

General Specifications

Model YS131
Indicator with Alarm

YS 100 SERIES

GS 01B07D02-01E

GENERAL

The YS131 indicator with alarm has 2 point inputs and dual loop display. For both inputs, high/low limit and high-high/low-low limit alarms are available. Total six output contacts are available after taking AND or OR logic of any alarms.

STANDARD SPECIFICATIONS

Basic Functions

Display / Setting Functions

PV input display : PV bar graph or trend display, and digital display

PV input 1 & 2 are displayed in the dual loop panel. Each loop input is also displayed in each loop or trend panel.

Parameter setting : Set on Tuning panel and Engineering panel

Alarm Functions

Applicable for process variable input 1 & 2

Alarm Action : High limit, Low limit, H-H Limit, L-L Limit alarms

Alarm Setting : -6.3 to 106.3% (in engineering unit)
Set on the Tuning panel.

Alarm setting point is displayed in the one loop and dual loop panels. The alarm setting points for High limit and Low limit are always displayed, the setting points for H-H Limit and L-L Limit are displayed only when pressing CHG key.

Alarm Hysteresis : 0.0 to 10.0 % of span

Alarm Indication : Yellow lamp (ALM) on front panel is lit, displayed on the single loop panel and alarm panel in detail

Output Contact: Total six output contacts after taking AND or OR logic of any alarms.

Alarm contacts output, open or close : Selectable
(For each output of six independently)

On power failure : Contact outputs open

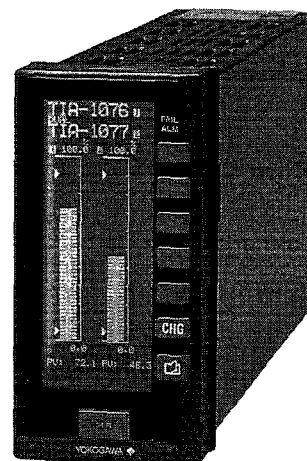
Input Signal Conditioning Computations

Square root with low signal cut off

Computes square root for PV input 1 & 2. Cut off signals below the "cut off" point (selectable between 0.0 and 100.0%)

First order lag filter

Computes input filter for PV input 1 & 2.
Time constant range: 0.0 to 800.0 sec



Input / Output Computational Period
100 msec

Trend Recorder Specification

Trend recording span (scan rate in parenthesis)

: 1.5min (1sec), 7.5min (5sec), 15min (10sec),
45min (30sec), 1.5hr (1min), 7.5hr (5min),
15hr (10min), 45hr (30min)

Trend data points : 90

Front Panel Specification

The YS131 display panels are changed by use of keys on the front display panel.

Change panel key : 1

CHG key (Switching SV of H/L or H-H/L-L limit) : 1

SHIFT key (Switching panel group) : 1

Display lamp : 2 Fail lamp red,
Alarm lamp yellow

Panel Specification

● Bar Graph

Scale graduations : Maximum 10 (1, 2, 4, 5, 10 available)
0% and 100% value of scale (in engineering units):

4 digits plus decimal point and sign

PV bar graph resolution : 0.5% (200 elements / 100%)

Alarm set value pointer display resolution : 0.5%

Displaying PV over flow : More than 100.1%

Displaying PV under flow : Less than 0%

● **Tag No. and Other Values Displayed**

Tag No. Display: Alphanumeric.
 Maximum 8 digit.
 Digital PV display: 4 digit in engineering unit
 plus decimal point and sign

Display Panel Specification

Front display panels are classified in three groups:
 Operation, Tuning, and Engineering panels.

● **Operation Panels**

LOOP 1, LOOP 2, TREND 1, TREND 2 and ALARM.

● **Tuning Panels**

SETTING, PARAMETER, and I/O DATA.

● **Engineering Panels**

CONFIG 1, CONFIG 2, CONFIG 3, SC MAINT, PASS -
 WORD and FX TABLE.

Communication Function

YS-net communication

YS-net can be used for personal computer communication.

● **Communication specifications**

Communication interface : Specification unique to YS-net (2
 terminals)

Communication speed : 78.125 kbps

Connection method : Daisy-chain connection

Communication distance : Maximum 1000 m

Communication cable : Twisted-pair cable

● **Function of Personal Computer Communication**

This function is used to communicate with a personal computer.
 Data can be exchanged with application software on Windows
 with the DDE server function without a program.

Maximum number of instruments to be connected :

16 (can be extended up to 63 by extra
 engineering) (combination of YS131, YS135,
 YS136, YS150 and YS170 is possible.)

Simultaneous use with peer-to-peer communication :
 available

YS-net communication specifications on the computer side :

Personal computer : compatible with IBM
 PC / AT

YS-net communication board (for ISA slot)

YSS50 YS-net parameter definition file

Communication softwares (DDE server)

OS of Microsoft Windows version 3.1 or later.

Also, application software with a DDE
 server function is necessary.

(For example, Microsoft Excel or other
 SCADA software)

* Windows is a trademark of Microsoft
 Corporation. Microsoft is a registered
 trademark of Microsoft Corporation.

Communication items :

Various kinds of parameters such as the
 measured value can be sent or received.
 Selectable data setting permission by
 communication.

Communication cycle: 1 sec

RS-485 communication

● **Communication Specifications**

Communication interface : RS-485 (5 terminals)

Transmission Control : Start - stop synchronization, no
 protocol, half - duplex

Communication speed : 1200 , 2400 , 4800 , 9600 bps

Connection Type : Multi Drop Type

Maximum number of instruments

to be connected : 16 (combination of YS131,
 YS135, YS136, YS150, YS170
 is possible.)

Communication distance : Max. length is 1200m

Max. text length : 220 Byte

Time to wait between characters : 0.1 sec

● **Communication Items**

Selectable to read/write several parameters. Selectable data
 permission by communication .

Power-Fail / Restart Functions

Select from following three recovery modes ;

TIM1 mode : Up to approx. 2 sec. , HOT start.

Longer than approx. 2 sec. , COLD start .

TIM2 mode : Up to approx. 2 sec. , HOT start .

Longer than approx. 2 sec. , Initial start .

AUT mode : Always HOT start .

For long power failure, always initial start .

Life of parameter backup : Over 48 hours , average is 7
 days (Backed up by charge on
 super capacitor)

If over for back up time, parameters previously stored in
 EEPROM are used . Use the SAVE Key to write to EEPROM.

Action by start type

	HOT Start	COLD Start	Initial Start
Parameter	Same as before Power-Fail	Same as before Power-Fail	Same as stored in EEPROM
First order lag filter	Continue	Initialize	Initialize

Self-Diagnostic Features

Failure of computation circuit :

FAIL lamp lit. Fail contact output is open.
 (open at power failure)

Failure of input signals :

ALM lamp lit, Display the origin for alarm

Display for failure of YS131

Upon failure, the display changes to the Fail panel.

I/O Signals Specifications

Analog Input Signal

Analog input : 1 to 5V DC , 2 points,
 Option for single direct input (mV, TC,
 RTD, 2-wire transmitter, potentiometer
 or frequency input).

Input resistance: More than 1M Ω

Status Output Signal

Alarm status output signal : 6 points

(Outputs after taking AND or OR logic of any alarms)

Transistor contact 30V DC 200mA (resistance load)

Fail output signal : 1 point

Transistor contact 30V DC 200mA (resistance load)

Signal Isolation

The analog input/output circuit is not isolated from the computation circuit, and use a negative common ground. Status output signals are isolated from computation circuit, and isolated from each other. Isolation is also provided between the computation circuit and power supply circuit.

For the direct input, isolation is provided between the computation circuit, the input circuit, and power supply circuit.

Distributor Power Supply for Transmitter

Power Supply for Transmitter : 24VDC 30mA

(No short circuit protection)

It is not isolated from the computational circuits.

When it is shorted the computation will stop.

Provide external resistance(250 Ω) for 1 to 5V.

Safety Requirements Conformity Standards

The YS131 conforms to the safety requirements as shown below except when with the option /D□□.

IEC1010-1 : 1990

EN61010-1 : 1992

EMC Conformity Standards

The instruments with the option /CE have the EMC conformity as shown below.

For EMI (Emission) - EN55011 : Class A Group 1

For EMS (Immunity) - EN50082 - 2 : 1995

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

Hazardous Area Classification

The YS131 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

Design Performance

Accuracy rating for 1 to 5V input : $\pm 0.2\%$ of span

Effect of ambient temperature change

on accuracy rating : $|Accuracy| / 2$ (per 10°C between 0°C to 50°C)

Effect of power supply voltage variation

on accuracy rating : $|Accuracy| / 2$ (within rated power supply voltage)

Max. current flow : 600mA (DC drive of 100V version)

100mA (DC drive of 220V version)

Max. power consumption :

26VA / 100VAC (AC drive of 100V version)

29VA / 220VAC (AC drive of 220V version)

Current flow and power consumption

for recommended voltage : 430mA Typ. at 24VDC

19VA Typ. at 100VAC

23VA Typ. at 220VAC

Isolation Resistance

Between I/O Terminals and Ground:

More than 100M Ω / 500VDC

Between Power supply and Ground :

More than 100M Ω /500VDC

Withstanding Voltage

Between I/O Terminals and Ground:

500V AC for 1minute

Between Power supply and Ground :

100V AC version : 1000V AC for 1 minute

220V AC version : 1500V AC for 1 minute

Common mode noise rejection : 83dB(50Hz)

Series mode noise rejection : 46dB(50Hz)

Normal Operating Condition

Ambient Temperature: 0 to 50°C

Ambient Humidity : 5 to 90%RH (non-condensing)

Rated Power Supply Voltage : For both DC and AC

100V version ;

DC drive ; 24 - 120VDC $\pm(\pm 10\%)$, no polarity

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

220V version ;

DC drive ; 135 - 190VDC $\pm(\pm 10\%)$, no polarity

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

Under this rated voltage the instruments conform to the safety requirements in IEC1010-1 and EN61010-1. Under this condition the safety barrier BARD is allowed to be connected to the inputs.

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 - 130VDC, no polarity

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

220V version ;

DC drive ; 120 - 340VDC, no polarity

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

Dimensions, Mounting, Wiring

Mounting type : Direct panel mount

Panel mounting: Direct panel mounting kit (side by side)

Panel cut out : $137^{+2} \times 68^{+0.7}$ (mm) [5.4 \times 2.7 (inch)]

Connecting type :

External connections : Use ISO M4 screws

Power supply, ground connections : Use ISO M4 screws

Housing dimensions : 144×72×320mm
 [5.7×2.8×12.6 (inch)]
 (H×W×Depth behind panel)

Weight : 2.6kg,

MODEL & SUFFIX CODES

Model	Suffix Code	Option	Description
YS131			Indicator with Alarm
For use	-0		General
	0		Always 0
Power Supply	1		100V version
	2		220V version
Options		/ □	Option (Refer to the following table)

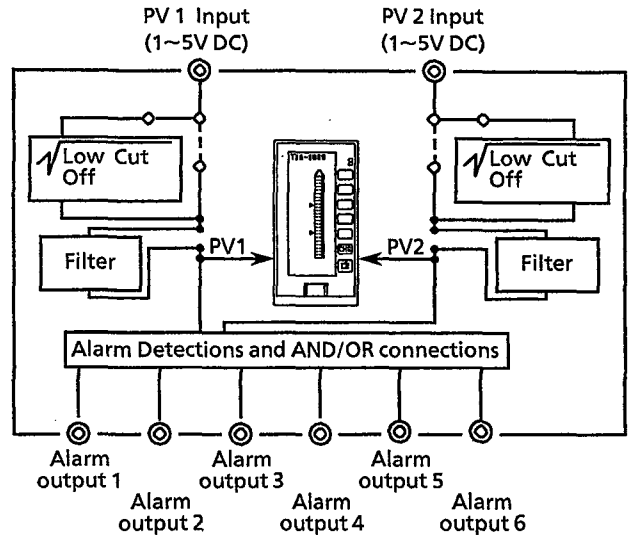
OPTION CODES

	Option Codes	Combination with /CE	Combination with /CSA	Description
	/ CE / CSA	- No	No -	CE Mark Approved CSA Non-incendive Approved
Input Options	/ 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 Options 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	
Communication	/ A31	Yes	Yes	It is possible to select one from the followings; RS - 485 YS - net
	/ A33	Yes	Yes	
Construction	/ D11	No	No	It is possible to select one from the followings; Replace for YEW SERIES 80 Internal Unit (Separate ordered for housing or use SHUP that already mounted) Closely Mounting for YEW SERIES 80 Housing Replace for 100 Line Internal Unit (Order YS006, YS100 Housing for 100 Line, separately.)
	/ D12	No	No	
	/ D13	No	No	

ORDERING INSTRUCTIONS

When ordering , specify the model & suffix code and option code if necessary.

BLOCK DIAGRAM



INPUT OPTIONS

Name		mV input	Thermocouple input	Resistance temperature detector input	Potentiometer
Option Code		/A01	/A02, /A12	/A03, /A13	/A04
Input Signal		DC voltage - 50 to +150mV	JIS, ANSI Thermocouple Type K, T, J, E, B, R, S IEC, ANSI Type N	RTS JIS' 89Pt100 (DIN Pt100) or JIS' 89 JPt100 3-wire Current : 1mA	potentiometer 3-wire
Measuring Limit	Span	10 to 100mV DC	10 to 63mV (Thermoelectric conversion)	10 to 650°C 10 to 500°C (JPt100)	Total resistance 100 to 2000Ω Span 80 to 2000Ω
	Zero El- evation	The smaller one of 3 times of span or ±50mV	The smaller one of 3 times of span or ±25mV	Max. 5 times of span	Within 50% of total resistance
Measuring Range		Set on Engineering panel			
Input Resistance		1MΩ (3kΩ when power off)		-	-
Input External Register		Less than 500Ω		Less than 10Ω / wire (note 1)	Less than 10Ω / wire
Allowable Input Current, Voltage		- 0.5 to 4V DC		-	-
Input Linearization		None	provided	provided	None
1 to 5V Output Accuracy Rating		Within ±0.2% of span	Within larger of ±0.2% of span or ±20μV of input conversion	Within larger of ±0.2% of span or ±0.2°C	Within ±0.2% of span
Reference Junction Compensation Error		-	Within ±1°C (note 2)	-	-

(note 1) The smaller one of 10Ω or measuring temperature span × 0.4Ω per wire.

(note 2) For Type B, there is no reference junction compensation.

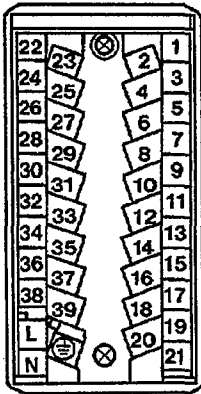
For other types, when the measured temperature is less than 0°C, multiply above error by K.

$$\text{where } K = \frac{\text{TC output per } ^\circ\text{C at } 0^\circ\text{C}}{\text{TC output per } ^\circ\text{C at measured temperature}}$$

Name	Input isolator (1 to 5V input)	2-wire transmitter input	2-wire transmitter input (Input : not isolated)
Option Code	/A05	/A06, /A16	/A07, /A17
Input Signal	1 to 5VDC	4 to 20mADC signal from 2-wire transmitter (Transmitter power supplies)	4 to 20mADC signal from 2-wire transmitter (Transmitter power supplies)
Input Resistance	1MΩ (100kΩ when power off)	250Ω	250Ω
Input External Register	-	Less than $RL = (20 - \text{minimum transmitter operating voltage}) / 0.02 \text{ A } (\Omega)$	Less than $RL = (20 - \text{minimum transmitter operating voltage}) / 0.02 \text{ A } (\Omega)$
Allowable Input Current, Voltage	±30VDC	40mADC	40mADC
Input Linearization	None	None	None
1 to 5V Output Accuracy Rating	Within ±0.2% of span	Within ±0.2% of span	Within ±0.2% of span

Name	Frequency input
Option code	/A08
Input Signal	2-wire type : ON/OFF contact , voltage pulse , current pulse (Internal distributor may be used to supply power to transmitter) 3-wire type : Voltage pulse , internal distributor may be used to supply power to transmitter
Input Frequency	0 to 10 kHz
100%Frequency	0. 1 to 10 kHz
Zero elevation	May be varied between 0 to 50% of input frequency.
Low level input cut off point	Set in range : 0. 01 Hz (and more than 1% of max. frequency) to 100%
Minimum input pulse width	ON time : 60 μ sec OFF time : 60 μ sec (for input frequency 0 to 6 kHz) ON time : 30 μ sec OFF time : 30 μ sec (for input frequency 6 to 10 kHz)
Input signal level	Contact input : Relay contact , transistor contact Detection level Open : more than 100 k Ω Close : less than 200 Ω Contact rating : at least 15 VDC , 15 mA Voltage / Current input : Low level : -1 to +8 V, High level : +3 to +24 V Voltage swing : at least 3 Vpp (for input frequency 0 to 6 kHz) at least 5 Vpp (for input frequency 6 to 10 kHz)
Internal load resistance	Selected from 200 Ω , 500 Ω , 1 k Ω (for current pulse input)
Input filter	10 msec filter enable/disable (contact or voltage)
Internal distributor	12VDC 30 mA or 24 VDC 30 mA can be selected .
1 to 5V output Accuracy rating	Within $\pm 0. 2\%$ of span

TERMINAL DESIGNATION



Terminal Designation Table

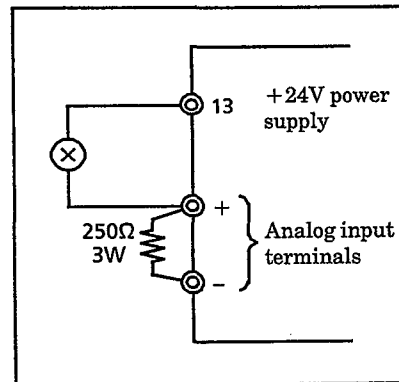
Terminal No.	Signal Contact
1	+ > PV 1 (1 to 5 VDC)
2	- > PV 1 (1 to 5 VDC)
3	+ > PV 2 (1 to 5 VDC)
4	- > PV 2 (1 to 5 VDC)
5	+ > PV 2 (1 to 5 VDC)
6	- > PV 2 (1 to 5 VDC)
7	+ > PV 2 (1 to 5 VDC)
8	- > PV 2 (1 to 5 VDC)
9	+ > Direct input signal output (1 to 5 VDC) (note 2)
10	- > Direct input signal output (1 to 5 VDC) (note 2)
11	+ > Fail output
12	- > Fail output
13	Power supply for transmitter + (24VDC (note 2))
14	Communication (SG)
15	Communication (SA)
16	Communication (SB)
17	Communication (RA) or YS-net DA
18	Communication (RB) or YS-net DB
19	+ } Direct input (note 3)
20	- } Direct input (note 3)
21	- } Direct input (note 3)
22	+ > Alarm output 1
23	- > Alarm output 1
24	+ > Alarm output 2
25	- > Alarm output 2
26	+ > Alarm output 3
27	- > Alarm output 3
28	+ > Alarm output 4
29	- > Alarm output 4
30	+ > Alarm output 5
31	- > Alarm output 5
32	+ > Alarm output 6
33	- > Alarm output 6
34	+ > Alarm output 7
35	- > Alarm output 7
36	+ > Alarm output 8
37	- > Alarm output 8
38	+ > Alarm output 9
39	- > Alarm output 9
L	+ > Power supply
N	- > Power supply
⊕	Ground (GND)

Wiring for Direct Input

		Terminals		
		19	21	20
mV, Thermocouple input		+		-
Resistance temperature detector RTD (note 1)		A	B	B
Potentiometer input (note 2)				
Fre- quency input	2-wire (volt contact)	+		-
	2-wire type	Signal	Power supply	
	3-wire type	+	Power supply	-
2-wire transmitter input (note 3)		+		-

(note 1) Designations for A,B,B obey JIS Standard .
 (note 2) Wiring resistance of 19 must be the same as 20 .
 (note 3) For 4-20mA input that does not need the power supply transmitter , wire to 20 (+) and 21 (-) .

Connection diagram of power supply to transmitter

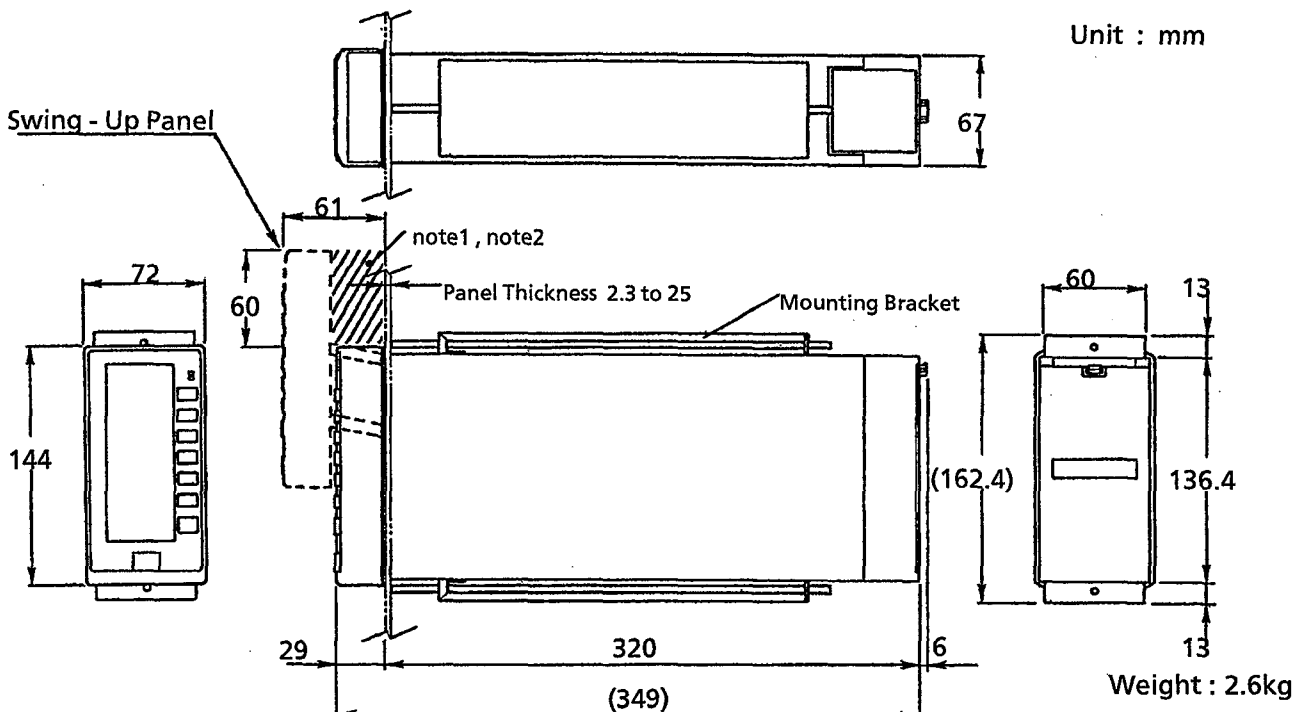


ACCESSORIES

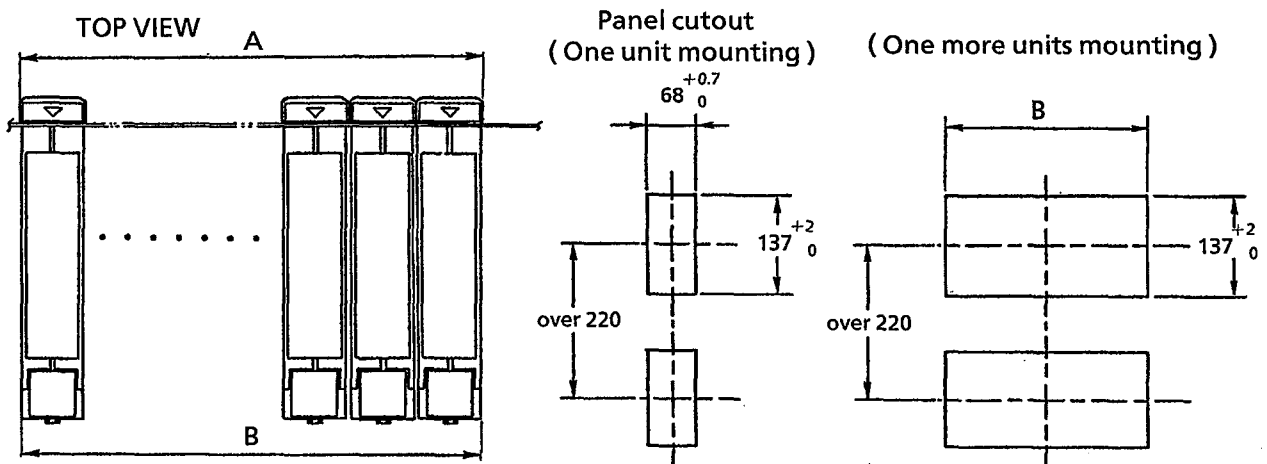
- Tag plate sheals : 4 sheets
- Range sheals : 4 sheets

(note 1) Nothing must be connected to the terminal with no designation.
 (note 2) When connecting a direct input to direct input terminals (19,20,21) , these terminals are the output terminals for the 1 to 5V output signals.
 (note 3) For terminal connection , refer to other table "Wiring For Direct Input. " .

EXTERNAL DIMENSION



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.



The Normal Allowable difference = ± (Value of IT18 for JIS B 0401 - 1986) / 2

Panel cutout for mounting closely multi - unit

Unit Size	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

Unit Size	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