
**User's
Manual**

YS100 SERIES

**YS136
Auto / Manual Station
for MV Setting**

IM 1B7D4-01E

Introduction

This User's manual is for YS136 Auto / Manual Station for MV Setting.

● Checking of Package Contents

When unpacking YS136 Auto / Manual Station for MV Setting, be sure to check the contents in the list below. If some items are lacking or broken, please contact our sales office or representative immediately.

Auto / Manual Station for MV Setting

- ① **Mounting Bracket** : 1 set (2 pcs)
- ② **Tag Number Label** : 1 set (4 pcs)
- ③ **Range Entry Label** : 1 set (4 pcs)
- ④ **Instruction Manual** :
 - ⑤ IM 1B7D4-01E (This manual)
 - IM 1B7C8-03E YS100 Series Communication Manual (supplied only for models with RS-485 or DCS-LCS communication function)
- ⑥ **Ferritic core** (Supplied only for models with direct input option for CE Marking)

● Storage of Packing Box and Inner Package

Please keep the Packing box and inner package, because they are necessary to send the YS136 to our Yokogawa sales / service office or the dealer from whom the unit was purchased in case of trouble.

● Intended Readers

This manual is intended for personnel who have enough on-the-job experience as maintenance technician in charge, party of construction execution instrumentation and control engineers, start up engineers and party of plant operation and monitoring.

Start-Up Process and Document Map

Figure 0.1 shows the Flow Chart of Start-Up Process of YS136 Auto / Manual Station for MV Setting. Table 0.1 lists YS100 Series Document Map (Technical Information and Instruction Manual) to be read at each step of starting up process. Refer to the appropriate documents for operation of your product.

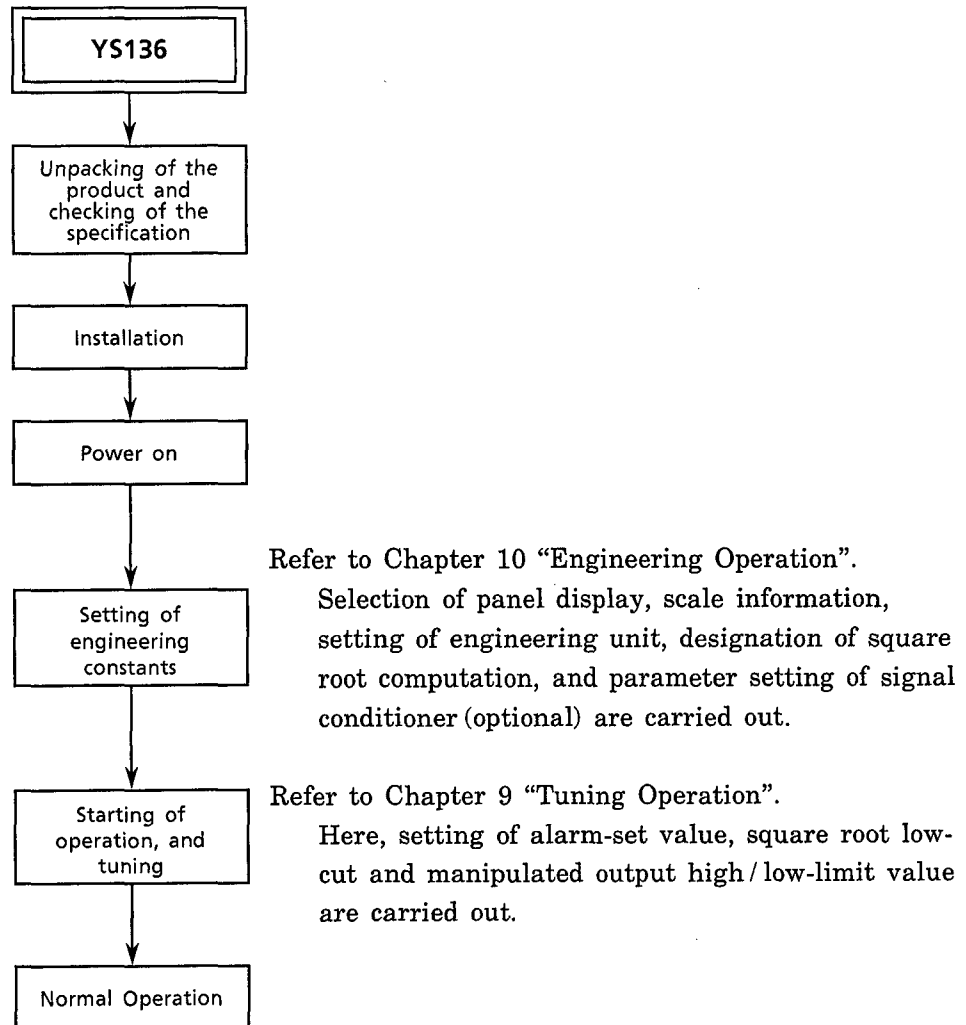


Figure 0.1 Flow Chart of Start-Up Process

Table 0.1 YS100 Series Document Map

Document Class	Document No.	Title	Usage (◎: Essential, ○: For Reference)				
			Programming for YS170	Engineering for function selections and parameter settings	Tuning	Normal Operation	Installation and Maintenance
Technical Information	TI 1B7A1-01E	YS100 SERIES Information	○	○		○	
	TI 1B7C0-01E Note 2	YS100 SERIES Intelligent Self-tuning Controllers			◎		◎
	TI 1B7C1-01E	YS150, YS170 Single-loop Controller Control Functions	◎	◎	◎	◎	
	TI 1B7C2-03E Note 3	YS170 Programmable Functions	◎		○		
	TI 1B7C8-03E Note 1	YS100 SERIES Communication Functions		◎		◎	
	TI 1B7C8-04E Note 5	YS-net Peer-to-peer Communication Functions		◎			
	TI 1B7C8-05E Note 5	YS-net Personal Computer Communication Functions		◎		◎	
User's Manual	IM 1B7C1-01E	YS150 Single-loop Multi-function Controller YS170 Single-loop Programmable Controller	○	◎	◎	◎	◎
	IM 1B7C8-01E	YSS10 YS100 SERIES Programming Package	◎				
	IM 1B7C8-03E Note 1	YS100 SERIES RS-485 Communication Functions (/A31) DCS-LCS Communication Functions (/A32)		◎		◎	◎
	IM 1B7D2-01E	YS131 Indicator with Alarm		◎	◎	◎	◎
	IM 1B7D3-01E	YS135 Auto/Manual Station for SV Setting		◎	◎	◎	◎
	IM 1B7D4-01E	YS136 Auto/Manual Station for MV Setting		◎	◎	◎	◎
	IM 1B7D5-01E Note 4	YS110 Standby Manual Station				◎	

(Note 1) Only when used with supervisory communication functions

(Note 2) Only when using self- tuning functions

(Note 3) Only for YS170 programmable controllers

(Note 4) The YS110 can be a standby station only for the YS150, YS170, or YS136

(Note 5) Only when using YS net communication functions

Notice

● Regarding This Manual

1. This Manual should be passed on to the end user.
2. Read this manual carefully and fully understand how to operate this product before you start operation.
3. Yokogawa makes no warranty of any kind with regard to this material, but not limited to, implied warranties of merchantability for particular purpose.
4. All rights reserved. No part of this manual may be reproduced in any form without Yokogawa's written permission.
5. The contents of this manual are subject to change without prior notice.
6. If any question arises or errors are found, or if there is any information missing from this manual, please inform Yokogawa's documentation department responsible for this manual or the nearest Yokogawa sales office, or use the form in the back of this manual to inform us accordingly.

● Regarding Protection, Safety, and Prohibition Against Unauthorized Modification.

1. For the protection and safe use of the product and the system controlled by it, be sure to follow the instructions on safety described in this manual when handling the product. In addition, if you handle the product in contradiction to these instructions, our company does not guarantee safety.
2. The following safety symbol marks are used on the product concerned and in this Manual:

Les symboles suivants touchant à la sécurité sont utilisés sur le produit concerné et dans ce manuel.



CAUTION:

This marking on the product indicates that the operator must refer to an explanation in the instruction manual in order to avoid injury or death of personnel or damage to the instrument. The manual describes that the operator should exercise special care to avoid electric shock or other dangers that may result in injury or the loss of life.

ATTENTION:

Ce symbole marqué sur le produit indique que l'opérateur doit se reporter au manuel d'instruction pour éviter tout accident corporel ou tout dégât matériel.

Le manuel d'instruction indique que l'opérateur doit faire particulièrement attention pour éviter tout choc électrique ou autre accident pouvant entraîner un accident ou la mort.



Protective ground terminal :

In order to provide protection against electrical shock in case of a fault. This symbol indicates that the terminal must be connected to ground prior to operation of equipment.

Borne de connexion à la terre de protection :

Ce symbole indique que la borne doit être reliée à la terre de protection avant toute utilisation du matériel, dans le but de se protéger d'une électrocution en cas de défaillance.



Function ground terminal :

In order to provide protection against noise.

This symbol indicates that the terminal must be connected to ground prior to operation of equipment.

Borne de connexion à la terre contre le bruit :

Ce symbole indique que la borne doit être reliée à la terre sans bruit avant toute utilisation du matériel, dans le but de se protéger du bruit.



Indicates the power switch is "ON".

Ce symbole indique que le commutateur de mise sous tension est en position de "Marche".



Indicates the power switch is "Stand-by".

Ce symbole indique que le commutateur de mise sous tension est en position de "Veille".



Indicates the power switch is on "OFF".

Ce symbole indique que le commutateur de mise sous tension est en position de "Arrêt".



Indicates the direct current.

Indique le courant continu.



Indicates the alternating current.

Indique le courant alternatif.

CAUTION

A CAUTION sign denotes a hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product.

Le symbole CAUTION annonce un risque. Il désigne une procédure, une marche à suivre ou autre qui, n'étant pas correctement observée, peut entraîner un dommage ou une destruction partielle ou totale du produit.

The symbolic conventions below are used only in the manual.
Les conventions suivantes sont utilisées uniquement dans le manuel d'instruction.



IMPORTANT :

Indicates that operating the hardware or software in this manner may damage it or lead to system failure.

IMPORTANT :

Indique que manipuler le matériel ou le logiciel de cette manière peut l'endommager ou provoquer l'arrêt du système.



NOTE :

Draws attention to information essential for understanding the operation and features.

NOTE :

Attire l'attention sur une information essentielle pour la compréhension des opérations à effectuer ou des caractéristiques.

3. If protection / safety circuits are to be used for the product or the system controlled by it, they should be installed outside of the product.
4. When you replace parts or consumables of the product, use those specified by our company.
5. Do not modify the product.

● **Regarding Force Majeure**


1. Yokogawa Electric Corporation does not make any warranties regarding the product except those mentioned in the WARRANTY that is provided separately.
2. Yokogawa Electric Corporation 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.

● **Regarding Software Supplied by YOKOGAWA**

1. Yokogawa makes no other warranties expressed or implied except as provided in its warranty clause for software supplied Yokogawa.
2. Use this software with one specified computer only.
You must purchase another copy of the software for use with each additional computer.
3. Copying this software for purposes other than backup is strictly prohibited.
4. Store the streamer, tape, or floppy disk (original medium) in a secure place.
5. Reverse engineering such as the disassembly of software is strictly prohibited.
6. No portion of the software supplied by Yokogawa may be transferred, exchanged, or sublicensed or leased for use by any third party without the prior permission of Yokogawa.

Documentation Conventions

Throughout this manual, the following conventions of notation clarify the input device (keyboard, touch panel, or mouse) used.

- [Enter] represents Enter key () on the keyboard.
- This manual uses the following conventional symbols.



TIP:

Gives information that complements the present topic.



See Also:

Gives the reference locations for further information on the topic.



: Indicates operation with a mouse.



: Indicates input operation from the keyboard.



: Indicates the display on a panel.

● **Figures of Display Screen**

- The figures that appear in this manual of display screen may sometimes be emphasized or simplified, or may fail to show the entire image for reasons of convenience in explaining them.
- These figures may sometimes differ from the real images on a screen in terms of the location at which they are displayed or the size of the characters (whether they are uppercase or lowercase letters, and so on). However, this occurs only when the difference does not interfere with due understanding of the relevant function or operation and monitoring.

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Customer Maintenance Parts List	CMPL 1B7D4-02E
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Reader's Comment Form

Revision Record

1. OUTLINE

The YS136 is an Auto / Manual Station for MV Setting for operating directly the operation terminal.

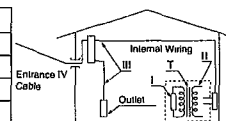
- Process variables can be displayed, and parameters and manual operation functions can be set and used freely by using the full dot LCD display and key switches on the front of the operation unit.
- Trend display of process variable is possible.
- Square root computation with variable low cutoff is possible for process variable inputs.
- Display and contact output for high and low limit alarms can be generated for process variable input.
- Manipulated output high and low limiter can be added (available only in the M operation mode).
- Communication functions (optional) can be incorporated to enable easy connection with a computer in a distribution control system.
- The self-diagnosis function can be used to check the operation of the instrument and the status of the input signal lines.



CAUTION:

This equipment has Measurement category I, therefore do not use the equipment for measurements within measurement categories II, III and IV.

Measurement category		Description	Remarks
I	CAT.I	For measurements performed on circuits not directly connected to MAINS.	
II	CAT.II	For measurements performed on circuits directly connected to the low voltage installation.	Appliances, portable equipments, etc.
III	CAT.III	For measurements performed in the building installation.	Distribution board, circuit breaker, etc.
IV	CAT.IV	For measurements performed at the source of the low-voltage installation.	Overhead wire, cable systems, etc.



1.1 Standard Specifications

- **Analog Signal (Measurement category I)**

Input : 1 to 5V DC, 2 points
One point may be specified optionally to accept a direct input.
(One of the following : small voltage source (mV), thermocouple, resistance temperature detector, slidewire resistance, input isolator, 2-wire transmitter, or frequency signal input)

Rated transient overvoltage : 1500V (Note)

Direct input option (for /A12, /A13, /A16 and /A17)

Input : +/- 0.1V DC (for /A12)
: 17 to 333 Ω (for /A13)
: 4 to 20mA DC (for /A16 and /A17)

Rated transient overvoltage : 1500V (Note)

Note : It is the value for safety standards estimated in measurement category I based IEC/EN61010-1.
It is not the value to guarantee its performance.

Input Resistance: 1M Ω or more

Output : 4 to 20mA, 1point Load resistance; 0 to 750 Ω
1 to 5V DC, 1point Load resistance; 2k Ω or more

- **Status Signal**

Input : 1 point
Output : 3 points
Transistor contact, rated output ;
30V DC / 200mA (With resistive load)

Fail Output : 1 point
Transistor contact, rated output ;
30V DC / 200mA (With resistive load)

- **Transmitter Power Supply**: 24V DC / 30mA (Without a short-circuit protection circuit)
Not insulated from the operation control circuit

- **Rated I / O Signal Conversion Accuracy:**

1 to 5V Input Signal : $\pm 0.2\%$ of span
4 to 20mA Output Signal : $\pm 1.0\%$ of span
1 to 5V Output Signal : $\pm 0.3\%$ of span

- **Power Supply**

Rated Power Supply Voltage : For both DC and AC

100V version ;

DC drive ; 24-120V DC $\overline{\text{---}}$ ($\pm 10\%$), no polarity

AC drive ; 100-120V AC \sim ($\pm 10\%$), 50 / 60Hz ($\pm 3\text{Hz}$)

220V version ;

DC drive ; 135-190V DC $\overline{\text{---}}$ ($\pm 10\%$), no polarity

AC drive ; 220-240V AC \sim ($\pm 10\%$), 50 / 60Hz ($\pm 3\text{Hz}$)

Under this rated voltage the instruments conform to the safety requirements in IEC/EN61010-1.

On the other hand, the instruments themselves have the ability to operate under the condition as shown below which is the same as the former description of the power supply voltage.

Usable Power Supply Voltage: For both DC and AC

100V version ;

DC drive ; 20-130V DC, no polarity

AC drive ; 80-138V AC, 47- 63Hz

220V version ;

DC drive ; 120-340V DC, no polarity

AC drive ; 138-264V AC, 47- 63Hz

Maximum Current Flow:

600mA (DC drive of 100V version)

100mA (DC drive of 220V version)

Maximum Power Consumption:

26VA (AC drive of 100V version)

29VA (AC drive of 220V version)

Current flow and power consumption at recommended voltages:

350mA Typ. at 24V DC

15VA Typ. at 100V AC

23VA Typ. at 220V AC

● **Insulation Resistance**

Between the I/O terminals and the grounding terminal;

100MΩ / 500V DC

Between the power supply terminals and the grounding terminal;

100MΩ / 500V DC

● **Withstanding Voltage**

Between the I/O terminals and the grounding terminal;

500V AC for 1 minute

Between the power supply terminals and the grounding terminal;

1000V AC for 1 minute for power supply specification of 100V AC

1500V AC for 1 minute for power supply specification of 220V AC

● **External Circuit Breaker Rating**

5A (For both AC and DC drive of 100V and 220V version)

Must conform to IEC60947-1 or IEC60947-3 standard. Must install the breaker in the same room as the utilized devices, and clearly indicate that is used to de-energize the devices.

● **Noise Reduction Ratio**

Common Mode Noise : 83dB (50Hz)

Series Mode Noise : 46dB (50Hz)

● **Installation** : Direct panel-mount

Use mounting brackets (for the top and bottom)

● **Signal Connections** : Terminal connections with M4 screws (for external signal, power supply and grounding)

● **Weight** : 2.6kg

● **Installation Conditions**

Ambient Temperature : 0 to 50°C

Relative Humidity : 5 to 90%RH (no dew condensation)

Temperature gradient : Within ±10°C/h

Installation location : Room
 Installation height : Altitude up to 2,000m
 Installation category based on IEC 61010 : II (*1)
 Pollution Degree based on IEC 61010 : 2 (*2)

*1: Installation category is the specification of the impulse withstanding voltage which is also called as overvoltage category.

*2: Pollution degree is the level of foreign body adhesion such as the solid, liquid, and gas which decrease the withstanding voltage, 2 means general indoor atmosphere.

● EMC Conformity Standards

The YS136 with the option /CE has the EMC conformity as shown below.

Compliant with EN61326.

No	Test Item	Test Specification	Performance Criteria
1	Electric discharge	4kV (contact) 8kV (air)	B
2	Radio-frequency electromagnetic field Amplitude modulated	80MHz -1GHz 10V/m (unmodulated) 80% AM	A
3	Radio-frequency electromagnetic field Pulse modulated	900MHz 10V/m (unmodulated) Duty 50%, 200Hz REP.	A
4	Fast transients common mode	2kV, 5 / 50 (Tr / Th) ns 5kHz REP.	B
5	Radio-frequency common mode Amplitude modulated	150kHz -80MHz 10V/m (unmodulated) 80% AM (1kHz) Source Impedance 150Ω	A

Note (1) Definition of performance criterion A

This instrument continues to operate with its measurement accuracy with $\pm 20\%$ of range during the test.

(2) Definition of performance criterion B

This instrument continues to operate without hang-up or falling into uncontrollable conditons during the test.

No change of actual operating state or stored data is allowed.

● External Connected Equipment

The instrument with the option / CE must be connected only to devices which are conformed to IEC61010-1 or IEC60950.

● Safety Requirements Conformity Standards

The instrument with the option / CE conforms to the safety requirements as shown below except when with the option /Dxx.

IEC/EN61010-1

● Hazardous Area Classification

The YS136 with the option / CSA is CSA approved as shown below.

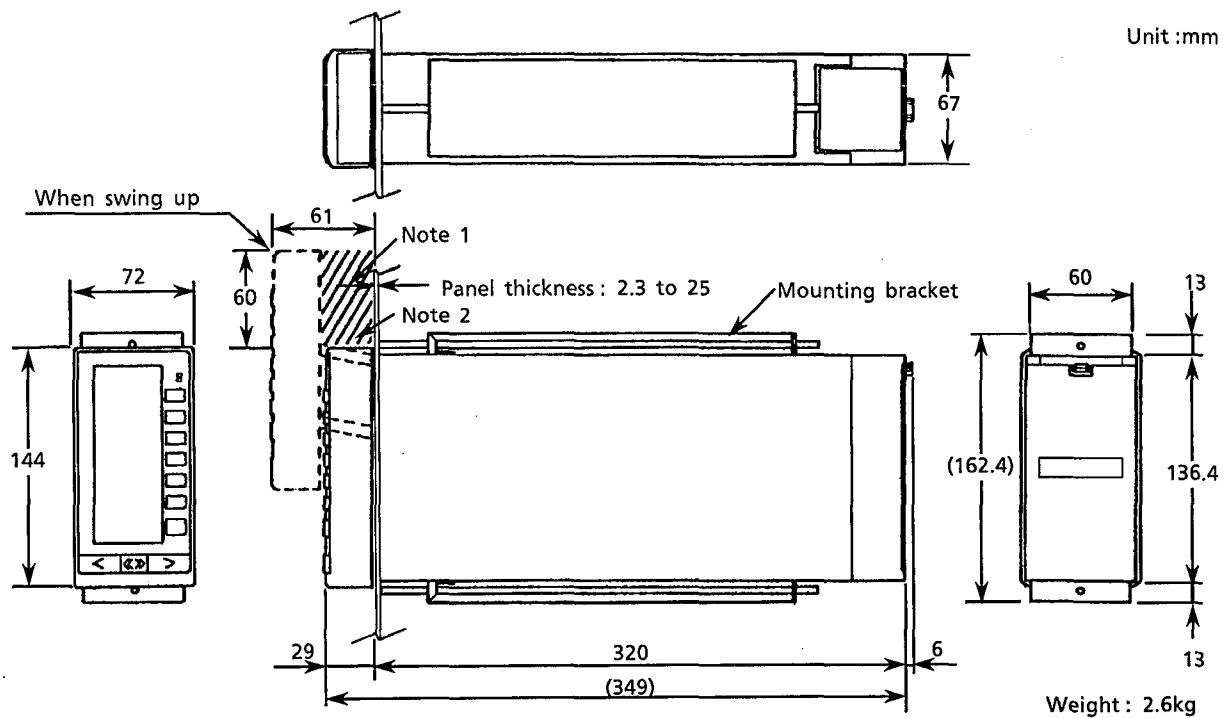
CSA standard : CSA C22.2 No.213

(Non-incendive electrical equipment for use in hazardous locations)

Location : Class I, Division 2, Groups A, B, C, & D

Temperature Code :T4

1.2 Dimensions of the YS136 and Panels



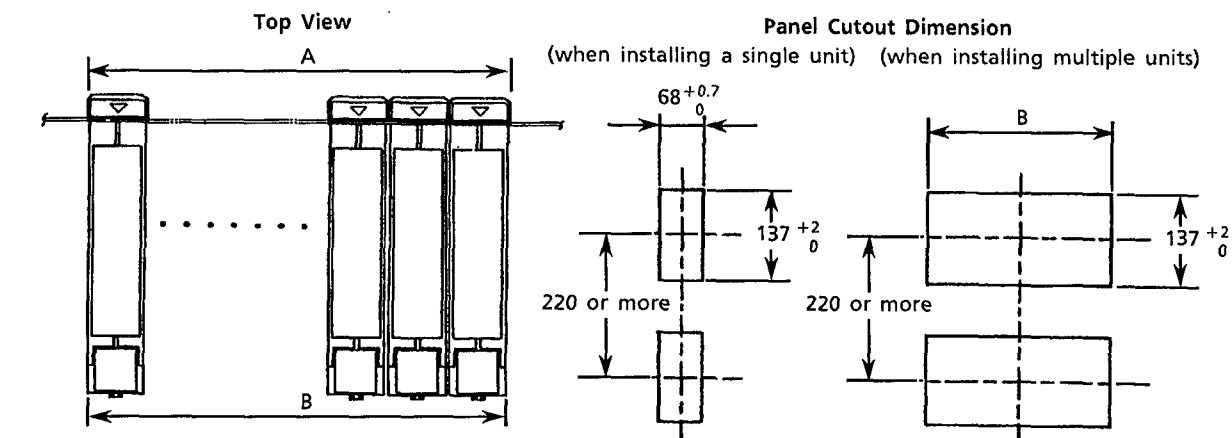
Note 1 : To allow the faceplate to swing up 60mm (see above), any obstruction at the top of the panel should project no more than 29mm.

Note 2 : To allow replacement of the fluorescent tube used for back-lighting, 130mm clearance above the swung up faceplate is required.

Note 3 : For good ventilation, keep space of more than 100mm in the upper and lower parts of the panel.

Figure 1.2.1 Dimensions of the Unit and Panels (1/2)

Unit :mm

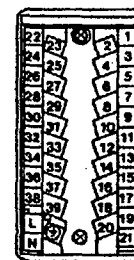


Normal allowance = \pm (value of JIS B 0401-1986, tolerance class IT18) / 2

Panel Cutout Dimension when Installing Multiple Units for Flush Mounting

Number of Location	1	2	3	4	5	6	7
A	72	144	216	288	360	432	504
B	$68^{+0.7}_0$	$140^{+1.0}_0$	$212^{+1.0}_0$	$284^{+1.0}_0$	$356^{+1.0}_0$	$428^{+1.0}_0$	$500^{+1.0}_0$

Number of Location	8	9	10	11	12	13	14
A	576	648	720	792	864	936	1008
B	$572^{+1.0}_0$	$644^{+1.0}_0$	$716^{+1.0}_0$	$788^{+1.0}_0$	$860^{+1.0}_0$	$932^{+1.0}_0$	$1004^{+1.0}_0$



Terminal Assignment

Figure 1.2.2 Dimensions of the Unit and Panels (2/2)

1.3 Model and Suffix Codes

Model	Suffix Codes	Option Codes	Remarks
YS136	.....	.....	Auto / Manual Station for MV Setting
Use	-0 .....	.....	General purpose
	0 .....	.....	Fixed to 0
Power supply	1 ...	.....	100V version
	2 ...	.....	220V version
Optional specification		/ □	Optional specification (Section 1.4)

1.4 Optional Specifications

	Option Code	Combina- tion with /CE	Combina- tion with /CSA	Description
	/CE /CSA	- No	No -	CE Mark Approved CSA Non-incendive Approved
Input Option	/A01	No	Yes	It is possible to select one from the followings : mV Input (EM1) Thermocouple input (ET5 / YS) (Type K, T, J, E, B, R, S) Resistance Temperature Detector Input (ER5) (Pt100, JPt100) Potentiometer (ES1) Input Isolator (EH1) 2 - wire Transmitter Input (EA1) 2 - wire Transmitter Input (EA9) (No isolation from the field) Frequency Input (EP3)
	/A02	No	Yes	
	/A03	No	Yes	
	/A04	No	Yes	
	/A05	No	Yes	
	/A06	No	Yes	
	/A07	No	Yes	
	/A08	No	Yes	
Input Option for /CE	/A12	Yes	No	It is possible to select one from the followings : Thermocouple input (ET5 / YS) (Type K, T, J, E, B, R, S) Resistance Temperature Detector Input (ER5) (Pt100, JPt100) 2 - wire Transmitter Input (EA1) 2 - wire Transmitter Input (EA9) (No isolation from the field)
	/A13	Yes	No	
	/A16	Yes	No	
	/A17	Yes	No	
Communi- cation	/A31	Yes	Yes	It is possible to select one from the followings : RS-485 DCS-LCS YS-net
	/A32	Yes	Yes	
	/A33	Yes	Yes	
Construc- tion (note 1)	/D11	No	No	It is possible to select one from the followings : Replace for YEW SERIES 80 Internal Unit Closely Mounting for YEW SERIES 80 Housing Replace for 100 Line internal Unit
	/D12	No	No	
	/D13	No	No	

(note 1) In case of specifying /D11, Direct input and /A31 Communication options cannot be used.

1.5 Accessories

- (1) Mounting bracket : 2 pieces
- (2) Tag number label : 4 pieces
- (3) Range entry label : 4 pieces
- (4) Ferritic core : 1 piece (only for modules with /A12, /A13, /A16 or /A17 option code)
- (5) Instruction Manual : IM 1B7D4-01E (This manual)
IM 1B7C8-03E (only for models with /A31 or /A32 option code)

2. Function

2.1 YS136 Function

Figure 2.1 shows the functional block diagram of the YS136.

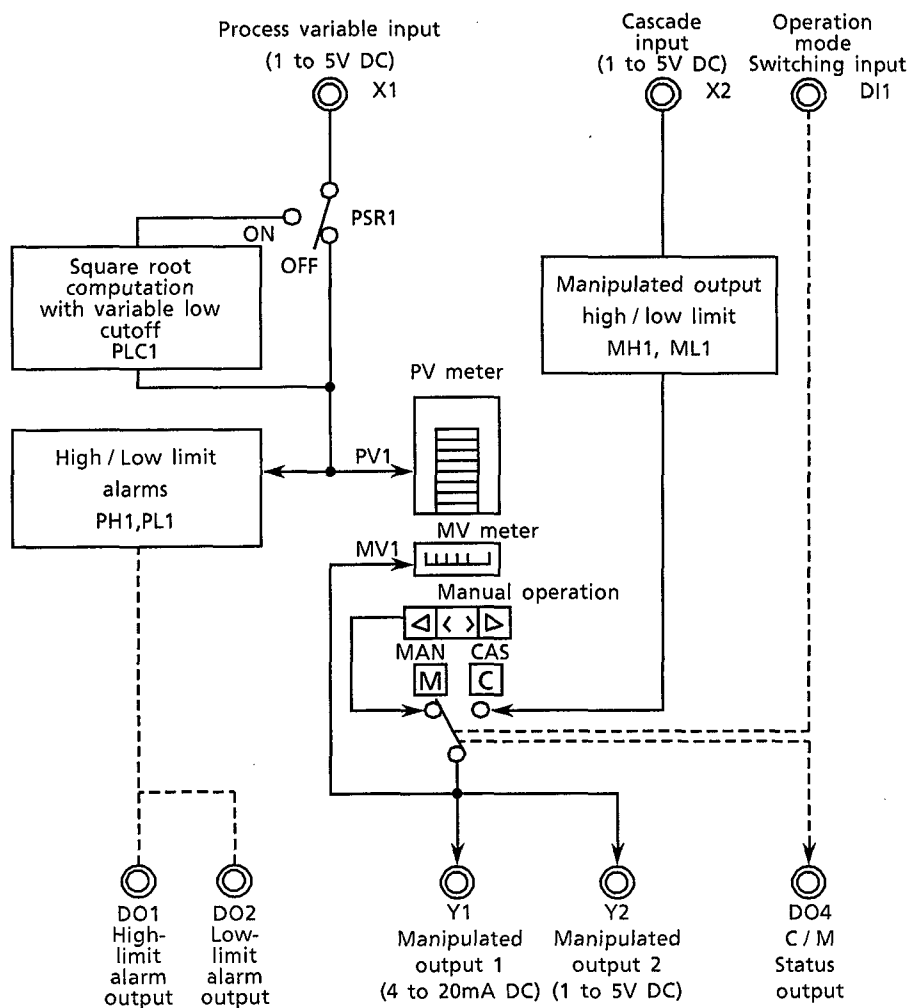


Figure 2.1 Functional Block Diagram of YS136

■ Square Root Extraction

Process variable signals can be subjected to square root extraction (low-signal cutoff point is adjustable).

Figure 2.2 shows the square root extracted output characteristics when the low-signal cutoff is provided.

For signals below the “cutoff” point, a linear characteristic “output=input” applies. For signals above the “cutoff” point, square root extracted output is provided.

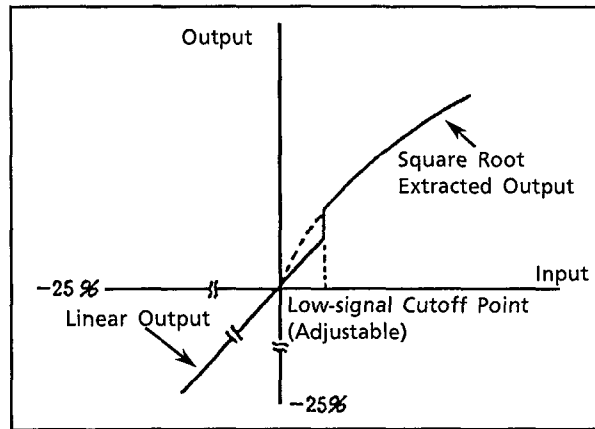


Figure 2.2 Square Root Extraction.

■ Current Output Characteristics

With the output signal decreased, when the output signal is below -6% of span, the current output is approximately 0.8mA (-20% of span). With the output signal increased, when the output signal is greater than -5% of span, the current output is released from 0.8mA (-20% of span) and returned to 3.2mA (-5% of span). When the output signal is above 100% , it increases up to 21mA (106.25% of span).

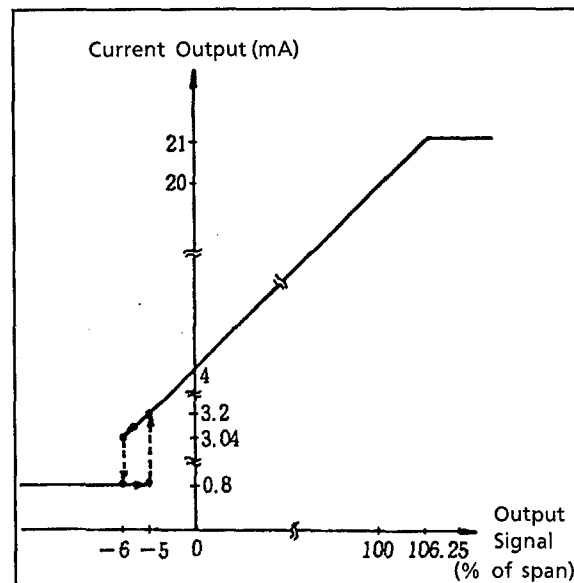


Figure 2.3 Current Output Characteristics.

■ Output High-Low Limiter (in C mode only)

The manipulated signal limiter functions while in the C mode (cascade through external analog signal, or computer).

(It does not function in the M mode.)

MH (high limit) adjustable: $-6.3 \sim 106.3\%$

ML (low limit) adjustable : $-6.3 \sim 106.3\%$

■ Ramp Functions

For YS136 Auto/Manual station, ramp functions are used for bumpless switching from **M** (local setpoint) to **C** (remote setpoint).

The ramp rate is (full span / 40 sec).

For example, if the setpoint is switched from 50% in **M** mode to 75% in **C** mode, it takes 10 sec. for the output to ramp from 50% to 75% at this ramp rate, as shown in Figure 2.4.

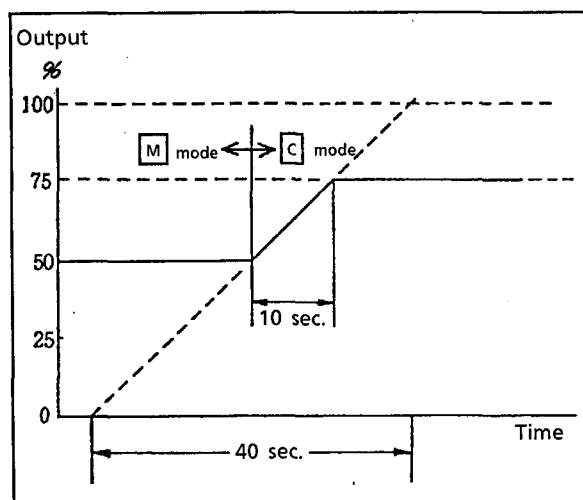


Figure 2.4 Ramp Functions.

■ Process Variable Input Alarm Detection and Output

Display or contact output of high or low limit alarm is possible for process variable.

Figure 2.5 shows alarm operation.

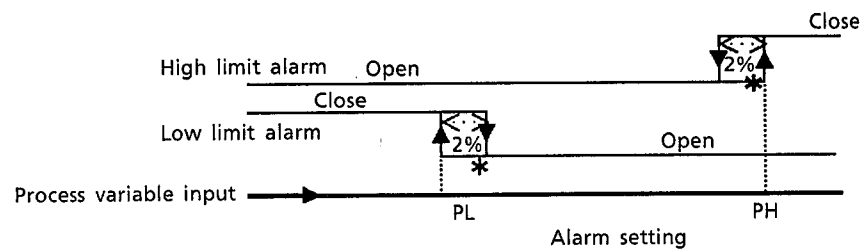
If the high-limit alarm is set to the maximum value and the low-limit alarm is set to the minimum value, alarms will not be generated.

PH (High limit alarm): -6.3~106.3% (Engineering unit quantity available)

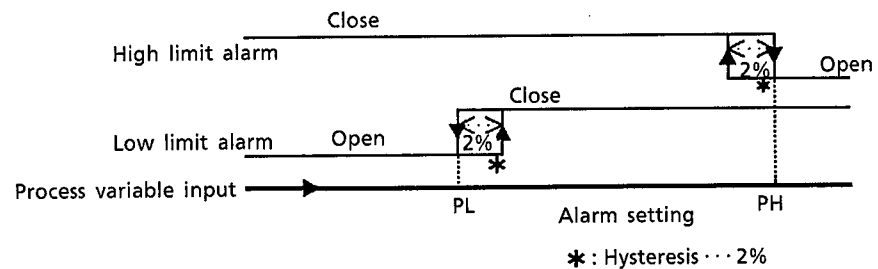
PL (Low limit alarm) : -6.3~106.3% (Engineering unit quantity available)

Hysteresis : 2%

- Normally Open (AOUT=NO)



- Normally Close (AOUT=NC)



- Set AOUT (Alarm output contact status specification) on the function setting panel 3.

Figure 2.5 Alarm Action

3. Installation

3.1 Installation

■ When Installing a Single Unit

- ① Using a screw driver, loosen the two screws of the mounting brackets supplied with the unit.
- ② Insert the unit in the front of the panel (see Figure 3.1).
- ③ Attach the mounting brackets to the unit, and fix the unit to the back of the front panel with screws (see Figure 3.2) through top and bottom mounting brackets.

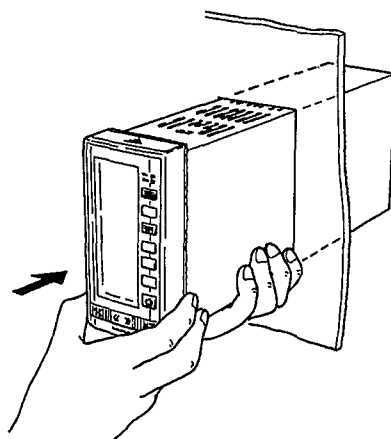


Figure 3.1 Inserting in the Panel

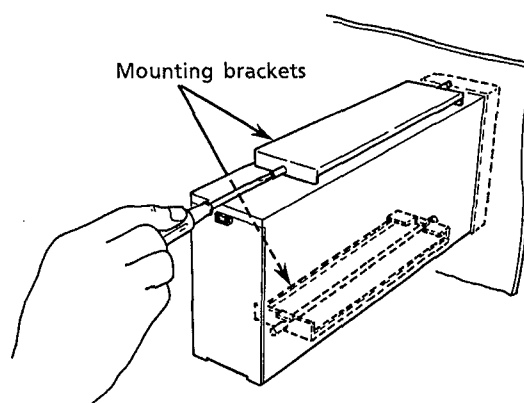


Figure 3.2 Attaching the Mounting Bracket

To remove the unit, reverse the steps (see Figure 3.3).

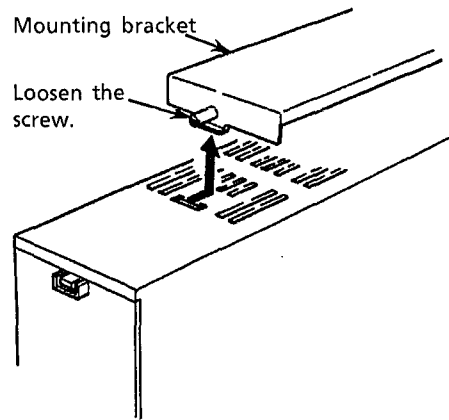


Figure 3.3 Detaching from the Panel

■ When Installing Multiple Units for Flush Mounting

- ① Place the units in the order of installation, and place the side panel of the unit flush with the side panel of the next unit. Then, insert the units in the panel (see Figure 3.4).
- ② For installation of other units, perform the same procedure as for “When Installing a Single Unit” on previous page.

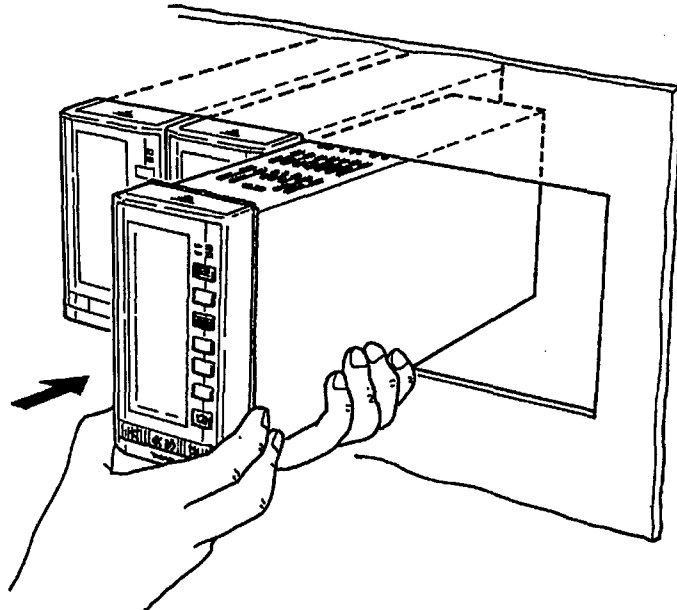


Figure 3.4 Installing Multiple Units for Flush Mounting

3.2 Terminal Assignment

The terminals can be checked by removing the terminal cover at the back of the unit (see Figure 3.5). The terminal numbers are marked on the labels attached to the left and right sides in the case, and also marked on the terminal cover.

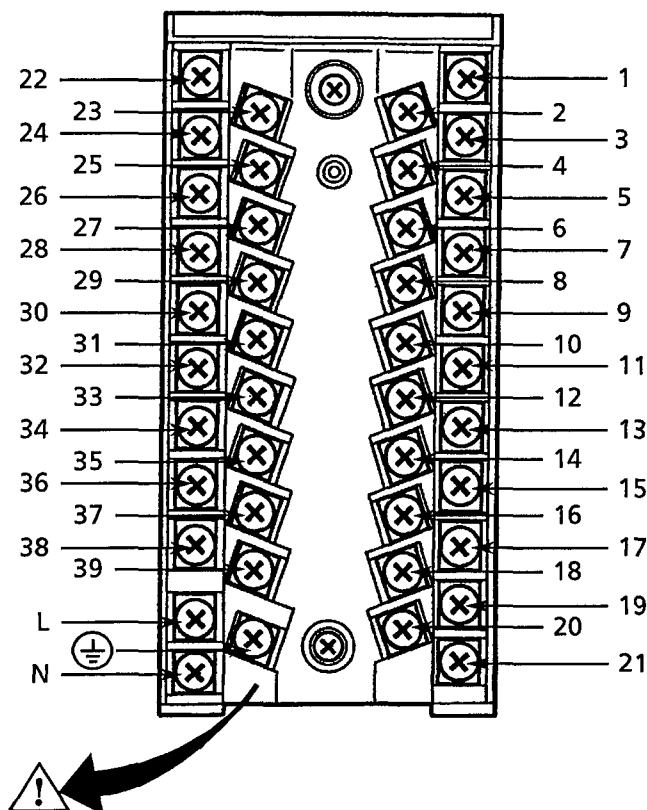


Figure 3.5 Terminal Assignment

3.2.1 Wiring to the Power Source



CAUTION

- Prior to wiring, first turn off the power supply, and use a tester to confirm that no current is flowing through the power cable.
- Be sure to keep the power cables at least 1 cm away from the other signal cables.
- Power supply cable must meet the requirements of relevant IEC standards or local installation requirements for specific details. In addition, in Canada it must meet the Canadian Electrical Code.

Wire the power cable to the L and N terminals with crimp terminals (for M4 threads).

3.2.2 Wiring for the Grounding



CAUTION

To avoid electrical shock to operators and service engineers as well as to avoid external noise, be sure to ground the instrument with a grounding resistance of 100Ω . To ground the instrument, wire the grounding cable to the terminal indicated by the ⏏ mark.

Grounding must be conducted with a resistance of 100Ω or less. Be sure to connect the grounding cable to the terminal indicated by the ⏏ mark. using crimp terminals for M4 threads.




After completion of wiring to the power source and for the grounding, re-mount the terminal cover to the instrument.



TIP

If separate grounding cannot be conducted for each instrument when you are using multi instruments, for example on a panel, then use grounding cables of 2mm^2 or more to ground each instrument and collect the cables from each instrument to wire them to a section of the grounding bus line.

Table 3.1 Table of Terminal Assignment

Terminal Number	YS136 Auto/Manual Station for MV Setting
1	+ > Process Variable input
2	- > (1 to 5V DC)
3	+ > Cascade input
4	- >
5	
6	
7	
8	
9	+ > Output of the direct-input
10	- > signal (1 to 5V DC) (Note 1)
11	+ > Fail output
12	- >
13	Transmitter power supply +(24V DC) (Note 2)
14	Communication terminal (SG)
15	Communication terminal (SD(A))
16	Communication terminal (SD(B))
17	Communication terminal (RD(A)) or LCS+ or DA
18	Communication terminal (RD(B)) or LCS- or DB
19	+  Terminal for the direct-input
20	-  (Note 3)
21	
22	+ > Manipulated output 1
23	- > (4 to 20mA DC)
24	+ > Manipulated output 2
25	- > (1 to 5V DC)
26	
27	
28	+ > High-limit alarm output (Note 4)
29	- >
30	+ > Low-limit alarm output (Note 4)
31	- >
32	
33	
34	+ > C/M status output
35	- >
36	
37	
38	+ > Operation mode input
39	- >
L	+ > Power supply terminal
N	- >
	Grounding terminal (GND)

Note 1 : These are the voltage conversion output terminals (1 to 5V DC) of the direct-input when the direct-input source is connected to the direct-input terminals (19, 20, and 21). Connect these voltage conversion output terminals to the appropriate input terminals.

Note 2 : See Section 3.4 "Transmitter Power Connection" for details of the transmitter power supply.

Note 3 : See Table 3.2 "Connection of the Direct-Input Terminal" to make connections of the terminals.

Note 4 : Settings of NO and NC can be possible. See Section 10.3.3 "Configuration Panel 3" for setting procedure.

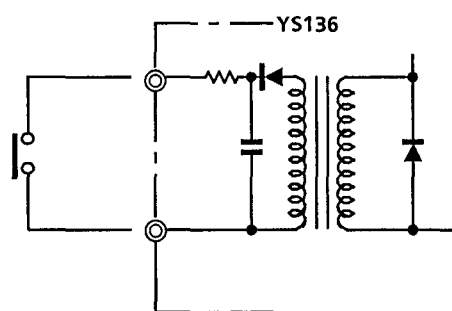


IMPORTANT

Do not connect anything to the vacant terminals.

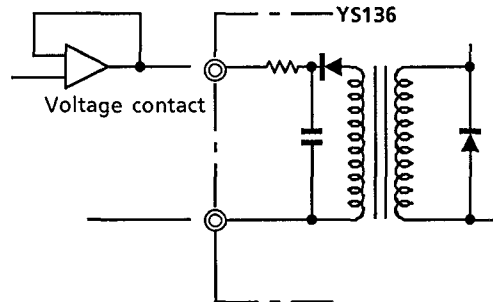
3.3 Notes on Wiring

- (1) To connect a wire to the terminal, use a round crimp-style terminal.
- (2) A non-voltage contact and a voltage contact for status input which will be connected externally shall meet the rating specifications (see Figures 3.6 and 3.7). Allow for resistance of the wire and voltage drop caused by the wire.



CLOSE: 200Ω or less
OPEN : 100kΩ or more

Figure 3.6 Connection to Status Input (Non-Voltage Contact)



ON : -0.5 to +1V
OFF : 4.5 to 30V

Figure 3.7 Connection to Status Input (Non-Voltage Contact)

- (3) Note the following for connection and wiring when driving an external unit using the fail output, alarm output, status output etc.



NOTE

- Do not connect a load which is more than the rated value of the contact (30V DC 200mA or less).
- Be sure to connect a protective diode (surge absorber) in parallel with the load when driving an inductive load such as a relay (see Figure 3.8).
- To connect the power supply which is to be used to drive the load, match the polarity of the power supply with the polarity marked on the terminal board (see Table 3.1 for terminal assignment) (see also Figure 3.8).
- An AC load cannot be switched directly by using the transistor contact. To switch the AC load, use a relay (see Figure 3.9).

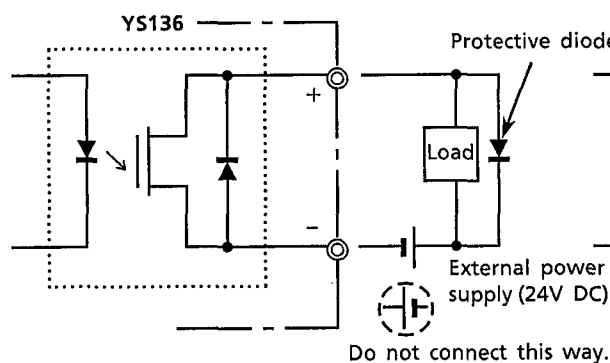


Figure 3.8 Connection Using the Status Output

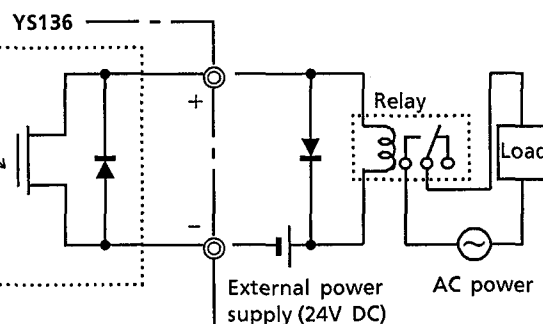

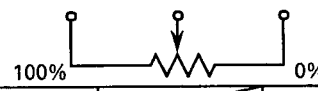
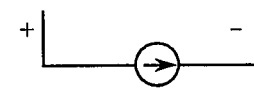
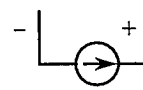


Figure 3.9 Connection of the Status Output when Driving a Load with AC Power

(4) See Table 3.2 for connection and wiring to the direct-input terminal.

Table 3.2 Connection of the Direct-Input Terminal

		Terminal Number		
		19	21	20
mV input/thermocouple input/isolation input		+		-
Resistance temperature detector input (RTD) (Note 1)				
Slidewire resistance input (Note 2)				
Frequency signal input	2-wire system (voltage / contact)	+		-
	2-wire system, power supply type	Signal	Power supply	
	3-wire system, power supply type	+	Power supply	-
2-wire system, transmitter input (Power supply is required.)				
2-wire system, transmitter input (Power supply is not required.)				

Note 1 : The resistance of the wires of 19 and 21 shall be the same. The symbols A, B, and B in the figure conform to the Japanese Industry Standard (JIS).

Note 2 : The resistance of the wires of 19 and 21 shall be the same.

For input option /A12, /A13, /A16, or /A17 a ferritic core is included in the option. You must use it like shown in Figure 3.10 when connecting the wire to the input option terminals.

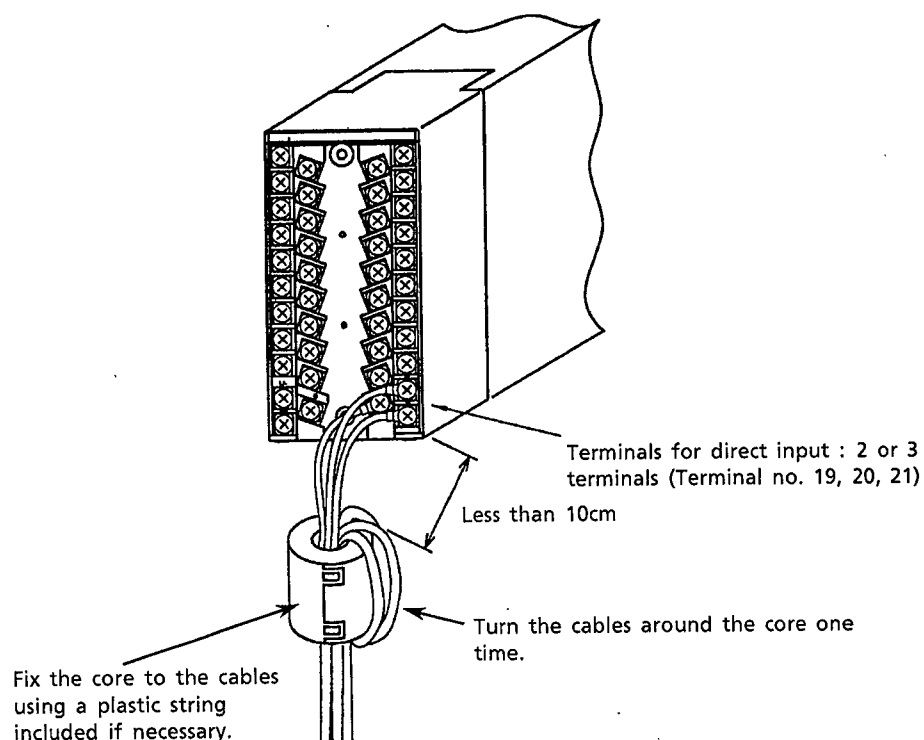


Figure 3.10 Wiring to the Direct Input Terminals with a Ferritic Core

- (5) For the /A08 frequency input card, the following three items can be set :
- Select the power supply for the oscillator (12V or 24V DC)
 - To prevent chattering on dry contact inputs, a filter can be inserted.
 - For current pulse input, load resistance can be set to 200 Ω , 500 Ω or 1k Ω .

Any of the three items above, can be set by jumper on the option card. For the setting procedure, refer to 4.5.1 "Setting Input Specifications of /A08 Frequency Input Card".

- (6) When finished wiring, attach the terminal cover for safety and protection from dust.

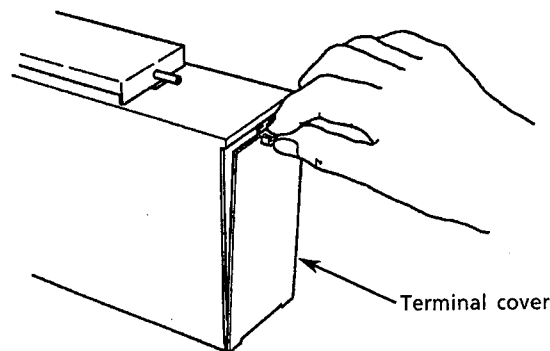


Figure 3.11 Attaching the Terminal Cover

3.4 Transmitter Power Connection

It is recommended that the field signals to be sent or received are insulated from the ground line of the YS136. Use transmitter input option (/A06 or /A16) to connect a 2-wire transmitter without using an external signal converter (primary is insulated from secondary) (See Figure 3.12).

The YS136 has a transmitter power supply terminal (24V DC) to connect a 2-wire transmitter simply. Wiring shown in Figure 3.13 allows the YS136 to read the signal sent by the transmitter.

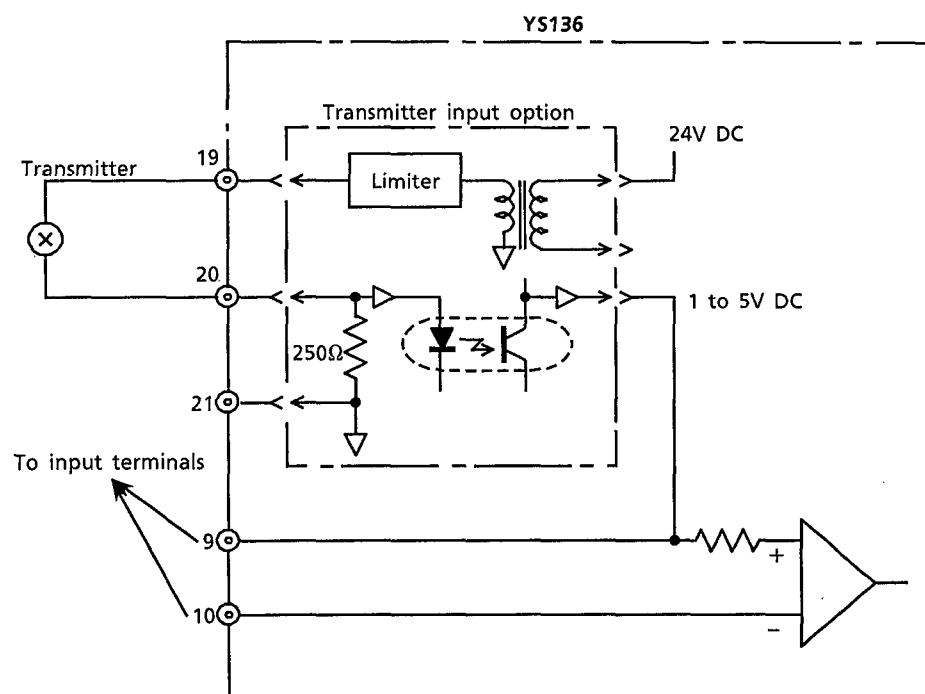


Figure 3.12 Connection to Two-wire Transmitter

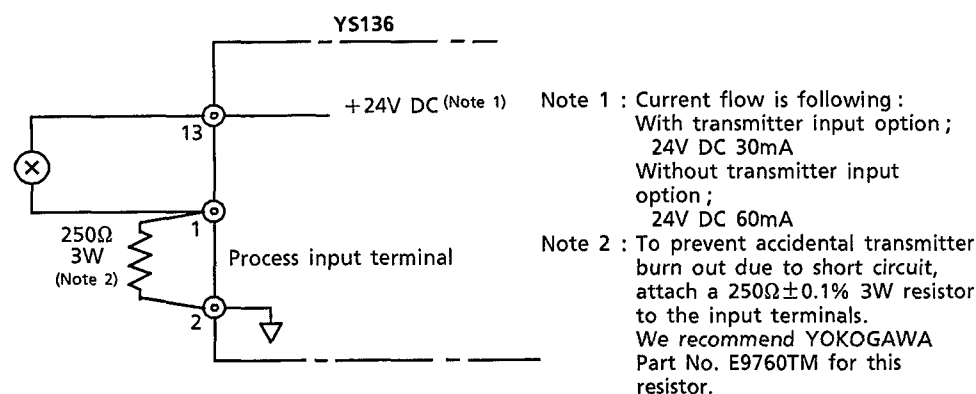


Figure 3.13 Example for Connection Case for Using Internal Distributor Terminal

3.5 RS-485 Communication Wiring to a Supervisory Computer

The YS100 instrument with the RS-485 communication interface (option /A31) allows you to communicate directly with the supervisory computer with which the same interface is provided. The instrument also communicates with a supervisory computer which does not have an RS-485 interface via an RS-485 ↔ RS-232C converter. The personal computer is often used as a supervisory computer.

3.5.1 4-wire Communication Wiring

The figure below indicates connection of the YS100 instrument and a personal computer.

See section 4.5 "Setting Hardware Switches", for how to set the terminating resistance value.

Communication data such as communication speed and address should be set from the "configuration 1" panel in advance.

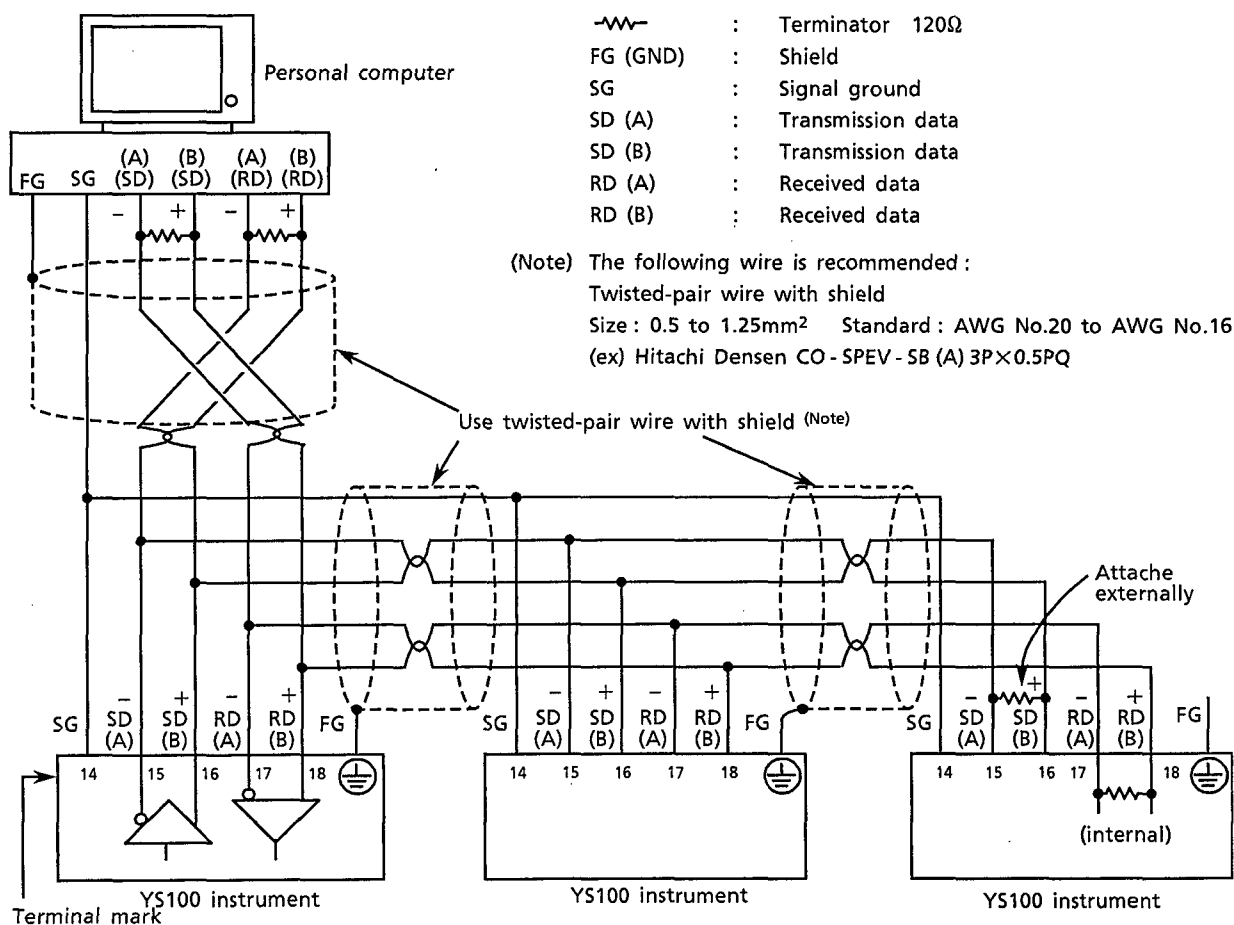


Figure 3.14 4-wire Communication Wiring

3.5.2 2-wire Communication Wiring

In case of a personal computer which can control the ON / OFF of transmission driver (RTS), 2-wire communication is also possible (transmission and reception line in common).

See section 4.5, "Setting Hardware Switches", for how to set terminating resistance value.

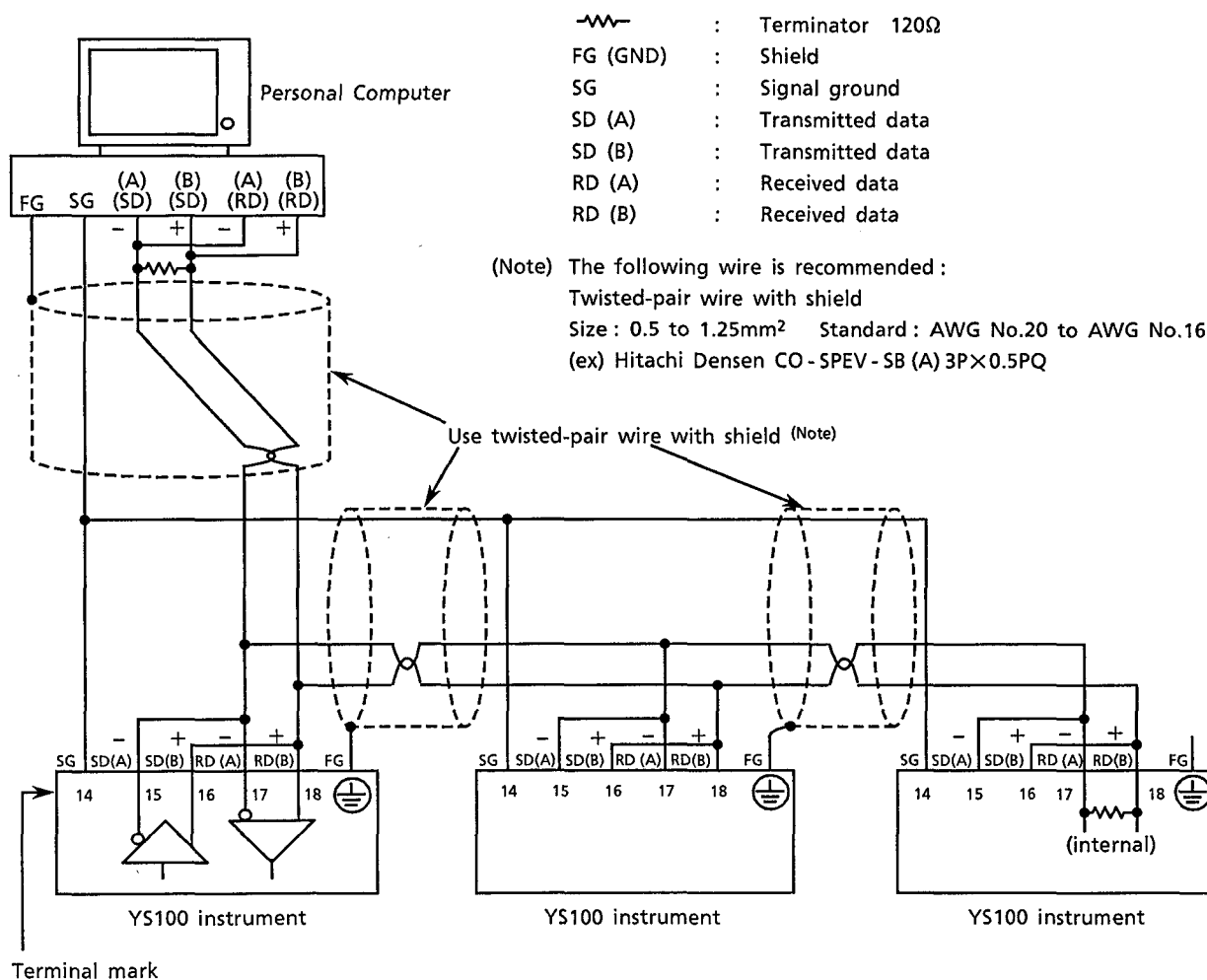


Figure 3.15 2-wire Communication Wiring

3.6 DCS Communication Wiring to CENTUM-XL or μ XL

Communication between the YS100 instrument with DCS-LCS communication interface (option /A32) and YOKOGAWA distributed control system (here in after, abbreviated as DCS) is performed via an LCS card equipped in the DCS. The figure below shows the wiring of the YS100, LCS card and TE08 terminal block. See the Installation manual for the μ XL or CENTUM-XL (Technical Information) for the wiring on the DCS side.

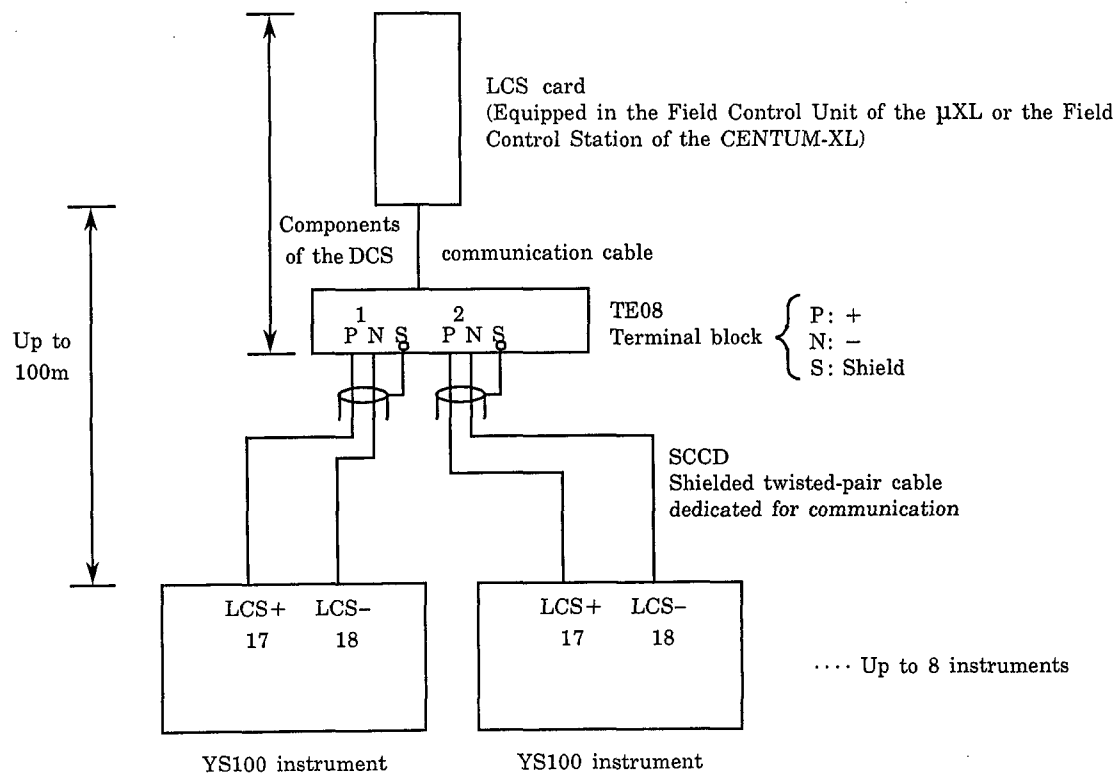


Figure 3.16 Wiring between YS100 instruments and a terminal block

3.7 YS-net Communication Wiring

The YS100 instrument with YS-net communication interface (option /A33) can be directly connected to another YS100 instrument with the same interface (only when YS170 each other) or a supervisory computer for communication.

The figure below shows the connection between a personal computer and the YS100 instruments. See section 4.5, "Setting Hardware Switches", for how to set the terminating resistance value.

Device numbers (communication addresses) should be set from the "configuration 1" panel in advance.

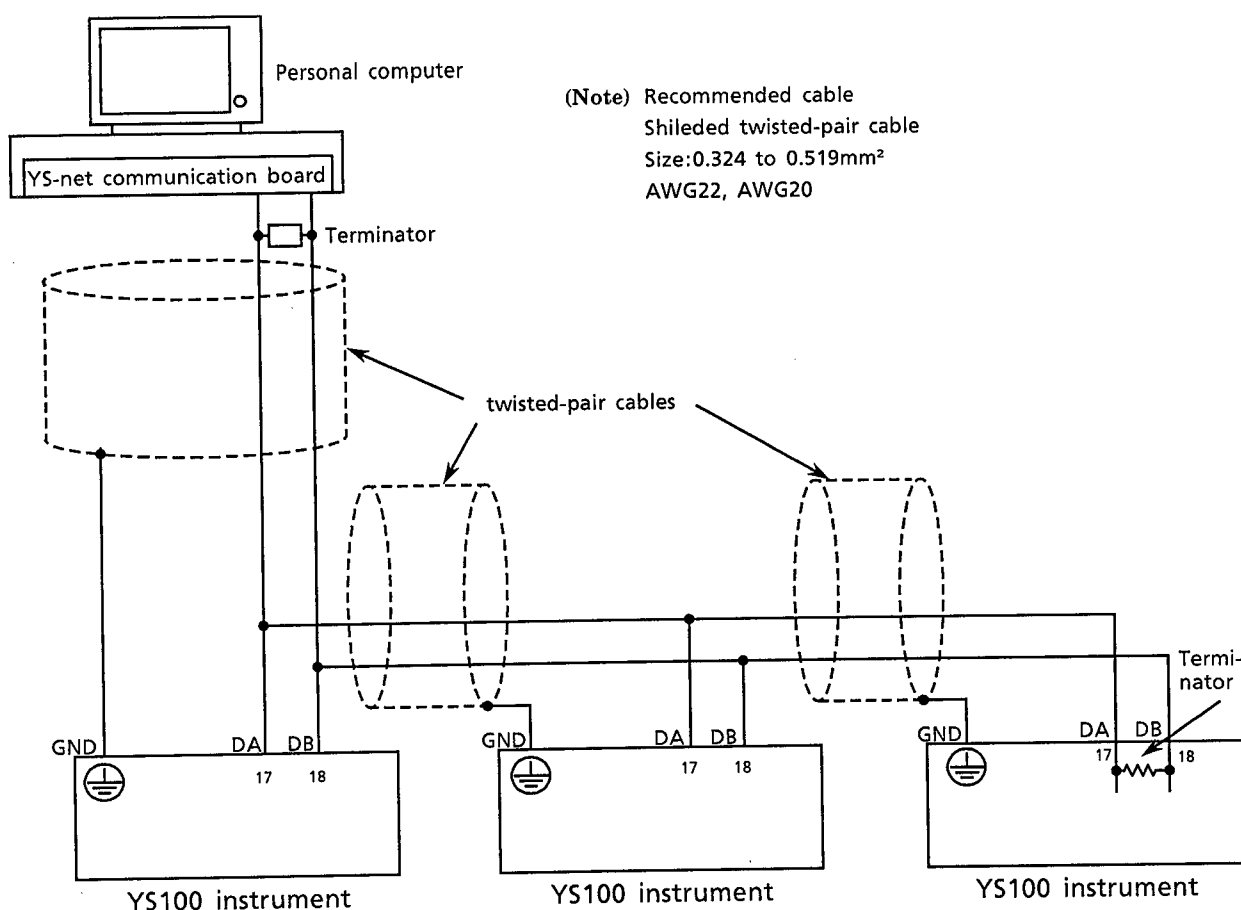


Figure 3.17 Communication Wiring

4. Names and Functions of Parts

This chapter explains the following items, such as names, types, functions, adjustments, and LCD displays of the parts.

- The LCD display, the FAIL lamp, the ALM lamp, operation mode keys and LED indicators, the Page key, MV operation keys and the Fast/Shift key located on the front panel
- How to swing up and swing down the front panel
- The hard manual operation function, the standby manual station connector, and the pull-out lever for the internal part behind the swing up internal panel
- How to remove and push in the internal unit

4.1 Names and Functions of the Parts on the Front Panel Display

See the following figure for the name and function of the front panel display.

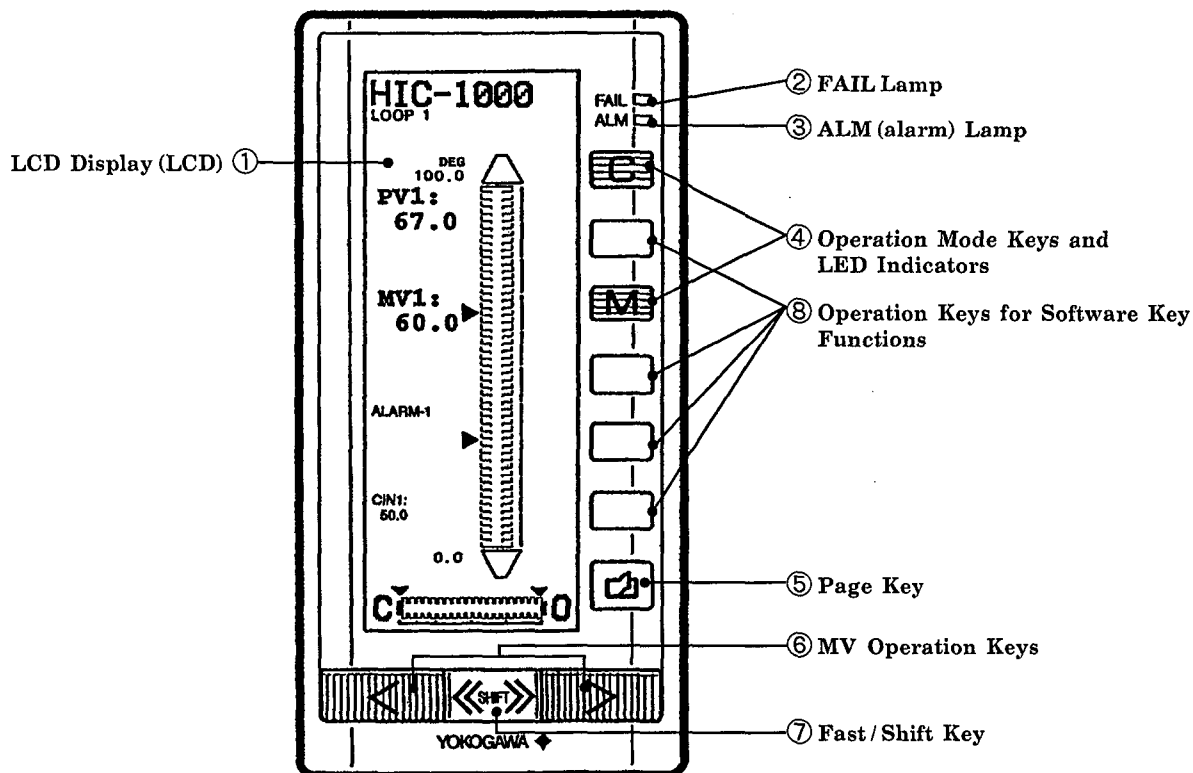


Figure 4.1 Parts of the Front Panel Display

① LCD Display (LCD)

This LCD display is a full-graphic dot display. It displays graphically or digitally the process variable (PV) and manipulated output (MV) in addition to displaying the process variable trend and alarms. This LCD display also shows the parameter settings in order to operate the YS136 with ease.

② FAIL Lamp

This is a red LED. It is lit when a problem has occurred in the YS136.

③ ALM Lamp

This is a yellow LED. It is lit when the high- or low-limit alarm of the YS136 is activated or when the input or output signal wirings open.

④ **Operation Mode Keys and LED Indicators**

These keys select the desired operation mode in the loop panel or the trend panel. The LED in the key which corresponds to the selected operation mode is lit.

There are two operation mode keys as follows:



: C Mode Key



: M Mode Key

In the tuning panel and the engineering panel, these keys function as software keys (as displayed on the LCD).

⑤ **Page Key**

This key selects the desired panel.

⑥ **MV Operation Keys**

These keys change the manipulated variable output (MV).

⑦ **Fast / Shift Key**

This key accelerates the manipulated output when it is used together with the MV operation key.

This key selects the desired panel group when it is used together with the page key.

⑧ **Operation Keys for Software Key Functions**

These keys function as software keys (the keys displayed on the LCD) when used in the tuning panel display and the engineering panel display.

**NOTE**

In the following pages, the software keys are indicated in the [] (for example, [SAV]).

4.2 Swinging the Front Panel Up and Down

■ Swinging Up

- ① Push up the bottom center of the front panel gently (the lock is released when pushed up), and pull the front panel to the front until you feel resistance (see Figure 4.2). Then, stop there.
- ② Push up the front panel (see Figure 4.3).

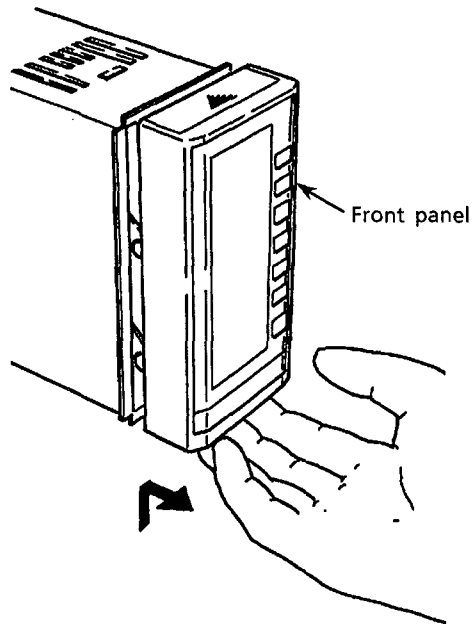


Figure 4.2 Swinging Up 1

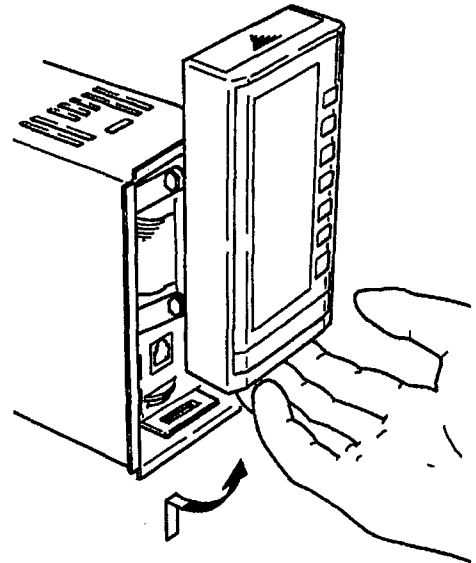


Figure 4.3 Swinging Up 2

■ Swinging Down

Push down the top center of the front panel until you feel resistance (see Figure 4.4). Then, stop there. Push the front panel back into the housing until it is locked with a click sound (see Figure 4.4).

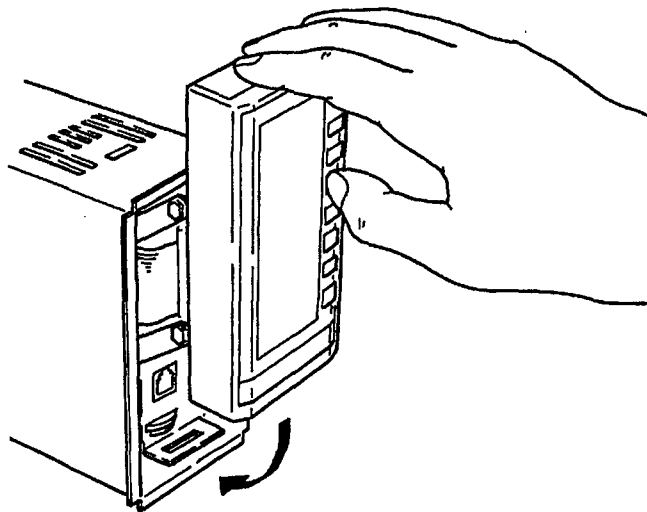


Figure 4.4 Swinging Down

4.3 Names of the Parts of the Swing Up Internal Panel

Push up the bottom center of the front panel (see Section 4.2 “Swinging Up”). Refer to the following figure for the name and function of the parts on the internal swing up panel.

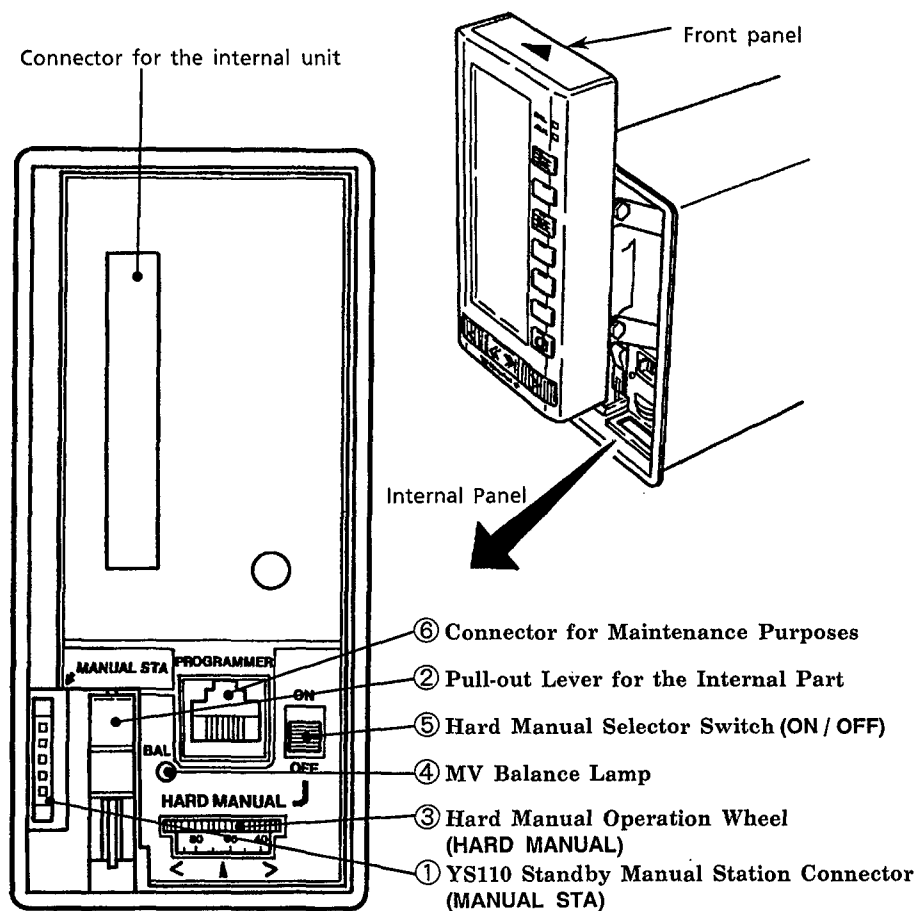


Figure 4.5 Swing Up Internal Panel

① Standby Manual Station Connector

This connector is used for replacing the internal parts, for connection to the Yokogawa YS110 Standby Manual Station.

② Pull-out Lever for the Internal Part

This release lever is used to remove the internal parts.

When pulling out the internal unit, the power is turned off.

③ Hard Manual Operation Wheel

This wheel adjusts the hard manual value. Turning this wheel in clockwise direction increases the hard manual value. Turning it in counterclockwise direction decreases the hard manual value.

When the hard manual selector switch ⑤ is set to off: the hard manual value is adjusted only internally. It is not output to an external unit. The MV balance lamp ④ lights up when the hard manual value reaches the specified value.

When the hard manual selector switch ⑤ is set to on: the hard manual value can be output to the external unit.

④ MV Balance Lamp

This is a green LED. It is lit by adjusting the hard manual operation wheel ③.

Note: The MV balance lamp remains lit while the hard manual selector switch is set to on.

⑤ Hard Manual Selector Switch

Turning this switch ON enables control of the output by the hard manual operation wheel ③.

Note: Turning the hard manual selector switch ON disables the front panel MV INC/DEC keys (and enables the hard manual wheel behind the front panel).

⑥ Connector for Maintenance Purposes

This connector is for Yokogawa's maintenance purposes. Do not connect any cable.

4.4 Removing and Installing the Internal Unit

Removal or installation of the internal unit shall be carried out by attaching the unit to the instrumentation panel or by placing the unit on a work bench.



IMPORTANT

- Do not pull out or push in the internal unit during power supply at any area unless it is an area where there is no danger from explosion hazards.
- Be careful not to pull out the internal unit unintentionally. When pulling out the internal unit, the power is turned off.
- Should the internal unit be removed or inserted for maintenance or similar purposes, care should be taken not to damage it by static electric discharge.

For removal and insertion of the internal unit, see Section 11.3.1 "Notes on Static Electric Discharge".

■ Removing the Internal Unit

- ① Swing up the front panel (see Section 4.2 "Swinging the Front Panel Up and Down").
- ② Pull down the release lever (see Figure 4.6). The connector part at the back comes off, and the power of the internal unit is turned off.
- ③ Hold the left and right sides of the front panel, and pull out the internal unit to the front (see Figure 4.7).

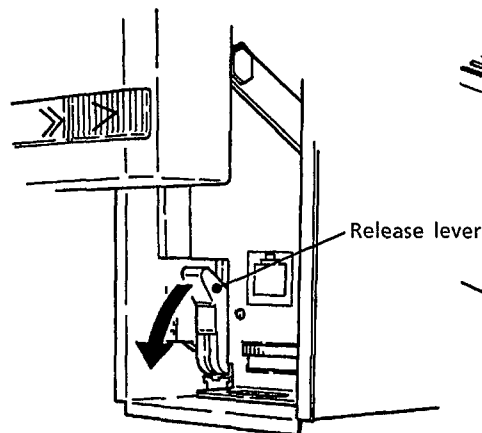


Figure 4.6 Removing the Internal Unit 1

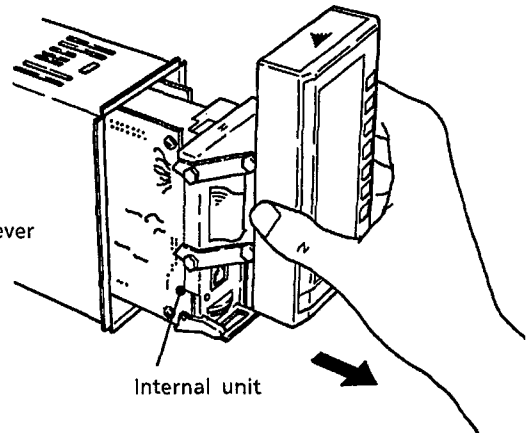


Figure 4.7 Removing the Internal Unit 2

■ Pushing in the Internal Unit

Do not install the internal unit in the wrong housing. Refer to the tag numbers for installation when the internal unit and the housing have tag numbers.

- ① Set the printed circuit board, which is at the left of the internal unit, in the guide rails at the left top and the left bottom in the housing (see Figure 4.8). Then, push in the internal unit until it touches the connector at the back and clicks. The release lever is set back to the hold position.

Under this condition, the internal unit can be powered.

- ② Firmly push the release lever upwards (see Figure 4.9).
- ③ Swing down the front panel (see Section 4.2 “Swinging the Front Panel Up and Down”).

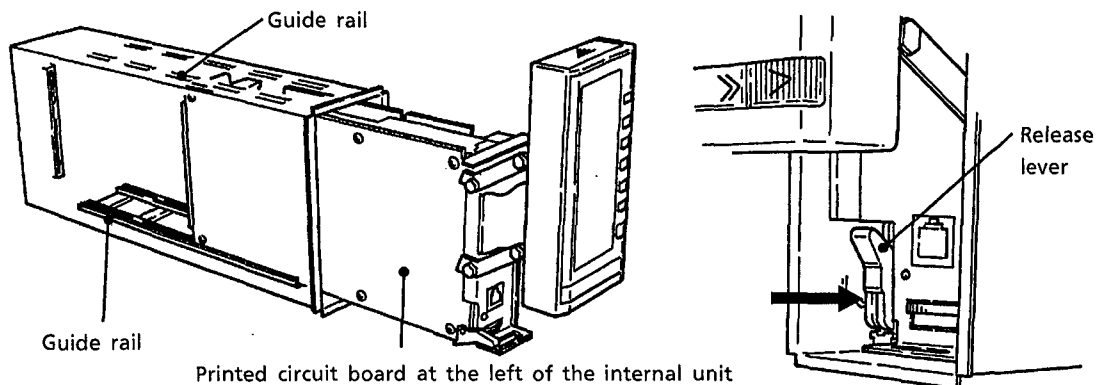


Figure 4.8 Installing the Internal Unit 1 Figure 4.9 Installing the Internal Unit 2

4.5 Setting Hardware Switches

Before using this instrument, preset the items shown in Table 4.1 by changing the jumper switches to those specified in Sections 4.5.1 and 4.5.2.

Table 4.1 Items to Be Predefined

Location of jumper switches	Items to Be Predefined	Default
Frequency input card (/A08)	Load resistance for current pulse Input filter Power supply voltage of the transmitter	Off Off Off
RS-485 communication card (/A31)	Terminating resistance	Off
YS-net communication card (/A33)	Terminating resistance	Off



IMPORTANT

To remove the internal unit from the housing or to dismount an option card, be sure to follow the procedure described in Section 11.3, "Parts Replacement".

4.5.1 Setting Input Specifications of /A08 Frequency Input Card

Insert the jumper into appropriate two of the pins for setting to connect.

(1) **Changing of Transmitter Power Supply Voltage (12V / 24V DC)**

Insert the jumper into the "ON" side for 12V, and "OFF" side for 24V (see the figure below).

(2) **To Insert Filter**

To prevent chattering of dry contact inputs (mechanical relay, etc.) if pulse input rate is 10Hz or less. Insert the jumper to the "ON" side of the appropriate pin.

(3) **To Set the Load Resistance for the Current Pulse Input**

Insert the jumper into the "ON" side of the pin to set resistor value (200Ω, 500Ω, or 1kΩ)



NOTE

- If setting is unnecessary, insert the jumper into appropriate pin on the "OFF" side.
- Take care not to bend the pin after setting.
Use tweezers, etc., when detaching the jumper.

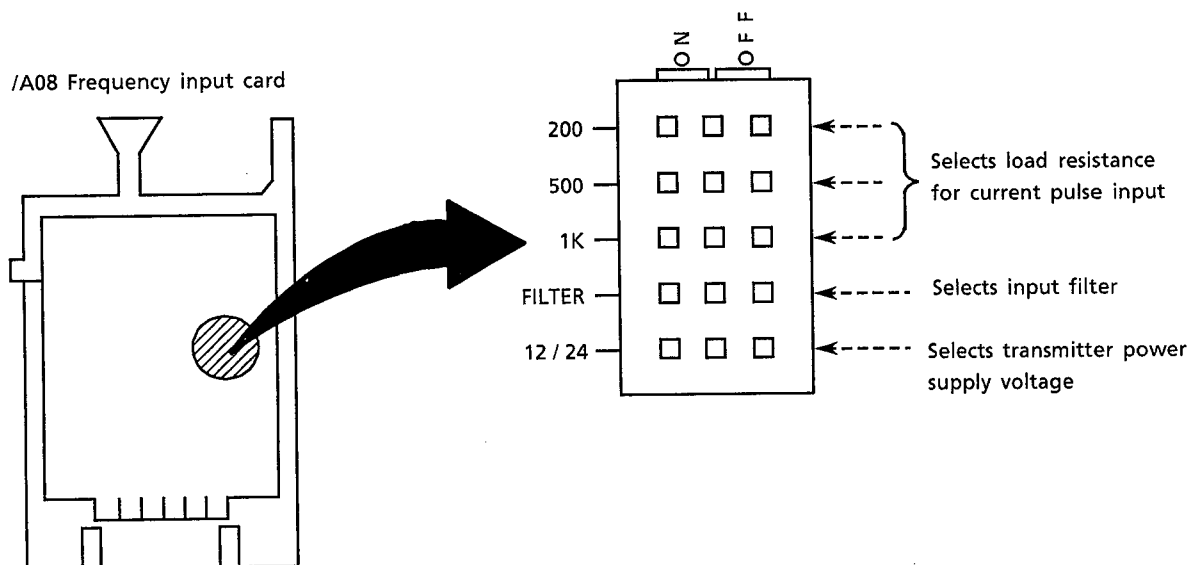


Figure 4.10 Jumper Block for Setting Input Specifications of /A08 Frequency Input card

4.5.2 Setting Terminating Resistance of the RS-485 Communication Card

Terminating resistors must be connected at both ends of RS-485 cable (twisted-pair).

Use the terminating resistor on JP1 jumper of RS-485 communication card as terminator of receiving side for two-wire and four-wire cabling, (between RD (A) and RD (B)).

Install JP1 jumper on RS-485 communication board to ON (J2) side to terminate, and install the jumper to OFF (J1) side not to terminate.

Attach a terminating resistor ($120\Omega \pm 1\%$, $1/2W$, $100\text{ppm}/^\circ\text{C}$) to the sending side (between SD (A) and SD (B)) at the instrument panel, in the four-wire case.

Refer to computer instruction manual for terminating resistor for computer side.

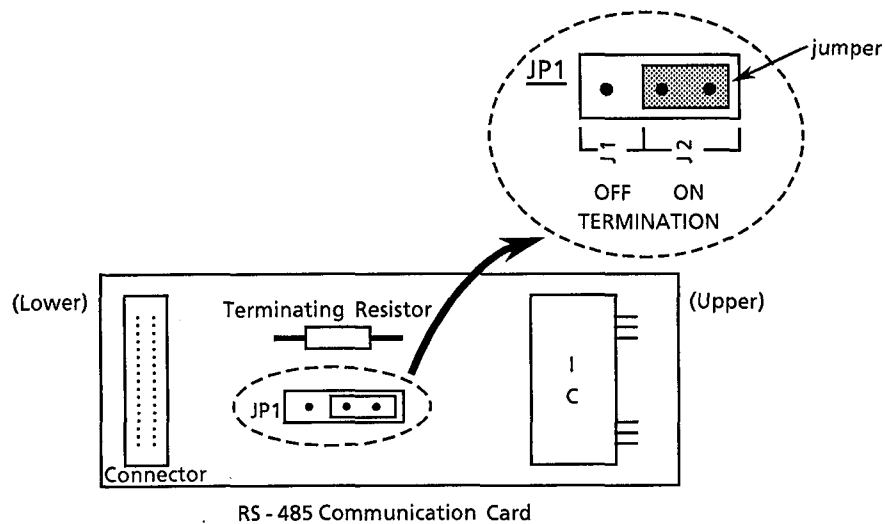


Figure 4.11 Setting Terminating Resistor on Communication Card

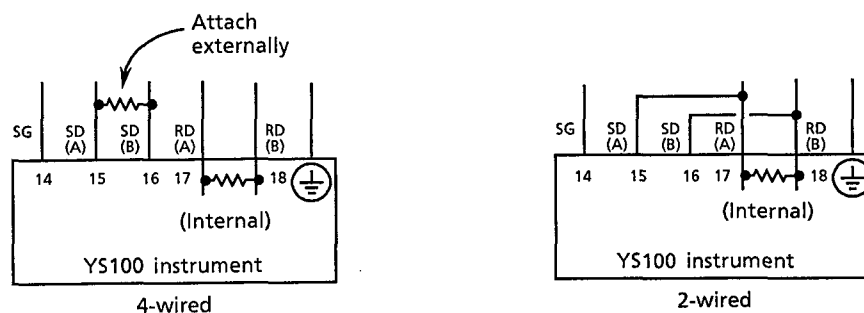
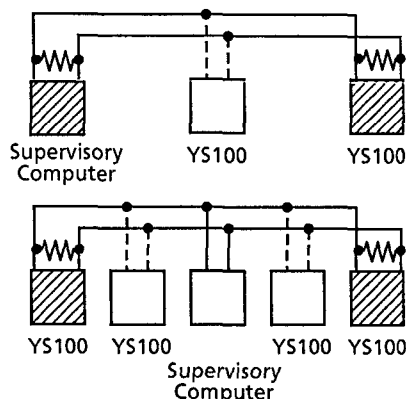


Figure 4.12 Attaching Terminating Resistor

(1) Two-wire Send / Receive

Set the terminating resistors at each terminal of the hatched apparatus in the figures to the right. The same applies to the case when the YS100 instruments connected with dotted lines are removed.

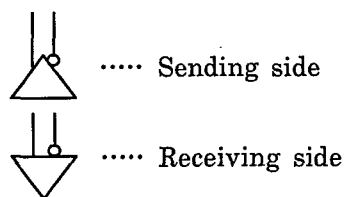
For the YS100 instruments shown connected with dotted lines, makes sure that the internal terminating resistor is OFF.



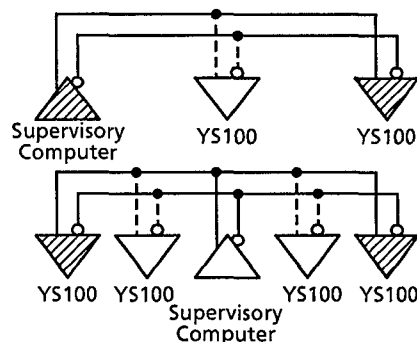
(2) Four-wire Send / Receive

Set the terminating resistors at each terminal of the hatched apparatus in the figures to the right. The same applies to the case when the YS100 instruments connected with dotted lines are removed.

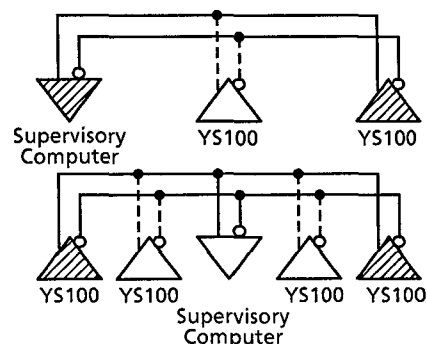
For the YS100 instruments shown connected with dotted lines, makes sure that the internal terminating resistor is OFF.



● YS100 Receive Line



● YS100 Send Line



4.5.3 Setting Terminating Resistance of the YS-net Communication Card

When connecting the YS100 instrument to the terminal of the YS-net, be sure to set a terminator. To set the terminator, slide the JP1 jumper (See Figure 4.13) to the ON side on the YS net communications card. To disconnect the terminator, slide the jumper to the OFF side. Note that the default is OFF.

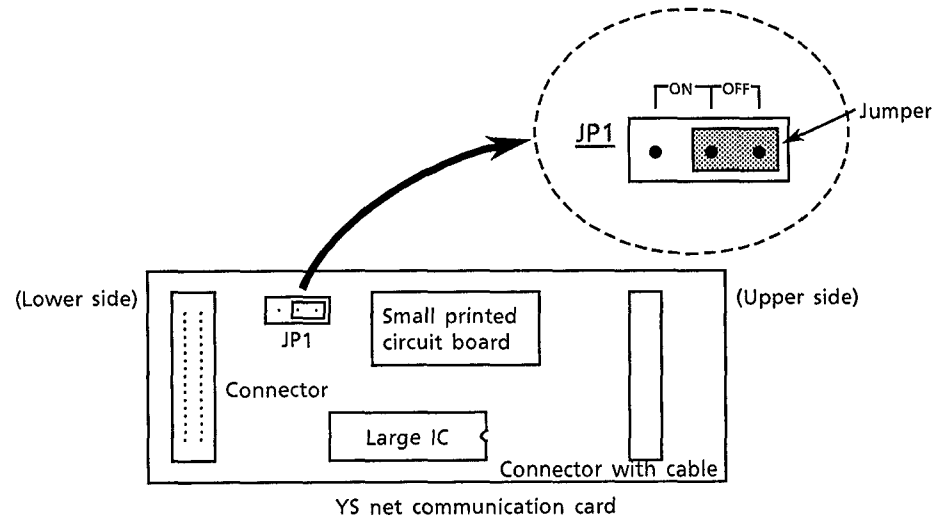


Figure 4.13 Setting of Terminating Resistance on YS-net Communication Card

5. Types and Operation of the Display Panels

5.1 Display Panel Groups

The following three display panel groups, which are grouped by operation, are available with the YS136.

(1) Operation Panel Group (for Normal Operation)

includes the following three types of display panels.

- Loop panel for operation mode selection, MV setting operation,
- Trend panel for trend display of PV, and
- Alarm panel for detail display of alarm information.

The color of each operation display panel can be set independently for white in blue background or for blue in white background. (Setting can be made from 10.3.1 “Configuration Panel 1”.)

(2) Tuning Panel Group

includes the following two types of display panels.

- Display and setting panel for tuning parameters, and
- Operation display panel for input and output signals.

The color of the display panel is the same as that of LOOP 1 of the operation panel group.

(3) Engineering Panel Group

includes the following three types of display panels.

- Configuration panel for auto/manual station for MV setting,
- Direct input specification setting panel, and
- Password setting panel.

The color of the display panel is also the same as that of LOOP 1 of the operation panel group.



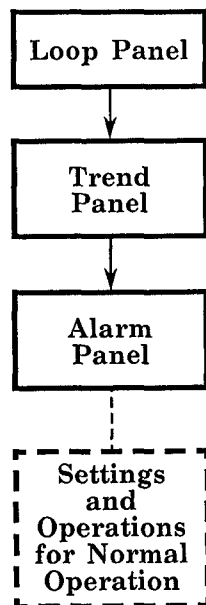
TIP

In the following sections, “group” of each panel group may be omitted when there is no doubt of confusion.

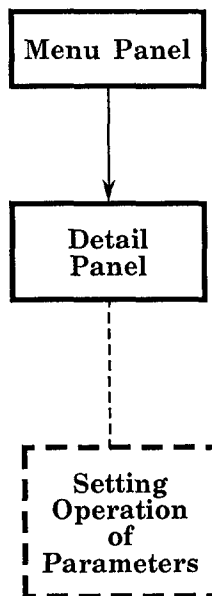
5.2 Construction of the Display Panel Groups

Each panel group is constructed as follows :

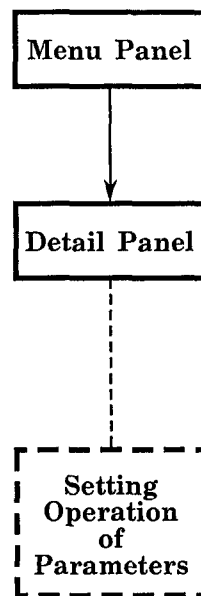
(1) **Operation Panel Group**



(2) **Tuning Panel Group**

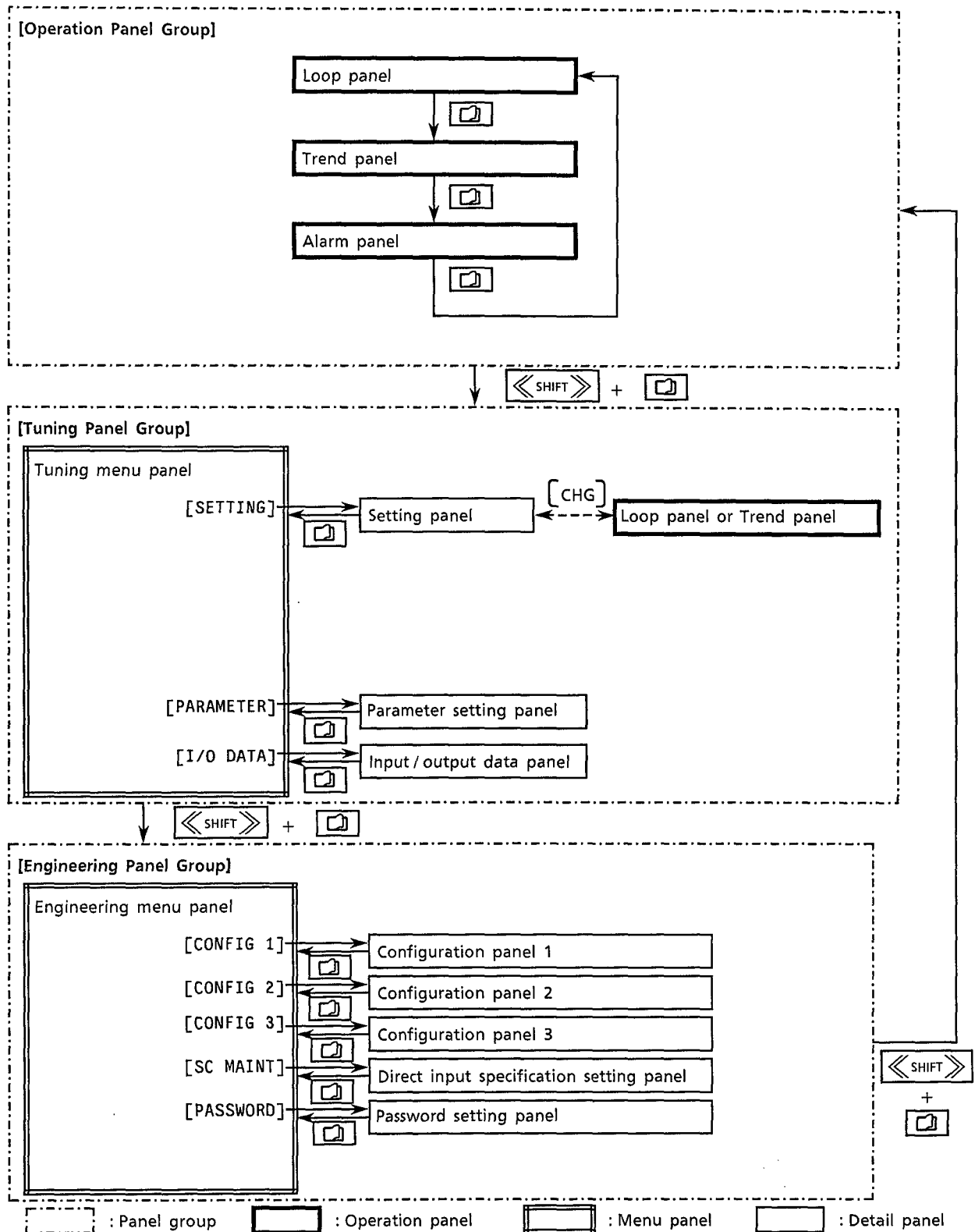


(3) **Engineering Panel Group**



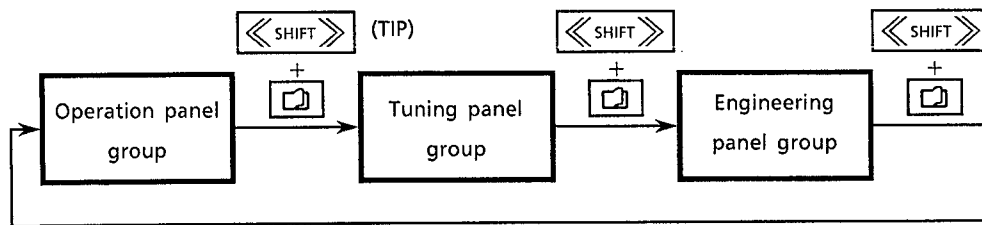
5.3 Panel-Switching Flow Charts


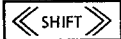
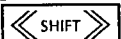

The following describes the types of panels in each group.



5.3.1 Panel Selection Operation from the Panel Groups

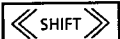


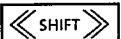
The following shows the flow of the panel group selection sequence.



- ① When power is turned on, initialization of the YS136 is carried out. Then, the YS136 shows the operation panel group.
- ② Every time you press the  key while holding down the  key, the panel group is selected one after another in the following sequence: the operation panel group to the tuning panel group to the engineering panel group. The YS136 shows the operation panel group again by pressing the  key while holding down the  key.



TIP

 +  operation indicates that you have to press the  key while holding down the  key. If you press these keys in the reverse order, the panel group does not appear as described above.

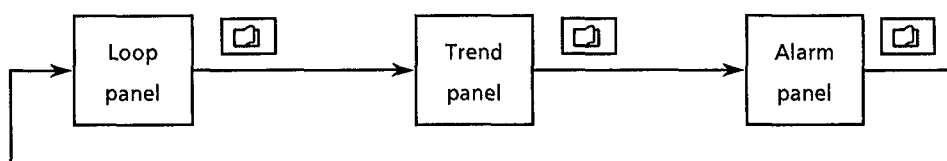
6. Normal Operation



6.1 Selection Operation of the Operation Panel

 +  operation displays the operation panel group.

There are three types of operation panels in the operation panel group.

The following shows the flow of the operation panel selection sequence.



- ① An operation panel is displayed when you select the operation panel group.
- ② The operation panel changes from current to next one every time you press the  key.
The operation panel is selected in the following sequence: loop panel to trend panel to alarm panel. The YS136 shows the loop panel again by pressing the  key.

6.2 Display and Operation of the Loop Panel

This section explains how to display and operate the loop panel.

6.2.1 Display of the Loop Panel

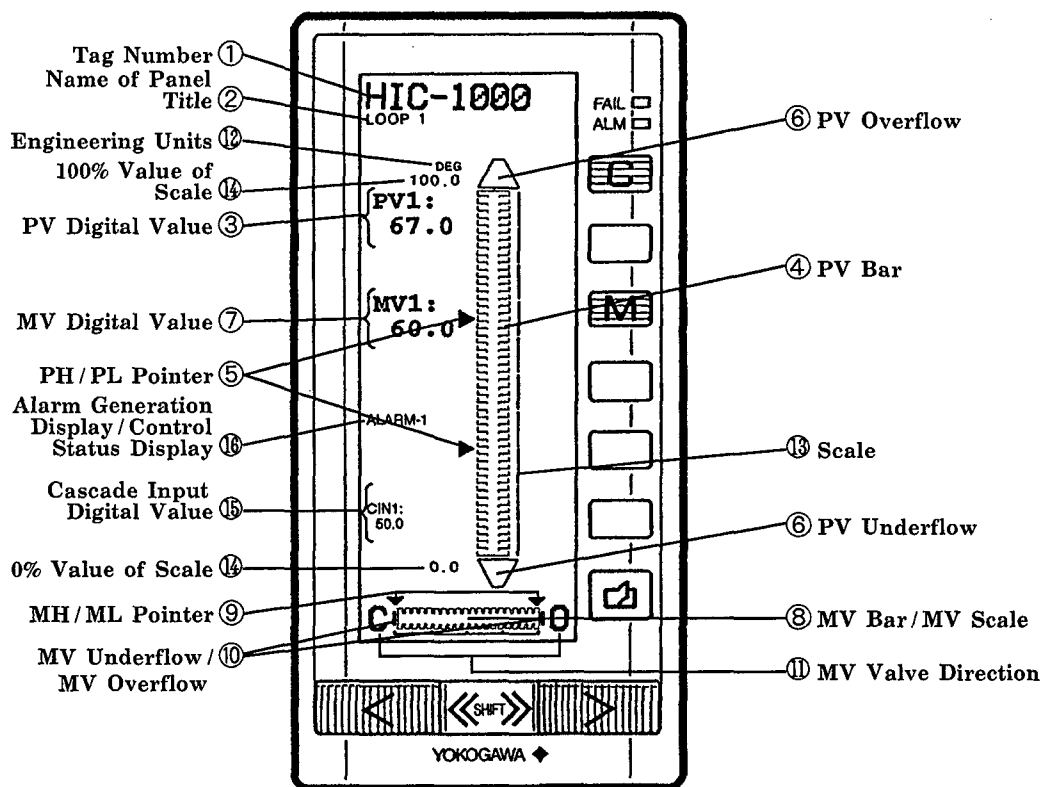


Figure 6.1 Display of the Loop Panel

① Tag Number

Up to 8 digits of tag number composed of alphanumeric characters and symbols are displayed.

The tag number (TAG) can be set in the configuration panel 2.

② Name of the Panel Title

This shows the name of the panel displayed at present.

③ PV Digital Value

Process variable (PV value) is displayed in 4-digit digital value of engineering units (6 digits including decimal point and sign).

④ PV Bar

Process variable (PV value) is displayed with a bar. The bar has a total of 200 elements for full-scale (100%). The display is divided in 50 segments (2%), and increases or decreases in 1-element unit (0.5%).

⑤ PH / PL Pointer

A PV-value-high-limit alarm set value (PH value) and a PV-value-low-limit alarm set value (PL value) are displayed with a triangular pointer. The PH value and the PL value are to be set in the PID setting panel.

⑥ PV Underflow / PV Overflow

The PV underflow is displayed when the PV value is less than 0%. The PV overflow is displayed when the PV value is more than 100%.

⑦ MV Digital Value

A manipulated output value (MV value) is displayed in 4-digit digital value in % (5 digits including decimal point and sign).

⑧ MV Bar / MV Scale

An MV value is displayed with a bar. The bar has a total of 80 elements for full-scale (100%). The display is divided in 20 segments (5%), and increases or decreases in 1-element unit (1.25%). The scale divided by four (25%) is also displayed.

⑨ MH / ML Pointer

An MV-high-limit value (MH value) and an MV-low-limit value (ML value) is displayed with a triangular pointer. The MH value and the ML value are to be set in the setting panel.

⑩ MV Underflow / MV Overflow

The MV underflow is displayed when the MV value is less than 0%. The MV overflow is displayed when the MV value is more than 100%.

⑪ MV Valve Direction

The direction of the MV valve is displayed with "C" (for closing direction) or "O" (for open direction). The direction of the opening of the valve (VDIR) is set in the configuration panel 2.

⑫ Engineering Units

Up to 6-digit engineering unit is displayed. The engineering unit is selected in the configuration panel 2.

⑬ Scale

The scale divided by up to 10 divisions (10%) is displayed. The number (scale) of divisions (SCDV) is to be set in the configuration panel 2.

⑭ 0% / 100% Value of Scale

The 0% value and the 100% value of the scale are displayed in 4-digit digital value of engineering unit (6 digits including decimal point and sign). The 0% value (SCL) of the scale, the 100% value (SCH) of the scale and position of decimal point (SCDP) are to be set in the configuration panel 2.

⑮ Cascade Input Digital Value

When setting this equipment in analog cascade mode (by setting parameter CMOD1 to CAS in configuration panel 2), the cascade input value will be displayed in % and in digital value of 4 significant digit (totally 5 digits including the decimal point and sign).

⑯ Alarm Generation Display / Control Status Display

Abbreviations representing the alarm status are displayed.

Table 6.1

Display Item	Display Abbreviation	Description
Alarm display (Note 1)	SYS-ALM ALARM-1	System alarm Process variable 1 process alarm
Control status display (Note 2)	CAS DDC BUM	During remote operation by cascade setting input During MV remote operation by a supervisory computer Changing to backup manual status
Control sub-status display	EXT-MAN	During MAN mode operation by operation mode selection input

Note 1 : Reverse display only when an alarm is generated. Multiple-line-display when multiple alarms are generated.

Note 2 : One item is displayed exclusively when the operation mode is set to C mode. There is no display for other modes.

6.2.2 Operation of the Loop Panel

The following describes key operations for setting and control of the loop panels.

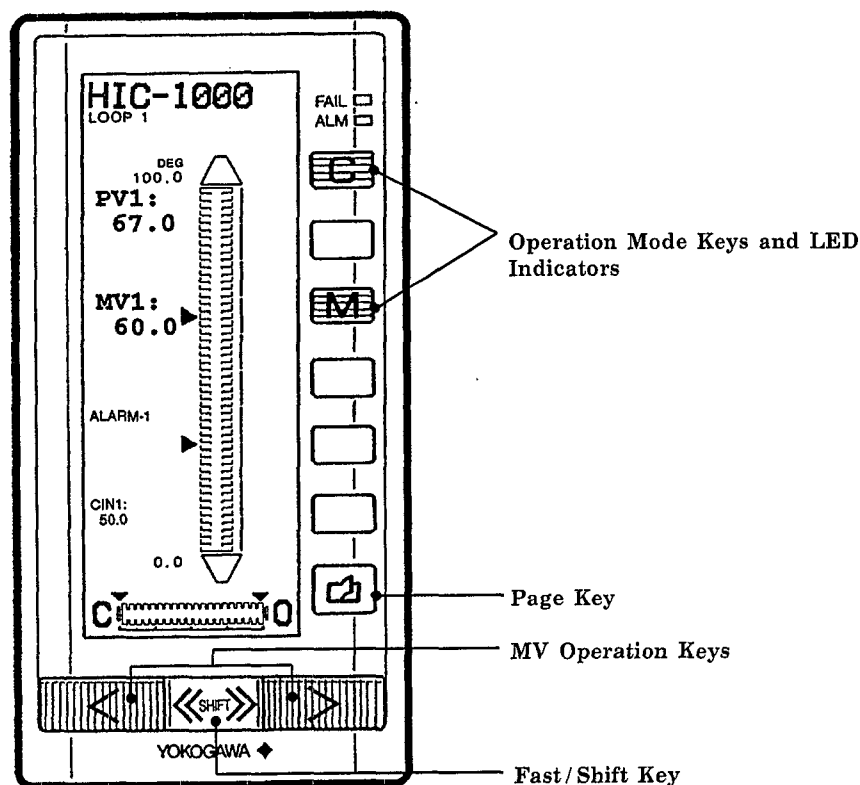


Figure 6.2 Operation of the Loop Panel

(1) Selecting the Desired Operation Mode

There are two operation mode keys. They are used to select the desired operation mode.



: C Mode Key

Selects the C (cascaded by external analog signals or computer) operation mode.



: M Mode Key

Selects the M (manual) operation mode.

Operation when changing operation mode is as follows:

C to M: Balanceless and bumpless

M to C: Follows the ramp (Changing ratio: 40s/full scale)

The LED indicator in the key which corresponds to the selected operation mode key is lit.

(2) Using the MV Operation Key

Use this key to operate the manipulated output (MV) manually.

This function is available in the M operation mode.

There are two MV operation keys. They are used to change the MV value.




: MV Operation Increasing Key

Increases the MV value.



: MV Operation Decreasing Key

Decreases the MV value.

An increase or decrease of the MV value can be accelerated by holding down the  key (Fast / shift key) then pressing the MV operation key.

(3) Operation Mode Switching with External Contact

When using this in the analog cascade mode (when setting parameter CMOD1 to CAS in the function setting panel 2), the operation mode can be switched through external contact.

Table6.2 YS136 Operation Mode Switching with External Contact.

Operation Mode Display Lamp	DI1F*1	DI1D*1	External Contact Input	Loop Panel Control status Display Control sub-status Display	Operation Mode	Operation Mode Status Output
Lamp M lights	— E-MAN	OPN CLS	OPEN CLOSED	No Display	M	OPEN
Lamp C lights	— E-MAN	OPN CLS	OPEN	CAS	C	CLOSED
			CLOSED	CAS, EXT-MAN	M	OPEN
		CLS	OPEN	CAS	C	CLOSED
			CLOSED	CAS, EXT-MAN	M	OPEN

*1: Set DI1F and DI1D on the function setting panel 3.

6.3 Display and Operation of the Trend Panel

The trend panel displays the trend of the PV in addition to the functions of the loop panel. This section explains the display and operation of the trend panel.

6.3.1 Display of the Trend Panel

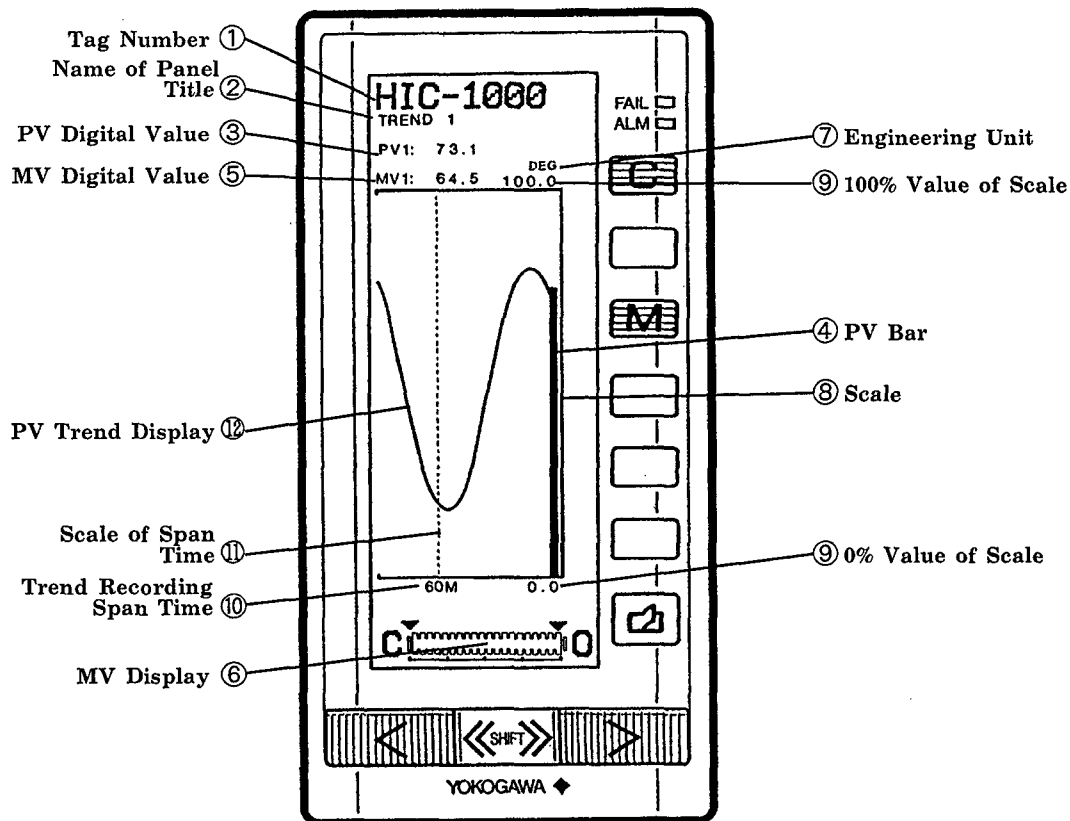


Figure 6.3 Display of the Trend Panel

① Tag Number

Up to 8 digits of tag number composed of alphanumeric characters and symbols are displayed.

The tag number (TAG) can be set in the configuration panel 2.

② Name of the Panel Title

This shows the name of the panel displayed at present.

③ PV Digital Value

A PV value is displayed in 4-digit digital value of engineering units (6 digits including decimal point and sign).

④ PV Bar

A PV value is displayed with a bar. The bar has a total of 200 elements for full-scale (100%), and increases or decreases in 1-element unit (0.5%).

⑤ MV Digital Value

An MV value is displayed in 4-digit digital value in % (5 digits including decimal point and sign).

⑥ MV Display

The MV bar, the MV scale, the MH pointer, the ML pointer, the MV underflow, the MV overflow, and the direction of the MV valve are displayed. The display contents in the panel are the same as those in the loop panel.

⑦ Engineering Unit

Up to six characters representing engineering unit are displayed. The engineering unit to be displayed is selected in configuration panel 2.

⑧ Scale

A scale divided into up to 10 divisions (10%) is displayed. The horizontal lines which correspond to the division of the scale are displayed with dotted lines. The number (scale) of divisions (SCDV) is set in configuration panel 2.

⑨ 0% / 100% Value of Scale

The 0% value and the 100% value of the scale are displayed as 4-digit digital values in engineering units (6 digits including decimal point and sign). The 0% value (SCL) of the scale, the 100% value (SCH) of the scale and position of decimal point (SCDP) are set in the configuration panel 2.

⑩ Trend Recording Span Time

The set value of the trend recording span time is displayed. Although the trend recording span is 90 lines, this trend recording span displays up to 60 lines of span time. The trend recording span time (TRDT) is set in the configuration panel 2.

The position of line 0 shows the current time of the trend recording, and that of line 90 shows the maximum past time. Changing the trend recording span time deletes the previously recorded data.

⑪ Scale of Span Time

The span time scale (vertical line) is displayed at the position of line 60 with a dotted line. When the scale ⑧ above is divided by four or more, the delay time scale is also displayed at the position of line 30 with a dotted line.

⑫ PV Trend Display

The trend recording span time (TRDT) is divided into 60 divisions, and minimum and maximum PV values within the one division of span time are displayed with a vertical line width of one element.

The PV value is displayed as 0% when it is less than 0%. The PV value is displayed as 100% when it is more than 100%.

6.3.2 Operation of the Trend Panel

The following two types of operations are available on the trend panel.

- (1) Changing the operation mode
- (2) Operation for MV

Operate the trend panel in the same manner as do the loop panel (see Section 6.2.2 “Operation of the Loop Panel”).

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6.4 Display and Operation of the Alarm Panel

The alarm panel displays all the detail information when an alarm occurs. The user can check an unacknowledged alarm. This section explains display and operation of the alarm panel.

6.4.1 Display of the Alarm Panel

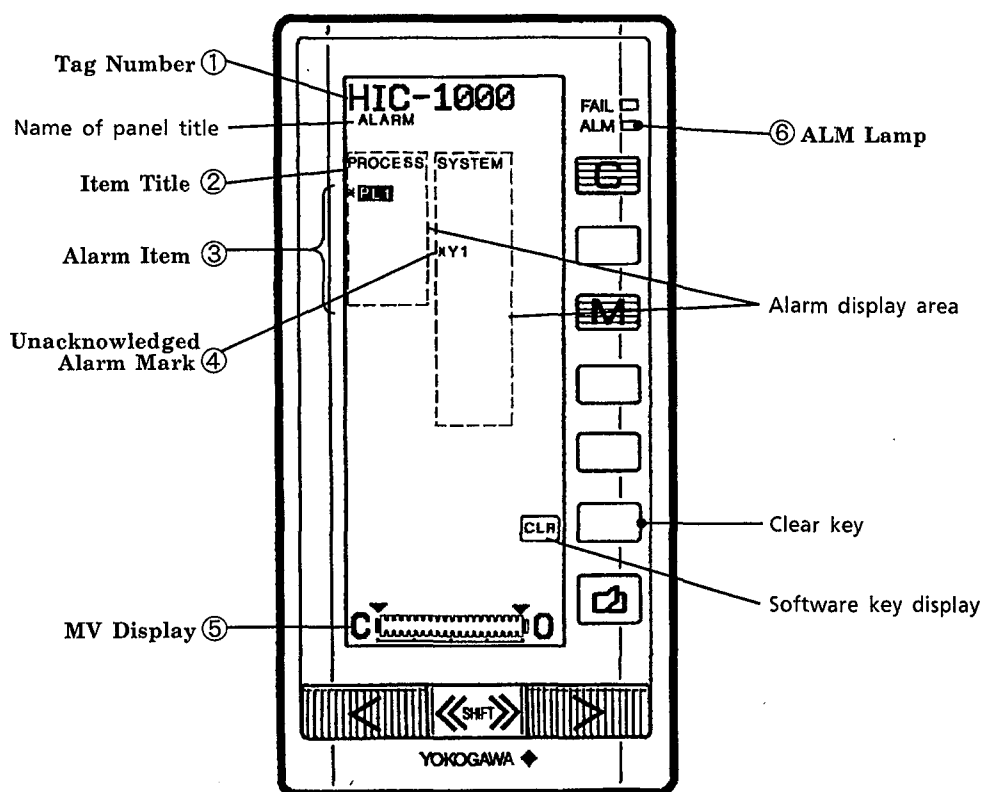


Figure 6.4 Display of the Alarm Panel

① Tag Number

The tag number is displayed.

② Item Title

Any of the types of alarm that occur are displayed. There are two types of alarms as follows:

- PROCESS : Process alarm
- SYSTEM : System alarm

③ Alarm Item

There are two types of display for the alarm items that occur as follows:

- Reverse Display of Items : means the alarm is current.
- Normal Display of Items : means the alarm occurred in the past, and recovered automatically.

The alarm items to be displayed are as follows:

- **Process Alarm** (Displayed by the parameter names for alarm setting.)

PH1 : Process variable high-limit alarm

PL1 : Process variable low-limit alarm

- **System Alarm**

X1, X2: Input overrange

The register names of X1, X2 assigned to each input terminal are displayed.

Y1 : Output open

The register name of Y1 is displayed.

RAM : RAM contents destroyed (volatile)



See Also

See Table 7.1 in the section “7.1 If the ALM Lamp Lights” for causes of each alarm.

④ Unacknowledged Alarm Mark

Unacknowledged alarms are displayed with “*” appearing at the head of each item.

⑤ MV Display

The MV bar, the MV scale, the MH pointer, the ML pointer, the MV underflow, the MV overflow, and the direction of the MV valve are displayed.

The contents of the display are the same as those of the loop panel.

⑥ ALM Lamp

This lamp lights when an alarm occurs.

6.4.2 Operation of the Alarm Panel

The operation of the alarm panel is as follows:

- (1) Operation for MV (same as the loop panel. See Section 6.2.2 “Operation of the Loop Panel”).
- (2) Checking of the unacknowledged alarm

■ Checking Unacknowledged Alarms

On the alarm panel, [CLR] (software key) appears at the right bottom on the LCD. In this case, the key on the right of the [CLR] key functions as a clear key. The clear key is used to acknowledge alarms. Pressing this key acknowledges the alarm and deletes “*” (which means the alarm has not been acknowledged yet).

When acknowledged alarms return to normal, the alarm display will disappear.

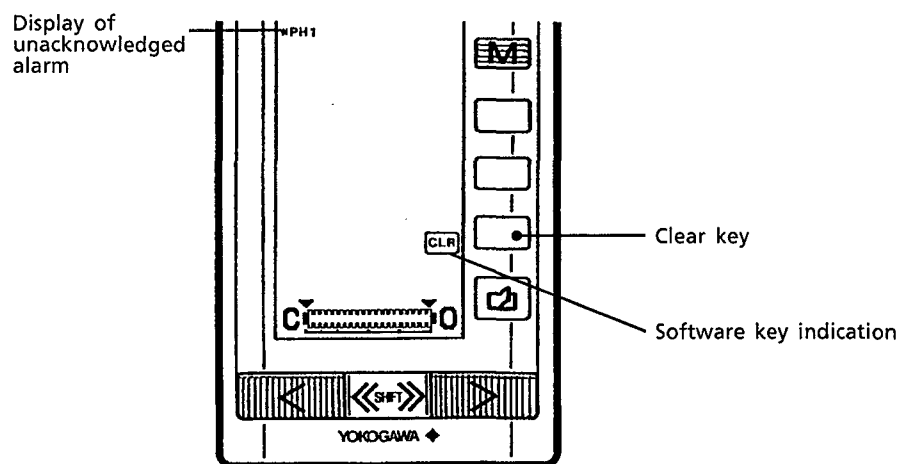


Figure 6.5 Checking the Unacknowledged Alarms

7. Alarm Lamp and Fail Lamp Displays

The YS136 tells you of abnormal conditions of signals or malfunction of the YS136 with the ALM lamp or the FAIL lamp, located on the front display panel. Should the lamps light, take appropriate countermeasures.

7.1 If the ALM Lamp Lights

The ALM (alarm) lamp lights up when the high- or low-limit alarms of the YS136 are activated, or when the input signals to the YS136 are disconnected. When the ALM lamp lights, check the cause by referring to the alarm items in the alarm panel of the operation panel (see the table below and Section 6.4.1 "Display of the Alarm Panel").

Appropriate action is required according to the type of cause.

Table 7.1 List of Causes when the ALM Lamp Lights

Name of Alarm Item	Alarm Display	Alarm Name	Cause	Remark
SYSTEM	X1, X2	Input, rangeover	Input value is -6.25% or less, or $+106.25\%$ or more	The operation mode of the instrument (C or M) will not change with this alarm.
	Y1	Current output connection open	Detects the output open of manipulated output 1 (current)	
	RAM	RAM, volatile	RAM pattern does not match when starting after power failure of 2 seconds or longer.	Invalid when start mode is TIM2.
PROCESS	PH1	process variable high-limit alarm	Process abnormal. PV1 is more than the high-limit-alarm set point	Hysteresis is 2%
	PL1	process variable low-limit alarm	Process abnormal. PV1 is less than the low-limit-alarm set point	Hysteresis is 2%

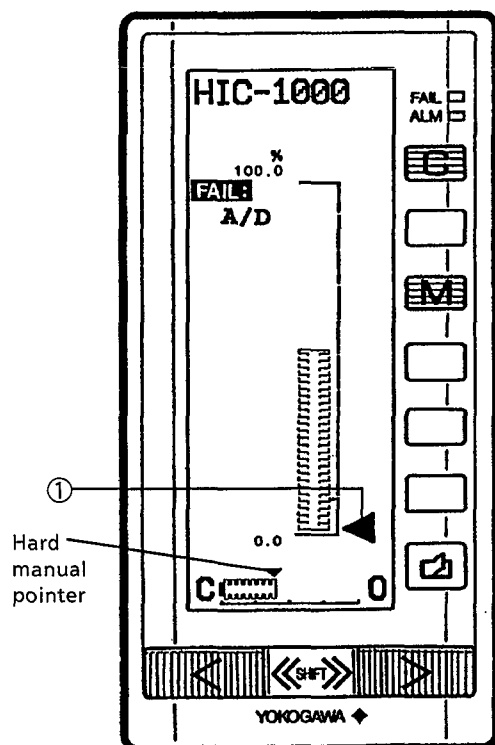
7.2 If the FAIL Lamp Lights

The lit FAIL lamp tells you that a problem has occurred with the YS136. When the FAIL lamp lights up, the cause of failure is displayed at the PV or MV digital display position in the loop panel. The table below shows the FAIL items.

Table 7.2 List of Alarm Items when the FAIL Lamp Lights

Item of Defect	FAIL Display	Operation when Failure Occurs	
Clock stops.	—	Computation Stops	<ul style="list-style-type: none"> ● Fail contact opens. ● Manipulated output hold (in MAN mode) ● Output may be varied in MAN mode. ● Communication (RS-485, DCS, or YS-net) stops.
Main microprocessor (MCU) abnormal	—		
Display processor (DCU) defective	—		<ul style="list-style-type: none"> ● Fail contact opens. ● Manipulated output hold (in MAN mode) ● Hard manual operation possible. ● Communication (RS-485, DCS, or YS-net) stops.
A / D error	A/D		
D / A error	D/A		
RAM error	RAM		<ul style="list-style-type: none"> ● Fail contact opens. ● Manipulated output hold (in MAN mode) ● Output operation is available in MAN mode. ● Communication (RS-485, DCS, or YS-net) stops.
ROM error	ROM		
EEPROM error	EEPROM		

■ Screen for the FAIL Status (except when the display block has an error)



- PV Bar :displays 1 to 5V (raw data) of process variable input in a range of 0% to 100%.
- MV Bar :displays the value of manipulated output 1 just before the failure in a range of 0% to 100%.
- Hard Manual Pointer: Indication is associated with the hard manual output.
- Scale :0% to 100% in any conditions with scale division just before the failure
- C, M etc. :M lamp lights.
- MH and ML : none
- PH, PL Pointer: none
- Valve Direction: displays C-O or O-C just before the failure.
- PV, MV Digital Value : none
- TAG Number: displays the tag number just before the failure.
- FAIL Cause : displays the cause of the failure. If there are multiple causes of A/D, D/A, RAM, EEPROM, and ROM, all are displayed.
- Key Input : all inputs disabled except for the one from the MV operation key.

Note: This panel is made the same as that of other YS100 series models. Therefore, the following items unavailable with the YS135 are also displayed.
 ①SV pointer (displays 0%)

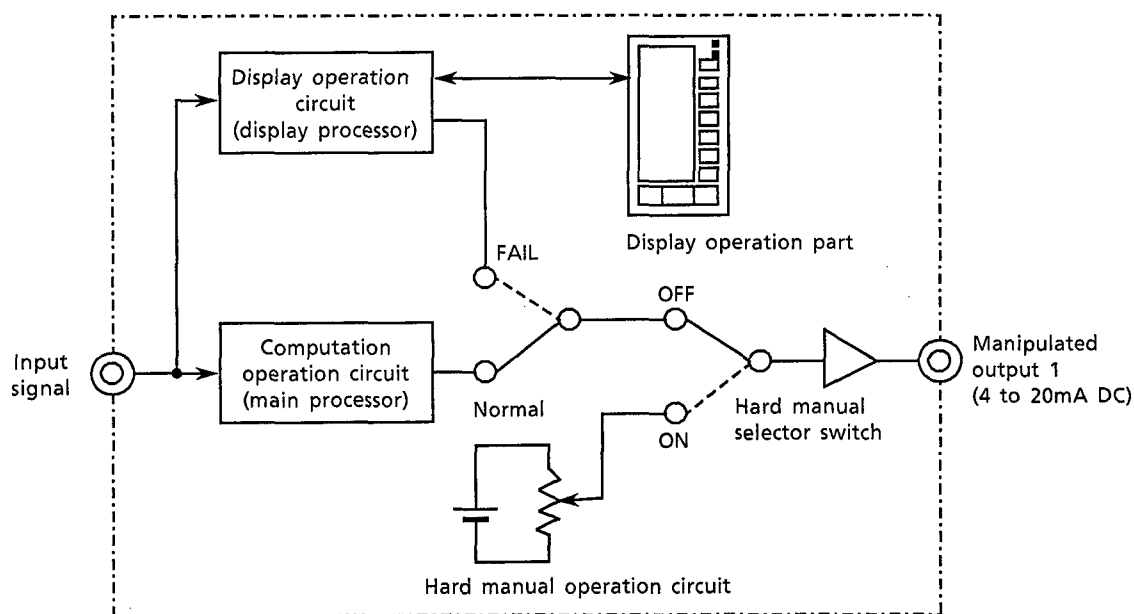


Figure 7.1 Screen for the FAIL Status, and Block Diagram for Input/Output Processing

7.3 Back Up Operation If Equipment Malfunctions

The FAIL lamp lights up if the YS136 goes into FAIL status, and the operation mode is set to the M mode automatically. At the same time, the MV value is held at the value immediately before the failure. If the operation must be carried out urgently, use the hard manual operation part to set a safe output.

7.3.1 Hard Manual Operation

You can find the hard manual operation part (manual output manipulated by analog circuitry) on the internal panel by swinging up the front panel (see Figure 7.2).

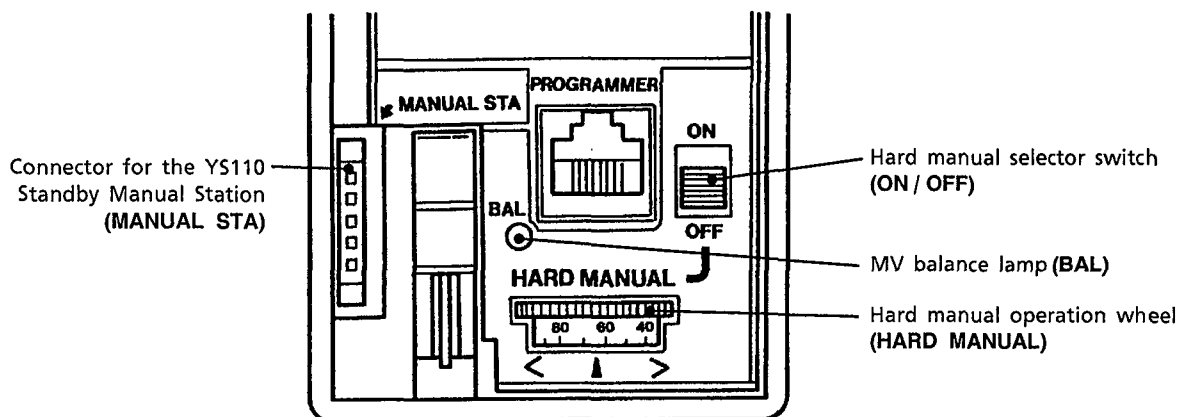


Figure 7.2 Hard Manual Operation

- ① Using the hard manual operation wheel, adjust the MV value (manipulated output from the hard manual analog circuitry) so that the value matches the MV value before FAIL occurred (manipulated output from the digital control circuit).
- ② When the MV values match, the MV balance lamp (green) lights up.
- ③ Set the hard manual selector switch to ON. The manipulated output is switched from the digital control circuitry to the analog circuitry of the hard manual without interruption. In this condition, operation of MV is possible with the hard manual operation wheel.
Note: The MV balance lamp remains lit when the hard manual selector switch is set to ON.
- ④ Adjust the hard manual operation wheel for safe output.

When you replace the internal unit, use the Yokogawa YS110 Standby Manual Station (see Section 7.3.2 "On-Line Replacement of the YS136").

7.3.2 On-Line Replacement of the YS136

If the YS136 fails, it can be replaced without interrupting the manipulated output, by using the Yokogawa YS110 Standby Manual Station.

- ① Swing up the front panel.
- ② Connect the YS110 Standby Manual Station to the connector for the Standby Manual Station (see Figure 7.2).
- ③ Enable MV operation using the YS110 Standby Manual Station.
- ④ Remove the internal unit.
- ⑤ Connect YS110 Standby Manual Station. The YS110 Standby Manual Station is operated with the external power supply when it is connected to the connector at the rear.



See Also

For details of functions, connections, and operations of the YS110 Standby Manual Station, refer to the separately supplied IM 1B7D5-01E “YS110 Standby Manual Station”.

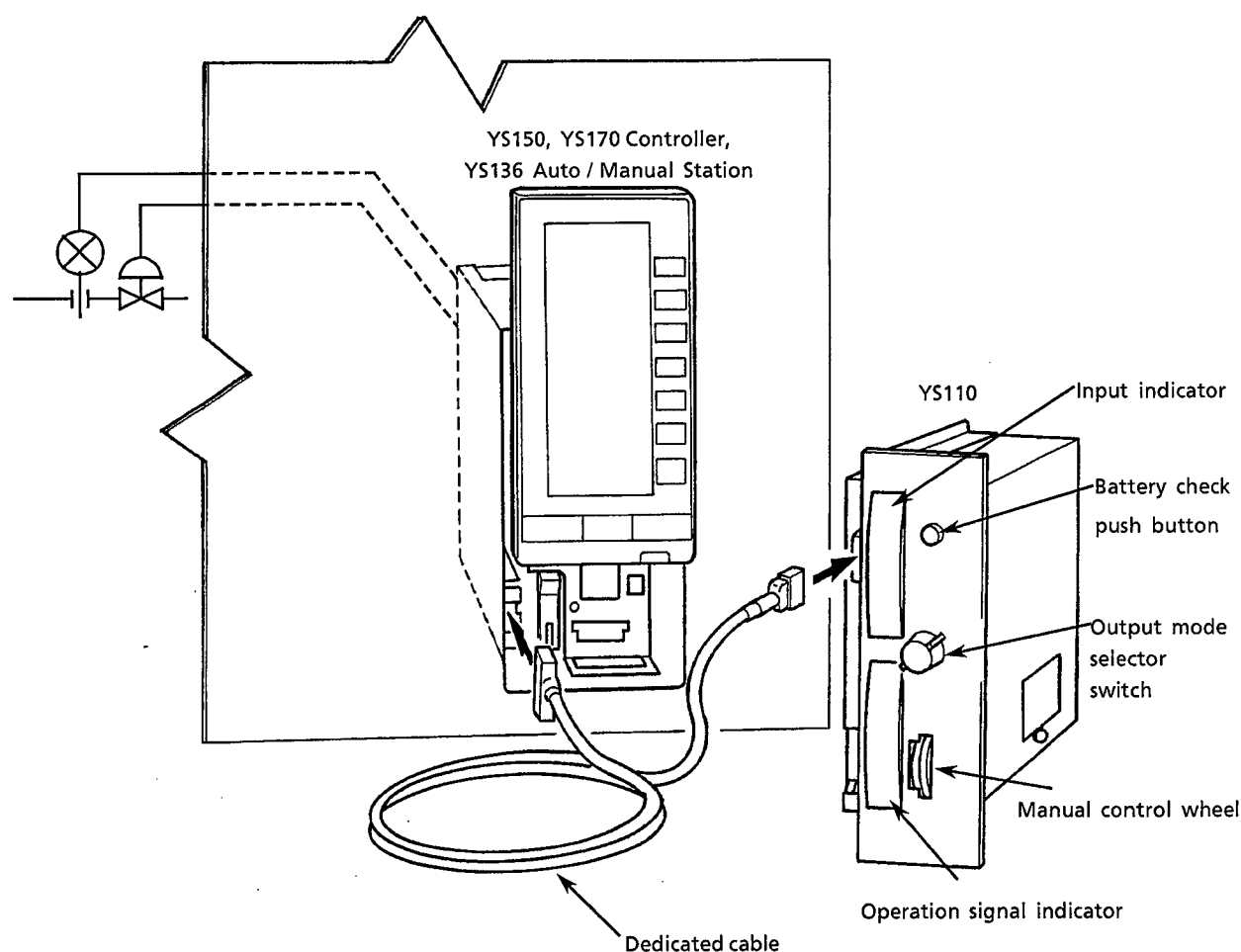


Figure 7.3 On-line Replacement of the YS136

8. Power Fail Restart Operation

The YS136 enters power down status if the 100V AC power supply fails for 20 ms or more or the 24V DC power supply fails for 1 ms or more. You can set the mode for YS136 recovery from power failure (TIM1, TIM2, and AUT modes).

Even if power fails when the EEPROM has not been written with the $\left[\text{SAV} \right]$ key, parameters set from the front panel will not be lost for at least 48 hours (lost in one week on average).

If power failure continues for a long time, and the RAM contents evaporate, the YS136 starts using the parameters written into the EEPROM as initial values for power recovery (so-called initial start). Saved trend data on the trend panel will be lost if the 1 to 20ms power holdup time is exceeded.

8.1 Restart Mode at Power Recovery from Failure

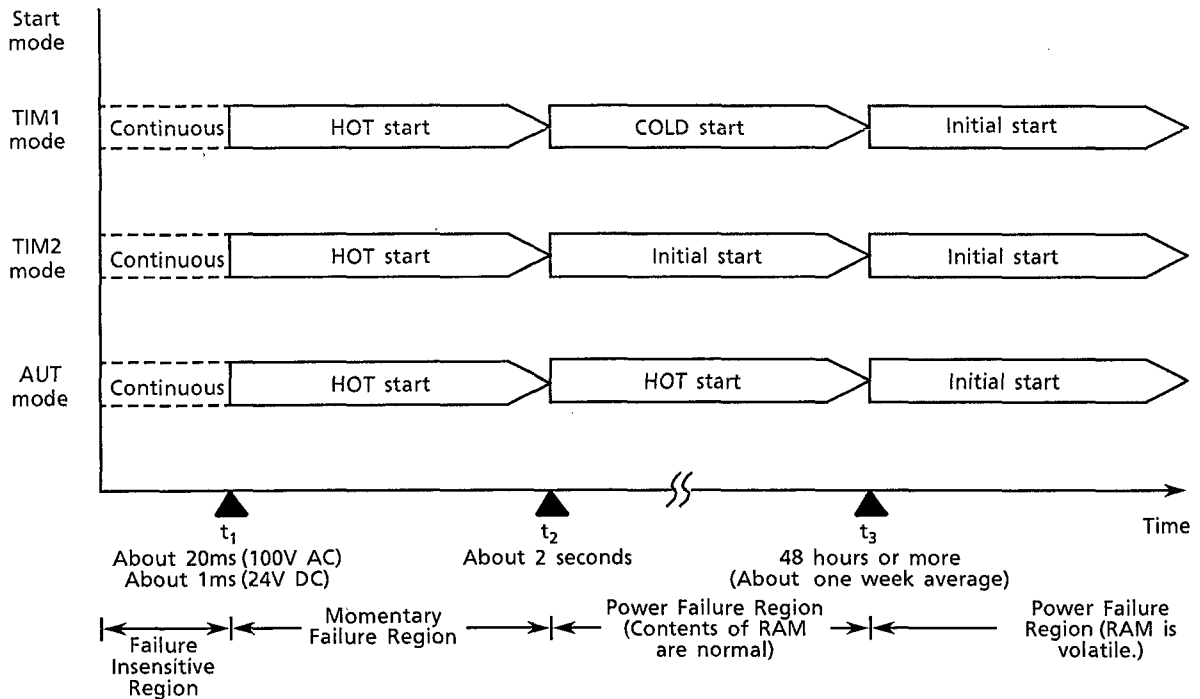
Select power-failure restart mode by specifying one of the following three modes from the configuration panel 1.

- ① **TIM1 Mode** : HOT start when power failure is less than 2 seconds.
COLD start when power failure is two or more seconds.
Initial start when the EEPROM RAM contents have evaporated.
- ② **TIM2 Mode** : HOT start when power failure is less than 2 seconds.
Initial start when power failure is two or more seconds.
- ③ **AUT Mode** : Always HOT start. Initial start when the EEPROM RAM contents have evaporated.

Table 8.1 lists restart mode after power recovery, and Figure 8.1 shows the relationship between power failure duration and start mode.

Table 8.1 Start Mode Operation at Power Recovery

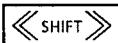

	HOT Start	COLD Start	Initial Start
Control mode	Same as before power failure	MAN	←
Manipulated variables (MV)	Same as before power failure	-6.3%	←
Parameters such as alarm setting values, etc.	Same as before power failure	←	Parameters revert to initial values stored in EEPROM
Conditions of alarm output, alarm display	Starting with the status before power failure	Starting with the status after power recovery	←



- [Failure Insensitive Region (power failure duration) $< t_1$]
- : t_1 = Approx. 1ms (24V DC supply)
 - t_1 = Approx. 20 ms (100V AC supply)
 - Operates in the same manner as power on status.
- [Momentary Failure Region ($t_1 < \text{power failure duration} < t_2$)]
- : t_2 = Approx. 2 seconds
 - The YS136 stops operation during this period.
- [Power Failure Region (Contents of RAM are normal) ($t_2 < \text{power failure duration} < t_3$)]
- : t_3 = 48 hours or more (average one week)
 - The YS136 stops operation during this period.
- [Power Failure Region (RAM contents lost) ($t_3 < \text{power failure duration}$)]
- : The YS136 stops operation during this period.

Figure 8.1 Power Failure and Start Mode

9. Tuning Operation

The tuning panel group is displayed by  + .



NOTE

■ Entering a Password

The YS136 allows you to set a password. When you set a password, enter the password on the password setting panel described in Section 10.3.5 “Password Setting Panel”, then perform tuning operation. When finishing tuning operation, set the password again.

9.1 Selection Operation from the Tuning Detail Panel

The menu panel will be displayed at first in the tuning panel group. The menu panel is used to select the desired detail panel. The three types of detail panel can be selected from one menu panel. Tuning is available on the detail panel. The following describes how to select the desired detail panel.

- Press the key at the right of the name of the desired menu panel.
The detail panel will be displayed.

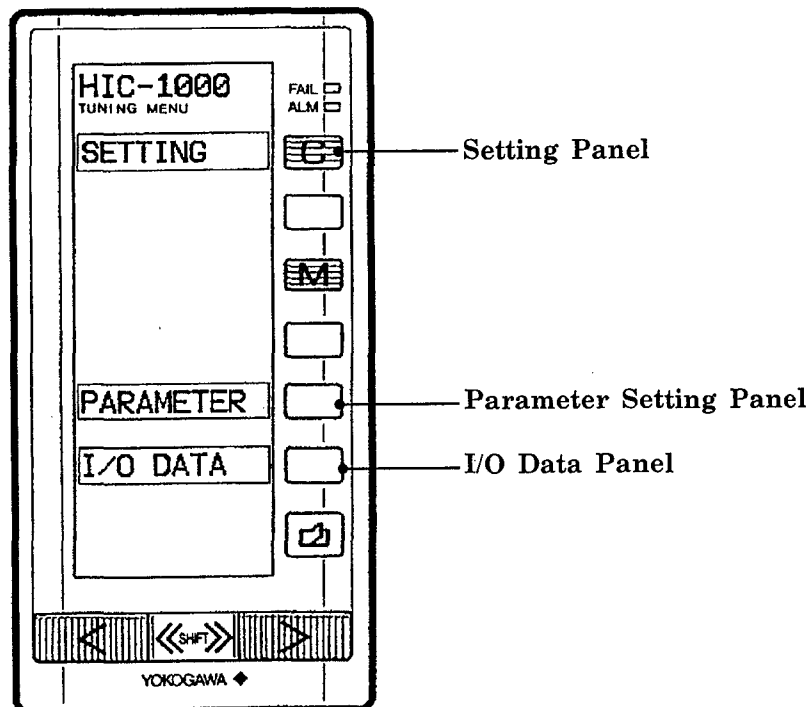


Figure 9.1 The Menu Panel

9.2 Tuning Parameter Setting Operation

Parameters can be set from the tuning detail panel.

■ Using the Software Key

On the detail panel, several keys which are called “software keys” are displayed on the right of the detail panel, in addition to the parameters and the setting values. This means that the operation keys to the right of the displayed keys function as they are displayed on the detail panel.

- [↑] key : Parameter selection key
- [↓] key : Parameter selection key
- [SAV] key : Save key
- [Δ] key : Parameter increasing key
- [▽] key : Parameter decreasing key
- [CHG] key : Change key

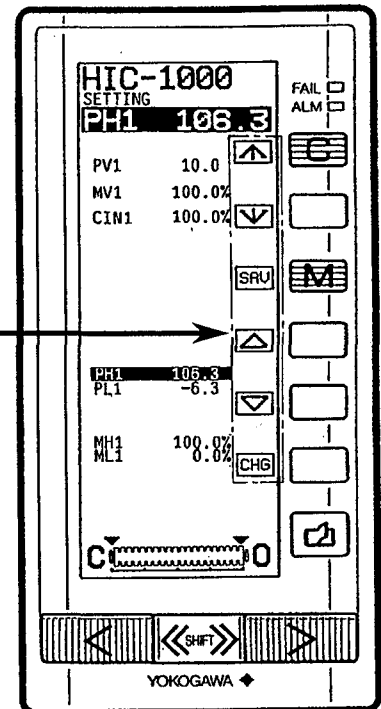


Figure 9.2 Using the Software Key

■ Setting Parameters

① Select the Desired Parameter to be Set.

- Some parameters shown on the detail panel cannot be set (or setting is disabled) while others can be set.
- In order to prevent incorrect setting, no parameters are selected (reverse display) when the detail panel is opened. Pressing the $\left[\uparrow \right]$ key or the $\left[\downarrow \right]$ key once selects the parameter at the bottom or the top of the list. The item name and the value of the selected parameter is displayed with black and white reversed, and it is also enlarged and displayed below the panel title.
- Pressing the $\left[\uparrow \right]$ key moves the reverse display towards the top, and pressing the $\left[\downarrow \right]$ key moves it towards the bottom. Pressing the $\left[\uparrow \right]$ key when it is at the top line moves the reverse display to the bottom line. Pressing the $\left[\downarrow \right]$ key when it is at the bottom line moves the reverse display to the top line.

② Set (or Change) the Parameter.

- Set (or change) the value of the parameter by pressing the $\left[\Delta \right]$ key or the $\left[\nabla \right]$ key.
- Pressing the $\left[\Delta \right]$ key increases the value of the parameter while pressing the $\left[\nabla \right]$ key decreases it.
- If you hold down the $\left[\Delta \right]$ key or the $\left[\nabla \right]$ key, the rate of change of the parameter increases.

■ $\left[\text{SAV} \right]$ Key Operation

- When the $\left[\text{SAV} \right]$ key is displayed on the right of the detail panel, the parameter displayed on the detail panel can be written to the EEPROM.
- The parameters which are not the same as those written to the EEPROM are displayed with “*” at the left of their item names.
- Press the $\left[\text{SAV} \right]$ key for more than two seconds to write the parameters to the EEPROM. When the parameters on the panel are the same as those written to the EEPROM, the “*” mark disappears.



IMPORTANT

When initial start is designated, if the parameter values have not been written to the EEPROM, the changed parameter values will be destroyed and the parameter values will be set with those already written to the EEPROM.

■ [CHG] Key Operation

- The [CHG] key can be used from the setting panel of the tuning panel group.
- By holding down the [CHG] key, the loop panel 1 or trend panel 1 of the operation panel group is displayed. When the operation panel immediately before opening to the tuning panel is the loop panel, the loop panel 1 appears at any time. When it is the trend panel, the trend panel 1 appears at any time. When it is the alarm panel, the loop panel 1 appears since it has higher priority. However, the trend panel 1 appears when the loop panel 1 display is not set in the configuration panel 1 of the engineering panel.
- By holding down the [CHG] key, the operation mode key can be used.

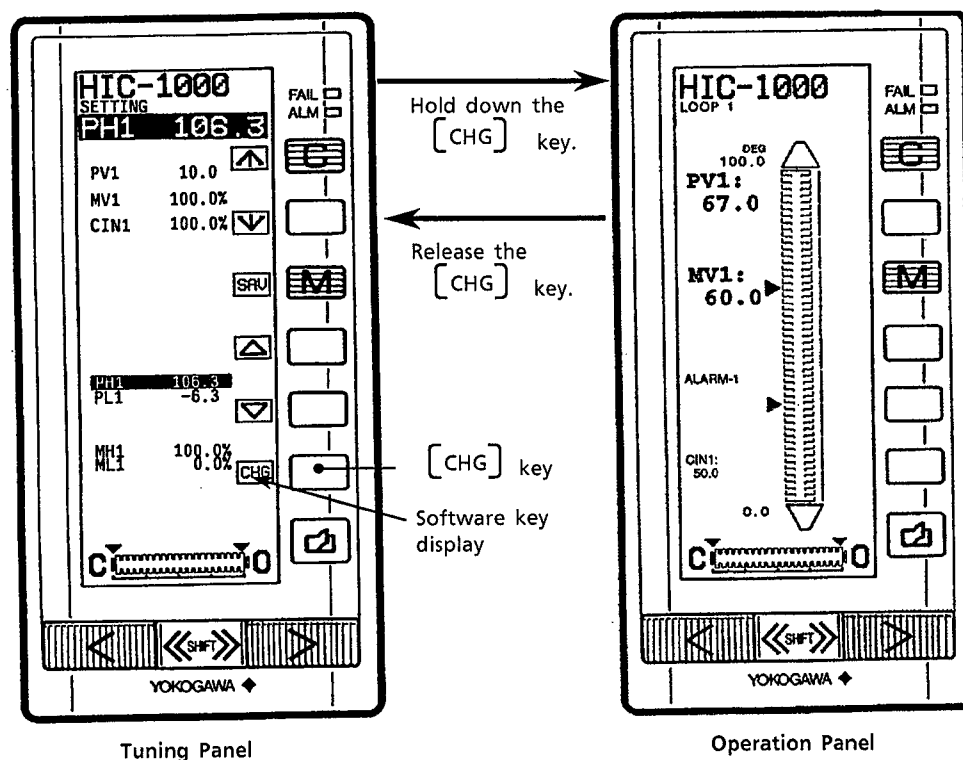


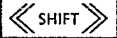


Figure 9.3 [CHG] Key Operation

■ Return Operation to the Menu Panel

After completing the parameter setting in the detail panel, press the  key. This operation returns the display back to the menu panel.

Note: Pressing the  key while holding down the  key can change the panel from the detail panel to another type of panel.

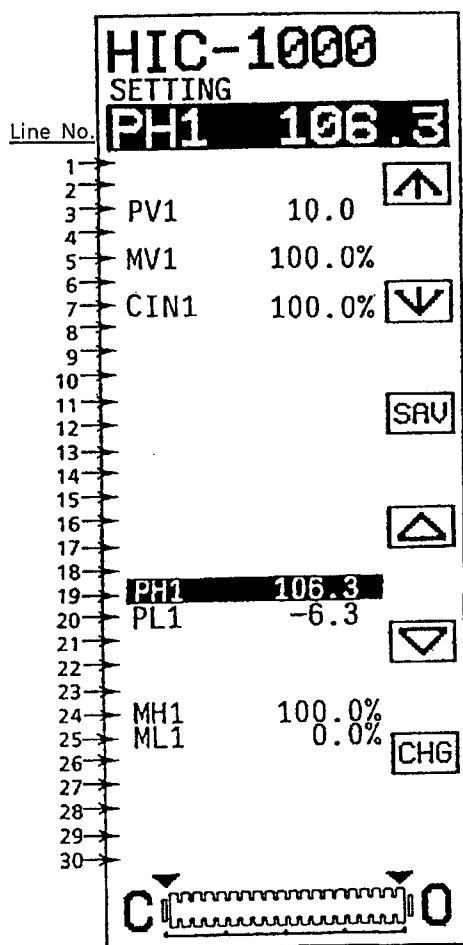
9.3 Function, Display and Operation of Each Tuning Detail Panel

9.3.1 Setting Panel

■ **Function** The setting and display of the alarm set value are carried out.

■ **Operation** (1) Operation of the software keys
 (2) Operation to set parameters
 (3) Operation of MV
 (4) Operation to switch panels

■ **Display** The following shows an example of the panel display.



① “%” Display

On the right of the parameter, the corresponding unit (%) will be displayed.

② MV Display

The MV bar, the MV scale, the MH pointer, the ML pointer, the MV underflow, the MV overflow, and the direction of the MV valve are displayed.

The contents of the display are the same as those of the loop panel.

Display 9.1 Setting Panel

■ Setting Panel Display Parameter List

Line No.	Display	Name	Unit	Default Value	Range of Setting and Display	Setting Possible
1						
2						
3	PV1	Process variable	Engineering unit		Engineering unit equivalent to -6.3 to 106.3% (Note 1)	×
4						
5	MV1	Manipulated output variable	%	-6.3	-6.3 to 106.3	(Note 2) ×
6						
7	CIN1	Cascade input value	%		-6.3 to 106.3	×
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19	PH1	High-limit-alarm-set-point for process variable	Engineering unit	106.3	Engineering unit equivalent to -6.3 to 106.3% (Note 1, 3)	○
20	PL1	Low-limit-alarm-set-point for process variable	Engineering unit	-6.3	Engineering unit equivalent to -6.3 to 106.3% (Note 1, 4)	○
21						
22						
23						
24	MH1	High-limit value of manipulated output signal	%	106.3	-6.3 to 106.3 (Note 5)	○
25	ML1	Low-limit value of manipulated output signal	%	-6.3	-6.3 to 106.3 (Note 5)	○
26						
27						
28						
29						
30						

Note 1: These are the engineering units set with scale SCH1, SCL1, and SCDP1.

Note 2: MV can be set only with the MV operation key located at the bottom front of the panel.

Note 3: Alarm will not occur if set at a maximum value.

Note 4: Alarm will not occur if set at a minimum value.

Note 5: These should be set so as to be MH1 > ML1.



TIP

Default values are the factory-set values.

If you have changed the parameter values once using parameter setting function, and have written them to the EEPROM using the [SAV] key, it is necessary to use parameter setting function again to set them back to the default values.

9.3.2 Parameter Setting Panel

■ Function

The display and setting of the input signal computation parameters are carried out.

■ Operation

- (1) Operation of the software keys
- (2) Operation to change parameters
- (3) Operation to switch panels

■ Display

The following shows an example of the panel display.

Line No.	Parameter	Value	Unit	Key
1	HIC-1000			
2	PARAMETER			
3	PLC1	1.0		
4	PLC1	1.0%		↑
5				
6				
7				↓
8				
9				
10				
11				SAU
12				
13				
14				
15				△
16				
17				
18				
19				
20				▽
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

① “%” Display

On the right of the parameter, the corresponding unit (%) will be displayed.

Display 9.2 Parameter Setting Panel

■ Parameter Setting Panel Display Parameter List

Line No.	Display	Name	Unit	Default Value	Range of Setting and Display	Setting Possible
1	PLC1	Square root extraction low cutoff setting for process input ^(Note)	%	1.0	0.0 to 100.0	○
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

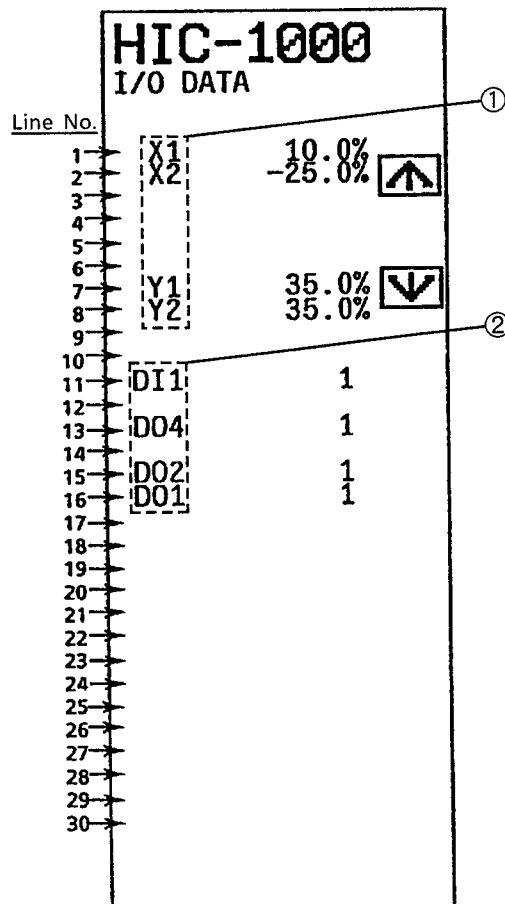
Note: Set the low cutoff point in % with respect to the input. An linear output is obtained for the output corresponding to the input where lower than the set value of the low-cut point.

9.3.3 Input and Output Data Panel

■ **Function** The display of the input and output signals at each terminal on the rear panel is carried out.

■ **Operation** (1) Operation to switch to panel

■ **Display** The following shows an example of the panel display.



① **The Names of the Analog Input and Analog Output Signals**

These are the names of the registers assigned to each terminal.

② **The Names of the Status Input and Output**

These are the names of the registers assigned to each terminal.

Display 9.3 Input/Output Data Panel

■ Input / Output Data Panel Display Parameter List

Line No.	Display	Name	Unit	Range of Display
1	X1	Process input	%	-25.0 to 125.0
2	X2	Cascade input	%	-25.0 to 125.0
3				
4				
5				
6				
7	Y1	Manipulated output 1	%	-20.0 to 106.3
8	Y2	Manipulated output 2	%	-6.3 to 106.3
9				
10				
11	DI1	Operation mode selection input	—	0 / 1(Note)
12				
13	D04	C / M status output	—	0 / 1(Note)
14				
15	D02	Process variable low-limit alarm output	—	0 / 1(Note)
16	D01	Process variable high-limit alarm output	—	0 / 1(Note)
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				



Note: 0 : contact output ; open
1 : contact output ; closed

10. Engineering Operation

This chapter explains the following items, such as selection / operation of the engineering detail panel, engineering parameter setting operation, and functions, operations and displays of each detail panel.

- **Selection / Operation of the Engineering Detail Panel**
- **Engineering Parameter Setting Operation**
Using the software key, entering a password, enabling / disabling of parameter setting, setting parameters
- **Configuration Panel 1**
Function, operation, display, and display parameter list
- **Configuration Panel 2**
Function, operation, display, and display parameter list
- **Configuration Panel 3**
Function, operation, display, and display parameter list
- **Direct Input Specification Setting Panel**
Function, operation, display, and display parameter list
- **Password Setting Panel**
Function, operation, and display

10.1 Selection / Operation of the Engineering Detail Panel

The engineering panel group is displayed by  + .

The menu is displayed first in the engineering panel group. The menu panel is used to select the desired detail panel. The five types of the detail panel can be selected from one menu panel. The following describes how to select the desired panel.

■ Press the Key at the Right of the Menu. The Detail Panel will be Displayed.

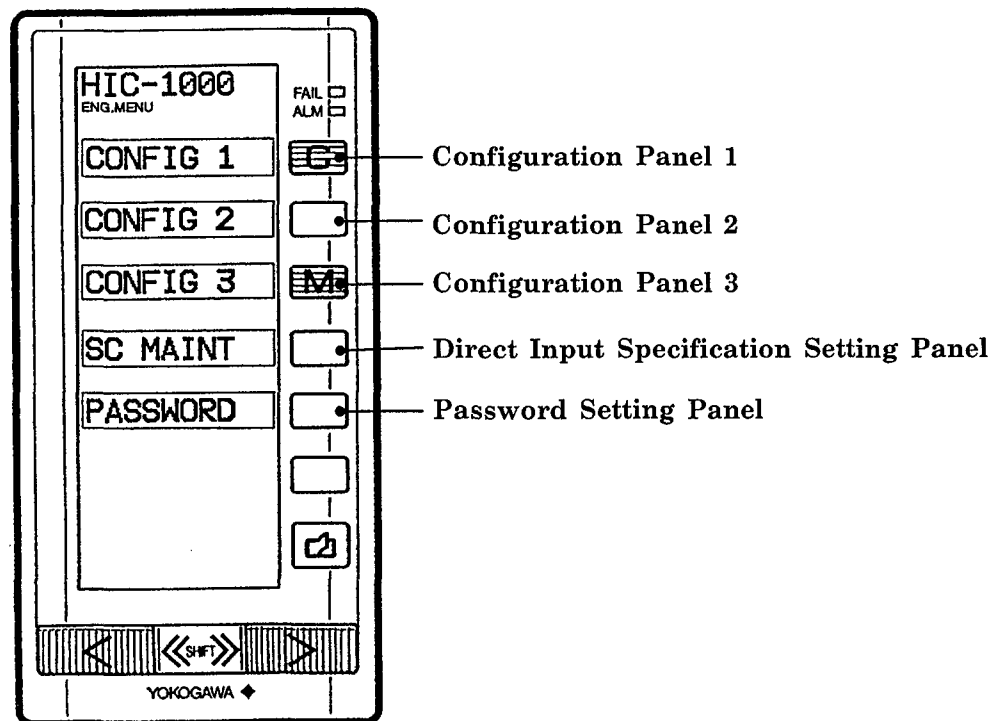


Figure 10.1 Menu Panel

10.2 Engineering Parameter Setting Operation

Functions and parameters can be set from the detail panel.

■ Using the Software Key

On the detail panel, several keys are displayed on the right of the detail panel (so-called “software keys”), in addition to the items of the parameters and the setting values. This means that the operation keys to the right of the displayed keys function as they are displayed on the detail panel.

- [↑] key : Parameter selection key
- [↓] key : Parameter selection key
- [△] key : Parameter increasing key
- [▽] key : Parameter decreasing key

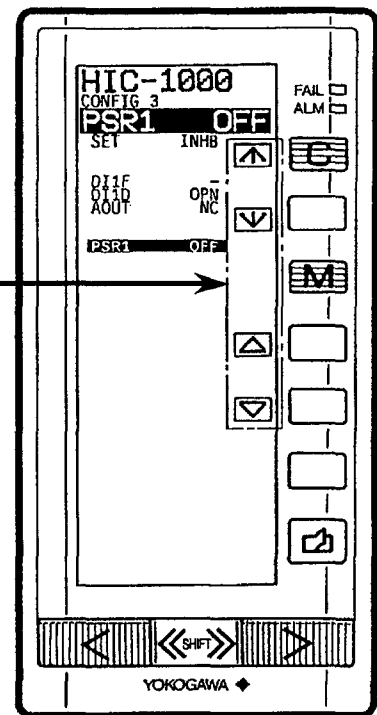


Figure 10.2 Using the Software Key



TIP

In addition to the software keys above, other software keys are available with the direct input specification setting panel and the password setting panel of the engineering panel group. See Section 10.3.4 “Direct Input Specification Setting Panel” and Section 10.3.5 “Password Setting Panel” for the use of those keys.



NOTE

■ Entering a Password

The YS136 allows you to set a password. When you set a password, enter the password on the password setting panel described in Section 10.3.5 “Password Setting Panel”, then perform tuning operation. When finishing tuning operation, set the password again.

■ Enabling / Disabling of Parameter Setting

- Enabling or disabling of parameter setting (SET) can be selected from the configuration panel 1, configuration panel 2, configuration panel 3, and the direct input specification setting panel of the engineering panel group.
- “Enabled” or “Disabled” parameter setting status (SET) is displayed as the top line of the parameters. This indication permits or inhibits setting (or change) of the parameters displayed below that indication.
- Permission or inhibition of parameter setting (SET) immediately after the panel is displayed set to “INHB” (setting, inhibited). Unless this setting is changed to “ENBL” (setting, enabled), the parameters below that line cannot be changed.
- When the setting is set to “ENBL” after selecting permission or inhibition of parameter setting (SET), the operation mode changes automatically in the M mode, and the manipulated output and alarm output are held. Also, the alarm detection function is reset. When the setting is set to “ENBL” a reverse display of STOP will appear on the right of the display title.
- Permission or inhibition of parameters setting (SET) reverts automatically to “INHB” when another panel is selected.

■ Setting Parameters

① Select the Desired Parameter to be Set.

- Some parameters shown on the detail panel cannot be set (or setting is prohibited) while the others can be set.
- In order to prevent incorrect setting, no parameters are selected (shown by reverse display) when the detail panel is first displayed. Pressing the ↑ key or the ↓ key once selects the parameter at the bottom (except for item REV) or the top of the list. The item name and the value of the selected parameter is displayed with black and white reversed, and it is also enlarged and displayed below the panel title.
- Pressing the ↑ key moves the reverse display towards the top, and pressing the ↓ key moves it to the bottom. Pressing the ↑ key when it is at the top line moves the reverse display towards the bottom. Pressing the ↓ key when it is at the bottom line moves the reverse display to the top line.

- When the value to be set for the parameter is of character type (i.e. tag numbers etc.), only one character is reversed. Pressing the $\left[\uparrow \right]$ key moves the reverse display to the left. Pressing the $\left[\downarrow \right]$ key moves the reverse display to the right. Pressing the $\left[\uparrow \right]$ key when the far left character is reversed moves up the reverse display. Pressing the $\left[\downarrow \right]$ key when the far right character is reversed moves down the reverse display.

② Set (or Change) the Parameter.

- Set (or change) the value of the parameter by pressing the $\left[\Delta \right]$ key or the $\left[\nabla \right]$ key.
- Pressing the $\left[\Delta \right]$ key increases the value of the parameter while pressing the $\left[\nabla \right]$ key decreases it.
- If you hold down the $\left[\Delta \right]$ key or the $\left[\nabla \right]$ key, the rate of change of the value of the parameter increases. Hold down the $\left[\Delta \right]$ key or the $\left[\nabla \right]$ key for at least one second to select a parameter.
- When the setting values are of characters (engineering unit (UNIT), tag numbers (TAG), or display register (NAME)) or when the scale is set for either 100% value (SCH) or 0% value (SCL), one character can be set (or changed) at a time. The selected character changes in the order of ASCII code number. Pressing the $\left[\Delta \right]$ key selects the higher code number (ascending order), while pressing the $\left[\nabla \right]$ key selects the lower code number (descending order). The range of the ASCII code which can be set is from 20H (space) to 5AH (Z) in hexadecimal notation.

[ASCII Code]

␣(Space)	!	"	#	\$	%	&	'	()	*	+	,	-	.	/
0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
A	B	C	.....	Z											

10.3 Function, Display, and Operation of Each Engineering Detail Panel

10.3.1 Configuration Panel 1

■ **Function** The setting of the configuration, communication environment, etc. is carried out.
Settings made using this panel are written to the EEPROM directly.

■ **Operation** (1) Operation of the software keys
(2) Operation to enable or disable parameter setting
(3) Operation to change parameters
(4) Operation to switch panels

■ **Display** The following shows an example of the panel display.

	HIC-1000	
	CONFIG 1	
Line No.	START TIM1	
1	SET	INHB
2		
3	CTL	MVSTN
4	START	TIM1
5	COMM	
6	COMWR	ENBL
7		
8	ADRS	1
9	STBIT	1
10	PAR	NO
11	BPS	9600
12		
13		
14		
15	LOOP1	1
16		
17	TRND1	1
18		
19	ALARM	1
20		
21		
22		
23		
24		
25		
26		
27	ID	00000000
28		0000
29		
30	REV	2.1

Display 10.1 Configuration Panel 1

■ Configuration Panel 1 Display Parameter List

Line No.	Display	Name	Default Value	Selection	Setting Possible
1	SET	Enable / disable setting	INHB	INHB, ENBL ^(Note 1)	○
2					
3	CTL	Operation mode display	SVSTN		×
4	START	Start mode	TIM1	TIM1, AUT, TIM2	○
5	COMM	Selection of communication	-	-, LCS, 485, YSNET ^(Note 2)	×
6	COMWR	Enable / disable setting through communication	ENBL	ENBL, INHB	○
7					
8	ADRS	(RS-485 or YS-net) address	1	1 to 16 (for RS-485) 0 to 16 (for YS-net)	○
9	STBIT	(RS-485) stop bit	1	1, 2	○
10	PAR	(RS-485) parity	NO	NO, ODD, EVEN	○
11	BPS	(RS-485) bit rate	1200	1200, 2400, 4800, 9600	○
12					
13					
14					
15	LOOP1	Panel display selection / loop	1	0, 1, 2 ^(Note 3)	○
16					
17	TRND1	Panel display selection / trend	1	0, 1, 2 ^(Note 3)	○
18					
19	ALARM	Panel display selection / alarm	1	0, 1, 2 ^(Note 3)	○
20					
21					
22					
23					
24					
25					
26					
27	ID	Communication ID on the YS-net		alphanumeric-12 digits (8 digits + 4 digits) ^(Note 2)	×
28					
29					
30	REV	System Rev. No.			×

Note 1: When the setting is set to "ENBL", a reverse display of STOP will appear on the right of the display title, the operation mode changes automatically to the M mode, and the manipulated output and alarm output are held. Also, the alarm detection function is reset.

Note 2: Automatically selected by the optional communication card.

Note 3: The loop 1 always appears even though you set 0 (no display) for all lines.

Panel display color selection: Displayed white in blue background when setting "1". Displayed blue in white background when setting "2".

All displays other than operation display are the same as those of LOOP1.

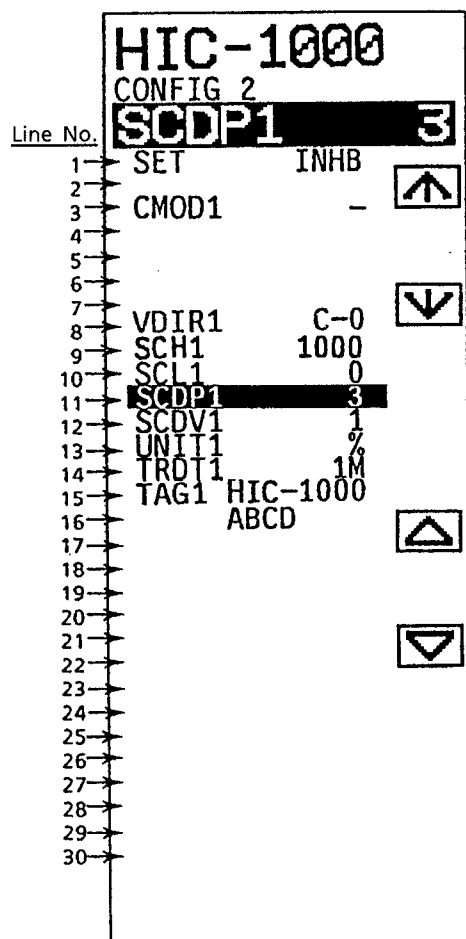
Display is set effective for new (changed) setting after new display by the page key appears.

10.3.2 Configuration Panel 2

■ **Function** Carry out setting of scale for engineering unit quantity and tag number. Settings made using this panel are written to the EEPROM directly.

■ **Operation** (1) Operation of the software keys
(2) Operation to enable or disable parameter setting
(3) Operation to change parameters
(4) Operation to switch panels

■ **Display** The following shows an example of the panel display.



Display 10.2 Configuration Panel 2

■ Configuration Panel 2 Display Parameter List

Line No.	Display	Name	Default Value	Selection	Setting Possible
1	SET	Permission / inhibition of setting	INH B	INH B, ENBL (Note 1)	○
2					
3	CMOD1	C mode	-	-, CAS, CMP	○
4					
5					
6					
7					
8	VDIR1	Valve opening direction	C-O	C-O, O-C	○
9	SCH1	100% value of scale	1000	-9999 to 9999	○
10	SCL1	0% value of scale	0	-9999 to 9999	○
11	SCDP1	Position of decimal point	3	1 to 4 (Note 2)	○
12	SCDV1	Scale division	1	1, 2, 4, 5, 10	○
13	UNIT1	Engineering unit	%	6 digits of alphanumeric characters	○
14	TRDT1	Trend recording time span	1M	1M, 5M, 10M, 30M, 1H, 5H, 10H, 30H	○
15	TAG1	Tag number	-YS136-	12 digits of alphanumeric characters (8 digits + 4 digits) (Note 3)	○
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

Note 1: When the setting is set to "ENBL", a reverse display of **STOP** will appear on the right of the display title, the operation mode changes automatically to the M mode, and the manipulated output and alarm output are held. Also, the alarm detection function is reset.

Note 2: Decimal point is set as follows:

□. □. □. □.
 ↑ ↑ ↑ ↑
 Setting value → 1 2 3 4 (no display)

Note 3: The lower 4 digits will not be displayed at the tag number display part at the top of the panel.

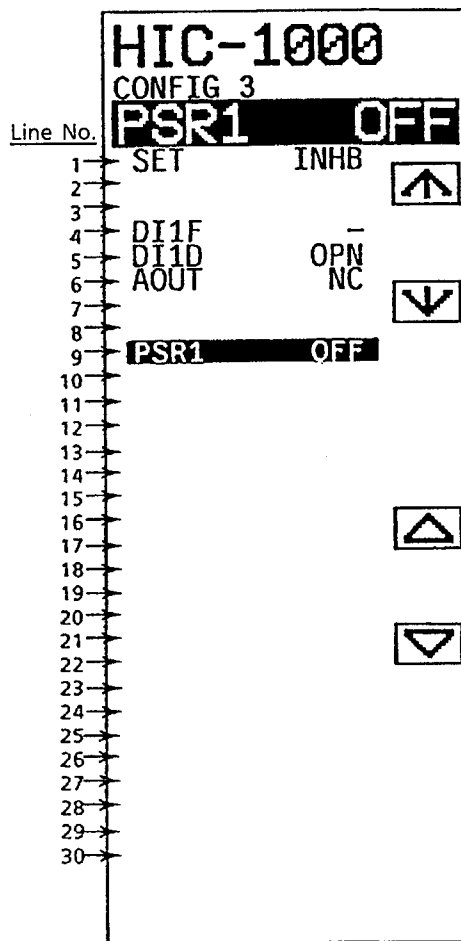
10.3.3 Configuration Panel 3

■ **Function** Function selection for operation mode selection input, setting of the alarm output contacts, and ON / OFF selection of square root operation are carried out.

Any setting with this panel will be directly written to the EEPROM.

■ **Operation** (1) Operation of the software keys
(2) Operation to enable or disable parameter setting
(3) Operation to change parameters
(4) Operation to switch panels

■ **Display** The following shows an example of the panel display.



Display 10.3 Configuration Panel 3

■ Configuration Panel 3 Display Parameter List

Line No.	Display	Name	Default Value	Selection	Setting Possible
1	SET	Enable/disable setting	INHB	INHB, ENBL (Note 1)	○
2					
3					
4	DI1F	Designation of operation mode switching input function	-	-, E-MAN	○
5	DI1D	Direction of operation mode switching input contact	OPN	OPN, CLS	○
6	AOUT	Designation of alarm output contact status	NC	NC, NO (Note 2)	○
7					
8					
9	PSR1	Designation of square root extraction of process input	OFF	OFF, ON	○
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

Note 1: When the setting is set to "ENBL", a reverse display of STOP will appear on the right of the display title, the operation mode changes automatically to the M mode, and the manipulated output and alarm output are held. Also, the alarm detection function is reset.

Note 2: The two contacts are set altogether at a time.

10.3.4 Direct Input Specification Setting Panel

■ Function

Maintenance of the SC card for direct input (optional), except for /A05 isolation input, /A06 2-wire transmitter input, and /A07 2-wire transmitter input (uninsulated input), is carried out.

The maintenance operation consists of communication with the SC card and setting of specification.

The SC card has the following six types of menus:

- ① Model Name (MODEL)
 - ② Tag Number (TAG NO.)
 - ③ Self-Diagnosis Test Result (SELF CHK)
 - ④ Display Item (DISPLAY) .. 4 parameters
 - ⑤ Setting Item (SET) 12 parameters
 - ⑥ Adjustment Item (ADJUST) 7 parameters
- ④ to ⑥ menus have the parameters to be set: ④ Display item menu has 4 parameters to be set, ⑤ Setting item menu has 12 parameters, and ⑥ Adjustment item menu has 7 parameters. You cannot change the ① to ③ menus and ④ Display item menu parameter with checking operation.

■ Operation

(1) Function to Prevent Accidental Setting

In order to prevent accidental setting of parameters, no parameters can be selected (not reverse display) immediately after opening this panel. Pressing the \rightarrow key once selects the parameter "SET" at the top line (enable/disable of parameter setting).

(2) Operation to Permit Parameter Setting

"SET" displayed on the top line is the parameter which allows the SC maintenance communications. It is set to "INHB" (setting inhibited) immediately after opening this panel. The SC maintenance communications cannot be carried out unless you change this setting to "ENBL" (setting enabled).

To change the setting from "INHB" to "ENBL", first select the "SET" parameter, and then press the Δ key. When the setting is changed to "ENBL", the operation mode is changed automatically to the M mode, and the manipulated output and alarm output are held. Also, the alarm detection function is reset. When you select another panel, the setting is set automatically back to "INHB."

(3) Software Key

● $\left[\text{MNU} \right]$ Key: Menu (MENU) Change Key

This key enables communication with the SC to displaying the menu. Every time this key is pressed, the YS136 communicates with the SC. The menu of the SC is read and displayed.

● $\left[\text{PRM} \right]$ Key: Parameter (PARAMETER) Change Key

This key enables communication with the SC to display the parameters. Every time this key is pressed, the YS136 communicates with the SC, and the parameters of the SC are read and displayed.

- **[→] Key : Cursor Shift Key**

This key shifts the digit for the data. When the data type is alphanumeric characters, the digit displayed in reverse is shifted to the right. From the far right digit, it is shifted to the far left position.

- **[Δ] Key : Data Increase Key**

This key increases the data value. The value changes from low to high, then to low continuously.

- **[▽] Key : Data Decrease Key**

This key decreases the data value. The value changes from high to low, then to high continuously.

- **[ENT] Key : Enter (ENTER) Key**

This key writes the data to the SC. The following two steps are required to write data to the SC.

- ① Press the [ENT] key once. The display of all the communication data changes to reverse display.
- ② Press the [ENT] key again. The data is written to the SC, and the display is set back to normal display. If you press any key other than the [ENT] key, the data will not be written to the SC but the display will also be set back to normal display.

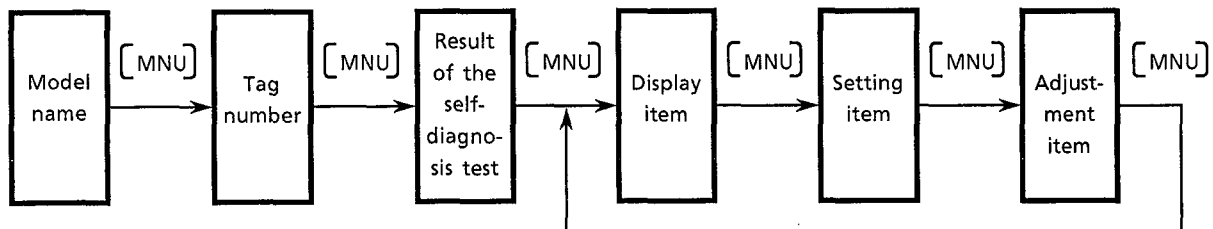
(4) Direct Input Specification Setting Operation

- Proceed as follows to set the direct input specification :

- ① Select the SC menu.

Press the [MNU] key to read and display the SC menu.

Every time you press the [MNU] key, three items : model name, tag number, and the result of self-diagnosis test appear in this order. Press the [MNU] key one more time, three items : the display item, setting item, and adjustment item appear repeatedly.



- ② When you select one of the display item, setting item, and adjustment item, select a parameter.

Press the [PRM] key to read the SC parameter and display it. Every time you press the [PRM] key, each parameter appears one after another. A displayed parameter is different depending on the SC card you use, so refer to the table of displayed parameter list.

Keep pressing the [PRM] key until the parameter to be set appears.

- ③ Set the parameter using the [→] (cursor shift) key, [Δ] (data increase) key, or [▽] (data decrease) key.

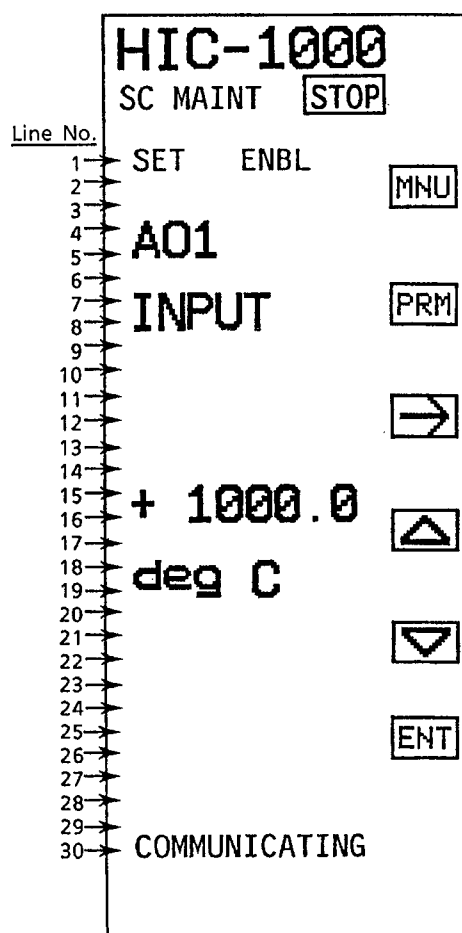
④ Press the [ENT] key. The displayed parameters you set change to reverse display.

⑤ Press the [ENT] key again. The data is written on the SC card, the displayed parameters are set back to normal display. If you do not press the [ENT] key in this step, data are not written and the displayed parameters are set back to normal display.

(5) Operation for Panel Opening

■ Display

The following shows an example of the panel display.



Display 10.4 Direct Input Specification Setting Panel

■ Direct Input Specification Setting Panel Display Parameter List

Number	Item	Name Display	Data Display Depending on the SC Card to be Used				
			A01 (EM1)	A02 (ET5)	A03 (ER5)	A04 (ES1)	A08 (EP3)
01	Model name	MODEL	EM1*B	ET5*B	ER5*B	ES1*B	EP3*A
02	Tag number	TAG NO.	16 alphanumeric characters				
03	Self-diagnostic test result	SELF CHK	GOOD or ERROR				
A00	Display item	DISPLAY					
A01	Input value	INPUT	_____mV	_____deg C	_____deg C	_____OHM	_____Hz
A02	Output value	OUTPUT	_____%				
A03	Status	STATUS	FF (2 digits of hexadecimal value)				
A04	Revision number	REV NO.	n.000 (n:Revision number)				
B00	Setting item	SET					
B01	Tag number 1	TAG NO 1	8 alphanumeric characters (First half of 8 characters of a tag number)				
B02	Tag number 2	TAG NO 2	8 alphanumeric characters (Later half of 8 characters of a tag number)				
B03	Comment 1	COMMENT 1	8 alphanumeric characters (First half 8 characters of a comment)				
B04	Comment 2	COMMENT 2	8 alphanumeric characters (Rest 8 characters of a comment)				
B05	ER5 input type	INP TYPE			PT/JPT (Note 1)		
B06	ET5 input type	INP TYPE		B/E/J/K/T/R/S/N			
B07	Low-cut	LOW CUT					_____Hz (Note 5)
B08	ES1 whole resistance	RESIST				_____OHM	
B09	Temperature unit	UNIT		deg C/deg F/K	deg C/deg F/K		
B10	0 point	ZERO	_____mV	_____deg C	_____deg C	(Note 4) _____OHM	_____Hz (Note 5)
B11	Span (Note 2)	SPAN	_____mV	_____deg C	_____deg C	_____OHM	_____Hz (Note 5)
B12	Burn-out	BURN OUT	OFF/UP/DOWN	OFF/UP/DOWN	OFF/UP/DOWN	OFF/UP/DOWN	
C00	Adjustment item	ADJUST					
C01	0% output compensation (Note 7)	OUT 0%	±10.00	±10.00	±10.00	±10.00	±10.00
C02	100% output compensation (Note 7)	OUT 100%	±10.00	±10.00	±10.00	±10.00	±10.00
C03	BURN-OUT compensation	WIRING R	EXECUTE/RESET (BURN-OUT compensation) (Note 3)	EXECUTE/RESET (BURN-OUT compensation) (Note 3)			
C04	Input zero adjustment (Note 6)	ZERO ADJ	_____mV RST/INC/DEC	_____mV RST/INC/DEC	_____OHM RST/INC/DEC		
C05	Input span adjustment (Note 6)	SPAN ADJ	_____mV RST/INC/DEC	_____mV RST/INC/DEC	_____OHM RST/INC/DEC		
C06	Input zero adjustment (Note 6)	ZERO ADJ				_____OHM	
C07	Input span adjustment (Note 6)	SPAN ADJ				_____OHM	

Note 1: Pt100=JIS. '89. Pt100 (IEC, DIN Pt100 or compatible), JPT=JIS. '89. JPt100 (former JIS Pt100)

Note 2: Processable data is within the range described in the standard specification.

Note 3: The BURN-OUT compensation means the function to compensate the errors caused by the BURN-OUT current which occurs when the resistance of the external wire is high (This function is used with the BARD type protector).

Note 4: Up to 30kΩ is available, but the standard specification is 100 to 2,000Ω.

Note 5: Set to 4 valid integer digits or less. However, for span, it is possible to set 10,000Hz.

Note 6: Input zero adjustment and input span adjustment are for adjusting the input signals of each SC card.

For A01 (EM1), A02 (ET5), and A03 (ER5) the offset and the gain of the A/D conversion can be adjusted. Select 'INC' or 'DEC' by pressing the [Δ] or [∇] key and press the [ENT] key twice.

Each time you press it twice the incremental or decremental adjustment is performed. Or select 'RST' and press the [ENT] key twice. Then the adjustment is re-set.

But in case of A04 (ES1) the adjustment here is for re-setting of ZERO and SPAN. That is, the setting to ZERO (B10) and SPAN (B11) is automatically done when you perform the adjustment by pressing the [ENT] key twice for zero adjustment with 0% input and span adjustment with 100% input.

Note 7: Output compensation is for adjusting the D/A conversion output (1 to 5 V DC output).

You can adjust the offset by '0% output compensation' and the gain by '100% output compensation'. You set the value within -10.0% and +10.0% and press the [ENT] key twice. Then the value is added to the 0% output or the 100% output of the D/A conversion and is output continuously. To stop this continuous output status you select other parameters in the SC MAINT display or shut off the power supply to the instrument once.

10.3.5 Password Setting Panel

■ Function

The setting (change) of the parameters of the tuning panel group and of the engineering panel group is prohibited.

When a password is set, the parameter increasing key (Δ soft key), and the parameter decreasing (∇ soft key) disappear from the tuning and engineering panels. As a result, the parameters cannot be changed. However, selection of each parameter item and opening to each panel are possible.

The following explains the details of the password.

- The password is a 4-digit number.
- The password is not factory-set when the YS136 is shipped.
- The password which has been set remains unchanged unless it is erased by password entering operation.
- Setting (change) of the parameters is enabled at power-on when a password has not been set yet.
- Setting (change) of the parameters is disabled at power-on when a password has already been set. In this case, setting (change) of the parameters can be enabled by entering the same number as the previously set password.

■ Operation

(1) Software Keys

- \rightarrow Key: Shift Key

This key shifts the password digit to the right.

- SET Key: Password Setting Key

This key is used to set the password.

- ENT Key: Password Entering Key

This key is used to enter the password.

- Δ Key : Numeric Increasing Key

This key increases the data value. The value changes from low to high, and then to low continuously.

- ∇ Key: Numeric Decreasing Key

This key decreases the data value. The value changes from high to low, and then to high continuously.

(2) Setting the Desired Password

(Operation to disable changes of parameters by setting the password)

- ① When shifting to the password panel, "SET PASSWORD" and "UNLOCK" are being displayed.
- ② Press the SET key.
- ③ "0000" appears. The display of the far left digit changes to reverse display.
- ④ Determine the password using the \rightarrow key (digit shift), the Δ key (increasing), and the ∇ key (decreasing).
- ⑤ Press the SET key. The display of all 4 digits is set to reverse display.
- ⑥ Press the SET key again. The password disappears, "ENT PASSWORD" and "LOCK" appear, and the password has been set. Then, the display of the SET key disappeared, and the ENT key appears.

(3) Inputting the Desired Password

(Operation to enable changes of parameters by entering the password for the unit to which the password is set)

- ① When shifting to the password panel, "ENT PASSWORD" and "LOCK" are being displayed.
- ② Press the [ENT] key.
- ③ "0000" appears. The display of the far left digit changes to reverse display.
- ④ Determine the password using the [→] key (digit shift), the [Δ] key (increasing), and the [▽] key (decreasing).
- ⑤ Press the [ENT] key. The display of all 4 digits is set to reverse display.
- ⑥ Press the [ENT] key. When the password is correct, the password disappears, "SET PASSWORD" and "UNLOCK" appear. In this condition, the password can be changed. If the password entered is incorrect, the status is set back to step ③ above.



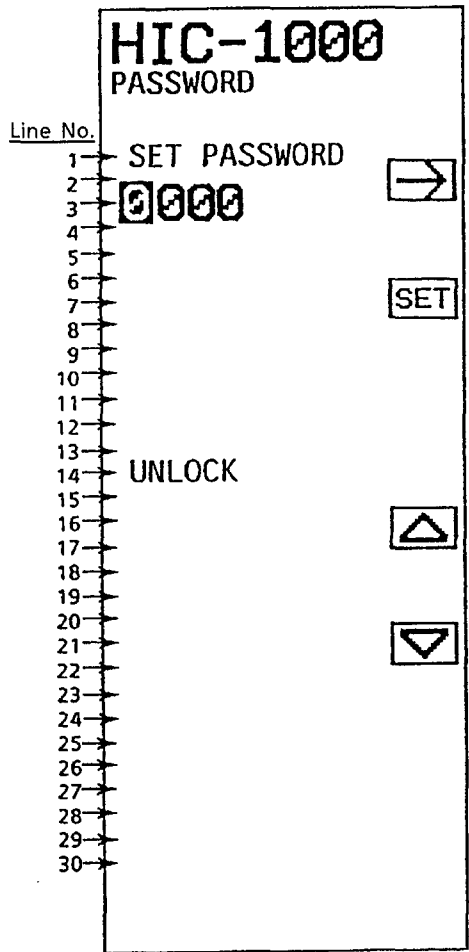
NOTE

Under "UNLOCK" status, the password is disregarded and abandoned. If you want to set in inhibition status for parameter change after completing operation for desired parameter change, set a password again.

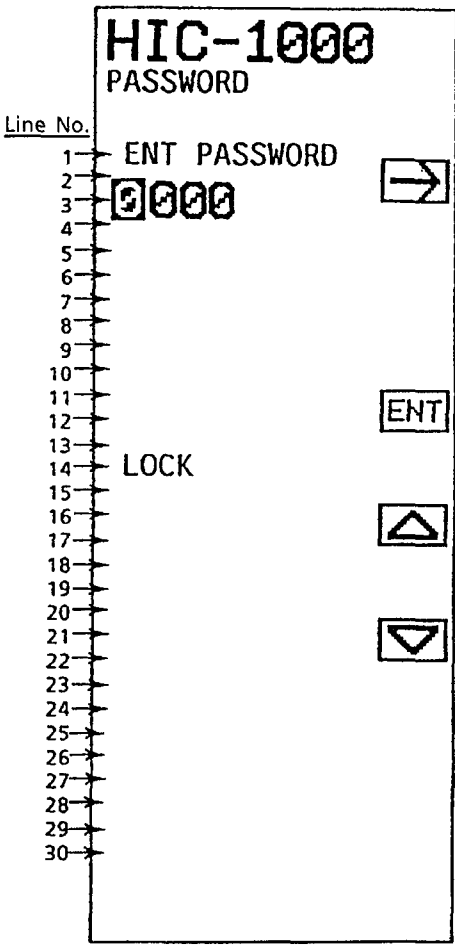
(4) Operation for Panel Opening

■ Display

The following shows an example of the panel display.



Display 10.5 Password Setting Panel



Display 10.6 Password Input Panel

11. Maintenance




This chapter explains adjustment and parts replacement of the YS136, which are relatively simple.

CAUTION

If there is dirt or dust on the YS136, wipe it with a dry soft cloth. Note that if you use any organic solvents, chemicals or chemical cloth, the case of the YS136 may be changed in its shape or color.

11.1 Standard Check

11.1.1 Contrast Adjustment of the Front Panel

The contrast of the front panel (LCD) can be adjusted with the  key. By holding down the  key for 10 seconds or more, the contrast of the front panel varies cyclically between high and low contrast settings. Release the  key at the desired setting.

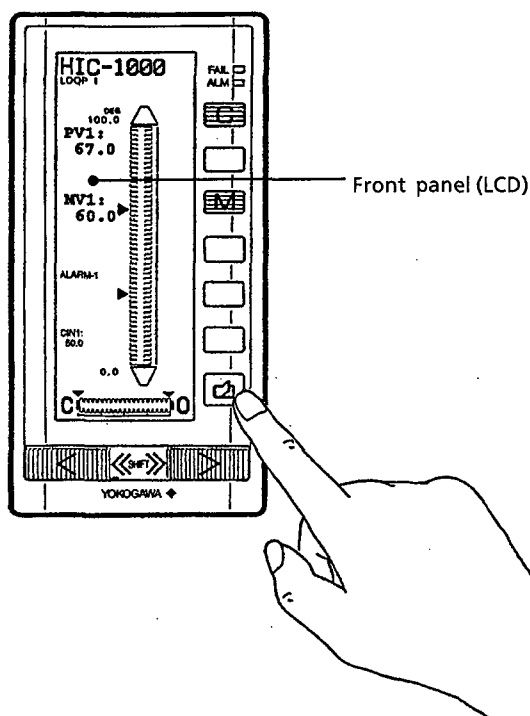


Figure 11.1 Contrast Adjustment of the Front Panel

11.2 Check of Indication Accuracy

We recommend to perform a check of the indication accuracy once or twice a year.

11.2.1 Test Kit for Checking

DC standard voltage generator

: Yokogawa TYPE7651 or similar, 1 unit

Digital multimeter : Yokogawa TYPE7560 Series or similar, 1 unit

11.2.2 Check of Input Indication Accuracy

Only checking is possible to the input indication accuracy. Check the process variable input and cascade setting input by following the procedure below.

- ① Apply 1.0V DC by a standard voltage generator to the process variable input terminal or the cascade setting input terminal.
- ② Check that, using the input output data panel of the tuning panel that the process variable signal or the cascade setting input signal (X1 or X2) is set to an engineering unit equivalent to $0\% \pm 0.2\%$.
- ③ In the same manner, apply 5.0V DC, and check for an engineering unit equivalent to $100\% \pm 0.2\%$.

11.2.3 Check of Output Indication Accuracy

Only checking is possible to the output indication accuracy. Check the 2 manipulated output by following the procedure below.

- ① Connect the digital multimeter to the manipulated output terminal in the current mode when the terminal is set to current output, and in the voltage mode when the terminal is set to voltage output.
- ② Set the operation mode to the M mode.
- ③ Set the manipulated output signal to 0%, using the input and output data panel of the tuning panel.
- ④ Check the output for 4mA DC when it is set to the current output. Check the output for 1.0V DC when it is set to voltage output (allowance is $\pm 1.0\%$ during the current output, and $\pm 0.3\%$ during the voltage output).
- ⑤ In the same manner, set the manipulated output signal to 100%. Then, check the output for 20mA DC when it is set to current output, and check the output for 5.0V DC when it is set to voltage output (allowance is $\pm 1.0\%$ during the current output, and $\pm 0.3\%$ during the voltage output).

11.3 Parts Replacement



IMPORTANT

To carry out the replacement, contact YOKOGAWA sales staff or Repair Center because the inspection is required for safety.



NOTE

■ Notes on Short-Life Parts

- (1) The short-life parts means the parts whose life is expected to end within 10 years under normal condition of use or storage. Therefore, the parts whose life in design is estimated to be more than 10 years are excluded here.
- (2) The recommended replacement cycle is set for the purpose of preventive maintenance of the short-life parts, and it does not guarantee the prevention of their accidental failures.
- (3) The recommended replacement interval is a standard cycle, and it may be longer or shorter depending on the actual condition of use.
- (4) The recommended replacement interval may be changed on the basis of the field failure rate.



TIP

Comments on fuse :

The fuses employed in YS100 Series are free from periodically replacement because it is not a short-life part. To carry out fuse replacement, sufficient handling skill of the instrument and also soldering skill are required. In case that the fuse has burned out, please contact YOKOGAWA sales staff or Repair Center.

	Part No.	Rated Current	Rated Voltage	Fuse Characteristics	Remarks
Fuse	A1422EF	1.6A	250V	Quick acting (F)	For both 100V and 220V version

See Figure 11.5 for location of the fuse.

11.3.1 Notes on Static Electric Discharge

The YS136 uses many semiconductor integrated circuits. Therefore, when removing the internal unit for maintenance or when replacing an internal card of the internal unit, care must be taken for the board not to be damaged by static electric discharge.



IMPORTANT

- ① Put on a conducting wrist-strap which is grounded via a 1MΩ resistor when you remove or install the internal unit. Be sure to ground the

wrist-strap to a grounding terminal close to the ground bus or to a part of the panel where not painted (this part shall be grounded).

- ② When you carry the internal unit with you or store the internal unit, put it in an appropriate conductive bag or a discharge protective bag.

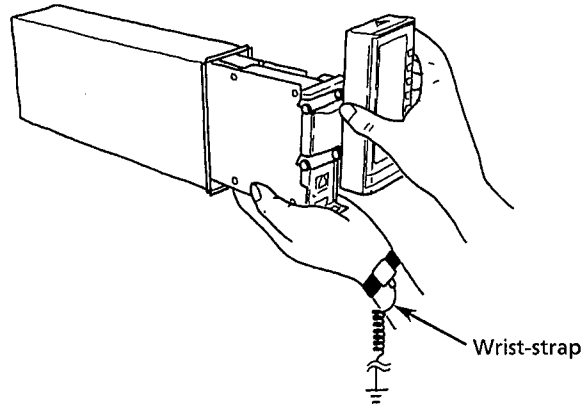


Figure 11.2 Removal and Insertion of the Internal Unit

- ③ To remove or install the internal card of the internal unit and/or the LCD display unit, work must be done on a conductive sheet (on a workbench) which is grounded via a $1M\Omega$ resistor. The operator shall put on the conductive wrist-strap in the same manner as shown under item ① above. Take any plastic materials which can be charged easily away from the workbench.

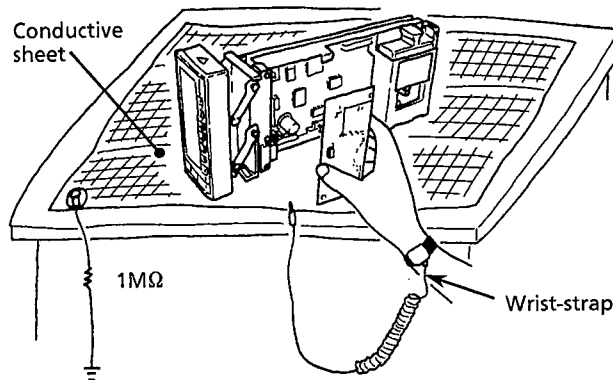


Figure 11.3 Replacement of the Internal Card

- ④ Do not touch components, metal patterns, connectors, pins, etc. of the internal card, by hands without wearing the wrist-strap.

If the wrist-strap and/or the conductive sheet is required, contact YOKOGAWA sales/service office or the dealer from whom the unit was purchased.

11.3.2 Replacing the Fluorescent Tube (Back-Lit Tube)

Average of life time for the FL tube is about 2 years.

Part name and Part No. of Fluorescent tube is following:

Part name : CFL

Part No. : E9760GM

Former YS136 models which 'Style' on the upper side of the instrument indicates S1 may be using different type of fluorescent tube. In that case the colors of its two wires are red and black respectively. Its part number is E9760GL and use the same one.

In case of the part E9760GM the colors of its two wires are blue and black.



CAUTION

Replace the fluorescent tube in accordance with the following procedure.

■ How to Detach

- ① Swing up the front panel.
- ② Detach the case cover at the top of the front panel.
- ③ Disconnect the connector of the fluorescent tube, and pull up the fluorescent tube (see Figure 10.4).

■ How to Attach

- ① Attach a new fluorescent tube by performing the reverse of the steps for "How to Detach" above.
One side of the connector has numbers on, plug in the connector with this side to the front.

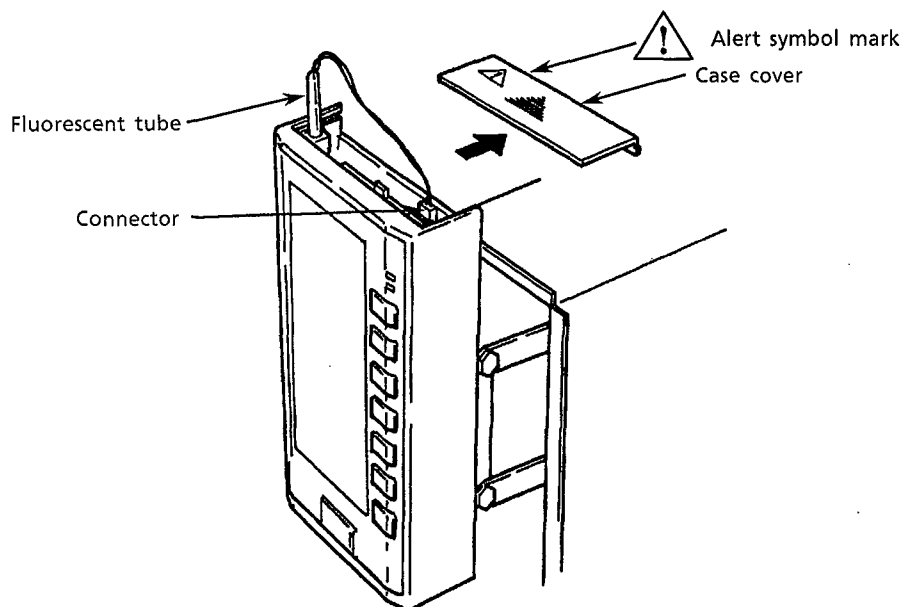


Figure 11.4 Replacing the Fluorescent Tube

11.3.3 Components and Functions of the Parts Inside the YS136

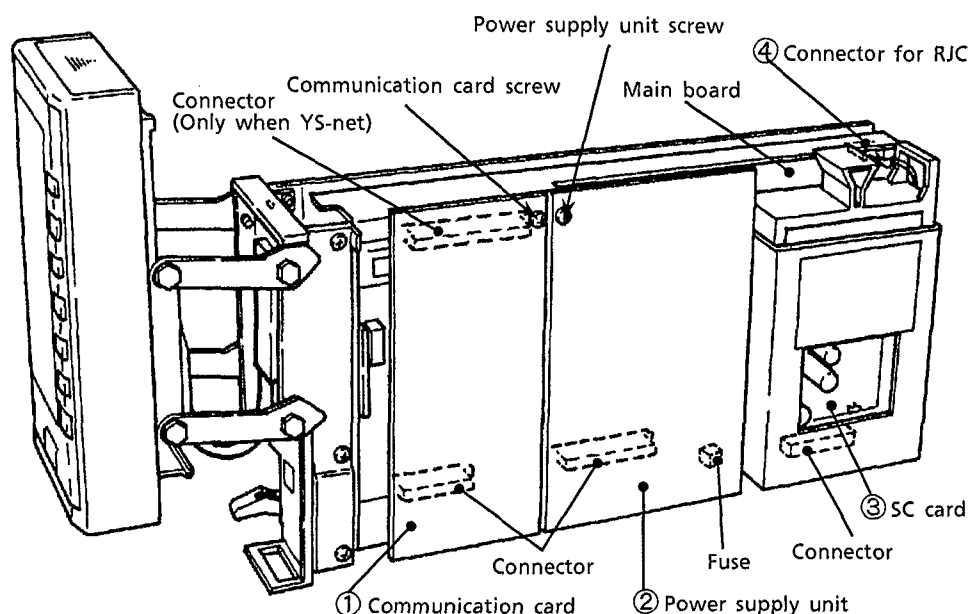


Figure 11.5 Components and Functions of the Parts Inside the YS136

① Communication Card

The RS-485, the DCS-LCS, or the YS-net communication card (optional) is mounted here.

② Power Supply Unit

The power supply unit is mounted here.

③ SC (Signal Conditioner) Card

One of the eight types of the SC cards (optional); mV input, thermocouple input, resistance temperature detector input (RTD), slide wire resistance input, isolation input, 2-wire transmitter input, 2-wire transmitter input (input is not isolated), and frequency input is mounted here.

④ Connectors for the Reference Junction Compensator (RJC)

These connectors are used when the thermocouple input SC card is installed.

11.3.4 Replacing the SC Card

■ How to Detach

- ① Swing up the front panel, and then remove the internal unit.
- ② Hold the pull-up knob at the top center of the SC card, and pull up (in case of the thermocouple input SC card, with taking care of the cable for the RJC) (see Figure 11.6).
- ③ For the thermocouple input SC card, disconnect the connector for the RJC (see Figure 11.7).

■ How to Attach

- ① Along the guides on the left and right, mount a new SC card by performing the reverse of the steps for “How to Detach” above.
- ② When installing the thermocouple input SC card, bind and push in the cable for RJC.

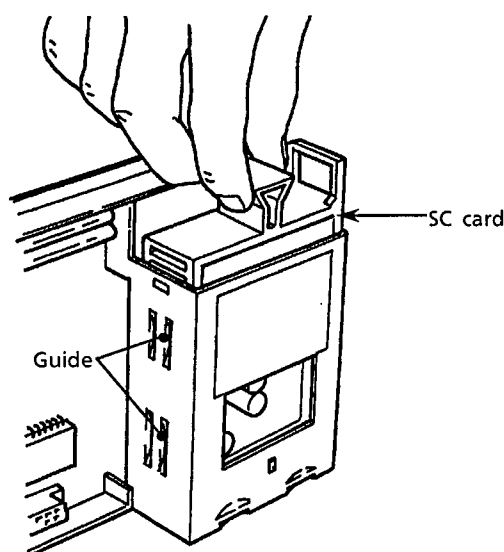


Figure 11.6 Replacing the SC Card

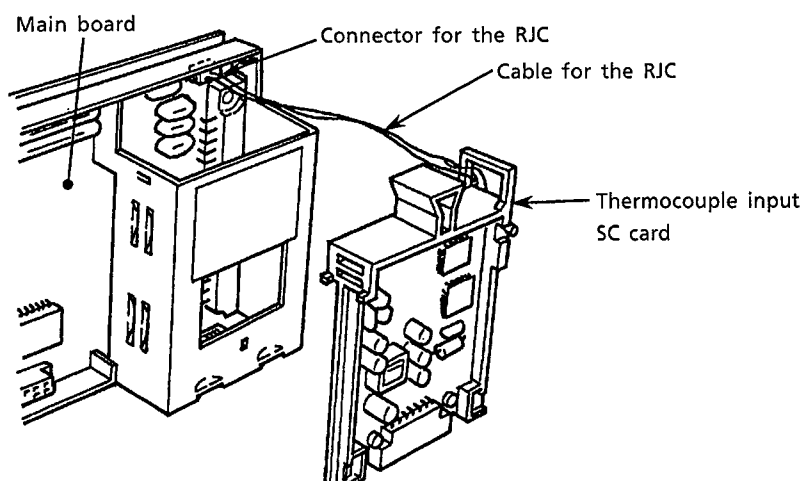


Figure 11.7 Detaching the Connector for the RJC

11.3.5 Replacing the Communication Card

■ How to Detach

- ① Swing up the front panel, and remove the internal unit.
- ② Loosen the fixing screw with a screwdriver.
- ③ While pushing the communication card slightly to the left, pull the right side of the communication card to the front so that it comes to the front of the fixing screw.
- ④ Hold the left and right parts of the connector part, and pull out the card to the front (see Figure 11.8).
- ⑤ When the card is for YS-net communication, it is still connected to the main board through a flat cable (omitted in the figure below). So disconnect the connector at the main board side.

■ How to Attach

- ① Mount a new communication card by performing the reverse of the steps for "How to Detach" above.

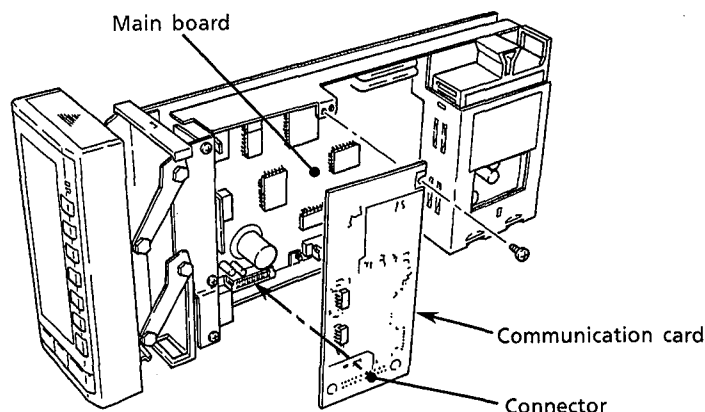


Figure 11.8 Replacing the Communication Card

11.3.6 Replacing the Power Supply Unit

■ How to Detach

- ① Swing up the front panel, and then remove the internal unit.
- ② Remove the screw with a screwdriver.
- ③ Hold the left and right parts of the connector part, and pull out the card to the front (see Figure 11.9).

■ How to Attach

- ① Mount a new power supply unit by performing the reverse of the steps for “How to Detach” above.

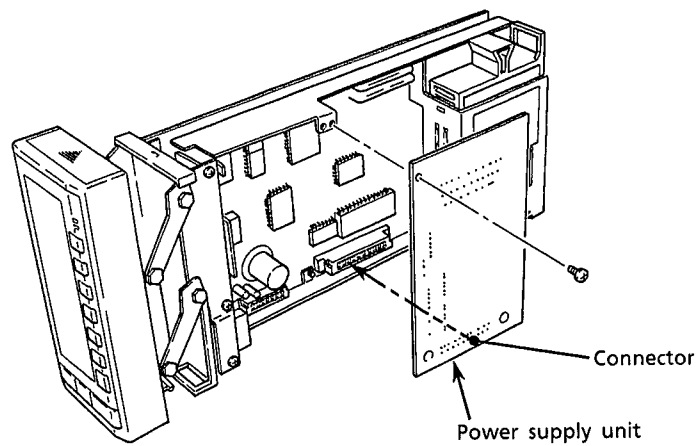


Figure 11.9 Replacing the Power Supply Unit

11.3.7 Replacing the LCD Display Unit

It is recommended that replace the LCD display units is about every seven years of use. To replace the LCD display unit, the display assembly (which contains the LCD display unit) shall be replaced.



IMPORTANT

~~~~~  
This replacement should be performed by an engineer who is thoroughly skilled in this work.  
~~~~~

Part No: E9760CJ (Display assembly)

■ How to Remove

- ① Swing up the front panel, and remove the internal unit.
- ② Remove the four bolts (four at left and right) which are used to fix the front panel, with a box driver (8mm).
- ③ Disconnect the connector of the printed film connector which is used to connect electrically the front panel to the internal unit.

■ How to Install

- ① Install a new front panel by performing the reverse of the steps for "How to Remove" above.
Do not tighten too much the holding bolt.

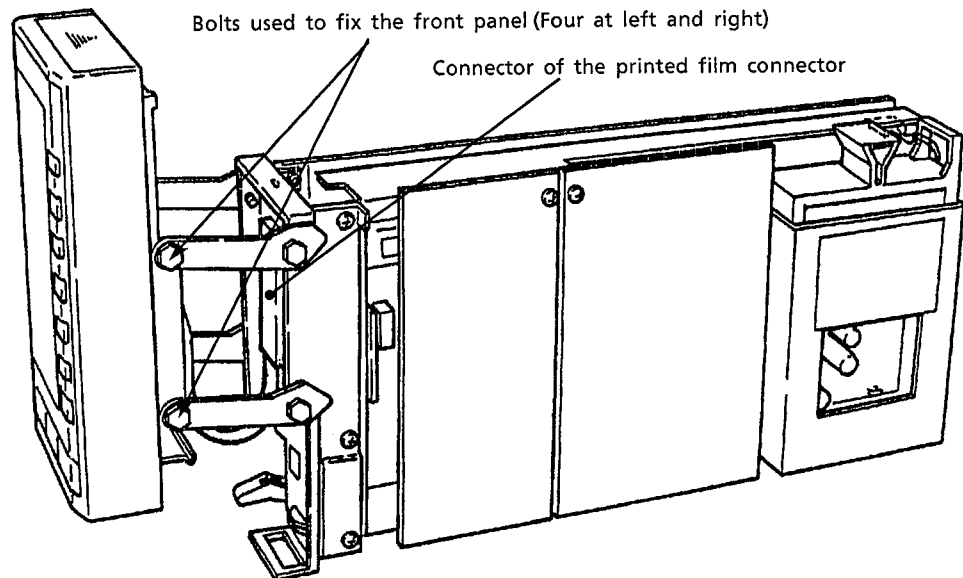


Figure 11.10 Replacement of the LCD Display Unit

11.3.8 Checking for Power-On

When you have replaced the SC card, the communication card, and/or the power supply unit, and/or the LCD display unit, be sure to perform the check of the input indication accuracy (see Section 11.2.2 "Check of Input Indication Accuracy"), and the check of the output indication accuracy (see Section 11.2.3 "Check of Output Indication Accuracy"), and the contrast adjustment of the front panel (see Section 11.1.1 "Contrast Adjustment of the Front Panel").

11.4 Note for Sending Product to be Repaired

If you have trouble with the YS136, please send it to our service office for repair in accordance with the following.



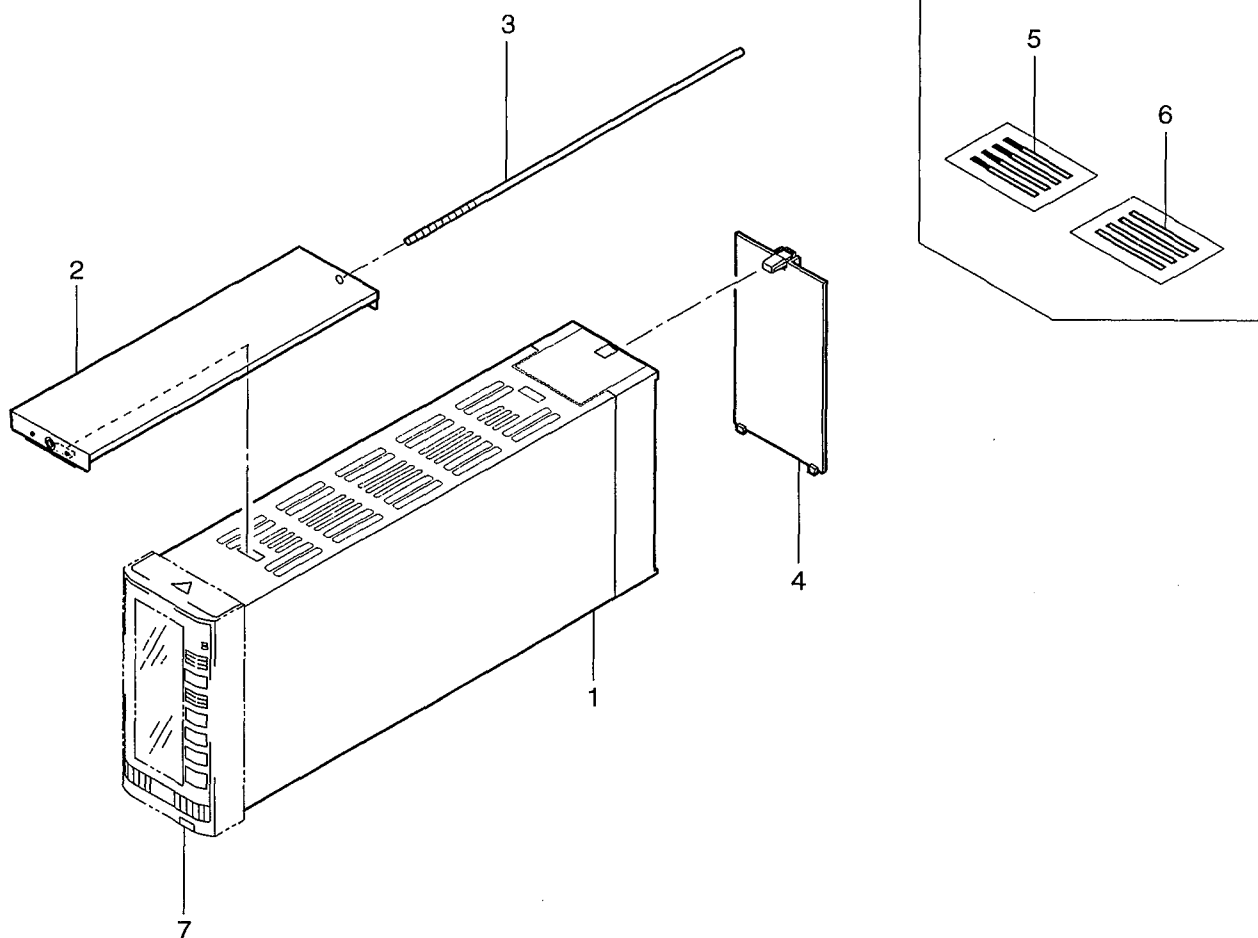
IMPORTANT

- ① Put the YS136 (in its housing) into an antistatic bag and put into the packing box with the inner package.
- ② When sending only internal unit (without housing), put it into antistatic bag and protect it with cushioning material such as air-bubble wrap. And put it into the packing box with the inner package. Be sure to use an antistatic bag to protect semiconductor integrate circuits from damages caused by static electricity.

Customer Maintenance Parts List

Model YS136(Style 2)
Auto/Manual Station (for MV Setting)

YS100 SERIES



Item	Part No.	Qty	Description
1	E9760NH	1	Case Assembly
2	E9760RJ	2	Clamp
3	E9760RN	2	Screw
4	E9760QD	1	Terminal Board Cover
5	E9760XA	4	Label (Tag No.)
6	E9760XL	4	Label
7	—	1	Main Frame Assembly (see pages 2 and 3)

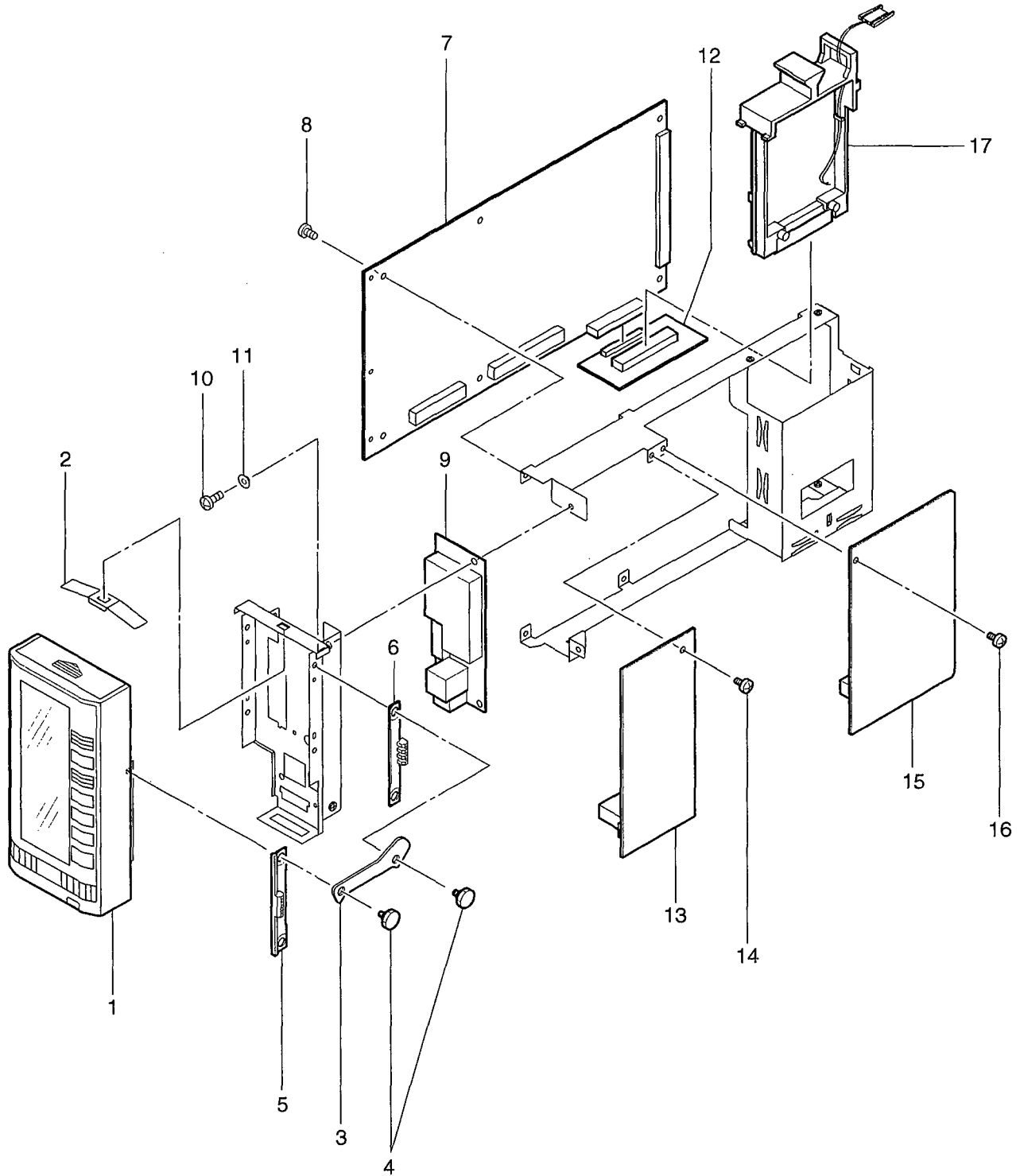
CAUTION

The Customer Maintenance Parts List (CMPL) is provided as reference for when ordering maintenance parts. Do not disassemble or assemble products using the CMPL. YOKOGAWA assumes no liability to any party for damages caused through disassembly or assembly.

注 意

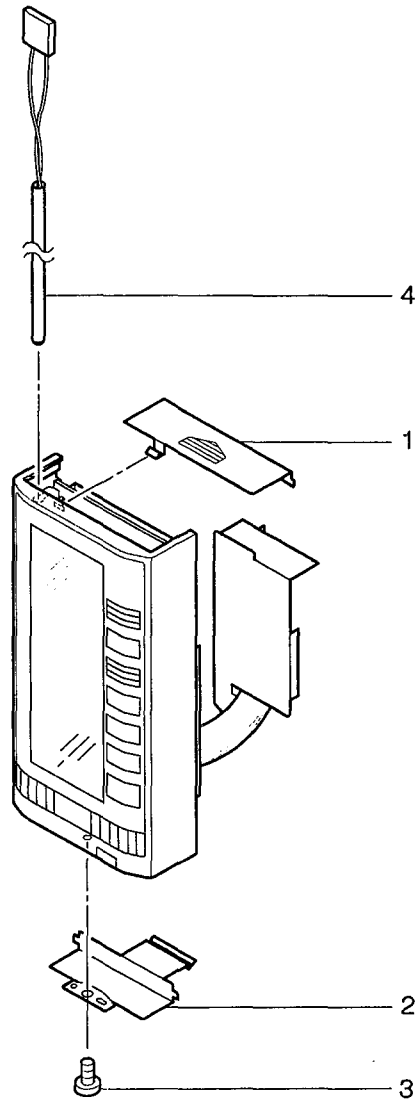
Customer Maintenance Parts List (CMPL)は、メンテナンスパーツをオーダーする時の参考資料として提供するものです。このCMPLにより当該製品の分解・組立てを行わないでください。分解・組立を行った結果お客様が被ったいかなる損害に対しても、当社は責任を負いかねますのでご了承ください。

Main Frame Assembly



Item	Part No.	Qty	Description
1	E9760CJ	1	Display Assembly (see page4)
2	E9760LH	1	Spring
3	E9760LF	4	Link
4	E9760LK	8	Screw
5	E9760LT	2	Spacer
6	E9760LT	2	Spacer
7	E9766BM	1	Main CPU Card Assembly
8	Y9306LB	8	B.H.Screw,M3×6
9	E9766CC	1	Hard Manual and CFL Power Supply
10	Y9308LB	2	B.H.Screw,M3×8
11	G9311AD	2	Bush
12	E9766CA	1	Connector Card
13	Below	1	Option Card
	E9766EB		RS-485 Communication Card (option code:/A31)
	E9766EA		DCS-LCS Communication Card (option code:/A32)
	E9766EC		YS-net Communication Card (option code:/A33)
14	Y9306LB	1	B.H.Screw,M3×6
15	Below	1	Power Supply Unit
	E9766YB		For 100V Version
	E9766YS		For 220V Version
16	Y9306LB	1	B.H.Screw,M3×6
17	Below	1	Signal Conditioner
	EM1		mV Input Card (option code:/A01)
	ET5/YS		Thermocouple Input Card (option code:/A02 or /A12)
	ER5		Resistance Thermometer Sensor Input Card(option code:/A03 or /A13)
	ES1		Potentiometer Input Card (option code:/A04)
	EH1		Input Isolator Card (option code:/A05)
	EA1		Two-wire Transmitter Input Card (option code:/A06 or /A16)
	EA9		Two-wire Transmitter Input Card (option code:/A07 or /A17)
	EP3		Frequency Input Card(option code:/A08)
—	A1179MN	1	Ferritic Core(attachment for option code:/A12,/A13,/A16 or /A17)

Display Assembly



Item	Part No.	Qty	Description
1	E9760FX	1	Cover
2	E9760GR	1	Spring
3	Y9304LE	1	B.H.Screw,M3×4
4	E9760GM	1	Fluorescent Tube(CFL)

Revision Record

- Manual Number : IM 1B7D4-01E
- Manual Title : YS136 Auto / Manual Station for MV Setting

Edition	Date	Revised Items
1st	Mar. 1994	First Edition
2nd	Nov. 1994	Chapter 2 "Function" added
3rd	Mar. 1996	Revised according to the addition of the options / CE and / CSA. Chapter 1 revised (specification) Chapter 3 revised (wiring, etc.) Chapter 7 revised (alarm specification) Chapter 11 revised (cautions, etc.).
4th	Feb. 1997	Revised according to style changes (S2). Chapter 3, 4 and 11 revised (YS-net function added, new LCD).
5th	Aug. 2004	Revised according to the addition of "CE mark safety standards supplement YS100 series" to the User's Manual, and the change of the company name.

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