



**TeleMetrix** *Pesage Mesure Surveillance Industrielle*

IMPLANTATION CAPTEUR DE VITESSE : 6012 C / EN



**DOCUMENTATION TECHNIQUE  
CAPTEUR DE VITESSE  
SERIE 6012**

- C
- EN
- P

Client	Matériel	Date
		21/01/2009

**TeleMetrix**

SAS TELEMETRIX BP118 78374 PLAISIR CEDEX FRANCE

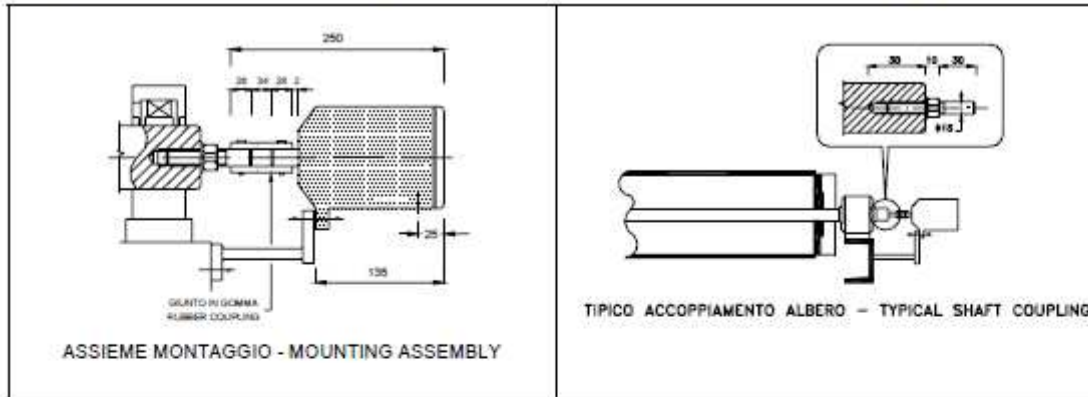
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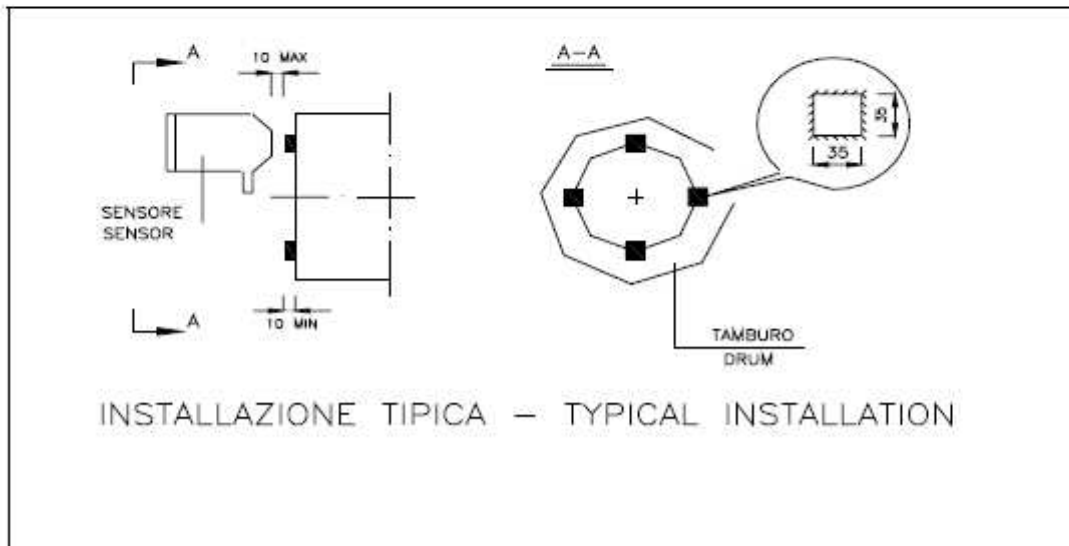
MODELLI 60-12C e 60-12EN

MODELS 60-12C and 60-12EN

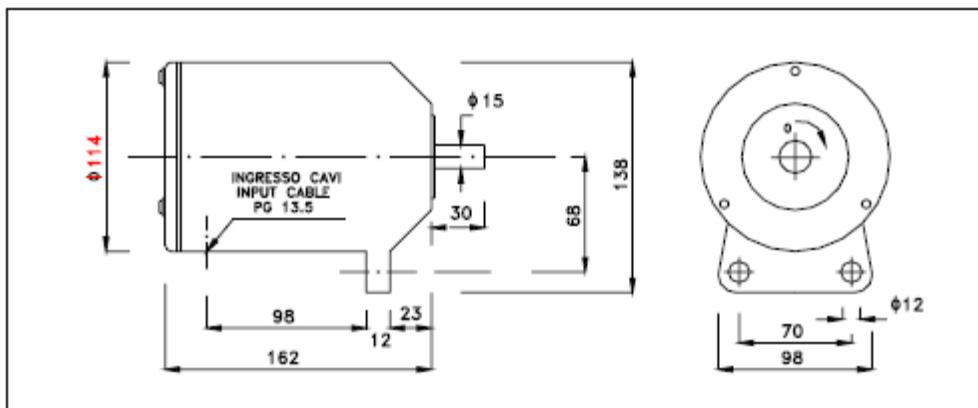


MODELLO 60-12P

MODEL 60-12P



ALL MODELS



## 1. Introduction

### 1.1 General

This manual includes the description and the information necessary for installation, use and maintenance of the speed sensors Mod. 60-12C, 60-12EN and 60-12P.

### 1.2 Applications

The Thermo Ramsey Speed sensors, are devices used to detect the speed of belt conveyor. Specifically they are used to send to Thermo Ramsey flow rate totalizer-integrator, a frequency signal proportional to the belt speed.

The speed sensors are also electrical apparatus available to work in potentially explosive atmospheres classified as Zone 2 / Zone 22 according to 94/9 CE "ATEX" (see section ATEX paragraph 4)

### 1.3 General features

- Enclosure Polyamide with 30% mineral
- Environmental temperature :
  - Operation -20 +65 °C
  - Stocking -40 +80 °C
- IP 65 protection degree.
- N°1 cables inlets threaded PG 13,5.

#### 1.3.1 Technical Specification 60-12C

- Minimum Speed: 20 revol./min (16,6 Hz)
- Maximum Speed: 200 revol./min (166 Hz)
- Generated Signal: 50 pulses/revolution
- Signal format: square wave
- Signal Level: 5,6 V
- Minimum Load: 1000 ohm

#### 1.3.2 Technical Specification 60-12EN

- Power Supply: 10-24 VDC
- Operation Speed: 0-180 revolution/min
- Generated Signal: 1000 pulses/revolution
- Frequency: 0-6000 pulses/revolution
- Signal format: square wave
- Output Signal: open collector
- Max .Output Current: 15 mA

#### 1.3.3 Technical Specification 60-12P

- Power Supply: 10-24 VDC
- Frequency: 0-3000 pulses/min
- Output Signal: open collector
- Max .Output Current: 100 mA

### 1.4 Warranty

The guarantee covers 12 months from start-up, but not more than 18 months from the delivery.

The guarantee consists in Thermo Ramsey's obligations to intervene, during the guarantee period, to remove possible defects and carry out the required interventions in order to make the equipment working in accordance with the standard, provided that the said defects are for manufacturing causes and not for installation, keeping, handling or not correct maintenance operations.

The guarantee covers the free charge repair or substitution of faulty parts at Thermo Ramsey's workshop. The transport from the Customer will be at Customer's charge.

## 2. Description

### 2.1 General

All the speed sensors, are equipped with a printed circuit to which the speed sensor is connected, and some terminals, for the connection, of the cable to the instruments.

### 2.2 60-12C

The speed sensor 60-12C, is equipped with a synchronous motor, with a permanent magnet, which it generate a train of pulses, with frequency proportional to the speed. The signal is generated through the shaft rotation of the sensor, which must mechanically be coupled to the belt conveyor (generally the drum). The device does not require any power supply

### 2.3 60-12EN

The 60-12EN speed sensor, is constituted from an incremental encoder with a led light source, able to generate 1000 pulses/revolution.

The speed sensor is equipped with a shaft that must mechanically be coupled to the belt conveyor (generally the drum). The device require a 24 VDC power supply.

### 2.4 60-12P

The 60-12P speed sensor, for its constructive characteristic does not need any mechanical coupling.

It uses a proximity sensor, that can detect a passage of a metallic plate at a distance of 10mm.

## 3. Equipment use

### 3.1 Inspection and unpacking

The speed sensors, are completely tested and rightly packed at the factory.

Before unpacking, be certain to check the package for external damage. In case of any damage, please inform the carrier and Thermo Ramsey.

After unpacking, inspect the device for broken components.

### 3.2 Installation

➤ For Installation in potentially explosive atmospheres zone see section ATEX paragraph 4

#### 3.2.1 Models 60-12C and 60-12EN: Mechanical installation

The installation procedure is described below.

- a. The speed sensor must be connected with a drum shaft which turns at true conveyor belt speed. In installation where the drum shaft is not accessible, an additional idler must be installed specifically for the speed sensor;
- b. Select the proper drum or additional shaft to provide a speed within the range of the speed sensor;
- c. Be sure that the conveyed material, does not build up on the idler, otherwise there will be an error on speed transmission;
- d. If the additional shaft is necessary, locate it on the clean side of the return belt and install the unit such a manner as to provide at least 30° contact of the belt wrap on the idler. Any slippage between belt and idler, will decrease the belt scale accuracy;

### 3.2.2 Model 60-12P: Mechanical Installation

The model 60-12P introduces a various installation regarding the other models.

- a. Install the sensor on a driven drum of belt conveyor, where must be placed iron pieces for signal transmission;
- b. The maximum distance between the sensor and iron piece must be of 10mm;
- c. The mechanical fixing of sensor must be performed using a support retrained to the belt conveyor frame. Set 2 fixing holes having a diameter of 12 mm and use the 2x10 MA bolts with relevant washers in order to permit an adjustment on the centering of sensor with the plates;
- d. To obtain a good signal, place on drum more iron piece possible (with reference to the drum speed rotation and frequency input of sensor);
- e. The minimum transit time of iron piece on sensor is 0,03 sec.; for a correct iron piece dimension use the following formula:

$$X = \pi \times D \times n \times T$$

Where:

X = iron piece width (min. 20 mm)

D =fixing diameter of iron piece(mm)

N = drum turns number/second

T = time 0,03 sec.

$\pi = 3,14$

- f. After fixing the sensor and the iron plates, start the belt and check that the iron plates pass in the center of sensor and at the maximum distance of 10 mm otherwise shim the instrument.

### 3.4 Functional Verification

The instrument is provided with a led on the front of the internal panel, by which it is possible to check the pulses generated by the sensor.

To check the right signal transmission it's necessary to have an oscilloscope.

With this instrument it will be possible to see:

- For the model 60-12C, a square wave signal 5,6 width, with a frequency proportional to the belt speed;
- For the model 60-12EN a square wave signal having a width equal to the power supply and a frequency proportional to the belt speed

For the model 60-12P, is enough to start the belt and check for the lighting up of the led at every passage of the iron plate.

### 3.5 Maintenance

The equipments does not require special maintenance; furthermore it is suggested a functional check of the ball bearings and the coupling, on the model 60-12C and 60-12EN (at least every month).

The user is the responsible of the frequency equipment check that depending of the instrument installation place. Every 3 year check the status of cover's gasket.

**4. ATEX: Instructions for a safety use  
in POTENTIALLY EXPLOSIVE  
ATMOSPHERES**

**4.1 Introduction**

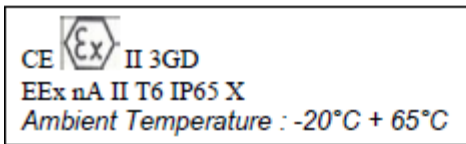
For Installation in potentially explosive atmospheres classified as zone 2 / 22, read, understand and apply everything described in this ATEX paragraph.

**4.2 General Feature for  
ATEX Application**

- read capitol 1.3
- Vmax:= 30VDC
- Imax := 400mA

**4.3 Marking**

Logo:



For the understanding of the marking,  
refer to the attached drawing:  
TG-006012X-E001A

**4.4 Installation and electric connection**



**DO NOT OPEN UNDER VOLTAGE**

To use this instrument in potentially explosive atmospheres (zone 2 / 22) you must to improve your system with the indication described below :

- The installation must be done according the indications reported in paragraph 3.3.
- To use cable gland with mode of protection "EEx" ATEX certified, in order to guarantee a degree of protection (IP) equal or greater then the original IP of the device.




**DIRETTIVE - DIRECTIVES**


CE 73/23 (Low Voltage Directive)  
CE 98/37 (Machinery Directive)  
94/9/CE "ATEX"

**NORMATIVE - STANDARDS**

EN50014 – EN50014/A1/A2  
EN 50021-EN 50281-EN60529  
LVD : EN 60204-1 - EN 60947-5-1  
Saf. of Machinery : EN 292 - EN 294 -  
EN 394

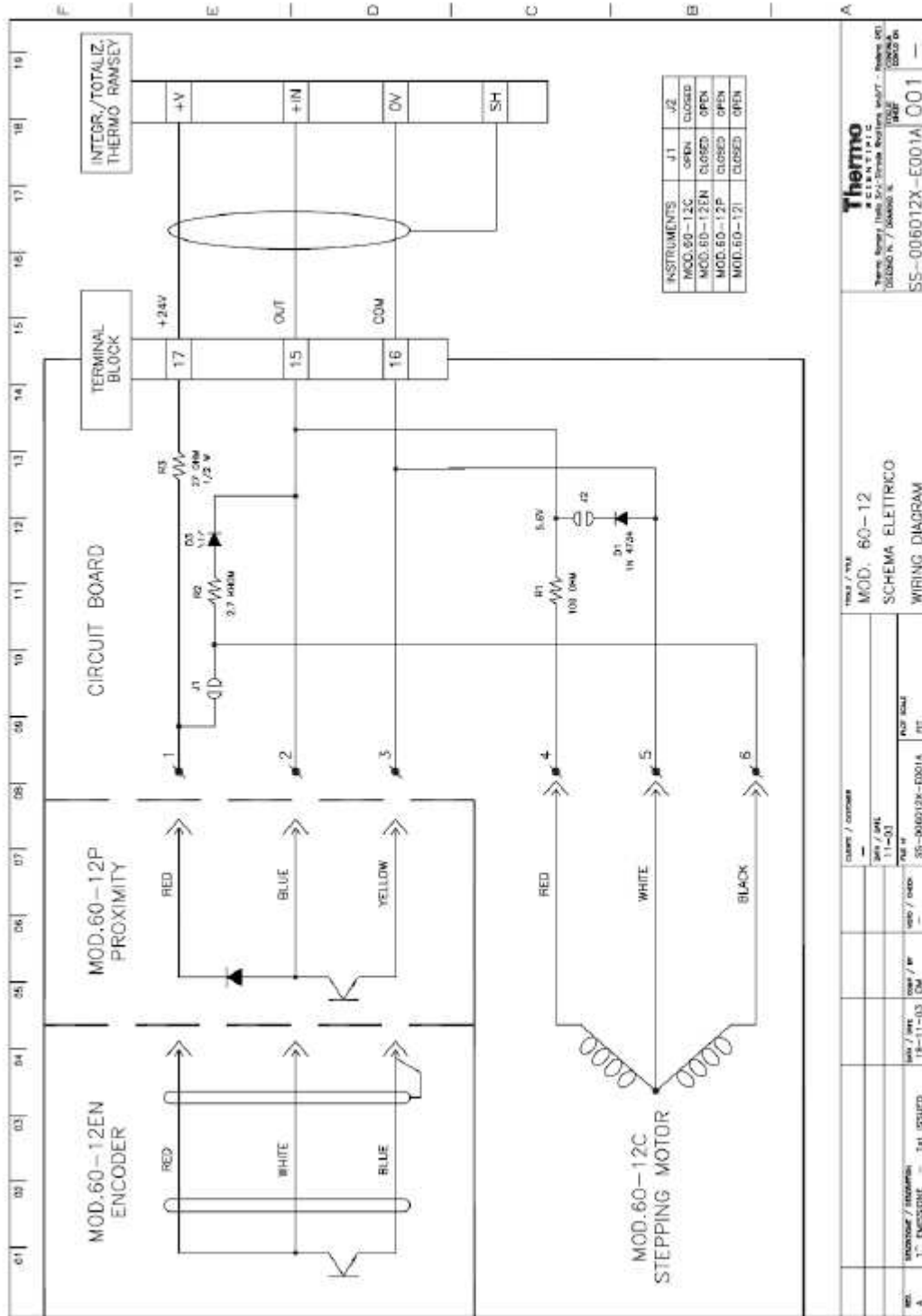
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# CABLAGE



**MONTAGE**

