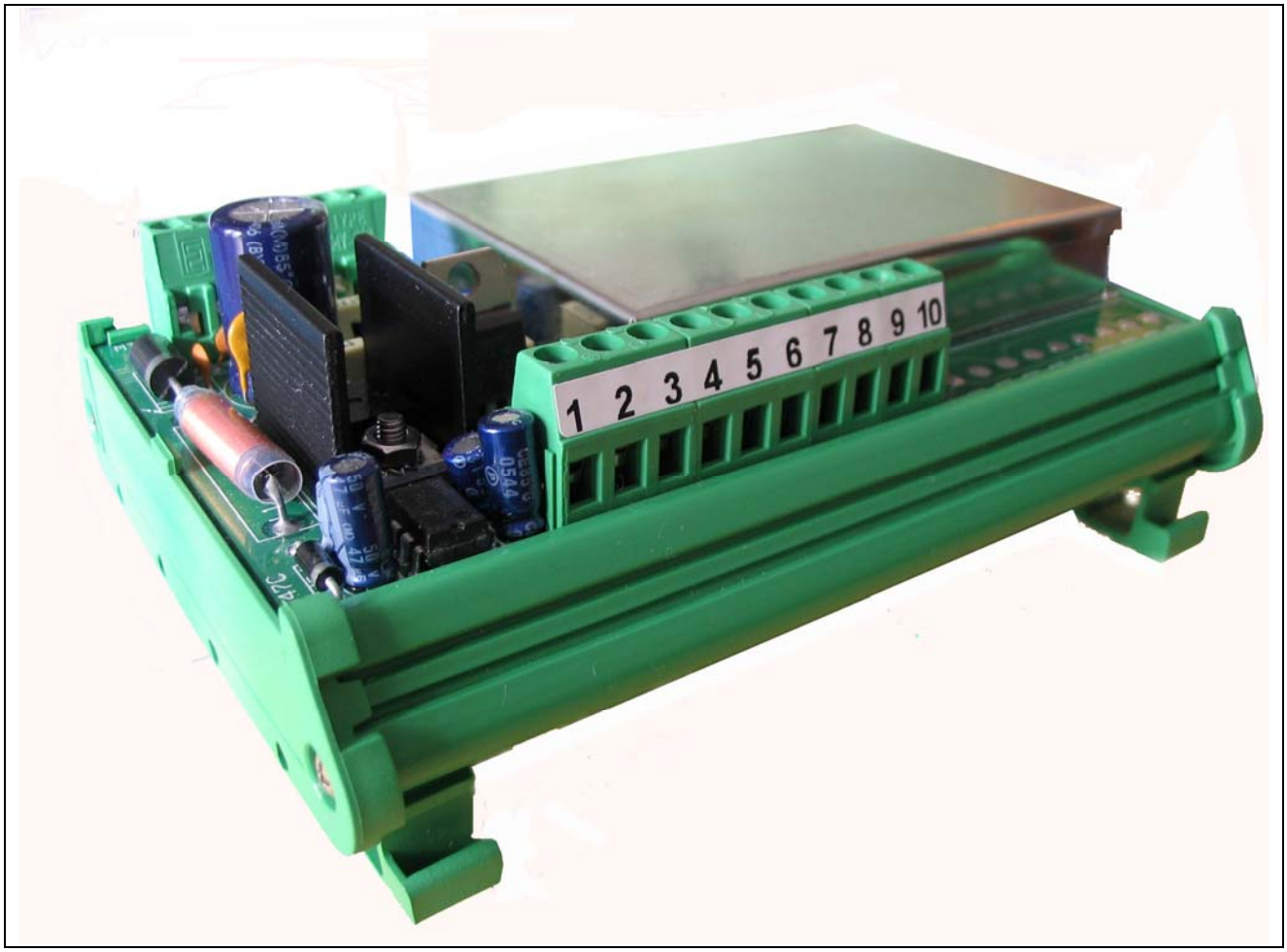
A1T
ANALOG AMPLIFIER
(for load cells on sensor roll)



USER MANUAL

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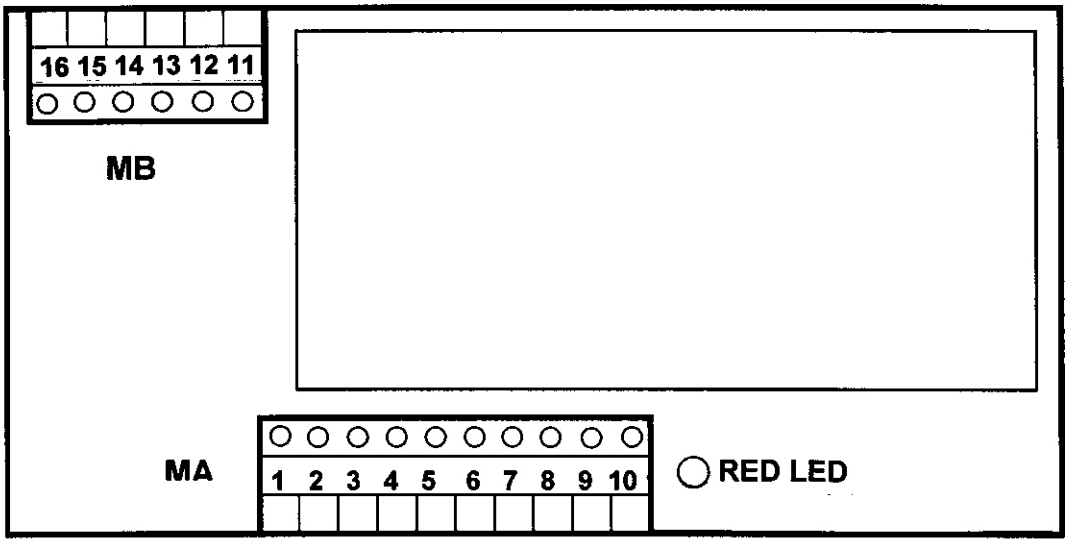
SPECIFICATIONS

POWER SUPPLY	*Form 20 Vdc to 28 Vdc*
LOAD CELL EXCITATION	*10 Vdc (max 2 load cells x 350Ω)*
POWER CONSUMPTION	*6 W*
AVAILABLE OUTPUTS	*0 – 5 Vdc, 0 – 10 Vdc*
FULL SCALE INPUT RANGES	*Selectables from 3mV to 30mV*
LINEARITY	*± 0.2% of full scale*
MOUNTING	*DIN rail mount*
DIMENSIONS (L x H x D)	*125mm x 90mm x 65mm (5,0"x3,5"x2,5")*
CONNECTIONS	*Terminal blocks, pitch 5.08mm (0,196")*
LOAD CELL CONNECTION	*4 wires + shield*
STORAGE TEMPERATURE RANGE	*-20 to + 50 °C (-4 to +122°F)*
OPERATING TEMPERATURE RANGE	*-10 to +40 °C (+14 to +104°F) (umidity max 85% w/o condensation)*
THERMAL STABILITY	*20ppm / °C*
ZERO CALIBRATION	*Coarse adjustment via 4 dip-switches*
	Fine adjustment via 20-turn trim pot
FULL SCALE CALIBRATION	*Coarse adjustment via 4 dip-switches*
	Fine adjustment via 20-turn trim pot
ANALOG FILTER	*Adjustment via 270° turn trim pot*
CE CONFORMITY	*EN50081-1 e EN50082-2 EMC*
	EN61010-1 LVD

A1T WIRING



10-POLE MA	6-POLE MB
1. Load Cell 1 Excitation -	*11.*
2. Load Cell 1 Excitation +	*12. Analog Output 0-10V +*
3. Load Cell 1 Signal –	*13. Analog Output -*
4. Load Cell 1 Signal +	*14. Power Supply (24V) -*
5. Shield	*15. Power Supply (24V) +*
6. Load Cell 2 Excitation -	*16. Ground*
7. Load Cell 2 Excitation +	
8. Load Cell 2 Signal –	
9. Load Cell 2 Signal +	
10. Shield	

■ **Red led on = supply on**

GENERAL

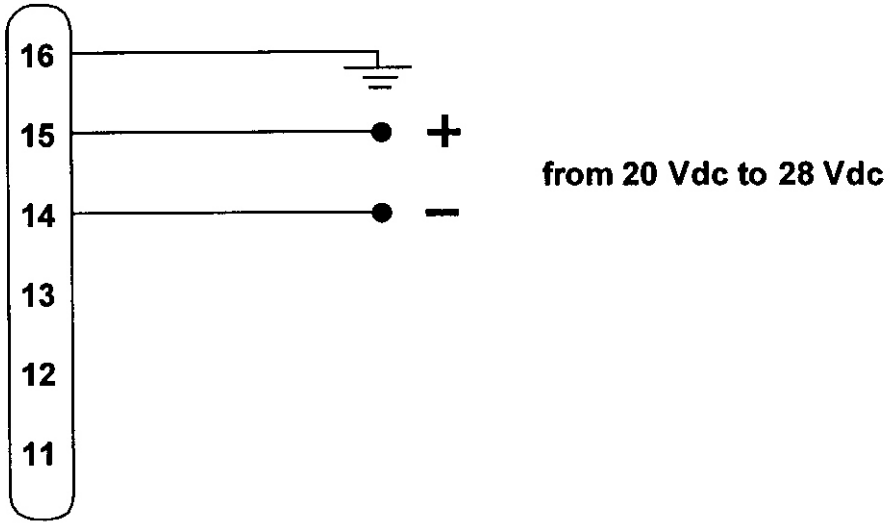
The amplifier must be installed on a DIN rail guide, the terminal block “MA” has to be positioned on the lower side.
In order to avoid any damage during the operation time, the metal cover must be positioned always on its seat.

A1T INPUT VOLTAGE

The input voltage must be connected to the terminal block **“MB”**.

Input voltage: from **20 Vdc to 28 Vdc** (6 VA).

WIRING ON TERMINAL BLOCK “MB”

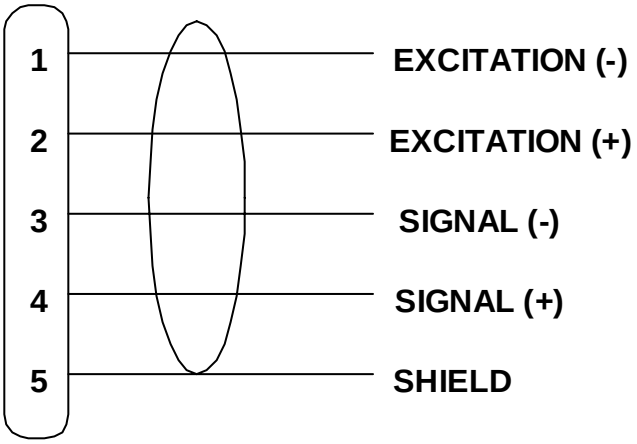


LOAD CELL WIRING

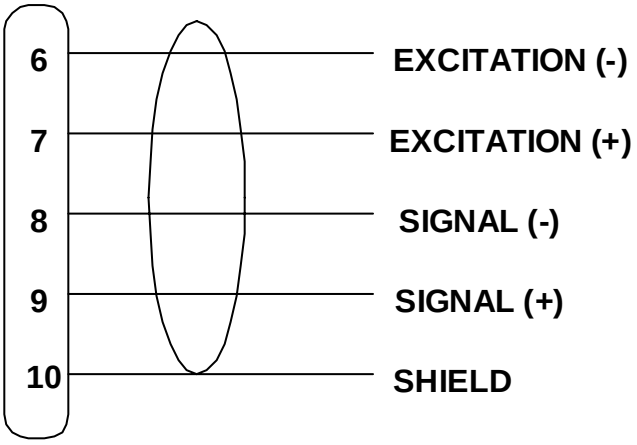
Please refer to the following indication before connecting any load cell:

- The load cells cables must follow their own path.
- If the cable of the load cell has 6 conductors (+/- sense), the "+ Sense" must be connected with "+ Excitation" in the same terminal; "- Sense" must be connected with "– Excitation" in the same terminal.
- The maximum number of load cells connected to the transmitter has to be 2 x 350 ohm.
- The excitation voltage is 10 Vdc.
- The input signal range of the transmitter allows to connect load cells having sensitivity from 1 to 3 mV/V.
- The load cells must be connected to the terminal block "MA"

LOAD CELLS WIRING:
1st load cell



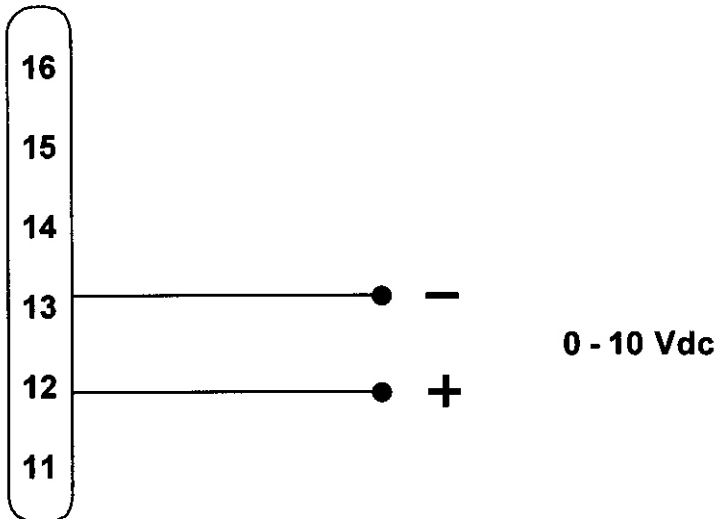
2nd load cell



AMPLIFIED ANALOG OUTPUT WIRING

The voltage output is 0 to 10 Vdc.
The cable connected to the analog output must follow its own path.

VOLTAGE OUTPUT (TERMINAL BLOCK "MB")



A1T CALIBRATION

The calibration consists to adjust the field of measure (input signal) coming from the load cells, through the TARE SUPPRESSION (ZERO CALIBRATION) and GAIN SETTING(FULL SCALE CALIBRATION).

The A1T amplifier is equipped with 2 groups of dip-switches and trim potentiometers; they have to be used to adjust the input signal range according to the calibration required (zero and full scale).

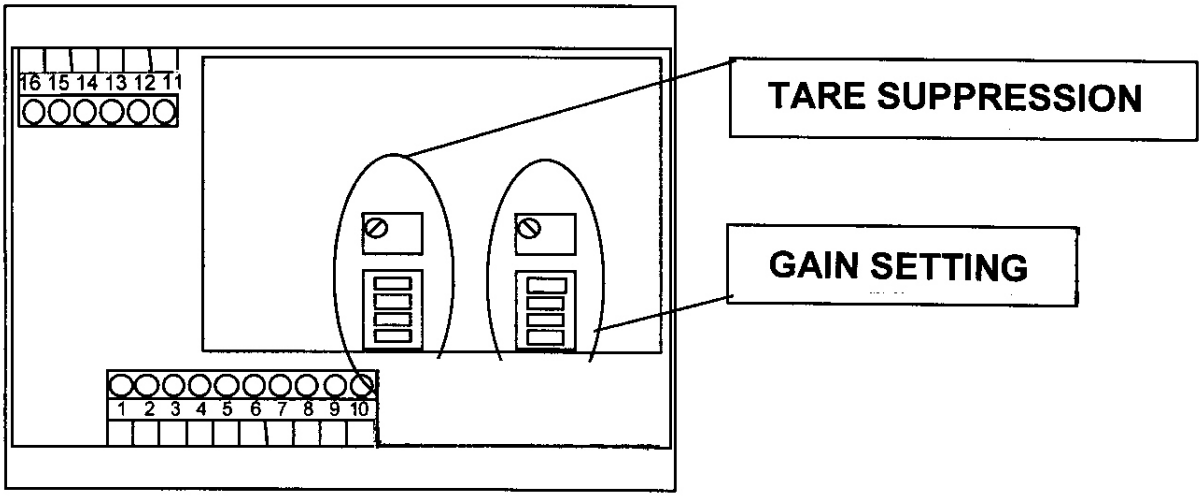
REMARKS :

- Up to 2 x 350 ohm load cells (sensitivity 1 mV/V, 2 mV/V or 3mV/V) can be connected to the A1T.
  Since the load cells excitation is 10 Vdc, the maximum signal value coming from the load cells could be 10 mV, 20 mV or 30 mV respectively.

- Is obligatory to effect the TARE SUPPRESSION (ZERO CALIBRATION) first, to perform a correct calibration.

- Use a digital meter to measure the output voltage on pin 12(+) and pin 13(-) to the terminal block MB.

Remove the metal cover from A1T.



TARE SUPPRESSION (ZERO CALIBRATION)

A) Make sure that the sensor roll is entirely free from any load.

B) Try to found the best combination by dip-switches, in the way to obtain a measurement output next to zero Volt as such as possible (coarse adjustment). Subsequently the trim pot. have to use to reach the right zero value precisely (fine adjustment).
   Remember : turning clockwise the trim pot. the signal value increase while
   It counter clockwise the value decrease.

GAIN SETTING (FULL SCALE CALIBRATION)

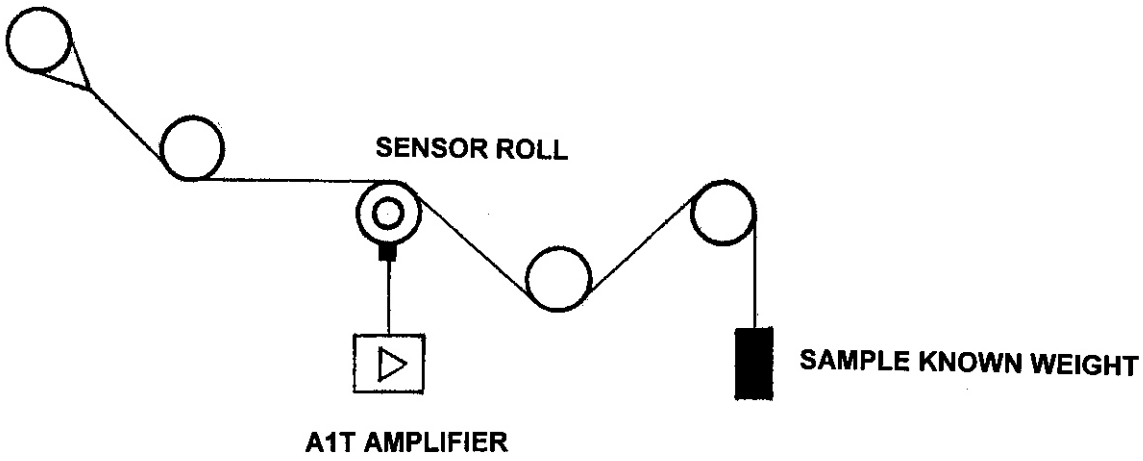
Before proceding to the following calibration it's important to establish the load value wanted to report the output 10 V (or 5 V).

As rule such value it correspond to the maximum load of system that is given by the maximum load cells capacity.
For example :
in a system by 2 load cells 50 Kg. each, the maximum loads is 2 x 50 = 100 Kg.
Otherwise the maximum load is identified by the maximum tension applied to the material (web tension).

A) Take a sample known weight that possibly corresponds to the maximum load of system or maximum tension applied on the material.

B) Apply the known weight with an inextensible rope following the reality run of material on the rolls.

ATTENTION : in case of application of sensor roll with alone load cell, the rope passage has to be in the precise middle point of roll.



C) Try to find the best combination by dip-switches in the way to obtain a measurement next to 10 V (coarse adiustment).
Subsequently the trim pot. have to use to reach the right 10 V value (or 5 V) precisely (fine adjustment).
Remember : turning clockwise the trim pot., the signal value increase while turning it counter clockwise the value decrease.

SUGGESTIONS FOR AN EASY CALIBRATION

TAB. 1

TARE SUPPRESSION DIP-SWITCHES

4	3	2	1	mV min	mV max
Off	Off	Off	Off	-5,6	-2,9
Off	Off	Off	On	-3,6	-0,9
Off	Off	On	Off	-1,9	0,8
Off	Off	On	On	-0,4	2,3
Off	On	Off	Off	0,9	3,6
Off	On	Off	On	2,1	4,8
Off	On	On	Off	3,4	5,9
Off	On	On	On	4,1	6,8
On	Off	Off	Off	5,0	7,8
On	Off	Off	On	5,8	8,6
On	Off	On	Off	6,5	9,3
On	Off	On	On	7,2	10
On	On	Off	Off	7,8	10,6
On	On	Off	On	8,4	11,1
On	On	On	Off	8,9	11,6
On	On	On	On	9,4	12,1

TAB. 2

GAIN SETTING DIP-SWITCHES

4	3	2	1	min	max
Off	Off	Off	Off	2,8	3,0
Off	Off	Off	On	2,9	3,2
Off	Off	On	Off	3,1	3,4
Off	Off	On	On	3,3	3,6
Off	On	Off	Off	3,5	3,9
Off	On	Off	On	3,8	4,2
Off	On	On	Off	4,1	4,6
Off	On	On	On	4,5	5,1
On	Off	Off	Off	5,0	5,8
On	Off	Off	On	5,6	6,5
On	Off	On	Off	6,3	7,5
On	Off	On	On	7,2	8,9
On	On	Off	Off	8,4	10,7
On	On	Off	On	10,1	13,7
On	On	On	Off	12,6	18,8
On	On	On	On	17,0	30,5

For calibration (TARE SUPPRESSION- GAIN SETTING) it's possible to act on relative dip-switches in non casual way, but making reference to the signal coming from load cells.

TARE SUPPRESSION (with unloaded sensor roll)
Measure with the digital meter the voltage (mV) amongst output signal wires of any load cell.
Actually the measured voltage is due to the roll sensor weight (tare).
Select the dip-switches combination where the signal measured fit in the min – max values (TAB. 1).

GAIN SETTING (with sensor roll loaded by sample known weight)
Measure the load cells output (m) owed the known weight and select the dip-switches combination correspondent to such signal (TAB.2).

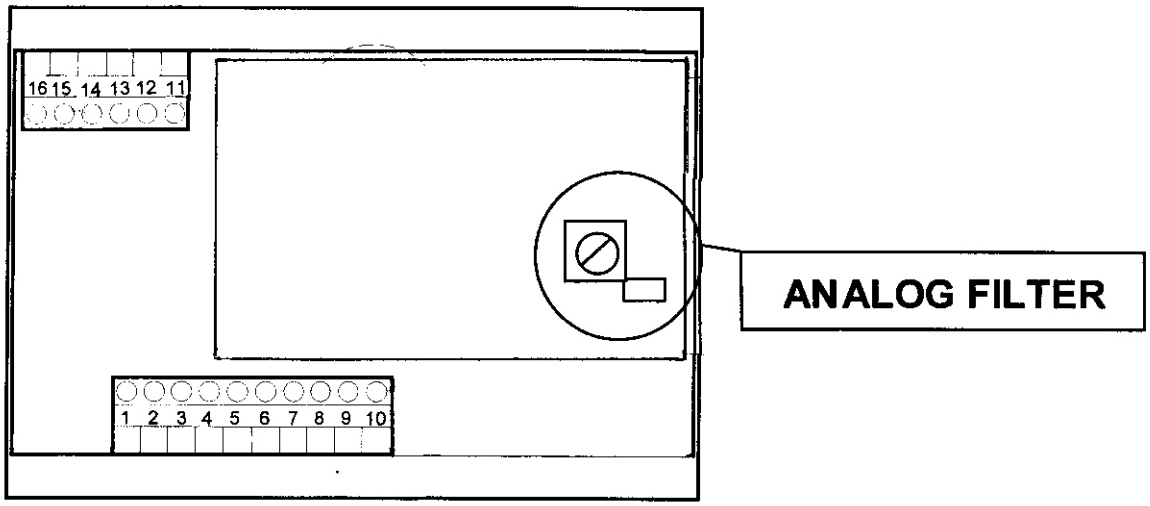
When used known weight is less-weighted than max paylod provided, adjust GAIN SETTING to the following proportion :
Max load = 50 Kg. → analog output 10 V
Known weight = 10 Kg. → analog output 2 V

ANALOG FILTER ACTIVATION

The jumper is used to insert the analog filter when the analog output is not stable.

Jumper closed: Filter activated
Jumper opened: Filter not activated

The effect of the filter increase when turning clockwise the trimmer potentiometer. The effect of the filter decrease when turning counter-clockwise the trimmer potentiometer.



ATTENTION : in order to avoid any damage during the operation time, replace the metal cover once the calibration procedure is finished.