

## SERIES FP21

- High Accuracy  $\pm 0.1\%$
- Programmable 9 Patterns and 9 Steps (81 Steps Max.)
- Auto-Tuning PID
- RA / DA Selectable
- User-Selectable Inputs (Thermocouple)
- User-Selectable Ranges
- Programmable Scaling (DC mV, DC mA)
- User-Friendly Operation (Menu-Driven)
- Universal Power Supply (90~264V AC)
- Interface RS-422A / RS-232C
- 96 (H)  $\times$  96 (W)  $\times$  140 (D) mm (Panel Depth: 125mm)



### SPECIFICATIONS

Display:	
Digital Display:	7-segment LED PV (Process value) = Red LED (14.3mm high) SV (Set value) = Green LED (10.0mm high) PTN and STP = Green LED (10.0mm high)
LCD Display:	16 Alpha-Numerical $\times$ 2 Lines (with backlight)
Display Tolerance:	$\pm (0.1\% + 1 \text{ digit})$ / standard accuracy at $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$
Display Resolution:	Scaling-dependent (0.1 or 1)
Input:	
Thermocouples: (User-Selectable) :	B, R, S, K, E, J, T, N, PL II, PR40-20, WRe5-26, U and L (DIN 43710) -Multi-range External resistance = $100\Omega$ max. Input impedance = $500\text{k}\Omega$ min. Burnout circuit = Standard feature (Up-scale)
R.T.D.:	Pt100-JIS / DIN - Multi-range Lead wire tolerable range = $5\Omega$ max. / wire Amperage=1mA
DC Voltage (User-Selectable) :	-10~10mV, 0~10mV, 0~20mV, 0~50mV, 10~50mV, 0~100mV or -1~1V, 0~1V, 0~2V, 0~5V, 1~5V, 0~10V DC - Programmable range Input impedance= $500\text{k}\Omega$ min.
DC Current (user-Selectable) :	4~20mA and 0~20mA DC - Programmable range Receiving impedance= $250\Omega$
Sampling Cycle:	0.25 sec.max.
PV Bias:	0~ $\pm 999$ unit
Digital Filter:	0~200 times (input sampling setting)

Control:	
Control Mode:	Auto-tuning PID Proportional band (PB) = 0.1~999.9% / FS Integral time (IT) = 1~6000 sec. Derivative time (DT) = 0~3600 sec. (PI mode at 0 setting)
Auto / Manual Selection:	Balanceless bumpless
Manual Control Range:	-10.0~110.0% (resolution = 0.1%)
Control Outputs:	Contact (Y) = 240V AC 2.5A / Resistive load, 1A / Inductive load Current (I) = 4~20mA DC, Load resistance: 600Ω max. RA / DA Voltage (V) = 0~10V DC, Load current: 2mA max. RA / DA SSR voltage (P) = 15V DC 20mA / Output rating
Proportional Cycle:	1~120 sec. variable (Y and P onl y)
Alarm:	
Alarm Mode:	Two individual alarms can be set independently from High Limit, Low Limit, High Deviaton, Low Deviation and Absolute Deviation, etc.
Alarm Setting:	By front key switch
Alarm Setting Range:	Deviation = High limit / 0~999, Low limit / -999~0 Absolute = Within measuring range for both high limit and low limit Absolute deviation = 0~999
Alarm Output Rating:	Contact / 240V AC, 2.5A / Resistive load. 1A / Inductive load
Alarm Sensitivity:	0.1~5.0% of measuring range
Inhibit / Non-inhibit:	Individual setting for AL1 and AL2
Program Pattern Control:	
Setting Method:	Local setting (by front key), remote setting available by interface function (option)
No.of Patterns:	9 max.
No.of Steps:	9 / pattern
No.of Memory Steps:	81 max.
Pattern Repeat:	9999 times max.
Pattern Link:	9 patterns max.
Pattern Link Repeat:	999 times max.
Program Setting Range:	Same as measuring range
Time 1:	0~99hr. and 59 min./ step
Time 2:	0~99 min. and 59 sec./ step
Ramp Setting:	Automatic calculation
Range Setting Resolution:	0.1 or 1
Time Setting Resolution:	1 min. or 1 sec.
Optional Functions:	
Analog Output:	2 outputs, one each for PV and SV
Analog Output Signal:	0~10V DC, Max.load current: 2mA max. 0~10mV DC, Output resistance: 10 Ω 4~20mA DC, Load resistance: 500 Ω max.
Analog Output Accuracy:	±0.1% FS vs. display
Analog Output Resolution:	0.01% FS, max.
Interface Signal:	RS-232C and / or RS-422A
Interface Speed:	1200, 2400 or 4800 bps selectable
Data Bit:	7-bit
Stop Bit:	1-bit
General Specifications:	
Memory Protection:	Non-volatile memory protection
Operating Ambient Temperature Range:	-10~50°C
Operating Ambient Humidity:	90% RH max.
Power Supply:	100~240V AC, 50 / 60Hz
Power Consumption:	Approx. 17VA
Insulation Resistance:	500V DC 20MΩ between input terminal and power supply terminal 500V DC 20MΩ between power supply terminal and ground terminal
External Dimensions:	96 (H) × 96 (W) × 140 (D) mm (panel depth 125mm)
Panel Thickness:	1.0~3.5mm
Panel Cutout:	92 (H) × 92 (W) mm (+0.8 / -0mm)
Installation:	Push-in panel (no mounting hardware necessary)
Weight:	Approx. 750g

# PROGRAMMABLE CONTROLLER

## ORDERING INFORMATION

ITEMS		CODE	SPECIFICATIONS
SERIES	FP21-		MPU-Based Auto-Tuning Programmable Controller, DIN 96 × 96mm
INPUT	1		Thermocouples, User-selectable inputs and ranges
	2		R. T. D. (Pt100), User-selectable ranges
	3		DC voltage, User-selectable -10~10, 0~10, 0~20, 0~50, 10~50, 0~100mV linear inputs and ranges
	4		DC current, User-selectable 4~20, 0~20mA linear inputs and ranges
	6		DC voltage, User-selectable -1~1, 0~1, 0~2, 0~5, 1~5, 0~10V linear inputs and ranges
	CONTROL OUTPUT	Y-	
I-			Current: 4~20mA DC, Load resistance: 600Ω max. ( Factory-set = RA)
P-			SSR voltage: PC 1~120 sec. variable, Output rating: 15V DC / 20mA max.
V-			Voltage: 0~10V DC, MAX. load current: 2mA max. ( Factory-set = RA)
ANALOG OUTPUT (TRANSMISSION)	00		None
	13		1-output, Voltage: 0~10mV DC / Output resistance: 10Ω
	14		1-output, Current: 4~20mA DC / Output resistance: 500Ω max.
	16		1-output, Voltage: 0~10V DC / Load current: 2mA max.
	23		2-output, Voltage: 0~10mV DC / Output resistance: 10Ω
	24		2-output, Current: 4~20mA DC / Load resistance: 500Ω max.
	26		2-output, Voltage: 0~10V DC / Load current: 2mA max.
INTERFACE	0		None
	6		RS-422A
	7		RS-232C
PLUG CORD FOR EXTERNAL I / O	0		None
	1		24-pin plug w / 1m wire
REMARKS	0		Without
	9		With (Please consult before ordering.)

## STANDARD RANGE & USER-PROGRAMMABLE SCALING

Since the Series FP21 has been designed for user-selectable inputs, user-selectable ranges and user-programmable scaling, the unit will be shipped with one factory-set standard range.

If a range selection other than the standard is required, user-selectable inputs (T / C's) and user-selectable ranges (T / C's and R.T.D.) are available as listed below at the specific application.

### Standard Range (Factory-Set When Shipped)

Input	Standard / Rating	Range
1 Thermocouple	JIS (K)	0~800.0°C
2 R.T.D.	JIS Pt100	0~200.0°C
3 DC Voltage	0~10mV	0~100.0%
4 DC Current	4~20mA	0~100.0%
6 DC Voltage	0~10V	0~100.0%

\* 1 = Effective range: 400~1800°C (750~3300°F)

\* 2 = Not our standard accuracy

### User-Selectable Range (Thermocouple and R.T.D.)

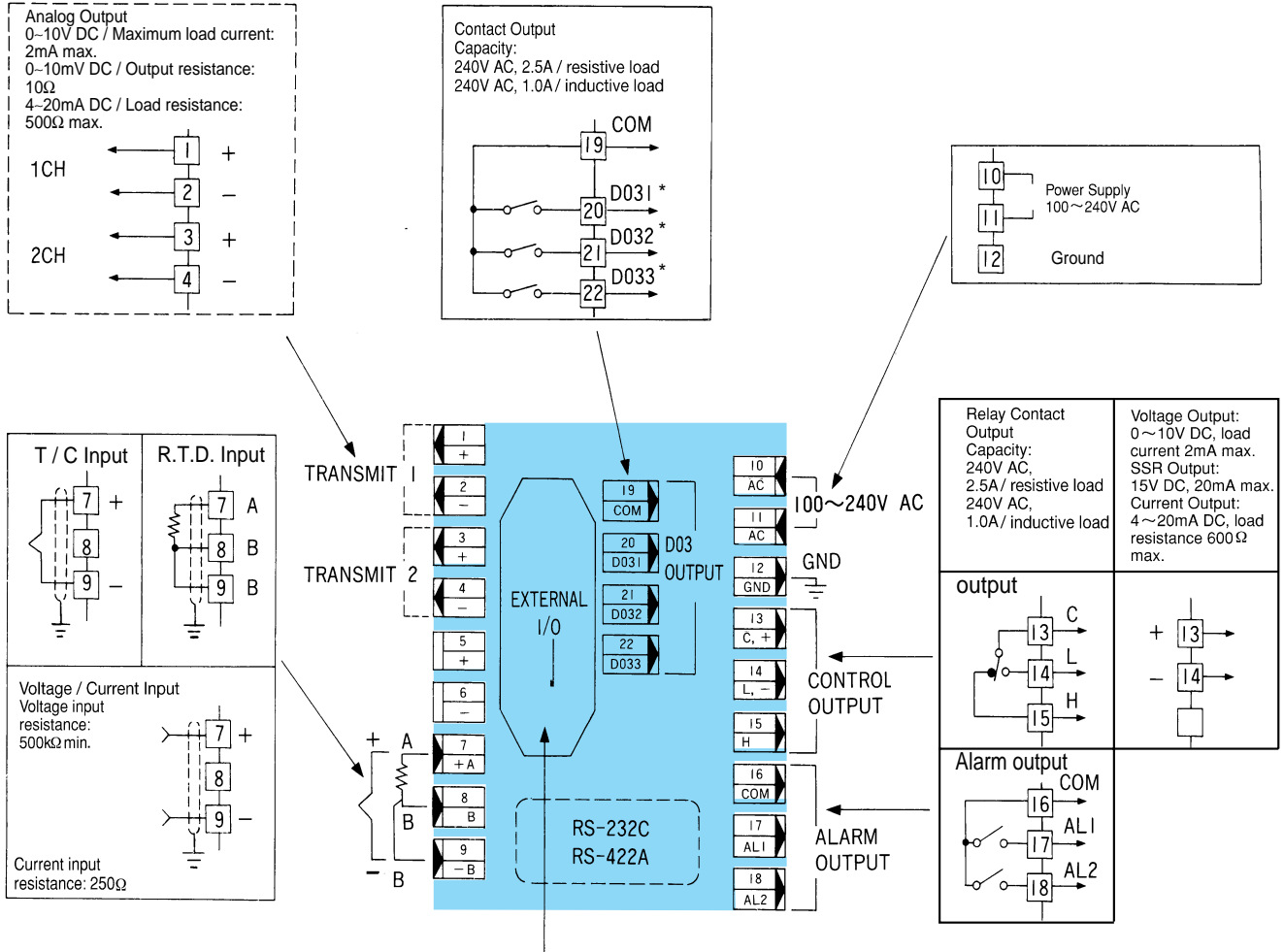
INPUT	TYPE	JIS ANSI	DIN	OTHERS	°C	°F
THERMOCOUPLES	T	○	○		-199.9 ~ 200.0	-300 ~ 400
	J	○	○		0 ~ 600.0	0 ~ 1100
	E	○	○		0 ~ 700.0	0 ~ 1300
	K	○	○		-100.0 ~ 400.0	-150 ~ 750
	K	○	○		0 ~ 800.0	0 ~ 1500
	K	○	○		0 ~ 1200	0 ~ 2200
	N			○	0 ~ 1300	0 ~ 2300
	PL II			○	0 ~ 1300	0 ~ 2300
	R	○	○		0 ~ 1700	0 ~ 3100
	S	○	○		0 ~ 1700	0 ~ 3100
	B *1	○	○		0 ~ 1800	0 ~ 3300
	PR40-20			○	0 ~ 1800	0 ~ 3300
	WRe5-26			○	0 ~ 2300	0 ~ 4200
	U (DIN 43710)			○	-199.9 ~ 200.0	-300 ~ 400
L (DIN 43710)			○	0 ~ 600.0	0 ~ 1100	
P.T.D. (Pt100)	Pt100	○	○		-199.9 ~ 600.0	-300 ~ 1100
	Pt100	○	○		-100.0 ~ 100.0	-150.0 ~ 200.0
	Pt100	○	○		-100.0 ~ 300.0	-150.0 ~ 600.0
	Pt100	○	○		-40.0 ~ 60.0	-40.0 ~ 140.0
	Pt100 *2	○	○		0.00 ~ 50.00	0 ~ 120.0
	Pt100	○	○		0 ~ 100.0	0 ~ 200.0
	Pt100	○	○		0 ~ 200.0	0 ~ 400.0
	Pt100	○	○		0 ~ 500.0	0 ~ 1000

### User-Programmable Scaling

DC Voltage and DC Current Inputs

For DC voltage and DC current inputs, user programmable scaling is available with a scaling range of-1999~9999 digits.

TERMINAL ARRANGEMENT



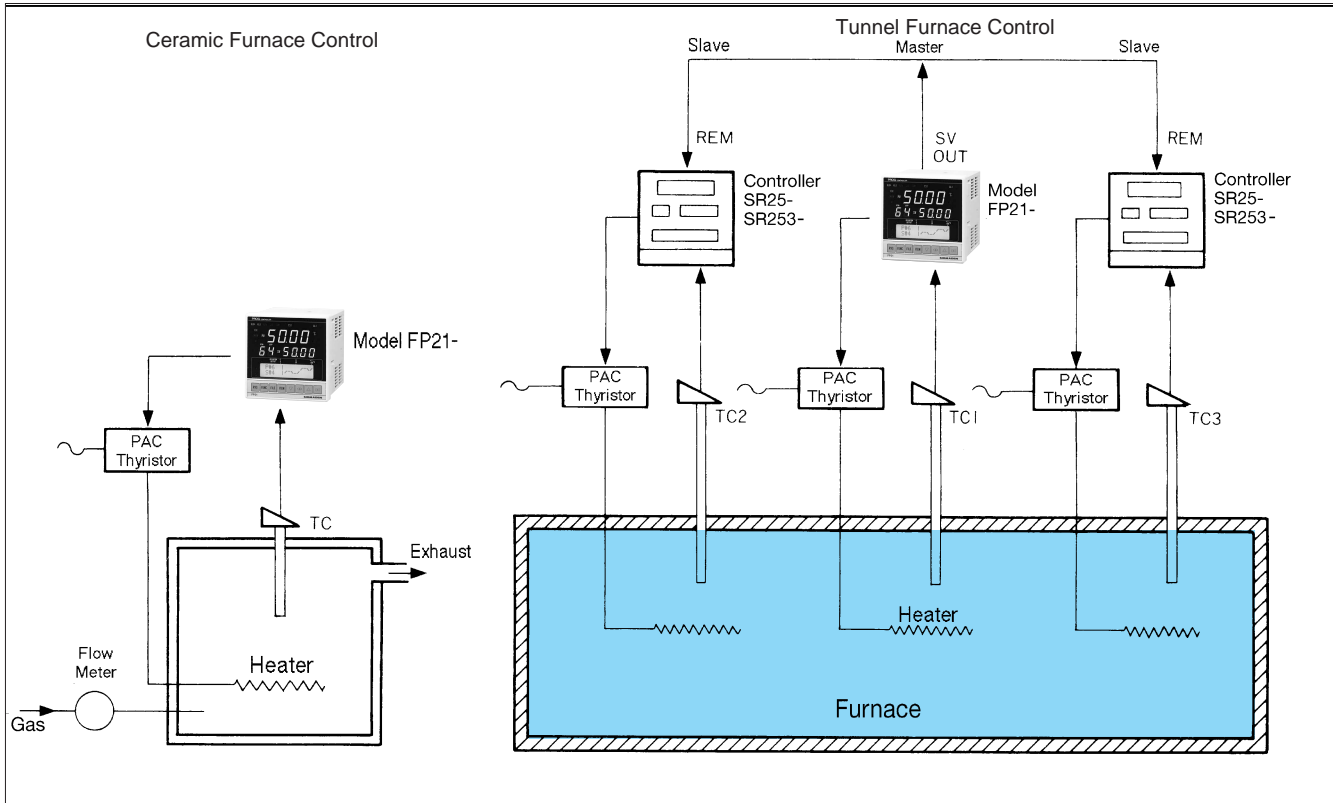
Status Output	External Contact Input / Output (24-pin)		External contact Input
	OUTPUT		INPUT
OUT PUT D01 (Open Collector Output) Max 5mA Max 24V DC On Voltage ≤ 0.6V	24 DO-COM	DI-COM (12)	Non-Voltage Contact: Max 2mA Max 5V DC when AT selected BIN CODE =Level Input =Edge Input
	23 DO17 (GUA)	(RUN) DI 18 (11)	
	22 DO16 (ADV)	(HLD) DI 17 (10)	
	21 DO15 (HLD)	(ADV) DI 16 (9)	
	20 DO14 (RUN or RST)	(SEL16 or AT) DI15 (8)	
	19 DO13 (FIX)	(SEL8) DI 14** (7)	
	18 DO12 (MAN)	(SEL4) DI 13** (6)	
	17 DO11 (AT)	(SEL2) DI 12** (5)	
	16 D023 *	(SEL1) DI 11** (4)	
	15 D022 *	(3)	
OUT PUT D02 (Open Collector Output) Max 50mA Max 24V DC On Voltage ≤ 1.5V	14 D021 *	(2)	
	13	(1)	

\* On Terminals DO21, DO22, DO23, DO31, DO32, DO33, only one each Status Signal comes out selected from TS1, TS2, TS3, TS4, SO, RUN, END, EXT

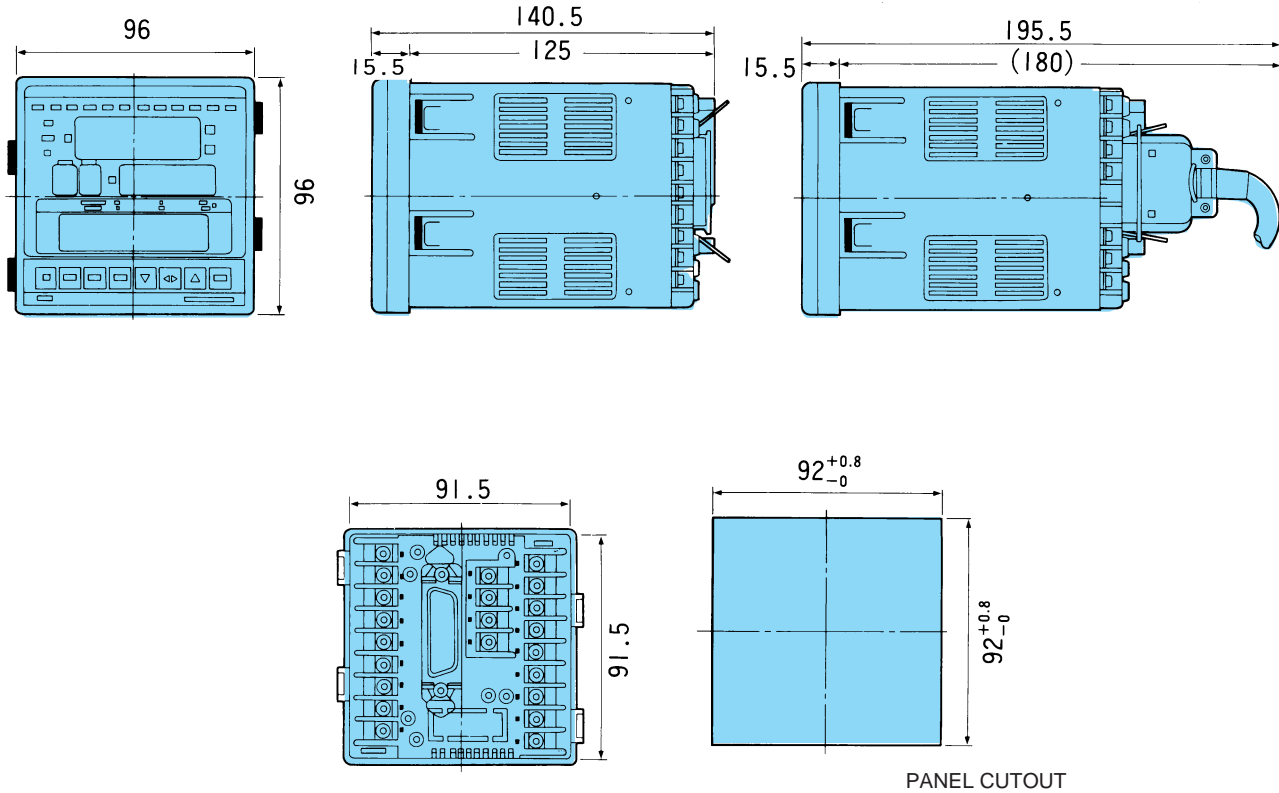
\*\* SEL1, SEL2, SEL4, SEL8 (SEL16) BIN Code Input

# PROGRAMMABLE CONTROLLER

## APPLICATION EXAMPLE



## EXTERNAL DIMENSIONS



PANEL CUTOUT

Unit: mm