

# Operating Manual

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## Differential Pressure Manometer MODEL KS3200

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## 1. Out Line

The KS3200 is a very small sized digital difference pressure indicator which incorporates a monolithic silicon semiconductor pressure sensor.

It is the best solution to very low pressure measurement.

KS3200 is designed for the application of the semiconductor device equipment such as Coetar Developer, Cleaning and Furnace etc and has two transistor output(NPN or PNP) and Relay output, analog output 4-20mA or 1-5V.

Connector type XH connector (JST)

## 2. Handling Note

Recheck the following items before turning on the power.

Input and output wires, If the output terminal is connected to the power the interior circuit will be damaged.

Power voltage : Pressure range : Begin actual operation after the heat line is activated for over five minutes after the power is turned on.

Excessive pressure.

Please do not apply pressure exceeding the maximum pressure as shown in the specification on catalogues.

The excessive pressure may affect the sensor characteristics and may make accurate measurement impossible.

Insert and contact of foreign matter.

A pressure sensor chip is placed inside the pressure port. If foreign matter such as wire inserts through the pressure port, damage could be occur.

This must be absolutely avoided.

### • On this manual

This Manual serves to illustrate the capabilities and appropriate use of the Pressure Controller KS3200.

Inappropriate use or improper handling can lead to potential hazards for persons and intrinsic values.

Therefore, any person entrusted with working with the device must be instructed and aware of the potential risks.

This manual and its safety notices in particular must be addressed to with care.

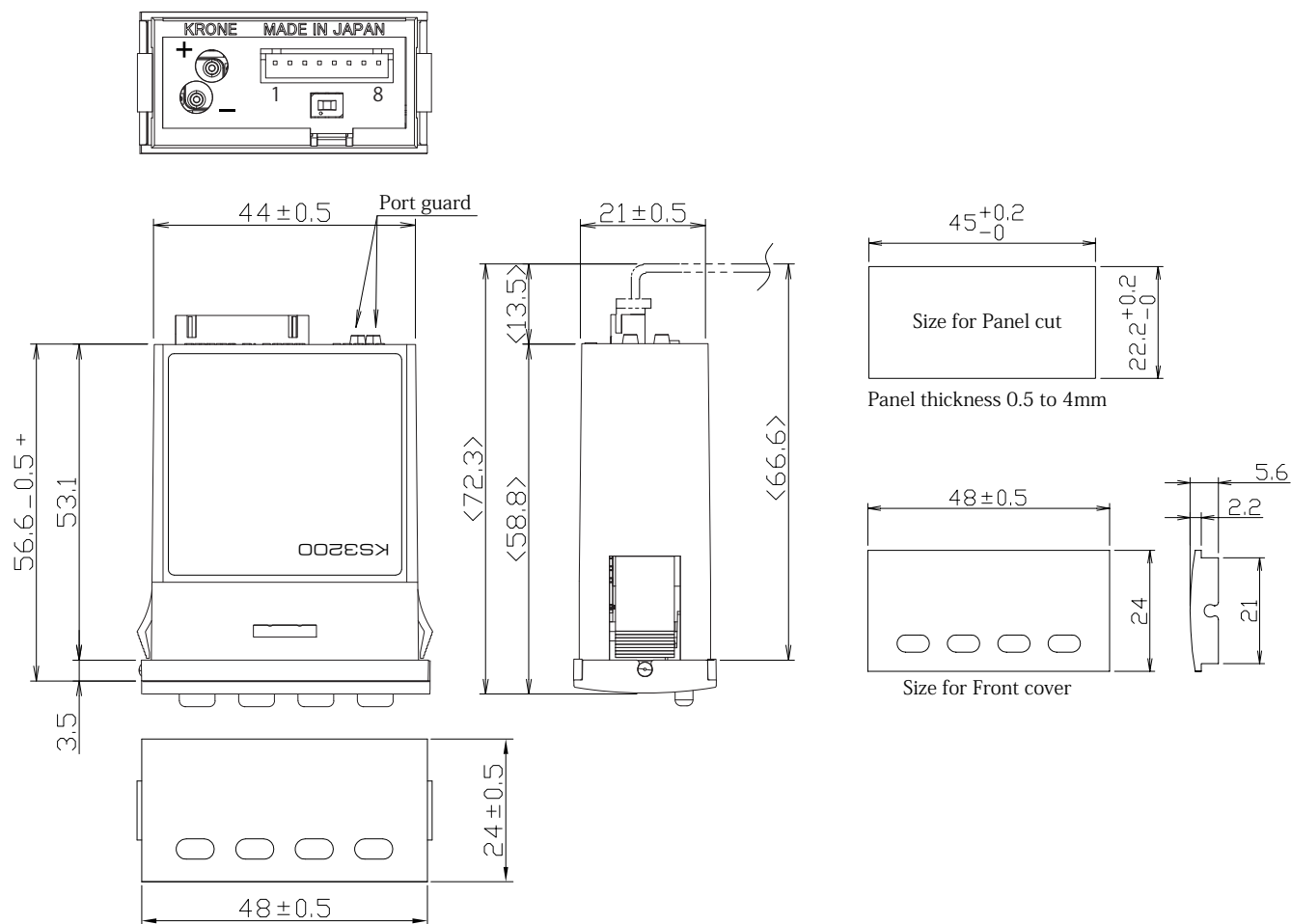
If any doubts occur concerning the proper understanding of any paragraph of this manual, please consult the manufacturing company.

- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- Do not close the pressure input ports when shipping, as changes in barometric pressure could damage instruments with low measuring ranges.
- Only technical personnel who are appropriately trained and authorized by the operator of the facility may assemble the instrument and set up its electrical connections.
- The instrument may only be operated by appropriately trained individuals who have been authorized by the operator of the facility.
- Measurement errors may occur if the instrument is not kept protected from sunlight.
- Altitude up to 2000 m;
- Applicable POLLUTION DEGREE of the intended environment (POLLUTION DEGREE 2).
- Please do not apply power when connect the connector.
- Please do not apply lateral stress on the ports in order not to break the ports.
- Do not operate the changeover switch on the back. Always keep the switch on the G side under normal circumstances. If the power supply is connected to COM via a relay connection, switching the switch to the P side will damage the device. In any other case, the power will be turned off when the switch is on the P side.

### 3. Size

3-1 B8B-XH-A (8pins connector)

Dimensions : mm



#### 4. Specification

Model		KS3200
Method of pressure		Differential
Sensor		Semi conductor piezoresistors wheatstone bridge
Pressure range		0-100~5000Pa、 $\pm 100 \sim \pm 5000$ Pa
Display accuracy (*1)		$\pm 1\%FS \pm 1$ digit, (More than 500Pa) 100Pa= $\pm 3\%FS \pm 1$ digit 200Pa= $\pm 2\%FS \pm 1$ digit 300Pa= $\pm 1.5\%FS \pm 1$ digit
Temperature drift		Max $\pm 0.1\%F.S./^{\circ}C$ (0~50 $^{\circ}C$ )
Medium		Air, non-corrosive dry gasses (dust is not permitted)
Element		Semi conductor silicon
Over pressure / Burst pressure		0-100~1000、 $\pm 100 \sim \pm 1000$ :50kPa/80kPa 0-2000~5000、 $\pm 2000 \sim \pm 5000$ :80kPa/550kPa
Power supply		24VDC( $\pm 10\%$ ) NEC(National Electrical Code) Class2 or LPS(Limited Power Source)
Current consumption		53 mA (within 20mA-Aout,Backlight:on, without PNP output current)
Comparator	Setting method	Digital setting by front panel
	Pressure setting range	Hi and Lo 0-100%F.S(min:1Pa)
	Switching hysteresis	0-100%(min:1Pa)
	Comparator output	Hi, Go, Lo output
	Output	[NPN open corrector] Sink Current:100mA less/ Resistive load(Vsat:1.35V) Maximum applying voltage:24VDC [PNP transistor output] Output voltage follows power source Source current:80mA less (Voltage drops:2V) Maximum applying voltage:24VDC [Relay output]* Contact: Normally open N.O (1-Form-A) On-resistance: 0.25 $\Omega$ (max) Dielectric strength voltage: 3750 Vrms (min) On-current: 0.9 A (max) resistiv load. Maximum applied voltage: 24 VDC
Display	Output display	7 segment LCD (with Backlight)
	Display rate	Selectable from 0.1/0.5/1/2/5/10/20/30/60/180/300/600/1800/3600 sec.
	Over flow display	Display Blink at pressure in $\geq 110\%F.S.$
Analog output	Analog output	4-20mA or 1-5V
	Accuracy (*1)	$\pm 1.0\%F.S \sim$
	Load resistance	standerd=250 $\Omega$ , Max : 350 $\Omega$
	Resolution	4 $\mu A$

\*SSR(Solid State Relay) UL508

Item		Specification
environment	Operating temperature range	0-50 °C (Not be freeze)
	Humidity Limits	35-85%
	Storage temperature range	-20°C ~ +70°C
	Operating environment	Indoor
	Altitude	up to 2000 m
	POLLUTION DEGREE	POLLUTION DEGREE 2
	Protection standard	IP40 (Front panel only)
	Warming up time	Not lower than 5 minute
Sampling rate		0.1 sec
Insulation resistance		Not lower than 100MΩ (Across the panel and terminals, DC500 V)
withstand voltage		500VAC (Across the panel and terminals, 50/60Hz 1 minute)
Pressure port		max $\phi$ 3.0mm (heat resistant polyamide) $\times$ 2
Electric connection		(8pins connector) JST:B8B-XH-A
Material		ABS(Case)
Dimensions		24(H) x 48(W) x 70(D)mm
Mounting		Panel mount
Mountng error		None
Weight		Approx.48 g
Tests / Admissions		UL : E361798 CE : EN61326-1-2021 RoHS

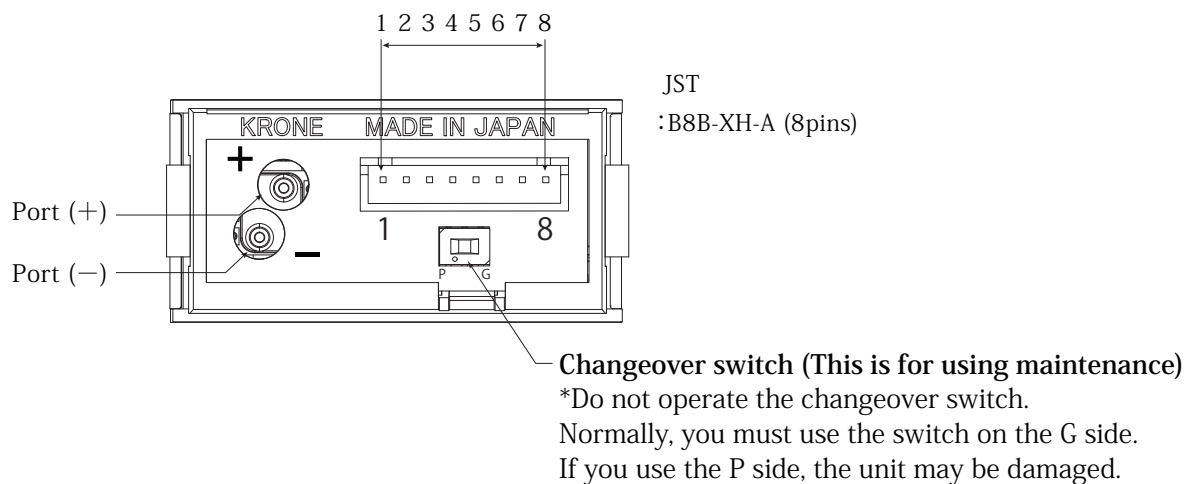
#### Option Pressure Range and accuracy

Pressure Range	Display accuracy	Analog output accuracy
0-100 Pa	$\pm 3 \%FS \pm 1 \text{ digit}$	$\pm 3 \%FS$
0-200 Pa	$\pm 2 \%FS \pm 1 \text{ digit}$	$\pm 2 \%FS$
0-300 Pa	$\pm 1.5 \%FS \pm 1 \text{ digit}$	$\pm 1.5 \%FS$
0-500 Pa	$\pm 1 \%FS \pm 1 \text{ digit}$	$\pm 1 \%FS$
0-1000 Pa	$\pm 1 \%FS \pm 1 \text{ digit}$	$\pm 1 \%FS$
0-2000 Pa	$\pm 1 \%FS \pm 1 \text{ digit}$	$\pm 1 \%FS$
0-2500 Pa	$\pm 1 \%FS \pm 1 \text{ digit}$	$\pm 1 \%FS$
0-5000 Pa	$\pm 1 \%FS \pm 1 \text{ digit}$	$\pm 1 \%FS$
$\pm 100 \text{ Pa}$	$\pm 2 \%FS \pm 1 \text{ digit}$	$\pm 2 \%FS$
$\pm 200 \text{ Pa}$	$\pm 1.5 \%FS \pm 1 \text{ digit}$	$\pm 1.5 \%FS$
$\pm 300 \text{ Pa}$	$\pm 1 \%FS \pm 1 \text{ digit}$	$\pm 1 \%FS$
$\pm 500 \text{ Pa}$	$\pm 1 \%FS \pm 1 \text{ digit}$	$\pm 1 \%FS$
$\pm 1000 \text{ Pa}$	$\pm 1 \%FS \pm 1 \text{ digit}$	$\pm 1 \%FS$
$\pm 2000 \text{ Pa}$	$\pm 1 \%FS \pm 1 \text{ digit}$	$\pm 1 \%FS$
$\pm 2500 \text{ Pa}$	$\pm 1 \%FS \pm 1 \text{ digit}$	$\pm 1 \%FS$
$\pm 5000 \text{ Pa}$	$\pm 1 \%FS \pm 1 \text{ digit}$	$\pm 1 \%FS$

FS : Full Scal

## 5.Terminal description

B8B-XH-A (8pins connector)



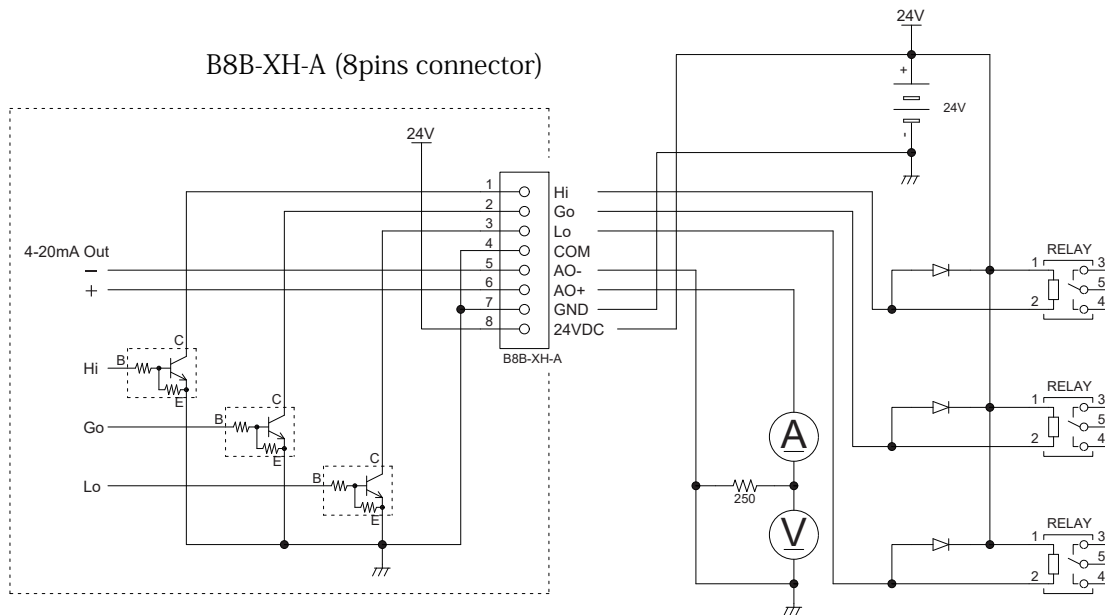
Pin number	Terminal name	Function contents
Pin 1	Hi	Hi Alarm output NPN open corrector output, PNP transistor output Relay output
Pin 2	Go (Good)	Go signal output NPN open corrector output, PNP transistor output Relay output
Pin 3	Lo	Lo Alarm output NPN open corrector output, PNP transistor output Relay output
Pin 4	GND (COM)	Power (common = GND)
Pin 5	A COM ( - )	Analog output (common)
Pin 6	A OUT ( + )	Analog output (out)
Pin 7	GND (COM)	Power (common = GND)
Pin 8	V ( + )	Power supply (DC24V)

## 6. Application Schematic

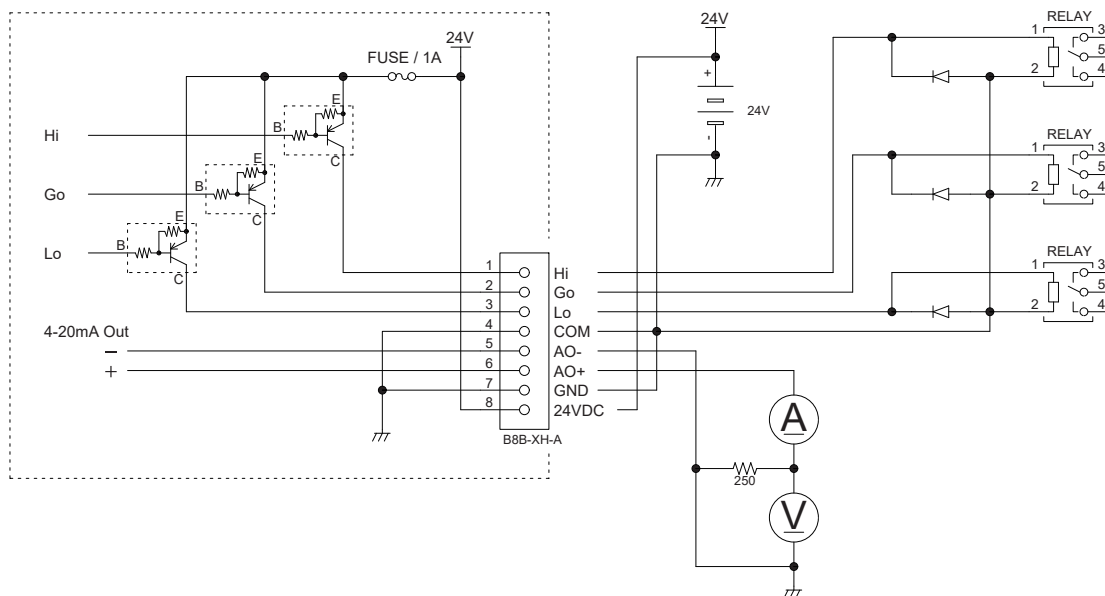
### ⚠ Caution

- Do not wire while power is on. If the connection is incorrect, the unit may be damaged.
- The voltage and current of the load connected to the output terminal and alarm terminal must be within the rated values. If the rated range is exceeded, It may cause a damaged.
- Do not apply a voltage or current to the input terminal that exceeds the rated value. If the rated value is exceeded, It may cause a damaged.

### ● NPN open corrector output



### ● PNP transistor output (option)



\*Analog output Recommendation Termination resistance

4-20mA : 250Ω (max. : 350Ω)

1-5V : 10kΩ (min. : 1kΩ)

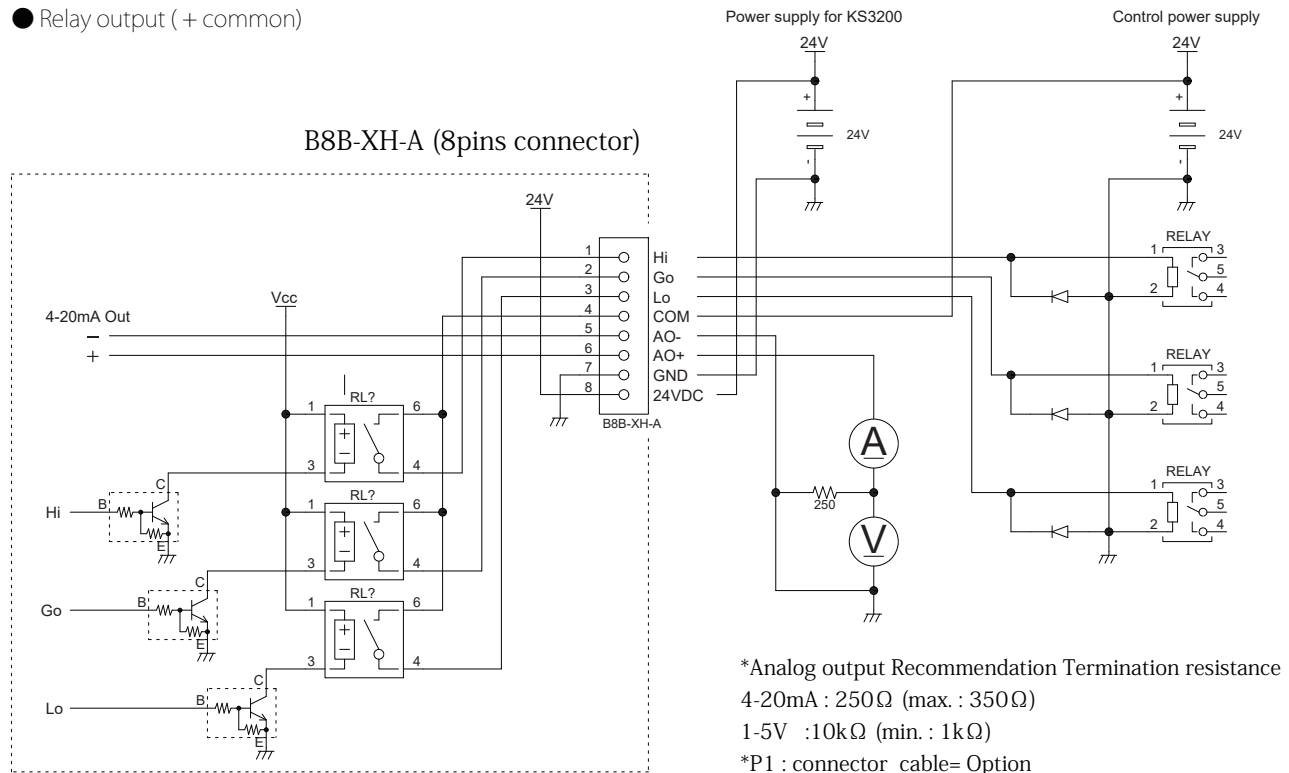
\*P1 : connector cable= Option

## 6. Application Schematic

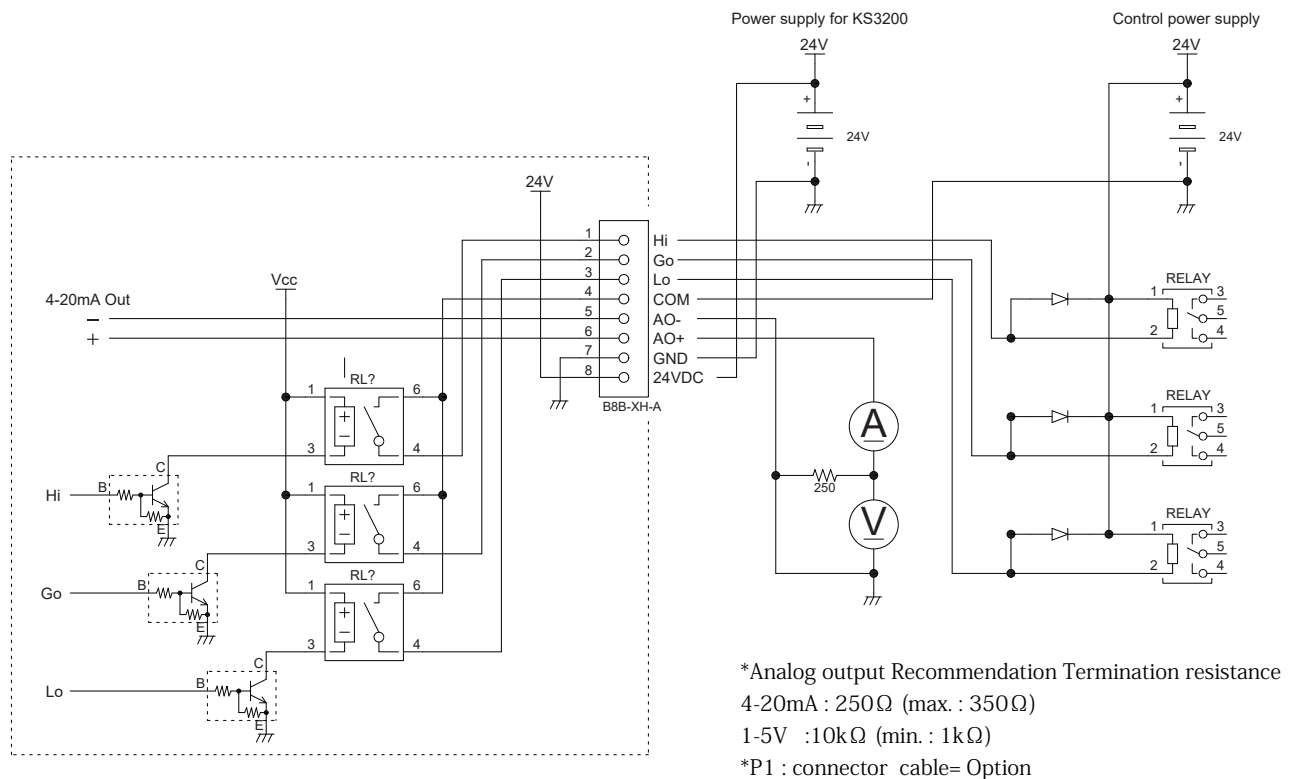


If the power supply is connected to COM via a relay connection, switching the switch to the P side will damage the device.

● Relay output ( + common)



● Relay output ( - common)





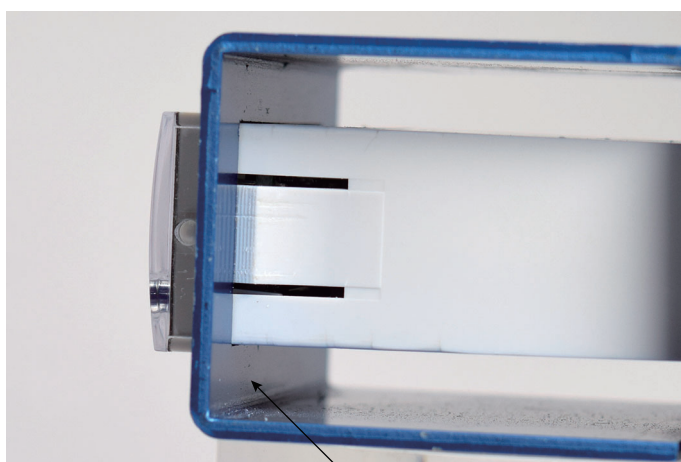
## 7. Panel Mount

### Installation

<Front view>



<Side view>



Place the main body into the panel cut hole.  
Mounting panel thickness is ....  
Min. 0.5mm to Max. 4.0mm.

<Top view>



KS2900 to stick to panel through force of pressure.

**8. Order code selection table**

KS3200 - [1] - [2] - [3] - [4] - [5] - [6]  
 (ex. KS3200 - 500 Pa- I - N - N - C - N)

[1] : Pressure Range

100 Pa, 200 Pa, 300 Pa, 500 Pa, 1000 Pa, 2000 Pa, 2500 Pa, 5000 Pa

$\pm 100$  Pa,  $\pm 200$  Pa,  $\pm 300$  Pa,  $\pm 500$  Pa,  $\pm 1000$  Pa,  $\pm 2000$  Pa,  $\pm 2500$  Pa,  $\pm 5000$  Pa

, other

[2] : Analog output

I = 4-20mA output

V = 1-5V output

[3] : Output connector

N = B8B-XH-A(JST)

[4] : Alarm output (Hi, Lo, Go output)

N = NPN transistor output

P = PNP transistor output

R = Relay output

[5] : Connector Cable

N = non

C = With Connector Cable(XH-8pins and cable, L=1m)

[6] : Option

Standard : N = non

Option : G = With Port Guard

## 9. Accessories

B8B-XH-A (8pins connector)

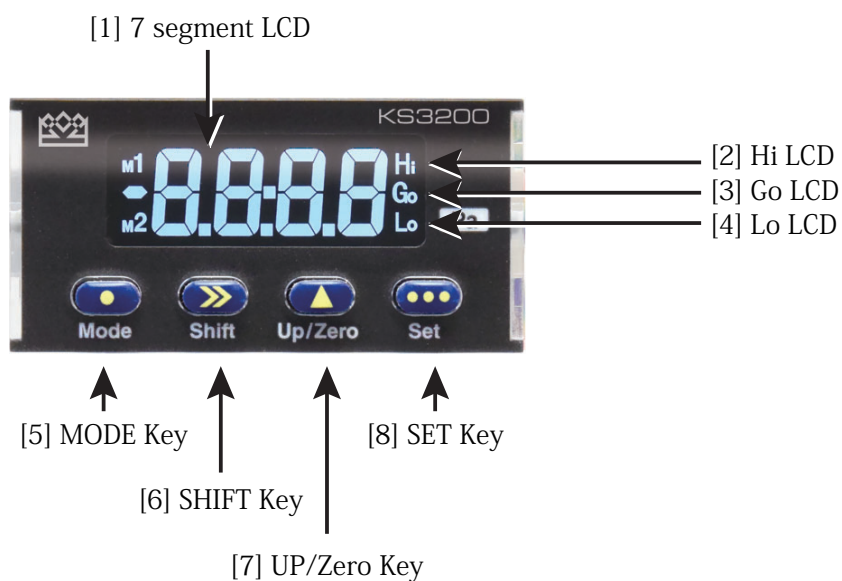
JST XH connector (8pins) UL Reconnized : E60389

Wire : L = 1m, UL2651 AWG#28, (8pins)

\*Please do not use it other than an attention designation article.

## 10. Operating components

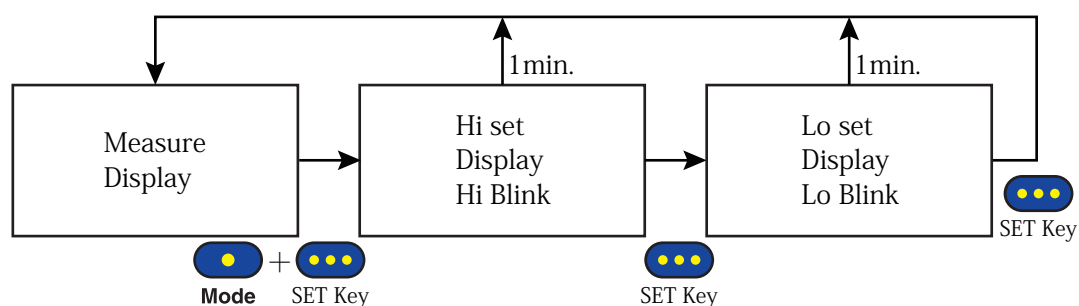
### 10-1 Display



### 10-2 Key functions (basic)














 Mode	Back to measurement mode
 Shift	Shift
 Up/Zero	Change the value
 Set	Return key
(Over 5 sec.) → Up/Zero      Set	Zero adjustment

Eg.








During operation, display returns to measuring mode after 1 min. if no Key operation done.  
During Hi or Lo setting mode, measuring function is going on.

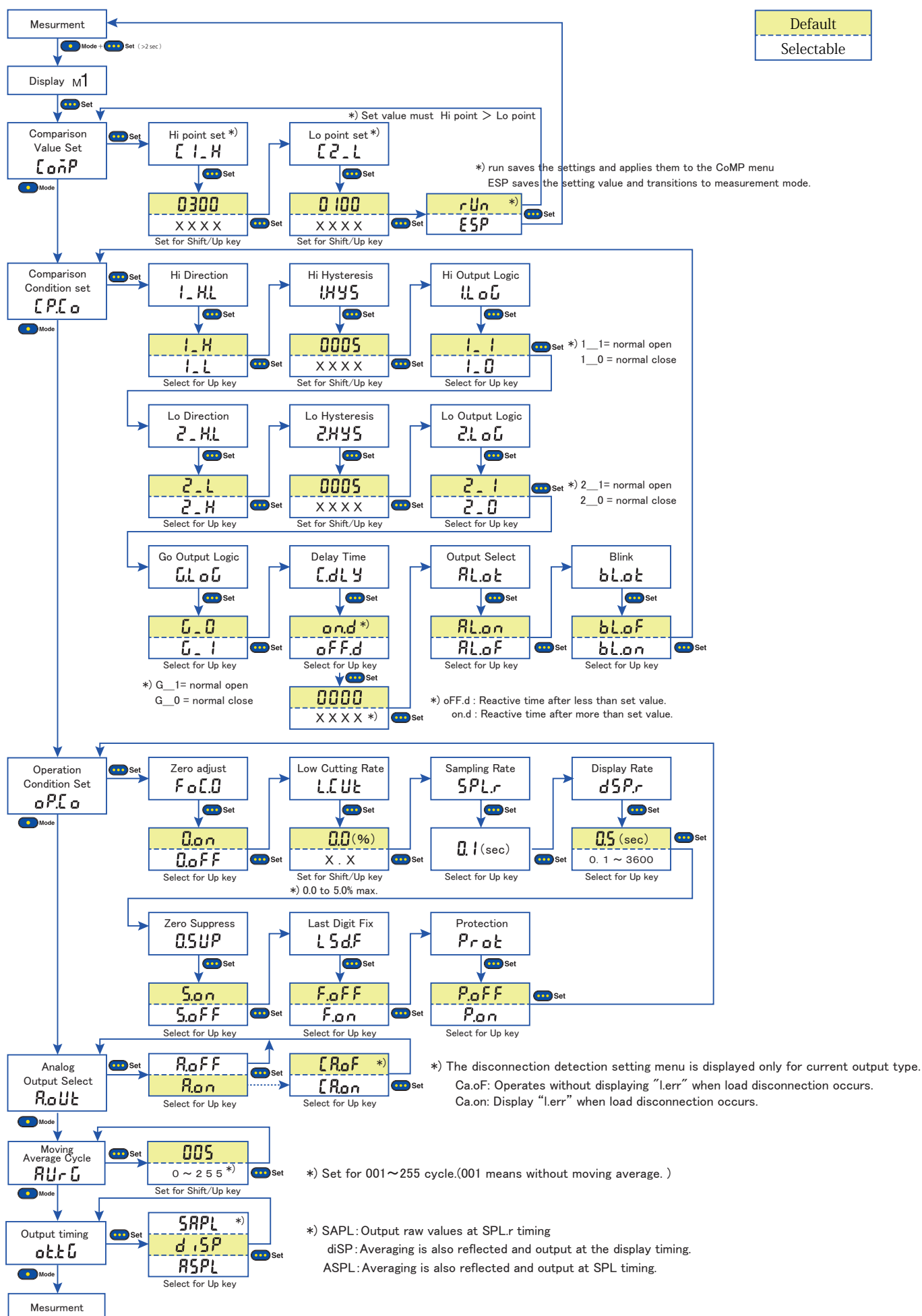
## 11. Setting menu

Menu Display	Description
<b>Ⓒ⓪ⓃⓅ</b>	Indicates " Alarm setting mode"
<b>Ⓒ1_ⓓ</b> <b>Ⓒ1_Ⓛ</b>	To set alarm point for Hi 1 __H indicates Hi setting, 1 __L indicates Low setting. Alarm condition of 1 __H or 1 __L is to be selected in the Condition setting mode. Figure shifted by  and set by  key. Value can be set within range of - 9 9 9 9 ~ + 9 9 9 9 digits. During setting operation, Hi LCD display lighting.
<b>Ⓒ2_ⓓ</b> <b>Ⓒ2_Ⓛ</b>	To set alarm point for Lo 2 __H indicates Hi setting, 2 __L indicates Low setting. Alarm condition of 2 __H or 2 __L is to be selected in the Condition setting mode. Figure shifted by  and set by  key. Value can be set within range of - 9 9 9 9 ~ + 9 9 9 9 digits. During setting operation, Lo LCD display lighting.
<b>ⒸⓅⒸ⓪</b>	Indicates " Alarm condition setting mode"
<b>1_ⓓⓁ</b>	To set alarm condition for Hi. Set by  key. 1 __H : to set Hi alarm point. 1 __L : to set Low alarm point. During setting operation, Hi LCD display lighting.
<b>1ⓓⓎ5</b>	To set hysteresis for Hi output to return from On to Off. Figure shifted by  key and set by  key. During setting operation Hi LCD display lighting.
<b>1Ⓛ⓪ⓞ</b>	Mode change for Positive Logic or Negative Logic. In the case of relay output, the output is normally open when it is 1_1, and the output is normally closed when it is 1_0.
<b>2_ⓓⓁ</b>	To set alarm condition for Lo. Set by  key. 2 __H : to set Hi alarm point. 2 __L : to set Low alarm point.
<b>2ⓓⓎ5</b>	To set hysteresis for Lo output to return from On to Off. Figure shifted by  key and set by  key. During setting operation Lo LCD display lighting.
<b>2Ⓛ⓪ⓞ</b>	Mode change for Positive Logic or Negative Logic. In the case of relay output, the output is normally open when it is 1_1, and the output is normally closed when it is 1_0.
<b>ⓞⓁ⓪ⓞ</b>	Mode change for Positive Logic or Negative Logic. In the case of relay output, the output is normally open when it is 1_1, and the output is normally closed when it is 1_0.
<b>ⒸⓓⓁⓎ</b>	To set delay time for Hi and Lo output to move from Off to On or On to Off. o n . d : To set delay time to move from Off to On. o F F . d : To set delay time to move from On to Off. Set by  key. Delay time can be set within range of 0 ~ 9 9 9 9 sec. Figure shifted by  key and set by  key.
<b>ⓅⓁ.⓪Ⓣ</b>	Alarm active or non active mode
<b>ⓅⓁ.⓪Ⓣ</b>	Backlight blink or not when alarm value on the display

## 12. Command

<b>oPCo</b>	Indicates " Operation Condition setting mode"
<b>FoCo</b>	Manual ZERO setting ON / OFF mode (  key)
<b>LEUt</b>	ZERO display under 5% FS (Adjustable)
<b>SPLr</b>	Sampling rate 0.1sec.
<b>dSPr</b>	Display rate selectable from 0.1/0.2/0.5/1/2/5/10/20/30/60/180/300/600/1800/3600 sec. (  key)
<b>QSUP</b>	ZERO suppress ON / OFF
<b>LSdF</b>	Smallest digit ZERO ON / OFF (  key)
<b>Prot</b>	Mode protection ON / OFF
<b>RoUt</b>	Active or non active for Analog output.
<b>oUtG</b>	Analog output mode S A P L : Outputs a raw value every 0.1 seconds. d i S P : Outputs the average value moved in synchronization with the refresh setting. A S P L : Outputs the moving average value every 0.1 seconds.
<b>[RoF</b>	Disconnection detection function
<b>[Ron</b>	By turning on the function, you can detect whether a device is connected to the Aout or Acom terminal. If it is not connected, "i.Err" will be displayed on the screen.
<b>m1</b>	 Mode +  Set (and over 3sec.)
<b>RUrG</b>	Sampling average mode Display showing result of setting average.

## 13. Parameter table



## 14. Warranty

KRONE warrants the Products to be free of defects in materials and workmanship for a period of one year from the date of shipment.

If any models or samples were shown to Buyer, such models or samples were used merely to illustrate the general type and quality of the Products and not to represent that the Products would necessarily conform to said models or samples.

Any Products found to be defective must be shipped to KRONE with all shipping costs paid by Buyer or offered to KRONE for inspection and examination.

Upon examination by KRONE, at its sole option, will refund the purchase price of, or repair or replace at no charge any Products found to be defective.

This warranty does not apply to any defects resulting from any action of Buyer, including but not limited to improper installation, improper interfacing, improper repair, unauthorized modification, misapplication and mishandling, such as exposure to excessive current, heat, coldness, moisture, vibration or outdoors air.

Components which wear are not warranted. Pressure port portion is thinner. Please be aware of the damage caused by overload.

KRONE is pleased to offer suggestions on the use of its various Products.

They are only suggestions, and it is Buyer's responsibility to ascertain the fitness of the Products for Buyer's intended use.

KRONE will not be responsible for any damages that may result from the use of the Products.