

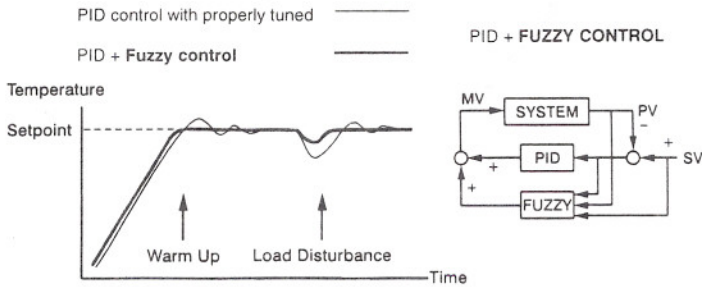
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1. INTRODUCTION

This manual contains information for the installation and operation of the **KERONICS** model **KF48** Fuzzy Logic micro-processor based controller.

The **Fuzzy Logic** is an essential feature of this versatile controller. Although PID control has been widely accepted by industries, yet it is difficult for PID control to work with some sophisticated systems efficiently, for examples systems of second order, long time-lag, various setpoints, various loads, etc. Because of disadvantage of controlling principles and fixed values of PID control, it is inefficient to control the systems with plenty of varieties, and the result is obviously frustrating for some systems. The **Fuzzy Logic** control can overcome the disadvantage of PID control, it controls the system in a efficient way by experiences it had before. The function of **Fuzzy Logic** is to adjust the PID values indirectly in order to making the manipulation output value MV adjusts flexibly and quickly adapt to various processes. By this way, it enables a process to reach its predetermined setpoint in the shortest time with minimum overshooting during tuning or external disturbance. Different from PID control with digital information, the **Fuzzy Logic** is a control with language information.



in addition, this instrument has functions of single stage ramp and dwell, auto-tuning and manual mode execution. Ease of use is also an essential feature with it.

2. NUMBERING SYSTEM

Model No. -
(1) (2) (3) (4) (5) (6)

(1) Power Input

4	90-264VAC
5	16-48VDC/12-36VAC
9	Other

(2) Signal Input

M	Configurable (Universal)
9	Other

(3) Output 1 Option

N	None
R	Relay rated 5A/240VAC resistive
S	SSR Drive rated 20mA/24V
A	4-20mA linear, max. load 500 ohms (Module OM91-1)
B	0-20mA linear, max. load 500 ohms (Module OM91-2)
C	0-10V linear, min. impedance 500K ohms (Module OM91-3)
9	Other

(4) Output 2 Option

N	None
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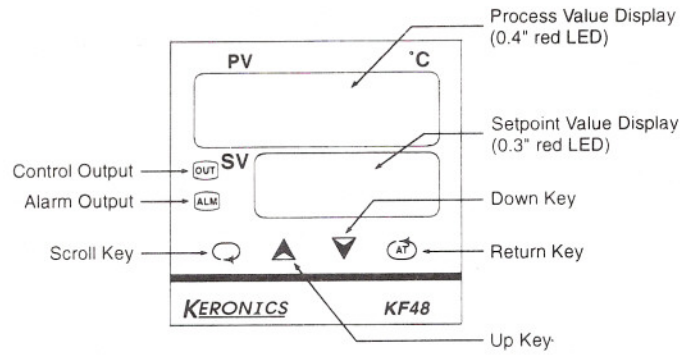
(5) Alarm Option

N	None
S	Relay rated 2A/240VAC resistive
9	Other

(6) Communication

N	None
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3. FRONT PANEL DESCRIPTION



4. INPUT RANGE & ACCURACY

IN	Sensor	Input Type	Range (°C)	Accuracy
0	J	Iron-Constantan	-50 to 999 °C	±2 °C
1	K	Chromel-Alumel	-50 to 1370 °C	±2 °C
2	T	Copper-Constantan	-270 to 400 °C	±2 °C
3	E	Chromel-Constantan	-50 to 750 °C	±2 °C
4	B	Pt30%RH/Pt6%RH	300 to 1800 °C	±3 °C
5	R	Pt13%RH/Pt	0 to 1750 °C	±2 °C
6	S	Pt10%RH/Pt	0 to 1750 °C	±2 °C
7	N	Nicrosil-Nisil	-50 to 1300 °C	±2 °C
8	RTD	PT100 ohms (DIN)	-200 to 400 °C	±0.4 °C
9	RTD	PT100 ohms (JIS)	-200 to 400 °C	±0.4 °C
10	Linear	-10mV to 60mV	-1999 to 9999	±0.05%

5. SPECIFICATIONS

INPUT

Thermocouple (T/C):	type J, K, T, E, B, R, S, N.
RTD:	PT100 ohm RTD (DIN 43760/BS1904 or JIS)
Linear:	-10 to 60mV, configurable input attenuation
Range:	User configurable, refer to Table above
Accuracy:	Refer to Table above
Cold Junction Compensation:	0.1 °C / °C ambient typical
Sensor Break Protection:	Protection mode configurable
External Resistance:	100 ohms max.
Normal Mode Rejection:	60dB
Common Mode Rejection:	120dB
Sample Rate:	3 times / second

CONTROL

Proportion Band:	0-200 °C (0-360 °F)
Reset (Integral):	0-3600 seconds
Rate (Derivative):	0-1000 seconds
Ramp Rate:	0-200.0 °C / minute (0-360.0 °F / minute)
Dwell:	0-3600 minutes
ON-OFF:	With adjustable hysteresis (0-20% of SPAN)
Cycle Time:	0-120 seconds
Control Action:	Direct (for cooling) and reverse (for heating)

POWER

Rating:	90-264VAC, 50/60Hz
Consumption:	Less than 5VA

ENVIRONMENTAL & PHYSICAL

Operating Temperature:	-10 to 50 °C
Humidity:	0 to 90% RH (non-condensing)
Insulation:	20M ohms min. (500 VDC)
Breakdown:	AC2000V, 50 / 60Hz, 1 minute
Vibration:	10-55Hz, amplitude 1mm
Shock:	200 m / s ² (20g)
Net Weight:	170 grams
Housing Materials:	Poly-Carbonate Plastic
Safety:	Complied with UL, CSA