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# PIAB Electronic Unit **9:300B**

For signal input 0 – ca 2 mV/V

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## 1. General

PIAB Electronic Unit 9:300B is an electronic overload guard intended for use in cranes with a single hoist.

To be connected to PIAB Load Cells with a signal output 0 – 2 mV/V (min. signal 1 mV/V).

Supply voltage: 230 VAC, alt. 115 VAC.

### **Enclosure:**

Polycarbonat, 235 x 185 x 119mm

## 2. Function

The mV-signal from the load cell is amplified and processed in the PIAB 9:300B electronic unit.

Three switch limits are available, named LIM1, LIM2A and LIM2B.

The switch limits control the alarm outputs (relays) LIM1 and LIM2.

The front panel diodes indicate the status for relay - LIM1 and relay - LIM2.

For further information, see section "Programming", page 4.

### 3. Connection

#### 3.1 Load Cell

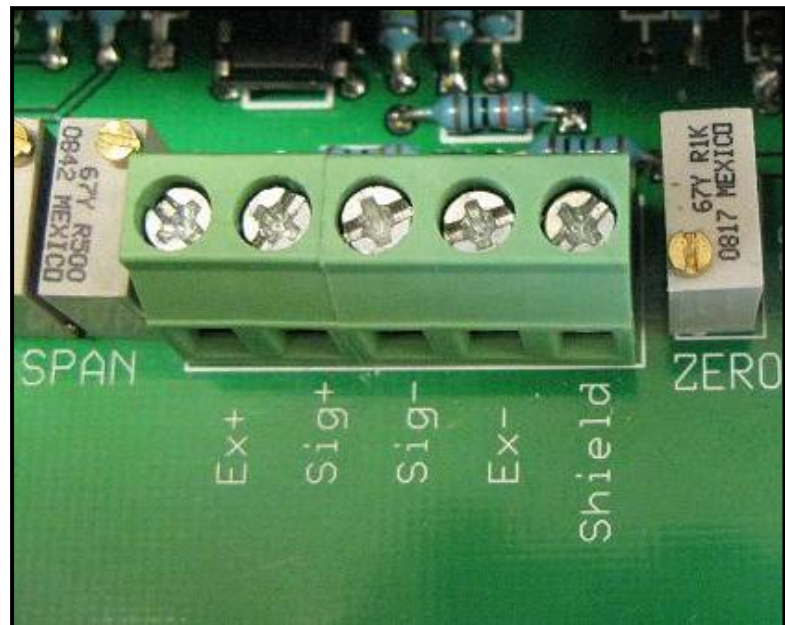
*At 4-wires cable:*

Ex +            connect to Ex +  
 Signal +       connect to Sig +  
 Signal –       connect to Sig –  
 Ex –            connect to Ex –

Monitor        connect to SHIELD

*At 6- wires-cable:*

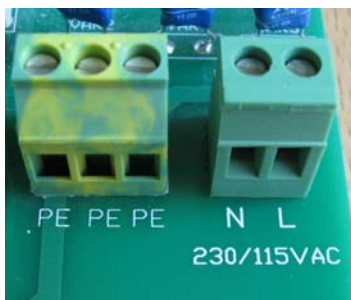
Sense +        connect to Ex +  
 Ex +            connect to Ex +  
 Signal +       connect to Sig +  
 Signal –       connect to Sig –  
 Sense –        connect to Ex –  
 Ex –            connect to Ex –



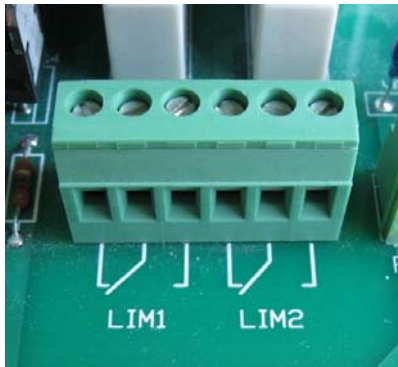
#### 3.3 Supply Voltage

Connect power supply according to installation information.

***NOTE! A wrongly connected supply voltage will damage the electronics!***



#### 3.4 Alarm Relays LIM1 and LIM2



Maximum allowed electrical load ( Relay ): 6A, 250VAC

Alarm relays LIM1 and LIM2 can be connected for normally open or closed contacts (at rest).

Both diodes on the front panel indicate relay status.  
When relay LIM1 and relay LIM2 are activated, the respective diode on the front panel is put out.

### **3.5 Analogue signal output 4-20mA**

See Chapter 5.3 – 5.5.

## 4. Programming



The programming of load capacity, switch values etc. are made in the following mode:

Display in operating mode:

LOAD: 100%      30,0 ton
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### 4.1 Press **MENU** for:

LOAD CAPACITY 100% <u>0</u> 30,0 ton
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### Set the max. load capacity

Position of the cursor is under the first digit.

Change this value with **+** or **-** buttons.

With the **ENTER** button **the value is saved** and the cursor moves to the next digit.

*By pushing the **MENU** button, the programming cycle is completed and the cursor moves to the left side of the display. To reach the recently programmed menu scroll through the set of menus with the **MENU** button until the desired menu is shown again on the display.*

After the load capacity is set then press the **ENTER** button at the last digit, the cursor moves to the left side of the display.

### 4.2 Press **MENU** for:

LIM 1 Limit set <u>x</u> xx%
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### **Setting slack rope switch control or warning (in percent of the load capacity)**

Position of the curser is under the first digit.

Change the value by pressing the **+** or **-** button.

The **ENTER** button confirms the programming and moves the cursor to the next digit.

*By pushing the **MENU** button, the programming cycle is completed and the curser moves to the left side of the display. To reach the recently programmed menu scroll through the set of menus with the **MENU** button until the desired menu is shown again on the display.*

When the limit is set to the desired value and you press the **ENTER** button at the last digit, the cursor moves to the left side of the display.

**NOTE! For slack rope control the relay function is set normally open contact at rest!**

#### **4.3 Press MENU for:**

LIM 2A	
Limit set	<u>xxx%</u>

### **Setting the overload switch limit (in % of the load capacity) with 0,5 sec on delay**

Position of the curser is under the first digit.

Change this value with **+** or **-** buttons.

The **ENTER** button confirms the programming and moves the marker to the next digit.

*By pushing the **MENU** button, the programming cycle is completed and the curser moves to the left side of the display. To reach the recently programmed menu scroll through the set of menus with the **MENU** button until the desired menu is shown again on the display.*

When the overload limit is set to the desired value and you press the **ENTER** button at the last digit, the marker moves to the left side of the display.

#### 4.4 Press **MENU** for:

LIM 2A On Dly	x,x sec
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#### Setting of the on delay (On Dly) overload switch limit LIM2A

Position of the cursor is under the first digit.

Change this value with **+** or **-** buttons.

The **ENTER** button confirms the programming and moves the marker to the next digit.

*By pushing the **MENU** button, the programming cycle is completed and the cursor moves to the left side of the display. To reach the recently programmed menu scroll through the set of menus with the **MENU** button until the desired menu is shown again on the display.*

When the on delay time (On Dly) is set to the desired time and you press the **ENTER** button at the last digit, the cursor moves to the left side of the display.

#### 4.5 Press **MENU** for:

LIM 2A Off Dly	x,x sec
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#### Setting for the off delay (Off Dly) for the overload switch limit LIM2A

Position of the cursor is under the first digit.

Change this value with **+** or **-** buttons.

The **ENTER** button confirms the programming and moves the marker to the next digit.

*By pushing the **MENU** button, the programming cycle is completed and the cursor moves to the left side of the display. To reach the recently programmed menu scroll through the set of menus with the **MENU** button until the desired menu is shown again on the display.*

When the off delay (Off Dly) is set to the desired time and you press the **ENTER** button at the last digit, the marker moves to the left side of the display.

#### 4.6 Press **MENU** for:

LIM 2B	
Limit set	<u>x</u> xx%

#### **Set the overload switch for LIM2B (No time delay at overload!)**

Position of the cursor is under the first digit.

Change this value with **+** or **-** buttons.

The **ENTER** button confirms programming and moves the marker to the next digit.

*By pushing the **MENU** button, the programming cycle is completed and the cursor moves to the left side of the display. To reach the recently programmed menu scroll through the set of menus with the **MENU** button until the desired menu is shown again on the display.*

When the limit is set to the desired time and you press the **ENTER** button at the last digit, the marker moves to the left side of the display.

#### **NOTE!**

**- Relay LIM2 has two switch limits, i.e. LIM2A and LIM2B.**

**- Switch limit LIM2B must always be set higher than switch limit LIM2A.**

Press **MENU** to return to operating mode.

Display in operating mode:

LOAD:	
100%	30,0 ton



## 5. Calibration

The zero point ( zero load )and the load calibration and the analogue signal output 4 – 20mA must be calibrated .

**At zero point calibration, the hook must be unloaded and show:**

Display on 9:300B:

LOAD:	
0%	00,0 ton

and

Display on your instrument ( multimeter ):

4.00	mA
	DC
0	Auto Range
	6

**At load calibration, the hook must be loaded with the test weight (known load) and show:**

**As example:**

Display on 9:300B:

LOAD:	
60%	18,0 ton

and

Display on your instrument ( multimeter ):

11.20	mA
	DC
0	Auto Range
	6

This is calculated from:

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Max. load = 30 .00ton = 16.00 mA = 100%  
 No load ( Zero) = 0 ton = 4 mA = 0%

Test load = 18,0 ton = ??,?? mA

$$\text{Signal (mA) for test weight} = \frac{18,0 \text{ ton}}{30,0 \text{ ton}} \times (16,00 - 4,00) + 4,00 = 11,20\text{mA}$$

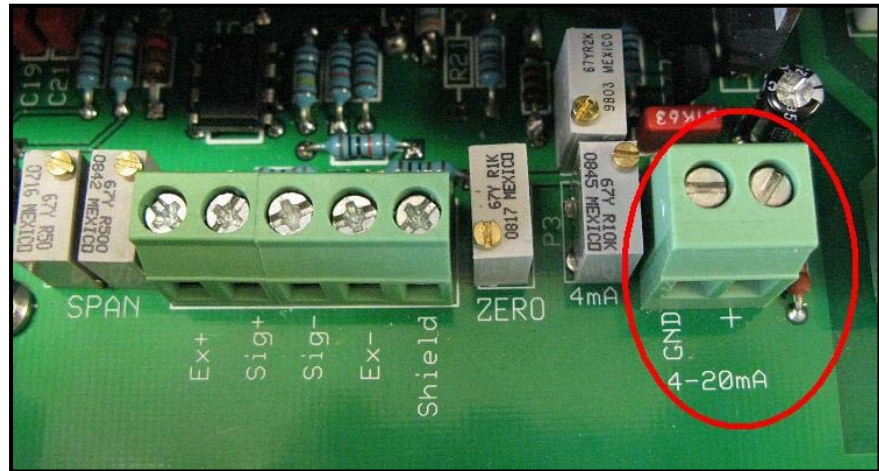

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**Calibration continues on the next page.**

The following workflow should be used when calibrating:

### 5.1

Connect your multimeter to the 4 – 20mA terminal (Encircled).



### 5.2 Zero calibration (no load):

Confirm that the hook is unloaded.

- Press **ENTER** followed by **+** and keep both buttons pressed simultaneously for 1 second.

ZERO CALIBRATE	
Off zero	0000

- Release both buttons simultaneously.

Adjust the potentiometer marked with "ZERO" until the value zero is received.



Finish with the **MENU** button.  
The normal operating mode is shown on the display:

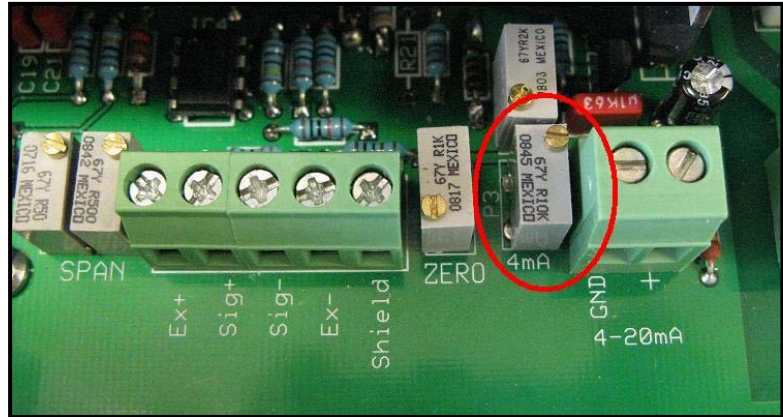
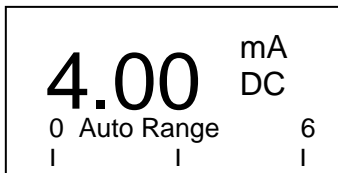
Display in operating mode:

LOAD:	
0%	00,0 ton

### 5.3 Setting the zero point (4mA) for the analog output: 4 – 20mA

*The hook must still be unloaded.*

Adjust the zero point with the potentiometer P3 until the your multimeter shows 4mA.



**NOTE!** When a remote display is provided by the manufacturer (Gigasense AB), this calibration is already made!

### 5.4 Test load calibration (SPAN):

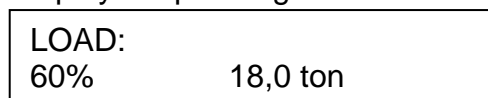
*Lift the test load.*

Adjust the potentiometer marked with "SPAN" until the correct weight is shown on the display.

The left potentiometer is for fine adjustment and the right is for coarse adjustment.



Display in operating mode:



## 5.5 Setting the amplification (SPAN) for analogue output signal: 4 – 20mA

### *Lift the test load.*

Now the mA value that was calculated according to the example on page 8 will be set.

Adjust the potentiometer until xx mA is shown on your multimeter display (Instrument).



**NOTE!** When a remote display is provided by the manufacturer (Gigasense AB), this calibration is already made!

5.6 Repeat step 5.1 - 5.5 until the right values are stable and precise.

**NOTE!** The zero (no load) must be controlled, after adjusting the signal calibration.