User's Manual

YEWSERIES 80

Model SALD (Style R) mV and Temperature Alarm Unit

IM 01B04K02-02E

YOKOGAWA
Yokogawa Electric Corporation

IM 01B04K02-02E
8th Edition

Model SALD (Style R)
Alarm Unit

IM 01B04K02-02E 8th Edition

Contents

1. INTRODUCTION

This manual describes the functions and operations of the SALD mV and Temperature Alarm Unit.

■ Intended Readers

This manual is intended for personnel in charge of:

- Installation and wiring
- Instrumentation and setup of functions
- Operation and monitoring of the controller
- Maintenance of equipment

■ Related Documents

The following documents all relate to the SALD mV and Temperature Alarm Unit. Read them as necessary. The codes enclosed in parentheses are the document numbers.

- Rack-Mounted Instruments (IM 1B4F2-01E)
  Describes mounting and wiring for YS80 rack-mounted instruments.

- Model JHT200 Handy Terminal (IM JF81-02E)
  Describes operation of JHT200.

- YEWSERIES 80 Installation Manual (TI 1B4A9-01E)
  Describes the installation conditions of YS80 instruments.

1.1 Inspection

The SALD mV and temperature alarm unit is shipped only after stringent inspection at the factory. Visually inspect the product upon delivery to make sure it is not damaged in any way.

Store the box and inner packing material of the package in a safe place / they may be needed if there is a problem with the product and it needs to be sent back for repair.

■ Check of Model and Suffix Codes

The model and suffix codes are indicated on the Name plate attached to the front cover of the instrument. Crosscheck this information with the model and suffix codes of Section 2.2 to ensure that the product is as specified in the order.

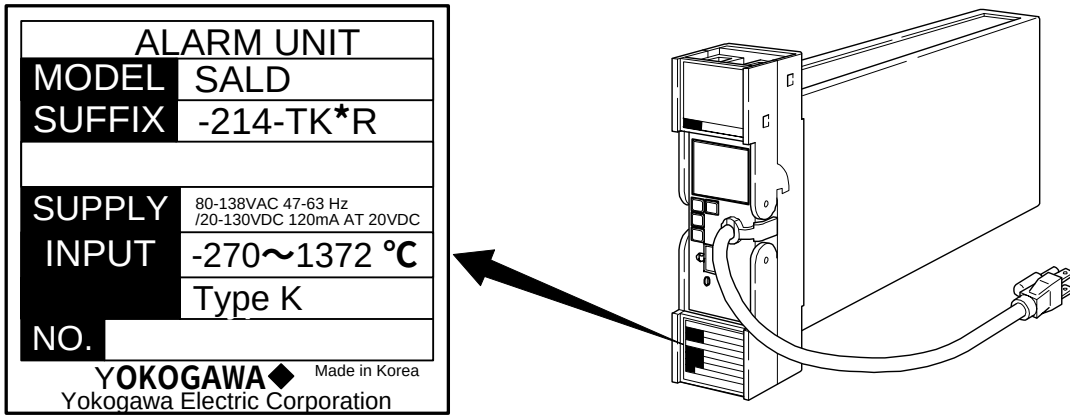

Figure 1-1 Name Plate

■ Confirmation of the Package Contents

Check the package contents against the list below. If anything is missing or damaged, immediately contact the sales office from which you purchased the product or your nearest Yokogawa representative.

- SALD mV and Temperature Alarm Unit 1
- Alarm Label (Parts No.: L4040JA) ..... 1 sheet
- Fuse (Parts No.: S9510VK) 1
- User's Manual (This manual) 1

1.2 Documentation Conventions

This manual uses the following notational conventions.

■ Symbols

The following symbols are used in this manual.

WARNING

Indicates that operating the hardware or software in a particular manner may damage it or result in a system failure.

NOTE

Draws attention to information that is essential for understanding the operation and/or features of the product.

TIP

Gives additional information to complement the present topic and/or describes terms specific to this document.

See Also

Gives reference locations for further information on the topic.

■ Description of Displays

Some of the representations of product displays shown in this manual may be exaggerated, simplified, or partially omitted for reasons of convenience when explaining them.

1.3 Notice

■ This User's Manual

- This manual should be passed on to the end user. Keep at least one extra copy of the manual in a safe place.
- Read this manual carefully to gain a thorough understanding of how to operate this product before you start using it.
- This manual is intended to describe the functions of this product. Yokogawa Electric Corporation (hereinafter simply referred to as Yokogawa) does not guarantee that these functions are suited to the particular purpose of the user.
- Under absolutely no circumstances may the contents of this manual, in part or in whole, be transcribed or copied without permission.
- The contents of this manual are subject to change without prior notice.
- Every effort has been made to ensure accuracy in the preparation of this manual. Should any errors or omissions come to your attention however, please contact your nearest Yokogawa representative or sales office.

■ Protection, Safety, and Prohibition against Unauthorized Modification

- In order to protect the product and the system controlled by it against damage and ensure its safe use, make certain that all of the instructions and precautions relating to safety contained in this document are strictly adhered to. Yokogawa does not guarantee safety if products are not handled according to these instructions.
- The following safety symbols are used on the product and in this manual.

If this symbol is indicated on the product, the operator should refer to the explanation given in the user's manual in order to avoid personal injury or death to either themselves or other personnel, and/or damage to the instrument. The manual describes that the operator should exercise special care to avoid shock or other dangers that may result in injury or loss of life.

Protective ground terminal:
This symbol indicates that the terminal must be connected to ground prior to operating the equipment.

Function ground terminal:
This symbol indicates that the terminal must be connected to ground prior to operating the equipment.

AC voltage:
This symbol indicates that AC voltage is present.

DC voltage:
This symbol indicates that DC voltage is present.

- Do not turn off the power of the product during adjustment.
- If protection/safety circuits are to be used for the product or the system controlled by it, they should be externally installed on the product.
- When you replace the parts or consumables of the product, only use those specified by Yokogawa.
- Do not modify the product.

■ Force Majeure

- Yokogawa does not make any warranties regarding the product except those mentioned in the WARRANTY that is provided separately.
- Yokogawa assumes no liability to any party for any loss or damage, direct or indirect, caused by the use or any unpredictable defect of the product.

1.4 About Compatibility with the Conventional Model (Style A)

- The operation and function differ from the conventional model.
  Read this manual carefully to gain a thorough understanding of how to operate this product before you start using it.
- Be sure to confirm the parameters such as alarm set point and setting jumper referring to "5. Setting" before installing the product in a system or plant. After confirming them, install the product in a system or plant and turn on the power.

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2. GENERAL

The SALD mV and temperature alarm unit receives a mV DC, thermocouple or RTD (resistance temperature detector) input directly, compares this input with an alarm set point, and outputs an alarm contact signal. The input has one or two absolute-alarm outputs.
Direct or reverse alarm action can be selected for each of the alarm output set points. The front panel is provided with an alarm LED indicator lamp for confirming alarm relay action (when relay is energized).
The JHT200 Handy Terminal*[1] is used for setting the SALD parameters.
On the SALD model with display setter (SALD-x04), input indication (engineering unit) can be displayed and alarm set points can be displayed / set on the front panel.

*1: The modular jack conversion adapter (E9786WH) is required for connecting the JHT200 Handy Terminal to the mV and Temperature Alarm Setter.
The 5 pin-connector type communication cable (F9182EE) and modular jack conversion adapter (E9786WH) is required for connecting the BT200 BRAIN Terminal of YOKOGAWA ELECTRIC Corporation

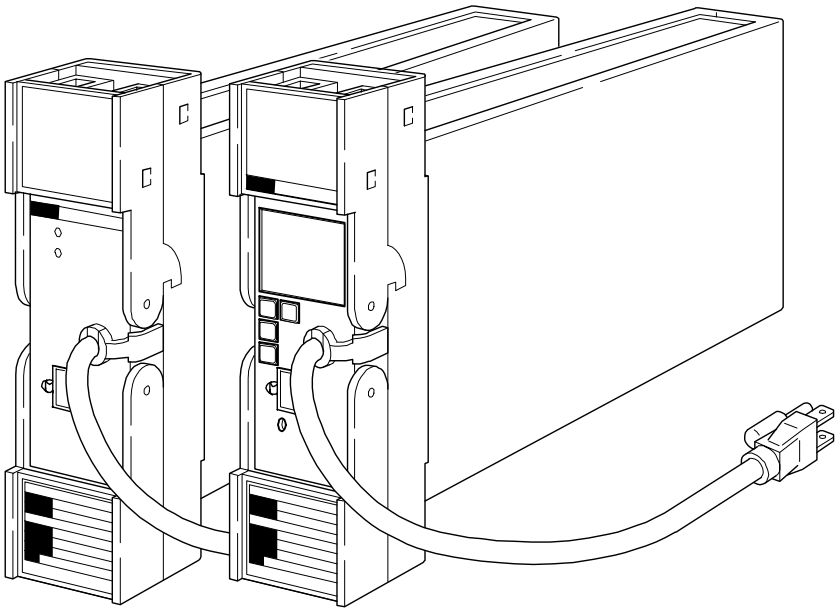


Figure 2-1 External View

2.1 Standard Specifications

The following table shows the SALD standard specifications.

Table 2-1 Standard Specifications

Item	Description	
Input Signal and Standards	mV DC input : 0 to 100 mV DC	
	Thermocouple input Types: K, T, J, E, B, R and S (N, W3 and W5 are for universal input only.) Standards: ITS-90, JIS'95	
	RTD input: JPt100 (JIS'89), Pt100 (ITS-90, JIS'97), and Pt50 (JIS'81) (Pt100 (IPTS-68, JIS'89) is for universal input only.) Three-wire	
Number of Input	1 input	
Input Resistance	1MΩ (power on), 4kΩ (power off)	
Input External Resistance; Input Lead Wire Resistance for Resistance Input	mV DC and thermocouple input: 500Ω or less RTD input: 10Ω or less/wire	
Input Overload	±4 V DC or less (for mV DC, thermocouple, or RTD input)	
Output Signal	Alarm output Transfer contact: 1 output (SALD-x1x) Alarm output Transfer contact: 2 outputs (SALD-724)	
Output Signal: Relay Contact Capacity	100 V AC: 1A (resistive load) 220 V AC: 0.5A (resistive load) 30 V DC: 1A (resistive load) 110 V DC: 0.1A (resistive load) Contact life expectancy: 600,000 times	
Alarm Action	Direct or Reverse Input absolute alarm: 1-input and 1-set point, or 1-input and 2-set point. Direct or Reverse can be set for each alarm set point. Hysteresis and dead time can be set for each alarm set point.	
Alarm Setting and Range	Setting mothod: ・By display setter on the front panel (SALD-xx4) ・By JHT Handy Terminal (sold separately) Alarm setting range: -19999 to 32000 (engineering unit)	
Accuracy	Input accuracy: See section 2.3	
	Alarm setting accuracy: Same as input accuracy	
	Reproducibility of alarm action: Same as input accuracy	
Selection of Burnout Function	SALD-xx0: Action (UP/DOWN/OFF) can be set by parameter SALD-xx4: Action (UP/DOWN/OFF) can be set using setting jumper on the main board.	
Burnout Time	60 s	
Power Supply	AC or DC (no change to instument) 100 V version DC: 20 to 130 V (no polarity) AC: 80 to 138 V, 47 to 63 Hz 220 V version DC: 120 to 340 V (no polarity) AC: 138 to 264 V, 47 to 63 Hz	
Power Consumption	SALD-x1x	DC: 24 V, 60 mA AC: 100 V, 5.4 VA 220 V, 8.4 VA
	SALD-724	DC: 24 V, 70 mA AC: 100 V, 5.8 VA 220 V, 8.7 VA
Ambient Temperature and Ambient Humidity	0 to 50°C, 5 to 90%RH (non-condensing)	
Mounting	Mounting method: Indoor, rack mounting Signal connection: M4 screw terminal connection Power supply and installation connection: 100 V version JIS C 8303 grounding, two-pole plug connection 200 V version CEE 7Ⅶ plug connection Cable length: 300mm	
Weight	Approx. 1.7 kg (including rack case)	

2.2 Model and Suffix Codes

The following table shows the SALD model and suffix codes.

Table 2-2 Model and Suffix Codes

Model	Suffix Codes	Auxiliary Codes	Style	Optional Suffix Codes	Description
SALD					mV and Temperature Alarm Unit
Input Signal	-1				mV input
	-2				Thermocouple input
	-3				RTD input
	-7				Universal input
Alarm	1				1-input, 1-set point absolut alarm
	2				1-input, 2-set point abolute alarm
Display Setter on Front Panel	0				Not provided
	4				Provided
Input Sensor Type		-MV			mV DC input
		-TK			Type K (ITS-90, JIS'95)
		-TT			Type T (ITS-90, JIS'95)
		-TJ			Type J (ITS-90, JIS'95)
		-TE			Type E (ITS-90, JIS'95)
		-TB			Type B (ITS-90, JIS'95)
		-TR			Type R (ITS-90, JIS'95)
		-TS			Type S (ITS-90, JIS'95)
		-PA			JPt100 (JIS'89)
		-PB			Pt50 (JIS'81)
		-PD			Pt100 (ITS-90, JIS'97)
		-UN			Universal
Style Code			*R		Style R
Option				/A2ER	220 V power supply
				/NHR	Without case
				/TB	Power supply terminal type

Available Combination

Suffix COdes

SALD-110/-114, SALD-210/-214, SALD-310/-314, SALD-710/-714/-724

Auxiliary Codes

SALD-1xx: "-MV", SALD-2xx: "-TK" to "-TS", SALD-3xx: "-PA" to "-PD", SALD-7xx: "-UN"

2.3 Measurement Range and Accuracy Warranty Range of Input

Input Type		Measuring Range	Input Accuracy
mV DC Input		0 to 100 mV DC	±0.5% of measuring range (*1)
Thermocouple Input	Type K (ITS-90, JIS'95)	-270.0 to 1372.0°C	±0.5% (*1) of measuring range + reference junction compensation error (*2)
	Type T (ITS-90, JIS'95)	-270.0 to 400.0°C	
	Type J (ITS-90, JIS'95)	-210.0 to 1200.0°C	
	Type E (ITS-90, JIS'95)	-270.0 to 1000.0°C	
	Type B (ITS-90, JIS'95)	50.0 to 1820.0°C	
	Type R (ITS-90, JIS'95)	-50.0 to 1768.0°C	
	Type S (ITS-90, JIS'95)	-50.0 to 1768.0°C	
	Type N (ITS-90, JIS'95)	-270.0 to 1300.0°C	
	Type W3(*3) (ASTM E988)	0 to 2315°C	
	Type W5(*4) (ASTM E988)	0 to 2315°C	
RTD	JPt100 (JIS'89)	-200.0 to 510.0°C	±0.5% of measuring range
	Pt50 (JIS'81)	-200.0 to 649.0°C	
	Pt100 (ITS-90, JIS'97)	-200.0 to 850.0°C	
	Pt100 (IPTS-68, JIS'89)	200.0 to 660.0°C	

*1: The accuracy is ±2.5% for a temperature range below -200 °C.
The accuracy is ±2.5% for a temperature range below 600 °C.
*2: Reference junction compensation error:
Above 0 °C: ±0.5% (except for TypeR, TypeS)
±1% (for TypeR, TypeS)
Below 0 °C:
*3: W3 is the abbreviation of W97Re3-W75Re25 (tungsten97 % rhenium 3 % - tungsten75 % rhenium25 %) ASTM E988 Standard
*4: W5 is the abbreviation of W95Re5-W74Re26 (tungsten95 % rhenium 5 % - tungsten74 %rhenium26 %) ASTM E988 Standard

2.4 Accessory

Fuse 1 A: 1
Alarm Label: 1 sheet

NOTE

The fuse (S9510VK) is the dedicated fuse, Do not use it for other products.

3. INSTALLATION

For details of the installation procedure and wiring precautions, refer to the technical information "YEWSERIES 80 Installation Manual" (TI 1B4A9-01E) or the instruction manual "Installation of Rack-Mounted Instruments" (IM 1B4F2-01E).

3.1 External Wiring

(1) All cable ends must be furnished with crimp-on type solderless lugs (for 4mm screws).

(2) Draw out the internal unit from the rack case.

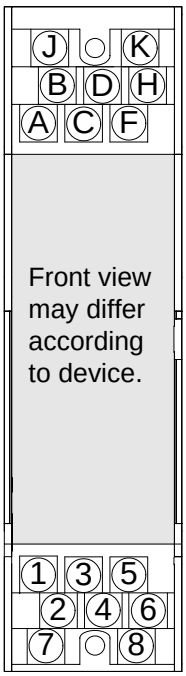
(3) Connect the cables to the correct terminals referring to Figure 3-1.

(4) Return the internal unit into the rack case after completing the wiring.

(5) Always return the terminal block cover to its original position after completing the wiring.

NOTE

The terminal block cover cannot be returned to its original position if the internal unit is not installed correctly inside in the rack case. Securely return the terminal block cover because it also functions as lock for the internal unit.



Terminal Designation	Description
A	NC — Alarm output 1
B	COM — Alarm output 1
C	
D	
F	NC — Alarm output 2(*1)
H	COM — Alarm output 2(*1)
J	NO — Alarm output 2(*1)
K	NO — Alarm output 2(*1)
1	+ — Input1(*2) (mV/Thermocouple)
2	- — Input1(*2) (mV/Thermocouple)
3	
4	
5	
6	Reference junction blcok installation terminal
7	
8	
A	Input1(*2) (RTD)
B	Input1(*2) (RTD)
B	Input1(*2) (RTD)

*1: SALD-724 only.
*2: For SALD-7xx, each is selected according to the selection of sensor type.

Note: When output is not used, the terminals are opened.
COM: Common
NC: Contact closes when relay is de-energized (CLOSE)
NO: Contact opens when relay is de-energized (OPEN)

Figure 3-1 Terminal Layout and Terminal Wiring

3.2 Example of Alarm Wiring

The SALD mV and temperature alarm unit provides various types or alarms depending on the setting of the alarm action or the method of connecting the alarm output terminals. Thus, the necessary wiring should be made with reference to the following two examples:

3.2.1 High-limit and High-high-limit Alarms

Set the direct action (DIRECT) for the alarm actions of both alarms 1 and 2. Then wire the terminals as illustrated in Figure 3-2.

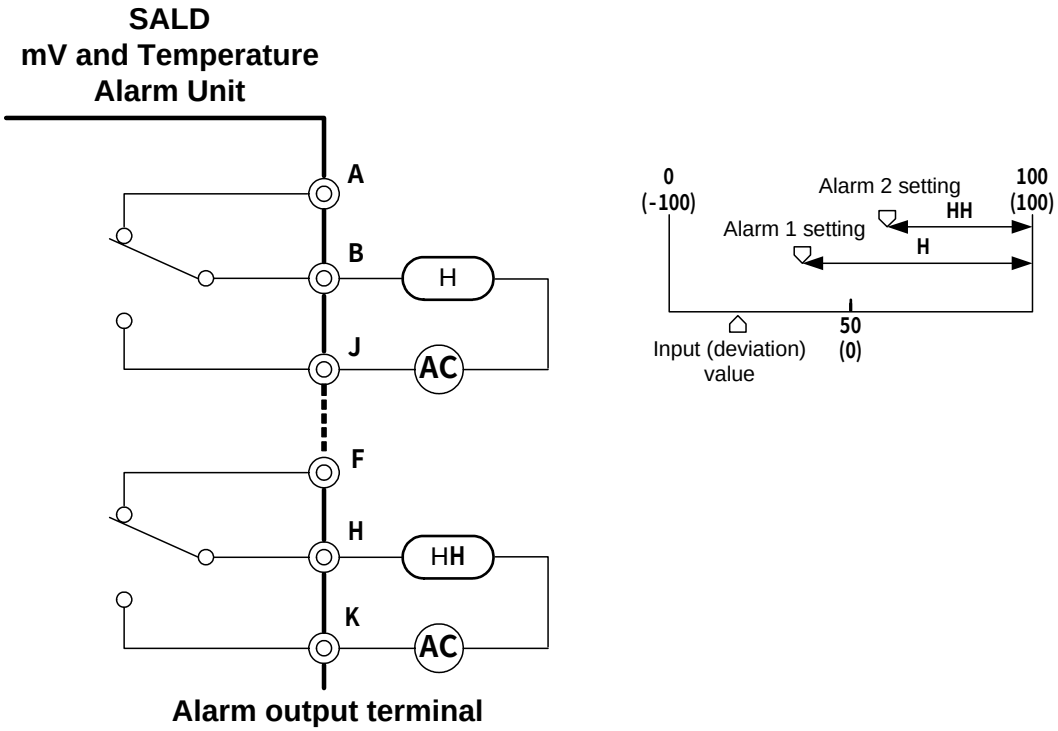


Figure 3-2 External Wiring - Example 1

3.2.2 Three-position Alarm

Set the reverse action (REVERSE) for the alarm action of alarm 1, and the direct action (DIRECT) for the alarm action of alarm 2. Then wire the terminals as illustrated in Figure 3-3.

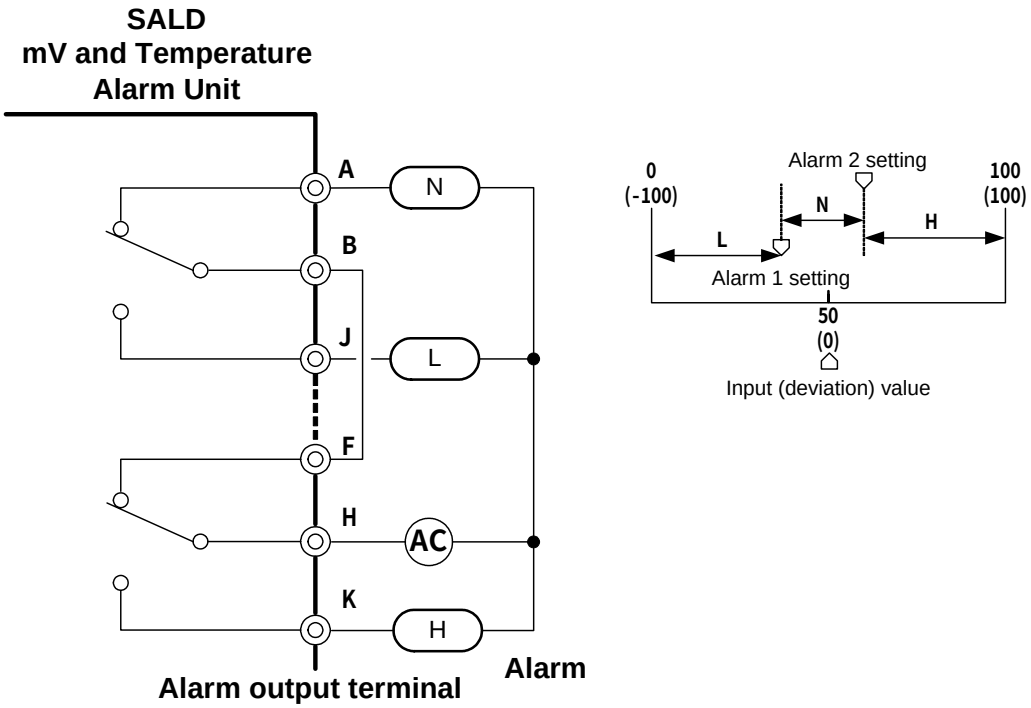


Figure 3-3 External Wiring - Example 2

■ Applicable Cables

(1) Signal circuit wiring

- Cross-sectional area of the cable conductor: 0.5 to 0.75 mm^2
- Examples of applicable cables: Single core PVC insulated flexible cable (VSF) stranded wires (JIS C 3306);
  heat-resistant vinyl-insulated cable (UL style 1007)

(2) Alarm circuit wiring

- Cross-sectional area of the cable conductor: 0.5 to 1.25 mm^2
- Examples of applicable cables: 600 V PVC insulated cable (IV) stranded wires (JIS C 3307);
  PVC insulated cable for electric appliances (KIV) stranded wires (JIS C 3316);
  heat-resistant vinyl-insulated cable (UL style 1007)

(3) Power supply wiring

- Cross-sectional area of the cable conductor: 1.25 to 2.00 mm^2
- Examples of applicable cables: 600 V PVC insulated cable (IV) stranded wires (JIS C 3307)

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4. PRINCIPLES OF OPERATION

4.1 Principle of Operation

Input signals are converted to digital data by the A/D conversion circuit. The resulting digital data is processed by the microcomputer, and the alarm relay is then energized/de-energized by alarm calculation processing (comparison, etc.).

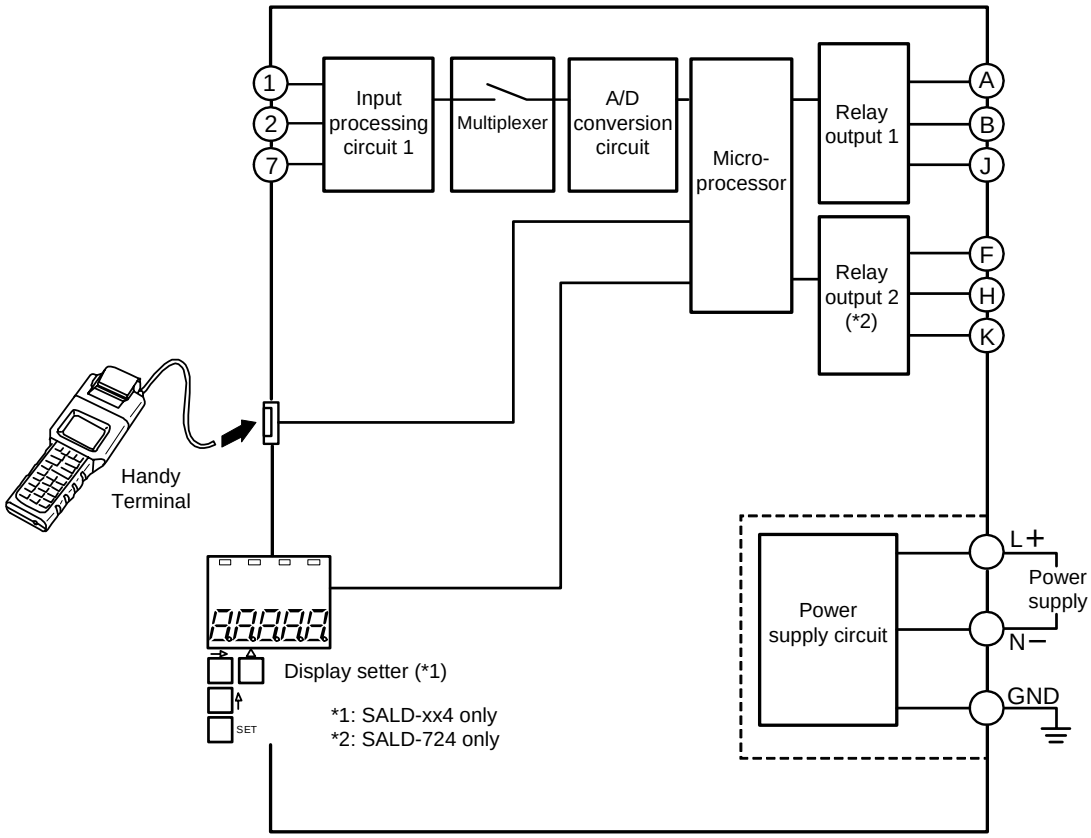


Figure 4-1 Hardware Function Block Diagram

4.2 Description of Functions

The following describes the functions of the SALD.

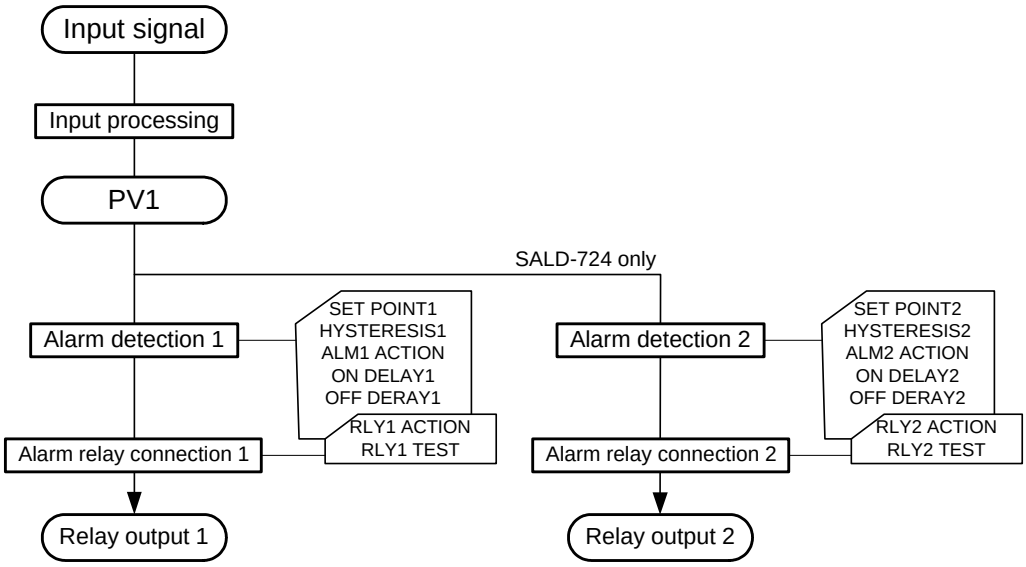


Figure 4-2 Software Function Block Diagram

The alphabet codes in the figure are the names of BRAIN communication parameters.

4.2.1 Input Processing Functions

The following process is performed for each input.

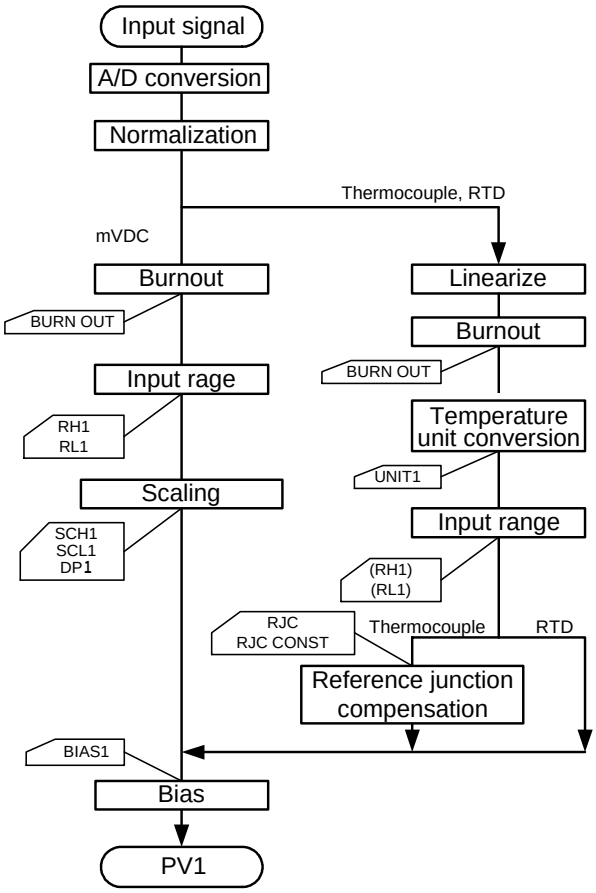


Figure 4-3 Input Processing Function Block Diagram

The alphabet codes in the figure are the names of BRAIN communication parameters.

- **Explanation of Input processing block**
  - A/D conversion: Performs A/D conversion on input signals.
  - Normalization:

    Calculates the value required for each of input.
  - Burnout:

    SALD-xx0: Action (UP/DOWN/OFF) can be set by parameter.

    SALD-xx4: Action (UP/DOWN/OFF) can be set using setting jumper on the main board.
  - Temperature unit conversion:

    When input signal is thermocouple or RTD, temperature unit (°C or K) can be set.
  - Input range:

    When input signal is mV DC, input range can be set (See Scaling below.)
  - Scaling:

    When input signal is mV DC, scaling is possible for the range set at input range.

    The value after scaling (or, when the bias function is used, the value obtained by adding bias to this value) becomes PV1.

■ Setting of INPUT1 L_RNG, INPUT1 H_RNG, SCH1, SCL1 and DP1

(Default: 0.0 to 100.0)

<Setting Method>

The following is the example when measuring range of 10.0 to 80.0 mV is scaled to 1000 to 20000.

(1) Set the measuring input range at the parameters INPUT1 H_RNG and INPUT1 L_RNG.

(Example: INPUT1 L_RNG=10.0, INPUT1 H_RNG=80.0)

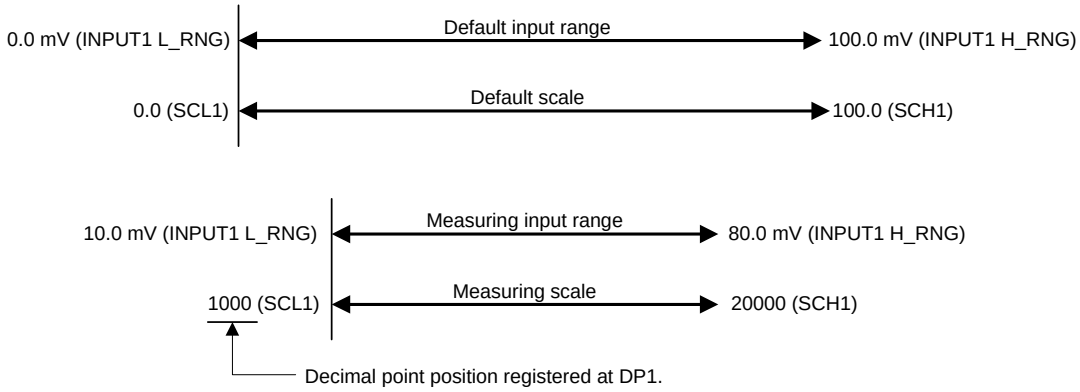
(2) Set the input decimal point position matched to the unit system actually in use at DP1.

(Example:DP1="#####", DP1=0)

(3) Set the measuring scale range at the parameters SCH1 and SCL1.

(Example: SCL1=1000, SCH1=20000)

(Example)



Note: Reverse scaling (SCH1 < SCL1) is also possible.

A setting error occurs when SCH1 is set to equal SCL1. Change the setting.

- Bias:

  A bias value (BIAS1) can be added to scaling values.

  This allows error to be compensated when there is an error between the input value and the indicated value.

  Bias can be set within the range ±10% [(SCH1 - SCL1) x 0.1] of the scaling width.
- PV1:

  The value obtained by adding bias to the scaling value.

  Displayed on the display setter on the front pane. (SALD-xx4 only)

4.2.2 Alarm Processing Function

SET POINTn (SPn) can also be set using display setter on the front panel.

- **Explanation of Alarm detection block**

  The following "n" indicates "1" or "2".

  - Alarm detection n: Performs alarm detection.
  - ALMn ACTION: Alarm action

    Direct ..... The alarm state is entered when the input value exceeds the preset alarm set point.

    Reverse..... The alarm state is entered when the input value is at the preset alarm value or lower.
  - SET POINTn: Alarm set point
  - HYSTERESISn: Alarm hysteresis
  - ON DELAYn: Alarm ON delay

    Sets the dead time until the alarm turns ON.

    An alarm state is entered when the input value is in the alarm range for the duration set at ON DELAYn.

    If input returns to the normal range before the time set at ON DELAYn is reached, the alarm does not turn ON.
  - OFF DELAYn: Alarm OFF delay

    Sets the dead time until the alarm turns OFF.

    A normal state is entered when the input value is in the normal range for the duration set at OFF DELAYn.

    If input returns to the alarm range before the time set at OFF DELAYn is reached, the alarm does not turn OFF.

NOTE

- When the ON delay/OFF delay settings are changed during a delay, delay action is discontinued, the current alarm or normal state is returned to, and the delay action is performed from that state.
- The alarm function does not work for about 3 seconds after power ON.

- Relay output block
  - RLYn ACTION: Alarm relay action

    De-energized at normal operation..... The relay is energized when the alarm detection result is an alarm state. (Factory-shipped setting)

    Energized at normal operation ..... The relay is energized when the alarm detection result is a normal state.
  - RLYn TEST: Relay action test

    This function is for testing relay action.

    Relays can be turned ON/OFF without influencing the currently alarm detection result.

Direction of alarm relay action: De-energized at normal operation (Factory-shipped settings)

ALMn	Direction of alarm action	Input value < Set point	Set point < Input value
DIR	Direct (high-limit alarm)	Output relay de-energized	Output relay energized
RVS	Reverse (low-limit alarm)	Output relay energized	Output relay de-energized

Direction of alarm relay action: Energized at normal operation

ALMn	Direction of alarm action	Input value < Set point	Set point < Input value
DIR	Direct (high-limit alarm)	Output relay energized	Output relay de-energized
RVS	Reverse (low-limit alarm)	Output relay de-energized	Output relay energized

4.3 Example of Alarm Function Setting

This section describes the alarm function setting showing the example using the alarm function parameters.

4.3.1 Condition of Alarm Function

Set the following conditions.

(1) Condition for Alarm 1

The alarm is output when the status where the input value is 80°C or more continues for 1 second or more.
The alarm is released when the status where the input value is 70°C or less continues for 2 seconds or more.

(2) Condition for Alarm 2

The alarm is output when the input value is 15°C or less.
The alarm is released when the input value is 20°C or more.

4.3.2 Parameters of Alarm Function

The table below shows the parameters the condition of alarm function described in 4.3.1 is placed to.

Table 4-1 Table of Parameters Setting Example for Alarm 1 and Alarm 2

Item	Alarm 1		Alarm 2	
	Parameter	Set point	Parameter	Set point
Alarm set point	E01: SET POINT1	80°C	E02: SET POINT2	15°C
Direction of alarm action	E07: ALM1 ACTION	DIRECT	E08: ALM2 ACTION	REVERSE
Alarm hysteresis	E09: HYSTERESIS1	10°C	E10: HYSTERESIS2	5°C
Alarm ON delay	E15: ON DELAY1	1 s	E16: ON DELAY2	0 s
Alarm OFF delay	E17: OFF DELAY1	2 s	E18: OFF DELAY2	0 s

4.3.3 Operating Condition of Alarm Function

Refer to the following figure for operating condition of alarm 1 and alarm 2.

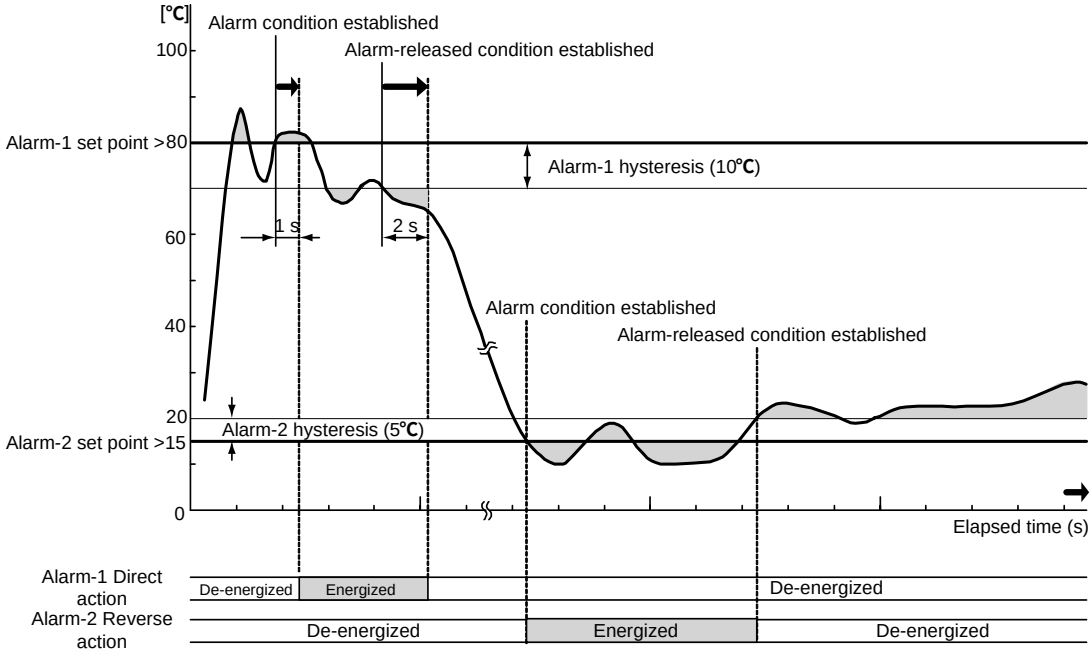


Figure 4-4 Alarm Action

5. SETTING

■ Items to Confirm before Start of Operation

Before you start operation, inspect and confirm the following items:

(1) Draw out the internal unit from the rack case, and make sure that the specified fuses are properly mounted in the fuse holders at the rear of the internal unit.

(2) When inserting the internal unit into the rack case, firmly connect the multi-pin connectors for connecting the internal unit and the case.

(3) Make sure that power plugs are properly connected to the power outlet.

(4) Make sure that external wiring to the terminal block is properly connected.

5.1 Names of Components

The following shows the names of SALD components.

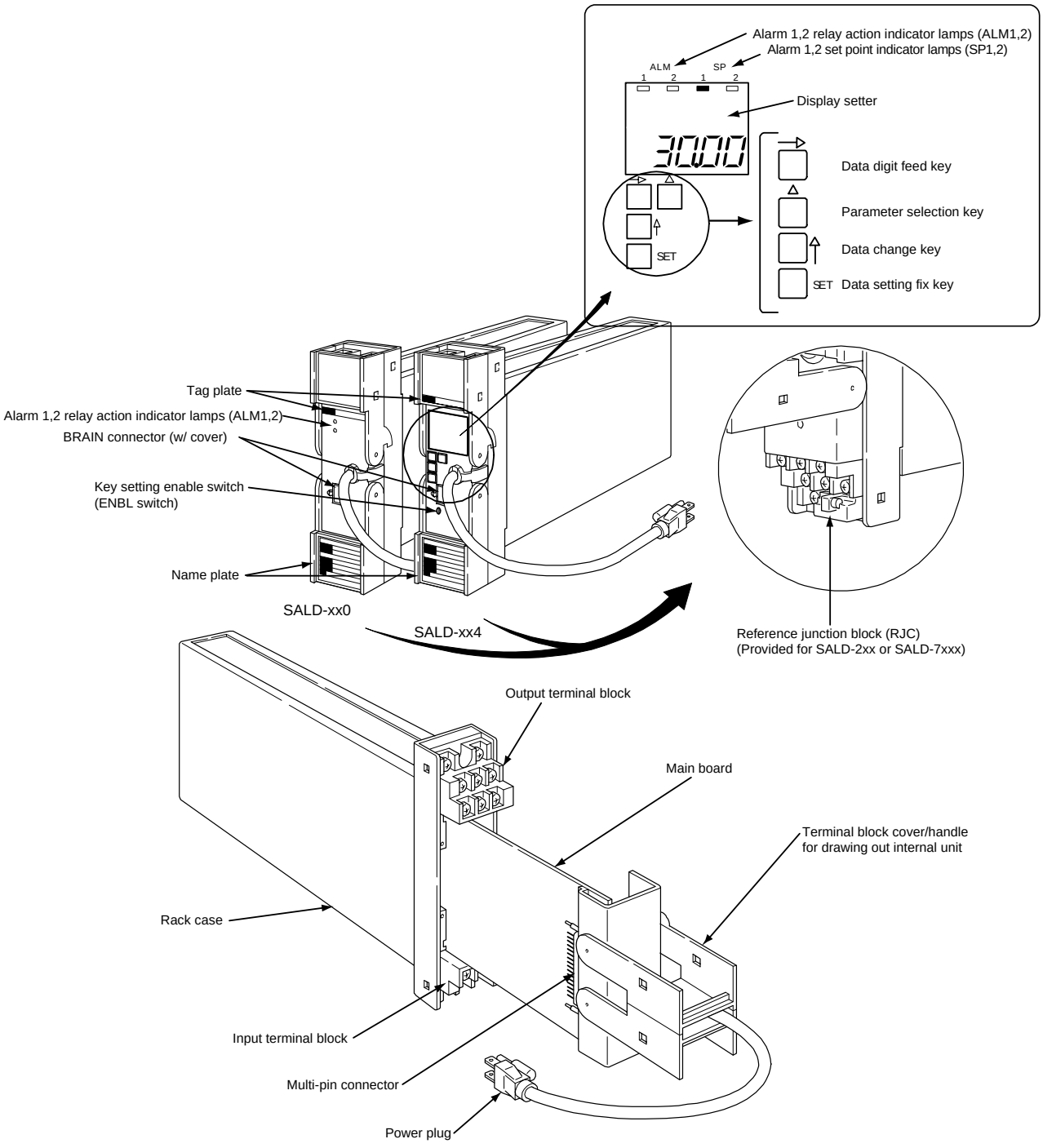


Figure 5-1 Names of Components

5.2 Setting Jumper

The SALD is provided with the following jumpers.

Jumper Code	Jumper Name	SALD-xx0	SALD-xx4
RJC	RJC (reference junction compensation) jumper	Not available	Available
W.P.	Parameter Write Protect jumper	Available	Available
BURN OUT(UP)	Burnout action setting jumper	Not available	Available
BURN OUT(DOWN)			
ALM1	Alarm 1 action setting jumper	Not available	Available
ALM2	Alarm 2 action setting jumper (SALD-724 only)	Not available	Available

- Parameter Write Protect jumper

  When this jumper is set to ON, changing of parameters by the key switches and Handy Terminal is disabled. "LOC" will be displayed on the display setter if the "→" switch is pressed with the SP1 or SP2 parameter displayed on the display setter.

  To cancel the "LOC" display and return to the previous display, press any key.

- RJC (reference junction compensation) jumper

  Setting is required only for thermocouple input.

  When set to ON, the reference junction compensation action is activated.

- Alarm action setting jumper

  This jumper is for setting the direction of alarm action.

  The table below shows the relationship between direction of alarm action and direction of relay action.

Direction of alarm relay action: De-energized at normal operation (Factory-shipped settings)

ALMn	Direction of alarm action	Input value < Set point	Set point < Input value
DIR	Direct (high-limit alarm)	Output relay de-energized	Output relay energized
RVS	Reverse (low-limit alarm)	Output relay energized	Output relay de-energized

Direction of alarm relay action: Energized at normal operation

ALMn	Direction of alarm action	Input value < Set point	Set point < Input value
DIR	Direct (high-limit alarm)	Output relay energized	Output relay de-energized
RVS	Reverse (low-limit alarm)	Output relay de-energized	Output relay energized

Factory-shipped settings : ALM1 DIR, ALM2 RVS

- Burnout action setting jumper

	BURN OUT Setting
Burnout OFF	Set both of UP and DOWN to OFF.
Upscale	Set only UP to ON.
Downscale	Set only DOWN to ON.

Do not set both UP and DOWN to ON. The action is not guaranteed.

5.2.1 Check of Setting Jumper and its Location

The setting jumpers are located on the main board of the internal unit.

Draw out the internal unit, and check the current jumper settings.

Current jumper settings can also be checked on the JHT200 Handy Terminal.

Jumper Name	Parameter Name
RJC jumper	D37: RJC
Parameter Write Protect jumper	A55: WRT PROTECT
Burnout action setting jumper	D31: BURN OUT1
Alarm 1 action setting jumper	E07: ALM1 ACTION
Alarm 2 action setting jumper (SALD-724 only)	E08: ALM2 ACTION

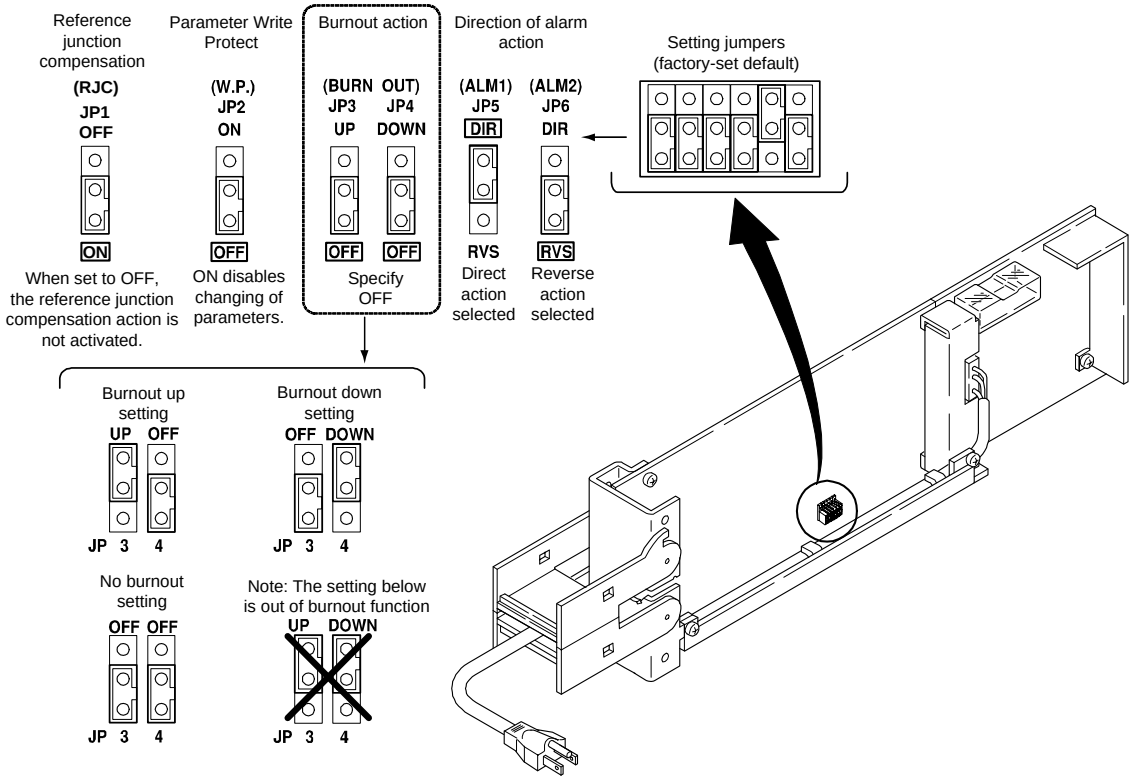


Figure 5-2 Setting Jumper

5.2.2 Change of Setting Jumper

Follow the procedure below to change the setting jumpers:

NOTE

For SALD-2xx or SALD-7xx, first remove the reference junction block (RJC) from the terminal block. Then draw out the internal unit.

(1) Pull the terminal block cover toward you to draw out the internal unit from the rack case.

(2) Check the jumpers on the main board of the internal unit, and change their settings as desired. Use tweezers or another fine-tipped object to change the setting jumpers.

(3) Return the internal unit to the rack case.

(4) Return the terminal block cover to its original position.

5.3 Setting of Parameters

This instrument has BRAIN communication parameters for specifying functions and adjusting input. Connect JHT200 Handy Terminal (*1) to the instrument to display or set parameters (modular jack conversion adapter (E9786WH) is required)

On the SALD model with display setter (SALD-xx4), input indication (engineering unit) can be displayed and alarm set points can be displayed/set on the front panel.

For details on parameters, refer to the Parameter List.

*1: BT200 BRAIN Terminal of YOKOGAWA ELECTRIC Corporation can also be used.

5.3.1 Parameter Change Disable Function

The SALD is provided with a parameter change disable function for preventing parameter settings from being changed by operator error.

Table 5-1 Parameter Change Disable Function

	Disable Setting Method	Disable Cancel Method	Description of Disable Operation
Parameter Write Protect jumper	Set W.P. jumper on the main board to "ON".	Set W.P. jumper on the main board to "OFF".	• Changing of parameter setting by key switches. • Changing of parameter setting by Handy Terminal.
Enable switch (SALD-xx4 only)	Changes cannot be made if no settings are made for 30 minutes after operating any key switch on the front panel in a setting change enable state.	Press the Enable switch.	• Changing of parameter setting by key switches.

5.3.2 Setting of Parameters Using Display Setter (SALD-xx4)

On the SALD-xx4, you can change alarm set point using the display setter on the front panel.

Other parameters are changed using the JHT200 Handy Terminal.

The table below describes the relationship between key switch operations and migration of display states.

Table 5-2 Relationship between Key Switch Operations and Migration of Display States

Key Switch	Display Function			
	Display Mode	Setting Change Mode	Setting Fix Mode	Indicator Out Mode
△	Displays the next parameter.	Cancels the newly changed values, returns to the display mode, and displays the next parameter.	Cancels the newly changed values, returns to the display mode, and displays the next parameter.	This mode is entered if no key switches are operated for 30 minutes when the display mode parameter is set to "OFF". The display mode is returned to if any key switch is pressed in the indicator out mode.
→	Advances to the setting change mode when a settable or changeable parameter is displayed in the setting change enabled state. (*1)	Moves setting digit.	Returns to the setting change mode, and moves to the next digit.	
↑	Displays the next parameter.	Changes the set point.	No operation	
SET	No operation	Advances to the setting fix mode.	Fixes the set point, and advances to the display mode.	
ENBL	Enters setting change enable state. Enable switch is disabled if the Parameter Write Protect jumper is set to "ON".			

*1: When the Parameter Write Protect jumper on the main board is set to "ON", the SALD will not advance to the setting change mode. In this state, "LOC" is displayed on the display setter.

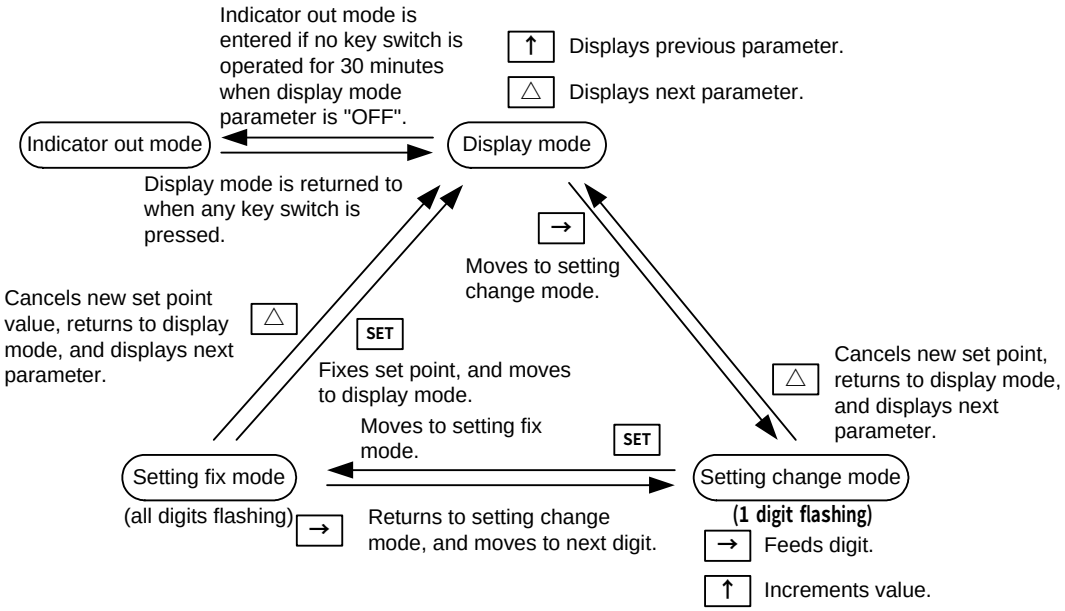
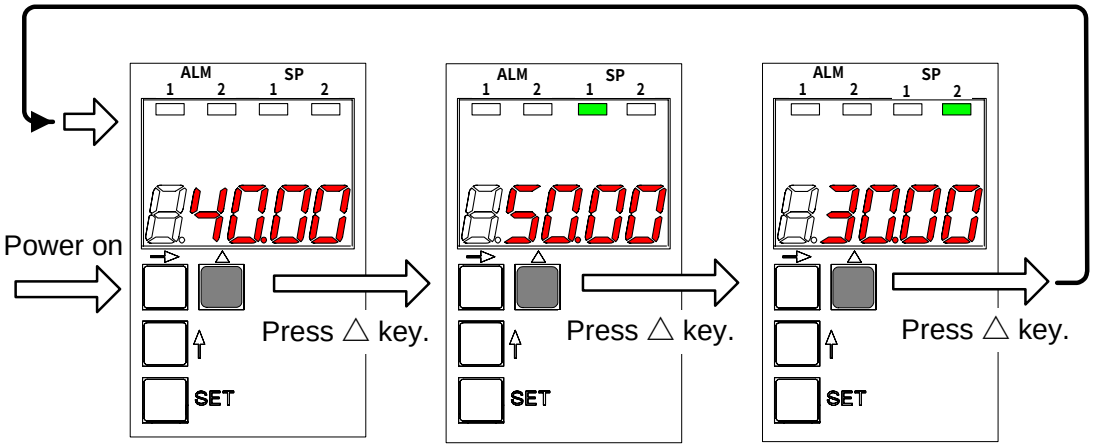


Figure 5-3 Key Switch Operations and Migration of Display States

■ Switching the Display

Each press of the △ key switches the display data.



Input value (PV1) is displayed.
ALM/SP lamps out
In this example, "40.00"

Alarm 1 set point (SP1) is displayed.
SP1 lamp lit
In this example, "50.00"

Alarm 2 set point (SP2) is displayed.
SP2 lamp lit
In this example, "30.00"

Figure 5-4 Progression of Display Screen

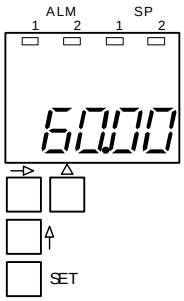
■ LED Indicator Lamps

The table below lists the type of LED indicator lamps on the front panel and their lighting conditions.

LED Lamp	Color	Lighting Conditions	Remarks
ALM1	Yellow	Lit when alarm 1 output relay is energized	
ALM2	Yellow	Lit when alarm 2 output relay is energized	
SP1	Green	Lit when alarm 1 set point (SP1) is displayed on the display setter	SALD-xx4 only
SP2	Green	Lit when alarm 2 set point (SP2) is displayed on the display setter	SALD-724 only

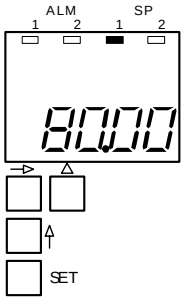
■ Setting Parameters

Display the desired parameter (e.g. alarm set point), and follow the procedure below to change its set point.



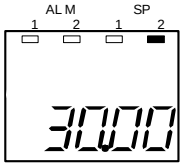
(1) Input value (60.00) is displayed at power ON.

Press the - △ key. →The SP1 lamp lights, and the alarm 1 set point is displayed.



(2) The alarm 1 set point (80.00) is displayed.

Press the - △ key. → In the case of the SALD-x14, the SP1 lamp goes out, and the input value is displayed.
→ In the case of the SALD-724, the SP2 lamp lights, and the alarm 2 set point is displayed.

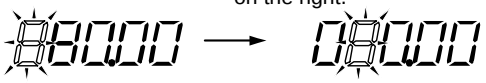


Alarm 2 set point (30.00) is displayed. (SALD-724 only)

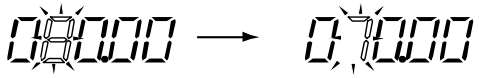
(3) Press the ENBL switch to enter setting change enable state.

(4) Set the alarm set point. (Change the alarm 1 set point to "70.00" from "80.00".)
Alarm set points whose SP lamp is lit can be changed.

Press the - ▷ key. → The uppermost digit on the display flashes.
Hold down the ▷ key to move the flashing section to the digit on the right.



Press the - △ key. → This increments the value at the flashing digit. Hold down the △ key to feed the value to "7".



Press the - SET key. → All parameter digits flash. Pressing the SET key again causes "70.00" to light. (This fixes the new parameter settings.).

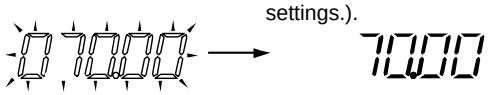


Figure 5-5 Setting Parameters

NOTE

When the Parameter Write Protect jumper on the main board is set to "ON", the SALD will not advance to the setting change mode. In this state, "LOC" is displayed on the display setter.

■ Display at Power ON

The model with display setter displays REV NO. (revision number of software for the SALD) for about 3 seconds after power ON.

Example of display (REV NO.2)

■ LOC Display

When "LOC" is displayed, this indicates that parameter settings cannot be changed.

(The Parameter Write Protect jumper on the main board is set to "ON".)

To cancel the "LOC" display and return to the previous display, press any key.

■ Indicator Out Mode Display

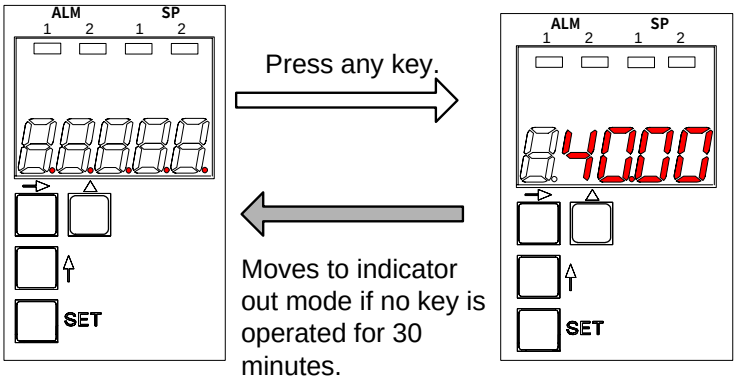
In this mode, only the decimal point is displayed on the display setter.

When the display mode parameter (DSP MODE) is set to "OFF", and no key operation is performed for 30 minutes, the SALD moves to the indicator out mode.

To cancel this mode and return to the display mode, press any key switch.

I/O signal processing and calculations are performed as usual even in the indicator out mode.

If the self check discovers an error (A/D conversion error, EEPROM error, EEPROMSUM error) in the indicator out mode, this mode is canceled, and the error is displayed. Also, the SALD does not move to the indicator out mode when an error (A/D conversion error, EEPROM error, EEPROMSUM error) occurs.



Indicator out mode
Only decimal point is lit.

Normal operation mode

Figure 5-6 Indicator Out Mode

5.3.3 Setting of Parameters Using Handy Terminal

NOTE

For details of operation and adjusting procedures of JHT200 Handy Terminal, refer to the instruction manual “JHT200 Handy Terminal” (IM JF81-02E).

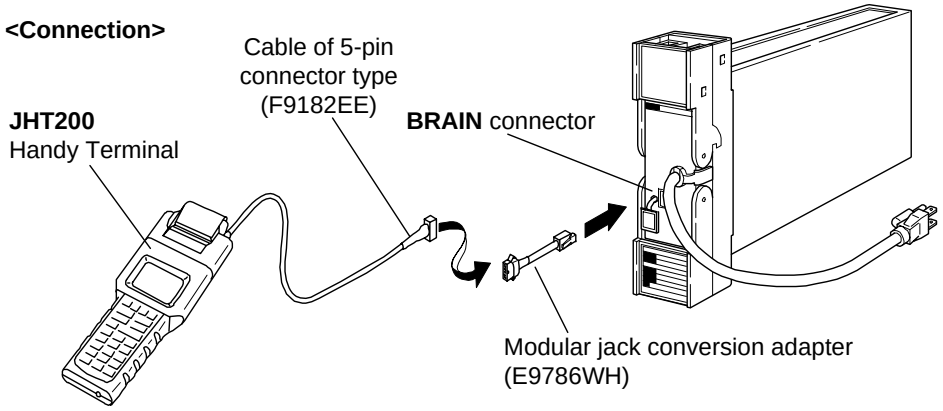


Figure 5-7 Connecting the Handy Terminal

5.4 Parameter List

BRAIN communication parameters for SALD are as follows.

On the SALD-xx4, only the input value can be displayed, and the alarm set point can be display/set on the display setter on the front panel. Other, parameters are display/set using the Handy Terminal.

No.	Parameter Name	Symbol	Description	Display Conditions
Initial display				
01	Model Name	MODEL	Displays the model name.	Displayed on all
02	Tag Number	TAG NO	Displays the tag number that is set.	
03	Self Check	SELF CHK	Displays the result (GOOD/ERROR) of the self check.	
A	Display 1	DISPLAY1		
A03	PV1	PV1	Input value after input processing (filter or scaling)	Displayed on all
A15	Alarm 1 Relay Display	RLY1 STATUS	Displays the state of the alarm 1 relay. DE-ENERGIZED: De-energized ENERGIZED: Energized	
A16	Alarm 2 Relay Display	RLY2 STATUS	Displays the state of the alarm 2 relay. DE-ENERGIZED: De-energized ENERGIZED: Energized	Displayed on SALD-724
A54	Status Display	STATUS	Displays the value added to the value (Hex) indicating the self check result. 0000: Normal 0001: EEPROM error 0002: EEPROMSUM error 0008:Input range exceeded 0010: Setting error 0020: Input burnout 0040: Power interruption during operation 0080: RJC error 1000: A/D conversion error	Displayed on all
A55	Parameter Write Protect	WRT PROTECT	Displays the state of the Parameter Write Protect jumper. OFF: Setting of parameters enabled ON: Setting of parameters disabled	
A56	Rev No.	REV NO.	Displays the device revision No.	
A58	MENU REV	MENU REV	Displays the revision No. of the parameter group.	
A60	Self Check	SELF CHK	Displays the result (GOOD/ERROR) of the self check.	

No.	Parameter Name	Symbol	Description	Setting Range	Default	Display Conditions
B	Display 2	DISPLAY2				
B03	PV1	Same as item A				
B15	Alarm 1 Relay Display					
B16	Alarm 2 Relay Display					
B60	Self Check					
D	Setting Parameters	SET(I/O)				
D01	Tag Number 1	TAG NO.1	8 alphanumerics can be entered.			Displayed on all
D02	Tag Number 2	TAG NO.2	8 alphanumerics can be entered.			
D03	Comment 1	COMMENT1	8 alphanumerics can be entered.			
D04	Comment 2	COMMENT2	8 alphanumerics can be entered.			
D07	Sensor Type 1	SENSOR TYPE1	Selects the sensor type of universal input.	TC mV RTD	TC Item to be specified at ordering.	Displayed on SALD-7xx
D08	Thermocouple Type 1	TC TYPE1	Selects the thermocouple type when universal input and TC. Note: Initialized when SENSOR TYPE1 is changed.	Type K Type E Type J Type T Type R Type S Type B Type N Type W3 Type W5	Type K Item to be specified at ordering.	Displayed on SALD-7xx, and when SENSOR TYPE1=TC.
D09	RTD Type 1	RTD TYPE1	Selects the RTD type when universal input and RTD. Note: Initialized when SENSOR TYPE1 is changed.	Pt100-90 Pt100-68 JPt100 Pt50	Pt100-90 Item to be specified at ordering.	Displayed on SALD-7xx and when SENSOR TYPE1=RTD.
D15	Input 1 Unit	UNIT1	Selects the unit when temperature input.	degC K	degC	Displayed on SALD-2xx, SALD-3xx, or SALD-7xx (universal input) and when SENSOR TYPE1=TC or RTD.
D27	Input 1 LOW Range	INPUT1 L_RNG	Settable at mV input only. Sets the minimum value of input range. Note: Initialized when - SENSOR TYPE 1 - TC TYPE1 - RTD TYPE1 or - UNIT1 is changed.	-50.0 to 150.0 mV However, INPUT1 L_RNG<H_RNG	0.0 mV	Displayed on SALD-1xx or SALD-7xx (universal input) and when SENSOR TYPE1=mV.

No.	Parameter Name	Symbol	Description	Setting Range	Default	Display Conditions
D28	Input 1 HIGH Range	INPUT1 H_RNG	Settable at mV input only. Sets the maximum value of input range. Note: Initialized when - SENSOR TYPE1 - TC TYPE1 - RTD TYPE1 - UNIT1 is changed.	-50.0 to 150.0 mV However, INPUT1 L_RNG<H_RNG	100.0 mV	Displayed on SALD-1xx or SALD-7xx (universal input) and when SENSOR TYPE1=mV
D31	Burnout1	BURN OUT1	Selects the action of input 1 burnout. For SALD-xx0, the setting is changeable. For SALD-xx4, indicates the status of setting jumper on main board.	OFF UP DOWN	OFF SALD-xx0 Item to be specified at ordering.	Displayed on all
D37	ON/OFF of Input Reference Junction Compensation	RJC	Sets ON/OFF for reference junction compensation. For SALD-xx0, the setting is changeable. For SALD-xx4, indicates the status of setting jumper on main board.	ON OFF	ON	Displayed on SALD-2xx or SALD-7xx (universal input) and when SENSOR TYPE1=TC
D38	Fixed Value of RJC	RJC CONST	The set point is available when RJC=OFF. Can fix the reference junction temperature. Note: Initialized when - SENSOR TYPE1 - UNIT1 or - RJC ON/OFF jumper is changed.	-20.0 to 80.0 (engineering unit)	0.0 (engineering unit)	Displayed when RJC=OFF.
D40	Input1 Decimal Point Position	DP1	Sets the position of the decimal point for the input scale (SCH1, SCL1). Note: Initialized when - SENSOR TYPE1 - TC TYPE1 - RTD TYPE1 or - UNIT1 is changed.	##### ####.# ###.## ##.###	####.#	Displayed on SALD-1xx or SALD-7xx (universal input) and when SENSOR TYPE1=mV.
D41	Input1 Scale L	SCL1	Sets the conversion standard value at INPUT1 L_RNG to scale and display the input value in engineering units. Note: Initialized when - SENSOR TYPE1 - TC TYPE1 - RTD TYPE1 or - UNIT1 is changed.	-9999 to 9999 (engineering unit)	INPUT1 L_RNG1	

No.	Parameter Name	Symbol	Description	Setting Range	Default	Display Conditions
D42	Input1 Scale H	SCH1	Sets the conversion standard value at INPUT1 H_RNG to scale and displays the input value in engineering units. Note: Initialized when - SENSOR TYPE1 - TC TYPE1 - RTD TYPE1 or - UNIT1 is changed.	-9999 to 9999 (engineering unit)	INPUT1 H_RNG1	Displayed on SALD-1xx or SALD-7xx (universal input) and when SENSOR TYPE1=mV.
D46	PV1	PV1	Displays the input value after input processing (scaling).	-		
D47	Input1 Bias	BIAS1	Adds the bias value to the value after input processing, and displays as the PV1. Note: Setting range is a span in engineering unit (EUS) ±10%. Note: Initialized when - SENSOR TYPE1 - TC TYPE1 - RTD TYPE1 - UNIT1 - INPUT1 H_RNG - INPUT1 L_RNG - SCH1 or SCL1 is changed.	-19999 to 32000 (engineering unit) (Note)	0 (engineering unit) (Note)	
D51	Display Mode	DSP MODE	Selects the display setter state after 30 minutes elapses after a key switch operation. OFF: Power save mode Only the decimal point is displayed. ON: Constant ON mode Data is displayed at all times regardless of elapsed time.	OFF ON	ON	Displayed on SALD-xx4.
D60	Self Check	SELF CHK	Result of self check (GOOD/ERROR) of the self check.			Displayed on all

No.	Parameter Name	Symbol	Description	Setting Range	Default	Display Conditions
E	Setting Alarm Parameters	SET(ALM)				
E01	Alarm 1 Set Point	SET POINT1	Sets alarm 1 set point in engineering unit. Note: Initialized when - SENSOR TYPE1 - TC TYPE1 - RTD TYPE1 - UNIT1 - INPUT1 H_RNG - INPUT1 L_RNG - SCH1 or SCL1 is changed. Default: Maximum value of measuring input range when ALM1 ACTION = DIRECT. Minimum value of measuring input range when ALM1 ACTION = REVERSE.	-19999 to 32000 (engineering unit)	(Note)	Displayed on all
E02	Alarm 2 Set Point	SET POINT2	Sets alarm 2 set point in engineering unit. Note: Initialized when - SENSOR TYPE1 - TC TYPE1 - RTD TYPE1 - UNIT1 - INPUT1 H_RNG - INPUT1 L_RNG - SCH1 or SCL1 is changed. Default: Maximum value of measuring input range when ALM2 ACTION = DIRECT. Minimum value of measuring input range when ALM2 ACTION = REVERSE.	-19999 to 32000 (engineering unit)	(Note)	Displayed on SALD-724.
E07	Alarm 1 Action	ALM1 ACTION	Sets the direction (direct/reverse) of action of alarm 1. For SALD-xx0, the setting is changeable. For SALD-xx4, displays the status of setting jumper on main board.	DIRECT REVERSE	DIRECT	Displayed on all
E08	Alarm 2 Action	ALM2 ACTION	Sets the direction (direct/reverse) of action of alarm 2 For SALD-xx0, the setting is changeable. For SALD-xx4, displays the status of setting jumper on main board.	DIRECT REVERSE	DIRECT	Displayed on SALD-724.

No.	Parameter Name	Symbol	Description	Setting Range	Default	Display Conditions
E09	Alarm 1 Hysteresis	HYSTERESIS1	Sets the hysteresis until the alarm 1 alarm state is canceled. Note: Initialized when - SENSOR TYPE1 - TC TYPE1 - RTD TYPE1 - UNIT1 - INPUT1 H_RNG - INPUT1 L_RNG - SCH1 or - SCL1 is changed. Setting range is 0 to 100% of span in engineering unit (EUS).	0 to 32000 (Note)	0.5% of span in engineering unit	Displayed on all
E10	Alarm 2 Hysteresis	HYSTERESIS2	Sets the hysteresis until the alarm 2 alarm state is canceled. Note: Initialized when - SENSOR TYPE1 - TC TYPE1 - RTD TYPE1 - UNIT1 - INPUT1 H_RNG - INPUT1 L_RNG - SCH1 or - SCL1 is changed. Setting range is 0 to 100% of span in engineering unit (EUS).	0 to 32000 (Note)	0.5% of span in engineering unit	Displayed on SALD-724.
E15	Alarm 1 ON Delay	ON DELAY1	Sets the dead time until the alarm is output after alarm 1 enters the alarm state.	0 to 999 s	0 s	Displayed on all
E16	Alarm 2 ON Delay	ON DELAY2	Sets the dead time until the alarm is output after alarm 2 enters the alarm state.	0 to 999 s	0 s	Displayed on SALD-724
E17	Alarm 1 OFF Delay	OFF DELAY1	Sets the dead time until alarm output is stopped after alarm 1 is released from the alarm state.	0 to 999 s	0 s	Displayed on all
D18	Alarm 2 OFF Delay	OFF DELAY2	Sets the dead time until alarm output is stopped after alarm 2 is released from the alarm state.	0 to 999 s	0 s	Displayed on SALD-724
E19	Alarm 1 Relay Action	RLY1 ACTION	Specifies the direction of alarm 1 relay action. NRM DE-ENERGIZED: De-energized during normal operation NRM ENERGIZED: Energized during normal operation	NRM DE-ENERGIZED NRM ENERGIZED	NRM DE-ENERGIZED	Displayed on all
E20	Alarm2 Relay Action	RLY2 ACTION	Specifies the direction of alarm 2 relay action. NRM DE-ENERGIZED: De-energized during normal operation NRM ENERGIZED: Energized during normal operation	NRM DE-ENERGIZED NRM ENERGIZED	NRM DE-ENERGIZED	Displayed on SALD-724
E60	Self Check	SELF CHK	Displays the result (GOOD/ERROR) of the self check.			Displayed on SALD-724

*1: For details on the Alarm Setting and Accuracy Warranty Range, see "2.1 Standard Specifications."

No.	Parameter Name	Symbol	Description	Setting Range	Default	Display Conditions
P	Adjustment Parameters	ADJUST				
P01	Wiring Resistance correction1	WIRING R1	Corrects the wiring resistance of input1. Note:Initialized when BURN OUT1 is changed by parameter or setting jumper.	RESET EXECUTE		Displayed on all
P03	Input1 Zero Adjustment	ZERO ADJ1	Performs zero adjustment (0% side) on input 1. n.nnn ** RST n.nnn ** INC n.nnn ** HINC n.nnn ** HDEC n.nnn ** DEC “n.nnn” indicates the current input value. “**” indicates mV when mV or TC input, and OHM when RTD input. Increase or decrease “n.nnn” until the target value is reached selecting INC/DEC. INC/DEC: Increase/decrease “n.nnn.” HINC/HDEC: Increase/decrease “n.nnn” more rapidly than INC/DEC. RST: When a reset is made, the adjustment values return to their factory settings. Note: Initialized when - SENSOR TYPE1 - TC TYPE1 or - RTD TYPE1 is changed.			
P04	Span Adjustment (Input 1)	SPAN ADJ1	Performs span adjustment (100% side) on input 1. Procedure for adjustment is same as that of ZERO ADJ1. Note: Initialized when - SENSOR TYPE1 - TC TYPE1 or - RTD TYPE1 is changed.			
P60	Self Check	SELF CHK	Displays the result (GOOD/ERROR) of the self check.			
Q	Test Parameters	TEST				
Q04	Alarm 1 Forced Output	RLY1 TEST	Forcibly executes relay output regardless of the input state. Note: After the test ends, press the OK key to cancel the forced output state and set to the normal operation state.	DE-ENERGIZED ENERGIZED		Display on all
Q05	Alarm 2 Forced Output	RLY2 TEST		DE-ENERGIZED ENERGIZED		Displayed on SALD-724
Q60	Self Check	SELF CHK	Displays the result (GOOD/ERROR) of the self check.			Displayed on all

6. MAINTENANCE

This chapter describes the simple maintenance procedures and fuse replacements that can be done in the instrument room or service shop.

6.1 Test Equipments

For efficient maintenance of this alarm unit, it is recommended that the user have the following test equipment manufactured by Yokogawa or their equivalent.

Device	Model Name	Number of Units	Remarks
DC voltage/current standard	7651	1 each	Required for mV DC and thermocouple input type equipment
Decade resistance boxes	2793-01	1	Required for RTD input type equipment
Digital voltmeter	7562	1	
Handy Terminal	JHT200 (BT200)	1	
Cold junction bottle	T-MJ	1	Only when necessary
Modular jack conversion adapter	Part No. E9786WH	1	
Analog tester	Type 2415	1	

6.2 Reference Table of Thermocouple and RTD

This instrument has been adjusted in accordance with the JIS thermoelectromotive force table and the resistance ratio table amended in 1995.

For the input signals used to adjust the instruments, refer to JIS C 1602-1995 for the thermocouple input type and to JIS C 1604-1997 for the platinum resistance temperature detector (RTD) input type.

6.3 Adjustment and Check

NOTE

- For details of operation and adjusting procedures of JHT200 Handy Terminal, refer to the instruction manual "JHT200 Handy Terminal" (IM JF81-02E).
- Do not turn off the power of the instrument during adjustment.

6.3.1 Adjustment of Input

Use JHT200 Handy Terminal for adjustment.

The procedure for adjustment is describes below.

(a) Connect the test equipment corresponding to each of input referring to Figure 6-1 through Figure 6-3.

(b) For thermocouple input, set reference junction compensation to OFF temporarily.

(c) Set the parameter write protect (W.P.) of setting jumper to OFF.

(d) Turn on the power while the equipment is connected to the instrument, and allow a warm-up period of about 5 minutes.

(e) Connect JHT200 Handy Terminal.

(f) Call P03: ZERO ADJ1 of the adjustment item (P: ADJUST).

(g) Apply an input equivalent to 0% of the input range. Check the input value and the input display value of P03: ZERO ADJ1.

(h) If the input value does not correspond to the display value of P03, adjust it using P03 parameter.

(i) Select INC (addition) or DEC (subtraction) for adjustment. (Selecting RST resets the adjusted value and retrieves the factory-set default.) When the error is large, select HINC or HDEC for adjustment using a value ten times as large as INC or DEC.

(j) Perform the same procedure for the 100% of input range. Use the parameter P04: SPAN ADJ1.

(k) After completing the adjustment, set the parameter write protect (W.P.) of setting jumper to ON as necessary.

(l) For thermocouple input, set the reference junction compensation to ON.

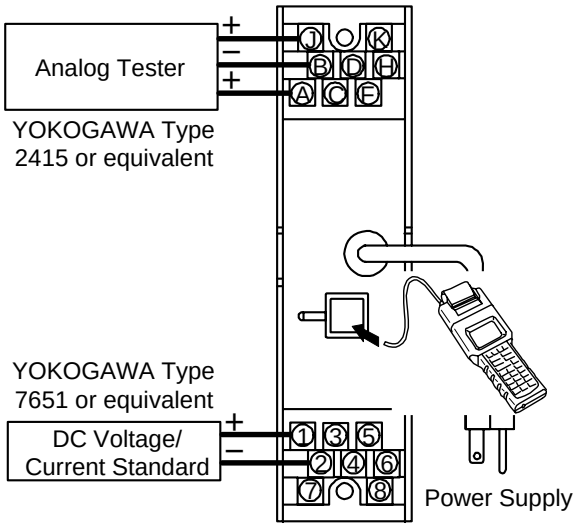


Figure 6-1 Wiring for mV DC Input Adjustment

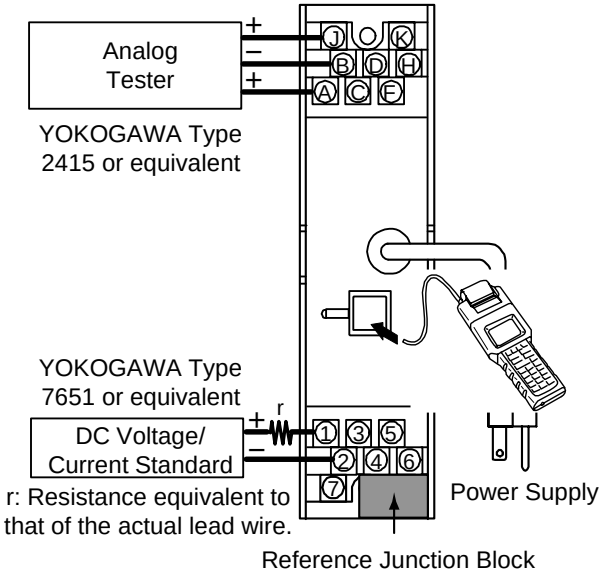


Figure 6-2 Wiring for Termocouple Input Adjustment

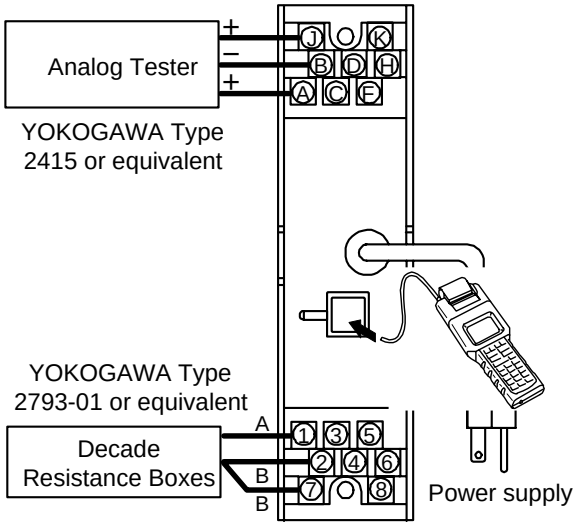


Figure 6-3 Wiring for RTD Input Adjustment

6.3.2 Check of Alarm Set Point

NOTE

- For details of operation and adjusting procedures of JHT200 Handy Terminal, refer to the instruction manual ‘‘JHT200 Handy Terminal’’ (IM JF81-02E).
- Do not turn off the power of the instrument during adjustment.

Use JHT200 Handy Terminal for check.

The procedure for check is describes below.

(a) Connect the test equipment corresponding to each of input referring to Figure 6-1 through Figure 6-3.

(b) For thermocouple input, set reference junction compensation to OFF temporarily.

(c) Set the parameter write protect (W.P.) of setting jumper to OFF.

(d) Turn on the power while the equipment is connected to the instrument, and allow a warm-up period of about 5 minutes.

(e) Connect JHT200 Handy Terminal.

(f) Call the setting (alarm) items, E: SET(ALM).

(g) Set “DIRECT” for E07: ALM1 ACTION.

(h) Set “NRM ENERGIZED” for E19: RLY1 ACTION.

(i) Set a value equivalent to 0% for E01: SET POINT1. (Example: Set “0.0” for 0 to 100°C of type K.)

(j) Vary the input and confirm that the voltage when the alarm1 relay action indicator lamp on front panel turns on is within ±0.5% of measuring range. (Example: Voltage equivalent to ±8.2°C for type K.)

(k) Then set a value equivalent to 50% for SET POINT1. Confirm that the voltage when the alarm1 relay action indicator lamp on front panel turns on is within ±0.5% of measuring range. (Example: Set “50.0” for 0 to 100°C of type K.)

(l) Set a value equivalent to 100% for SET POINT1. Confirm that the voltage when the alarm1 relay action indicator lamp on front panel turns on is within ±0.5% of measuring range. (Example: Set “100.0” for 0 to 100°C of type K.)

(m) For SALD-724, set E08 and E20 of alarm 2 as described above. Set the value equivalent to 0%, 50% and 100% for E02 and confirm as above.

(n) After completing the check, set the parameter write protect (W.P.) of setting jumper to ON as necessary.

(o) For thermocouple input, set the reference junction compensation to ON.

Table 6-1 Relationship between Relay Action Indicator Lamp and Alarm Output

Indicator Lamp	Condition of Alarm Output	
ON (illuminated)	Between terminals A and B	OPEN
	Between terminals J and B	CLOSE
	Between terminals F and H	OPEN
	Between terminals K and H	CLOSE
OFF (extinguished)	Between terminals A and B	CLOSE
	Between terminals J and B	OPEN
	Between terminals F and H	CLOSE
	Between terminals K and H	OPEN

F, H and K terminals are for SALD-724 only.

6.3.3 Correction of Input Wiring Resistance

If an error occurs because of input wiring resistance when mV DC, thermocouple or RTD input, or if using a safety barrier such as BARD and the like with the instrument, input wiring resistance can be corrected by parameter using JHT200 Handy Terminal.

NOTE

Correction of input wiring resistance should be made after completion of mounting wiring.

(a) Set the parameter write protect (W.P.) of setting jumper to OFF.

(b) Short-circuit the wires for input by the sensor side.

Short-circuit the 2 wires for mV DC or thermocouple input.

Short-circuit the 3 wires for RTD input.

(c) Connect JHT200 Handy Terminal. (Refer to Figure for Wiring.)

(d) Call P01: WIRING R1 of adjustment items (P: ADJUST).

(e) Select <EXECUTE>, and press ENTER twice.

(f) After the correction, set the parameter write protect (W.P.) of setting jumper to ON.

6.3.4 Check of Reference Junction Temperature Compensation Action

For thermocouple input, check the action of reference junction temperature compensation using the cold junction bottle. The figure for wiring is shown in Figure 6-4.

NOTE

When using the cold junction bottle, install the reference junction block (RJC) to the terminal block, then return the terminal cover and warm up the instrument for about 15 minutes.

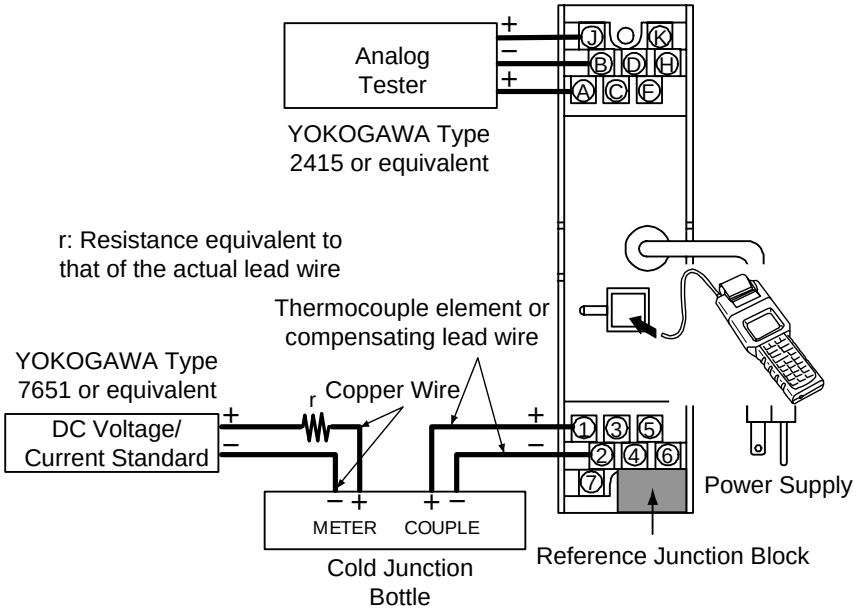


Figure 6-4 Check of Action for Reference Junction Temperature Compensation (Using Cold Junction Bottle)

6.4 Replacement of Fuse

When the fuse has blown or requires replacement, replace it according to the following procedure. Recommended replacement interval: About 3 years.

Before replacing a fuse, turn off the power to the instrument.

NOTE

- When a fuse has blown, check for the cause first because a fuse itself may not be responsible for the problem. Then replace the fuse.
- Use the dedicated fuse (S9510VK). Do not use a fuse for other products.

(1) Remove the fuse holder cap, then pull the fuse out in the direction shown in Figure 6-5.

(2) When installing a new fuse, use a fuse with the correct rating. Fasten the cap securely.

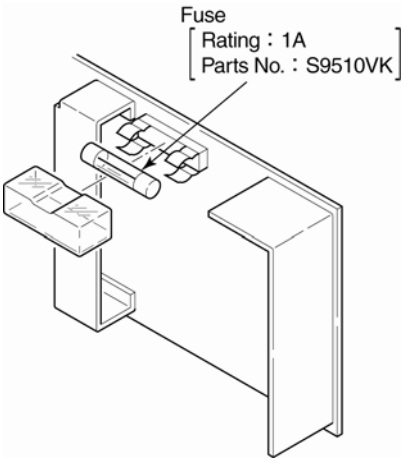


Figure 6-5 Replacement of Fuse

6.5 Replacement of Capacitor

Degradation of the aluminum electrolytic capacitor used in the power supply unit depends on operating temperature condition or operating environment.
Recommended replacement interval: 5 to 10 years.

NOTE

- Ask your nearest Yokogawa sales staff to replace the capacitor.
- Do not replace the capacitor by yourself, because the parts number of power supply unit (refer to CMPL 01B04K02-02E) and capacitor to be used are different according to the power supply specifications.

6.6 Replacement of Relays

The relays used for alarm action are influenced and deteriorate according to the connected load and number of ON/OFF switching operations. We recommend replacing relays at the following replacement cycle:

600,000 ON/OFF switching operations with rated load connected
(equivalent to 10 years with one operation every 10 minutes)

NOTE

- Ask your nearest Yokogawa sales staff to replace relays.
- Do not replace relays by yourself, because the parts number of the relays to be used are different according to the relay specifications.

7. TROUBLESHOOTING

If any fault occurs in the instrument, note down the symptoms, and follow Section 7.1 Troubleshooting Flowchart.

To find the fault, first wire the instruments according to the maintenance wiring diagram, apply an input signal, and note down the symptoms.

If the fault also requires replacement of the power supply unit, main board or display, or is difficult to find, contact your nearest Yokogawa sales staff.

7.1 Troubleshooting Flowchart

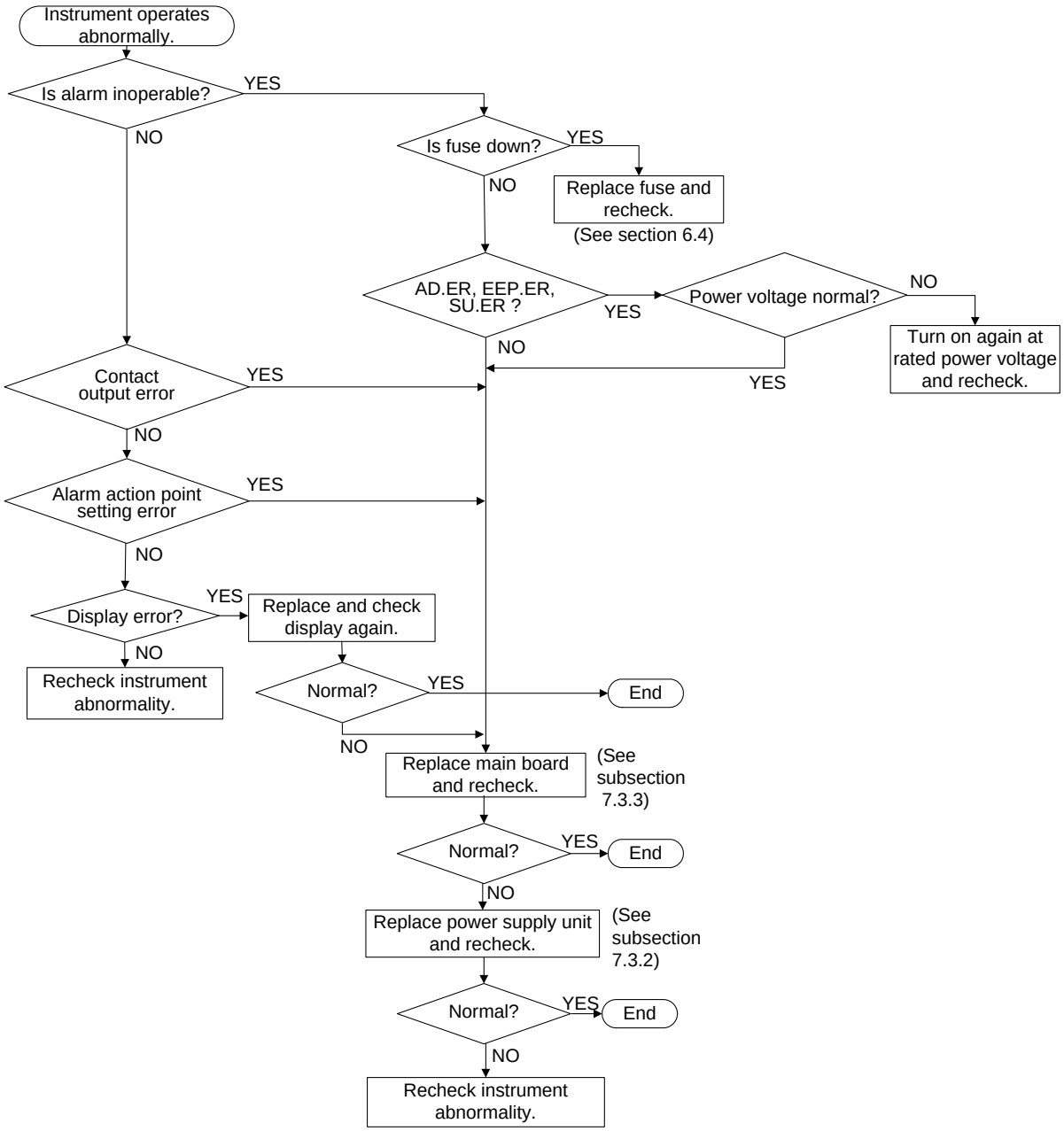


Figure 7-1 Troubleshooting Flowchart

7.2 Action in Fault Condition

The SALD has a self check function for detecting device errors on the actual SALD itself.

Details of SALD errors can be confirmed on the display setter on the front panel and in the STATUS parameter using the JHT200 Handy Terminal.

The blinking error display means failure.

Indication on Display Setter (*1)	Indication on Handy Terminal			Device Operation	Cause of Error	Remedy
	STATUS (*2)	SELF CHK	Error Information			
Out				Same state as power OFF Lamp: All out Alarm output: NO: Open, NC: Closed Key switch: Disabled Communications: Stopped	Hardware error	Replace the main board.
Out					Power supply error, broken fuse	Replace power board. Replace fuse.
Out				Lamp: All out Alarm output: Normal Key switch: Disabled Communications: Normal action	Display malfunction	Replace the display.
AdEr (AD.ER) Blinking	1000	ERROR	AD ERROR	Lamp: All out Alarm output: NO: Open, NC: Closed Key switch: Disabled Communications: Unstable	A/D conversion error	Replace the main board.
EEPEr (EEP.ER) Blinking	0001	ERROR	EEPROM ERROR		EEPROM error	
SUEr (SU.ER) Blinking	0002	ERROR	EEPROM SUM ERROR	Lamp: All out Alarm output: NO: Open, NC: Closed Key switch: Disabled Communications: Read only	EEPROM SUM error (Parameter error)	Replace the main board
rJCEr (RJC.ER) Indicating RJC.ER and PV alternately	0080	ERROR	RJC ERROR	(*3) Lamp: Normal action Alarm output: Normal Key switch: Enabled Communication: Normal action	RJC sensor error	Replace RJC or check the ambient temperature
IboUt (1.BOUT)	0020	ERROR	INPUT1. BURN OUT	Lamp: Normal action Alarm output: Normal Key switch: Enabled Communication: Normal action	Input 1 burnout	Check the connection of input 1
	0008	ERROR	INPUT OVER RANGE		Out of input range -25 to +125%	
	0010	ERROR	RANGE SET ERROR		SCH1 and SCL1 are same values.	Set SCH1 or SCL1 again.
	0040	GOOD	None		Power interruption during operation	Write "0000" at the STATUS display on the Handy Terminal.
	0000	GOOD	-		-	-

Note 1: On the SALD-x04, the error details are indicated in alphabet characters.
When two or more errors occur, high priority errors are displayed.
The table shows the errors in order of priority.

Note 2: STATUS error code is to be the addition display (hexadecimal number) when two errors or more occur.

Note 3:

7.3 Replacement of Parts

WARNING

Replacement of parts must be performed by trained service personnel with the required electrical knowledge and skills. If customer service personnel are to replace parts, first thoroughly read this user's manual to familiarize yourself with the procedure.

7.3.1 Replacement Procedure

The following replacement procedures are described:

- Replacement of Power Supply Unit
- Replacement of Main Board
- Replacement of Display

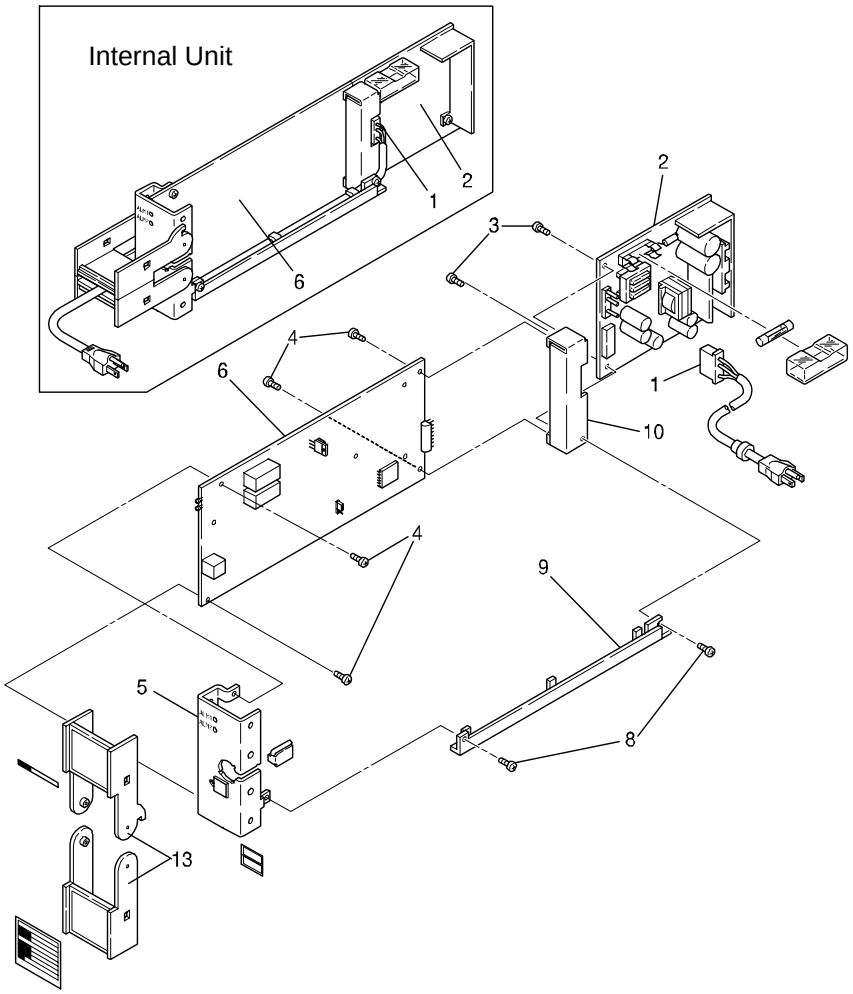


Figure 7-2 Disassembled View

NOTE

- Limit the number of disassembled parts to a minimum when disassembling the SALD during replacement of parts.
- Perform disassembly and assembly carefully.
- For thermocouple input, remove the reference junction block (RJC) from the terminal block, then draw out the internal unit.

7.3.2 Replacement of Power Supply Unit

(a) Pull the terminal cover (13) toward you to draw out the internal unit from the rack case.

(b) Unplug the connector (1) from the power supply unit (2).

(c) Remove two screws (3) to separate the power supply unit (2) from the bracket (10).

(d) Assemble the new power supply unit following steps (c) through (a).

NOTE

- Use the power supply unit for style R for replacement (refer to CMPL).
- The power supply unit of former style without compatibility cannot be used.

7.3.3 Replacement of Main Board

(a) Remove the power supply unit (2).
(Refer to Subsection 7.3.2 for operating procedure.)

(b) Remove two screws (8) to separate the bracket (9).

(c) Remove four screws (4) to separate the bracket (10) and the front bracket (5) from the main board (6).

(d) Assemble the new main board following steps (c) through (a).

7.3.4 Replacement of Display (SALD-xx4 only)

(a) Remove the connector (1) from the power supply unit (2).

(b) Remove two screws (8) to separate the bracket (9).

(c) Remove two screws (4) to separate the front bracket (5) from the main board (6).

(d) Assemble the new front bracket following steps (c) through (a).

Appendix /TB Power Supply Terminal Connections (Option)

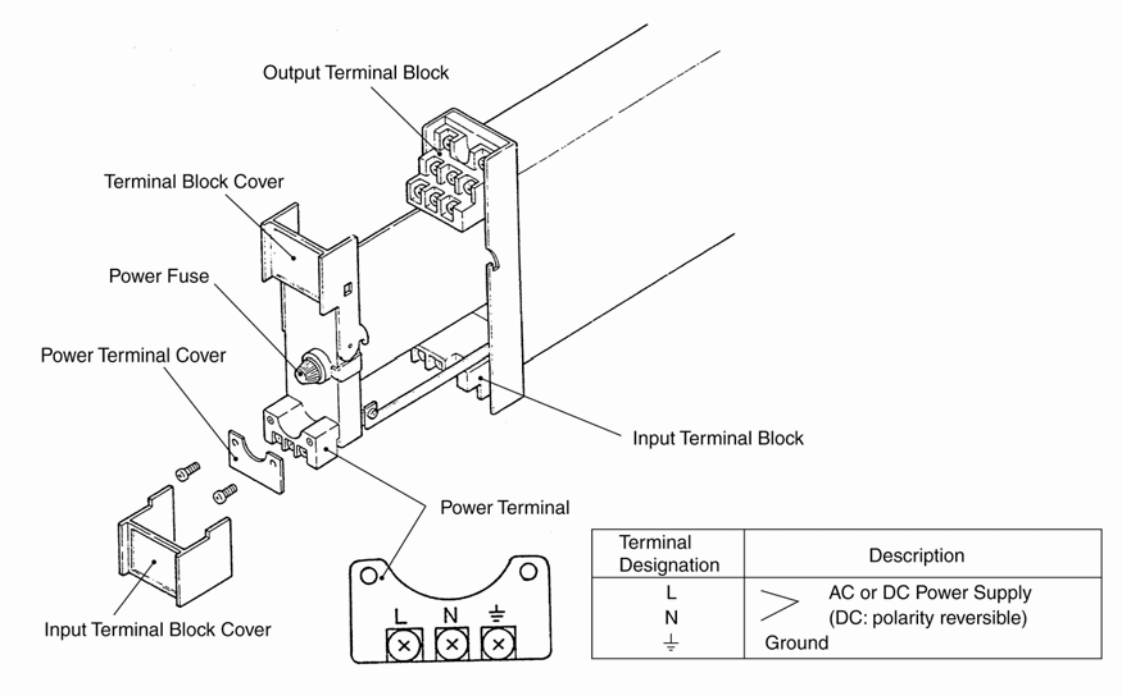
Appendix-1 GENERAL

If you specify the optional terminal block (optional suffix code /TB), the power supply is connected directly to the terminal block. So, drawing out the internal unit requires turning off the power supply and disconnecting the wiring from the terminal block.

Appendix-2 APPLICABLE INSTRUMENTS

Model	Description
STED	mV, Temperature and Potentiometer/Voltage Converters
SKYD	Alarm Unit
SALD	mV and Temperature Alarm Unit
SDAU	Digital Alarm Unit
SPLR	Programmable Computing Unit
SIND	Integrator
SISD	Isolator
SDBT	Distributor (for 1 point)
SDBS	Distributor (for 4 points)
SDBU-21	Distributor (for 1 point)

Appendix-3 NAMES OF COMPONENTS AND POWER TERMINAL SYMBOLS



Terminal Designation	Description
L	AC or DC Power Supply
N	(DC: polarity reversible)
⏚	Ground

Figure 1 Names of Parts and Power Terminal

Appendix-4 POWER SUPPLY AND GROUND WIRING

(1) All cable ends must be furnished with crimp-on type solderless lugs (for 4 mm screws).

(2) Examples of applicable cables:

Cross-sectional area of the cable conductor: 2.0 mm^2 *
For the power supply, use cable having a cross-sectional area of at least 1.25 mm^2.

Applicable cable: 600 V PVC insulated cable (IV) stranded wires, conforming to JIS C3307.
PVC insulated cables for electric appliances (KIV) stranded wires, conforming to JIS C3316.

Note *: Power supply cables should be determined from the instrument power consumption. They must have conductors with cross-sectional area of at least 1.25mm^2.

(3) Wirings to power supply and ground terminals should be made after completion of signal terminal wirings.

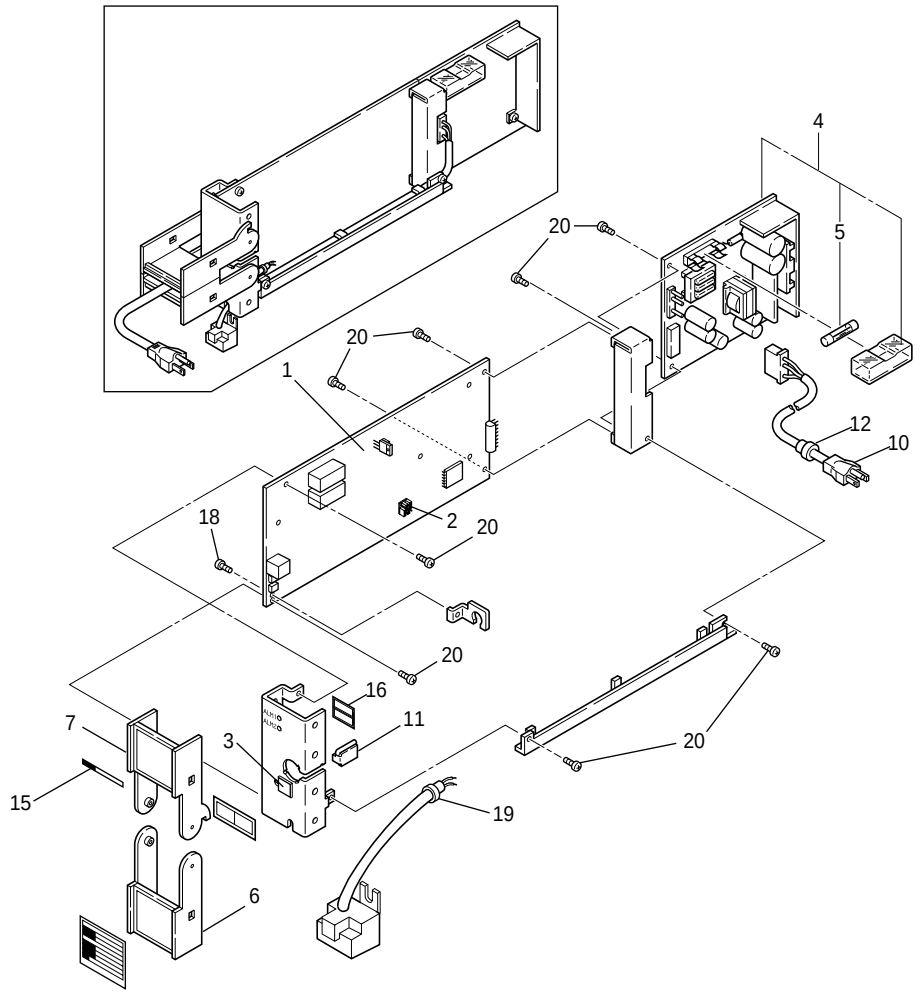
(When signal terminal wirings are made after completion of power supply wiring, pull the internal unit approximately half way out of the housing. Do not remove the power terminal block.)

(4) After completing the power supply and ground wiring, mount the power terminal cover.

Customer Maintenance Parts List

Model SALD (Style R)
mV and Temperature Alarm Unit

YEWSERIES 80



CMPL 01B04K02-02E
8th Edition: May 2004

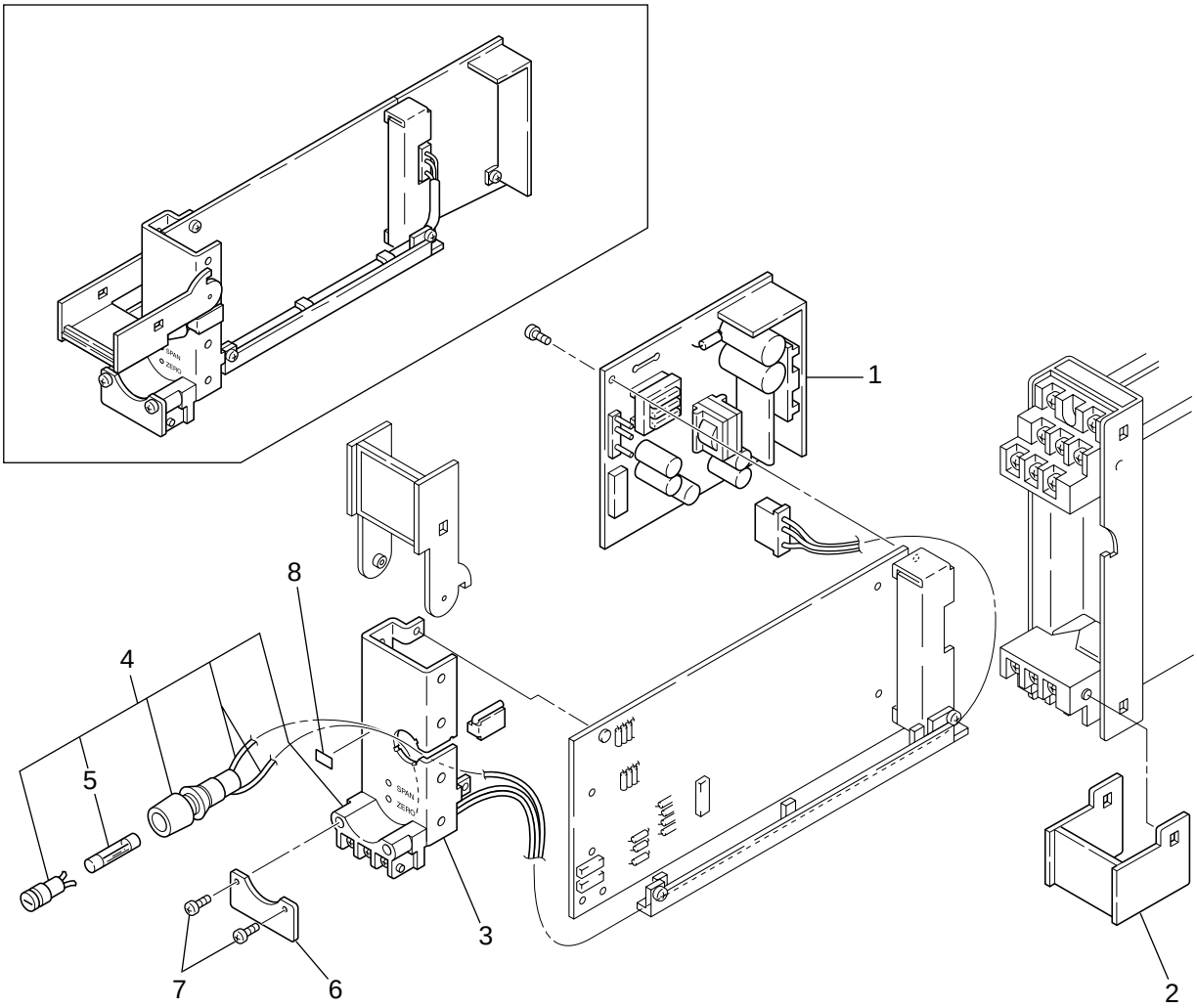
Item	Part No.	Qty (Model) SALD-110	SALD-114	SALD-210	SALD-214	SALD-310	SALD-314	SALD-710	SALD-714	SALD-724	Description
1	L3040EA	1				1					Main Board Assembly
	L3040EB			1				1			Main Board Assembly
	L3040EC		1				1				Main Board Assembly
	L3040ED				1				1		Main Board Assembly
	L3040EE									1	Main Board Assembly
2	A1211JS	1	1	1	1	1	1	1	1	1	Socket & Holder
3	L4040EA	1	1	1	1	1	1	1	1	1	Cap
4	L3040YB	1	1	1	1	1	1	1	1	1	Power Supply Unit (for 100V Version)
	L3040YS	1	1	1	1	1	1	1	1	1	Power Supply Unit (for 220V Version)
5	S9510VK	1	1	1	1	1	1	1	1	1	Fuse (1A)
6	E9713CA	1	1	1	1	1	1	1	1	1	Cover
7	E9713CK	1	1	1	1	1	1	1	1	1	Cover
10	E9713EG	1	1	1	1	1	1	1	1	1	Cable Assembly(for 100V Version)
	E9713FS	1	1	1	1	1	1	1	1	1	Cable Assembly(for 220V Version)
11	E9713CE	1	1	1	1	1	1	1	1	1	Cover
12	S9079PB	1	1	1	1	1	1	1	1	1	Bushing
15	Y9422NP	1	1	1	1	1	1	1	1		Tag No. Label (blank)
16	L4040JA	1	1	1	1	1	1	1	1	1	Label (blank)
18	Y9306JB			1	1			1	1	1	Pan H. Screw, M3x6*1
19	G9320EY			1	1			1	1	1	Bushing*1
20	Y9306JB	8	8	8	8	8	8	8	8	8	Pan H. Screw, M3x6

Note 1: Only for thermocouple input type.

Customer Maintenance Parts List

/TB
Power Supply Terminals
For Rack-Mounted Instruments
(Option)

YEWSERIES 80



CMPL 01B04F02-11E
8th Edition: May 2004

Item	Part No.	Qty	Descripion
1	—	1	Power Supply Unit (see Table 1)
2	E9713CJ	1	Cover
3	—	1	Bracket (see Table 2)
4	E9713ET	1	Terminal Assembly
5	S9510VK	1	Fuse (1A)
6	E9713CV	1	Cover
7	Y9306JB	2	Pan H. Screw, M3 × 6
8	E9714DM	1	Label (1A/250V)

Table 1. Power Supply Unit Part Number.

Applicable Instruments	Power Supply Unit Part No.	
Model	100 V Version	200 V Version
SPLR	E9715YH	
STED, SISD, SDBT	L3040YH	
SALD, SKYD, SIND, SDAU	L3040YJ	
SDBS, SDBU-21	E9715YK	
SPCM	E9715YL	

Table 2. Bracket Part Number.

Applicable Instruments Model	Bracket Part No.
STED-110/310/410	L4040CA
STED-210	L4040CB
STED-710	L4040CC
SISD,SIND-100/200, SDBT-21	L4040CE
SKYD-200/201/302	L4040CG
SKYD-100/101,SALD-110/310	L4040CH
SKYD-204/304	L4040CL
SKYD-104	L4040CM
SALD-210/710	L4040CQ
SALD-724	L4040CS
SALD-214/714	L4040CT
SIND-104/204	L4040CX
SDBS	E9713DR
SDBT-11	E9713DL
SDAU-xxx/TB	L4040DA
SDAU-100/RLY4/TB	L4040DB
SDAU-270/RLY4/TB	
SDAU-xxx/TB/COM	L4040DE
SDAU-100/RLY4/TB/COM	L4040DF
SDAU-270/RLY4/TB/COM	

Revision Information

Title :Model SALD (Style R) mV and Temperature Alarm Unit
Manual No. :IM 01B04K02-02E

Jul. 2002/5th
Renewal
Dec. 2002/6th
Correct
Mar. 2003/7th
Correct
May 2004/8th
Change of the company name.

Written by Yokogawa Electric Corporation

Published by Yokogawa Electric Corporation
2-9-32 Nakacho, Musashino-shi, Tokyo 180-8750, JAPN

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