

# DF Series

## Economical digital temperature controller

- Proportional control or ON/OFF control
- Simple temperature setting
- Auxiliary output setting (SUB)
- Clear digital indication
- Simple 8 pin socket type (DF4)



### ●● Suffix code

Model	Code					Description
DF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Economical digital temperature controller
Dimension	2					48(W) X 96(H) mm
	4					48(W) X 48(H) mm (socket type, 8 pin)
Control type	F					ON/OFF control
	P					Proportional control
Input	K					K thermocouple
	J					J thermocouple
	D					RTD KPt100 Ω
	P					RTD Pt100 Ω (IEC)
	V					1 – 5 V DC
	C					4 – 20 mA DC
Control output	M					Relay
	C					Current output (4 – 20 mA DC)
	S					SSR (voltage pulse output, 12 V DC)
Auxiliary output (SUB) ※ only with DF2	N					None
	O					High deviation
	P					Low deviation
	W					High/Low deviation
Control action (internal selection)	R					Reverse action (heating control)
	D					Direct action (cooling control)
Range code						Refer to the range and input code

※ Model DF4 selects proportional control/ON-OFF control by using internal deep switch.

※ Model DF4 requires displaying voltage power such as for 220V and for 110V.

## ● Specification

### Input

Thermocouple	K, J
RTD input	KPt100 $\Omega$ , Pt100 $\Omega$
DC rated voltage	1 – 5 V DC, 4 – 20 mA DC
Input sampling time	500 ms
Input display resolution	Usually less than 1 $^{\circ}\text{C}$
Input impedance	Thermocouple and DC voltage input (mV) : min 1 M $\Omega$ , DC voltage input (V) : approx. 1 M $\Omega$
Allowable signal source resistance	Thermocouple (max 250 $\Omega$ ), DC voltage (max 2 k $\Omega$ )
Allowable wiring resistance	RTD max (10 $\Omega$ however resistance among 3 wires should be same)
Allowable input voltage	Within $\pm 10$ V (thermocouple, RTD, DC voltage (mV)), within $\pm 20$ V (DC voltage(V))
Input compensation	Due to the internal volume
Cold junction compensation error	$\pm 2.0$ $^{\circ}\text{C}$ (0 ~ 50 $^{\circ}\text{C}$ )

### Performance

Display accuracy	$\pm 1$ % of FS $\pm 1$ Digit
Insulation resistance	Min 20 M $\Omega$ (500 V DC)
Dielectric strength	2,000 V AC, 50 / 60 Hz, for 1 min (between the different recharging terminal from each other)

### Control function and output

Control type	Proportional control and ON/OFF control (selected by suffix code)
Control action	Reverse action or direct action (selected by suffix code)
Range setting	Same as the range and input code
Proportional band	1 ~ 10 % of FS
Manual reset(M.R)	$\pm 3$ % of mV (amount of output)
Proportional cycle	Approx. 20 sec (relay output), approx. 2 sec (SSR output)
Hysteresis	0.2 % fixed (when performing ON/OFF control)
Input signal break detection	Output become OFF when exceeding 10 $^{\circ}\text{C}$ of range limit
Auxiliary output (SUB)	By suffix code (only with Model DF2)
Auxiliary output setting range	Within the range
Auxiliary output hysteresis	Fix 1 $^{\circ}\text{C}$

### ● Output

Control output	Relay	Contact capacity : 1 C, 250 V AC, 3 A (resistive load)
	SSR	Approx. more than 12 V DC (resistive load min 800 $\Omega$ )
	Current	4 – 20 mA DC (resistive load max 600 $\Omega$ )
Alarm output	Relay	Contact capacity : 1 C, 250 V AC, 3 A (resistive load)



General specification

Model	DF2	DF4(8 pin type)
Power Supply Voltage	110 / 220 V AC, 50 / 60 Hz	220 V AC, 110 V AC, 50 / 60 Hz. (Order separately)
Voltage fluctuation	±10 % of the Power Supply Voltage	
Power consumption	3 VA max	
Ambient temperature/humidity	0 ~ 50 °C, 35 – 85 % RH (without dew condensation)	
Storage temperature	-25 ~ 65 °C	
Vibration	10 – 55 Hz, peak amplitude 0.76 mm for 2 min each in 3 axis direction	
Shock	300 $\frac{m}{s^2}$ , to the direction 6 each 3 times	
Weight	Approx. 450g	Approx. 200g

※ Power supply voltage for DF4 is divided into 110 V and 220 V

Range and input code

Classification	Code	DF2		DF4 / DF4T	
		Input type	Range (°C)	Input type	Range (°C)
Thermocouple	4	K, J	-	K, J	0 ~ 199
	5		0 ~ 199		0 ~ 299
	6		0 ~ 299		0 ~ 399
	7		0 ~ 399		0 ~ 599
	8		-		K
RTD	1	Pt100 Ω	-99 ~ 99	Pt100 Ω	-
	2		-		-99 ~ 99
	3		-		0 ~ 99
	4		0 ~ 99		0 ~ 199
	5		0 ~ 199		0 ~ 299
	6		0 ~ 299		0 ~ 399
	7		0 ~ 399		-
DC voltage	-	1 – 5 V DC	0 ~ 99	1 – 5 V DC	0 ~ 99
DC current	-	4 – 20 mA DC	0 ~ 99	4 – 20 mA DC	0 ~ 99

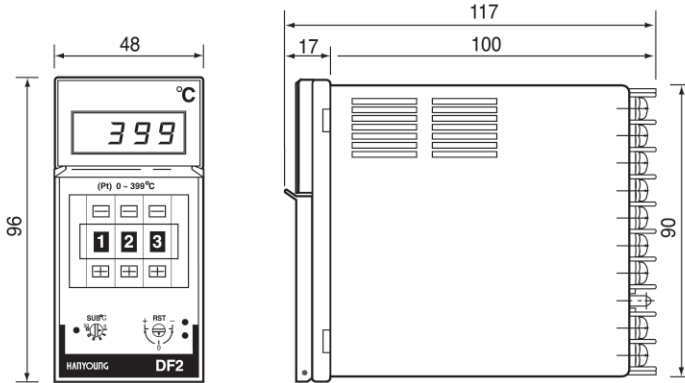
A

Temperature  
Controller

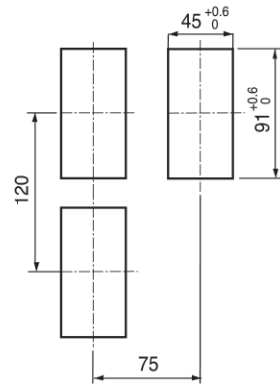
Dimension and panel cutout (Unit : mm)

DF2

● Dimension

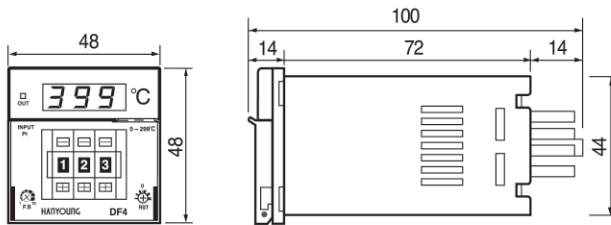


● Panel cutout

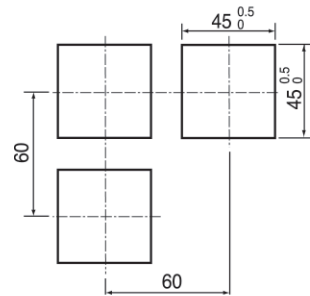


DF4

● Dimension

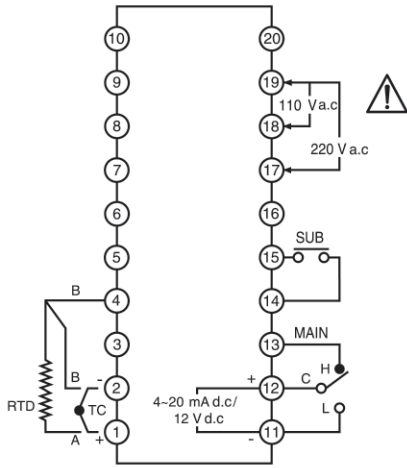


● Panel cutout

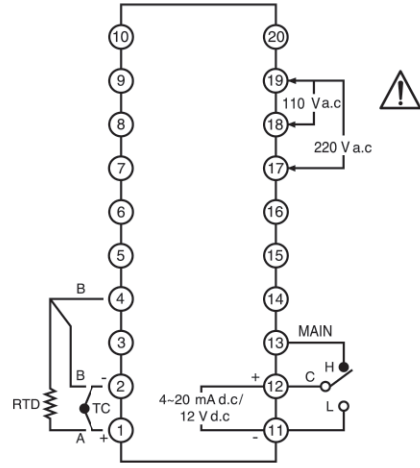


●● Connection diagram

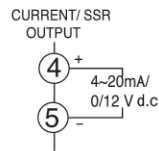
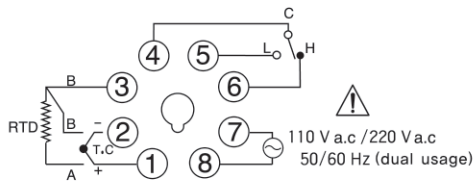
■ DF2 (alarm output built in)



■ DF2



■ DF4



※ Power supply voltage is divided into 110 V and 220 V.