

YOTTA SENSE

Non-Contact Infrared Temperature Sensor/Transmitter

SIR-80F

SIR-80F non-contact infrared thermometer measures the infrared wavelength emitted from the target and converts it to standard current signal output (4~20mA) or RS-485 communication signal output. It can measure from 500 °C to maximum 1700°C in the distance of 80:1 D:S (Distance to Spot). Emissivity is 0.10 ~ 0.99 adjustable. Two built-in laser pointers can aim at the target. SIR-80F is composed of sensor & controller. The measurement temperature displays on LCD in controller. Various parameters are adjustable in controller.





Specifications

Segment	Specification
Temperature Range	500~1700°C
Device	InGaAs, Silicon
Accuracy	±1% / full scale or 2°C
Repeatability	±1% of reading
Field of View (D:S)	80:1
Optical spectrum wave	1~1.6µm
Responsive Time	100msec or below
Emissivity rate	0.10~0.99
Analog Output	4~20mA, 1~5V(option)
Communication output signal	RS-485 communication signal
Relay Output	2 step- Relay Contact (High/Low)
Power	DC 12~24V (Max 100mA)
Ambient temperature (no water cooling)	0~70°C
Temperature Resolution	0.1°C
Operating Relative Humidity	5~90%
Storing Ambient Temperature	-30~85°C
Waterproof	IP, NEMA 4
Laser pointer	630~670 nm (red)
Dimensions	Sensor:Ø46 ×125.5(L) , Controller:105.5 (W) x 130 (L)
Signal Cable	4wire shield type
Casing material	Aluminum Alloy
Weight	850g
Cable length	3m (standard), other(option)

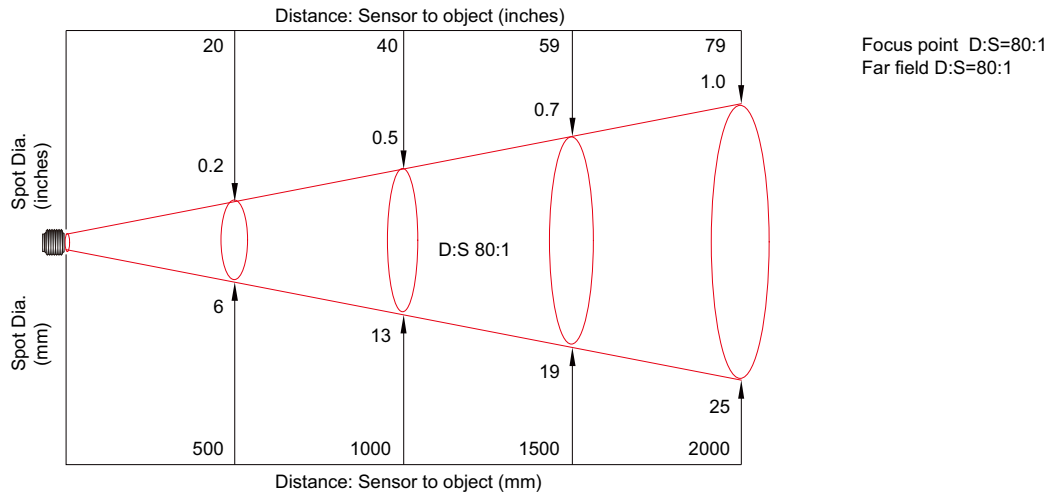
Applications

Aluminum, Chrome, Copper, Metal, Magnesium, Oxide-nickel, Platinum, Gold, Silver, Oxided-Titanium, Zinc, Tin, Steel, Oxided-Steel ,Oxided-Brass

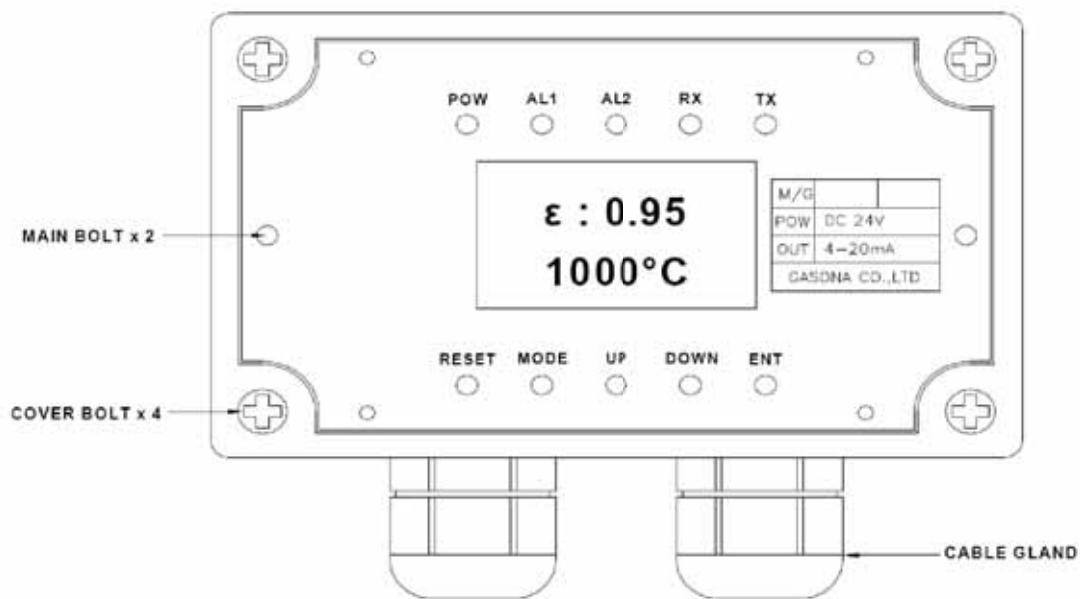
Accessories

Segment	Shape	Usage	Remark
Fixing nut		Sensor fixing nut	Basic accessories
Mounting bracket		Sensor mounting bracket	Basic accessories

Optical field of view (D:S = 80:1)



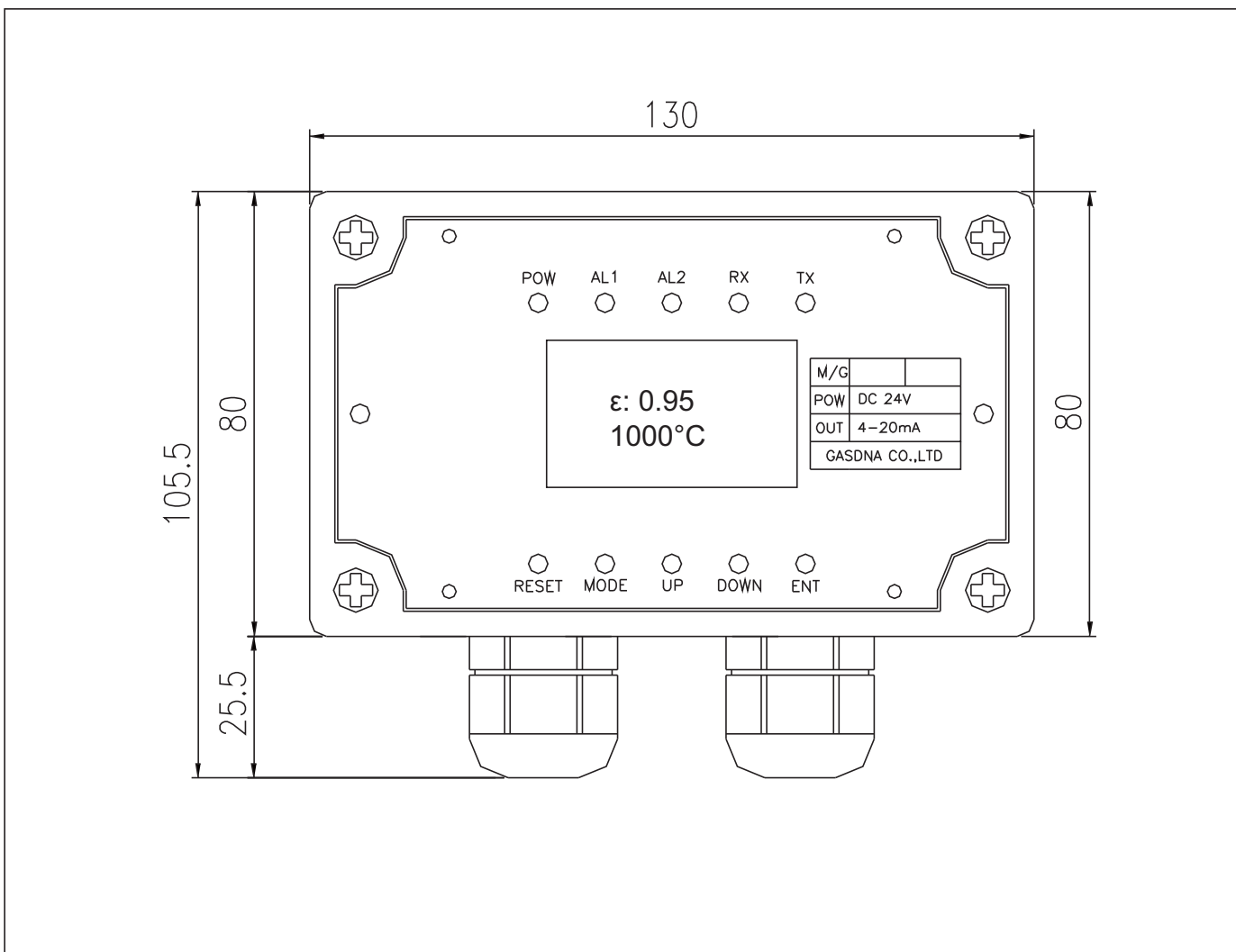
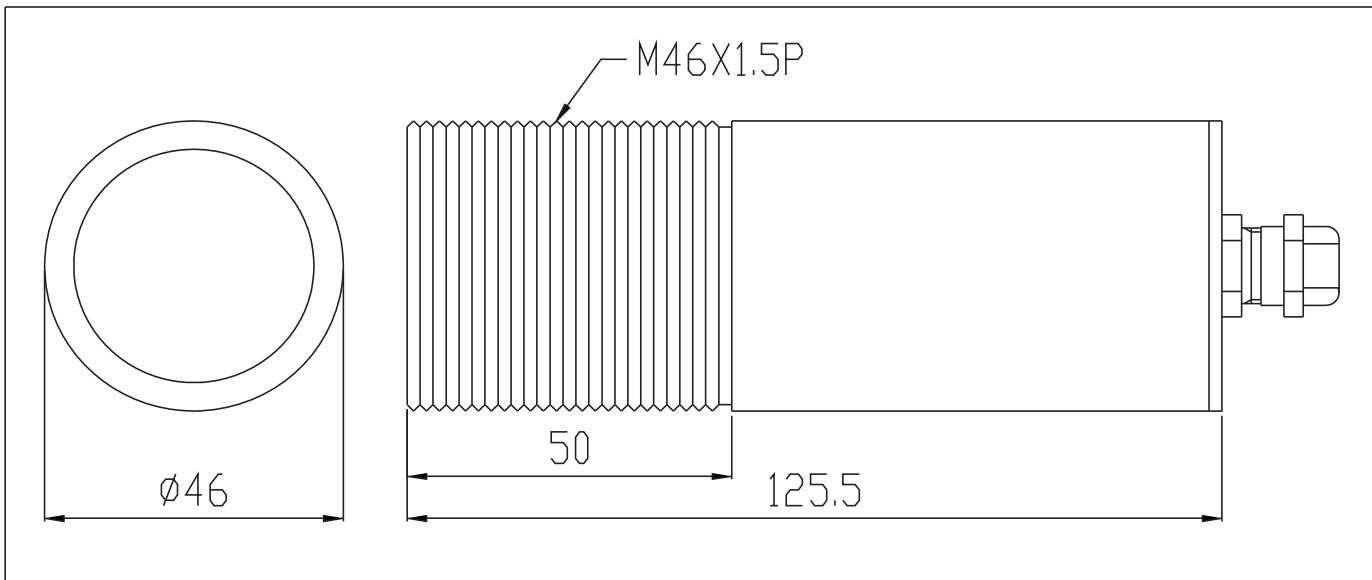
Controller Overview

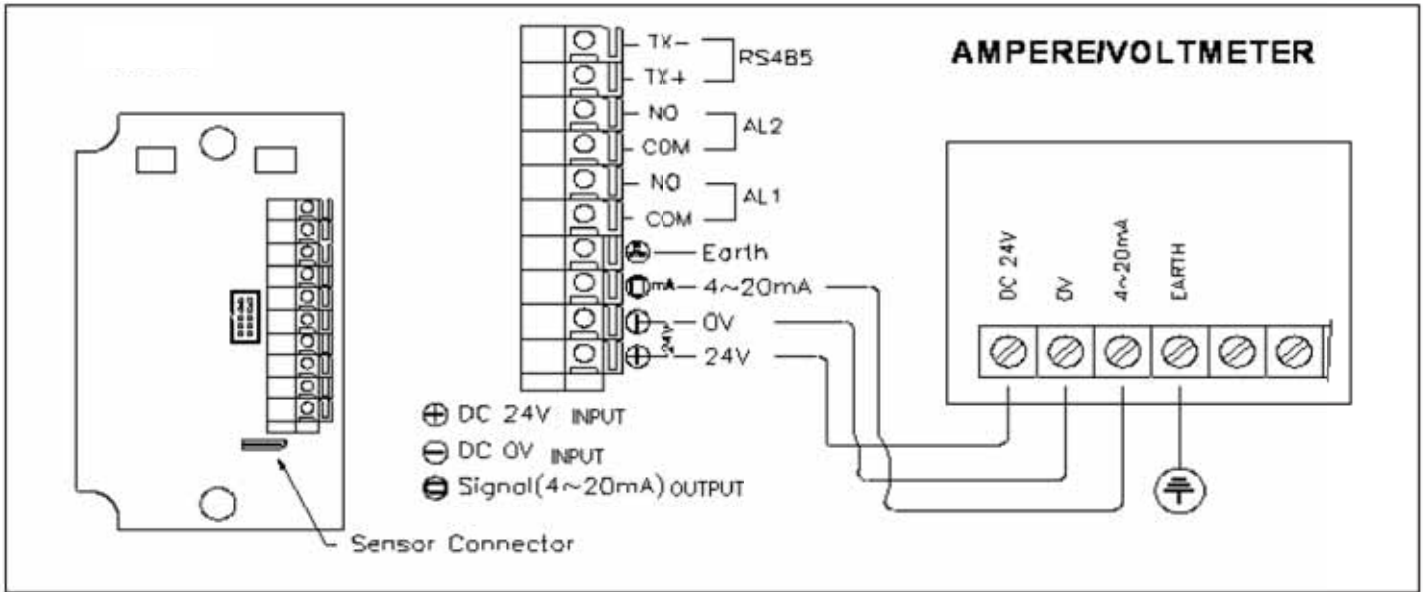


Menu Fuction

Label	Function
RESET	Measuring Mode - When ALARM relay operates, it makes the ALARM off (In Manual Mode) (ex) In AL-RESET menu, when you set Manual Mode: (1) If the measured value is less than AL1 value, AL1 ALARM relay OFF. (2) If the measured value is more than AL1 value, AL1 ALARM relay ON. (3) If the measured value is less than AL1 ALARM, AL1 ALARM relay ON. (4) If you push RESET switch, AL1 ALARM relay OFF. Set-up Mode - Enter into Measuring Mode.
MODE	- Enter into Set-up Mode. - In Set-up Mode, move the setting area.
UP	Increase the value of measuring range by 1 unit. When you keep touching it during 5 sec, the value increases fast.
DOWN	Decrease the value of measuring range by 1 unit. When you keep touching it during 5 sec, the value increases fast.
ENT	Store the set value
POW	Power
AL1	Alarm 1
AL2	Alarm 2
RX	RS-485 Receiving signal
TX	RS-485 Sending signal

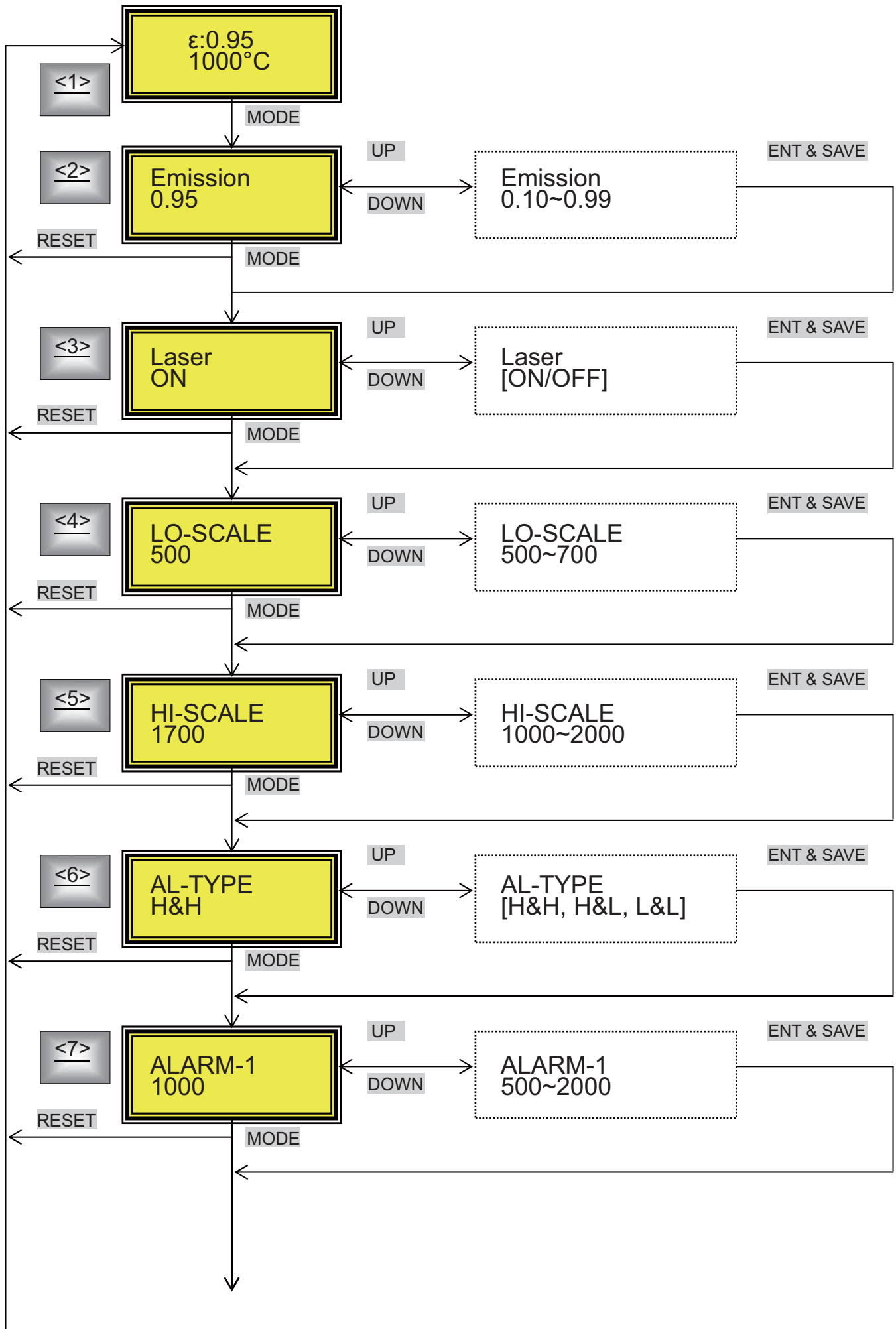
Dimension

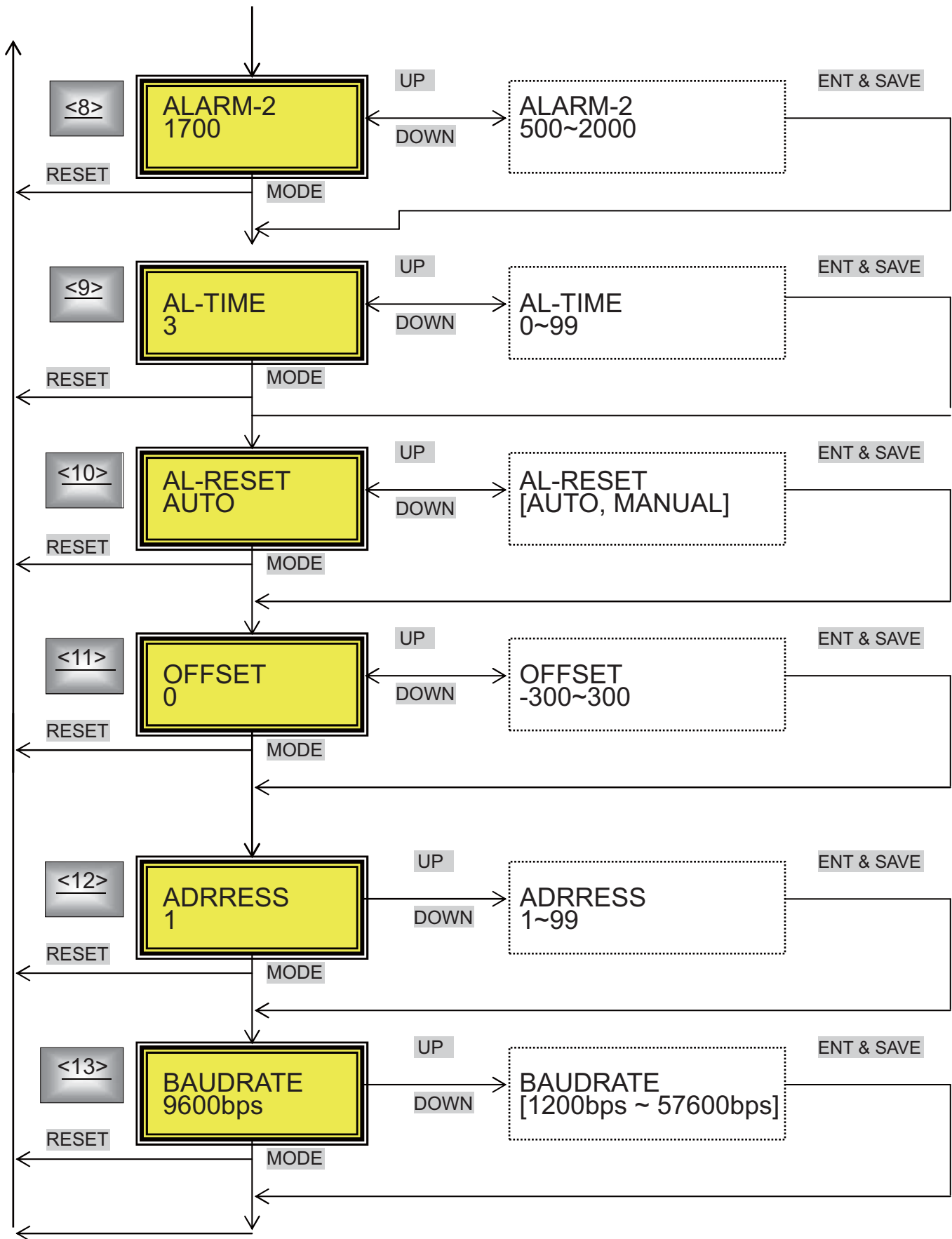




NO.	Letters	Usage
1	24V	Power 24 VDC (+)
2	0V	Power 0V (-)
3	mA	Analogue Signal Output
4	E	FIELD GROUND
5	AL1 COM	Alarm #1 Relay Contact Terminal
6	AL1 NO	Alarm #1 Relay Contact Terminal
7	AL2 COM	Alarm #2 Relay Contact Terminal
8	AL2 NO	Alarm #2 Relay Contact Terminal
9	TX+	RS485 A
10	TX-	RS485 B

Parameterizing





<1> Measuring Mode

- Measure the temperature of object and display it on LCD in real time.
- When you push **MODE** during 2 seconds, you can enter into Set-up Mode.

<2> HI-SCALE

- 20mA for FULL SCALE

(ex) If you set HI-SCALE as 10.0:

4mA Analogue Output -----	0.0	Display.
12mA Analogue Output -----	5.0	Display.
20mA Analogue Output -----	10.0	Display

<3> ALARM-1

- ALARM-1 alarm relay output (according to ALARM TYPE, alarm on)

<4> ALARM-2

- ALARM-2 alarm relay output (according to ALARM TYPE, alarm on)

<5> AL-TYPE(ALARM-TYPE)

- 4 types of alarm settings - H&HH, H&L, L&H, L&LL

- two(2) alarm relays – ALARM-1 & ALARM-2

ex) If you set H&L:

→ ALARM-1: ALARM-1(If more than set value, relay on)

→ ALARM-2: ALARM-2(If less than set value, relay on)

<6> AL-RESET(ALARM RESET)

- After ALARM on, the way how to relay off

- Select: AUTO ↔ MANUAL.

(1) AUTO: relay off according to set value only regardless of reset switch.

(2) MANUAL: relay off according to set value After press AL-RESET button

<7> AL-TIME (ALARM TIME)

- This menu is to prevent abrupt malfunction affected by shock or noise from outside.

<8> INITTIME (Initialization time)

- After power supplied, Sensor need certain time to transmit stable output(Warming Up Time)

<9> OFFSET (Compensate measured value)

- compensate the error of measured value which happened by sensor.

ex) OFFSET: If you set -5:

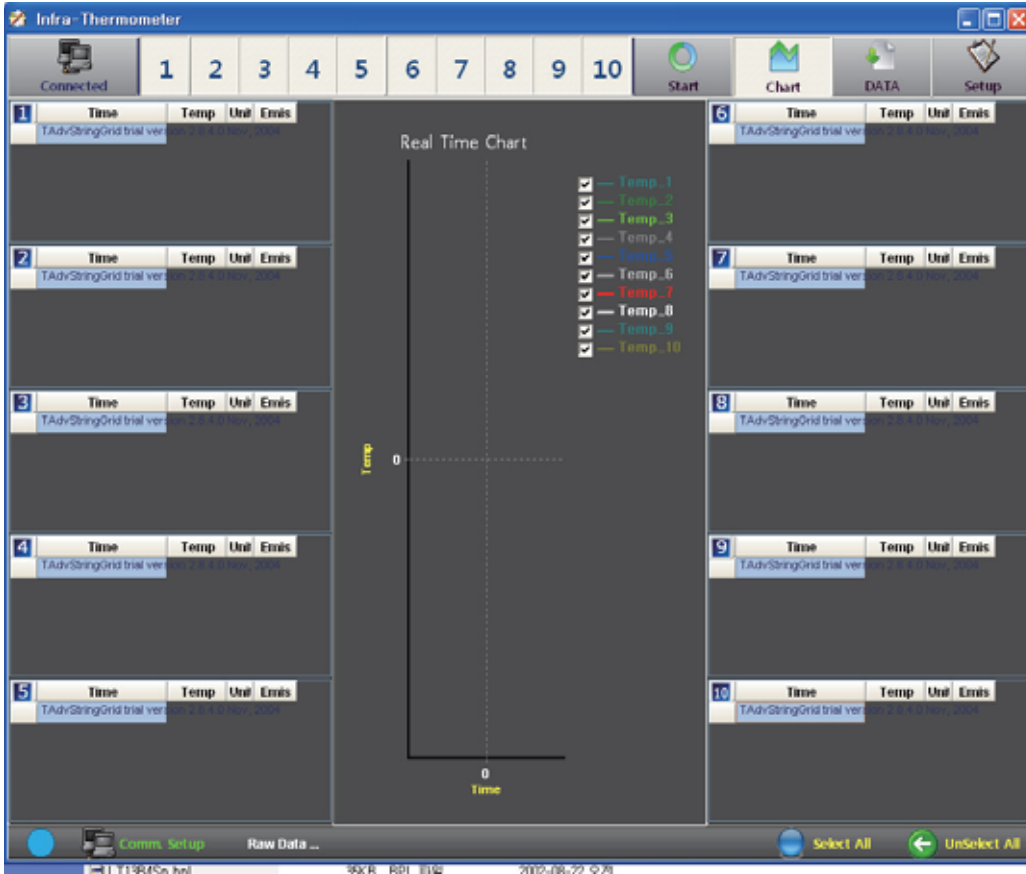
→ When the sensor output error is +5, display shows 0 after it compensates -5.

<10> ADDRESS

- RS-485

<11> BAUDRATE

- RS-485



Serial Interface (Initial value setting)

Baud Rate: 4800, 9600 setting

Data Request time: data reading speed setting

Ambient temperature: Ambient Temperature

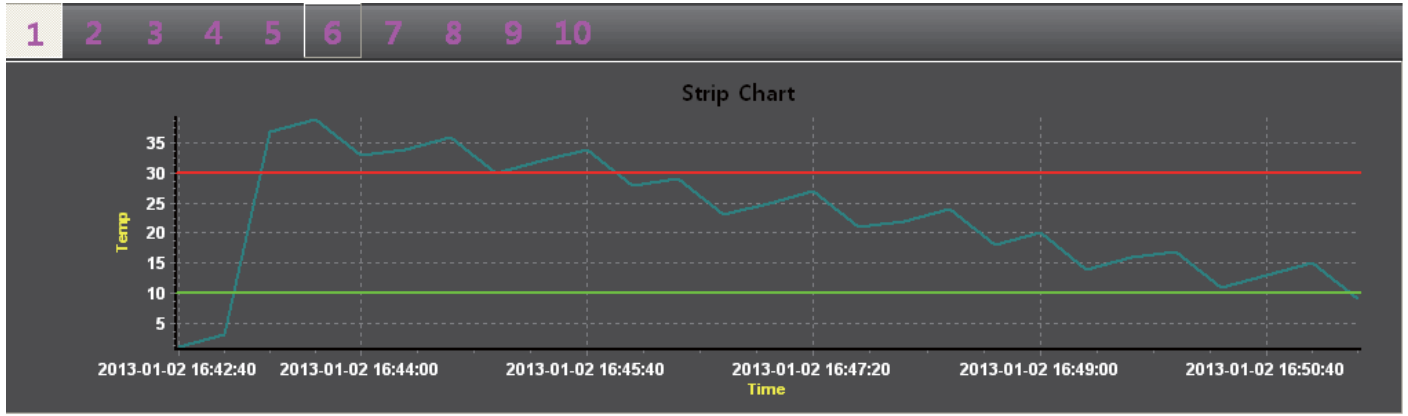
Emissivity: Emissivity setting

DB Save Temperature: storage temperature setting

Alarm : setting when you want to see temperature transition in detail by graph within measured temperature range

EX> Set low alarm to 10°C (Green) and Set High Alarm to 30°C (Red) for No 1 Thermometer as below.

EX >

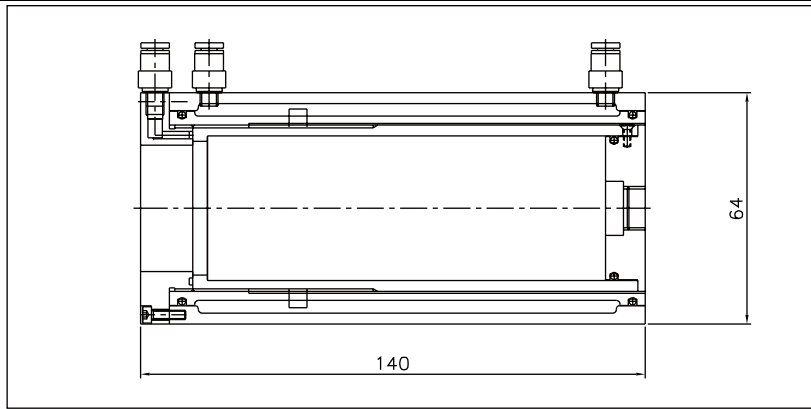


Caution: After setting value, Please do not forget to press 'Save' button

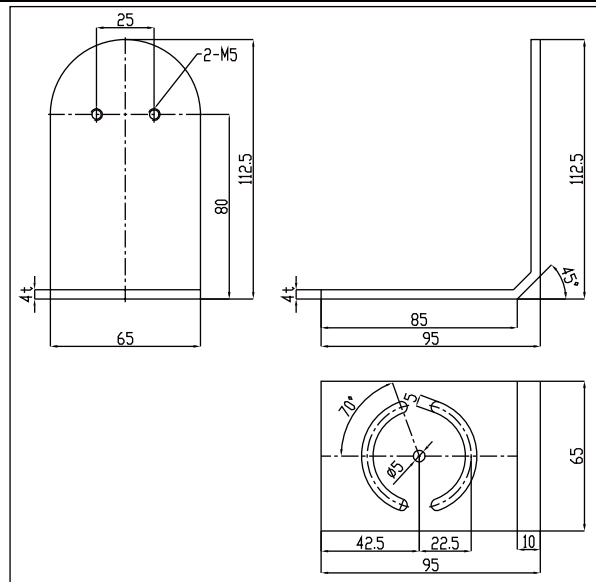
Option

<p>SIR-80F-CF-150</p>	<p>Technical drawing of a probe. The drawing shows a tapered shaft with four different diameters: $\phi 8$, $\phi 2$, $\phi 6.5$, and $\phi 24.5$. The lengths of the sections are indicated as 150, 300, and 900.</p>
<p>Air-purge</p>	<p>Technical drawing and photograph of an air-purge component. The drawing shows a cylindrical component with a diameter of $\phi 55$ and a width of 22. It has an $\phi 6$ hole at the top and an $M46(P1.5)$ TAP. The diameter of the main body is 52. Below the drawing is a photograph of the component, which is a black, cylindrical ring with a blue cap on one end.</p>

Air/Water Cooler



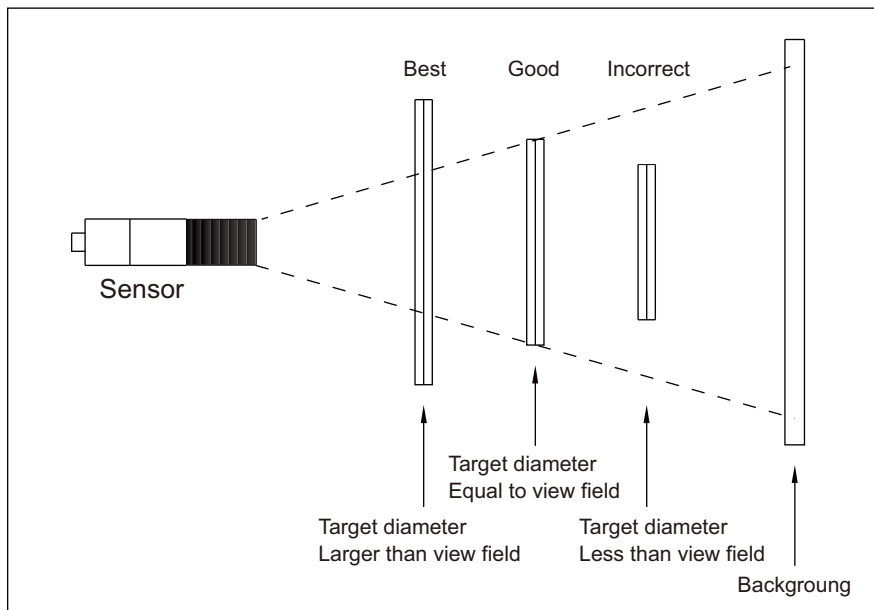
Up and down adjustable Bracket



<p>485 To RS232 converter</p>	
<p>Indicator (Model No.DI-20)</p>	
<p>2 inch LED Display</p>	

Installation

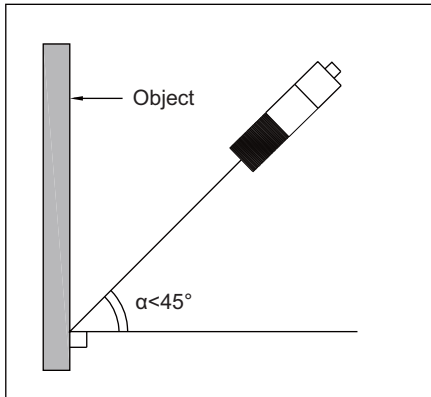
Please make sure the target area is larger than the field of view.



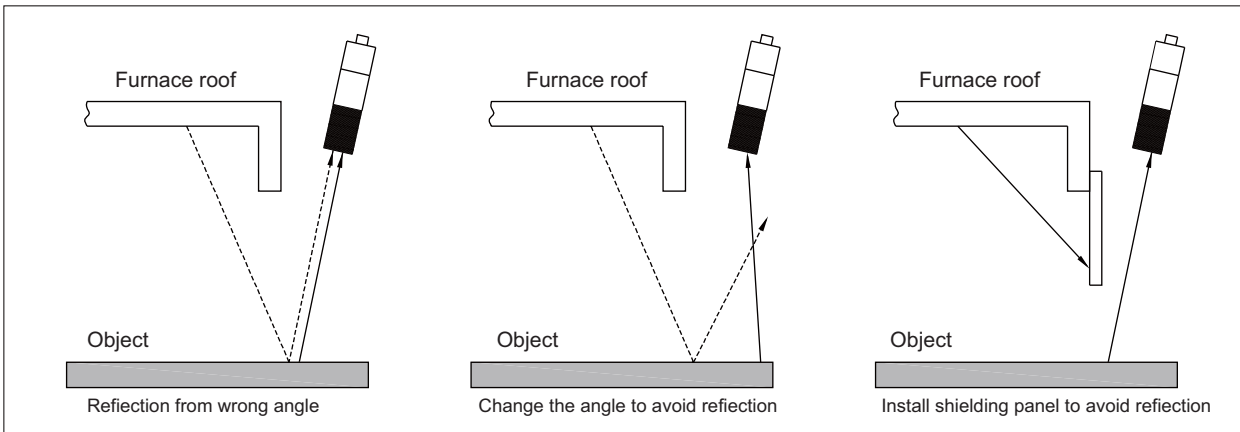
The spot size is decided by the distance from the sensor to the target. Please refer to the 'section 5. Optical field of view' and make sure your target area is larger than the field of view.

- Please locate the sensor vertical against the target.

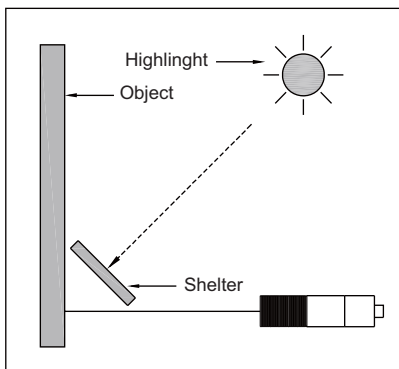
It is the best for you to install the sensor vertical against the target area or object. If it is not available, the sensor should be more than 45° against the target area. Otherwise, it can affect the measuring accuracy.



- Please avoid the heat reflection from other high temperature materials



- Please avoid Highlight



- Please avoid electronic noise.

Please avoid the high frequency or high voltage area such as motor, pump, power line, and so on.

Emissivity Table

Appendix A – Emissivity Table for Metals

Material		Typical Emissivity
Aluminium	Non oxidized	0.02~0.1
	Polished	0.02~0.1
	Roughened	0.1~0.3
	Oxidized	0.2~0.4
Brass	Polished	0.01~0.05
	Roughened	0.3
	Oxidized	0.5
Copper	Polished	0.03
	Roughened	0.05~0.1
	Oxidized	0.4~0.8
Chrome		0.02~0.2
Gold		0.01~0.1
Haynes	Alloy	0.3~0.8
Inconel	Electro polished	0.15
	Sandblast	0.3~0.6
	Oxidized	0.7~0.95
Iron	Non oxidized	0.05~0.2
	Rusted	0.5~0.7
	Oxidized	0.5~0.9
	Forged, blunt	0.9
Iron, casted	Non oxidized	0.2
	Oxidized	0.6~0.95
Lead	Polished	0.05~0.1
	Roughened	0.4
	Oxidized	0.2~0.6
Magnesium		0.02~0.1
Mercury		0.05~0.15
Molybdenum	Non oxidized	0.1
	Oxidized	0.2~0.6
Monel (Ni-Cu)		0.1~0.14
Nickel	Electrolytic	0.05~0.15
	Oxidized	0.2~0.5
Platinum	Black	0.9
Silver		0.02
Steel	Polished plate	0.1
	Rustless	0.1~0.8
	Heavy plate	0.4~0.6
	Cold-rolled	0.7~0.9
	Oxidized	0.7~0.9
Tin	Non oxidized	0.05
Titanium	Polished	0.05~0.2
	Oxidized	0.5~0.6
Wolfram	Polished	0.03~0.1
Zinc	Polished	0.02
	Oxidized	0.1

Emissivity Table

Appendix B – Emissivity Table for Non Metals

Material	Typical Emissivity
Asbestos	0.95
Asphalt	0.95
Basalt	0.7
Carbon	0.8-0.9
Non oxidized	
Graphite	0.7-0.8
Carborundum	0.9
Ceramic	0.95
Glass	0.95
Grit	0.85
Gypsum	0.95
Ice	0.8-0.95
Limestone	0.98
Paint	0.98
Non alkaline	
Paper	0.9-0.95
Any color	
Plastic >50µm	0.95
Non transparent	
Rubber	0.95
Sand	0.9
Snow	0.9
Soil	0.9-0.98
Textiles	0.95
Water	0.93
Wood	0.9-0.95
Natural	

YOTTA SENSE

www.yotta-sense.com

+886-4-23780928

sales@yotta-sense.com