LASER ACTIVE OPTOELECTRONIC PROTECTIVE DEVICE “AOPD”

SERIES

“FUTURA2RL”

Designed and produced in accordance with EEC directives

USER MANUAL

PREFACE

This manual provides the user and/or installer with the information required for correct use of the “FUTURA2RL” device in the application for which it was designed, and in safety and risk-prevention.
The manual must be kept carefully in such a way as to be immediately available should it be required.
Contact the manufacturer for clarification, explanations or additional copies or updates of the manual itself.

The manufacturer reserves the right to vary products and the manual without being obliged to update previous products and manuals.

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3 WARRANTY

The warranty is valid for a period of 12 months from the consignment date and expires at the end of this period, irrespective of whether the appliance has in fact been used. The guarantee covers all parts of the device if the materials or assembly of said parts are shown to be faulty and in respect of the following conditions:

1) The warranty covers replacement of all those parts shown to be of faulty manufacture under normal conditions of use.
   The warranty is not valid unless accompanied by a copy of the invoice proving purchase.
   The warranty is not valid in the following cases:
   a - if the device has been tampered with in any way;
   b - use of the device in ways not conforming to the instructions and warnings given in this manual;
   c - damage caused by an unsuitable working environment or phenomena not dependent on normal operation (e.g. an unsuitable mains voltage and/or frequency values);
   d - repairs carried out by persons or technical assistance centres not authorised by the manufacturer.

2) The resulting costs and risks associated with transport, packing and labour are the responsibility of the purchaser.

3) The replacement of the device and/or extension of the period of guarantee validity following a fault are excluded.

4) Compensation will not be paid for damages occurring as a result of the device being inoperative while repairs are carried out.

5) Where not explicitly specified, reference should be made to 85/374/EEC on the responsibility for faulty products as incorporated in Italian Decree D.P.R. 224 of 1998.

ATTENDANCE

The servicing, meant like informative support of answer to any type of relating clarification the device in object, and the repairs are supplied directly from the manufacturer.

MATERIAL SUPPLIED AS STANDARD

The “FUTURA” invisible optoelectronic active infrared light curtain consists of the following elements supplied suitably packed:
- Transmitter (TX) complete with M12 - 5 pole output connector with 5 m long cable
- Receiver (RX) complete with M12 - 8 pole output connector with 5 m long cable
- Copy of the present manual including the “DECLARATION OF CONFORMITY”
- Adjustable brackets for installing the Transmitter TX and Receiver RX.
VERIFYING THE PROTECTED AREA

This should be performed using a cylindrical Test Piece with a diameter corresponding to the detection capability of the device concerned. This must be intercepted anywhere within the protected area, causing the green **RUN** LED to light-off and the red **ALT** LED to light-on. The Output Signal Switching Devices (OSSDs) should also open, disabling operation of the machine. A Test Piece, suitable for the device in use, should always be available near the work station, to allow the every day verification.

**NORMATIVE REFERENCES**

The intangible Barrier with Laser emission “FUTURA2RL” has been designed and manufactured following the indications supplied from **IEC-EN 61496-1** “ESPE Elettro Sensitive Protective Equipment” and **IEC 61496-2** ed. 97 “AOPD Active Opto Electronic Protective Devices” normes, and is classifiable as ESPE of TYPE 3 or TYPE 4. The device is also in compliance with the paragraph 5.3.2. - f) and 5.3.12 of the **UNI EN 12622** norm “Hydraulic Press Brakes”. The visible and modulated Laser light source, emitted from the Transmitter (TX) section, having an intensity so much limited (approximately 1mW) is classified as safety CLASS 2 as the **EN 60825** ed.4 norm.

**VERIFYING THE PROTECTED AREA**

This should be performed using a cylindrical Test Piece with a diameter corresponding to the detection capability of the device concerned. This must be intercepted anywhere within the protected area, causing the green **RUN** LED to light-off and the red **ALT** LED to light-on. The Output Signal Switching Devices (OSSDs) should also open, disabling operation of the machine. A Test Piece, suitable for the device in use, should always be available near the work station, to allow the every day verification.
The safety device “FUTURA2RL” is an intangible Barrier with a visible light laser emission that in coupling to the machine control system supplies protection from accidents to the operator uses in it of the same one. It is composed by a Transmitter (TX) and a Receiver (RX) units. The Control Logic of the Receiver drives the two outputs to the active state ON when both the sensing elements are illuminated from the red light laser emitted from the Transmitter, while the outputs are driven to the inactive state OFF in the event in which the intrusion of any opaque element inside of the survey area it prevents that just one of the sensing elements can be illuminated from the laser light beam. The function of the device is therefore that to inhibit to the command elements of the machine the consent to the operation in the moment in which there are not the safety conditions to operate. Any improper use of the device must be thought thus prohibited cause the consequent loss of any form of explicit and implicit warranty, like every responsibility from the manufacturer for eventual damages and accidents that could be taken place. The “FUTURA2RL” device has been designed and manufactured with the aim of eliminating or reducing as far as possible all risks for the user. However, improper use could result in unforeseen conditions with some degree of danger which cannot be completely eliminated. Installation, testing and maintenance of the “FUTURA2RL” device must be performed exclusively by qualified personnel following the instructions in this manual faithfully and meticulously.

In order that the laser guard “FUTURA2RL” can work in the more appropriate way it is fundamental that it is correctly installed, tested and used as it follows. Ensure the two units, TX and RX, are perfectly parallel and fix using the special adjustable insulating brackets at the working distance specified when ordering and reported on the rating plate under the heading "Working Distance". Keep the Receiver out of direct sunlight. The equipment is turned on by powering the transmitter TX and receiver RX according to the information given on the rating plate. After about one second the device should be ready for operation. From the frontal head of TX section a visible light laser beam has to come out and has to illuminate the frontal head of RX section with references for the correct alignment in correspondence of the two light incoming holes to the sensors (Pag.9 - Fig.9). Eventually improve the alignment of the two sections in the event the laser beam did not have to perfectly illuminate the zone of the references. The meaning of the light indicators is described and illustrated in detail in paragraph 8 “Light indicators and setting controls - RX". After turning power to the two units on and aligning them correctly, make sure that the green RUN indicator on the RX are on. The red ALT indicator on the RX lights on in the presence of an obstacle inside the protected area or if the units are not perfectly aligned. To prolong the connections, use shielded cable to avoid all interference. If there are shiny reflectant surfaces near the light curtain, they should ideally be coated with matt black paint to reduce the risk of undesirable reflections. At the end of the installation, also verify correct operation of the devise using the test piece to ensure it is intercepted at all points of the area to be protected. The minimum diameter of the test piece unequivocally intercepted at all points of the protected area is known as the Maximum Detection Capability (from IEC-EN 61496 standard) of the light curtain. For example, for the FUTURA2RL series this is greater or equal to 14 mm.
**FUTURA2RL/3 - FUTURA2RL/4**

The choice between the two models must be made on the basis of the risk category attributed to the machine, assessed in accordance with European standard EN954-1. The FUTURA2RL/4 model is suitable for all applications with maximum accident risk, both in terms of the frequency with which the operator is exposed to said risk and the gravity of the danger (machines listed in annex IV of Directive 98/37). The FUTURA2RL/3 model is suitable for all other applications where the severity and frequency of exposure to the risk of accident is less.

**MECHANICAL WARNINGS**

To prevent shift of the laser light guard and consequently also of the protected area, it must be fixed solidly and precisely respecting the instructions given in paragraph 13 "Mechanical Data". It has to be adopted every precaution in order to reduce at the minimum the vibrations of the machine, protect the device and its supports with mechanical shelters so as to avoid direct collisions. Connection cables must be arranged so as to avoid accidental contact with, for example, abrasive, hot or sharp objects which could cause dangerous damage to the cables themselves. In the event of damage to the connection cables, do not use the device and disconnect immediately from the power supply. Avoid the connection cables coming into contact with water or damp surfaces. In addition, prevent access to the danger zone with other fixed material barriers where this is not possible by the use of electro sensitive protective devices.

**ELECTRICAL WARNINGS**

Verify that the available power supply source corresponds to that operating one of the device in use that must be verified from the data plate of both sections Transmitter (TX) and Receiver (RX). The TX and RX housings are electrically connected to the earth of the internal circuit, thus to the GND conductor of the connector. Contact between the housing and the chassis of the machine (unless free of potential) must therefore be avoided. Failure to observe this precaution could lead to damage of the units. This danger is totally avoided if the sensor units are correctly fixed by means of the special adjustable insulating "L" brackets. Connection of other equipment to the power source used to power the "FUTURA2RL" device is not recommended. This could generate electrical disturbance, jeopardising correct operation of the various parts of the device itself. If liquid or foreign bodies of any kind penetrate the device, stop using it immediately and disconnect it from the power supply. The "FUTURA2RL" device has been designed and produced in such a way that the housing does not have to be opened for the device to be used. Given the particular function of the device itself, removal of the heads of the aluminium housings of the transmitter TX and receiver RX is prohibited. No attempt should be made to repair them. Always contact the manufacturer only.

**OPTICAL WARNINGS**

The presence of a visible light laser emission, even if of low power as established by the enforced European norms, could cause the use of the device dangerous. The protection of the person eye from accidental flash turns out however assured, also without particular precautions, by the own reactions defense like as an example the palpebral glare. It is however advised to avoid itself to frontally fix or to direct the visible light laser source emitted from the Transmitter.
AVAILABLE FUNCTIONS

START RESTART INTRLOCK
FUTURA2RL devices can be easily setted, without making any internal modifications (Pag.8 - Fig.1/2 “SRI” led and “MODE” selector), to switch from the automatic restart to the manual restart operation with start-restart interlock by a remote push-button.
In automatic restart operation the receiver control logic, without consents from the outside, automatically drives the two output signal switching devices to the active ON state every time that the laser beam emitted from the Transmitter catches up the two sensing elements of the receiver after that the same one has been interrupted from an obstacle. Instead, in the event in which the device comes setted for manual restart operation, every time that the light beam comes interrupted is necessary to supply, for example by a push-button or a safety-pedal, an external input signal on the respective dedicated YELLOW and GREEN color conductors (see paragraph 12.1 “Electrical connections - RX”) that it qualifies the control logic of the Receiver to bring back to the active ON state the output signal switching devices after a switching OFF of the same ones as as a result of an interruption of the laser light beam.

EXTERNAL DEVICE MONITOR
An External Device Monitor (EDM) control loop circuit allows, the safety FUTURA2RL guard, to control the state of the correct operation of the devices (eg. relé, contactors, etc) externally connected to the two outputs as a load, thus extending the safety level up to the machine primary control elements. To such scope the Receiver, of the laser guard, is provided of two YELLOW and GREEN color input conductors who make head to the inside EDM circuit.
Between these two conductors has to be in series connected the normally open switches of the external output load devices thus from being able to test their own efficiency as a consequence of every actuation (passage from ON to the OFF state) of the barrier for the interruption of the laser beam. In the event in which such function it does not used, it is necessary to short-circuit the conductors YELLOW and GREEN and connect them to the “0V” of power supply.

MUTING
For the “FUTURA2RL/4” Laser guard model, the “Neutralization” or “Muting” function is also provided, that is the possibility of being able to suspend in temporary way its own protecting function. That it means that when the two dedicated inputs are simultaneously activated (within a maximum time of 0,8 second) putting separately in short-circuit the PINK and GRAY conductors to the “0V” of power supply (RED conductor and Shield), the Laser Guard surveillance action comes temporarily neutralized, allowing that the laser beam can be darkened without that the output signal switching devices (OSSDs) switch to the inactive OFF state. A red color blinking signaler, situated on the top head of the “RX” section (Pag.8), shows the activation of the Muting function. In the event of the two dedicated muting inputs are not simultaneously activated, or however with a time delay more than 0,8 second, the FUTURA2RL switches into the block state opening the output signal switching devices (OSSDs) and signaling it as the “D” case of the diagnostic table of Pag 8. Make attention using this function as it could generate potentially dangerous situations. Adopt a visual and/or acoustic additional external signaler to indicate in unequivocal way the inactivity state of the Barrier to activated Muting.
## RX - TOP HEAD

- **Indicates** aligned laser-guard with no obstacles
- **Indicates** misaligned laser-guard or obstacles presence
- **Indicates** lockout state laser-guard for failure
- **Indicates** manual restart operation laser-guard
- **Indicates** muted state laser-guard (FUTURA2RL/4 only)

### MODE function
- Mode function selector: taking of the jumper located under the black cap the laser-guard switches from the automatic to the manual restart operation (start/restart interlock) manual restart operation selection indicator (start/restart interlock), it lights on taking of the jumper **MODE**

### SRI function
- Switching of the laser-guard selector function mode

### TROUBLESHOOTING

<table>
<thead>
<tr>
<th>CASE</th>
<th>LED’s STATUS</th>
<th>DEVICE STATUS</th>
<th>CHECK AND SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>RUN ON, ALT OFF, BLK OFF, MUTE OFF</td>
<td>Optical alignment O.K., no obstacles, No failures</td>
<td>Check if the OSSDs are in the ON state</td>
</tr>
<tr>
<td>B</td>
<td>RUN OFF, ALT ON, BLK OFF, MUTE OFF</td>
<td>No optical alignment or obstacles presence Possible internal fault</td>
<td>Improve the alignment, remove probable obstacles. If persist send to factory</td>
</tr>
<tr>
<td>C</td>
<td>RUN ON, ALT OFF, BLK OFF, MUTE BLINKING</td>
<td>MUTING activated, protective action temporarily neutralized (FUTURA2RL/4 model only)</td>
<td>Warning, possible unsafe situation</td>
</tr>
<tr>
<td>D</td>
<td>RUN OFF, ALT ON, BLK BLINKING, MUTE BLINKING</td>
<td>Disparity state between the MUTING inputs, or inputs activated with obstacles presence</td>
<td>Check MUTING sources, remove probable obstacles. If persist send to factory</td>
</tr>
<tr>
<td>E</td>
<td>RUN OFF, ALT ON, BLK BLINKING, MUTE OFF</td>
<td>Disparity between the inside driving channels</td>
<td>Block briefly the protective curtain, if persist send to factory</td>
</tr>
<tr>
<td>F</td>
<td>RUN OFF, ALT BLK BLINKING, MUTE OFF</td>
<td>OSSD1 or OSSD2 connected to the +24Vcc or OSSD1 short-circuited with OSSD2 (FUTURA2RL/4 model only)</td>
<td>Remove the factor and block briefly the protective curtain</td>
</tr>
<tr>
<td>G</td>
<td>RUN OFF, ALT BLK BLINKING, MUTE OFF</td>
<td>Load sinking current connected to the OSSD1 or OSSD2 higher than 0,7A, OSSD1 or OSSD2 short-circuited to GND (FUTURA2RL/4 model only)</td>
<td>Remove the factor and block briefly the protective curtain</td>
</tr>
<tr>
<td>H</td>
<td>RUN OFF, ALT ON, BLK ON, MUTE OFF</td>
<td>OSSD1 or OSSD2 connected to the +24V during power-on (FUTURA2RL/4 model only)</td>
<td>Switch-off power supply, remove the factor, switch-on power supply</td>
</tr>
</tbody>
</table>
On both Transmitter (TX) and Receiver (RX) units there is a label showing all the technical data typical of the device according to the Machinery Directive 98/37/EEC Annex I § 1.7.3 concerning safety components.

Following with reference to a specific model of active optoelectronic protective device with visible light laser emission called “FUTURA2RL/4” there is an example of rating plate.

A second label, located on the aluminium housing, shows on how to carry out electrical connections useful for a correct use of the device. It identified all the conductors with reference to their colouring and to the corresponding function.

**TX FUTURA2RL**

- **Device model**: M12 - 5 poles male plug
- **Detection capability**: Output connector for electric connections is a standard type M12 - 8 pole

Label located on the housing of the “TX” section. The output connector for the electric connections is a standard type M12 - 8 pole.

**RX FUTURA2RL /3**

- **Device model**: M12 - 8 poles male plug
- **Detection capability**: Output connector for electric connections is a standard type M12 - 8 pole

Label located on the housing of the “RX” section. The output connector for electric connections is a standard type M12 - 8 pole.

**RX FUTURA2RL /4**

- **Device model**: M12 - 8 poles male plug
- **Detection capability**: Output connector for electric connections is a standard type M12 - 8 pole

Label located on the housing of the “RX” section. The output connector for electric connections is a standard type M12 - 8 pole.

**TX FUTURA2RL**

Label located on the housing of the “TX” section. It shows the features of the light emitted and alert the user not to look directly the outgoing Laser beam.

**RX FUTURA2RL**

Label located on the frontal head of the “RX” section. It shows the references for a correct optic alignment and the two incoming holes to the sensors.
To ensure the device fulfils its accident prevention functions correctly, it must be installed at a safe distance from the point actually dangerous for the operator of the machine in such a way as to stop the dangerous movement before that point is actually reached.

The procedure for calculating this distance is established in the harmonised European standard EN999 which gives a number of formulas using parameters dependent on various factors discussed below (for more detail see the standard itself).

For information only, a number of examples to calculate the installation distance from the danger point for vertically-installed light curtains with a detection capability of no more than 40 mm are given below:

\[ S = K \times T + C \]  
where \( T = t_1 + t_2 \) while \( C = 8 \times (d - 14) \)

- \( S \) is the safe distance to be respected when installing the device
- \( K \) is a constant establishing the speed at which the operator approaches the danger point, established at 2 m per second
- \( T \) is the time in milliseconds deriving from the sum of the time \( t_1 \) taken by the machine to stop its dangerous movement after an ALT command and the time \( t_2 \) taken by the light curtain to open the OSSDs after an obstacle has been introduced into the protected area.
- \( d \) is the detection capability of the light curtain in millimetres

**REFERENCE CODE FOR ORDERING**

```
FUTURA2RL / ( ) / ( ) / [ ] / WORKING DISTANCE

TH = 153
WD = up to 6mt
TH = 165
```

All models of the "FUTURA2RL" active optoelectronic at Laser emission are calibrated during factory testing according to the working distance specified by the customer in the last part of the order code. Should it be necessary to modify this distance at a later date, you should contact the manufacturer who will modify the calibration for the new working distance. Alternatively, contact the factory telephonically for instructions on how to proceed.
## TECHNICAL CHARACTERISTICS

### FUTURA2RL / 3 MODEL

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protected Height (PH)</td>
<td>6mm</td>
</tr>
<tr>
<td>Total Height (TH)</td>
<td>TX=153mm - RX=165mm</td>
</tr>
<tr>
<td>Detection Capability (DC)</td>
<td>&gt;14mm</td>
</tr>
<tr>
<td>Working Range</td>
<td>1 ÷ 6 meters</td>
</tr>
<tr>
<td>Response Time</td>
<td>8msec</td>
</tr>
<tr>
<td>TX Indicator</td>
<td>RED LASER BEAM = ACTIVE EMISSION</td>
</tr>
<tr>
<td>RX Indicator</td>
<td>GREEN=ALERT RED=ALARM YELLOW=BLOCK ORANGE=MUTING MANUAL RESTART</td>
</tr>
<tr>
<td>OSSDs Types</td>
<td>2 VOLTAGE FREE SWITCHES 0,7A @ 40Vdc/ac</td>
</tr>
<tr>
<td>Max. Load Capacity</td>
<td>0,1 uF</td>
</tr>
<tr>
<td>Supply Voltage</td>
<td>24Vdc ±10% - 12Vdc on request</td>
</tr>
<tr>
<td>CURRENT CONSUMPTION</td>
<td>TX 70mA RX 50mA</td>
</tr>
<tr>
<td>Protection Features</td>
<td>POLARITY INVERSION</td>
</tr>
<tr>
<td>Working Temperature</td>
<td>0 to +50°C</td>
</tr>
<tr>
<td>Umidity</td>
<td>25 ÷ 85%</td>
</tr>
<tr>
<td>Emission</td>
<td>RED LASER $\lambda = 650 \text{ nm} / P=1\text{mW}$</td>
</tr>
<tr>
<td>Interferent Light Immunity</td>
<td>30,000 lux</td>
</tr>
<tr>
<td>Output Connection</td>
<td>5 METERS CABLE LENGHT M12 CONNECTOR - TX = 5 POLE - RX = 8 POLE</td>
</tr>
<tr>
<td>Housing</td>
<td>YELLOW RAL 1021 ALUMINIUM - CROSS SECTION 41 x 46 mm</td>
</tr>
<tr>
<td>Available Functions</td>
<td>EXTERNAL DEVICE MONITOR - START/RESTART INTERLOCK - MUTING</td>
</tr>
<tr>
<td>Protection Degree</td>
<td>IP54</td>
</tr>
</tbody>
</table>

### FUTURA2RL / 4 MODEL

<table>
<thead>
<tr>
<th>Parameter</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Protected Height (PH)</td>
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</tr>
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</tr>
<tr>
<td>RX Indicator</td>
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<tr>
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</tr>
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</tr>
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<td>Supply Voltage</td>
<td>24Vdc ±10% - 12Vdc on request</td>
</tr>
<tr>
<td>CURRENT CONSUMPTION</td>
<td>TX 70mA RX 50mA</td>
</tr>
<tr>
<td>Protection Features</td>
<td>POLARITY INVERSION - OUTPUT SHORT CIRCUIT - CURRENT THRESHOLD</td>
</tr>
<tr>
<td>Working Temperature</td>
<td>0 to +50°C</td>
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<tr>
<td>Umidity</td>
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<td>IP54</td>
</tr>
</tbody>
</table>
If the function TEST is not used, short circuit the conductors 4-5 and connect them to the “0V” of power supply blue (3).

If the functions E.D.M. and START-RESTART are not used, short circuit the conductors 3-4 and connect them to the “0V” of power supply red/shield (8).

If the function TEST is not used, short circuit the conductors 4-5 and connect them to the “0V” of power supply blue (3).
For the Laser guard model, the "Neutralization" or "Muting" function is also provided, that is the possibility of being able to suspend in temporary way its own protecting function. That means that when the two dedicated inputs are simultaneously activated (within a maximum time of 0.8 second) putting separately in short-circuit the PINK and GRAY conductors to the "0V" of power supply (RED conductor and Shield), the Laser Guard surveillance action comes temporarily neutralized, allowing that the Laser beam can be darkened without that the output signal switching devices (OSSDs) switch to the inactive OFF state. A red color blinking signaler, situated on the top head of the "RX" section (Pag.8), shows the activation of the Muting function. In the event of the two dedicated muting inputs are not simultaneously activated, or however with a time delay more than 0.8 second, the FUTURA2RL switches into the block state opening the output signal switching devices (OSSDs) and signaling it as the "D" case of the diagnostic table of Pag 8. Make attention using this function as it could generate potentially dangerous situations. Adopt a visual and/or acoustic additional external signaler to indicate in unequivocal way the inactivity state of the Barrier to activated Muting.

**RX FUTURA2RL/3**

8 conductors shielded cable

If the functions E.D.M. and START-RESTART are not used, short circuit the conductors 3-4 and connect them to the "0V" of power supply red/shield (8)

Control devices of the MUTING function. WARNING: when activated, temporarily, they neutralize the light-curtain protective action.

**RX FUTURA2RL/4**

8 conductors shielded cable

If the functions E.D.M. and START-RESTART are not used, short circuit the conductors 3-4 and connect them to the "0V" of power supply red/shield (8)

For the "FUTURA2RL/4" Laser guard model, the "Neutralization" or "Muting" function is also provided, that is the possibility of being able to suspend in temporary way its own protecting function. That means that when the two dedicated inputs are simultaneously activated (within a maximum time of 0.8 second) putting separately in short-circuit the PINK and GRAY conductors to the "0V" of power supply (RED conductor and Shield), the Laser Guard surveillance action comes temporarily neutralized, allowing that the Laser beam can be darkened without that the output signal switching devices (OSSDs) switch to the inactive OFF state. A red color blinking signaler, situated on the top head of the "RX" section (Pag.8), shows the activation of the Muting function. In the event of the two dedicated muting inputs are not simultaneously activated, or however with a time delay more than 0.8 second, the FUTURA2RL switches into the block state opening the output signal switching devices (OSSDs) and signaling it as the "D" case of the diagnostic table of Pag 8. Make attention using this function as it could generate potentially dangerous situations. Adopt a visual and/or acoustic additional external signaler to indicate in unequivocal way the inactivity state of the Barrier to activated Muting.

**MUTING**

For the "FUTURA2RL/4" Laser guard model, the "Neutralization" or "Muting" function is also provided, that is the possibility of being able to suspend in temporary way its own protecting function. That means that when the two dedicated inputs are simultaneously activated (within a maximum time of 0.8 second) putting separately in short-circuit the PINK and GRAY conductors to the "0V" of power supply (RED conductor and Shield), the Laser Guard surveillance action comes temporarily neutralized, allowing that the Laser beam can be darkened without that the output signal switching devices (OSSDs) switch to the inactive OFF state. A red color blinking signaler, situated on the top head of the "RX" section (Pag.8), shows the activation of the Muting function. In the event of the two dedicated muting inputs are not simultaneously activated, or however with a time delay more than 0.8 second, the FUTURA2RL switches into the block state opening the output signal switching devices (OSSDs) and signaling it as the "D" case of the diagnostic table of Pag 8. Make attention using this function as it could generate potentially dangerous situations. Adopt a visual and/or acoustic additional external signaler to indicate in unequivocal way the inactivity state of the Barrier to activated Muting.
MECHANICAL DATA

"FUTURA2RL - TX"

"FUTURA2RL - RX"

MOUNTING BRACKETS

HOUSING CROSS SECTION VIEW

TOP HEAD SECTION VIEW

BOTTOM HEAD SECTION VIEW
The Transmitter and Receiver units require no particular maintenance. However, the frontal heads of the two sections protective of the optics, with the holes for exit and entrance of the laser light beam, should be cleaned daily to remove large quantities of dust. Avoid rubbing the screens with abrasive cloths as rubbing causes static electricity and attracts dust. To clean, use alcohol. Avoid plastic solvents.

**DAILY CONTROLS AND PERIODICAL TESTS**

When the device is used for the first time, to guarantee safe conditions, the correct setting of the functions must be controlled. When using the device for the first time, operation of the device in the particular application must first be verified. This must be done by specialist personnel. Accident prevention legislation specifies that this control should be performed daily.

Before beginning any form of work, it is good practice to verify that:

a) with the machine stationary and power to the laser guard on (no obstacle in the protected area), the green **RUN** indicator is lit.

b) with the machine stationary and power to the laser guard on in the presence of an obstacle in the protected area, the red **ALT** indicator is lit.

c) with the machine running, introduction of the test piece at any point in the protected area switches the green indicator to the red **ALT** indicator, shutting down the machine within the specified time.

d) moving parts are not accessible to personnel. Any extraordinary maintenance must therefore be carried out under the strict supervision of the safety manager. All accesses not protected by electro sensitive protective devices must be equipped with fixed material barriers or other.

A sheet indicating the daily checks must be compiled by the operator of the machine and must be clearly visible near the workstation.

**MATERIAL SUPPLIED AS SPARE PARTS**

The "FUTURA2RL" active optoelectronic visible light laser emission intangible guard consists of the following elements, provided on request as spare parts:

<table>
<thead>
<tr>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>M12 - 5 pole output connector for TX with 5 m long cable</td>
<td>CON-M12-5P-5M</td>
</tr>
<tr>
<td>M12 - 8 pole output connector for RX with 5 m long cable</td>
<td>CON-M12-8P-5M</td>
</tr>
<tr>
<td>Manual with duplicate of the &quot;DECLARATION OF CONFORMITY&quot;</td>
<td>MISU-FUTURA</td>
</tr>
<tr>
<td>Adjustable brackets for installing the TX and RX</td>
<td>SSO-49-28,5</td>
</tr>
</tbody>
</table>