

E5AC-T OMRON Digital Controller

EN INSTRUCTION MANUAL

Thank you for purchasing the OMRON E5AC-T Digital Controller. This manual describes the functions, performance, and application methods needed for optimum use of the product. Please observe the following items when using the product.

- This product is designed for use by qualified personnel with a knowledge of electrical systems.
- Before using the product, thoroughly read and understand this manual to ensure correct use.
- Keep this manual in a safe location so that it is available for reference whenever required.

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Refer to the E5AC-T Digital Controllers User's Manual (Cat. No. H185) for detailed application procedures.

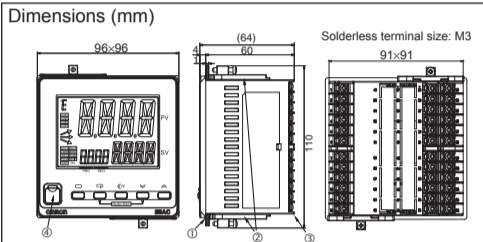
Safety Precautions

Key to Warning Symbols

CAUTION Indicates a potentially hazardous situation which, if not avoided, is likely to result in minor or moderate injury or property damage. Read this manual carefully before using the product.

Wiring

Dimensions



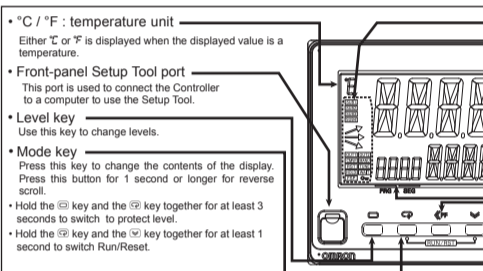
ACT1 2284568-8C

In the pack:
 *Main unit
 *Instruction manual
 *Waterlight packing (Y92S-P10)
 *Two adapters (Y92F-S1)
 *Terminal cover (Provided only for models with E5AC-T111S1)
 *Port cover for Front-panel Setup Tool (Y92S-P7)

Sold Separately:
 *Terminal cover (E53-COV24)
 *USB-Serial Conversion Cable (E58-CIF22)
 *E58-CIF22 Cable (E58-CIF22-C)

* Do not remove the terminal block. Doing so may result in failure or malfunction.
 * Setup Tool ports are provided on the top and front of the Digital Controller. Use these ports to connect a personal computer to the Digital Controller when using the Setup Tool. The E58-CIF22 USB-Serial Conversion Cable is required to connect to the top-panel port. (Do not use the product with the USB-Serial Conversion Cable left permanently connected.) Refer to the instruction manual provided with the USB-Serial Conversion Cable for details on connection methods.
 * If the front-panel port cover is lost or damaged, order it separately. The Waterproof Packing should be periodically replaced because it may deteriorate, shrink, or harden depending on the operating environment.

Names of Parts on Front Panel



Operation Menu

Input Type

Input type	Input	Setting	Setting range
Temperature inputs	Platinum resistance thermometer	Pt100	0 -200 to 850 -300 to 1500
		JPt100	2 0.0 to 100.0 0.0 to 210.0
	Thermocouple	K	3 -199.9 to 500.0 -199.9 to 900.0
		J	5 -200 to 1300 -300 to 2300
		T	6 -20.0 to 500.0 0.0 to 900.0
		K	7 -100 to 850 -100 to 1500
		R	8 -20.0 to 400.0 0.0 to 750.0
		E	9 -200 to 400 -300 to 700
		L	10 -199.9 to 400.0 -199.9 to 700.0
		U	11 -100 to 850 -100 to 1500
		N	12 -200 to 400 -300 to 700
		R	13 -199.9 to 400.0 -199.9 to 700.0
		S	14 -200 to 1300 -300 to 2300
		W	15 -200 to 400 -300 to 700
Infrared Thermosensor	ES1B	16 10 to 70°C 21 0 to 90 0 to 190	
	ES1B	17 60 to 120°C 22 0 to 120 0 to 240	
Analog input type	Current input	23 0 to 20mA 24 0 to 20mA	
	Voltage input	25 1 to 5V 26 0 to 5V 27 -1.999 to 99.99, -1.999 to 99.99, 0 to 10V 28 0 to 10V 29	

*The default is "5".
 *SEPR will be displayed when a platinum resistance thermometer is mistakenly connected while input type is not set for it. To clear the SEPR display, correct the wiring and cycle the power supply.

Alarms

Setting	Alarm type	Alarm output function
0	No alarm function	Output off
*1	Deviation upper/lower limit	ON OFF Vary with "L", "H" values
	2 Deviation upper limit	ON OFF Vary with "L", "H" values
*1	3 Deviation lower limit	ON OFF Vary with "L", "H" values
	4 Deviation upper/lower range	ON OFF Vary with "L", "H" values
*1	5 Deviation upper/lower limit standby sequence ON	ON OFF Vary with "L", "H" values
	6 Deviation upper limit standby sequence ON	ON OFF Vary with "L", "H" values
*1	7 Deviation lower limit standby sequence ON	ON OFF Vary with "L", "H" values
	8 Absolute value upper limit	ON OFF Vary with "L", "H" values
*1	9 Absolute value lower limit	ON OFF Vary with "L", "H" values
	10 Absolute value upper limit standby sequence ON	ON OFF Vary with "L", "H" values
*1	11 Absolute value lower limit standby sequence ON	ON OFF Vary with "L", "H" values
	12 LBA (only for alarm 1)	ON OFF Vary with "L", "H" values
*1	13 PV Change Rate Alarm	ON OFF Vary with "L", "H" values
	14 SP absolute value upper limit	ON OFF Vary with "L", "H" values
*1	15 SP absolute value lower limit	ON OFF Vary with "L", "H" values
	16 MV absolute value upper limit	ON OFF Vary with "L", "H" values
*1	17 MV absolute value lower limit	ON OFF Vary with "L", "H" values

* The default alarm type is "2".
 *1: Upper and lower limits can be set for parameters 1, 4 and 5 to provide for different types of alarm. These are indicated by the letter "L" and "H".
 *2: Refer to the tables above for details of input types and alarm types.
 *3: Only the value set to the CH5: Temperature Input Shift parameter is applied to the entire temperature input range. When the process value is 200°C, the process value is treated as 201.2°C after input shift if the input shift value is set to 1.2°C. The process value is treated as 198.8°C after input shift if the input shift value is set to -1.2°C.
 *4: Operation is stopped when moved to the initial setting level.
 *5: The four numeric digits of the product code are displayed in the No. 2 display. The setting cannot be changed and there is nothing that you need to set.
 * The grayed-out setting items are not displayed for some models and some settings of other setting items.

Conformance to EN/IEC Standards

This is a class A product. In residential areas it may cause radio interference, in which case the user may be required to take adequate measures to reduce interference.

A 급 기기 (업무용 방송통신기자재)
 이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외지역에서 사용하는 것을 목적으로 합니다.

Warning Symbols

CAUTION

Minor injury due to electric shock may occasionally occur. Do not touch the terminals while power is being supplied.

Electric shock, fire, or malfunction may occasionally occur. Do not allow metal objects, conductors, cuttings from the installation work, or moisture to enter the Digital Controller, the Setup Tool ports, or between the pins on the connectors on the Setup Tool cable. Attach the cover to the front-panel Setup Tool port whenever you are not using it to prevent foreign objects from entering the port.

Do not use the product where subject to flammable or explosive gas. Otherwise, minor injury from explosion may occasionally occur.

Never disassemble, modify, or repair the product or touch any of the internal parts. Minor electric shock, fire, or malfunction may occasionally occur.

CAUTION - Risk of Fire and Electric Shock

a) This product is UL listed as Open Type Process Control Equipment. It must be mounted in an enclosure that does not allow fire to escape externally.

b) More than one disconnect switch may be required to de-energize the equipment before servicing.

c) Signal inputs are SELV/limited energy.

d) Caution: To reduce the risk of fire or electric shock, do not interconnect the outputs of different Class 2 circuits.

If the output relays are used past their life expectancy, contact fusing or burning may occasionally occur. Always consider the application conditions and use the output relays within their rated load and electrical life expectancy. The life expectancy of output relays varies considerably with the output load and switching conditions.

Loose screws may occasionally result in fire. Tighten the terminal screws to the specified torque of 0.43 to 0.58 N·m.

Set the parameters of the product so that they are suitable for the system being controlled. If they are not suitable, unexpected operation may occasionally result in property damage or accidents.

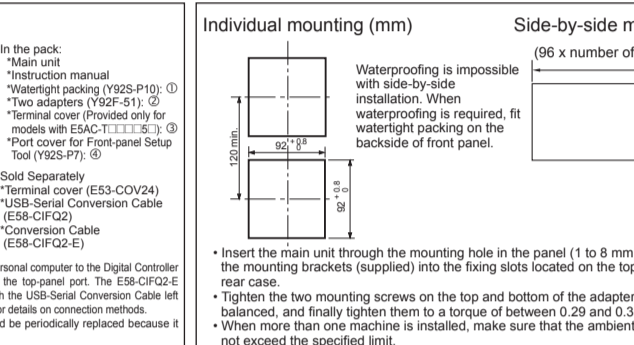
A malfunction in the Digital Controller may occasionally make control operations impossible or prevent alarm outputs, resulting in property damage. To maintain safety in the event of malfunction of the Digital Controller, take appropriate safety measures, such as installing a monitoring device on a separate line.

Suitability for Use

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Installation



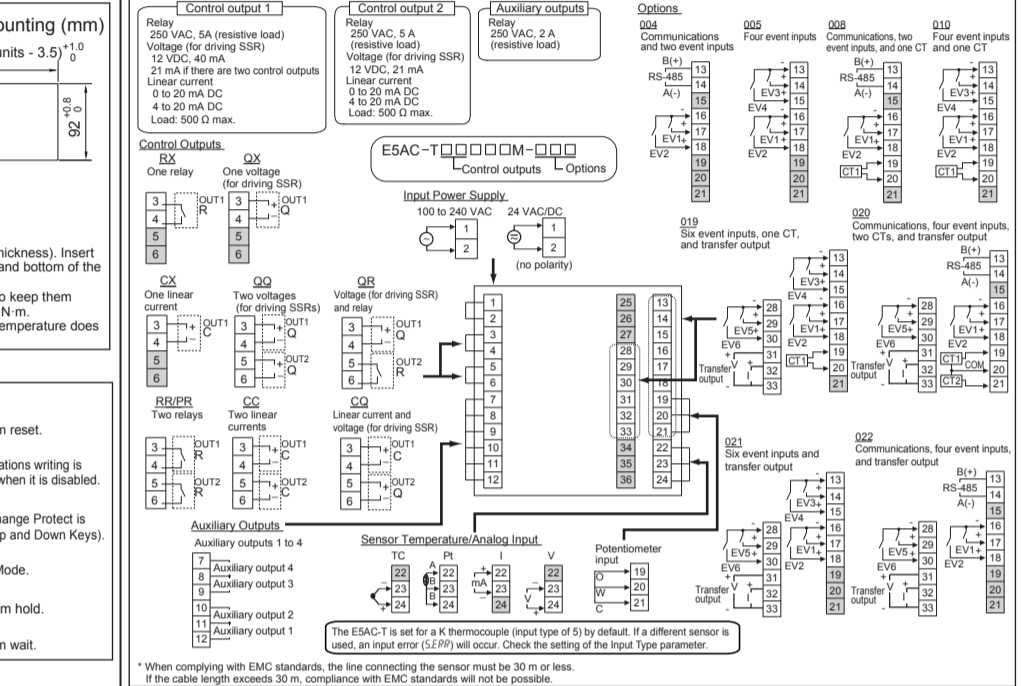
Precautions for Safe Use

- Be sure to observe the following precautions to prevent operation failure, malfunction, or adverse effects on the performance and functions of the product. Not doing so may occasionally result in unexpected events. Use the product within specifications.
- The product is designed for indoor use only. Do not use the product outdoors. Do not use or store the product in any of the following locations.
 - Places directly subject to heat radiated from heating equipment.
 - Places subject to splashing liquid or oil atmosphere.
 - Places subject to direct sunlight.
 - Places subject to dust or corrosive gas (in particular, sulfide gas and ammonia gas).
 - Places subject to intense temperature change.
 - Places subject to icing and condensation.
 - Places subject to vibration and large shocks.
 - Use/store within the rated temperature and humidity ranges. Provide forced-cooling if required.
 - To allow heat to escape, do not block the area around the product. Do not block the ventilation holes on the product.
 - Be sure to wire properly with correct polarity of terminals.
 - Use the specified size of crimped terminals (M3, with 5.8 mm or less) for wiring. To connect bare wires to the terminal block, use copper braided or solid wires with a gage of AWG24 to AWG18 (equal to cross-sectional area of 0.205 to 0.8231 mm²). (The stripping length is 6 to 8 mm.) Use up to two wires of same size and type, or two crimped terminals can be inserted into a single terminal.
 - Do not wire the terminals which are not used.
 - Allow as much space as possible between the controller and devices that generate a powerful high-frequency or surge. Separate the high-voltage or large-current power lines from other lines, and avoid parallel or common wiring with the power lines when you are wiring to the terminals.
 - Use this product within the rated load and power supply.
 - Make sure that the rated voltage is attained within two seconds of turning ON the power using a switch or relay contact. If the voltage is applied gradually, the power may not be reset or output malfunctions may occur.
 - Make sure that the Digital Controller has 30 minutes or more to warm up after turning ON the power before starting actual control operations to ensure the correct temperature display.
 - A switch or circuit breaker should be provided close to this unit. The switch or circuit breaker should be within easy reach of the operator, and must be marked as a disconnecting means for this unit.
 - Wipe off any dirt from the Digital Controller with a soft dry cloth. Never use thinners, benzene, alcohol, or any cleaners that contain these or other organic solvents. Deformation or discoloration may occur.
 - Design system (control panel, etc.) considering the 2 second delay that the controller's output to be set after power ON.
 - The output will turn OFF when you move to the Initial Setting Level. Take this into consideration when performing control.
 - The number of non-volatile memory write operations is limited. Therefore, use RAM write mode when frequently overwriting data during communications or other operations.
 - When disassembling the Temperature Controller for disposal, use suitable tools.
 - Do not connect cables to both the front-panel Setup Tool port and the top-panel Setup Tool port at the same time. The Digital Controller may be damaged or may malfunction.
 - Do not exceed the communications distance that is given in the specifications and use the specified communications cable. Refer to the E5AC-T Digital Controllers User's Manual (Cat. No. H185) for the communications distance and cable specifications.
 - Do not turn the power supply to the Digital Controller ON or OFF while the USB-Serial Conversion Cable is connected. The Digital Controller may malfunction.
 - The terminals can reach temperatures of up to 75°C.

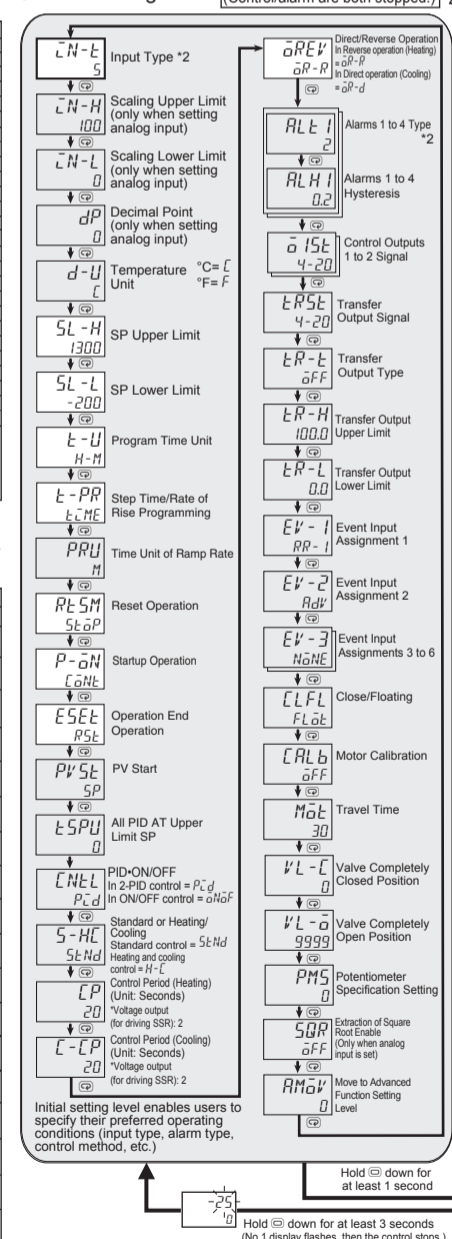
Specifications

Power supply voltage	100 to 240 VAC, 50/60 Hz or 24 VDC, 50/60 Hz / 24 VDC
Operating voltage range	85 to 110% of the rated voltage
Power consumption	9.0 VA max. (100 to 240 VAC) 5.6 VA max. (24 VAC)/3.4 W max. (24 VDC)
Indication accuracy (Ambient temperature: 23°C)	Thermocouple: (±0.2 % of indication value ± 1°C, whichever is greater) ± 1 digit max. Platinum resistance thermometer: (±0.2 % of indication value ± 0.8°C, whichever is greater) ± 1 digit max. Analog input: ±0.2 % FS ± 1 digit max. Must be between 100 Ω and 10 kΩ for maximum open position
Potentiometer input	Output current: approx. 7 mA per contact. ON: 1 kΩ max., OFF: 100 kΩ min. ON: residual voltage 1.5 V max., OFF: leakage current 0.1 mA max.
Event input	Relay output: SPST-NO, 250VAC, 5A (resistive load) Electrical life of relay: 100,000 operations Voltage output (for driving SSR): 12 VDC ±20%, 21 mA Linear current output: 4 to 20 mA DC or 0 to 20 mA DC with load of 500 Ω max.
Control output 1	Relay output: SPST-NO, 250 VAC, 5 A (resistive load) Electrical life of relay: 100,000 operations Voltage output (for driving SSR): 12 VDC ±20%, 21 mA Linear current output: 4 to 20 mA DC or 0 to 20 mA DC with load of 500 Ω max.
Control output 2	Relay output: SPST-NO, 250 VAC, 5 A (resistive load) Electrical life of relay: 100,000 operations Voltage output (for driving SSR): 12 VDC ±20%, 21 mA Linear current output: 4 to 20 mA DC or 0 to 20 mA DC with load of 500 Ω max.
Control method	ON/OFF or 2-PID control
Auxiliary outputs	Relay outputs: SPST-NO, 250 VAC, 2 A (resistive load) Electrical life of relay: 100,000 operations 4 to 20 mA DC with load of 500 Ω max.
Transfer output	Relay output: SPST-NO, 250 VAC, 2 A (resistive load) Electrical life of relay: 100,000 operations 4 to 20 mA DC with load of 500 Ω max.
Ambient temperature	-10 to 55°C (Avoid freezing or condensation)
Ambient humidity	25 to 85% (Avoid freezing or condensation)
Storage temperature	Max. 2,000m
Altitude	TZA: 250 VAC, time-lag, low-breaking capacity
Recommended fuse	Front panel: Digital Controller only
Weight	Approx. 250 g (Terminal Controller only)
Degree of protection	IP20
Installation environment	Rear case: IP20, Terminal case: IP00 Installation category: II, pollution degree 2 (as per IEC61010-1)
Memory protection	Non-volatile memory (No. of write operations: 1,000,000)
Temporary overvoltage	Short term: 1200 V+ power supply voltage Long term: 250 V+ power supply voltage

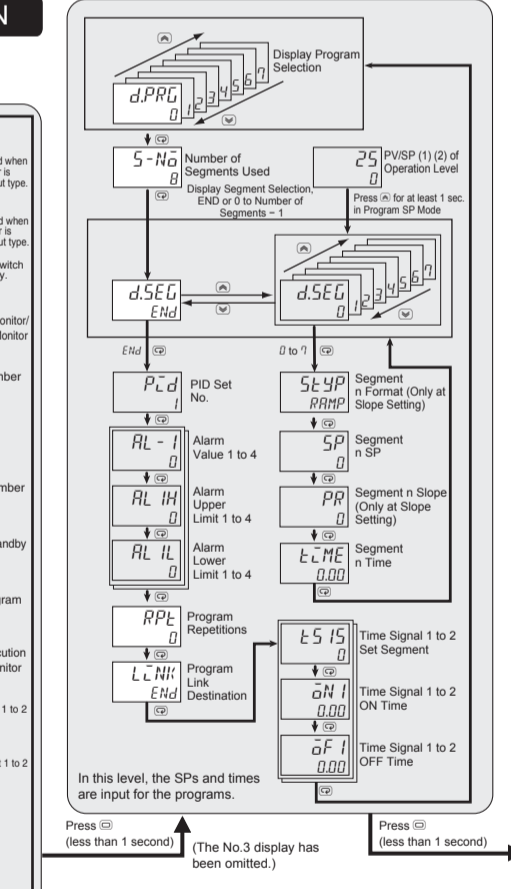
Connections



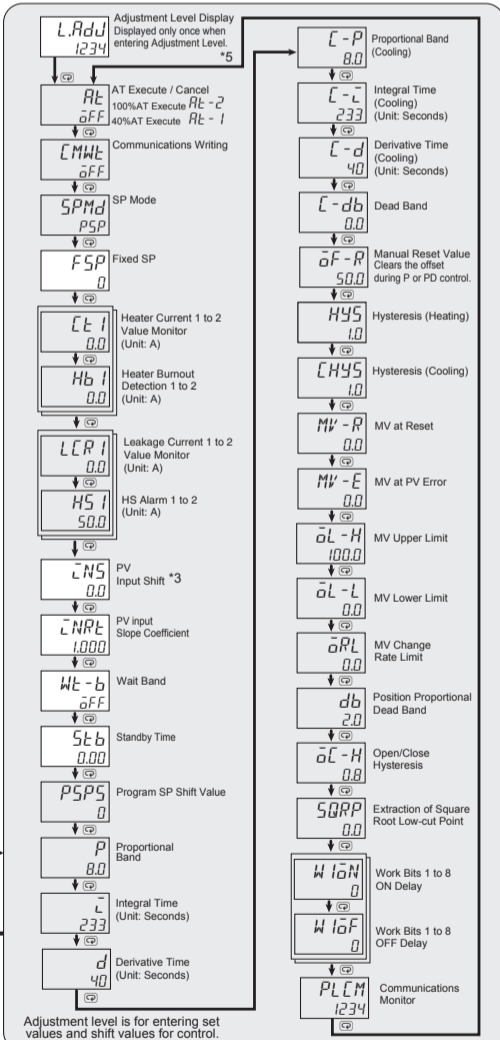
Initial Setting Level



Program Setting Level



Adjustment Level



Error Display (troubleshooting)

When an error has occurred, the No. 1 display shows the error code. Take necessary measure according to the error code, referring the table below.

No.1 display	Meaning	Action	Status at alarm
SEPR (S.Err)	Input error	Check the setting of the Input Type parameter, check the input wiring, and check for broken or shorts in the temperature sensor.	OFF Operates as above the upper limit.
E333 (E333)	A/D converter error	After the check of input error, turn the power OFF then back ON again. If the display remains the same, the controller must be repaired. If the display is restored to normal, then a probable cause can be external noise affecting the control system. Check for external noise.	OFF OFF
E111 (E111)	Memory error	Turn the power OFF then back ON again. If the display remains the same, the controller must be repaired. If the display is restored to normal, then a probable cause can be external noise affecting the control system. Check for external noise.	OFF OFF

If the input value exceeds the display limit (-1999 to 9999), though it is within the control range, [] will be displayed under -1999 and [] above 9999. Under these conditions, control output and alarm output will operate normally. Refer to the E5AC-T Digital Controllers User's Manual (Cat. No. H185) for the controllable ranges.

* Error shown only for "Process Value" Set point". Not shown for other status.

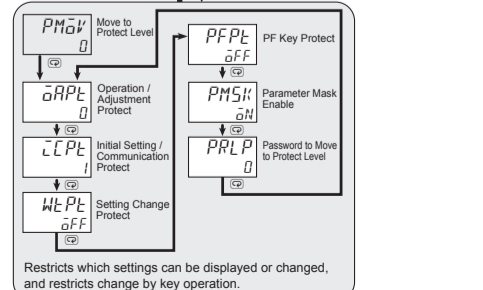
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Protect Level



Other functions

Refer to the E5AC-T Digital Controllers User's Manual (Cat. No. H185) for information on the Advanced Function Setting Level, Manual Control Level, and other functions.
 Refer to the E5AC-T Digital Controllers Communications Manual (Cat. No. H186) for information on communications.

形 E5AC-T

デジタル調節計

JPN 取扱説明書

このたびは、オムロン製品をお買い上げいただきまして、まことにありがとうございます。この取扱説明書で、この製品を使用する上で、必要な機能、性能、使用方法などの情報を記載しています。この製品をご使用に際して下記のことを守ってください。

・この製品は電気の知識を有する専門家が扱ってください。

・この取扱説明書をよくお読みになり、十分に理解のうえ、正しくご使用ください。

・この取扱説明書はいつでも参照できるよう大切に保管ください。

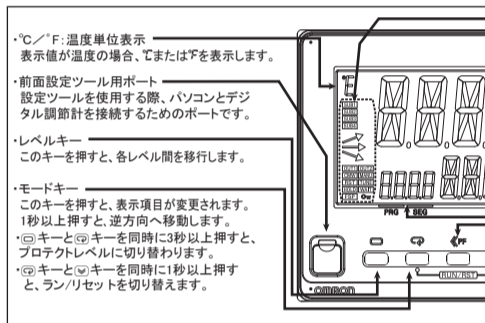
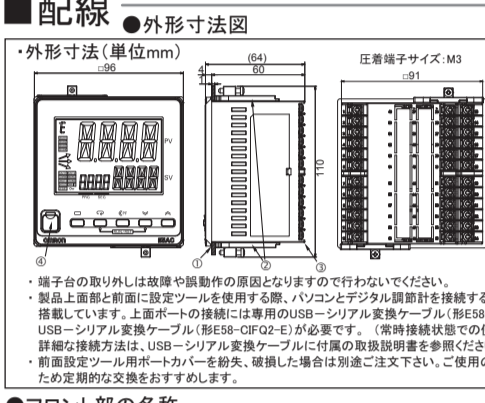
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安全上のご注意

警告表示の意味

正しい取扱いをしなければ、この危険のために、時に軽微、中程度の傷害をおったり、あるいは物的損害を受ける恐れがあります。お使いになる前にこの取扱説明書をお読みになり、十分に理解してください。



操作メニュー

初期設定レベル

運転が停止します。(制御・警報共に停止) *4

センサ種類	センサ仕様	設定値	設定範囲	
測温抵抗体	Pt100	0	-200~850 / -300~1500	
		1	-199.9~500.0 / -199.9~900.0	
	Jp100	2	0.0~100.0 / 0.0~210.0	
		3	-199.9~500.0 / -199.9~900.0	
	熱電対	K	4	-200~1300 / -300~2300
			5	-20.0~150.0 / 0.0~300.0
		J	6	-100~850 / -100~1500
			7	-20.0~400.0 / -20.0~750.0
		T	8	-200~400 / -300~700
			9	-199.9~400.0 / -199.9~700.0
E		10	-200~600 / -300~1100	
		11	-100~850 / -100~1500	
U		12	-200~400 / -300~700	
		13	-199.9~400.0 / -199.9~700.0	
N	14	-200~1300 / -300~2300		
	15	-20.0~150.0 / 0.0~300.0		
R	16	0~1700 / 0~3000		
	17	0~1700 / 0~3000		
S	18	100~1800 / 300~3200		
	19	0~2300 / 0~3200		
PL	20	0~1300 / 0~2300		
	21	0~1300 / 0~2300		
非接触温度センサ	形E5I-B	22	0~120 / 0~240	
		23	0~165 / 0~320	
電圧入力	4~20mA	24	0~260 / 0~500	
		25	スケールにより-1999~9999、-199.9~999.9、-19.99~99.99、-1.999~9.999の範囲で使用。	

警報種別

設定値	警報種別	警報出力機能
0	警報機能なし	出力OFF
1	上下限	ON/OFF
	2	上限
3	下限	ON/OFF
	4	上下限範囲
5	上下限待機シーケンス付	ON/OFF
	6	上限待機シーケンス付
7	下限待機シーケンス付	ON/OFF
	8	絶対値上限
9	絶対値下限	ON/OFF
	10	絶対値上限待機シーケンス付
11	絶対値下限待機シーケンス付	ON/OFF
	12	LBA(警報1種別のみ)
13	PV変化率警報	ON/OFF
14	SP絶対値上限	ON/OFF
	15	SP絶対値下限
16	MV絶対値上限	ON/OFF
	17	MV絶対値下限

初期値は「2」です。

*1: 設定値1, 4, 5は警報の上・下限値が個別に設定でき、LHで表しています。

*2: 入力種別と警報種別の項目は、上の表を参照してください。

*3: 「L」: PV入力補正値の設定値分だけ、センサ入力範囲のすべての点において入力値を補正します。補正前の現在値が200°Cのとき、補正値を1.2°Cとすると補正後は201.2°C、補正値を-1.2°Cとすると補正後は198.8°Cとして扱います。

*4: 初期設定レベルに実行すると運転が停止します。(制御・警報共に停止)

*5: 第2表示には、商品コードの数字部4桁が表示されます。設定変更ができませんが、お客様に何か設定していただく必要はございません。

※ グレー表示になっている設定項目は機種や設定内容により表示されない場合があります。

EN/IEC 規格対応について

この商品は「class A」(工業環境用)です。住宅環境でご利用されると、電波妨害の原因となる可能性があります。その場合には電波妨害に対する適切な対策が必要となります。

警告表示

注意

感電により軽度の傷害が頻りに起こる恐れがあります。

軽度の感電、発火、機器の故障が頻りに起こる恐れがあります。

製品の内部や設定ツール用ポート内部、設定ツール用ケーブルのケーブル部分に感電、発火、機器の故障が頻りに起こる恐れがあります。

また、前面設定ツール用ポートに使用しないものは、上記の異物が入らないようカバーを確実に閉めてください。

爆発により軽度の傷害の恐れがあります。

引火性、爆発性のある粉じんは使用しないでください。

軽度の感電、発火、機器の故障が頻りに起こる恐れがあります。

分解、改造、修理したり、内部に触らないでください。

注意: 火災や感電の危険

a) 当機は、オープンタイプのプロセスコントローラとしてUL Listingの認証を受けていますので、必ず外へ火の出ない構造の筐体内でご使用ください。

b) 2以上の電源を同時に使用する場合は、修理前検閲に、全てのスイッチをOFFし製品を無電圧状態にしてください。

c) 信号入力はSELV、制御回路です。

d) 注意: 火災や感電の危険を低減する為、異なるClass 2回路の出力を内部で接続しないでください。

寿命を超えた状態で使用するすると接点劣化や焼損が頻りに起こる恐れがあります。

必ず実使用条件を考慮し、定格電流、電圧の寿命範囲内でご使用ください。

出力リレーの寿命は、閉回路容量、閉回路条件により大きく異なります。

ただし、閉回路容量と電圧が頻りに起こる恐れがあります。端子には規定トルク0.43-0.58 N・mで締め付けてください。

設定内容と制御対象の内容が異なる場合は、意図しない動作により、装置の破損や事故の原因となります。

デジタル調節計の各種設定値は、制御対象に合わせて正しく設定してください。

デジタル調節計の故障により制御不能や警報出力が出ないなど本機へ接続されている設備、機器への物的損害が頻りに起こる恐れがあります。本機の故障時にも安全上より、別系統で監視機器を取り付けるなどの安全対策を行ってください。

ご承諾事項

当社は、一般工業製品向けの汎用品として設計製造されています。従いまして、次に掲げる用途での使用を意図していません。お客様が当社製品をこれらの用途に使用される際は、当社は当社製品に対して一切保証をいたしません。ただし、次に掲げる用途であっても当社の意図した商品用途の場合や特別の合意がある場合は除きます。

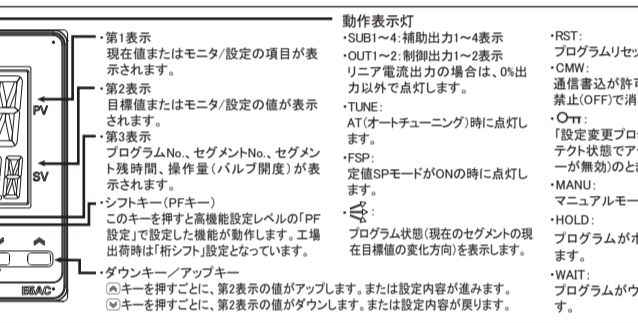
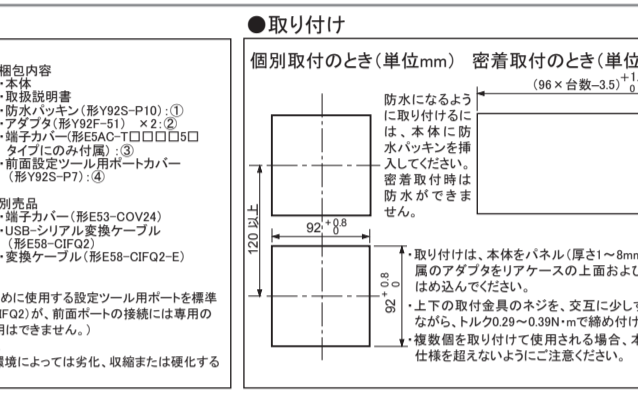
a) 高い安全性が必要とする用途 (例: 原子力制御設備、燃焼設備、航空・宇宙設備、鉄道設備、昇降設備、航業設備、医用機器、安全装置、その他生命・身体に危険が及ぶ用途)

b) 高い信頼性が要求される用途 (例: ガス・水道・電気等の供給システム、24時間連続運転システム、決済システムほか) 重要な用途または重要な用途 (例: 屋外に設置する設備、化学的汚染を受ける設備、電磁的妨害を受ける設備、振動・衝撃を受ける設備など)

c) カタログ等に記載のない条件や環境での用途

d) (から)に記載されている、カタログ等記載の商品は自動車(二輪車含む)を以下(以下)向けではありません。自動車に搭載する用途には利用しないでください。自動車搭載用商品については当社営業担当者にご相談ください。

* 上記は適合用途の一部です。当社のベスト、総合カタログ、データシート等最新のカタログ、マニュアルに記載の保証・免責事項の内容をご確認ください。



プログラム設定レベル

