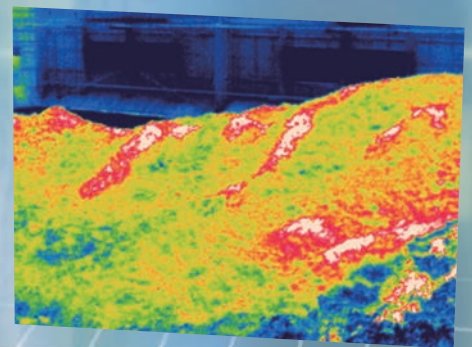
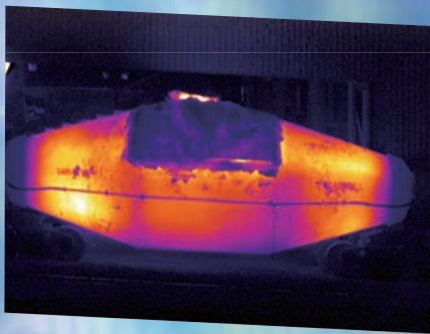


Fixed Mount Type Thermal Image Measuring Device ThermoPix

CPA-L series

Fixed Mount Type Thermal Image Measuring Device
for Online Monitoring, Measurement, and Inspection



Fixed Mount Type Thermal Image Measuring Device

CPA-L3



Small Type Thermal Image Measuring Device

CPA-L4

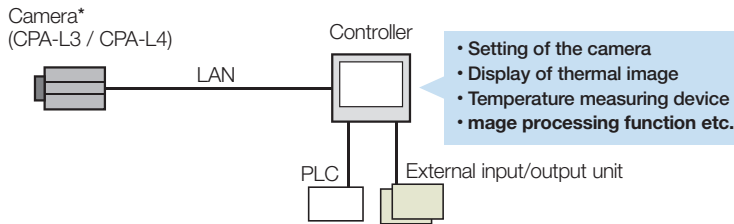
Fixed Mount Type Thermal Image Measuring Device CPA-L series

CPA-L series are fixed mount type thermal image measuring devices consisting of a camera and a controller. The camera image pixel size is 320x240 pixel (measuring wavelength of 8 to 14 μm) and has measurement range of -20 to 150°C, 0 to 300°C and 0 to 500°C. The shutter-less mechanism which does not require calibration enables continuous measurement without measurement loss when measuring moving objects.

Other than temperature measuring process of spot, line and area the controller has functions like binary image processing and particle analysis. In addition to this, measured values / evaluation results can be displayed on the LCD monitor of main unit as well as can be output to LAN, analog signal and digital signal.

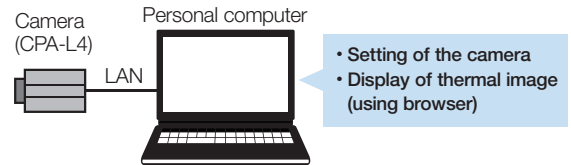
System Configuration

Operation with a camera and a controller



*Max. 4 units of CPA-L3 and CPA-L4 can be used together.

Operation without controller



Camera

Fixed mount type thermal image measuring device CPA-L3



- **Field angles five types covering telephoto to wide angle are provided.**
Lens of 12°, 25°, 50°, 70° and 90° are provided.
- **Measuring temperature range can be extended up to maximum of 2000°C. (Accuracy is guaranteed up to 1500°C.)**
The temperature range can be extended according to various needs covering those from monitoring of heat generation near common temperature up to temperature measurement of objects with high temperature such as glass/iron and steel process.
- **Remote focus function**
Camera focus can be changed by entering the distance through controller.

Small type thermal image measuring device CPA-L4



- **Operable without the controller.**
Alarm can be output from camera by setting alarm setting area through WEB browser. Further thermal images can also be output as image.
- **2 types of lens, 25° and 50° are provided.**
- **Manual focus function on board**
Focus adjustment function is provided at the back of camera so that the focus can be changed easily even if the camera is having protection case.

Controller

CPG-GMP2L



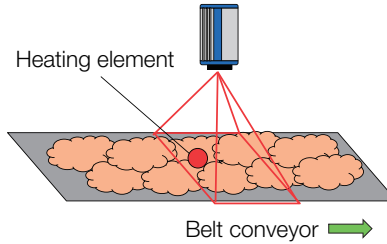
- **Maximum of 4 cameras can be connected**
Four cameras in maximum can be connected to one unit of the controller for measurement and display.
System configuration of multiple cameras can be carried out easily.
- **Automatic measurement and inspection by connecting external input/output units**
Additional I/O of 32 points of analog output, 40 points of contact output and 40 points of contact input external I/O units can be achieved by connecting external I/O unit.
- **Measured data can be sent to high order PC and PLC and control is possible**
Measured values can be sent to high order PC/ PLC through socket communication. Further measured data can be by setting shared network drive.

Stable continuous measurement

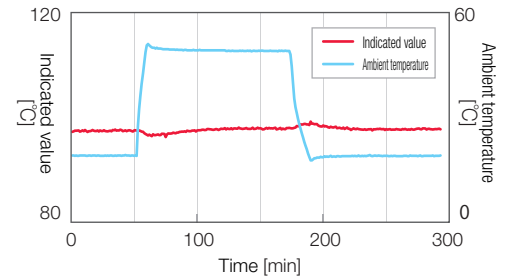
- Continuous measurement by shutter-less structure
- Indicated variation is controlled in ambient temperature changes

CPA-L series comes with ambient temperature compensation algorithm that enables stable measurement. Shutter less structure enables continuous measurement without measurement loss even in the continuous operating line.

- Continuous measurement of wood chips



- Fluctuation in indication in case of sudden change in the ambient temperature



Calculation function corresponding to diverse needs

Numeric operation functions and logical operation functions provided as standard functions of controller enable the high order judgment.

• Temperature judgement

Event is judged when maximum temperature within inspection frame is within threshold temperature.

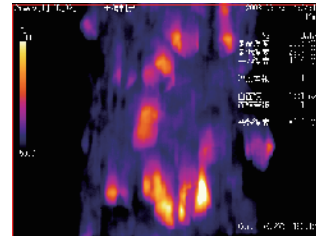
• Area judgement

Event is judged when pixel count of threshold temperature within inspection frame is within set range. Temperature judgement is also possible along with area judgement.

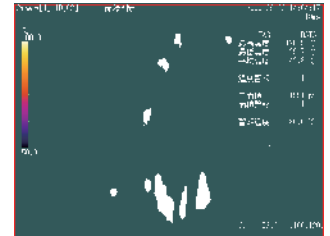
• Particle judgement

Event is judged when the threshold pixel count within inspection frame is continued in the set range it is considered as particle, and when the particles are in the set range.

Thermal image



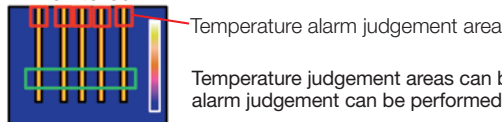
Binarization image



Wide range of inspection and measurement functions

• Temperature judgement (Thermal image)

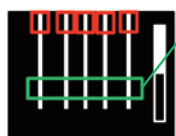
Max temperature is monitored and overheating and resin disconnection can be monitored.



Temperature judgement areas can be set at various extrusion points of resin and alarm judgement can be performed by measuring max temperature within area.

• Mass detection judgement (Binarization processing)

Can be checked if multiple resins are getting mixed or not



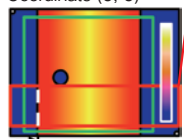
Resin fusion judgement area

- Binary threshold of temperature that can be judge the presence of resin can be set, judgement as lump based on the size of white particles (resin) can be done.
- As the values at the time of fusion are different for normal and lump, the alarm can be output at the time of lump.

• Edge judgement (Thermal image)

Images are processed based on temperature difference and width of non-bonded part can be measured.

Coordinate (0, 0)



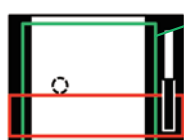
Edge judgement area

- Scan is made in a direction from the left to the right (or the upper side to lower side).
- A part having presence of temperature difference is evaluated as an edge.
- Edge position when there are position is taken as 0 to 100 % is analog output.

Edge position Coordinate (319, 239)

• Extraction of cold spot (Binarization processing)

Cold spots (defective areas) can be determined by enlargement / reduction process after binarization process is carried out.

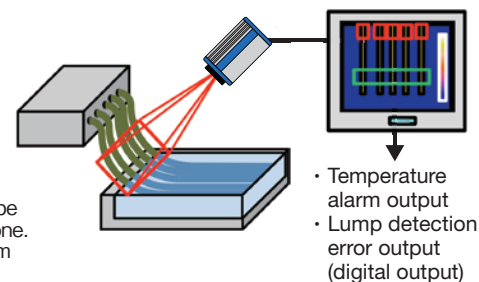


Judgement area of cold spot temperature

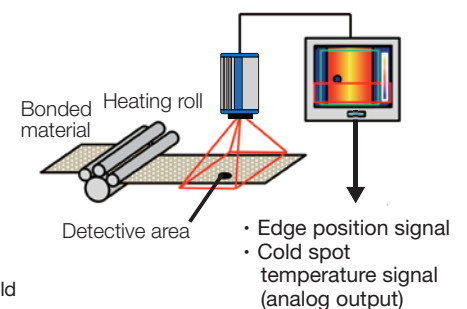
- Temperature that can determine the existence of bonding can be set as threshold of binarization.
- Enlargement and reduction is done by image processing and black area that can also be identified as a lump.
- Lowest temperature of lump can be extracted and lowest temperature within the lump can be analog output.

Resin extrusion fusion monitoring

Checking resin temperature and if two resins are mixed or not



Monitoring of bonded materials and cold spots



Fixed mount type thermal image measuring device CPA-L3

Models



● Camera

CPA-L□□B3

Field angle:

- 12 : Horizontal 12° × Vertical 9°
- 25 : Horizontal 25° × Vertical 19°
- 50 : Horizontal 50° × Vertical 37°
- 70 : Horizontal 70° × Vertical 51°
- 90 : Horizontal 90° × Vertical 67°

● Protective case

CPY-Z3□□□

Cooling system

- E : Air cooling (connection of waterproof connector)
- G : Air cooling (cable-incoming type)
- H : Water cooling

Option 1

- N : None
- P : Front purge
- C : Air cooler
- B : Front purge + air cooler

Option 2

- N : None
- S : Cover glass

Camera type

- 0 : For L12B3/L25B3/L50B3
- 7 : For L70B3
- 9 : For L90B3

● Cover glass (for single unit)

CPY-Z3CWS□

Camera type

- 0 : For L12B3/L25B3/L50B3
- 7 : For L70B3
- 9 : For L90B3

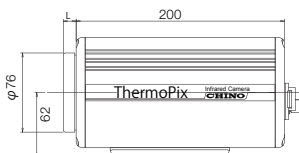
● Camera Specifications

Model	CPA-L12B3	CPA-L25B3	CPA-L50B3	CPA-L70B3	CPA-L90B3
Element	Uncooled solid state imaging element				
Number of pixels	320×240				
Frame rate	60Hz (30 Hz when controller is connected)				
Temperature range	Specify -20 to 150°C / 0 to 300°C / 0 to 500°C at the time of purchase. Temperature range can be extended up to max 2000°C as option				
Measuring indication accuracy	Larger one out of ± 2% or ±2°C (However ± 3% in case of ε=1.0, 0°C)				
Focus	Remote (by inputting a numerical value from the controller)				
View angle (horizontal x vertical)	12°×9°	25°×19°	50°×37°	70°×51°	90°×67°
Measuring distance	1.0m to ∞	0.3m to ∞	0.2m to ∞		
Transmission of image data	UDP (exclusive protocol) 1000BASE-T				
Working temperature range	-10 to 50°C				
Protective structure	IP65 compliance				
Weight	2.4kg	2.3kg	2.3kg	2.4kg	2.5kg

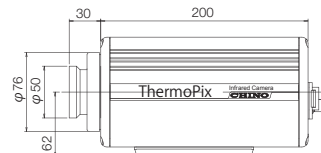
External dimensions

● Camera

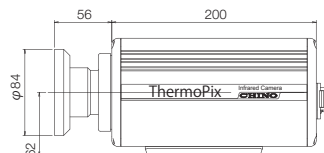
CPA-L12B3/L25B3/L50B3



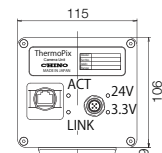
CPA-L70B3



CPA-L90B3



Back side of camera are common for all models

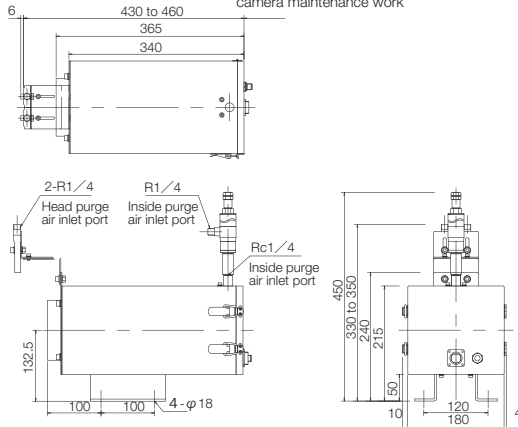


Unit: mm

● Air-cooling protective case CPY-Z3ENN□ (with waterproof connector)

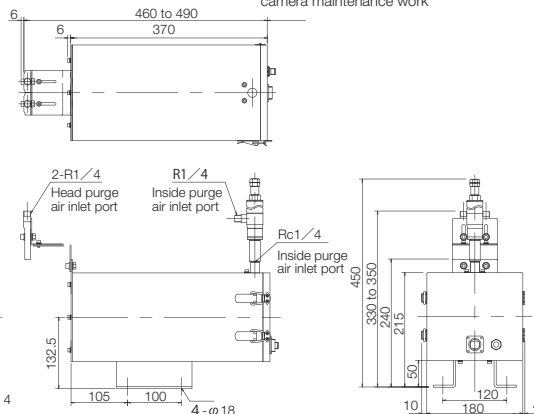
For CPA-L12B3/L25B3/L50B3

(*) Space of 500 mm is required for camera maintenance work



For CPA-L70B3/L90B3

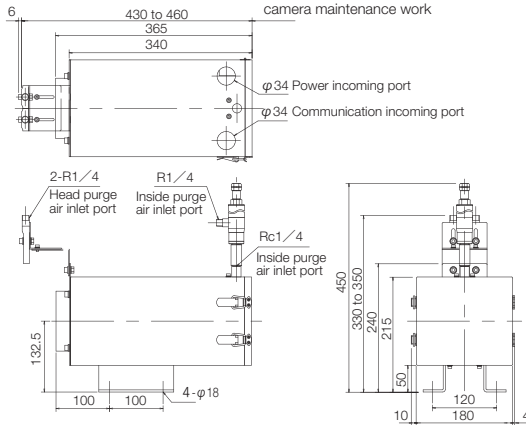
(*) Space of 500 mm is required for camera maintenance work



CPY-Z3GNN□ (Cable incoming type)

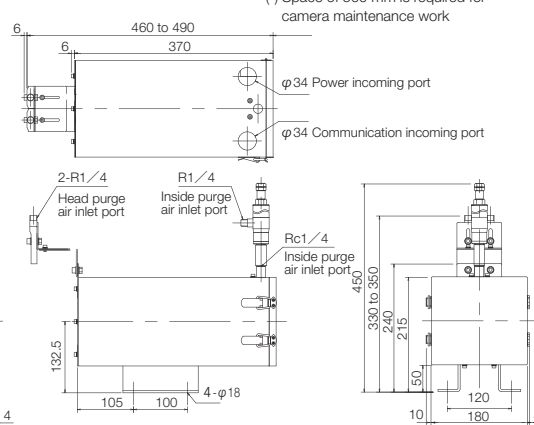
For CPA-L12B3/L25B3/L50B3

(*) Space of 500 mm is required for camera maintenance work



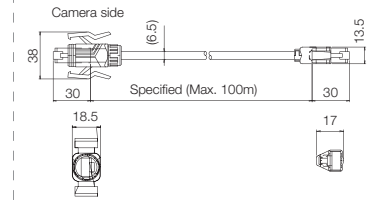
For CPA-L70B3/L90B3

(*) Space of 500 mm is required for camera maintenance work

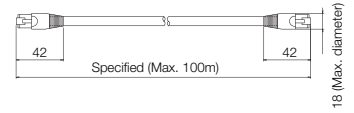


● Camera communication cable

CPY-ZMC□□□ (at the use of camera alone)



CPY-ZMR□□□ (at the use of protective case)

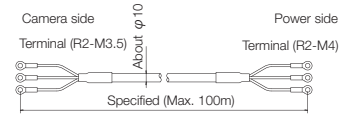


● Camera power cable

CPY-ZMP□□□ (at the use of camera alone)



CPY-ZME□□□ (at the use of protective case)

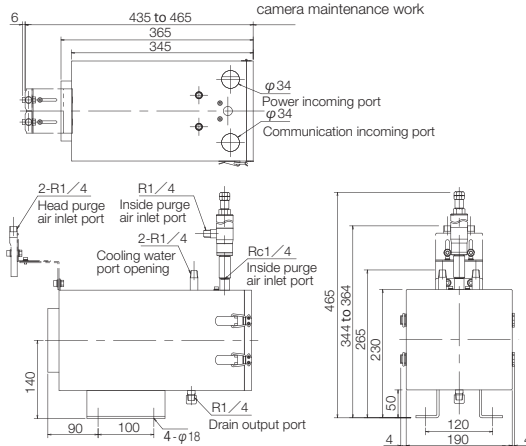


Unit: mm

● Water-cooling protective case CPY-Z3HNN□

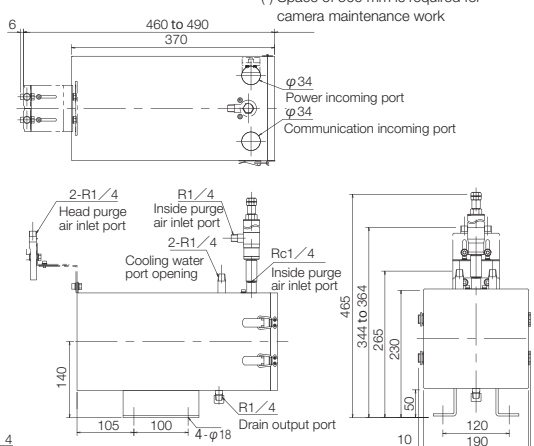
For CPA-L12B3/L25B3/L50B3

(*) Space of 500 mm is required for camera maintenance work



For CPA-L70B3/L90B3

(*) Space of 500 mm is required for camera maintenance work



● CPA-L3 series cables list

Combination	Models	Communication cables		Power cables	
		CPY-ZMR	CPY-ZMC	CPY-ZME	CPY-ZMP
Main body	CPA-L□□B3		○		○
	CPY-Z3E□□□		○		○
Protective case	CPY-Z3G□□□	○		○	
	CPY-Z3H□□□	○		○	

● Utility

Flow	Head air	Apparatus inside air		Cooling water
		Without using of air-cooler	When used	
	100 to 320 NL/min	100 to 400 NL/min	165 to 390 NL/min	0.5 to 2 L/min (10L/min MAX)
	5 to 50kPa	5 to 50kPa *Air temperature: 35°C or less	0.3 to 0.7MPa *Adjustment is required by temperature of flow-in air.	0.3 MPa MAX

Small type thermal image measuring device CPA-L4

Models

● Camera

CPA-L□□B4□□

Field angle:
 25 : Horizontal 25° × Vertical 19°
 50 : Horizontal 50° × Vertical 37°
Device specifications:
 Blank space : Standard
 01 : Controller-less*

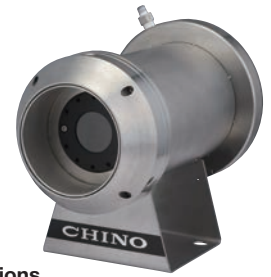


*Controller cannot be connected in case of controller less model.

● Protective case

CPY-Z4□□□□

Cooling system
 G : Air cooling
 H : Water cooling
Front purge
 P : Attached
 N : None
Air cooler
 C : Attached
 N : None
Device specifications
 N : Standard
 A : Controller-less



● Camera Specifications

Model	CPA-L25B4□□	CPA-L50B4□□
Detection element	Uncooled solid state imaging element	
Number of pixels	320×240	
Frame rate	60Hz (30 Hz when controller is connected)	
Temperature range	Specify -20 to 150°C / 0 to 300°C / 0 to 500°C at the time of purchase.	
Measurement indication	Larger one out of ± 2% or ±2°C (However ± 3% in case of ε=1.0, 0°C)	
Focus	Manual	
View angle (horizontal x vertical)	25° × 19°	50° × 37°
Measuring distance	0.3m to ∞ (Focusing range, accuracy rating is 0.5m or more)	0.2m to ∞ (Focusing range, accuracy rating is 0.5m or more)
Transmission of image data	UDP (protocol for exclusive use) 1000BASE-T	
Working temperature range	-10 to 50°C	
Protective structure	IP40 compliance	
Weight	1.2kg	1.3kg

Controller-less

[Controller-less] Operation with CPA-L4 camera alone is possible by option. Setting parameters can be registered in camera main unit and PC can be disconnected at the time of measurement.

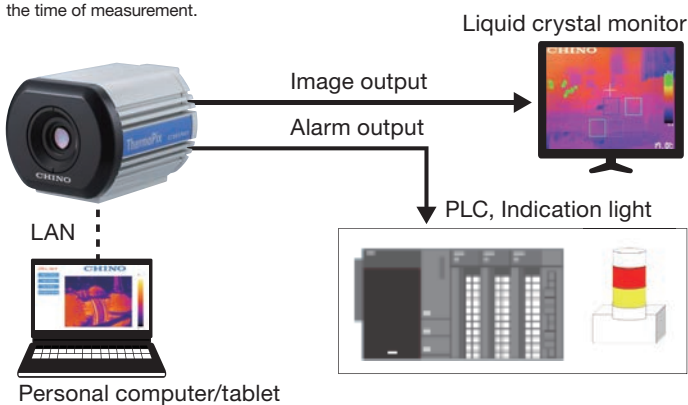
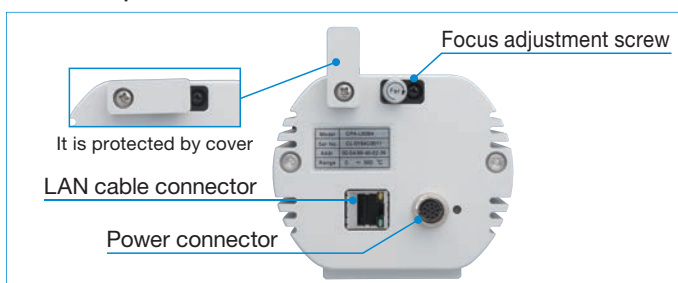


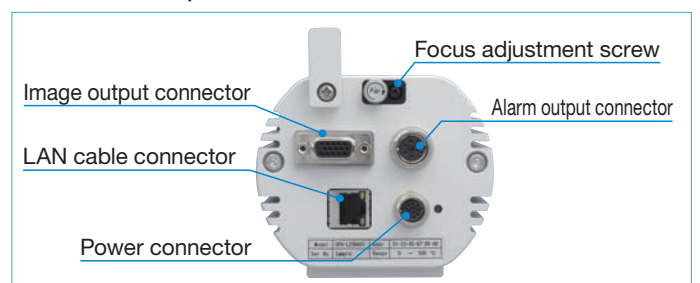
Image output	<p>The images can be displayed on the commercially available monitor</p> <ul style="list-style-type: none"> Real-time display (60Hz) Color bar display (Scale setting Automatic/Manual) Specified spot and temperature display (optional setting) Isothermo display
Alarm output	<p>Area can be set and alarm can be output from the camera main unit.</p> <ul style="list-style-type: none"> Alarm contact point: 2 points (non-voltage contact point, 24VDC, 0.1A) Alarm values can be set for max. of 5 specified areas Area shape: square Alarm conditions can be set between areas (AND / OR) Max. value, min value average value within area
Web setting / display	<p>Thermal image display and setting of extension functions</p> <ul style="list-style-type: none"> Camera specific thermal images and color scales are displayed in Web browser Various setting of camera (such as alarm conditions)

Back side of the main body

Standard specifications



Controller-less specifications



Controller CPG-GMP2L

● Controller



● Controller specification

Camera connection	Max. 4 units (When using of HUB)
Display unit	8.4 type TFT color LCD (with touch panel), with analogue VGA output for external display
External I/O	Contact output: Max. 40 points (Main unit 8 points, others via the external I/O unit) * Contact input: Max. 40 points (Main unit 8 points, others via external I/O unit) * Analog output: Max. 32 points (via the external I/O unit)
High order interface	1Gbps Ethernet 1 port
Power	24V DC, 50W (100 to 240V with DC power for AC)
Working temperature and humidity range	0 to 45°C, 20 to 85%rh (No dew condensation)
Protective structure	IP65 compliant (front panel part)
Mounting	Embedding in panel front (installation on panel back)
Weight	About 3.5kg
Accessories	USB keyboard, mouse, power unit

* Standard DIO cables are necessary for input/output of the eight contact points in the main unit.

With terminal unit : CPY-ZMDT□□

Round tip : CPY-ZMDC□□

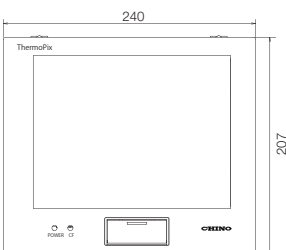
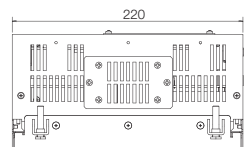
● External I/O Unit (Option)

AC/DC power unit	100 to 240V AC, 2 units in maximum are required.
IO controller module	Controller and LAN are connected. Max. 2 units are required. When 2 units are connected, HUB is required.
AO module	Path insulated, 4-point output/module, be connectable to 8 modules in maximum Output ... 1 to 5V DC or 4 to 20mA DC (module unit) (In case of current output, external power 10 to 24V DC is required.)
DIO module	8-point input/8-point output / Module, can be connected to 8 points in maximum. Input ... Photocoupler insulation (current sink/source, 8-point common) Output ... Photocoupler insulation open corrector (8-point common)
Used temperature and humidity ranges	0 to 45°C, 20 to 80% (No dew formation)
Mounting method	Mounting of DIN rail

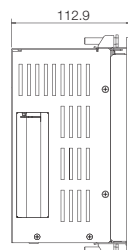
● Data processing functions

Processing products	32 types (a series of set of setup values that combine below mentioned measurements and inspection processes)
Measurement, inspection mode	Once/continuous/auto repeat
Emissivity compensation	0.001 to 2.000
Image data display	Thermal image display ... Standard/Zoom/Multi/(multiple cameras) switching, and image freezing available Simulated color iron/rainbow/grey etc. total 10 kinds
	Display of data ... Display of current values of measured values, judgement value, and calculated values Real time trend, temperature profile, histogram
	Binarization ... Temperature °C or numerical values calculation setting (Black and white image)
Spot processing	16 points / types temperature values and upper and lower limit determination
Line processing	32 lines / types, max temperature / coordinates, average temperature and higher lower limit judgement Temperature profile (graph display) histogram (graph display)
	Inspection processing ... Extracting the number of pixels within the threshold range by binarization, judgement of the upper and lower limits
Area processing	32 areas/product kinds, area ... Rectangle, circle, polygon shape Maximum temperature/coordinates, minimum temperature/coordinates, average mean temperature and the upper and lower limits judgement
	Inspection processing ... binarization Extraction of the number of pixels within the threshold range, evaluation of the upper and lower limits
	Analyses of particles ... Extraction of white lumps of pixel count within setting range by binarization, lump count upper and lower limit determination, extraction of center position of lump / temperature, No of pixels, perimeter etc
	Edge of contrasting density ... Rectangle area is differentiated horizontally or vertically and the edge position is then detected from the variation rate.
Calculation of numerical values	Calculation by mathematical formula set for calculated values Arithmetic formula ... 64 expressions / types, Arithmetic formula ... AND, OR, XOR, NOT
	Output setting
Images storage/replay	Storage of static image data ... 100 pieces/camera
	Storage trigger ... Manual/interval/event/external contact point/LAN Replay ... Search and replay the saved images remeasure and can be inspected
High-order LAN	Socket communication: Measured values etc. are transmitted to an high-order PC or PLC by UDP/IP socket. Common drive: Whole image data is written in the drive of the high-order PC.
Screen hard copy	Displayed screen is converted to BMP file and stored in USB memory (Screen of setting mode cannot be saved)
Self diagnosis	Error contact point output (FAN stop/CPU temperature abnormality, camera abnormality), WDT

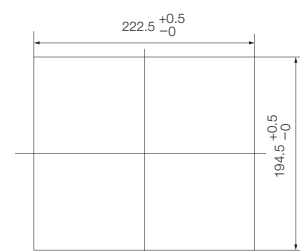
■ External dimensions



For supplying and discharging air around the main body, ensure 200mm of space.



● Panel cutout dimensions

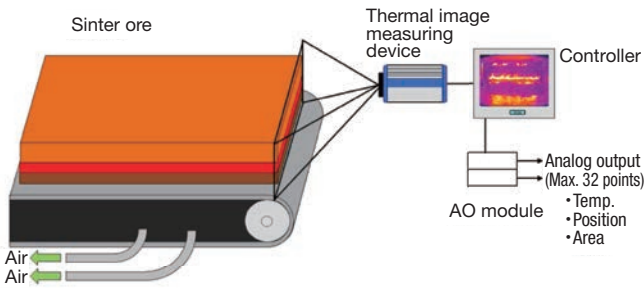


For supplying and discharging air around the main body, 200mm of space is required.

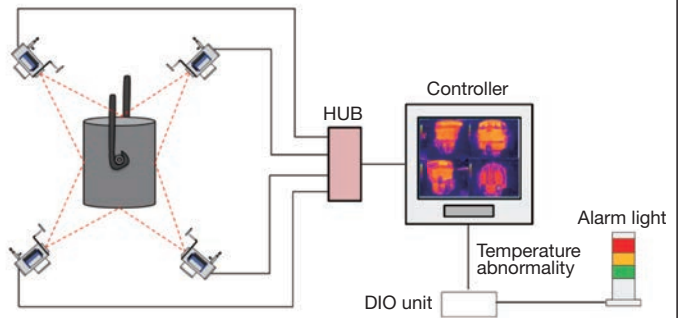
Unit: mm

Application examples

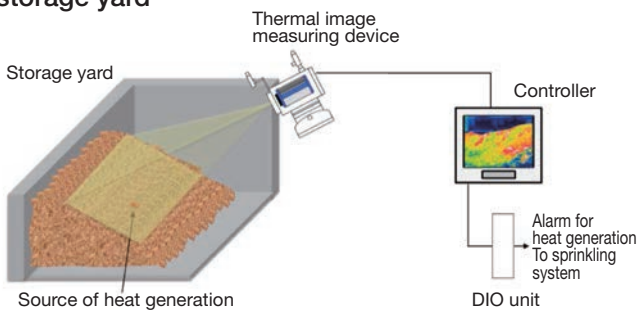
Monitoring of Sinter ore combustion surface



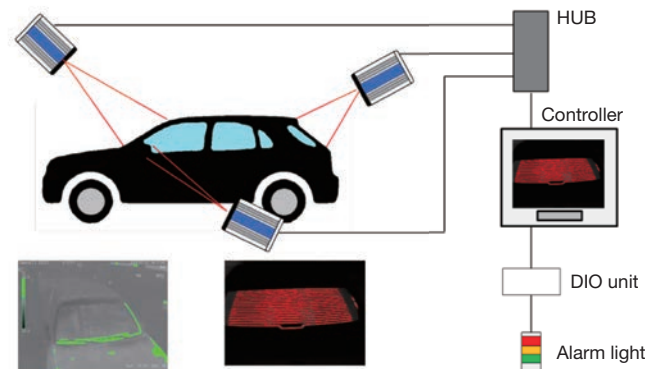
Monitoring of ladle iron surface temperature



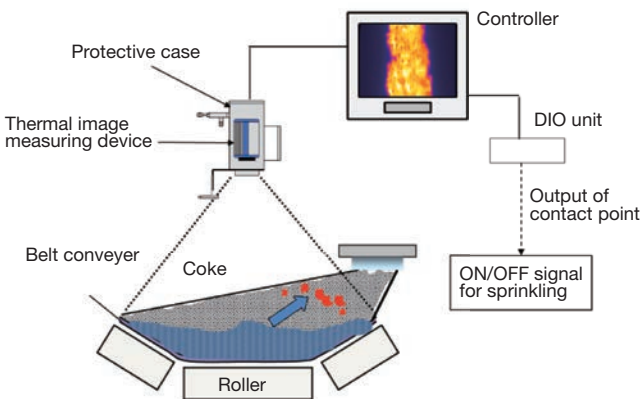
Monitoring of heat generation at raw-material storage yard



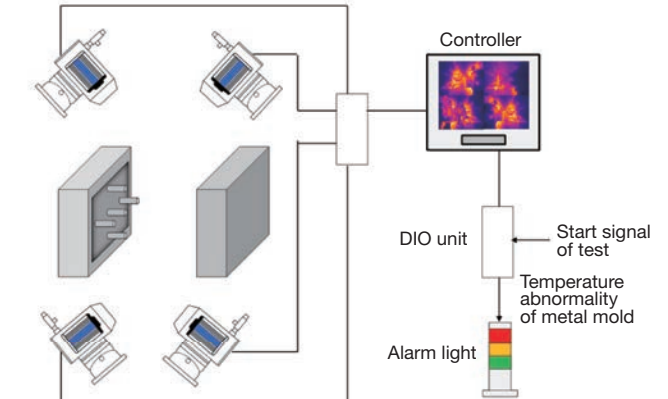
Monitoring of Automobile window defogger



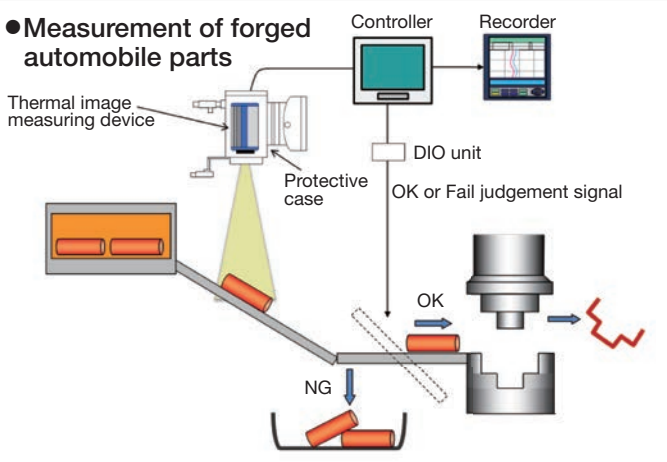
Detection of remaining fire of coke



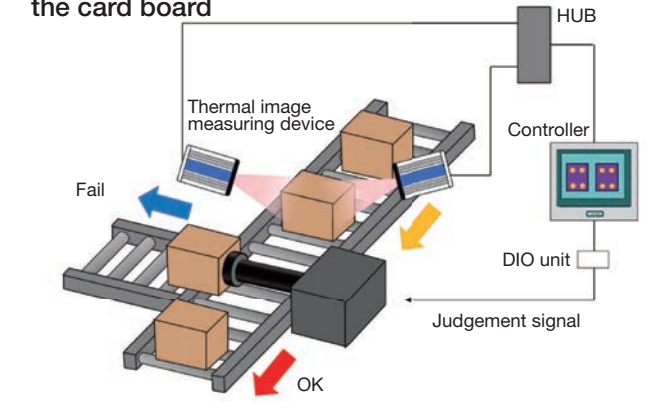
Monitoring of temperature of metal mold



Measurement of forged automobile parts



Detection of adhesive defect of hot-melt glue on the card board

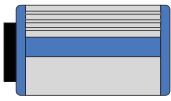


System configuration

Thermal image measuring device

Devices for power / extension

CPA-L3

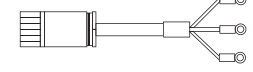


CPA-L4

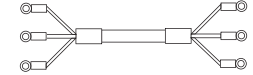


Power cables

CPY-ZMP
Maximum length : 50m (When using CPA-L3 as stand-alone)
CPY-Z4MP
Maximum length : 50m (When using CPA-L4 as stand-alone)

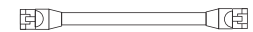


CPY-ZME Maximum length : 100m
(at the use of the protective case)



Communication cables

CPY-ZMR Maximum length : 100m
(at the use of CPA-L4 alone, at the use of CPA-L3 protective case)

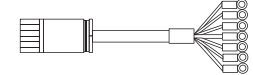


CPY-ZMC Maximum length : 100m
(at the use of CPA-ZMC alone, at the use of CPA-L4 protective case)



Optional cables (for CPA-L4)

Alarm output cable
CPY-Z4MK Maximum length : 50m



Non-voltage contact point
2-point output

Image output cable
(at the use of the protective case)
CPY-Z4MV Maximum length : 20m

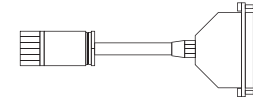
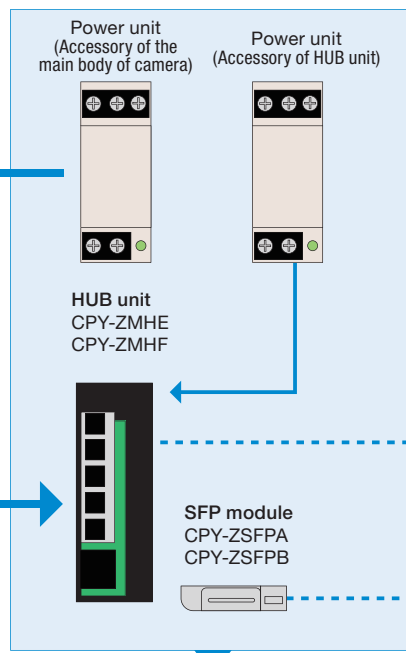


Image output

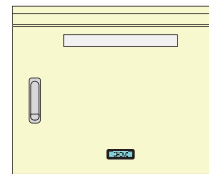


LAN cable
Maximum length : 100m

LAN

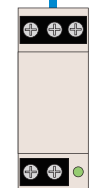
SFP module

Box of camera communication relay
CPY-ZOP□□□



Optical cable
Connector : LC
Laying length :

Max. 550m at the use of CPY-ZSFPA
Max. 2000m at the use of CPY-ZSFPB



Power unit
(Accessory of HUB unit)

View angle table

Model	Field angle	Minimum imaging distance (m)	Items		Measurement distance (m)						Spatial resolution (mrad)
					0.2	0.3	0.5	1	3	5	
CPA-L12B3	Horizontal 12° × Vertical 9°	1.0	Width of view field (m)	Horizontal view	—	—	—	0.21	0.63	1.05	0.65
				Vertical view	—	—	—	0.16	0.47	0.79	
			One-pixel view (mm)	—	—	—	0.66	1.97	3.28		
CPA-L25B3 CPA-L25B4	Horizontal 25° × Vertical 19°	0.3	Width of view field (m)	Horizontal view	—	0.13	0.22	0.44	1.33	2.22	1.36
				Vertical view	—	0.10	0.17	0.33	1.00	1.66	
			One-pixel view (mm)	—	0.42	0.69	1.39	4.16	6.93		
CPA-L50B3 CPA-L50B4	Horizontal 50° × Vertical 37°	0.2	Width of view field (m)	Horizontal view	0.19	0.28	0.47	0.93	2.80	4.66	2.73
				Vertical view	0.14	0.21	0.35	0.70	2.10	3.50	
			One-pixel view (mm)	0.58	0.87	1.46	2.91	8.74	14.57		
CPA-L70B3	Horizontal 70° × Vertical 51°	0.2	Width of view field (m)	Horizontal view	0.28	0.42	0.70	1.40	4.20	7.00	3.82
				Vertical view	0.21	0.32	0.53	1.05	3.15	5.25	
			One-pixel view (mm)	0.88	1.31	2.19	4.38	13.13	21.88		
CPA-L90B3	Horizontal 90° × Vertical 67°	0.2	Width of view field (m)	Horizontal view	0.40	0.60	1.00	2.00	6.00	10.00	4.91
				Vertical view	0.30	0.45	0.75	1.50	4.50	7.50	
			One-pixel view (mm)	1.25	1.88	3.13	6.25	18.75	31.25		

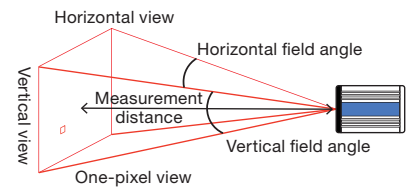
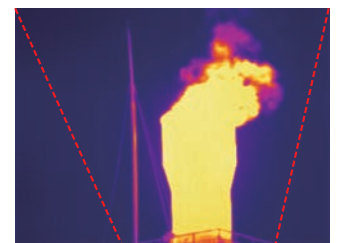
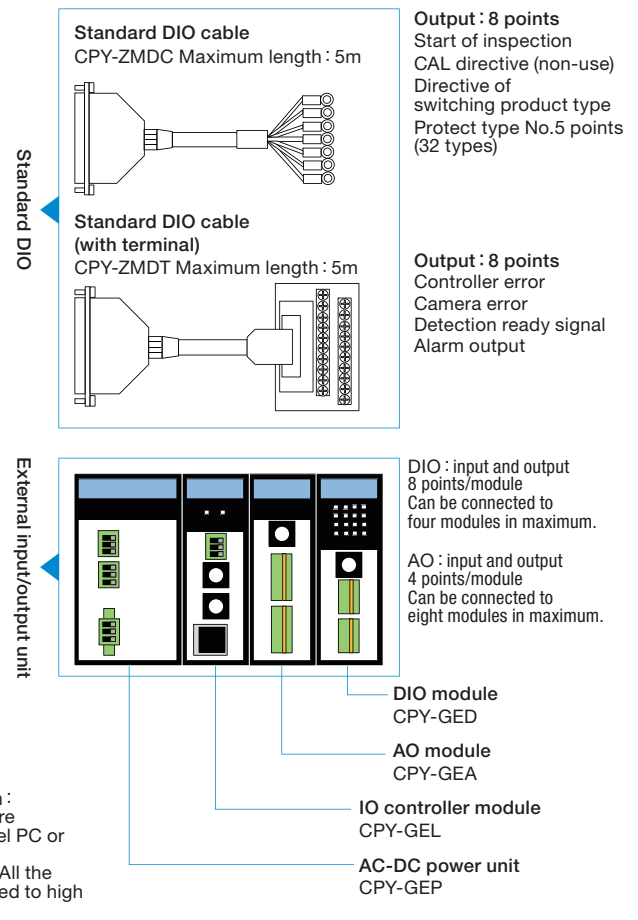
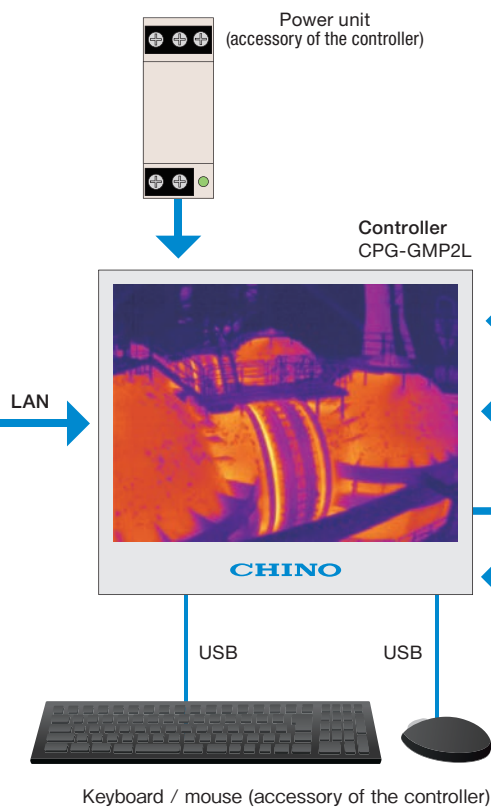


Image comparison of flare stack misfire detection



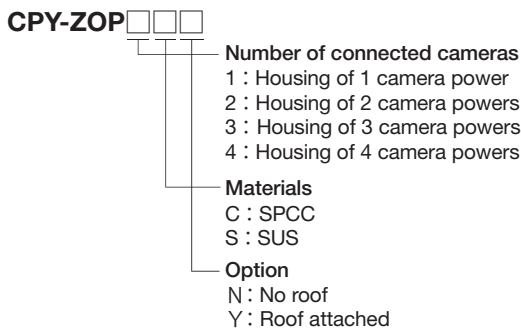
Controller

External input and output

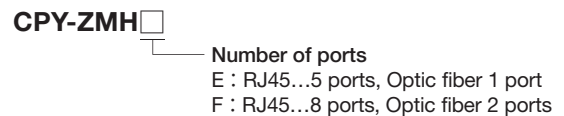


Accessories

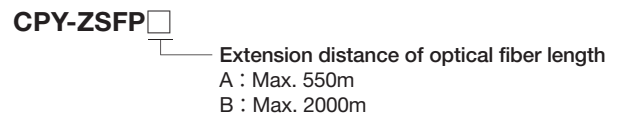
Camera communication relay box



HUB unit



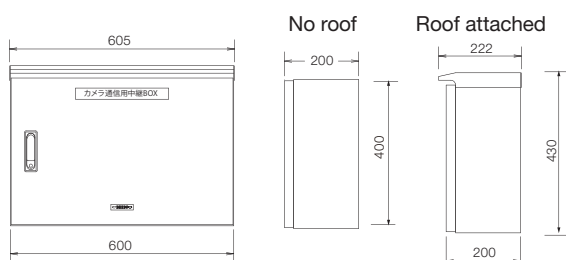
SPF module



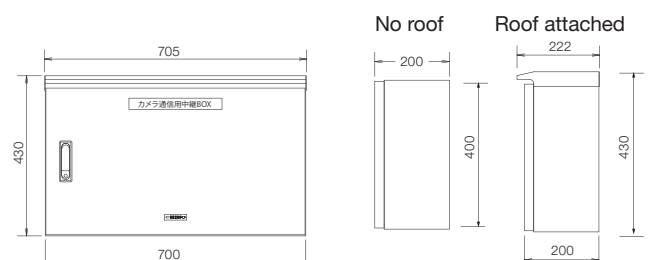
External dimensions

Camera communication relay box

CPY-ZOP1 / CPY-ZOP2



CPY-ZOP3 / CPY-ZOP4

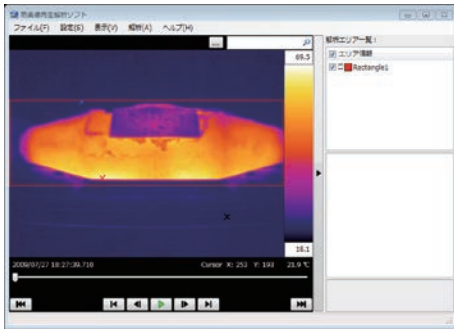


Unit: mm

Analysis software of thermal image replay (Separately sold)

This is the software to replay, analyze, save image data acquired from thermal imaging device offline.

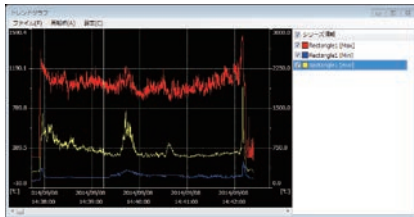
Image replay screen



Analysis data list screen

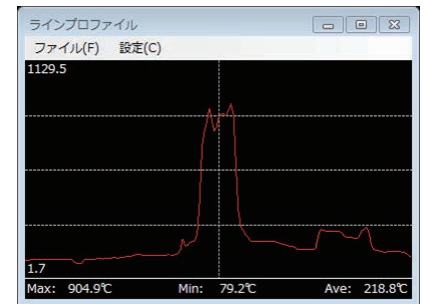
エリア名	最高温度	最低温度	最大温度	最小温度	平均温度	上限温度	下限温度	CA温度	SH温度	OL温度	CF温度
Rectangle1	203.170	1078.3	172.99	92.7	342.5	--	--	41.4	35.9	35.1	34.4
Sport1	86.174	96.3	--	--	--	--	--	41.4	35.9	35.1	34.4
Circle1	75.57	346.9	45.66	73.7	131.4	--	--	41.4	35.9	35.1	34.4
Triangle1	259.86	415.5	306.118	76.9	159.3	--	--	41.4	35.9	35.1	34.4
Polygon1	203.170	1078.3	106.119	70.0	183.1	--	--	41.4	35.9	35.1	34.4

Trend graph



CSV data

Line profile



Wide area heat generation motioning software (sold separately)

As multiple thermal image cameras are connected, conditions for detection of heat generation and evaluation of alarms are set and temperature alarms can be output at any abnormal time.

This is PC exclusive software having functions of wide area, multiple places heat generation monitoring that display thermal images of specific camera from multiple monitors.

- Corresponds to max 36 camera and 6 LCD monitors
- Monitoring cycle one second to (depending on the number of cameras)
- Processing function
 - Screen mask function
 - Temperature alarm (upper/upper-upper limit)
 - Trend graph display
 - Storage/reproduction of alarm screen
 - Alarm log etc.

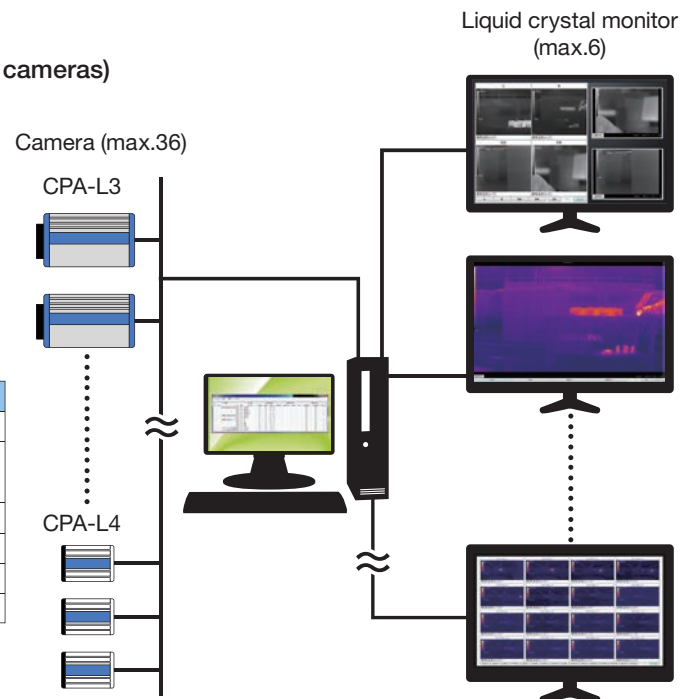
*We also produce software tailored to your needs.
For details, please contact to your nearest CHINO office.

■ Operation environment (common)

Items	Contents
Computer	Stable Windows 7 or Windows 10
Display	Image resolution 1280 x 1024 or higher, Compatible with Windows
OS	32bitOS 2GB or higher / 64bitOS 4GB or higher
Memory	2GB or larger
Software alliance	Installation of .NET Framework 4.0 is required.
DPI	96pt

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⚠ Cautions on Safety

- This product was designed and manufactured as a general industrial measuring device.
- In installing, connecting and using this product, read the manual sufficiently and then use the product correctly.
- The written contents may be changed without advance notice because of improvement in the performance etc. Please understand it in advance.
- The contents in this catalog are as of October, 2019.



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