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- SENSOR OPTIONS
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- ENERGY CONSUMPTION VISUALIZATION COMPONENTS
- FA COMPONENTS
- MACHINE VISION SYSTEMS
- UV CURING SYSTEMS

## ORDER GUIDE

### Sensor heads

Laser class	Type	Measuring range	Resolution	Spot diameter	Model No.	
					IEC standards conforming type	FDA regulations conforming type
Class 1	<b>LM10-50</b>	50 ±10 mm <b>1.969 ±0.394 in</b>	5 μm <b>0.197 mil</b>	0.6 × 1.1 mm <b>0.024 × 0.043 in</b>	ANR1150	ANR11501
	<b>LM10-50S</b>	50 ±10 mm <b>1.969 ±0.394 in</b>	5 μm <b>0.197 mil</b>	0.09 × 0.05 mm <b>0.004 × 0.002 in</b>	ANR1151	ANR11511
	<b>LM10-80</b>	80 ±20 mm <b>3.150 ±0.787 in</b>	20 μm <b>0.787 mil</b>	0.7 × 1.2 mm <b>0.023 × 0.047 in</b>	ANR1182	ANR11821
	<b>LM10-130</b>	130 ±50 mm <b>5.118 ±1.969 in</b>	100 μm <b>3.937 mil</b>	0.7 × 1.4 mm <b>0.028 × 0.055 in</b>	ANR1115	ANR11151
Class 2	<b>LM10-50</b>	50 ±10 mm <b>1.969 ±0.394 in</b>	1 μm <b>0.039 mil</b>	0.6 × 1.1 mm <b>0.024 × 0.043 in</b>	ANR1250	ANR12501
	<b>LM10-50S</b>	50 ±10 mm <b>1.969 ±0.394 in</b>	1 μm <b>0.039 mil</b>	0.09 × 0.05 mm <b>0.004 × 0.002 in</b>	ANR1251	ANR12511
	<b>LM10-80</b>	80 ±20 mm <b>3.150 ±0.787 in</b>	4 μm <b>0.157 mil</b>	0.7 × 1.2 mm <b>0.028 × 0.047 in</b>	ANR1282	ANR12821
	<b>LM10-130</b>	130 ±50 mm <b>5.118 ±1.969 in</b>	20 μm <b>0.787 mil</b>	0.7 × 1.4 mm <b>0.028 × 0.055 in</b>	ANR1215	ANR12151
	<b>LM10-250</b>	250 ±150 mm <b>9.843 ±5.906 in</b>	150 μm <b>5.906 mil</b>	0.8 × 1.5 mm <b>0.031 × 0.059 in</b>	ANR1226	ANR12261

### Controllers

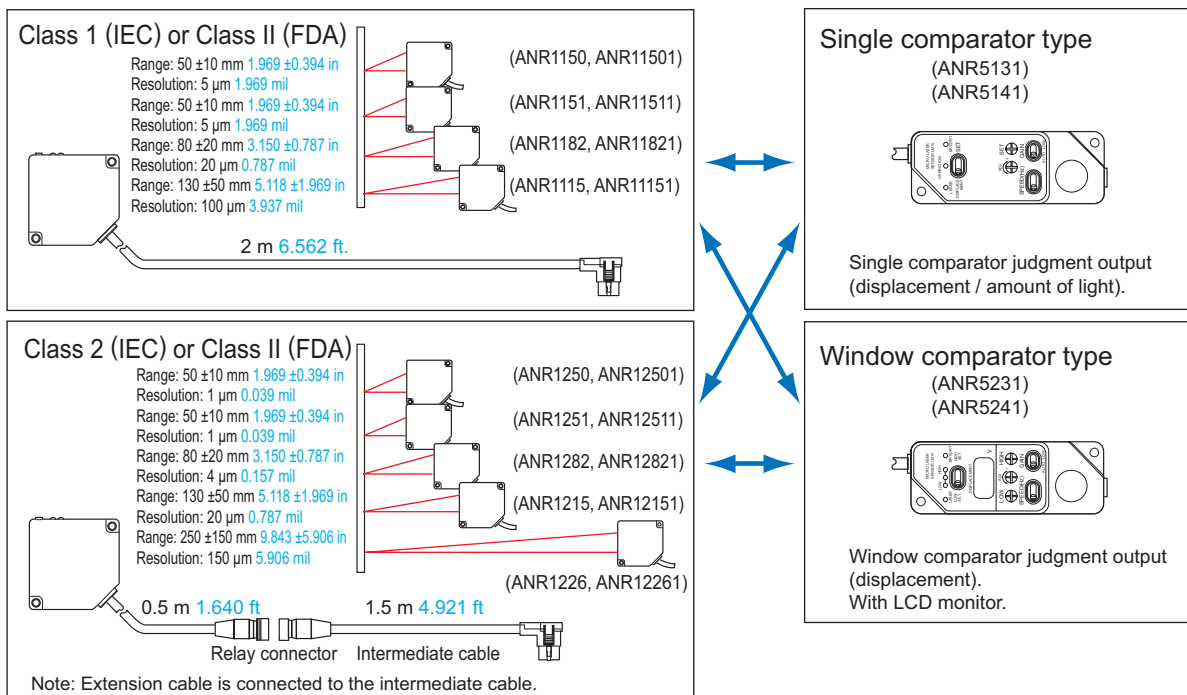
	Output	Specifications	Model No.
Controller	±5 V	Built-in single comparator	ANR5131
		Built-in window comparator	ANR5231
	4 to 20 mA (NPN output)	Built-in single comparator	ANR5141
		Built-in window comparator	ANR5241

Note: NPN and PNP outputs are coordinated as per all the models' comparative outputs.

**Extension cable (for sensor Class 2 types only) for connection to the intermediate cable** (1.5 m **4.921 ft** intermediate cable is supplied with Class 2 type sensor heads)

Designation	Specifications	Model No.
Extension cable (Flexible cable)	2 m <b>6.562 ft</b> cable length	ANR81020
	3 m <b>9.843 ft</b> cable length	ANR81030
	5 m <b>16.404 ft</b> cable length	ANR81050
	8 m <b>26.247 ft</b> cable length	ANR81080
	10 m <b>32.808 ft</b> cable length	ANR81100
	20 m <b>65.617 ft</b> cable length	ANR81200
	30 m <b>98.425 ft</b> cable length	ANR81300

## SENSOR HEAD AND CONTROLLER ASSEMBLY



- Selection Guide
- Laser Displacement
- Magnetic Displacement
- Collimated Beam
- Digital Panel Controller
- Metal-sheet Double-feed Detection
- HL-G1
- HL-C2
- HL-C1
- LM10**

**SPECIFICATIONS****Sensor heads****Class 1 type**

Item	Model No.	IEC standards conforming type	ANR1150	ANR1151	ANR1182	ANR1115
		FDA regulations conforming type	ANR11501	ANR11511	ANR11821	ANR11151
Measurement center distance			50 mm <b>1.969 in</b>	50 mm <b>1.969 in</b>	80 mm <b>3.150 in</b>	130 mm <b>5.118 in</b>
Measuring range			±10 mm <b>±0.394 in</b>	±10 mm <b>±0.394 in</b>	±20 mm <b>±0.787 in</b>	±50 mm <b>±1.969 in</b>
Light source		Laser diode (Peak emission wavelength: 650 nm <b>0.026 mil</b> )				
	Pulse width / Max.output / Laser class	15 µs (Duty 50 %) / 0.4 mW (Peak value) / Class 1 (IEC 60825-1), (Class II for FDA regulations conforming type)				
Beam spot diameter (Representative values from a measurement center distance)			0.6 × 1.1 mm <b>0.024 × 0.043 in</b> approx.	0.09 × 0.05 mm <b>0.004 × 0.002 in</b> approx.	0.7 × 1.2 mm <b>0.028 × 0.047 in</b> approx.	0.7 × 1.4 mm <b>0.028 × 0.055 in</b> approx.
Resolution (2 σ)	10Hz		5 µm <b>0.197 mil</b>	5 µm <b>0.197 mil</b>	20 µm <b>0.787 mil</b>	100 µm <b>03.937 mil</b>
	100Hz		16 µm <b>0.630 mil</b>	16 µm <b>0.630 mil</b>	65 µm <b>2.559 mil</b>	330 µm <b>12.992 mil</b>
	1kHz		50 µm <b>1.969 mil</b>	50 µm <b>1.969 mil</b>	200 µm <b>7.874 mil</b>	1 mm <b>00.039 in</b>
Linearity error (Note 2)		Within ±0.2 % of F.S.				
Protection (excluding connector)		IP67 (IEC)				
Ambient illuminance (Incandescent lamp)		2,500 lx or less				
Weight (including cable)		Net weight: 300 g approx.				

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.  
2) White ceramics is the target of this value.

**Class 2 type**

Item	Model No.	IEC standards conforming type	ANR1250	ANR1251	ANR1282	ANR1215	ANR1226
		FDA regulations conforming type	ANR12501	ANR12511	ANR12821	ANR12151	ANR12261
Measurement center distance			50 mm <b>1.969 in</b>	50 mm <b>1.969 in</b>	80 mm <b>3.150 in</b>	130 mm <b>5.118 in</b>	250 mm <b>9.843 in</b>
Measuring range			±10 mm <b>±0.394 in</b>	±10 mm <b>±0.394 in</b>	±20 mm <b>±0.787 in</b>	±50 mm <b>±1.969 in</b>	±150 mm <b>±5.906 in</b>
Light source		Laser diode (Peak emission wavelength: 650 nm <b>0.026 mil</b> )					
	Pulse width / Max.output / Laser class	15 µs (Duty 50 %) / 1.6 mW (Peak value) / Class 2 (IEC 60825-1), (Class II for FDA regulations conforming type)					
Beam spot diameter (Representative values from a measurement center distance)			0.6 × 1.1 mm <b>0.024 × 0.043 in</b> approx.	0.09 × 0.05 mm <b>0.004 × 0.002 in</b> approx.	0.7 × 1.2 mm <b>0.028 × 0.047 in</b> approx.	0.7 × 1.4 mm <b>0.028 × 0.055 in</b> approx.	0.8 × 1.5 mm <b>0.031 × 0.059 in</b> approx.
Resolution (2 σ)	10Hz		1 µm <b>0.039 mil</b>	1 µm <b>0.039 mil</b>	4 µm <b>0.157 mil</b>	20 µm <b>0.787 mil</b>	150 µm <b>5.906 mil</b>
	100Hz		3.5 µm <b>0.138 mil</b>	3.5 µm <b>0.138 mil</b>	13 µm <b>0.512 mil</b>	65 µm <b>2.551 mil</b>	500 µm <b>19.685 mil</b>
	1kHz		10 µm <b>0.394 mil</b>	10 µm <b>0.394 mil</b>	40 µm <b>1.575 mil</b>	200 µm <b>7.874 mil</b>	1.5 mm <b>0.059 in</b>
Linearity error (Note 2)		Within ±0.2 % of F.S.					Within ±0.4 % of F.S.
Protection (excluding connector)		IP67 (IEC)					
Ambient illuminance (Incandescent lamp)		3,000 lx or less					2,500 lx or less
Weight		Net weight: Sensor head (including cable): 240 g approx., Intermediate cable: 130 g approx.					

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.  
2) White ceramics is the target of this value.

FIBER  
SENSORSLASER  
SENSORSPHOTO-  
ELECTRIC  
SENSORSMICRO  
PHOTO-  
ELECTRIC  
SENSORSAREA  
SENSORSLIGHT  
CURTAINSPRESSURE /  
FLOW  
SENSORSINDUCTIVE  
PROXIMITY  
SENSORSPARTICULAR  
USE  
SENSORSSENSOR  
OPTIONSSIMPLE  
WIRE-SAVING  
UNITSWIRE-SAVING  
SYSTEMSMEASURE-  
MENT  
SENSORSSTATIC  
CONTROL  
DEVICES

ENDOSCOPE

LASER  
MARKERSPLC /  
TERMINALSHUMAN  
MACHINE  
INTERFACESENERGY  
CONSUMPTION  
VISUALIZATION  
COMPONENTSFA  
COMPONENTSMACHINE  
VISION  
SYSTEMSUV  
CURING  
SYSTEMSSelection  
GuideLaser  
DisplacementMagnetic  
DisplacementCollimated  
BeamDigital Panel  
ControllerMetal-sheet  
Double-feed  
Detection**HL-G1****HL-C2****HL-C1****LM10**

## SPECIFICATIONS

### Controllers

Model No.	ANR5131	ANR5141	ANR5231	ANR5241
Item	Single comparator		Window comparator	
Comparative output type	Single comparator		Window comparator	
Analog output	±5 V/F.S. (2 mA max.)	4 to 20 mA/F.S. (250 Ω max.)	±5 V/F.S. (2 mA max.)	4 to 20 mA/F.S. (250 Ω max.)
Output impedance	50 Ω	————	50 Ω	————
Zero-point adjustment	Within ±10 % of F.S.			
Temperature drift (Sensor and controller set)	Within ±(0.03 % of F.S.) /°C	Within ±(0.04 % of F.S.) /°C	Within ±(0.03 % of F.S.) /°C	Within ±(0.04 % of F.S.) /°C
Response frequency (–3 dB)	1 kHz / 100 Hz / 10 Hz			
Response time (10 to 90 %)	0.4 ms / 4 ms / 40 ms (switchable)			
Comparative output (Note 2)	NPN open-collector 2 Nos. (100 mA, 30 V DC or less, residual voltage 1.5 V or less)		NPN open-collector 3 Nos. (100 mA, 30 V DC or less, residual voltage 1.5 V or less)	
Hysteresis	0.15 % of F.S. or less			
Alarm output	NPN open-collector 1 No. (100 mA, 30 V DC or less, residual voltage 1.5 V or less) (Note 2)			
Intensity monitor output	±5 V			
Comparative timing Input	No voltage input (when earthing, no comparative output allowed)			
Displacement display	Sensor head: Measuring range display LED (RANGE)		Sensor head: Measuring range display LED (RANGE) Controller: LCD 3 digit display	
Gain selection	AUTO / LOW (switchable)			
Mutual interference prevention (Note 3)	Between 2 sets			
Operating voltage range	12 to 24 V DC $\pm 10\%$ including ripple 0.5 V (P-P)			
Current consumption (Sensor and controller set)	250 mA or less (at 12 V DC), 125 mA or less (at 24 V DC)			
Weight (including cable)	Net weight: 180 g approx.			

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.

2) PNP output type is also available.

3) The value of the linearity characteristics, resolution and response time might get worse.

### Common

Insulation resistance (Initial)	Between external DC input and sensor metal parts (except for connector metal parts) 20 MΩ or more (at 500 V DC megger)
Voltage withstandability (Initial)	Between external DC input and sensor metal parts (except for connector metal parts) AC 500 V 1 min.
Vibration resistance (Screw installation)	10 to 55 Hz (1 cycle/min.) double amplitude of 1.5 mm 0.059 in (controller: 0.75 mm 0.030 in), in X, Y and Z directions for two hours each
Shock resistance (Screw installation)	20 G or more, in X, Y and Z directions for three times each
Ambient temperature	0 to +50 °C +32 to +122 °F, Storage: –20 to +70 °C –4 to +158 °F
Ambient humidity	35 % to 85 % RH (No dew condensation)

Note: If there is no description for measurement conditions, the test is performed under operating voltage 24 V DC, ambient temperature +20 °C +68 °F, gain AUTO, response frequency 10 Hz, interference prevention OFF and white ceramics as a target at a measurement center distance.

HL-G1

HL-C2

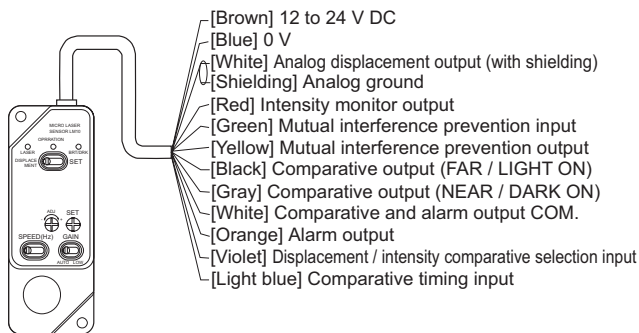
HL-C1

LM10

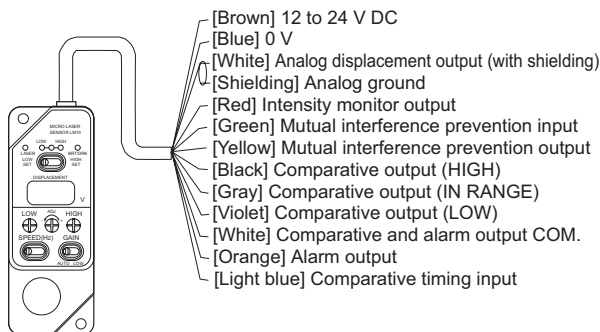
**I/O CIRCUIT AND WIRING DIAGRAMS**

**Wiring and functions**

**Single comparator type**

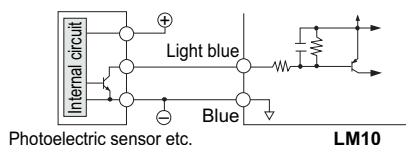


**Window comparator type**



- ① **Power input [brown (+) · blue (-)]**  
• Input 12 to 24 V DC.
- ② **Comparative timing input [light blue]**  
• While shorted to the 0 V (blue), comparative output is prevented. When using a transistor to establish the timing, use a transistor with a residual output voltage of 1.5 V or less during output.

**Comparative timing input connection example**

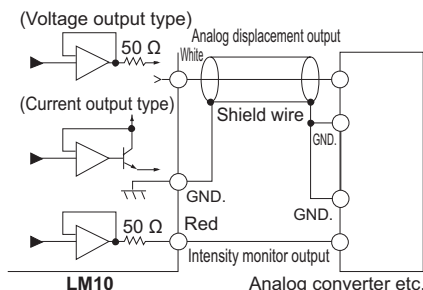


- ③ **Mutual interference prevention I/O [green (input), yellow (output)]**  
• When using two sensors, you can set the mutual interference prevention mode by connecting the input wire of each to the output wire of the other. Be aware that this mode may adversely affect the linearity characteristics, resolution, and response.
- ④ **Analog displacement output [white, shielding (GND.)]**  
• An analog voltage / analog current (for each type separately) is output that corresponds to the displacement of the target within the measurement range. When the output selection switch is in the SET position, each comparative setting is outputted as voltage / current (for each type separately).

\* In case of window comparator type  
In both the voltage output and current output types, the LCD display the voltage ( $\pm 5$  V/F.S.). Between the current output type's analog displacement output and the LCD display, there is a maximum 3 % of F.S. offset. Therefore, exercise caution when aligning the 0 setting the comparative values.

⑤ **Intensity monitor output [red, shielding (GND.)]**

- Analog voltage ( $-5$  V to  $+5$  V) is output corresponding to the amount of light reflected from the target. If the amount of light increases, the voltage value becomes larger and if it decreases, the voltage value becomes smaller.



⑥ **Alarm output [orange, white (COM.)]**

- Outputs during insufficient light (DARK) or too much light (BRIGHT).

⑦ **Comparative output**

**Single comparator type [black, gray, white (COM.)]**

Displacement / intensity comparative selection input [Violet]	Comparing operations
When not connected	When displacement data is set value or over (far side): FAR / LIGHT ON output is ON. When displacement data is less than set value (near side): NEAR / DARK ON output is ON.
When connected to 0 V [blue]	When intensity data is set value or over (near side): FAR / LIGHT ON output is ON. When intensity data is less than set value (far side): NEAR / DARK ON output is ON.

Note: With the single comparator type, connecting the violet wire and blue wire changes from the analog displacement output to the light amount monitoring value output.

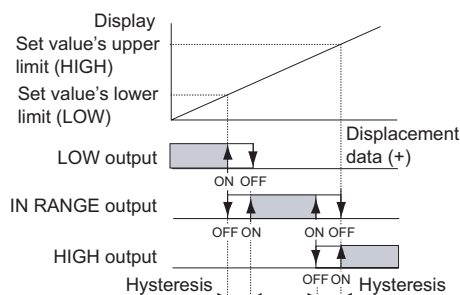
**Window comparator type [black, gray, violet, white (COM.)]**

Judgment result of analog displacement data is output.

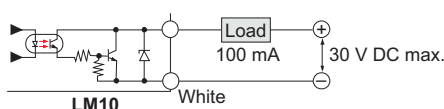
LOW [violet]	Outputs when below the set value's lower limit.
IN RANGE [gray]	Outputs when between the set value's lower and upper limits.
HIGH [black]	Outputs when above the set value's upper limit.

**Description of comparative output operations**

**<Double comparator type>**



**<Alarm and comparative output connection example>**



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HL-G1

HL-C2

HL-C1

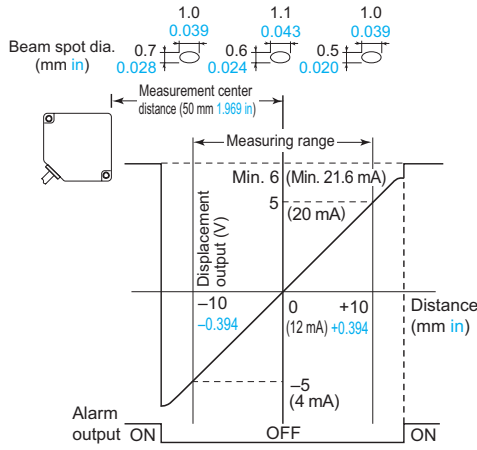
LM10

**SENSING CHARACTERISTICS (TYPICAL)**

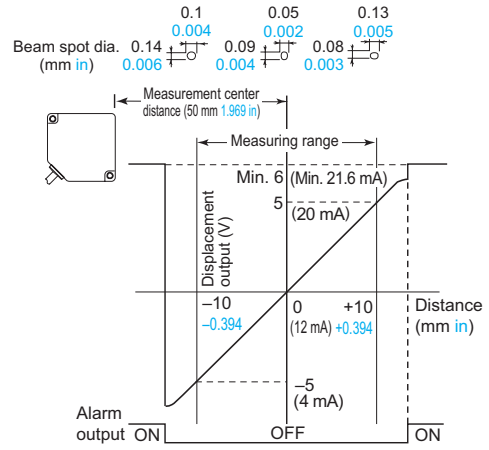
**Correlation between distance and output range characteristics**

An analog voltage is output that corresponds to the displacement of the target within the measurable range. [( ): current output type]

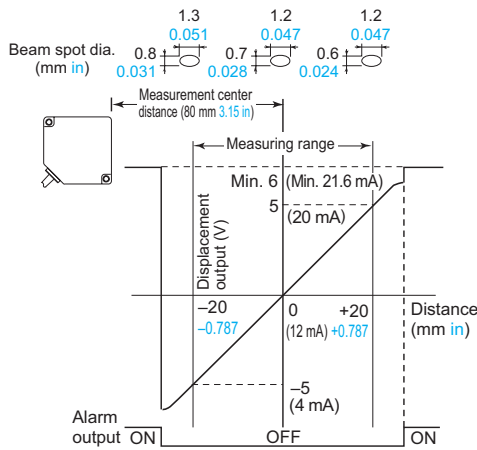
**ANR1150 ANR11501 ANR1250 ANR12501**



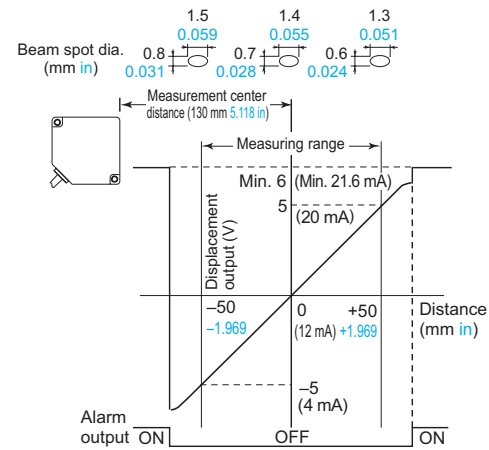
**ANR1151 ANR11511 ANR1251 ANR12511**



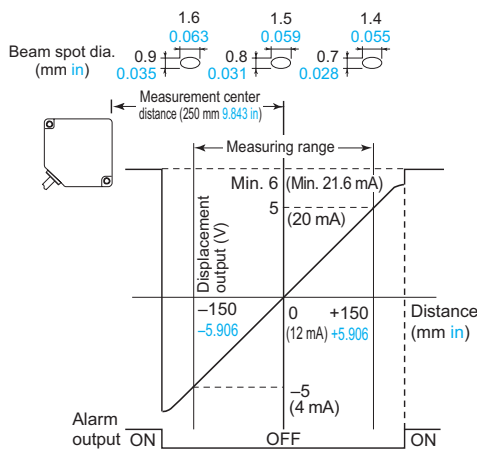
**ANR1182 ANR11821 ANR1282 ANR12821**



**ANR1115 ANR11151 ANR1215 ANR12151**



**ANR1226 ANR12261**

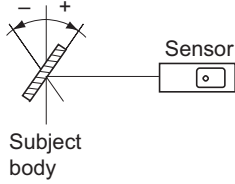


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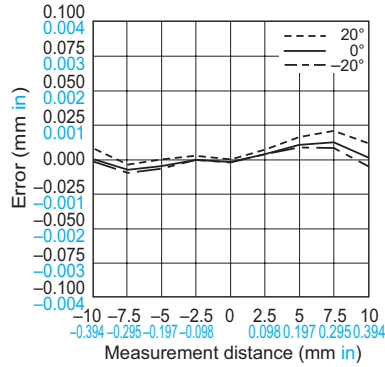
**SENSING CHARACTERISTICS (TYPICAL)**

**Distance characteristics (Class 2 type sensor head)**

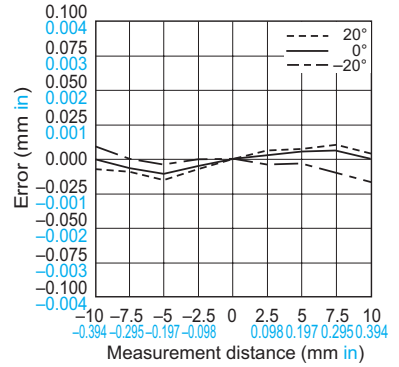
**White ceramic (0°, ±20°) vertical orientation**



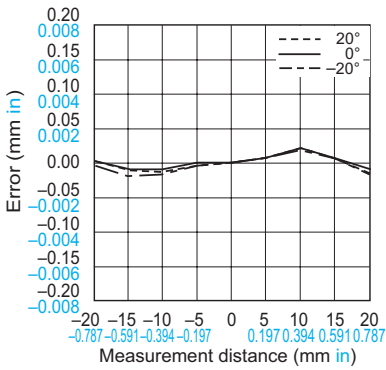
**ANR1250 ANR12501**



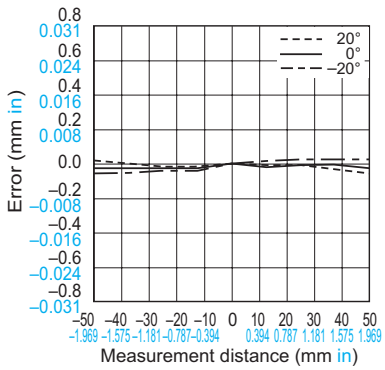
**ANR1251 ANR12511**



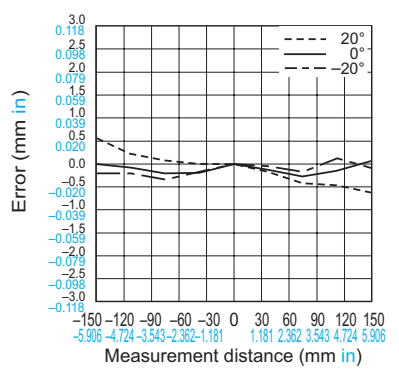
**ANR1282 ANR12821**



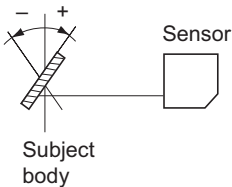
**ANR1215 ANR12151**



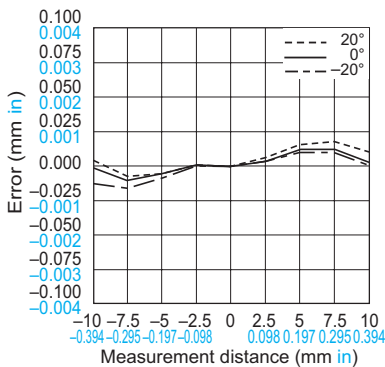
**ANR1226 ANR12261**



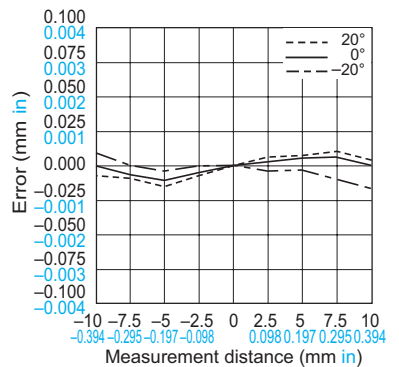
**White ceramic (0°, ±20°) horizontal orientation**



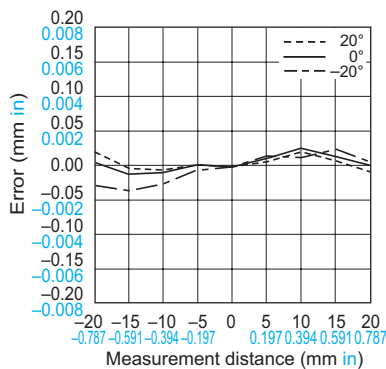
**ANR1250 ANR12501**



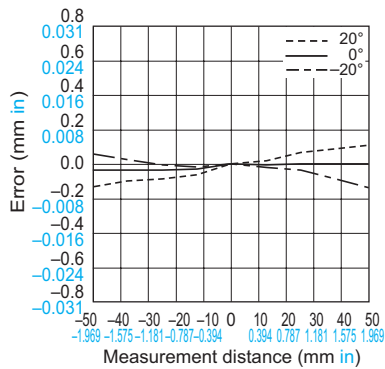
**ANR1251 ANR12511**



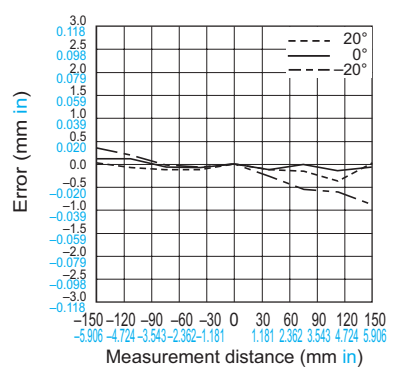
**ANR1282 ANR12821**



**ANR1215 ANR12151**



**ANR1226 ANR12261**

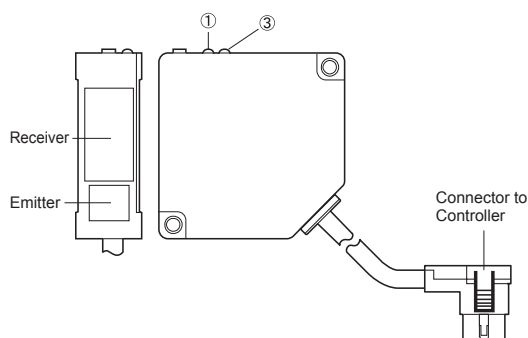
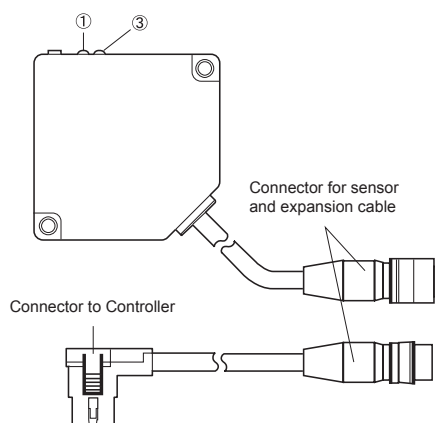


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- PRESSURE / FLOW SENSORS
- INDUCTIVE PROXIMITY SENSORS
- PARTICULAR USE SENSORS
- SENSOR OPTIONS
- SIMPLE WIRE-SAVING UNITS
- WIRE-SAVING SYSTEMS
- MEASUREMENT SENSORS
- STATIC CONTROL DEVICES
- ENDOSCOPE
- LASER MARKERS
- PLC / TERMINALS
- HUMAN MACHINE INTERFACES
- ENERGY CONSUMPTION VISUALIZATION COMPONENTS
- FA COMPONENTS
- MACHINE VISION SYSTEMS
- UV CURING SYSTEMS
- Selection Guide
- Laser Displacement
- Magnetic Displacement
- Collimated Beam
- Digital Panel Controller
- Metal-sheet Double-feed Detection

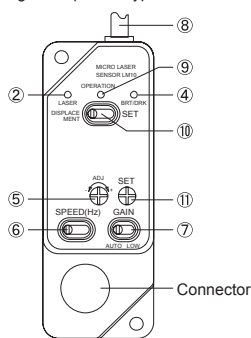
- HL-G1**
- HL-C2**
- HL-C1**
- LM10**

**PRECAUTIONS FOR PROPER USE**

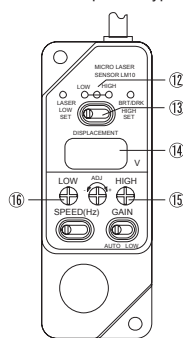
Refer to General precautions and About laser beam.

**PART DESCRIPTION****Sensor (ANR11□)****Sensor (ANR12□), Extension cable (ANR81□)****Controller (ANR5□)**

Single comparator type



Window comparator type

**For each type****① ② Laser emission indicator LED**

The LED lights up during laser emission or just before its emission. To indicate an alarm condition, the LED on the sensor head blinks.

**③ Measuring range indicator LED**

Blinks when a target is within the measurable range. Lights up when a target is around the measurement center. However, it may light up or blink even with a significant error in the measuring range when the alarm is enabled.

**④ Alarm LED**

Lights up when measurement is not possible (not enough light [DARK] or too much light [BRIGHT]).

**⑤ Zero-point adjusting potentiometer**

Adjusts the zero-point position to within a  $\pm 10\%$  of F.S. Use to make minute adjustment after installing the sensor.

**⑥ SPEED selection switch**

The response speed can be set to one of three settings to allow adjustment for the target speed. When high response speed is unnecessary, set to the 10 Hz mode.

**⑦ GAIN selection switch**

Under normal conditions, set to AUTO. During edge detection and other applications where you want to cut out the low light level areas, set to LOW.

**⑧ I/O cable****Only for single comparator type****⑨ Operation indicator LED**

Lights up when NEAR / DARK ON output is ON.

**⑩ Analog displacement output switch**

Switches between the displacement data / intensity data output and the comparative value setting output.

**⑪ Comparative value setting potentiometer**

Sets the comparative value. By setting the analog displacement output switch to the right, the set value can be monitored by the analog displacement output.

**Only for window comparator type****⑫ Operation indicator LED**

The LED lights up that corresponds to the comparative output currently being output.

**⑬ Display / Analog displacement output switch**

Switches between the displacement data output and the comparative value setting output.

**⑭ LCD display**

3-digit display of the displacement data or the upper and lower limit value.

**⑮ HIGH limit setting potentiometer****⑯ LOW limit setting potentiometer**

Sets the comparative value's upper limit (HIGH) and lower limit (LOW). Set it so that the HIGH value is greater than the LOW value. By setting the display and analog displacement output switch to either LOW or HIGH, you can monitor the set value by display and analog displacement output. When not set, return the switch to the center position.

FIBER  
SENSORSLASER  
SENSORSPHOTO-  
ELECTRIC  
SENSORSMICRO  
PHOTO-  
ELECTRIC  
SENSORSAREA  
SENSORSLIGHT  
CURTAINSPRESSURE /  
FLOW  
SENSORSINDUCTIVE  
PROXIMITY  
SENSORSPARTICULAR  
USE  
SENSORSSENSOR  
OPTIONSSIMPLE  
WIRESAVING  
UNITSWIRESAVING  
SYSTEMSMEASURE-  
MENT  
SENSORSSTATIC  
CONTROL  
DEVICES

ENDOSCOPE

LASER  
MARKERSPLC/  
TERMINALSHUMAN  
MACHINE  
INTERFACESENERGY  
CONSUMPTION  
VISUALIZATION  
COMPONENTSFA  
COMPONENTSMACHINE  
VISION  
SYSTEMSUV  
CURING  
SYSTEMSSelection  
GuideLaser  
DisplacementMagnetic  
DisplacementCollimated  
BeamDigital Panel  
ControllerMetal-sheet  
Double-feed  
Detection

HL-G1

HL-C2

HL-C1

LM10

**PRECAUTIONS FOR PROPER USE**

Refer to General precautions and About laser beam.

FIBER  
SENSORSLASER  
SENSORSPHOTO-  
ELECTRIC  
SENSORSMICRO  
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LASER  
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Detection

HL-G1

HL-C2

HL-C1

LM10

- This catalog is a guide to select a suitable product. Be sure to read instruction manual attached to the product prior to its use.



- Never use this product as a sensing device for personnel protection.
- In case of using sensing devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.



- This product is classified as a Class 1 / Class 2 Laser Product in IEC / JIS standards and a Class II Laser Product in FDA regulations. Do not look at the laser beam directly or through optical system such as a lens.
- The following label is attached to the product. Handle the product according to the instruction given on the warning label.



(The English warning label based on FDA regulations is pasted on the FDA regulations conforming type.)

(The Japanese warning label is packed with the sensor head.)

**Safety standards for laser beam products**

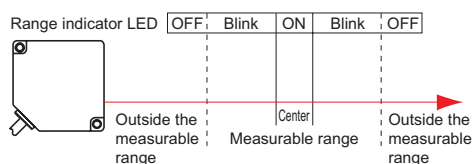
- A laser beam can harm human being's eyes, skin, etc., because of its high energy density. IEC has classified laser products according to the degree of hazard and the stipulated safety requirements. The **LM10** series is classified as Class 1 / Class 2 laser. (Refer to About laser beam.)

**Safe use of laser products**

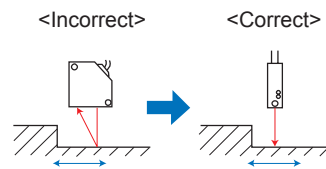
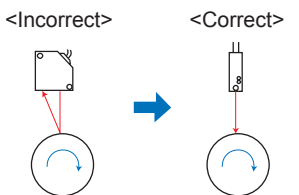
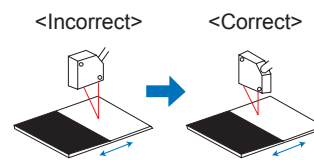
- For the purpose of preventing users from suffering injuries by laser products, IEC 60825-1(Safety of laser products). Kindly check the standards before use. (Refer to About laser beam.)

**Procedure for setting the sensor head**

- While watching the measuring range indicator LED, set the sensor head so that the distance to the subject body is within the measuring range. It may light up or blink even with a significant error in the measuring range when the alarm is enabled.



- Be careful of the sensor head's orientation during mounting. When the subject body moves as shown below, errors will develop depending on the orientation of the sensor head. In order to minimize these errors, be sure to mount the sensor head in the correct orientation.

**Step detection****Eccentricity measurement****Extremely different adjacent colors or materials****Mounting the sensor head**

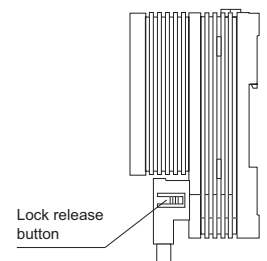
- Using the two mounting holes, firmly mount the sensor head so that the sensor head's front surface is parallel to the target. Do not tighten the installation screws to a torque over 2 N·m.
- Glass is used at the sensor head's light emitting and light receiving surfaces and, therefore, **never subject it to impacts of any kind**. Also, be very careful not to allow oils, finger prints, or other substances that may refract the light, to get on the glass during mounting.
- If light reflected off the target is then reflected off nearby objects or walls and then received by the sensor head, the sensor head reading will be adversely affected. To prevent this, either further separate the sensor head or apply a black delustering paint to prevent the unwanted reflection of light.

**Mounting the controller**

- When mounting more than one controller in a row, **maintain at least 10 mm 0.394 in between each unit**. Also, when mounting the controller inside control panels or other areas where the air is not properly ventilated, the controller will cause the ambient temperature to rise. In these cases, **ensure the proper cooling facilities**.

**Wiring**

- Perform all wiring by faithfully following the input and output circuit explanations and documents that came with the instrument. Also, **to protect the inner circuitry, arrange the lead wire that is not interconnected in a way so that it does not come into contact with other lead wires**.
- When mounting or removing a connector, always **first turn off the controller** and then begin operations.
- All connectors are of the lock-on type. When connecting a connector, be sure to securely insert it until it locks into place. When removing a connector, **first press in the lock release button on the connector side** and then remove the connector.
- After removing a connector, **do not touch the terminals located inside**.



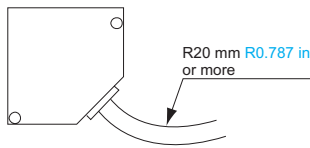


## PRECAUTIONS FOR PROPER USE

Refer to General precautions and About laser beam.

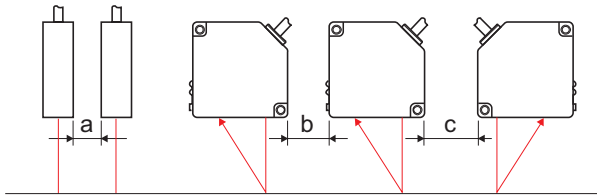
### Cable

- When the sensor head and controller are fixed and cables connected, **do not subject the cables to a pull of more than 3 kg. Have no bends in the cables with a radius of less than 20 mm 0.787 in. Also, do not bend a sensor head's cable near where the cable is attached to the sensor head.**
- When the sensor head is to be moved while in use, do not have it so that the sensor head's cable becomes bent. If the location is such that it cannot be helped, we recommend purchasing the appropriate length extension cable (ANR12□).



### Area of interference

- When using more than one sensor together, be careful of the area of interference.



Units: mm in

Sensor head model No.	a	b	c
ANR1150, ANR11501	40 1.575	20 0.787	70 2.756
ANR1151, ANR11511			
ANR1182, ANR11821	50 1.969	60 2.362	110 4.331
ANR1115, ANR11151	80 3.150	100 3.937	150 5.906
ANR1250, ANR12501	50 1.969	40 1.575	90 3.543
ANR1251, ANR12511			
ANR1282, ANR12821	80 3.150	80 3.150	130 5.118
ANR1215, ANR12151	120 4.724	140 5.512	190 7.748
ANR1226, ANR12261	210 8.268	350 13.780	400 15.748

### Operating environment

- Use in an ambient temperature between **0 to +50 °C +32 to +122 °F**. Store in a location where the temperature stays between -20 to +70 °C -4 to +158 °F.
- Use in an ambient humidity between 35 to 85 % RH. Avoid use in locations with drastic humidity changes which cause condensation.
- Use in locations where the illuminance from incandescent lamps received at the light receiving surface is below 2,500 lx (ANR11□ and ANR1226), or below 3,000 lx (ANR1250, ANR1251, ANR1282, ANR1215). Also, locate the unit so that sunlight, **does not directly hit the beam-receiving part**. When exceptional accuracy is required, **mount a shielding plate or other type of shading mechanism**.
- The power supply voltage should be between 85 to 110 % of the rated voltage.
- Since the internal circuits may become damaged if an external surge voltage exceeds 500 V [ $\pm(1.2 \times 50)$   $\mu$ s unipolar full-wave voltage], always use a surge absorber or surge absorbing element.

- Keep the sensor head beam-emitting part and beam-receiving part surface clean and free of moisture, oil, finger prints, and other light refracting substances, and free of dust, dirt, and other light blocking substances.**

When cleaning the glass surfaces, wipe with a soft cloth or lens cleaning paper.

- Although the sensor head is of water proof construction, it does not mean that measurements can be taken underwater or in the rain. Moreover, **the connectors are not watertight**.
- Do not use the unit in locations with flammable or corrosive gases, locations with excessive dust, locations splashed by water, or locations subjected to vibrations or excessive shocks.
- Since the controller contains molded resins, do not use in environments that contain, or where contact with, benzene, thinners, alcohols and other organic solvents; and ammonia, caustic sodas, and other alkaline substances is possible.

### Noise precautions

- The connector's metal portion is internally connected to the analog output GND. In order to prevent affects from noise or damage to the internal circuits, be sure to insulate the metal portion with electrical tape or other means.
- Mount the unit as far away as possible from high voltage lines, power lines, or devices that generate large switching surges.**
- Separate the sensor head cable wiring, high voltage circuit, and power circuit.
- If there is much noise on the power supply, it will affect the analog output. In such cases, use a noise filter or noise-cut transformer.

### Insulation resistance and voltage withstandability

- Do not perform insulation resistance or withstand voltage tests between the connector's metal portions and input / outputs.

### Power supply

- Select a power supply with a **ripple voltage below 0.5 V (P-P) and a current capacity above 0.3 A**.
- In order to avoid high-frequency noises when using a commercially available switching regulator, be sure to ground the frame ground (F.G.) terminal.
- When using a power supply that uses a transformer, be sure to use an insulated transformer. When using an autotransformer (single-wound transformer), it is possible to damage this unit or the power supply.
- Do not turn the power on again within 10 sec. after turning the power off.

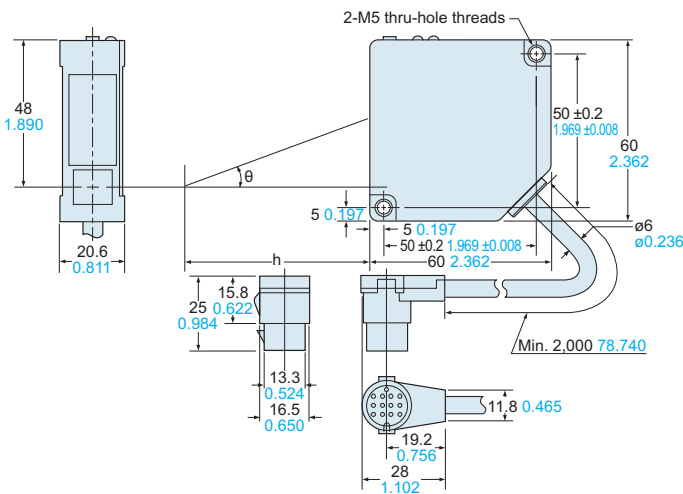
### Warm-up time

- Allow at least 30 minutes, after turning on the unit, for the unit to properly warm up.**

**DIMENSIONS (Unit: mm in)**

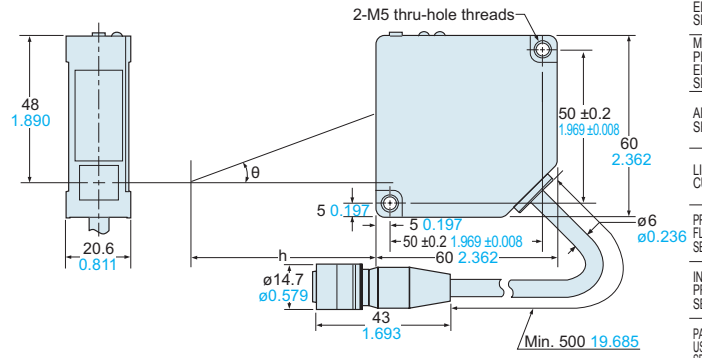
The CAD data in the dimensions can be downloaded from our website.

**ANR11□ Sensor head**



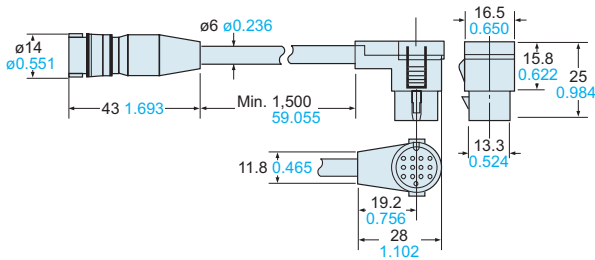
Model No.	Mark	h	θ
ANR115□, ANR115□1		50 mm 1.969 in	20°
ANR1182, ANR11821		80 mm 3.150 in	16°
ANR1115, ANR11151		130 mm 5.118 in	11°

**ANR12□ Sensor head**

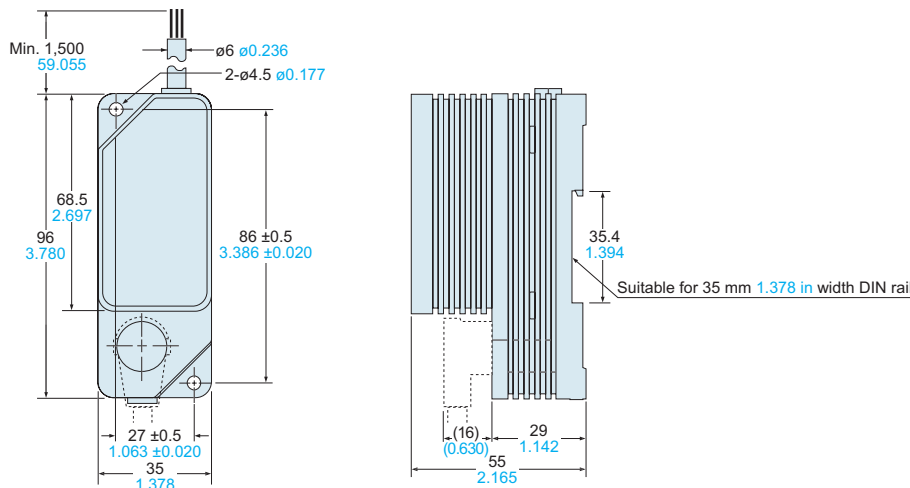


Model No.	Mark	h	θ
ANR125□, ANR125□1		50 mm 1.969 in	20°
ANR1282, ANR12821		80 mm 3.150 in	16°
ANR1215, ANR12151		130 mm 5.118 in	11°
ANR1226, ANR12261		250 mm 9.843 in	5.8°

**ANR81□ Intermediate cable for ANR12□ (Accessory for sensor head)**



**ANR5□ Controller**



FIBER SENSORS

LASER SENSORS

PHOTO-ELECTRIC SENSORS

MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

LIGHT CURTAINS

PRESSURE / FLOW SENSORS

INDUCTIVE PROXIMITY SENSORS

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**HL-C2**

**HL-C1**

**LM10**