Overall dimensions: 138 x 110 (147 with connector) x 38 mm
Drilling interaxis: 119 x 99 mm (n° 4 screw M5)

Pinout FCI connector (24 ways)

<table>
<thead>
<tr>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>A4</th>
<th>A5</th>
<th>A6</th>
<th>A7</th>
<th>A8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>+V transducer 1 supply</td>
<td>+V transducer 2 supply</td>
<td>+V RESET sw. supply</td>
<td>+V DECR. sw. supply</td>
<td>input TRANSD. 2 (P)</td>
<td>DV input</td>
<td>Emergency input</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B1</th>
<th>B2</th>
<th>B3</th>
<th>B4</th>
<th>B5</th>
<th>B6</th>
<th>B7</th>
<th>B8</th>
</tr>
</thead>
<tbody>
<tr>
<td>RX serial comm.</td>
<td>+V PRG2 supply</td>
<td>ground for 90% signal</td>
<td>+ELV1 signal</td>
<td>ELV1 ground</td>
<td>input TRANSD. 1 (P)</td>
<td>input DECREMENT</td>
<td>Emergency output</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>C5</th>
<th>C6</th>
<th>C7</th>
<th>C8</th>
</tr>
</thead>
<tbody>
<tr>
<td>TX serial comm.</td>
<td>PRG2 ground signal</td>
<td>ground for 100% signal</td>
<td>not used</td>
<td>not used</td>
<td>input RESET</td>
<td>not used</td>
<td>GND</td>
</tr>
</tbody>
</table>
FEATURES
Power supply range: from 10Vdc, up to 30Vdc.
Connector FCI, 24 ways, IP68, mechanical polarization, easy locking cam.
Maximum output current supply: 3A

In the respect of EN 954-1 the safety features belong to category 2

CLG-D Load Limiter Control Unit has been designed to measure the differential pressure of the hydraulic cylinder of the first boom.
The pressure readen is always the difference between the pressure of the two chambers of the cylinder: the bottom chamber (or cap end) and the piston rod side chamber (or rod end).
To have an accurate pressure measurement it is necessary to know the area ratio of the piston.

The Pressure Transducer no.1 (cable 5) must be installed in the bottom chamber (cap end).
The Pressure Transducer no.2 (cable 6) must be installed in the the piston rod side chamber (rod end).
This is requested for the good working of the CLG-D Load Limiter.

Two different working areas with two different load limits.
Fast and easy programming sequence.

HUMAN MACHINE INTERFACE
The green led on the board, in normal operation mode, is lighten to show the power supply.
When faults are present, the green led blinks following a particular sequence related to the fault reasons. (look at the last page for a detailed blinking sequence meaning).

Also, it is present a LED bargraph to show the load percentage in real time, compared to the maximum load. When the load exceeds the 100% of the limit, red LED of the bargraph blinks.

In RESET condition, it is not allowed that the differential pressure increases; if this occurs, the ELV1 output is blocked before the end of the standard RESET time.
This function can be disableb by the crane manufacturer with a PC serial connection software.

Leds placed into the emergency button box (red colour and yellow colour), are lighten in the following situations:
- When emergency button is pressed, the red button and the yellow button blink together.
- When the load exceeds the 90% of the limit, yellow led is ON.
- When the load exceeds the 100% of the limit, red led is ON.

INPUT
- RESET: That input allows the load limiter to power the valve for a short period, even if the load value exceeds the load limit.
- LIMIT REDUCTION: It is used to set the working area. When it is low value, then the load limiter compare the pressure from the transducer with a reduced threshold.
- 2 PRESSURE transducer inputs: 4÷20 mA.
- INPUT DV: It allows to connect the load limiter to a remote control in a safety way.
- DIFFERENT POWER SUPPLY for logic control unit and powered OUTPUT.

OUTPUT
- Powered output to drive bypass valve coil. The board implements a feedback current control on the mentioned output.
- Two powered output to drive external optional lamps. The mentioned outputs are driven as well as the leds into emergency button box (90% and 100%).
### SETTING PARAMETERS by CRANE MANUFACTURER

The load limiter’s thresholds are programmed using an external, little, 4 buttons, keyboard. The keyboard is an optional. Its name is "PRG-CLG". When it is connected the green led blinks four times in a second. In order to set whole the load limiter’s parameters and download the working configuration, an optional serial interface can be used to connect the PC to the load limiter. The program interface is named SepSim.

In the CLG-D Load Limiter it also necessary to set (only with SepSim software) the area ratio of the piston, required to calculate the differential pressure.

### SETTING PARAMETERS by FINAL USER

The final user uses a different programmer "PRG2-DEC", which is only allowed to decrease the manufacturer thresholds. Moreover the programmer is able to recall the manufacturer parameters.

### HARDWARE KEY TO INCREASE THE LOAD LIMIT THRESHOLD

The PRG2 (either CLG version or DEC version) can be used even to increase the load limit threshold up to 125%, for a brief period of time.

In order to increase the limit: when you connect the PRG2, the "+" button has to be pressed within 5 seconds then kept pressed till the green led blinking will becomes slower.

---

**AREA RATIO**

This parameter expresses the ratio of the piston rod side chamber area (rod end area) divided by the area of the bottom chamber (cap end), multiplied by 1000.

**CONFIG WORD**

Set to 1 the Check pressure increase bit to perform this check: in RESET condition, it is not allowed that the differential pressure increases; if this occurs, the ELV1 output is blocked before the end of the standard RESET time. This function can be disableb by the crane manufacturer with this bit.
CLG-D - Load Limiter

**ELECTRONIC BOARD**

CLG-D

Ordering code PCLDE : Control unit only.
Ordering code PCLDS2 : Control unit + cabling.

- **POWER SUPPLY**
  - + Red
  - - Black

- **CABLES**
  - Connector to plug the PRG2_CLG

- **ELECTRONIC BOARD CLG-D**
  - 3x0.75 L=0.25m
  - 2x1+2x0.5 L=1.1m
  - 2x0.75 L=5.0m (protection conduit ø ext.=11mm)

- **EMERGENCY BUTTONS**
  - with LED 90% and 100%
  - wire 0.5mm² L: 30 cm.
  - to connect the remote control DV (hidden under the conduit)

- **Programming keyboard PRG2-CLG**

- **Programming keyboard PRG2-DEC**

- **Not included in the scope of supply**

- **+ Battery**
  - 90%
  - 100%
### LED BLINKING IN CASE OF ERROR

When an error occurs the green led, near the main connector, start blinking. Here below you can see a table to summarize the green led blinking and a brief description of the related error.

<table>
<thead>
<tr>
<th>CLG STATE</th>
<th>BLINKING</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WORKING STATE</strong></td>
<td>Slow sequence</td>
<td>Fast sequence</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>Input from transducer 1 exceedes the maximum working limit.</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>Input from transducer 1 is lower than minimum working value.</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>Input from transducer 2 exceedes the maximum working limit.</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Input from transducer 2 is lower than minimum working value.</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>The current value on the valve 1 is outside the normal working range.</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>The current value on the valve 2 is outside the normal working range.</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>The input transducer 1 is in protection mode.</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>The input transducer 2 is in protection mode.</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>Relay broken because of the welded contacts.</td>
</tr>
<tr>
<td><strong>AUTOTEST</strong></td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>It is not possible to close the relay. The outputs are not powered.</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>There is current flowing on the valve coil even though the CLG is not driving the related output.</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>There is current flowing on the transducer even though the CLG gives no power to it.</td>
</tr>
<tr>
<td>5</td>
<td>7</td>
<td>There is current flowing on switches even though the CLG gives no power to it.</td>
</tr>
<tr>
<td><strong>ANY TIME</strong></td>
<td>LED 100% + LED 90% blinking together</td>
<td>Emergency button pressed</td>
</tr>
</tbody>
</table>