



# TMHX-C series Specifications sheet



Features	General purpose			Minute points		Long distance:500mm
Photo						
Model	<b>TMHX</b> -CNE0500 -0035E1.6	<b>TMHX</b> -CNE0500 -0070E003	<b>TMHX</b> -CNE0500 -0120E5.5	<b>TMHX</b> -CSE0500 -0100E001	<b>TMHX</b> -CSE0500 -0040H0.7	<b>TMHX</b> -CLE1350 -0500B009
Temperature range	 0 ~ 500°C			 0 ~ 500°C		 0 ~ 1350°C
Spectral range	2.0 ~ 6.8μm			2.0 ~ 6.8μm	5.0 ~ 6.8μm	3.0 ~ 5.6μm
Measurement distance	35mm	70mm	120mm	100mm	40mm	500mm
Spot size *2	 ∅ 1.6mm	 ∅ 3mm	 ∅ 5.5mm	 ∅ 1mm	 ∅ 0.7mm	 ∅ 9mm
Accuracy *1	< 300°C: ±3.0°C ≥ 300°C: measured value ±1%			± 5°C	< 300°C: ±3.0°C ≥ 300°C: measured value ±1%	< 300°C: ±3.0°C ≥ 300°C: measured value ±1%
Repeatability *1	±0.5°C			±2°C	±1°C	±1°C
Resolution *1	≤ 0.5°C			< 100°C: ≤ 3°C ≥ 100°C: ≤ 1.5°C	< 50°C: ≤ 1°C ≥ 50°C: ≤ 0.5°C	< 50°C: ≤ 1°C ≥ 50°C: ≤ 0.5°C
Response Time	0.01 ~ 5s (0 ~ 95% analog output) configurable by smoothing function			0.05 ~ 5s (0 ~ 95% analog output) configurable by smoothing function	0.01 ~ 5s (0 ~ 95% analog output) configurable by smoothing function	0.01 ~ 5s (0 ~ 95% analog output) configurable by smoothing function *3
Warm-up time	1min			1min	3min	1min
Dimension category	HX-C1			HX-C2a	HX-D4	HX-C2b
Weight (cable not included)	80g			85g	190g	90g
Cable	2m Direct leading out			2m Direct leading out	2m With a connector	2m Direct leading out
Accessory category	A			B	C	B *4

*1	Ambient temperature 23±5°C, Emissivity 1.0, Averaging time 0.05s.
*2	Check the optics diagrams for spot sizes outside of the ranges in the measurement distance section above. It shows the area where 90% of the total energy is included.
*3	The response time may be longer by 0.001s when switching the internal range.
*4	Water cooling jacket the TMWX-A3 is available.



Features	Quick response : 1ms		Ultra quick response : 0.1ms	Glass				
	Photo							
Model	<b>TMHX</b> -CHE0500 -0100B3.5	<b>TMHX</b> -CHE0500 -0200B007	<b>TMHX</b> -CUE0500 -0200H008	<b>TMHX</b> -CGE1200 -0180E007	<b>TMHX</b> -CGE1200 -0500E020	<b>TMHX</b> -CGE2400 -0150H2.2	<b>TMHX</b> -CGE2400 -0300H4.5	<b>TMHX</b> -CGE2400 -1500H020
Temperature range	 0 ~ 500°C		 0 ~ 500°C	 50 ~ 1200°C		 50 ~ 2400°C		
Spectral range	2.0 ~ 6.8μm		2.0 ~ 6.8μm	5.0 ~ 5.6μm				
Measurement distance	100mm	200mm	200mm	180mm	500mm	150mm	300mm	1500mm
Spot size *2	 ø 3.5mm	 ø 7mm	 ø 8mm	 ø 7mm	 ø 20mm	 ø 2.2mm	 ø 4.5mm	 ø 20mm
Accuracy *1	< 350°C: ±3.5°C ≥ 350°C: measured value ±1%		< 400°C: ±4.0°C ≥ 400°C: measured value ±1%	< 300°C: ±3.0°C ≥ 300°C: measured value ±1%		< 300°C: ±3.0°C ≥ 300~1200°C: measured value ±1% ≥ 1200°C: measured value ±2% *5		
Repeatability *1	±1°C		±0.5°C	±1°C		Measured value ±0.2% ±2°C		
Resolution *1	< 50°C: ≤ 1.5°C ≥ 50°C: ≤ 0.7°C		< 50°C: ≤ 4°C ≥ 50°C: ≤ 3°C	< 100°C : ≤ 1°C ≥ 100°C : ≤ 0.5°C				
Response Time	0.001 ~ 5s (0~95% analog output) configurable by smoothing function		0.0001 ~ 5s (0~95% analog output) configurable by smoothing function	0.05 ~ 5s (0~95% analog output) configurable by smoothing function *3		0.01 ~ 5s (0~95% analog output) configurable by smoothing function *4		
Warm-up time	1 min		3 min	1 min		3 min		
Dimension category	HX-C2a		HX-D4	HX-C1		HX-D4		
Weight (cable not included)	85g		190g	80g		190g		
Cable	2m Direct leading out		2m With a connector	2m Direct leading out		2m With a connector		
Accessory category	B		C	A		C		

*1	Ambient temperature 23±5°C, Emissivity 1.0, Averaging time 0.001s.	Ambient temperature 23±5°C, Emissivity 1.0, Averaging time 0.0001s.	Ambient temperature 23±5°C, Emissivity 1.0, Averaging time 0.05s.					
*2	Check the optics diagrams for spot sizes outside of the ranges in the measurement distance section above. It shows the area that 90% of the total energy is included.							
*3	The response time may be longer by 0.001s when switching the internal range.							
*4	The response time may be longer by 0.002s when switching the internal range.							
*5	Accuracy not guaranteed for the temperature higher than 2,000°C.							



Features	Mirror surface		Film	Through quartz		Lamp heating	Through flame	Flame detection
Photo								
Model	<b>TMHX</b> -CME0250 -0020E004	<b>TMHX</b> -CME0250 -0050H003	<b>TMHX</b> -CFE0350 -0200E012	<b>TMHX</b> -CQE0500 -0200E011	<b>TMHX</b> -CQE0500 -0200H004	<b>TMHX</b> -CPE1200 -0180E007	<b>TMHX</b> -CVE1300 -0200H4.5	<b>TMHX</b> -CBE1500 -0300E018
Temperature range	1500°C 1000°C 500°C 0°C 50 ~ 250°C		80 ~ 350°C	50 ~ 500°C		0 ~ 1200°C	200 ~ 1300°C	150 ~ 1500°C
Spectral range	2 ~ 6.8μm		3.4μm	3.0 ~ 4.0μm	2.8 ~ 3.9μm	5.0 ~ 6.8μm	3.9μm	4.3μm
Measurement distance	20mm *Note5	50mm *Note5	200mm	200mm		180mm	200mm	300mm
Spot size *2	 ∅ 4mm	 ∅ 3mm	 ∅ 12mm	 ∅ 11mm	 ∅ 4mm	 7mm	 ∅ 4.5mm	 ∅ 18mm
Accuracy *1	±5°C	±4°C	±4°C	< 300°C: ±3.0°C ≥ 300°C: measured value ±1%	< 300°C: ±4.0°C ≥ 300°C: measured value ±1.5%	< 300°C: ±3.0°C ≥ 300°C: measured value ±1%	< 300°C: ±3.0°C ≥ 300~1200°C: measured value ±1% ≥ 1200°C: measured value ±2%	none
Repeatability *1	±2°C		±1°C	±1°C		±0.5°C	Measured value ±0.2% ±0.2°C	±5°C
Resolution *1	≤ 2°C		< 120°C: ≤ 1°C ≥ 120°C: ≤ 0.5°C	< 100°C: ≤ 1°C ≥ 100°C: ≤ 0.5°C	≤ 0.5°C	≤ 0.5°C	< 300°C: ≤ 1°C ≥ 300°C: ≤ 0.5°C	≤ 1°C
Response time	0.05 ~ 5s (0~95% analog output) configurable by smoothing function		0.05 ~ 5s (0~95% analog output) configurable by smoothing function	0.05 ~ 5s (0~95% analog output) configurable by smoothing function *3		0.01 ~ 5s (0~95% analog output) configurable by smoothing function *3	0.01 ~ 5s (0~95% analog output) configurable by smoothing function *4	0.05 ~ 5s (0~95% analog output) configurable by smoothing function
Warm-up time	3 min		1 min	1 min	3 min	1 min	3 min	1 min
Dimension category	HX-C1 + Light shielding hood	HX-D5	HX-C1	HX-C1	HX-D4	HX-C1	HX-D4	HX-C1
Weight (cable not included)	110g	210g	80g	80g	190g	80g	190g	80g
Cable	2m Direct leading out	2m With a connector	2m Direct leading out	2m Direct leading out	2m With a connector	2m Direct leading out	2m With a connector	2m Direct leading out
Accessory category	A	C	A	A	C	A	C	A

*1	Ambient temperature 23±5°C, Emissivity 0.05, Averaging time 0.5s.	Ambient temperature 23±5°C, Emissivity 1.0, Averaging time 0.5s.	Ambient temperature 23±5°C, Emissivity 1.0, Averaging time 0.1s.		Ambient temperature 23±5°C, Emissivity 1.0, Averaging time 0.05s.	Ambient temperature 23±5°C, Emissivity 1.0, Averaging time 0.05s.	Ambient temperature 23±5°C, Emissivity 1.0, Averaging time 1s.	
*2	Check the optics diagrams for spot sizes outside of the ranges in the measurement distance section above. It shows the area that 90% of the total energy is included							
*3	The response time may be longer by 0.001s when switching the internal range.							
*4	The response time may be longer by 0.002s when switching the internal range.							
*5	Valid measurement distance; ±10mm.							

## Common Specifications

Detective Element	InSb (Indium antimonide)	
Sight	Red LED sight *switchable on/off	
Output	Analog output (non-isolated)	
	Output type (selective)	Output Range
	0 ~ 1V	≥ 30mV
	mV/°C	≥ 30mV (30°C)
	0 ~ 20mA	≥ 0.2mA
	4 ~ 20mA	≥ 4.0mA
	Output Accuracy *1	
	±1.5mV	
±1.5mV		
±0.02mA		
±0.02mA		
RS232C output (non-isolated)		
output swing: approx. ±4V baud rate: 4800, 9600, 19200, 38400, 57600, 115200bps		
Alarm output (non-isolated)		
open-drain: 27VDC, 0.2A hysteresis: 0 ~ 99.9°C		
Peak Hold	reset (switchable)	time: 0.01 ~ 10s (configurable) discharge: time 0.01 ~ 10s, level 0.2 ~ 1.0
Emissivity correction	guaranteed range ; 0.3 ~ 1.0 *2 setting range ; 0.05 ~ 1.000 (setting resolution:0.001) ☉ reflected correction function	
Sensor correction function	span:0.500 ~ 2.000 / zero: -50 ~ +50( °C or °F selectable)	
Temperature indication	none	
Cable length	2m (standard)	
Protection class	same quality as IP67, not included:e-con connector	
Ambient temperature	0 ~ 50°C *3	
Ambient humidity	30 ~ 85%RH (non-condensing)	
Storage temperature	-15 ~ 70°C *3	
Supply voltage	DC4.7 ~ 27V、 0.1A max.	

CE Aquired CE marking (EMC EN61326-1:2013,RoHS EN50581:2012)

\*1 : Static error is reflected in the accuracy rating.

\*2 : The TMHX-CME, guaranteed range is 0.05 ~ 1.0.

\*3 : The TMHX-CME250-0020E004, ambient temperature 0 ~ 70°C, storage temperature -15 ~ 80°C.

Ordering information	Cable length	-00	2m (standard)	Analog output mV/°C 4 - 20mA 0 - 20mA switchable	0	0 ~ 1V (standard)
		-05	5m		5	0 ~ 5V (built-in resistor)
		-10	10m		1	0 ~ 10V (built-in resistor)

## Operations

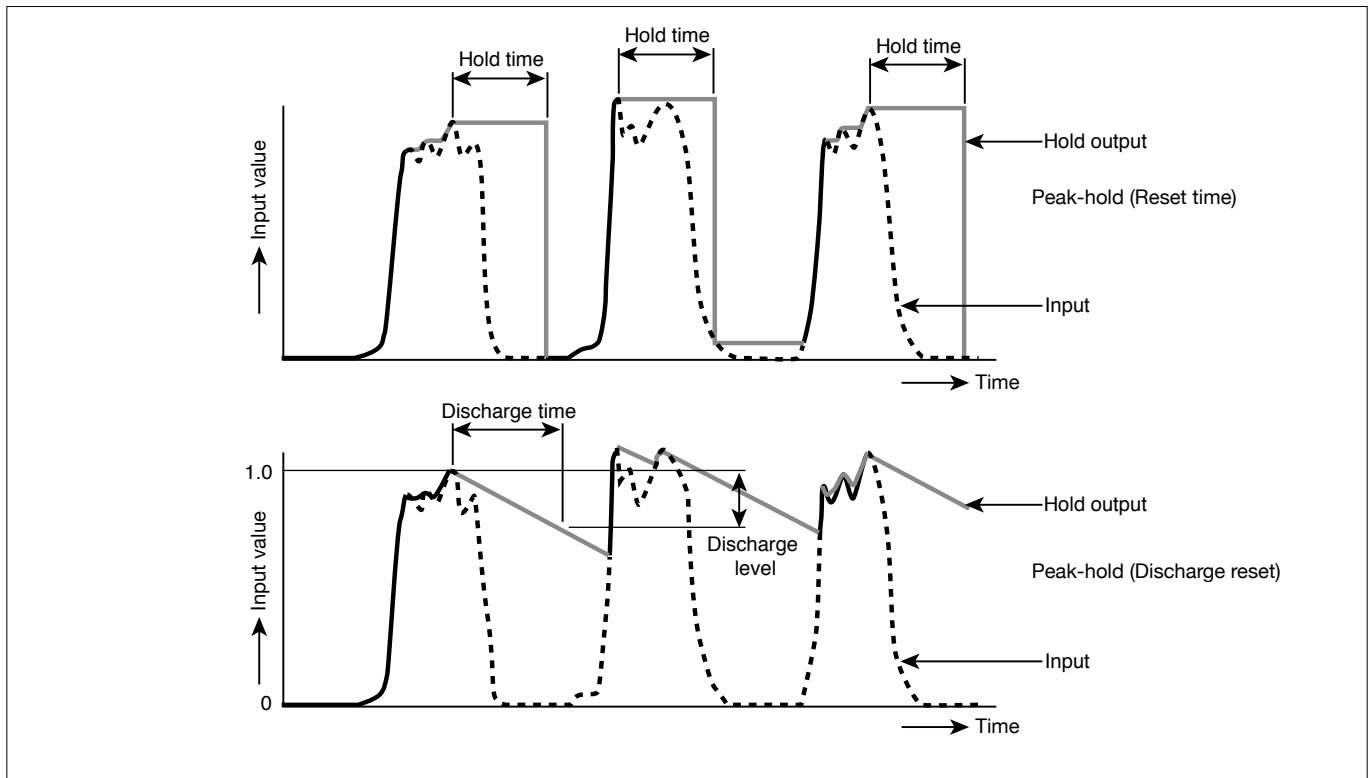
### Alarm outputs

Mode No.	Alarm name	Measurement temperature			
		← Low	Low set point	High set point	High →
1	High ON				█
2	High OFF	█			
3	Low ON	█			
4	Low OFF		█		
5	Band ON		█		
6	Band OFF	█			█
7	Error ON	█			█
8	Error OFF				

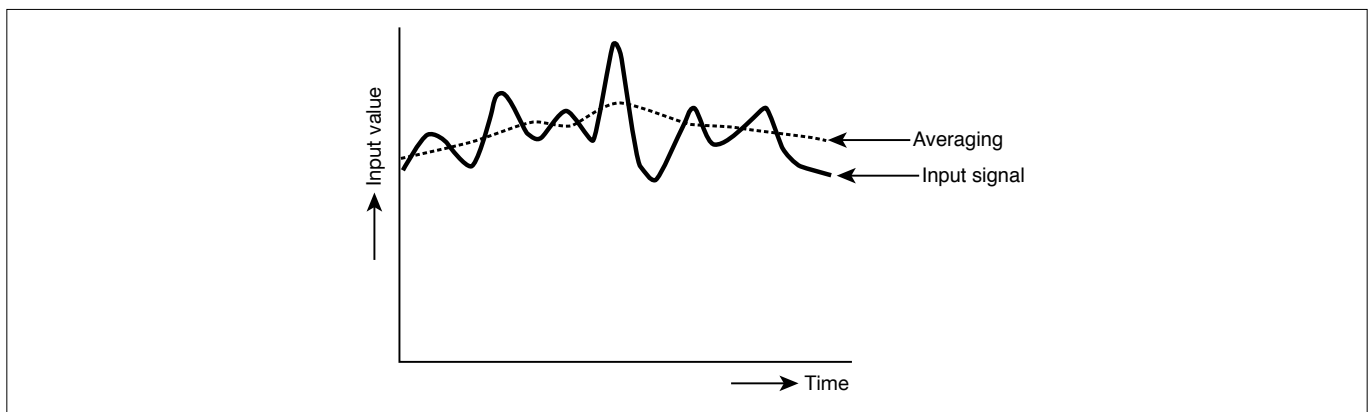
\*Error : an inner voltage malfunction

ON █

### Peak-hold operation

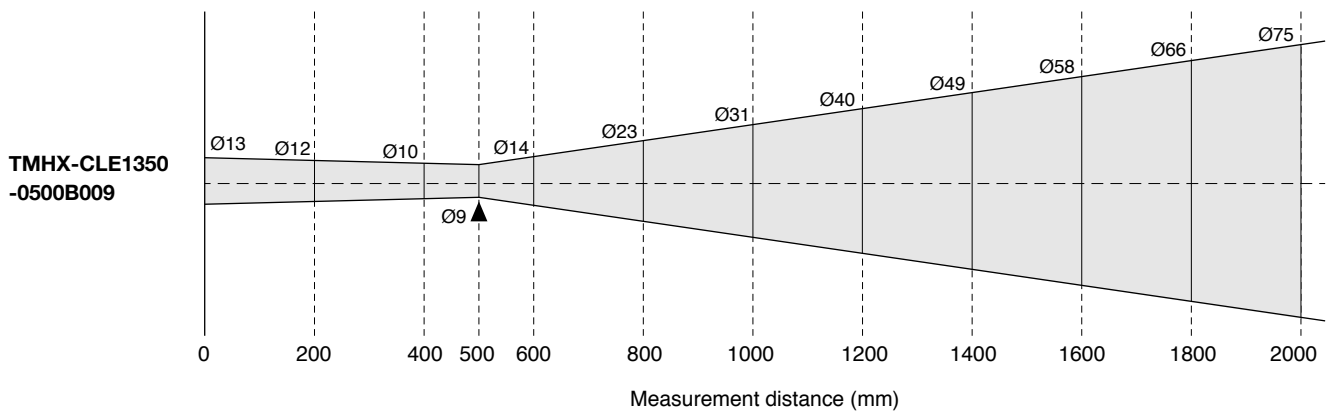
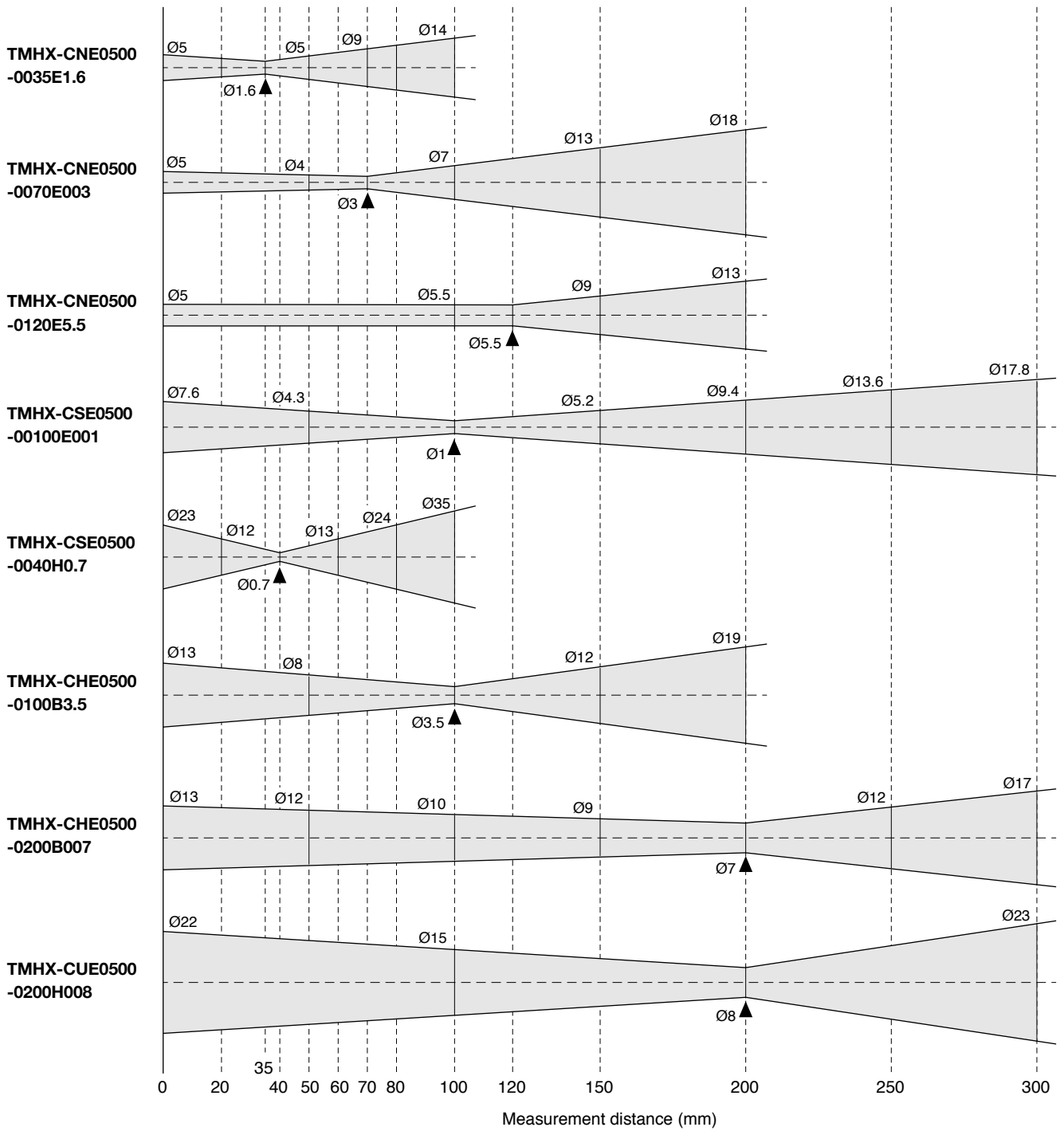


### Averaging time



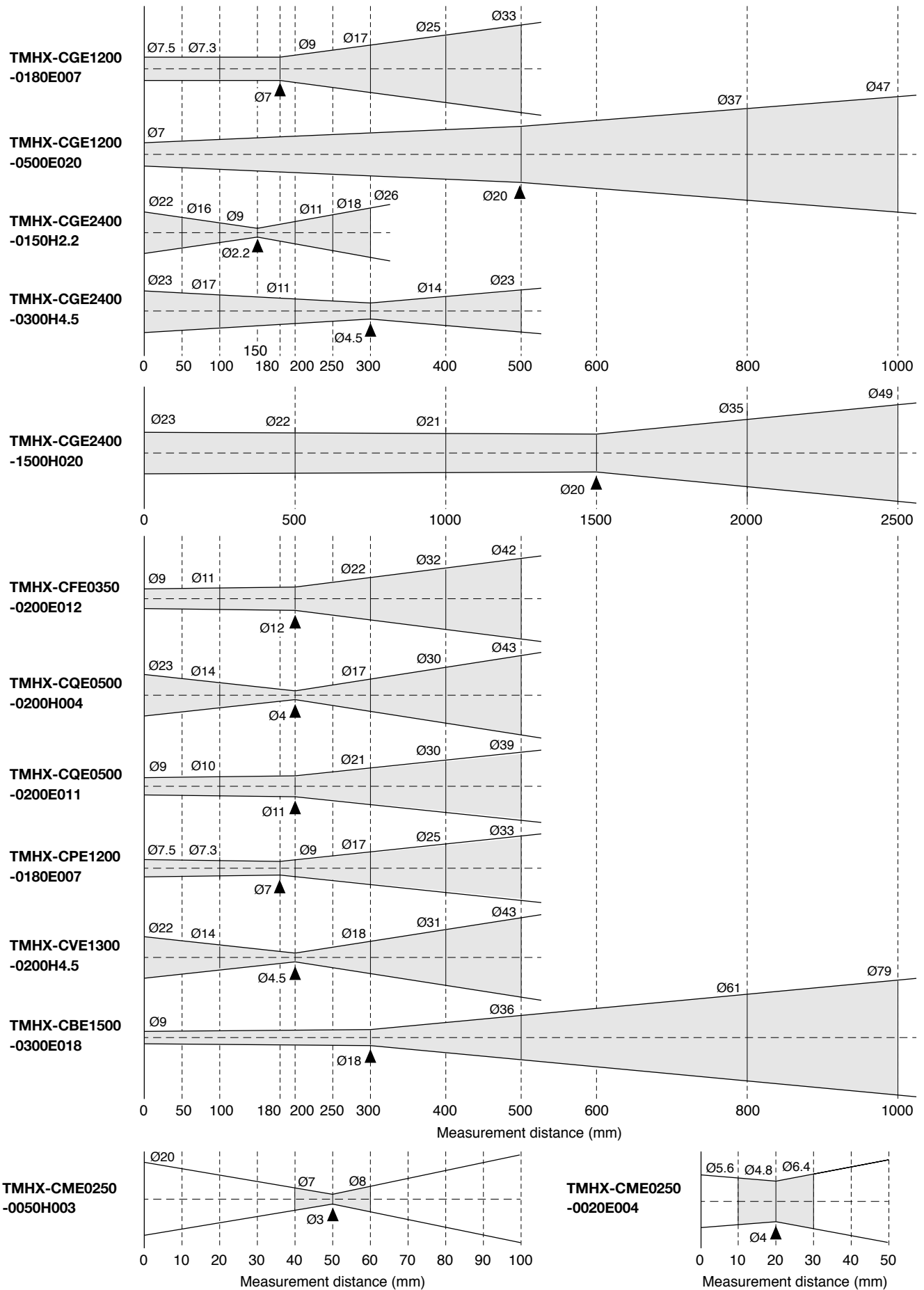
Optics diagram

It shows the area that 90% of the total energy is included.



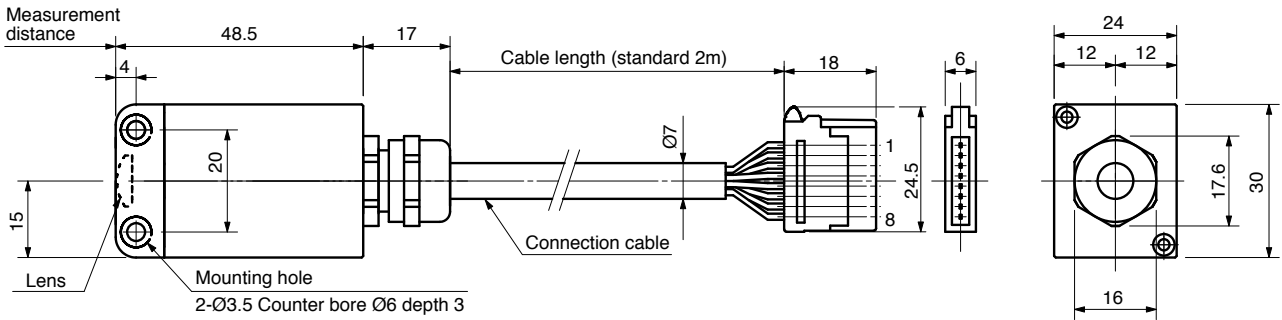
Optics diagram

It shows the area that 90% of the total energy is included.

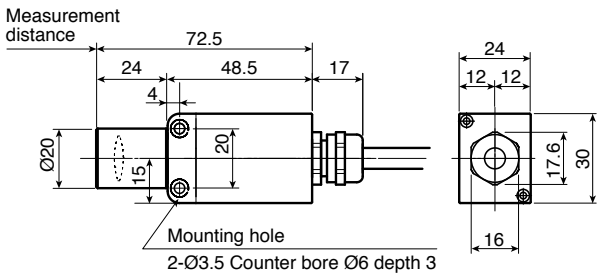


Sensor head dimensions (mm)

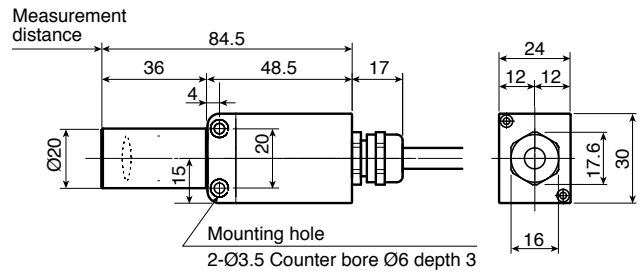
HX-C1



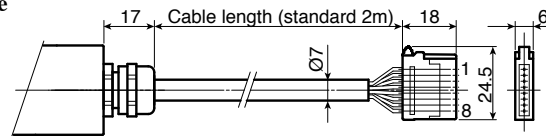
HX-C2a



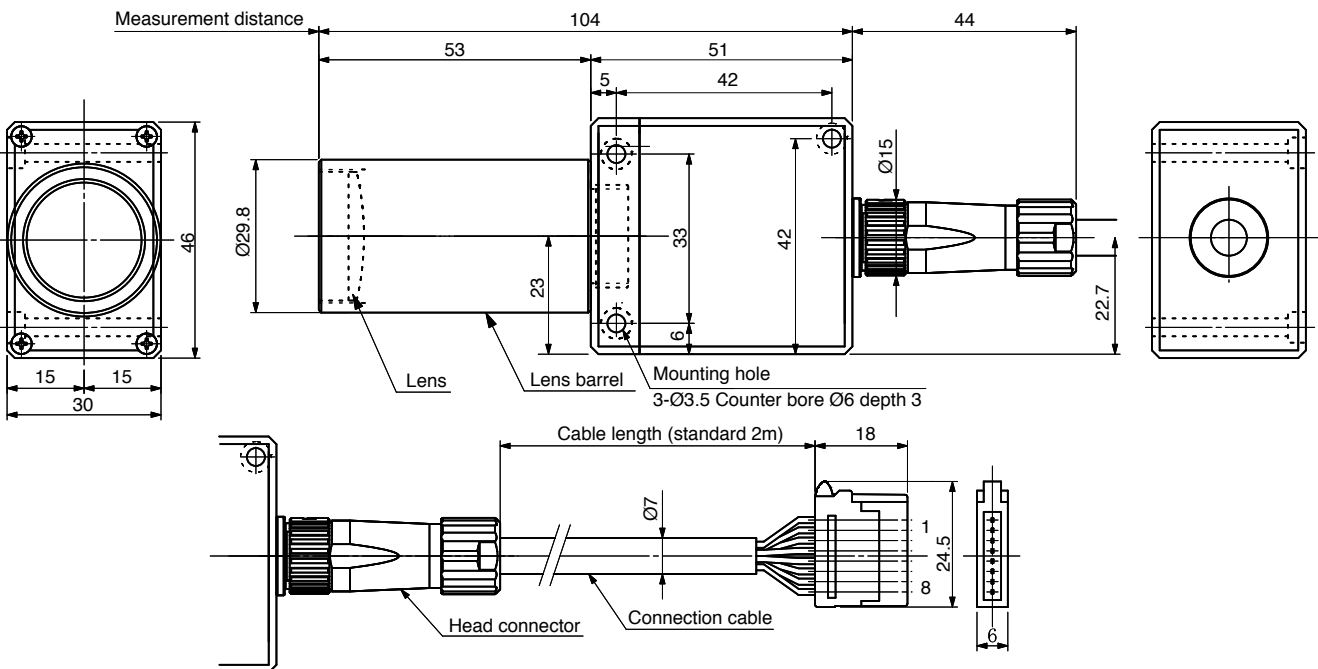
HX-C2b



HX-C2a / HX-C2b Alternative cable



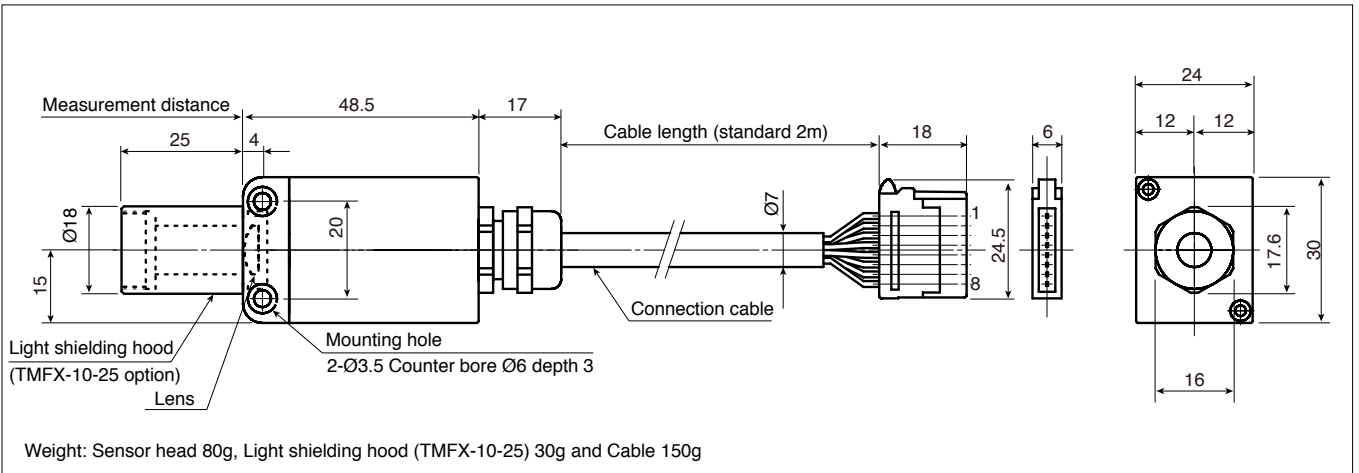
HX-D4



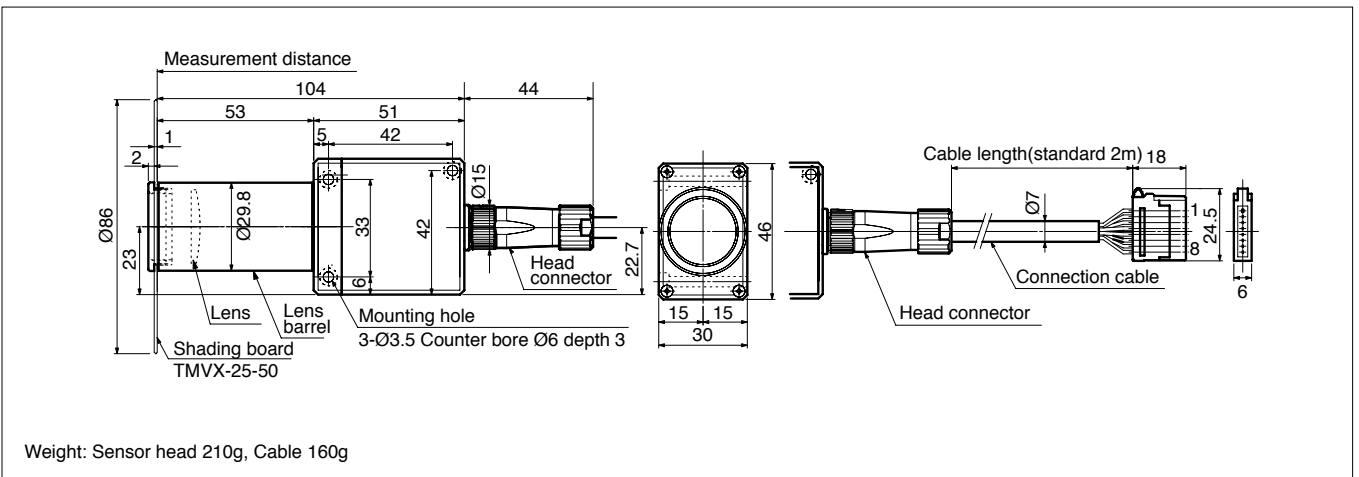


Sensor head dimensions (mm)

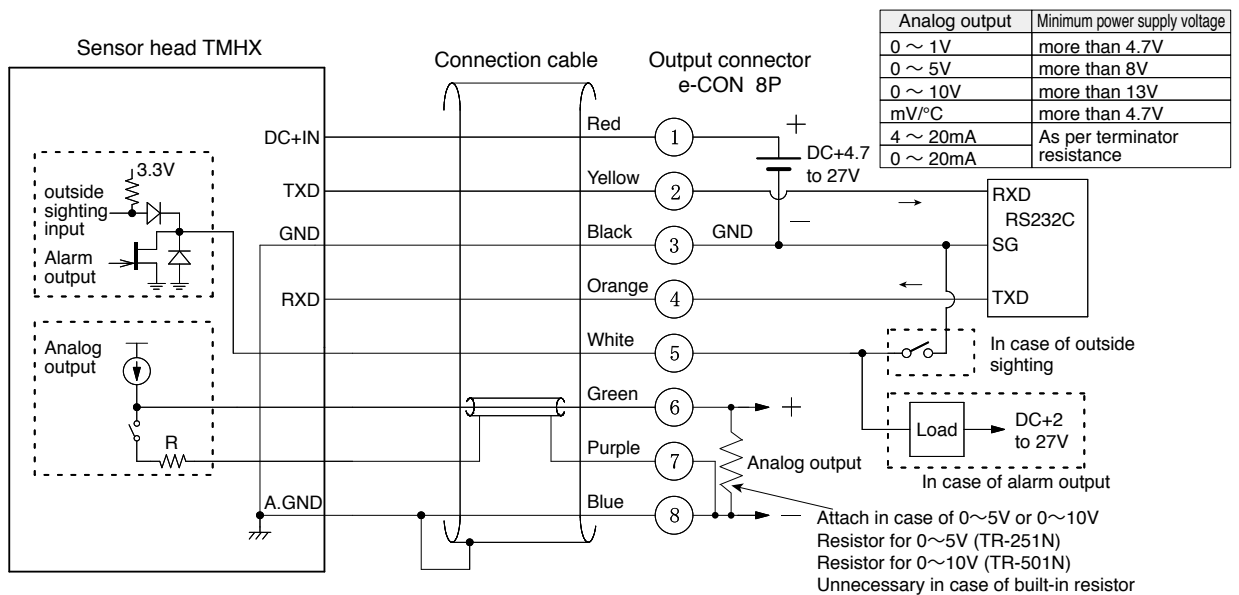
HX-C1+Shading hood



HX-D5



Wiring (in case the thermometer is used alone)



Accessories

**Mounting bracket TMAX-A**

Bracket for sensor head installation Accessory : A,B

t 2.0  
Weight : 45g

**Mounting bracket TMAX-B**

Bracket for sensor head installation Accessory : C

t 2.0  
Weight : 85g

**Protective window TMDX-A1C / TMDX-15C / TMDX-25C**

Use with the lens to prevent contamination and damage.

Model	A	B	C	D	Accessories
TMDX-A1C	Ø20.5	7	12	M16P2	A
TMDX-15C	Ø20.5	7	10	M16P0.75	B
TMDX-25C	Ø30.5	9	12	M26P0.75	C

**Air purge hood TMPX-A1 / TMPX-15 / TMPX-25**

Use with the lens to prevent dust and condensation.

Model	A	B	C	D	E	F	Accessories
TMPX-A1	Ø18	Ø10	35	40	M16P2	24.5	A
TMPX-15	Ø20	Ø17	50	53	M16P0.75	27	B
TMPX-25	Ø30	Ø25	75	79	M26P0.75	32	C

**Airless dust protector TMNX-A1 / TMNX-15 / TMNX-25**

Use with the lens to prevent dust. No air supply required.

Model	A	B	C	D	Accessories
TMNX-A1	Ø28	50	54.5	M16P2	A
TMNX-15	Ø40	70.5	73.5	M16P0.75	B
TMNX-25	Ø66	107	112.5	M26P0.75	C

**Right angle mirror TMLX-A1C / TMLX-15C / MLX-25C**

Reflects sensor field of view by 90 degrees.


Model	A	B	C	D	E	F	G	Optical path	Accessories
TMLX-A1C	23.8	20	5	14.9	M16P2	34	29.8	34.9	A
TMLX-15C	23.8	20	3	14.9	M16P0.75	34	29.8	34.9	B
TMLX-25C	36	30	5	22	M26P0.75	50	45	52	C

Accessories

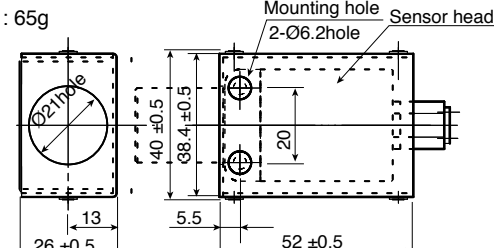
**Shield case** **TMSX-A**

Use with the sensor head to protect from electromagnetic at applications such as high frequency heating.

Accessory : A,B



Weight : 65g


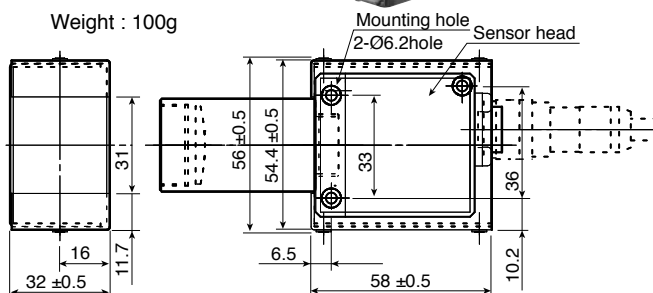


**Shield case** **TMSX-B4**

Use with the sensor head to protect from electromagnetic at applications such as high frequency heating.


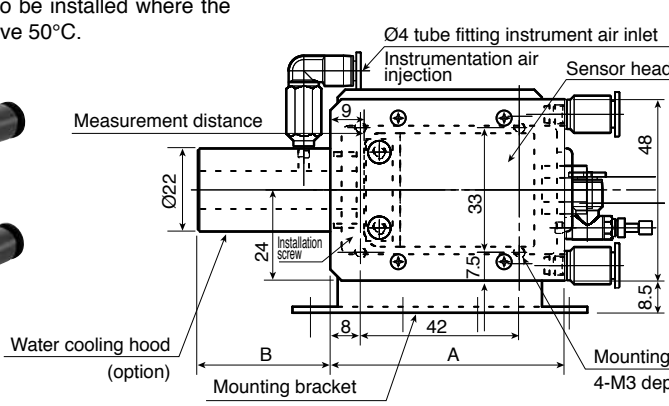
Accessory : C

Weight : 100g

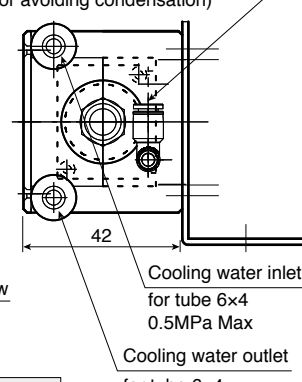



**Water cooling jacket** **TMWX-A1 / TMWX-A2 / TMWX-A3**

Use with the sensor head to be installed where the ambient temperature is above 50°C.

Air controller for the container purge air inlet dried air for 4x2.5 tube (for avoiding condensation)




Model	A	B	Accessories	Hood Model
TMWX-A1	62	35	A	TMPX-10W
TMWX-A2	86	50	B ※	TMPX-15W
TMWX-A3	98	50	TMHX-CLE	TMPX-15W

※not included : TMHX-CLE

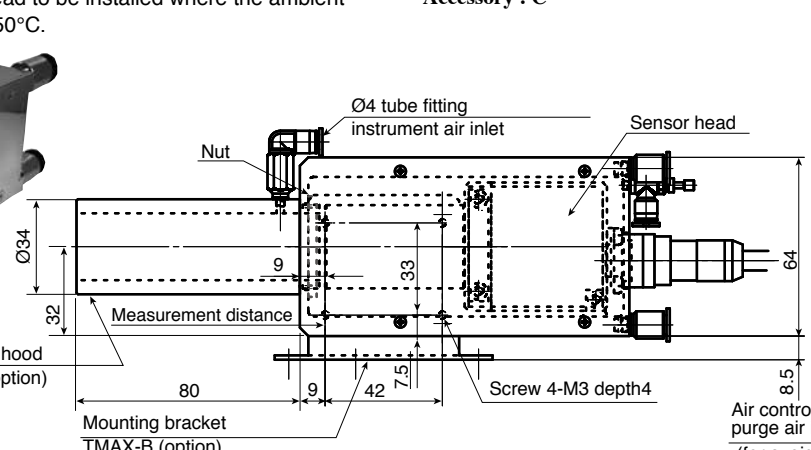
**Water cooling jacket** **TMWX-B4**

Use with the sensor head to be installed where the ambient temperature is above 50°C.

Accessory : C



\*Image





Cooling water inlet for tube 6x4 (0.5MPa Max)


Cooling water outlet for tube 6x4

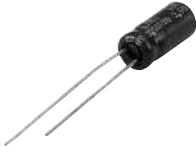
Air controller for the container purge air inlet dried air for 4x2.5 tube (for avoiding condensation)


**Accessories**

Extension cable	<b>TMBX-E05</b>
Extension cable : 5m e-con female / e-con male	Accessory : <b>A,B,C</b>
	
Weight : 390g	

Branch cable	<b>TMBX-B01</b>
For setting unit when thermometer is used alone. e-con branch	Accessory : <b>A,B,C</b>
	
Weight : 85g	

Resistor	<b>TR-251N / TR-501N</b>
Analog output TR-251N : 0 ~ 5V TR-501N : 0 ~ 10V To change from current to voltage : 0 ~ 20mA	Accessory : <b>A,B,C</b>
	
Weight : 0.5g	

Capacitor	<b>TC-105N</b>
Noise suppressor for analog.	Accessory : <b>A,B,C</b>
	
Weight : 0.5g	

Ferrite core	<b>FC-2032</b>
For power noise. Install to cables.	Accessory : <b>A,B,C</b>
	
Weight : 23g	

•If you have any questions, contact us at the address or links shown below.