

PLC COUPLER OVER THREE-PHASE MEDIUM-VOLTAGE CABLES



DESCRIPTION OF TGMT-2

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ZIV
Antonio Machado,78-80
08840 Viladecans, Barcelona-Spain
Tel.: +34 933 490 700
Fax: +34 933 492 258
Mail to: ziv@zivautomation.com
www.zivautomation.com

SAFETY SYMBOLS



WARNING OR CAUTION:

This symbol denotes a hazard. Not following the indicated procedure, operation or alike could mean total or partial breakdown of the equipment or even injury to the personnel handling it.



NOTE:

Information or important aspects to take into account in a procedure, operation or alike.

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1 INTRODUCTION

1.1 GENERAL

The TGMT-2 is an inductive PLC (Powerline Communications) coupler intended for wideband transmission, which allows a high-frequency signal to be injected and transmitted over medium voltage power lines.

It allows clamping a three-phase medium voltage cable without discharging the line.

It can be used indoors and outdoors thanks to its resin encapsulation.

The idea behind the mechanical design of the TGMT-2 is to make installation easy and convenient for cables up to 110 mm in diameter.



Figure 1 TGMT-2 coupler

1.2 TECHNICAL CHARACTERISTICS

1.2.1 Electrical characteristics

| | |
|---|--|
| Coupling | Inductive (split-core type) between three phases and earth over insulated cables |
| Use | Indoors or outdoors ⁽¹⁾ |
| Maximum system voltage (between phases) | 24 kV _{rms} |
| Frequency range | 2 ÷ 30 MHz |
| Nominal impedance | 50 Ω |
| Insertion losses | See graph ⁽²⁾ in Figure 2 |

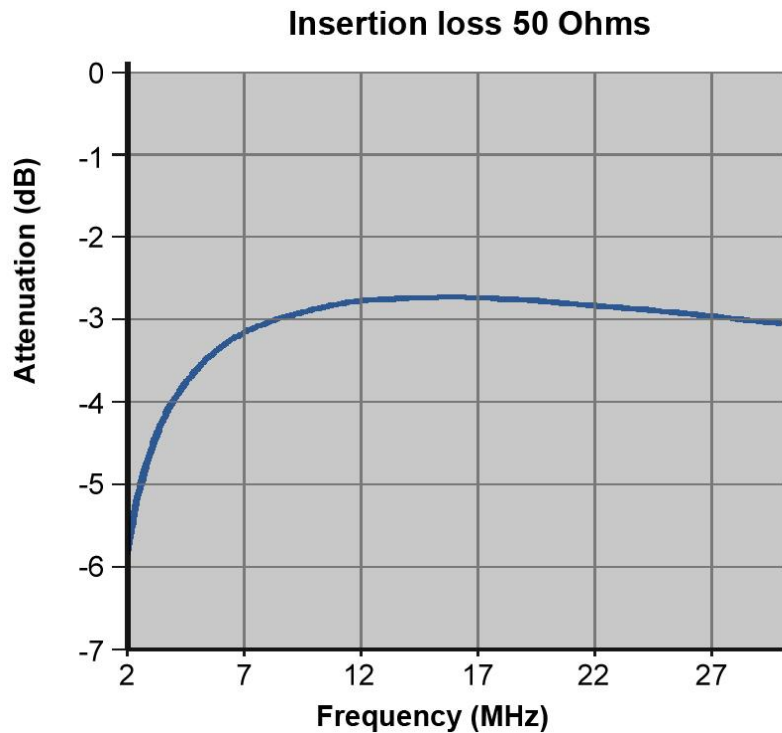


Figure 2 Insertion losses for 50 Ω resistive line impedance

⁽¹⁾ When installed outdoors the BNC connector must be protected against water.

⁽²⁾ The insertion losses depend on the generator and line impedances. The graph shows the losses for a 50 Ω impedance generator and 50 Ω impedance line.

TGMT-2

1.2.2 Nominal operating conditions

Temperature range From -10°C to +60°C

1.2.3 Mechanical characteristics

| | |
|---------------------------|---|
| Dimensions | Internal Ø: 115 mm External Ø: 174 mm Width: 195 mm Thickness: 47 mm See Figure 3 |
| Maximum MV cable diameter | 110 mm |
| Equipment connection | BNC connector (2 m coaxial cable) |
| Locking system | Two Allen M5 screws |
| Accessories | BNC female-female cable extension |
| Weight | 2 kg |

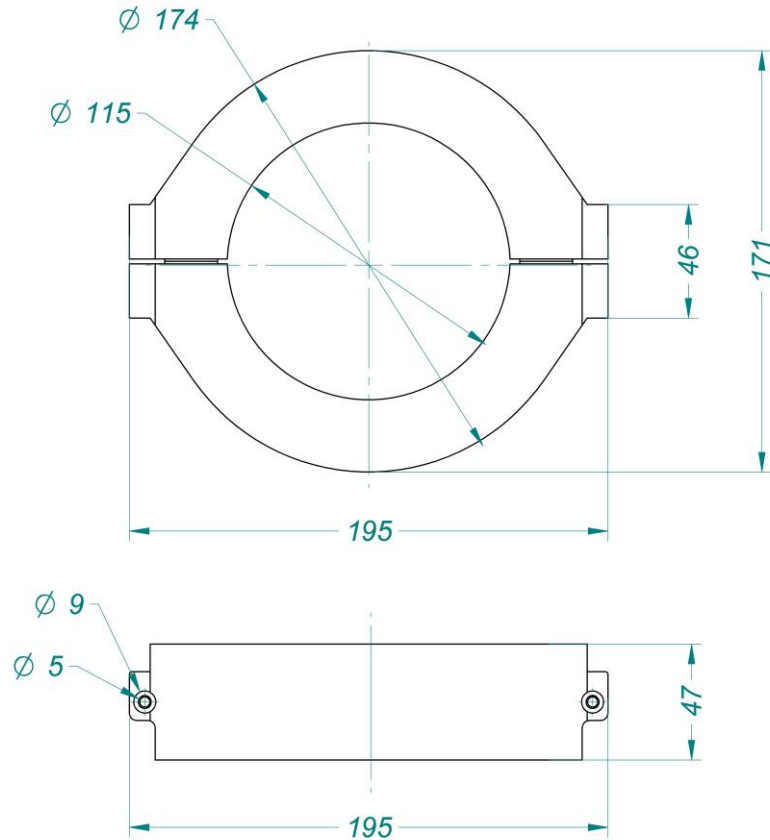


Figure 3 TGMT-2 overall dimensions

2 INSTALLING THE TGMT-2 COUPLER

2.1 WARNINGS BEFORE INSTALLING



- !
1. The TGMT-2 coupler must be installed and handled following the safety standards (EN 50110-1 and EN 50110-2).
 2. Special consideration should be the following:
 - Only qualified personnel appointed by the electricity company that owns the installation should carry out the installation and handling of the TGMT-2.
 - The safety measures and prevention of risks established for this type of work by the electricity company that will use these devices have to be taken in consideration.
 - The environment in which it is to operate should be suitable for the TGMT-2, fulfilling all the conditions indicated in section 1.2, *Technical characteristics*.
 3. ZIV will not accept responsibility for any injury to persons, installations or third parties, caused by the non-fulfilment of points 1 and 2.

2.2 INSTALLATION

The installation process of the TGMT-2 coupler consists of connecting it to the medium-voltage power line and to the communication equipment.

The connection to the medium-voltage power line basically consists of inserting the insulated three-phase cable inside the TGMT-2 making sure, as applicable (see *Configuration 2* in section 2.2.3), that the shield does not touch any metal surface before the earth connection.

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2.2.1 Clamping procedure

The TGMT-2 is of split-core type and allows installation by clamping the conductor.

In order to insert the insulated three-phase cable inside the coupler, and its shield as applicable, the TGMT-2 must be reassembled as follows.

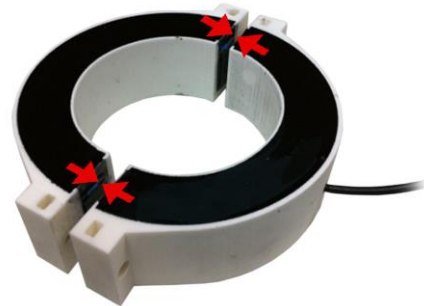
Step 1:

Arrange the two cores.



Step 2:

Once the insulated three-phase cable, and its shield as applicable, are inserted, line up the two cores as indicated.



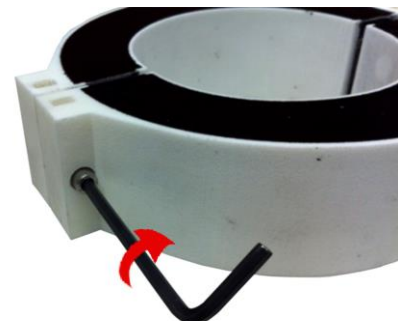
Step 3:

Introduce the two M5 screws in the core provided with the cable.



Step 4:

Fix the two screws by means of a number 5 ALLEN spanner, making sure that the two cores are completely joined and there are no air gaps between them.



In order to disassemble the coupler, the process must be carried out in reverse.

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2.2.2 Connection to the communication equipment

The cable coming from the communication equipment is connected to the TGMT-2 by means of the BNC connector.

The TGMT-2 is supplied with a BNC cable 2 m long. If a longer cable is needed, a BNC female-female extension cable can be supplied on request.



Figure 4 BNC female-female extension

2.2.3 Electrical connection to the medium-voltage power line

There are two different configurations for injecting the PLC signal depending on whether the transmission is performed using both the shield and the conductor or just the conductor.

Configuration 1 (without access to the shield)

In this configuration the PLC signal is injected over the three conductors and the shield.

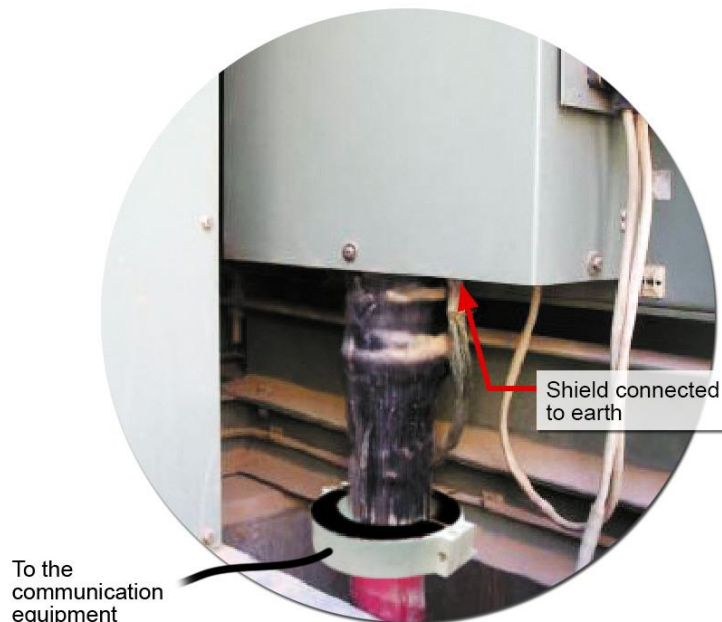


Figure 5 Configuration with transmission over both the shield and the conductor

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Configuration 2 (having access to the shields)

In this configuration the PLC signal is injected over the three conductors.

The shields of each of the three cables pass through the TGMT-2 and then should be connected to earth.

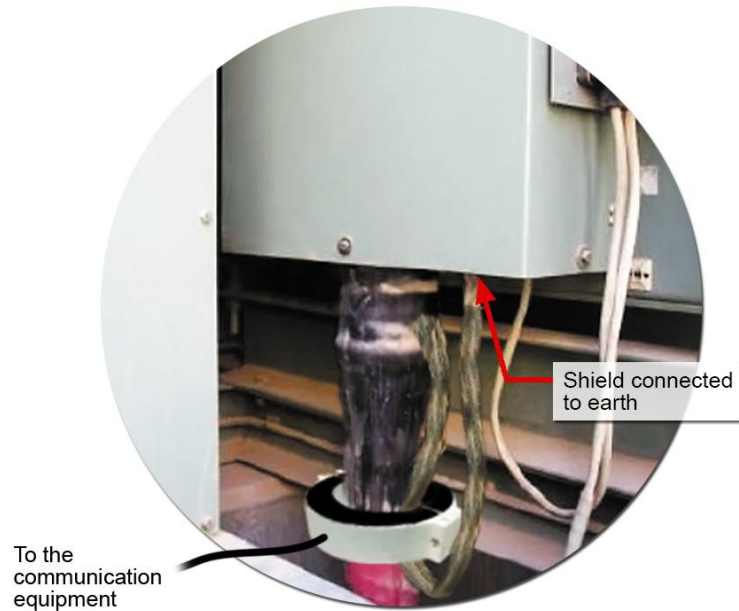


Figure 6 Configuration with transmission over just the conductor