ÉTUDES ET RÉALISATIONS
ÉLECTRONIQUES / INSTRUMENTATIONS / AUTOMATISME

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MEASURE TRANSMITTER

for DC voltage and current

TMvP

User handbook

Route de Brindas - Parc d'Activité d'Arbora - N°2
69510 SOUCIEU EN JARREST

ARDETEM - FRANCE
Tél. : 33 (0)4 72 31 31 30 - Fax. : 33 (0)4 72 31 31 31

SUMMARY

UE CONFORMITY DECLARATION

The manufacturer:

ARDETEM-SFERE
Route de Brindas
Parc d'activité d'Arbora n°2
69510 Soucieu en Jarrest
France

declares that the following products:

Name: Measure transmitter
Type: TMvP, TMvP HI

correspond to the following directives and standards:

The EMC Directive 2014/30/UE

EN 61326-1 : 2013

The Low Voltage Directive 2014/35/UE

EN 61010-1 : 2011

The Directive ATEX 2014/34/UE

EN 60079-0 : 2011 EN 60079-15 : 2010

Soucieu en Jarrest, May 31, 2017

Jacques Huguet
Signature of the Manager

The instrument may be connected to dangerous electrical voltages.
It must be mounted, connected and implemented respecting the current specific regulations, by a qualified technician, trained to the safety regulations, who will have read this manual.

This appliance has to be installed in an environment defined in pollution degree 2 / Overvoltage category II or better for a max. altitude of 2000 m.

Before any installation or maintenance work, make sure the power supply of the instrument is cut.

This symbole indicates that the module is protected by a double or reinforced isolation.

When the instrument is permanently connected to a dangerous voltage, it is necessary to add a means of sectionalizing on the power supply (switch, fuse or circuit breaker) near to the product, to make it easy of access and to mark it as being the means for cutting the instrument.

This sectionalizing means should cut all the conductors leading the current.

The person who has designed the system (electrical installation including the instrument) is sole responsible for the safety and must make sure it has been designed according to the current safety standards.

This appliance contains electronic components and should not be disposed of with the domestic waste. It should be collected with the WEEE (Waste Electrical and Electronic Equipment), according to the current regulation.

1 . INTRODUCTION

The **TMvP** is an analogue measure converter for **DC magnitudes**; it will convert any IDC or UDC signal into a normalised 0-20 mA, 4-20 mA (active or passive) or 0-10 V signal.

The input and output calibres can be modified by straps, accessible behind the front face according to your applications.
Any modification of the input or output straps leads to a down scale and up scale adjustement.

The device also offers ;

- galvanic partition Input / Output / Power supply: 3KV/50Hz/1min (5KV/50Hz/1min for the TMvP HI)
- a broad supply span
- a response time between 7 ms and 30s. (optional)

General features

- Reduced case volume
- Plug-off connectors for screwed connections
- Operating temperature: -20°C to +60°C.
- Storage temperature: -20°C to +70°C.

Compliance with standards:

Directive LV 2014/35/UE ..... EN 61010-1

Directive ATEX 2014/34/UE (area 2).... EN 60079-0, EN 60079-15

Directive EMC 2014/30/UE ..... EN 61326-1

Marking:

CE

Ex II 3 G Ex nA IIC T4 Gc

The device is dedicated to the industrial environment. They can be found in various applications:

- PLC input interface.
- Data centralising on API.
- Acquisition, regulation, registering, watching of signals.
- Retransmission of voltages and intensities on panels and low voltage switchboxes.
- Watching of engine intensities and voltages.

2. TECHNICAL FEATURES

INPUT

Internal selection of the range by removable straps and fine settings by multi-turn potentiometers. (see configuration of the inputs p8)

Voltage	± 10 mV / ±100 mV ±1 V / ±10 V / ±100 V / ±500 VDC
Current	± 5 mA / ±50 mADC

Integrated supply for 2-wire sensors 24V ±15% protected from short-circuits (I max.:25 mA)

Possibility to achieve shifted scales.

OUTPUTS

Current	0-20mA, 4/20mA,	Lr* < 750Ω
	±20mA	Lr* < 320Ω
Voltage	0-10 V,	Lr* > 1KΩ
bidirectional	±10 V,	Lr* > 1KΩ

SUPPLY

20 to 250 Vac 50/60/400Hz and 20 to 250 Vdc

Consumption max. 2.5W (8VA)

TRANSFER

Accuracy rating	: ≤ 0.2
Undulation	: ≤ 0.5%
Galvanic partition	: input / output / power supply 3 kV eff. 50Hz 1min. TMvP HI (5kV eff - 50Hz - 1mn)
Response time	: ≤ 200ms [Tr]
Pass-band	: 1.7 Hz (-3 decibels) [Bp = 0,35/Tr]
Temperature Coeff.	: ≤ 0.015%/°C

OPTIONS

Shifted or reversed scales.

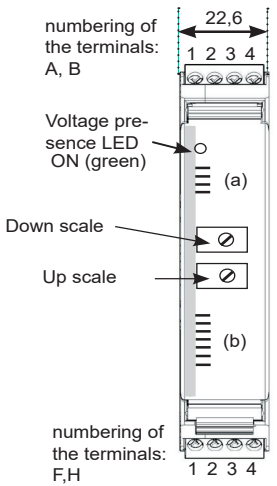
Passive current output: 0/20mA, 4/20mA U: 30V max.

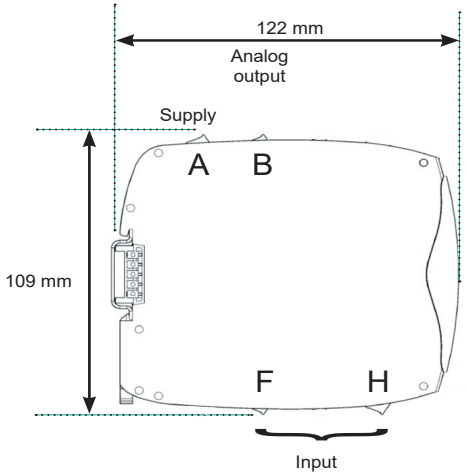
Short response time: > 7 ms

Long response time: < 30 s

* Lr = load resistance

3. EXTERNAL FEATURES





Selection of the calibers:
(a): output
(b): input

Protection: housing/terminals: IP20
Removable terminal blocks for screwed connections
(2.5 mm², flexible or rigid)
Weight: 290g (with packaging)
Housing: self-extinguishing case of black UL 94VO PA66.
Mounting in cabinet: latching on symmetrical DIN rail

4 . CONNECTIONS

• INSTALLATION IN AREA 2 (ATEX) :

II3 G Ex nA IIC T4 Gc

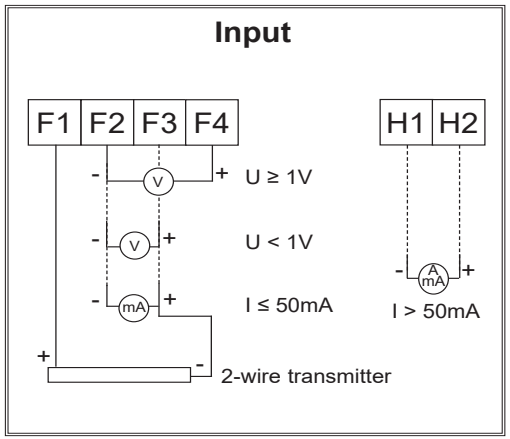
The product must be installed by qualified staff, competent on the directives and the regulation applicable to the area 2.

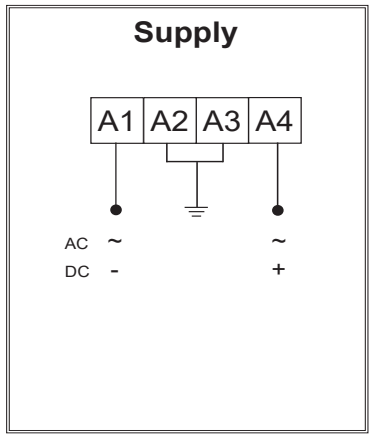
It must be installed in a protecting enveloppe conform with the EN 60079-15.

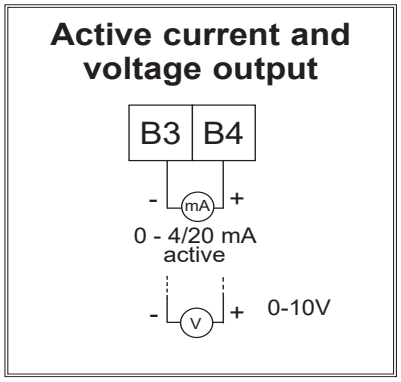
The operator must ensure an external protection in order to prevent transient disturbances on the supply higher than 40% of the nominal voltage.

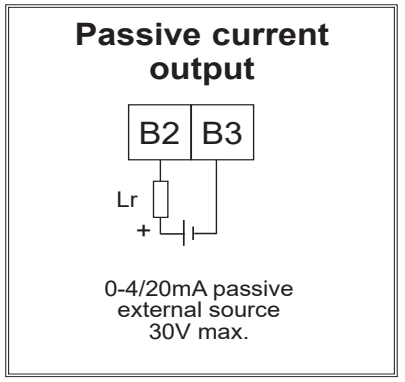
Cut both the main and emergency power supplies or make sure you are in non-hazardous area before any connection or disconnection of any cable connected to the the TMvP.
Any change of configuration of the jumpers of the input or the output must be performed in non-hazardous area.

The installation must comply with the EN 60079-14 :2014.









5 . INPUT/OUTPUT CONFIGURATION

Switch the device off

- Take the front face off.
- Select input and output calibres using the straps as indicated page 8.
- Connect the instrument to a < 0.2 accuracy rating multimeter

Switch the device on

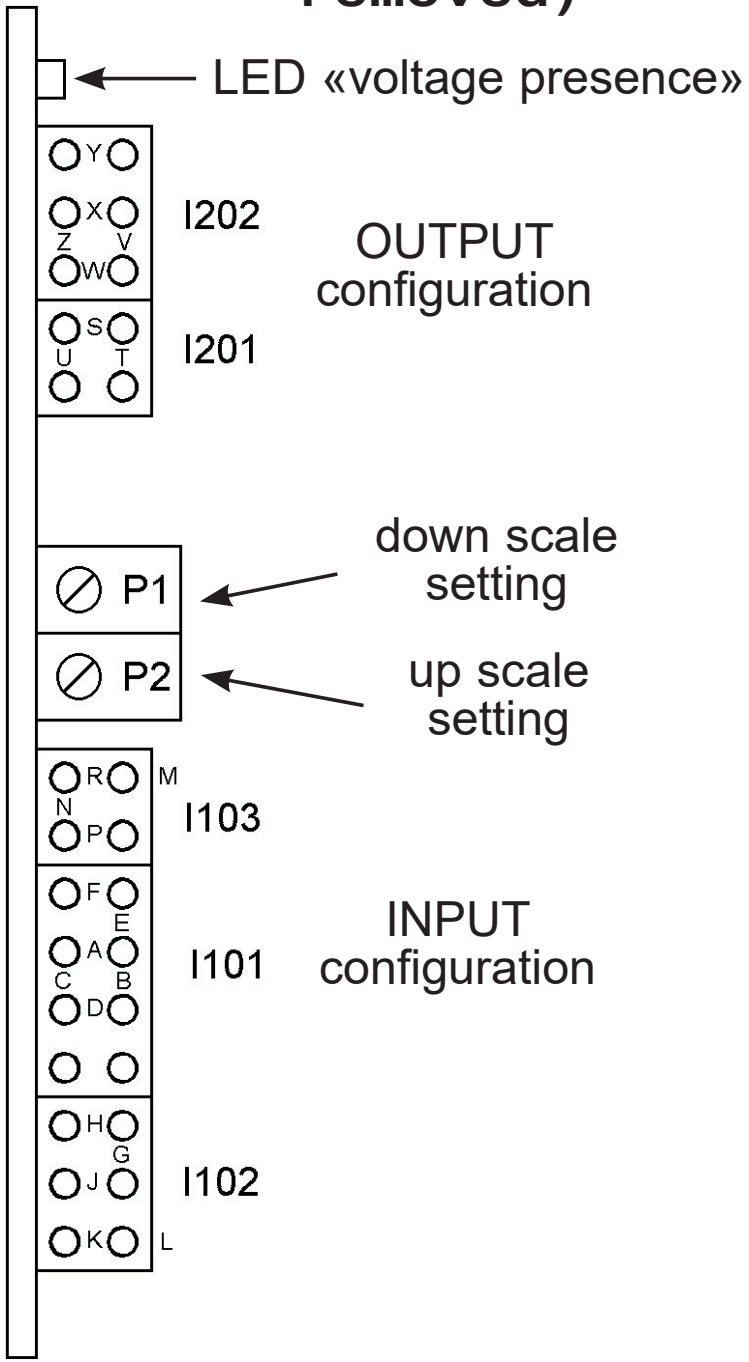
Input x V / x A

- Generate 0 V / A
- Set output down scale, using potentiometer P1
- Generate full scale on the input
- Set output full scale using potentiometer P2
- Adjust down and full scale settings if necessary

Symmetrical input : ± xmV / ± xmA

- Apply 0 mV / mA
- Adjust the half scale of the output thanks to the potentiometer P1 (eg : 5V if 0-10V, 0mA if ±20mA)
- Apply the full scale at the input
- Adjust the full scale of the output thanks to the potentiometer P2
- Readjust the half and full scales if nedeed.
- Check the down scale in applying the down scale of the input.

VIEW OF THE CARD (with front face removed)



A -DC CURRENT INPUT CONFIGURATION

		DC current input - Straps														
		I101						I102					I103			
Terminals	Caliber	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R
F2 / F3	+/-5 mA			ON			ON			ON		ON			ON	
	0-5 mA			ON			ON			ON	ON		ON			
	+/-10 mA			ON			ON		ON			ON			ON	
	0-10 mA			ON			ON			ON		ON	ON			
	+/-15 mA			ON			ON	ON			ON				ON	
	0-15 mA			ON			ON		ON		ON		ON			
	+/-20 mA			ON			ON	ON				ON			ON	
	0-20 mA			ON			ON		ON			ON	ON			
	0-40 mA			ON			ON	ON				ON	ON			
	4-20 mA			ON			ON		ON			ON				ON
F3 / F1	4-20 mA (2W sensor)			ON			ON		ON			ON				ON

B -DC VOLTAGE INPUT CONFIGURATION

		DC voltage input - Straps														
		I101						I102					I103			
Terminals	Caliber	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R
F2 / F3	+/-100 mV	ON					ON			ON		ON			ON	
	0-100 mV	ON					ON			ON	ON		ON			
F2 / F4	+/-1 V	ON					ON			ON		ON			ON	
	0-1 V	ON					ON			ON	ON		ON			
	+/-5 V			ON			ON			ON	ON				ON	
	0-5 V	ON					ON	ON			ON		ON			
	+/-10 V			ON			ON			ON		ON			ON	
	0-10 V			ON			ON			ON	ON		ON			
	+/-15 V			ON			ON		ON		ON				ON	
	0-15 V			ON			ON			ON		ON	ON			
	+/-20 V			ON			ON		ON			ON			ON	
	0-20 V			ON			ON			ON		ON	ON			
	+/-50 V		ON				ON			ON	ON				ON	
	0-50 V			ON			ON	ON			ON		ON			
	+/-100 V		ON				ON			ON		ON			ON	
	0-100 V		ON				ON			ON	ON		ON			
	+/-150 V		ON				ON		ON		ON				ON	
	0-150 V		ON				ON			ON		ON	ON			
	+/-500 V		ON				ON	ON				ON			ON	
	0-500 V		ON				ON	ON			ON		ON			
	0-750 V		ON				ON	ON				ON	ON			

C -OUTPUT CONFIGURATION

			Output - Straps							
			I201			I202				
Terminals	Straps		S	T	U	V	W	X	Y	Z
B3 (-) B4 (+)	Active	0-20 mA	ON			ON				ON
		4-20 mA		ON		ON				ON
		+/- 20 mA			ON	ON				ON
		0-10V	ON				ON		ON	
		+/-10 V			ON		ON		ON	
B3 (-) B2 (+)	Passive	0-20 mA	ON				ON	ON		
		4-20 mA		ON			ON	ON		

ON Straps set

(or (1))

No strap

Note:
For any configurations not mentioned above, please consult with us for a feasability study.

Your instrument is now **ready** to work.