

User's Manual

PMM L2-D

DELTA NETWORK

SERIAL NUMBER OF THE INSTRUMENT

You can find the Serial Number on the rear panel of the instrument.

Serial Number is in the form : 0000X00000.

The first four digits and the letter are the Serial Number prefix, the last five digits are the Serial Number suffix. The prefix is the same for identical instruments, it changes only when a configuration change is made to the instrument.

The suffix is different for each instrument.

NOTE:

If the instrument is used in any other way than as described in this Users Manual, it may become unsafe



Before using this product, the related documentation must be read with great care and fully understood to familiarize with all the safety prescriptions.


To ensure the correct use and the maximum safety level, the User shall know all the instructions and recommendations contained in this document.

This product has a **Pollution Degree II** normally only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation must be expected.



The information contained in this document is subject to change without notice.

KEY TO THE ELECTRIC AND SAFETY SYMBOLS:

 You now own a high-quality instrument that will give you many years of reliable service. Nevertheless, even this product will eventually become obsolete. When that time comes, please remember that electronic equipment must be disposed of in accordance with local regulations. This product conforms to the WEEE Directive of the European Union (2002/96/EC) and belongs to Category 9 (Monitoring and Control Instruments). You can return the instrument to us free of charge for proper environment friendly disposal. You can obtain further information from your local Narda Sales Partner or by visiting our website at www.narda-sts.it.



Warning, danger of electric shock



Earth



Read carefully the Operating Manual and its instructions, pay attention to the safety symbols.



Unit Earth Connection



Earth Protection



Equipotential

KEY TO THE SYMBOLS USED IN THIS DOCUMENT



DANGER

The DANGER sign draws attention to a potential risk to a person's safety. All the precautions must be fully understood and applied before proceeding.



WARNING

The WARNING sign draws attention to a potential risk of damage to the apparatus or loss of data. All the precautions must be fully understood and applied before proceeding.



CAUTION

The CAUTION sign draws attention against unsafe practices for the apparatus functionality.



NOTE:

The NOTE draw attention to important information.

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SAFETY RECOMMENDATIONS AND INSTRUCTIONS

This product has been designed, produced and tested in Italy, and it left the factory in conditions fully complying with the current safety standards. To maintain it in safe conditions and ensure correct use, these general instructions must be fully understood and applied before the product is used.

- Over current protection is not provided in the LISN. The LISN must be connected to a power mains which has the properly rated mains protection installed.
- When the device must be connected permanently, first provide effective grounding;
- If the device must be connected to other equipment or accessories, make sure they are all safely grounded;
- In case of devices permanently connected to the power supply, and lacking any fuses or other devices of mains protection, the power line must be equipped with adequate protection commensurate to the consumption of all the devices connected to it;
- In case of connection of the device to the power mains, make sure before connection that the voltage selected on the voltage switch and the fuses are adequate for the voltage of the actual mains;
- Devices in Safety Class I, equipped with connection to the power mains by means of cord and plug, can only be plugged into a socket equipped with a ground wire;
- Any interruption or loosening of the ground wire or of a connecting power cable, inside or outside the device, will cause a potential risk for the safety of the personnel;
- Ground connections must not be interrupted intentionally;
- To prevent the possible danger of electrocution, do not remove any covers, panels or guards installed on the device, and refer only to NARDA Service Centers if maintenance should be necessary;
- To maintain adequate protection from fire hazards, replace fuses only with others of the same type and rating;
- Follow the safety regulations and any additional instructions in this manual to prevent accidents and damages.
- The probe cannot be handled in proximity of high voltage mains line.
- If the probe is to be connected to high voltage mains line a safety interlock equipment must be installed to ensure the mains line be switched off before any probe handling or connection
- The user must provide a safety protection cover with a low voltage interlock switch able to cut off mains voltage before probe handling or connection.

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1 - General Information

1.1 Documentation

Enclosed with this Operating Manual are a service questionnaire to send back to NARDA in case of equipment service is needed, and an accessories check list to verify all accessories enclosed in the packaging.

1.2 Introduction to PMM DELTA Network

PMM DELTA Network is defined in CISPR 16 and VDE 0876 Normative about its equivalent circuit and principal characteristic.

The DELTA Network is used to measure electromagnetic interference on balanced lines (typically on twisted telephon lines)

DELTA Network LISN (Line Impedance Stabilization Network) or Artificial Network, allows the symmetrical or asymmetrical measurement of electromagnetic interferences conducted by DUT (Device Under Test) on signal lines.

The following figure shows as to simulate the LISN impedance depending on DUT connection.

Relationship between voltages measured in symmetrical or asymmetrical connection is also shown.

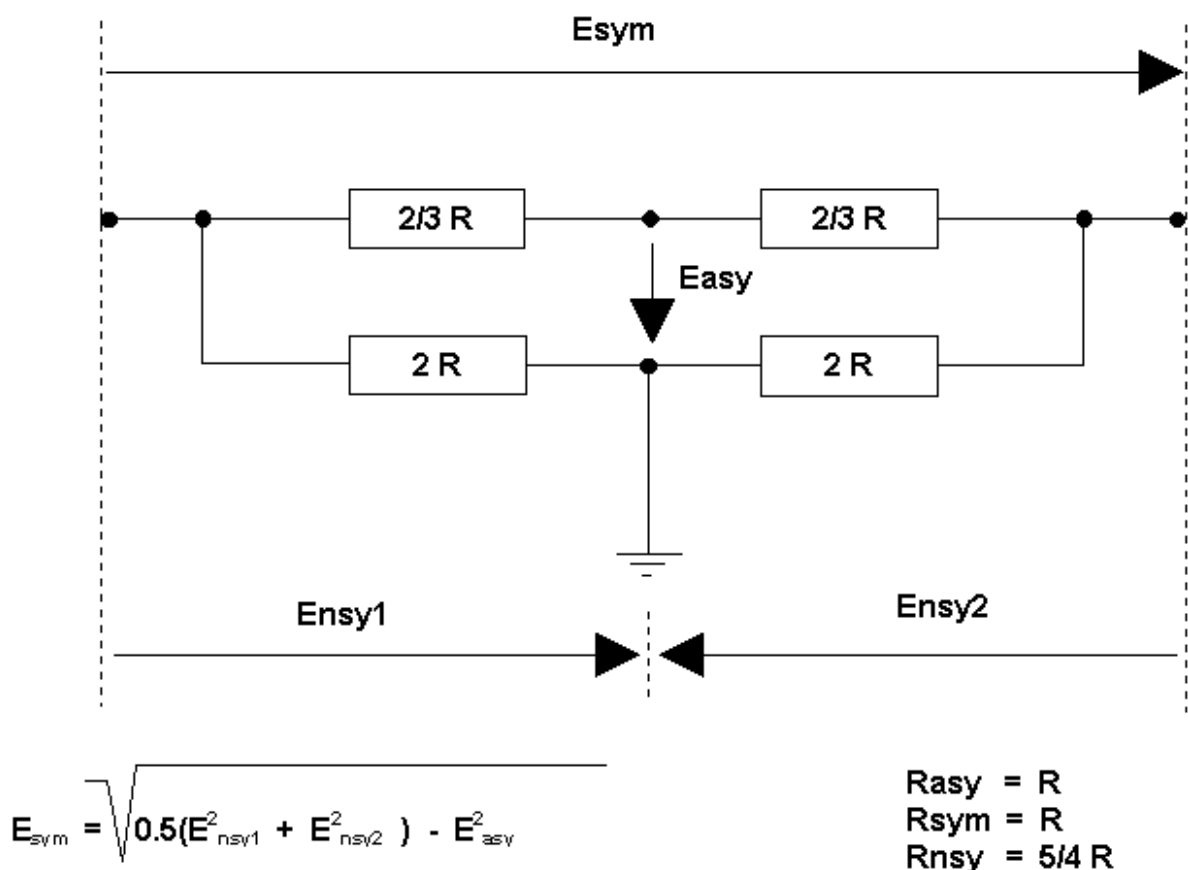


Fig. 1-1 Network impedance simulation

1.3 Shipping components

PMM DELTA Network is composed by the following components:

- PMM DELTA Network
- Operating Manual.

1.4 Packing/Unpacking

Inspect the shipping container for damage.

If the shipping container or cushion material is damaged, it should be kept until the contents of the shipment have been checked for completeness and the instrument has been checked mechanically and electrically.

Verify the accessories availability in the shipping container referring to the accessories check list enclosed with the Operating Manual.

Notify any damage to the carrier as well as the NARDA Representative.

1.5 Environment

The operating environment is specified to be within the following limitations :

- Temperature 0° to +45° C
- Humidity < 90% relative

The instrument should be stored in a clean, dry environment

The storage and shipping environment is specified to be within the following limitations :

- Temperature -25° to + 70° C
- Humidity < 95% relative

1.6 Return for service

If the instrument should be returned to NARDA for service, please complete the service questionnaire enclosed with the Operating Manual and attach it to the instrument.

To minimize the repair time, be as specific as possible when describing the failure. If the failure only occurs under certain conditions, explain how to duplicate the failure.

If possible, reuse of the original packaging to ship the equipment is preferable.

In case other package should be used ensure to wrap the instrument in heavy paper or plastic.

Use a strong shipping container and use enough shock absorbing material around all sides of the equipment to provide a firm cushion and prevent movement in the container.

Protect the front panel to prevent damage during shipment.

Seal the shipping container securely with shipment tape.

Mark the shipping container FRAGILE to encourage careful handling.

1.7 Equipment cleaning

Use a clean, dry non abrasive cloth for external cleaning of the equipment.



CAUTION

To clean the equipment do not use any solvent, thinner, turpentine, acid, acetone or similar matter to avoid damage to external plastic or display surfaces.

2 - Main specifications

2.1 Main specifications

Table 2-1 lists the PMM DELTA Network performance specifications.
 The following conditions apply to all specifications :

- The ambient temperature must be 0° to 45°.

TABLE 2-1 Main specifications	
Equivalent Circuit	CISPR 16 (see Fig. 2-1)
Frequency Range	150 kHz - 30 MHz)
Symmetrical connection attenuation	see graphic on Fig. 2-2
Asymmetrical connection attenuation	see graphic on Fig. 2-3
LISN impedance	150 ohm
RF output impedance	50 ohm
Maximum current	2 Ampere
Operating temperature	0 to +45 °C
Storage temperature	-25 to +70 °C
Mechanical dimensions	265 x 120 x 295 mm
Weight	5 Kg. Ca.

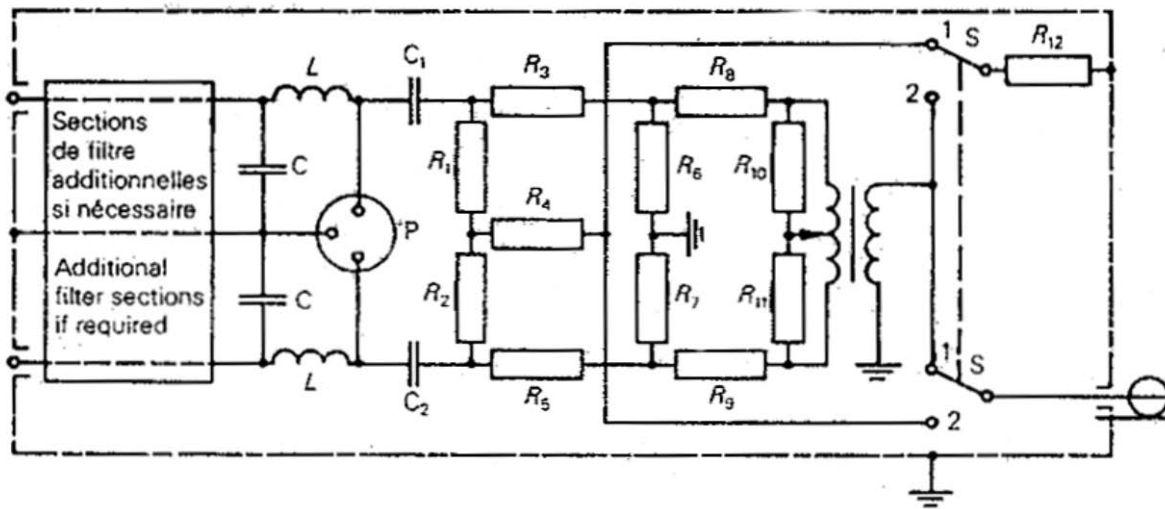


Fig. 2-1 Equivalent CISPR 16 circuit

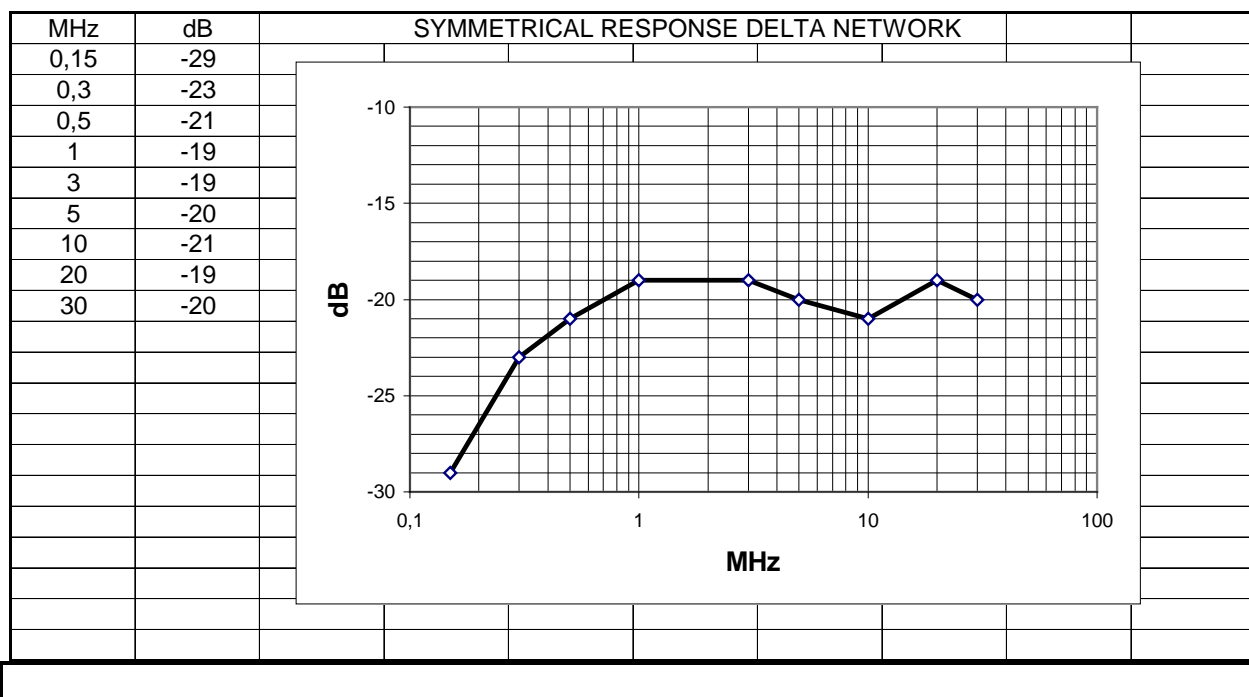


Fig.2-2 Symmetrical response of the DELTA Network

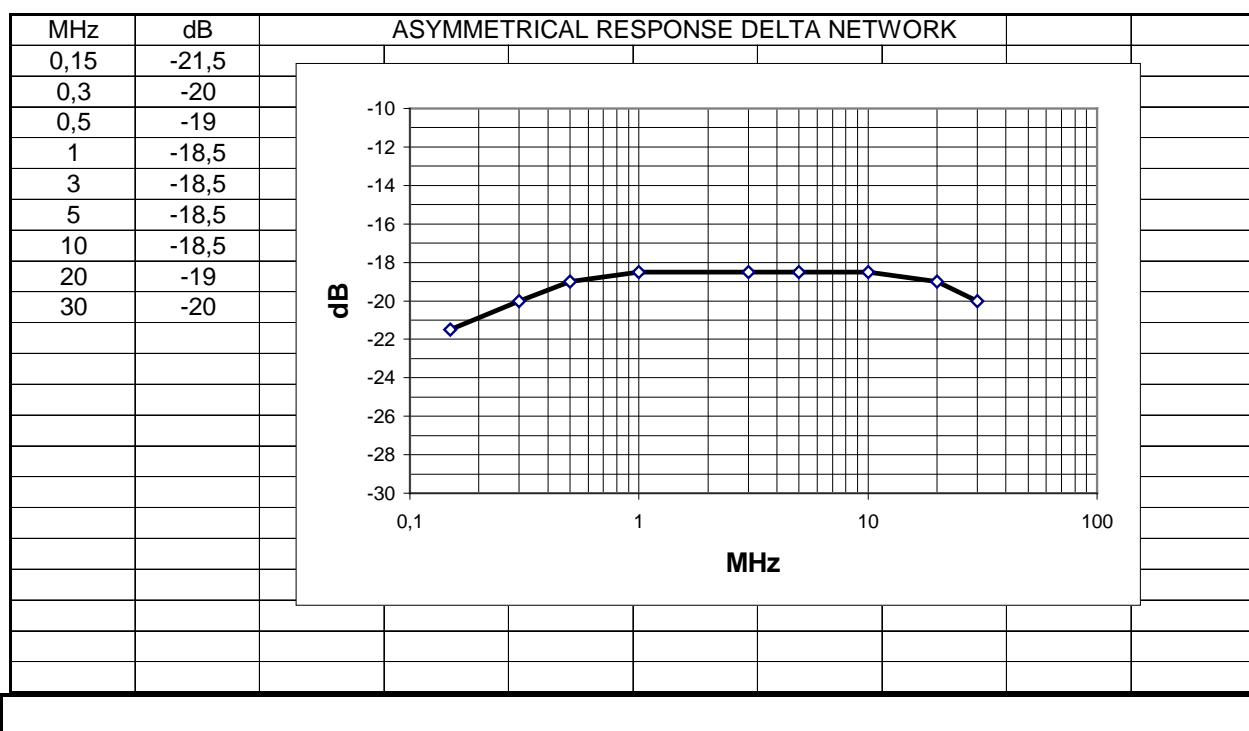


Fig. 2-3 Asymmetrical response of the DELTA Network

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3 - Front and Rear Panel connections

3.1 Front and Rear Panels

In Figure you can see front and rear connections of DELTA Network.

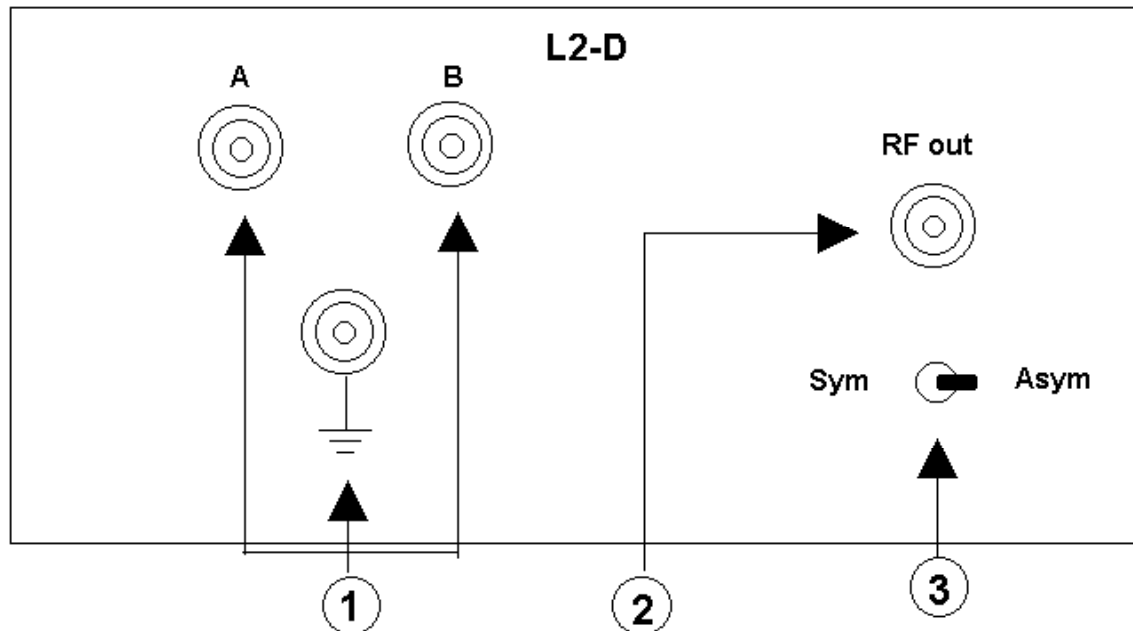


Fig. 3-1 Front panel

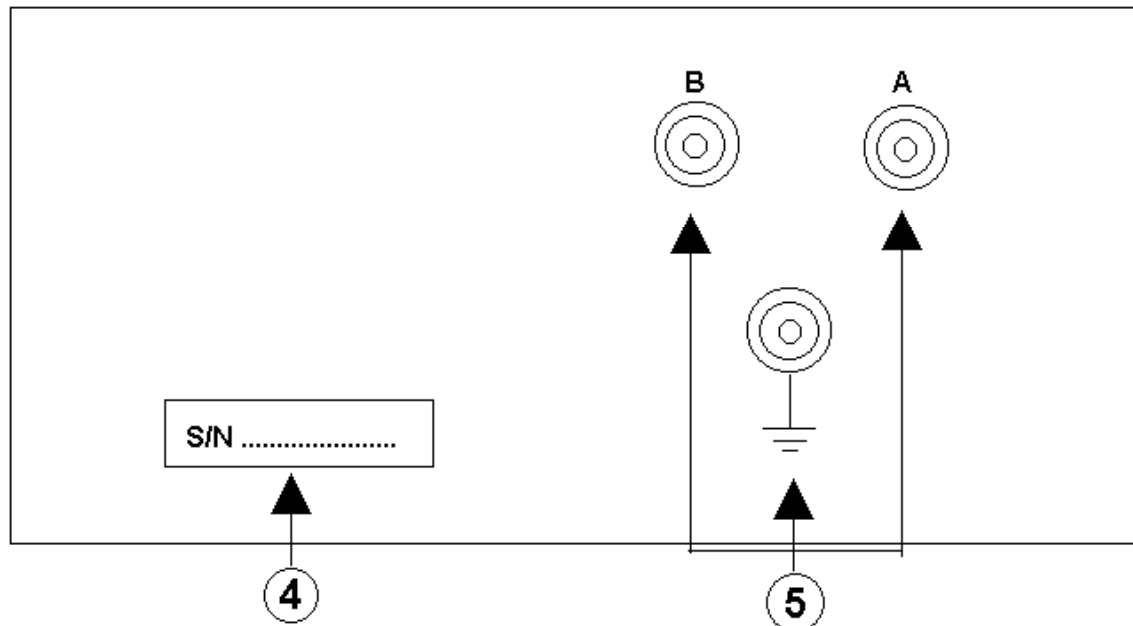


Fig. 3-2 Front panel

- 1 - DUT side connection (Line A, Line B, Ground)
- 2 - RF out connector (50 ohm BNC female)
- 3 - Symmetrical/Asymmetrical RF signal connection switch
- 4 - Equipment Serial Number
- 5 - Network side connection (Line A, Line B, Ground)

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Caro cliente

grazie per aver acquistato un prodotto NARDA! Sei in possesso di uno strumento che per molti anni ti garantirà un'alta qualità di servizio. NARDA riconosce l'importanza del Cliente come ragione di esistenza; ciascun commento e suggerimento, sottoposto all'attenzione della nostra organizzazione, è tenuto in grande considerazione. La nostra qualità è alla ricerca del miglioramento continuo. Se uno dei Suoi strumenti NARDA necessita di riparazione o calibrazione, può aiutarci a servirla più efficacemente compilando questa scheda e accludendola all'apparecchio.

Tuttavia, anche questo prodotto diventerà obsoleto. In questo caso, ti ricordiamo che lo smaltimento dell'apparecchiatura deve essere fatto in conformità con i regolamenti locali. Questo prodotto è conforme alle direttive WEEE dell'Unione Europea (2002/96/EC) ed appartiene alla categoria 9 (strumenti di controllo). Lo smaltimento, in un ambiente adeguato, può avvenire anche attraverso la restituzione del prodotto alla NARDA senza sostenere alcuna spesa. Può ottenere ulteriori informazioni contattando i venditori NARDA o visitando il nostro sito Web www.narda-sts.it.

Dear Customer

thank you for purchasing a NARDA product! You now own a high-quality instrument that will give you many years of reliable service. NARDA recognizes the importance of the Customer as reason of existence; in this view, any comment and suggestion you would like to submit to the attention of our service organization is kept in great consideration. Moreover, we are continuously improving our quality, but we know this is a never ending process. We would be glad if our present efforts are pleasing you. Should one of your pieces of NARDA equipment need servicing you can help us serve you more effectively filling out this card and enclosing it with the product.

Nevertheless, even this product will eventually become obsolete. When that time comes, please remember that electronic equipment must be disposed of in accordance with local regulations. This product conforms to the WEEE Directive of the European Union (2002/96/EC) and belongs to Category 9 (Monitoring and Control Instruments). You can return the instrument to us free of charge for proper environment friendly disposal. You can obtain further information from your local NARDA Sales Partner or by visiting our website at www.narda-sts.it.

☒ **Servizio richiesto:** ☒ *Service needed:*

☐ Solo taratura ☐ Riparazione ☐ Riparazione & Taratura ☐ Taratura SIT ☐ Altro:
☐ Calibration only ☐ Repair ☐ Repair & Calibration ☐ Certified Calibration ☐ Other:

Ditta:

Company:

Indirizzo:

Address:

Persona da contattare:

Technical contact person:

Telefono:

Phone n.

Modello:

Equipment model:

Numero di serie:

Serial n.

☒ **Accessori ritornati con l'apparecchiatura:** ☐ Nessuno ☐ Cavo(i) ☐ Cavo di alimentazione ☐ Altro:
☒ Accessories returned with unit: ☐ None ☐ Cable(s) ☐ Power cable ☐ Other:

☒ **Sintomi o problemi osservati:** ☒ *Observed symptoms / problems:*

☒ **Guasto:** ☐ Fisso ☐ Intermittente **Sensibile a:** ☐ Freddo ☐ Caldo ☐ Vibrazioni ☐ Altro
☒ Failure: ☐ Continuous ☐ Intermittent **Sensitive to:** ☐ Cold ☐ Heat ☐ Vibration ☐ Other

Descrizione del guasto/condizioni di funzionamento:

Failure symptoms/special control settings description:

Se l'unità è parte di un sistema descriverne la configurazione:

If unit is part of system please list other interconnected equipment and system set up:

[illegible]