PROGRAMMABLE SIGNAL CONDITIONER
SIL2 SAFETY

TPIvL10

SIL2 IEC 61508

The TPIvL10 has been designed according to the standard EN61508 in order to fulfil the requirements of a safety integrity level 2 (SIL 2).



Features

- **Universal power supply:**
  20 to 250 Vac and 20 to 250 Vdc
- **Universal input:**
  100mV, 1V, 10V, 300V, 20mA, Pt100 3 fils, Ni 100, thermo-couple, resistance and potentiometer.
  Typical response time 500 ms
- Supply for 2-wire sensor

1 isolated analog output (A) programmable in current 0-4-20mA (active / passive) or in voltage 0-10V.

Relay outputs (option R): 2 change-over relays (5A/250 VAC on resistive load).

Isolated digital output (option N):
RS485 2-wire protocol Modbus/Jbus

Isolation: *input / outputs / supply.*

- **Safety:**

Checking of the current on the output loop
Self-diagnosis
Sensor break detection (depending on input)
Checking of the configuration data
Passcode protected programming

- **Test functions:**

- Simulation of the input measure
- Simulation of the analog output
- Test for setting in safety position

Programming with the micro-console or by PC via the software SuperVISION.

Configuration

Easy programming on front face with a micro-console or by PC with the software SuperVISION.

Programming with the Micro-console

This miniaturized micro-console for clipping on the front face of the instruments allows:
The visualization of the measure and the status of the analog and relay outputs.
The visualization and the modification of the programming (passcode protected programming).
The uploading of programming files for duplication to other signal conditioners.

Programming by PC: SuperVISION

Requires the programming interface USB-SER

Software for programming (Windows environment) allowing: The storage of configurations as files which can be consulted, modified, duplicated or loaded into the converters.
The edition and printing of files with or without having a converter connected.

Features

Self-extinguishing case of black UL 94VO PA66.
Mounting in cabinet: latching on symmetrical DIN rail.
Removable terminal blocks for screwed connections (2.5mm², flexible or rigid)
Protection: IP20 housing / terminals

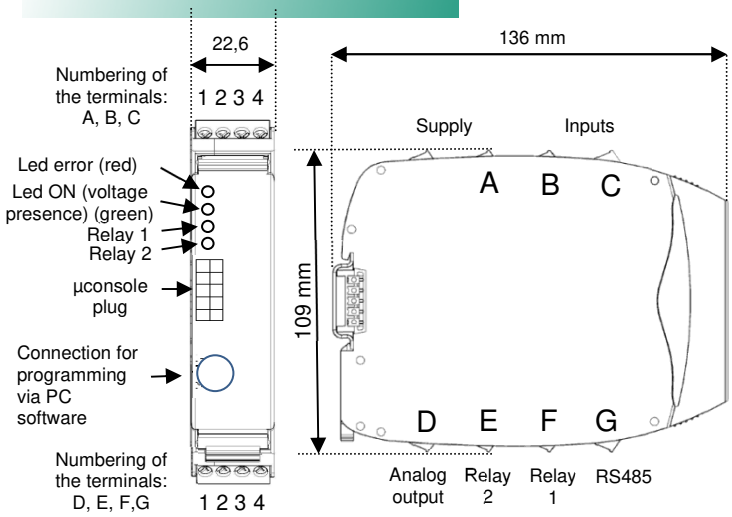
Dimensions: 22.6x109x122 mm
With µconsole: 22.6x109x136 mm

Operating T°: -5° to 50°C
Storage T°: -20 to 70°C

Installation: Pollution degree 2 / voltage surge II

Compliance with standards:
Directive Low Voltage 2014/35/UE.....EN 61010-1
Directive EMC 2014/30/UE.....EN 61326-1
Functional safety SIL2 according to IEC61508: 2010
Marking: CE

Dimensions



Coding

Type TPIvL10 ARN

Outputs:
A analog I/U isolated
R 2 change-over relays
N RS485 Modbus

Power supply: 20 to 250 Vac and 20 to 250 Vdc

Power consumption : 3.5 W max. 6 VA max.
Dielectric withstanding : 3 kV-50Hz-1min.

Order example: ***For a signal conditioner with universal input*** *+ analog output + 2 relays, request the reference* ***TPIvL10 AR***

ARDETEM 69510 SOUCIEU EN JARREST - Tél. : 33(0)4 72 31 31 30 Fax. : 33(0)4 72 31 31 31

Features

Inputs

INPUT types	Measure range adjustable from:		Permanent overload	Intrinsic error	Console resolution	Input impedance
mA*	-2 to +22mA		±100mA	< ±0.1% of the measure range	10 µA	Max. drop 0.9V
mV*	-10 to +110mV		±1V		100 µV	≥ 1MΩ
V	- 0.1 to +1.1V		±50V		1 mV	
	-1 to +11V				10 mV	
	-30 to +330V		±600V		100 mV	
Thermocouples* Standard IEC 581	°C	°F	-	(2) <±0.1% of the MR	0.1° or 1° C or F	≥ 1 MΩ
J	-160/1200	-256/2192				
K	-270/1370	-454/2498				
B	200/1820	392/3308				
R	-50/1770	-58/3218				
S	-50/1770	-58/3218				
T	-270/410	-454/770				
E	-120/1000	-184/1832				
N	0/1300	-32/2372				
L	-150/910	-238/1670				
W	1000/2300	1832/4172				
W3	0/2480	32/4496				
WRE5	0/2300	32/4172				
Pt100Ω (1)*3-wire sensor, Stand. IEC 751 (DIN 43760)	°C	°F	-	<±0.1% of the MR	0.1° or 1° C or F	Max. current 250µA
	-200/850	-328/1562	-			
Ni 100 3-wire sensor (1)*	-60/260	-76/500	-			
Resistive sensors	Calibers 0-440 Ω * and 0-2,2 kΩ (0-8.8 kΩ optional)		-	<±0.1% of the MR (0.5% for 0-2 kΩ)	0.1Ω (400Ω) 1Ω (2kΩ)	Max. current 250µA
Potentiometer	from 100Ω to 10 kΩ		-		0.1%	Max. voltage 100mV
Supply for 2-wire sensor	24 VDC ±15% with short-circuits protection 25 mA max.					
Special linearisation *programmable up to 20 points*	On inputs: mV, V, mA. Resistive sensors and potentiometer					
Square root extraction	On inputs : mV, V or mA					

MR = measure range

(1) Line resistance <25Ω
(2) Or 30 µV typical (60µV Max.) CJC efficiency: 0.03°C/°C from -5 to 50°C

Thermal drift <150ppm /°C

* Sensor break detection: mA input (if down scale ≥3.5mA) Other inputs: a 12µA pulsed current allows the detection of line or sensor break.

Outputs

Code	OUTPUT types		Features
A	1 analog	Current active/ passive	Current: Direct or reversed 0-4-20mA Load impedance ≤ Lr 600Ω
		Voltage	Voltage: Direct or reversed 0-10V Load impedance ≥ Lr 5000Ω
R	2 change-over relay		2 setpoint per relay, configurable over the whole MR. Hysteresis programmable from 0 to 100%. Time delay programmable from 0 to 25 sec. (250 VAC 5A or 30VDC 2A on resistive load)

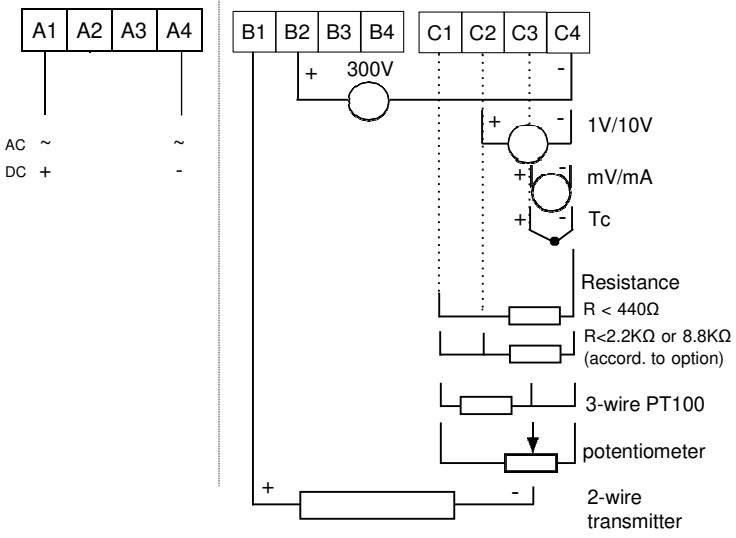
Typical response time 500 ms (for a variation from 0 to 90 % of the input signal)
Add 50 ms for the response time on the analog output

Galvanic isolation:

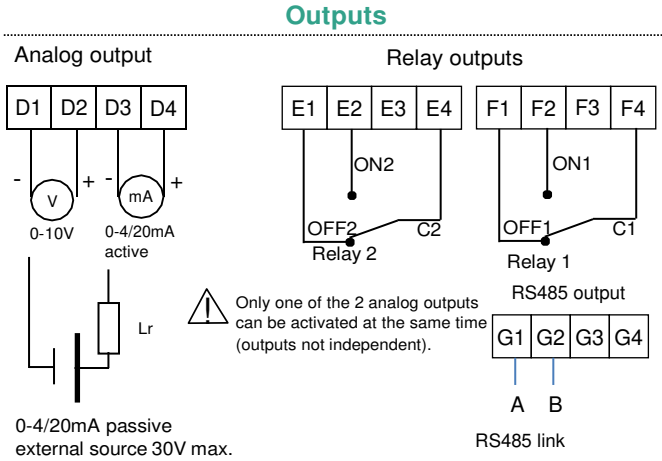
3kV-50Hz-1min. between supply, input, analog output,relay outputs

Connectings

Upper connectors



Lower connectors



Features related to the safety

TPIvL10

Type of the instrument	B
SIL (safety integrity level)	2
HFT (hardware fault tolerance)	0
PFH (probability of failure per hour)	$5E10^{-8}/h$
PFD (probability of failure on demand For a Tproof of 1 year	$2,2E10^{-4}$
SFF (safe failure fraction)	93%

Only the output 4-20mA and the relays can be used within a safety system.

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ARDETEM®
RCS Lyon 444-429-476 - Printed in France.
e-mail : info@ardetem.com
www.ardetem-sfere.com

Route de Brindas
Parc d'activité d'Arbora N°2
69510 SOUCIEU EN JARREST
- FRANCE -
Tél. : 33 (0)4 72 31 31 30
Fax. : 33 (0)4 72 31 31 31

your representative