P1D AE

Installation manual

Manual code:
D296AE00GB

MARPOSS

MANUFACTURER	MARPOSS S.p.A.
ADDRESS	Via Saliceto, 13 - Bentivoglio (BO) Italy - www.marposs.com
TYPE OF EQUIPMENT - MODEL	P1dAE Firmaware V 2.2
FUNCTION	System for checking working on grinding machines
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ORIGINAL LANGUAGE	Italian

MARPOSS S.p.A. is not obliged to notify customers of any subsequent changes to the product.
The descriptions in this manual in no way authorise tampering by unauthorised personnel.
The guarantee covering the equipment shall be void if any evidence of tampering is found.

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This product conforms to the following directives:
- 2014/30/EU EMC directive
- 2011/65/EU RoHS & 2015/863/EU RoHS III

This product conforms to the following UK regulations:
- SI 2016/1091 The Electromagnetic Compatibility Regulations 2016
- SI 2012/3032 The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

The applicable standards are:
- EN 61326-1 (EMC)
- EN 61010 - 1 (SAFETY)
- EN IEC 63000: RoHS

About the directive "**ROHS**" regulating the presence of certain hazardous substances in electrical and electronic equipment: http://www.marposs.com/compliance_detail.php/eng/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 IEC EN 62262-classification IEC 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

concerning the terms of the National Legislation enforcing the Directive UK SI 2013/3113 and 2012/19/EU on waste electrical and electronic equipment (WEEE).

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.

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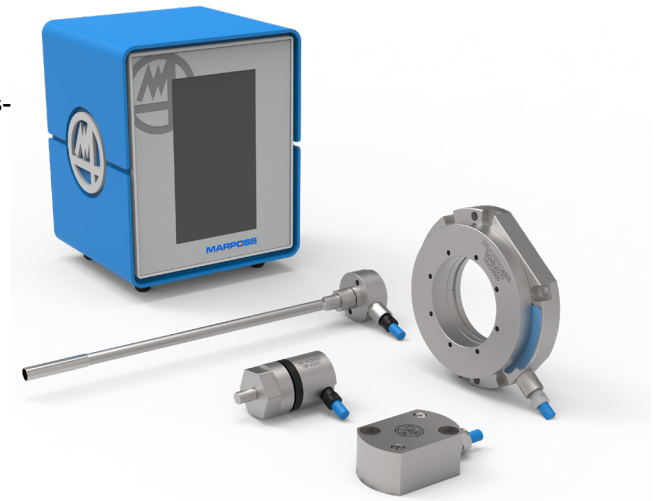
1. GENERAL INFORMATION

1.1 Introduction

This manual has been drawn up to provide the information necessary for safe use of the P1dAE.



1.2 General Description of the System

The P1dAE is an electronic gauging unit for grinding machines. It uses the signal picked up by an AE sensor (piezoelectric transducer) to perform the following functions;

GAP Check

Air gap detection: the definition of a noise threshold allows detection of contact between the grinding wheel and the part for passing from the approach speed to the stock removal speed.
Grinding wheel position check: defining a noise threshold makes it possible to detect the position of the grinding wheel relative to a known reference point.
Dressing continuity check: detection of ultrasound emissions allows dressing cycle optimisation.

CRASH Check

Collision detection. Definition of a correct noise threshold allows detection of accidental grinding wheel collisions.

The P1dAE performs the following functions:
Detection of a significant event (GAP or CRASH) generates a corresponding output logic signal available on the I/O connector. The GAP and CRASH signals are available with opto-isolated output for sending to the machine tool control logic.
The Gap or Crash processing analogue signals can be made available on a connector (analogue output) for connection to an analogue input of a CNC which allows parallel processing on the signal arriving from the grinding wheel.
The P1dAE has functions for checking the integrity of the AE sensor cable. If enabled, detection generates the ALARM signal available on the I/O connector (as well as setting the related outputs to the safety condition).
The unit is available with one or two channels, each performing both the Gap and Crash functions. Simultaneous Gap and Crash cycles are supported on all available channels. Two cycle/part sets are also available.

The tables below show the names used to identify the functions and the sets for each channel.

CHANNELS	FUNCTIONS	
CH1	GAP 1	CRASH 1
CH2	GAP 2	CRASH 2

SET #1	CH1		CH2	
	GAP 1	CRASH 1	GAP 2	CRASH 2
SET #2	CH1		CH2	
	GAP 1	CRASH 1	GAP 2	CRASH 2

Main features of the P1dAE:

- Input for 1 or 2 AE sensors (1 or 2 channels);
- Simultaneous GAP check and CRASH check on both channels;
- Manual or auto-acquired adjustment of hardware channel gain 0-40 dB in 10 dB steps;
- Manual or auto-acquired adjustment of hardware channel filtering stage: FB (>4 kHz), HP (>80 kHz), HF (>400kHz);
- Manual or auto-acquired adjustment of minimum and maximum gauging frequencies;
- Auto-acquired adjustment of hardware channel gain, individual channel GAP and CRASH gain, minimum and maximum gauging frequencies by means of a two-step guided procedure with automatic analysis of the working noise and background noise;
- Gap check processing modes (absolute, incremental, incremental with automatic cycle request zero-setting and self-calculation of the dynamic thresholds);
- Programming of conditions for generating output signals (GAP and CRASH) and the level (high/low) of the signal generated;
- GAP or CRASH signal analogue output of both channels simultaneously;
- Opto-isolated inputs and outputs (24V/10mA) for connecting to a CNC;
- Opto-isolated output (24V/10mA) for signalling the alarm condition due to cable or AE sensor breaking (if enabled via SW).

The 24V/10mA opto-isolated outputs, protected against short-circuit, allow direct connection to a 24V machine input of a CNC/PLC (type 1 input according to IEC 1131-2). The SOURCE or SINK compatibility of these outputs is obtained by setting up the appropriate connection.

2. GENERAL INFORMATION

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 of the manufacturer of the machine tool that will house the P1dAE (henceforth “the Client”) who will install the equipment directly.
- Technical personnel employed by the end user (hereafter "the User") who will be directly responsible for operating the Marposs equipment.
- User's technical Personnel responsible for the maintenance of the production line in which the P1dAE 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.
Marposs liability is limited to correct use of the P1dAE, 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:

- Position and secure the P1dAE on the machine correctly.
- Carry out the electric connections.
- Set-up the P1dAE.

The User shall:

- Program the P1dAE
- Perform the routine and extraordinary maintenance operations.

The safety of any system that incorporates this device and its accessories shall be sole responsibility of the personnel assigned to assemble the system.

2.2 Testing and guarantee

Materials are guaranteed against defects, with the following limitations:

- DURATION OF GUARANTEE: the guarantee covers the product and all repairs carried out on it during the standard guarantee period.
- SUBJECT OF THE GUARANTEE: the guarantee 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 P1dAE is designed and built to be installed on automated machinery such as grinding machines, for managing Marposs acoustic sensors which allow monitoring of various stages of working by the grinding wheel and any collisions between the part and the grinding wheel.

The P1dAE must 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

The device may not be used for any purpose other than those it was designed for. Any use that differs from the use described in this manual shall be considered unauthorised.

It is also prohibited to:

1. Modify the original P1dAE configuration
2. Connect the device 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. Remove the 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 responsibility in case of any non-compliance with the above.

2.7 Identification Labels and Symbols

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 the risk of damage to the electronic unit or other devices connected to it, or the risk conditions for the operator or technician.

NOTE
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.

DANGER FOR THE ENVIRONMENT
Recycle and/or dispose of in accordance with the applicable regulations in the destination Country.

WARNING
Observe the procedures for handling devices that are sensitive to electro-static discharges. The failure to observe these procedures may damage the equipment or cause it to malfunction.

ELECTRIC SHOCK HAZARD
Hazardous voltages present: electric shock hazards may be present when carrying out fault finding routines on live components

CAUTION
Always consult the product documentation when identifying potential hazards and the measures necessary to avoid them.

In the case of P1DAE, this symbol is associated with the rating IK, which means that the device has an impact 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. (See page 6 for the complete reference to the regulation). The symbol is present both in the documentation and on the rear of the panel, in order to remind the user to consult the manual.

2.7.2 Symbols present on the equipment

The following is a list of the pictograms that are displayed on the system and referred to in the instruction manual:

WARNING
Observe the procedures for handling devices that are sensitive to electro-static discharges. The failure to observe these procedures may damage the equipment or cause it to malfunction.

ELECTRIC SHOCK HAZARD
Hazardous voltages present: electric shock hazards may be present when carrying out fault finding routines on live components

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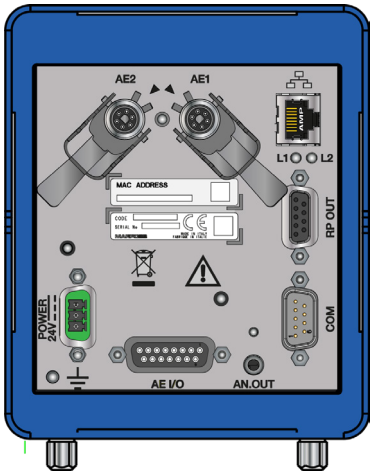
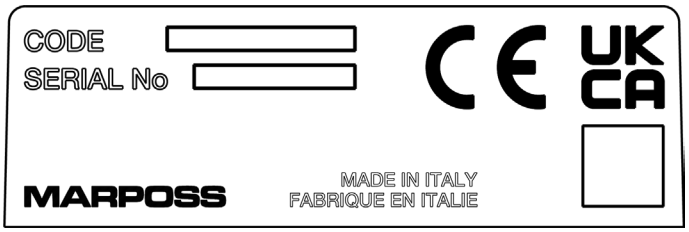
2.7.3 Labels and markings on the P1dAE unit and its components

P1DAE IDENTIFICATION PLATE

The identification plate is positioned on the rear of the P1dAE device.
The following information appears on the plate:

- The SERIAL N. of the individual P1dAE device
- CE marking
- The Marposs product identification CODE.





NOTE
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.

3. *SAFETY DEVICES*

3.1 General safety information

3.1.1 Reference directives

The P1dAE System has been designed and manufactured in accordance with the directives indicated on page 3 of this manual.
The P1dAE must be managed by a grinder type machine used to machine mechanical parts, in compliance with the applicable safety standards in the user's country in terms of machinery equipment.

3.1.2 Product conformity

The safety warnings are intended to prevent injuries to personnel and damage to both the P1dAE and the environment in which it is used. All operators are expected read the safety warnings, and respect them at all times.
The P1dAE System is a state-of-the-art device that guarantees a high level of safety, provided all the appropriate safety measures are implemented during daily usage.
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.

BEWARE
Any modification that alters the P1dAE design and/or manufacturing 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 Definition of P1dAE Users and respective duties

Installation technician: person qualified to install the P1dAE inside the machine.
Duties:
1. Lifting, handling, transporting and storing the P1dAE device;
2. Assembling and programming the P1dAE system;
3. Removing the P1dAE system.

Maintenance technician: personnel who are trained and qualified to carry out routine and extraordinary maintenance work on the P1dAE.
Duties:
1. Routine maintenance activities;
2. Extraordinary maintenance activities;
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: personnel assigned to activate the measurement acquisition cycle and monitor the correct operation of the P1dAE System.
Duties:
1. Process monitoring.
2. Modifying the programmed parameters via the control panel, when necessary.

The operator is not required to intervene in any way while the P1dAE is operating.

3.2.1 Physical and mental health of the operator/installation personnel

The operator assigned to install the P1dAE must be aware of dangers that may be generated while installing machining equipment, and capable of dealing with them.

3.2.2 Personal protection equipment (PPE)

The operators assigned to assemble and service the P1dAE must use the following personal protection 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.

BEWARE
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 obligatory personal protection 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 the operators assigned to the normal operation must follow the instructions set out in the documentation of the final machine that the P1dAE is fitted 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 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 P1dAE, 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 P1dAE 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 procedures for installing the equipment, such as wiring the electrical parts, so as to avoid any assembly errors that could place the operators' well-being at risk.

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.

Maintenance technicians, in order to:
• Ensure they are aware of the correct procedures for carrying out scheduled and unscheduled maintenances activities on the P1dAE.

4. TRANSPORTATION. STORAGE

4.1 Personal protection equipment (PPE)

The operators assigned to transport, store and install the P1dAE must procure and use the PPE indicated in this manual and those that are obligatory in the environment where the P1dAE unit is used and operated.

4.2 Training

The operators assigned for transportation, storage and installation of the P1dAE must be trained and informed as required by the applicable directives in the respective 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 P1dAE technical material is thoroughly checked in order to ensure that no damaged material is shipped.
When unpacking the material check that the P1dAE is perfectly intact and not damaged in any way. If it is damaged, notify Marposs immediately.

4.5 Packaging, handling, transport

4.5.1 Packaging

The P1dAE is protected with carton and an internal insert for the movement and transport operations.

4.5.2 Handling the packaging

No special equipment is required for handling the packaging.

4.5.3 Transporting the package

The package containing the P1dAE must be transported on covered transport vehicles to prevent it and the P1dAE being exposed to atmospheric agents.

4.5.4 Disposing of packaging materials

The packaging used for the P1dAE consists of materials that can be disposed of without exposing people, animals or property to any significant hazards

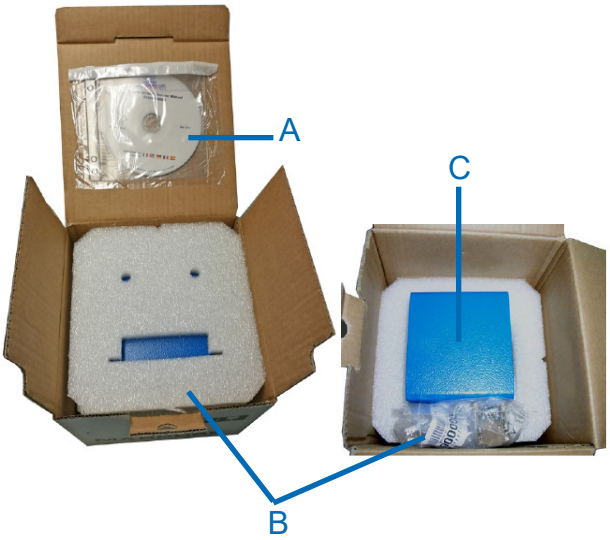
Operators or personnel responsible for disposing of the packaging should be aware that it consists of:
• Cardboard: external container and internal insert
• Polyurethane film: internal insert.

DANGER FOR THE ENVIRONMENT
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.

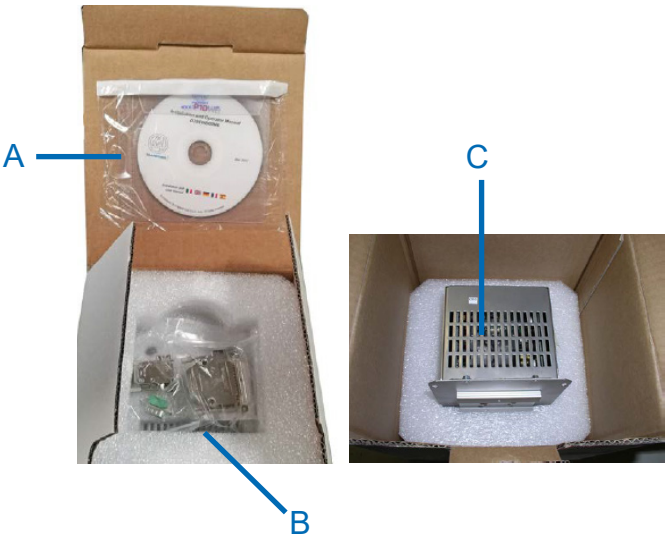
4.6 Removing the P1dAE unit from its packaging

Marposs has not indicated special devices for removing the P1dAE from the packaging.

VERSION WITH CASE



RACK VERSION WITH REMOTE PANEL



- Remove the CDs (A) from the packaging containing the product instruction manuals (do not throw the manuals away!)
- Remove the packaging and the connectors (B)
- Lastly, remove the equipment from its packaging (C)

DANGER FOR THE ENVIRONMENT
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.

WARNING
Handle with care: observe the procedures for handling devices that are sensitive to electro-static discharges. The failure to observe these procedures may damage the equipment or cause it to malfunction.
In particular, it is important to:

- Eliminate any electrostatic charges accumulated by the operator by touching a metallic surface that is connected to the building earth system;
- Take care not to touch the pins of the connectors present on the device when removing the packaging or connecting the respective cable connectors, or when operating the device. Avoid direct contact with the pins and contact via the wires connected to the cable connectors. Observe these precautions irrespective of whether the connectors are fitted with protective plastic covers or not. The plastic covers should only be removed when connecting the corresponding external connectors. Always replace the plastic covers when it is necessary to reassemble one or more connector.

5. *ENVIRONMENTAL CONDITIONS*

The mechanical and electronic components installed in the P1dAE have been selected based on their reliability and resistance. The components satisfy the manufacturing safety requirements and have been designed to withstand temperatures between -20 °C and +70 °C (between -4 °F and 158 °F) during transport and storage.

5.1 P1dAE storage environment

The P1dAE 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 P1dAE package and the P1dAE itself, as this may damage it.

5.2 P1dAE 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 P1dAE 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. Use of the device is prohibited in residential or light industrial environments.
The P1dAE must be positioned outside the machine in a dry location, whereas the measurement heads that are connected to it must be installed in a moist environment inside the machine.
Unless indicated otherwise in the contract the P1dAE can operate regularly only 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 P1dAE components will operate correctly at temperatures between +5 and + 45 °C (41 and 113 °F).

Operating relative humidity

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

Environmental Pollution Rating

Level 2

Altitude

Correct operation is guaranteed up to an altitude of 2000 m.

Pollutants

The electrical components have been adequately protected against the foreseeable level of infiltration of solid and liquid bodies when using the P1dAE 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 P1dAE 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.

6. *DESCRIPTION OF THE EQUIPMENT*

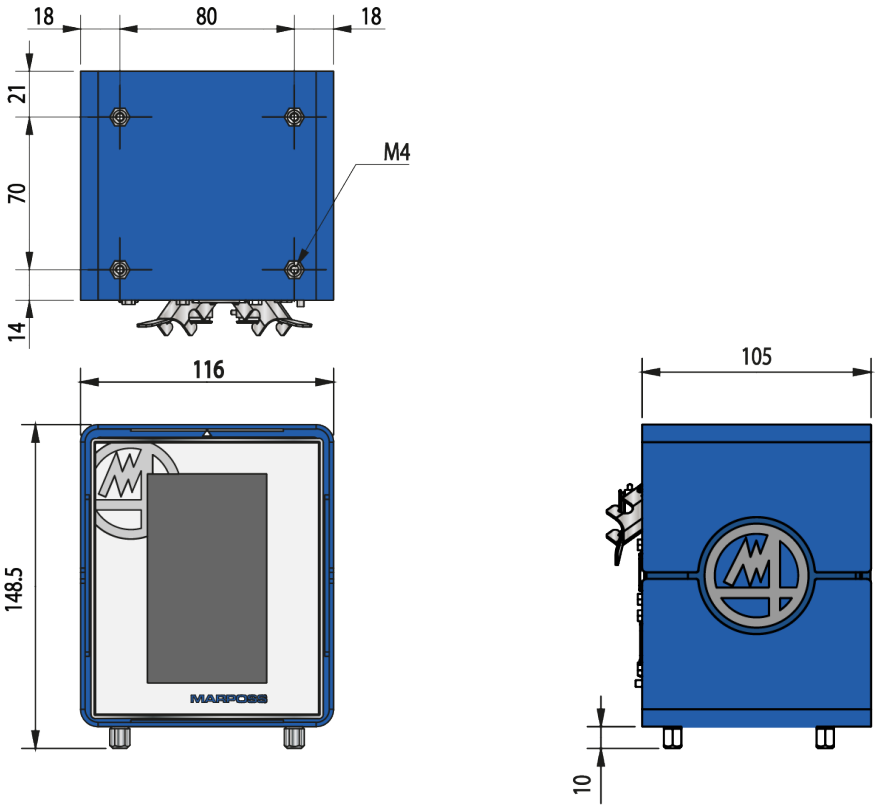
6.1 P1dAE versions

The device is available in 6 different models, which may be identified as follows:

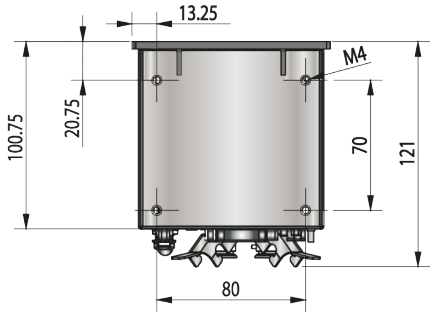
RACK VERSION		
	Code	Description
	830AEA1000 830AEB1000	P1dAE BLU SENSORS Rack version – 1 Channel Rack version – 2 Channels
VERSION WITH CASE		
	Code	Description
	830AEA0000 830AEB0000	P1dAE BLU SENSORS Version with case – 1 Channel Version with case – 2 Channels
VERSION WITH REMOTE PANEL		
	Code	Description
	830AEA2000 830AEB2000 7708010003	P1dAE BLU SENSORS Version with Remote Panel – 1 Channel Version with Remote Panel – 2 Channels P1d AE Remote Panel

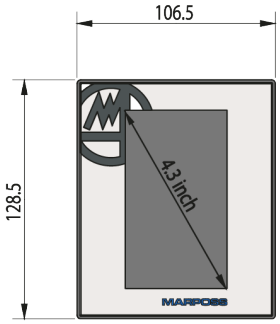
6.2 Overall Dimensions

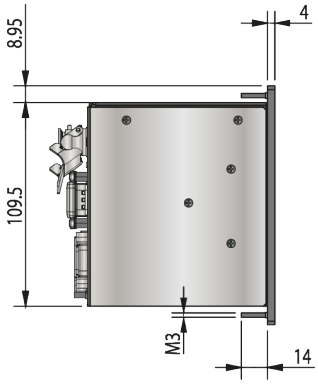
P1dAE dimensions and volumes: case versions

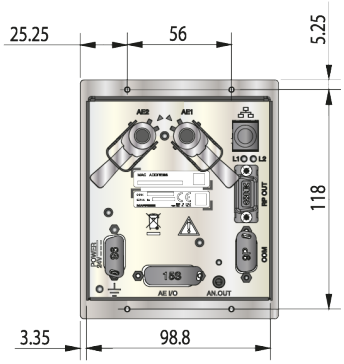


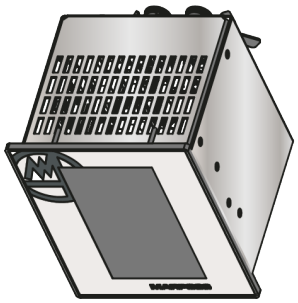
P1dAE dimensions and volumes: Rack version





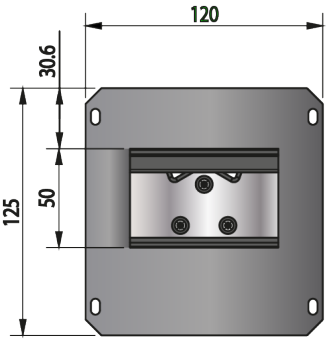


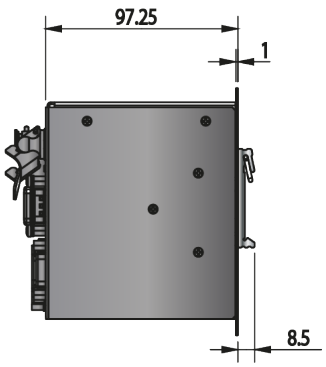


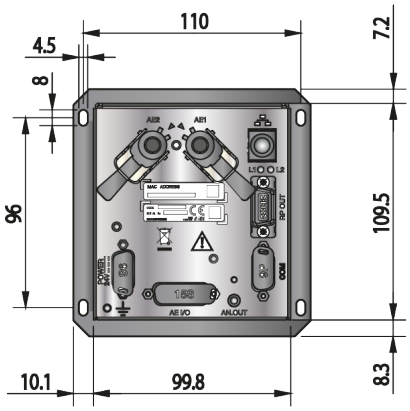


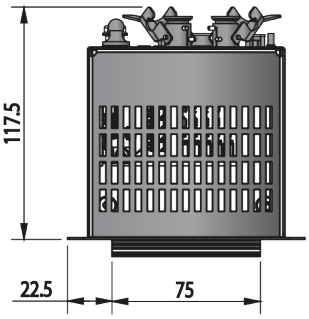
BEWARE
The rack version requires a fire-resistant covering irrespective of whether it is fitted with the front or remote panel.

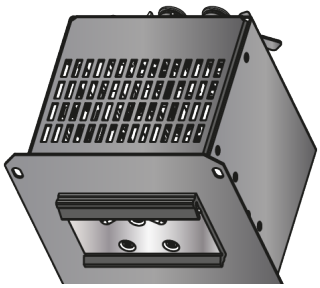
P1dAE dimensions and volumes: remote panel version

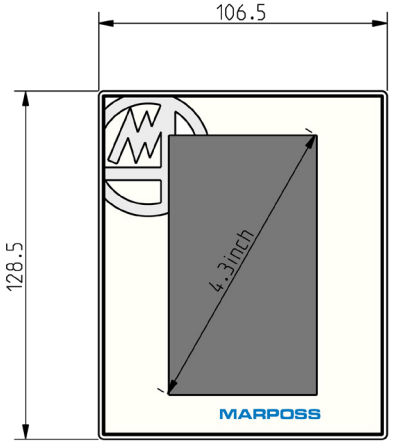


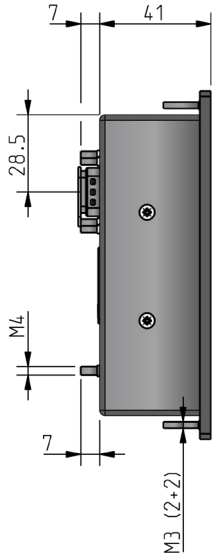


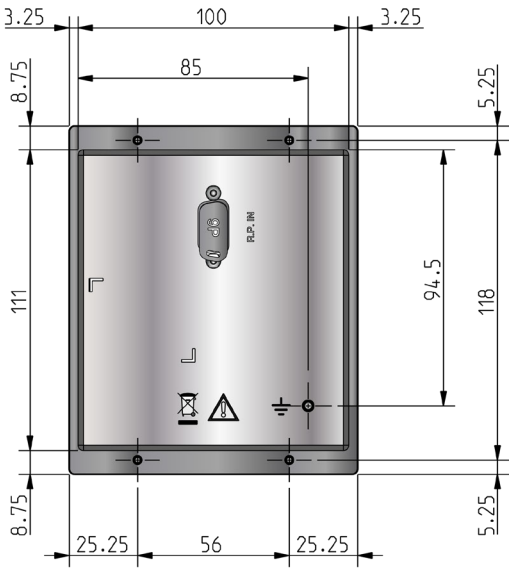










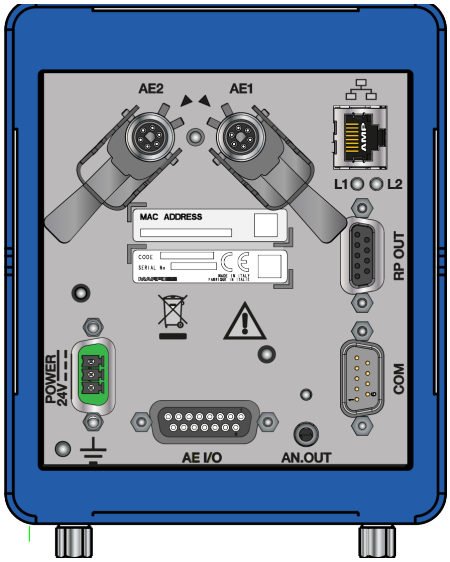


6.3 Technical Specifications

Structure	Rack, Case or Remote panel
Version	1 CHANNEL 2 CHANNELS
Power supply	SELV type 24 Vdc ± 20 %
Current drawn	0.5 A
Operating temperature	Between +5° and +45° C
Storage temperature	Between -20° and +70° C
Humidity	Storage <90% Shipping <90% In use <85%
Weight	Rack 900 g – Case 2000 g
Protection rating (IEC 60529)	IP54 - Front panel IP 40 - Product
I/O signal connection	D-SUB male 15 pin connector.
I/O signals	Sink & Source
Output signal rate	1 ms
Serial Interface	RS232 RX and TX only
Ethernet Interface	RJ45 LAN Port
Display	LCD Touchscreen display. Resolution 272x480 pixel – Size 4.3”
Electrical Safety Standard	EN 61010-1
EMC Immunity Standard	EN 61326-1
Sensor acoustic signal conditioning frequency range	4 to 1000 KHz

NOTE
All the voltages present on the connector are SELV rated.

7. INSTALLING THE P1DAE



CONNECTOR	DESCRIPTION
POWER 24V ⎓	Electrical power supply collector.
⏚	Functional earth terminal (M4)
RP OUT	Output for remote panel connection (D-SUB female 9 pin connector)
COM	Serial RS232 interface for connection to an external PC (D-SUB male 9 pin connector)
ETHERNET	RJ45 LAN connection port
AE1	Connection to AE Sensor 1 - Blu Unimar 6 pin connector
AE2	Connection to AE Sensor 2 - Blu Unimar 6 pin connector
I/O	D-SUB male 15 pin connector for I/O connection to the machine PLC
AN. OUT	Analogue outputs connector.

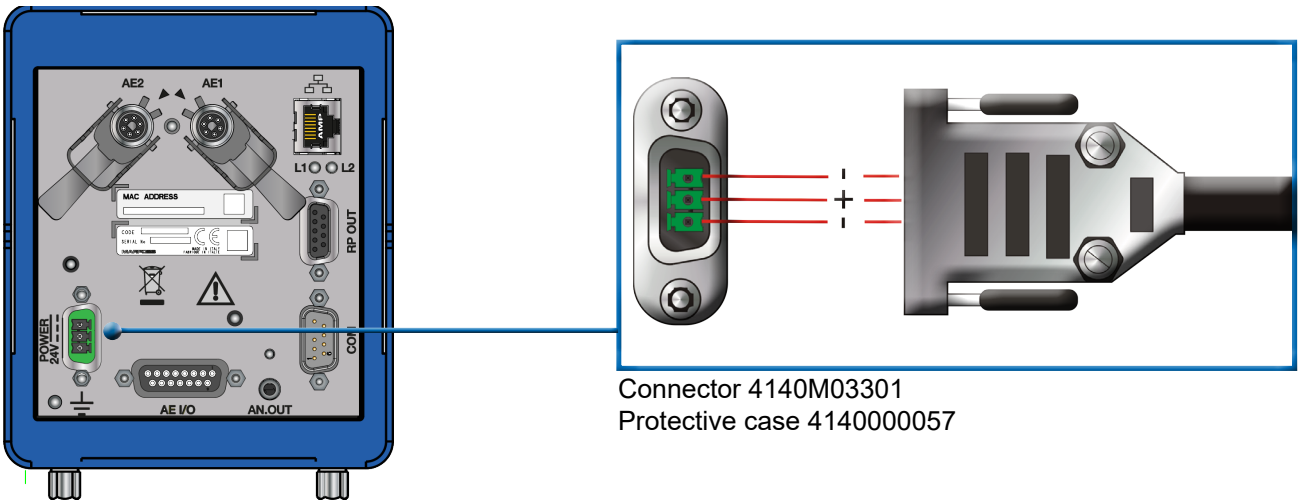
7.1 Connecting the power supply

POWER specifications:

Voltage: 24V DC (±20%) SELV type as defined by EN 60950-1
Consumption (current): 0.5 A

The Phoenix connector is supplied with the equipment and has screws with knobs for manual tightening.
We recommend fitting a breaker switch upstream of the machine during installation and operation.

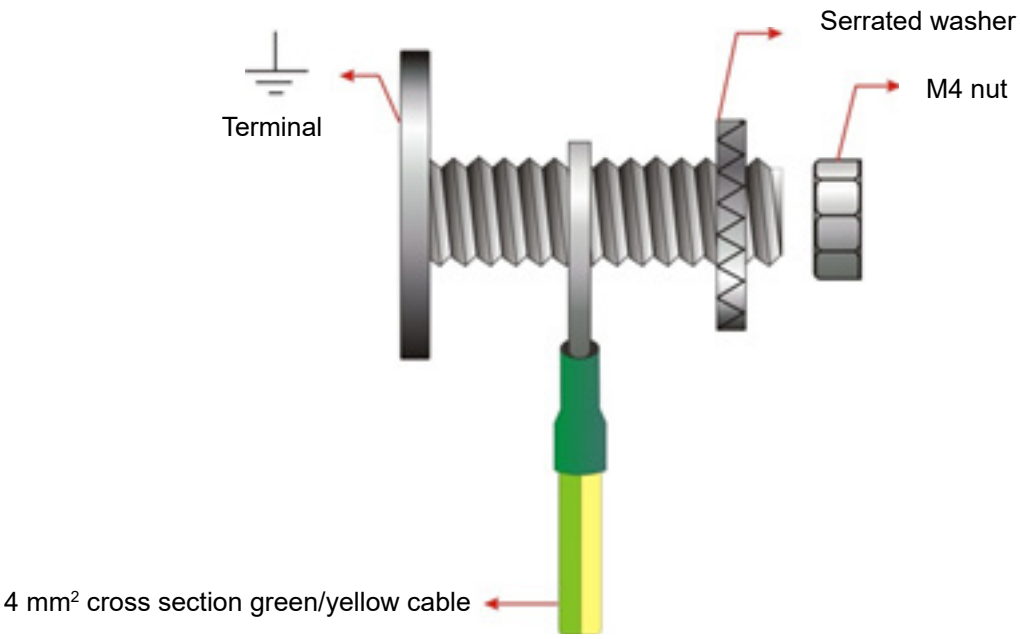
NOTE
The maximum power cable cross section that is compatible with this connector is 1.5mm^2



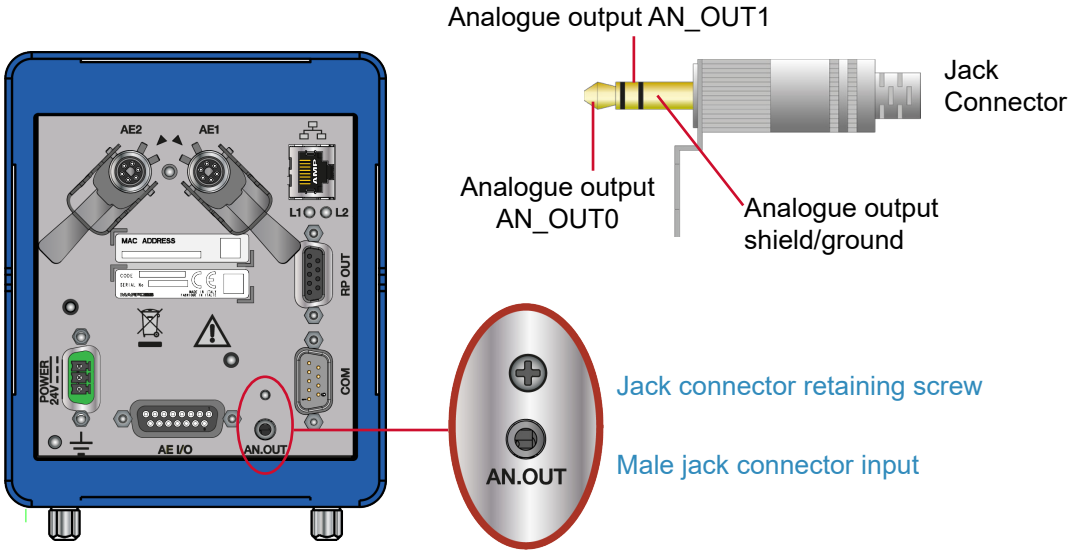
Connector 4140M03301
Protective case 4140000057

7.2 Functional Earth Connection

Connect the unit to earth with the dedicated terminal (labelled with ⏚).
The earth connection is made by connecting the terminal to the centre of mass of the machine the drawer is installed on. Use the shortest possible connection.
Use yellow/green cable with a cross section of at least 4 mm^2.



7.3 Analogue Output Connection



7.3.1 Analogue output connector connection diagram

The Gap&Crash acoustic signal analogue output is available on the connector jack.
Output signal characteristics:

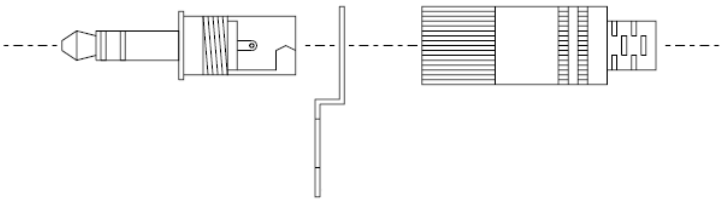
- Output with voltage range 0 to 10 VRDC
- output resistance = 200 Ohm.

SECURING THE JACK CONNECTOR

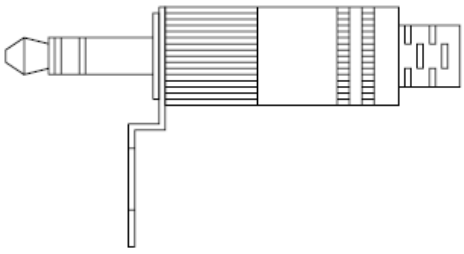
To prevent the male connector jack from accidentally coming out of the socket, secure it using the stop hook (1502040900) supplied (male connector jack kit, Marposs code 6134653900).
Proceed as follows:

- tighten the stop hook on the male connector jack until it is past the thread (figure A);
- make the connections and assemble the connector jack (figure B);

(A)



(B)

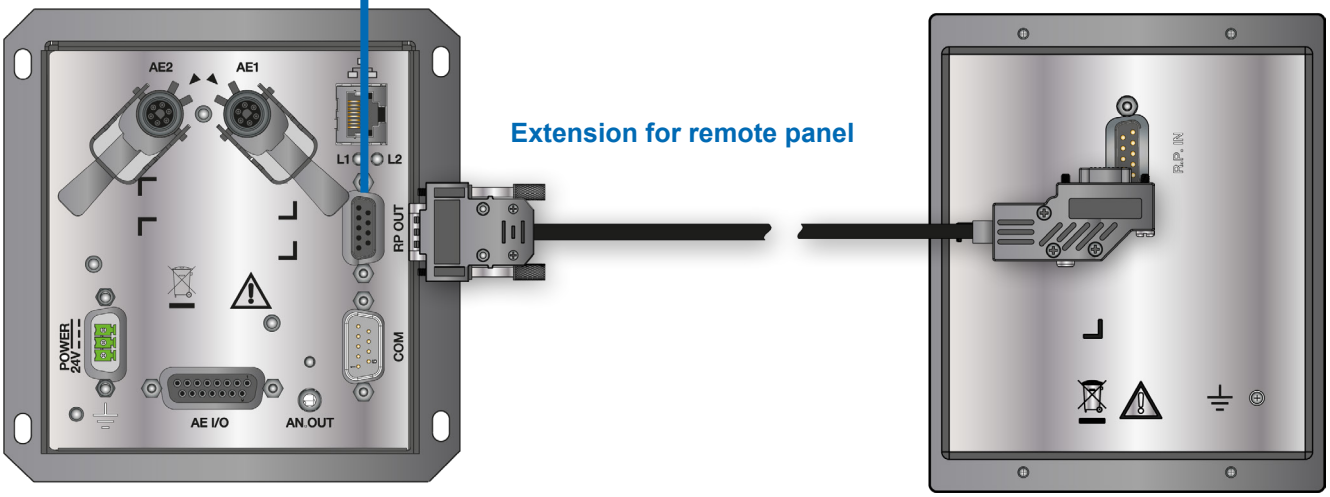


- Plug the male connector jack into the socket and secure the stop hook to the board using the screw on the board.

7.4 Connecting the remote panel

D-SUB female 9 pin connector for connecting the remote panel.

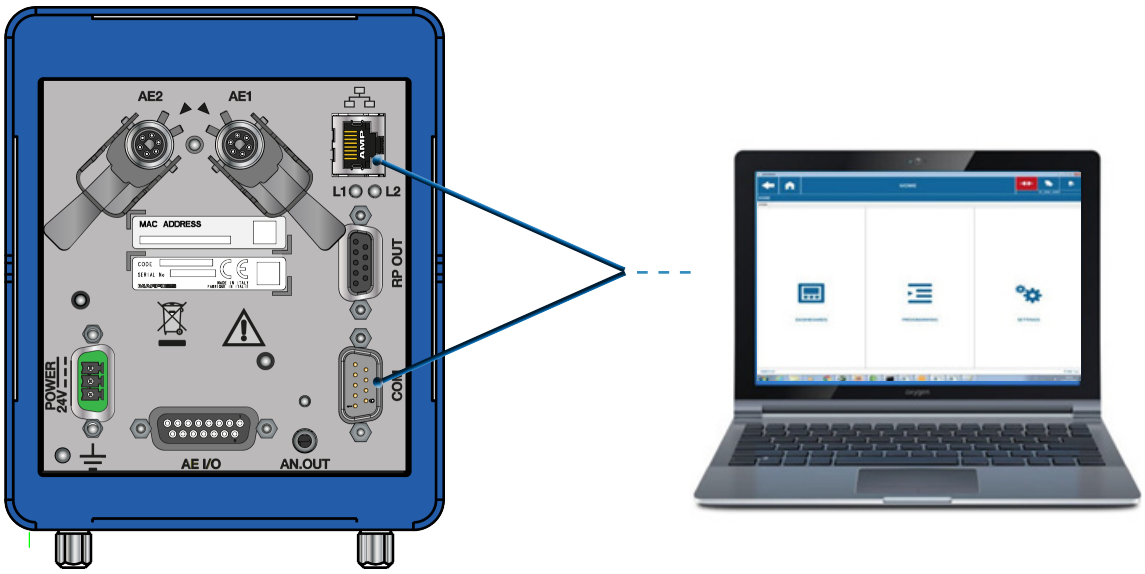
This connector is protected by a metal cap, which should only be removed if it is necessary to connect the unit to the remote panel.



7.4.1 Extension for remote panel

EXTENSION FOR REMOTE PANEL	
Length (m)	Code
1	6737959031
6	6737959030
10	6737959032
15	6737959034
20	6737959036
30	6737959052

7.5 Connecting to a PC



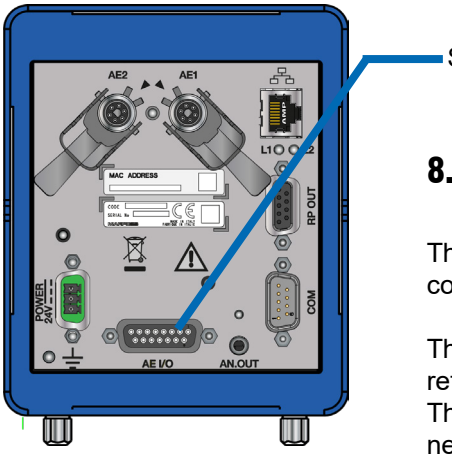
The COM and/or ETHERNET ports are used for connecting to an external PC, which may be used to install the “P1dAE TOOL SW” software supplied with the unit.

The P1dAE TOOL SW is a software help tool that may be used by technical service personnel to control the device functions via a PC.

8. I/O CONNECTION - P1DAE/P3SE MODE

8.1 Connection diagrams (P1dAE/P3SE)

NOTE
The I/O must be powered by a 24 VDC ±20%, SELV type power supply, in accordance with the specifications set out in the Standard EN60950-1



SUB-D female 15 pin connector for I/O connections.

8.2 Technical specifications of the I/O circuits (P1dAE/P3SE)

The devices is connected to the machine logic via a Cannon, 15 pin female connector.

The inputs and outputs are opto-isolated with respect to the P1dAE internal references. The outputs are protected against short-circuits.
The system is equipped with 24 V, SINK/SOURCE type I/O boards for the connections to the machine logic: the operating mode is programmed depending on how they are connected.

To program **SOURCE mode**:
- connect the +SOURCE/-SINK signal to the +24 V line and the -SOURCE/+SINK signal to earth (GND).

To program **SINK mode**:
- connect the -SOURCE/+SINK signal to the +24 V line and the +SOURCE/-SINK signal to earth (GND).

In **SOURCE** mode, the outputs deliver output current from the terminal, while the inputs absorb current from the terminal.
In **SINK** mode, the inputs deliver output current from the terminal, while the outputs absorb input current from the terminal.

DESCRIPTION	VALUE	U.M.
Input/Output power supply voltage (+V_{DC})	From 20 to 32	V_{DC}
Current absorbed at +VDC (VDC = max voltage without loads on the outputs)	<10	mA
Max ripple on input power supply voltage	2	Vpp

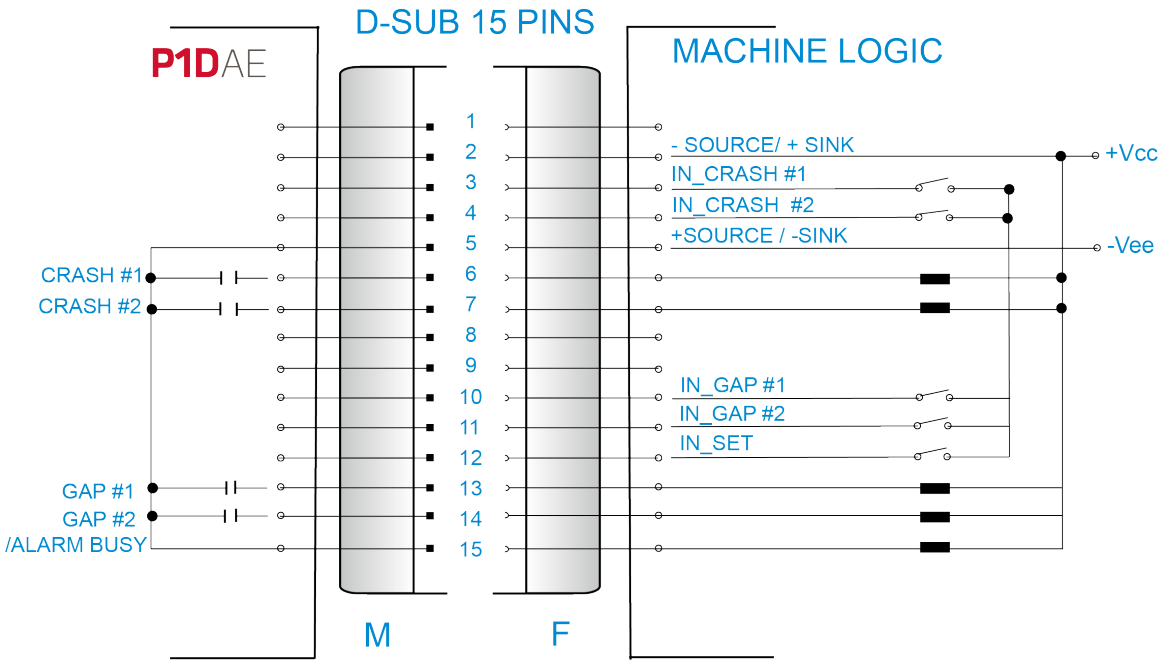
INPUT DESCRIPTION	VALUE	U.M.
Input voltage	Minimum 0 Maximum 36	V_{DC}
Input impedance	> 4800	Ohm
Maximum input current	9	mA
Maximum voltage at logic state 1 - SINK	+ V_{DC} – 13	V_{DC}
Minimum voltage at logic state 0 - SINK	+ V_{DC} – 3	V_{DC}
Minimum voltage at logic state 1 - SOURCE	13	V_{DC}
Maximum voltage at logic state 0 - SOURCE	3	V_{DC}

OUTPUT DESCRIPTION	VALUE	U.M.
Current for each output	10 (maximum)	mA
Voltage at logic state 1 at 20 mA - SOURCE	> + V_{DC} – 2	V_{DC}
Voltage at logic state 1 at 20 mA - SINK	< 2	V_{DC}

8.3 Connection diagrams (P1dAE/P3SE)

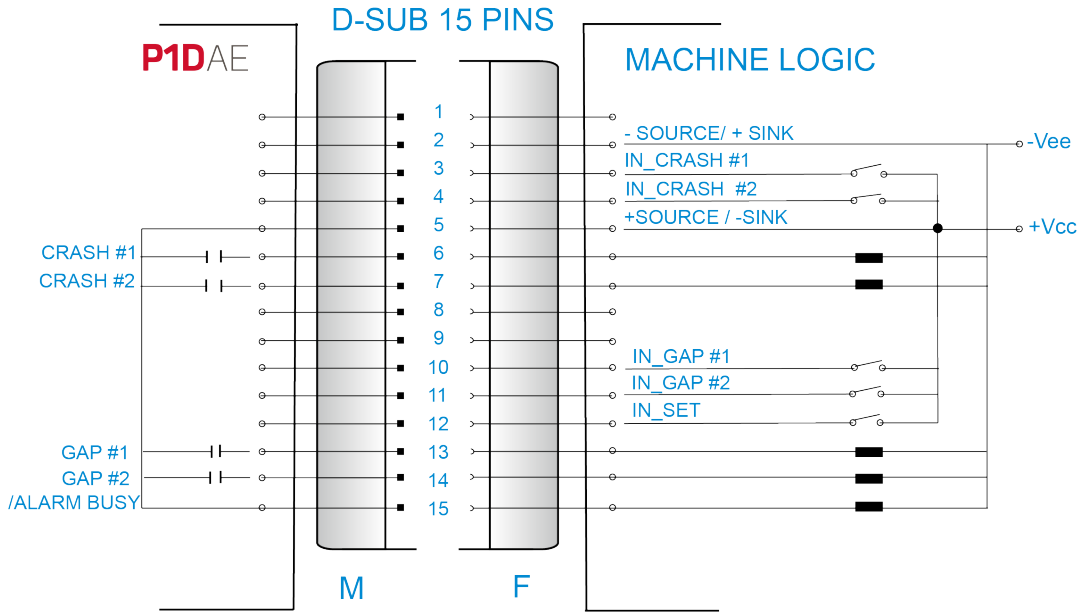
SINK TYPE

Conventional logic state of the signals:
• logic state 0 → + Vdc
• logic state 1 → - Vee

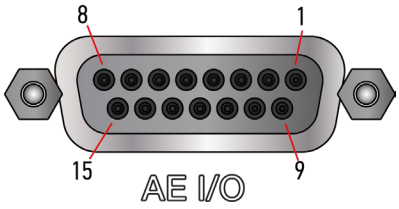


SOURCE TYPE

Conventional logic state of the signals:
• logic state 0 → - Vee
• logic state 1 → + Vdc



8.4 D-SUB I/O connector, signal connection diagram for machine PLC (P1dAE/P3SE)



Female D-SUB DB15

24V DC (±24V) SELV type power supply as defined by EN 60950-1
The maximum load of the outputs is 10 mA

PIN No.	IN/OUT	Description
1	---	Not connected
9	---	Not connected
2	IN	Connect to 0 V for SOURCE type outputs Connect to +24V for SINK type outputs
10	IN	GAP#1 input logic signal
3	IN	CRASH#1 input logic signal
11	IN	GAP#2 input logic signal
4	IN	CRASH#2 input logic signal
12	IN	SET input logic signal
5	IN	Connect to +24V for SOURCE type outputs Connect to 0 V for SINK type outputs
13	OUT	GAP#1 output logic signal
6	OUT	CRASH#1 output logic signal
14	OUT	GAP#2 output logic signal
7	OUT	CRASH#2 output logic signal
15	OUT	ALARM/BUSY output logic signal
8	---	Not connected

NOTE
The maximum power cable cross section compatible with this connector is 0.5 mm^2.

8.4.1 Recommended Bit activation level (P1dAE/P3SE version)

For reasons of safety, we strongly recommend setting up a **low activation level** for the following Bits.

- CRASH#1 Output
- CRASH#2 Output

For reasons of safety, we strongly recommend setting up/programming the following bits with a **low activation level**

- CRASH_IN#1 Input
- CRASH_IN#2 Input
- GAP_IN#1 Input
- GAP_IN#2 Input
- GAP#1 Output
- GAP#2 Output

For safety reasons, the following Bit is held permanently at the **low activation level**, that is to say, in the active logic state, the system may be in one of the following two conditions:

- BUSY
- ALARM

BUSY identifies a temporary condition envisaged during normal use. ALARM is an abnormal condition which is not envisaged during normal operation of the system.

8.4.2 Flow Control Bit (P1DAE/P3SE)

DESCRIPTION	TYPE	MNEMONIC	PIN
Alarm, Busy			
Alarm This output is active if a fatal alarm is in progress: • Memorised value not valid • Circuits in error state; • Acoustic Sensors disconnected (if the relative physical channel is declared “enabled with alarm also enabled”). An Alarm Condition is terminated only when it is assumed that no critical errors are active. The Alarm Condition also activates all output commands: • GAP #1 Activated • CRASH #1 Activated • GAP #2 Activated • CRASH #2 Activated **Busy** This output is active if a "system already busy" condition is in progress because of an operator request on the panel: • Manual SET-UP; • Manual working set change; • Zero-setting. This output is activated in the event of a BUSY condition attributable to one of the following PLC Logic requests: • Change working set; • Start cycle zero-setting. In either case, the P1DAE may not be enabled for processing the measurements required by the flow control: the cycle must not be requested. For reasons of safety, the /Alarm|Busy bit is activated at the low level. The PLC must check its /Alarm|Busy input bit to determine whether the P1dAE is ready to change set or activate a cycle.	OUTPUT BIT	/ALARM|BUSY	15
Sets			
Set Selection This input bit allows the user to select set A or set B It is always possible to activate set A. Set B could be disabled: selecting it while it is disabled forces an Alarm Condition and activates the /Alarm|Busy output bit This Set selection bit is not processed when a cycle is in progress. This Set selection bit is not processed when the remote SET-UP mode or change SET is in progress (via the operator panel): in this case, a “system already busy” condition is forced and the /Alarm|Busy output bit is activated **Low level: Set A** **High level: Set B**	INPUT BIT	IN_SET	12

Cycles			
Crash Cycle request on physical channel #1 The requested cycle may not be accepted if an Alarm/Busy condition is present.	INPUT BIT	IN_CRASH #1	3
Crash Cycle check on physical channel #1 The check bit is activated during the Crash Cycle #1 if the threshold value <1C THRS> is exceeded for almost < 1C TTRG > [ms], and remains active for at least < OUT TPLC > [ms]. In the event of an alarm condition, the check bit is activated, irrespective of whether a cycle is in progress or not.	OUTPUT BIT	CRASH #1	6
Gap Cycle request on physical channel #1 The requested cycle bit may not be accepted if an Alarm/Busy condition is present	INPUT BIT	IN_GAP #1	10
Gap Cycle check on physical channel #1 The check bit is activated during the Gap Cycle #1 if the threshold value <1G THRS> is exceeded for almost < 1G TTRG > [ms], and remains active for at least < OUT TPLC > [ms]. In the event of an alarm condition, the check bit is activated, irrespective of whether a cycle is in progress or not.	OUTPUT BIT	GAP #1	13
Crash Cycle request on physical channel #2 The requested cycle may not be accepted if an Alarm/Busy condition is present.	INPUT BIT	IN_CRASH #2	4
Crash Cycle check on physical channel #2 The check bit is activated during the Crash Cycle #2 if the threshold value <2C THRS> is exceeded for almost < 2C TTRG > [ms], and remains active for at least < OUT TPLC > [ms]. In the event of an alarm condition, the check bit is activated, irrespective of whether a cycle is in progress or not.	OUTPUT BIT	CRASH #2	7
Gap Cycle request on physical channel #2 The requested cycle bit may not be accepted if an Alarm/Busy condition is present	INPUT BIT	IN_GAP #2	11
Gap Cycle check on physical channel #2 The check bit is activated during the Gap Cycle #2 if the threshold value <2G THRS> is exceeded for almost < 2G TTRG > [ms], and remains active for at least < OUT TPLC > [ms]. In the event of an alarm condition, the check bit is activated, irrespective of whether a cycle is in progress or not.	OUTPUT BIT	GAP #2	14

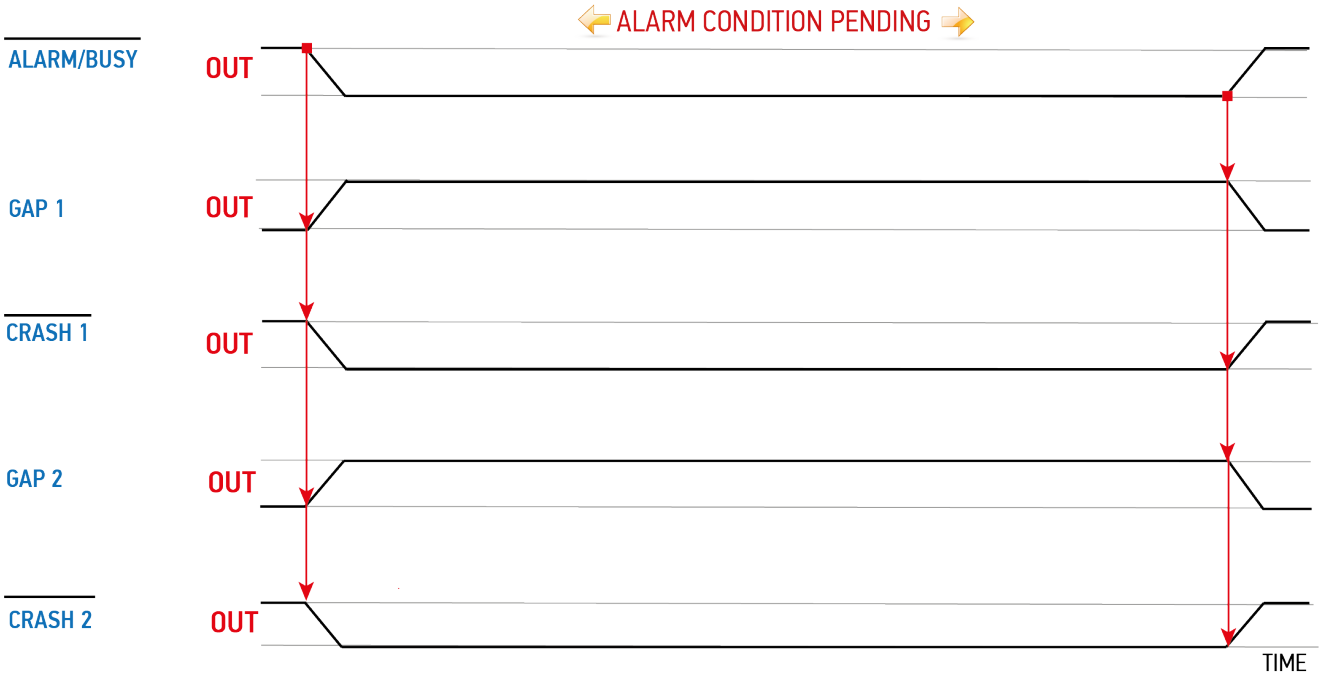
BEWARE
For safety reasons, we strongly recommend setting up a low activation level for the following signals:
CRASH # 1 OUT BIT
CRASH # 2 OUT BIT

8.5 Alarm/Busy Conditions

8.5.1 Alarm Condition.

In the event of a P1DAE fatal error, the ALARM/BUSY bit is activated with all of the other output checks activated:

- ALARM/BUSY activated
- GAP #1 activated
- CRASH #1 activated
- GAP #2 activated
- CRASH #2 activated



GAP bit output mode. Active High
CRASH bit output mode Active Low

The alarm condition is activated immediately when a fatal error is detected.
The alarm condition is deactivated one second after all fatal errors have been cleared.

8.5.2 Busy Conditions

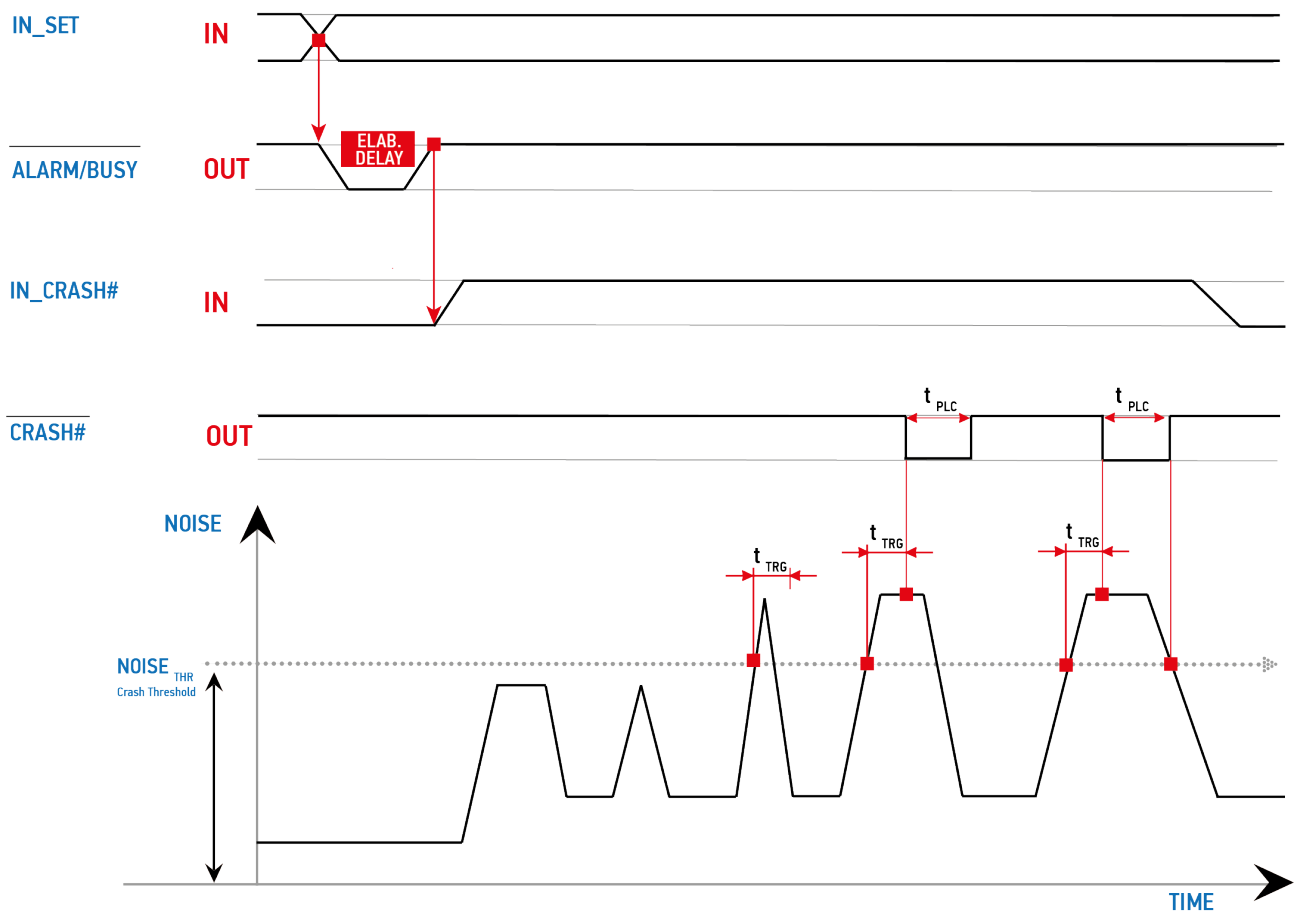
If processing is in progress, so the P1DAE does not allow immediate processing of a Set Change or a Cycle Request, the ALARM/BUSY bit is activated, with all of the other output commands inactive.
The P1DAE is not ready to perform a Set Change or a Cycle Request (“busy” condition) after the following events:

Set Change from PLC	Time strictly necessary for the electronic unit to finish the operation
Set Change from local panel or remote host interface	Until the set is released again
Zeroing from PLC	Until the set is released again Time strictly necessary for the electronic unit to finish the operation
Zeroing from local panel or remote host interface	Time strictly necessary for the electronic unit to finish the operation
Automatic Set-up from local panel or remote host interface	Until the set is released again

8.6 P1dAE Cycles

8.6.1 CRASH check, with non self-locking command

The following is an example of CRASH detection: the cycle is executed without alarms.



t_{trg} Crash signal Minimum Trigger Time

t_{plc} PLC Minimum Time for Output Bit

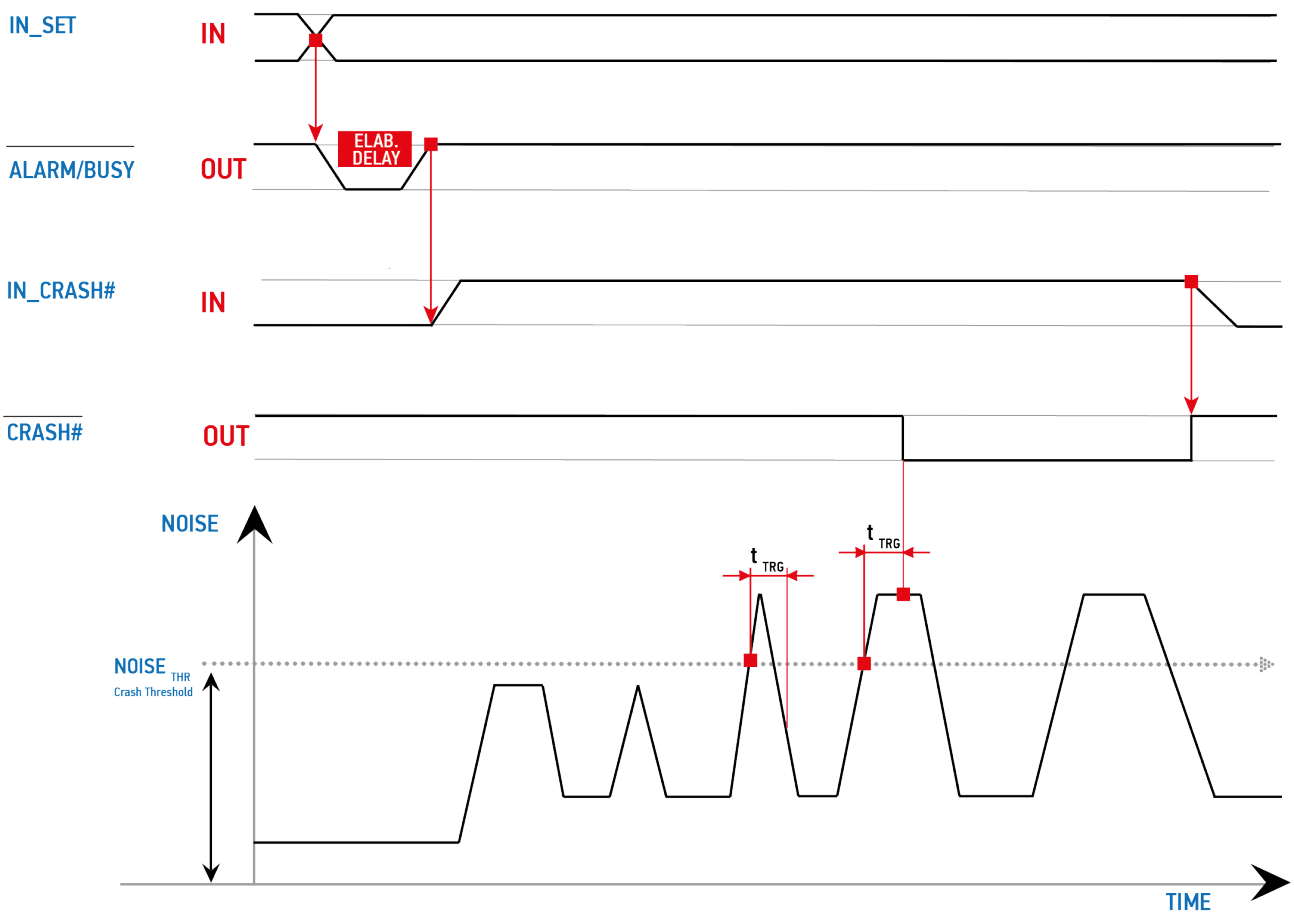
In this example:
► CRASH Bit input mode: Active High
► CRASH Bit output mode: Active Low

ELAB. DELAY It is essential to observe the ALARM/BUSY output bit following a Set Change in order to ensure that the system is ready.

The ALARM/BUSY output bit indicates a “Busy” condition.

8.6.2 Crash check, with self-locking command

The following is an example of CRASH detection: the cycle is executed without alarms.



t_{trg} Crash signal Minimum Trigger Time

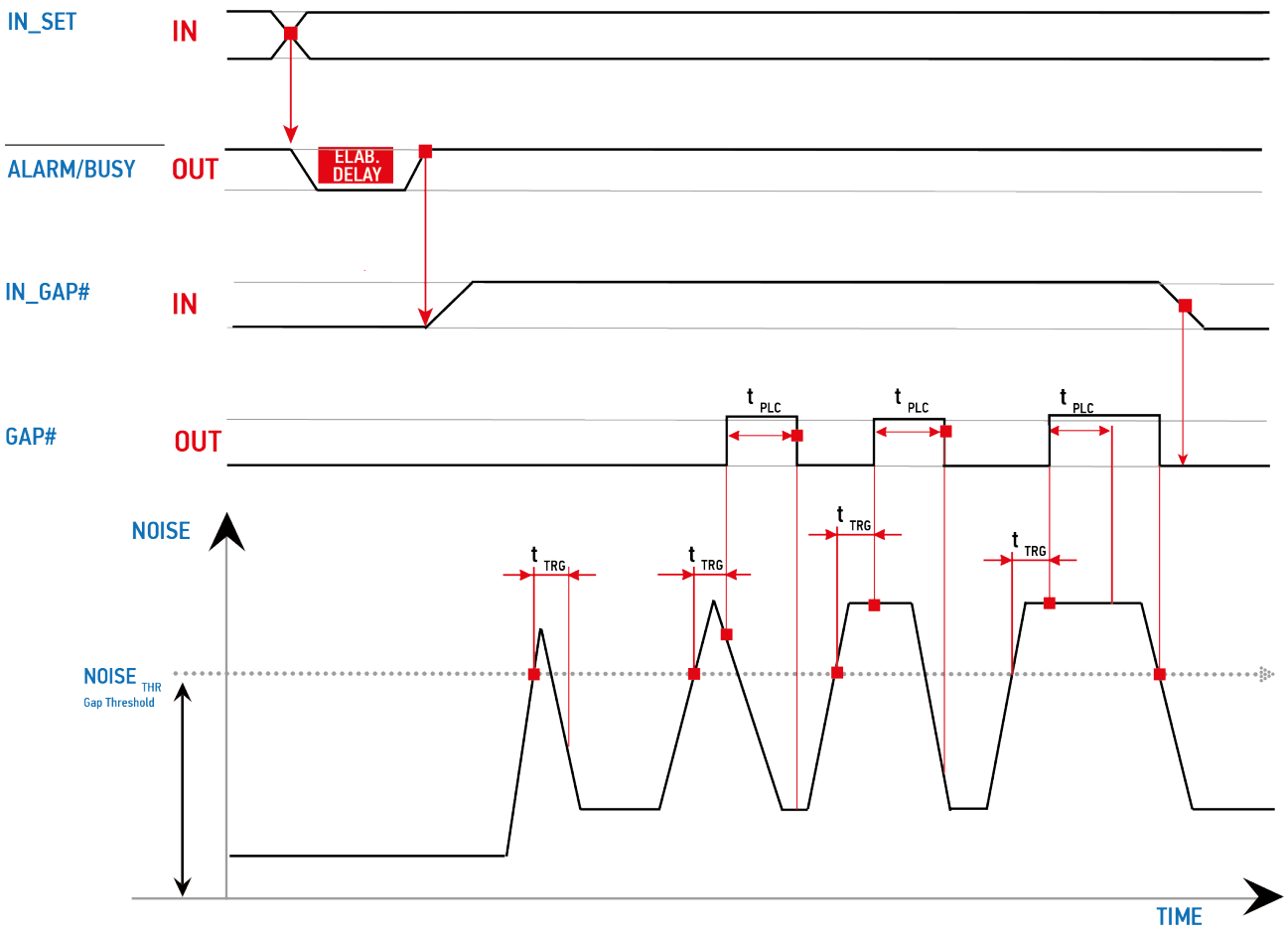
In this example:
- ► CRASH Bit input mode: Active High
- ► CRASH Bit output mode: Active Low

ELAB. DELAY It is essential to observe the ALARM/BUSY output bit following a Set Change in order to ensure that the system is ready.

The ALARM/BUSY output bit indicates a “Busy” condition.

8.6.3 GAP cycle with non self-retaining command, without zeroing mode

The following is an example of a GAP cycle: the cycle is executed without alarms. No gap zeroing setting measurement is performed.



t_{trg} Crash signal Minimum Trigger Time

t_{plc} PLC Minimum Time for Output Bit

In this example:

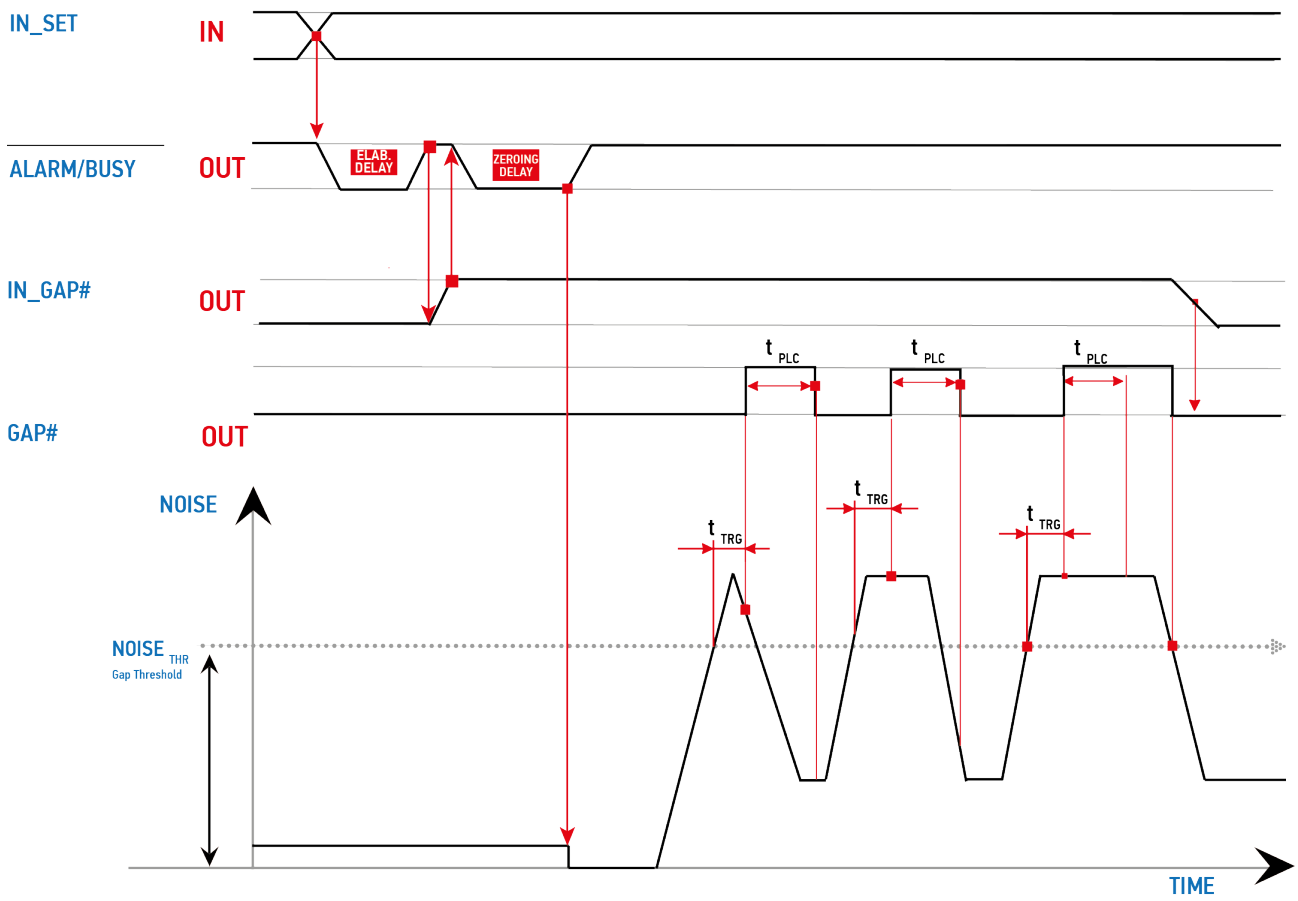
- ► GAP Bit input mode: Active High
- ► GAP Bit output mode: Active High
- ► GAP Zero setting: disabled
- ► GAP The programmed threshold value is used

ELAB. DELAY It is essential to observe the ALARM/BUSY output bit following a Set Change in order to ensure that the system is ready.

The ALARM/BUSY output bit indicates a “Busy” condition.

8.6.4 GAP cycle, with non self-retaining command, automatic in-cycle zeroing mode, threshold programming mode

The following is an example of a GAP cycle: the cycle is executed without alarms.
There is Zeroing of the Gap measurement (without saving the Zeroing data).



t_{trg} Crash signal Minimum Trigger Time
t_{plc} PLC Minimum Time for Output Bit

In this example:

- ► GAP Bit input mode: Active High
- ► GAP Bit output mode: Active High
- ► GAP Zeroing: enabled, when requested by the cycle
- ► GAP Automatic threshold calculation during zeroing setting: disabled
- ► GAP The programmed threshold value is used

ELAB. DELAY It is essential to observe the ALARM/BUSY output bit following a Set Change in order to ensure that the system is ready.

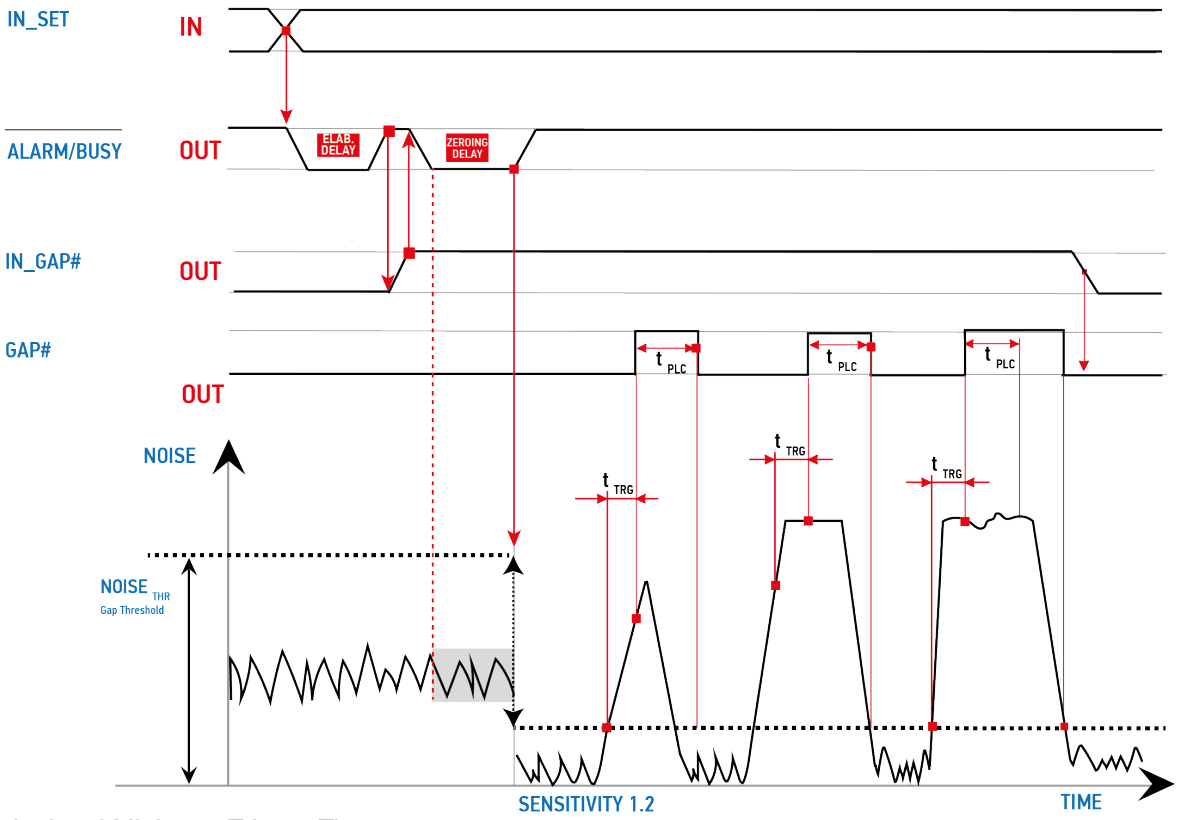
ZEROING DELAY It is essential to observe the ALARM/BUSY output bit following a GAP Cycle with zeroing in order to ensure that the system is ready.

The ALARM/BUSY output bit indicates a “Busy” condition.

The Zeroing Delay is set-up as in the Zeroing Time parameter [ms]: the pre-defined value is 250 [ms].
Open Zeroing Delay time, the Background Noise must be subjected to P1dAE for analysis: no processing is permitted during this phase.

8.6.5 GAP cycle, with self-retaining command, automatic in-cycle zeroing mode, threshold programming calculated

The GAO cycle is executed without alarms.
The Gap signal is zeroed: the maximum and minimum acoustic emission signal values are analysed during the zeroing interval and the Gap Threshold is recalculated based on the observed noise and the programmed sensitivity.



t_{trg} Crash signal Minimum Trigger Time

t_{plc} PLC Minimum Time for Output Bit

In this example:

- ► GAP Bit input mode: Active High
- ► GAP Bit output mode: Active High
- ► GAP Zeroing: enabled, when requested by the cycle
- ► GAP Calculate the threshold automatically during the zeroing interval: enabled
- ► GAP The auto-calculated threshold value is used

ELAB. DELAY It is essential to observe the ALARM/BUSY output bit following a Set Change in order to ensure that the system is ready.

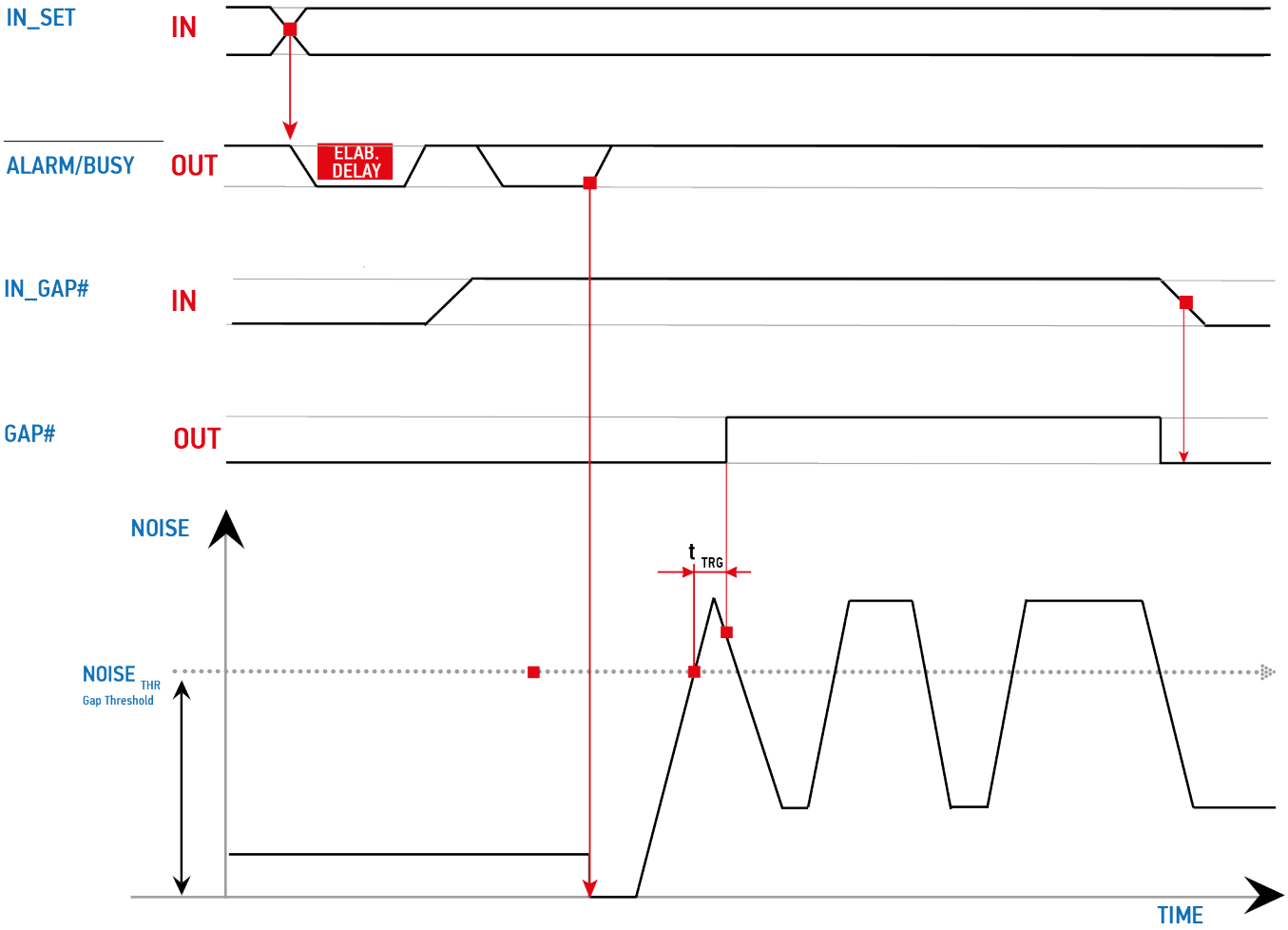
ZEROING DELAY It is essential to observe the ALARM/BUSY output bit following a GAP Cycle with zeroing in order to ensure that the system is ready.

The ALARM/BUSY output bit indicates a “Busy” condition.

The Zeroing Delay is set-up as in the Zeroing Time parameter [ms]. the predefined value is 250 [ms]
Open Zeroing Delay time, the Background Noise must be subjected to P1dAE for analysis: no processing is permitted during this phase.
Automatic Threshold Sensitivity is set-up in the Sensitivity number] parameter: the predefined value is 1.2.

8.6.6 GAP cycle with self-retaining command, in Absolute mode

The Gap Cycle request on channel number # is explained as example: the cycle is run without alarms.
No Zeroing of the Gap measurement



t_{trg} Crash signal Minimum Trigger Time

In this example:

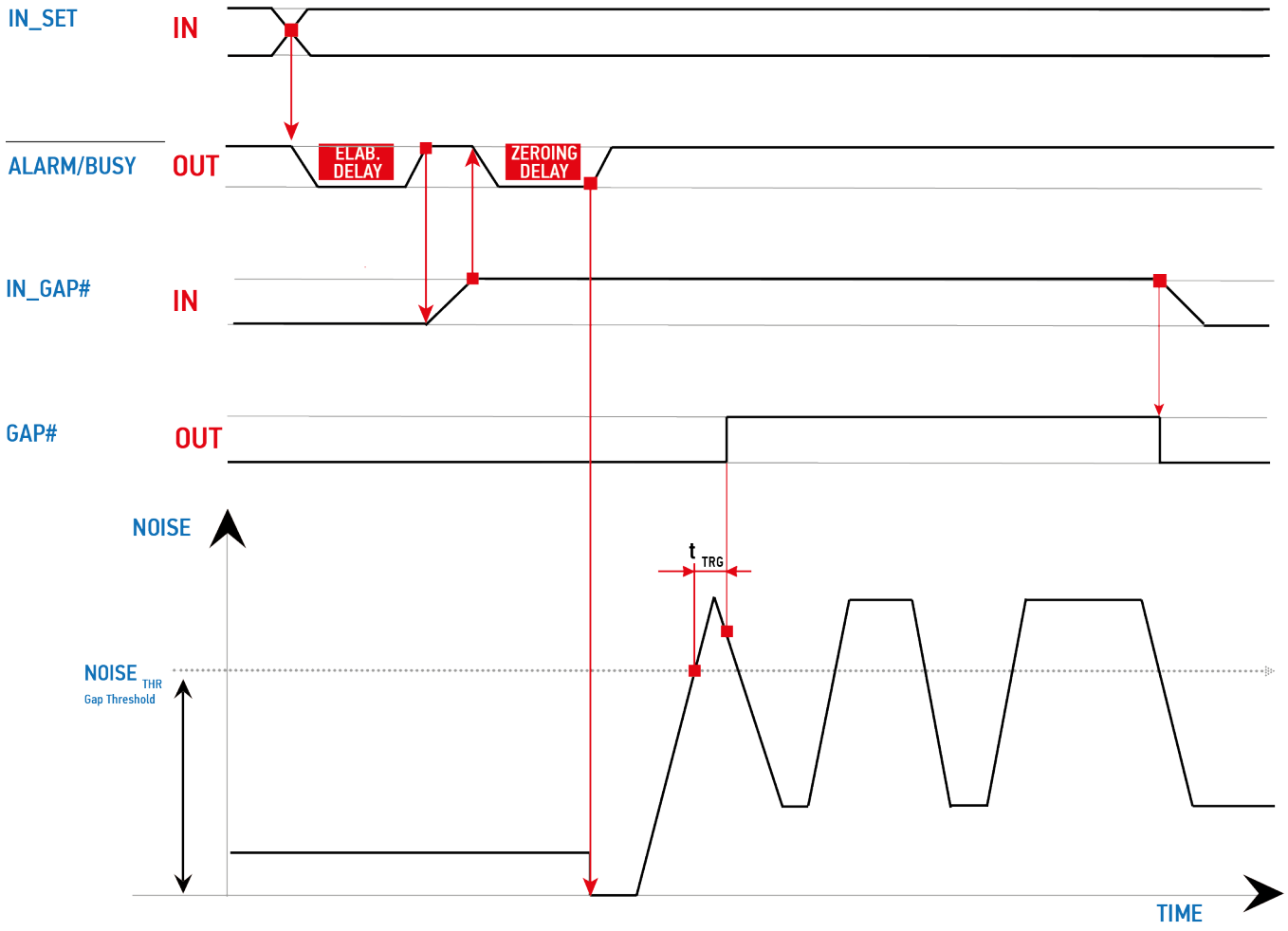
- ► GAP Bit input mode: Active High
- ► GAP Bit output mode: Active High
- ► GAP Zero setting: disabled

ELAB. DELAY It is essential to observe the ALARM/BUSY output bit following a Set Change in order to ensure that the system is ready.

The ALARM/BUSY output bit indicates a “Busy” condition.

8.6.7 GAP cycle, with self-retaining command, automatic in-cycle zeroing mode

The Gap Cycle request on channel number # is explained as example: the cycle is run without alarms.
The Gap measurement is zeroed (without zeroing the data saved in the retentive memory).



t_{trg} Crash signal Minimum Trigger Time

In this example:

- ► GAP Bit input mode: Active High
- ► GAP Bit output mode: Active High
- ► GAP Zeroing: enabled, when requested by the cycle.
- ► GAP Automatic threshold calculation during zeroing setting: no

ELAB. DELAY It is essential to observe the ALARM/BUSY output bit following a Set Change in order to ensure that the system is ready.

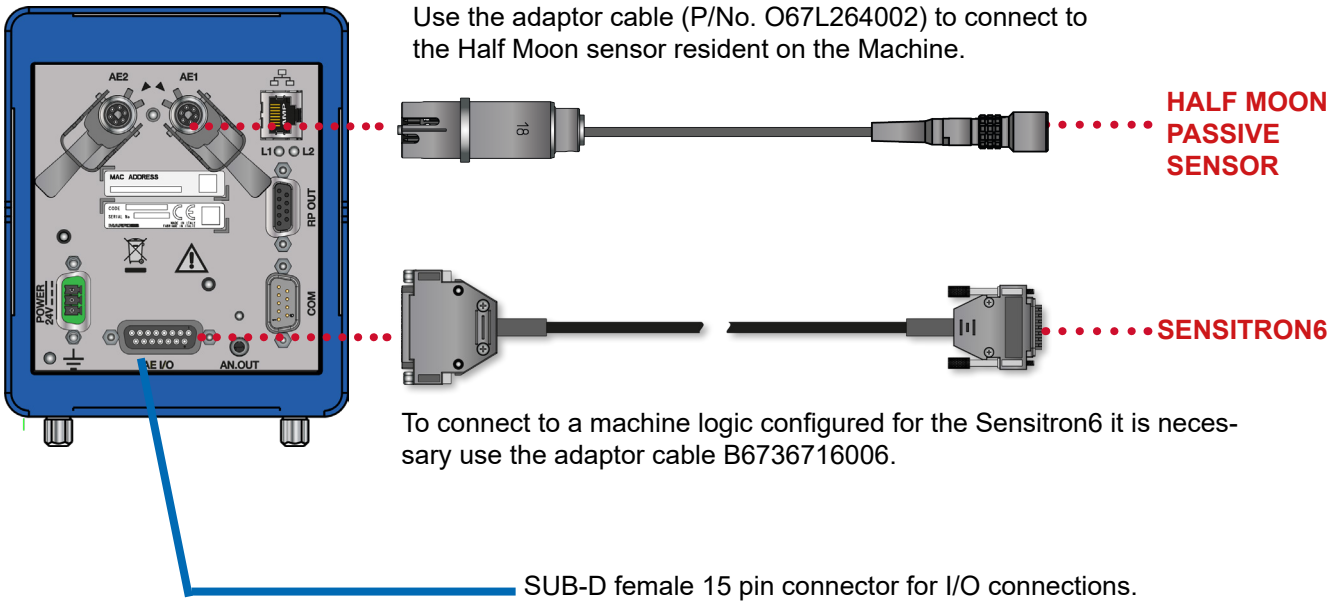
ZEROING DELAY It is essential to observe the ALARM/BUSY output bit following a GAP Cycle with zeroing in order to ensure that the system is ready.

The ALARM/BUSY output bit indicates a “Busy” condition.

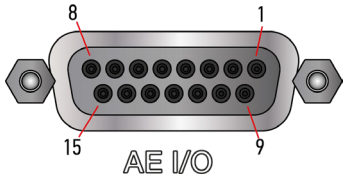
The Zeroing Delay is set-up as in the Zeroing Time parameter [ms]. the predefined value is 250 [ms] Open Zeroing Delay time, the Background Noise must be subjected to P1dAE for analysis: no processing is permitted during this phase.

9. *I/O CONNECTION - SENSITRON 6 MODE*

9.1 Connection diagram (SENSITRON 6)



9.2 D-SUB I/O connector, signal connection diagram for machine PLC (SENSITRON6)



Female D-SUB DB15

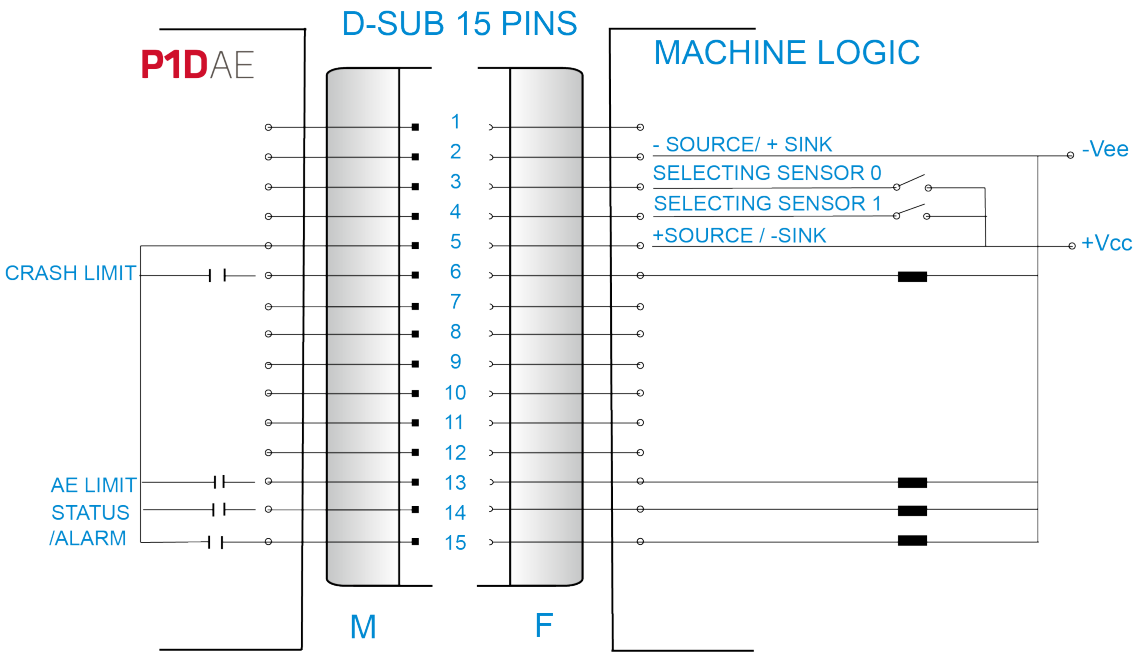
24V DC (±24V) SELV type power supply as defined by EN 60950-1
The maximum load of the outputs is 10 mA

PIN No.	IN/OUT	Description
1	---	Not connected
9	---	Not connected
2	IN	Connect to 0 V for SOURCE type outputs Connect to +24V for SINK type outputs
10	IN	FRONT PANEL INHIBIT
3	IN	SELECTING SENSOR 0
11	IN	Not connected
4	IN	SELECTING SENSOR 1
12	---	Not connected
5	IN	Connect to +24V for SOURCE type outputs Connect to 0 V for SINK type outputs
13	OUT	AE LIMIT
6	OUT	CRASH LIMIT
14	OUT	STATUS
7	---	Not connected
15	OUT	/ALARM
8	---	Not connected

9.3 Connection diagram (SENSITRON 6)

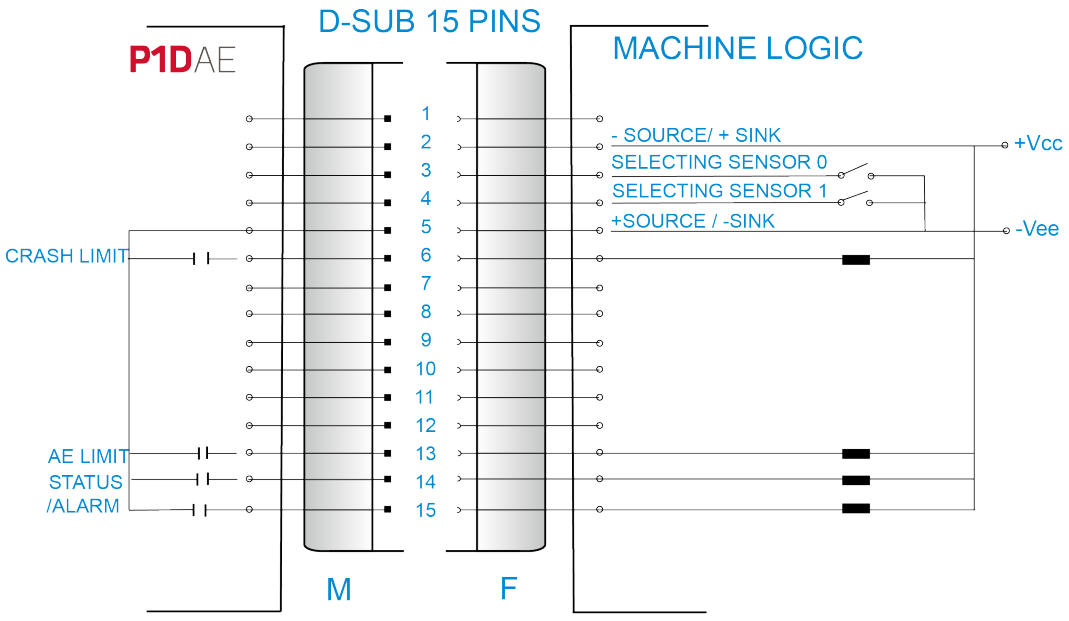
SINK TYPE

Conventional logic state of the signals:
• logic state 0 → + Vdc
• logic state 1 → - Vee



SOURCE TYPE

Conventional logic state of the signals:
• logic state 0 → - Vee
• logic state 1 → + Vdc



9.3.1 Flow Control Bit (SENSITRON6)

<table>
<tr><th>DESCRIPTION</th><th>TYPE</th><th>MNEMONIC</th><th>PIN</th></tr>
<tr><td colspan="4">Alarm</td></tr>
<tr><td>Alarm
This output bit is not activated if one of the following critical alarms is active:
• retained data invalid;
• circuits faulty;
• microphone disconnected (if the respective physical channel is programmed as “enabled even with alarm active”).
An Alarm Condition is terminated only when it is assumed that no critical errors are active.

The Alarm Condition also activates all output commands:
• AE Limit deactivated
• CRASH LIMIT deactivated
For reasons of safety, the alarm output bit has a low activation level.</td><td>OUTPUT BIT</td><td>/ALARM</td><td>15</td></tr>
<tr><td colspan="4">Status</td></tr>
<tr><td>State.
This output bit is deactivated in the event of a BUSY condition attributable by the operator requesting a switch to manual mode via the control panel.

The output bit must be checked to determine when the P1dAE unit is ready to to provide the AE LIMIT and CRASH LIMIT outputs.
• P1dAE operational: Status at LOW level.
• P1dAE non-operational: Status at HIGH level.</td><td>OUTPUT BIT</td><td>STATUS</td><td>14</td></tr>
<tr><td colspan="4">Client inhibit</td></tr>
<tr><td>Client inhibit
This input prevents the parameters from being modified in any way via the control panel or the P1dAE Tool.</td><td>INPUT BIT</td><td>FRONT PANEL INHIBIT</td><td>10</td></tr>
<tr><td colspan="4">Current Sensor Selection</td></tr>
<tr><td>Selecting either current sensor AE1 or AE2.
The following inputs are used to select the requested sensor (see table).
<table>
<tr><th>Sensor</th><th>Pin 3</th><th>Pin 4</th><th></th></tr>
<tr><td>AE1</td><td>High</td><td>Low</td><td></td></tr>
<tr><td>AE2</td><td>Low</td><td>High</td><td></td></tr>
<tr><td></td><td>Low</td><td>Low</td><td rowspan="2">The machine control signals are ignored.</td></tr>
<tr><td></td><td>High</td><td>High</td></tr>
</table></td><td>INPUT BIT

INPUT BIT</td><td>SELECTING SENSOR 0

SELECTING SENSOR 1</td><td>3

4</td></tr>
</table>

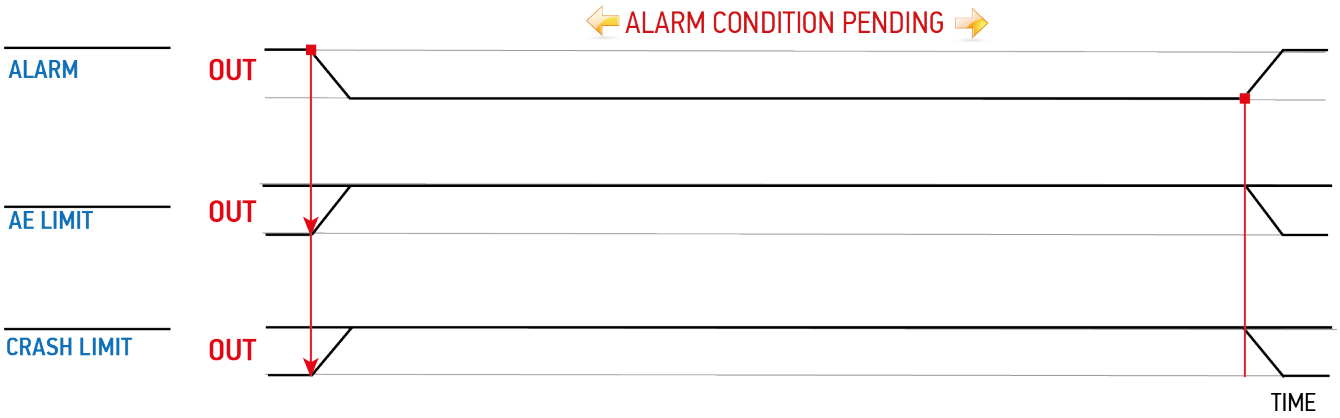
Active Controls			
Gap control in physical channel No. 1 or No. 2. The control bit is activated if the value of the “Gap#1 or Gap#2 Threshold [‰]” is exceeded for at least the “Minimum Gap#1 or Gap#2 activation time [ms]”, and remains active for at least the “minimum PLC time [ms]”. The control bit is deactivated if an alarm condition is detected. The selection inputs for the sensor in use commutate between AE#1 and AE#2.	OUTPUT BIT	AE LIMIT	13
Physical channel No. 1 or No. 2 Crash Control. The control bit is activated if the value of the “Crash#1 or Crash#2 Threshold [‰]” is exceeded for at least the “Minimum Crash#1 or Crash#2 activation time [ms]”, and remains active for at least the “minimum PLC time [ms]”. The control bit is deactivated if an alarm condition is detected. The selection inputs for the sensor in use commutate between AE#1 and AE#2.	OUTPUT BIT	CRASH LIMIT	6

9.4 Alarm/Busy Conditions

9.4.1 Alarm Condition.

In the event of a P1DAE fatal error, the ALARM/BUSY bit is activated with all of the other output checks activated:

- ALARM activated
- AE LIMIT deactivated
- CRASH LIMIT deactivated



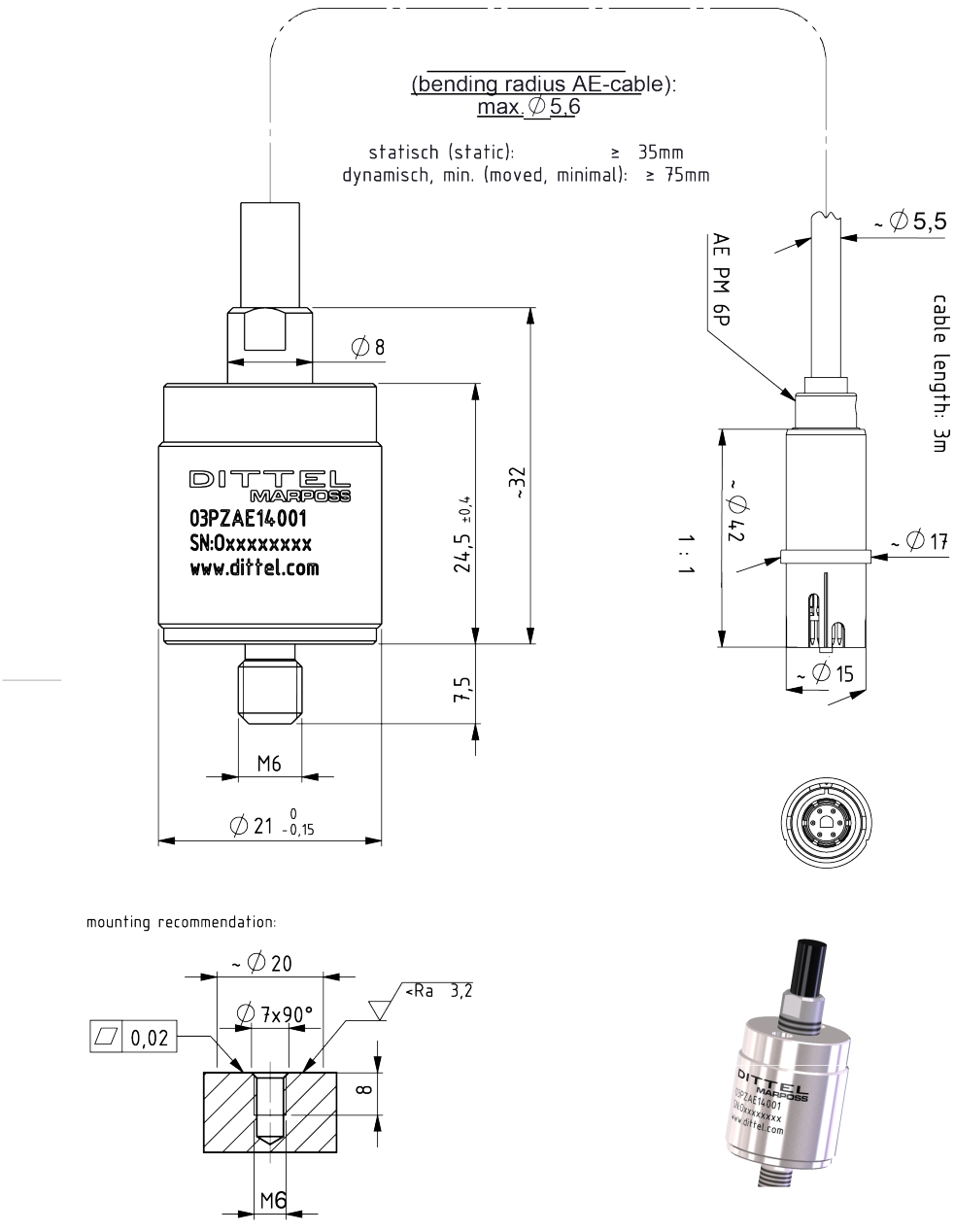
The alarm condition is activated immediately when a fatal error is detected.
The alarm condition is deactivated one second after all fatal errors have been cleared.

10. HARDWARE ACCESSORIES (ACOUSTIC SENSORS)

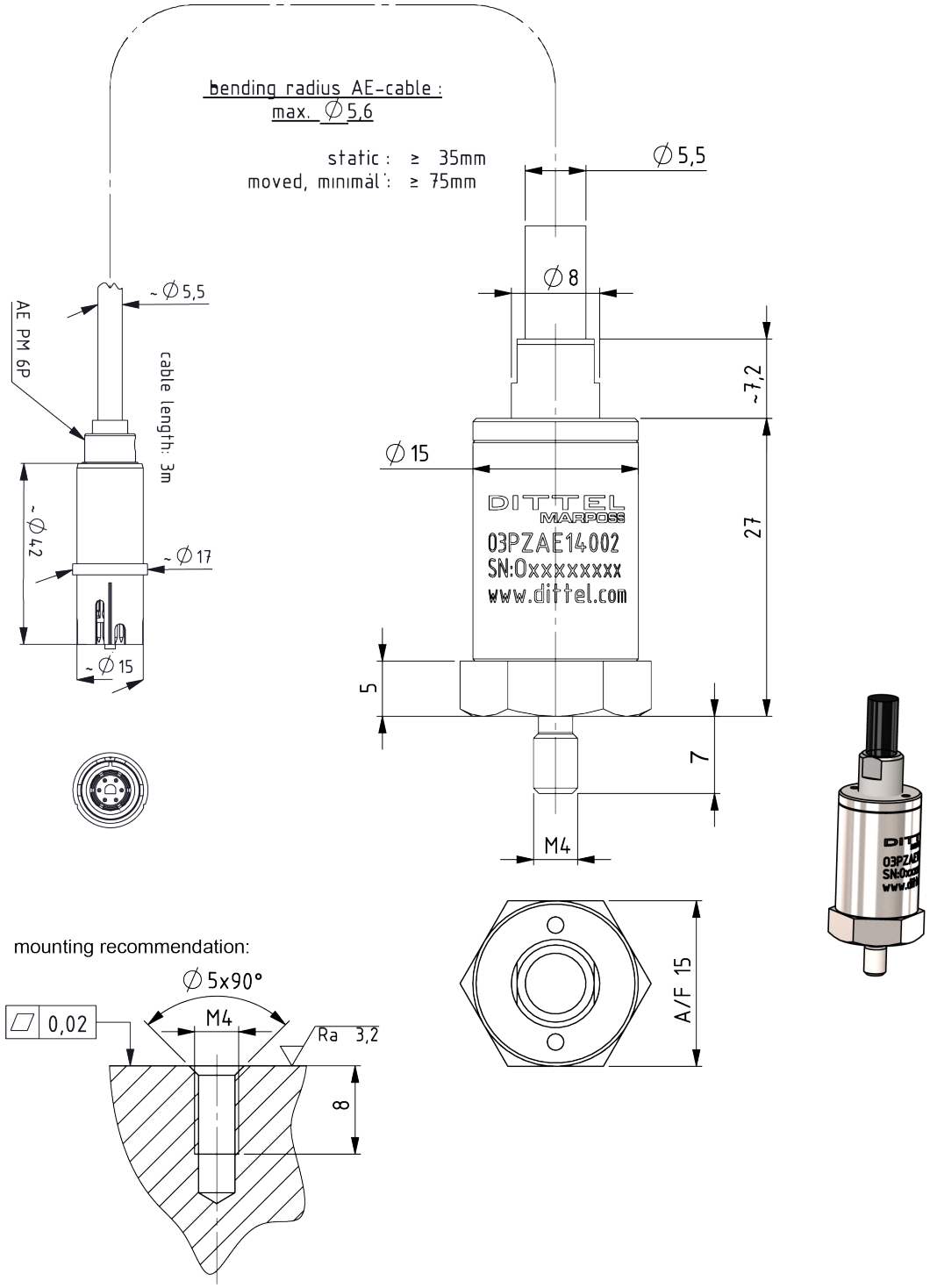
The P1DAE can be fitted with various types of acoustic sensor:
1. Fixed wideband acoustic sensor;
2. Wideband acoustic sensor with contactless transmission.

10.1 Fixed acoustic sensors

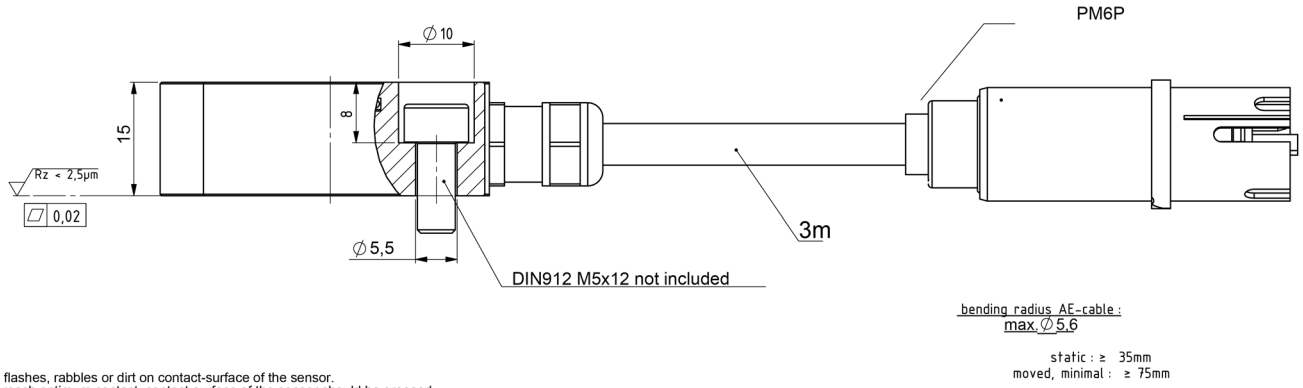
Fixed Acoustic Sensor S O3PZAE14001



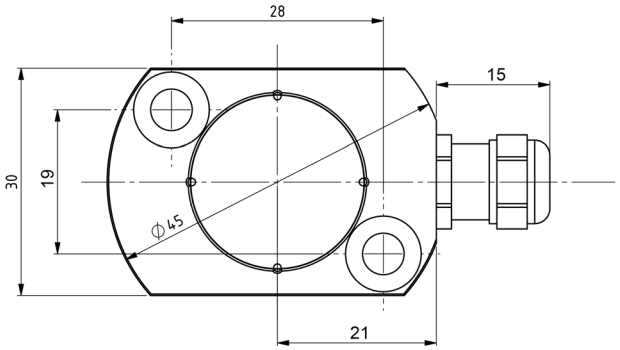
Mini Fixed Acoustic Sensor SF O3PZAE14002

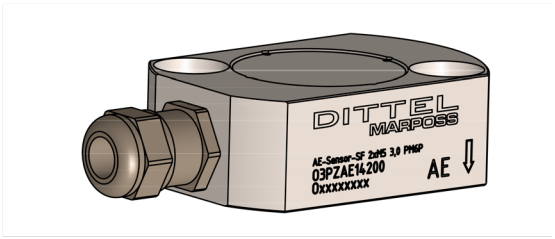


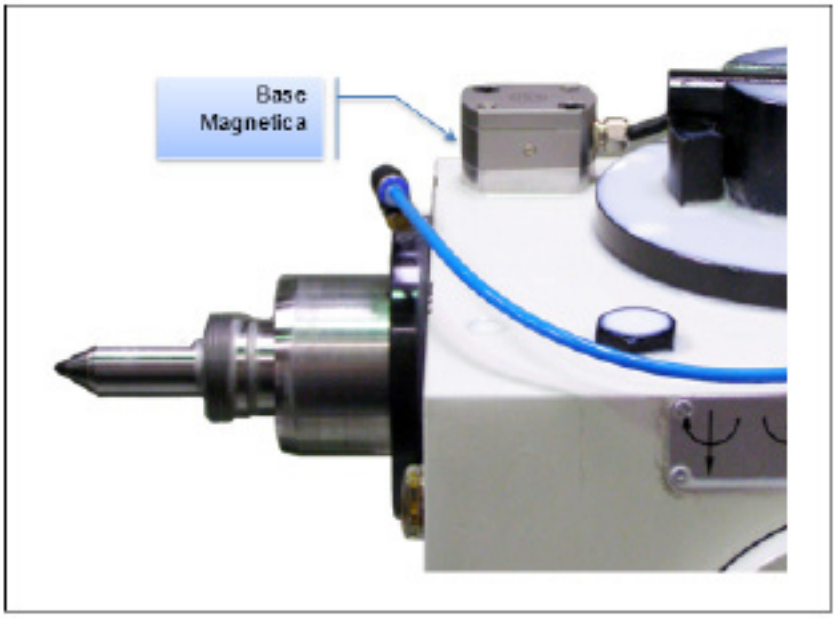
Fixed Acoustic Sensor SF O3PZAE14200



No flashes, rabbles or dirt on contact-surface of the sensor.
To reach optimum contact, contact-surface of the sensor should be greased.







Recommended positions for installing the FS or Mini FS acoustic sensor in the machine:
• on the tailstock: near the part axis of rotation;
• on the part holder head: near the spindle;
• on the grinding wheel carriage: as close as possible to the grinding wheel.
The best position must always be found, since it may vary considerably from one machine to another. In any case the acoustic sensor should never be fixed on the grinding machine bed.

NOTE
Before installing the acoustic sensor, remove the paint from the fixing surface and apply silicone grease between the acoustic sensor and the supporting surface to improve sound transmission to the acoustic sensor.

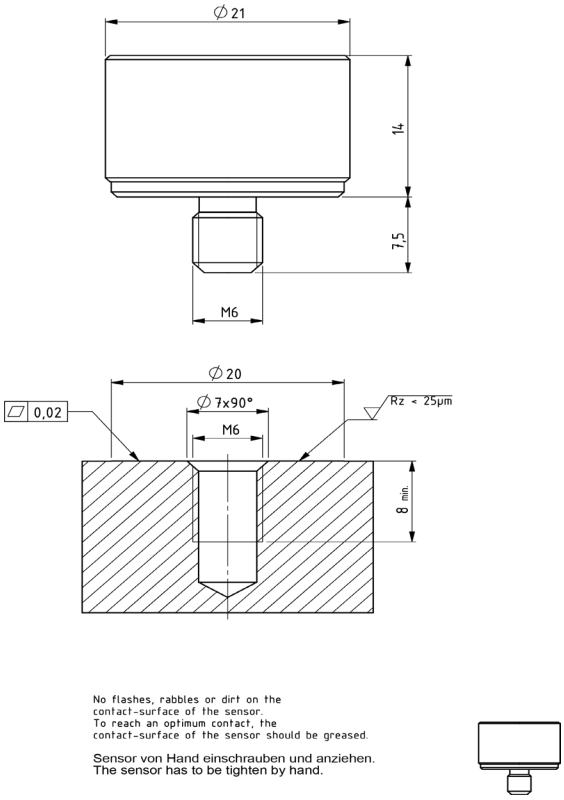
The FS sensor body has two machine mounting holes designed to accept M5 x 12 screws, while the Mini FS sensor body has a single M5 x 12 screw mounting hole.

10.2 Acoustic sensor with contactless transmission

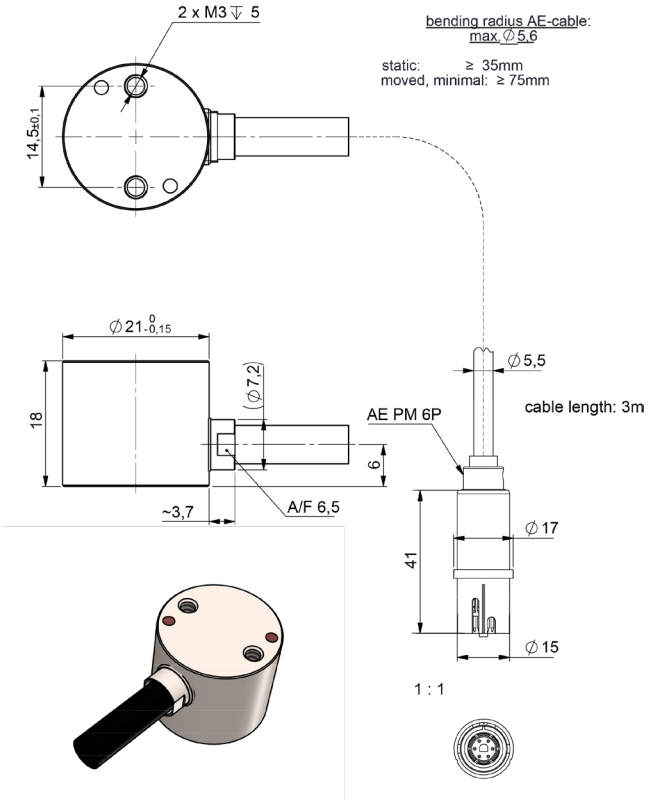
The acoustic sensor consists of two parts:

- Rotating part (03PZ1124200) to be mounted directly in the grinding wheel - spindle unit;
- Fixed part with 3 metre cable (03PZAE24001) to be connected to the electronic unit.

Rotor 03PZ1124200

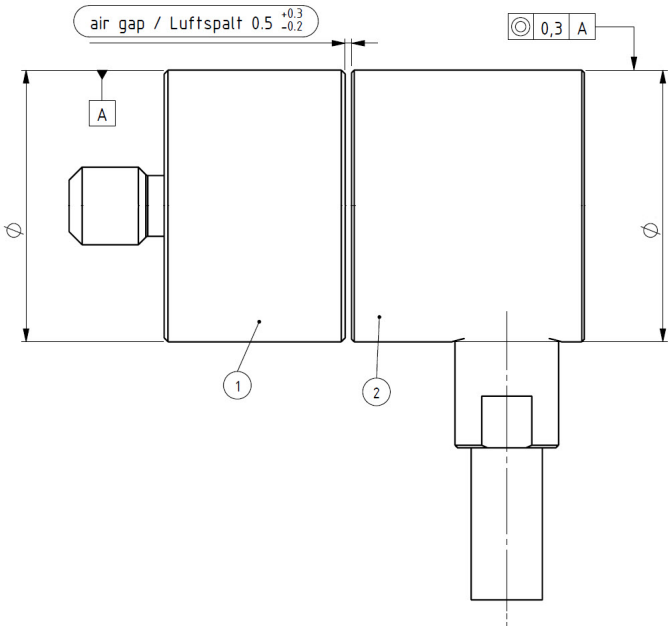


Stator 03PZAE24001



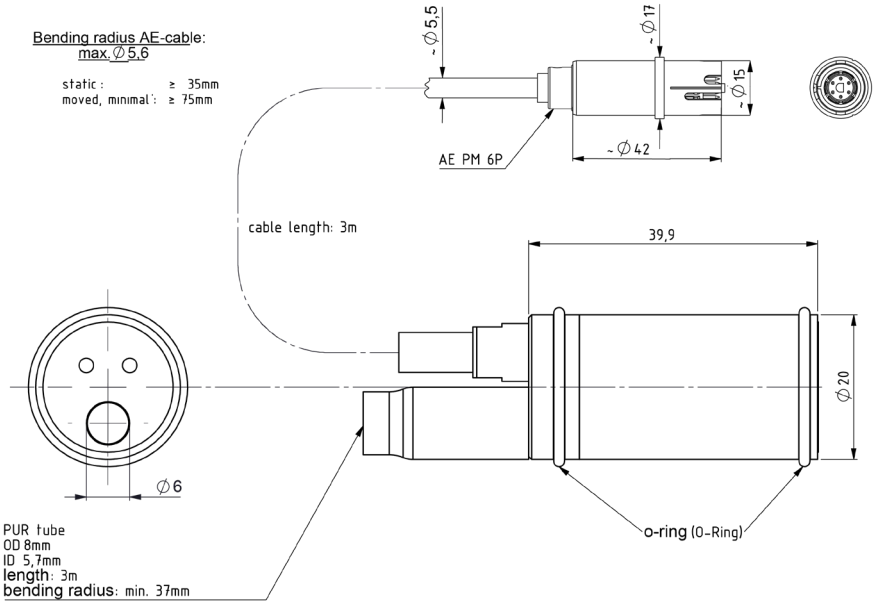
To ensure the contactless acoustic sensor is installed correctly, respect the distances indicated in the applicable documentation.

Please see the adjacent figure as an example.

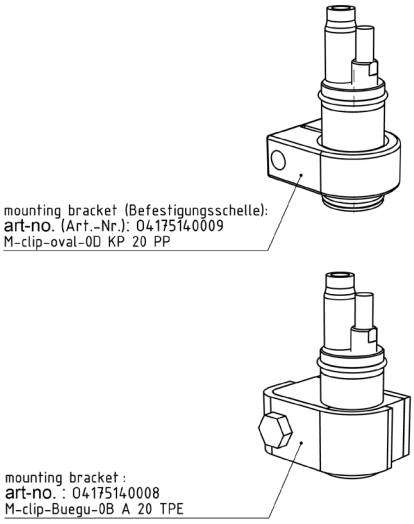


10.3 Acoustic fluid sensor

AE Fluid sensor - O3PZAE14301



optional accessories:

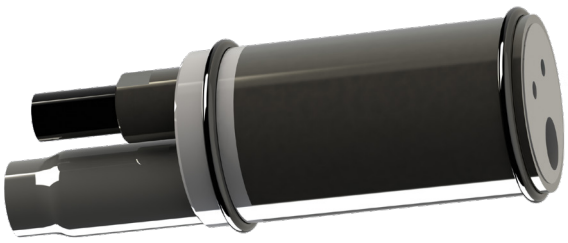


AE-Fluid-Regelnadelventil 1/4"
art-no. (Art.-Nr.): 04710000002
form. art-no. (vorm. Art.-Nr.): F22307

consisting of (bestehend aus):
- Needle-Valve-1/4" 04175140004
- Push-In-Fitting-Metal-1/4" 04175140005

Flow reference values:
- 2 l/min for oil
- 4 l/min for emulsion
- Reference pressure at choke point 1 Bar

Maximum peripheral rotation velocity of the work piece:
- 10 m/s using oil
- 5 m/s using emulsion

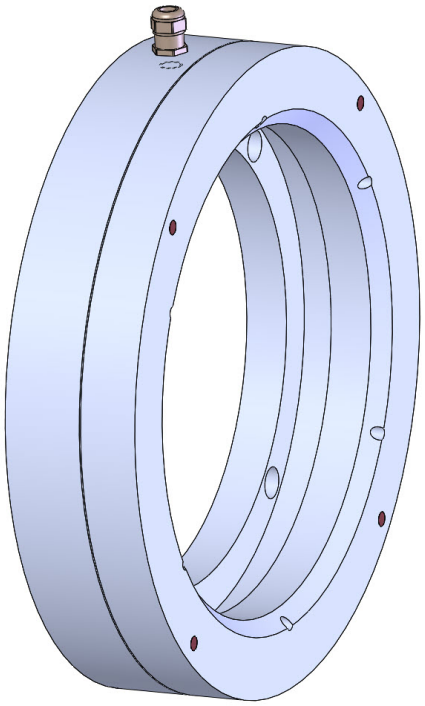


10.4 Acoustic sensor built into the spindle

To ensure the acoustic sensor built into the spindle is installed correctly, respect the distances indicated in the applicable documentation. The dimensions must be agreed with the customer.

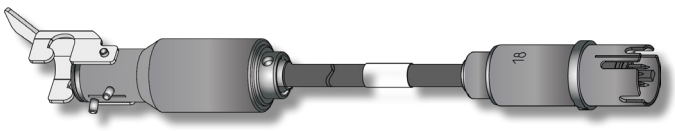
10.5 Ring acoustic sensor

To ensure the acoustic ring sensor is installed correctly, respect the distances indicated in the applicable documentation. The dimensions must be agreed with the customer.

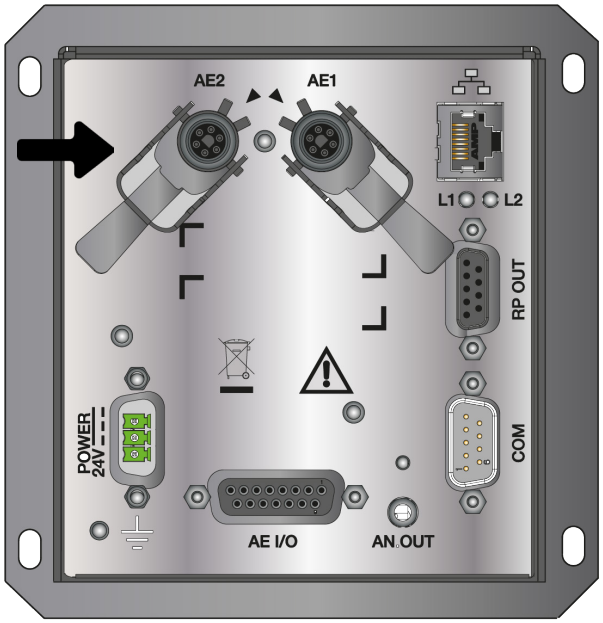


10.6 Extensions for acoustic sensor

Acoustic Sensor



Extension for acoustic sensor



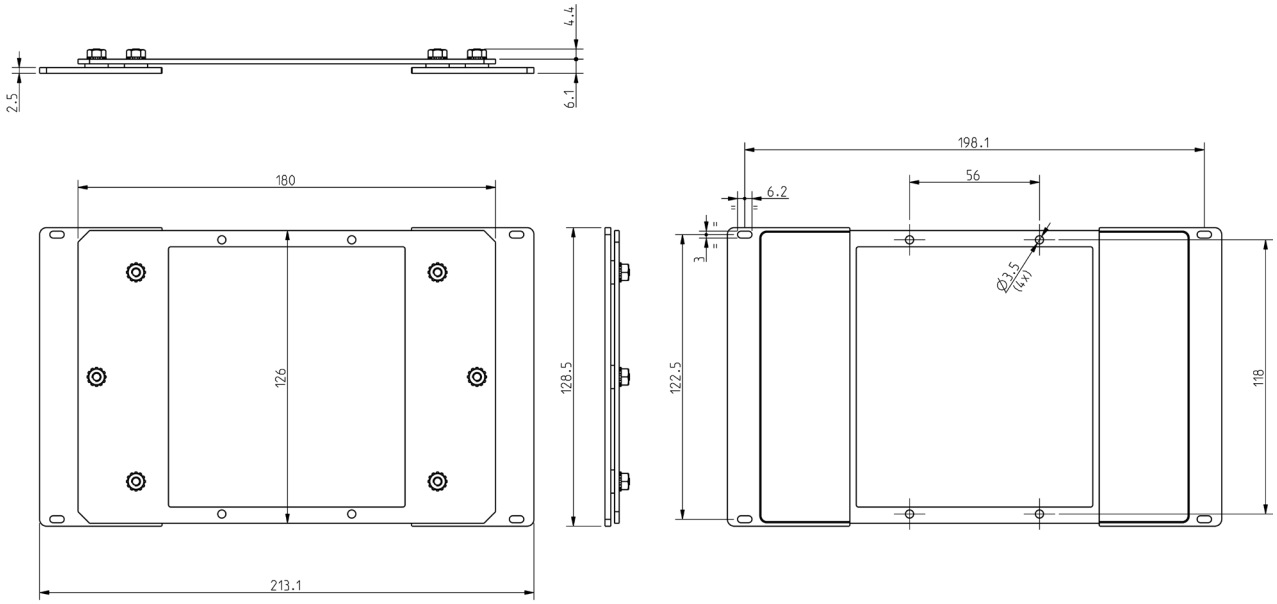
Extensions for acoustic sensor	
Length (m)	Code
3	67MAE00310
6	67MAE00610
10	67MAE01010
15	67MAE01510
20	67MAE02010
27	67MAE02710

10.7 Mechanical accessories

Backing panel for remote or rack panels, use when mounting P1dAE in place of a Sensitron6

BACKING PANEL Part n. 6134802600

EXTERNAL DIMENSIONS OF BACKING PANEL



End of Documents