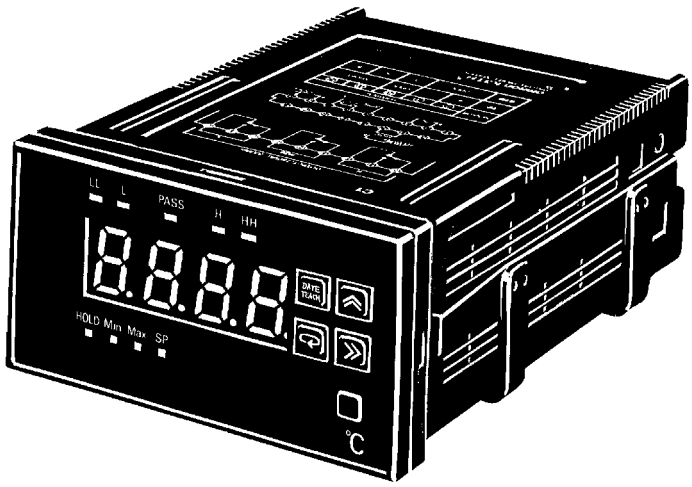
K3TH Intelligent Signal Processor

Operation Manual

Revised October 1991



Notice:

OMRON products are manufactured for use according to proper procedures by a qualified operator and only for the purposes described in this manual.

The following conventions are used to indicate and classify warnings in this manual. Always heed the information provided with them.

DANGER! Indicates information that, if not heeded, could result in loss of life or serious injury.

Caution Indicates information that, if not heeded, could result in minor injury or damage to the product.

OMRON Product References

All OMRON products are capitalized in this manual. The word “Unit” is also capitalized when it refers to an OMRON product, regardless of whether or not it appears in the proper name of the product.

The abbreviation “Ch,” which appears in some displays and on some OMRON products, often means “word” and is abbreviated “Wd” in documentation in this sense.

The abbreviation “PC” means Programmable Controller and is not used as an abbreviation for anything else.

Visual Aids

The following headings appear in the left column of the manual to help you locate different types of information.

Note Indicates information of particular interest for efficient and convenient operation of the product.

1, 2, 3... Indicates lists of one sort or another, such as procedures, precautions, etc.

TABLE OF CONTENTS

About this Manual:

Section 1 introduces the basic features of the K3TH Intelligent Signal Processor, illustrates some application examples, and provides an internal circuit block diagram.

Section 2 identifies all the major features of the front panel and gives a brief description of each function.

Section 3 identifies all the input and output features of the terminal configurations and gives a brief description of each terminal.

Section 4 provides the dimensions and environmental conditions needed for mounting the K3TH Intelligent Signal Processor.

Section 5 briefly describes the General-purpose Temperature Sensor Input Model and the High Temperature Thermocouple Input Model, one of which can be used on the K3TH Intelligent Signal Processor.

Section 6 gives comprehensive descriptions on setting the parameters and the operation of the K3TH Intelligent Signal Processor.

Section 7 provides a troubleshooting guide for possible errors during operation and the corrective actions to be taken.

Appendix A provides a list of standard models and options (special specifications).

Appendix B provides a list of sensor models and a list of factory-set parameters.

Appendix C provides a list of specifications and ratings.

SECTION 1
Introduction

This section deals with the basic features of the K3TH Intelligent Signal Processor. A brief description is given of each major feature. Possible applications of the K3TH Intelligent Signal Processor are also illustrated. An internal circuit block diagram illustrates how various internal circuits are being used when processing inputs.

1–1 Features

The basic features of the K3TH Intelligent Signal Processor are outlined below. Refer to relevant sections of this manual for details.

Display Unit

The Intelligent Signal Processor can display the temperature as Celsius (%C) or Fahrenheit (%F).

Setting the Input Shift Value

The Intelligent Signal Processor is equipped with a function that compensates the input value.

Display Refresh Period

If display data is updated in synchronization with the normal sampling period (500 ms), the data may change too rapidly to be read. In this case, the speed at which the displayed data is updated can be slowed down. When a slow data display speed is selected, the sampling period for measurement is not changed. The comparative outputs or BCD outputs are updated in synchronization with the sampling period.

Setting the Set Values

When setting set values, the decimal point is automatically displayed according to the sensor type selected. Also, there is no limitation on the relationship among HH, H, L, and LL.

Setting Hysteresis

The set value includes a hysteresis setting to prevent the comparative output status indicators from turning ON/OFF if the measured value (displayed value) fluctuates in the vicinity of the set value.

Set Value Protection

With the Basic and LED Models, the set values can be protected against changes, even in RUN mode.

Checking, and Changing Set Values

With the Basic, LED, and Thumbwheel Switches Models, the set values can be checked and changed in RUN mode.

Setting Linear Output Range

The Intelligent Signal Processor outputs a linear voltage or current in proportion to the changes in the measured value.

Maximum/Minimum Values

The maximum and minimum of the values measured since power application or RESET signal input up to the present point are retained. When the RESET signal turns ON, both the maximum and minimum values are reset to the present value. Even though the maximum and minimum values are retained in memory, the comparative output and BCD output are output in accordance with changes in the measured value, regardless of the display or even if the RESET signal is OFF except as controlled by the HOLD input (see next feature).

Hold Measured Value

When the HOLD input is turned ON, measurement stops and the input measured just before the HOLD input turned ON is held. The displayed value, comparative output, BCD data, etc., are also held.

Test Mode

The Intelligent Signal Processor is provided with a test mode in which simulated signals can be input. When a simulated input signal is applied, an actual corresponding output signal is issued.

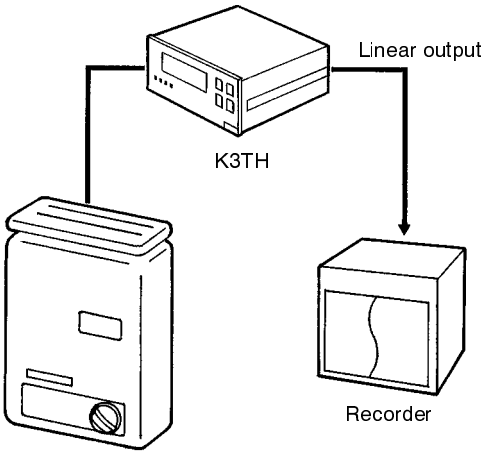
Setting Set Values with the Teaching Function

The Intelligent Signal Processor is provided with a teaching function that can set an actual measured value as a set value.

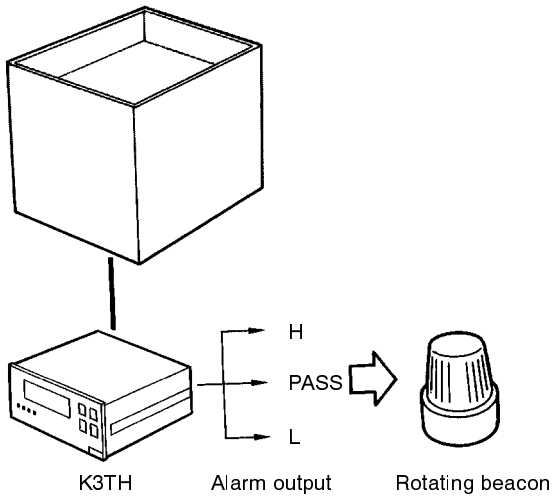
1–2 Application Examples

The following diagrams illustrate some potential uses of the K3TH Intelligent Signal Processor.

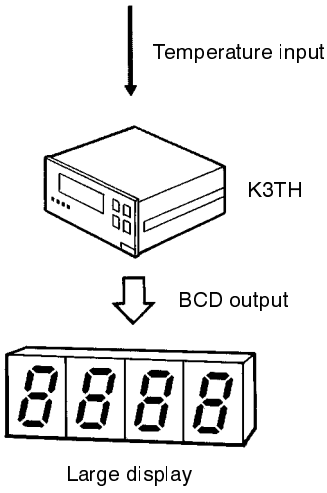
Inspection Lines for Gas Appliances



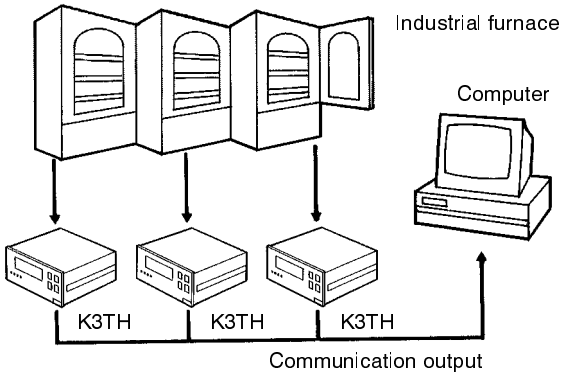
Temperature Monitoring for Plating and Coating Baths



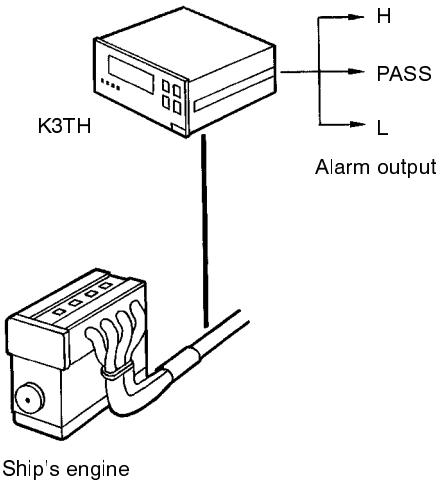
Interfacing Large External Displays



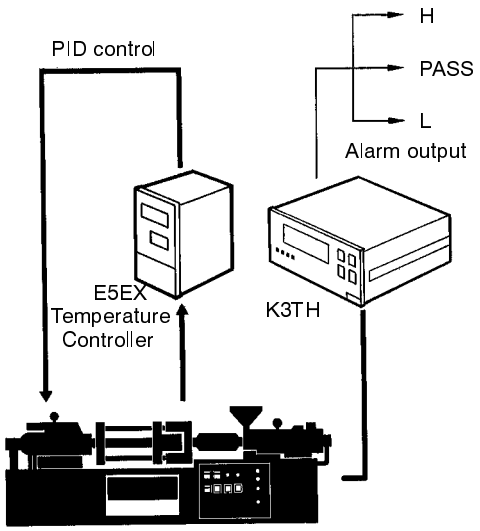
Centralized Temperature Monitoring for Industrial Furnaces



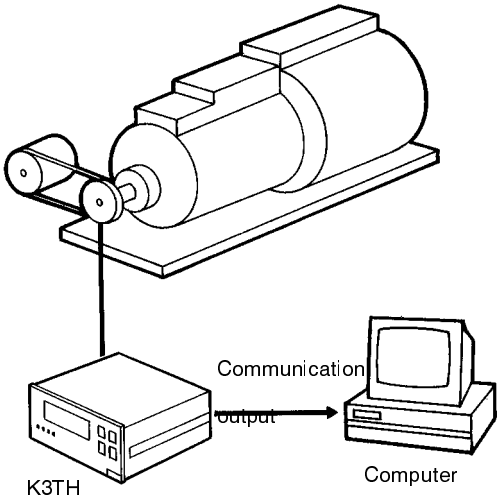
Monitoring Exhaust Temperatures on Marine Engines



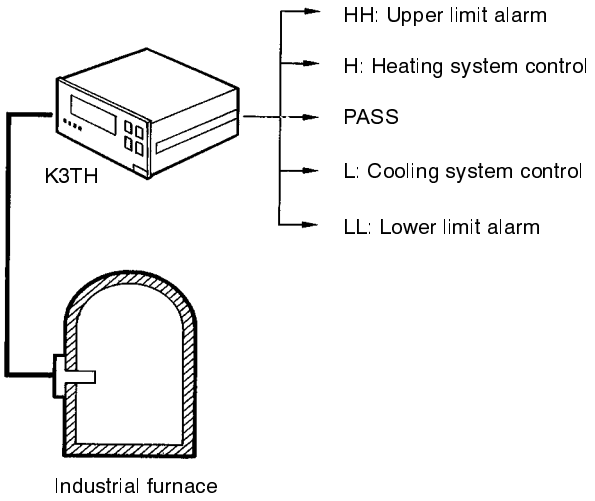
Temperature Display and Alarms for Forming Equipment



Monitoring Bearing Temperature on Generators and Motors

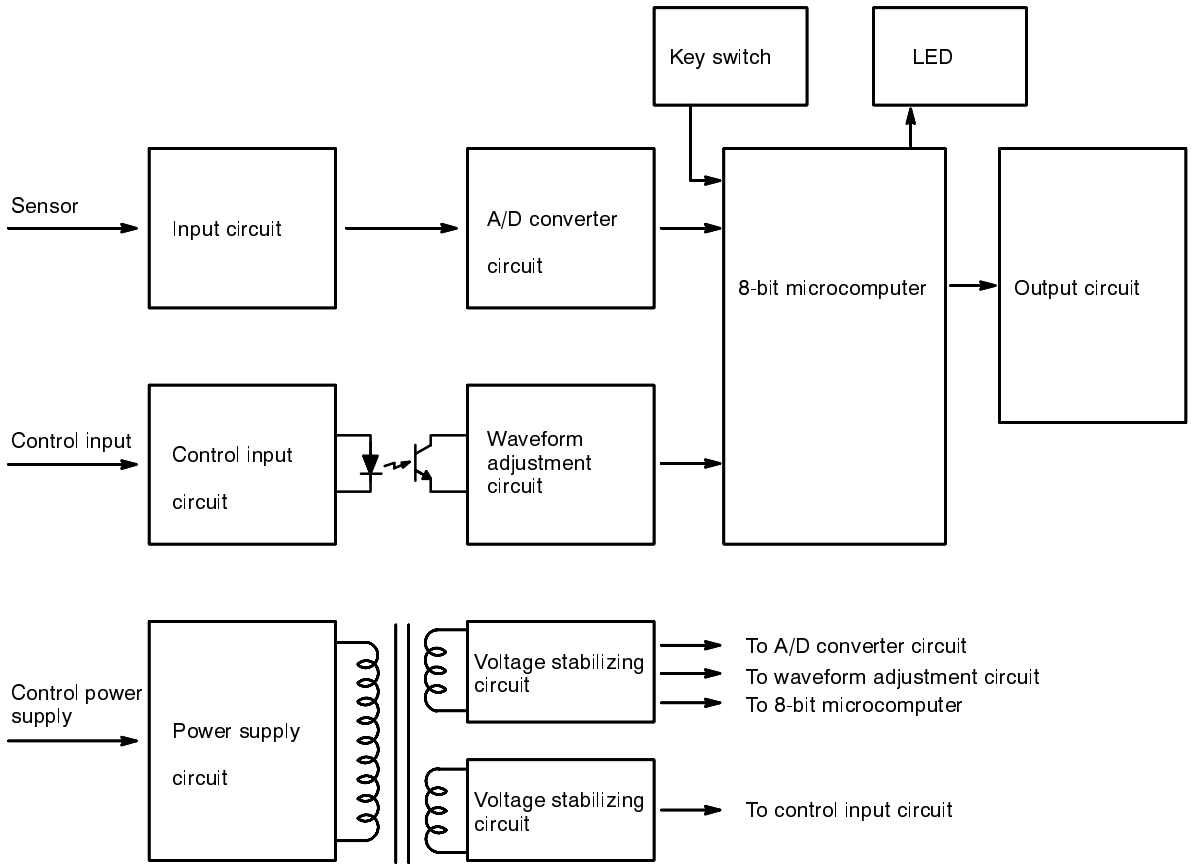


Temperature Monitor and Control Interfaces for Multilevel Alarms



1–3 Internal Circuit Block Diagram

The following schematic illustrates how various internal circuits are being used when processing inputs from sources such as sensors, control inputs, and control power supply.

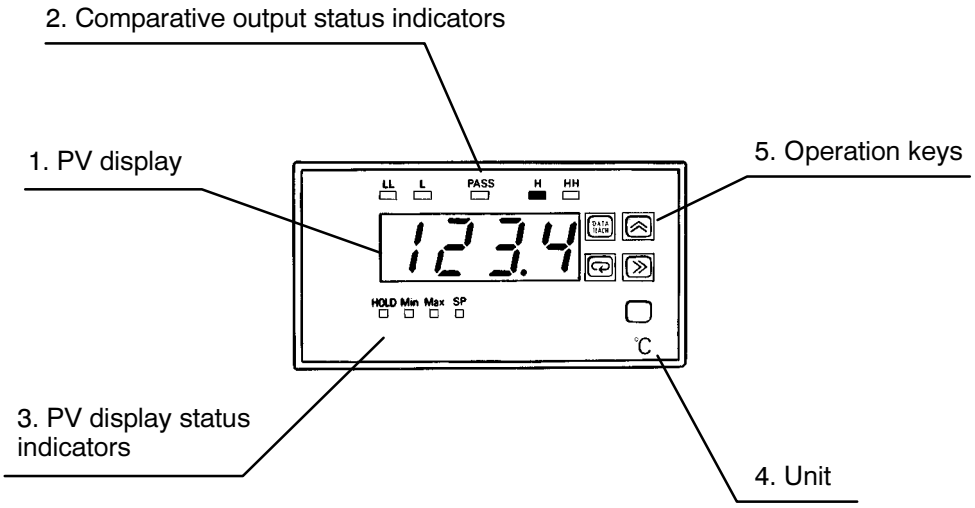


SECTION 2
Front Panel: Nomenclature and Functions

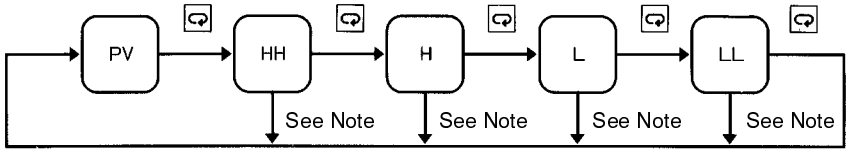
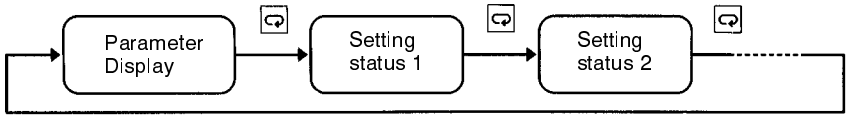
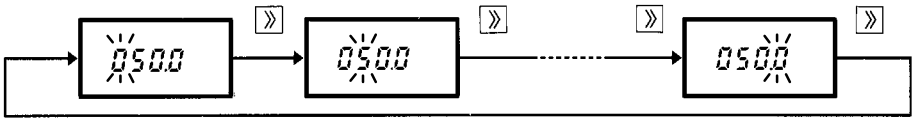
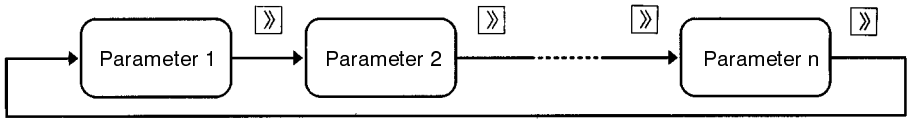
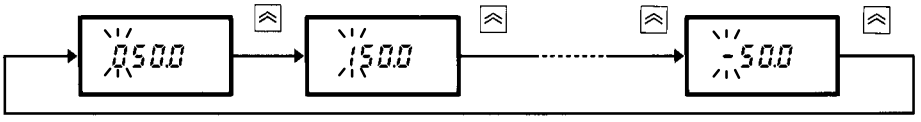
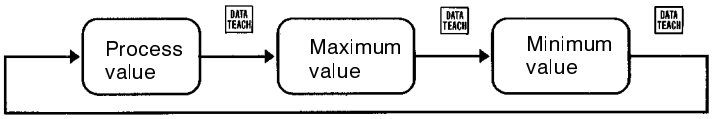
This section gives a general and introductory description of the Intelligent Signal Processor's front panel. Three front panel models are described in this section: K3TH-T_1_A-__ (Basic Model), K3TH-T_1_B-__ (with Set Value LED Display), K3TH-T_1_D-__ (with Thumbwheel Switches). This description consists of the front panel nomenclature and a brief description of each of its functions.

2–1 K3TH-T_1_A-__ (Basic Model)

The following diagram identifies the major features found on the K3TH Basic Model front panel. The table gives a brief description of the function of each front panel feature.

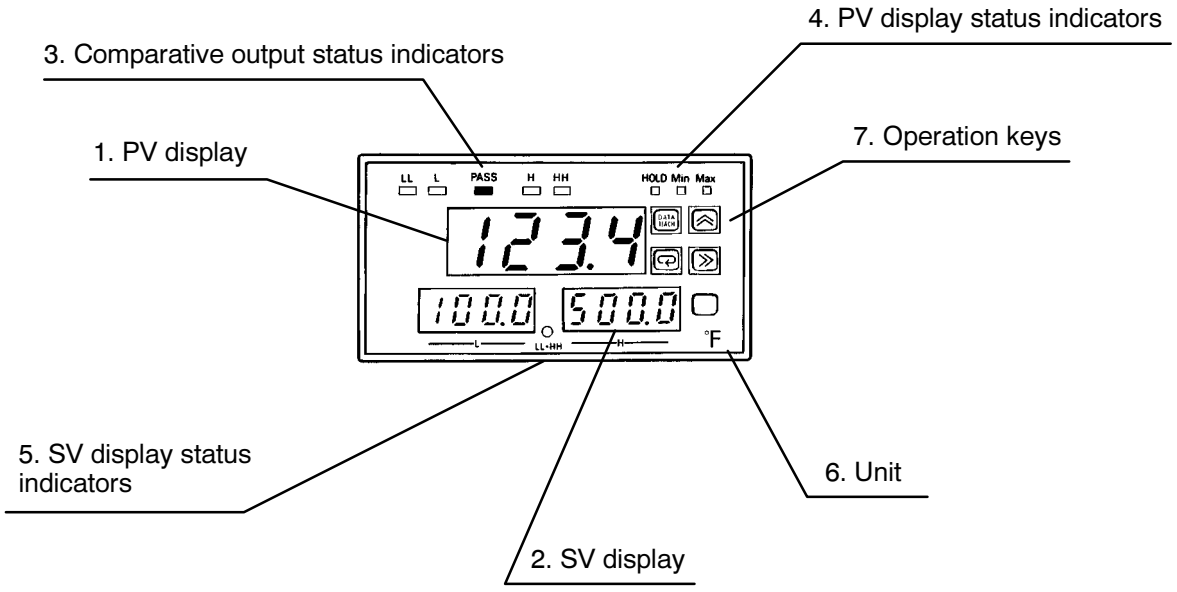


No.	Name		Functions
1.	PV (process value) display		Displays the process, maximum, and minimum values. Also displays set values while the SP indicator is lit. Displays characters indicating the set mode and set values. Displays an error message when an error occurs.
2	Comparative output status indicators	HH	Is lit when HH comparative output status is ON. HH comparative output status turns ON when the measured value exceeds the HH set value. This indicator does not light in models not provided with the comparative output function.
		H	Is lit when H comparative output status is ON. H comparative output status turns ON when the measured value exceeds the H set value. This indicator does not light in models not provided with the comparative output function.
		L	Is lit when L comparative output status is ON. L comparative output status turns ON when the measured value falls below the L set value. This indicator does not light in models not provided with the comparative output function.
		LL	Is lit when LL comparative output status is ON. LL comparative output status turns ON when the measured value falls below the LL set value. This indicator does not light in models not provided with the comparative output function.
		PASS	Is lit when PASS comparative output status is ON. PASS comparative output status turns ON when all HH, H, L, and LL comparative output status are OFF. This indicator does not light in models not provided with the comparative output function.
3	PV display status indicators	HOLD	Is lit when HOLD input is ON. By turning ON the HOLD terminal on the rear panel, the hold function can be effected.
		Min	Indicates that the value displayed on the PV display is the minimum value. To display the minimum value, use the DATA TEACH key.
		Max	Indicates that the value displayed on the PV display is the maximum value. To display the maximum value, use the DATA TEACH key.
		SP	Indicates that the value displayed on the PV display is a set value. To display a set value, use the Display Key. This indicator does not light in models not provided with the comparative output function; in this case, no set value can be displayed with the Display Key.
4	Unit		Attach the appropriate label (use the labels supplied as accessories).

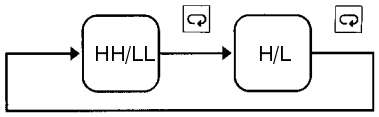
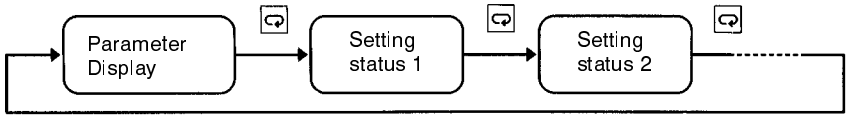
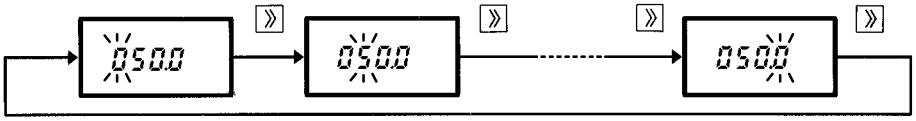
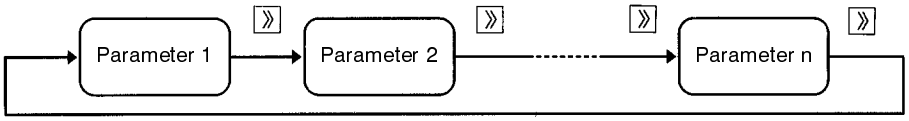
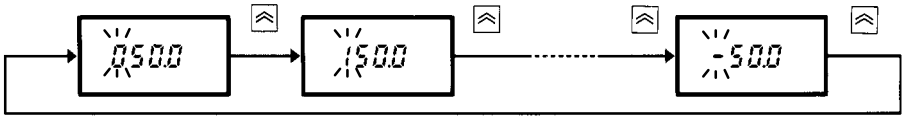
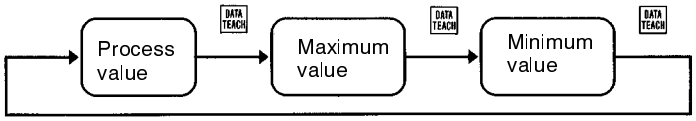
No.	Name		Functions
5	Operation keys	□ Level key	Selects the setting mode, in which the setting levels can be changed. For details on the setting levels, refer to *Section 6 Before Setting the Parameters*.
		Display Key	Displays a set value on the PV display. This function is not provided on models not equipped with the comparative output function.  **Note:** Unless another operation key is pressed within 5 seconds after this key has been pressed, the process value is displayed again. In the setting mode, after a parameter is selected with the Shift Key, the selected setting is enabled or disabled with this key; or, the set value is written to memory. 
		Shift key	Shifts the digit where the set value is to be changed.  Selects a parameter at each setting level.  For details on the setting parameter, refer to *Section 6 Parameter Setting*.
		Up key	Increases the set value by one. 
		DATA TEACH key	Displays the process, maximum, or minimum value.  In the setting mode, effects the teaching function. With this function, the set values and linear output range are set by means of actual input. For details on the teaching function, refer to *Section 6 Special Functions*.

2–2 K3TH-T_1_B-__ (with Set Value LED Display)

The following diagram identifies the major features found on the K3TH with Set Value LED Display front panel. The table gives a brief description of the function of each front panel feature.

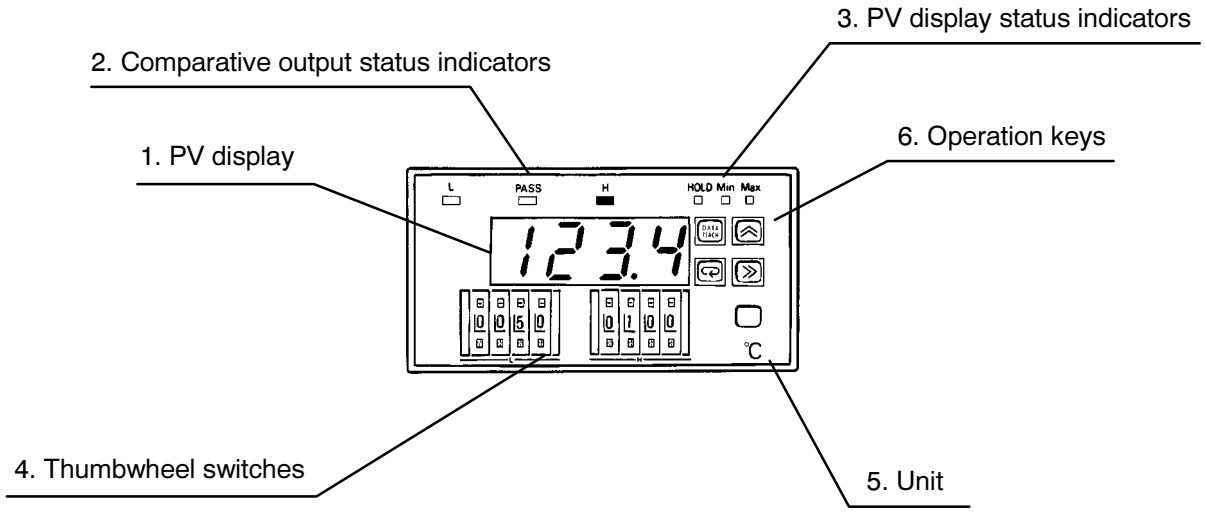


No.	Name		Functions
1	PV (process value) display		Displays the process, maximum, and minimum values. Displays characters indicating the set mode and set values. Displays an error message when an error occurs.
2	SV (set value) display		Displays the set value of a comparative output. In setting mode, displays the set parameter.
3	Comparative output status indicators	HH	Is lit when HH comparative output status is ON. HH comparative output status turns ON when the measured value exceeds the HH set value.
		H	Is lit when H comparative output status is ON. H comparative output status turns ON when the measured value exceeds the H set value.
		L	Is lit when L comparative output status is ON. L comparative output status turns ON when the measured value falls below the L set value.
		LL	Is lit when LL comparative output status is ON. LL comparative output status turns ON when the measured value falls below the LL set value.
		PASS	Is lit when PASS comparative output status is ON. PASS comparative output status turns ON when all HH, H, L, and LL comparative output status are OFF.
4	PV display status indicators	HOLD	Is lit when HOLD input is ON. By turning ON the HOLD terminal on the rear panel, the hold function can be effected.
		Min	Indicates that the value displayed on the PV display is the minimum value. To display the minimum value, use the DATA TEACH key.
		Max	Indicates that the value displayed on the PV display is the maximum value. To display the maximum value, use the DATA TEACH key.
5	SV display status indicator		Indicates whether the set values displayed on the SV display is HH and LL, or H and L.
6	Unit		Attach the appropriate label (use the labels supplied as accessories).

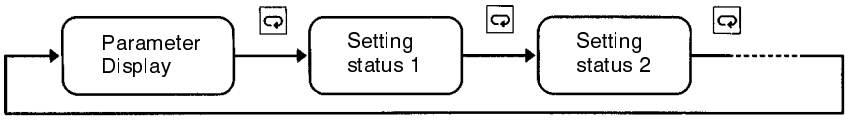
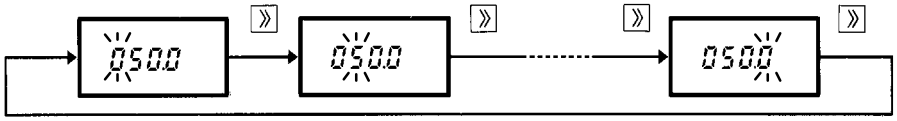
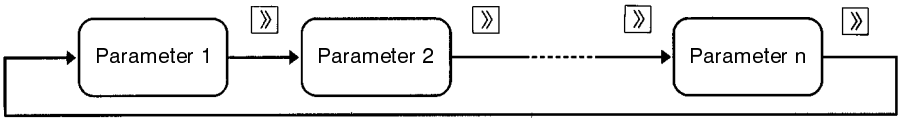
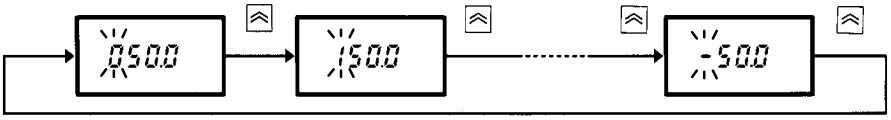
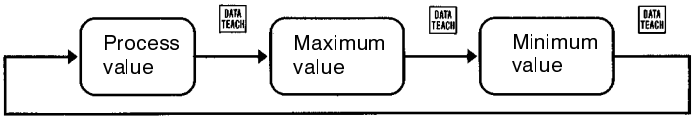
No.	Name		Functions
7	Operation keys	Level key	Selects the setting mode, in which the setting levels can be changed. For details on the setting levels, refer to *Section 6 Before Setting the Parameters*.
		Display Key	Displays a set value on the SV display.  In the setting mode, after a parameter is selected with the Shift Key, the selected setting is enabled or disabled with this key; or, the set value is written to memory. 
		Shift key	Shifts the digit where the set value is to be changed.  Selects a parameter at each setting level.  For details on the setting parameter, refer to *Section 6 Parameter Setting*.
		Up key	Increases the set value by one. 
		DATA TEACH key	Displays the process, maximum, or minimum value.  In the setting mode, effects the teaching function. With this function, the set values and linear output range are set by means of actual input. For details on the teaching function, refer to *Section 6 Special Functions*.

2–3 K3TH-T_1_D-__ (with Thumbwheel Switches)

The following diagram identifies the major features found on the K3TH with Thumbwheel Switches front panel. The table gives a brief description of the function of each front panel feature.



No.	Name		Functions
1	PV (process value) display		Displays the process, maximum, and minimum values. Displays characters indicating the set mode and set values. Displays an error message when an error occurs.
2	Comparative output status indicators	H	Is lit when H comparative output status is ON. H comparative output status turns ON when the measured value exceeds the H set value.
		L	Is lit when L comparative output status is ON. L comparative output status turns ON when the measured value falls below the L set value.
		PASS	Is lit when PASS comparative output status is ON. PASS comparative output status turns ON when all HH, H, L, and LL comparative output status are OFF.
3	PV display status indicators	HOLD	Is lit when HOLD input is ON. By turning ON the HOLD terminal on the rear panel, the hold function can be effected.
		Min	Indicates that the value displayed on the PV display is the minimum value. To display the minimum value, use the DATA TEACH key.
		Max	Indicates that the value displayed on the PV display is the maximum value. To display the maximum value, use the DATA TEACH key.
4	Thumbwheel switches		Set H and L set values. The set values can be changed at any time regardless of the RUN or setting mode.
5	Unit		Attach the appropriate label (use the labels supplied as accessories).

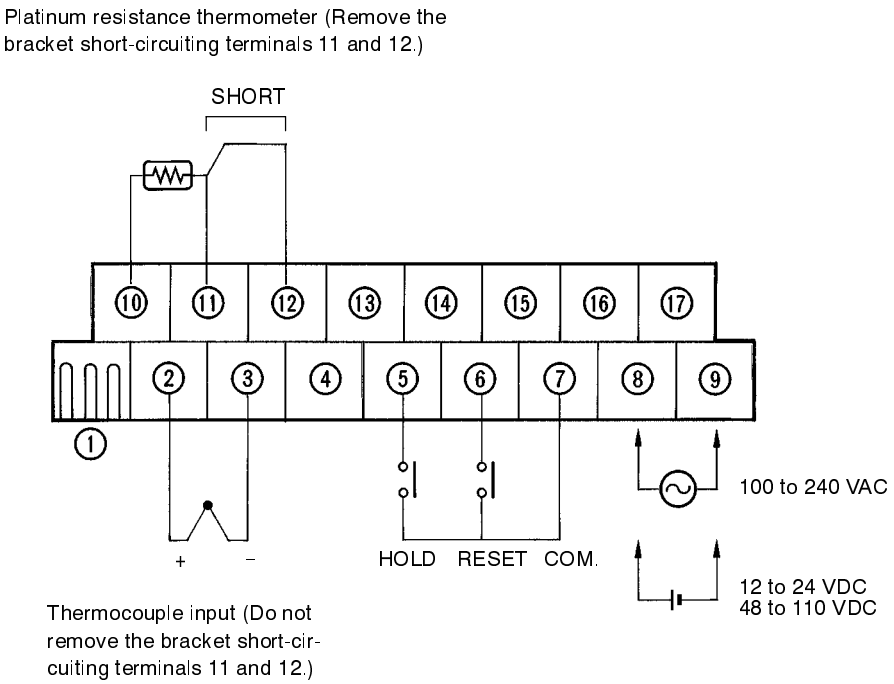
No.	Name		Functions
6	Operation keys	Level key	Selects the setting mode, in which the set levels can be changed. For details on the set levels, refer to *Section 6 Before Setting the Parameters*.
		Display Key	This key has no function in RUN mode. In the setting mode, after a parameter is selected with the Shift Key, the selected setting is enabled or disabled with this key; or, the set value is written to memory. 
		Shift key	Shifts the digit where the set value is to be changed.  Selects a parameter at each setting level. For details on the setting parameter, refer to *Section 6 Parameter Setting*. 
		Up key	Increases the set value by one. 
		DATA TEACH key	Display, the process, maximum, or minimum value.  the set values and linear output range are set by means of actual input. For details on the teaching function, refer to *Section 6 Special Functions*.

SECTION 3
Terminals: Nomenclature and Functions

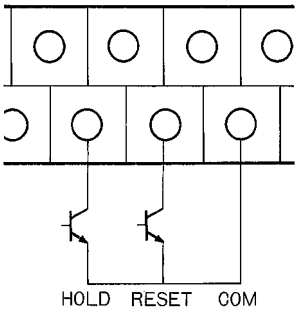
This section gives a general description of the K3TH Intelligent Signal Processor's terminals. Depending upon the requirements, one of several Output Models can be selected for use in the Intelligent Signal Processor.

3–1 Inputs

The K3TH Intelligent Signal Processor's terminal inputs terminal are described in the following diagram and table. The table identifies each terminal and briefly describes its input function.



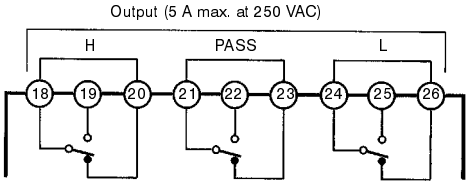
No.	Name	Function
1	Air outlet for temperature sensor	Do not obstruct this vent hole; it is used by the thermosensitive element for cold-junction compensation.
2 3	Thermocouple input (+) Thermocouple input (–)	Inputs the signal from an externally connected thermocouple. When using a thermocouple, do not remove the bracket short-circuiting terminals 11 and 12. For a list of compatible thermocouples, refer to *Section 5 Connectable Sensors*.
4	Unused terminal	–––
5	HOLD	When the signal input to this terminal (HOLD signal) turns ON, measurement is stopped and the value input immediately before the HOLD signal is retained. The displayed value, comparative outputs, and BCD data are also retained. While the HOLD signal is ON, the hold operation continues. The effect of the hold function is canceled when the HOLD signal is turned OFF.
6	RESET	When the signal input to this terminal (RESET signal) turns ON, the present peak (maximum) and bottom (minimum) values are cleared, and measurement of new peak and bottom values begins. While the RESET signal is ON, both the peak and bottom values change with the input values.

No.	Name	Function
7	COM	ɔr the HOLD and RESET signals. Supply the HOLD ɑge contact input signals. To input the signals through a tor configuration shown below. 
8 9	Power	Supply power to these terminals. Be sure to supply 100 to 240 VAC for AC-operated models, and 12 to 24 VAC or 48 to 110 VDC for DC-operated models.
10 11 12	Platinum resistance thermometer input (A) (B) (B)	Connect an external platinum resistance thermometer across these terminals. In this case, remove the bracket short-circuiting terminals 11 and 12. For a list of compatible platinum resistance thermometers, refer to *Section 5 Connectable Sensors*.
13 to 17	Unused terminals	– – –

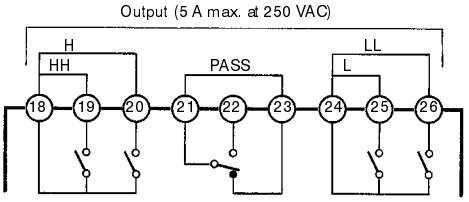
3–2 Outputs

Depending upon the requirements of the receiving unit, the K3TH Intelligent Signal Processor can use one of the following outputs.

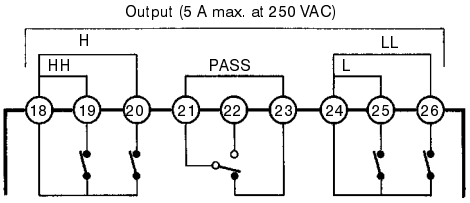
K31-C1: Relay (3 Outputs)



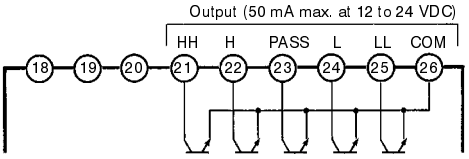
K31-C2: Relay (5 Outputs)



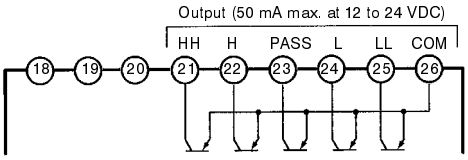
K31-C5: Relay (5 Outputs)



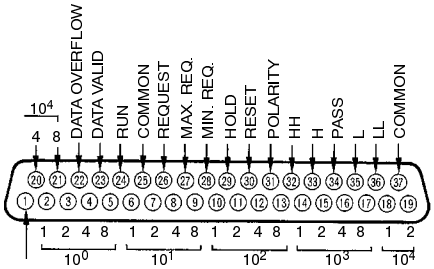
K31-T1: Transistor (NPN Open Collector)



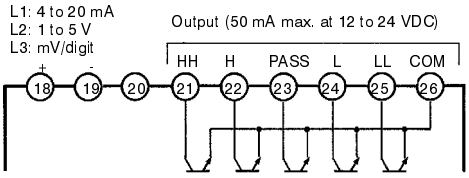
K31-T2: Transistor (PNP Open Collector)



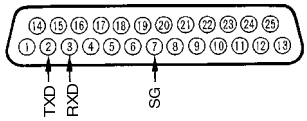
K31-B2: BCD (NPN Open Collector)
(Terminals 32 to 36 are provided only on models with special specifications.)



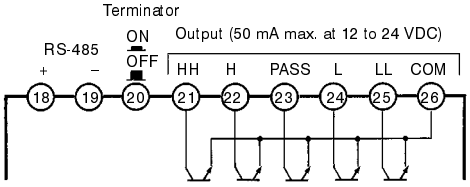
K31-L1, L2, L3: Linear
(Terminals 21 to 26 are provided only on models with special specifications.)



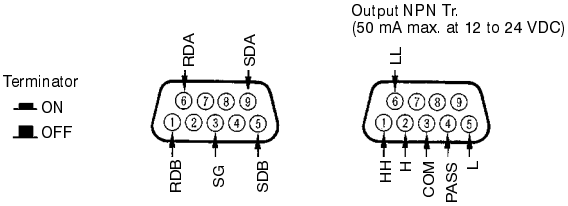
K31-S1: RS-232C



K31-S2: RS-485
(Terminals 21 to 26 are provided only on models with special specifications.)



K31-S3: RS-422
(The right connector is provided only on models with special specifications.)



Models with BCD output include a D-sub 37-pin connector (attachment).
Plug: XM2A-3701
Hood: XM2S-3711

For models with an RS-232C terminal, use a D-sub 25-pin connector (sold separately).
Plug: XM2A-2501 or XM4A-2521
Hood: XM2S-2511

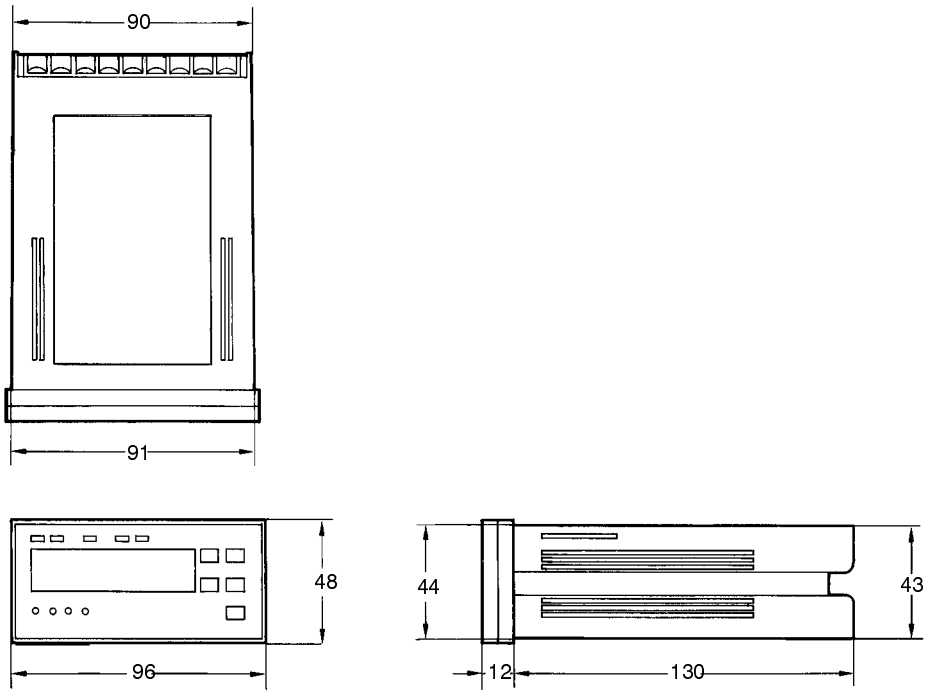
For models with an RS-422 terminal, use a D-sub 9-pin connector (sold separately).
Plug: XM2A-0901 or XM4A-0921
Hood: XM2S-0911

SECTION 4
Mounting

This section provides the dimensions and instructions required for mounting the K3TH Intelligent Signal Processor. Mounting conditions for the Unit are also given.

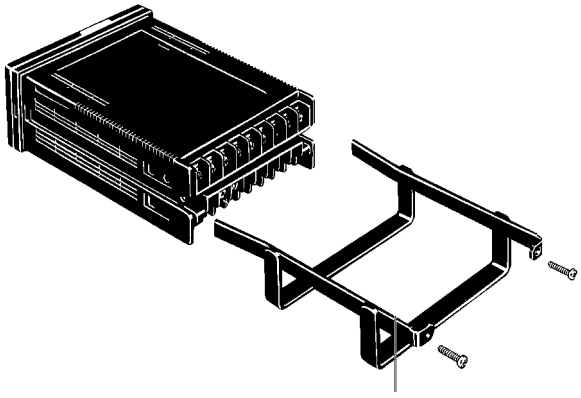
4–1 Dimensions

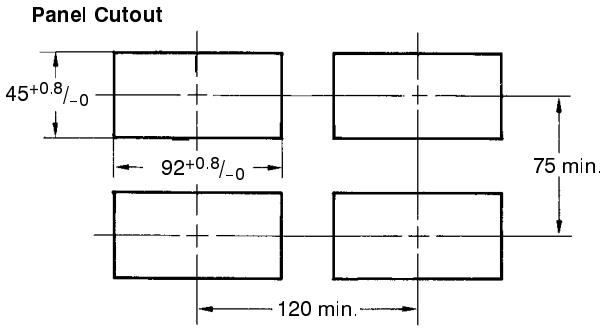
All dimensions are in millimeters.



4–2 Panel Mounting

The mounting dimensions of the Intelligent Signal Processor conform to DIN 43700. Recommended panel thickness is 1 to 3.2 mm. Attach the mounting brackets supplied as accessories to the Intelligent Signal Processor from behind and tighten the mounting screws of the brackets to a torque of 5 kgf $ cm (0.49 N $ m).





All dimensions are in millimeters.

Note: Attach mounting bracket before wiring the terminals. When removing the Intelligent Signal Processor, first disconnect the wiring, then remove the mounting bracket.

Operating Environment

Whenever possible, keep the Intelligent Signal Processor horizontal. Do not install the Intelligent Signal Processor where it will be exposed to corrosive gases (especially sulfurized gas and ammonia gas). Do not install the Intelligent Signal Processor where it will be subject to vibration, shock, dust, or high humidity. The ambient temperature of the installation site must be within −10% to +55%C.

The Processor does not have a water-resistive structure preventing the internal circuitry from drops of water that may penetrate through the space between the keys and operating panel. If operated by wet or oily hands, put a soft cover (sold separately) onto the operating panel. Although the soft cover corresponds to IP51, avoid places where the Processor is directly exposed to water or oil.

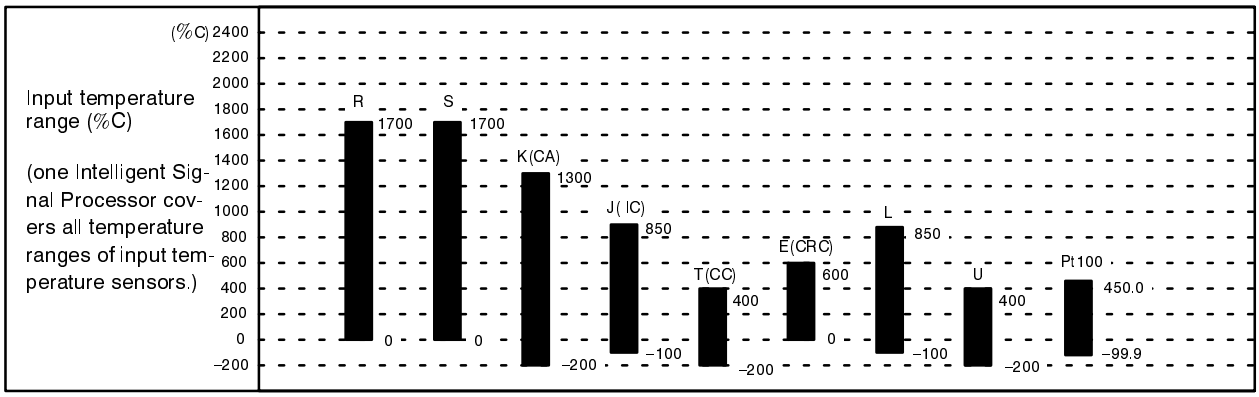
SECTION 5
Connectable Sensors

This section outlines the two main types of K3TH Intelligent Signal Processors; one which can be connected to a General-purpose Temperature Sensor Input Model and one which can be connected to a High Temperature Thermocouple Input Model. Each type, however, can be connected with one type of sensor among them. The temperature range coverage of the two types of Intelligent Signal Processor are also included in this section.

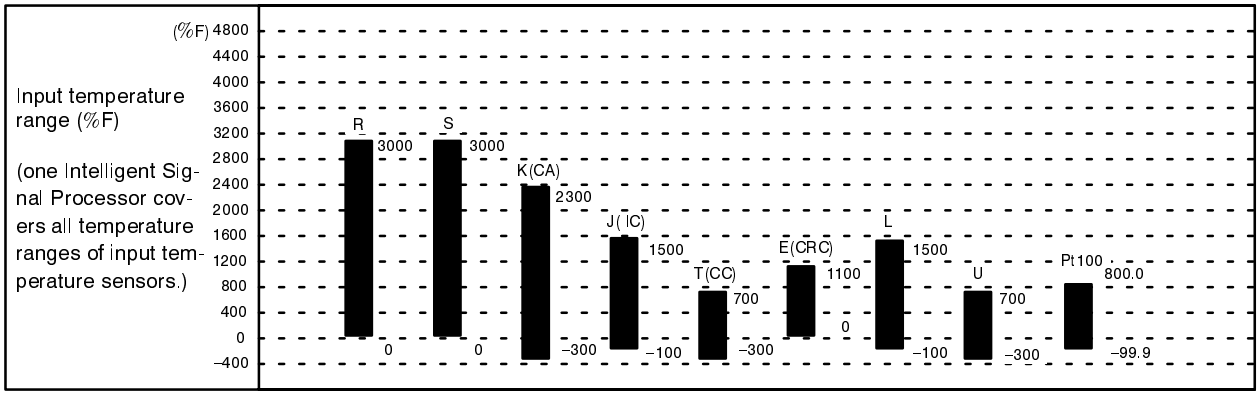
5–1 General-purpose Temperature Sensor Input Model

This Intelligent Signal Processor can be connected with one General-Purpose Temperature Sensor Input Model. The graph below shows the range of temperature that this Intelligent Signal Processor can cover using various General-purpose Temperature Sensor Input Models.

For: R, S, K, J, T, E, L, U, Pt100; Unit of measurement: %C



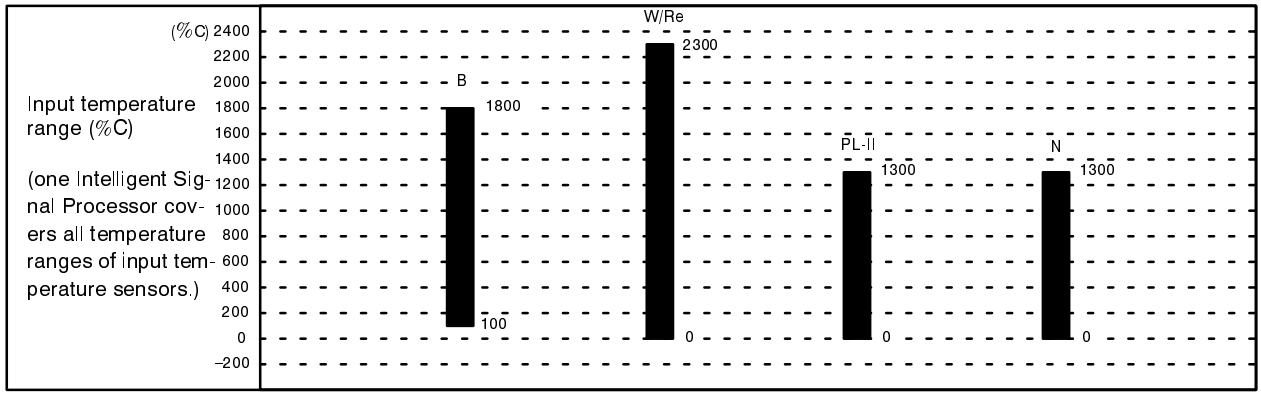
For: R, S, K, J, T, E, L, U, Pt100; Unit of measurement: %F



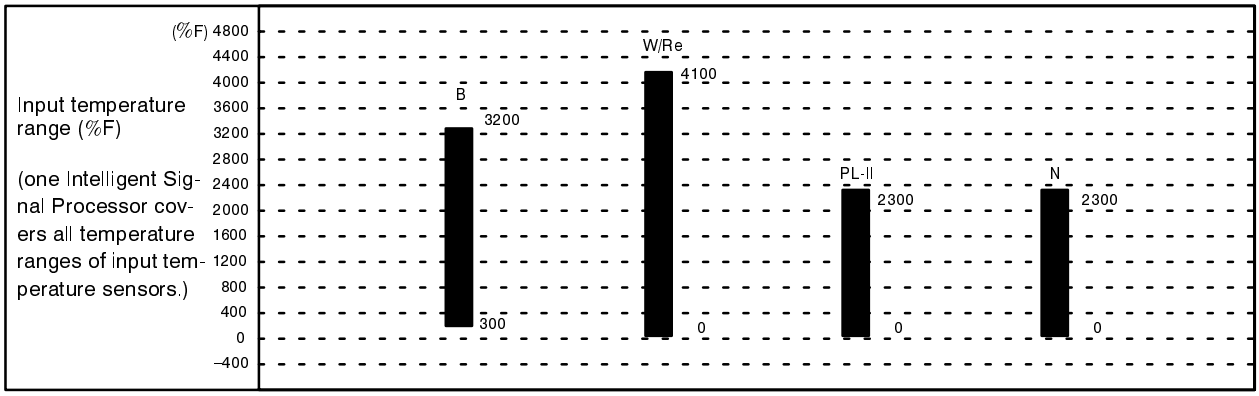
5–2 High Temperature Thermocouple Input Model

This Intelligent Signal Processor can be connected with one High Temperature Thermocouple Input Model among them. The graph below shows the range of temperature that this Intelligent Signal Processor can cover using various High Temperature Thermocouples Input Models.

For: B, W/Re, PL-II, N; Unit of measurement: %C



For: B, W/Re, PL-II, N; Unit of measurement: %F



For a complete list of sensors, refer to Appendix B.

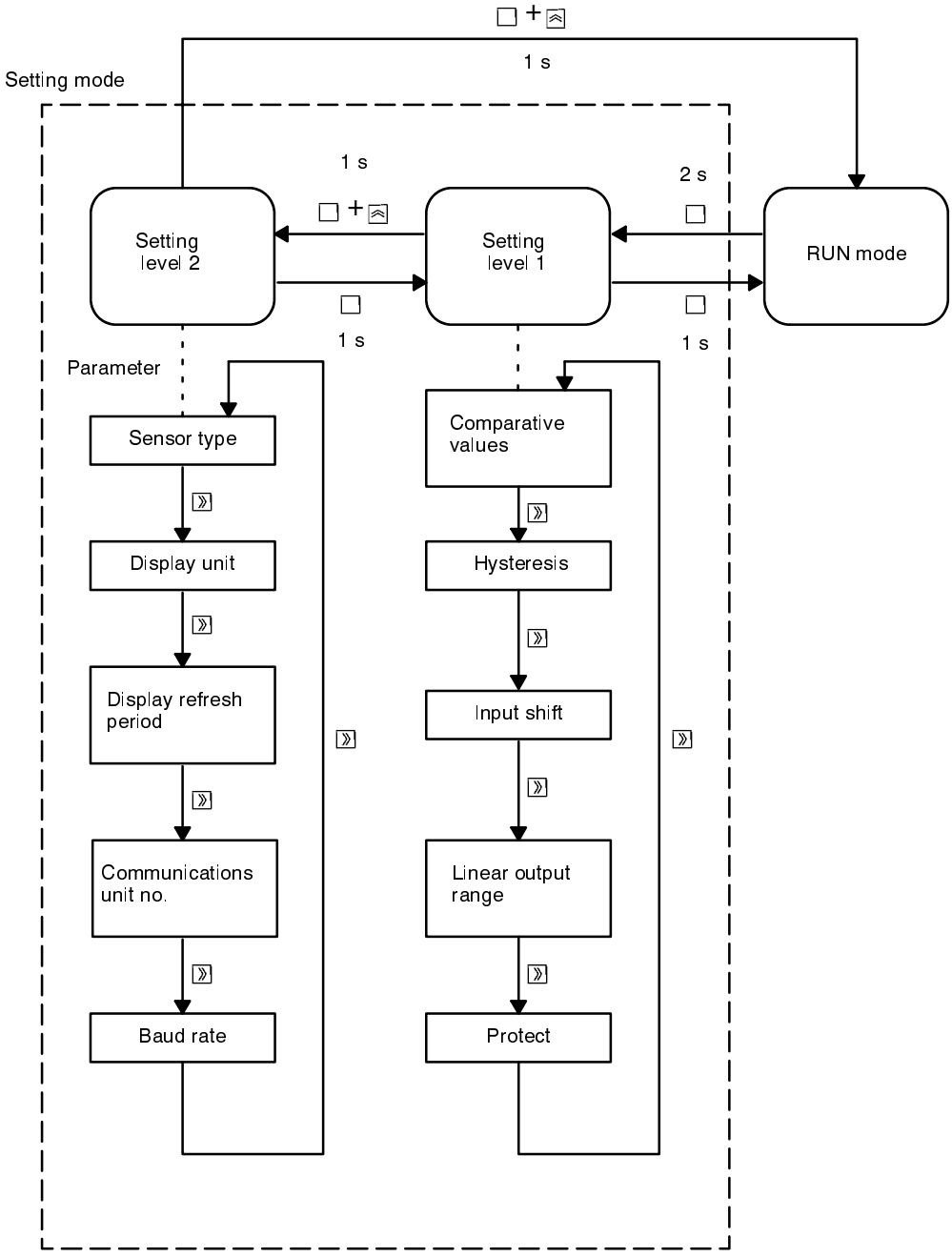
SECTION 6
Parameter Setting and Operation

This section provides instructions for the operation of the K3TH Intelligent Signal Processor. Each operational procedure is described using flow diagrams.

6–1 Before Setting the Parameters

6–1–1 Level of Setting Mode and Parameters

The Intelligent Signal Processor is used mainly in two modes: the RUN mode and the setting mode. In these two modes, the various parameters of the Intelligent Signal Processor can be set. The setting mode has two levels, in each of which one or more parameters can be used. To set the parameters, therefore, first select the setting mode, then select the level and parameter required, from which the necessary parameters can be set. The following diagram illustrates how this is be done.



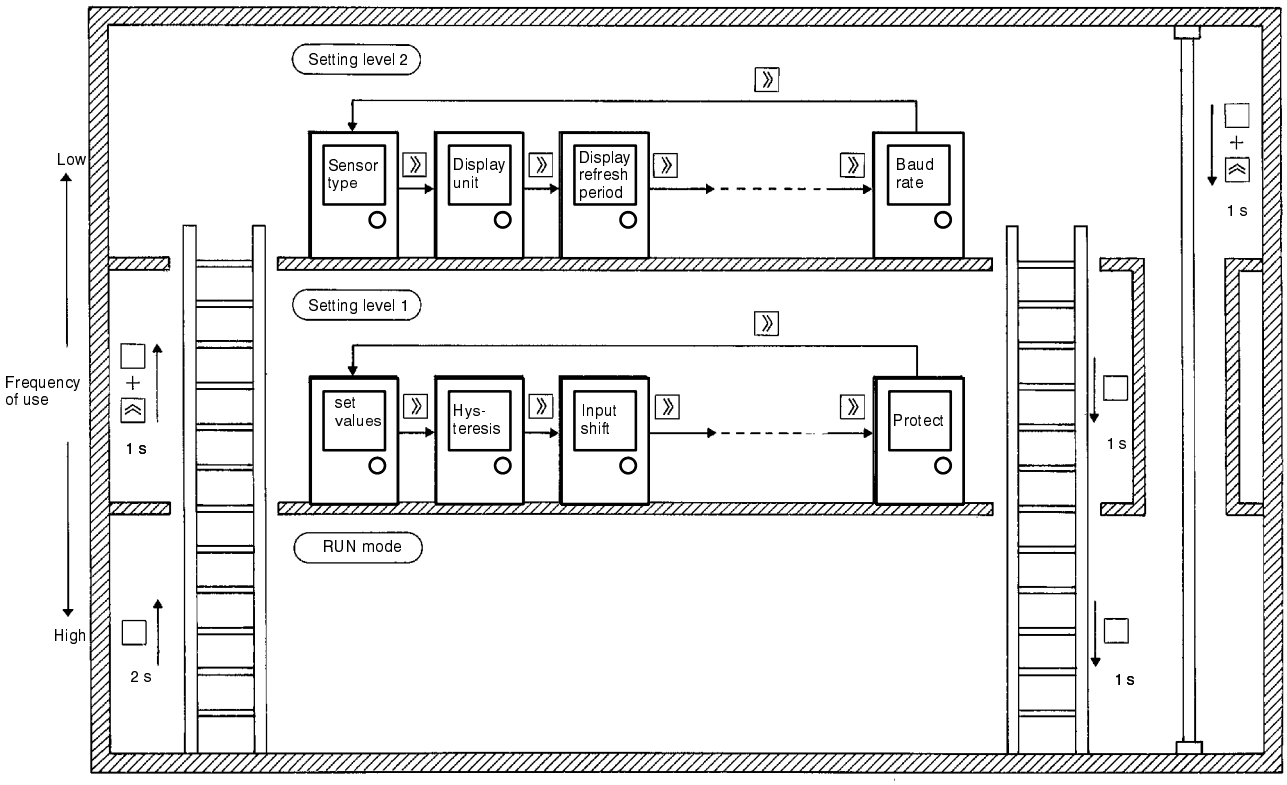
When setting mode is selected, measurement is stopped. Some parameters may not be displayed (i.e., cannot be selected or set) due to differences in display type and output type. For details, refer to 6-1-3 List of Parameters for Each Model.

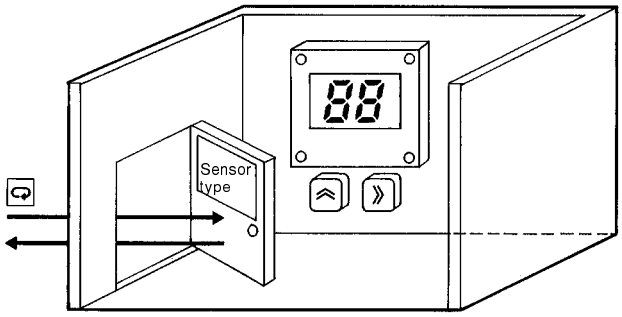
During operation, if you are unsure of the present status (such as the level or parameter with which the setting has been made), press the Level Key for one second to go one level lower. Be sure to write the set value again on that level. The following list and accompanying diagrams describe how to set levels in step-by-step fashion.

Setting procedure:

1. Go up the stairs to the level you want (Level Key or Level Key + Up Key).
2. Look for the parameter (Shift Key).
3. Access the parameter (Display Key).
4. Change the number inside (Up or Shift Key).
5. Leave the parameter (Display Key).
6. Go back to RUN mode (Level Key or Level Key + Up Key).

Setting Level Diagram



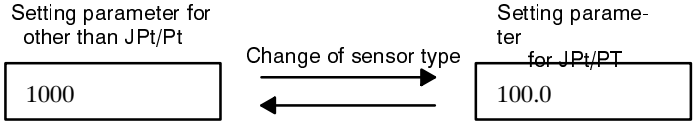


6–1–2 Parameter Setting Procedure

No particular sequence needs to be followed when making parameter settings; however, note the following:

If the setting for sensor type is changed, the other parameter settings in the parameter are not changed, except in the following case:

- When changing the setting for sensor type to JPt/Pt from another sensor type or vice versa, the position of the decimal point will shift as follows:



6–1–3 List of Parameters for Each Model

The following tables indicate which parameters are available for each model.

Basic Models: K3TH-T_1_A-__

Level	Item	Display	Output									
			None	C1/2/5 ,T1/2	B2	L1/2	L3	S1/2/3	B4	L4/5	L6	S5/6
1	Set value	cset	---	Yes	---	---	---	---	Yes	Yes	Yes	Yes
	Hysteresis	hys	---	Yes	---	---	---	---	Yes	Yes	Yes	Yes
	Input shift	in–s	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Linear output range	lset	---	---	---	Yes	---	---	---	Yes	---	---
	Set value protect	prot	---	Yes	---	---	---	---	Yes	Yes	Yes	Yes
2	Sensor type	in–t	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Display unit	c–-f	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Display refresh period	disp	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Communications unit no.	u–no	---	---	---	---	---	Yes	---	---	---	Yes
	Baud rate	bps	---	---	---	---	---	Yes	---	---	---	Yes

Set Value LED Display Models: K3TH-T_1_B-__

Level	Item	Display	Output				
			C1/2/5 ,T1/2	B4	L4/5	L6	S5/6
1	Set value	cset	Yes	Yes	Yes	Yes	Yes
	Hysteresis	hys	Yes	Yes	Yes	Yes	Yes
	Input shift	in–s	Yes	Yes	Yes	Yes	Yes
	Linear output range	lset	---	---	Yes	---	---
	Set value protect	prot	Yes	Yes	Yes	Yes	Yes
2	Sensor type	in–t	Yes	Yes	Yes	Yes	Yes
	Display Unit	c–-f	Yes	Yes	Yes	Yes	Yes
	Display refresh period	disp	Yes	Yes	Yes	Yes	Yes
	Communications unit no.	u–no	---	---	---	---	Yes
	Baud rate	bps	---	---	---	---	Yes

Thumbwheel Switches Models: K3TH-T_1_D-__

Level	Item	Display	Output	
			C1/2/5, T1/2	B4
1	Set value	cset	Yes	Yes
	Hysteresis	hys	Yes	Yes
	Input shift	in–s	Yes	Yes
	Linear output range	lset	–––	–––
	Set value protect	prot	–––	–––
2	Sensor type	in–t	Yes	Yes
	Display Unit	c––f	Yes	Yes
	Display refresh period	disp	Yes	Yes
	Communications unit no.	u–no	–––	–––
	Baud rate	bps	–––	–––

6–2 Parameter Setting

There are three general parameter settings available on the K3TH Intelligent Signal Processor: Sensor Type, Display, and Output. Tables indicating the range of settings for each parameter type and accompanying flow diagrams are given as parameter setting instructions.

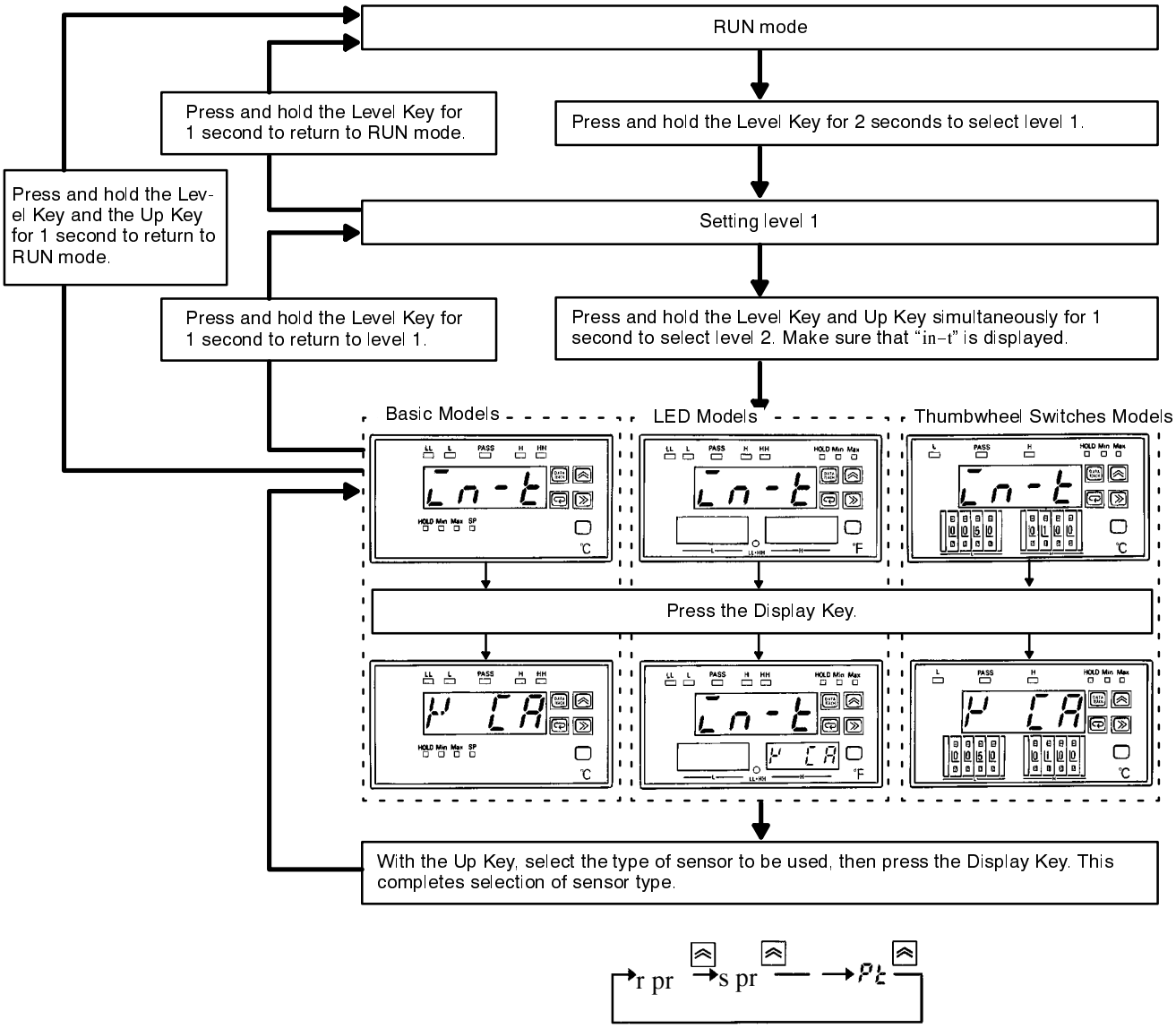
6–2–1 Setting the Sensor Type

In order to set the sensor type, follow the instructions outlined in the flow diagram (after the tables) and specify the type of sensor to be used as follows:

Setting range: General-purpose Temperature Sensor	
Displayed characters	**Meaning**
r pr	R thermocouple
s pr	S thermocouple
k ca	K thermocouple
j ic	J thermocouple
t cc	T thermocouple
e cr	E thermocouple
l ic	L thermocouple
u cc	U thermocouple
jpt	PT100 Ω (JIS, 1981)
pt	PT100 Ω (JIS, 1989)

Setting range: High Temperature Thermocouple	
Displayed characters	**Meaning**
b pr	B thermocouple
w526	W/Re5-26 thermocouple
n	N thermocouple
pl 2	PL-II thermocouple

When the sensor type is changed, set values will be reset to default.

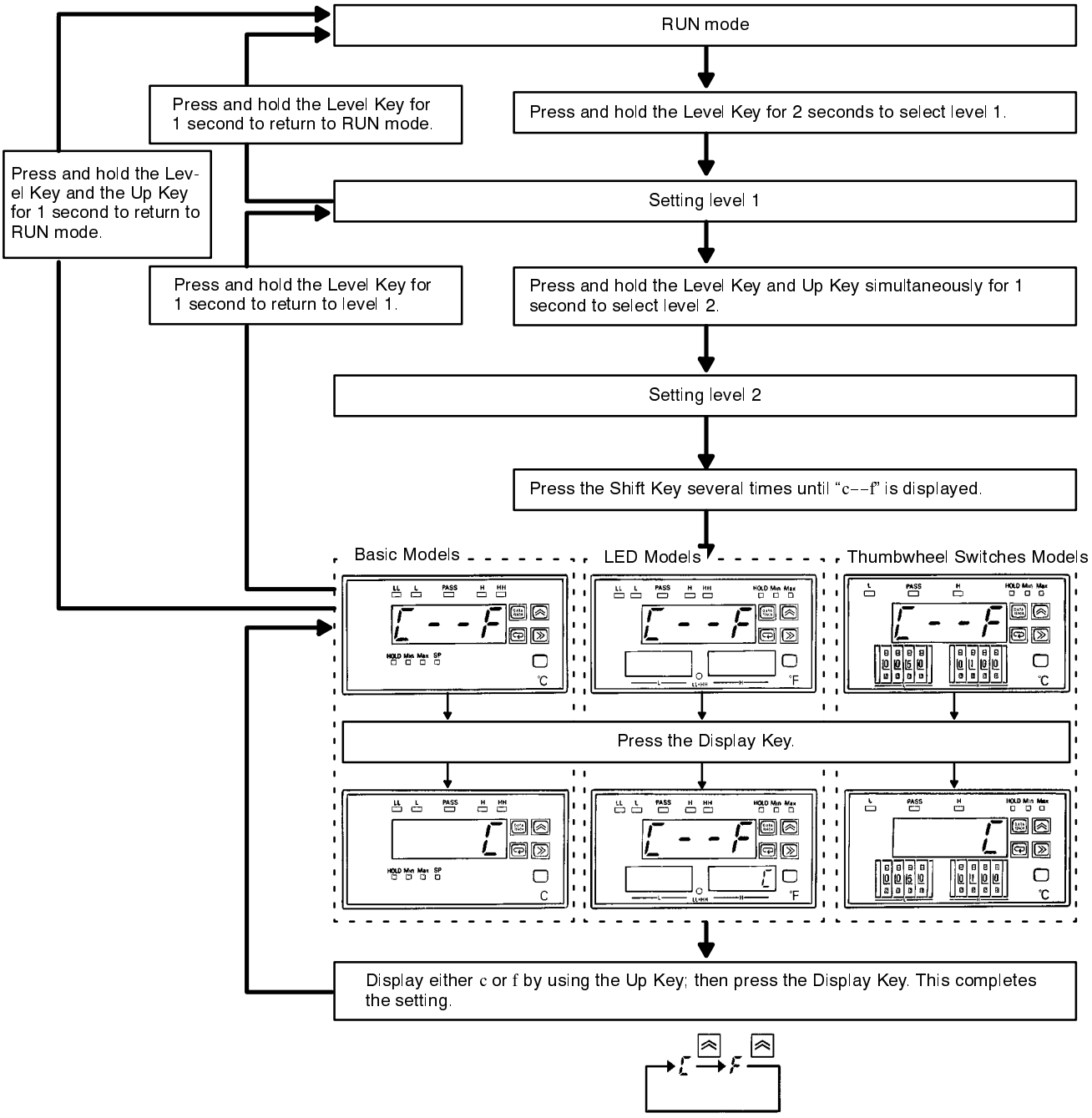

RUN mode
Press and hold the Level Key for 1 second to return to RUN mode.
Press and hold the Level Key for 2 seconds to select level 1.
Press and hold the Level Key and the Up Key for 1 second to return to RUN mode.
Setting level 1
Press and hold the Level Key for 1 second to return to level 1.
Press and hold the Level Key and Up Key simultaneously for 1 second to select level 2. Make sure that "in–t" is displayed.
Basic Models
LED Models
Thumbwheel Switches Models
Press the Display Key.
With the Up Key, select the type of sensor to be used, then press the Display Key. This completes selection of sensor type.
r pr
s pr
Pt

6–2–2 Setting Parameter for Display

Display Unit

The Intelligent Signal Processor displays the temperature as either Celsius (%C) or Fahrenheit (%F). In order to set the display unit, follow the instructions outlined in the flow diagram (after the table) and specify the type of display as follows:

Setting range	
Celsius Display	c
Fahrenheit Display	f



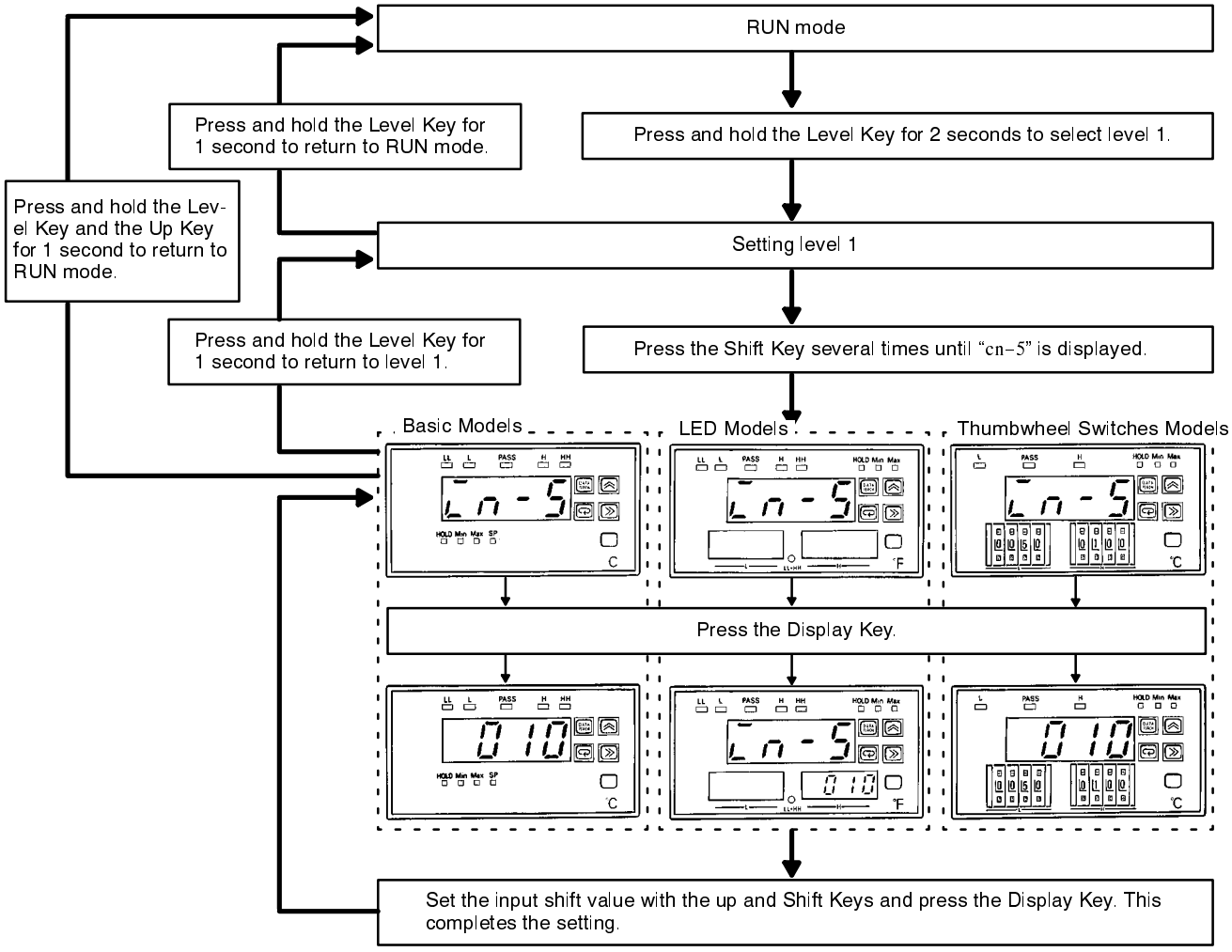
Input Shift Value

The Intelligent Signal Processor is equipped with a function that compensates the input value. In order to set the input shift value, follow the instructions outlined in the flow diagram (after the table) and set within the following range:

Setting range
–99 to 099

Example:

Input Shift Value	Sensor Temperature	Display
0	100%C/%F	100%C/%F
10	100%C/%F	110%C/%F
–10	100%C/%F	90%C/%F

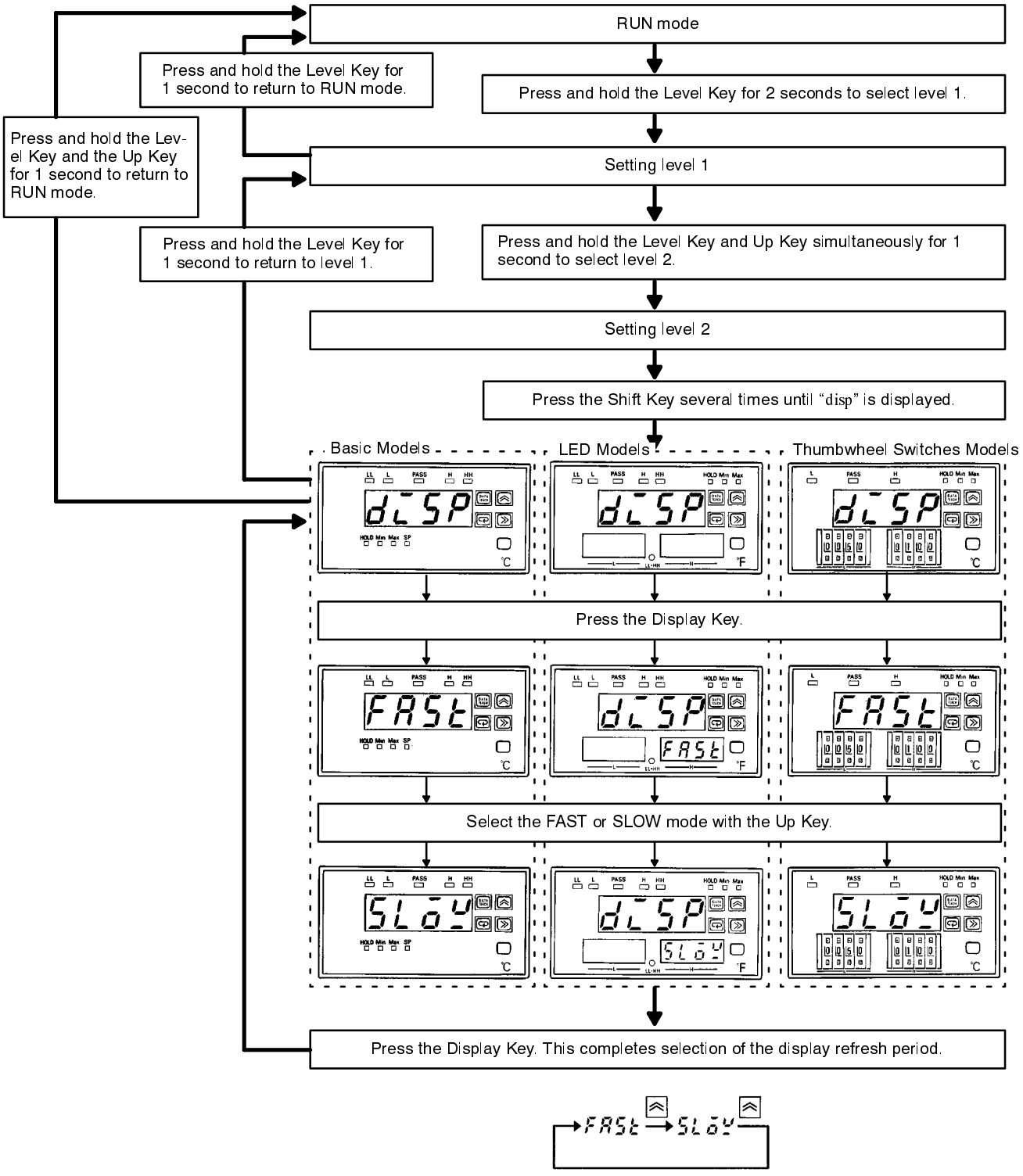


Display Refresh Period

If display data is updated in synchronization with the normal sampling period (500 ms), the data may change too rapidly to be read. In this case, the speed at which the displayed data is updated can be slowed down. When a slow data display speed is selected, the sampling period for measurement is not changed. The comparative outputs and BCD output are updated in synchronization with the sampling period.

In order to set the display refresh period, follow the instructions outlined in the flow diagram (after the table) and operate using one of two settings:

Setting range	
fast	Display is updated every 500 ms.
slow	Display is updated every 2.0 seconds.


RUN mode
Press and hold the Level Key for 1 second to return to RUN mode.
Press and hold the Level Key for 2 seconds to select level 1.
Press and hold the Level Key and the Up Key for 1 second to return to RUN mode.
Setting level 1
Press and hold the Level Key for 1 second to return to level 1.
Press and hold the Level Key and Up Key simultaneously for 1 second to select level 2.
Setting level 2
Press the Shift Key several times until "disp" is displayed.
Basic Models
LED Models
Thumbwheel Switches Models
Press the Display Key.
Select the FAST or SLOW mode with the Up Key.
Press the Display Key. This completes selection of the display refresh period.
FAST
SLOW

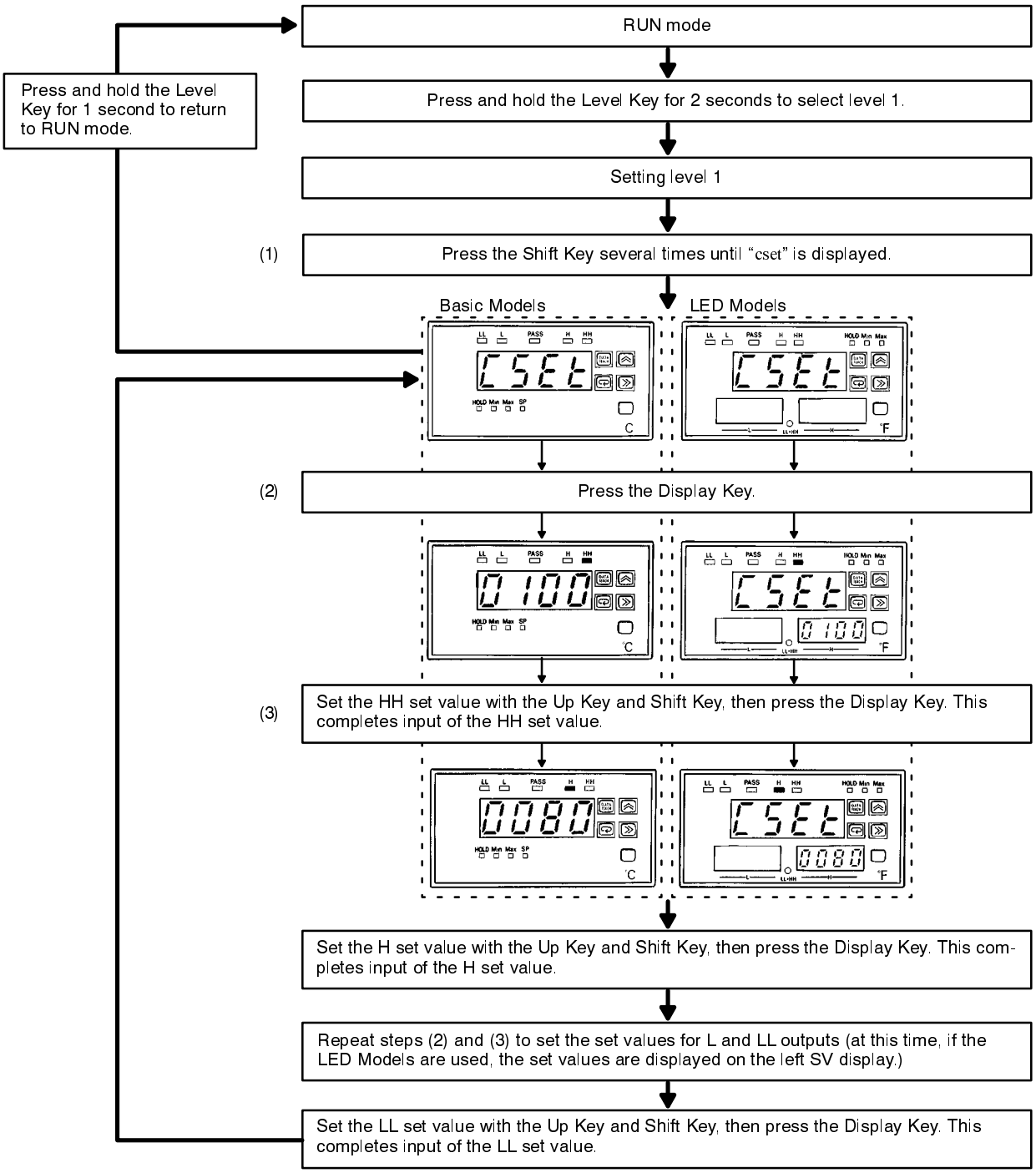
6–2–3 Setting Parameters for Output

Set Values

When setting set values, the decimal point is automatically displayed according to the sensor type selected. Also, there is no limitation on the relationship among HH, H, L, and LL. On the Thumbwheel Switches Models, the set value parameter is not displayed . In this case, set the set values with the thumbwheel switches on the front panel. If the values are set with the thumbwheel switches, the set values are registered (in 1.5 seconds) and the Intelligent Signal Processor operates according to the new set values. Models provided with only H and L outputs do not allow HH and LL set values to be set.

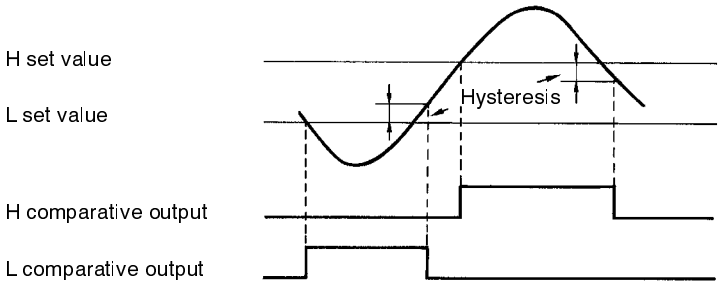
In order to establish set values, follow the instructions outlined in the flow diagram (after the table) and set within the following range:

Setting range
–9999 to 9999


RUN mode
Press and hold the Level Key for 2 seconds to select level 1.
Setting level 1
(1)
Press the Shift Key several times until "cset" is displayed.
Basic Models
LED Models
(2)
Press the Display Key.
(3)
Set the HH set value with the Up Key and Shift Key, then press the Display Key. This completes input of the HH set value.
Set the H set value with the Up Key and Shift Key, then press the Display Key. This completes input of the H set value.
Repeat steps (2) and (3) to set the set values for L and LL outputs (at this time, if the LED Models are used, the set values are displayed on the left SV display.)
Set the LL set value with the Up Key and Shift Key, then press the Display Key. This completes input of the LL set value.
Press and hold the Level Key for 1 second to return to RUN mode.

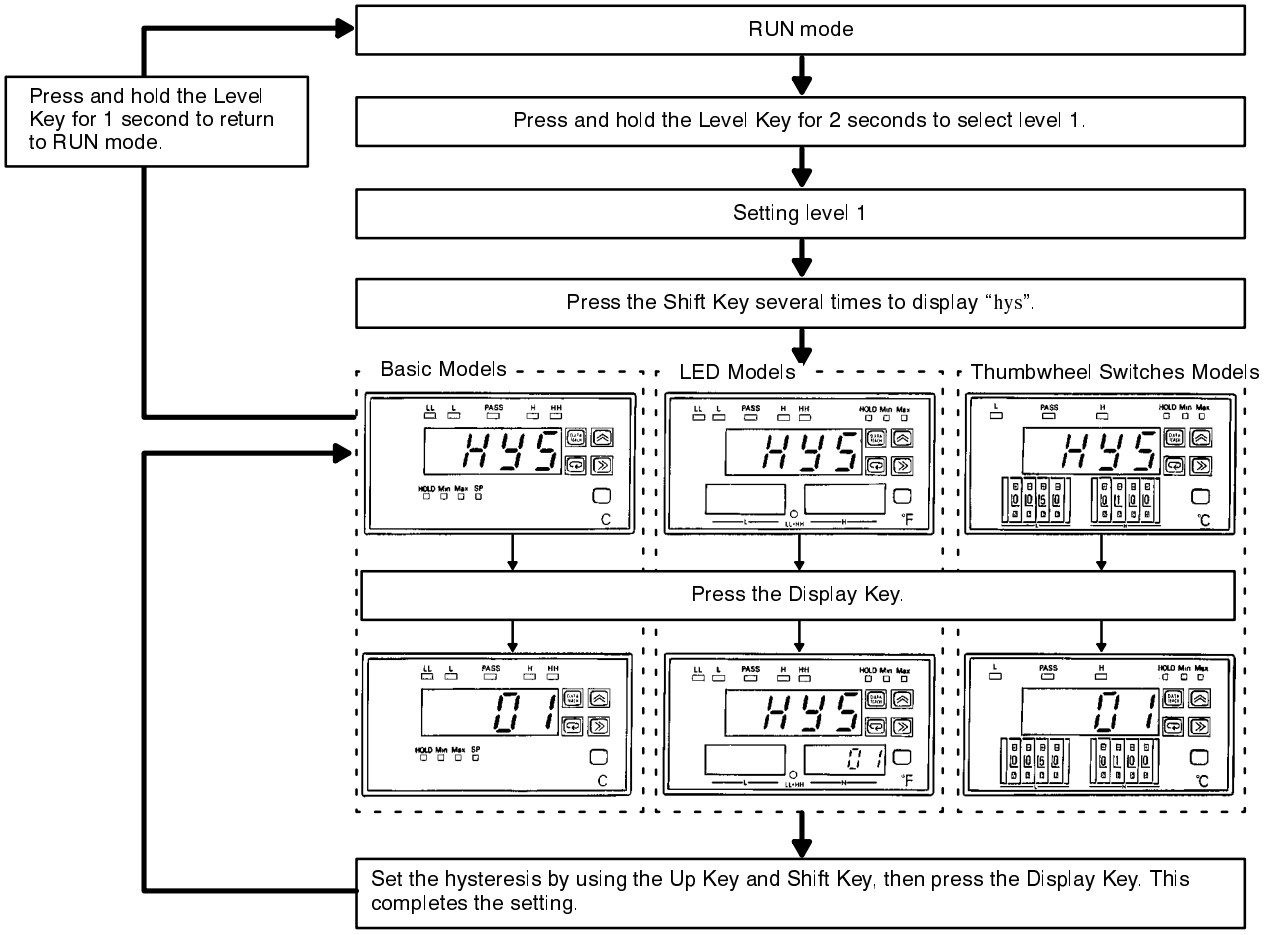
Hysteresis

The established set value includes a hysteresis to prevent the comparative output status from turning ON/OFF when it should not if the measured value (displayed value) fluctuates in the vicinity of the established set value. The hysteresis can be set in a range of 1 to 99 digits (lower 2 digits), and all inputs (HH, H, L, and LL) operate in the same range of hysteresis. In principle, the hysteresis cannot be 0. If set to 0, 1 is assumed. The following graph illustrates the concept of hysteresis.



In order to set hysteresis, follow the instructions outlined in the flow diagram (after the table) and set within the following range:

Setting range
01 to 99

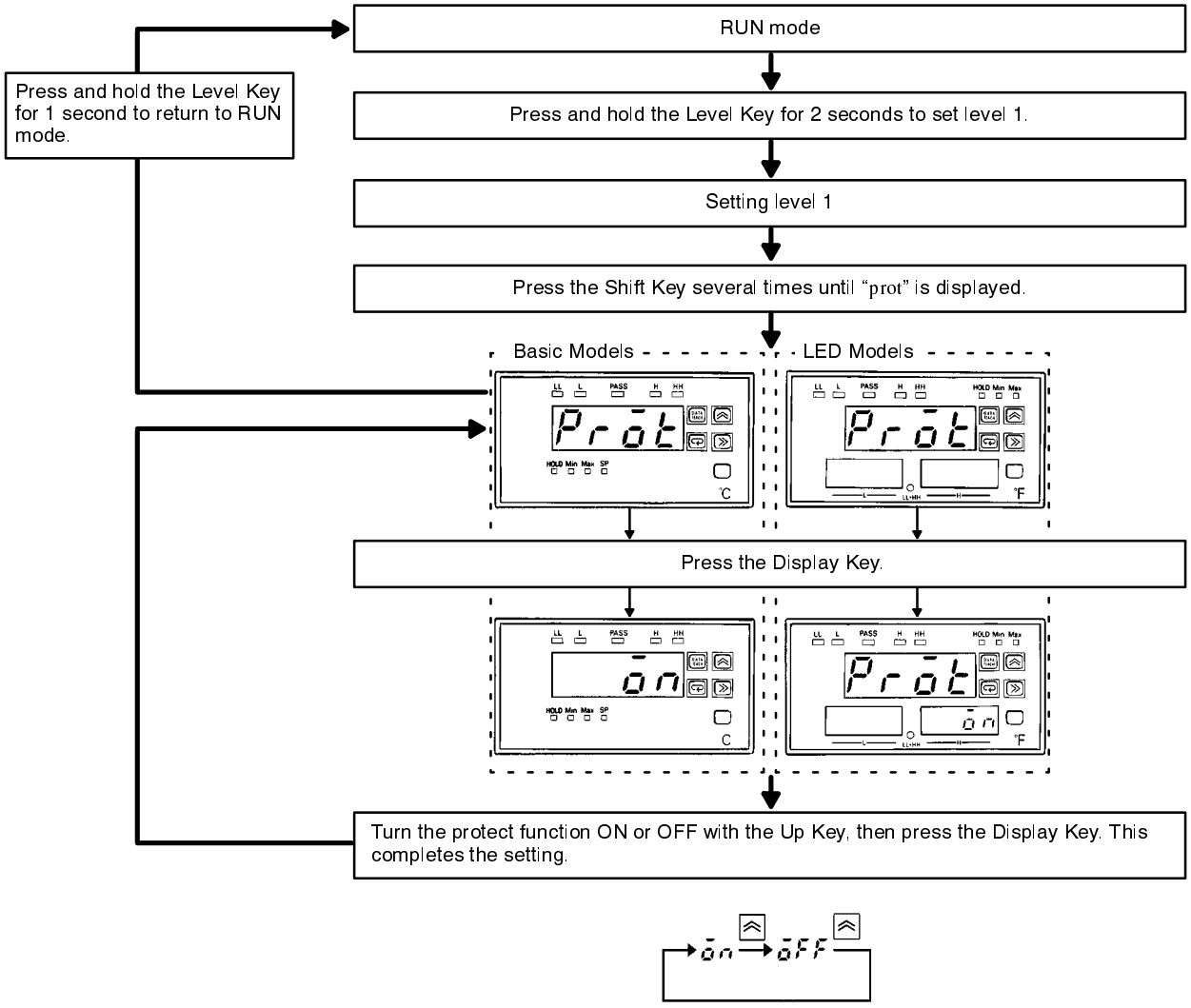


Set Value Protection

With the Basic, LED, and Thumbwheel Switches Models, the set values can be changed in RUN mode. However, this feature can be disabled to protect the set values. With the Basic and LED Models, the set values can be protected against changes, even in RUN mode. The Thumbwheel Switches Models are not provided with the protection function; therefore, no protect parameter will be displayed.

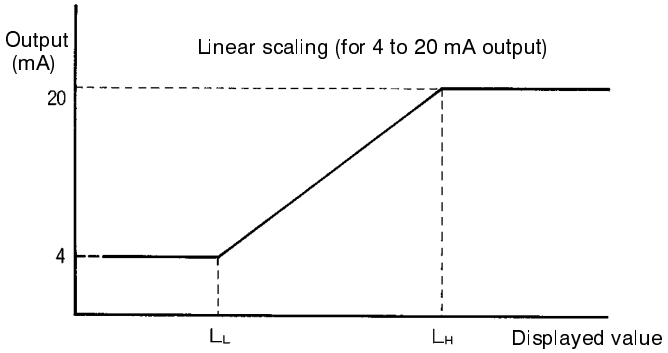
In order to protect set values, follow the instructions outlined in the flow diagram (after the table) and operate using one of two settings:

Setting range	Display
Protect ON	on
Protect OFF	off



Linear Output Range

This feature is only on the 4 to 20 mA, 1 to 5 V linear output types.

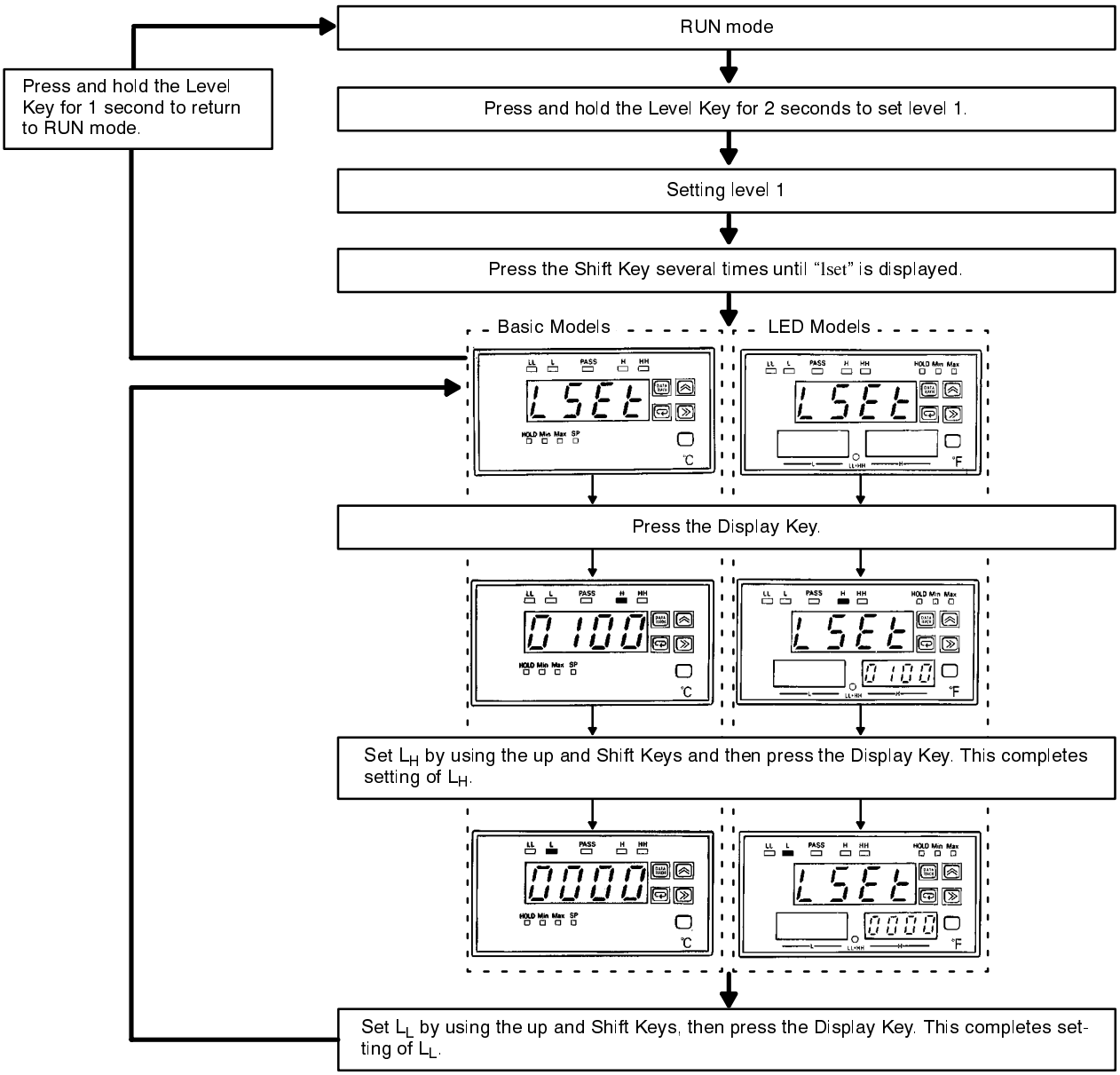


The Intelligent Signal Processor with the 4 to 20 mA, 1 to 5 V linear output, outputs a linear voltage or current in proportion to the changes in the measured value. In the example above, a displayed value corresponding to the maximum output value (20 mA or 5 V) and a displayed value corresponding to the minimum output value (4 mA or 1 V) is set.

When setting the linear output range, the decimal point is automatically displayed according to the type of sensor selected. Do not set $L_L = L_H$; otherwise, it is assumed that L_L + 1 digit = L_H. This function is not provided on the mV/digit output type.

The mV/digit output type outputs 1 mVDC per 1 digit of displayed value regardless of the display position of the decimal point (where display value =150.0, output = 1500 mVDC). This function is not provided on the Thumbwheel Switches Models; they do not have the linear output function.

In order to set the linear output range, follow the instructions outlined in the flow diagram and operate the Intelligent Signal Processor as follows:

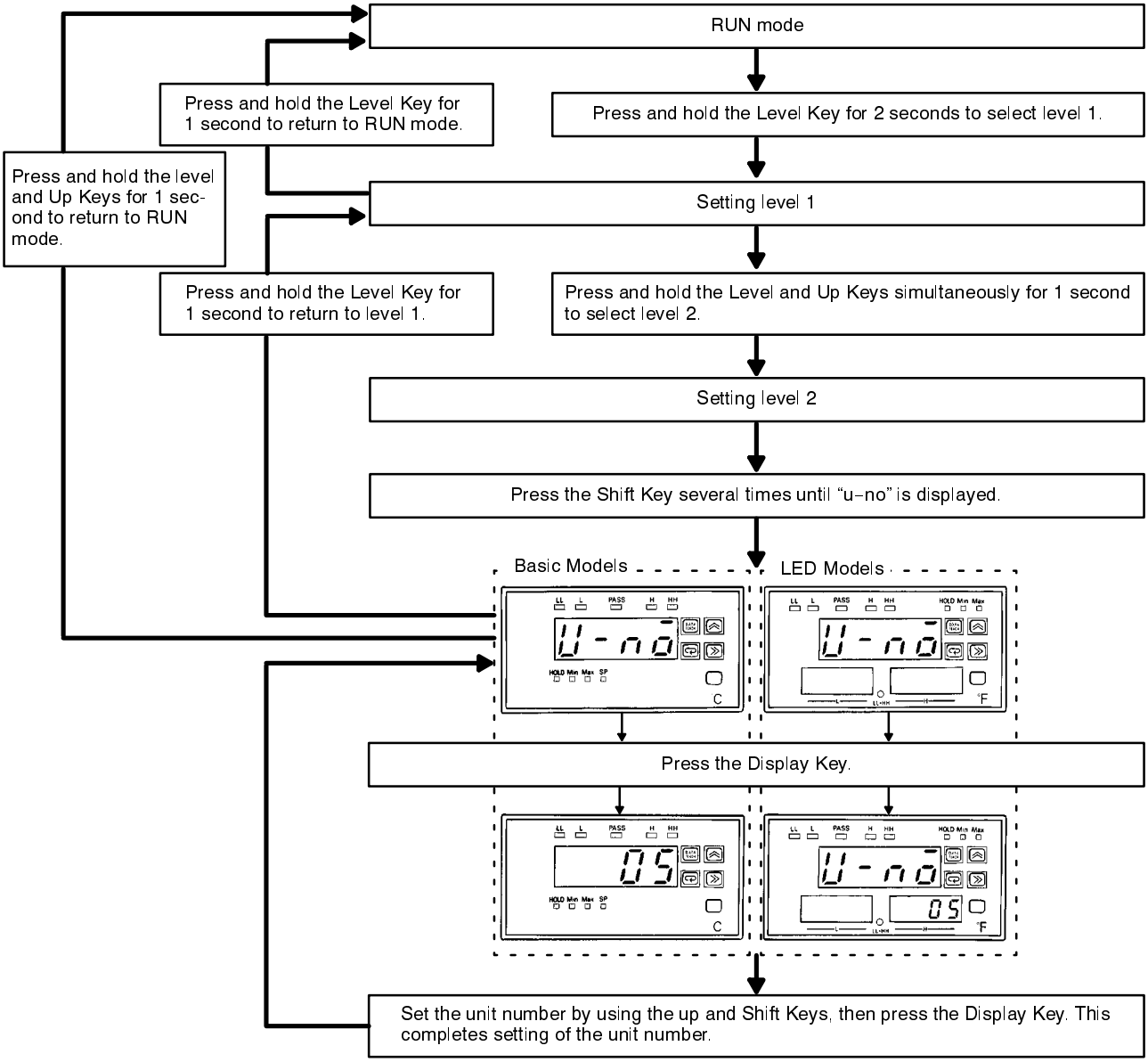

RUN mode
Press and hold the Level Key for 1 second to return to RUN mode.
Press and hold the Level Key for 2 seconds to set level 1.
Setting level 1
Press the Shift Key several times until "1set" is displayed.
Basic Models
LED Models
Press the Display Key.
Set L_H by using the up and Shift Keys and then press the Display Key. This completes setting of L_H.
Set L_L by using the up and Shift Keys, then press the Display Key. This completes setting of L_L.

Communications Unit Number

The communications unit number is an identification number by which the host computer to which the Intelligent Signal Processor is connected identifies the Intelligent Signal Processor. The Thumbwheel Switches Models are not provided with the communications output function; therefore, communications unit number setting is not required. A separate manual containing details of the communications specifications is available from OMRON.

In order to set the communications unit number, follow the instructions outlined on the flow diagram (after the table) and set within the following range:

Setting range
00 to 99

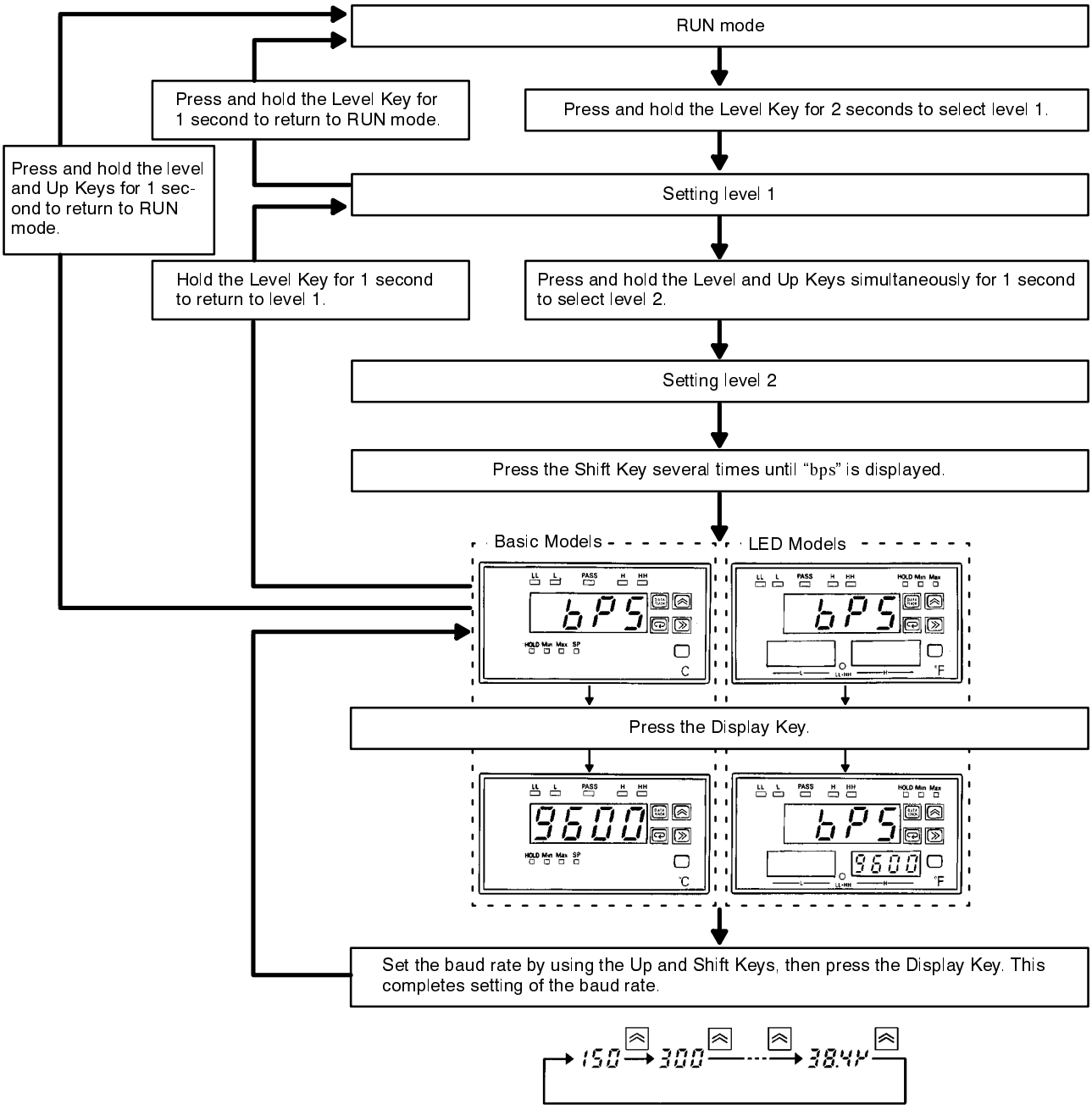


Baud Rate

The Thumbwheel Switches Models are not provided with a communications output function; therefore, setting of the baud rate is not required. For details, refer to the K3TH Communication Instruction Manual.

In order to set the baud rate, follow the instructions outlined in the flow diagram (after the table) and set within the following range:

Setting range	
Display	**Meaning**
150	150 bps
300	300 bps
600	600 bps
1200	1200 bps
2400	2400 bps
4800	4800 bps
9600	9600 bps
19.2k	19.2k bps
38.4k	38.4k bps


RUN mode
Press and hold the Level Key for 2 seconds to select level 1.
Setting level 1
Press and hold the Level and Up Keys simultaneously for 1 second to select level 2.
Setting level 2
Press the Shift Key several times until "bps" is displayed.
Basic Models
LED Models
Press the Display Key.
Set the baud rate by using the Up and Shift Keys, then press the Display Key. This completes setting of the baud rate.
Press and hold the Level Key for 1 second to return to RUN mode.
Press and hold the level and Up Keys for 1 second to return to RUN mode.
Hold the Level Key for 1 second to return to level 1.
150
300
38.4K

6–3 Operations

In order to perform operations in RUN mode and other useful functions, graphs and flow diagrams are given as explanations.

6–3–1 Operations in RUN Mode

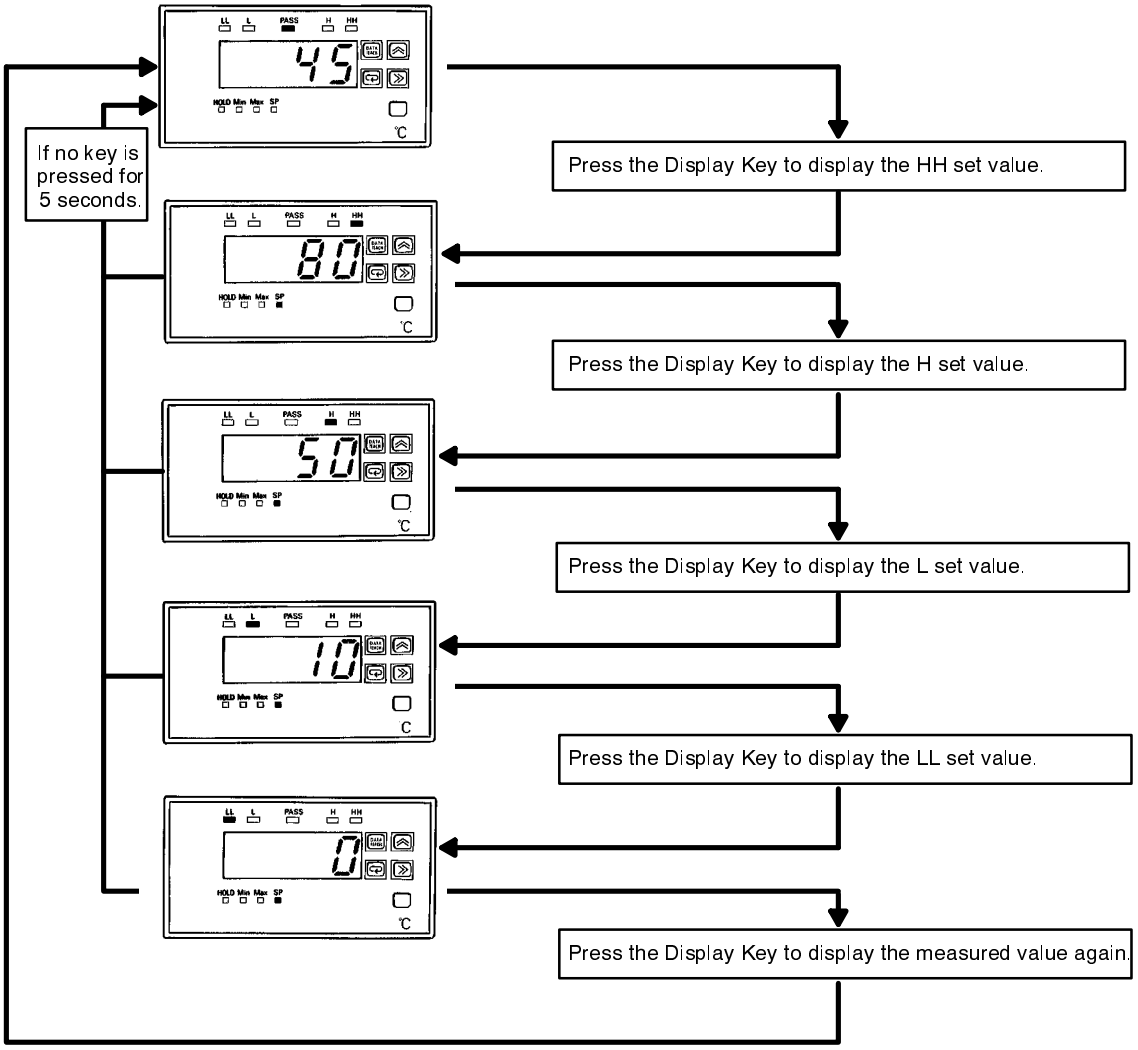
Checking Set Values

The Intelligent Signal Processor allows set values to be checked even in RUN mode.

Basic Models

If no key is pressed for 5 seconds, the current measured value will be displayed. On Models provided with only H and L comparative output status indicators, the set values HH and LL cannot be displayed.

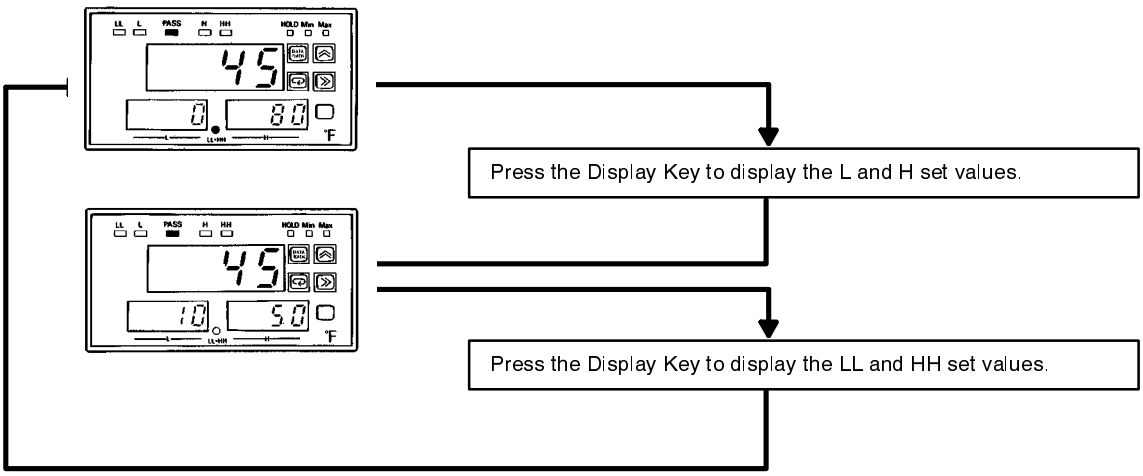
In order to check the set values on the Basic Models, follow the instructions outlined in the flow diagram:



Set Value LED Display Models

Set values LL and HH or L and H are always displayed on the SV display.

In order to check the set values on the LED Models, follow the instructions outlined in the flow diagram:



Thumbwheel Switches Models

On the Thumbwheel Switches Models, set values H and L are always displayed.

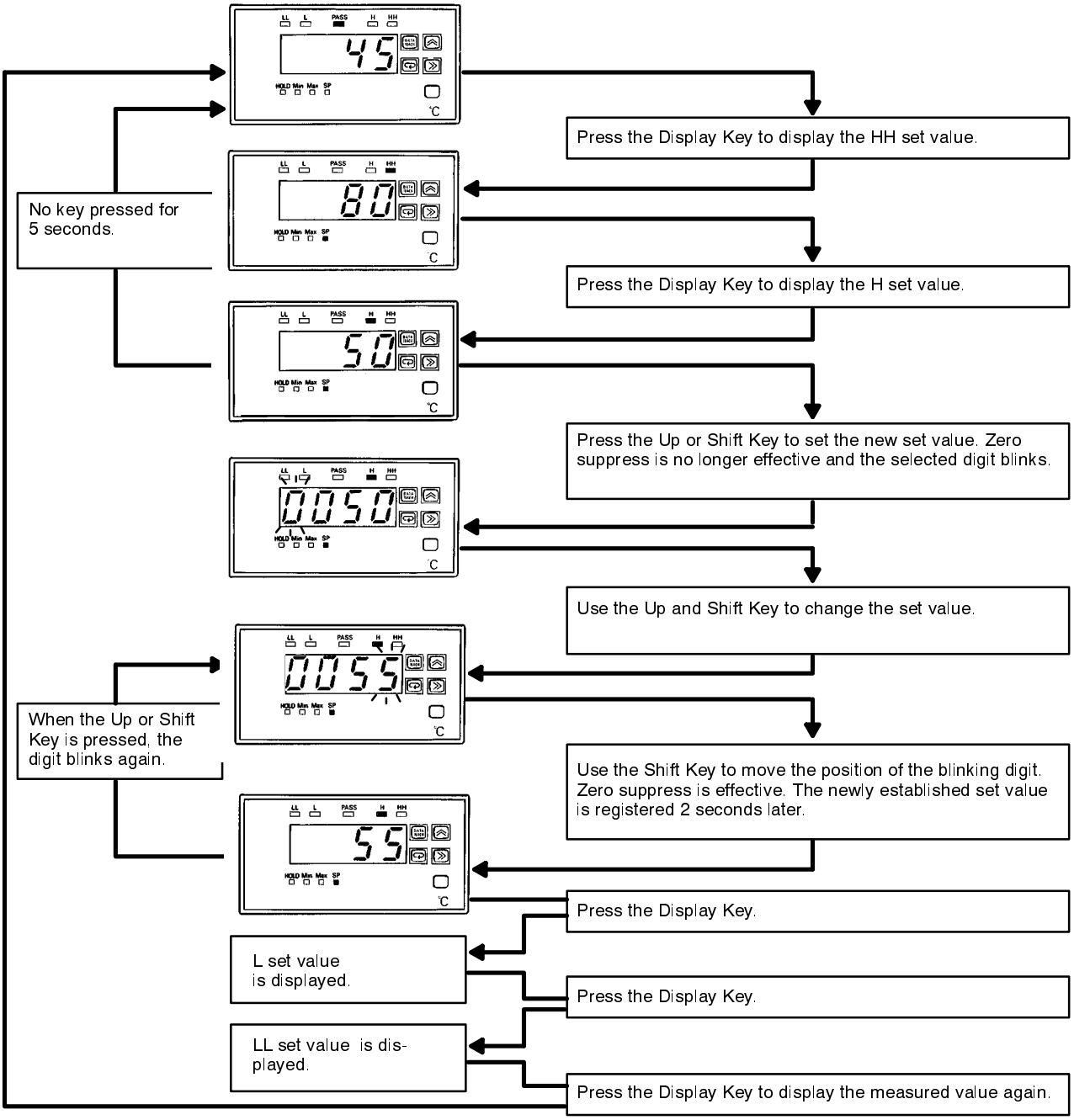
Changing Set Values

Set values can be changed even in RUN mode except when the set value protect is ON.

Basic Models

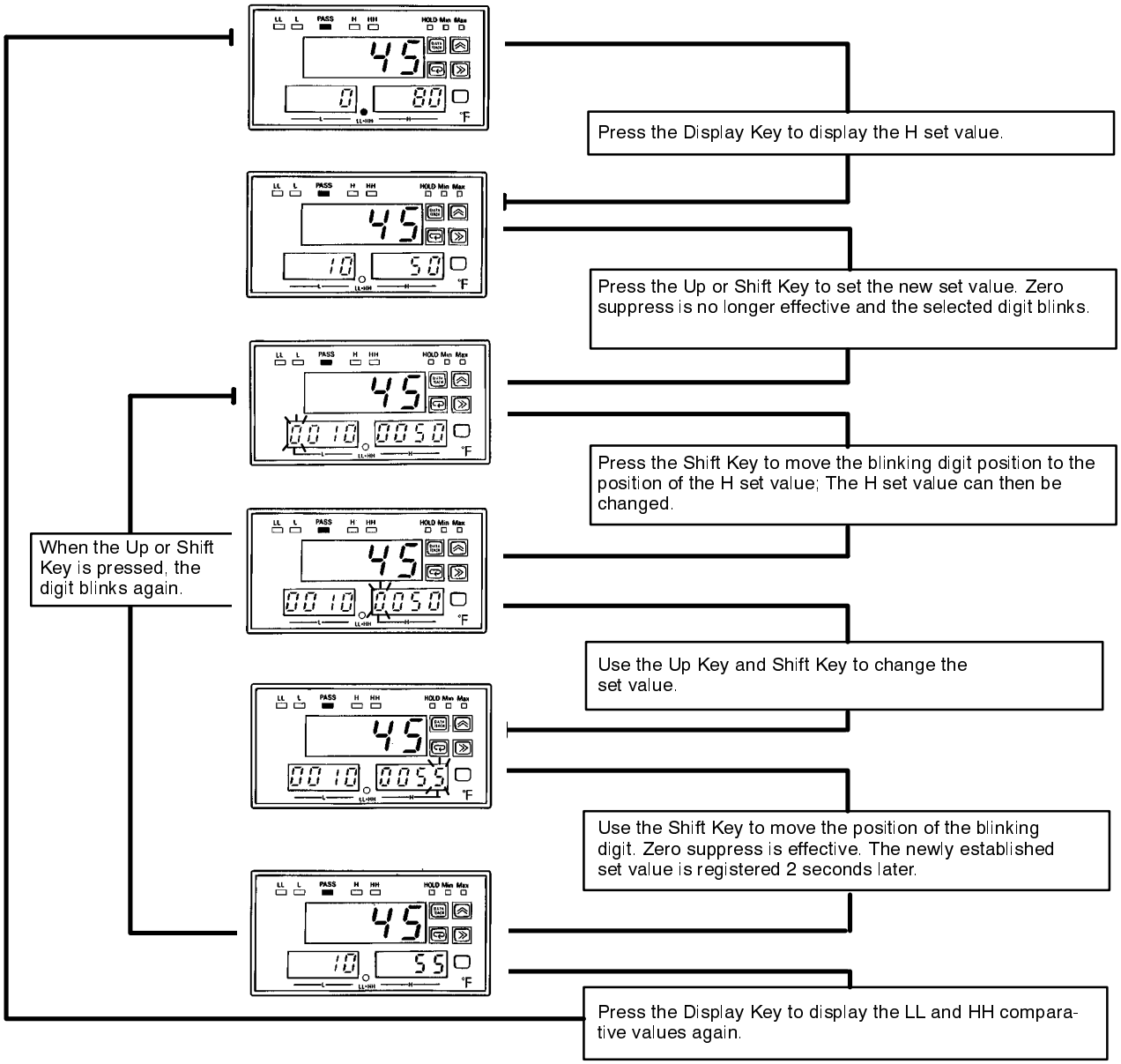
On Models provided with only the H and L comparative output status indicators, the set values HH and LL are not displayed. When setting the new set value, zero suppress is not effective and leading zeroes will appear to the left of the current set value.

In order to change the set values on the Basic Models, follow the instructions outlined in the flow diagram, which shows how to change set value HH from 50 to 55:



Set Value LED Display Models

In order to change the set values on the Basic Models, follow the instructions outlined on the flow diagram, which shows how to change set value H from 50 to 55:

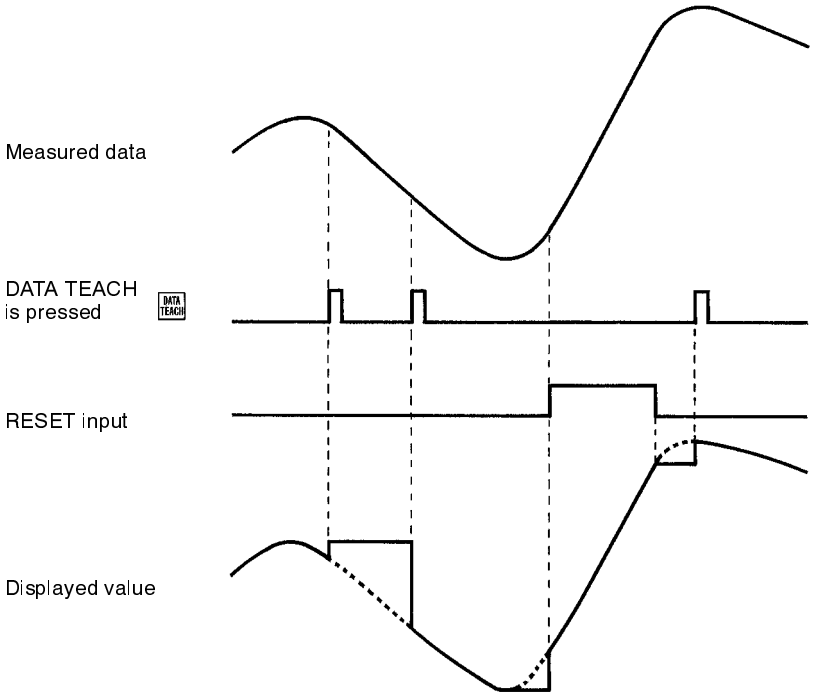


Thumbwheel Switches Model

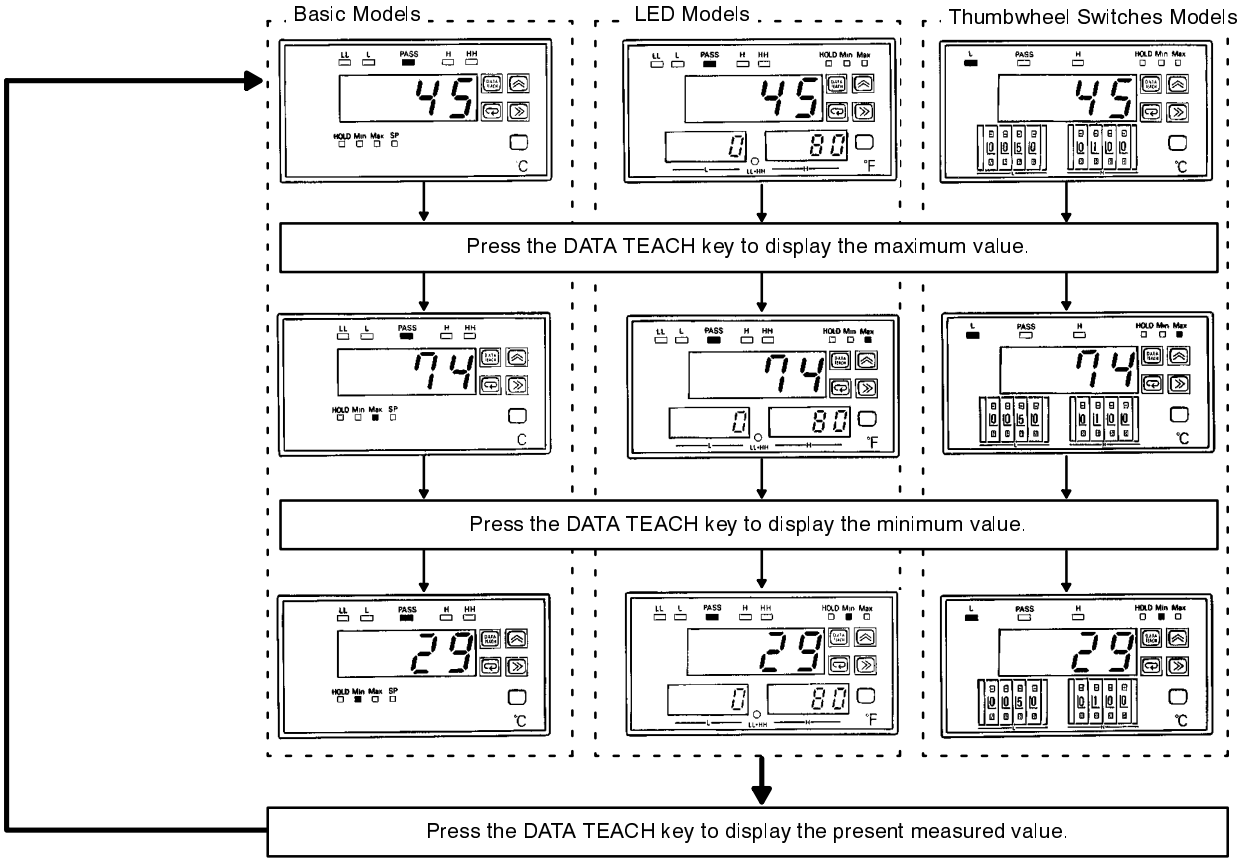
With the Thumbwheel Switches Models, set values can be changed at any time with the thumbwheel switches. The set values are registered 1.5 seconds after the values have been set with the thumbwheel switches and the Intelligent Signal Processor operates according to the new set values.

Retaining, Resetting Maximum/Minimum Values

The maximum and minimum of the values measured since power application or RESET signal input up to the present point are retained. Each time the DATA TEACH key is pressed, the maximum value, minimum value, and present value are displayed on the PV display in this order. When the RESET signal turns ON, both the maximum and minimum values are reset to the present value. Maximum and minimum data are reset under one of the following conditions: when the RESET input is ON, when power is OFF, or in SET mode. While the hold function of the maximum and minimum values is effective, the comparative outputs and BCD outputs are output in accordance with changes in the measured value, regardless of the display or even if the RESET signal is off. The following graph illustrates the effect of this operation.

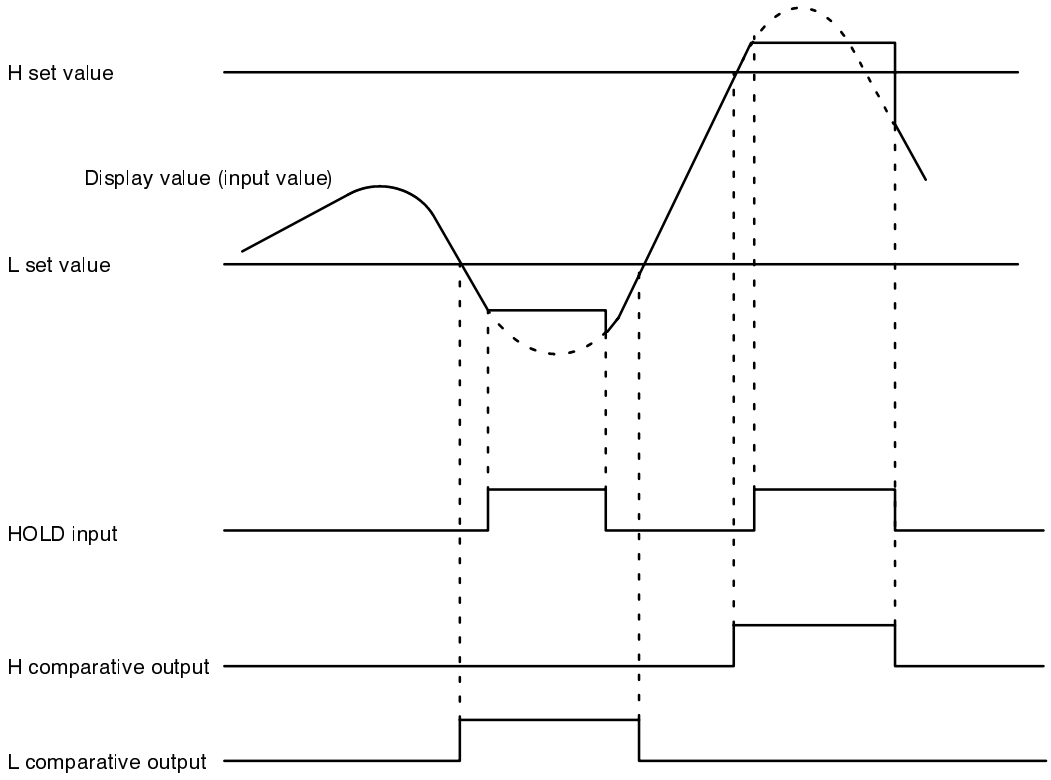


In order to perform this operation, follow the instructions outlined in the flow diagram:


Basic Models
LED Models
Thumbwheel Switches Models
Press the DATA TEACH key to display the maximum value.
Press the DATA TEACH key to display the minimum value.
Press the DATA TEACH key to display the present measured value.

Hold Measured Value

When the HOLD input is turned ON, measurement stops and the input measured just before the HOLD input turned ON is held. The displayed value, comparative outputs, and BCD data are also held. When the HOLD input is turned OFF, the held data is released. If you change set values while the K3TH is holding the measured value, the comparison outputs will change according to the new set value. If power is switched ON while the HOLD input is ON, the K3TH holds 0 as the input value. In this case, 0 is displayed. Make sure the HOLD input is OFF before applying power. The following graph illustrates the effect of this operation.



6–3–2 Special Functions

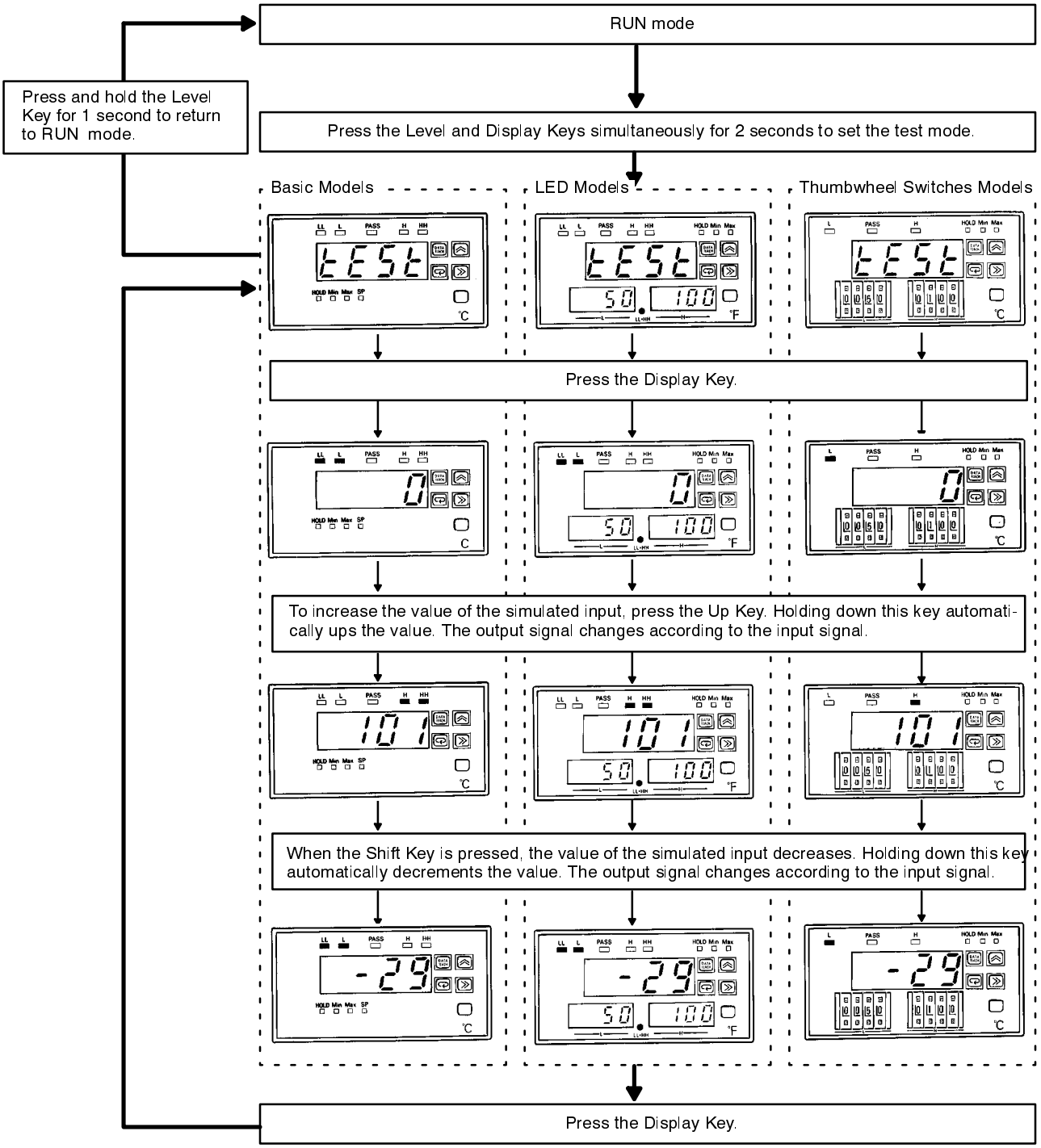
The K3TH Intelligent Signal Processor is provided with two special functions: test mode and teaching function.

1. Test mode: This function is convenient for checking a system to which the Intelligent Signal Processor is connected, especially when some inputs cannot be operated. The Intelligent Signal Processor simulates the input, changing the display and output conditions.
2. Teaching function: This function allows the measured values to be set as set values or prescale values while actual measurement is being carried out. This function is useful for setting parameters while checking the operating status of the Intelligent Signal Processor.

Test Mode

The Intelligent Signal Processor is provided with a test mode in which simulated signals can be input. When a simulated input signal is applied, an actual corresponding output signal is issued. Confirm the status of the equipment connected to the output side of the Intelligent Signal Processor.

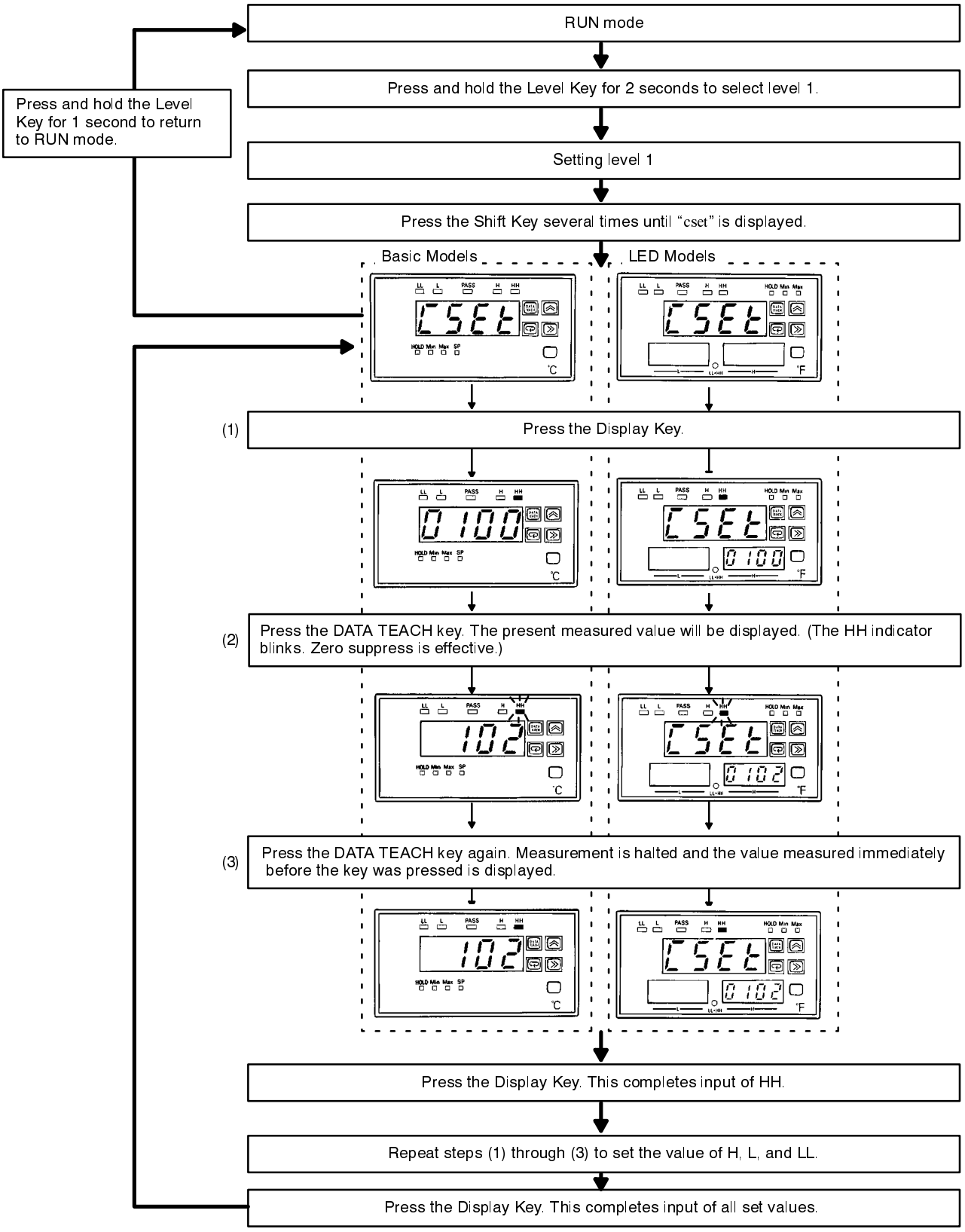
In order to perform this operation, follow the instructions outlined in the flow diagram:



Setting Set Values with the Teaching Function

The Intelligent Signal Processor is provided with a teaching function that can set an actual measured value as a set value. The Thumbwheel Switches Models are not provided with this function.

In order to perform this operation, follow the instructions outlined in the flow diagram, which shows how to change set value HH from 100 to 102:


RUN mode
Press and hold the Level Key for 2 seconds to select level 1.
Press and hold the Level Key for 1 second to return to RUN mode.
Setting level 1
Press the Shift Key several times until "cset" is displayed.
Basic Models
LED Models
(1)
Press the Display Key.
(2)
Press the DATA TEACH key. The present measured value will be displayed. (The HH indicator blinks. Zero suppress is effective.)
(3)
Press the DATA TEACH key again. Measurement is halted and the value measured immediately before the key was pressed is displayed.
Press the Display Key. This completes input of HH.
Repeat steps (1) through (3) to set the value of H, L, and LL.
Press the Display Key. This completes input of all set values.

SECTION 7
Troubleshooting

If an error message appears while using the K3TH Intelligent Signal Processor, the problem may originate from either the incorrect use of the Intelligent Signal Processor or from external sources such as a faulty sensor. This troubleshooting section suggests some possible sources of error and the corrective action to be taken.

Troubleshooting Guide

The following table shows possible errors during the K3TH Intelligent Signal Processor operation and corrective actions to be taken.

Item	Condition	Error message	Output status				Corrective action
			Comparative outputs	BCD output	Linear output	Communications	
Device failure	CPU RAM error, external memory error, memory data error.	eror	OFF	OFF	OFF	OFF	Turn the power OFF and then ON again once. If the error persists, contact OMRON.
	Corrupted data.	cg–s	OFF	OFF	OFF	OFF	Turn the power OFF and then ON again once. If the error persists, press the mode key and set all parameters again.
Sensor error	Breakage or short-circuit of sensor. When thermocouple is used, terminals 11 and 13 are not short-circuited.	s.err	OFF	OFF	OFF	OFF	Check sensor for breakage, short-circuiting, and correct wiring.
Overflow, underflow	Input value or display value outside range.	Blinks	Continues	Continues OVER ON	Continues	Continues OVER ON	Keep the input value and display value within the range.
Output type change	When output type has changed.	cg–o	OFF	OFF	OFF	OFF	Check the output type. If correct, press the mode key. At this time, the parameters are initialized; therefore, set the parameters again. If the error persists, contact OMRON.
Output type error	Output type other than specified.	er–o	OFF	OFF	OFF	OFF	Turn the power OFF and then ON again once. If the error persists, contact OMRON.
Input specification error	Input type other than specified.	er–i	OFF	OFF	OFF	OFF	Turn the power OFF and then ON again once. If the error persists, contact OMRON.

Appendix A
Standard Models

The K3TH Intelligent Signal Processor is suited to essentially any application. The following lists the standard models available:

K3TH - □ □ □ □ □ - □ □
1 2 3 4 5 6 7

1, 2: Input sensor codes
TA: General-purpose temperature sensors
TB: High temperature thermocouples

3: Series number
1: Current series

4: Power supply voltage
1: 100 to 240 VAC
2: 12 to 48 VDC
3: 48 to 110 VDC

5: Type of display
A: Basic
C: Set Value LED Display
D: Thumbwheel Switches

6,7: Output type codes
C1: Relay output [H, PASS, L (SPDT)]
C2: Relay output [HH, H, L, LL, (SPST), PASS (SPDT)]
C5: Relay output [HH, H, L, LL, (SPST-NC), PASS (SPDT)]
T1: Transistor output (NPN open collector HH, H, PASS, L, LL)
T2: Transistor output (PNP open collector HH, H, PASS, L, LL)
B2: BCD output (NPN open collector)
L1: Linear output (4 to 20 mA)
L2: Linear output (1 to 5 V)
L3: Linear output (mV/digit)
S1: Communication output (RS-232C)
S2: Communication output (RS-485)
S3: Communication output (RS-422)

Options (Special Specifications)

Processors with the following outputs are also available as follows:

Optional output type codes/output configuration	Basic	Set Value LED	Thumb-wheel switches
B4: BCD and Transistor output (NPN open collector HH, H, PASS, L, LL)	Yes	Yes	Yes
L4: 4 to 20 mA and Transistor output (NPN open collector HH, H, PASS, L, LL)	Yes	Yes	– – –
L5: 1 to 5 V and Transistor output (NPN open collector HH, H, PASS, L, LL)	Yes	Yes	– – –
L6: mV/digit and Transistor output (NPN open collector HH, H, PASS, L, LL)	Yes	Yes	– – –
S5: RS-485 and Transistor output (NPN open collector HH, H, PASS, L, LL)	Yes	Yes	– – –
S6: RS-422 and Transistor output (NPN open collector HH, H, PASS, L, LL)	Yes	Yes	– – –

Note: Thumbwheel Switches Models have the following transistor outputs only: H, PASS, and L.

Accessories (Order Separately)

Transparent Front Cover Model K32-49SC

The K32-49SC Soft Front Cover protects the front panel of the Processor (the Basic and Set Value LED Display Models) from oil and water. All keys on the front panel can be operated with the cover on.

Appendix B
Sensor Models

The following lists the various E52 Temperature Sensor models that can be used with the K3TH Intelligent Signal Processor along with the K3TH factory-set parameters associated with the use of temperature sensors.

Temperature Sensors (Optional)

The E52 Temperature Sensors can be used to suit specific job requirements.

Model number

E52 - □ □ □ □ □
1 2 3 4 5

OMRON E52 Temperature Sensor

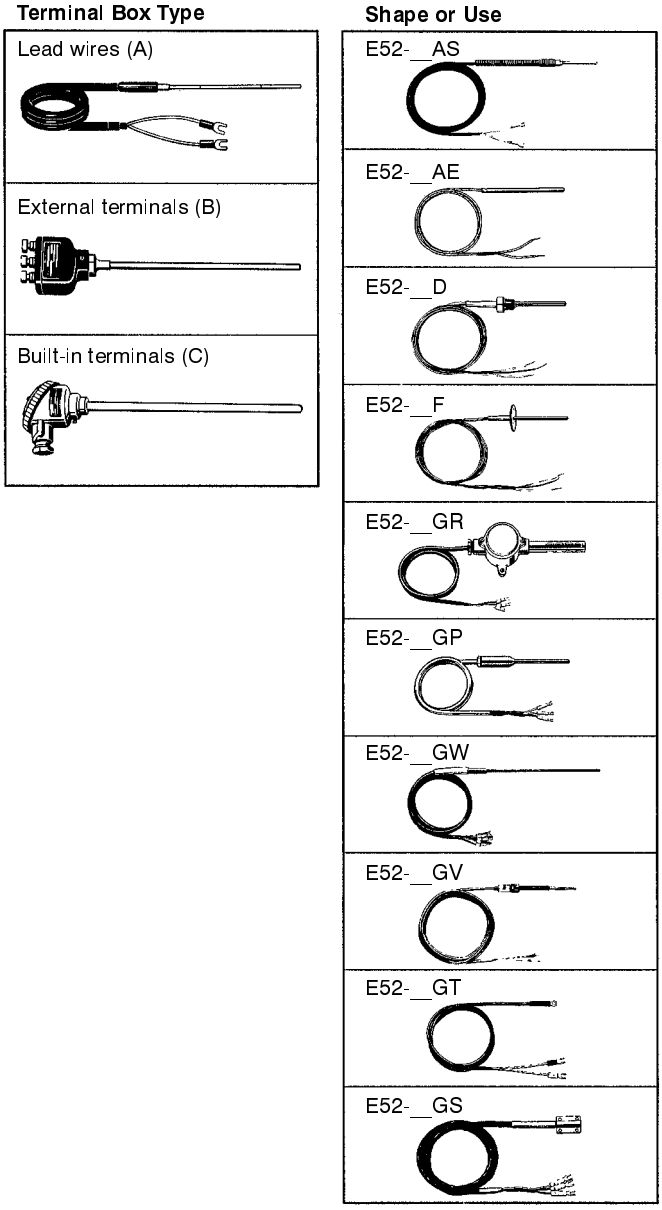
1,2,3: Sensing element
P: Pt100 temperature-resistance thermometer
PT: JPt 100 temperature-resistance thermometer
K(CA): K(CA) thermocouple
J(IC): J(IC) thermocouple
R: R(PR) thermocouple
T: T thermocouple
E: E thermocouple

4: Protection tube length
1: 10 to 20 mm
2: 25 mm
5: 50 mm
6: 65 mm
15: 150 mm
20: 200 mm
35: 350 mm
50: 500 mm
75: 750 mm
100: 1,000 mm

5: Terminal box type
A: Lead wires
B: External terminals
C: Built-in terminals

5: Shape or use (See note)
AS: Low-cost, lead-wire type with springs
AE: Low-cost, lead-wire type
D: Low-cost, lead-wire type with screws
F: Low-cost, lead-wire type with flange
GR: For room temperature use
GP: Waterproof
GW: Twin elements
GV: For pressure welding machines
GT: With solderless terminals
GS: For sensing surface temperatures

Note: For more details, refer to the catalog of temperature controllers.



List of Factory-set Parameters

These values are factory-set for temperature sensors.

Setting level	Content of menu	Displayed characters		Initial value
Level 1	Set value	cset	HH	9999
			H	9999
			L	–999
			LL	–999
	Hysteresis	hys		01
	Input shift	in–s		000
	Linear output range	lset	LH	9999
			LL	–999
	Set value protect	prot		off
Level 2	Sensor type	in–t		k ca
	Display unit	c––f		c
	Display refresh period	disp		fast
	Unit no.	u–no		00
	Baud rate	bps		9600

Appendix C
Specifications

Specifications and Ratings

The following lists the ratings and characteristics of the K3TH Intelligent Signal Processor:

Ratings

Supply voltage	100 to 240 VAC (50/60 Hz); 12 to 24 VDC; 48 to 110 VDC
Operating voltage range	85% to 110% of supply voltage (48 to 110 VDC: 85% to 115%)
Power consumption	15 VA max. (max. AC load); 10 W max. (max. DC load)
Insulation resistance	10 MW min. (at 500 VDC) between external terminal and case
Dielectric withstand voltage	2,000 VAC min. for 1 min between external terminal and case
Noise immunity	+1,500 V on power supply terminals in normal or common mode (square-wave noise with 1 ms, 100 ns)
Vibration resistance	Malfunction: 10 to 55 Hz, 0.5-mm (approx. 7G) for 10 min each in X, Y, and Z directions Destruction: 10 to 55 Hz, 0.75-mm (approx. 10G) for 2 hrs each in X, Y, and Z directions
Shock resistance	Malfunction: 100 m/s^2 (approx. 10G) for 3 times each in X, Y, and Z directions Destruction: 300 m/s^2 (approx. 30G) for 3 times each in X, Y, and Z directions
Ambient temperature	Operating: –10% to 55%C (with no icing) Storage: –20% to 65%C (with no icing)
Ambient humidity	Operating: 35% to 85% (with no condensation)
Ambient atmosphere	Must be free of corrosive gas

Characteristics

Indication accuracy	(±0.3% rdg or +1%%C whichever greater) ±1 digit max.*
Input	General-purpose Temperature Sensors: Thermocouple (R, S, K, J, T, E, ,L, U), Platinum resistance thermometer (Pt 100) High Temperature Thermocouples: Thermocouple (B, W/Re5-26, PL-II, N)
Sampling period	500 ms
Display refresh period	500 ms/2.0 s (switch selectable)
Input shift	Thermocouple: -99 % to 99 %C/%F Platinum resistance thermometer: -9.9 % to 9.9 %C/%F
Other functions	PV hold, Max. value retain, Min. value retain, Max./Min. data reset, Selectable display unit (%C/%F), Set value write-protection (only on Processors with comparative outputs), Variable linear output range (only on Processors with linear outputs)
Output configuration	Relay contact output (5 or 3 outputs), Transistor output (NPN open collector and PNP open collector), Parallel BCD, Linear output (4 to 20 mA, 1 to 5 V, mV/digit), Communication functions (RS-232C, RS-485, RS-422)
Delay in comparative output	1.0 s max. (Transistor output)
Enclosure rating	Front panel: IEC standard IP50 Rear case: IEC standard IP20 Terminals: IEC standard IP00

*The accuracy of R and S thermocouples at temperature from 0% to 200%C (0% to 400%F) is +3%C (+5.4%F) +1 digit. The accuracy of U thermocouples from -150% to 400%C (-240% to 700%F) is +2%C (+3.6%F) +1 digit. Accuracy is not guaranteed below -150%C (-240%F). The accuracy of W thermocouples from 0% to 200%C (0% to 400%F) is +3%C (+5.4%F) +1 digit. Accuracy of B thermocouples is not guaranteed below 400%C (750%F). The accuracy of L thermocouples over 320%C (600%F) is +0.6% rdg. +1 digit.

I/O Ratings

The following tables list the various I/O Ratings. These I/O Ratings are categorized according to: Contact Output, Transistor Output, I/O Ratings of BCD Output, and Linear Output.

Relay Contact Output

Item	Resistive load (cosf = 1)	Inductive load (cosf = 0.4, L/R = 7 ms)
Rated load	5 A at 250 VAC; 5 A at 30 VDC	1.5 A at 250 VAC, 1.5 A at 30 VDC
Rated carry current	5 A max. (at COM terminal)	
Max. contact voltage	380 VAC, 125 VDC	
Max. contact current	5 A max. (at COM terminal)	
Max. switching capacity	1,250 VA, 150 W	375 VA, 80 W
Min. permissible load	10 mA at 5 VDC	

Transistor Output

Rated load voltage	12 to 24 VDC $^{+10\%}/_{-15\%}$
Max. load current	50 mA
Leakage current	100 mA max.

BCD Output

I/O signal name		Item	Rating
Inputs	REQUEST	Input voltage	No-voltage contact input
	HOLD MAX REQ.	Input current	10 mA
	MIN REQ. RESET	Operating voltage	ON: 1.5 V max. OFF: 3 V min.
Outputs	DATA (4 1/2 digits) POLARITY	Rated load voltage	12 to 24 VDC $^{+10\%}/_{-15\%}$
	DATA OVERFLOW DATA VALID	Max. load current	10 mA
	RUN	Leakage current	100 mA max.

Linear Output

Item	4 to 20 mA	1 to 5 V	mV/digit
Resolution	4,096 resolution		
Permissible load resistance	600 W max.	500 W min.	1 KW min.

Communications Specifications

The following lists the Intelligent Signal Processor specifications related to communications (for more details, refer to the K3TH/K3TR Communication Operation Manual.

Item		RS232C, RS422	RS485
Transmission method		4-wire, half-duplex	2-wire, half-duplex
Synchronization method		Start-stop synchronization	
Baud rate		150/300/600/1,200/2,400/4,800/9,600/19,200/38,400	
Transmission code		ASCII (7-bit)	
Communications	**Write to K3TH**	Set values, reset control (maximum/minimum values)	
	Read from K3TH	Set values, process value, maximum/minimum values, model data, error code, etc.	

Index

M

O

P

R

S

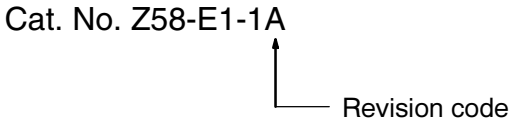
T

U

Z

Revision History

A manual revision code appears as a suffix to the catalog number on the front cover of the manual.



The following table outlines the changes made to the manual during each revision. Page numbers refer to previous version.

Revision code	Date	Revised content
1	May 1991	Original production
1A	October 1991	The term “Mode Key” has been replaced by “Display Key” throughout the manual. **Page 26**: Columns added to both tables. **Page 50**: First 2 sentences of “teaching function” have been replaced. **Page 56**: “Incorrectly set data” has been replaced with “DATA” in table. **Page 62**: 500 W replaced with 600 W in Linear Output table.