



Installation and User Manual

Solo Lighting Control Series

LEL-0.2 model

Manual V 4.0

Software V 2.05.0



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1 General Information

1.1 Introduction

The Solo family of products is designed to adapt to a variety of controlled environments. It is exceptionally well suited for all types of farm buildings including poultry houses, pig houses, dairy barns, and greenhouses.




We recommend that you read this manual thoroughly before connecting and commissioning this product. Installation and use of this unit which does not comply with the operating instructions described in this manual is hazardous to the health and safety of people, may result in damages to the building and will void the warranty.

1.2 Revisions

Version	Content/Changes	Date	Author/In charge
3.3	Corrections Software V1.14	2014-06-09	Josée Samson
4.0	Describe software V. 2.05.00	2017-06-05	Louissette Fournier

1.3 Symbols used

The following symbols will be used in this manual:

	Caution, risk of ELECTRIC SHOCK
	Caution, risk of DANGER
	Important NOTE

2 Usage & Features

The lighting controller units are specifically developed to modulate the intensity of LED lighting products. It is equipped of two strong 1000W power output able to dim the light at very low intensity with a very high precision. Each output is fully independent and the level of the light intensity is displayed on a large led indicator. The light intensity can be controlled locally with the front-end dedicated knobs or via two independent analog inputs compatible with a 0 to 10 VDC signal

The LEL-0.2 comes in two models:

- The LEL-0.2-120V is intended for 120V.
- The LEL-0.2-240V is intended for 240V.



The main characteristics of the controller include:

- Two 1000W precise light dimming output
- Output overload protection
- Minimum inertia method used for smooth sudden transitions in light intensity
- Minimum and maximum intensities specified as a percentage of full lamp intensity
- Manual intensity adjustment for each output
- Protection against leaving manual adjustment ON
- Capability to adjust light intensity according the voltage applied
- Two Analog 0-10V signals can be configured as inputs to dim the light according to the signal level.
- Built-in USB port used for import/export configuration and firmware updates

3 Installation, Commissioning and Operation

3.1 Technical support

The technical support related to the Solo models can be obtained from your distributor or directly from the manufacturer.

Website: www.intelia.com

Email: support@intelia.com

Phone: 1-866-666-6221

3.2 Safety

The technical staff performing an operation on a controller must have read and understood this manual and accept its content.

Before the commissioning of the controller, all the connections must be checked. All the electrical cables and connections must be inspected to detect any potential defect.

The controller must not be operated if one of its components (whatever it is) is defective.

The repair or replacement of a defective component can only be done by the technical staff trained for this purpose. The qualification of this technical staff must be previously confirmed and accepted by your distributor.

The manual switches on a Solo controller are not a safe way to disconnect the equipment from the electrical network.

It is important to provide a complete disconnection device between the equipment and the controller, or to turn off the power at the source before undertaking any work on the equipment and its electrical wiring.



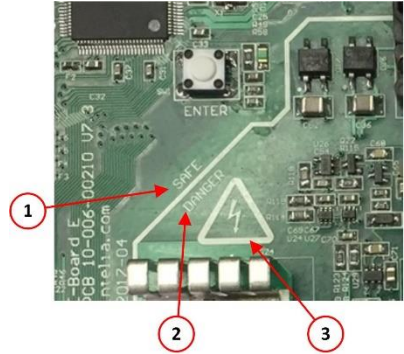
The non-compliance with these instructions can cause the complete or partial voiding of the warranty.



When accessing the unit's electronic board directly, there is a risk of ELECTRIC SHOCK if touching specific areas. To help the user know where these areas are located, a white line is printed right on the board to show the limits of the safe (1) and danger (2) areas. The danger area is also identified by a danger symbol (3) (refer to illustration below).

LEGEND :

1. Safe area
2. Danger area
3. Danger of electrocution symbol



3.3 Installation and Positioning

It is essential to respect the following installation instructions:

1. The controller is designed for a wall installation and it absolutely needs to be installed vertically.
2. The heat generated by the modulation circuit is released by the heat spreader located at the back of the device. It is therefore important to make sure that there is no obstacle that obstructs or disrupts the free flow of air 20 cm (8") above and 10 cm (4") below the controller.
3. It is important never to install the controller over a heat source such as a radiator or another controller equipped with a heat sink.
4. The controller must be installed in a location where it will not be exposed to noxious gases or excessive moisture. It shall in no case be sprayed directly.
5. The temperature of the location where the controller will be installed must always be between 0°C and 40°C (32°F and 104°F).
6. The relative humidity of the location where the controller is installed must always remain between 5% and 90%.
7. The low voltage cables (control signals, sensors and potentiometers) must be isolated from the high voltage cables.
8. It is absolutely mandatory to connect the ground wire at the location provided to this purpose. An improper grounding could lead to malfunction.
9. The wall where the controller is installed must be flat and able to withstand a temperature of 80°C (180°F). The controller must never be installed directly on a Styrofoam or urethane wall, or any other heat-sensitive material.
10. Install the controller in an accessible location at eye level for ease of installation, usage and maintenance.

3.4 Electrical Connection

3.4.1 Electrical Wiring and Connections



TURN OFF POWER AT THE SOURCE BEFORE AND DURING THE CONNECTION TO AVOID ANY RISK OF ELECTROCUTION AND DETERIORATION OF THE CONTROLLER.

The controller installation must comply with the wiring diagrams provided. These will give all the necessary information for an electrician to carry out all the wiring operations. In addition to all the electrical standards in effect, the following conditions must be respected:

1. All the perforations for the passage of the electrical cables must be made from underneath the unit. The non-compliance with this instruction can cause the complete or partial voiding of the warranty.
2. All the perforations made to route the electrical cables must be sealed with putty to prevent damage caused by moisture condensation inside the controller.
3. The wires must be identified at both ends with appropriately sized wire markers so they do not slip and come off.
4. The signal and communication cables must not run along an AC power cable for more than 60 cm (2 feet) to avoid electrical background noise affecting the signal.
5. The probe and communication cable must be of minimum size #22AWG in shielded, twisted and insulated copper with a PVC sheath.
6. A grounding conductor of stranded copper #12AWG must be provided and installed at the required location.

3.4.2 Wiring Diagram

For input/output connection details, please refer to the wiring diagrams shown in Appendix B.

3.5 Starting the System

For system start up, follow these steps:

System Start up	
1	Connect the lighting control unit to the power source and lighting outputs. For connection details, please refer to the wiring diagrams shown in Appendix B.
2	Connect the light controller to the master controller via the 0-10V signal to manage the light intensity from a remote system. To do this, connect the 0-10 V inputs of the light controller to the 0-10V outputs of the master controller, referring to the wiring diagrams shown in Figure 4 of Appendix B. Then, configure the master controller as described in the applicable manual for this unit.
3	Set all connected outputs to AUTO mode by turning the front panel knob in the most counter clockwise position.
4	Set the light curves as described in section 5.5




The controller outputs will not perform in accordance with the master controller lighting setpoint if the knob is not set at **AUTO** position.

4 User Interface

4.1 Control and display for model LEL-0.2

Manual control

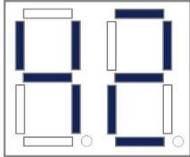
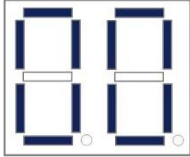
	<p>Each output has a knob used to adjust the light intensity manually. When the knob is set to the AUTO position, the output is set in automatic mode and the light intensity is determined by the current program. When the knob is turned to the MAN. (0% to 100%) position, the light intensity is determined by the position of the knob.</p>
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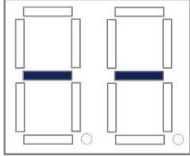
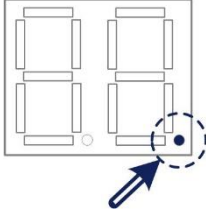
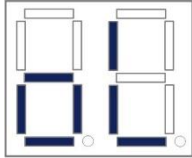
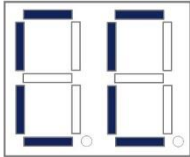
Manual Intensity

Indicators

The output LED indicators always show the current lighting intensity in percent of their respective outputs (A or B).

The details for the indications they provide are described below:

<p>In this example, the output intensity is set to 42%</p>	
<p>When the intensity is at 100%, it displays 00</p>	

<p>When the intensity is at 0% or the control switch is OFF, it displays - -</p>	
<p>When the light intensity is set manually by the knob, a small dot at the bottom right hand side flashes at a frequency of once per second.</p> <p>When the intensity is set by the program, this dot is turned off.</p>	
<p>When the current required by the lamps exceed the capacity of the output, it displays "oL" for overload</p> <p>The controller will protect against damage by limiting the output current. Reduce the load below this limitation to revert to a normal operation.</p>	
<p>When the output is shorted, it displays "CC".</p> <p>To prevent damage, the controller shuts down the power to the output. Once the short circuit is removed, recover from this mode by setting the knob to intensity 0 and then go back in AUTO or manual intensity.</p>	

5 Hardware Configuration

Several configurations may be done through the hardware located on the electronic board. This section describes each of them.

5.1 USB Interface

The system includes a USB interface which enables software updates and the calibration of lighting outputs. The USB interface is located close to the circuits delivering the power to the lamps. When using the USB key, it is imperative to avoid any contact with those power circuits to avoid severe and lethal injuries. The use of a USB key is reserved for electricians or technicians qualified by Intelia.

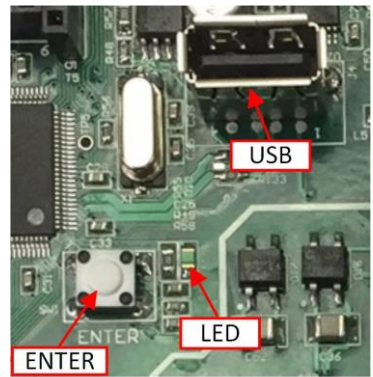
5.2 Firmware update



Warning: risk of electrocution.

Refer to section 3.2 for more detailed information.

1. Copy the software update at the root folder of a formatted fat 32 USB key;
2. Insert the USB key into the USB interface;
3. Press and hold the ENTER button for 5 seconds;
4. Take out the USB key.



Note: The approximative time for the file transfer to be completed is about 10 to 30 seconds. During the file transfer, the green LED close to the USB connector will blink quickly. The transfer is completed when the green LED pauses for 2 seconds and then turns off permanently.

5.3 Import / Export the output calibration

Using the USB key, the controller can import and export the control mode and the outputs calibration from a file. This option is useful when you want to reuse your favorite calibration on other controllers.

The following procedure imports the configuration from the **curves.ini** file and creates a copy of the current configuration in the **curves.bak** file.

The user can easily edit those files with any standard text editor like Notepad to change the configuration. The **curves.bak** file can also be renamed to **curve.ini** for importation in other controllers.



Warning: risk of electrocution.

Refer to section 3.2 for more detailed information.

1. Insert the USB key into the USB interface;
2. Press the ENTER button momentarily.
3. Remove the USB key.

Note: The approximate time for the file transfer to be completed is about 1 to 5 seconds. During the file transfer, the green LED close to the USB connector will blink quickly. The file transfer is completed when the green LED pauses for 2 seconds and then turns off permanently.

5.4 Removing a point of intensity from the lighting curve

This procedure allows the removal of a 1% intensity point on the lighting curve where lamps may be unstable or have different levels of intensity. When an intensity point is removed, the system creates an intensity jump avoiding the problem area. For instance, while executing this procedure, when the intensity is adjusted at 13%, the increasing intensity will jump from 12% to 14% and inversely from 14% to 12% when the intensity decreases.

It is possible to remove a maximum of 5 intensity point of 1%.



Warning: risk of electrocution.

Refer to section 3.2 for more detailed information.



When activating a programming mode, the unit will exit this mode automatically if no change is done within 60 seconds. To exit a mode, press ENTER momentarily.

1. Press quickly and consecutively on the ENTER button twice to enter the withdrawal point mode. The system will confirm the activation of this mode by continuously flashing the status LED as follows: 2 fast pulses followed by a pause.
2. Adjust the intensity of the lighting to the value you wish to remove.
3. Press the ENTER button for 1 second.
Note: If one of the outputs is in automatic or OFF mode, this will not affect it.
4. Repeat for all the points to be removed from the curve (a maximum of 5 points per curve)

To remove all exclusion points, make sure to be in the programming mode. Then hold the ENTER button for 5 seconds.

5.5 Light curve adjustment

Light intensity differs from one lamp model to another. Thus, a light calibration must be performed for the lowest acceptable brightness desired.



Warning: risk of electrocution.

Refer to section 3.2 for more detailed information.



When activating a programming mode, the unit will exit this mode automatically if no change is done within 60 seconds. To exit a mode, press ENTER momentarily.

1. Press quickly and consecutively the ENTER button 3 times to enter the lighting curve adjustment mode. The status LED confirms the activation of this mode by continuously flashing as follows: 3 fast pulses followed by a pause.
2. Adjust the intensity of the lighting to the minimum intensity.
3. Press the ENTER button for 1 second.

To reset the lighting curve to the factory default configuration, make sure to be in the programming mode press the ENTER button for 5 seconds.

5.6 Adjusting timespan in manual mode

The system incorporates a timer which forces the lighting control to go back into automatic mode following a prolonged use of the controller in manual mode. The delay allowed in manual mode begins when the lighting output switch is changed from the automatic position to the manual position.

5.6.1 Adjusting timespan



Warning: risk of electrocution.

Refer to section 3.2 for more detailed information.

Use a small screwdriver to adjust the timespan (1 to 120 minutes) by turning the potentiometer to the desired time delay.

It is important that no contact is made with any surrounding parts, which could lead to severe injuries or permanent damages to the system.



To disable the timer, align the potentiometer arrow with the infinite symbol ∞ .

To revert to the manual mode after the timer expiration, change the controller switches position to automatic and then back to manual. This will start a new timer cycle.

Appendix A. Technical Specifications


Power supply	
Operating voltage and frequency	85-145VAC, 50/60Hz (LCL-0.2-120V) 200-260VAC, 50/60Hz (LCL-0.2-240V)
Inputs	
Analog input (AI1 & AI2) in Slave Mode	0 - 1 0 VDC, input resistance: 43k Ω
Outputs	
Power Variable Output (A & B)	1000 W per output
Communication (option)	
Protocol	Modbus
Interface	RS-485
Mechanical	
Dimensions	8.7" X 10.6" X 5.5"
Operating temperature	32° to 104°F (0° to 40° C)
Storage temperature	5° à 122°F (-15° to 50° C)
Relative humidity	5 to 90% without condensation

Appendix B. Connection Diagrams

This appendix contains all the connection diagrams needed. A list is provided below giving a brief description and a figure reference for each diagram.

Models	Description	Figure
Solo LEL-0.2	Main board - Page 1 of 4	Figure 1
	System Connections - Page 2 of 4	Figure 2
	Electrical panel details for models 120V and 240V - Page 3 of 4	Figure 3
	Power Bus connections - Page 4 of 4	Figure 4
Solo LCL-0.2	For connection purposes, the LCL model is similar to the LEL except that it has a few more connectors. For more information about this model, refer to its user manual.	

Solo Lighting Control - LEL-0.2 model

	<p>The electrical load distribution must be determined by a qualified electrician and installed as prescribed by the applicable regulations of the electrical code.</p>
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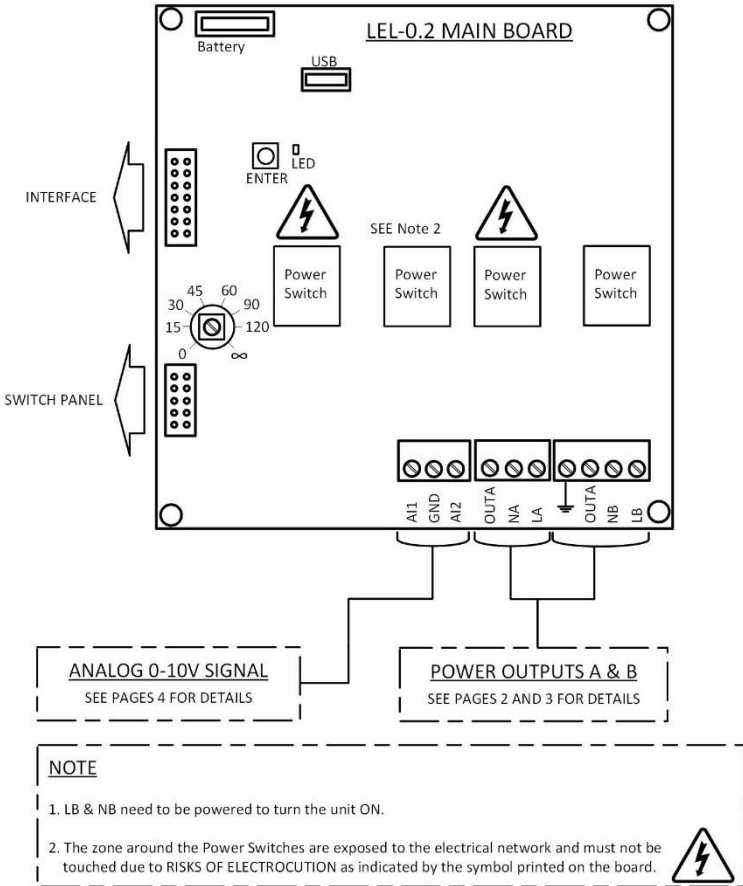
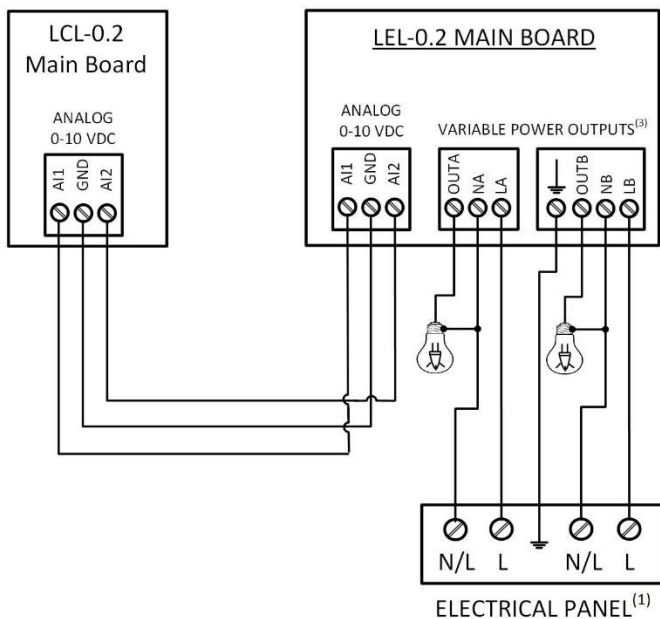


Figure 1. Solo LEL-0.2 - Main Board - Page 1 of 4



The electrical load distribution must be determined by a qualified electrician and installed as prescribed by the applicable regulations of the electrical code.



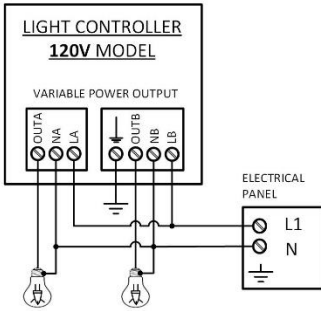
NOTES

- (1) Refer to page 3 for electrical panel details for the 120V or 240V models.
- (2) Refer to page 4 for power extension connection details.
- (3) LB and NB must always be powered to allow the unit to operate.

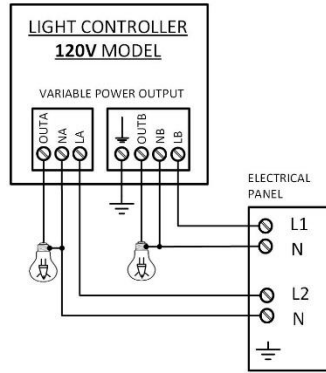
Figure 2. Solo LEL-0.2 - System Connections - Page 2 of 4

Solo Lighting Control - LEL-0.2 model

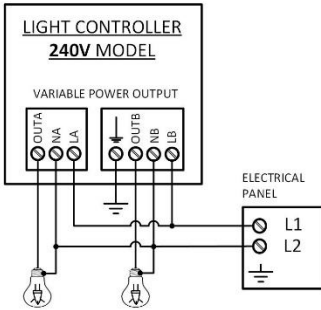
120 V MODEL
BOTH CIRCUIT ON A SINGLE BREAKER



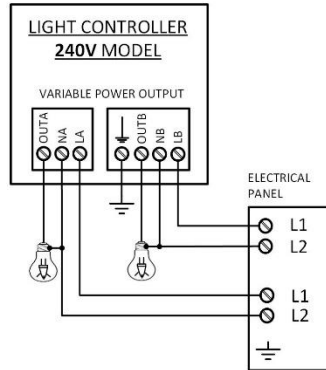
120 V MODEL
EACH CIRCUIT ON A SINGLE BREAKER



240 V MODEL
BOTH CIRCUIT ON A SINGLE BREAKER



240 V MODEL
EACH CIRCUIT ON A SINGLE BREAKER



NOTES

- LB and NB must always be powered to allow the unit to operate.

Figure 3. Electrical Panel details for models LEL-0.2-120V and LEL-0.2-240V - Page 3 of 4

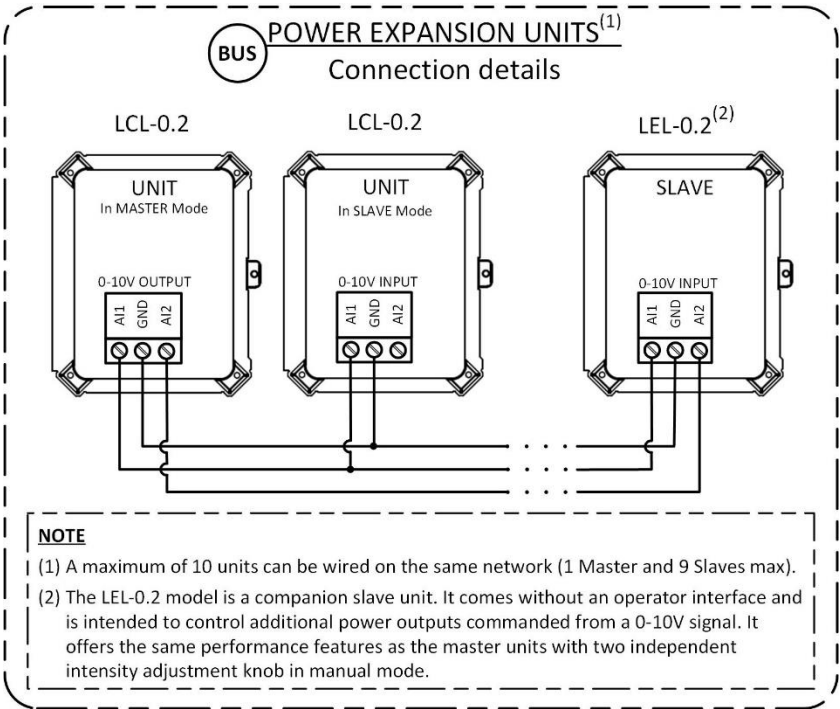


Figure 4. Power Bus Connections - Page 4 of 4

Appendix C. Intelia Warranty Declaration

1. INTELIA guarantees the customer that prior to shipment, each unit is free from defects in materials or labor for a period of twenty-four (24) months from the date of shipment. In no event, INTELIA cannot be held liable under this warranty, for any type of incidental, contingent, special or consequential damages, including, without limitation, lost profits.
2. The INTELIA warranty of Section 2 applies only to defects in parts, including, without limitation, the software and hardware manufactured by INTELIA or incorporated by INTELIA in the units, and to assembly defects related to a normal use. It does not cover the handling, the use, or the improper or careless storage of its products, nor any other handling, storage or improper use non-compliant with the instructions provided by INTELIA. It does not cover the items which the original label or serial number has been removed or altered. The warranty is automatically void if a backup controller and/or an alarm system is not installed on all control systems of the end customer in order to prevent losses caused by a controller failure. Without limiting the foregoing, the warranty does not cover improper usages or the damage caused, for example, by a bad connection relay to the circuit by the user;
 - I. Incurred during shipping, storage or handling;
 - II. Caused by inadequate maintenance;
 - III. Caused by the failure to provide a suitable installation environment to the products;
 - IV. Caused by a fortuitous event;
 - V. Caused by the use of the products for purposes other than those for which they were designed;
 - VI. Caused by a repair, adjustment, alteration or change made by a person not authorized by INTELIA.
3. INTELIA only performs the obligations set forth herein, excluding any other warranty or obligation. This warranty provides that in all cases, INTELIA is only responsible for the supply of parts or replacement products, and cannot be held responsible for any injury, damage, loss of profits, interruption of operations, fine for violations of the law or damage to the client's production, and the client must take up the defense of INTELIA and hold INTELIA responsible regarding any judicial or extra judicial proceeding, notice or request by the customer or a third party, regarding any judicial or extra judicial expense or cost resulting from such damage.



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