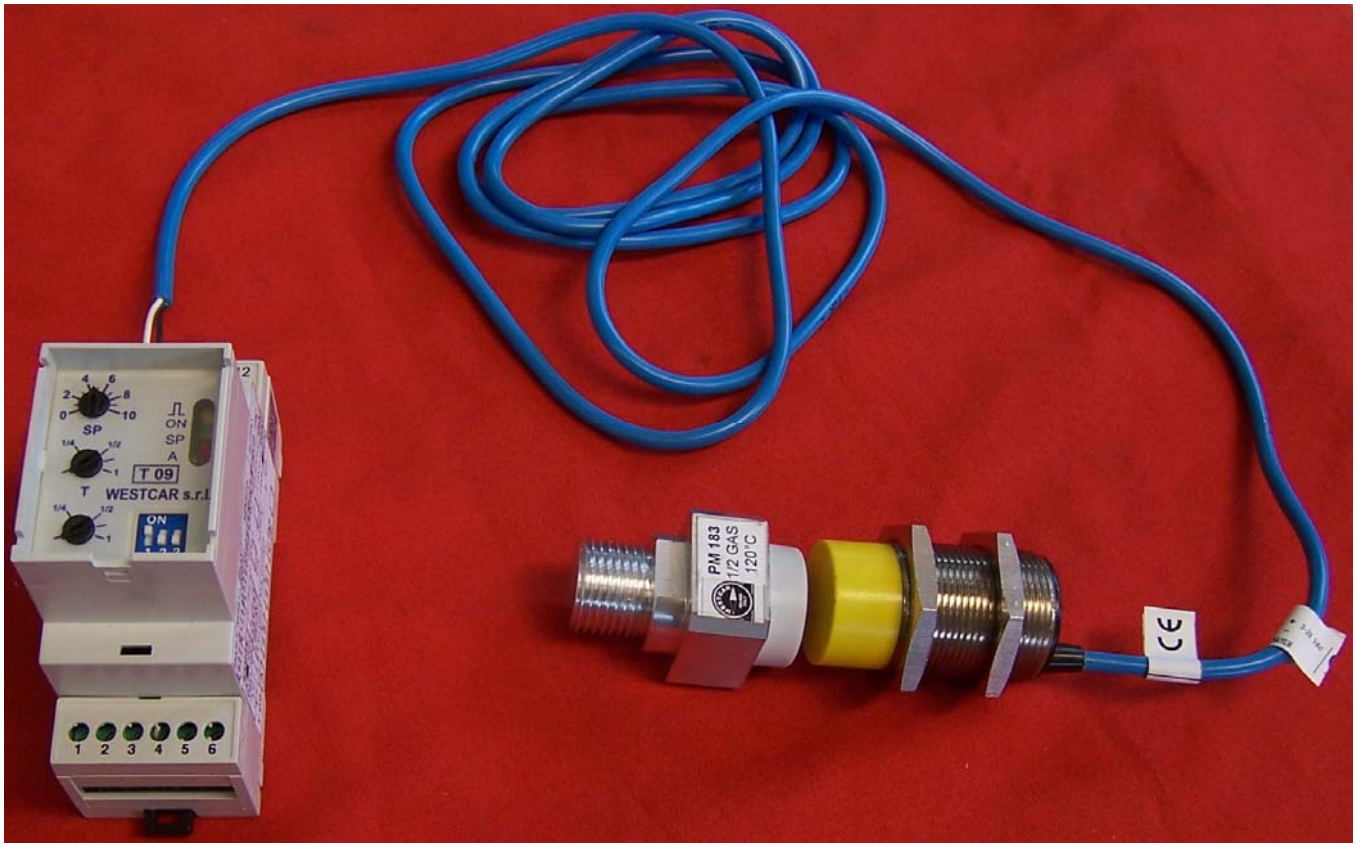
DEVICE T09
NO-CONTACT RPM AND TEMPERATURE TESTER

MANUAL MANUAL

ISSUE 2019-05 CODE 17135IN



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The system is made of 3 elements:

- T 09 : Speed Control LOGIC
- SE (Ø 30) : "BOLT", impulse generator for the LOGIC
- PM 183... : "BOLT", impulse generator of the SENSOR (without switch)
- PM 184 : "BOLT" impulse generator for the SENSOR (with switch)

Please refer to image 1

The "BOLT" contains a thermal element that opens when the temperature of 120°C is reached (or 100°C). Until the thermal element is closed, the BOLT works like an impulse generator when passing in front of the sensor SE (positioned at about 5 mm from the BOLT). The sensor SE sends impulses to the logic T09. When the thermal element opens, the Bolt stops to generate impulses when passing in front of SE and this will not send impulses to the LOGIC, which will detect the lack of impulses and it will signal it by commuting the internal relay.
As indicated in frig. 1, the Bolt is installed on the "external wheel" "Side A" in a hole connected to the internal part of the JOINT, which is in contact with the oil inside the joint.

- If the power is connected to the side "A", the system detects the absence of power or an exceeding oil temperature (> 120°C or 100°C).
- If the power is connected to the side "B", the system detects the slowing down of side A (conduced) or an exceeding oil temperature (> 120°C or 100°C).

Tt is the time taken by the bolt to make a complete turn.
The LOGIC receives an impulse from the Bolt at each passage and this impulse quickly discharges a Condenser in the LOGIC T09 that recharges during the remaining part of the turn, waiting for another discharge impulse. Choosing the condenser charging time properly with the "SP" adjustment in the LOGIC you can set a mode so that the condenser does not recharge fully before the arrival of another impulse and consequently the LOGIC does not signal any alarm, but if the impulses stop or are less frequent, Tl increases (slowing down of the wheel fitting the bolt), the condenser will have the time to recharge further and the LOGIC will commute its internal relay indicating the anomaly. (in Figure 2 a possible application is indicated). The relationship between Tt, the RPM speed and the frequency is expressed by some formulas in Table 3, with the list of values for the 3 ranges of T09: Tt = 0,1s; 1s; 10s

Example: you want to detect the SLOWING DOWN at 150RPM with a basic speed of 300RPM
From the table in Figure 3: the speed of 150 RPM is in the central RANGE, at line 4 of the column SP (set point).
You select RANGES with the dip-switch "RANGE" and the SP value with the scale "SP", you have access to both of them from the frontal part of T09. In this case you will turn the cursor no. 2 of the RANGE to ON and you will rotate SP until 4.
With the rotating JOINT, the yellow led blinks (led is ON when the bolt is in front of the sensor, this may be helpful when you establish the distance Sensor-Bolt (5mm+/-2mm)).
T09 takes into consideration the impulses after the closure of the ENABLING contact and after the possible time Tab.
Typically the Enabling contact is a contact of the Remote Control Switch connected to the power plug.
At the minimum speed T09 will not intervene, if the metallic joint slows down below 150 RPM the red led SP will switch on (that indicates the overflow of the set value SP = 4) and after the set time T the led A will switch on and the internal relay will commute.

The status of the internal relay depends on the connection between pin 2 and 3:
Pin 2 – 3 free: relay is ON in no-alarm condition
Pin 2 – 3 connected: relay is OFF in no-alarm condition

The alarm mode of the relay depends on the connection of pin 1 and 3:
Pin 1 – 3 free: the alarm reset is MANUAL, with temporary closure of pin 1-3 (on condition that the alarm cause has been deactivated)
Pin 1 – 3 connected: the alarm reset is AUTOMATIC; if after the first alarm impulses are still present, even if less frequent, the outlet relay will continue to feel all the impulses, commuting ON and OFF.

SUMMARY: The setting of T09 includes:

1. Selection of the status of the internal relay (pin 2-3)
2. Selection of the reset type (pin 1-3)
3. Enabling setup (pin 7-8)
4. Setup of the enabling delay with Tab (for low systems to reach the revs per minute)
5. Selection of the range with the dip-switch RANGE (operate only one cursor at a time)
6. Selection of the SP value
7. Selection of the delay of the relay intervention, with T (to overcome without alarm a possible slowing down of the system).

NOTE1: The intervention due to an extremely high temperature of the oil occurs because of the disappearance of the impulses, therefore the passage through the SP will be faster and there will not be less frequent impulses.

NOTE2: It is possible to check the functioning of the system, without causing any slowing down, increasing SP from 2 to 4 (approximately) (see the central column of the table in Figure 3)

NOTE3: The Bolt can be supplied in 2 versions:

PM184: it is equipped with a switch to simulate the opening of the contact of the thermostat inside the Bolt , it allows you to check the intervention distance between Sensor and Bolt.

PM183: it does not allow you to simulate the opening of the contact inside the Bolt.

NOTE4: The table in figure 3 refers to the case of 1 impulse for each revolution, in other words it refers to the equipment of 1 Bolt. If you want to apply a REDUNDANCY you can apply 2 bolts, diametrically opposed, doing so the frequency doubles and time Tt is halved.

NOTE5: The sensor must be installed in front of the BOLT, at a distance of 5mm±2mm with a locking system that must be placed towards the tail of the sensor and not towards its the head, if it is in metal.

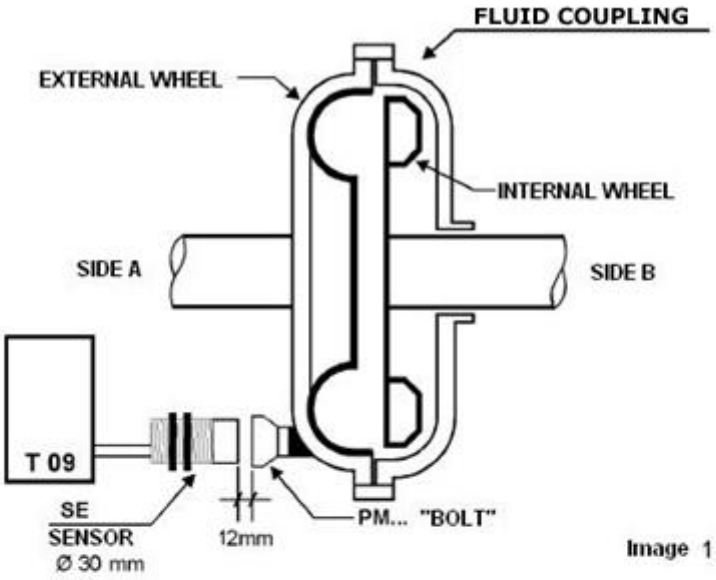


Image 1

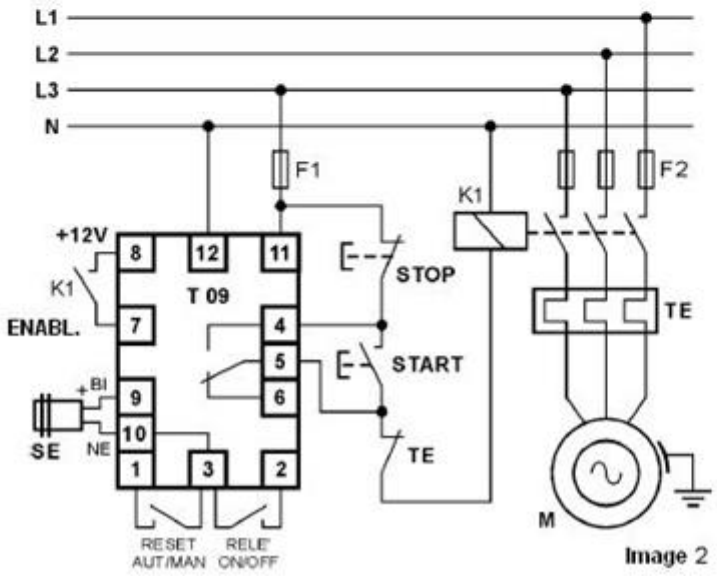
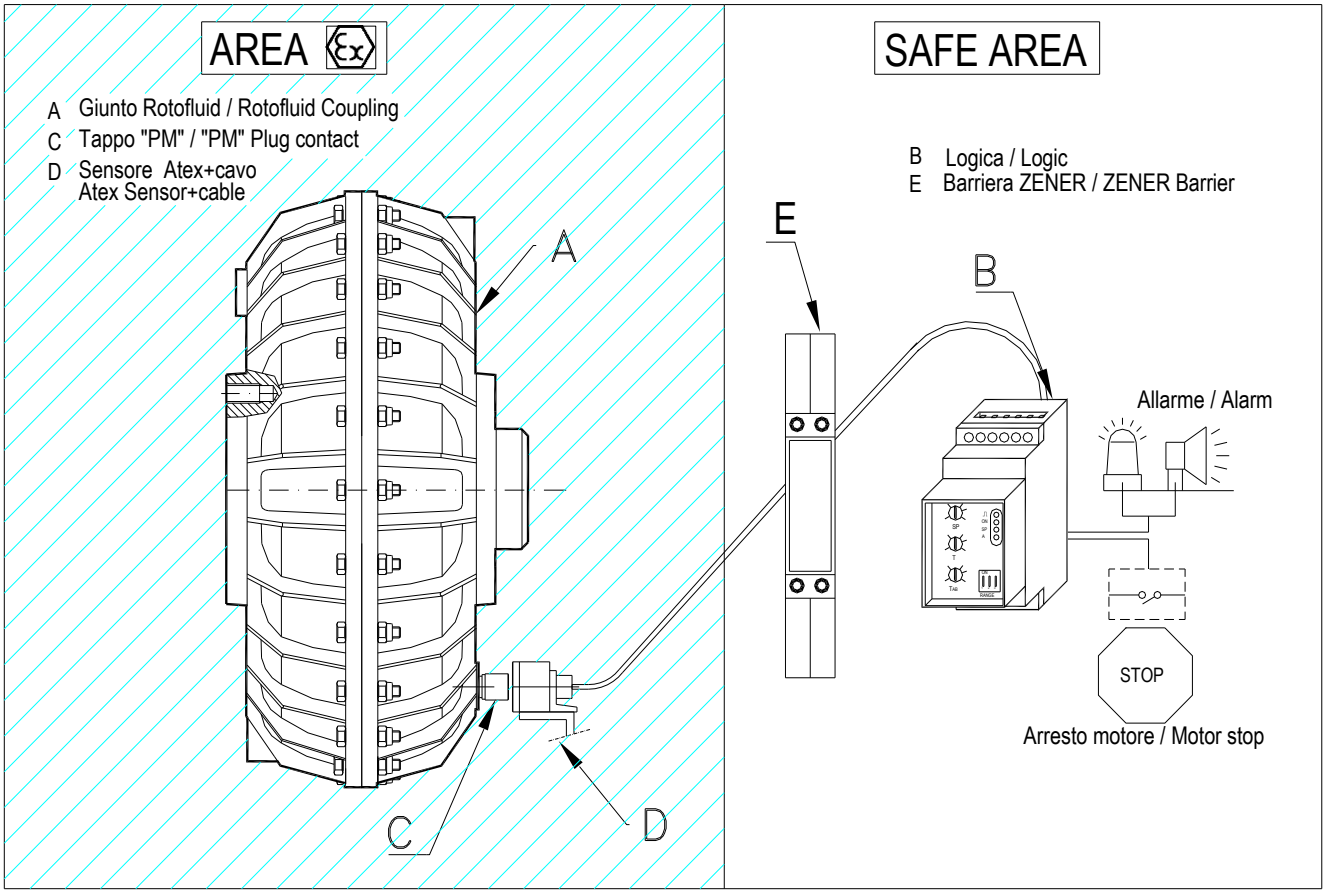


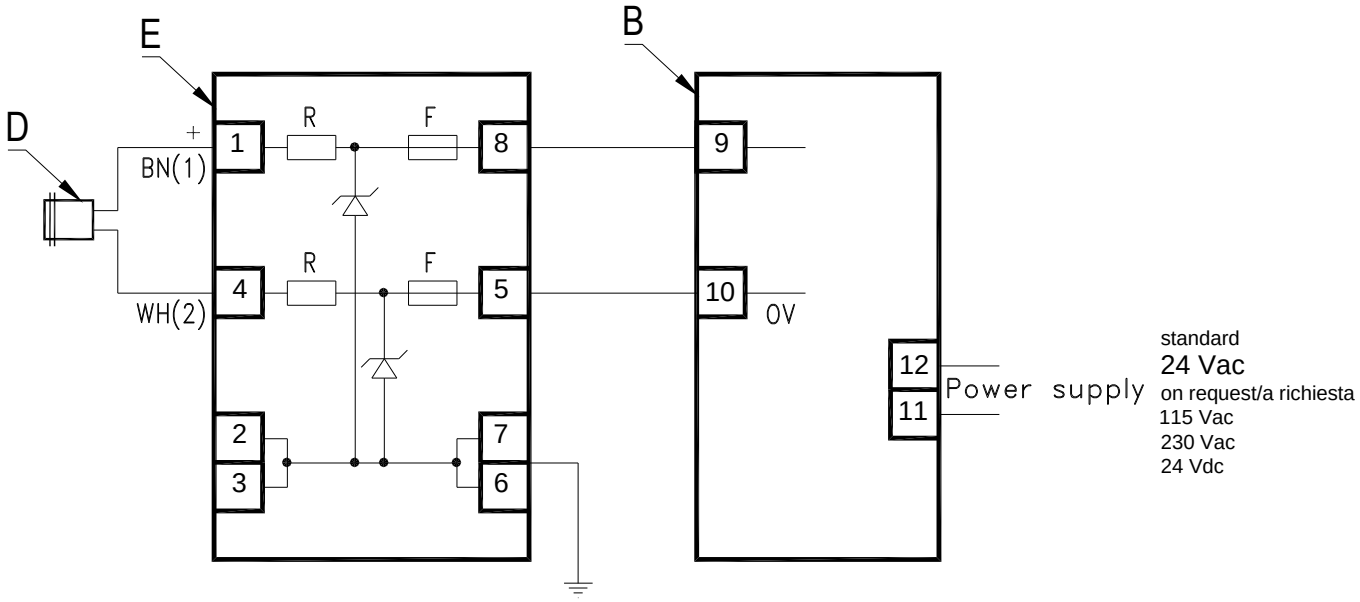
Image 2

GAMME / RANGES									
SCALA *RANGE*	DS 1 = ON			DS 2 = ON			DS 31 = ON		
SP	$T_{T(S)}$	**RPM**	Hz	$T_{T(S)}$	**RPM**	Hz	$T_{T(S)}$	**RPM**	Hz
10	0,10	**600**	10	1	**60**	1	10	**6**	0,10
9	0,09	**660**	11	0,9	**66**	1,1	9	**6,66**	0,11
8	0,08	**750**	12,5	0,8	**75**	1,25	8	**7,5**	0,12
7	0,07	**840**	14	0,7	**84**	1,4	7	**8,5**	0,14
6	0,06	**1000**	16	0,6	**100**	1,6	6	**10**	0,16
5	0,05	**1200**	20	0,5	**120**	2	5	**12**	0,20
4	0,04	**1500**	22,5	0,4	**150**	2,25	4	**15**	0,25
3	0,03	**2000**	33,3	0,3	**200**	3,33	3	**20**	0,33
2	0,02	**3000**	50	0,2	**300**	5	2	**30**	0,50
1	0,01	**6000**	100	0,1	**600**	10	1	**60**	1
In case of 1 impulse/rev $T_{T(S)}$ = 60/RPM ; RPM = 60/ $T_{T(S}$ = 60Hz; Hz = RPM/60 = 1/ $T_{T(S}$									

Image 3



Schema di collegamento di
SENSORE NAMUR-BARRIERA ZENER -TACHIMETRO T 09
Connection scheme
NAMUR SENSOR-ZENER BARRIER -TACHIMETER T 09



Nota: Per AREA SICURA si intende anche il posizionamento all'interno di appositi quadri elettrici.
Note: For SAFE AREA we also mean placement inside suitable junction boxes.

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