USER'S OPERATING MANUAL FOR PID DIGITAL TEMPERATURE CONTROLLER

(Models: Fx - 438 / 738 / 938 / 638 / 838)

Fx - 438
(48 X 48)

Fx - 738
(72 X 72)

Fx - 938
(96 X 96)

Fx - 638
(96 X 48)

Fx - 838
(48 X 96)

SPECIFICATIONS : -

1. DISPLAY TYPE : 8 - Digit 7 segment LED

Model no.	Fx-438	Fx-738	Fx-938	Fx-638	Fx-838	Display Colour
Display height (PV)	0.60"	0.70"	0.80"	0.60"	0.60"	White
Display height (SV)	0.36"	0.60"	0.56"	0.36"	0.36"	Green

2. STATUS LED'S :1 : Control Output Status
2 : Output 2 Status
3 : Output 3 Status
R : Re-Transmission Status
S : Soak Time Status
T : Tune Status

3. INPUT
Sensor Input : TC-J,K,R,S,N,T,B & RTD (PT-100)
Analog Input : 0 - 20mA, 4 - 20mA, 0 - 1VDC, 0 - 5VDC, 0 - 3.3VDC, 0 - 10VDC (Selectable)
Range : -1999 to 9999 (Analog Input Only)
Resolution : 0.001, 0.01, 0.1 & 1°C (Selectable for Analog Input only)
Sampling Time : 125 msec.
Resolution : 1°C
CJC for TC : Built in automatic
LWC for Pt-100 : Built in up to 18E max.
Digital Filter : 1 to 10 Sec.

4. RELAY OUTPUT
Contact type : N/O, COM
Contact Rating : 5A @ 250VAC or 30 VDC
Life expectancy : > 5,00,000 operations
Isolation : Inherent

5. SSR DRIVE OUTPUT
Drive Capacity : 12V @ 30mA.
Isolation : Non-Isolated.

6. FUNCTION
Output 1 : Main Control output (Factory Set)
1) Relay 2) SSR
3) mA (4~20 / 0~20)
Output 2 : Programmable
1) Auxiliary control 2) Alarm
3) None
Output 3 : 1)Auxiliary Control 2) Alarm
3) Soak Timer 4) None
Control Action : ON-OFF/PID (Select)
Control Mode : Heat/Cool (Select)

7. ENVIRONMENTAL
Operating Range : 0 ~50°C, 5~90% Rh
Storage Humidity : 95% Rh (Non-condensing)

8. POWER SUPPLY
Supply Voltage : 90~270VAC, 50/60Hz.
Consumption : 4W Maximum.

9. PHYSICAL
Housing : ABS Plastic

INSTALLATION GUIDELINES

1. Prepare the cut-out with proper dimension as shown in figure.
2. Remove clamp from Controller.
3. Push the Timer through panel cut-out and secure the Controller in its place by tightening the side clamp.

SAFETY INSTRUCTION

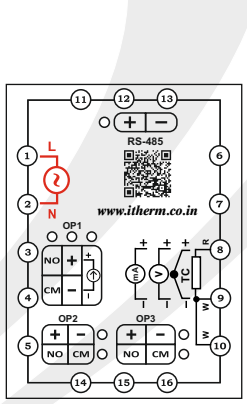
MECHANICAL

❖ Ambient temperature and relative humidity surrounding the Controller must not exceed the maximum specified limits.
❖ The Controller in its installed state must be protected against excessive electrostatic or electromagnetic interferences.

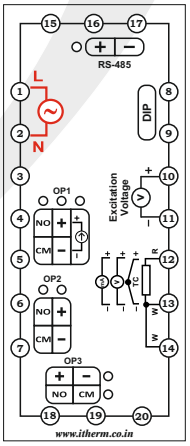
ELECTRICAL

❖ The Controller must be wired as per wiring diagram & it must comply with local electrical regulation.
❖ The Electrical noise generated by switching inductive loads might create momentary Fluctuation in display, latch up, data loss or permanent damage to the instrument. To reduce this use snubber circuit across the load.

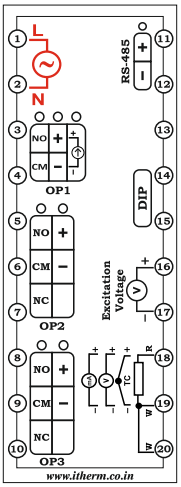
TERMINAL CONNECTIONS :



Fx - 438



Fx - 738



Fx - 638/838/938

PROGRAMMING

Press and Hold SET & UP Key Simutaneously for 3 Sec.

Configuration

Display	Default	Parameter Name	Range
LOCP	15	Lock Code	1 ~ 9999
InPt	J	Input Type	Refer Table 1
OP it	0-20	mA Output Type	0-20 ~ 4-20 mA
ānFn	Ctrl	mA Function	Control, Retransmitter
rELo	0	Re-Tx Low Value	-1999 ~ rE.Hi
rEHi	1200	Re-Tx High Value	rE.Lo ~ 9999
CLO	16.70	mA Low Calibration	0 ~ 99.99
CHO	85.50	mA High Calibration	0 ~ 99.99
dānA	YES	mA Default	Yes, No
rESL	0	Resolution	0, 0.0, 0.00, 0.000
LSPL	0	Lower SP Limit	Refer Table 1
HSPL	400	Higher SP Limit	Refer Table 1
Ai Lo	0	Analog Input Low Value	Refer Table 2
Ai Hi	9999	Analog Input High Value	Refer Table 2
OFSt	0	Process Value Offset	Refer Table 2
FLtr	6	Input Filter	1 ~ 10
ānOdE	PId	Control Mode	PID, On Off
OP iL	HEAt	Control Logic For OP1	Heat, Cool, HT.CL
OCP	dSbL	Overshoot Control Point	0 ~ 100
rAtE	EnbL	Ramp Rate	Enable , Disable
tunE	EnbL	Auto tTune	Enable , Disable
SP1	EnbL	Setpoint 1	Enable , Disable
OP2ā	EnbL	Output 2 Mode	Enable , Disable
OP2C	15.0	Output 2 Control	00.0 ~ 40.0 °C
OP2	AUCn	Output 2 Function	None, Aux, Alarm
SP2	AbS	OP2 Mode	Absolute, Deviation

A

Configuration

Display	Default	Parameter Name	Range
OP2L	HEAt	OP2 Logic	Heat, Cool
SP2	EnbL	Setpoint 2	Enable , Disable
A1ty	LOY	Alarm Type 1	Low, High, LO.DV HI.DV, Band
A1LG	dir	Alarm 1 Logic	Direct, Reverse
A1iH	YES	Alarm 2 Inhibit	Yes, No
A1AP	AUtO	Alarm 2 ACK.	Auto, Manual, Both
A1SP	EnbL	Alarm 2 Set Point	Enable , Disable
OP3	AUCn	Output 3 Function	None, Aux, Alarm, Soak, AL.ST
SP3	AbS	Setpoint 3	Absolute, Deviation
OP3L	HEAt	Output Logic 3	Heat, Cool
SP3	EnbL	Setpoint 3	Enable , Disable
A2ty	LOY	Alarm 2 Type	Low, High, LO.DV HI.DV, Band
A2LG	dir	Alarm 2 Logic	Direct, Reverse
A2.iH	nO	Alarm 2 Inhibit	Yes, No
A2AP	AUtO	Alarm 2 ACK.	Auto, Manual, Both
A2SP	EnbL	Alarm 2 Set Point	Enable , Disable
SPES	both	End Of Soak Strategy	None, H.off, Al.on, Both
SPtb	nnnn	Time Base Soak Timer	MM.SS, MMMM, HH.MM, HHHH
St.dr	UP	Direction For Soak Time	Up, Down
SPrS	YES	Reset Running Soak Time	Yes, No
SPnd	nod2	Timer Start Mode	Mod1, Mod2, Mod3, Mod4
duid	1	Device ID	1 ~ 255
bAUd	9600	Baud Rate	9600, 1920, 3125, 3840, 7680
PAr	o_81	Parity	n_81, n_82, o_81, o_82, E_81, E_82
LdSP	tOGL	Lower Display Message	Toggle, Setpoint, Timer
ULOC	15	User Lock Code	1 ~ 9999

Press and Hold SET & DOWN Key Simutaneously for 3 Sec.

Control List

Display	Default	Parameter Name	Range
LOCP	15	Lock Code	1 ~ 9999
Pb	5.0	Proportional Band	0.5 ~ 99.9 °C
Int	240	Integral Time	0 ~ 3600 Sec.
dt	60	Derivative Time	0 ~ 300 Sec.
CYCt	16.0	Cycle Time	1.0 ~ 100.0 Sec.
Pān	YES	Manual Power	Yes, No
OUtL	100.0	Output Power Limit	0.0 ~ 100.0 %
SStā	50	Soft Start Time	5 Sec. ~ 300 Sec.
OPOF	dSbL	Output Off	0 ~ 10
tOFS	100	Tune Offset	50.0 ~ 100.0 %
HY1	2	Control Hysterisis	Refer Table 2
dLY1	0	Delay 1	0 ~ 500 Sec.
HY2 ★	2	Hysteresis 2	Refer Table 2
dLY2	0	Delay 2	0 ~ 500 Sec.
HY3 ⊗	2	Hysteresis 2	Refer Table 2
dLY3	0	Delay 3	0 ~ 500 Sec.
GAP1	0.0	Gap 1	-9.9 ~ 9.9 °C
GAP2	0.0	Gap 2	-9.9 ~ 9.9 °C
St.dL	10	Soak Time Delay	0 ~ 99 °C
St.bd	0.0	Soak Band	0.0 ~ 99 °C

Press & Hold Shift Key for 3 Sec. in Run Mode

Press SET Key Once in Run Mode

User List

Display	Default	Parameter Name	Range
SP1	0	Control Setpoint	LSPL ~ HSPL
SP2	0	Setpoint 2	LSPL ~ HSPL
SP3	0	Setpoint 3	LSPL ~ HSPL
rAtE	5.0	Ramp Rate	0.0 ~ 25.0 °C
Pān	50	Manual Power	0.0 ~ 100.0
OP2ā	AUtO	OP2 Mode	On, Off, Auto
A1SP	0	Alarm Set Point	LSPL ~ HSPL 2 ~ 99 °C
A2SP	00.30	Alarm 2 Set Point	LSPL ~ HSPL 2 ~ 99 °C
Stta	00.30	Soak Time	1 Sec ~ 9999 Hrs.
ā in	30	Minute Elapsed	—

Auto Tunning Mode

Display	Default	Parameter Name	Range
At	nO	Auto Tunning Mode	Yes, No

Parameter will display according to below symbols	
⚙	Control Mode = PID
■	Control Mode = ON-OFF
➢	Control Logic is Heat - Cool
♦	OP2 = Auxiliary
★	OP2 = Alarm & Alarm Soak
✚	OP3 = Auxiliary
⊗	OP3 = Alarm & Alarm Soak
●	OP3 = Soak & Alarm Soak
▲	Rate is Enable
↑	Factory Set OP1 = Current
→	mA Function = Retransmission
#	If Analog Input Selected
⤮	Factory Set RS-485 Given

OVER ALL DIMENSIONS & PANEL CUT OUT (IN MM)

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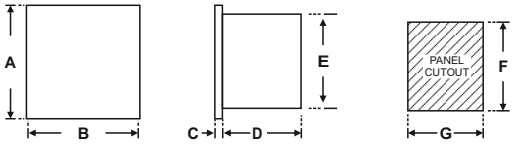
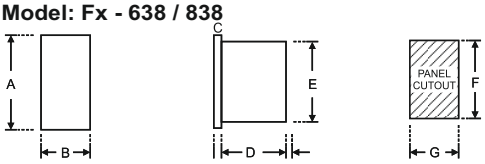


Model: Fx - 638 / 838



Dim / Model	A	B	C	D	E	F	G
Fx - 438	50	50	3	85	45	45	45
Fx - 738	72	72	3	60	68	68	68
Fx - 938	96	96	10	45	89	92	44
Fx - 638	96	50	3	60	90	92	45
Fx - 838	50	96	3	60	90	92	45

INSTALLATION GUIDELINES :

1. Prepare the cut-out with proper dimension as shown in figure.
2. Remove clamp from controller
3. Push the controller through panel cut-out and secure the controller in its place by tightening the side clamp.

Table 1 :- Range of Different Sensor Types.

Sensor Type	Range	Resolution
Fe-k(J) T/C	0 ~ 760°C	1°C
Cr-AL(K) T/C	-99 ~ 1300°C	1°C
(R) T/C	0 ~ 1700°C	1°C
(S) T/C	0 ~ 1700°C	1°C
TC - N	-99 ~ 1300°C	1°C
TC - T	-99 ~ 400°C	1°C
TC - B	0 ~ 1800°C	1°C
Pt-100 (RTD)	-100 ~ 450°C	1°C
Pt-100 (RTD 0.1)	-100.0 ~ 450.0°C	0.1°C
0 ~ 1 V	-1999 ~ 9999	0.000 00.00 000.0 0000 (Selectable)
0 ~ 3.3 V		
0 ~ 5 V		
0 ~ 10 V		
0 ~ 20 mA		
4 ~ 20 mA		

Table 2 :- Range as per Resolution.

Input	Resolution	Analog Input Low Value	Analog Input High Value	Process Value Offset	Hysterisis 1	Hysterisis 2	Hysterisis 3
J,K,R,S,N,T,B RTD	0000	—	—	-25 to 25	1 to 25	1 to 25	1 to 25
RTD.1	000.0	—	—	-25.0 ~ 25.0	0.1 ~ 25.0	0.1 ~ 25.0	0.1 ~ 25.0
0 ~ 1 V , 0 ~ 3.3 V , 0 ~ 5 V , 0 ~ 10 V , 0 ~ 20 mA , 4 ~ 20 mA	0000	-1999 to 9999	-1999 to 9999	-25 to 25	1 to 25	1 to 25	1 to 25
	000.0	-199.9 to 999.9	-199.9 to 999.9	-25.0 to 25.0	0.1 to 25.0	0.1 to 25.0	0.1 to 25.0
	00.00	-19.99 to 99.99	-19.99 to 99.99	-15.00 to 25.00	0.01 to 25.00	0.01 to 25.00	0.01 to 25.00
	0.000	-1.999 to 9.999	-1.999 to 9.999	-1.500 to 2.500	0.001 to 2.500	0.001 to 2.500	0.001 to 2.500

Mfgd by: Innovative Instruments & Controls LLP
Unit no 101- 105, Patel Industrial Estate, Building No.5, Near Range office,
Gauraipada, Vasai East, Palghar, Maharashtra 401208.
Sales : +91-8591939916 / 17 / +91-8655832205
Support : +91-7208897610
E-mail : sales@itherm.co.in Website : www.itherm.co.in