

TR/TA & GR/GA

MOUNTING MANUAL

(Common for TR/TA as GR/GA)

ATEX INSTRUCTION MANUAL

(ATEX material is having a specific marking)



You must read all these instructions carefully. You must not start the installation before taking these instructions into account.

Any modification without authorisation of the transmitter is strictly prohibited. GEORGIN will not bear any responsibility for a problem caused by such a modification. This instruction and operating manual should be kept by a person who is actually using the transmitter.

This manual should be kept at a place accessible to persons who have to intervene on the transmitter. In case of subcontracting this manual must be delivered to the end user. For more details, refer to the specifications supplied separately.



1) START-UP DIRECTIONS

1.1. FUNCTIONS

Pressure transmitters are aimed at measuring relative (TR/GR) or absolute (TA/GA) pressure. The equipment delivers a 4...20mA signal (2-wire method) proportional to the measured pressure.

To be installed in some explosive atmosphere (ATEX version only, please refer to the codification), this equipment must be integrated in an intrinsically safe loop

1.2. USE AND MARKING

1.2.1. NON-ATEX MODEL

Installation	Safe area
Operating temperature	
TR/TA	-20°C to +70°C
GR/GA	-30°C to +80°C

1.2.2. ATEX MODEL (in compliance with the ATEX directive 2014/34/EU)

Method of protection	Intrinsic Safety (I.S.) "ia" manufacturing
Marking	CE 0081 Ex II 1 GD - Ex ia IIC Ga CE 0081 Ex II 1 GD - Ex ia IIC Da For GR/GA models CE 0081 Ex I M1 - Ex ia I Ma
Location of the equipment	Surface industries / Mine (for GR/GA models)
Installation area	"ia" type of protection Zone 0, 1 or 2 for gas of groups IIA, IIB or IIC (according to EN 60079-10-1) Zone 20, 21 or 22 for dusts of groups IIIA, IIIB or IIIC (according to EN 60079-10-2)

Operating temperature

	Surfaces Industries	
	TR/TA	GR/GA
T5/T100°C	-30°C < amb. T* < 70°C	-30°C < amb. T* < 70°C
T6/T85°C	-30°C < amb. T* < 55°C	-30°C < amb. T* < 55°C
GR/GA - group I (Mines)		
	-30°C < amb. T* < 80°C	

EC type Examination Certificate

TR/TA	LCIE 01 ATEX 6065 X
GR/GA	LCIE 02 ATEX 6137 X

Nota: See the corresponding certificate for the Group I mounting (Mines) of the GR/GA.

1.3. CERTIFICATIONS

This product installed according to this instructions sheet is declared in conformity with the following standards :

Electromagnetic compatibility	EN 61326 & IEC61000-6-2
Intrinsic Safety (ATEX products)	EN 60079-0 EN 60079-11 & EN 61241-11

1.4. SAFETY PARAMETERS

	TR/TA... model	GR/GA...model
U (V)	≤28V	≤28V
I (A)	≤ 140 mA	≤ 100 mA
P (W)	≤ 1 W	≤ 0.7 W
Ci	1.3nF + 0.1nF/m (for wire output)	21pF + 65pF/m (for wire output)
Li	168µH + 1.5 µH/m (for wire output)	168µH + 550nH/m (for wire output)

1.5. ELECTRICAL DATA

Output	4...20mA
Power supply:	
TR/TA	12V...28Vcc
GR/GA	10V...30Vcc
Charge:	
TR/TA	$R(\Omega) = (U_{supply} - 12V) / 0.02A$
GR/GA	$R(\Omega) = (U_{supply} - 10V) / 0.02A$
Max global error (Linearity* + Hysteresis + Repeatability) at 25°C	
TR/TA	from 0.2% F.S. to 0.4% F.S. if Pmax>100bar
GR/GA	from 0.5% F.S. to 1% F.S. if Pmax>100bar

*Best straight line with forced zero.

Temperature drift

±0.03%/°C typical F.S. (between 0 and 50°C)
±0.06%/°C max F.S.

Strain gauge breaking detection (not configurable)

NAMUR NE 43 Up scale	≈ 25 à 27 mA
NAMUR NE 43 Down scale	≈ 3.7 mA

1.6. MECHANICAL DATA

Presentation

stainless steel made housing and 316L stainless steel process connection

Index of protection (I.P.)

Connector output	IP65
Cable output	IP66 (TR/TA; GR/GA) & IP68 (GR/GA)
Cable gland output	IP66 (TR/GA)

Ambient temperature (NON-ATEX models)

TR/TA	-20 to 70°C
GR/GA	-30 to 80°C

Process temperature (refer to the codification regarding the ring material)

TR/TA	-20 to 70°C
GR/GA	-30 to 80°C

Storage temperature

TR/TA	-40 to 80°C
GR/GA	-30 to 80°C

1.7. INSTALLATION

This equipment can be installed in hazardous atmosphere (ATEX version only, please refer to the codification - surface industries or mining according to the model) and is in compliance with the ATEX directive 94/9 CE. The surface temperature must not exceed the one indicated in section 1.2. The wiring of this equipment in hazardous area must be executed with the in force rules by a qualified staff according to the national and international standards.

Preparation

- Check the equipment and all its attachments.
- Check that the materials in contact are compatible with the process. Take into account any instability in the process.
- According to its application, the transmitter must be protected by a safety pressure feature. The manifolds are chosen according to the process conditions. Be careful: the measurement can be mistaken by leakage of the process.
- If the process temperature is too high, the equipment must be installed away from the measuring point.
- The equipment must be sited at a location large enough to allow maintenance and checking.

1.7.1. FIXING AND MOUNTING

The housing must be protected from mechanical shocks. No drilling or machining must be done. Make sure the cable gland is appropriately tightened and make a wiring system to avoid running water alongside and to maintain the appropriate level of IP. If you do not take these precautions into account, the envelop certification would be put at risk and the ingress of protection of the housing might be modified. With an appropriate spanner, make sure the pressure connector is properly tightened.

Liquid pressure measurement

The transmitter must be installed below the pressure taps. The piping must be installed in a way to prevent gas accumulation in the transmitter. Connecting a tank gas may be useful. The impulse pipes should have a downward slope of 1/10 or more between the process connection and transmitter to prevent accumulation of gas.

Gas pressure measurement

The transmitter must be installed above the canalization to prevent condensation in the impulse pipes and in the measurement chamber. If the gas temperature is too high, a condenser must be used. The impulse pipes should have an upward slope of 1/10 or more between the process connection and transmitter to prevent accumulation of liquid or condensate.

Steam pressure measurement

The transmitter must be installed below or sideways the pressure taps. A drain pot must be installed between the transmitter and the pressure tap. The impulse pipe connecting the drain pot to the transmitter must be filled with water. A purge must be installed.

Cautions on impulse piping

- Protection is required to prevent dust from entering through the atmospheric air inlet after installation of the manifold valve.
 - During installation, avoid mechanical constraints on the transmitter connections.
 - If external deterioration (corrosion, overflow, shock ... etc) is observed, then the concerned transmitters must be checked before commissioning. To avoid the deterioration of the transmitter mounted externally, mount it in a protection box.
 - When the process fluid is likely to freeze, the transmitter and the impulse pipes must be equipped with a reheating system (i.e. steam tracing)
 - The temperature must never overrun the fixed limits
- The reheating must be maintained even when the installation is shut down, if not the transmitter and impulse pipes must be drained to prevent freezing.
- **Flange mounted transmitters**
- The flange screw down must be done in diagonal order and in three passes with the fitted torque.

1.7.2. INSTALLATION CONDITIONS IN HAZARDOUS AREA

These equipments can be installed in hazardous area and are in compliance with the ATEX 2014/34/EU directive: class II (1) GD with "ia" type of protection. The ambient temperature must be in keeping with the one indicated in section 1.2.

1.7.3. ELECTRICAL CONNECTION

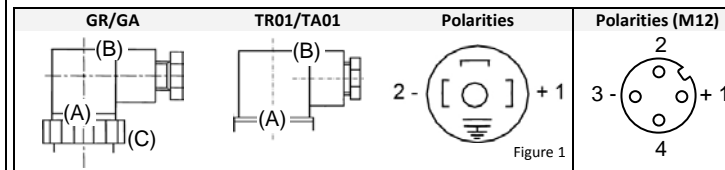
Electrical connections must be executed when DE-ENERGIZED (after the mounting and fixing of the equipment). Make sure that no hazardous atmosphere is present. The wiring must be executed according to the sound engineering practice and the in force norms. For relative transmitter of range inferior to 0...10bar (full scale), a cable with vent should be used to prevent output signal drift when tightening the mobile plug screw (P_{atm} influence). The transmitter is protected from a change of polarity of the supply voltage.

Instrumentation cable

To obtain the best Electromagnetic compatibility protection, the cables used must be shielded and fit to cable inputs furnished as standards. Terminal blocks are designed for wires of 1.5mm² max. If it is not by the pressure connector, the transmitter grounding must be assured by the cable connector and shielding. For intrinsically safe installation, the shielding should not be grounded on the power supply side but connected to the transmitter.

Models with connector (GR/GA;TR01/TA01)

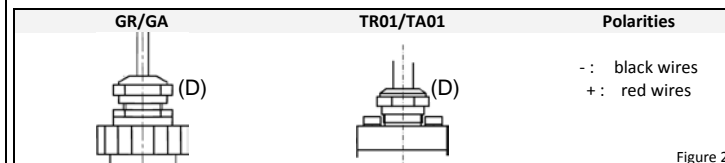
To ensure a perfect sealing, the supplied joint (B) should be mounted between the fixed connector and the mobile plug. The adequate torque for the central screw (A) is 50 to 60 Ncm. The DIN43650 is designed for 4.5 to 7 mm cable diameter. The adequate torque for the PG11 cable gland is 250 to 375 Ncm according to the cable Ø. Do not unscrew the part (C).



As the connector is sensitive to electrostatic charges, measures must be taken to avoid them (ex. Do not rub the connector).

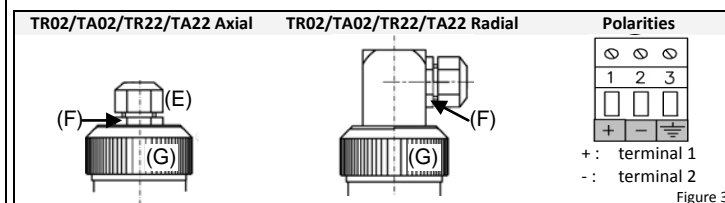
Models with output cable

To ensure a perfect sealing, do not act on the cable gland (D). The features of the cable are: Ø outer: 7.3mm – shielded type – PVC coated – conductor 2x0.34mm² – nylon vent tube. Radius of sharpest curve: 75mm. The electric connector of these transmitters must be done in compliance with the section 6.1 of the EN 60079-11 standard. Do not rub the PVC cable with a dry cloth.



Models with cable gland (TR02/TA02)

To ensure a perfect sealing, the cable gland must be tightened with an appropriate spanner. The cable gland is designed for cables of diameter from 4 to 8 mm. The adequate torque for the cap nut (E) on the body (F) is 15 to 22 Nm; always hold the body (F) in position with a spanner to prevent rotation during tightening the cap nut (E). The cover (G) will be screw in abutment (sealing by internal ring).



1.7.4. SPECIAL CONDITIONS FOR SAFE CONNECTION

The transmitters must only be connected to intrinsically safe interfaces. The association of these equipment with the jumper lead must be compatible with intrinsic safety rules. The electrical parameters of these interfaces must not exceed the values indicated in section 1.4. For the ATEX material, the ambient use temperature must never exceed +55°C (T6 class) or +70°C (T5 class). For non ATEX material this temperature must never exceed the operating temperature range. The equipment surface temperature (indicated on the material) must never be exceeded. This temperature must take into account both ambient and fluid temperatures. The installation of the equipment in zone 0 must be in compliance with the EN 60079-14 standard and especially the section 12. The transmitters must be connected in compliance with the section 12 of the EN 60079-11 standard.

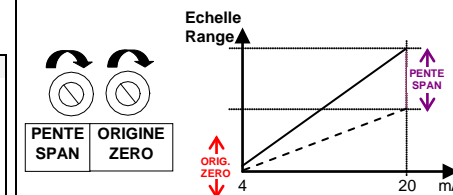
1.7.5. ROUTING OF CABLES

Particular precaution must be taken to avoid electromagnetic coupling with other cables that might cause hazardous voltage or currents. The type and path of cable designed for hazardous area (Intrinsic Safety cables) must be in compliance with the sections 9 of the EN 60079-14 standard.

The Intrinsically safe cables must be bridled to avoid an accidental contact with other cables in the event of a wrenching.

1.7.6. SETTING

All TR/TA transmitters are equipped with two internal potentiometers that allow the operator to adjust the 0 and the span (+/-3%). For models with "rangeability" option, the operator can adjust the span from 50 to 100% of the F.S. (refer to datasheet for corresponding models).



TR/TA*1

2 screws (V) will give you access to internal potentiometers for TR/TA (non varnished screws). Torque : 1.2Nm

TR/TA*2 : The access is via the cover (G) – refer to figure 3.

1.7.7. CONDITIONS FOR SAFE USE (SIL PRODUCT)

Conditions for safe use must be consulted on the SIL declaration of conformity.

2) MAINTENANCE

No particular maintenance is necessary. No object should be inserted in the pressure connector orifice and no object should be able to bend the stainless steel diaphragm (transmitter with flush diaphragm or diaphragm seal pressure transmitter). According to the application conditions and the measured process, a periodic check of the output signal of the transmitter has to be done by skilled people (**suggested period: 12 months**). The equipment removal must be done when DE-ENERGIZED and with a spanner adapted to the connection. GEORGIN guarantees the certification of the equipment EX Works. Any operation other than the setting of the zero or the span (TR/TA) will rule out GEORGIN's responsibility in case of failure. If a fault is suspected or observed, the equipment must be returned to our service or mandatory, them alone are authorized to expertise or repair the equipment.

3) CONTACT US

This manual as well as certificates are available on our website www.georgin.com.