

UDA single and double sheet detection series - quick start

- 3 control outputs
- Sensitive sensing
- Learning single and double sheets of any material



Precautions

- Please read the operating instructions of RAYCOH before commissioning.
- Connection, installation and configuration must be carried out by trained RAYCOH specialists.
- During debugging, the equipment should be protected from moisture and contamination.
- This device does not constitute a safety component according to the corresponding machine safety standards.
- Do not allow moisture or water to enter the internal components of the sensor and the output contacts of the wiring board.
- Protected against use in explosive atmospheres.
- Do not use solvents, paraffin, propylene glycol, gasoline or other chemically active substances to clean the sensor.
- The sensor should be installed away from moisture, water droplets, dust, corrosive and harmful substances, as well as high temperature, discharge and vibration.
- Do not use the sensor in corrosive environments where the atmosphere contains acids, alkalis, and other corrosive substances.
- In the process of operation and maintenance, RAYCOH professionals recommend that you abide by the requirements of "User Electrical Equipment Technical Operation Regulations" and "Labor Protection Regulations in Electrical Equipment Operation". Before connecting the sensor, you must ensure that all connections are correct and that the power and signal lines must not be mixed, otherwise the sensor may be damaged or personnel may be injured.
- Sensors that have reached the end of their useful life should be disassembled and RAYCOH recommends disposing of them through a facility that recycles ferrous and non-ferrous metals.

Packaged content

sensor (transmitter)	1 pcs
sensor (receiver)	1 pcs
mounting nut	4 pcs
Manual	1 pcs

Working principle

- Designed to automatically distinguish single and double sheet application scenarios to protect equipment and avoid waste.
- Ultrasonic junction sensor is mainly used for packaging or label positioning to automatically and accurately realize industrial automation.
- The working principle is that the transducer transmitter transmits a series of ultrasonic pulses through the material. The ultrasonic pulses cause the material to vibrate, and an attenuated sound signal is emitted from the other side of the material. The receiving element located on the other side of the material receives it and transmits the data to the receiving element. A device that analyzes the intensity of sound waves.
- In the case of overlapping sheets (sheet twinning), the intensity of the sound waves is reduced (see Figure 1), and the receiving unit detects this and builds appropriate algorithms for discrete sensor outputs based on these measurements.



Figure 1 - The process of ultrasonic waves traveling through materials

Dimensions

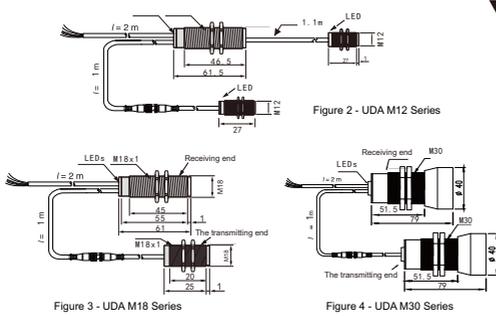


Figure 3 - UDA M18 Series

Figure 4 - UDA M30 Series

Model range

UDA	
Housing (size, diameter)	12GM25
	18GM55
	30GM60
frequency	400
	200
	100
output type	3E1(NC) 3E2(NC) 3E3(NC) 3E4(NC)
3 switching outputs (NPN)	
3 switching outputs (PNP)	

parameter

Transmitter-receiver spacing	20...40mm	20...60mm	20...100mm
Maximum angle deviation allowed	45°		
Blind area	5mm	7mm	
The scope of work	Paper and paper with a unit area weight of 20-60g/m ² , alloy laminates and films with a thickness of 0.2mm, self-adhesive films	<1mm thick metal composite board and film, self-adhesive film, label on substrate material, >0.01mm paper, PCB board, silicon wafer	<3mm metal plate
Response delay	4ms	10ms	
Operating Voltage	10-30V DC, reverse polarity protection		
Overload protection	200mA		
No load current consumption	≤ 30mA		
Shell material	Plastic fittings, nickel plated brass, glass filled epoxy		
Working current	3~200mA short circuit protection/overload protection		
Connector	2m, PVP cable 0.14mm ²		
Voltage drop	≤2V		
脉冲宽度	≥100ms		
防护等级	IP67		
开关信号	LED lights on the housing		
连接头	6-conductor cable (P+P), 2 meters		
工作温度	-25...+70 °C		
Atmospheric pressure	460...918		
Storage temperature	-40...+85 °C		
Weight	200g	220	480g

Electrical connection

- The sensor is connected via the cable outlet (2 m) at the end of the housing. The contact color identification and wiring diagram are as follows:

Symbols/Connections: (3E3 normally open/3E4 normally closed, PNP)	Connection method
1.BN	+U _S
2.PK	learning function
3.WH	single output
4.BK	double output
5.GY	air output
6.BU	-U _S
	conform to: EN 60947-5-2

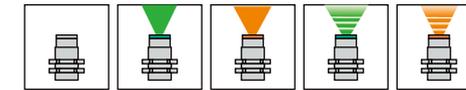
Symbols/Connections: (3E1 normally open/3E2 normally closed, NPN)	Connection method
1.BN	+U _S
2.PK	learning function
3.WH	single output
4.BK	double output
5.GY	air output
6.BU	-U _S
	conform to: EN 60947-5-2



When the sensor is operating in paper detection mode, the pink (teach contact) and blue (-UB (OV) contact) leads must be closed. When the contact is open, the teach pendant switches to teach mode.

Indicator status

LED indicators on the sensor housing show the status of the sensor:



- off - the sensor is off;
- Green light on - a piece of paper is detected;
- Red light on - two sheets detected;
- Yellow light on - damaged: no paper detected;
- Flashing yellow and green - sensor is in learning mode;
- Flashing red - learning not completed (paper thickness is too large);

Adjustment to material (teach-in mode)

- In order for the sensor to work properly and detect objects correctly, it is necessary to adjust the sensor, and the adjustments must be made together with the object to be detected.

Adjustment steps:

- Move the contact teach pendant from the contact -UB. (OB);
- Turn on the sensor and wait for the yellow and green lights to flash;
- Place a piece of paper between the receiver and transmitter. When an object is detected, the green LED will blink. Short the teach-in and -UB wires so the green LED lights up. The sensor has entered the information of a piece of material;
- Put two sheets of paper between the receiver and transmitter. Short-circuit the teach pin and the +UB pin to make the red LED flash. Short-circuit the teach pin and the -UB pin so that the red LED lights up. Teaching has been completed;
- Turn off the power after teaching;
- Turn off the teach-in and -UB(OV) pins;
- Turn on the sensor. The teaching is completed and the sensor can be put into operation.



During presetting, the red LED will flash if the material thickness exceeds the allowable value.

transportation and storage

- RAYCOH sensors are transported and stored in independent factory packaging at an ambient temperature of -40~85°C, a relative humidity of 35~95%, and no condensation to prevent the packaging from being affected by atmospheric precipitation.
- RAYCOH reminds you not to store the sensor in a room containing corrosive gases and other harmful impurities (acid, alkali).

Installation adjustment

- To ensure triggering, the sensor axis must overlap the object by at least 10 mm

Figure 5 - M12 Installation/Adjustment

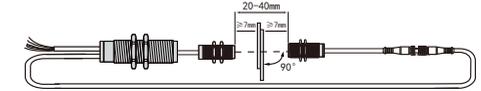


Figure 6 - M18 Installation/Adjustment

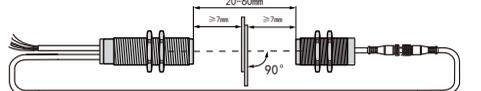
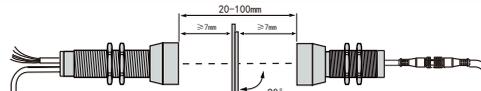
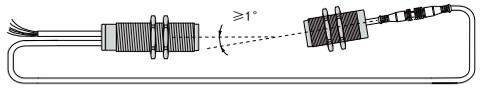


Figure 7 - M30 Installation/Adjustment



The relative inclination of the receiver and transmitter housings must not exceed 1°

Figure 8 - Tilt Installation



The misalignment of the receiving unit (or receiving element) and the transmitter housing should not exceed 1mm.

Figure 9 - Installing the Offset Ultrasonic Sensor

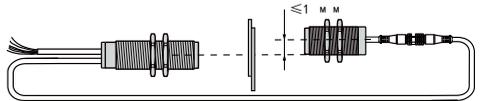
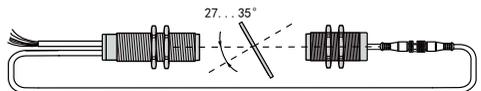


Figure 10 - Installation/Adjustment When Handling Thick Material



For non-standard materials, the installation location must be selected experimentally; please contact a RAYCOH representative for advice

- For paper and film, it is recommended to mount the sensor at a right angle (see Figure 6).
- When processing thin metal sheets or thick plastic films such as credit cards, the sensor should be mounted at a 27° perpendicular angle to the surface of the material being controlled (see Figure 10).
- To avoid false alarms when handling thick paper or cardboard, the sensor should be mounted at an angle of 27° to 35° to the surface of the material being monitored (see Figure 10).

Influencing factors

The measurement accuracy and working range of the sensor are affected by the following factors:

- Object surface temperature. If the air temperature changes suddenly (for example, if you are measuring the distance to hot metal), the ultrasonic waves will be refracted at the junction of cold and warm air and will not return to the sensor at right angles.
- Object surface material. Porous and sound-absorbing objects (such as wool, foam rubber, foam, feathers) reflect ultrasonic waves poorly. Due to the damping effect of the sound waves, the working range of the transducer is reduced.
- environmental conditions. Air temperature and humidity, air velocity Air velocity and atmospheric pressure affect the speed and attenuation of sound waves.
- object position. In order to operate stably on a smooth surface, the position of the sensor should be perpendicular to the object surface, and the allowable deviation from the vertical plane should not exceed 3°.
- If the surface of the object is uneven (such as gravel, gravel), the perpendicularity of the sensor is allowed to deviate not more than 3°.
- Formation and attachment of foreign matter on the sensor PE. During sensor operation, water, dust, or other substances may form on the sensor surface, limiting sensor performance. RAYCOH recommends that you protect the sensor from external influences, clean the sensor or use a reflector (for mounting the sensor at an angle).

Warranty

- Running Warranty - 12 months from date of sale*
- On the premise that the user abides by RAYCOH's transportation, storage, installation, operation and maintenance rules, if the sensor fails during the warranty period, RAYCOH promises to repair or provide technical support for free.
- Conditions under which RAYCOH Enterprises terminates its warranty obligations: internal components showing signs of opening and handling, chemical or mechanical damage,* - dated on the delivery note (SDP) / promissory note