Digital Controller for Control Applications Requiring Rapid Response and High Resolution.

The E5□R samples at 50 ms per loop for use with high-speed response equipment, such as ceramic heaters. Measurements, fluctuation detection, and logging for environmental testing equipment are performed at a high resolution of 0.01°C.
The R in E5□R represents the two areas where this Digital Controller excels - Rapid response and high Resolution.

Rapid response:
50 ms
High Resolution:
0.01°C

E5ER
48 x 96 x 95mm
(W x H x D)

E5AR
96 x 96 x 95mm
(W x H x D)

Advanced & Sophisticated Digital Controller

Choose from 14 models with dimensions of 96 x 96 mm or 96 x 48 mm.

■ E5□R Selection Guide

E5AR (96 x 96 mm)

Basic models	1 loop for standard control/1 loop for heating and cooling control	4 alarm outputs, 2 event inputs, 2 outputs (control/transfer)
		4 alarm outputs, 6 event inputs, RS-485 communications, 4 outputs (control/transfer)
2-loop models	2 loops for standard control/2 loops for heating and cooling control 1 loop for cascade control 1 loop for standard control with remote SP 1 loop for proportional control	4 alarm outputs, 4 event inputs, RS-485 communications, 4 outputs (control/transfer)
4-loop models	4 loops for standard control 2 loops for standard control 2 loops for heating and cooling control	4 alarm outputs, 4 event inputs, RS-485 communications, 4 outputs (control/transfer)
Position-proportional control models	1 loop for position-proportional control	4 alarm ouputs, 4 event inputs, 2 relay ouputs (open, closed)
		4 alarm outputs, 4 event inputs, 2 relay outputs (open, closed) RS-485 communications, 1 output (transfer)

E5ER (48 x 96 mm)

Basic models	1 loop for standard control/1 loop for heating and cooling control	4 alarm outputs, 2 event inputs, 2 outputs (control/transfer)
		4 alarm outputs, 2 event inputs, RS-485 communications, 4 outputs (control/transfer)
2-loop models	2 loops for standard control/1 loop for heating and cooling control 1 loop for cascade control 1 loop for standard control with remote SP 1 loop for proportional control	4 alarm outputs, 4 event inputs, RS-485 communications, 2 outputs (control/transfer)
Position-proportional control models	1 loop for position-proportional control	4 alarm outputs, 4 event inputs, 2 relay outputs (open, closed)
		4 alarm outputs, no event input, 2 relay outputs (open, closed) RS-485 communications, 1 output (transfer)

■ Specifications

Display	7-segment LCD with backlight Display colors: Red, green, and orange Number of digits per display line: 5 Number of display lines: 3
Supply voltage	100 to 240 VAC, 24 VAC/VDC
Input (multiple)	K, J, T, E, L, U, N, R, S, B, W, Pt100, 1 to 5 V, 0 to 5 V, 0 to 10 V, 4 to 20 mA, 0 to 20 mA
Outputs (multiple)	Pulse voltage outputs: 12 VDC, PNP Linear current outputs: 4 to 20 mA, 0 to 20 mA Relay outputs: Position proportional
Indication accuracy	Thermocouple: (±0.1% of PV or ±1°C, whichever is greater) ±1 digit max. Platinum resistance thermometer: (±0.1% of PV or ±0.5°C, whichever is greater) ±1 digit max. Current/voltage input: ±0.1% FS ±1 digit max.
Input resolution	0.01°C (Pt100)
Sampling period	50 ms per loop
Functions	Control type : Standard, heating/cooling, position proportional Control method : ON/OFF, 2-PID Tuning : Autotuning Setting related : SV limits, parameter protection, 8 banks Control related : Input compensation, digital input filter, input scaling, forward/reverse operation, run/stop control, manual output, SP ramp, MV limit, MV rate-of-change limit, MV when stopped, MV for error, SV tracking, special control (cascade, proportional) Calculation related : Square root calculation, broken-line approximation Communications : RS-485 (CompoWay/F or MODBUS)

Refer to the E5□R datasheet (H122) for more information.

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Note: Specifications subject to change without notice.

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OMRON

Rapid response:
50 ms

High Resolution:
0.01°C

Advanced Digital Controller

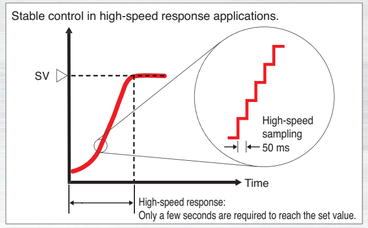
Rapid Response & High Resolution

E5□R Digital Controllers

Advanced Functions for Control

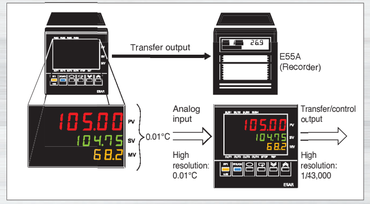
High-speed Sampling at 50 ms

The E5□R features high-speed sampling at 50 ms per loop, making it ideal for ceramic heater, flowrate, and pressure control. A square root function for flowrate control is available.



Resolution of 0.01°C with Platinum Resistance Thermometers

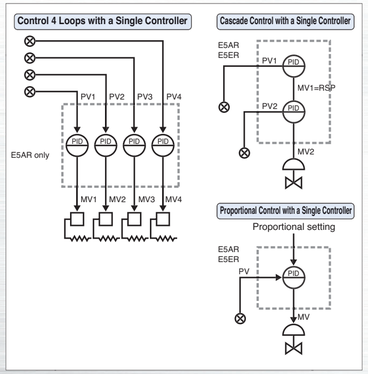
Analog inputs have a high accuracy of ±0.1%. The resolution when using platinum resistance thermometers is 0.01°C and is 1/43,000 for transfer and control outputs (between 4 and 20 mA). This allows measurements of temperature and humidity, fluctuation detection, and logging with environmental testing equipment to be performed at high resolution.



4 Loops in a Single Controller

The E5□R is available in 1-loop, 2-loop, and 4-loop analog input models. (See note.) The control mode can be selected from standard, heating/cooling, cascade, and proportional control with a single Controller using a software setting. (E5AR: 4 loops max.: E5ER: 2 loops max.) The ability to perform temperature, humidity, and pressure control for up to 4 loops contributes to cost reductions and panel downsizing.

Note: Models equipped with 4 analog inputs have dimensions of 96 x 96 mm (E5AR).



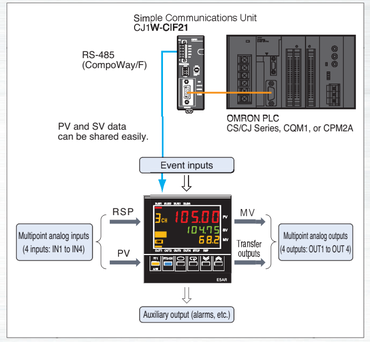
A Variety of I/O to Control with PLCs

Up to 6 Event Inputs
Event inputs allow the external control of bank selection (4 or 8), run/stop control, automatic/manual operation, the SV mode, and enabling/disabling writing via communications.

Up to 2 Transfer Outputs
The PVs, SVs, MVs (manipulated variables), and SP ramp monitor values can be output to other devices.

Up to 4 Auxiliary Outputs
Eleven types of alarms and input errors can be output to other devices.

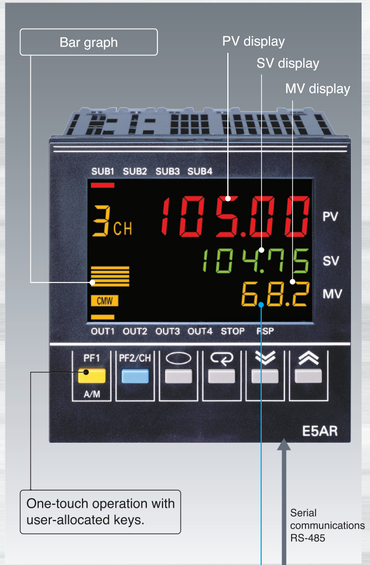
RS-485 Serial Communications
No programming is required to share PV and SV data with OMRON PLCs.



Convenient Display Features, Visual Clarity, and Easy Operation

LCD with 3 Lines of 5 Digits

In addition to the PV and SV, the MV (manipulated variable) is also displayed. You can watch the corresponding changes in the MV while making adjustments for PID control by changing the SV. An LCD is used for high visual clarity.



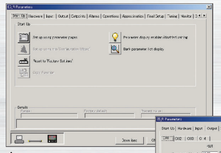
Bank Number Display
The bank number (0 to 7) can be displayed instead of the MV. Up to 8 sets of settings, including SVs and PID constants, can be stored. You can switch between these settings using either event inputs or a front panel key.

Example of Bank Number Display

Easy Setting with Thermo Tools Support Software

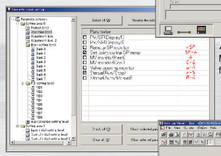
Initial settings can be performed easily from a computer (see note). In particular, when using more than one E5□R, downloading initial settings significantly reduces labor costs. You can mask unused parameters and settings can be exported as electronic documents (e.g., in CSV format) and printed if required.

Note: Only possible for Controllers with communications functions.



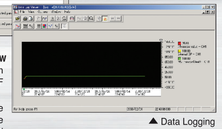
Easy Initial Setup

▲ Select the E5□R from a list of OMRON components (e.g., Temperature Controllers, Digital Panel Meters, Timers, and Counters).

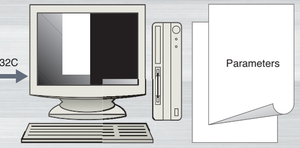


▲ Make initial parameter settings from a computer screen.

Parameter Mask Setting Window
Restrict parameter settings with the front panel keys with ON/OFF display settings.
Example: The display can be restricted only for the SV, alarm settings, and special parameters.



▲ Data Logging



Support Software for Easy Setting Thermo Tools (Sold Separately)
ESTT Support Software

Solve Application Problems with the E5□R

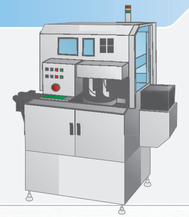
Rapid Response

Problem
Temperature controllers for rapid response equipment, such as ceramic heaters are required.

Solution
The E5□R Improves control performance with high-speed sampling (50 ms).

50 ms

Applications
- Bonding equipment
- Evaporation equipment
- Coil winding equipment



High Resolution

Problem
High-resolution temperature measurement/monitoring and fluctuation detection inside equipment are required.

Solution
The input resolution of the E5□R is 0.01°C with a platinum resistance thermometer.

0.01°C

Applications
- Semiconductor manufacturing equipment (exposure and air conditioning)
- Environmental testing equipment
- Vacuum furnaces
- Sterilization equipment
- Food processing equipment

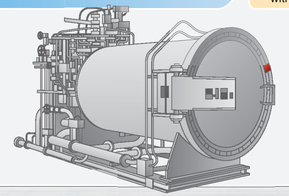
Multi-loop

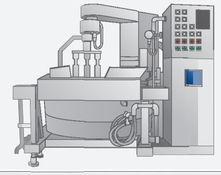
Problem
In a process control system, single-loop controllers have to be changed to a simple instrumentation system.

Solution
The E5□R supports 2- or 4-loop control, cascade control, or proportional control with a single contoroller.

Multi-loop

Applications
- Sterilization equipment
- Food processing equipment





E5□R

Digital Controllers That Deliver the R's - Rapid Response and High Resolution