL 3</i>	Alarm 3 threshold	AL3L to AL3H			If digit <b>R</b> of <i>E<i>od</i></i> 2 is > <b>1</b>
	<i>AL 3L</i>	Alarm 3 low threshold/Low limit	-1999 to +9999 (E.U.)	-1999		
	<i>AL 3H</i>	Alarm 3 high threshold/High limit		9999		
<i>HAL 3</i>	AL3 hysteresis	1 to 9999 (E.U.)	1			
Soft Start	<i>S<u>t</u>P</i>	Soft Start Output value	-100 to 100%	0		
	<i>S<u>S</u>t</i>	Soft Start Time	0.00 to 8.00 (hh.mm)	0		
Input	<i>S<u>S</u>c</i>	Low Scale readout	-1999 to 9999	-1999		For linear Input types only
	<i>F<u>S</u>c</i>	High Scale readout	-1999 to 9999	9999		
	<i>d<u>P</u></i>	Number of decimals	0 to 3 (linear inputs); 0 to 1 (other inputs)	0		
	<i>F 1<u>L</u></i>	Measured value Digital filter	OFF; 0.1 to 20.0 s	1.0		
I/O	<i>i<u>o</u>4F</i>	I/O 4 Function	ON = Transmitter Power Supply; OUT4 = SSR out; DI2C = Dig. In. from contact; DI2U = 24 VDC Digital Input;	OUT4		
Digital Inputs	<i>d 1F 1</i>	Digital Input 1 Function	0 to 21	0		See the DI1, DI2 functions table
	<i>d 1F 2</i>	Digital Input 2 Function	0 to 21	0		
	<i>d 1A</i>	Digital Inputs Action	0 = DI1 direct action, DI2 direct action; 1 = DI1 reverse action, DI2 direct action; 2 = DI1 direct action, DI2 reverse action; 3 = DI1 reverse action, DI2 reverse action.	0		DI2 only if configured
	<i>u<u>S</u>r<u>b</u></i>	Key  Function	noNE, tunE, oplo, aac, asi, chsp, st.by, str.t	tunE		See the  Key function table
Display	<i>d 1<u>L</u></i>	Color of the Process Value display	0 = Change 1 = Red 2 = Green 3 = Orange	2		If Change, the color is <b>green</b> if PV differs from SP less than <i>AdE</i> , <b>red</b> if higher than <i>AdE</i> and <b>orange</b> if is lower than <i>AdE</i>
	<i>AdE</i>	Display change color threshold (when <i>d 1<u>L</u></i> = 0)	0 (OFF) to 9999 (e.u.)			
	<i>d 1<u>S</u>t</i>	Display Power OFF time (mm.ss)	oFF (display ON) 0.1 to 99.59	oFF		
Serial com-munications	<i>Ad<u>d</u></i>	Instrument Address	1 to 254	1		Modbus RTU slave protocol
	<i>b<u>R</u>ud</i>	Baud rate	1200, 2400, 9600 baud, 19.2, 38.4 kbaud	9600		
Wattmeter	<i>Uo<u>L</u>t</i>	Load Voltage	1 to 999 (V)	230		If digit <b>S</b> of <i>E<i>od</i></i> 2 is > <b>1</b>
	<i>c<u>u</u>r</i>	Load Current	1 to 9999 (A)			
Password	<i>PR<u>S</u>4</i>	Configuration access Password	201 to 400	300		
	<i>PR<u>S</u>2</i>	Parameters access Password	0 to 200	20		

**Note:** To access all the instrument features, please see the **"Complete configuration procedure"** in the **"Engineering Manual"**.

### 4.1F\_ Digital Inputs DI1 and DI2 Functions

Code displayed	Description
0	Disabled (OFF) (default)
1	Alarm Reset
2	Alarm Acknowledge (ACK)
3	Hold of the measured value
4	Stand by mode
5	Manual Mode
6	Heat with "SP" and Cool with "SP2"
7 to 17	Reserved
18	Sequential Set Point selection [on transition]
19	SP/SP2 selection
20	Binary coding for Set Point selection on Dh and Dl2 (00 = SP, 01 = SP2, 10 = SP3, 11 = SP4)
21	Digital inputs in parallel to the UP and Down keys (Dh = UP key, Dl2 = DOWN key)

### u5rb Key Function

Code displayed	Description
<i>nonE</i>	Not used
<i>AutoE</i>	Starts auto tuning functions (default)
<i>oPLo</i>	Manual mode
<i>ARc</i>	Alarm Reset
<i>AS ,</i>	Alarm Acknowledge
<i>chSP</i>	Circular Set Point Selection (shows SP, SP2, SP3)
<i>Stby</i>	Stand-by mode

## 关于产品有害物质限制使用管理 Control of Concentration Limits for Certain Restricted Substances by the Product

根据中华人民共和国电器电子产品有害物质限制使用管理办法对本产品进行了说明。  
This is an explanation for the product based on “Requirements of concentration limits for certain restricted substances in electrical and electronic products” in the People’s Republic of China.

部件名称	有害物质									
	铅(Pb)	汞(Hg)	镉(Cd)	六价铬(Cr6+)	多溴联苯(PBB)	多溴二苯醚(PBDB)	邻苯二甲酸二正丁酯(DBP)	邻苯二甲酸二异丁酯(DIBP)	邻苯二甲酸丁基苄酯(BBP)	邻苯二甲酸二(2-乙基)己酯(DEHP)
框架（塑料）	×	×	×	○	○	○	○	○	○	○
框架（金属）	×	×	×	○	○	○	○	○	○	○
内部接线材料	×	×	×	○	○	○	○	○	○	○
电源	×	×	×	○	○	○	○	○	○	○

注1：○：表示该有害物质在该部件所有均质材料中的含量均不超出电器电子产品有害物质限制使用国家标准要求。  
 ×：表示该有害物质至少在该部件的某一均质材料中含量超出电器电子产品有害物质限制使用国家标准要求。  
 注2：以上未列出的部件，表明其有害物质含量均不超出电器电子产品有害物质限制使用国家标准要求。

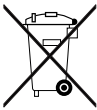
注1：○：表示该有害物质在该部件所有均质材料中的含量均不出电器电子产品有害物质限制使用国家标准要求。  
×：表示该有害物质至少在该部件的某一均质材料中含量超出电器电子产品有害物质限制使用国家标准要求。  
注2：以上未列出的部件，表明其有害物质含量均不出电器电子产品有害物质限制使用国家标准要求。

环保使用期限



该标识适用于SJ/T11364中所述,在中华人民共和国销售的电器电子产品的环保使用期限。  
注释) 该年数为“环保使用期限”,并非产品的质量保证期。零件更换的推荐周期,请参照使用说明书。

本产品的部分部件包含RoHS指令中的限用物质,但是其使用方法不受该指令限制。  
Some parts of this product include the restricted substances of RoHS Directive, but their applications are under the exemption of the directive.



## Waste Electrical and Electronic Equipment (WEEE)

(Only valid in the EEA for EU WEEE Directive  
and in the UK for UK WEEE Regulation)

This product complies with the WEEE  
marking requirement.

This marking indicates that you must not  
discard this electrical/electronic product  
in domestic household waste.

When disposing of products in the EEA or  
UK, contact your local Yokogawa office in  
the EEA or UK respectively.