Instruction Manual　Air Gap Sensor【DPA-LR1】

■Specification

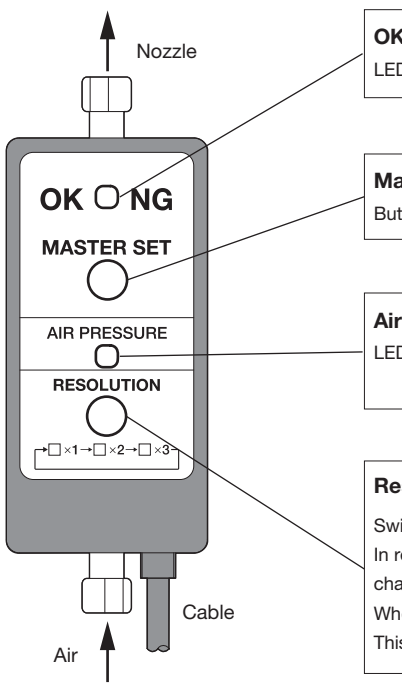
Product No.	**DPA-LR1**
Detection distance	80–350μm
Signal point	Configurable by master set button
Repeatability	±1μm Detection distance 80–150μm
	±3μm Detection distance 150–250μm
	±5μm Detection distance 250–350μm
	Pressure change : within ±1%
Response speed	0.8 second (Tube length: 1.5m)
Protective structure	IP67
Setting pressure	0.15-0.2MPa

Pipe diameter	O.D. φ6 X I.D.φ4 tube
Fluid	Dry air (filtered to 5μm)
Consumption flow rate	24ℓ/min (max)
Operating temperature range	0°C-60°C（no condensation）
Cable	Standard length 3m
	φ5/4 cores AWG30
Output specification	Photo MOS relay
	DC30V (max) 100mA (max)
Power supply voltage	DC24V ±10%
Current consumption	Less than 50mA

Note: Specifications apply to conditions where one nozzle is used per body.
When using multiple nozzles, make appropriate judgments upon confirmation of use with the actual device.

Note: Specifications apply to conditions where a recommended nozzle is used.
When using different nozzles, make appropriate judgments upon confirmation of use with the actual device.

■Component Names and Functions



OK/NG LED
LED displaying judgement results.
OK: Green/lit
NG: Red/lit

Master set button
Button for setting master values.

Air pressure alarm LED
LED displaying setting pressure status.
Good: Green/lit
Bad: Red/lit/blinking
Orange/blinking

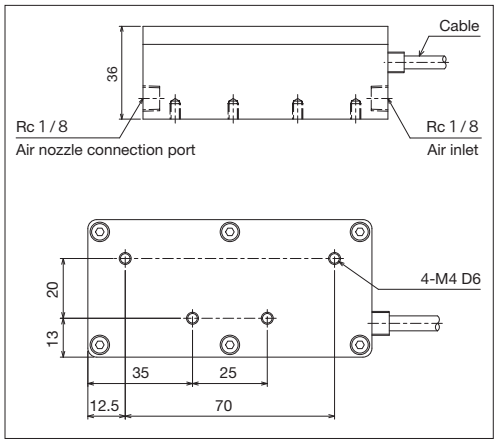
Resolution set button
Switching button for control resolution.
In resolution setting mode, the air pressure alarm LED changes to display of resolution switching.
When chattering occurs, switch to x2 or x3.
This is used to give hysteresis.

■Operation Preparation

1.Joint mounting

Mount joints to the air nozzle connection port and the air inlet as in the figure at right.

Note: Joints are not included.
Note: Make sure to use a seal tape.



2.Body mounting

Using 4-M4 D6 on the mounting surface, mount on the machine body referring to the figure at right.

Precautions for body mounting

(1) Mount the body as far above the nozzle as possible. (in order to prevent backflow of coolant from the nozzle)

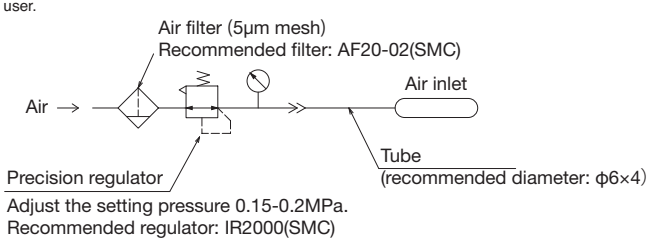
(2) To maintain reproducibility of detection accuracy, keep the piping between the body and the nozzle as short as possible when determining location.

3.Air piping

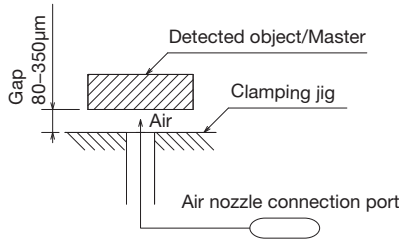
Connect the supply air to the air inlet referring to the air piping diagram, and connect the air nozzle to the air nozzle connection port referring to the air nozzle piping diagram.

●Air supply piping diagram

Air lines are to be provided by the user.

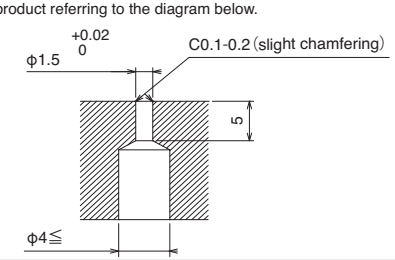


●Air nozzle piping diagram



●Recommended nozzle shape

Air nozzle is not included with the product.
Make the product referring to the diagram below.



Precautions for air piping

(1) For the piping from the body to the detection nozzle, do not use devices or joints which will lead to air leaks or resistance.

(2) Use a precision-class regulator. (±0.5%-class)

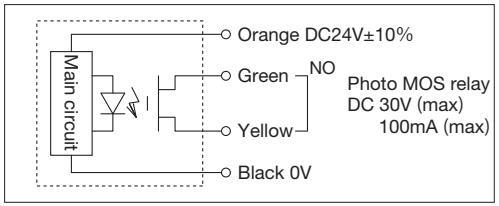
(3) When supplying air of 0.3MPa or higher to the device, there is a risk of sensor damage.
Connect the air pipe after adjusting the setting pressure within the range of 0.15 to 0.2 MPa.

4.Connecting power supply and cables

●Color of the lead wire

DC24V±10%	Orange
Photo MOS relay output	Green
Photo MOS relay output	Yellow
0V	Black

●Circuit diagram



Wiring precautions

(1) Connect each signal in accordance with the color of the lead wire.
(2) Photo MOS relay is closed at OK and open at NG.
(3) Photo MOS relay is continually output when measurement starts.
When changing workpieces, the target moves away from the nozzle and causes an NG signal to be output.
Read the output signal only when detection is necessary.

■Measuring Mode

●Operations at application of power

State	OK/NG LED	Air pressure alarm LED	Photo MOS relay
1. Power ON	**Red**/lit(for 1 sec)	**Orange**/lit(for 1 sec)	OFF
2. Starting of Measuring Mode	Operation according to the state		

●Master setting method

(1)Confirm that the supply air pressure is normal(Air pressure alarm LED : Green/lit).
(2)Place the setting master on the measurement point.
(3)Press the master set button for 1 second .
(4)After OK/NG LED and Air pressure alarm LED are turned off for 1 second, judgement operation starts.

●LED display and Photo MOS relay in measuring mode

State	OK/NG LED	Air pressure alarm LED	Photo MOS relay
OK (When the detected gap is within a range of the set distance)	**Green**/lit	**Green**/lit	ON
NG (When the detected gap is beyond a range of the set distance)	**Red**/lit	**Green**/lit	OFF
Supply air pressure error	Unlit	**Red**/blinking(≧0.22MPa) **Red**/lit(≦0.1MPa) **Orange**/blinking(±0.01MPa Change)	OFF

■Resolution Setting Mode

If the resolution set button is held down for 1 second or more during measuring mode, the device switches to resolution setting.

Resolution set button	OK/NG LED	Air pressure alarm LED	Resolution
1. Press	Unlit	**Red**/blinking	×1
2. Press	Unlit	**Orange**/blinking	×2
3. Press	Unlit	**Green**/blinking	×3
4. Press(Return to 1)	Unlit	**Red**/blinking	×1
After this it cycles.			

If the resolution setting mode button is not held down for 3 seconds or more, the device will automatically return to measuring mode.

* After the change to resolution setting mode, the air pressure alarm LED display responds to the current resolution.

■Terms of Warranty

We endeavour to achieve zero claims and complaints rate with respect to product quality assurance.

Although malfunctions are a problem that comes before the warranty and even one should be prevented, malfunctions cannot be prevented through our efforts alone. We would therefore like to request that our customers have an understanding of the functions and specifications of applicable products as indicated in our catalogs, instruction manuals and web site to ensure that they are used properly under specified conditions.

Furthermore, applicable products are designed and manufactured primarily for general industrial use.
Therefore, we would also like to request our customers to cooperate in employing a safe design for preventing accidents, fires and the like through providing of fail-safe measures, preventing operational errors and employing redundant safety designs.

1) Applicable Products

The warranty defined below is applicable to products manufactured and sold by METROL (to be referred to as the "applicable products").

2) Warranty Period

The warranty for applicable products is valid for one year and three months from the original delivery date to the location designated by the customer.
**The initial three months are assumed to be a preparation period until use of the products following purchase.*

3) Range of Coverage

a. A replacement product will be provided on an exchange basis or the malfunctioned product will be repaired free of charge within the warranty period. If the product is or becomes defective and that at the sole discretion of METROL, the defects due to faulty materials or workmanship.

However, applicable products will not covered by the warranty in the case of the following malfunctions even within the warranty period.

(Ⅰ) Malfunctions occurred due to use of a product in a manner that deviates from standards, specifications, environments, usage procedures or usage precautions described in the catalog, instruction manual or specifications.

(Ⅱ) Malfunctions having occurred for reasons other than those attributable to the delivered product.

(Ⅲ) Malfunctions having occurred due to modifications or repairs made by someone else other than the Metrol representative.

(Ⅳ) Malfunctions or damage that results from external causes outside our control which shall include accident fire disaster, other natural disaster or other force majeure.

b. The range of coverage is limited to warranty of the applicable product only, and any other secondary loss or damage resulting from the malfunction of an applicable product is not covered by the warranty.

c. Please be aware that charges for service (including installation, de-installation on-site confirmation and repairs) are not included in the price of products.

4) Applications

Applicable products are designed and manufactured as general-purpose products used in ordinary industrial environments.

In the case of incorporating an applicable product in an apparatus, machine or system, please confirm the suitability of the application along with any related standards, regulations and restrictions.

With respect to the applications indicated below in particular, customers are requested to conduct necessary tests on an actual product in advance after consulting with the manufacturer regarding usage conditions and other details.

a. Applications for which usage conditions or environment are outside those presumed by the manufacturer or applications unable to be confirmed as being appropriate by the manufacturer when using applicable products.

b. Applications likely to have an effect on human life or property (such as nuclear power equipment, transportation machinery or medical devices), applications used in public utilities (such as electricity, gas or water lines), or applications applying correspondingly thereto.

c. Applications in harsh environments (special environments requiring heat resistance, vacuum and the like)

**Although METROL believes that sound reliability in harsh environments is one of the characteristics of our products, there are still cases in which it is difficult to ascertain actual circumstances.*

Since there is the potential for accidents in such cases, customers are requested to have an understanding of protective structures, materials and so forth and provide additional covers and other equipment as necessary.

5) Other Matters

The contents of this catalogue, including specific models and, specifications, and any other contents, are subject to change without notice at METROL's sole discretion.

Help Desk

We accept inquiry regarding sensor selection, exclusive specification, and technical matter through e-mail, Fax, Tel and Web.

www.metrol.co.jp/en/
CAD data and product catalogs are available on our website.

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The specifications and descriptions are subject to change without notice due to improvements in products.

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