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QUALITY SYSTEM
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= ISO 9001:2015 =

USER'S MANUAL AND MAINTENANCE

ABSOLUTE TRANSDUCER MAT2_

ABSOLUTE MAGNETIC BAND PA50/10

Manual purpose
This manual has been designed by the manufacturer to provide the necessary information regarding the instrument MAT2 to those who are authorized to carry out safely its installation, maintenance, dismantling and disposal. All the necessary information for the buyers and planners can be found in the Sales catalogue. Other than adopting good technical construction methods, the information should be read carefully and strictly applied. Inobservance of this information could cause risks for the health and safety of people and economical damage. This information, provided by the Manufacturer in the original language(Italian) is also available in other languages to satisfy legislative and/or commercial needs. This manual must be kept in good conditions by a responsible person in an ideal place so that it is always available for consultation. In case this manual is lost or deteriorates, a replacement should be requested directly from the manufacturer quoting the manual's code. This manual reflects the state of skill of the instrument at the time of input on the market: however the manufacturer reserves the right to make changes, add or improve the manual without giving any reason to hold the present manual inadequate.

Identification of the equipment
The identification plate represented is applied on the instrument.
To find out the identification code of the instrument, consult the sales catalogue.

Environmental conditions
Temperature setting: min. 0°C, max. + 50°C.
It is forbidden to use the instrument other than its specific use and in potentially explosive conditions or where anti- explosive elements are used.

Storage
Here below are some references to be followed for the storage of the instrument.
Avoid environments with excessive humidity and those exposed to bad weather (avoid open areas). Avoid putting the instrument directly on the ground. Store the instrument in its original packing.

Conformity declaration and EC marking
The instrument answers to the following Communitarian Directives:
2014/30 UE Elettromagnetic Compatibility
2011/65 Rohs

Maintenance
The instrument does not needs a particular maintenance except cleaning to do only with a soft cloth dampen with ethylic alcohol or water. Do not use hydrocarbon solvents (petrol, diluents, etc.): the using of these products could affect the proper functioning of the instrument.
Reparations should be done only and exclusively at the FIAMA technical assistance centre.

Calibrations and tests
It is advisable to verify the transducer calibration periodically, once every working year.

Assistance request procedure
For any kind of technical assistance request, contact the sales department of the Manufacturer directly indicating the information given on the identification plate, the number of hours used and the type of defect.

Manufacturer's responsibility
The manufacturer declines any responsibility in case of :
• Using the instrument contrary to the national safety and accident-prevention laws.
• Wrong installation, inobservance or wrong procedures of the instructions provided in the present manual.
• Defective electrical power supply.
• Modifications or tampering.
• Operations carried out by untrained or unqualified staff.
The safety of the instrument also depends on the strict observance of the procedures indicated in the manual: always operate the instrument in its functioning capacity and carry out a careful routine maintenance.
• All phases of inspection and maintenance should be done by qualified staff.
• The configurations provided in the manual are the only ones permitted.
• Do not try to use it anyway contrary to the indications provided.
• The instructions in this manual do not substitute but accomplish the obligations of the current legislation regarding the safety laws.

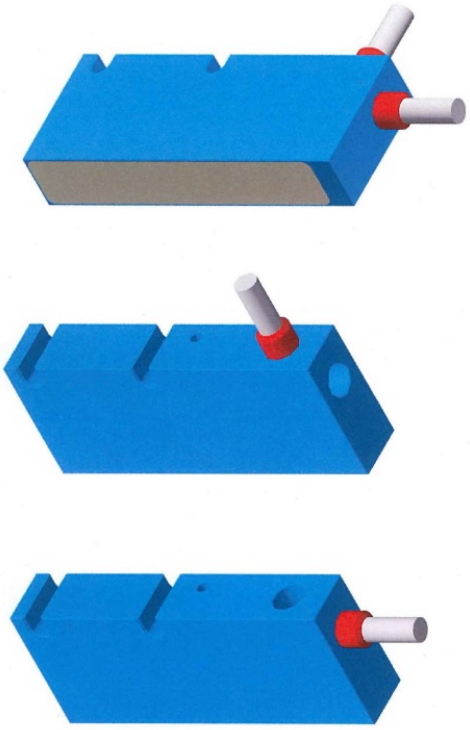
Installation

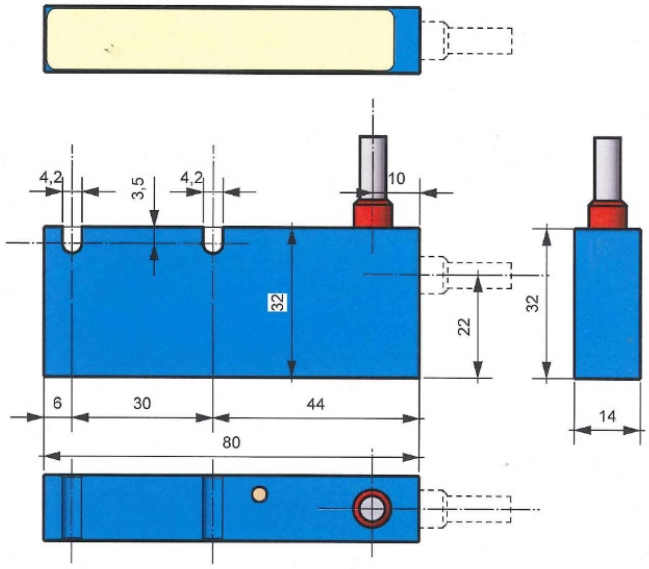
Before installing the instrument, read the following warnings:

a) Connect the instrument strictly following the instructions of the manual.
b) It is the responsibility of the user to check, before using, the correct settings of the parameters of the instrument to avoid damage to persons or things.
c) The instrument CANNOT function in a dangerous environment (inflammable or explosive).

Description

MAT2 is an absolute position transducer for linear measures without contact with a measure range up to 40 meters: it has to be combined with the absolute magnetic band PA50/10.
Running on the band, the sensor produces a signal which, properly amplified and worked out, is changed into an absolute position signal.
Transducer MAT2 integrates in the same device a sensor sensible to magnetic fields, an electronic signals conversion circuit and an output stage. The most importan feature is that this sensor always keeps the quota, it means that is possible to move the sensor also without power supply and without loosing the quota. There are available two inputs to define the zero-setting and the direction.
The data exchanging is made through protocol SSI with format Gray or Binary.
Magnetic Band PA50/10: the band consists of a plastic-ferrite strip carried by a stainless steel band with two magnetic traces, one with alternate poles of 5 mm pitch, the other with an univocal binary.
This system is suitable for a large number of applications within industry: guides and linear transmission members, pneumatic and oil-pressure cylin-ders, handling systems, automatic shearers, etc.: in any situations where is necessary an absolute, accurate and repeatable measure without contact and wear-proof.
It can goes with display F1XSSI (reading range -99999, +999999) with interface SSI .

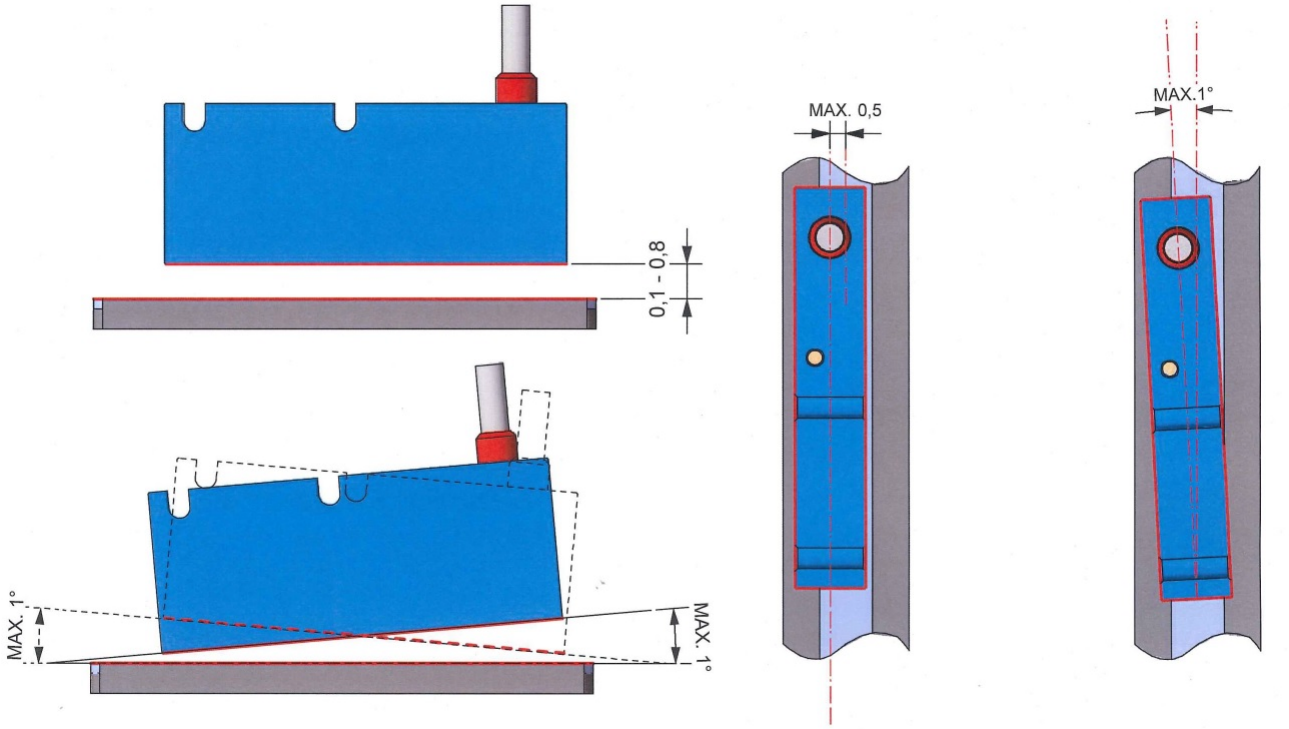




Transducer mounting

For the optimal operating of the system the magnetic sensor, is necessary to observe the quotas mounting on the following draws, pay attention that the distance between the sensor and the magnetic band doesn' t exceed 0,8 mm.

Alignement tolerance magnetic band – transducer:



A color led indicator shows the following state:

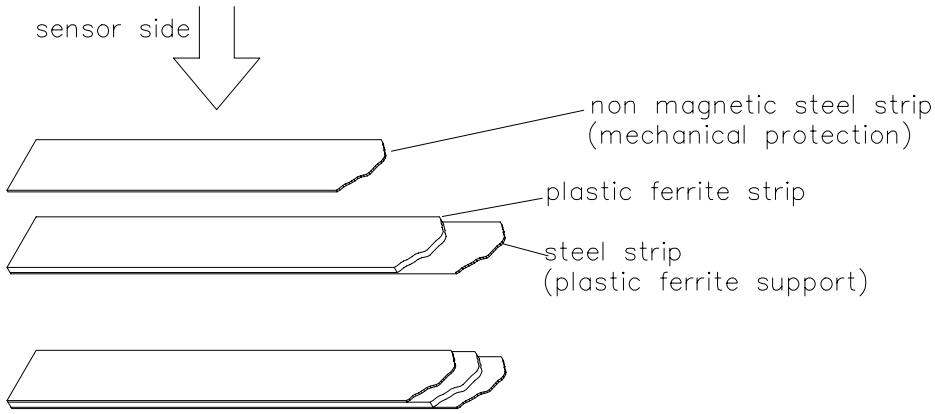
1) green: transducer power on ok,
2) red: error condition.

Magnetic band

The band consists of a magnetized plastic ferrite strip with alternate magnetic poles, carried by a ferromagnetic steel strip. Mechanical protection of the plastic ferrite strip is supplied by a non magnetic steel strip with tickness 0,2mm.

The magnetic band is assembled by sticking it with a biadhesive tape. The surface has to be smooth, clean and dry: is advisable to clean it with a degreasing product (isopropyl alcohol, ethyl alcohol, solvents, etc). The magnetic band has to be sticked holding the plastic ferrite side in the direction of the sensor, which means the steel side leaned on the stand surface. Fixed the magnetic band, to keep off damages due to abrasions or grazes of the plasic ferrite strip, is advisable the appliance (always biadhesive) of the non magnetic protection streep.

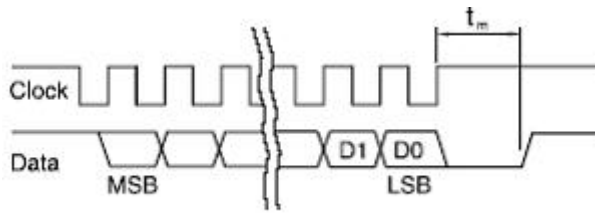
The optimal ambient temperature for stick the biadhesive tape is over 10°C. The maximum adherence of the tape works out after 48 hours (about) of the application and is kept between –10 and 80°C.



Electrical wiring

Brown	+24Vdc	Positive power supply
Green	GND	Negative power supply
Yellow	CK+	Clock+ SSI
Orange	CK-	Clock – SSI
White	D+	Data+ SSI
Purple	D-	Data - SSI
Grey	ZR	Zero input (PNP)
Black	DIR	Direction input (PNP)

Output signals
The transducer must be connected to an instrument which has an SSI 24 bit interface with Gray or Binary coding (according to the chosen transducer version) with negative numbers represented in both cases in two's complement. The following schematic shows the clock and data signals:



The data is read from the MSB to the LSB.
Once the reading cycle has been completed, it is necessary to wait at least t_m (15µs) before beginning a new reading.
Admissible clock frequencies range from 32kHz to 1.5MHz but the actual maximum value depends upon also the length of the connecting cable. In any case it is recommended to use a shielded twisted pair cable for the clock and data signals.
In an environment which has noise, it can be useful to implement a verification on transmission errors by executing a multiple reading cycle, i.e. after the first reading, initiate a second reading before t_m has passed to verify that the value has not changed meaning that both readings are the same. If in one of the two cycles the value is corrupted by noise, the two values will be different and the reading must be repeated.
The data is a 24 (or 25 bit) right aligned, Binary (or Gray) coded.

Zero point setting
After the transducer has been positioned on the magnetic band, it is necessary to set the value to zero otherwise the minimum value can be any value within the admissible range.
With the transducer fixed in position and correctly positioned on the magnetic band, by connecting the ZR input to the positive wire, zero is assigned to the position in which the transducer is currently located. The zero point that has been set will remain memorized by the system even after the instrument has been turned off and will remain unvaried until a new point is set. The ZR input must return open (or closed towards GND) after zeroing the value.
Note: the zeroing procedure must be repeated in case of substitution of the transducer or of the magnetic band.

Setting the counting direction
Starting from the zero point, the data from the transducer will increase towards the left and decrease towards the right (refer to the image on page 1). To change the counting direction connect the DIR input to the positive wire.

MAT TRANSDUCER FEATURES

Power supply	10-25 Vdc, max 200mA
Rasolution	0,01 mm
Measure accuracy	±0,1mm/m
Max lenght	40,875 m
Maximum speed	5 m/s
Transducer-band distance	0,1 ÷ 0,8 mm
Electric connection -	Cable Ø6,6 PUR, standard lenght 2, 5, 10m
Output	SSI, RS422
Data output	24 bit Gray/binary code (+ optional parity) 25 bit Gray/binary code (+ optional parity)
Clock SSI	32KHz ÷ 1,5MHz
Protection degree	IP66
Case	Alluminium
Working temperature	0 ÷ 50°C
Electromagnetic compatibility -	2014/30 UE

PA50/10 MAGNETIC BAND

Length	max 40,955 m
Width	10 mm
Thickness	1,7 mm
Bending radius -	> 75mm
Linear thermal expansion coefficient	11 ppm/K
Working temperature	-10 ÷ 65°C