IR-CZ SERIES

HIGH-SPEED RADIATION TERMOMETER

PERFORMANCE SPECIFICATION CHINO

High Accuracy,Fast Response

Wide Low-Temperature Range

Setting Display Unit

Abundant Accessories

Implementing high accuracy and long-term stability

The low-temperature model (2µm) uses a chopper-less structure

The world's best two-color thermometers

Up to 60 ºCworking temperature

SINGLE COLOR MODELS

Low to Medium Temperature

Distance Factor	Models
50	IR-CZP0 ☐☐
200	IR-CZP2 ☐☐
300	IR-CZP3 ☐☐

Medium Temperature

Distance Factor	Models
50	IR-CZI0 ☐☐
200	IR-CZI2 ☐☐
300	IR-CZI3 ☐☐
200 with field diaphragm ϕ10mm	IR-CZI7 ☐☐
300 with field diaphragm ϕ10mm	IR-CZI8 ☐☐

High Temperature

Distance Factor	Models
50	IR-CZS0 ☐☐
200	IR-CZS2 ☐☐
300	IR-CZS3 ☐☐
200 with field diaphragm ϕ10mm	IR-CZS7 ☐☐
300 with field diaphragm ϕ10mm	IR-CZS8 ☐☐

TWO COLOR MODELS

HighFunction

Distance Factor	Models
50	IR-CZQ0 ☐☐
200	IR-CZQ2 ☐☐
300	IR-CZQ3 ☐☐
200 with field diaphragm ϕ10mm	IR-CZQ7 ☐☐
300 with field diaphragm ϕ10mm	IR-CZQ8 ☐☐

High Accuracy High Temperature

Distance Factor	Models
200 with field diaphragm ϕ10mm	IR-CZH7 ☐☐
300 with field diaphragm ϕ10mm	IR-CZH8 ☐☐

☐ Connecting type / Options

N : Connector / No option
5 : Connector / Analog input 4-20mA
J : Connector/Contact input 1 P ,Contact output 2P
T : Terminal/No option

☐ Sighting type

Blank : View finder (standard)
3 : Built-in close-up lens 300mm*
6 : Built-in close-up lens 600mm*
L : Red color laser targeting (no view finder)

*Applicable for only 2 color models

FEATURES

●Implementing high accuracy and long-term stability

Leveraging our experience and know-how, the optical unit and circuit design have been revamped to ensure stable measurement from low to ultra-high temperatures. The long-term stability has been evaluated for about three years and the IR-CZ series maintains the indicated temperature within the accuracy rating.

●The low-temperature model (2μm) uses a chopper-less structure

The previous low-temperature model, the IR-CAP, utilized a P b Sdetecting element, but the latest model, the IR-CZP, uses an InGaAs detecting element. This improvement in the detecting element gives the IR-CZPa wider low-temperature measurement range.
In addition, the IR-CZPdoes not have a built-in motor. It uses a chopper-less structure that improves the long-term stability.

●The world's best two-color thermometers

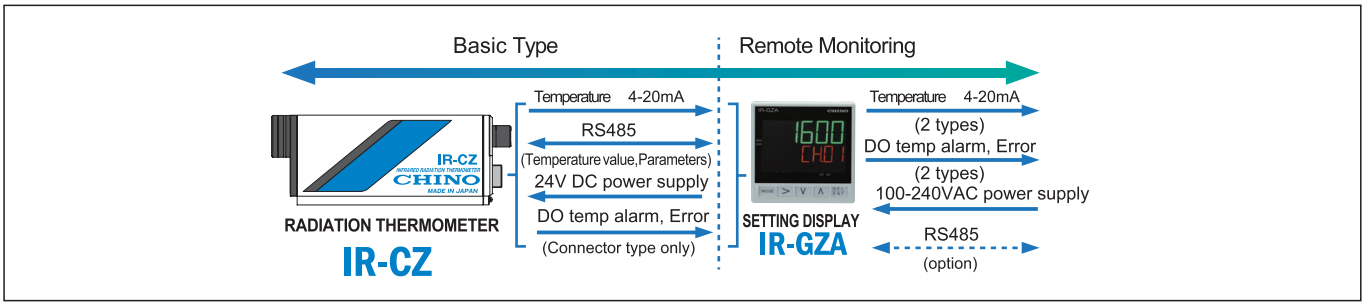
The high-temperature, high-accuracy IR-CZH has a new design for the optical unit that reduces chromatic aberration and significantly improves the light-condensing efficiency of the detector. The impact on the indicated value from a lack of view or obstruction has also reduced as much as possible. As a result, the stability of the indicated value of the two-color thermometer is outstanding, and it is widely used in the world's most advanced ultra-high temperature firing processes.

●Up to 60 ºC working temperature

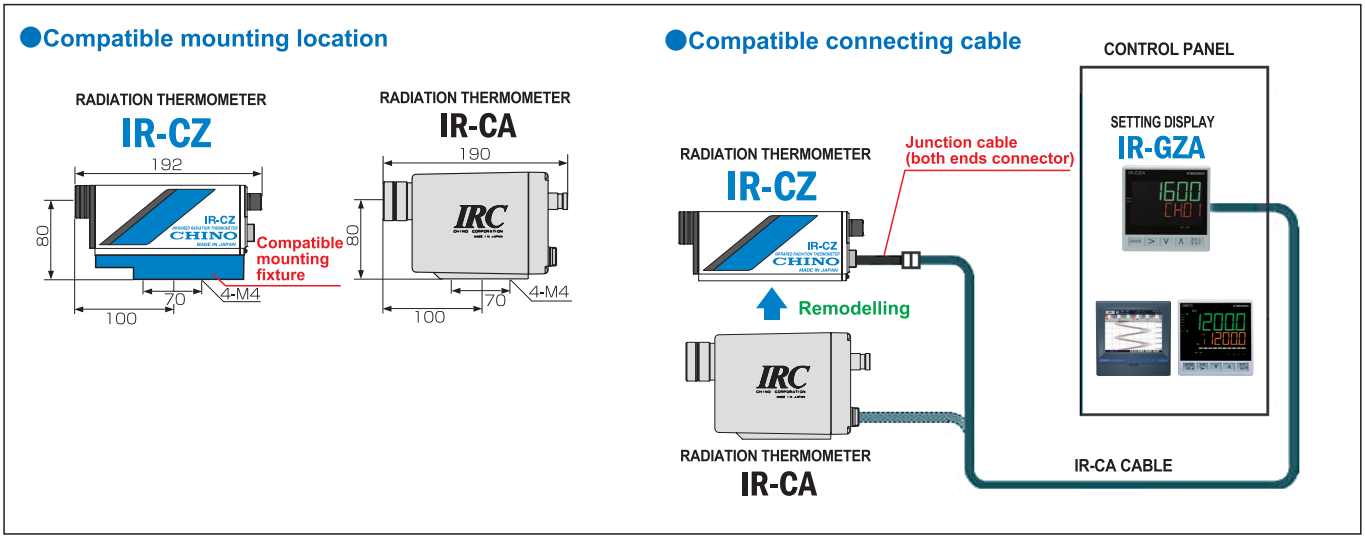
This higher working temperature was achieved by using heat-resistant electronic components, improving the heat-resistance of the objective lens, and improving the ambient temperature compensation performance. Combined with our numerous accessories, the IR-CZ can be used in even harsher environments.

CONFIGURATION

■Communication interface and contact output are standard provision.

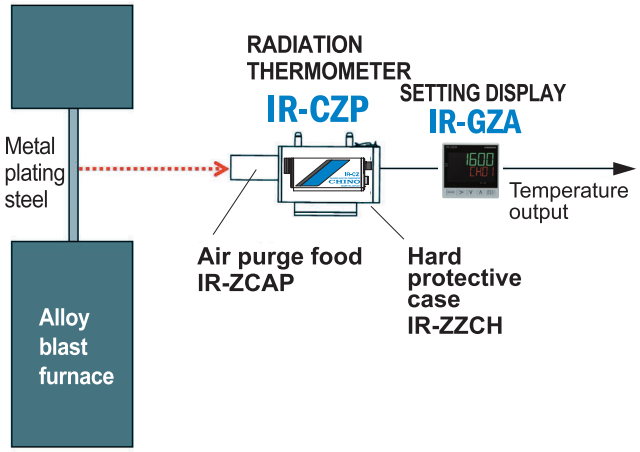


■Compatibility with IR-CA models

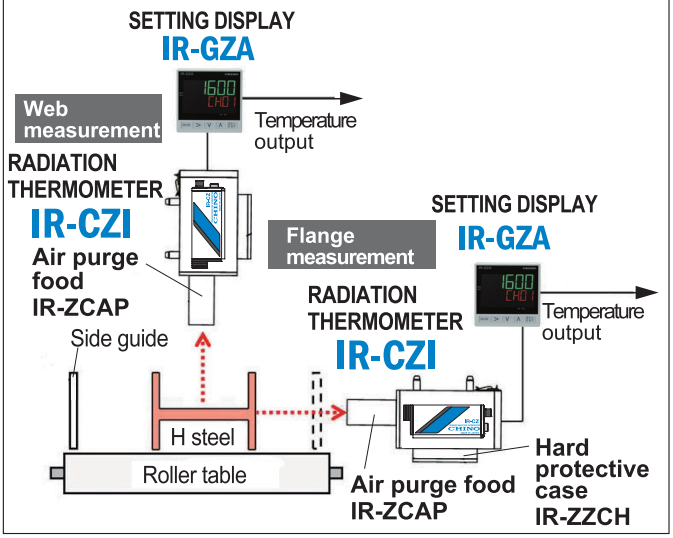


APPLICATIONS

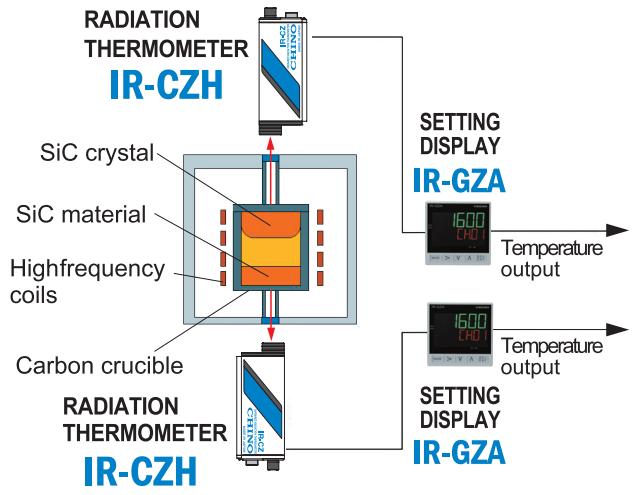
METAL PLATING TEMPERATURE MEASUREMENT



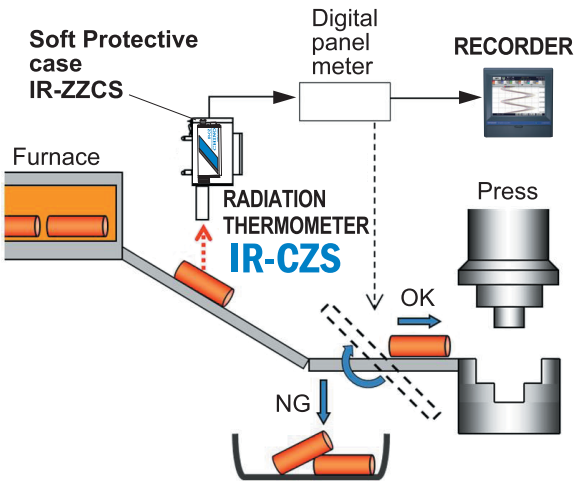
SECTION STEEL ROLLING TEMPERATURE MEASUREMENT



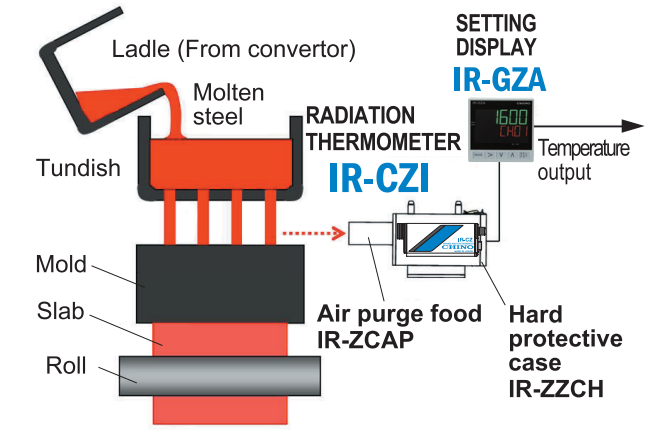
SiC SINGLE CRYSTAL GROWTH TEMPERATURE MEASUREMENT



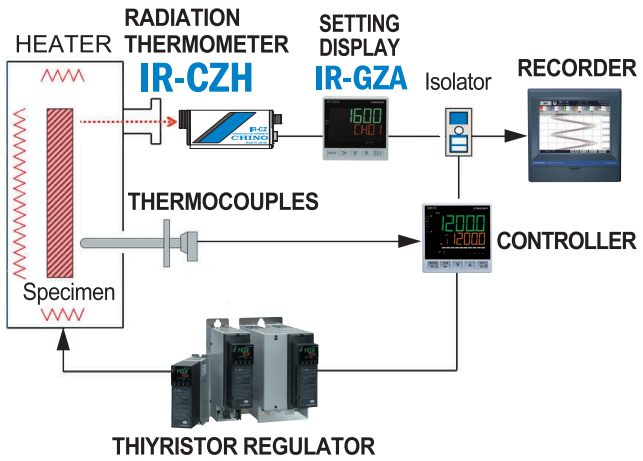
FORGING TEMPERATURE MEASUREMENT



TUNDISH MOLTEN STEEL TEMPERATURE MEASUREMENT



ULTRA HIGH TEMPERATURE FURNACE CONTROL



SPECIFICATIONS

3 models of single color thermometers

Low Temperature | Low to Medium | High Temperature

Models	IR-CZP	IR-CZI	IR-CZS
Element	InGaAs	InGaAs	Si
Measuringwavelength	2 μm	1.55 μm	0.9μm
Measuringrange (Distance factor shows in parentheses)	80 to 1000℃(50) 150 to 1400℃(200) 200 to 1400℃(300)	200 to 1000℃(50) 300 to 1600℃(200, 300) 400 to 2000℃(200 or 300 when in use diaphragm ϕ10)	450 to 2000℃(50) 600 to 3000℃(200, 300) 700 to 3500℃(200 or 300 when in use diaphragm ϕ10)
Accuracy rating	Lower than 500°C --- ±3°C 500 to 1000°C --- ±5°C Higher than 1000°C --- ±0.5% of measured value	Lower than 1000°C --- ±5°C 1000 to 1500°C --- ±0.5% of measured value Higher than 1500°C --- ±0.6% of measured value	Lower than 1000°C --- ±5°C 1000 to 1500°C --- ±0.5% of measured value 1500 to 2000°C --- ±0.6% of measured value High erthan 2500°C --- ±1% of measured value
Repeatability	Within 0.2°C		
Temperature drift	500°C or less: 0.15°C / °C 500°C or higher: 0.25°C / °C	0.1°C / °C or 0.015% / °C of measured value whichever larger	
Resolution	0.5°C		
Response time	3ms		
Distance factor	50, 200, 300		
Sighting	Direct view finder or Laser targeting(option)		
Lens diameter	ϕ20mm	ϕ20mm or ϕ10mm with field diaphragm	
Workingtemperature	0 t o 5 0℃	−10 to 60℃	
Power consumption	Max 3.3 VA		

■Common Specifications

Optical System	Focusable Lens Type
Measuringdiameter	Measuringdistance :0.5 to ∞ Measuringdiameter (mm) = Measuringdistance / Distance factor *Consider 1.5 times bigger of measuringdiameter due to unstable optical alignment.
Display	LCD 4 digits (Temperature and parameter display). Temperature resolutions 1°C(at 1000°C or higher) 0.1°C(at 1000°C or lower)
Emissivity setting	Settingvalue: 1.999 to 0.050 (Emissivity ratio settingwith 2-colour thermometer)
Signal modulation	· Delay: First-order lag Time constant: 0.000 to 99.9sec (0.1 sec or 0.01 sec or 0.001 sec increments. Real signal must be set at 0 sec. · Peak: Peak tracingof highest values, Attenuation factor 0.1 to 10.0℃ / sec, 0.1 sec increments selectable .
Computation function	Zero / Span adjustment, Automatic emissivity calculation, Output compensation
Analogoutput	4 t o20mA DC isolated output, load resistance 750Ω or lower · Accuracy rating: ±0.2% of output range · Analogoutput resolution: 0.003% of output range · Output scaling: Enable to set within range · Simulation output: Enable to set within range of 0 to 100% of analogoutput
Communications interface	RS485: Transmission of measured data, Transmission & Receivingor vaious parameters)
Contact output (for connector connection model only)	1 point, Higher (lower) alarm, Error signal (self-diagnostic), Dirty detection (2-colour model only), open-collector 30VDC, Max. 50mA.
Operations keys	· Operator mode: Enable to set emissivity (emissivity ratio), signal modulations and alarm · Engineeringmode: Enable to set unit, output scaling, zero/span adjustment, reference temperature input of automatic emissivity calculation, output compensation and options.
Self-diagnostic	Thermometer temperature abnormal, Parameter error
Power suppy	24VDC (Allowable voltage fluctuations range: 22 to 28V)
Connections	Terminal or connector
Casing	Aluminum
Weight	Approx 0.8Kg

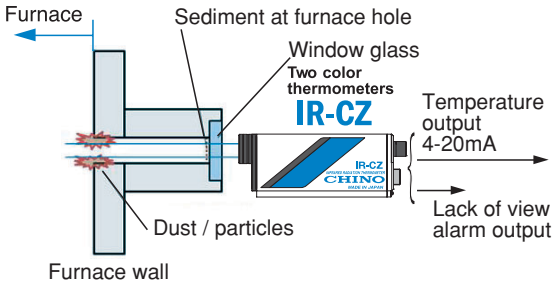
	Measuringdistance (mm)		
Distance factor	500	1000	2000
50	ϕ10	ϕ20	ϕ40
200	ϕ2.5	ϕ5	ϕ10
300	ϕ1.7	ϕ3.4	ϕ6.7

2 models of two color thermometers

High Function Type | **High Temperature High Accuracy Type**

IR-CZQ	IR-CZH
Si / InGaAs / InGaAs	Si / InGaAs
0.9 / 1.35 / 1.55μm	0.9 / 1.55μm
350 to2000°C (50) 400 to2000°C (200) 450 to2000°C (300) 500 to2000°C (200 with field diaphragm φ10mm) 550 to2000°C (300 with field diaphragm φ10mm)	900 to3500°Coto2000°C (200or 300 with field diaphragm φ10mm)
Lower than 1000°C --- ±5°C 1000 to1500°C --- ±05%of measured value Higher than 1500°C --- ±0.6%of measured value	Lower than 1000°C --- ±5°C 1000 to1500°C --- ±0.5%of measured value 1500 to2000°C --- ±0.6%of measured value Higher than 2500°C --- ±1 % o fmeasured value
Within 0.5°C	
0.2°C / °Cor 0.02% / °Cof measured value whichever larger	
0.5℃	
2 t o 1 5 m s	200、300
50、200、300	
Direct view finderor Laser targeting (option)	
φ20mmor φ10mm with field diaphragm	
-10 to60°C	
Max 2.4VA	

Useful function of two color thermometers



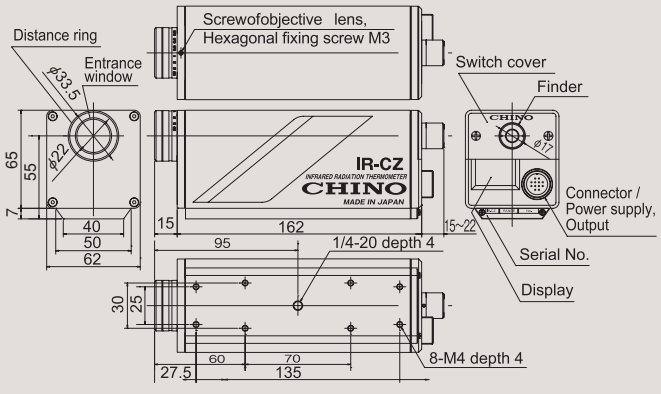
When measuring in a vacuum firing furnace, the field of view may be missing due todirton the window glassor depositson the furnace wall.
Using a two-color thermometer can reduce the effect on the indicated value, but if the fieldof view is extremely lacking, the indicated value will be affected.
The IR-CZ two-color type canoutput a warning by calculating the degreeof visual field loss from the temperature difference measured for eachof the single and twocolors inside the thermometer.

■Options

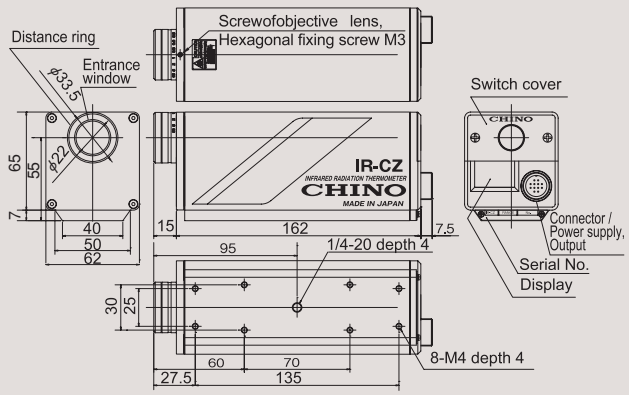
Options	Contents
Analog input (Connector type only)	Input signal: 4 to 20mA DC Selectable from emissivity remote setup or automatic emissivity calculation
Contact input (Connector type only)	1 point: Peak hold reset or Sample hold or Laser on/off Dry contact or Open collector
Contact output (Connector type only)	2 points: High (low) alarm or Error signal (self-diagnostic) or Dirty lens detection (2-colour model) Open collector 30V DC, Max. 50mA
Laser targeting	Built-in semiconductor laser emitter. 1 mW or lower (645nm), class 2, No viewfinder

EXTERNAL DIMENSIONS

View finder type



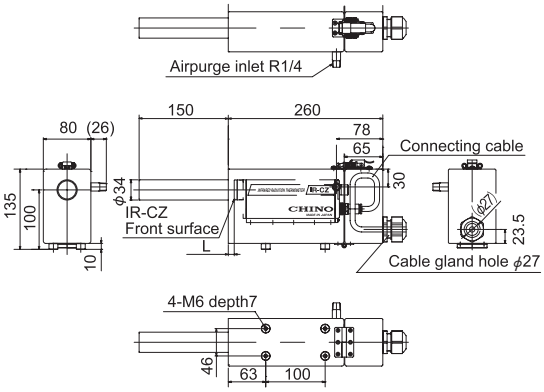
Laser targeting type



ACCESSORIES

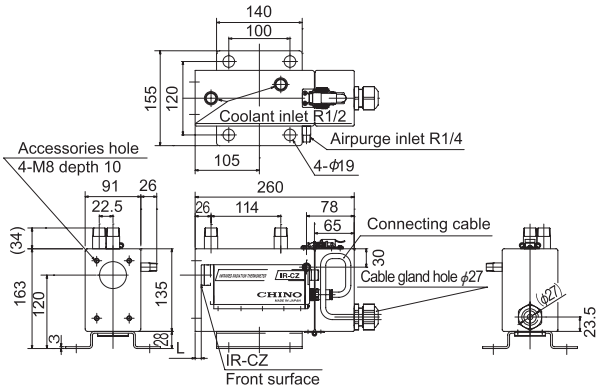
Soft protective case IR-ZZCS

The soft protective case IR-ZZCS is an exclusive accessory for the IR-CZ series to protect the thermometer from smoke, dust, etc at the installation site. This unit provides air-purge to remove smoke and dust for keeping the lens clean. Use clean instrumentation dried air. (Common use for connector type and terminal type)



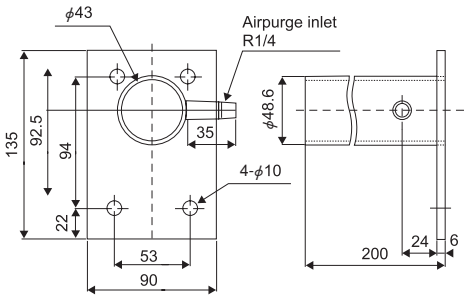
Hard protective case IR-ZZCH

The hard protective case IR-ZCCHT is an exclusive accessory for the IR-CZ series to protect the thermometer from high-temperature, humidity, smoke, dust, fume, etc. This unit provides air-purge and water-cooling to operate the thermometer properly in harsh environment. Use clean instrumentation dried air and coolingwater without scale. (Common use for connector type and terminal type)



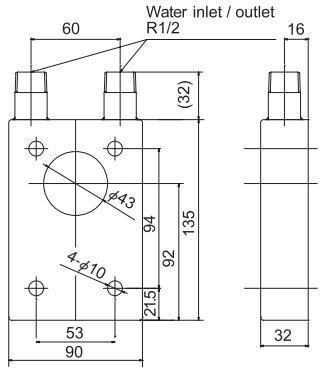
Airpurge food IR-ZCAP (for IR-ZZCH)

Usewhen there is a lot of smoke, dust, etc. in the installation location and the measurement optical path is obstructed. Secure the measurement optical path by airpurge.



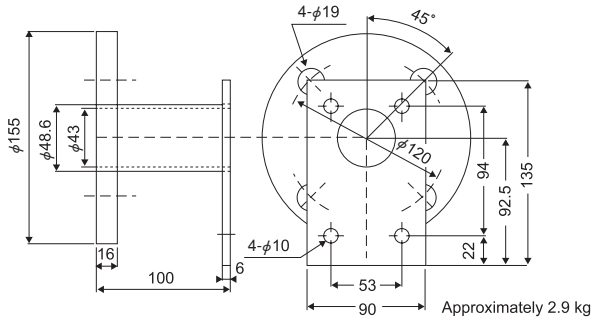
Front water-cooling plate IR-ZZWC (for IR-ZZCH)

The frontwater-cooling plate is usedwhen installing the thermometer under high ambient temperature. It is mounting to the front of the hard protective case IR-ZZCH.



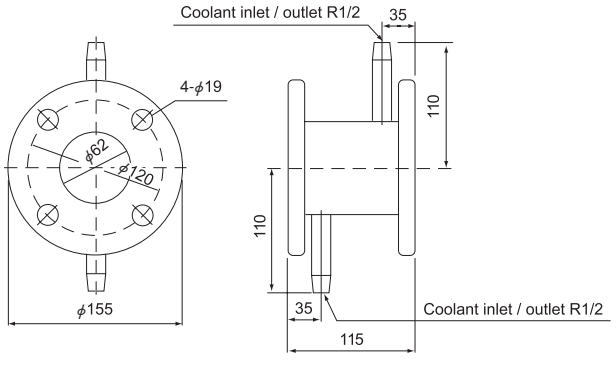
Flangemounting plate IR-ZCAF (for IR-ZZCH)

The flange mounting unit is used for mounting at the front of hard protective case IR-ZZCH. It is also applicable for mounting various accessorieswith front 10K 50A flange.



Water-cooling flange IR-VSW

The water-cooling flange is used for mounting the hard protective case IR-ZZCH at high temperaturewall

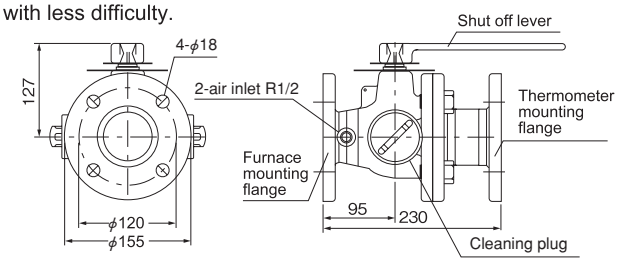


Approximately 5.0 kg

■Sealing window IR-ZW□

0：Quatz
1：CaF_2
2：BaF_2

The sealing window is used for protecting the thermometer to create a tight seal between furnace inside and outside whilst furnace temperature measurement. Cleaning and replacing the window glass with less difficulty.

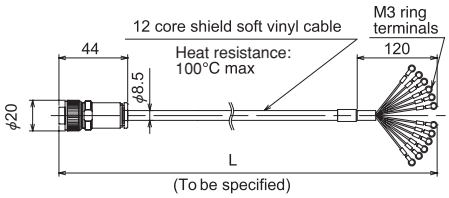


Approximately 17.0 kg

■Connecting cable

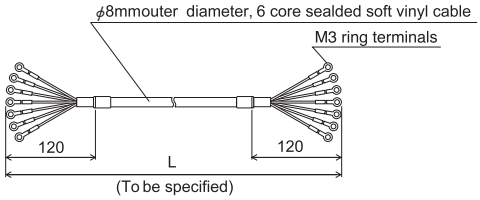
IR-ZZRC□□□(for connector type)

Length to be specified inmeter (Ex. 001 means 1 m e t e r, 200metersmax)



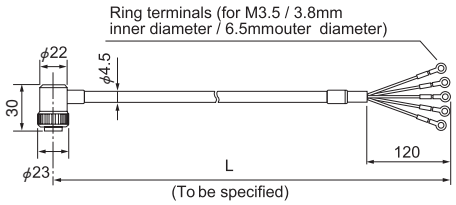
IR-ZCRT□□□(for terminal type)

Length to be specified inmeter (Ex. 001 means 1 m e t e r, 200metersmax)



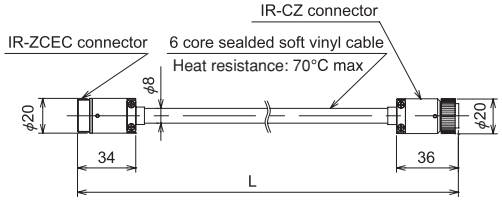
IR-ZZRL□□□(L type cable for connector type)

Length to be specified inmeter (Ex. 001 means 1 m e t e r, 200metersmax)



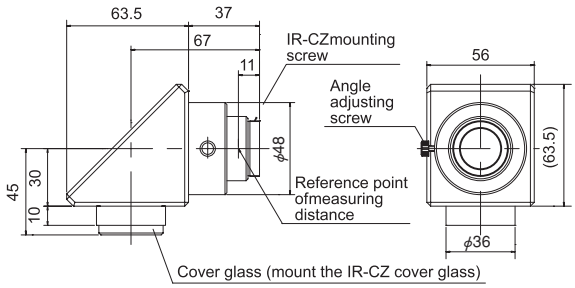
IR-ZZCC□(for connecting IR-CA cable)

S：Communications
K：Contact
＊ Only 0.2min length



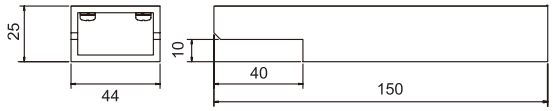
■Mirror IR-ZZLM

Mount the IR-ZZLM with objective lens for enabling to bend a light pass 90 degrees



■Compatible mounting base IR-ZCZS

Maintain the same position of IR-CAmounting height.



■Close-up lens IR-ZZD□

Utilize for smallmeasuring object.
Enable to shorten a m e a s u r i n g distance in order tomeasure a small spot size.

Models	Measuring distance
IR-ZZD30A	190-300mm
IR-ZZD60A	270-600mm

SETTING DISPLAY UNIT IR-GZA SERIES

IR-GZA is combined with IR-CZ, IR-SA, IR-CA with optional RS485to program parameters, to display measuring data and to supply 24V DC power to each connected radiation thermometers.

General Specifications

Items	Contents
Connecting thermometer	IR-CZ, IR-SA, IR-CA series
Thermometer input	RS485
Function	Temperature display, parameter settings and parameter transmission to thermometer, Temperature alarm judgment, Signal modulation processing, Analog temperature signal transmission Option (Remote emissivity, Reflection compensation)
Connecting thermometer numbers	1 (Up to 2 units for IR-GZA2□□, prepare separate power supply for the second unit)
Setting parameter	For thermometers parameter transmission Emissivity: 1.999 to 0.050 Signal modulation mode, signal modulation time constant, attenuation factor, analog output scaling
Information	Temperature, self diagnostic function
Signalmodulation	DELAY: First-order lag (Modulation time constant: 0.0 to 99.9s, 0.1s increment or 0.00 to 9.99s, 0.01s increment 0.000 to 9.999s, 0.001s increment) Real signal must be set at 0 sec. PEAK: Peak tracing Attenuation degree...Select within 0.1 to 10.0ºC/s, for IR-CZ and IR-CA Select within 0,2,5,10.0ºC/s for IR-SA
Display	Temperature, event status
Analog output	Output 1...IR-GZA output 4 to 20mA DC, Load resistance: 600Ω or less renewal cycle: 0.1s accuracy ratings: 0.3% of output range Output 2… Thermometer output
Event output	2 points Select 2 points within High temperature alarm, High-high temperature alarm, Low temperature alarm, Low-low temperature alarm and thermometer self diagnostic function Relay-a contact output (Common is same) Contact capacity 240V AC 1.5A, 30V DC 1.5A
External input	· Optional IR-GZA1□□: Emissivity remote Non-voltage contact, contact capacity5V DC 2mA IR-GZA2□□: Reflection compensation input 4 to 20mA, Pt100, thermometer (Ch31), key input DC current…4 to 20mA (use attached shunt resistor 250Ω, allowable input voltage ±10V DC, accuracy ratings ±0.1% ± 1 digit, sampling speed about 100ms RTD…PT100 (allowable input voltage ±5V DC, accuracy ratings, ±0.1% ± 1 digit, sampling speed about 100ms)
Co unications interface	· Optional IR-GZA□S□: RS485
Ambient temperature	-10 to50ºC *-10 to 40ºC when close installation
Ambient humidity	20 to 90%RH (No dew condensation)
Power supply to Thermometer	24V DC, 830mA
Rated power supply	100 to 240V AC50/60Hz
Power consumption	100VAC: Max. 28VA, 240VAC: Max. 36VA
Terminal size	M3 chip
Casing	Nonflammable ABS
Installation	Panel mount type
Weight	About 0.5kg
CEmarking	EMC: EN61326-1 Class A *Under the test conditions of the EMC directive, indication values and output values which are equivalent to maximum FS±10% may vary. Safety: EN61010-1 Over voltage category Ⅱ pollution level2 EN61010-2-030

Models

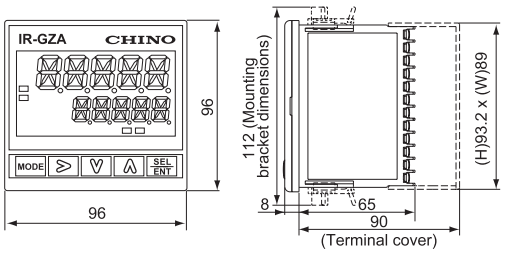
IR-GZA□□□

External input
- 0 : None
- 1 : Remote emissivity
- 2 : Reflection compensation
  *Confirm about combination
  (Not applicable for 2-colour model)

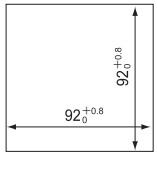
Communication interface
- N : None
- S : RS485

Damp proof treatment
- N : None
- C : With damp treatment

External dimentions



Panel cutout



Unit : mm

Specifications subject to change without notice. Printed in Japan (I) 2020. 2

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