P1DME

Installation manual
Manual code No.:
D296ME00GB
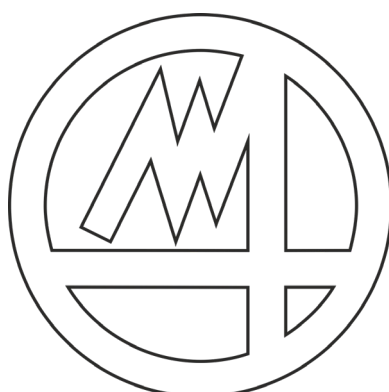
MARPOSS

MANUFACTURER	MARPOSS S.p.A.
ADDRESS	Via Saliceto, 13 - Bentivoglio (BO) Italy - www.marposs.com
TYPE OF EQUIPMENT - MODEL	P1dME
FUNCTION	Measurement system for grinding machines
MANUAL CODE	D296ME00GB
ISSUE	December 2019
REVISION	June 2021
ORIGINAL LANGUAGE	Italian

$$C\,E$$

This product conforms to the following directives:
- 2014/30/EU EMC directive
- 2014/35/EU Low Voltage directive
- 2011/65/EU RoHS directive

The applicable standards are:
- EN 61326-1 (EMC)
- EN 61010 - 1 (SAFETY)
- EN 50581 (RoHS)

For information about possible use in Marposs products of materials coming from conflict areas, refer to: http://www.marposs.com/compliance_detail.php/eng/conflict_minerals

IK06

INFORMATION FOR USERS

Pursuant to the Standard IEC 62202 (corresponding to the Italian Standard CEI EN 62262-classification CEI 70-4) "Degree of protection against mechanical impacts".

The equipment has an energy protection level equivalent to 1 J, corresponding to a rating of IK06 (ref. IEC 62262). The energy level was verified in accordance with the test defined in the Standard EN 61010-1: 2010 paragraph 8.2.2 (impact test). If the glass is broken, use the appropriate safety gloves when handling the object and contact customer service in order to replace the equipment.

INFORMATION FOR USERS

in accordance with article 26 of the Italian Legislative Decree N. 49, "Enactment of the Waste Electrical and Electronic Equipment Directive 2012/19/EU", dated 14 March 2014.

The crossed out wheelie bin symbol that appears on the product or its packaging indicates that the product must be disposed of separately from other waste materials at the end of its working life.

The manufacture shall be responsible for organizing and handling separate collection of the equipment described in this manual at the end of its working life. Users who wish to dispose of the equipment must contact the manufacture and follow the procedures implemented by the latter for the separate collection of the equipment at the end of its working life.

Sorting the equipment to be disposed of into its component materials before recycling, treatment and environmentally compatible disposal helps to prevent potentially harmful effects on health and the environment and favours re-use and/or recycling of these materials.

Illegal disposal of the product by the user is punishable by the application of fines or other penalties as defined by the applicable regulation.

P1DME

INSTALLATION MANUAL CONTENTS

P1DME

1. GENERAL INFORMATION

1.1 Introduction

The P1dME has been designed and built to be installed as a machining control accessory in machines such as grinders.

The P1dME must be installed in accordance with the instructions provided in this manual and shall not conform to the European standards and directives listed on page 2 unless these conditions are fulfilled.

Any modification or maintenance work not covered in this technical document shall be considered unauthorised since any modification that alters the P1dME construction specifications, whether mechanical or electrical, can only be performed by Marposs, which will certify compliance with the safety standards.

Marposs declines all responsibility in case of any non-compliance with the above.

The descriptions and illustrations supplied with this documentation are not definitive. Marposs reserves the right to modify the product as and when necessary, in order to improve performance, or for any other reason, and without the obligation to update this document.

This document may not be reproduced or transmitted, either wholly or partially, in any form or medium without the prior permission of Marposs SpA.

Legal action will be taken in the event of any violations of this condition.

The safety of any system that incorporates this device and its accessories is the sole responsibility of the system assembler.

2. *GENERAL WARNINGS*

2.1 Warnings for users

This instruction manual provides all the specific information necessary for knowledge and correct use of the Marposs equipment in your possession.
THE BUYER MUST ENSURE THAT ALL PERSONNEL ASSIGNED TO INSTALL, OPERATE AND SERVICE THE EQUIPMENT READ THIS MANUAL.
The information contained in this manual is intended for use by the following categories of personnel:
• Marposs personnel, or personnel assigned by the manufacturer of the machine tool that will house the P1dME (hereafter the "Customer"), who will be directly responsible for installing the equipment.
• Technical personnel employed by the end user (hereafter "the User") who will be directly responsible for operating the Marposs equipment.
• Technical Personnel assigned by the User to carry out maintenance work on the production line where the P1dME is installed.
The manual is an integral part of the equipment, therefore the user must ensure that it is always available and is kept good condition throughout the working life of the equipment.
The liability of Marposs is limited to correct use of the P1dME as defined in this manual and its attachments.
Marposs shall provide the customer with a copy of this manual and its attachments.
Preparations that are the responsibility of the Customer.
The customer shall:
Correctly position the P1dME on its own machine and secure it.
• Make the electrical connections.
• Setup the P1dME
The User shall:
• Program the P1dME
• Perform the routine and extraordinary maintenance operations.

The safety of any system that incorporates this device and its accessories is the sole responsibility of the system assembler.

2.2 Testing and guarantee

Materials are guaranteed against defects, with the following limitations:
•   DURATION OF THE WARRANTY: the warranty covers the product and all repairs carried out on it during the standard guarantee period.
•   SUBJECT OF THE WARRANTY: the warranty applies to the product or its parts marked with the serial number or other identification systems used by Marposs.
The above guarantee applies unless other agreements are reached between Marposs and the Customer.

2.3 Requesting technical assistance and maintenance

In case of failures or faults that require the intervention of Marposs personnel contact your local technical support centre (for a complete list, go to:http://www.marposs.com/worldwide_addresses.php/eng).

2.4 How to order spare parts

To order spare parts please contact your closest Marposs centre (see: http://www.marposs.com/worldwide_addresses.php/eng)

2.5 Original version

This document was originally written in Italian.
In case of any dispute arising from translation errors and inaccuracies, even where carried out by Marposs, the definitive version shall be in Italian.

2.6 Authorised and unauthorised use

2.6.1 Intended use

The P1dME has been designed and built to be installed on automatic machines such as grinders in order to manage the Marposs measuring heads used for in-process part dimension checks.
The P1dME system may be used:
•   by competent trained personnel only
•   only if it is in perfect working order. (Notify your local service centre and, if necessary, contact the specialized customer service technicians in the event of faults or malfunctions during operation, or if you are in any doubt about the correct operating procedures).

2.6.2 Unauthorised uses

Under no circumstance may the P1dME be used for any purpose other than that for which it was designed. Any use that differs from the use described in this manual shall be considered unauthorised.

The following are also prohibited:
1.   Modification of the original P1dME configuration;
2.   connection of the **P1dME** to power supplies other than those described in this manual;
3.   Use the components for purposes not envisaged by Marposs.
4.   allow unauthorised personnel to carry out maintenance work on the system.
5.   Removal of safety indications and warnings displayed on the equipment

All modifications or maintenance operations not covered by the technical documentation shall be considered arbitrary. Marposs declines all liability in the event of failure to comply with the above

2.7 Identification Labels and Pictograms

Various different text formats were used when preparing this manual. Various safety warnings have been defined.

2.7.1 Symbols used in the instruction manual

ATTENTION/WARNING
This type of note indicates a risk of damage to the electronic unit or other devices connected to it, or risk conditions for the operator or technician.

N.B.
Important information that may help the operator to use and understand the system is contained in boxes indicated by the letters "N.B." in bold type.

ENVIRONMENTAL HAZARD
Recycle and/or dispose of in accordance with the applicable regulations in the destination Country.

CAUTION
Observe the procedures for handling devices that are sensitive to electro-static discharges. Failure to comply may cause malfunctions or damage the equipment.

For the P1dME, this symbol is on the packaging of the I/O BOX ("5. Removing the P1dME from its packaging" on page 16)

ELECTRIC SHOCK HAZARD
Dangerous voltages: There may be electric shock hazards when troubleshooting on live components.

GENERIC HAZARD
Warning sign that indicates the possibility of damage to things or a generic risk to people.
For the P1dME, this symbol is associated exclusively with the connector H1 of the I/O BOX accessory ("9. P1dME I/O BOX" on page 29) and indicates the cable specifications that must be satisfied. The symbol is on both in the documentation and the H1 connector of the I/O BOX, in order to remind the user to consult the manual.

2.7.2 Symbols present on the equipment

Below there is a list of the pictograms on the device and referred to in the instruction manual:

CAUTION
Observe the procedures for handling devices that are sensitive to electro-static discharges. Failure to comply may cause malfunctions or damage the equipment.
For the P1dME, this symbol is on the packaging of the I/O BOX ("5. Removing the P1dME from its packaging" on page 16)

ELECTRIC SHOCK HAZARD
Dangerous voltages: There may be electric shock hazards when troubleshooting on live components.

GENERIC HAZARD
Warning sign that indicates the possibility of damage to things or a generic risk to people.
For the P1dME, this symbol is associated exclusively with the connector H1 of the I/O BOX accessory ("9. P1dME I/O BOX" on page 29) and indicates the cable specifications that must be satisfied. The symbol is on both in the documentation and the H1 connector of the I/O BOX, in order to remind the user to consult the manual.

P1DME

2.7.3 Plates/markings on the P1dME and components

P1DME IDENTIFICATION PLATE

The identification plate is positioned at the rear of the P1dME
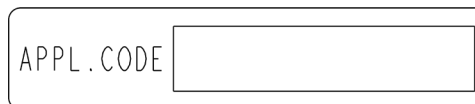The following information appears on the plate:
•   The SERIAL No of the individual P1dME
•   CE marking
•   The Marposs product identification CODE.
830PMxxxxx identifies a device with hardware and software,
830PNxxxxx identifies a device with hardware only.

If a device with hardware only was purchased, and the software is installed later, and additional label will be applied to identify the type of software installed (code CMxxxxxxxx)

```
CODE XXXXXXXXXX   C E
SERIAL No XXXXXXXX
                  MADE IN ITALY
MARPOSS  FABRIQUE EN ITALIE
```

```
APPL.CODE [                    ]
```

I/O BOX IDENTIFICATION PLATE

The identification plate is positioned at the rear of the I/O BOX
The following information appears on the plate:
•   The Marposs product identification model
•   The SERIAL No of the individual I/O BOX
•   CE marking.

```
MODEL:    SERIAL No  (M)  MADE IN ITALY   C E
                          FABRIQUÉ EN ITALIE
```

Warnings related to the P1dME and I/O BOX identification plates:
a) Never remove the plate from the original position chosen by Marposs;
b) Do not modify or alter any of the technical details indicated on it;
c) Do not attempt to clean the plate using objects such as wire brushes, which could render the data indicated on it illegible.
d) When requesting technical assistance, always quote the data indicated on the plate;

> **N.B.**
> All the data listed on the plate must always be legible.
> If a data plate is damaged or even partially illegible due to wear, ask MARPOSS for another one, quoting the data in these instructions or on the original data plate.

IK06 DATA PLATE (P1DME)

IK06
The IK06 label indicates that the equipment has an energy protection level equivalent to 1 J, corresponding to a rating of IK06. If the glass is broken, use the appropriate safety gloves when handling the object and contact customer service in order to replace the equipment.
(The second page contains the complete reference to the standard.)

I/O TYPE DATA PLATE (I/O BOX)

```
I/O   TYPE   C1
```
This label is at the rear of the I/O BOX.
It indicates the I/O BOX type (see chapter 6.2 for the list)

POWER SUPPLY DATA PLATE

```
24 V    - - -
```
This label identifies the kind of power supply for the 24 V d.c. device.

3. SAFETY DEVICES

3.1 General safety information

3.1.1 Reference directives

The P1dME has been designed and manufactured in accordance with the directives indicated on page 3 of this manual.
The P1dME must be managed by a machine tool used to machine mechanical parts, in compliance with the applicable safety standards for machinery equipment in the user's country.

3.1.2 Product conformity

The safety warnings are intended to prevent injuries to personnel and damage to both the P1dME and the environment in which it is used. All operators are expected read the safety warnings, and respect them at all times.
The P1dME is a state-of-the-art device that guarantees a high level of safety, provided all the appropriate safety measures are implemented during daily use.
The End User's responsibilities include defining such measures, and ensuring that they are implemented. Failure to observe the following instructions may result in serious injury as an indirect consequence of improper usage of the device. Device safety may only be guaranteed if the following instructions are adhered to.

WARNING
Any modification that alters the P1dME design and/or build specifications may only be implemented by Marposs, who shall be responsible for certifying compliance with the safety standards.
Therefore the modifications or maintenance interventions not set out in this document shall be considered unauthorised.
Marposs declines all responsibility in case of any non-compliance with the above.

3.2 P1dME User Categories and Duties

Installation technician: person qualified to install the P1dME system inside the machine.
Duties:
1. lift, transport and store the P1dME;
2. assemble and program the P1dME;
3. remove the P1dME.

Maintenance technician: person who is trained and qualified to carry out routine and extraordinary maintenance work on the P1dME.
Duties:
1. routine maintenance;
2. extraordinary maintenance;
3. Notify Marposs customer service personnel of unexpected situations (e.g. wear, failures, breakages, errors, etc.) not set out in this document and therefore generated by unforeseen causes.

Operator: person assigned to activate the measurement acquisition cycle and monitor the correct operation of the P1dME.
Duties:
1. Monitor the process
2. Modify the programmed parameters via the control panel, when necessary.

The operator is not required to intervene in any way while the P1dME is operating.

3.2.1 Physical and mental health of the operator/installation personnel

The operator assigned to install the P1dME must be aware of the dangers that may be created while installing machining equipment, and be capable of dealing with them.

3.2.2 Personal protection equipment (PPE)

The operators assigned to assemble and carry out maintenance on the P1dME must use the following personal protective equipment:

INSTALLATION TECHNICIANS:

	SUITABLE CLOTHING		SAFETY SHOES
	SAFETY GLOVES		SAFETY GOGGLES

MAINTENANCE TECHNICIANS:

	SUITABLE CLOTHING		SAFETY SHOES
	SAFETY GLOVES		SAFETY GOGGLES

The operator must use only PPE that complies with the locally applicable directives.

IMPORTANT
In order to guarantee the complete safety of the operator, it is important to note that **this list is not exhaustive**. The operator must use both the mandatory personal protective equipment required in the specific production environment (plant) and that prescribed by the employer

3.3 Training

THE FINAL MACHINE DOCUMENTATION MUST BE READ
The training of operators assigned to normal operation must follow the instructions set out in the documentation of the final machine that the P1dME is installed in, as this documentation cannot be exhaustive.

Personnel included in the following categories are obliged to read the instruction manual supplied with the equipment.

Installation technicians personnel assigned to transport, store and install the gauge, in order to:
• Ensure they are aware of the appropriate lifting and transport methods used for the parts of the P1dME, as stipulated by Marposs, in order to prevent the risks associated with moving loads;
• Ensure they are aware of the correct storage procedures for the parts of the P1dME in order to avoid damaging important parts, not only in terms of safety but also from an operational point of view;
• Ensure they are aware of the correct P1dME installation procedures, such as wiring the electrical parts, in order to prevent assembly errors that could lead to dangerous situations for the health and safety of the operators.

Operators assigned to supervise normal operation of the equipment, in order to:
• Ensure they adhere to the applicable regulations governing use of the equipment, and that they read and following the instructions and other information provided in the attached documentation.

P1dME maintenance technicians, in order to:
• Ensure they are aware of the correct procedures for carrying out scheduled and unscheduled maintenances activities on the P1dME.

3.4 Electrical Dangers

Every effort has been made to adopt all the necessary safety and protection measures during the design phase, however some electrical dangers remain. These risks are listed below.

ELECTRICAL PARTS
The system is energized by an electrical power supply. Personnel may be exposed to the risk of electric shocks in the event of electrical faults or when working on electrical parts. Ensure that all electrical work is carried out exclusively by qualified personnel.
Display the appropriate warning signs. After deactivating the machine, and before starting working on its electrical parts, make sure that the control panel or system controls are not connected to the electrical power supply.

Moreover, it is important to remember that:
Incorrect actions by the operator can cause residual risks.
The risks and dangers generated by:

• Operator carelessness,
• Failure to comply with the information and instructions contained in these operating instructions,
• Deliberate tampering with the P1dME or its safety devices,

Any modification that alters the P1dME build specifications, whether mechanical or electrical, can only be performed by Marposs, which will certify compliance with the safety standards. Any modification or maintenance not indicated in this document shall be considered unauthorised.
Marposs declines all responsibility in case of any non-compliance with the above.

4. TRANSPORTATION. STORAGE

4.1 Personal protection equipment (PPE)

The operators assigned to transportation, storage and installation of the P1dME must obtain and use the PPE indicated in this manual, as well as the mandatory PPE for the environment in which the P1dME is used.

4.2 Training

The operators assigned to transportation, storage and installation of the P1dME must be trained and informed as required by the applicable directives in the relative countries.

4.3 State of tools and equipment

The operators must use the equipment listed in the corresponding paragraphs when carrying out transportation, storage and installation operations.
It is important to ensure that the equipment and tools are in good condition and that they are not worn, excessively aged or fatigued in any way.
The tools must be selected in accordance with the applicable laws and regulations governing working tools and must be used in accordance with the manufacturers' instructions.

4.4 Taking delivery of the material

During packing, all the P1dME technical material is thoroughly checked in order to ensure that no damaged material is shipped.
When unpacking the material, check that the P1dME is in perfect condition and not damaged in any way. Notify Marposs immediately if it is damaged.

4.5 Packaging, handling, transport

4.5.1 Packaging

The P1dME is protected with carton and an internal insert for handling and transportation.

4.5.2 Handling the package

No specific equipment is required for handling the package.

4.5.3 Transporting the package

The package containing the P1dME must be transported on covered transport vehicles so that it and the P1dME are not exposed to the weather.

4.5.4 Disposing of packaging materials

The packaging used for the P1dME consists of materials that can be disposed of without exposing people, animals or property to any significant hazards.

Operators or personnel responsible for disposing of the packaging should be aware that it consists of:
• Cardboard: external container and internal insert
• Polyurethane film: internal insert.

ENVIRONMENTAL HAZARD
The polyurethane film is NOT biodegradable. It must NOT be disposed of in the surrounding environment: recycle and/or dispose of materials in accordance with local regulations.

5. REMOVING THE P1DME FROM ITS PACKAGING

Marposs has not indicated special devices for removing the P1dME from the packaging.
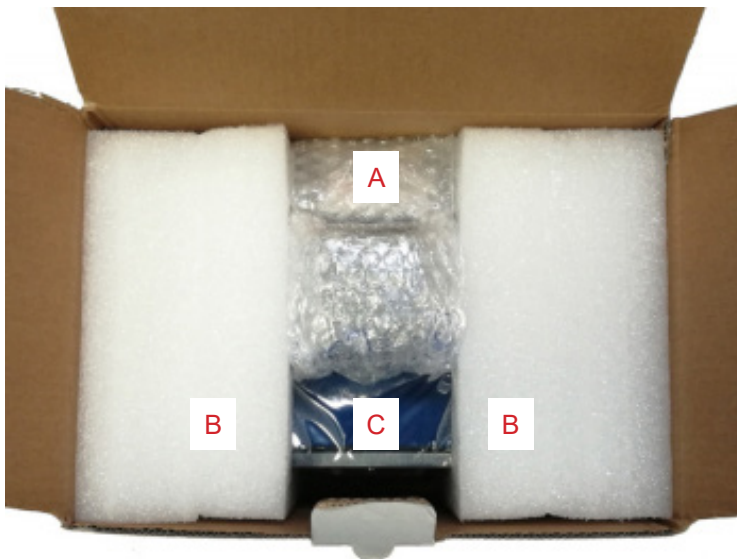

| ⚠️ | **ENVIRONMENTAL HAZARD**
Failure to dispose of the packaging correctly may result in the following consequences: burning the plastic parts will release poisonous gases that may cause health problems. |

5.1 Removing the I/O Box from its packaging

Marposs has not specified any special devices for removing the I/O Box from its packaging.

- Remove the connectors (A) from the packaging.

- Extract the protective shells (B) and remove the I/O Box (C), which is inside an antistatic bag.

| ⚠️ | **CAUTION**
Handle with care: observe the procedures for handling electrostatic sensitive devices. Failure to comply may cause malfunctions or damage the equipment.
Specifically, it is important to:
• Discharge any accumulated electrostatic charges by touching a metal surface that is connected to the building earth system;
• Take care not to touch the connector pins on the equipment while removing it from the packaging, while connecting it to the corresponding flying connector, or during operation. Avoid direct contact with the pins and contact through wires connected to the flying connectors. Follow these directions for both connectors with plastic caps and those without. Only remove the plastic caps to make the connections to the corresponding flying connectors. Always replace the plastic covers when it is necessary to disconnect one or more connector. |

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6. *ENVIRONMENTAL CONDITIONS*

The mechanical and electronic components installed in the P1dME have been selected for their reliability and durability. The components meet the manufacturing safety requirements in force and have been designed to withstand temperatures from -20 °C to +70 °C (from -4 °F to 158 °F) during transport and storage.

6.1 P1dME Storage Environment

The P1dME must be stored in a covered area where dust and humidity levels are kept to a minimum.
The warehouse storage shelf must be level and smooth.
Do not rest other materials, even light items, on top of the P1dME package or the P1dME itself, as this may damage it.

6.2 P1dME Working Environment

When installing the unit, the operator must check that the final machine has been designed and built to operate in the environmental conditions set out below.

Type of environment:
The P1dME and the relative electrical components have been designed and built to be installed in a heavy industrial environment, and to be used only in closed environments where they are protected from the weather. Do not use the equipment in residential or light industrial environments.
The P1dME panel must be located in a dry place outside the machine, while the measuring heads connected to it must be installed in a damp environment inside the machine.
Unless otherwise specified in the contract, the P1dME can only operate regularly in the environmental conditions set out below. Environmental conditions other than those described may damage the machine or cause it to malfunction, giving rise to potential hazardous situations for the operator and exposed personnel.

Ambient air temperature
The P1dME components will operate correctly at temperatures from +5 to + 45 °C (41 to 113 °F).

Operating relative humidity
Maximum relative humidity 80% at Tmax 31°; the relative humidity decreases linearly to 50% at 40°.

Environmental pollution grade
Grade 2

Altitude
The electrical components are designed to operate correctly up to 2000 m above sea level.

Pollutants
The electrical components are adequately protected against the infiltration of solid bodies when using the P1dME for the intended purposes and in the specified operating environment.
Unless otherwise stated in the contract, the electrical components DO NOT have specific protections against contaminating agents such as dust, liquids, acids, corrosive gases, salt, etc.
If it is necessary to use the electrical components and the complete equipment in environments subject to such contaminating agents contact Marposs immediately. Marposs will check the suitability of the assembly based on the environments they are used in.

"Normal" environmental lighting
The installation procedure must be carried out under "normal" lighting conditions, i.e. without dazzling the operators with too much light or causing them to strain their eyes in insufficient lighting.
The personnel responsible for installing the P1dME must comply with the minimum requirements set out by the applicable laws in the respective countries in terms of natural and artificial lighting of the premises.
If there is poor lighting in the workplace the operator must use portable lighting equipment.

7. GENERAL DESCRIPTION OF THE EQUIPMENT

Using the P1dMEtogether with Marposs measuring heads permits you to monitor the state of the machining process. The value of the measurement during the grinding process is compared with the pre-defined machining allowance, thus providing the machine with the signals it requires to control the progress of the grinding wheel.
The P1dME and Marposs measuring heads input protection ratings mean that they are suitable for use in a workshop environment.

7.1 Product version

Various versions of the P1dME are available:

PART NUMBER	DESCRIPTION
IN-PROCESS CYCLE	
830PM11000	P1 UPGRADE - LVDT or HBT, no recharging, smooth surfaces, no memory
830PM21000	In-Process ID/OD - LVDT or HBT, no recharging, smooth surfaces, no memory
830PM21100	In-Process ID/OD - LVDT or HBT, recharging, smooth surfaces, no memory
830PM21103	In-Process ID/OD - LVDT or HBT, recharging, smooth surfaces, no memory, active positioning (+/- 1mm), BCD output (free-run) Accessories: I/O expansion box (Code: 7104000010)
830PM21104	In-Process ID/OD - LVDT or HBT, smooth surfaces, no memory, recharging, passive positioning (+/- 1mm), BCD output.
830PM31100	In-Process ID/OD - LVDT or HBT, recharging, grooved, memory
830PM31101	In-Process ID/OD - LVDT or HBT, recharging, grooved, memory, BCD output Accessories: I/O expansion box (Code: 7104000010)
830PM21004	In-Process ID/OD - LVDT or HBT, no recharging, smooth surfaces, no memory, range +-500M
830PM21006	In-Process ID/OD - LVDT or HBT, no recharging, smooth surfaces, no memory, range +-500M
830PM21105	In-Process ID/OD - LVDT or HBT, no recharging, smooth surfaces, no memory, two In-Process cycles
830PM31102	In-Process ID/OD - LVDT or HBT, grooved, memory, range +-500M
830PM21003	In-Process ID/OD - LVDT or HBT, no retraction, smooth surfaces, no memory, Pulse Feedback enabled (code 7104000010 not required).
830PM31105	In-Process ID/OD - LVDT or HBT, retraction, grooved, memory, Pulse Feedback enabled (code 7104000010 not required).
830PM21101	Post-process ID/OD (LVDT or HBT, recharging, smooth surfaces, no memory)
830PM21002	Post-process ID/OD (LVDT or HBT, no recharging, smooth surfaces, memory, BCD output (free-run) with 1 µm resolution). Compatible P1C exept START CYCLE. Accessories: I/O expansion box (Code: 7104000010)

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PART NUMBER	DESCRIPTION
830PM21007	Post-process ID/OD (LVDT or HBT, no recharging, smooth surfaces, no memory, BCD output (free-run) with 0.1 µm resolution). Compatible P1C exept START CYCLE.
830PM21105	Post-process (as well as In-process) ID/OD (LVDT or HBT, no recharging, smooth surfaces, no memory, BCD output (free-run) with 1 µm resolution) Accessories: I/O expansion box (Code: 7104000010)
OTHER	
830PM21001	P1dME with Operator Interface for the GAP/CRASH function via AE sensors.

P1dME is also available in two formats:

►**The STAND ALONE P1dME**
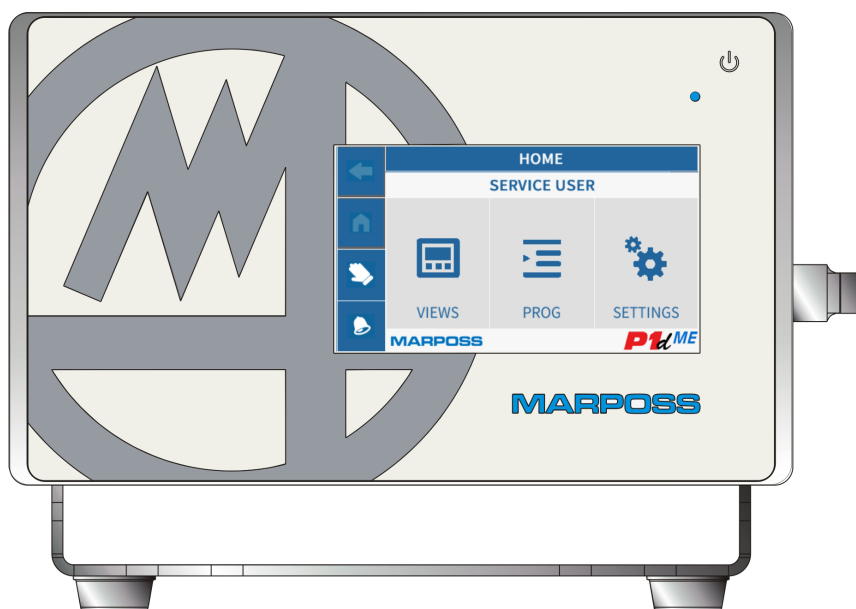
►**The PANEL MOUNTED P1dME**

7.2 Installation kit

Below there is a list of the components needed for installation, which are supplied together with the equipment.

> **N.B.**
> Some components are only for some specific P1dME models and therefore may not be included.

▶ **IP20 connection kit (code 6134720710)**

Cannon 25-pin (female) straight connector

▶ **IP54 connection kit (code 6134720720)**

Water-tight Cannon 25-pin connector for the I/O connector
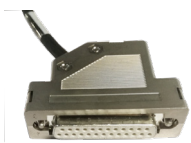
Water-tight Cannon 9-pin connector for water-tight USB or Ethernet connections

Three closure plates (2 USB + 1 Ethernet)

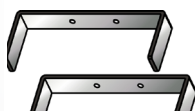▶ **Remote panel kit with wings (code 6134720730) for panel mounted P1dME**

Panel mounting adapters

Cannon 25-pin (female) 50° connector

▶ **Remote panel kit with brackets (code 6134731700) for panel mounted P1dME**

Panel mounting brackets

Cannon 25-pin (female) 50° connector

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► Panel support (code 6134720700) for stand alone P1dME

► I/O expansion box (code 7104000010), optional

This accessory increases the number of I/O normally available on the P1dME in order to use the Pulse Feedback and BCD encoding functions.

NOTE
Refer to section 7.3 for instructions on connecting the I/O expansion box.

► I/O BOX (Upgrade), optional

There are various types of I/O Box so that the P1dME can be connected to different types of digital I/O for the purpose of replacing old applications with the Marposs E9 gauge.

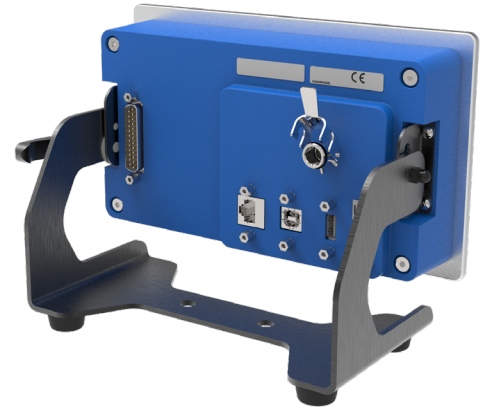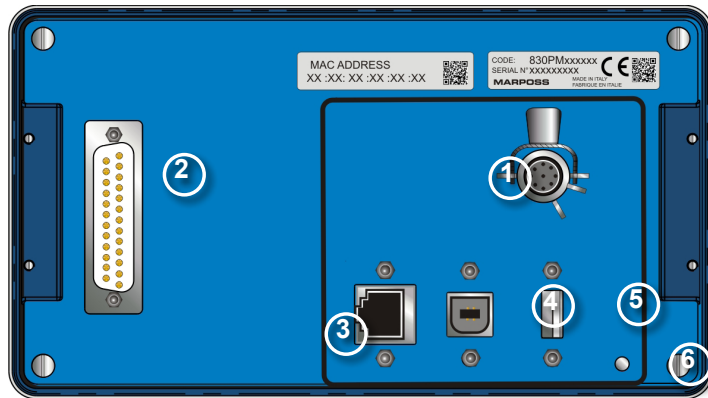|		
•	7104000020 P1DME I/O BOX, I/O TYPE BLUE 3I/4O	(I/O TYPE C1)
•	7104000030 P1DME I/O BOX, I/O TYPE OPTO24 V 3I/6O	(I/O TYPE B)
•	7104000040 P1DME I/O BOX, I/O TYPE OPTO24 V 5I/7O	(I/O TYPE B)
•	7104000050 P1DME I/O BOX, I/O TYPE E5 3I 24 V/5O 115 V	(I/O TYPE A1)
•	7104000060 P1DME I/O BOX, I/O TYPE E5 5I 24 V/6O 115 V	(I/O TYPE A5)
•	7104000070 P1DME I/O BOX, I/O TYPE E5 3I 115 V/5O 230 V	(I7O TYPE A2)

N.B.
Refer to chapter "9. P1dME I/O BOX" on page 29 for the I/O Box connection.

► Configurable USB-Serial converter (RS232-RS422-RS485) for connection to the P1c (Code 6871500020), optional

Accessory for connecting the P1dME to a printer as was possible with the P1c.

7.3 Description of connectors

ELECTR. N	DESCRIPTION
1	**W1** Marposs 9-pin (female) connector for measuring head.
2	**I/O** Cannon 25 pin (male) connector for machine logic interface I/O signals. The I/O are powered at +24 V d.c. The I/O expansion box or I/O BOX (code 71040000XX) may optionally be connected to this connector.
2	**POWER 24 VDC** Pins 22, 23, 24 and 25 of the same Cannon 25-pin connector are used for the +24 V d.c. power supply connections (see paragraph 6.5 "Power supply and functional earth connections")
3	ETHERNET For connection to Marposs configurator.
4	USB (device) For Marposs internal use
5	USB (host) For connection to the USB-Serial converter used to connect the printer to the P1dME
6	⏚ Functional earth stud (M4).

WARNING
Use Marposs measuring heads only with the W1 connector.

N.B.
Connect the power supply to the dedicated pins on the Cannon 25-pin connector to power up the P1dME,

after which the capacitive front panel switch ⏻ may be used to turn the device on or off. (See paragraph 7; to access and switch off, press the button on the panel for at least 3 seconds)

N.B.
STAND ALONE P1dME: position the device so that it is easy to disconnect the Cannon 25 pin connector.
PANEL MOUNTED P1dME: install a switching device to interrupt the connection to the Cannon 25-pin connector. The switching device must isolate all the power supply conductors and be easy to access and operate. It must not be necessary to use any kind of special tool to deactivate it.
When using the I/O Box, the 24 V d.c. connector and the H1 digital I/O connector (see chapter 8) are power supply disconnecting devices; use only the corresponding flying connectors provided with the equipment. Position the equipment so that they can both be disconnected easily.
If the two connectors are not easily accessible, provide a disconnecting device to break the power supply connections. It must break all the power supply conductors and be easy to identify. It must not be necessary to use any kind of special tool to deactivate it.

P1DME

7.4 P1dME Technical Specifications Table

STRUCTURE	STAND ALONE or Panel Mounted
DISPLAY	4.3" (480 x 272) capacitive LCD
MEASUREMENT CHANNELS	1 or 2 channels Note: Connect Marposs LVTD or HBT type measurement heads
MEASUREMENT CYCLES	• In-process grinding checks • Active/Passive cycle positions • Post-Process cycle
MEASUREMENT RANGE *(*)*	Depending on the type of head that is connected: ±250 µm ±500 µm ±1000 µm
POWER SUPPLY	24 V d.c. SELV (-20% / +25%), one of the two terminals of that power supply must be connected to the equipotential protection circuit Note: connection via the Cannon 25 pin connector Refer to chapter 8 for applications with the I/O Box.
POWER CONSUMPTION	• Maximum 8 W without retraction option • Maximum 32 W with retraction option See I/O signals for Input and Output power consumption figures
POWER On/Off LED	On front panel
WORKING TEMPERATURE	5° to 45° C / 41°F to 113°F
STORAGE TEMPERATURE	-20° to 70° C / -4°F to 158°F
WEIGHT	1.2 Kg
PROTECTION DEGREE (Standard IEC 60529)	• Stand alone version: IP40 • Panel mounted version: IP40 (IP54 on front panel) • Version with IP54 kit: IP54
MACHINE LOGIC INTERFACE (I/O)	Cannon 25 pin connector 24 V d.c. opto-isolated
I/O SIGNALS	• Sink or Source • Input current 5 mA • Output current 10 mA
SAFETY STANDARDS	EN 61010-1
ELECTRO-MAGNETIC COMPATIBILITY	EN 61326-1
ENVIRONMENTAL CONDITIONS	For internal use
OVERVOLTAGE CATEGORY	II

(*) also available in inches

8. INSTALLATION PROCEDURE

The safety of any system that incorporates this device and its accessories is the sole responsibility of the system assembler.

To install the unit, proceed as follows:

CAUTION
Work with the device off.

1. Secure the P1dME to the machine tool
2. Connect the measurement heads to the connectors on the rear of the unit.
3. Connect the unit to earth using the earth stud.
4. Use the cannon connector provided to connect the I/O and power supply.
5. Switch the equipment on
6. Perform the mechanical zero-setting procedure on the measuring head(s)
7. Perform the electric zero-setting procedure on the master part.
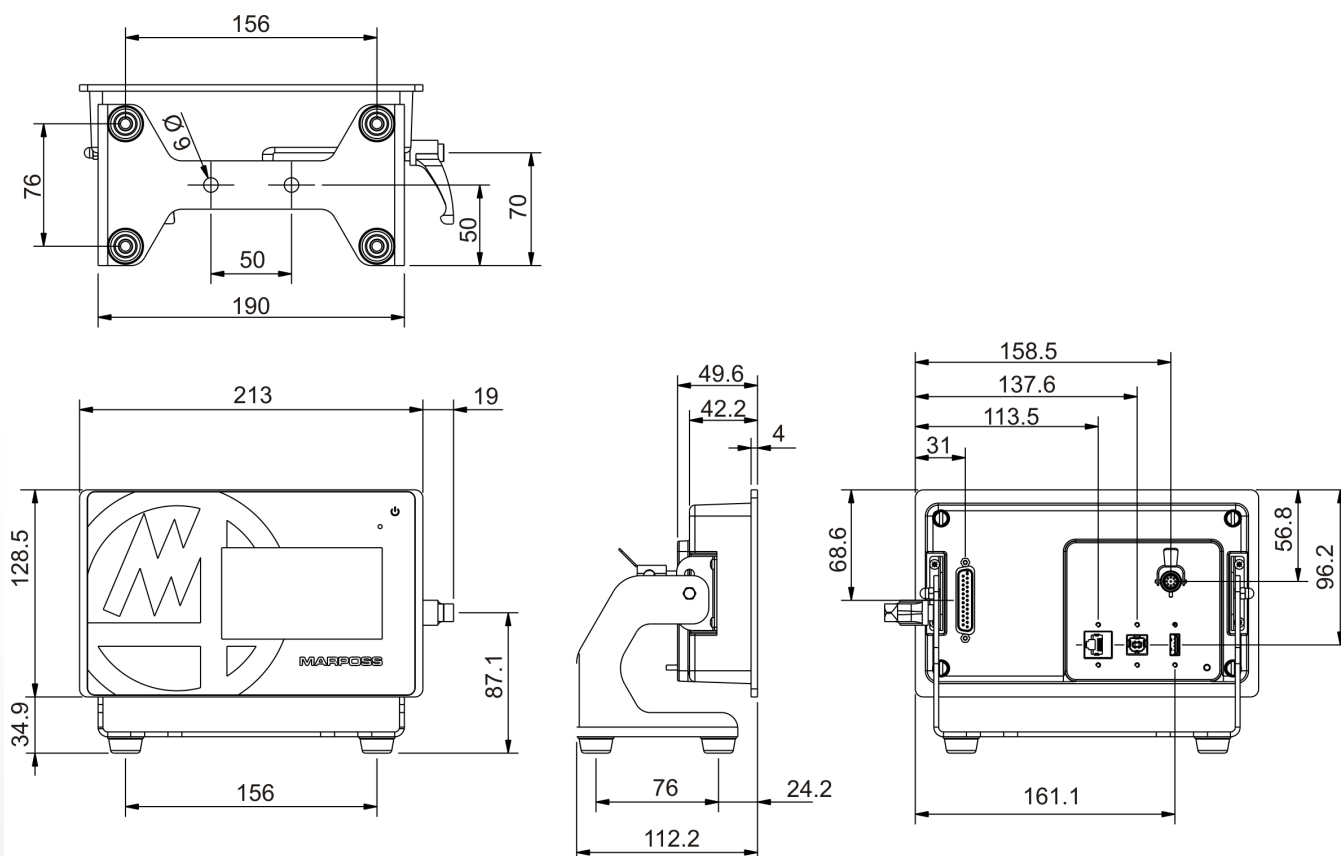
WARNING
The plastic covers that protect the unit connectors should only be removed when connecting the corresponding external connectors. Always replace the plastic covers when it is necessary to disconnect one or more connector. Take care not to touch the connector pins either directly or via the leads connected to the various external connectors when removing or fitting the plastic covers, whether the unit is switched on or not.

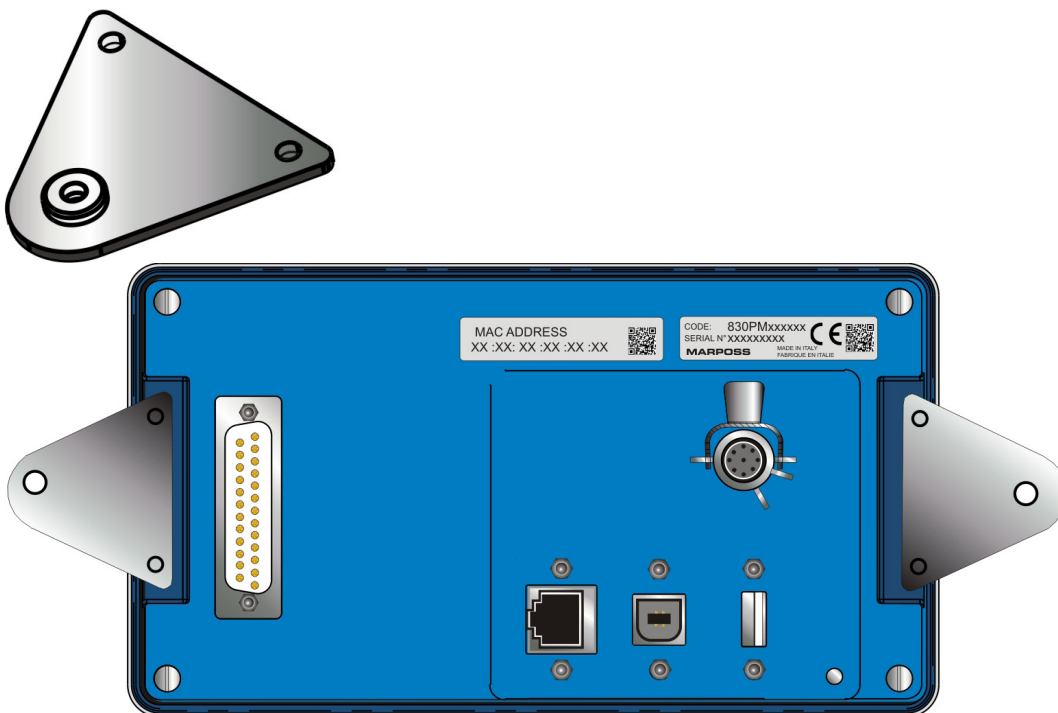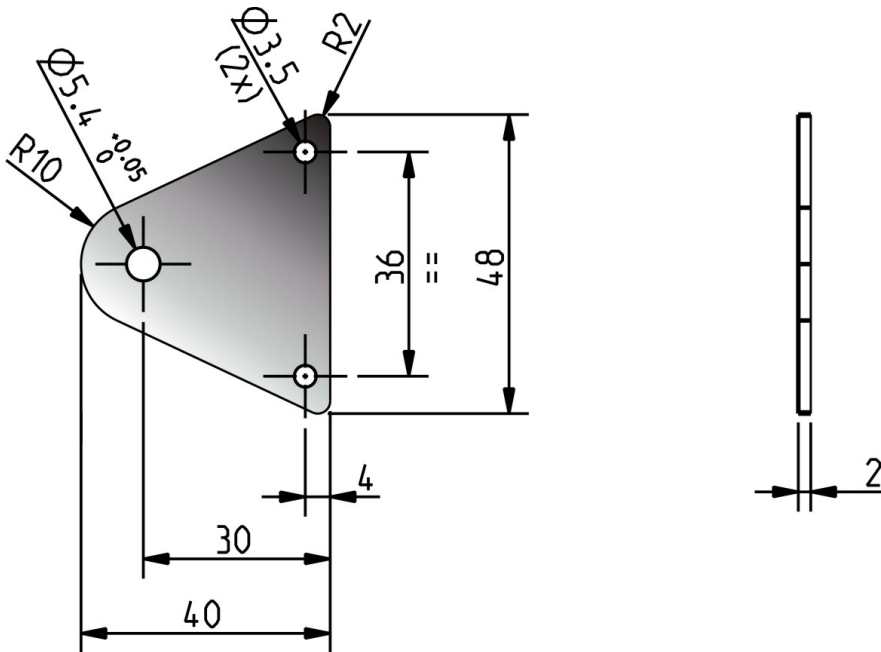## 8.1 Securing the unit to the Machine Tool

8.1.1 Stand Alone P1dME

The stand alone P1dME does not need to be secured in any way as the support is built in, as illustrated below.

P1DME

8.1.2 Panel Mounted P1dME

For the panel mounted P1dME, secure the gauge to the machine tool using the holes at the base of the support.
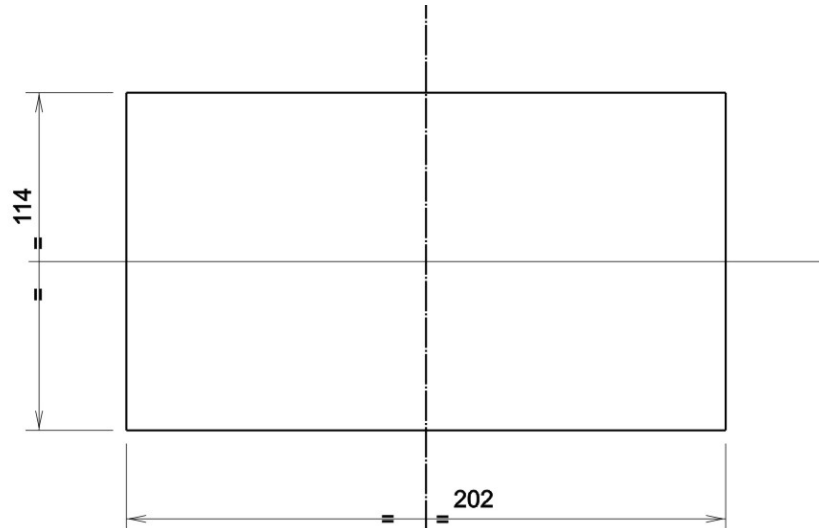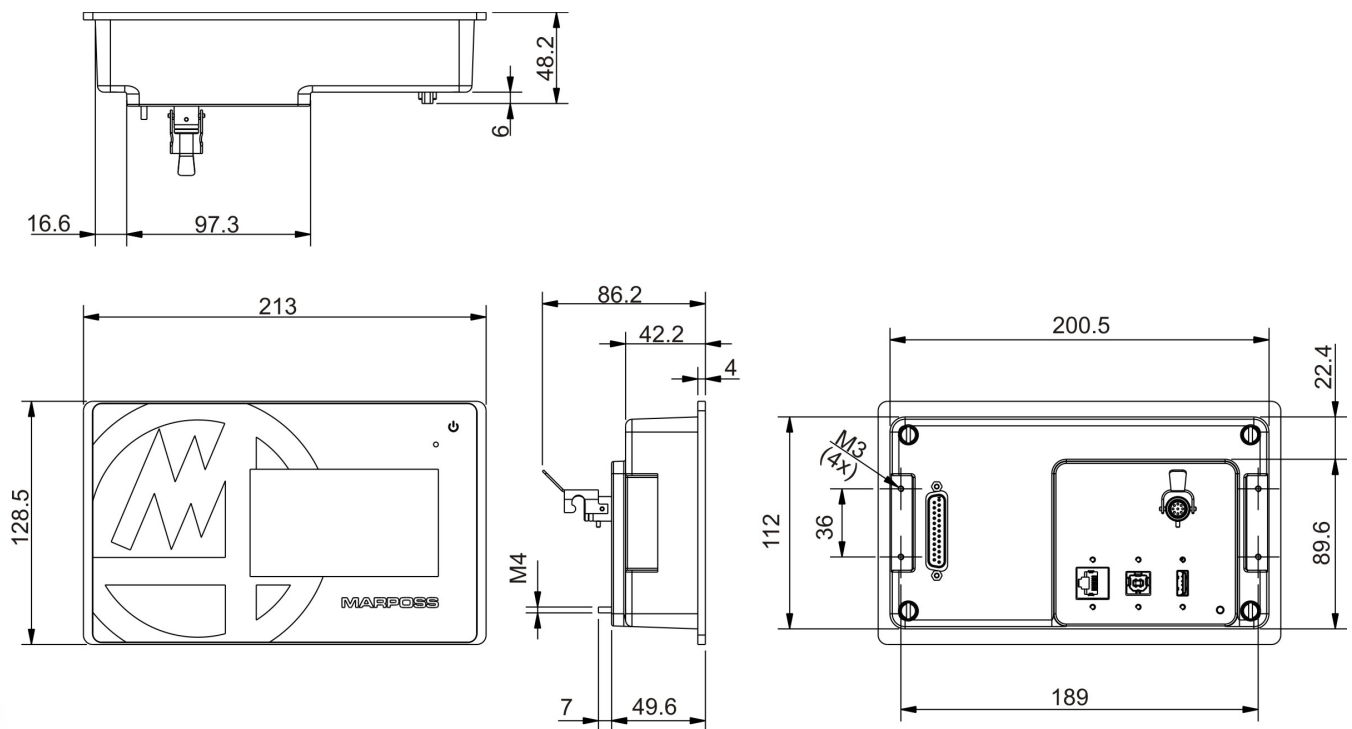Use the fixing adapters provided:

WARNING
Use Marposs measurement heads only with the W1 connector

Panel mounted PP1dME fixing template, dimensions in mm

Panel mounted P1dME external dimensions

Refer to the figure above for the dimensions of the cut-out in the machine housing. It is necessary to guarantee that there are no objects (panels, other equipment, etc.) within 12 mm. In any event, when the P1dME is switched on, the ambient temperature must not exceed 45°C, even in the areas around the grilles.

P1DME

MARPOSS

8.2 Installing the I/O expansion box for P1dME (Optional)

(I/O Expansion Box, Part No. 7104000010)
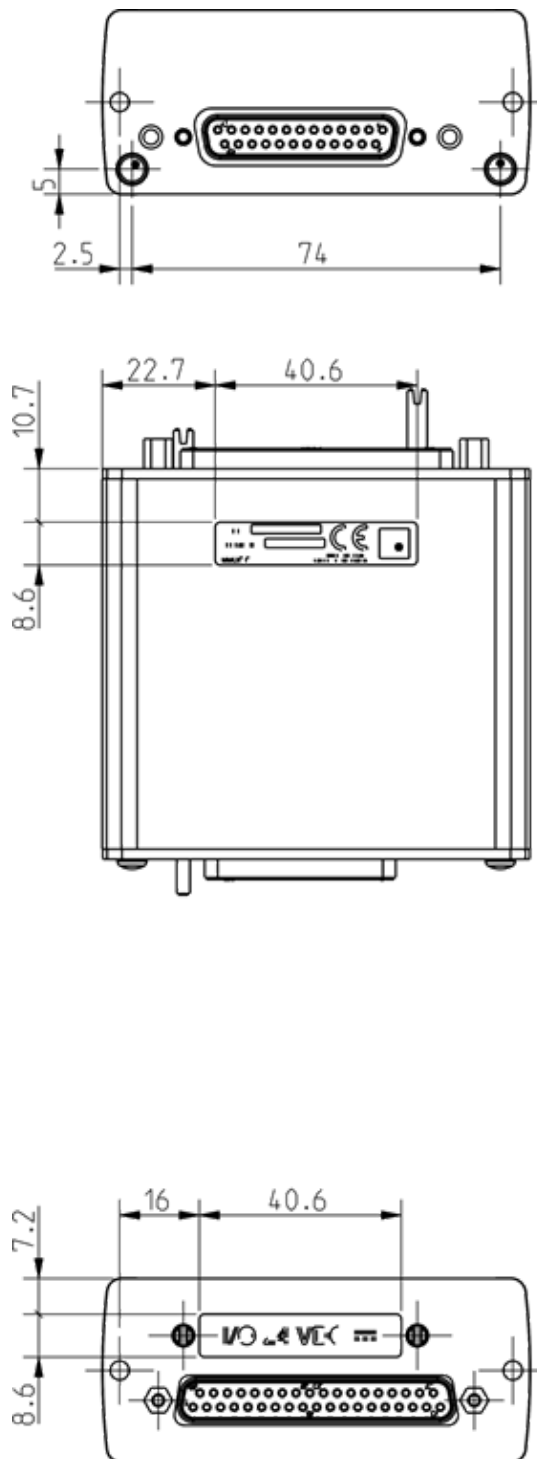
NOTE
The codes 830PM021003 and 830PM31105 include the Pulse Feedback function without the need to use the Expansion Box 7104000010, although it must be used if BCD is required.

8.2.1 Procedure to connect the I/O expansion box to the P1D ME
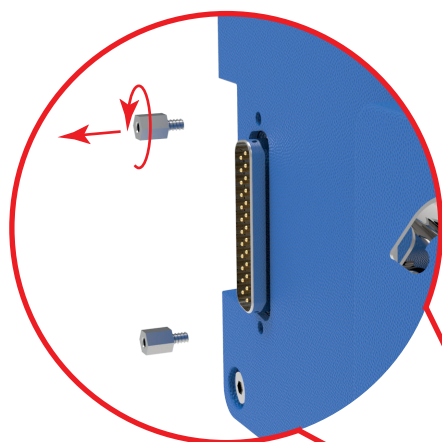
1) Unscrew the metallic retaining screws at either side of the Cannon connector as shown in the figure
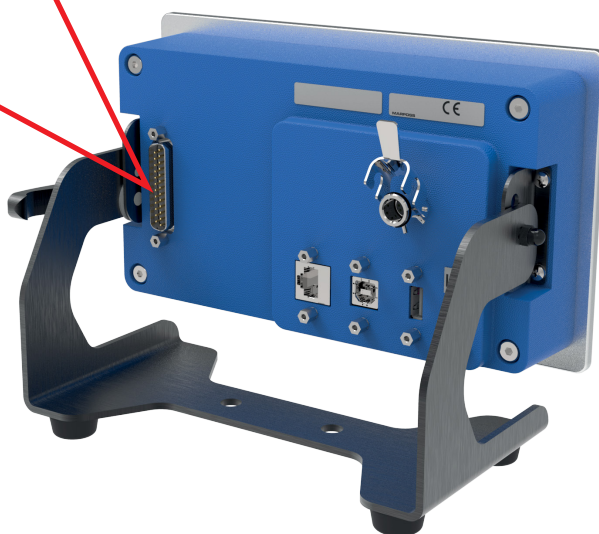
2) Insert the I/O expansion box 7104000010 and secure it in place using the two screws as shown in figure.

P1DME

8.3 P1dME I/O BOX

1) H1: E9 connector for the Dig-
ital I/O connections

4) power supply
LED

Functional
earth connection (M5)

POWER 24V ⎓   H2

2) 24 V d.c. POWER

3) H2: Connector for P1dME connections

1) H1: E9 connector for the Digital I/O connections
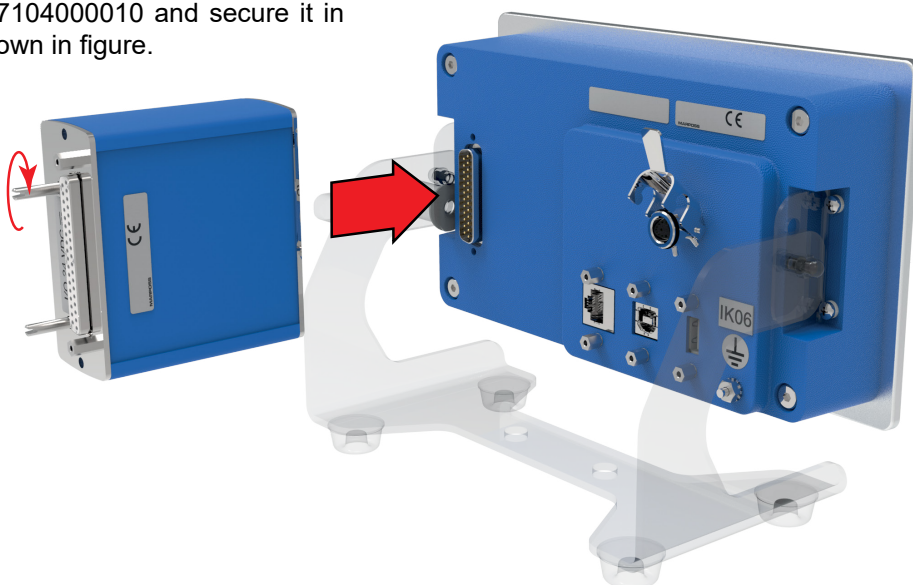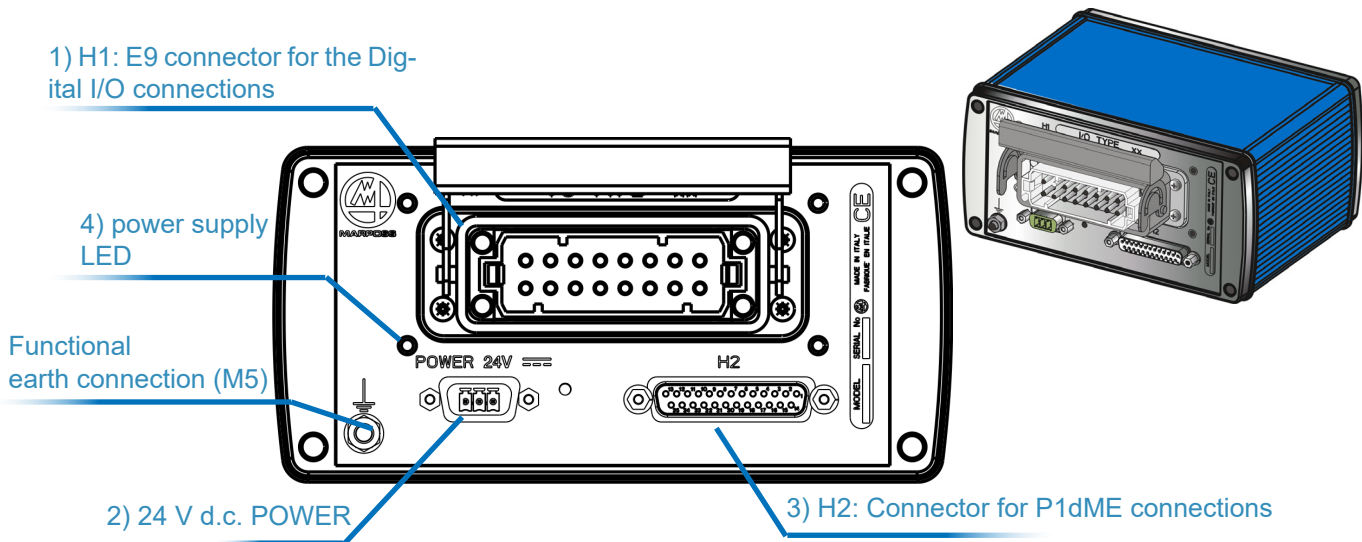Heavy duty 16-pin connector for the digital I/O signal connections. See para.9.4.
NOTE: some pins may not be present, depending on the specific model

2) 24 V d.c. POWER
Phoenix 3-pin connector for the +24 V d.c. power supply connection. The central pin of the 3-pin connector is for +24 V d.c., and the two side pins are for the +24 V d.c. return. It is possible to use either one of the two side pins on the 3-pin connector indifferently for the +24V d.c. return. (See "Power supply and earth connections")

3) Connector for P1dME connections
Cannon 25-pin D-sub connector for the P1dME connections. The +24 V d.c. to power the P1dME is also available on this connector. There is also a 5 A self-resetting surge protector.
Use it for connecting one of the two extension cables provided (code 6734520146 50 cm long, or 6734520147 10 m long)

> CAUTION
> Secure all the flying connectors to the corresponding fixed connectors with the fastening screws or levers.

4) I/O Box power supply LED
The I/O BOX power supply LED can be one of two colours:
• 	Green = I/O BOX powered;
• 	Red = I/O BOX in alarm state.
The alarm state may indicate a fault in the I/O BOX or an overload/short circuit condition on the +24 Vnst output (if any, see the following pages for the various i/o types). The alarm state is also indicated on the P1dME panel (see the user manual).
In the event of an alarm:
• 	If there is a +24 Vnst output, check for an overload or short circuit on the output and remove it;
• 	If there is no +24 Vnst output, check that the power supply voltage is correct (see paragraph 8.3). If it is cor-
	rect, disconnect the power to the I/O BOX and wait a few seconds. Reconnect the power supply to the I/O
	BOX, and contact the Marposs Customer Service department if the alarm persists.

8.3.1 I/O BOX external dimensions

P1DME
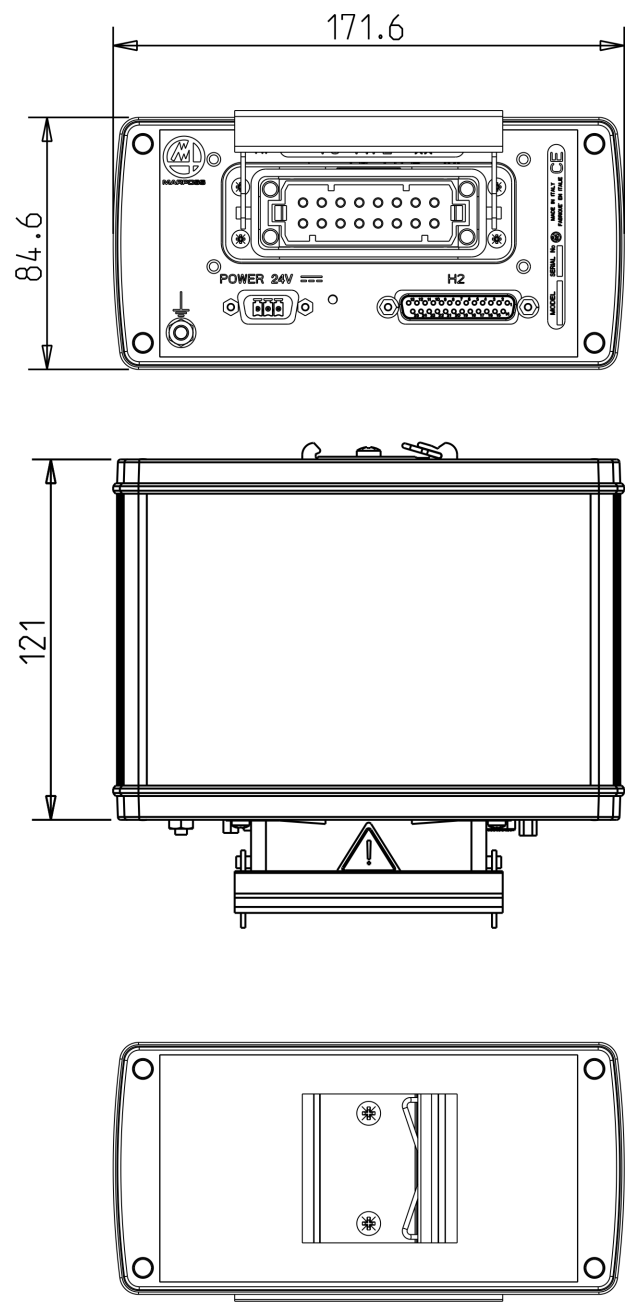
8.3.2 Securing the I/O BOX

8.3.2.1.Assembly Layout using feet (Assembly kit 4135600027)
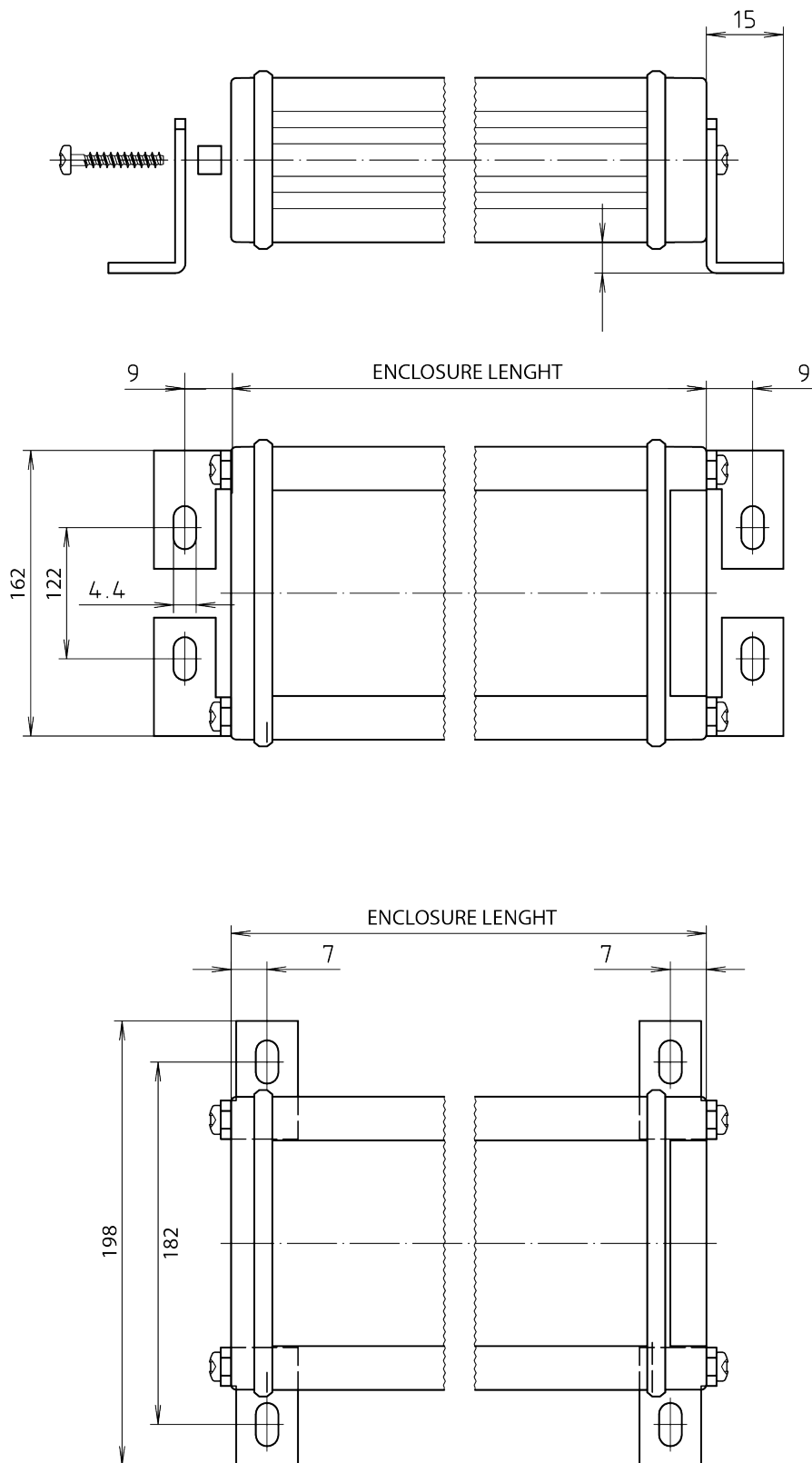
8.3.2.2.Assembly Layout with the Module on a DIN rail

ASSEMBLY

MODULE ASSEMBLED

DISASSEMBLY

2. Push and lock

4. Pull outwards

5. Remove
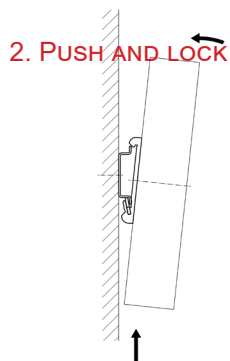
1. Hook

3. Push upwards

P1DME

8.4 Measuring Head connections

The unit can be connected to Marposs measurement heads with one or two transducers. Connect the head to the rear connector and make sure that the locking lever is inserted.
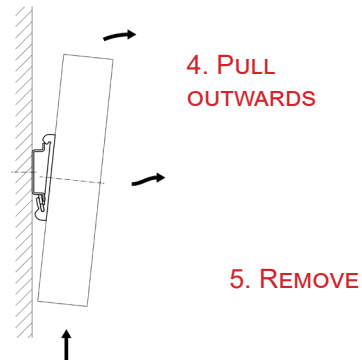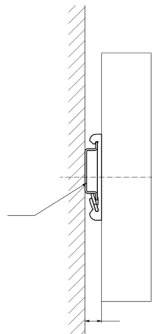
UNIMAR MEASURING HEAD

JBox

Unimar cable 9p - Veam cod. 2914021243

Unica cable

UNICA MEASURING HEAD
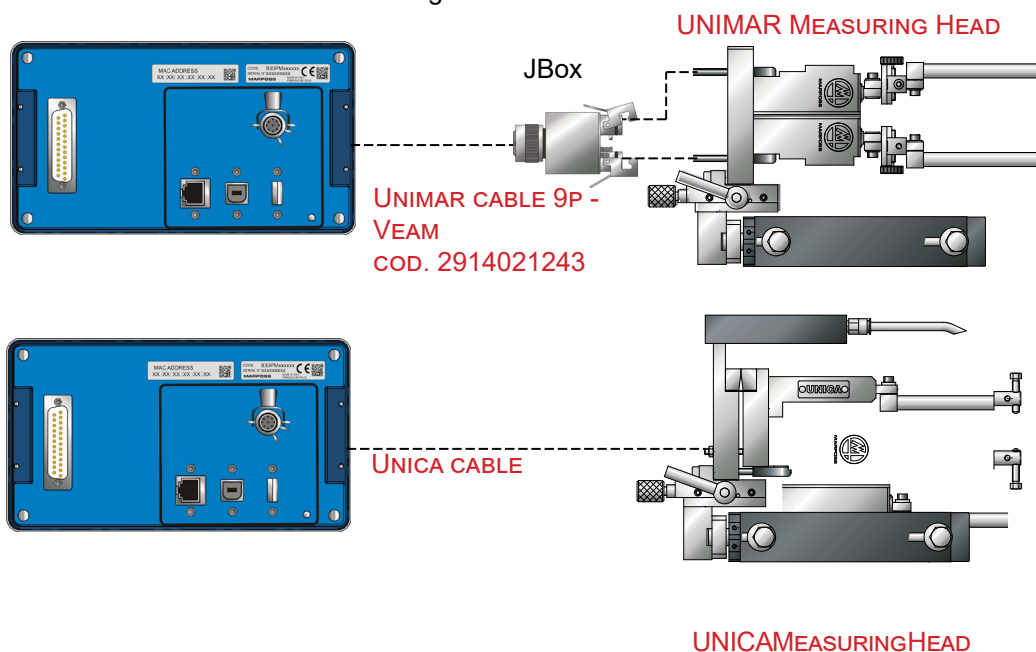
To connect the Marposs measurement heads to the P1dME, use one of the following cables:

Cable for Micromar 3, Idmar, Alsar and Unimar + Jbox

Male 9-pin connector - P1dME side

Veam – JBox connector - Measuring Head side

- • Part N. 2914021240 – Length 0.5 metres
- • Part N.2914021243 – Length 3 metres
- • Part N.2914021246 – Length 6 metres

Cable for UNICA

Male 9-pin connector - P1dME side

Female 9-pin connector - Measurement Head side

• Part N. 2914021293 – Length 3 metres
• Part N.2914021296 – Length 6 metres

Cable for M1 Plug

Male 9-pin connector - P1dME side

Lumberg connector – M1 plug side

• Code 2914021272 – (K5) Length 2 metres
• Code 2914021274 – (SV50) Length 2 metres
• Code 2914021276 – (SV50) Length 6 metres

8.5 Digital I/O connections

Connect the I/O to the machine logic using Cannon D-sub 25 pin male connector mounted on the rear panel of the P1dME as follows:

P1DME CODE 830PM21000

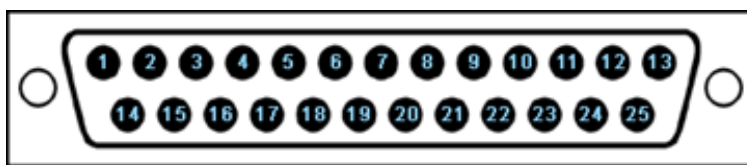| PIN Nr.	IN/OUT	DESCRIPTION
1	OUT	C0 Zero command (final dimension reached). Stop the machining cycle. OFF: command deactivated ON: command activated
2	OUT	C1 First grinding wheel forward command (2) OFF: command deactivated ON: command activated
3	OUT	C2 Second grinding wheel forward command (2) OFF: command deactivated ON: command activated
4	OUT	C3 Third grinding wheel forward command (2) OFF: command deactivated ON: command activated
5		
6	OUT	Automatic Mode The P1dME processes the measurement and updates the commands during the machining cycle: OFF: Automatic mode disabled ON: Measurement processing active
7	OUT	End Delay "Delay time over" signal. Once the delay time has expired, the P1dME processes the measurement and updates the commands. ON: delay time active
8		
9		Common Output
10		
11		
12	IN	-Start Cycle Start measurement cycle signal: OFF: the measurement cycle is activated ON: the measurement cycle is deactivated
13		Common Input
14-21		
22-23		**Power supply ground** Power supply earth return line
24-25		**+24VDC ext Power Supply** P1dME 24 V d.c. power supply

(2) The number of active controls can be set-up in the programming menu.

P1DME

MARPOSS

Example showing Current Sink Output/Current Source Input connections

Example showing Current Source Output/Current Sink Input connections

P1DME 830PM11000

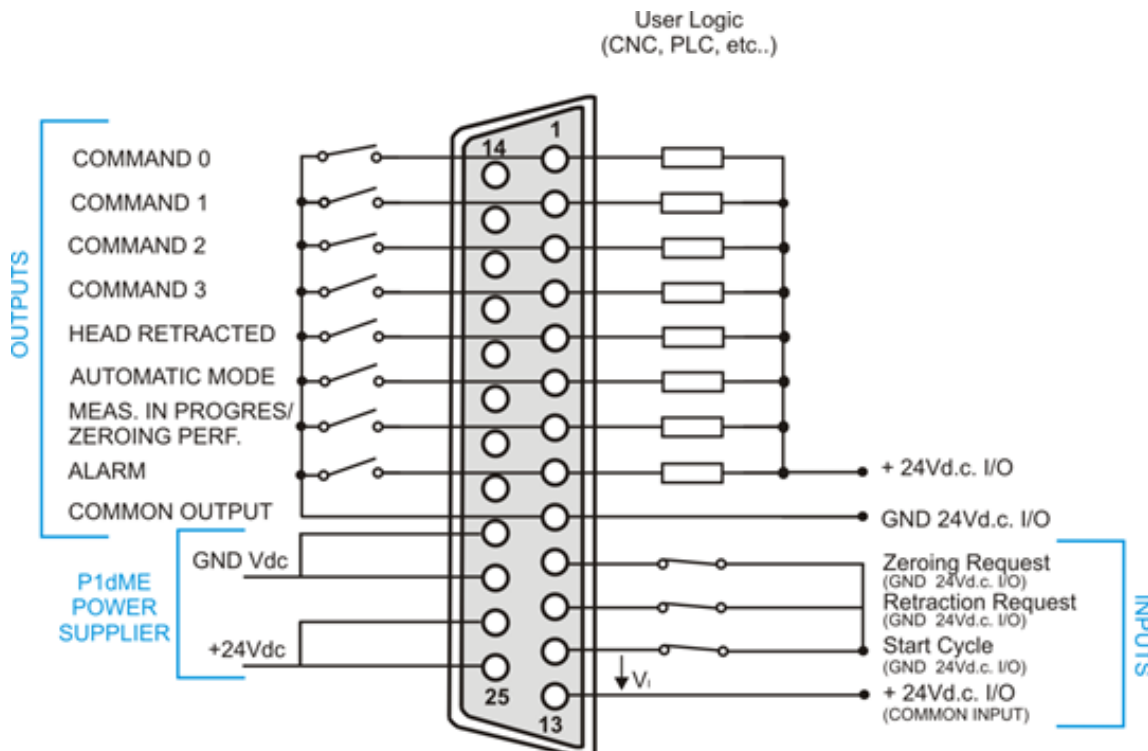| PIN Nr.	IN/OUT	DESCRIPTION
1	OUT	**C0** Zero command (final dimension reached). Stop the machining cycle. OFF: command deactivated ON: command activated
2	OUT	**C1** First grinding wheel forward command (2) OFF: command deactivated ON: command activated
3	OUT	**C2** Second grinding wheel forward command (2) OFF: command deactivated ON: command activated
4	OUT	**C3** Third grinding wheel forward command (2) OFF: command deactivated ON: command activated
5	OUT	**Head Retracted** The Marposs measuring head is retracted.
6	OUT	**Automatic Mode** The P1dME processes the measurement and updates the commands during the machining cycle: OFF: Automatic mode disabled ON: Automatic mode active
7	OUT	**Measurement in progress** Once the delay time has expired, the P1dME processes the measurement and updates the commands. ON: The P1dME processes the measurement and updates the commands OFF: The P1dME is out of the measuring cycle and does not update the commands **Zeroing performed** When the automatic zeroing cycle is performed, this pin indicates that the measurement has been calibrated. ON: measurement calibrated
8	OUT	**Alarm** The P1dME is in the alarm state.
9		**Common Output**
10	IN	**Zeroing/-Measure** This input is used to execute the zeroing cycle on the master part. ON: Zeroing command
11	IN	**Head Retraction** This input it used retract the head, or carry out the head retracted check. ON: measurement head retracted OFF: measurement head not retracted
12	IN	**Start Cycle** The start measurement cycle command signal is connected to this terminal ON: the measurement cycle is activated OFF: the measurement cycle is deactivated
13		**Inputs common** Inputs common
14-21		
22-23		**Power supply ground** Power supply earth return line
24-25		**+24VDC ext Power Supply** P1dME 24 V d.c. power supply

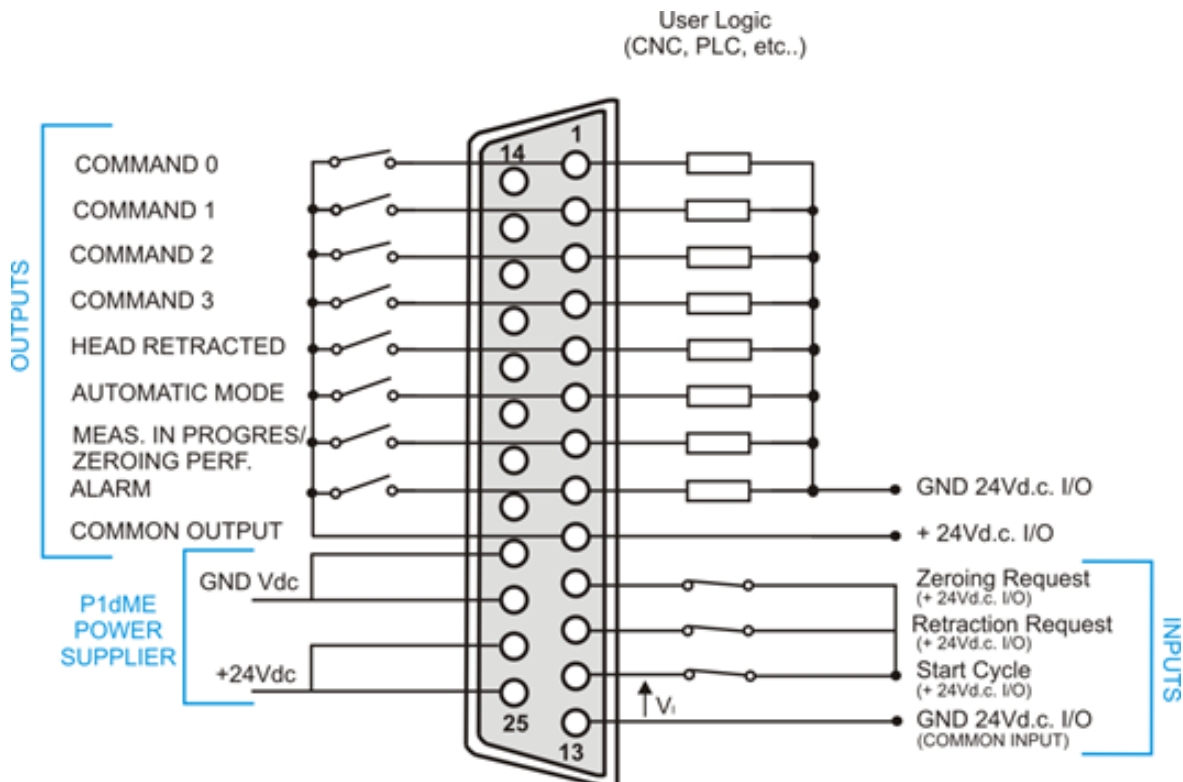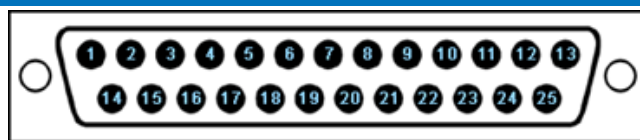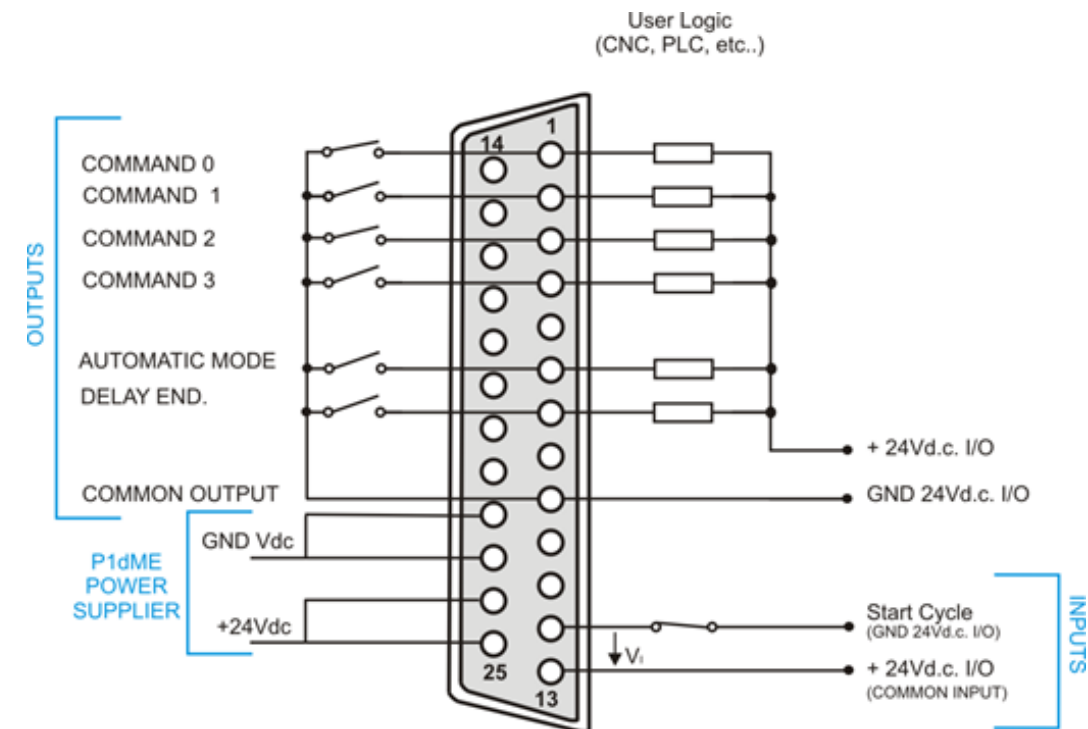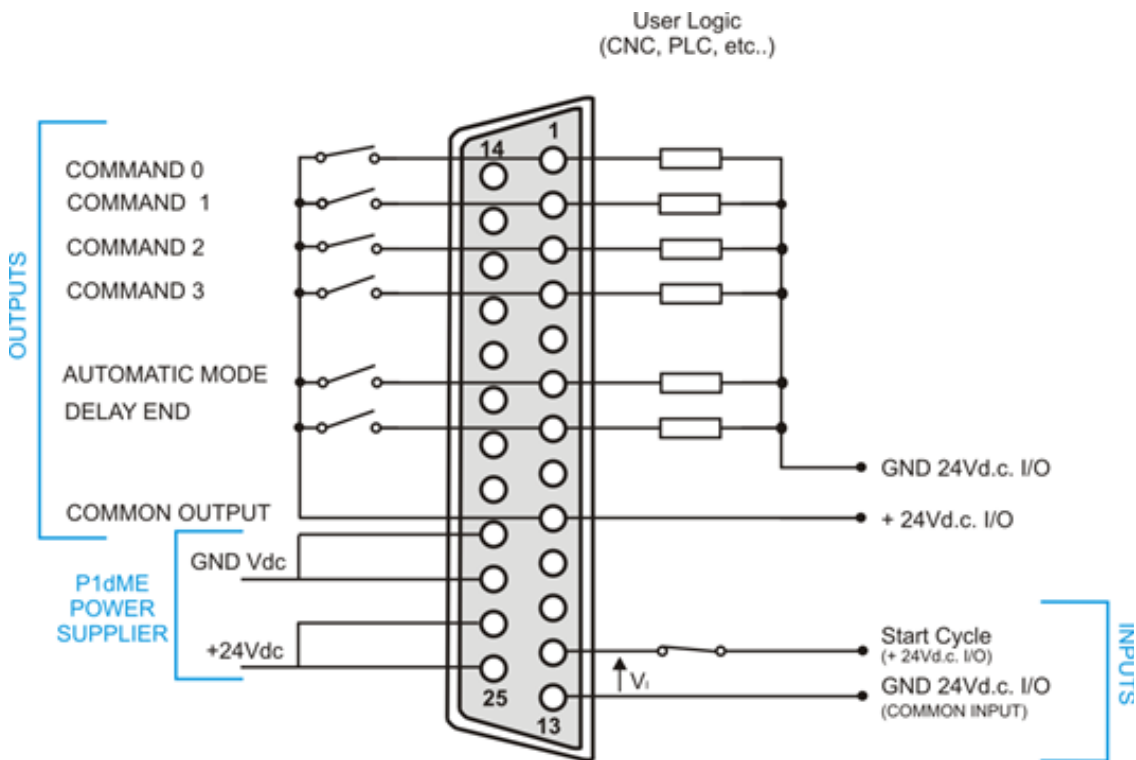(2) The number of active controls can be set-up in the programming menu.

P1DME

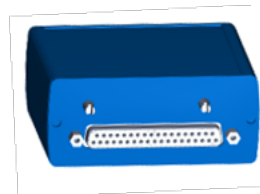SINK current output (SOURCE current input connections)

SOURCE current output (SINK current input connections)

8.6 Connecting Digital I/O with the I/O Expansion Box

Connect the I/O to the machine logic using Cannon D-sub 25 pin male connector mounted on the rear panel of the P1dME as follows:

I/O + BCD CONNECTIONS
(I/O EXPANSION BOX)

Connettore 37 poli femmina.
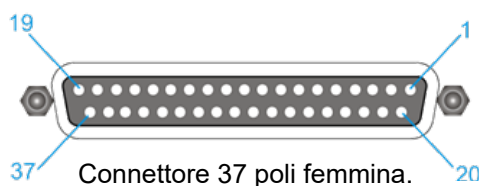
PIN Nr.	IN/OUT	LOGIC I/O N.	DESCRIPTION	
1	---	---	N.C.	
20	OUT	0	D0.0	Digit 0 (lsd)
2	OUT	1	D0.1	
21	OUT	2	D0.2	
3	OUT	3	D0.3	
22	OUT	4	D1.0	Digit 1
4	OUT	5	D1.1	
23	OUT	6	D1.2	
5	OUT	7	D1.3	
24	OUT	8	D2.0	Digit 2
6	OUT	9	D2.1	
25	OUT	10	D2.2	
7	OUT	11	D2.3	
26	OUT	12	D3.0	Digit 3 (msd) 1 cifra
8	OUT	13	Sign (1 = -)	
27	OUT	14	Automatic mode	
9	OUT	15	Valid data	
28	OUT	16	** Non-reworkable reject	
10	OUT	17	Gauge not efficient	
29	OUT	18	< Correction back	
11	OUT	19	@ (OK) Good	
30	OUT	20	> Correction forward	
12	OUT	21	* Reworkable reject	
31	OUT	22	OVR	
13	OUT	23	Parity	
32	OUT	24	Measure in progress/ Req Performed	
14	IN	25	Autozero	
33	IN	26	Set Selection	
15	IN	27	---	
34	IN	28	Start Cycle	
16	IN	29	---	
35	---	30	COMOUT(*)	

P1DME

PIN Nr.	IN/OUT	LOGIC I/O N.	DESCRIPTION
17	---	31	COMIN(**)
18/19	---	---	GND 24 V d.c. (I/O power supply common)
36/37	---	---	+24V d.c. (I/O power supply)

(*) COMMON OUT – Source Mode +24 V – Sink Mode GND24
(**) COMMON IN – Source Mode GND24 – Sink Mode +24V

SINGLE POWER SUPPLY CONNECTION
We recommend using a single power source (GND and +24 V) to supply the P1dME and the I/O.

SOURCE CONNECTION TYPE
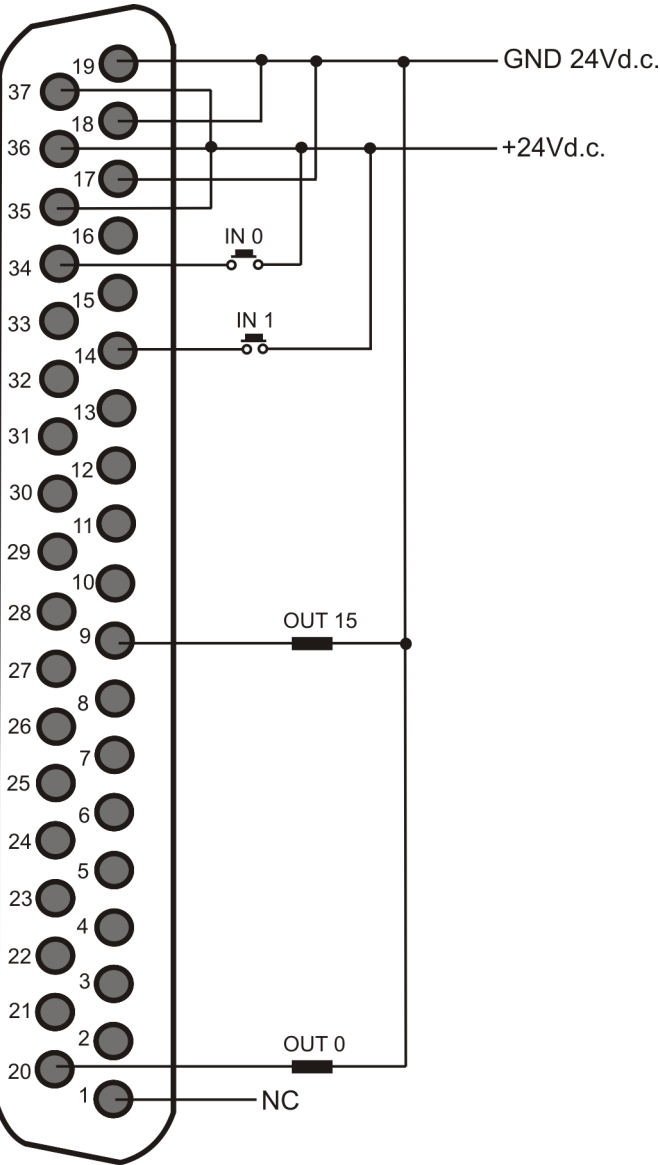
SINK CONNECTION TYPE
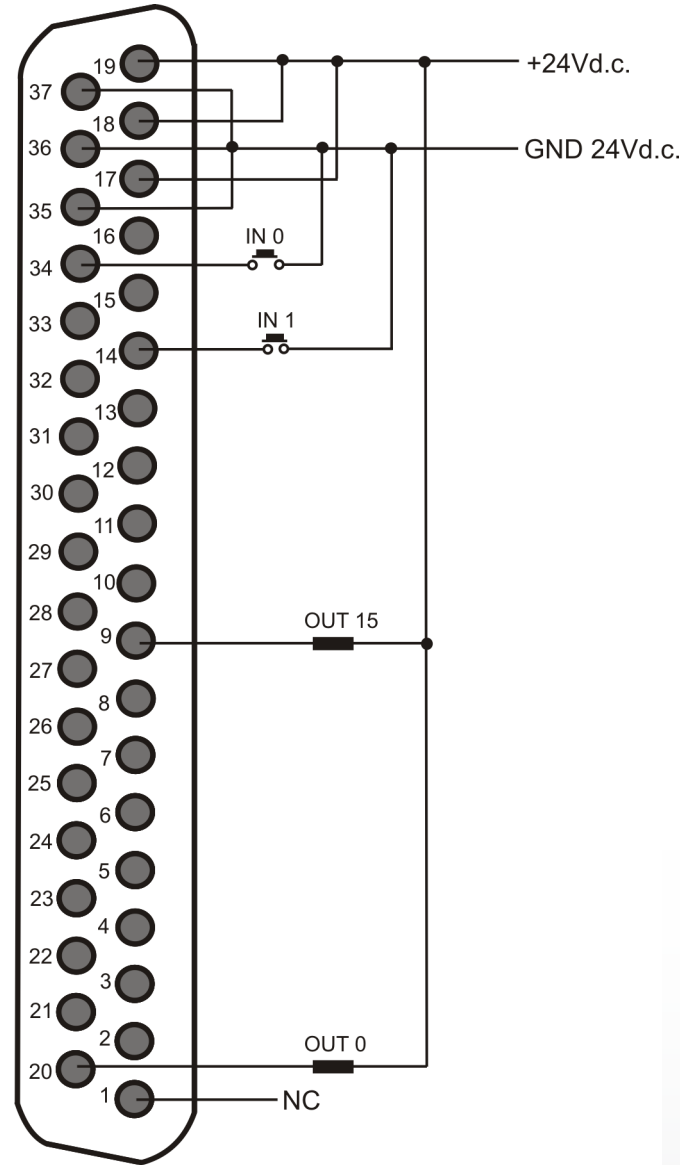
P1DME

DUAL POWER SUPPLY CONNECTION

SOURCE CONNECTION TYPE

P1dME Supply — GND 24Vd.c. (A)
P1dME Supply — +24Vd.c. (A)
Common IN — GND 24Vd.c. I/O(B)
Common OUT — +24Vd.c. I/O (B)
IN 0
IN 1
OUT 15
OUT 0
NC

SINK CONNECTION TYPE

P1dME Supply — GND 24Vd.c. (A)
P1dME Supply — +24Vd.c. (A)
Common IN — +24Vd.c. I/O (B)
Common OUT — GND 24Vd.c. I/O (B)
IN 0
IN 1
OUT 15
OUT 0
NC
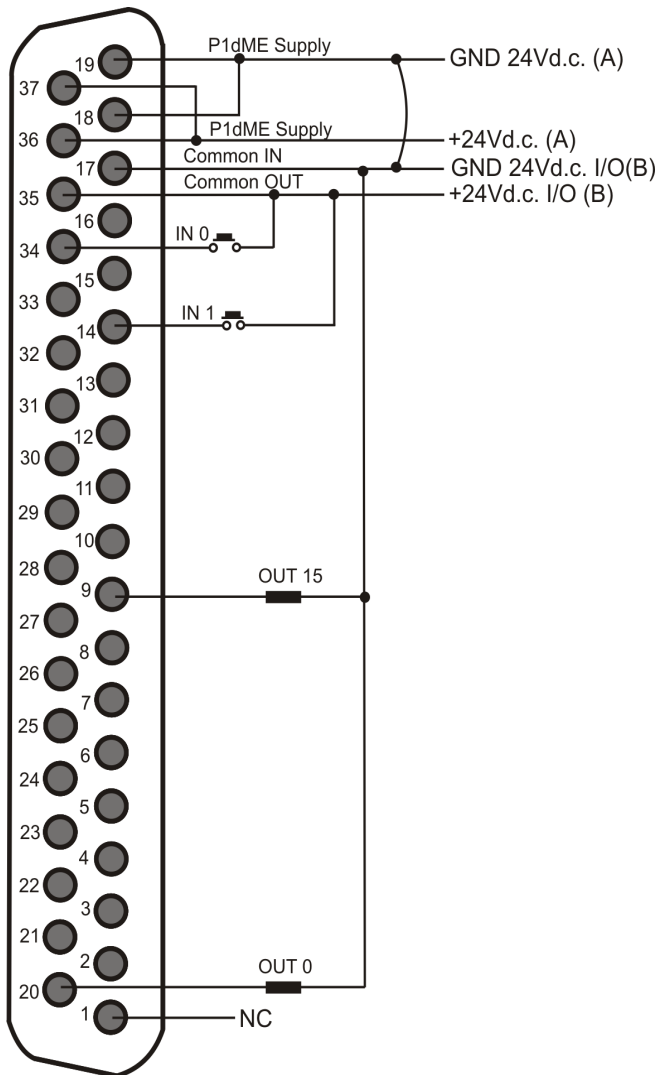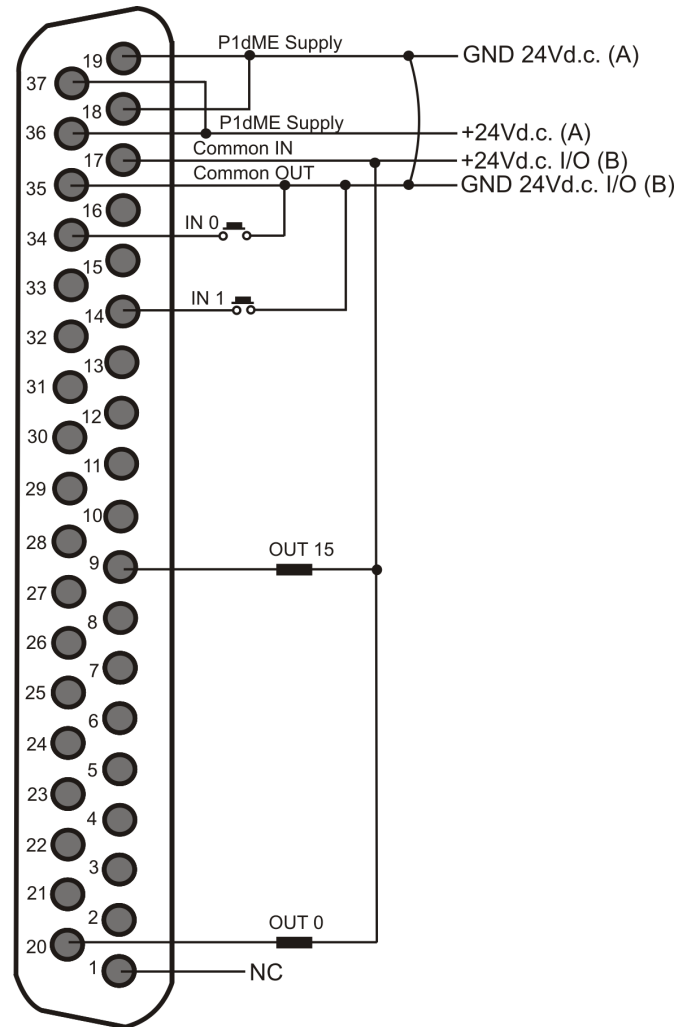
If it is not possible to use a single power source to supply the P1dME and the I/O in the case of P1 e P1c upgrades, it is necessary short-circuit the various GND lines together so that they are the same voltage.

P1dME Supply — GND 24Vd.c. (A)
Connects the ground lines together.
P1dME Supply — +24Vd.c. (A)
Common IN — GND 24Vd.c. I/O(B)
Common OUT — +24Vd.c. I/O (B)
IN 0
IN 1

P1DME

Use the connector provided to connect the I/O. The maximum power cable cross section compatible with this connector is 0.5 mm²
- 24 V d.c./0.1 A outputs that conform to the provisions of the specification EN61131-2 in both SOURCE and SINK configuration
- Type 1 and 3 inputs that conform to the provisions of the specification EN61131-2 in both SOURCE and SINK configuration

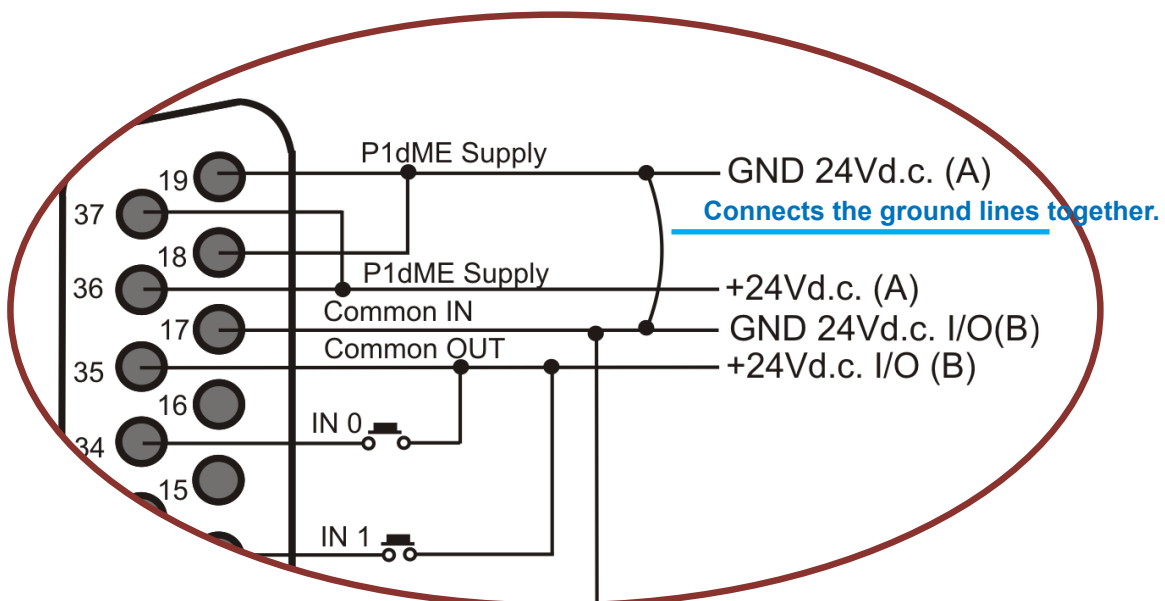| I/O SPECIFICATIONS	
Input circuits (SINK current 24 V d.c.)	
I_i (at 24 V)	5.2 mA
V_i (ON)	(15 – 30) V (I_{IH} = 2.9 – 6 mA) 3.2 mA -> 6.6 mA
V_i (OFF)	(-3 – 5) V
Output circuits (SOURCE current 24 V d.c.)	24 V d.c. / 0.1 A
I_o max (ON)	0.13A max. with resistive load
VDROPOUT(ON)	0.2 V tip. (0.4 V max.) 1.0V tip, 1.3V max @ 100mA
ILEAKAGE (OFF)	10 µA

WARNING
The I/O must be driven by a SELV type power supply, as defined in EN60950-1.
Digital I/O power supply specifications: voltage 24 V d.c. (-20% /+25%) ripple between 100-120Hz; maximum ripple at 100-120Hz less than 1.2V peak value.

All the outputs are provided with protected agaist permanent short-circuit, overload and the connection of small inductive loads. In case of short-circuit, the output current is limited electronically and the output is restored automatically a short time after the short-circuit is eliminated.

WARNING
The I/O cable must be shorter than 30 m, and must always be screened when it carries the power supply for the electronics. Use a cable with an overall screening braid connected to the case of the Cannon D-sub connector (P1dME side) and to the machine chassis at the other end by means of suitable terminal block or metal cable clamp. Make sure that the contact surface between the shields and the machine chassis is ample, free from surface insulation (e.g. paint) and the connections are kept as short as possible. It is important to guarantee the continuity of the shield even when there are switches and circuit breakers installed along the line, making sure that the parts that require shielding in the vicinity of the switches are kept to an absolute minimum.
Make sure that the shield is connected securely to the case of the Cannon D-sub connector by means of the cable clamp (ensure that the braid is well distributed along the cable clamp and connector case contact surfaces to provide an ample contact surface). Do not solder or weld the shield to the cable clamps or directly to the connector cases.
Lastly, connect the Cannon D-sub connector securely to the P1dME using the appropriate screws.

8.7 Digital I/O connections

The I/O BOX may be fitted with various types of digital I/O:
"I/O TYPE A" relays outputs with N.A. contact (normally open)
"I/O TYPE B" optoisolated inputs and outputs
"I/O TYPE C1" relay outputs with changeover contacts
Each type features one or two variants that are identified by a dedicated "I/O TYPE xx" label where the type identifier letter (A, B, C) is followed by a number that indicates the variant.

IMPORTANT
The symbol on the left is on the H1 connector of the I/O BOX together with a data plate with "I/O TYPE xx". It indicates the exact type of I/O installed on the equipment and the wiring specifications to be followed.

NOTE (VOLTAGE AND CURRENT VALUES)
All the a.c. current and voltage values are r.m.s., the frequency is 50-60 Hz (-6%/+5%). The total r.m.s. content of the pure harmonics (integer multiples of the nominal frequency) not exceeding 10 times the nominal frequency may constitute up to 10% of the total voltage. The total content of harmonics and other frequencies above this level may constitute up to 2% of the total voltage.

WARNING
The H1 connector contains the protection earth connection for the equipment, so make sure that the green/yellow wire in the flying cable connected to H1 is connected properly to the building safety earth. Only use the flying connector provided with the equipment.

P1DME

8.7.1 "I/O TYPE A" Relays outputs with N.A. contact

The following table lists the variants that are available:

Label	Nominal input voltage	Output voltage
I/O TYPE A1	24 V a.c./ d.c.	Max 150 V a.c.
I/O TYPE A2	115 V a.c.	Max 250 V a.c.
I/O TYPE A5	24 V a.c. / d.c.	Max 150 V a.c. / d.c.

H1 connector wiring diagram for I/O TYPE A1/A2/A5
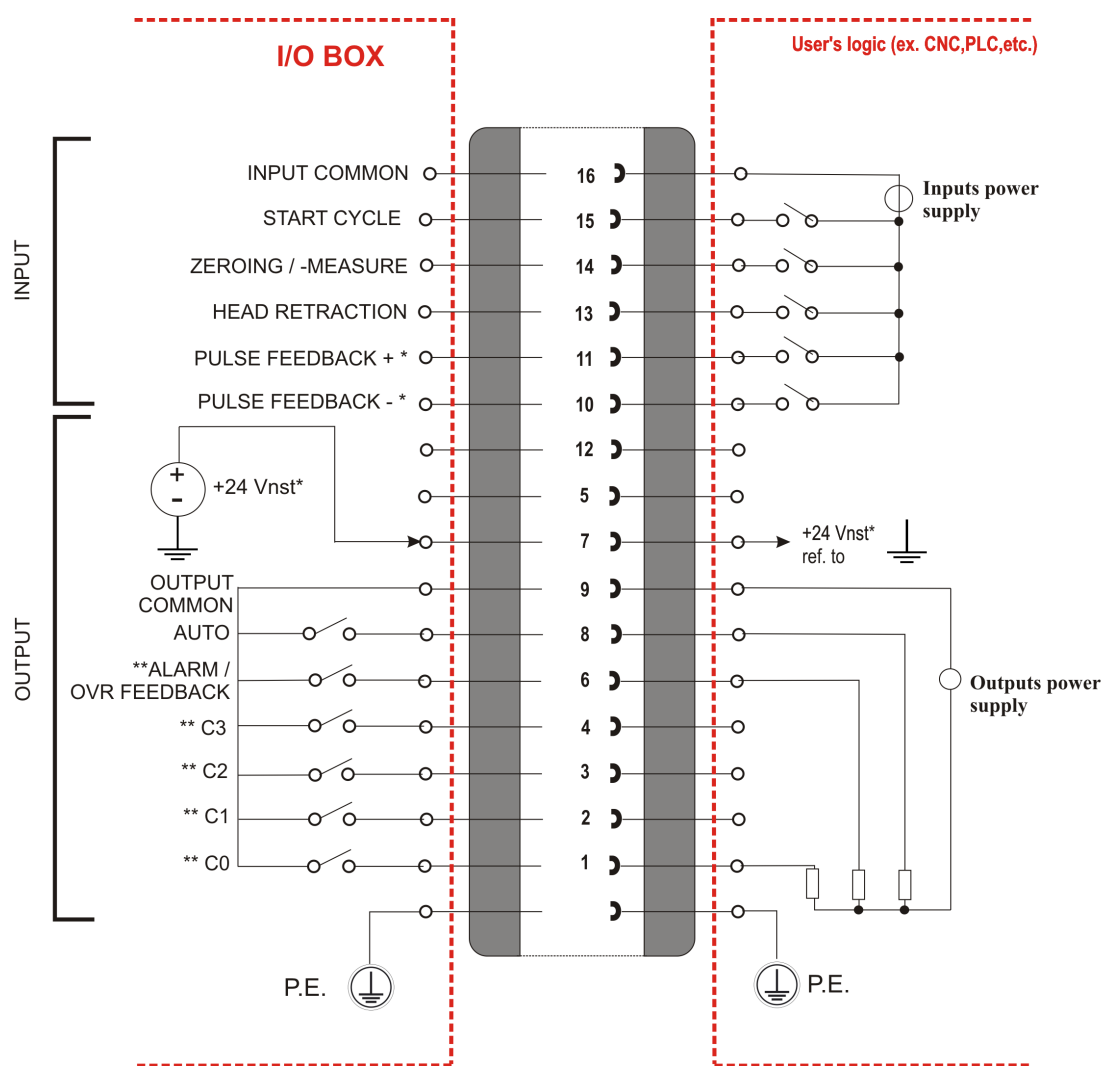
NOTES
* Only present in some configurations
** Depending on the configuration set in the P1dME

⚠️ **IMPORTANT**
For the input voltages ("Inputs Power Supply") and output voltages ("Outputs Power Supply") to be applied to the H1 connector in accordance with the diagram, be aware of the I/O type fitted in the I/O BOX.

INPUTS	OUTPUTS
"I/O TYPE A1" or I/O TYPE A5" variants These two variants are equipped with 24 V d.c. or 24 V a.c. r.m.s. drivable inputs, the difference between the two versions is explained below. 1. SINK/SOURCE current, 24 V d.c. drive. The SINK/SOURCE current connection for the inputs can be selected by connecting the inputs common terminal. Electrical specifications: • Input active V_I (ON) = 15 – 30 V d.c I_I (ON) = 10 mA (V_I = 24 V d.c), 6 to 12 mA (V_I = 15 – 30 V d.c) • Input inactive V_I (OFF) = (-3 – 5) V d.c **N.B.** The SINK current type inputs connection features specifications that are compatible with the "TYPE 1" digital inputs as defined in the Standard EN61131-2. **WARNING** The power supply for the digital inputs must be SELV as defined in EN60950-1, and one of the two terminals must be connected to the equipotential protection. **N.B.** The "SINK current" input is driven by a switch or limit switch connected between the input and the positive pole of the digital I/O power supply. The SOURCE current input is driven by a switch or limit switch connected between the input and the negative pole of the digital I/O power supply. 2. 24 V a.c. drive (sinusoidal), specifications: • input active V_I (ON) = 18 – 30 V a.c. I_I (ON) = 10 mA a.c. (V_I = 24 V a.c.), 7 – 12 mA a.c. (V_I = 18 – 30 V a.c.) • input deactivated V_I (OFF) <= 3 V a.c. (see NOTE on voltage and current values page 50) **WARNING** The power supply for the machine inputs must be SELV as defined in EN60950-1, and one of the two terminals must be connected to the equipotential protection. (.../...)	**"I/O TYPE A1" variant** Relay with N.O. contact (Normally Open = closed when active) Maximum current per contact: 3 A, with restive load • Maximum relay common contact current: 3.5 A • Maximum voltage: 150 V a.c. r.m.s., 50-60 Hz (-6% / +5%) or 30 V d.c. • Leakage current for each open contact: 1.3 mA max (150 V a.c.) **CAUTION** The outputs are not protected: on the shared outputs, install a magneto-thermal protection device with a nominal current no greater than In= 4A, curve "B" in accordance with EN60947 and magnetic trip current no greater than 4 In= 16A, or an equivalent fuse. It is left to the user's discretion whether to protect the individual outputs with a suitable device. The power supply should also be fitted with a differential circuit breaker. **"I/O TYPE A2" variant** Relay with N.O. contact (Normally Open = closed when active) Maximum current per contact: 3 A, with restive load • Maximum relay common contact current: 3.5 A • Maximum voltage: 250 V a.c. r.m.s., 50-60 Hz (-6% / +5%) or 30 V d.c. • Leakage current for each open contact: 2 mA max (250 V a.c.) **CAUTION** The outputs are not protected: on the shared outputs, install a magneto-thermal protection device with a nominal current no greater than In= 4A, curve "B" in accordance with EN60947 and magnetic trip current no greater than 4 In= 16A, or an equivalent fuse. It is left to the user's discretion whether to protect the individual outputs with a suitable device. The power supply should also be fitted with a differential circuit breaker. (.../...)

P1DME

| INPUTS	OUTPUTS
"I/O TYPE A2" variant These two variants have inputs that can be driven at 115 V a.c. (sinusoidal): • Input active V_i (ON) = 79 to 132 V a.c I_i (ON) = 11 mA a.c. (VI = 115 V a.c.), 8 –14 mA a.c. (V_i= 79 – 132 V a.c.) • Input inactive V_i (OFF) <= 10 V a.c. (see NOTE on voltage and current values page 50)	**"I/O TYPE A5" variant** Relay with N.O. contact (Normally Open = closed when active) • Maximum voltage: 150 V a.c. / d.c. • A.c. power supply: 120 VA – max 1 A, max 150 V a.c. r.m.s., 50–60 Hz (-6% / +5%), with a resistive load • D.c. power supply: 60 W - max 1 A, max 150 Vd.c., with resistive load • Maximum relay common contact current: 3.5 A • Parasitic current for each open contact: 1.3 mA max (150 V a.c.) **CAUTION** The outputs are not protected. On the shared outputs, install a magneto-thermal protection device (or equivalent fuse) with a nominal current no greater than In= 4A, curve "B" in accordance with EN60947 and magnetic trip current no greater than 4 In= 16A. Similarly on single outputs, install a magneto-thermal protection device (or equivalent fuse) with a nominal current no greater than In= 1A, curve "B" in accordance with EN60947 and magnetic trip current no greater than 5 In= 5A. The power supply should also be fitted with a residual current circuit breaker.

CONNECTION INSTRUCTIONS

The digital I/O are designed for a single-phase power supply system: Connect all the output relays using the same power supply phase; 115/230 V a.c. inputs must also be connected to the same power supply phase as the outputs; protect the inputs using a residual current circuit breaker, which may be common with that for the outputs. The energy distribution system neutral line must be connected to earth: When using an IT type energy distribution system, always connect via a suitable isolating transformer.

To wire the flying heavy duty 16-pin 16 A female connectors provided for the digital I/O, proceed as follows:
1. Use shielded cables with adequate insulation for the selected power supply voltage (150 V a.c. or 250 V a.c.) for all the signals, including the inputs. The cables must be protected by global type braided shielding (covering > 85%). Use wire with a section from 0.75 mm² to 2.5 mm² Maximum cable length (including breaker connections): less than 30 m;
2. Strip the wires by 7.5 mm at either end;
3. Terminate each wire using a suitably rated lug; the lugs must also guarantee the surface distances (see below);
4. Tighten the screws to a torque from 0.5 Nm to 0.55 Nm. All screws must be tightened fully, including those of unused terminals: check that the surface distance between adjacent screws and adjacent lugs is greater than 3.2 mm;

5. For the PE (Protection Earth) connection, use a conductor with a section equal to or greater than that used for the I/O contacts. Use a green/yellow wire and connect it to the heavy duty connector using a suitable lug (one that is compatible with sections from 0.25 mm^2 to 1.5 mm^2 is provided) and the earth screw provided. Tighten the earth screw to a torque from 1.2 Nm to 1.5 Nm.
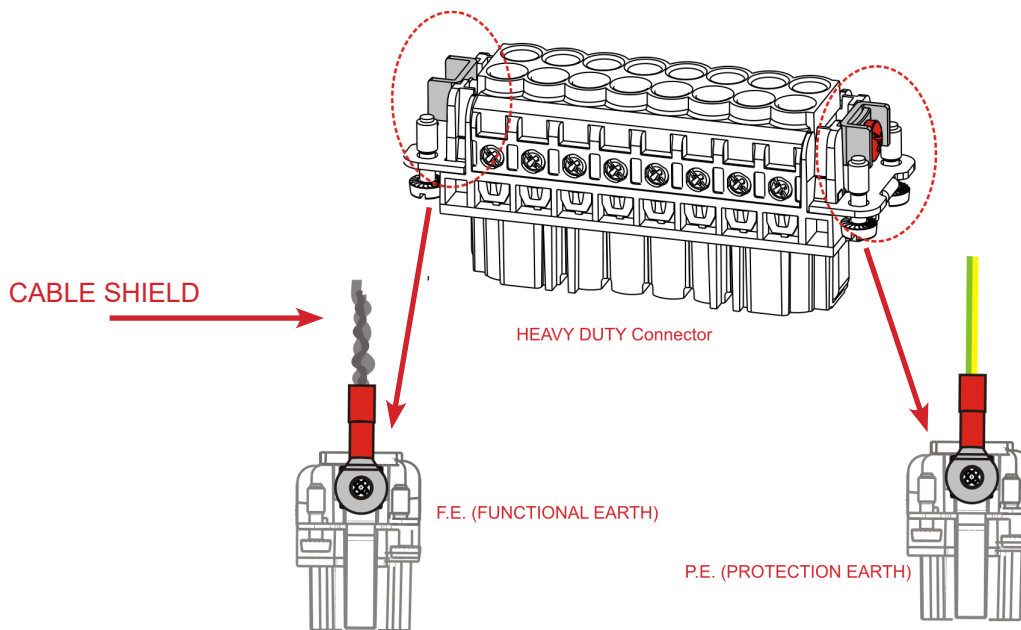
CABLE SHIELD

HEAVY DUTY Connector

F.E. (FUNCTIONAL EARTH)

P.E. (PROTECTION EARTH)

6. Connect the shield (on the I/O Box side) to the case of the heavy duty connector and to the chassis (on the PLC, CNC, etc. side) using suitable terminals or metal cable clamps. Make sure that the contact surface between the shields and the machine chassis is ample, free from surface insulation (e.g. paint) and the connections are kept as short as possible. It is necessary to
ensure the shield continuity even when there are breaks (terminal blocks) installed along the line, making sure that the uninsulated parts of the shield near the breaks are kept to a minimum. Make sure that the shield is connected properly to the case of the heavy duty connector using the second screw and second lug provided (see the illustration above). Do not solder or weld the shield to the cable clamps or directly to the connector cases.
7. the digital I/O connector must not be inserted/extracted when there is voltage/current.

⚠ If dangerous voltages are used to drive the inputs and/or outputs, apply the provided label with "electric shock hazard" symbol in a visible place on the flying connector case.
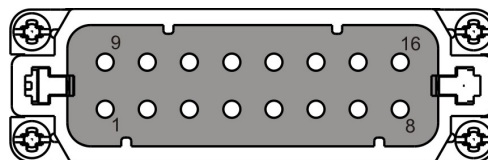
N.B.
Set up the Control trip thresholds so that multiple commands cannot be tripped simultaneously during normal working cycles.

N.B.
+24 Vnst ("I/O TYPE A1" or "I/O TYPE A5" only)
There is a + +24 V d.c. (with respect to Ground), non-stabilised (+ 10%) short-circuit protected voltage present on pin 7 of connector H1 capable of supplying a max current of 20 mA. This terminal may be used to drive external micro-switches and/or 24 V d.c. inputs (check the power consumption of the inputs indicated above).

P1DME

MARPOSS

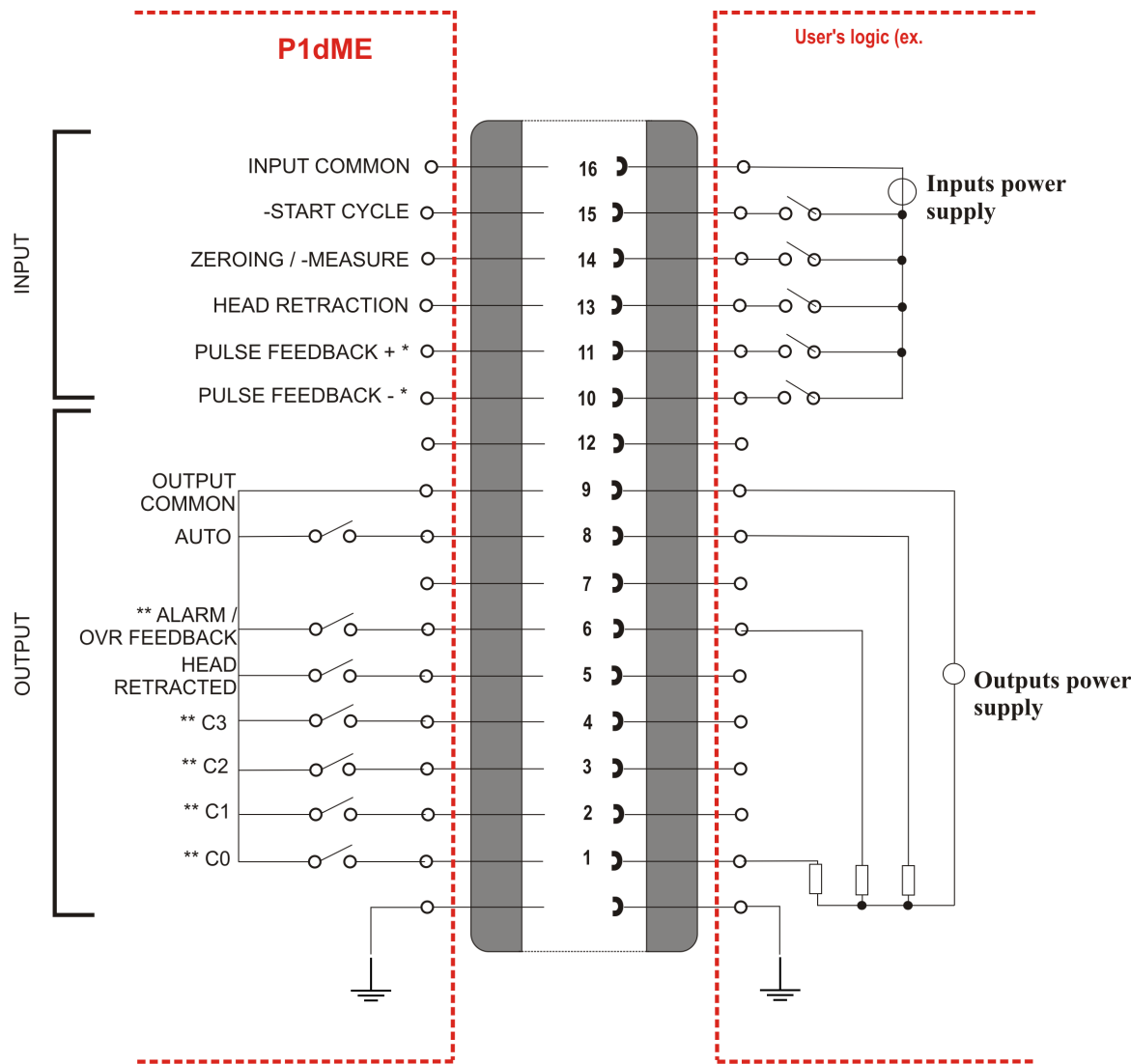H1 CONNECTOR PIN-OUT
(IO TYPE A1 /A2 / A5)

I/O signal connection

TERMINAL N	SIGNAL	I/O	DESCRIPTION
16	INPUT COM-MON	IN	The input circuits drive voltage supply must be applied between this terminal (inputs common) and each individual terminal in use (via a micro-switch or similar device).
15	START CY-CLE	IN	The Start Cycle signal is connected to this terminal. Connect the power supply to this terminal to enable measurement system during working cycle.
14	ZEROING/ -MEASURE	IN	This input is used to execute the zeroing cycle on the master part. Providing power activates the zero-setting command
13	HEAD RE-TRACTION	In	The retraction signal is connected to this terminal; it is used when the measurement heads retraction circuit is installed. Connect the power supply to this terminal to retract the measurement heads.
5.10.11.12	n.c.	-	Not used.
9	OUTPUTS COMMON	Out	The output signals can be monitored by connecting the external loads (relays or other compatible input devices) between one pole of the power supply and each individual terminal in use. The other pole of the power supply must be connected to this terminal (outputs common).
1	C0	Out	The zero command (C0) signal is connected to this terminal.
2	C1	Out	The first command (C1) signal is connected to this terminal.
3	C2	Out	The second command (C2) signal is connected to this terminal.
4	C3	Out	The second command (C3) signal is connected to this terminal.
7	+24 Vnst	Out	There is an unstabilised 24 V d.c. voltage present on this terminal.
6	ALARM	Out	The P1dME is in an alarm state.
8	AUTO	Out	The automatic signal is connected to this terminal.

[

N.B.
For a list the functions present on your model, consult the I/O list supplied with the unit.
Some pins may not be present, depending on the specific model

8.7.2 I/O TYPE B - 24 V d.c. optoisolated digital I/O

H1 connector wiring diagram for I/O TYPE B

NOTES:
** = depending on the configuration set in the P1dME

P1DME

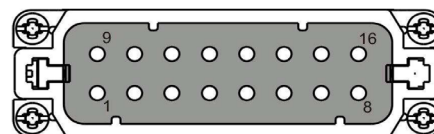| INPUTS	OUTPUTS
24V d.c., current SINK/SOURCE. The SINK/SOURCE current connection for the inputs can be selected by connecting the inputs common terminal. Electrical specifications: • Input active V_I (ON) = 15 – 30V d.c. I_I (ON) = 10 mA (V_I = 24 V d.c), 6 to 12 mA (V_I = 15 to 30 V d.c) • Input inactive V_I (OFF) = -3 – 5V d.c.	24 V d.c. / 10 mA, current SOURCE/SINK selectable via the output common connection: • Output active: I_O (ON) = 10 mA (max 13 mA) with resistive load V_O dropout (ON) = 3 V (min 2.2 V / max 3.4 V) • Output inactive V_O (OFF) = max 30V d.c. I_O (OFF) = max 200 µA (leakage current in inactive state)
N.B. The SINK current type inputs connection features specifications that are compatible with the "TYPE 1" digital inputs as defined in the Standard EN61131-2. **N.B.** The "SINK current" input is driven by a switch or limit switch connected between the input and the positive pole of the digital I/O power supply. The SOURCE input is driven by a switch or limit switch connected between the input itself and the negative pole of the digital I/O power supply.	**WARNING** **The outputs are fitted with a short duration short circuit protection: max 0.5 s; install a protection device capable of limiting the fault current at each output to less than 100 mA. For example, each individual input may be fitted with:** **• a quick-blow, non-resettable fuse with a rating of 50-70 mA;** **• a resettable, 450-500 Ohm fuse that can handle a current of at least 100 mA.** **In this case it is important to pay special attention to the signal level, since the voltage drop across the fuse is summed with the dropout at the output. In the worst case scenario, when using SOURCE current output with a power supply at the minimum level stipulated by the Standard EN61131, a PTC type 450 Ohm fuse and maximum load conditions, the resulting output voltage may be as low as: 19.2V – 3V – 450 Ohm x 10 mA = 11.7 V, which would not be sufficient to drive the corresponding machine input to the high logic state.**

CONNECTION INSTRUCTIONS

To wire the heavy duty 16-pin female connectors provided for the digital I/O, proceed as follows:
1. Use a wire with a section from 0.75mm^2 to 2.5 mm^2, and strip wires by 7 – 7.5 mm at each end;
2. Terminate each wire with lugs;
3. Tighten the screws to a torque from 0.5 Nm to 0.55 Nm;
4. the digital I/O connector must not be inserted/extracted when there is voltage/current.

WARNING
The power supply for the digital I/O must be SELV as defined in EN60950-1, and one of the two terminals must be connected to the equipotential protection.
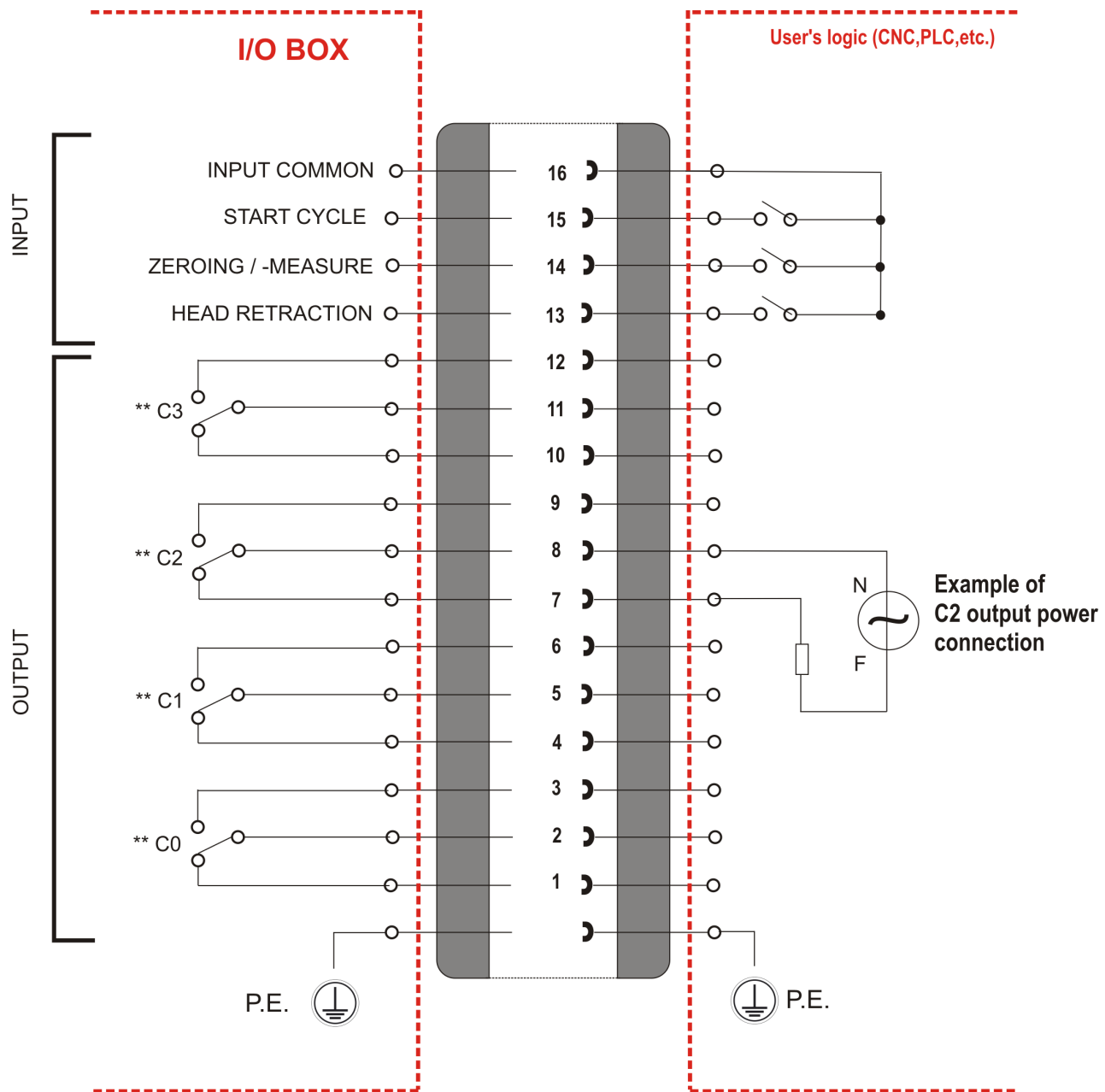
"I/O TYPE B" H1 CONNECTOR PIN-OUT

I/O signal connection

TERMINAL N	SIGNAL	I/O	DESCRIPTION
16	INPUT COMMON	In	The input circuits drive voltage supply must be applied between this terminal (inputs common) and each individual terminal in use (via a micro-switch or similar device).
15	START CYCLE	In	The Start Cycle signal is connected to this terminal Connect the power supply to this terminal to enable measurement system during working cycle.
14	ZEROING/ -MEASURE	IN	This input is used to execute the zeroing cycle on the master part. Providing power activates the zero-setting command
13	HEAD RE-TRACTION	In	The retraction signal is connected to this terminal; it is used when the measurement heads retraction circuit is installed. Connect the power supply to this terminal to retract the measurement heads.
7.10.11.12	n.c.	-	Not used.
9	OUTPUTS COMMON	Out	The output signals can be monitored by connecting the external loads (relays or other compatible input devices) between one pole of the power supply and each individual terminal in use. The other pole of the power supply must be connected to this terminal (outputs common).
1	C0	Out	The zero command (C0) signal is connected to this terminal.
2	C1	Out	The first command (C1) signal is connected to this terminal.
3	C2	Out	The second command (C2) signal is connected to this terminal.
4	C3	Out	The second command (C3) signal is connected to this terminal.
5	HEAD RETRACTED	Out	The Marposs measuring head is retracted.
6	ALARM	Out	The P1dME is in an alarm state.
8	AUTO	Out	The automatic signal is connected to this terminal.

N.B.
For a list the functions present on your model, consult the I/O list supplied with the unit.
Some pins may not be present, depending on the specific model

8.7.3 I/O TYPE C1 - relay outputs with changeover contacts

H1 connector wiring diagram for I/O TYPE C1

NOTES:
** = depending on the configuration set in the P1dME

INPUTS	OUTPUTS
The inputs are "current SOURCE" type and supplied by the internal power source(*). Electrical specifications: Input active • The inputs are activated by being connected to the inputs common (terminal 16), • Maximum contact resistance: 100 Ohm • Maximum contact voltage drop: 1.1 V • Current output I_i (ON) <= 10 mA d.c. Input inactive • The inputs are deactivated by disconnecting them from the inputs common (terminal 16), • Minimum contact resistance: 100kOhm (or loss current < 300 uA @ 30V d.c.) • Voltage V_i (OFF) typ. 5 V d.c. (max. 30 V d.c.) ***N.B.** The SOURCE current input is driven by a switch or limit switch connected between the input itself and the inputs common.	Relay with N.O. contact (Normally Open = closed when active) or N.C. (Normally Closed = open when active). **A.C. power supply** Maximum current per contact: 3 A, with restive load • Maximum voltage: 150 V a.c. r.m.s., 50-60 Hz (-6% / +5%) (maximum voltage 250 V a.c. only under the special conditions described below) • Leakage current for each open contact: 2 mA max (250 V a.c.) **D.C. power supply** • Maximum current per contact: 3 A, with restive load • Maximum voltage: 30V d.c. The output signals can be monitored by connecting the external loads (relays or other compatible input devices) between the power supply voltage phase and the terminal corresponding to the contact to be used (N.A. or N.C.). The power supply neutral line must be connected to the common terminal of the corresponding output. It is possible to invert the phase and neutral terminals. **WARNING** The outputs are not protected: install on each output a magnetothermic protection device with nominal current not greater than In= 4A, characteristic "B" in compliance with EN60947 and magnetic trigger current not greater than 4 In= 16A or an equivalent fuse. The power supply should also be fitted with a differential circuit breaker.

CONNECTION INSTRUCTIONS

OUTPUT VOLTAGES NOT EXCEEDING 150 V A.C.

WARNING
The connection instructions for I/O TYPE C1 depend on the output voltage:
•　　Output voltages below 150 V
•　　Output voltages from 150 V to 250 V

WARNING
Between inputs and outputs there is a double insulation because there can be a voltage of up to 150 V a.c. on the outputs. The double insulation must be maintained in the wiring and in the switching section (relays, SSR, etc.) that drives the inputs.
Bear in mind that the inputs, in the case of outputs powered with a maximum of 150 V a.c., are SELV in compliance with EN60950-1.

Connection instructions

► The digital I/O are designed for a single-phase power supply system: Connect all the relays using the same power supply phase. The energy distribution system neutral line must be connected to earth: <u>When using an IT type energy distribution system, always connect via a suitable isolating transformer.</u>

► To wire the flying heavy duty 16-pin female connectors provided for the digital I/O, proceed as follows:

1. Use shielded cables insulated for at least 150V a.c. for all signals, including inputs. The cables must be protected by global type braided shielding (covering > 85%). Use wire with a section from 0.75 mm^2 to 2.5mm^2 Maximum length of cable, including switch and breaker connections: 30m;

2. Strip the wires by 7 – 7.5 mm at either end;

3. Terminate each wire using a suitably rated lug; the lugs must also guarantee the surface distances (see below);

4. Tighten the screws to a torque from 0.5 Nm to 0.55 Nm. All screws must be tightened fully, <u>including those of un-used terminals</u>: check that the surface distance between adjacent screws and adjacent lugs is greater than 3.2mm;

5. For the PE (Protection Earth) connection, use a conductor with a section equal to or greater than that used for the I/O contacts. Use a green/yellow wire and connect it to the heavy duty connector using a suitable lug (one that is compatible with sections from 0.025 mm^2 to 1.5 mm^2 is provided) and the second earth screw provided. Tighten the earth screw to a torque from 1.2 Nm to 1.5 Nm.

6. Connect the shield (on the I/O BOX side) to the case of the heavy duty connector and to the chassis (on the machine side) using suitable terminals or metal cable clamps. Make sure that the contact surface between the shields and the machine chassis is ample, free from surface insulation (e.g. paint) and the connections are kept as short as possible. It is important to guarantee the continuity of the shield even when there are switches and circuit breakers installed along the line, making sure that the parts that require shielding in the vicinity of the switches are kept to an absolute minimum. Make sure that the shield is connected securely to the case using of the heavy duty connector using the dedicated screw (ensure ample contact surface). Do not solder or weld the shield to the cable clamps or directly to the connector cases.

7. the digital I/O connector must not be inserted/extracted when there is voltage/current.

CABLE SHIELD

HEAVY DUTY Connector

F.E. (FUNCTIONAL EARTH)

P.E. (PROTECTION EARTH)
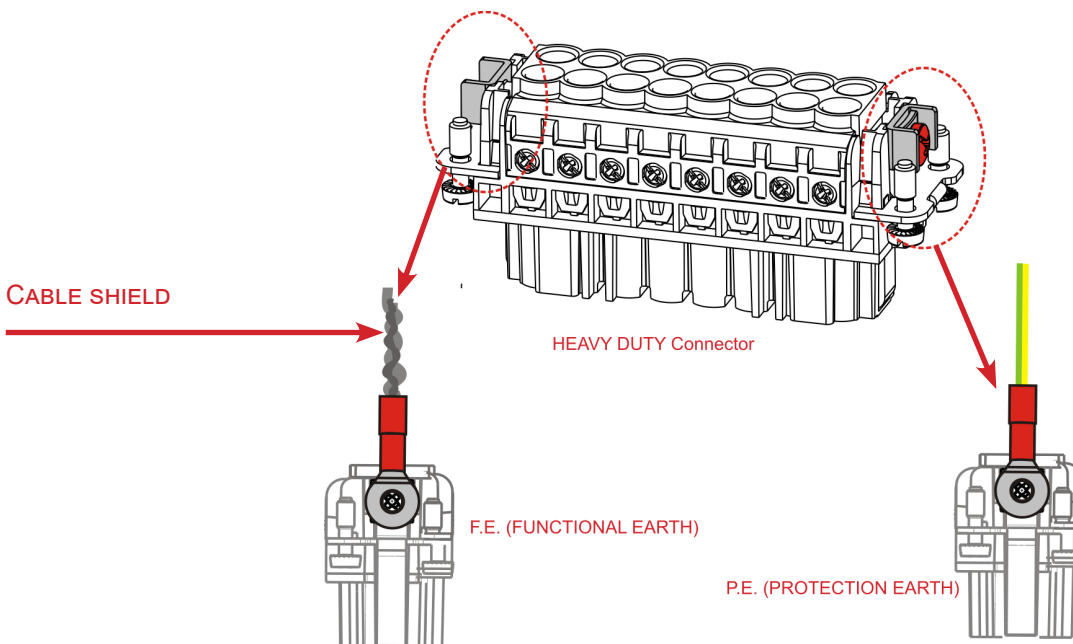
If dangerous voltages are used to drive the inputs and/or outputs, apply the provided label with "electric shock hazard" symbol in a visible place on the flying connector case.

N.B.
Set up the Control trip thresholds so that multiple commands cannot be tripped simultaneously during normal working cycles.

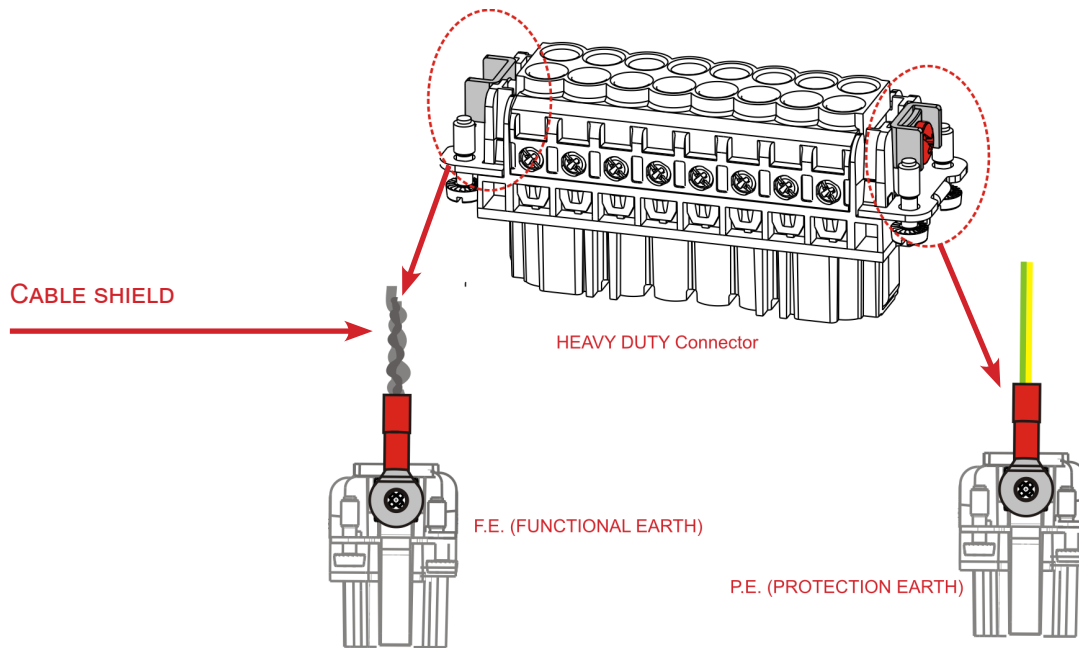OUTPUT VOLTAGES BETWEEN 150 V A.C. AND 250 V A.C.

The output contacts can be used at voltages from 150 V a.c. to 250 V a.c. (Max): voltages higher than those specified in the previous paragraph require different precautions.

WARNING
Although the voltage present on the input pins is relatively low, it should be considered as hazardous as the voltage present on the outputs. The input wiring and drive circuits must comply with the applicable regulations, taking all the necessary precautions associated with circuits supplied by voltages of up to 250 V a.c. r.m.s.

Connection instructions
► The digital I/O are designed for a single-phase power supply system: Connect all the relays using the same power supply phase. The energy distribution system neutral line must be connected to earth. When using an IT type energy distribution system, always connect via a suitable isolating transformer.
► When selecting the circuit breakers (or relays or SSR, etc.) that drive the inputs, it is important to bear in mind that there are hazardous voltages present on the input circuits (max 250 V a.c. r.m.s.) Even the potential difference between the individual contacts on the circuit breaker device may reach a maximum of 250 V a.c. r.m.s.
► To wire the flying heavy duty 16-pin female connectors provided for the digital I/O, proceed as follows:
1. Use shielded cables insulated for at least 300V a.c. for all signals, including inputs. The cables must be protected by global type braided shielding (covering > 85%). Use wire with a section from 0.75 mm^2 to 2.5 mm^2 Maximum length of cable, including switch and breaker connections: 30 m;
2. Strip wires by 7 - 7.5 mm at either end;
3. Terminate each wire using a suitably rated lug; the lugs must also guarantee the surface distances (see below);
4. Tighten the screws to a torque from 0.5 Nm to 0.55 Nm. All screws must be tightened fully, including those of unused terminals: check that the surface distance between adjacent screws and adjacent lugs is greater than 3.2 mm;
5. For the PE (Protection Earth) connection, use a conductor with a section equal to or greater than that used for the I/O contacts. Use a green/yellow wire and connect it to the heavy duty connector using a suitable lug (one that is compatible with sections from 0.025 mm^2 to 1.5 mm^2 is provided) and the second earth screw provided. Tighten the earth screw to a torque from 1.2 Nm to 1.5 Nm.
6. Connect the shield (on the I/O BOX side) to the case of the Heavy Duty connector and to the chassis (on the machine side) using suitable terminals or metal cable clamps. Make sure that the contact surface between the shields and the machine chassis is ample, free from surface insulation (e.g. paint) and the connections are kept as short as possible. It is important to guarantee the continuity of the shield even when there are switches and circuit breakers installed along the line, making sure that the parts that require shielding in the vicinity of the switches are kept to an absolute minimum. Make sure that the shield is connected securely to the case of the Heavy Duty connector using the dedicated screw (ensure ample contact surface). Do not solder or weld the shield to the cable clamps or directly to the connector cases.
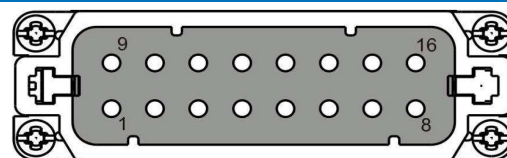7. the digital I/O connector must not be inserted/extracted when there is voltage/current.

MARPOSS

CABLE SHIELD

HEAVY DUTY Connector

F.E. (FUNCTIONAL EARTH)

P.E. (PROTECTION EARTH)

If dangerous voltages are used to drive the inputs and/or outputs, apply the provided label with "electric shock hazard" symbol in a visible place on the flying connector case.

N.B.
Set up the Control trip thresholds so that multiple commands cannot be tripped simultaneously during normal working cycles.

P1DME

I/O signal connection

TERMINAL N	SIGNAL	I/O	DESCRIPTION
16	INPUT COMMON	In	The input circuits must be driven leaving each individual terminal in use free or connecting them to this terminal (inputs common).
15	START CYCLE	In	The Start Cycle signal is connected to this terminal Connecting the input to the input common enables the measurement system during the machining cycle.
14	ZEROING/ -MEASURE	IN	Connection terminal to activate the zero-setting procedure on the master part. Connect this input to the input common to activate the zero-setting command.
13	HEAD RETRACTION	In	The retraction signal is connected to this terminal; it is used when the measurement heads retraction circuit is installed. Connect this input to the inputs common termnal to retract the measurement head.
12	C3 N.O.	Out	Normally Open connection terminal for the third command (C3); the contact is closed when C3 is active.
11	C3 COMMON	Out	Common terminal for the third command (C3); the third command may be replaced by other functions.
10	C3 N.C.	Out	Normally Closed connection terminal for the third command (C3); the contact is open when C3 is active.
9	C2 N.O.	Out	Normally Open connection terminal for the second command (C2); the contact is closed when C2 is active.
8	C2 COMMON	Out	Common terminal for the second command (C2).
7	C2 N.C.	Out	Normally Closed connection terminal for the second command (C2); the contact is open when C2 is active.
6	C1 N.O.	Out	Normally Open connection terminal for the first command (C1); the contact is closed when C1 is active.
5	C1 COMMON	Out	Common terminal for the first command (C1).
4	C1 N.C.	Out	Normally Closed connection terminal for the first command (C1); the contact is open when C1 is active.
3	C0 N.O.	Out	Normally Open type connection terminal for the zero command (C0); the contact is closed when C0 is activated.
2	C0 COMMON	Out	The zero command (C0) signal is connected to this terminal.
1	C0 N.C.	Out	Normally Closed connection terminal for the zero command (C0); the contact is open when C0 is active.

N.B.
For a list the functions on your model, consult the I/O list supplied with the unit.
Some pins may not be present, depending on the specific model

8.8 P1dME Power supply and functional earth connections

Voltage: +24 V d.c. (-20% / +25%) ripple at 100-120Hz inclusive
Maximum ripple: 1.2 V (peak)
Power consumption: 8W without retraction option
Up to 32 W with retraction
Conformity: The +24 V d.c. must be SELV (EN60950-1), and one of the two terminals of that power supply must be connected to the equipotential protection.

Use the connector provided to connect the unit to the power supply (see the wiring on page 21). The maximum power cable cross section that is compatible with this connector is 1.5 mm^2.

The **P1dME is fitted with self-resetting safety devices that protect it against inverting the polarity of the 24 V power supply and small overloads.** If either if these safety devices is tripped, proceed as follows:

1.Switch the device off and disconnect the cable;

2.Check the connections and eliminate the cause of the inverted polarity or overload;

3.Switch the P1dME on.

N.B.
The power supply board is protected against fault conditions caused by internal components by a replaceable fuse. If the board malfunctions or becomes damaged, contact Marposs customer service.

WARNING
The power supply must be SELV as defined in EN60950-1, and one of the two terminals must be connected to the equipotential protection.

Connect the unit to earth using the earth stud. Connect the stud to the earth centre on the machine where the unit is installed. The connection must be kept as short as possible. Use green/yellow cable with a cross section of at least 4mm^2.
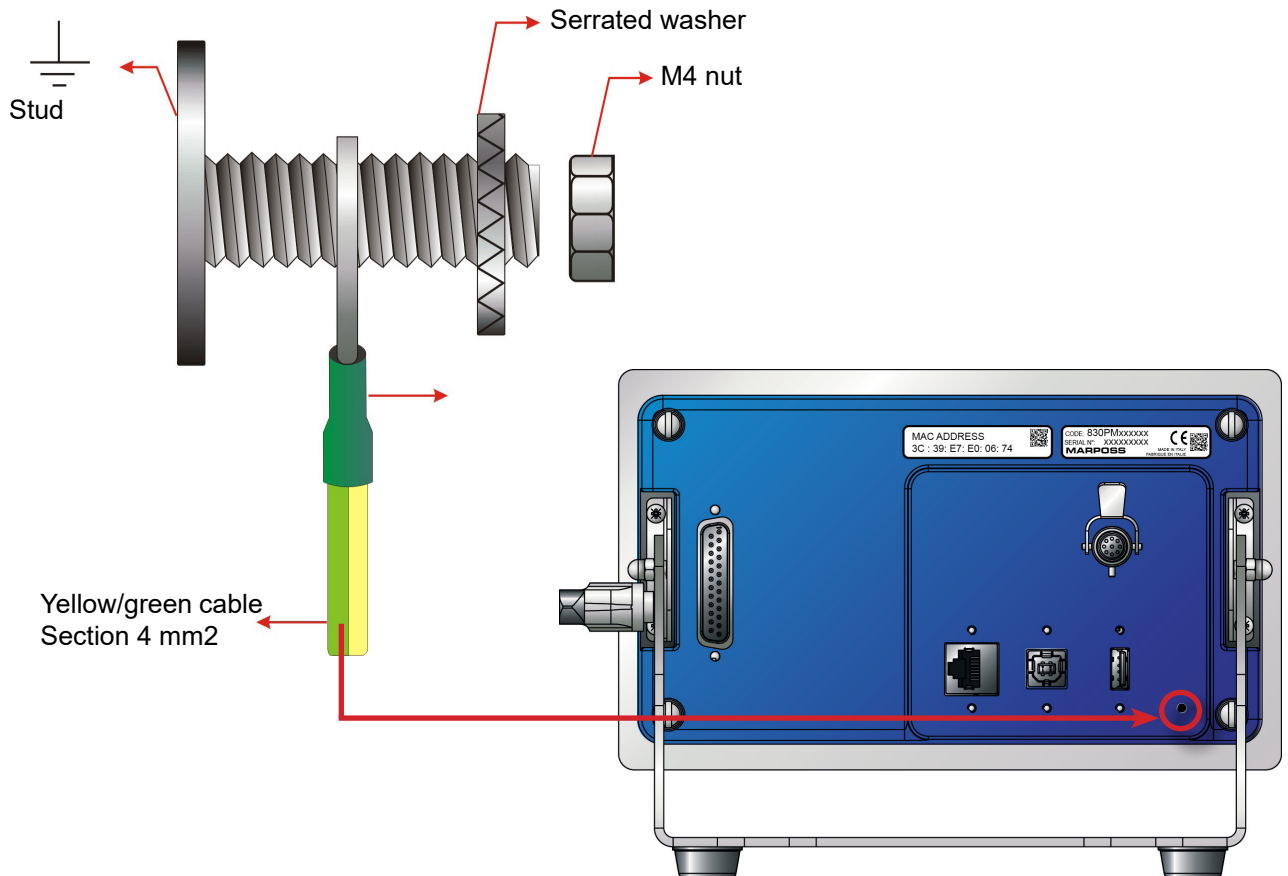
Fit a serrated washer (as shown in the figure) to ensure that the contact remains good.
For the panel mounted version, secure the P1dME to a metal panel on the machine that is connected to its earth centre using the studs at the rear of the P1dME.
Check that there is a low-resistance connection between the metal panel on the machine and the P1dME.

P1DME

8.9 I/O BOX Power supply and earth connections (optional)

Voltage:	+24 V d.c. (-20% / +25%) ripple at 100-120Hz inclusive
Maximum ripple:	1.2 V (peak)
Power consumption:	• 40 W for the P1dME with recharging option connected (32 W due to the P1dME) • 16W for the P1dME without recharging option connected (8 W due to the P1dME)
Conformity:	The +24 V d.c. must be SELV (EN60950-1), and one of the two terminals of that power supply must be connected to the equipotential protection.

Use the connector supplied to connect the unit to the power supply. The maximum power supply cable section that is compatible with this Phoenix 3-pin connector is 1.5 mm². The cable must be no longer than 30 m.

The P1dME is fitted with self-resetting safety devices that protect it against inverting the polarity of the 24 V power supply and small overloads. If either if these safety devices is tripped, proceed as follows:

1. Switch the equipment off and disconnect the power supply
2. Check the connections and eliminate the cause of the inverted polarity or overload;
3. Switch on the equipment and provide power to the I/O BOX.

N.B.
The power supply board is protected against fault conditions caused by internal components by a non-replaceable fuse. If the fuse blows, it is necessary to contact Marposs customer service.

WARNING
The +24 V d.c. must be SELV (EN60950-1), and one of the two terminals of that power supply must be connected to the equipotential protection.

CAUTION
In the event of a momentary power failure, it is important to be aware that:
a) The digital outputs (see chapters 8.3 and 9.4) may change state;
b) When using measuring heads equipped with a P1dME operated arm set opening (retraction) system, this may not function correctly (e.g. it may not be possible to open the fingers if they are closed, or close them if they are open).
Take the necessary measures to avoid harming personnel or property.

CAUTION
When the power supply that provides 24 V d.c. to the I/O BOX has an output capacity of more than 100 A, it is necessary to insert a magneto-thermal switch or equivalent fuse to limit the fault current.

- Safety earth connection, see paragraph 9.44
- Functional earth connection: connect the equipment to earth suing the earth stud. Connect the stud to the earth centre on the machine where the unit is installed. The connection must be kept as short as possible. Use yellow/green cable with a cross section of at least 4 mm^2.
- Fit a serrated washer (see figure) to ensure that the contact remains good.
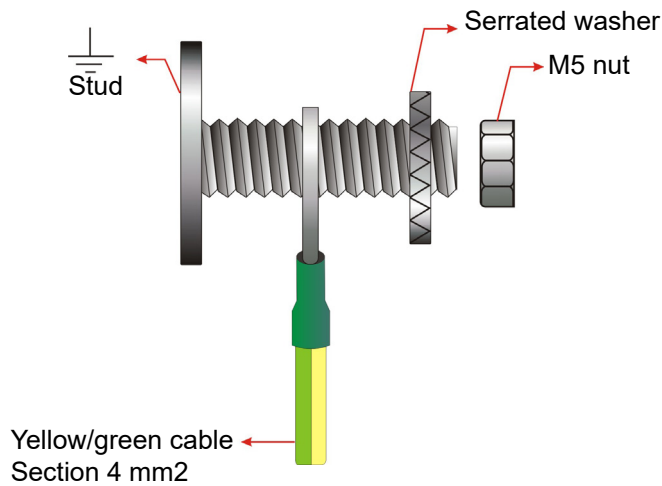
8.10 Switching the unit on

After completing all the connections to the machine logic signals, connect the Cannon 25-pin female connector to the corresponding connector on the P1dME, and then provide power to the power supply pins.

[
N.B.
Once the power-on procedure is complete, contact Marposs service personnel if any messages that are not included in the alarms list appear on the display (see the P1dME use and programming manual).

P1DME

8.11 Measurement Head Mechanical Zero-Setting

Perform the mechanical zero-setting procedure for the measuring heads with the P1dME in the SETUP MENU. The individual In-Process measuring head channels can be displayed by selecting channel T1 or T2.

8.11.1 Mechanically adjusting in-process heads with adjustment guides

►**Micromar 3 measuring heads with two ball contacts**
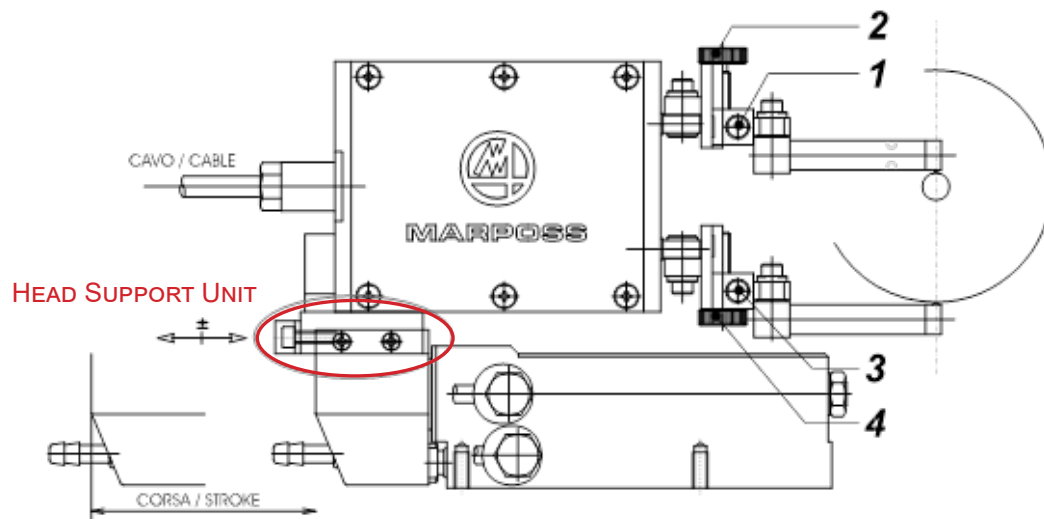
►**Unimar measuring heads with ball contacts**
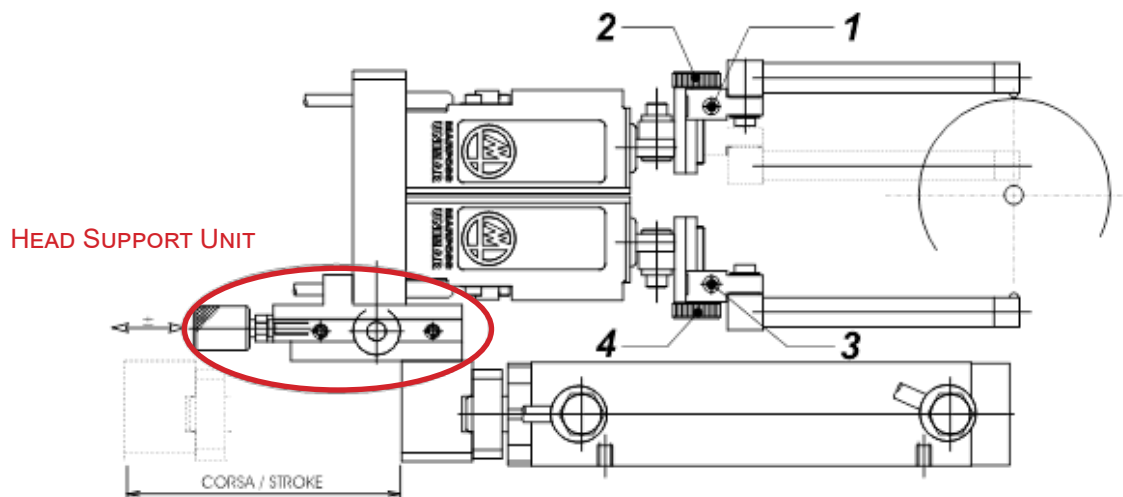
►**Micromar 3 measuring heads with two bar contacts**
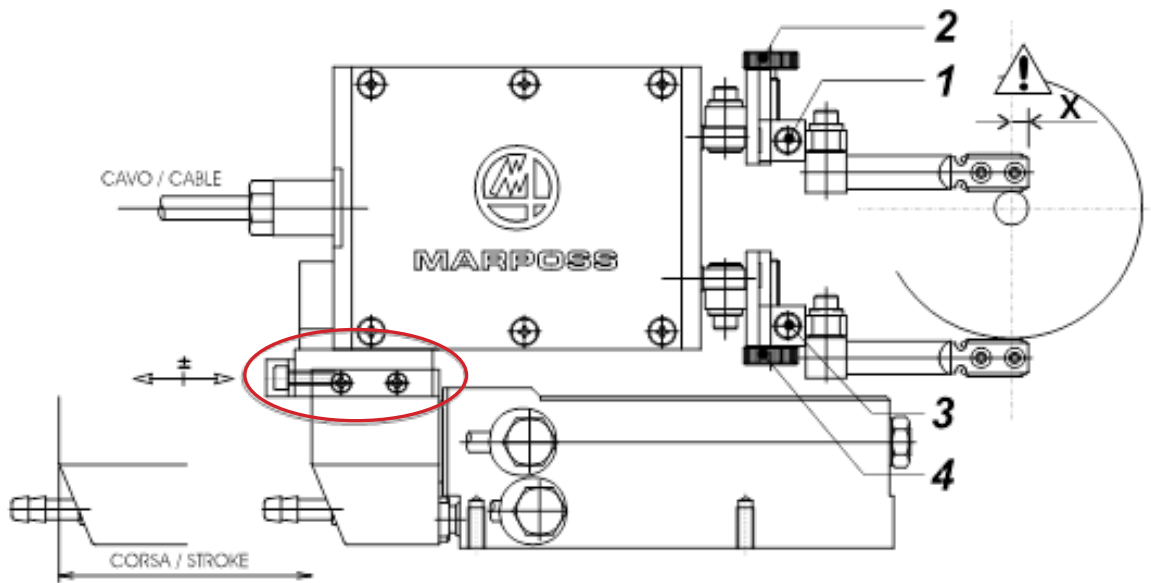
►**Unimar Measuring heads with bar contacts:**
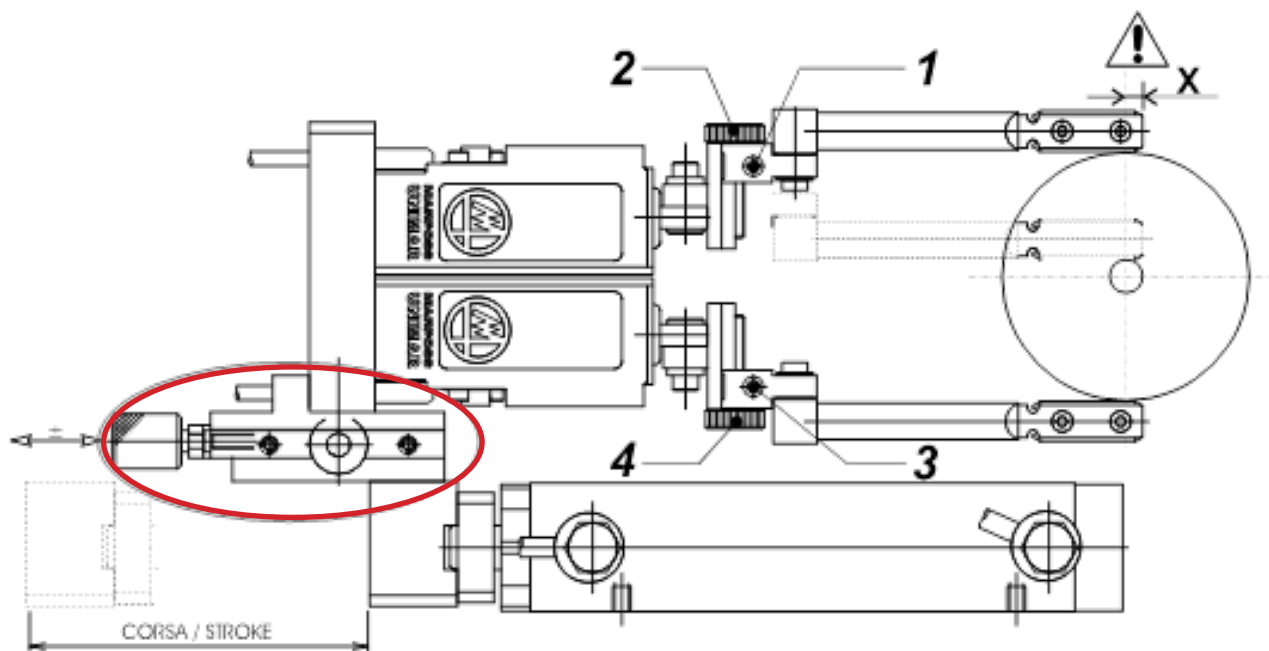
Diameter set-up of **UNIMAR** measuring heads (with bar contacts)
1. Place a ground workpiece either on the spindle or between the tips.
2. Loosen screws **1** and **3** to allow frictioned movement of the guides;
3. Rotate screws **2** and **4** (knob or hexagonal head screw) bringing the styli to a position allowing to insert the head in measuring position in safe conditions (without impact with the workpiece).
4. Bring the measuring head to measuring position.
5. Rotate screws **2** and **4** to so that the contacts are touching the workpiece and are within range (refer to the read-out of the individual transducers on the electronic unit).
6. Tighten screws **1** and **3**.
7. Now act on the head holding unit.
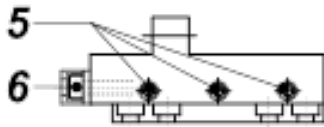
P1DME

Head support
Dovetail with locking screws

Loosen screws **5** maintaining the friction on them.

Head support
Slider with locking lever

Release the movement of the head support by adjusting the handle **5b**.
Adjust screws **5a** so as to allow frictioned movement of the head support.

Rotate the screw/knob 6 moving the measuring head forwards/backwards(*) until it reaches the position corresponding to the maximum measurement readout (contacts on diameter); refer to the diameter display on the electronic unit.
- Tighten screws **5**.
- Lock the head support with handle **5b**.
- Rotate the screw/knob 6 in the opposite direction to release it and avoid tensioning the adjustment system.

Measurement heads with bar contacts
When positioning the contacts lengthwise on the work piece (measuring head back/forth movement) pay attention to value X.
The value **X** shall be less than 1/2 the diameter to be measured in order to prevent a collision between stylus and wheel.

$X < ½ Ø$
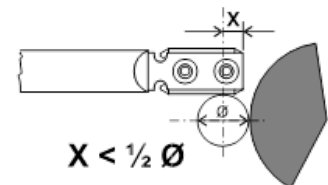
Measuring grooved parts
When measuring grooved parts with interruptions >10 mm, the working portion Y of the contact should be greater than the interruption sector. If there be interruptions with different lengths, consider the longest one.
Interruptions >10 mm must be considered one at a time.
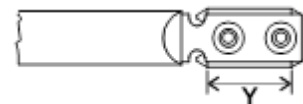
Mechanical zeroing procedure when changing the part diameter

**Adjusting the Upper Contact**
1. Loosen screw **1** maintaining the friction on it.
2. Rotate screw **2** (knob or hexagonal head screw) so that the upper contact touches the master workpiece and the measurement value that appears on the gauge is around zero (± 10 µm).
3. After completing these operations, tighten screw **1** and rotate screw **2** in the opposite direction until it is released in order to avoid tensioning the adjustment system.

Adjusting the Lower Contact

1. Loosen screw **3** maintaining the friction on it.
2. Rotate screw **4** (knob or hexagonal head screw) so that the lower contact touches the master workpiece and the measurement value that appears on the gauge is around zero (± 10 µm).
3. After completing these operations, tighten screw **3** and rotate screw **4** in the opposite direction until it is released in order to avoid tensioning the adjustment system.

8.11.2 Mechanically adjusting in-process heads with contacts

►Measuring heads with two contacts
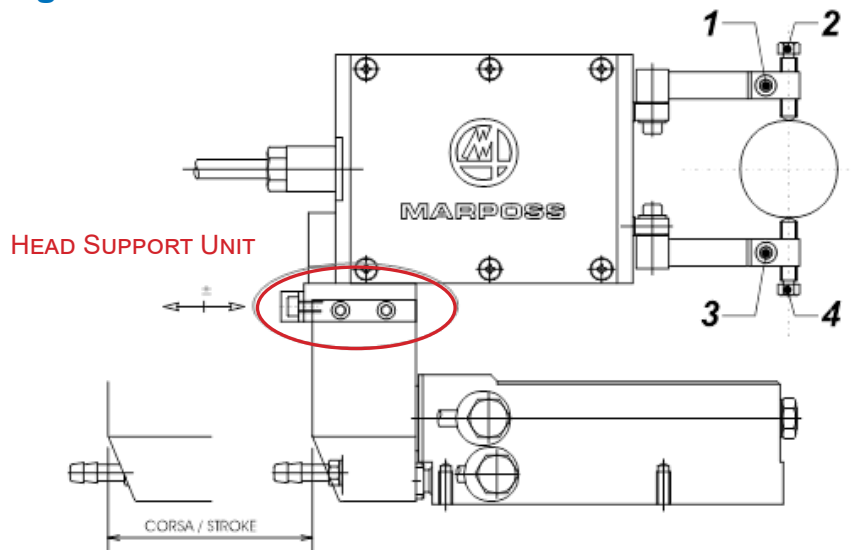
►Unimar measuring heads
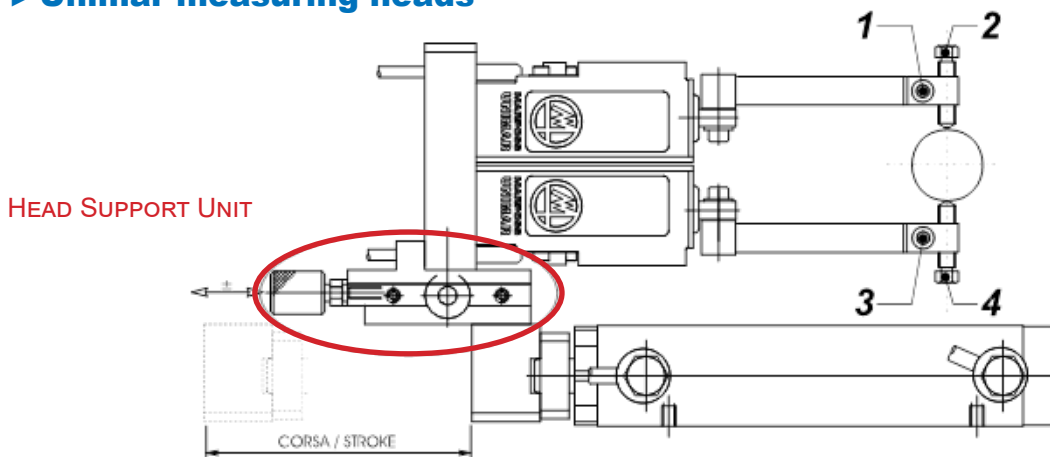
Diameter set-up of the UNIMAR measuring head (with contacts)

1. Place a ground work piece in the spindle or between the tips.
2. Loosen screws **1** and **3** to allow a frictioned movement of the contact tips **2** and **4**.
3. Rotate contact tips 2 and 4 moving them to a position where it is possible to insert the head in the measurement position in safely (without impacting the part).
4. Move the measurement head to the measurement position.
5. Rotate contact tips **2** and **4** so that the contacts touch the workpiece and are within their range (refer to the display of individual transducers on the electronic unit).
6. Tighten screws **1** and **3**.
7. Now adjust the head support unit.

Head support –
Dovetail with locking screws
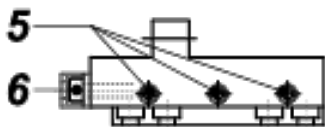
Loosen screws **5** maintaining the friction on them.

Head support
Slider with locking lever
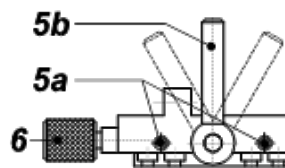
Release the movement of the head support by adjusting the handle **5b**.
Adjust screws **5a** so as to allow frictioned movement of the head support.

Rotate the screw/knob **6** moving the measuring head forwards/backwards until it reaches the position that corresponds to the maximum measurement readout (contacts on diameter); refer to the diameter display on the electronic unit.

- Tighten screws **5**.
- Lock the head support with handle **5b**.
- Rotate the screw/knob **6** in the opposite direction to release it and avoid tensioning the adjustment system.

## Mechanical zeroing procedure when changing the part diameter

Adjusting the Upper Contact

1. Loosen screw **1** maintaining the friction on it.
2. Rotate the latch **2** so that the upper contact touches the master workpiece and the measurement value that appears on the gauge is around zero (± 10 µm).
3. Tighten screw **1** after completing these operations.

Adjusting the Lower Contact

1. Loosen screw **3** maintaining the friction on it.
2. Rotate the latch **4** so that the lower contact touches the master workpiece and the measurement value that appears on the gauge is around zero (± 10 µm).
3. Tighten screw **3** after completing these operations.

8.11.3 Mechanically adjusting Unimar in-process heads with locking levers
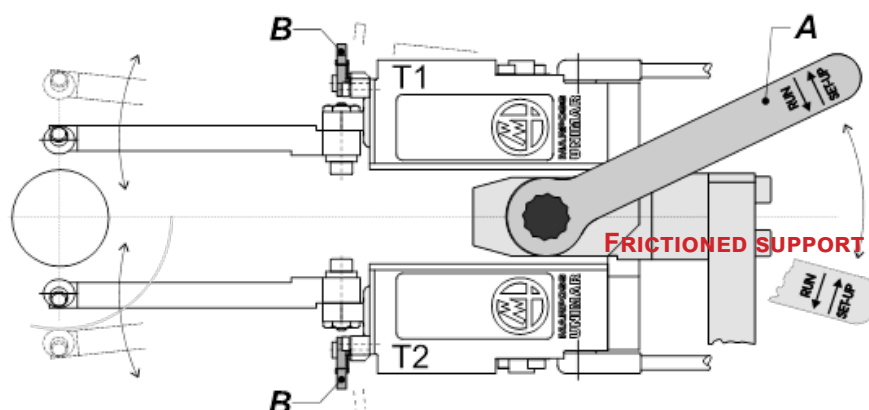
(T)   To make it easy to assemble the frictioned support and to adjust the rapid zero-setting units correctly (lever B and corresponding stop dowel) refer also to document "UNIMAR - Swing bracket application" (code D4340021M1).
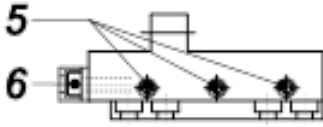
Diameter set-up of UNIMAR measuring heads (with locking levers)

1. Place a ground workpiece either on the spindle or between the centers.
2. Rotate the locking lever A on the frictioned support to "SET UP", so that a small degree of friction is applied to head T1 and T2 movements.
3. Open the heads in order to insert them on the work piece safely.
4. Move the heads to measurement position.
5. Simultaneously push levers B on the rapid zero-setting unit, present on the stylus holders, and close the heads with a single movement bringing the contacts into contact with the master workpiece.
6. While holding down levers B, rotate lever A to "RUN" until the heads are locked
7. Release the B levers on the rapid zero-setting unit making sure they return to rest position.
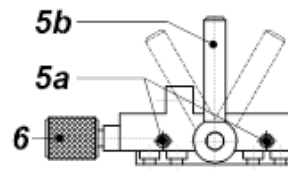**8.** Now adjust the head support unit.

[

N.B.
Given the nature of the zero-setting system, we suggest you perform this adjustment based on the mean diameter of the application measurement range.

Head support – Dovetail with locking screws	Head support Slider with locking lever
Loosen screws **5** maintaining the friction on them.	Release the movement of the head support by adjusting the handle **5b**. Adjust screws **5a** so as to allow frictioned movement of the head support

Rotate the screw/knob **6** moving the measuring head forwards/backwards until it reaches the position corresponding to the maximum measurement readout (contacts on diameter); refer to the diameter display on the electronic unit.

- Tighten screws **5**.
- Lock the head support with handle **5b**.

Rotate the screw/knob **6** in the opposite direction to release it and avoid tensioning the adjustment system.

Mechanical zeroing procedure when changing the part diameter

1. Place a ground workpiece either on the spindle or between the centers.
2. Rotate the locking lever A on the frictioned support to "SET UP", so that a small degree of friction is applied to head T1 and T2 movements
3. Open the heads in order to insert them on the workpiece safely
4. Bring the heads to measuring position.
5. Simultaneously push levers **B** on the rapid zero-setting unit present on the stylus holders and close the heads with a single movement bringing the contacts into contact with the master workpiece.
6. While holding down levers **B**, rotate lever A to "RUN" until the heads are locked
7. Release the **B** levers on the rapid zero-setting unit. Make sure that the B levers return to the rest position and that the contacts T1 and T2 measurement is within ±150 µm (refer to the readout of the individual transducers on the electronic unit).

8.11.4 Mechanically adjusting in-process heads with WEMAR supports
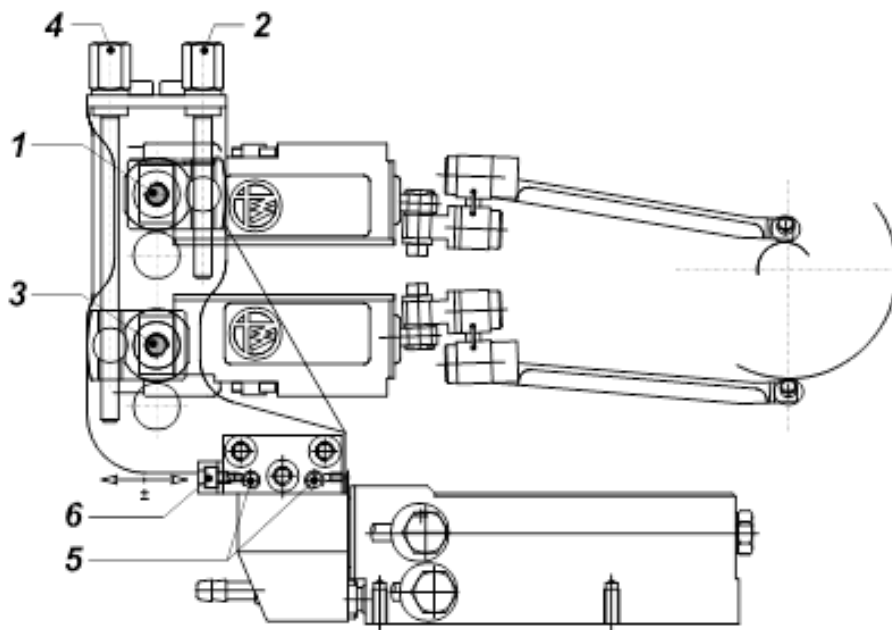
Diameter set-up of WEMAR measuring heads

1. Place a ground workpiece either on the spindle or between the centers.
2. Loosen screws **1** and **3** so as to allow frictioned movement of screws **2** and **4** (fractioned head movement on support).
3. Rotate screws **2** and **4** in order to move the styli to a position where it is possible to insert the head in the measurement position in safely (without impact with the workpiece).
4. Move the measurement head to the measurement position.
5. Rotate screws **2** and **4** to so that the contacts are touching the work piece and are within range (refer to the readout of the individual transducers on the electronic unit).
6. Tighten screws **1** and **3**.
7. Loosen screws **5** maintaining the friction on them.
8. Rotate screw **6** moving the measuring head backwards/forwards until it reaches the position corresponding to the maximum measurement readout (contacts on diameter); refer to the diameter display on the electronic unit.
9. Tighten screws **5**.
10. Rotate the screw/knob **6** in the opposite direction to release it and avoid tensioning the adjustment system.

Mechanical zeroing procedure when changing the part diameter

Adjusting the Upper Contact:
1. Loosen screw **1** maintaining the friction on it.
2. Rotate the screw **2** so that the upper contact touches the master workpiece and the measurement value that appears on the gauge is around zero (± 10 µm).
3. After completing these operations, tighten screw **1** and rotate screw **2** in the opposite direction until it is released in order to avoid tensioning the adjustment system.

Adjusting the Lower Contact:
1. Loosen screw **3** maintaining the friction on it.
2. Rotate the screw **4** so that the lower contact touches the master workpiece and the measurement value that appears on the gauge is around zero (± 10 µm).
3. After completing these operations, tighten screw **3** and rotate screw **4** in the opposite direction until it is released in order to avoid tensioning the adjustment system.

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8.11.5 Mechanically adjusting UNICA in-process heads

UNICA measurement head diameter set-up procedure
1. Starting position for the measuring head diameter set-up procedure: slide "**F**" in the fully retracted rest position.
2. Position a master workpiece either on the spindle or between the tips.
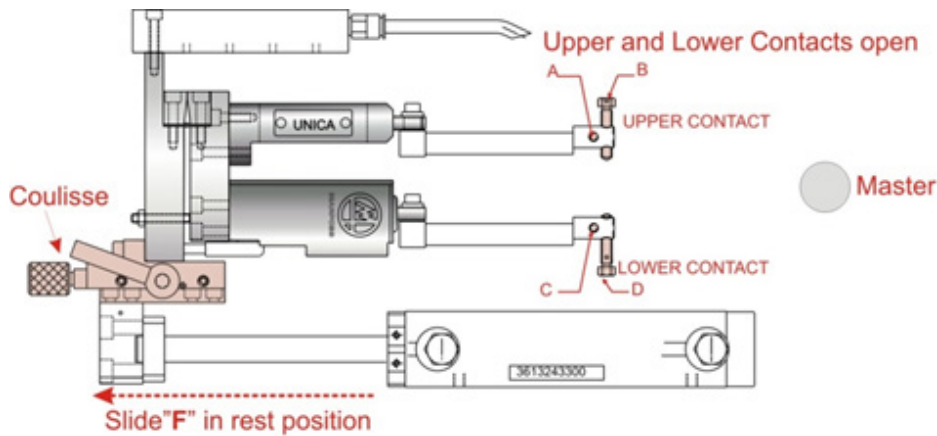
3. Loosen screws **A** and **C** to allow frictioned movement controlled by the contact tips **B** and **D**.
4. Rotate the contact tips **B** and **D** moving them to a position where it is possible to insert the head in the measurement position in safely (without impacting the workpiece).
5. Move the measurement head to the measurement position (trolley advanced).
6. Rotate the contacts **B** and **D** until they come into contact with the part. Monitor the single transducer as displayed on the control unit in order to obtain a valid measurement value (≤ ±300μm)
7. Tighten the screws **A** and **C**
**8.** At this point it is necessary to intervene on the slider
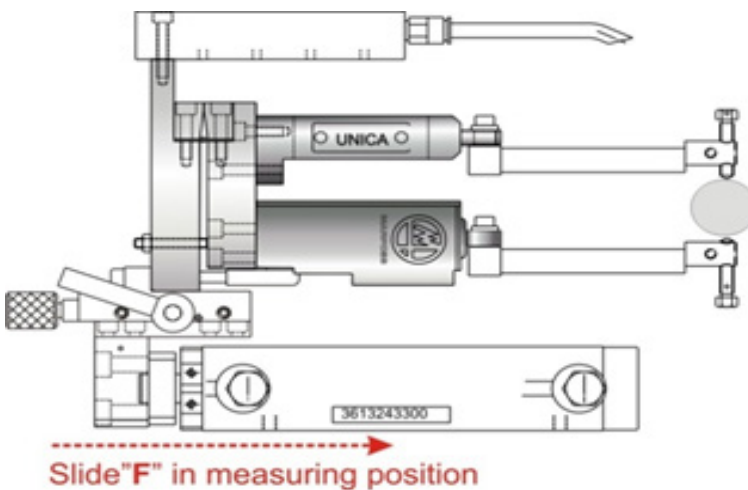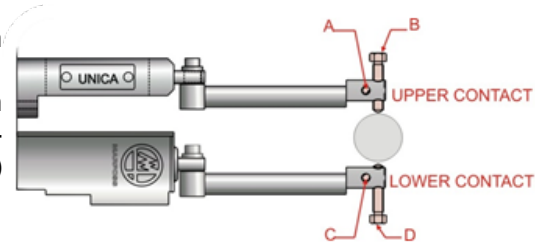
9 . Release the slider movement using the locking lever L2
10. Adjust screws L1 so as to allow friction controlled movement of the slider.
11. Rotate the knob **M** moving the measuring head backwards/forwards until it reaches the position corresponding to the maximum measurement readout (contacts on diameter); refer to the diameter display on the electronic unit.
12. Lock the dovetail in position using the knob **L2.**
13. Rotate the knob **M** in the opposite direction in order to release it and avoid tensioning the adjustment system.
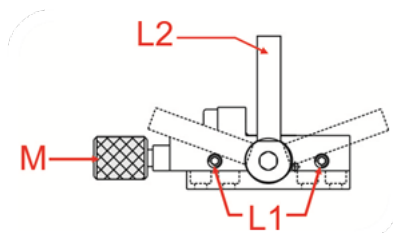
Mechanical zeroing procedure when changing the part diameter

1. The measurement group trolley "**F**" must be in the fully retracted (home) position. Mount a new part (Master) in the machine.
2. Before moving the trolley into position to perform the measurement on the new part, make sure that the arms are mounted correctly and that both contacts "**B**" and "**D**" are open, so that they do not impact the part. (see points "c"/"d" chap. 2).
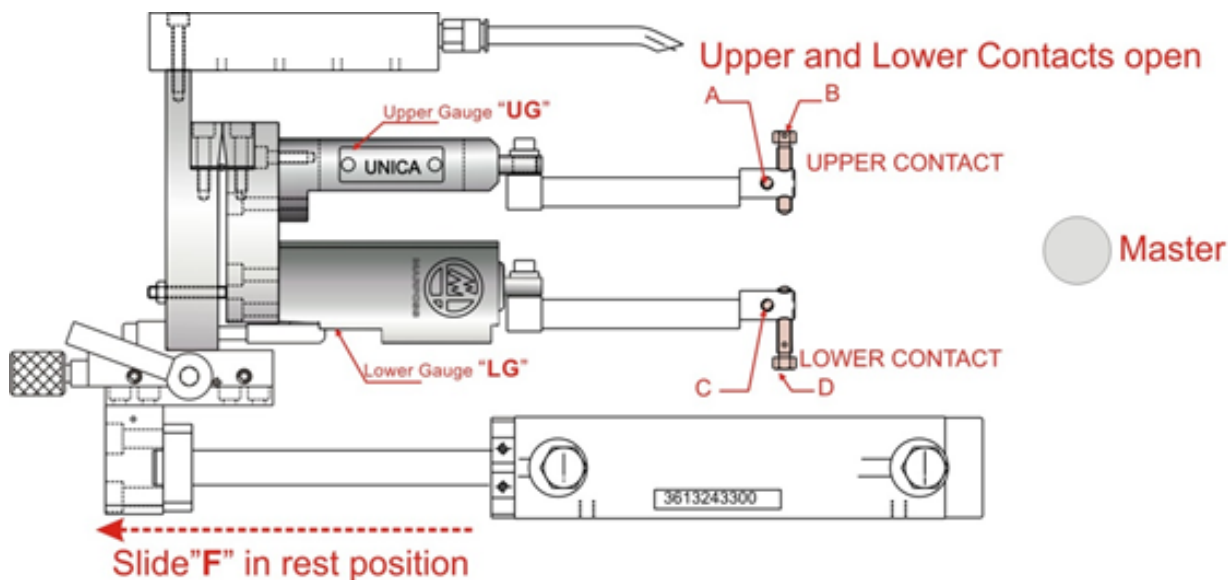
3. Move the trolley to the measurement position.
4. Insert a 30μm shim between the set screw "**I**" and the support head "**H**"
5. Rotate the upper contact "**B**" so that it is in contact with the part, using a 50 μm lock it on the arm by tightening the screw "**A**".
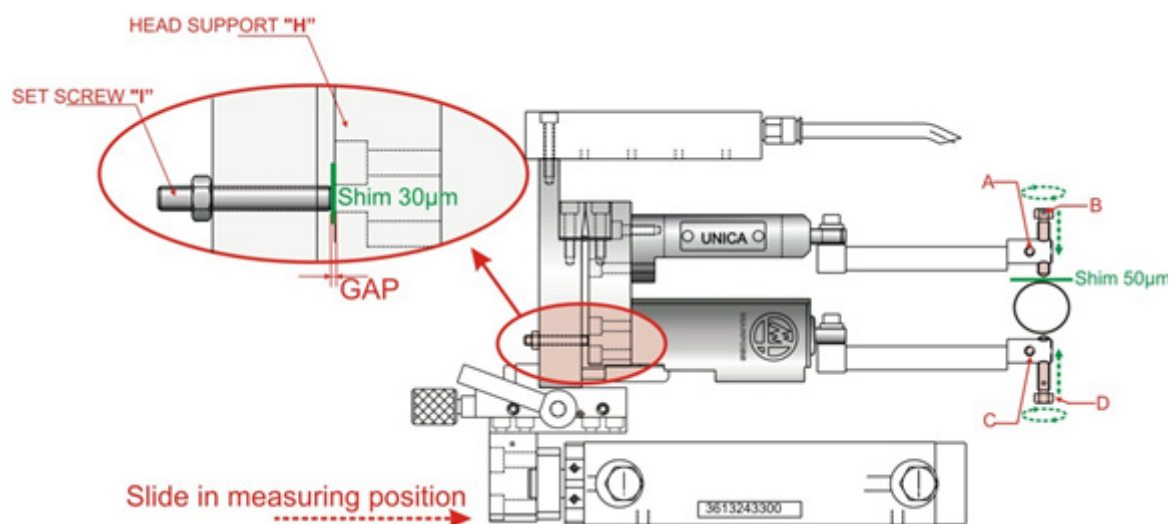

6. Position the lower contact "**D**" so that the reading is close to zero (±10μm) and lock it on the arm by tightening the screw "C".
7. Remove the 30μm shim between the set screw "**I**" and the support head "**H**"
8. Use the electronic control unit currently connected to the measuring head to carry out the electrical reset.

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9. CYCLOGRAMS

The following is a typical timing chart for the P1dME with In-Process measurements The cyclograms may vary, depending on the application, consult the documentation supplied with the unit.
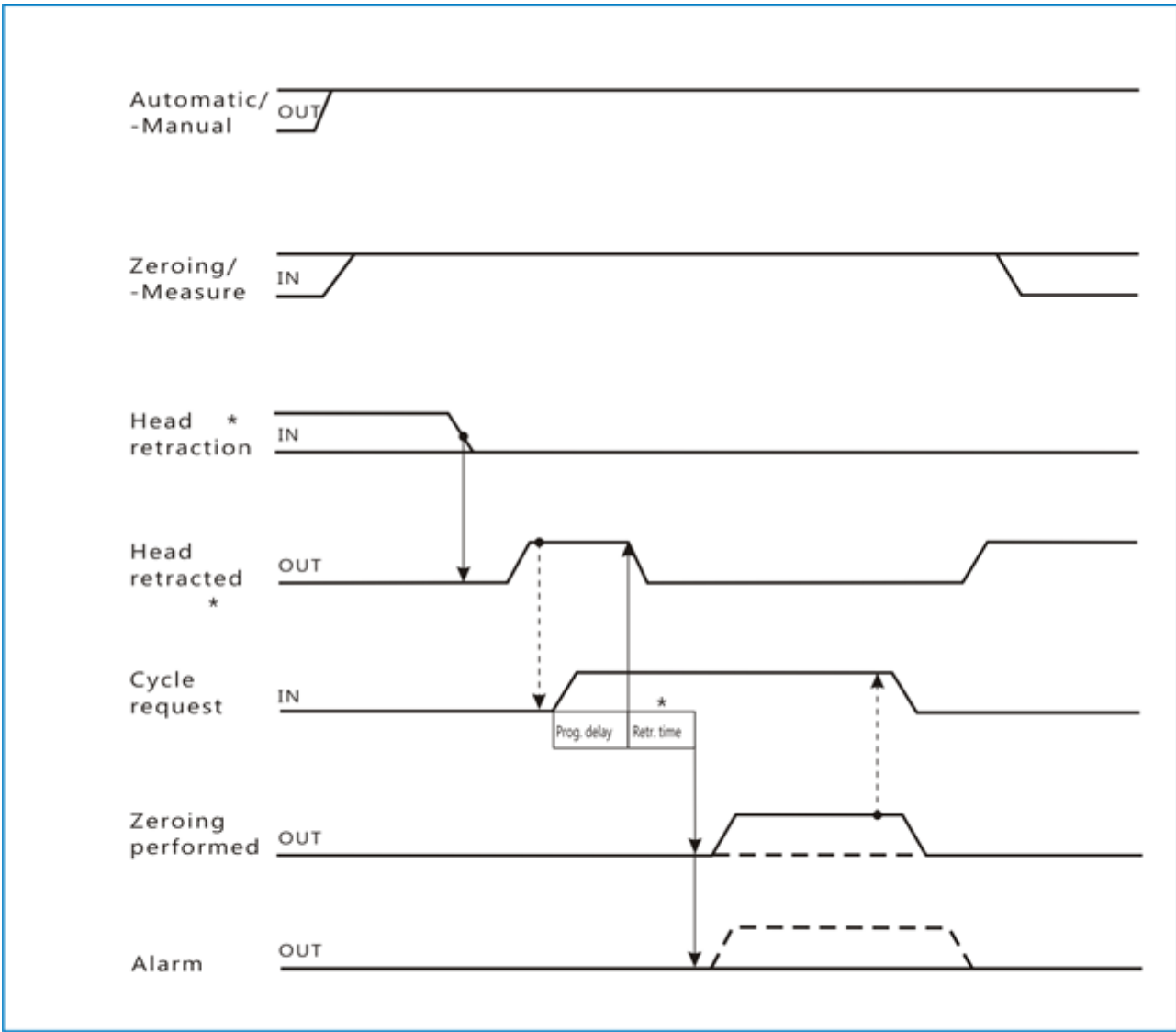
The P1dME is always in automatic mode when switched on.

9.1 In-process cycle
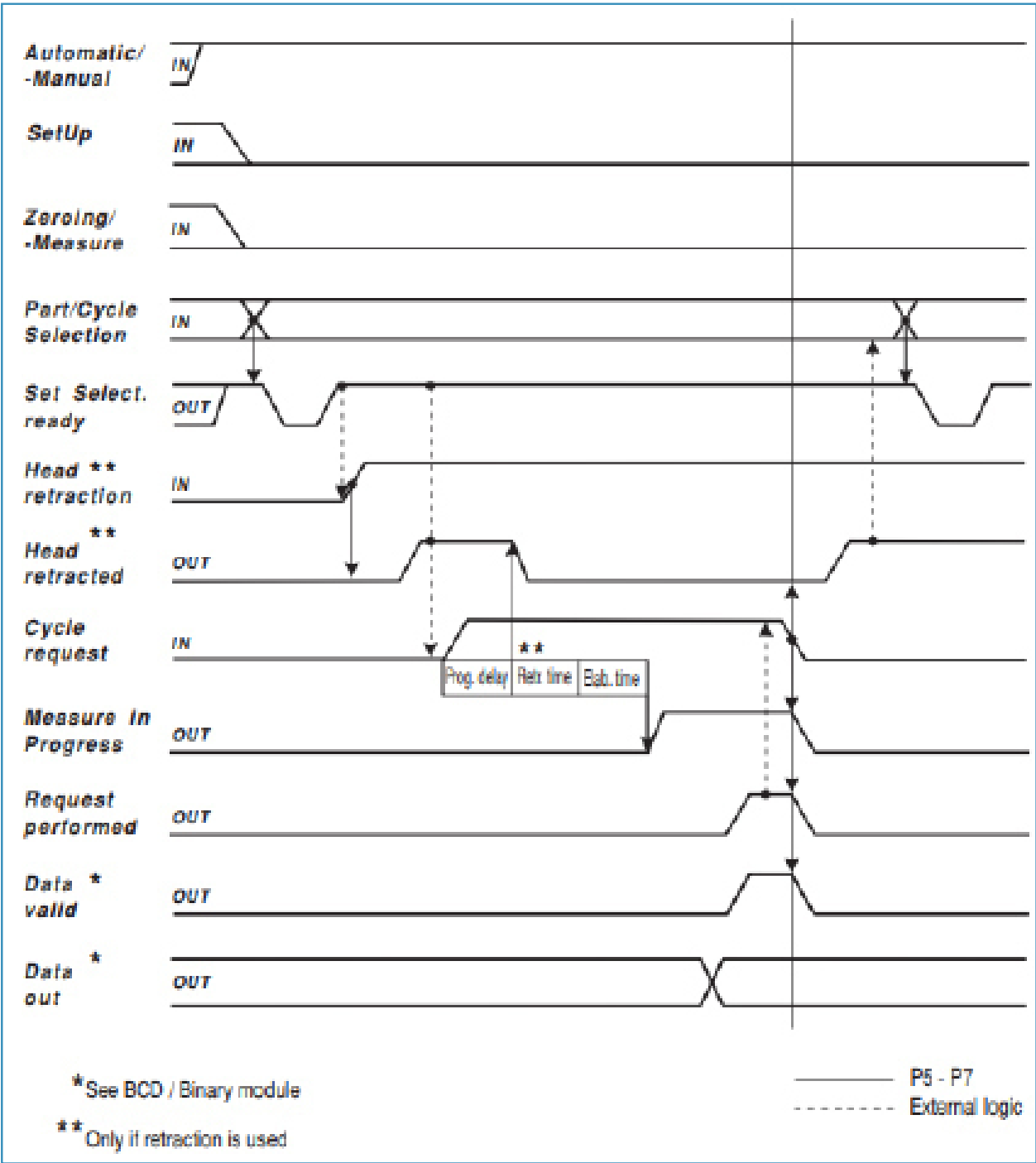

* Only if retraction is used
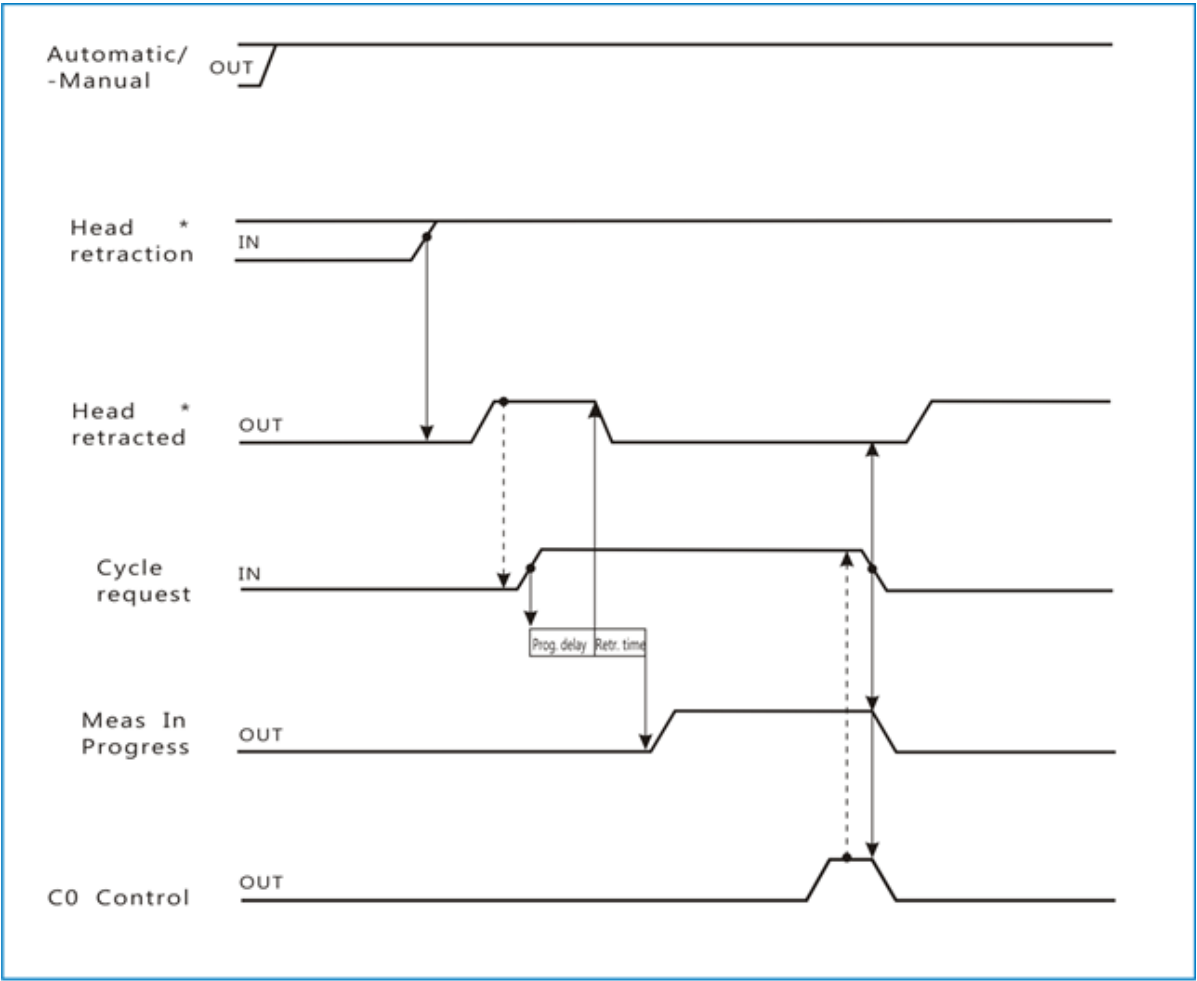
———— P1DME
- - - - - - - External logic

P1DME

9.2 Zero-setting Cycle

*Only if retraction is used

——— P1DME
- - - - - - - External logic

P1DME

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9.3 Passive Positioning Cycle

P1dME

P1DME

9.4 Post-Process cycle
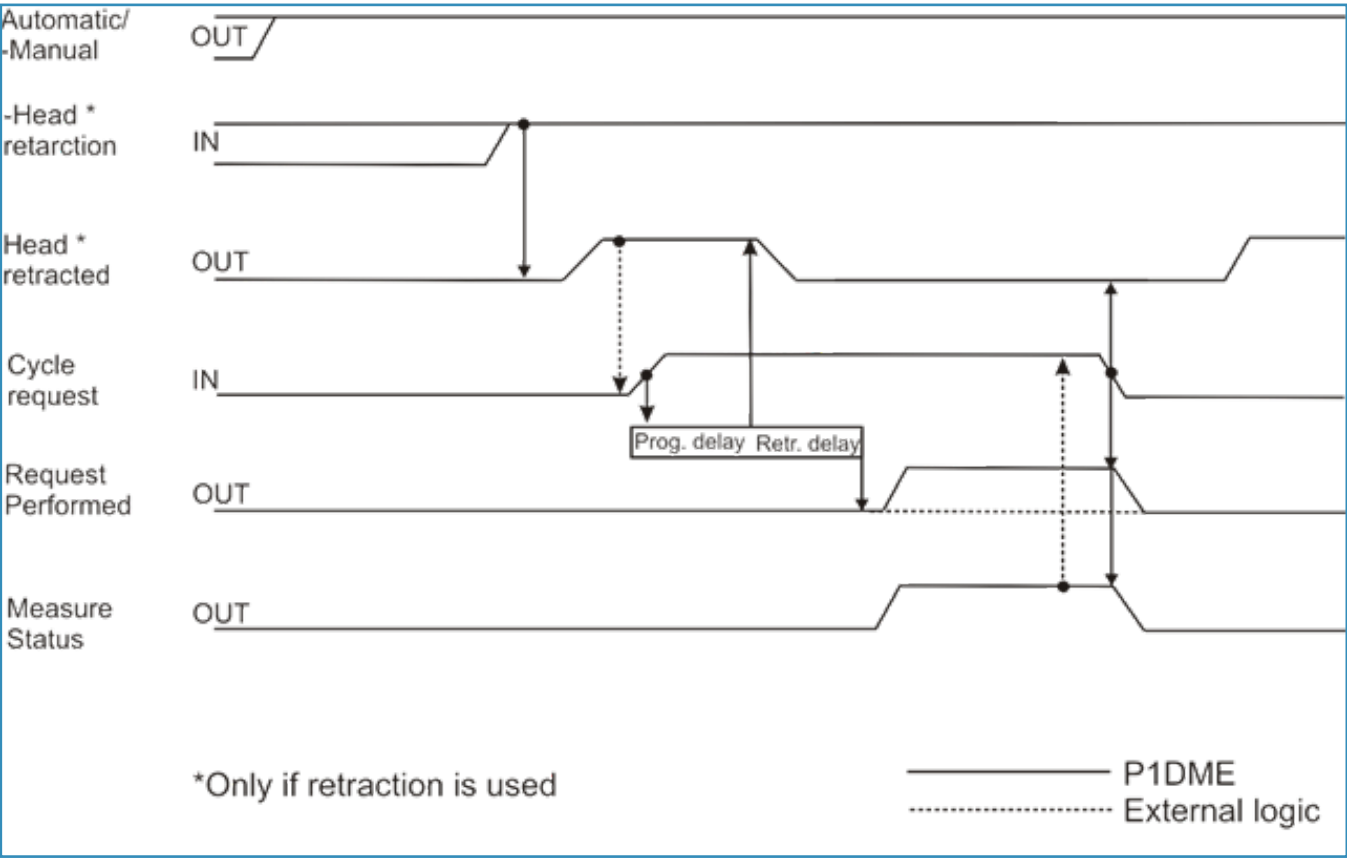
10. *MAINTENANCE*

10.1 Routine maintenance

10.1.1 Cleaning the machine

To clean the external part of the electronic unit and the front panel, use a damp, static-free cloth.
If there is an I/O BOX:

WARNING
DO NOT USE SOLVENTS OR ABRASIVE PRODUCTS.

WARNING
I/O BOX: disconnect the power supplies from the 24 V d.c. POWER and H1 (digital I/O) connectors before cleaning.

10.1.2 Cleaning the heads

Clean the heads using a soft cloth at regular intervals, depending on the operating conditions, taking care to avoid damaging any rubber seals and output cables.

WARNING
DO NOT USE SOLVENTS OR ABRASIVE PRODUCTS.

10.1.3 Extraordinary maintenance

No extraordinary maintenance is required.
Contact Marposs customer service if it is necessary to replace broken or malfunctioning parts.

End of Documents