TRS-System

TRS-AN-E

Documentation

Tecnologie e Prodotti per l'Automazione

Document data

Date	19/07/2011
Revision	2
File Name	eTRS-AN-E.pdf
Protocol	
Typology	
By	T.P.A
Group name	
Notes	

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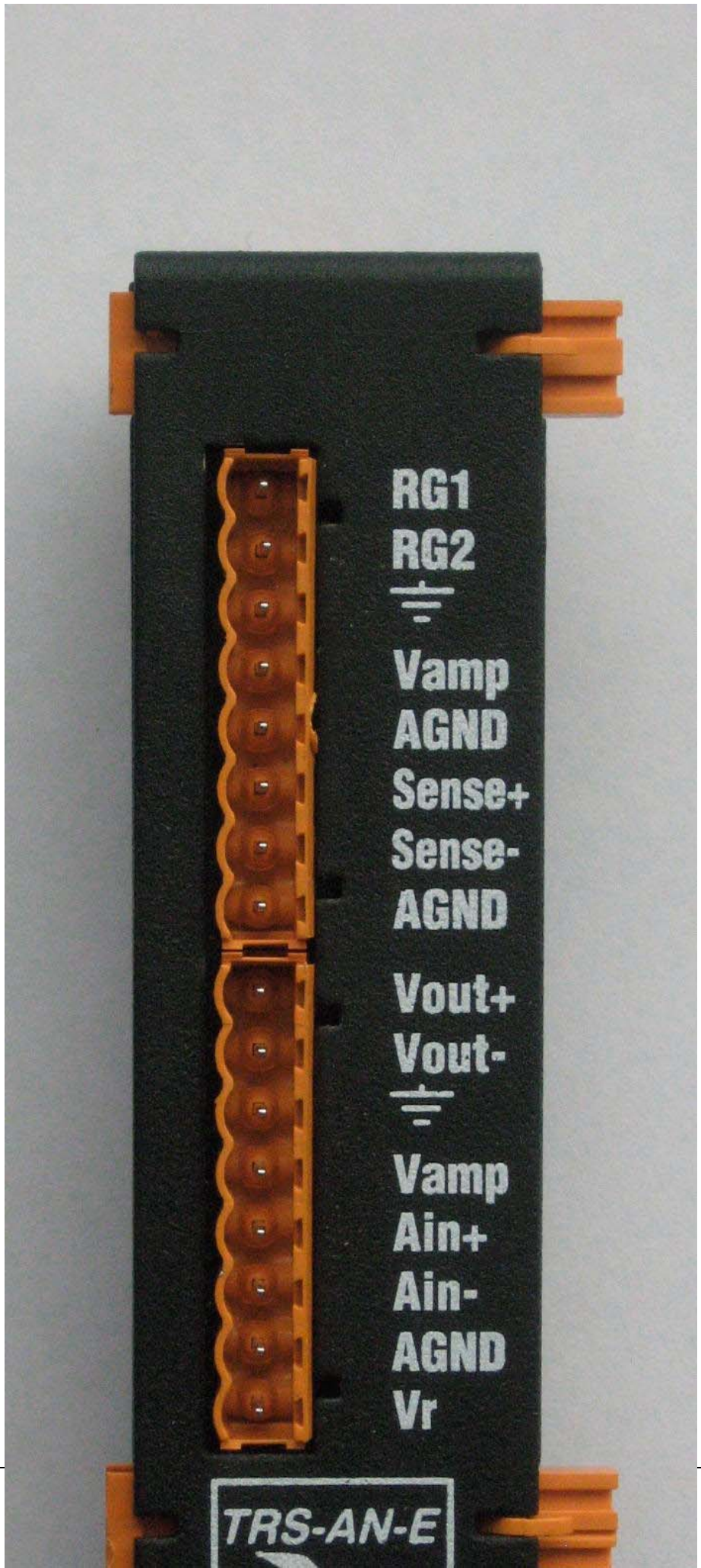
REVISIONS

Revision No.	Date	Protocol	Changes and/or changed paragraphs
Rev 0	02/08/2010		First release
Rev 1	08/03/2011		Cabling updated
Rev 2	19/07/2011		Updated specification according to M1 modification

CONTENTS

Description of requirements and production specifications of TRS-AN-E expansion module.


RG1
RG2
Vamp
AGND
Sense+
Sense-
AGND
Vout+
Vout-
Vamp
Ain+
Ain-
AGND
Vr
TRS-AN-E

1 DESCRIPTION

- 1 +/- 10V analog differential input line, with 16 bit resolution
- 1 +/- 10V analog differential output line, with 16 bit resolution and 15 mA max current
- 1 precision amplification line with +/-10V high impedance differential input, gain setting from 1 to 1000 through resistor and single-ended output.
- 1 reference voltage +10V (+/- 0.1%), 20mA max.
- Assembly on DIN rails type EN50022 and EN50035
- Total compatibility with TRS remote modules and TRS expansions.
- Through connection to TRS remote module (master on TRS bus):
    - communication synchronized with the bus cycle time (1-4 ms.)
    - expansion diagnosis (power supplies)

2 TECHNICAL DATA

- Analog output protection against short-circuit
- Voltage reference protection against short-circuit
- Input protection against electrostatic discharges
- Connections through AWG 24¸ 12
- Power Supply from TRS bus
- Output activation synchronized according to the execution of the GPL instruction (by TRS bus)
- Field input synchronized sampling (constant delay guaranteed via TRS bus)

2.1 Amplifier Properties

TRS-AN-E is equipped with inputs/outputs for interface with an amplifier, which has
- settable gain
- +/-10V input range
- single ended output with +/-10V range (with reference to the analog mass)

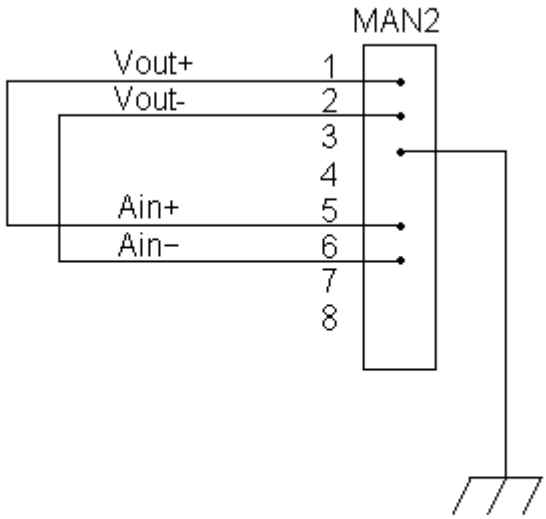
The differential input (Sens+,Sense- pair), gain set (RG1, RG2 pair) and output (Vamp), with the analog mass are supplied on the MAN1 terminal block. The Vamp output is supplied also on the MAN2 terminal block.

The amplifier gain is expressed as G= = (49.4k/RG) +1. In the following table you will find some typical examples for the gain set by means of a resistance cabling with a convenient value on the RG1-2 clamps. Gain value can be set between G = 1 and G = 1000.

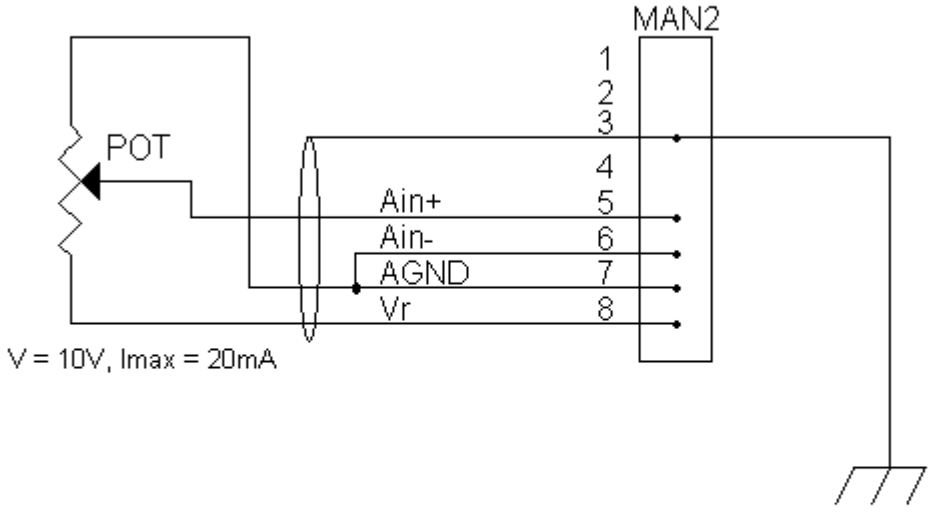
RG (1%) value	Gain
n.c.	1
49.9k	1.99
5.49k	9.998
1k	50.4
499	100
249	199.4
49.9	991

Sense inputs are protected against electrostatic discharge up to 1KV.

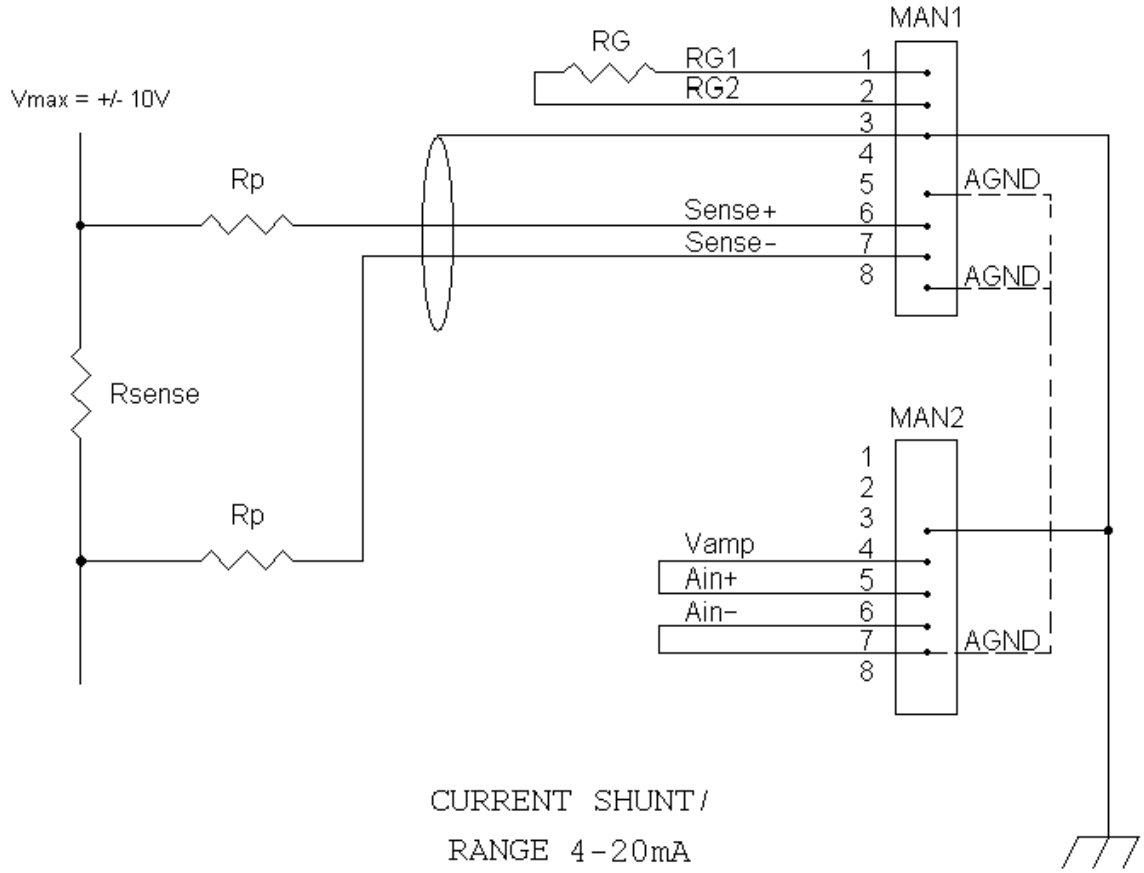
2.2 Examples of measurement type



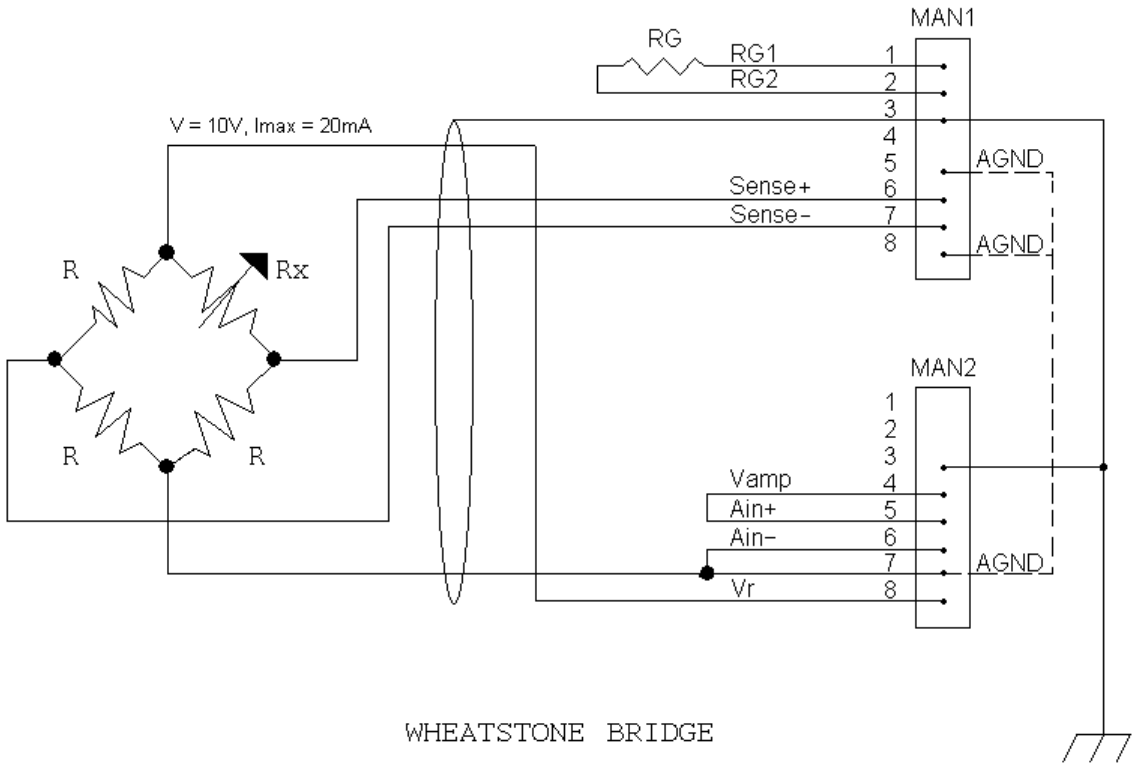
READ BACK ANALOG INPUTS



FEED-RATE OVERRIDE ACQUISITION



CURRENT SHUNT/
RANGE 4-20mA



WHEATSTONE BRIDGE

3 ELECTRICAL CHARACTERISTICS

3.1 Acceptable maximum values

Parameter	Condition	Min	Type	Max	Unit
Vcc, Power Supply	by Bus TRS	4.5		6.5	V
Analog Input Ain voltage	Common and differential			+/- 12	V
Analog Input Sense voltage	Common and differential			+/- 12	V
On Output Vout current max(*)				15	mA
On Output Vamp current max(*)				18	mA
On Output Vr current max(*)				30	mA
Temperature		0		65	°C

(*) Absolute current max (Vout + Vamp + Vr) is 50mA.

3.2 Operating parameters

Parameter	Condition	Min	Type	Max	Unit
Vcc, Power Supply	by Bus TRS	4.75	5	5.25	V
Iq, Quiescent Current	Vcc=5V, no DAC Load, ADC @ 250KsPS		45	60	mA
Ip, Operating Current	Output current = 5mA, Vcc=5V, ADC @ 2KsPS, Vamp = Ain+, Vr current = 0		60		mA
Analog Input Ain, Sense range	Ain+ - Ain-, Sense+ - Sense-			+/- 10	V
Input Current Ain			100		uA
Input Current Sense				1	nA
Input Filter	Ain+, Ain-		7		KHz

Input Impedance	Sense+, Sense- (Common and differential)		100//2		GΩ//pF
Analog Output Vout range	Vout+ - Vout-			+/- 10	V
Analog Output Vamp range	Vamp - AGND			+/- 10	V
Vr output voltage	Vr – AGND	9.99	10.00	10.01	V
On Output Vout Current		0		15	mA
On Output Vamp Current				15	mA
On Output Vr Current				20	mA
Operative Temperature		5		60	°C

3.3 Additional parameters

Parameter	Condition	Min	Type	Max	Unit
Vout resolution			16		bit
Ain resolution			16		bit

4 SPECIFICATIONS

Overall, the values of power supply, temperature and humidity must not exceed the values as indicated in the chapter 3.
TRS-AN-E must be interfaced by means of cables/terminals and anything else (see next chapters).
For measures and installation we recommend to use shielded cables, with earthed shield and, if necessary, double twisted wires.
The terminal block must be inserted also when it are not cabled.

TRS-AN-E must be assembled on a EN50022 or EN50035 DIN rail by means of the rear spring connection. For coupling and removal, the user should work on the connecting tongue with a flat-blade screwdriver, in such a way as to move it back and allow the coupling, or the release from the guide.

Warning! The metal coupling for the DIN rail is electrically connected to the circuit earth of TRS-AN-E: the connection to earth MUST be provided through this connection (that is the DIN rail must be earthed).

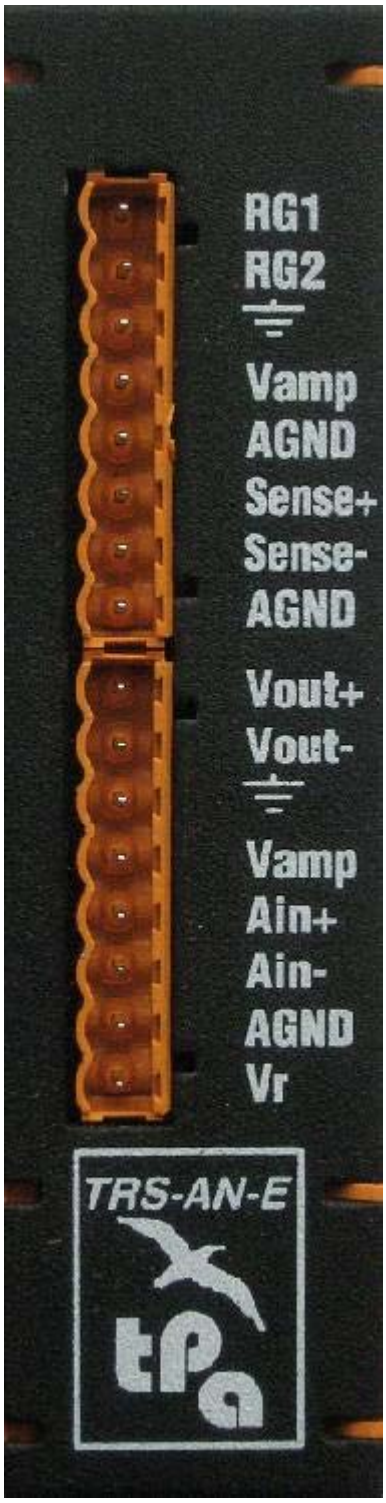
TRS-AN-E is an electronic device for general purposes in the environment of the light industry.
It is an A - class product, that, if installed in the home environment, can produce electromagnetic interferences.

Therefore, the final user must take all the necessary precautions.

5 SELF-TEST

TRS-AN-E expansion self test is managed by the TRS bus master, that performs the appropriate action in order to communicate any system errors toward the Cnc Albatros.

6 CABLING MAPS

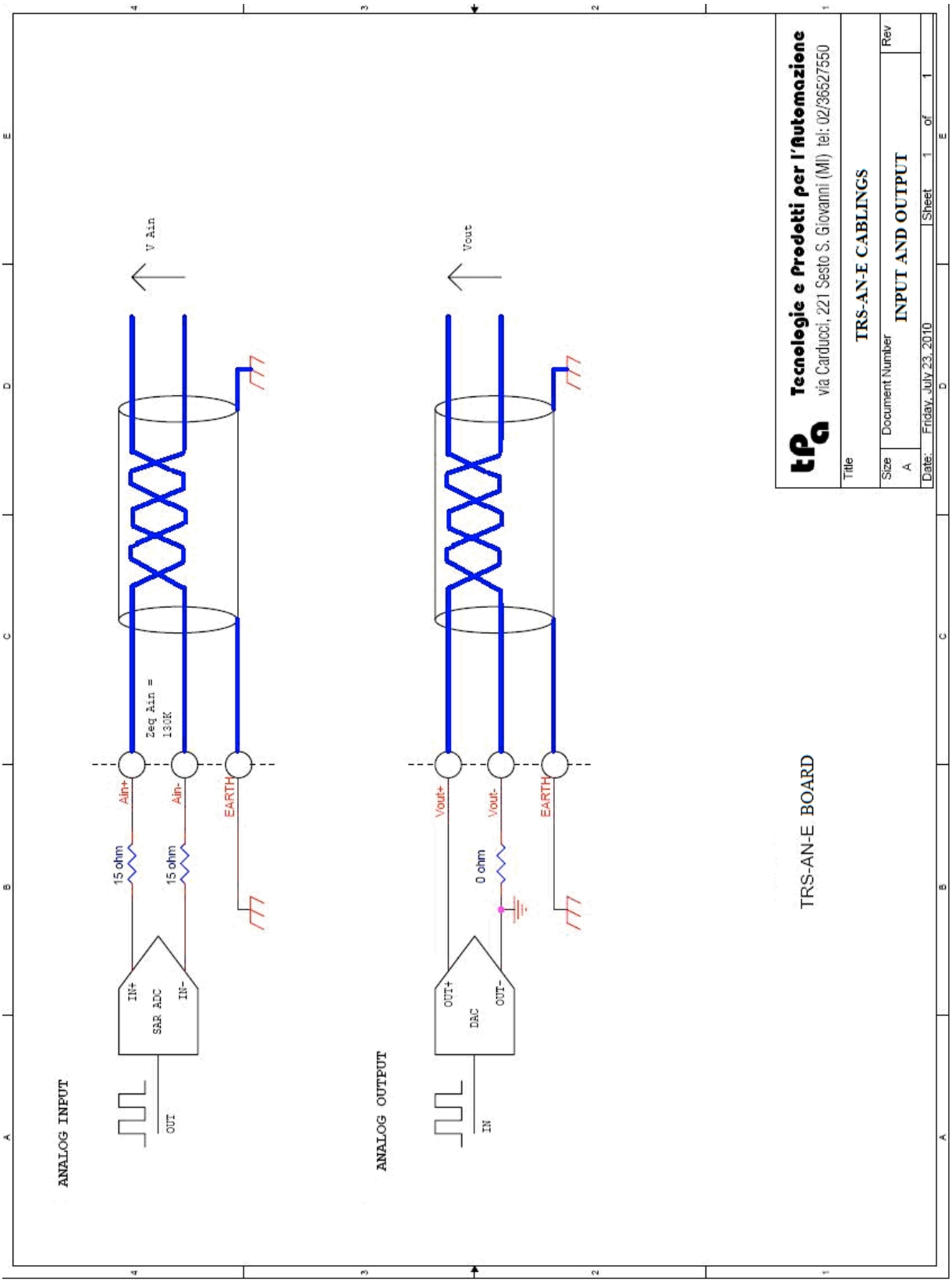


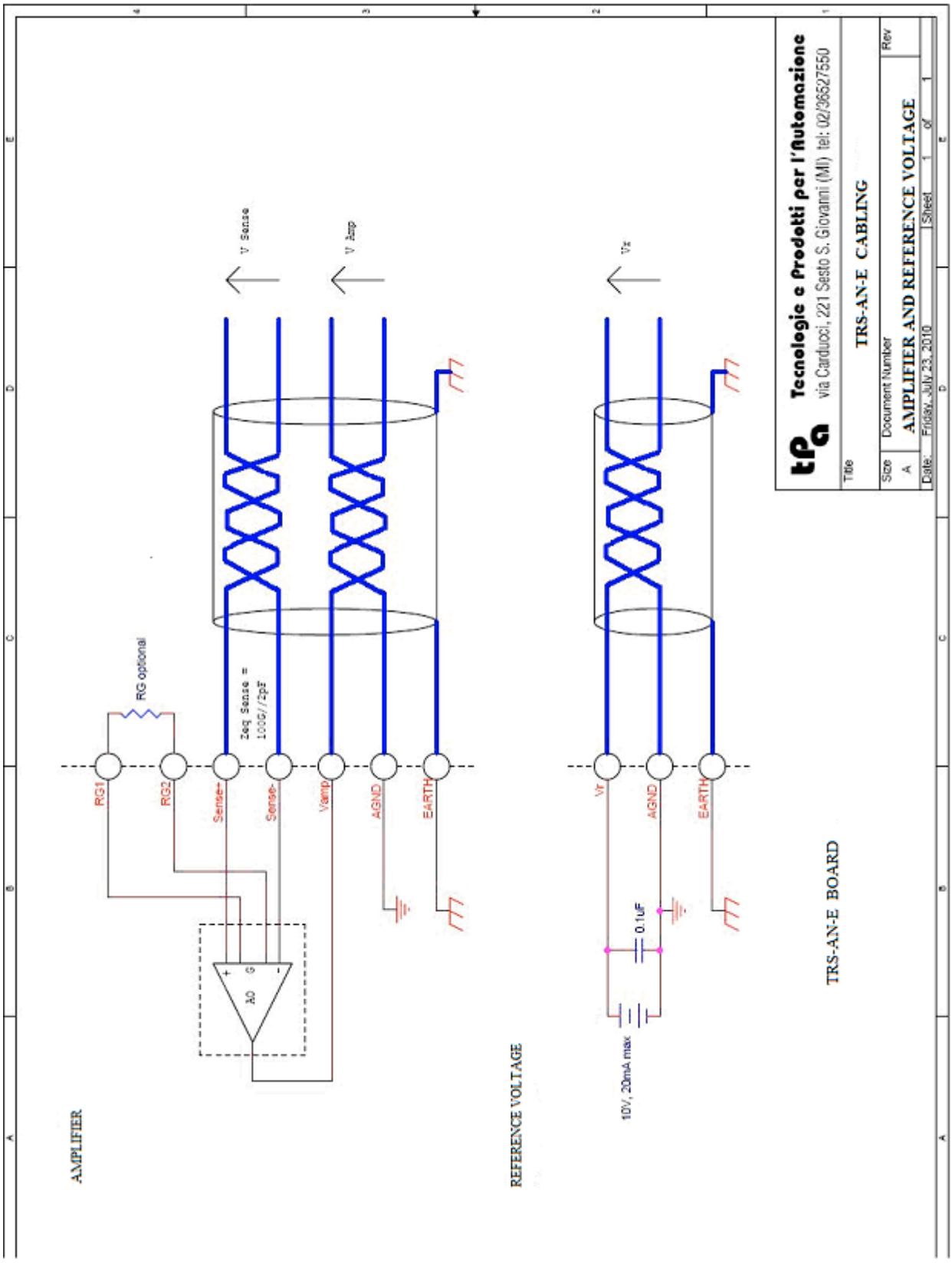
1	RG1		
2	RG2		
3	EARTH		
4	Vamp		

5	**AGND**		
6	**Sense+**		
7	**Sense-**		
8	**AGND**		

1	**Vout+**		
2	**Vout-**		
3	**EARTH**		
4	**Vamp**		
5	**Ain+**		
6	**Ain-**		
7	**AGND**		
8	**Vr**		

7 INPUT/OUTPUT CABLING

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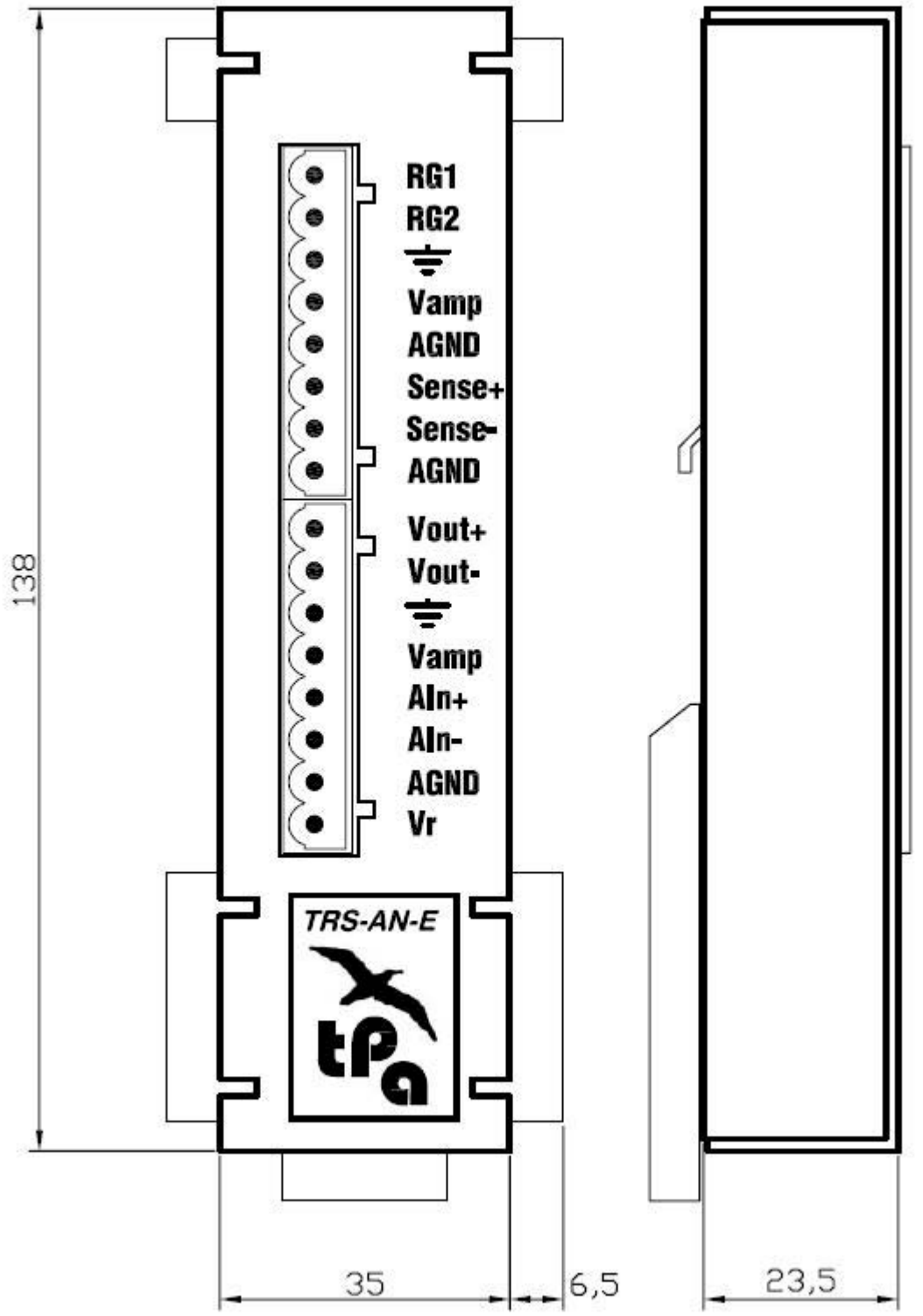
Title
TRS-AN-E CABLING
Size
A
Document Number
AMPLIFIER AND REFERENCE VOLTAGE
Rev
Date: Friday, July 23, 2010
Sheet 1 of 1
V Sense
V Amp
Vr
RG optional
RG1
RG2
Sense+
Sense-
Vamp
AGND
EARTH
Zeq Sense = 100G//2pF
AO
G
Vr
AGND
EARTH
0.1uF
10V, 20mA max
AMPLIFIER
REFERENCE VOLTAGE
TRS-AN-E BOARD

8 DIMENSIONS



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