

PHOTOELECTRIC BARRIER

ULISSE UNC



INSTALLATION, USE AND MAINTENANCE

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CAUTION

ULISSE UNC series photocells

WITHOUT THE CONTROL UNITS AU S3, AU S-TWIN or AU S3M2

cannot be used as safety devices for the protection of people exposed to hazardous machines or systems.

Accordingly, REER will not be liable for any consequences arising from the use of its ULISSE photocells without the relative control units, as this use does not meet the requirements of EC machine directive 98/37.

WARNINGS

The ULISSE UNC safety system is composed of one or two pairs of photocells connected either to the standard control unit (AU S3) or to the unit with built-in muting function (AU S3M2); the system can be composed of one, two, three or four pairs of photocells connected to the control unit AU S-TWIN.

To understand the operation of these devices we recommend reading a few sections of the relative installation manuals; in particular:

- Manual code 8540399 - "AU S-TWIN":
 - Operating modes
 - Configuration of the unit
 - Status of contacts
 - Indicator lights
 - Specifications
- Manual code 8540449 - "ARGOLUX series AS":
 - Test function and control unit status
 - Start up test
 - Operating diagram
 - Status of contacts
 - Indicators (Control unit)
 - Technical data (Control unit)
 - Electrical connections
- Manual code 8540408 - "MUTING, AU S3M2 control unit":
 - General
 - Operating diagram
 - Status of contacts
 - Indicators
 - Technical data
 - Electrical connections

GENERAL

ULISSE UNC is a barrier type photocell consisting of a separate emitter and a receiver.

Whether connected to the control units, AU S3, AU S-TWIN, or to the control unit with built-in muting function, AU S3M2, ULISSE UNC represents a type 2 safety system with one, two, three or four (AU S-TWIN) beams, suitable for the protection against accidents of people exposed to hazards on dangerous machinery. The metal container and the glass lenses make the product extremely sturdy and immune to the electrostatic attraction of dust, i.e., ideally suited for use in the textile processing plants.

The switching of the output relays of the control unit upon the interception of the beam stops the movement of machine tools with mechanical moving parts, such as, for instance:

- Looms;
- Assembly lines;
- Automated industrial warehousing systems;
- Robotised areas;
- Handling, palletising/de-palletising systems.

The protection function will not work if:

- ☞ **The control part of the machine cannot be controlled electrically or is unable to stop the hazardous movement at once and at any time in the course of the processing cycle.**
- ☞ **The hazard condition is associated with the risk of objects falling from above or ejected from the machine.**
- ☞ **For applications in the food processing industry, contact the manufacturer to assess the compatibility between the photocell material and the chemical agents employed.**
- ☞ **For questions affecting safety, if necessary, consult the authorities responsible for safety-related matters in your country, or the cognisant manufacturers' association.**

OPERATION

The ULISSE UNC safety system may consist of one two, three or four emitter/receiver pairs connected to a control unit. This system is able to detect the passage of a person's entire body and cannot be used for the protection of arms and hands.

Whenever the optical path of the infrared beam linking the emitter to the receiver is totally interrupted, the receiver cuts off the output signal. Upon recognising this condition, the control unit immediately de-energises its outputs thereby preventing the coming into being of a hazard condition.

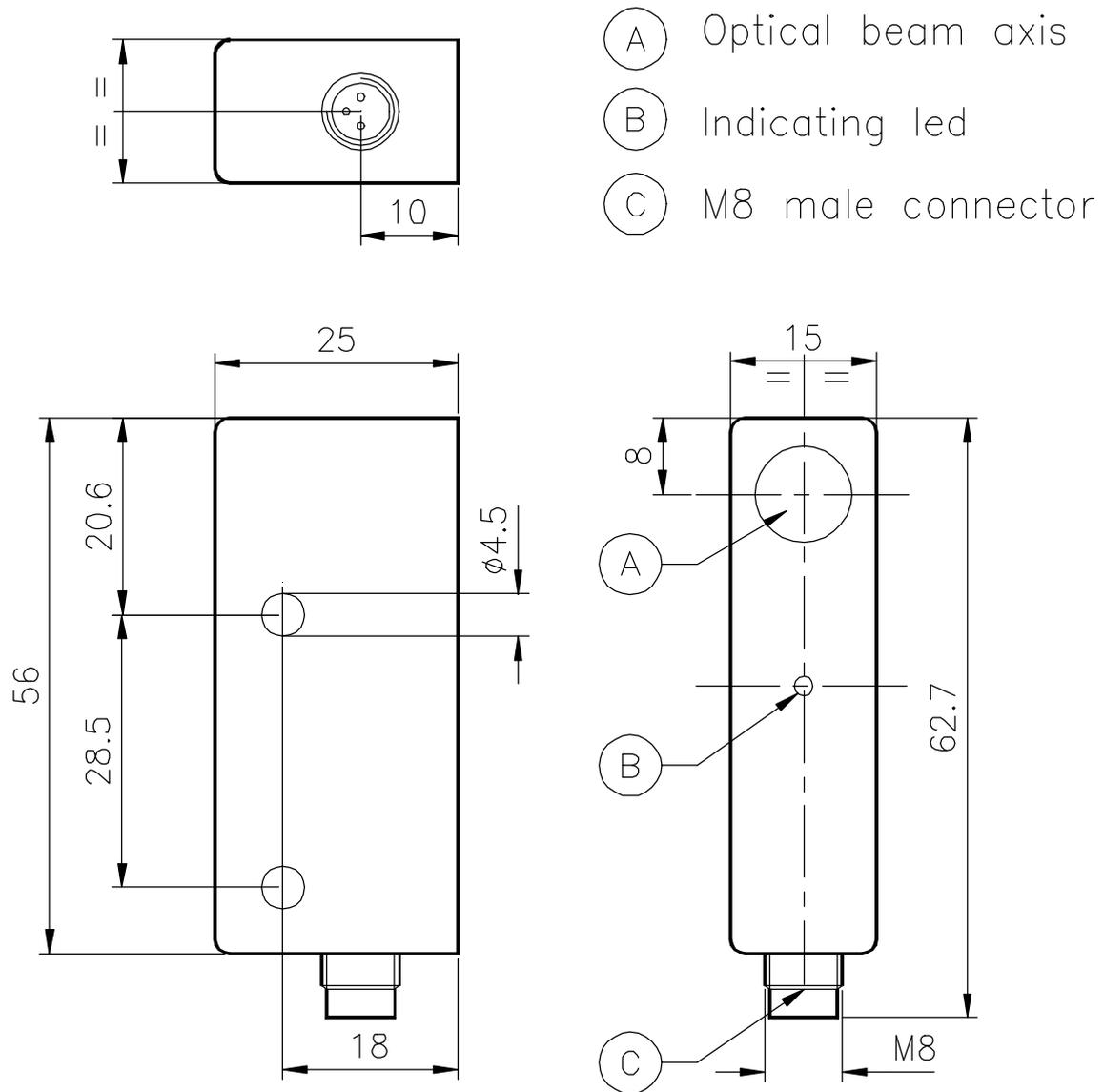
When the beam is released, the system restart depends on the positive outcome of the test function. The test is conducted as follows:

- the control unit turns off the emitter;
- the receiver detects the interruption of the beam and cuts off the output signal;
- the control unit checks the adequacy of the reaction time of the receiver, the outputs of the latter and the external relays, if any are used.

This test is controlled externally, by pressing a special test button.

DIMENSIONS

Emitter and receiver



INDICATORS

	COLOUR	STATE	INDICATION
EMITTER	Yellow	ON	Beam emitted
	Yellow	OFF	Test function or no beam
RECEIVER	Green	ON	Controlled area is free
	Green	OFF	Controlled area is obstructed



Figure 1

TECHNICAL DATA

MODEL		UNCE-EMITTER	UNCR-RECEIVER
Scanning range	m	0,8 ÷ 6	
Minimum detectable item	mm	8	
Immunity to ambient light	lx	> 10.000 (solar)	
Emission angle		± 4°	
Emission wavelength	nm	880 (modulated infrared)	
Response time	ms	≤ 8	
Power supply	Vdc	24 ± 20%	
Power consumption at 24 Vdc	W	0,7	0,4
Output			NPN 100 mA max Light on
Test input		NPN active low	
Connections		M8 Connector	
Operating temperature	°C	0 ÷ 55 (with no condensate and no frosting)	
Protection degree		IP 65	
Dimensions	Width	15	
	Depth	25	
	Height	63	
Weight	g	40	

INSTALLATION

The ULISSE UNC photocell used in conjunction with control unit AU S3, AU S-TWIN or AU S3M2 represents an electro-sensitive type 2 protection system.

As provided for in the standard IEC 61496-1/2 (formerly prEN50100) in a type 2 safety device, faults or malfunctioning must be detected during the test stage.

In a type 2 safety device, the test is mandatory, at least at power on of the machine. If the test is successful, the output relays are then energized.

Before installing the ULISSE UNC safety system, make sure that:

- ☞ The hazard level of the machine is compatible with the use of type 2 electro-sensitive safety devices.
- ☞ The machine/processing cycle are compatible with the use of a type 2 electro-sensitive safety system.
- ☞ The processing cycle or any dangerous movement of the machine parts can be started only by working on a control. In particular, the safety system must be used solely as a stopping device, not as a machine control unit.
- ☞ The test control is outside the hazardous area, at a place offering a clear view of the working area.
- ☞ The machine can be electrically controlled.
- ☞ Any hazardous movement of the machine can be stopped at once. In particular, it is necessary to ascertain the machine stopping time, by measuring it, if necessary.
- ☞ The machine will not give rise to hazardous conditions due to parts being ejected or falling from above; otherwise, it becomes necessary to fit additional protective devices of a mechanical type.

Before positioning the system, take into consideration the following general provisions:

- Make sure that the temperatures of the environments in which the system is installed are compatible with the temperature operating parameters given in the technical data table (page 5).
- Do not place the emitter or the receiver in the proximity of high-intensity or blinking light sources.
- Place the control unit in an environment whose degree of protection is at least IP54.

Special environmental conditions may affect the sensing efficiency of the photoelectric device.

If the system is installed in places subject to sudden temperature variations, it is indispensable to adopt the customary measures to prevent the formation of condensate on the lenses, as this might impair their detection capabilities.

SAFETY DISTANCE AND POSITIONING

The photocell must be installed at a distance greater than or equal to the minimum safety distance, S , so that no hazardous point can be reached until the hazardous action of the machine has stopped (fig. 2).

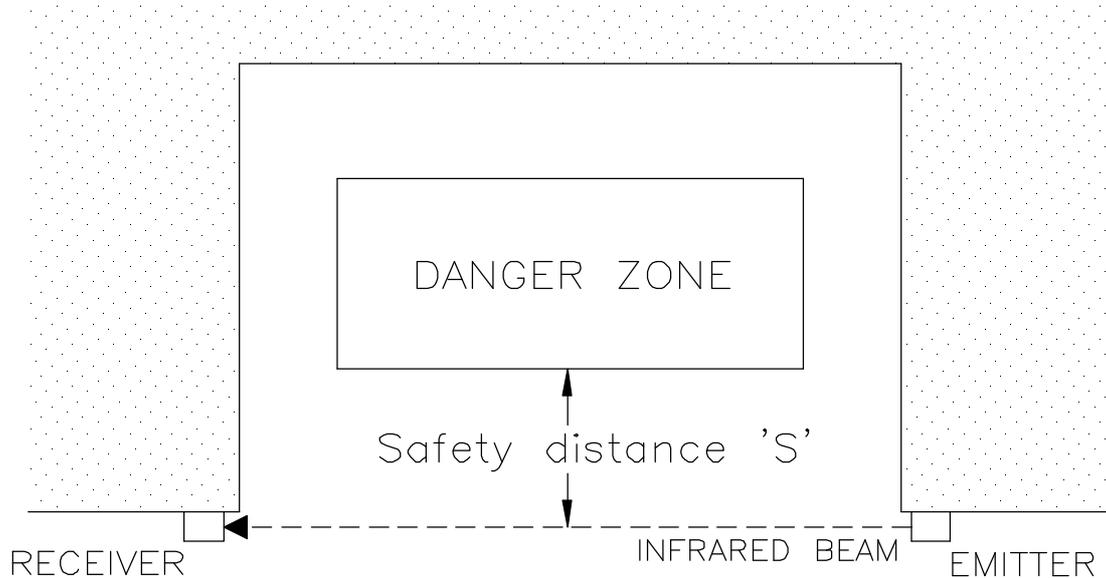


Figure 2

With reference to the proposed European standard prEN999, the minimum safety distance, S , must be calculated through the following formula:

$$S = K(tb + tu + t1) + C$$

where:

S is the minimum safety distance expressed in mm.

K is the speed of approach of the body to the hazardous zone in mm/sec.

tb+ tu is the total reaction time of the sensor plus the control unit (≤ 31 ms).

t1 is the reaction time of the machine in seconds, i.e., the time it takes for the machine to stop the hazardous action from the time the control unit transmits the stop signal through the opening of its output circuit.

C is an additional distance in mm

Single beam protection.

If the risk analysis permits the use of a single beam to detect the presence of a person intercepting the beam with his/her body as he/she approaches the hazardous area in a standing position (fig. 3), determine the minimum safety distance with the aid of the following formula:

$$S = 1600(tb + tu + t1) + 1200$$

In this case we recommend arranging the equipment so that the beam will run parallel to the reference plane, G, at a height H=750mm (fig. 3).

When using a single beam system, it is necessary to examine closely the risk of people intruding into the hazardous area without intercepting the beam.

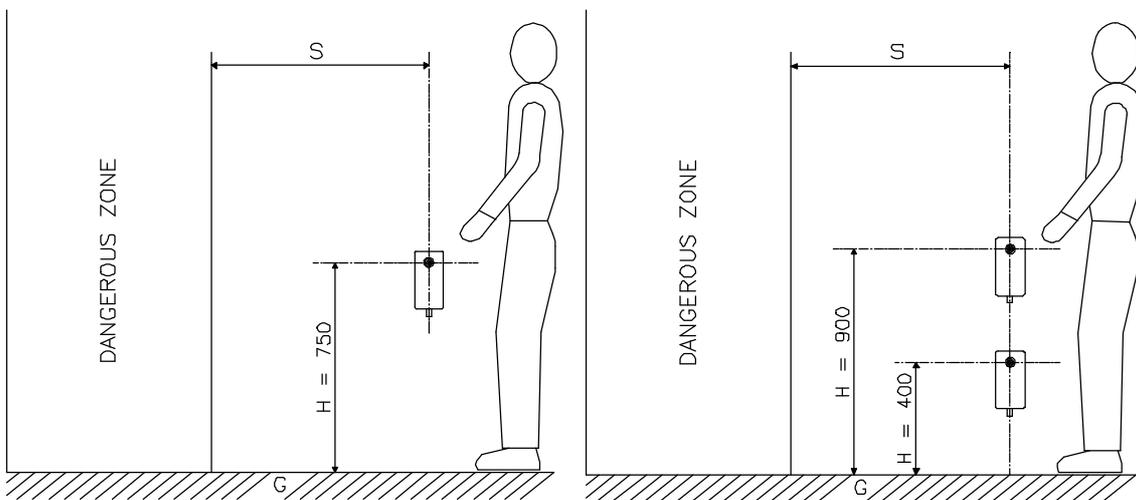


Figure 3

Figure 4

Double beam protection.

When using two ULISSE UNC photocells one on top of the other so that the beams are arranged one on top of the other, it becomes possible to set up a double beam protective system.

In these conditions, the minimum safety distance must be determined through the following formula:

$$S = 1600(tb + tu + t1) + 850$$

The distances, H, of the beams from the reference plane G, are 400mm and 900mm, respectively (fig. 4).

Distance from reflecting surfaces.

Reflecting surfaces located next to the photocell(s) may cause spurious reflections that would close the optical path between the emitter and the receiver and inhibit the system's detection capability (fig. 5).

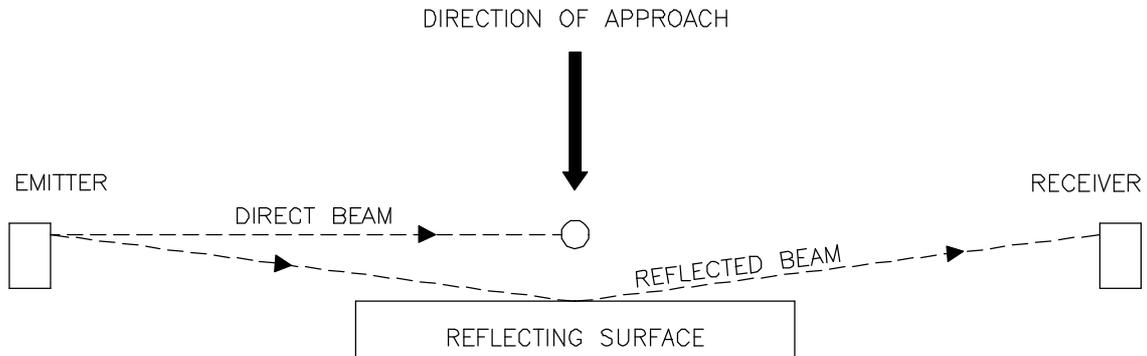


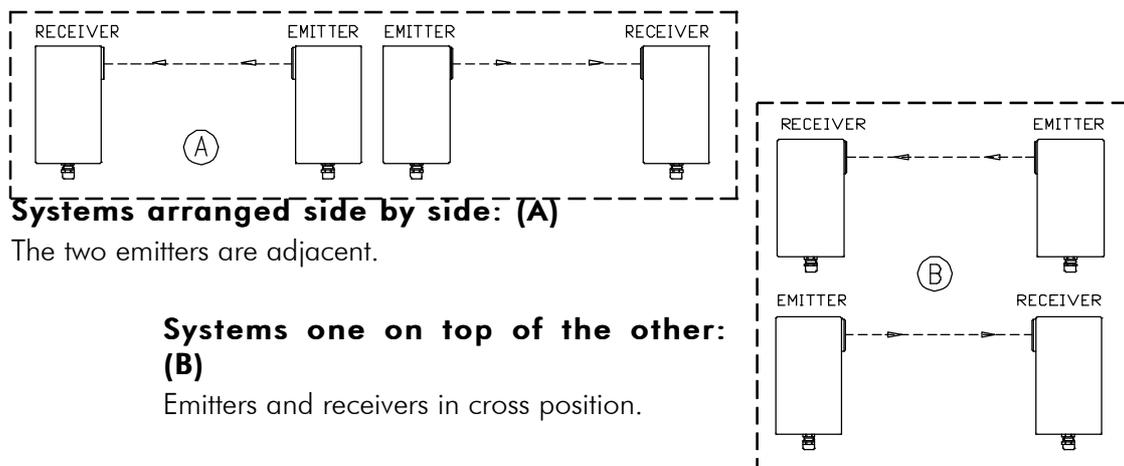
Figure 5

Having completed the installation, check for the presence of reflecting surfaces which might intercept the beam, first in the centre and then in the proximity of the emitter and the receiver. If any object is intercepted, the green led located on the receiver (fig. 1) must never light up.

Multiple systems.

When using 2, 3 or 4 pairs of ULISSE UNC photocells arranged next to or on top of each other in order to prevent them from mutually interfering it is necessary to arrange the elements so that the beam emitted by one system is received only by the respective receiver (fig. 6).

☞ **The emitter of one pair must not result in front of the receiver of the other pairs.**



Systems arranged side by side: (A)

The two emitters are adjacent.

Systems one on top of the other: (B)

Emitters and receivers in cross position.

Figure 6

Electrical connections

For the electrical connections, ULISSE UNC photocells are fitted with a 3 pin male connector (fig. 7). It is possible to use 5 m cables equipped with M8 female connector, either straight or at 90°, supplied on request.

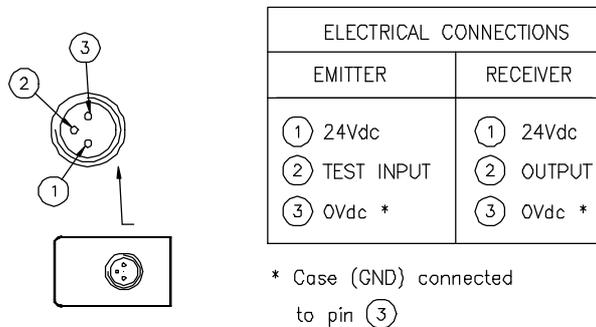
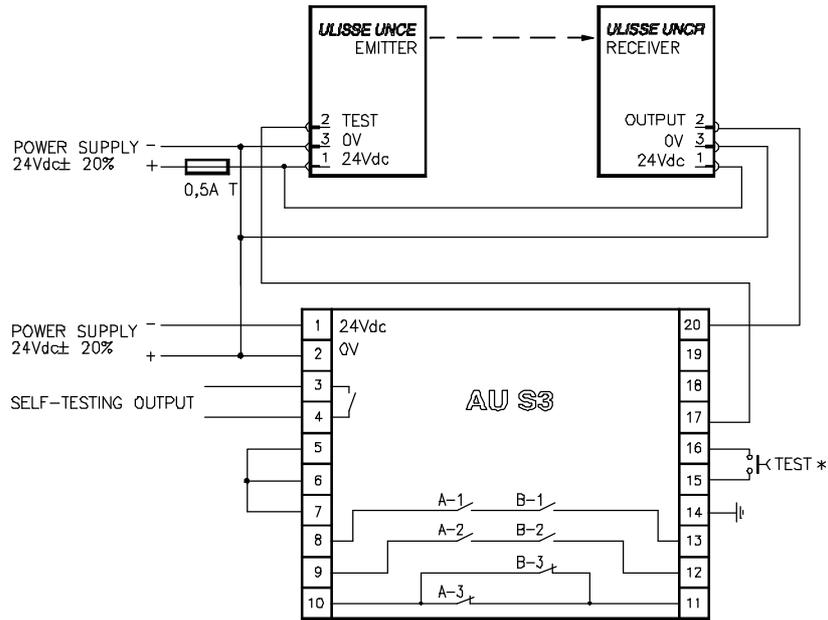


Figure 7

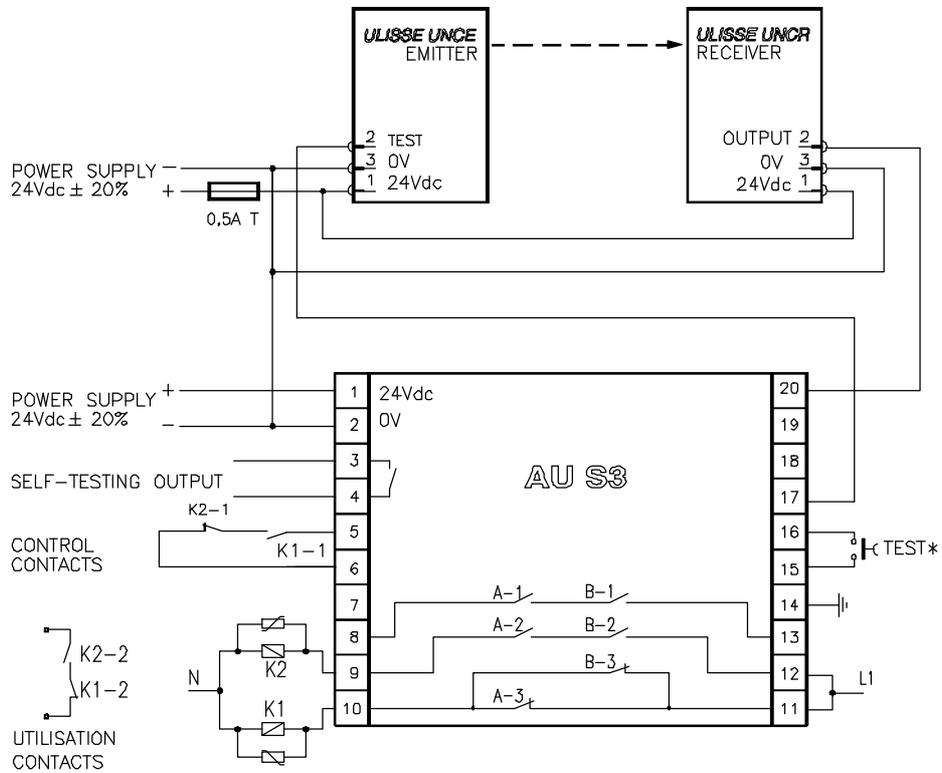
- Make the connections according to the diagrams given in pages 12, 13, 14, 15 and 16.
 - It is important to take into account the following indications:
 - Before making the connections, make sure that the mains voltage value corresponds to the rating given in the technical data.
 - Photocells and control unit must be supplied with PELV type 24Vdc $\pm 20\%$ power supply (e.g. through an isolating transformer conforming to EN 60742).
 - Connector pin No. 3 is electrically connected to the metal case of the photocell. If the photocell has to be linked to a metal part of the machine which is connected to the ground, the return line of the 24 Vdc voltage distribution system has to be connected to ground too. If this is not so, the photocell case must be insulated from the metal part of the machine.
 - For connections of over 50m in length, use cables with cross section of 1 mm².
 - The power line for the barrier and the control unit should be separate from the lines powering the other electrically operated devices (electric motors, inverters, frequency variators) or other possible sources of noise.
 - Connect the control unit to the ground socket.
 - The cables linking the control unit and the photocell, the connection for the test command and any connections relating to system control parts (e.g. self-test output) must follow a different path with respect to the power cables.
- ☞ **For a correct operation of the ULISSE UNC photoelectric system, we recommend reading a few sections of the relative installation manuals; in particular:**
- Code 8540399 - "AU S-TWIN":
 - Operating modes
 - Installation and electric connections
 - Code 8540449 - "ARGOLUX series AS" Manual:
 - Technical data of the output circuit
 - Use of auxiliary contact elements K1 and K2
 - The TEST control
 - Code 8540408 - "MUTING, AU S3M2 safety unit" Manual:
 - Technical data of output circuit
 - Use of auxiliary contact elements K1 and K2
 - The TEST control
 - Muting sensors
 - Technical data of external indicator system

Connection with AU S3 unit.



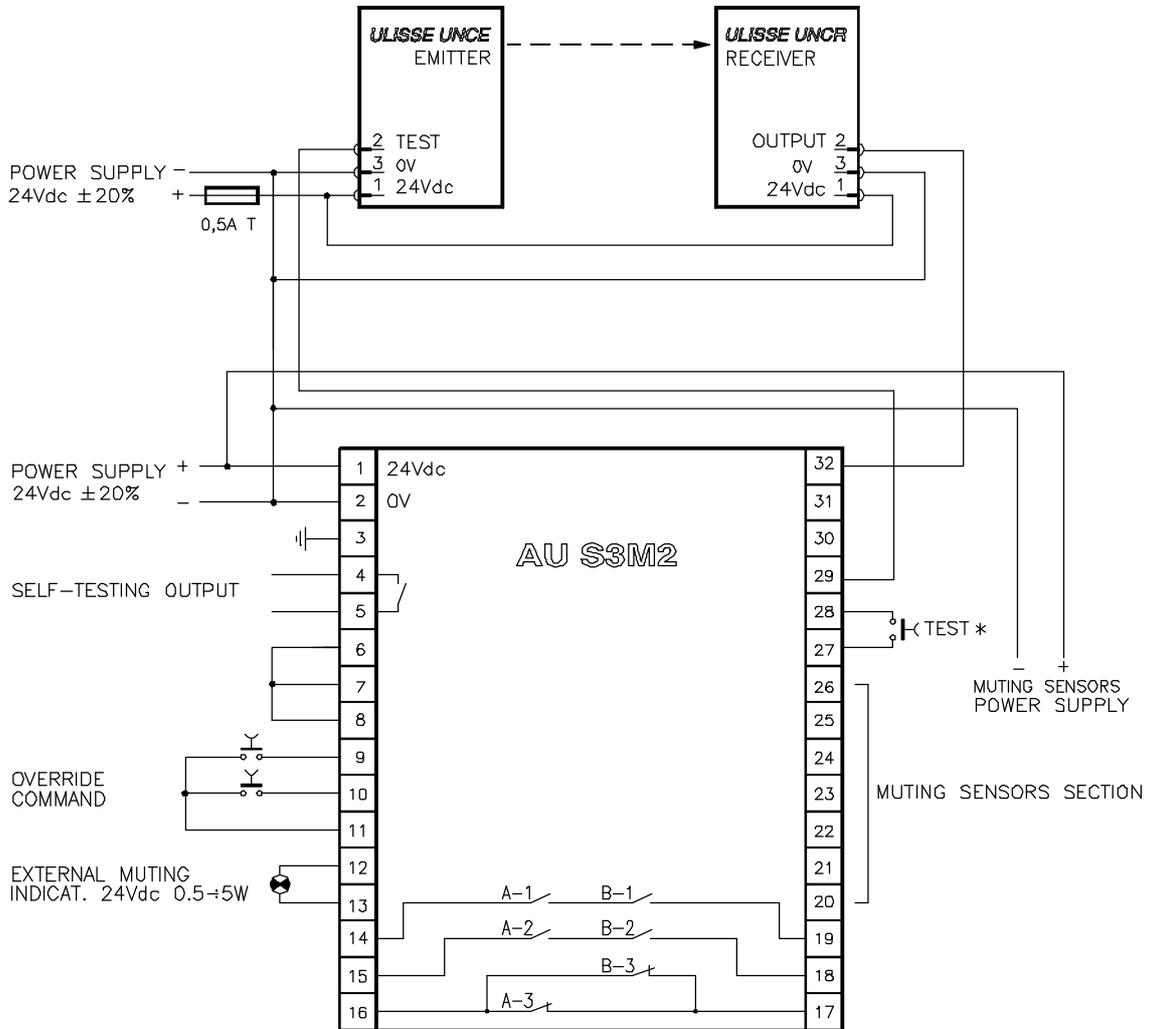
* USE BUTTON WITH ELECTRICAL INSULATION OF AT LEAST 230 Vac

Connection with AU S3 unit and with auxiliary external relays K1 and K2 control.



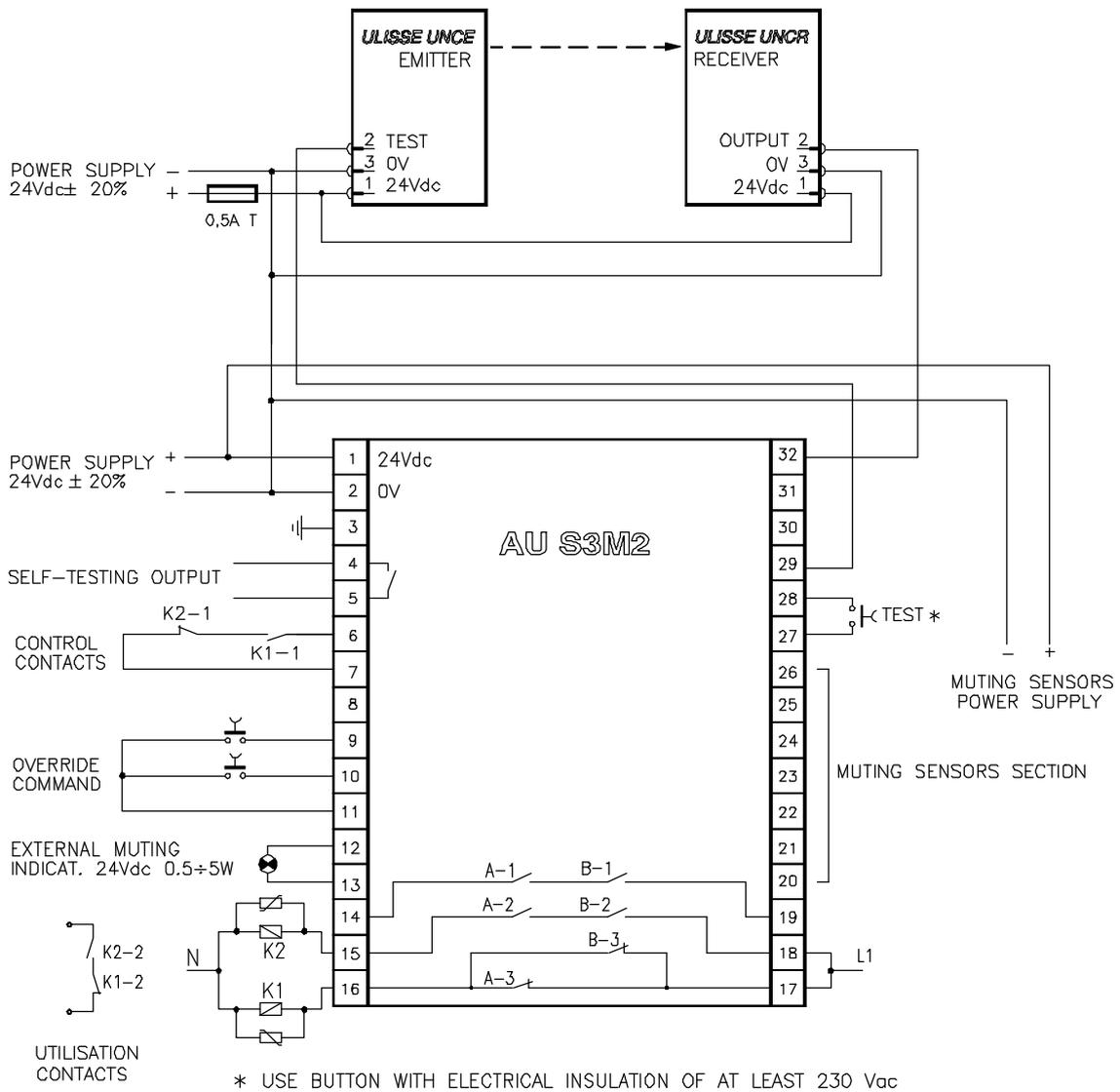
* USE BUTTON WITH ELECTRICAL INSULATION OF AT LEAST 230 Vac

Connection with AU S3M2 muting unit.



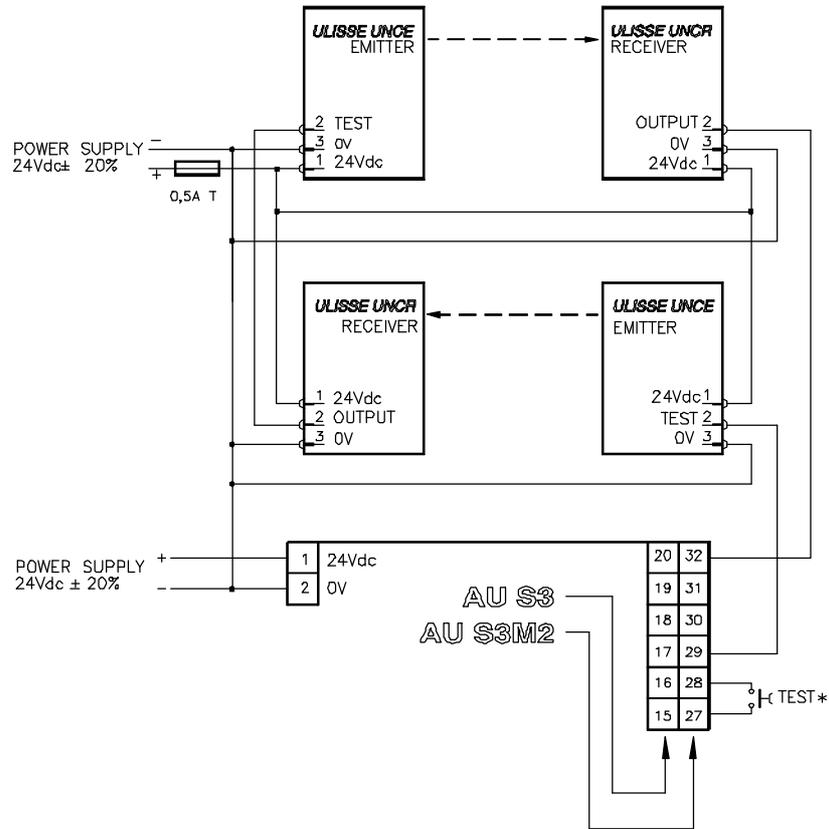
* USE BUTTON WITH ELECTRICAL INSULATION OF AT LEAST 230 V_{ac}

**Connection with AU S3M2 muting unit
with auxiliary external relays K1 and K2 control.**



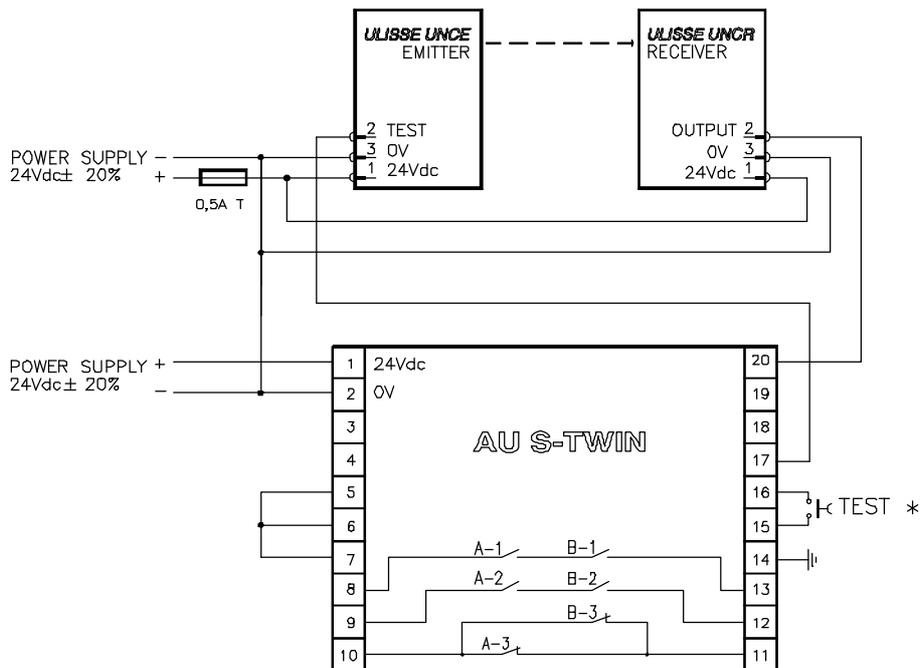
WARNING: To connect the muting sensors, refer to manual code 8540408.

Connection of two pairs of photocells with AU S3 unit or AU S3M2 muting unit.



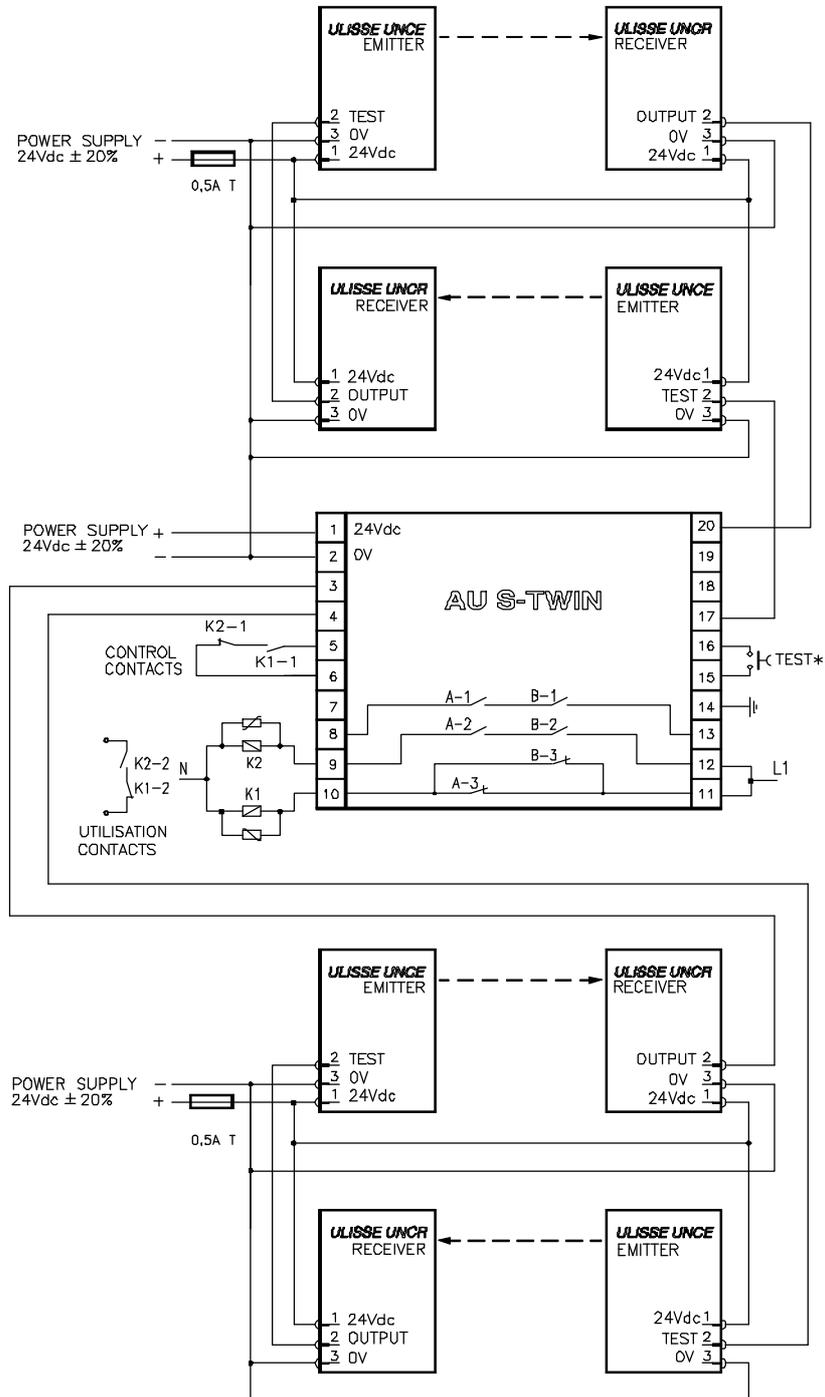
* USE BUTTON WITH ELECTRICAL INSULATION OF AT LEAST 230 Vac

Connection with AU S-TWIN unit.



* USE BUTTON WITH ELECTRICAL INSULATION OF AT LEAST 230 Vac

Connection of four pairs of photocells with AU S-TWIN and with auxiliary external relays K1 and K2 control.



* USE BUTTON WITH ELECTRICAL INSULATION OF AT LEAST 230 Vac

Mechanical installation and optical alignment

The emitter and the receiver must be installed one in front of the other at a distance not to exceed the effective capacity of the equipment.

A perfect alignment between the emitter and the receiver is essential for the flawless operation of this device. This operation is facilitated by the presence of a green indicator LED on the receiver.

CHECKS AND MAINTENANCE.

The ULISSE UNC photocell must be used within the working parameters given in the technical data. At the beginning of each work shift, or at power up, it is necessary to check the functionality of the photocell through the following procedure: intercept the beam with a cylinder shaped opaque object with a diameter of 8 mm to be placed at the centre of the area between the emitter and the receiver, and then in the proximity of both, and make sure that in each of these cases, the green led "free area light" on the receiver goes off, while at the same time the control unit output is switched.

The ULISSE UNC photocell has no specific maintenance requirement; at all events, we recommend cleaning the lenses of the emitter and the receiver at regular intervals, so as to prevent an excessive quantity of dust from building up and hampering the optical beam transmission and reception functions, as this may result in the failure of the equipment and the machine connected to it.

Do not use abrasive or corrosive products, or solvents or alcohol which might damage the parts to be cleaned.

OPERATING FAULTS.

If any operating faults persist even if the system is turned off and on, check the conditions of the electrical connections.

Furthermore, make sure that the emitter and the receiver are correctly aligned, and the lenses are perfectly clean. If these measures are not sufficient to restore correct system operation, send the equipment to our laboratories, complete with all its parts, specifying clearly:

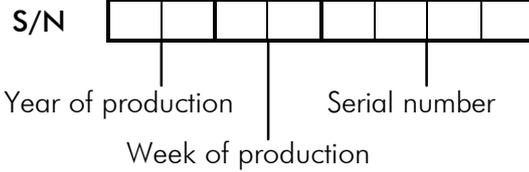
- part number;
- date of installation;
- hours of operation;
- type of installation;
- fault observed.



IDENTIFICATION LABELS



S/N field codification:



ORDERING CODE AND SPARE PARTS

Ordering codes.

ITEM	CODE
Emitter+ Receiver UNCE + UNCR	1200302
Emitter UNCE	1400302
Receiver UNCR	1500302

Spare parts.

ITEM	CODE
Female connector M8 90° (5m cable)	1200216
Female connector M8 (5m cable)	1200217
Female connector M8 (15m cable)	1200219
Female connector M8 90° (15m cable)	1200221

WARRANTY

For each newly produced ULISSE UNC, in regular utilisation conditions, REER S.p.A. warrants the absence of defects in terms of materials and construction for a period of 12 (twelve) months.

During said period, REER S.p.A. undertakes to eliminate any product flaw by repairing or replacing the defective parts, at no cost to the buyer where both the materials and labour are concerned.

At any rate, REER S.p.A. reserves the right to replace a defective apparatus in its entirety, with another of identical or similar characteristics, instead of repairing individual defective parts, at its discretion.

The validity of this warranty is subject to the following conditions:

- The fault is notified to REER S.p.A. within twelve months of the date of delivery of the product.
- The parts making up the equipment are undamaged.
- The REER part number is clearly legible.
- The fault or malfunctioning has not been directly originated by any of the following causes:
 - Utilisation for purposes other than those the equipment is intended for;
 - Failure to comply with utilisation instructions;
 - Negligence, human errors, inadequate maintenance;
 - Repairs, changes, adaptations not performed by REER personnel, tampering, etc.;
 - Accidents or impact (even those due to transport or force majeure);
 - Other causes independent of REER S.p.A.

Repairs shall be performed at the laboratories of REER S.p.A., where the material must be delivered or shipped to: transport expenses and the risks of damage or loss of materials during shipment shall be borne by the user.

Replaced products and components become the property of REER S.p.A.

REER S.p.A. does not recognise any warranties or rights other than those expressly described above; in no circumstances shall the user be entitled to seek damage for expenses incurred, down-time or any other events associated with faults of the product or parts thereof.

The data and instructions contained in this manual may change as ULISSE products are developed.

Since a good knowledge of this manual is essential for correct use and installation, please always refer to the version contained in the product's packaging case.