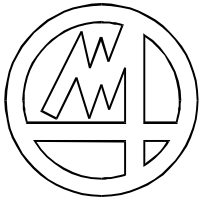
E20N

GRINDER ACOUSTIC CONTROLLER

Installation Manual

Manual code No. D2200004UB



CE

This product is in conformity with the **EMC** requirements as for the directives:

2004/108/CE

This product is intended to operate in industrial locations; it is not intended for connections to a public mains network but is intended to be connected to a power network supplied from a high or medium voltage transformer.

This product is in conformity with the **"Electrical Safety"** requirements as for the directive

73/23/CEE

Electrical safety
The equipment has been manufactured in conformity with **EN 61010-1** specifications.

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MARPOSS S.p.A. does not take on the obligation of notifying possible further changes to the product.

The descriptions reported in this book do not authorize any tampering by non-authorized personnel.

The warranty on the equipments will decay if such tamperings are found.

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About the Directive 2002/95/EC "RoHS" regulating the presence of certain hazardous substances in electrical and electronic equipment.

The Member States of the European Community are in the process of completing the national reception and enforcement of the Directive 2002/95/EC regulating the presence of certain hazardous substances in electrical and electronic equipment.

The Directive explicitly excludes from its scope of application finished products such as those manufactured and sold by Marposs. It is still indeed a widely debated matter whether the complete removal of the regulated substances could affect the reliability of the product.

Marposs shares in the social responsibility of continuously supporting every form of innovation that reduces or minimizes any risk of adverse impact on human health and the environment.

Marposs is therefore voluntarily pursuing the progressive removal of the regulated substances from our products. Marposs will do so with the clear understanding that any improvement achieved on the protection of health and the environment should not come as a compromise for the quality and reliability of our products.

Marposs will put the greatest consideration in any initiative that our Customers undertake with the purpose of reducing the environmental risk. Our commitment is the support of their effort developing products that be of the highest quality and reliability.

Preface

The instructions refer to all possible configurations of the MARPOSS E20N so only the parts relevant to the specific application must be considered.

The code number of the MARPOSS E20N electronic amplifier is indicated on the label on the back.

The configuration of your MARPOSS E20N amplifier may be determined, on the basis of the code number, by consulting capter 2.1, "Codification plan" on page 11.

Warning

All servicing or special maintenance operations must be carried out by authorized personnel.

List of documentation

List of drawing

1. SPECIFICATIONS AND GENERAL WARNINGS

1.1 Premise

This instruction manual supplies all the specific information necessary to know and correctly use your MARPOSS equipment.

The descriptions reported in this manual are aimed to the following personnel:

- MARPOSS personnel or Customer's personnel who has to install the equipment;
- Customer's technicians who directly operate the MARPOSS equipment;
- Customer's technicians who are responsible of the maintenance of the production line where the MARPOSS equipment is installed.

1.2 Final test and warranty

The defects of the materials are covered by the warranty with the following limitations:

- DURATION OF THE WARRANTY: the warranty covers all repairs made within the agreed terms
- OBJECT OF THE WARRANTY: the warranty is applied to the product and to its parts marked with serial number or other identification number by MARPOSS.

The above mentioned warranty has to be considered valid, unless of different agreements between MARPOSS and the Customer.

1.3 Definition of safety notices

There are two types of notices: Warning and Attention

Warning

This note indicates the possibility to damage the electronic unit and other devices connected to it, or the possibility to loose data.

Attention

This note indicates dangerous conditions for the operator/technician.

1.4 Customer to provide:

The Customer must provide the following connections:

- power supply according to the data reported on the equipment plate;
- connection to the machine logic according to the indications of chapter 3.2, on page 20.

2. DESCRIPTION OF MARPOSS E20N SYSTEM

2.1 Codification plan

Below there is a list of the possible configurations and the corresponding coding plan of the MARPOSS E20N:

Code number: **8 3 0 2 8 x y z v w**

"x" TYPE OF STRUCTURE	
With rack assembly	**A**
Blindbox for remote panel (*)	**B**
With stand alone case	**C**
Without case, without panel	**D**
"y" FUNCTIONAL CHARACTERISTICS	
1 GAP channel	**0**
2 GAP switching channels with 1 microphone	**1**
2 GAP switching channels with 2 microphones	**2**
2 simultaneou channel (GAP + CRASH) with 1 microphone	**3**
2 simultaneous channels (GAP + CRASH) with 2 microphones	**4**
1 CRASH channel	**5**
1 GAP channel + analogue output	**6**
2 GAP switching channel with 1 microphone+ analogue output	**7**
2 GAP switching channels with 2 microphones+ analogue output	**8**
"z" SPECIAL OPTIONS	
No optional features (self-locked commands)	**0**
Non-self-locked command for Channel 1	**1**
Non-self-locked command for Channel 2	**2**
Non-self-locked commands for Channel 1 and Channel 2	**3**
EGC function (Ext Gain Control) with self-locked commands	**5**
EGC function + non-self-locked command for Channel 1	**6**
EGC function + non-self-locked command for Channel 2	**7**
EGC function + non-self-locked commands for Channel 1 and Channel 2	**8**
"v" TYPE OF INPUTS	
24 VDC Source/Sink / 24VAC	**4**
"w" NETWORK POWER SUPPLY	
200-240 VAC (IEC)	**2**
100-120 VAC (IEC)	**3**

(*)

Remote Panel	Codice
1 GAP channel	6303411245
2 GAP channels	6303411205
1 GAP channel +1 CRASH channel	6303411225
1 CRASH channel (not available with EGC)	6303411265

Cable	*Lengh*	*Cable*	*Lengh*
6734516039	3 m	6734516040	6 m
6734516041	10 m	6734516062	15 m
6734516049	20 m	6734516071	30 m

2.2 Dimensions of the electronic unit

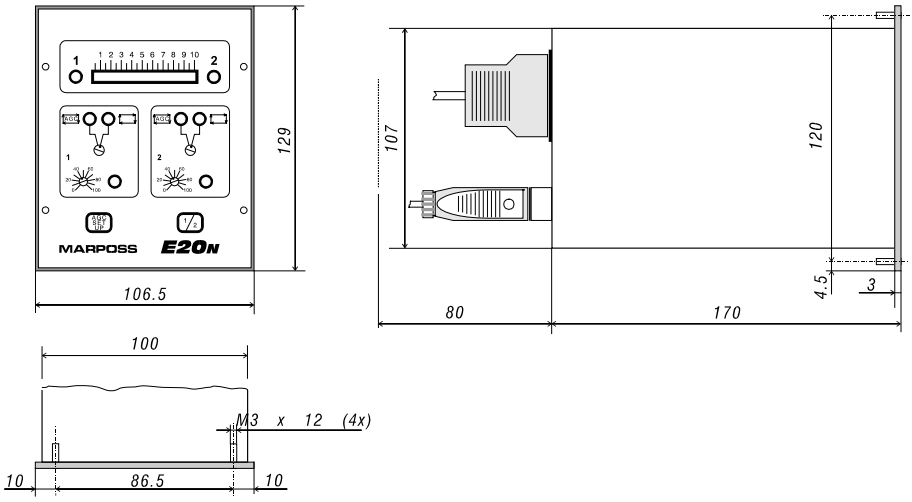


Figure 1. Overall dimensions of E20N with rack 19" assembly

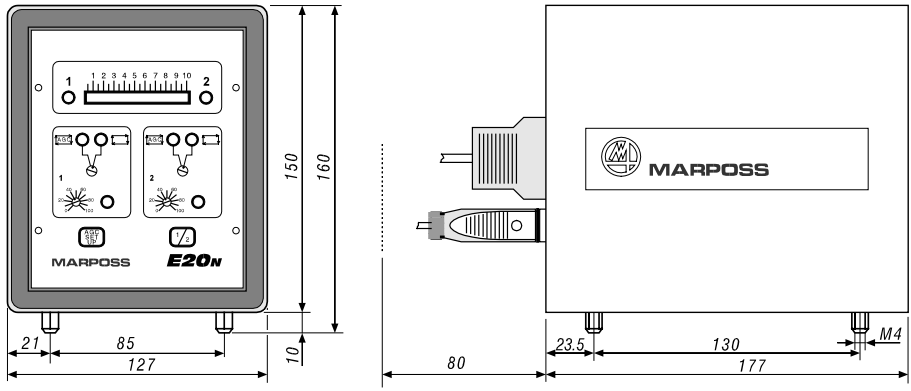
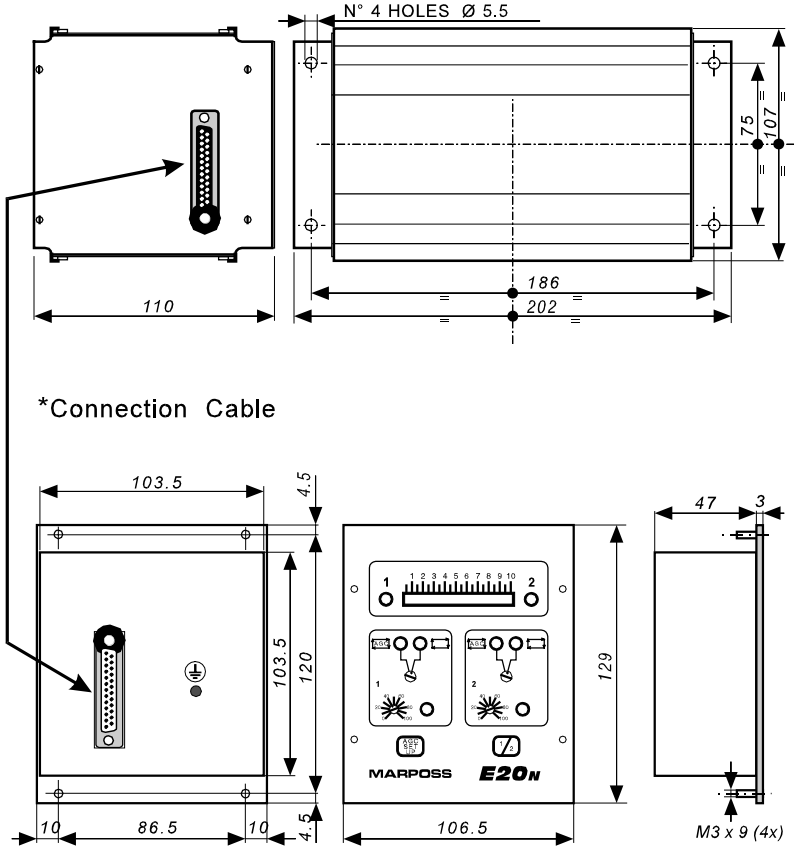


Figure 2. Overall dimensions of E20N with stand alone case (IP54)

Blind box: Fixing with brackets



Remote panel assembly

Terminal (M4) for the connection to the center of ground terminal.

Cable	*Length*	*Cable*	*Length*
6734516039	3 m	6734516040	6 m
6734516041	10 m	6734516062	15 m
6734516049	20 m	6734516071	30 m

Figure 3. Overall dimensions of E20N with remote panel

2.3 Applications

The MARPOSS E20N detects, by means of a piezoelectric transducer (microphone), the ultrasonic energy generated by the contact of the grinding wheel with the workpiece or another part of the grinder

2.3.1 GAP control

The following applications are possible:

- **Check of the contact between wheel and workpiece.**

  The definition of a noise threshold makes it possible to detect the contact between wheel and workpiece to switch from approach speed to feed rate.

- **Check of wheel position.**

  The definition of a noise threshold makes it possible to detect the position of the wheel with respect of a known reference.

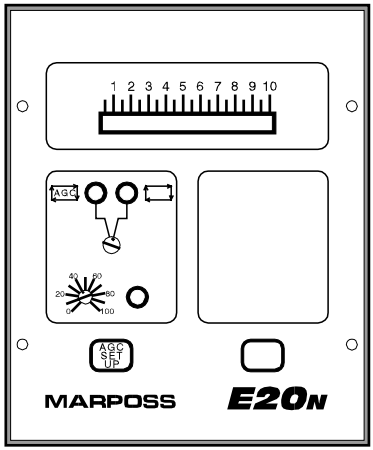
- **Check of continuity of dressing.**

  The detection of the ultrasonic emissions during the wheel dressing makes it possible to optimize the dressing cycle. The dressing cycle can be considered completed when the ultrasonic emission is continuous and not interrupted.

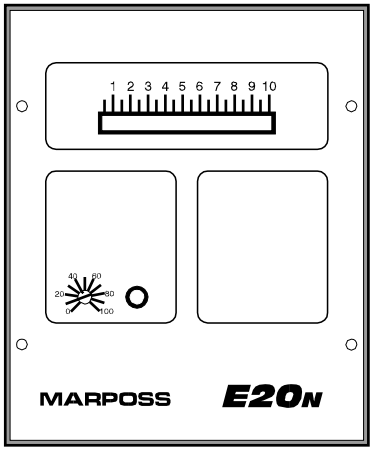
2.3.2 CRASH control

The definition of an appropriate noise threshold makes it possible to detect accidental collisions of the grinding wheel.

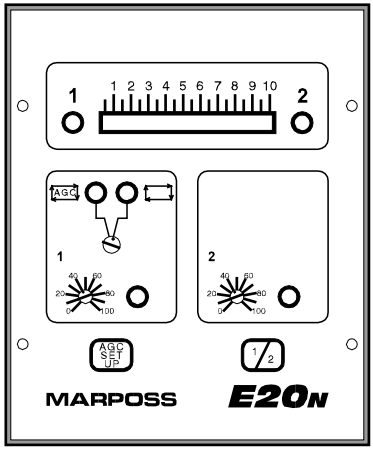
2.4 Configuration of the system



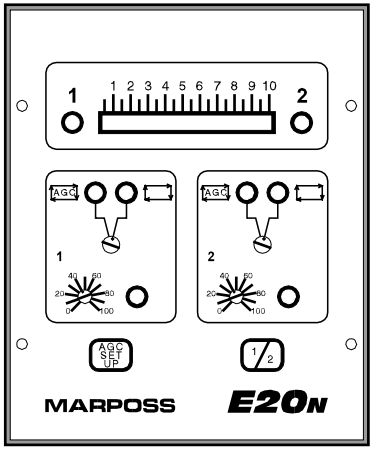
1 GAP channel



1 CRASH channel



1 GAP channel + 1 CRASH channel



2 GAP switching channels

2.4.1 E20N with one GAP channel

The E20N is connected to one microphone for GAP control.

Machine connection diagram in Figure 5, on page 23.

2.4.2 E20N with one CRASH channel

The E20N is connected to one microphone for CRASH control.

Machine connection diagram in Figure 6, on page 24.

2.4.3 E20N with two GAP channels in switching

The E20N is connected to one or two microphones for GAP control with two independent and switching channels.

In case of applications with two microphones, each channel is connected to a given microphone.

Only one channel at a time is active.

When the E20N is switched on, channel 1 is automatically Inserted.

Machine connection diagram in Figure 7, on page 25.

2.4.4 E20N with one GAP channel + one CRASH channel

The E20N is connected to one or two microphones for gap and crash control:

- Channel 1 for GAP control
- Channel 2 for CRASH control

In case of applications with two microphones, each channel is connected to a given microphone.

Both channels are active at the same time

Machine connection diagram in Figure 8, on page 26.

2.5 Microphones compatibility

The E20N can be connected to different types of microphones (see 6.1, on page 42):

wide range microphone

- traditional type (3424802152) with contactless transmission (3424802000+ 3424802014)
- "old" type microphone (34130011XX)

Warning

The E20N is factory programmed for wide range microphones (3424802xxx).

3. CONNECTIONS TO THE ELECTRONIC UNIT

3.1 General connections (rear view)

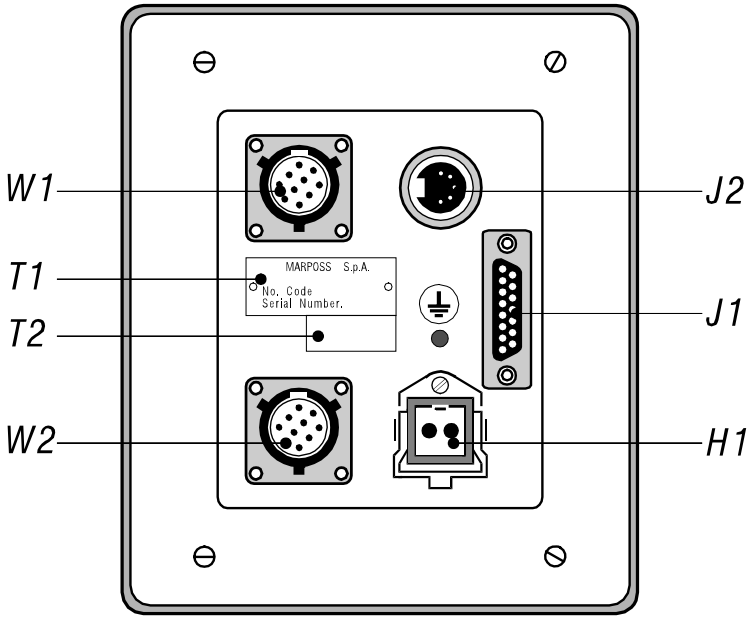
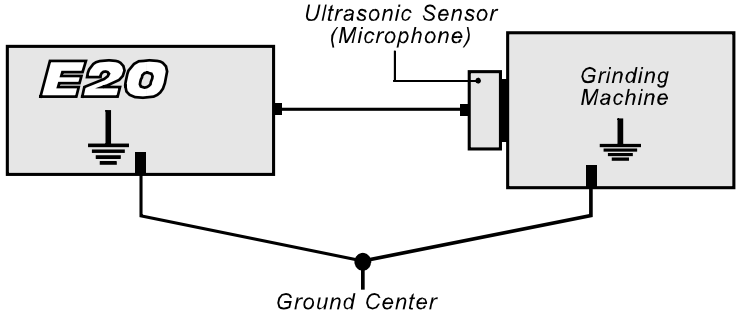


Figure 4. Connections to the electronic unit (rear view)

W1	10-pole Veam connector for the connection of the microphone 1. Microphone relevant to channel 1 (and channel 2 for systems with only one microphone).
W2	10-pole Veam connector for the connection of the microphone 2 (relevant to channel 2). **In the systems with one microphone this connector is not present.**
J1	15-pole Cannon connector for the connection to the machine logic.
J2	5-pole Lumberg connector for the connection of EGC function / analog I/O. **In the systems without this function, the connector is not present.**
H1	Hirshman connector (2 poles + ground) for the connection to the power network.

T1	Identification plate with code and serial number of the electronic unit.
T2	Plate for the electrical characteristics of the equipment.
⏚	Terminal (M4) for ground connection.



Warning

The ground connection of the system and of the machine tool must be common.

3.2 Connection to the machine logic

The connection to the machine logic is performed through a 15-pole cannon connector (reference J1 in Figure 4 on page 18).

Warning

In the following connection diagrams, the relay outputs are represented in rest position.
When the E20N is switched on (in case of CRASH) or when the "GAP start cycle" signal is given (in case of GAP), the relevant relay is energized and the state of the contacts is inverted

3.2.1 Input signals

Inputs power supply: 24V DC/AC

The 24VDC connection can be either SOURCE or SINK type.

The following connection diagrams show the different types of connection for the input signals.

Description of the input signals

The following is a general description of all the input signals; to determine the signals of your E20N, please see the relevant connection diagram.

pin 10 **Start cycle**

Normally-open contact for START CYCLE signal.
When the contact is closed, the start cycle is given

pin 3 **Selection 1/2**

Normally-open contact for SELECTION OF CHANNEL 1/CHANNEL 2

- Contact open = channel 1 (CH1)
- Contact closed = channel 2 (CH2)

The selection of channel 1 or channel 2 must be given at the START CYCLE signal.

For a correct operation, the channels must not be switched during the Gap cycle.

CRASH enable
Normally-open contact for CRASH enable.

When the contact is closed, the CRASH control is enabled.

3.2.2 Output commands

The output commands may or may not be **self-locked** (see 2.1 "Codification plan", on page 11).

Description of the output signals

See the connection pins on the relevant connection diagrams

- **Normally-open relay contact (N.O.).**
  When the relay is energized, the contact is closed; when the relay is de-energized, the contact is opened.
- **Normally-closed relay contact (N.C.).**
  When the relay is energized, the contact is open; when the relay is de-energized, the contact is closed.

GAP output

pin 5-6 Terminals for the connection to a normally-open contact (N.O.) of the relay relevant to GAP output. By supplying the start cycle signal, the relay is energized (the contact is closed).
As soon as the wheel touches the part, the relay is de-energized (the contact is opened) and the GAP command is given.

pin 5-13 Terminals for the connection to a normally-closed contact (N.C.) of the relay relevant to GAP output. By supplying the start cycle signal, the relay is energized (the contact is opened).
As soon as the wheel touches the part, the relay is de-energized (the contact is closed) and the GAP command is given.

CRASH output

pin 5-6/7-8 Terminals for the connection to a normally-open contact (N.O.) of the relay relevant to the CRASH output. When the E20N is switched on the relay is energized (the contact is closed). When the crash enable signal is given as soon as a collision is detected, the relay is de-energized (the contact is opened) and the CRASH command is given.

pin 5-13/7-15 Terminals for the connection to a normally-closed contact (N.C.) of the relay relevant to the CRASH output. When the E20N is switched on the relay is energized (the contact is opened).
When the crash enable signal is given as soon as a collision is detected, the relay is de-energized (the contact is closed) and the CRASH command is given.

Warning

The GAP and/or CRASH commands are supplied at the output if the following alarm conditions are verified:

- *Alarm for breakage or disconnection of the microphone cable.*
- *Alarm of microphone efficiency. It is verified whether the amplifier receives a perceivable noise.*

This type of alarm can take place when the wheel is NOT rotating.

3.2.3 Connection diagram for 1 GAP Channel

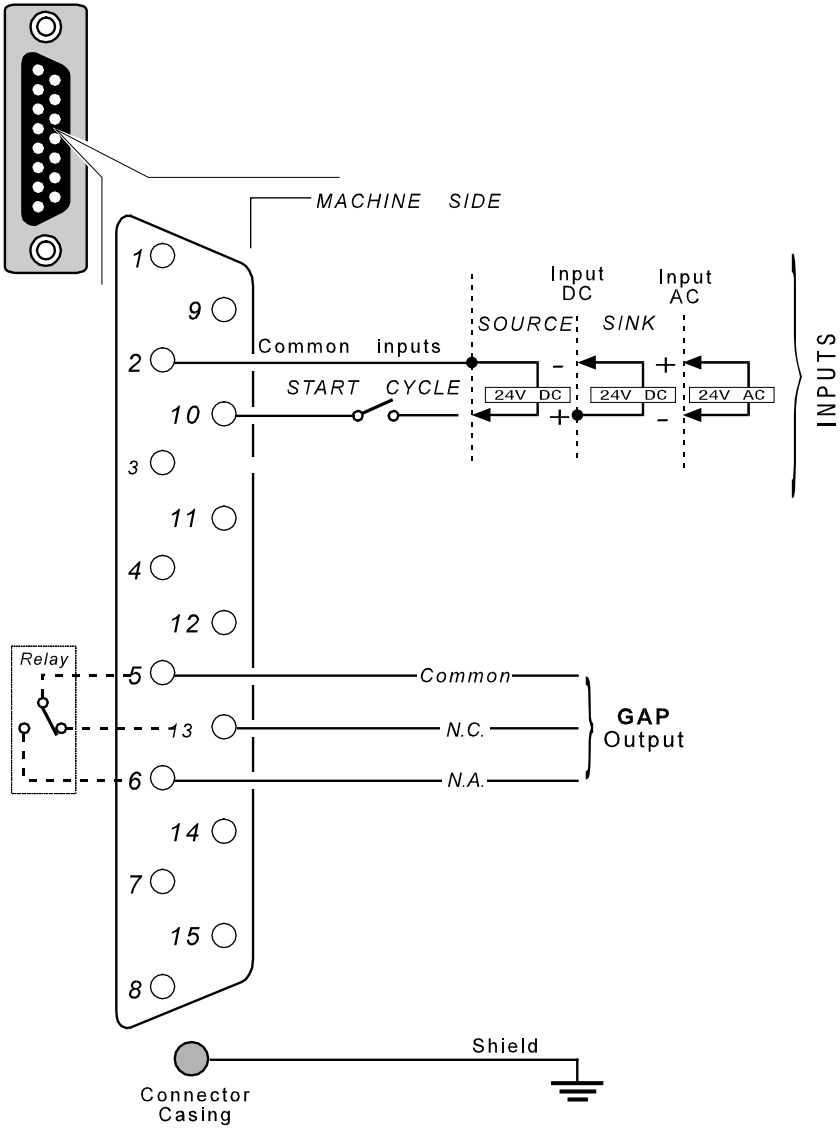


Figure 5. Connection diagram for 1 GAP Channel

3.2.4 Connection diagram for 1 CRASH Channel

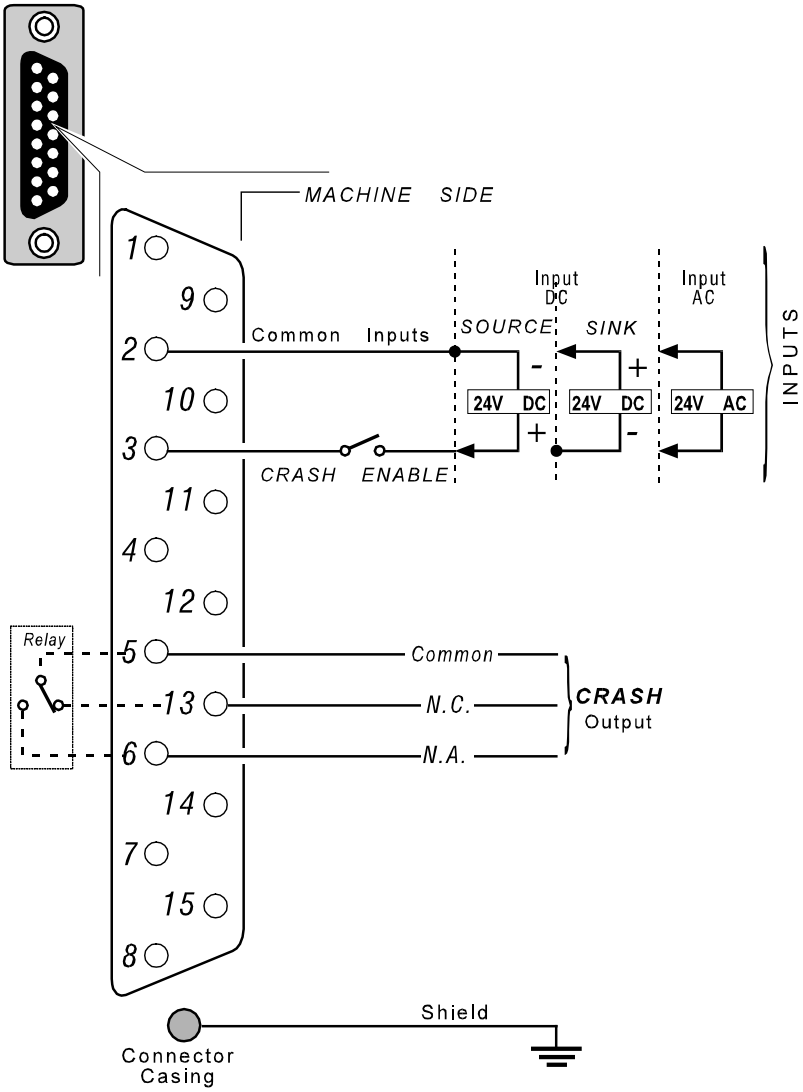


Figure 6. Connection diagram for 1 CRASH Channel

3.2.5 Connection diagram for two switching GAP channels

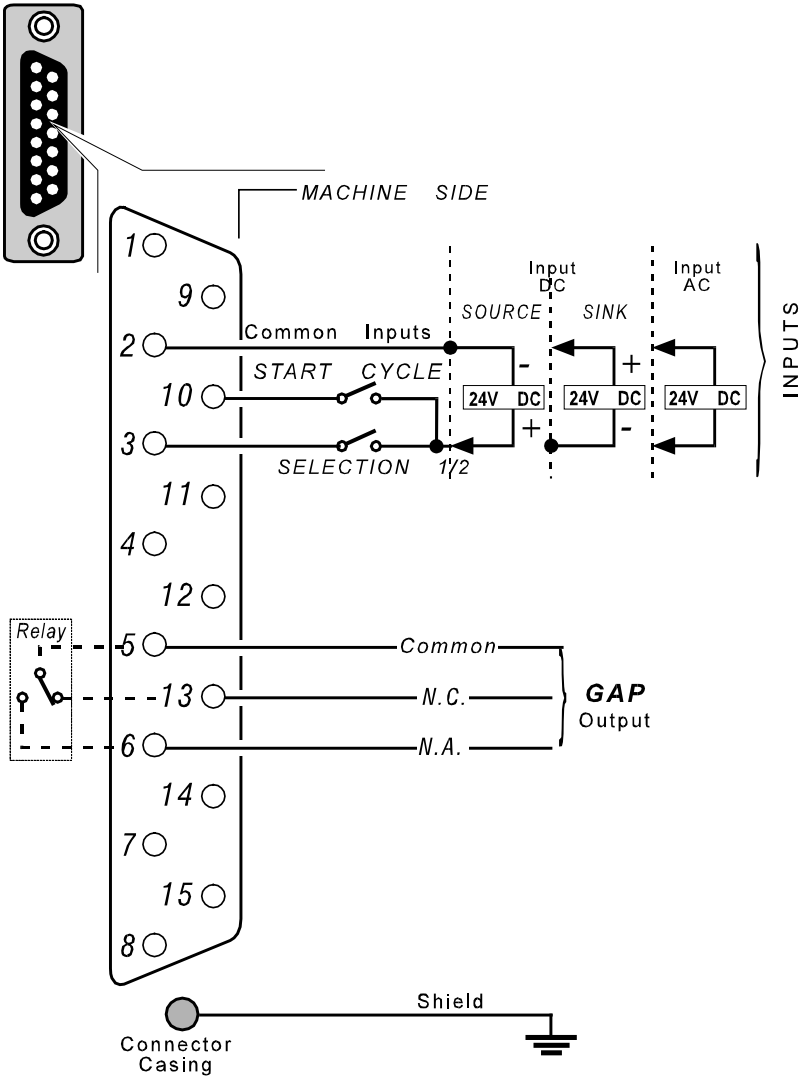


Figure 7. Connection diagram for two switching GAP channels

3.2.6 Connection diagram for one GAP channel + one CRASH channel

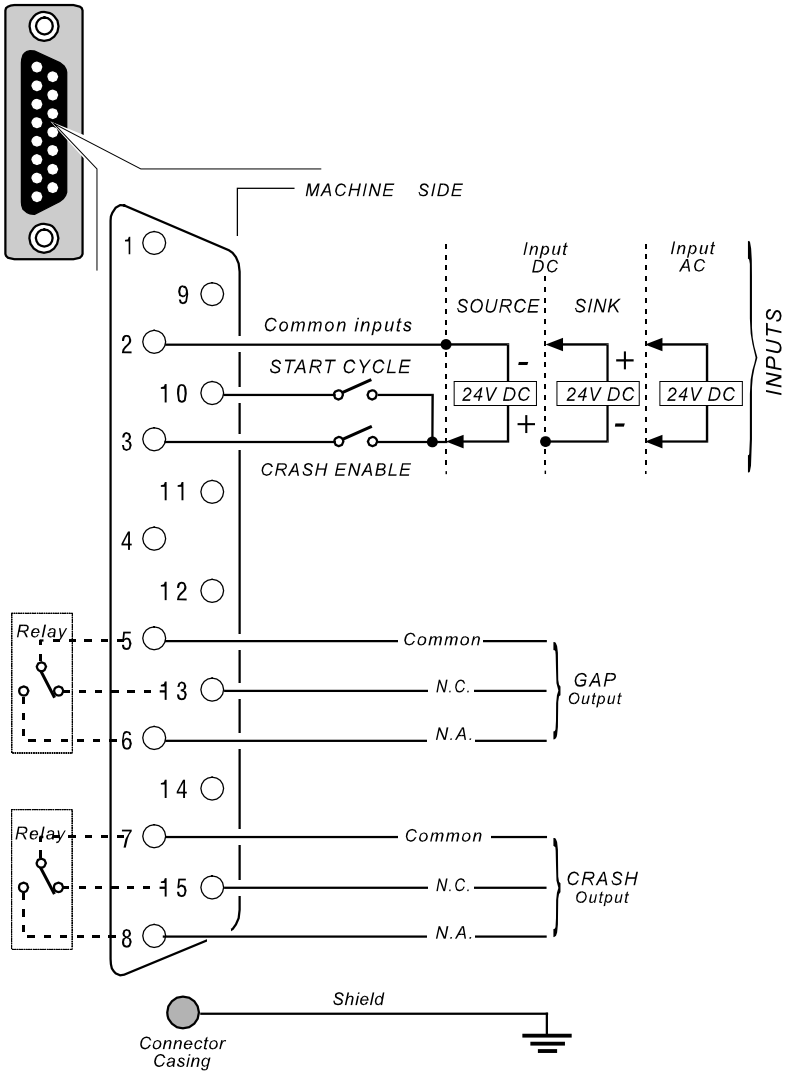
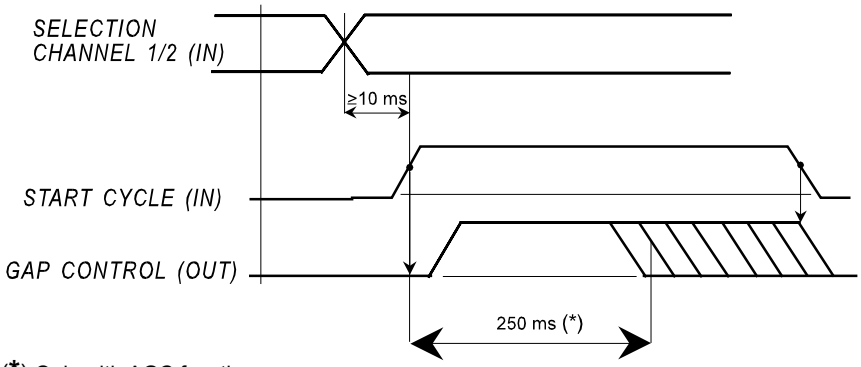


Figure 8. Connection diagram for 1 GAP channel + 1 CRASH channel

3.2.7 GAP control cycle



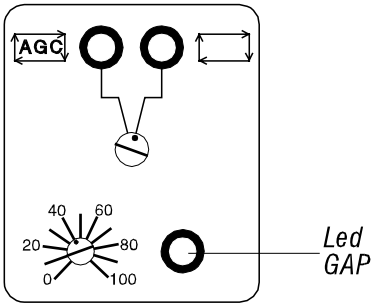
(*) Only with AGC function

Figure 9. Time chart of the signals for GAP control cycle

Two switching GAP channels

Select channel 1 or channel 2 with SELECTION ½ input signal and the relevant LED on the display of the E20N lights up.

1. Supply the START CYCLE signal. The relay relevant to GAP output command is energized; the LED relevant to the GAP cycle lights up.



Warning

In case of AGC function the time between the Start Cycle signal and the moment of the contact wheel/workpiece must be equal or greater than 250 ms (noise acquisition time) to avoid wheel collisions.

2. When the noise generated by the wheel/workpiece contact reaches the programmed threshold, the "GAP command" is given at the output (the relay is de-energized) and the GAP LED switches off.

3. Depending on the type of command, the following two cases are possible:

- *self-locked command*: once the GAP command is given at the output, it becomes active again at the following start cycle. This mode is recommended for GAP and wheel position control.
- *not-self-locked command*: the command at the output is related to the programmed sound threshold. The relay is de-energized when the detected sound exceeds the threshold (the GAP LED switches off) and it is energized when the detected sound goes below the threshold. This mode is recommended for dressing control.

3.2.8 CRASH control cycle

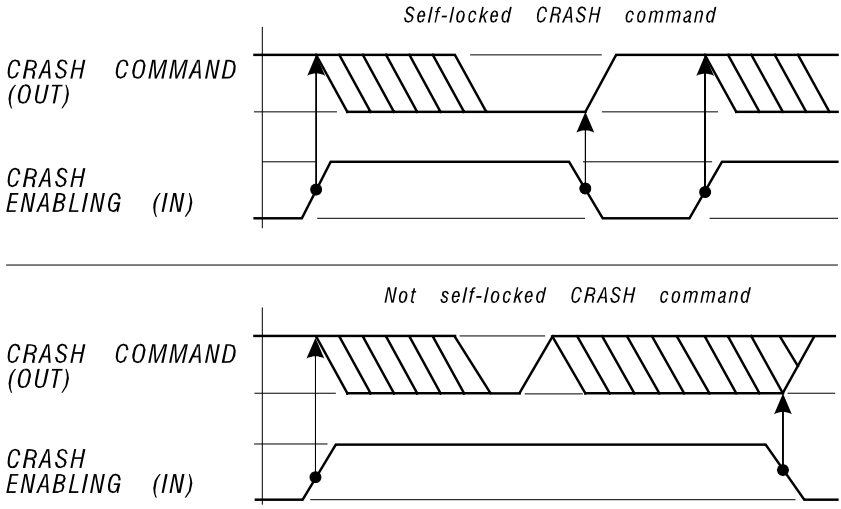
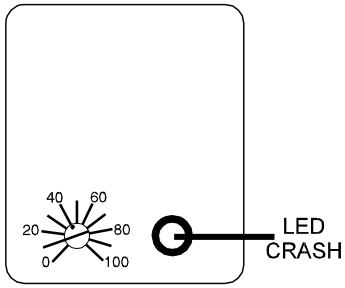


Figure 10. Time chart of the signals for CRASH control cycle

1. When the E20N is switched on the CRASH command relay is energized, and the relevant LED lights up.



2. To enable the crash control it is necessary to supply the crash enable signal.

3. When the detected sound exceeds the programmed threshold (see 5.3.1 "Programming procedure", on page 40), the CRASH command is given at the output (the relay is de-energized) and the CRASH LED switches off.

4. Depending on the type of command, the following cases are possible:

- *self-locked command:* once the CRASH command has triggered, to restore the initial conditions (relay energized), disable the CRASH control and then enable it again.
- *not-self-locked command:* the command at the output is related to the programmed sound threshold.
  The relay is de-energized when the detected sound exceeds the threshold (the CRASH LED switches off) and it is energized when the detected sound goes below the threshold.

3.3 Connection to EGC - Analog output function

The connection to the EGC - Analog output (*) function is through a 5-pole Lumberg connector (reference J2 in Figure 4 on page 18).

(*) EGC = External Gain Control

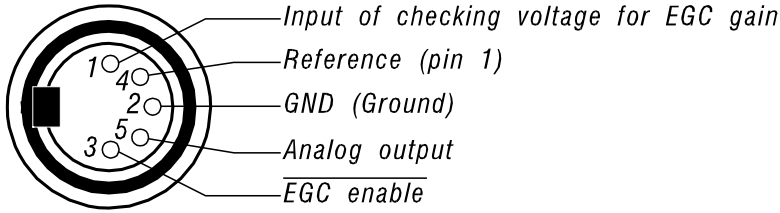


Figure 11. Connection to EGC - Analog output function

Specifications for input voltage

Max. sensitivity: input voltage +10 VDC

Min. sensitivity: input voltage 0 VDC

The above value is the voltage between pin 1 and pin 4 (reference pin)

Warning
A negative voltage could damage the device.

Specifications for output voltage

The output voltage corresponding to the full-range reading meter is 5 VDC.

Output resistance (R) = 1 Kohm

4. INSTALLATION OF THE MICROPHONE

The E20N can be equipped with two different types of microphones:

Table 1. Types of microphone

Code	Type of microphone
3424802152	Wide range microphone with 3 meters cable
3424802000 + 3424802014	Wide range microphone with contactless transmission and 3 meters cable

Table 2. Extensions for microphones connection

Code	Length
679060001U	6 meters
679100001U	10 meters
679150001U	15 meters
679200001U	20 meters

4.1 Fixed microphone

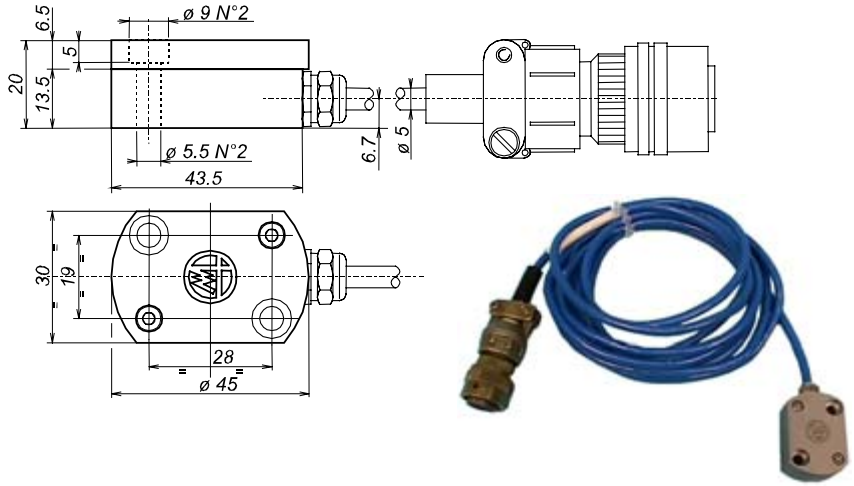


Figure 12. Installation of fixed microphone

The recommended positions to install the microphone (3424802152) on the machine are the followings:

A. On the tailstock: close to the rotation axis of the part

B. On the workhead: close to the spindle

C. On the wheel slide: as close as possible to the wheel.

It is always necessary to find the best position as it may considerably vary from machine to machine.

In any case, the microphone should never be fastened to the bed of the grinder.

The shell has two holes for M5 x 25 screws, for fastening it to the machine.

Note
Before installing the microphone, it is good procedure to scratch off the paint from the mounting surface and apply silicon grease between the microphone and the support surface in order to improve the sound transmission to the microphone.

4.2 Microphone with contactless transmission

The microphone consists in two parts

- Rotating part (3424802000) to be mounted directly in the wheel / spindle assembly.
- Fixed part with 3 meters cable (3424802014) to be connected to the electronic unit.

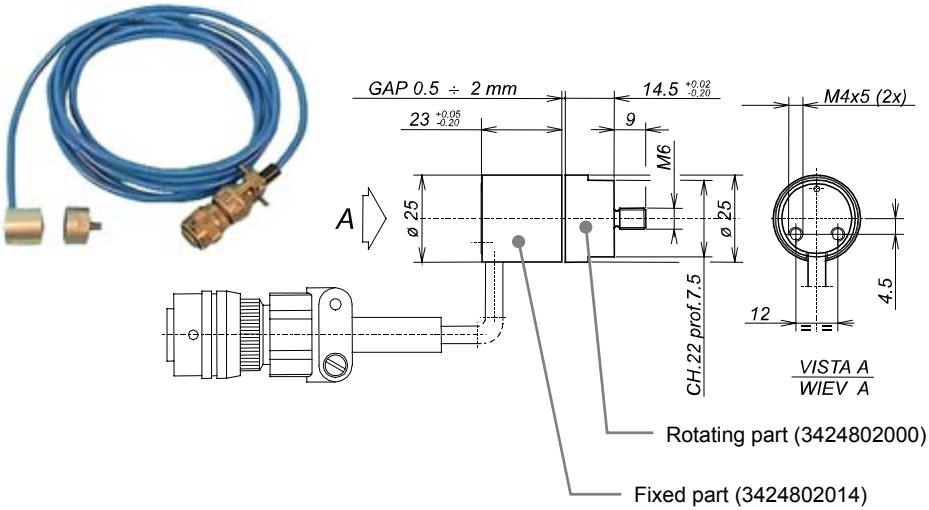


Figure 13. Installation of microphone with contactless transmission

For a correct installation of the microphone, the following conditions must occur:

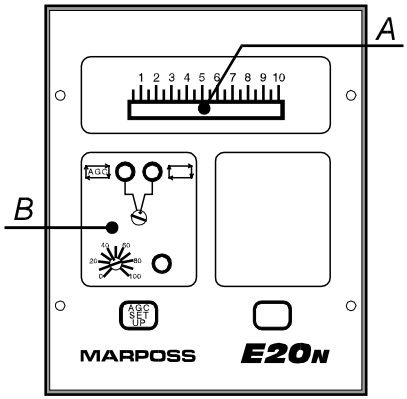
- Distance between the two transmission surfaces: 05 ÷ 2 mm
- Alignment error between fixed and rotating sensor: ± 05 mm
- Remove the painting from the surface on which the fixed sensor of the microphone must be fixed. This operation is necessary to ensure the stability of the measurement displayed on the electronic unit and for the immunity to noises.
- It's recommended to apply a thin layer of silicone grease between rotation part of the sensor and the machine support surface.

5. USE AND PROGRAMMING

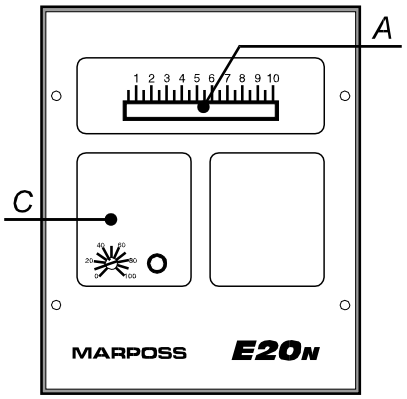
The following is a description of the operations to be performed for the use and programming of MARPOSS E20N amplifier.

Note
The programming of the E20N system must be carried out during the installation by authorized personnel.
Once it is programmed, the operating mode (Automatic only) does not require any intervention of the machine Operator.

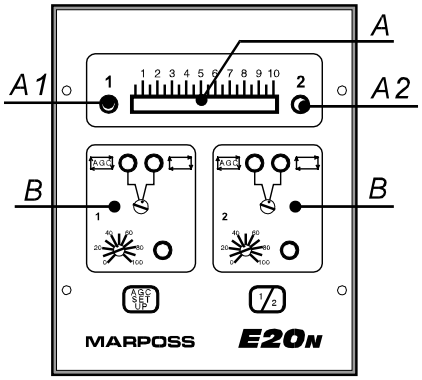
5.1 Front Panel



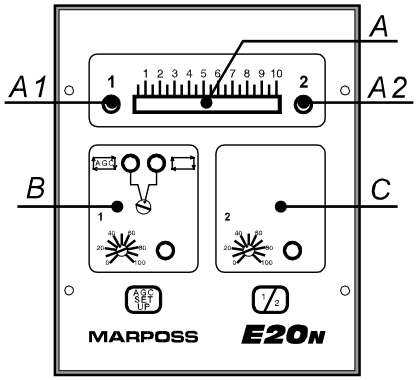
1 GAP channel



1 CRASH channel



2 GAP channels



1 GAP channel + 1 CRASH channel

A LED Bargraph scale (20 segments) for the visualization of the sound detected by the microphone. The color of the graduation of the scale changes from the value of 6,5, triggering point of the command.

A1 LED to display that channel 1 has been selected.

A2 LED to display that channel 2 has been selected.

B Programming section of GAP control (see 5.2, on page 36).

C Progamming section of CRASH control (see 5.3, on page 40).

Key for enabling the AGC function (automatic gain control of the sensitivity) during the programming of the GAP control.

Key for the manual selection of channel 1 or channel 2.

5.2 GAP control programming

The GAP cycle can be controlled with the definition of an appropriate ultrasonic limit value; this limit must be empirically defined according to the characteristics of the application.

At first the grinding wheel must be driven to rest position, normally spinning and with the coolant off . The microphone is already mounted and connected to the E20N unit. The noise displayed by the E20N LED bargraph in this particular condition is the **background noise** which is a basic characteristic of the application.

We suppose that the proper frequency range has already been selected (see 6.2 "Selection of the frequency range", on page 43), the value of the displayed background noise can be:

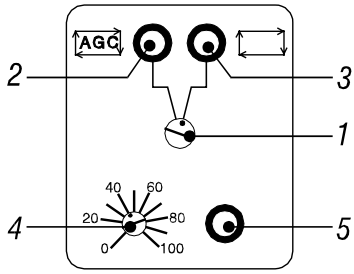
- fairly stable and repetitive
- variable and oscillating.

5.2.1 Stable and repetitive background noise

Press the key 

, if present, and select the channel to program.
On the programming area of the selected channel proceed as follows:

1. Bring the selector 1 to the right position (the LED 3 lights up) to select ***the fixed gain control procedure*** ().



2. Rotate the potentiometer 4 counterclockwise to "zero"

3. Bring the wheel almost in contact with the workpiece, reference pin, etc as in normal working conditions (wheel spinning at work speed, workpiece rotating, coolant on, etc)

4. Adjust the sensitivity on potentiometer 4 to amplify the displayed noise slightly below the value of 6,5 on the graduated bargraph scale and just before the LED 5 switches off.

5. To verify the programming perform a few cycles and verify that the gap command is triggered at the right time.

Note
If the type of wheel, workpiece, etc. is changed it may be necessary to reprogram the system.

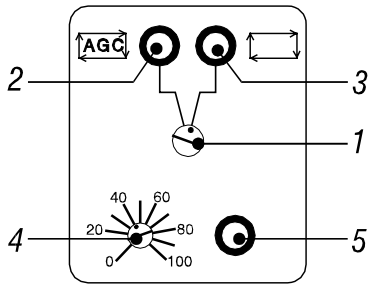
In case of dressing cycle control, intended as continuity check on the grinding wheel during the traverse of the dresser, it is necessary to make sure that the command is triggered when there is a contact between dresser and wheel and it is released when there is a discontinuity (hole or similar) on the wheel.
The command must be "not self-locked" (see 2.1 "Codification plan", on page 11).
The dressing can be considered over when, during a complete traverse, the command is always triggered.

5.2.2 Variable and oscillating background noise

Press key 1/2, if present, and select the channel to program.

On the programming area of the selected channel proceed as follows:

1. Bring the selector 1 to the left position (the LED 2 lights up) to select the ***automatic (variable) gain control*** (AGC) feature.



2. Rotate the potentiometer 4 counterclockwise to "zero".

3. Bring the wheel almost in contact with the workpiece, reference pin, etc as in normal working conditions (wheel spinning at work speed, workpiece rotating, coolant on, etc).

4. Keeping the AGC SET UP key pressed adjust the sensitivity on potentiometer 4 to amplify the displayed noise slightly below the value of 6,5 on the graduated bargraph scale and just before the LED 5 switches off.

5. To verify the programming perform a few cycles and verify that the gap command is triggered at the right time.

Warning

The background noise acquisition time is 250 ms from the start cycle so it is mandatory that the grinding wheel reaches the workpiece, reference pin, dresser, etc. in a greater time.

Note

If the type of wheel, workpiece, etc. is changed it may be necessary to reprogram the system.

In case of dressing cycle control intended as continuity check on the grinding wheel during the traverse of the dresser it is necessary to make sure that the command is

triggered when there is a contact between dresser and wheel and it is released when there is a discontinuity (hole or similar) on the wheel. ***The command must be not self-locked*** (see 2.1 "Codification plan", on page 11).
The dressing can be considered over when, during a complete traverse, the command is always triggered.

5.2.3 EGC Function - Analog Output

The EGC (External Gain Control) function allows to adjust the sensitivity of the gap control from an external device (CNC/PLC)

Note
The EGC can only control the GAP function and not the CRASH.

When the EGC enable signal is given, all adjustment/programming procedure of the front panel are disabled.

At the output it is supplied a signal proportional to the noise displayed on the bargraph scale of the E20N.

This signal can be used as a remote visualization.

For all additional information, please see paragraph 3.3 "Connection to EGC - Analog output function", on page 30.

5.3 CRASH control programming

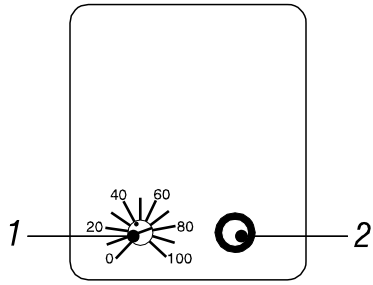
The CRASH control must be intended as an ALARM signal that is given when the grinding wheel collides against the workpiece or other devices and/or parts of the grinder due to a malfunctioning or to a bad programming.

5.3.1 Programming procedure

Press the key 

, if present, to select the CRASH channel.

1. Set the sensitivity on the potentiometer 1 approximately to the center of its range (40-60) or to the same value relative to the GAP control (in case of dual channel units)



2. Simulate a few cycles and all the possible machine conditions (grinding, loading, unloading, dressing, etc) to identify the maximum noise condition and adjust the sensitivity to have the displayed value just below 6.5 on the graduated bargraph display of the E20N (triggering point of the command).

In case the above procedure leads to the definition of a CRASH limit value which a much lower sensitivity than in the GAP programming, to have a reliable crash control it may be necessary:

- to program the sensitivity on potentiometer 1 only 10-20% lower than for gap control.
- disable the crash enable signal (see 3.2 "Connection to the machine logic", on page 20) in the normal machine conditions that exceed the crash value.

6. INTERNAL PROGRAMMING

Warning

The user is responsible of every consequence caused by a variation of the internal programming made by not authorized personnel.

On the "Buffer" card 63033254xx (see Figure 14) there are programming jumpers to program or enable specific functions.

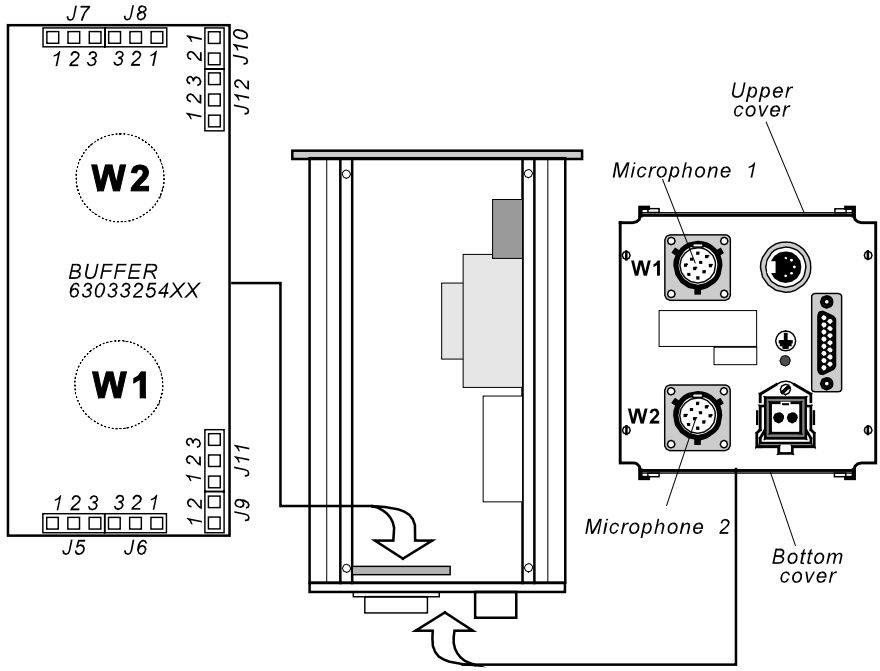


Figure 14. E20N internal programming

The jumpers on the Buffer card allow to program the following features:

- selection of the type of microphone (jumpers J6 and J8)
- selection of the frequency range (jumpers J11 and J12)
- microphone/cable alarms (jumpers J5, J7, J9 and J10)

The jumpers relative to microphone 1 (W1) can be programmed by removing the upper cover of the E20N rack assembly while the jumpers relative to microphone 2 (W2) can be programmed by removing the bottom cover of the E20N rack assembly.

Note
These functions are enabled when the jumpers are connected.

6.1 Selection of the type of microphone

Program the jumpers J6 and J8 as follows:

Wide range microphone - code 3424802XXX	
J6/2-3	For microphone 1 (connected to W1)
J8/2-3	For microphone 2 (connected to W2)

"Old" type microphone - code 34130011XX	
J6/1-2	For microphone 1 (connected to W1)
J8/1-2	For microphone 2 (connected to W2)

Warning
The E20N is factory programmed for connection to the wide range microphones (code 3424802XXX)

6.2 Selection of the frequency range

Through the jumpers J11 and J12 (see Figure 14, on page 41), it's possible to program the frequency range as follows:

Band 1 - 60 - 120 KHz range

Band 2 - 170 - 270 KHz range

Band 1 / 60-120 KHz	
J11/1-2	For microphone 1 (connected to W1)
J12/1-2	For microphone 2 (connected to W2)

Band 2 / 170-270 KHz	
J11/2-3	For microphone 1 (connected to W1)
J12/2-3	For microphone 2 (connected to W2)

Warning

The E20N is factory programmed on Band 2 for both microphones (W1 and W2).

Warning

In case the E20N is connected to the "old" type microphone (34130011xx) the jumpers J11 and J12 must be set on Band 1 / 60-120 KHz.

6.2.1 Definition of the frequency range

- Select the Band 1
  - record the noise value (NOISE 1) displayed on the bargraph with the wheel away from the workpiece (rest position)
  - record the noise value (SIGNAL 1) displayed on the bargraph during the working cycle (contact condition)
- Select the Band 2
  - record NOISE 2 and SIGNAL 2 as indicated above

- Calculate following ratios:

$$\text{Band 1 ratio} = \frac{\text{SIGNAL 1}}{\text{NOISE 1}}$$

$$\text{Band 2 ratio} = \frac{\text{SIGNAL 2}}{\text{NOISE 2}}$$

- Select the frequency range with the highest SIGNAL/NOISE ratio.

Note

If the type of wheel, workpiece, etc. is changed it may be necessary to reprogram the frequency range.

6.3 Alarms programming

The following alarms can be programmed:

- Cable continuity alarm for microphone 1 (W1) and microphone 2 (W2);
- alarm of microphone efficiency for microphone 1 (W1) and microphone 2 (W2)

When the an alarm condition is verified, the GAP or CRASH output signal is supplied at the output (see paragraph 3.2, "Connection to the machine logic" on page 20).

"Old" type microphone (code 34130011XX)	
J5/2-3	Cable continuity alarm to detect cable failures and/or connection problems to W1.
J7/2-3	Cable continuity alarm to detect cable failures and/or connection problems to W2.
To disable the alarms disconnect the jumpers.	

Wide range microphone (code 3424802XXX)	
J5/1-2; J9/1-2	Alarm of cable continuity and microphone 1 efficiency (W1).
J7/1-2; J10/1-2	Alarm of cable continuity and microphone 2 efficiency (W2).
To disable the alarms disconnect the jumpers.	

Warning

In case of E20N units with presetting for two microphones (connectors W1 and W2 present on the back panel) and connection to 1 microphone only (W1), in order to ensure a proper operation of the unit it's necessary to disable all the alarms relative to microphone 2 (W2), or replace the missing microphone with the simulation connector code 6134523300.

7. TROUBLESHOOTING AND MAINTENANCE

Warning

The internal maintenance of the unit can be made by authorized personnel only.

7.1 Alarm conditions

When at least one of the following alarm conditions occur, the GAP and/or CRASH control is supplied at the output:

- **Alarm of cable continuity:** it is checked whether the microphone connection is not interrupted (cut of the cable for the connection or disconnection of the microphone)
- **Alarm of microphone efficiency:** it is checked both the microphone correct operation and the correct interfacing between fixed sensor and revolving sensor (microphone with contactless transmission)

OPERATIONS TO BE CARRIED OUT

Verify the integrity of the connection cable of the microphone and the correct connection; verify the correct interfacing between fixed sensor and revolving sensor (see 4.2, "Microphone with contactless transmission" on page 33).

If the alarm condition remains, replace the microphone.

7.2 Replacement of the protection fuse

As to the replacement of the short-circuit protection, proceed as follows:

- Disconnect the electronic unit from mains voltage.
- Withdraw the electronic unit from its assembly (case or drawer).
- Remove the bottom cover of the electronic unit by removing the four fastening screws.
- Replace the fuse (F1) on the power supply card (see Figure 15), as indicated in the table below .

Power supply	Fuse
100-120 VAC	0,2A 250V half-delayed (5x20)
200-240 VAC	0,1A 250V half-delayed (5x20)

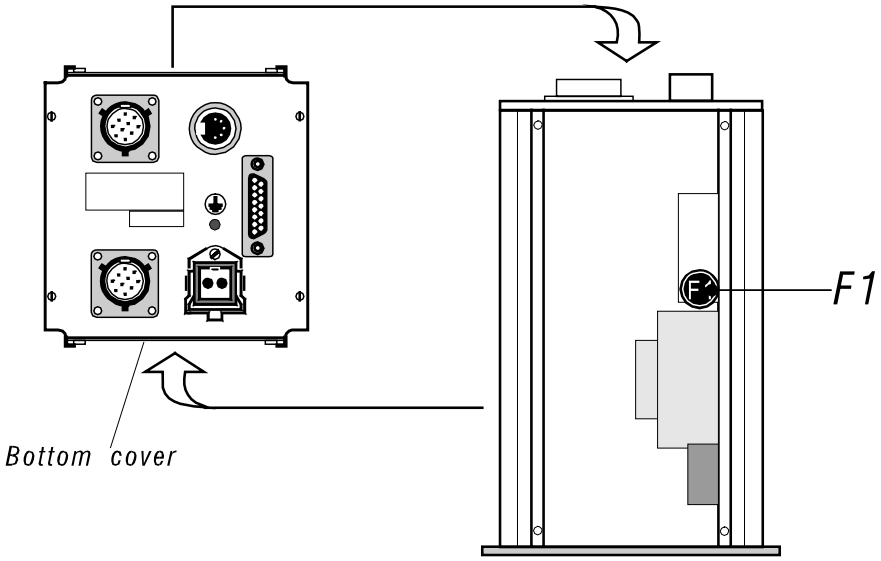


Figure 15. Replacement of the protection fuse

7.3 Microphones protection fuses

On the amplifier card 63030055xx there are two fuses for the power supply (±15V) of the wide range microphones (3424802xxx)

The fuses used on the card may be:

- to be substituted (see paragraph 7.3.1, on page 48).
- Resettable (see paragraph 7.3.2, on page 49). This type of fuse was used from the device with serial number 0KL5899.

7.3.1 Substituting microphone fuses

To replace them proceed as follows:

- Disconnect the electronic unit from mains voltage
- Withdraw the electronic unit from its assembly (case or drawer)
- Remove the upper cover of the electronic unit by removing the four fastening screws
- Replace fuses F1 and F2 respectively for microphone 1 and microphone 2 (see Figure 16), as indicated below:

  Fuses F1 and F2 -> 100mA delayed 5x20

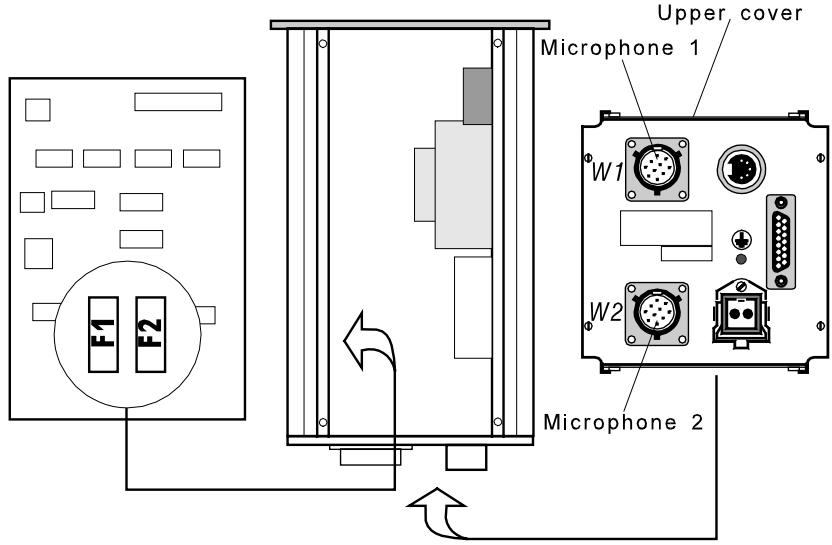


Figure 16. Replacement of the microphone protection fuses

7.3.2 Resetting operation with resettable fuses

From the device with serial number 0KL5899 conventional fuses were replaced with resettable fuses.

In the event of a short circuit they no longer need substituting, instead, simply:

- Switch off the device
- Remove the cause of the fault
- Switch on the device again

In this way, operation of the fuses 1 (see Figure 17) is reset automatically.

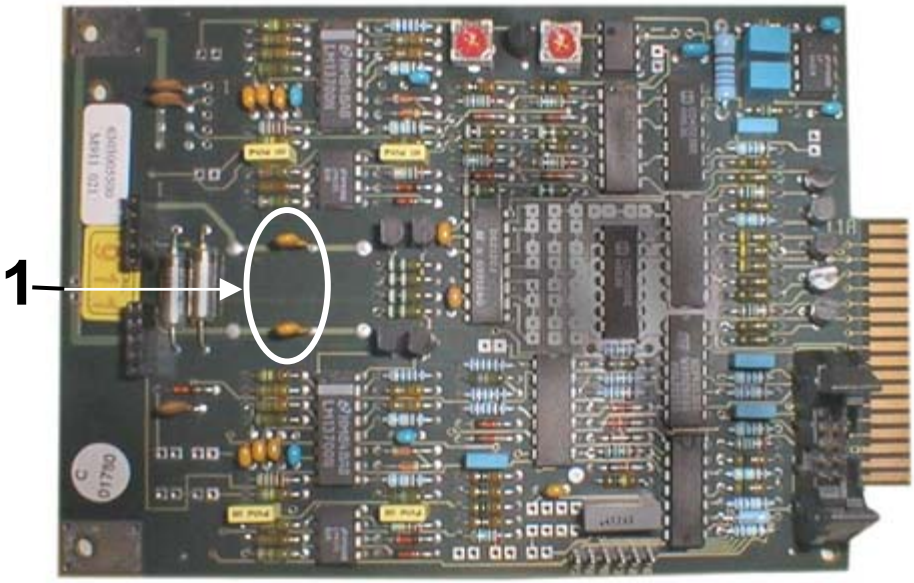


Figure 17. Sheet for amplifier with resettable fuses

8. TECHNICAL DATA

8.1 Electrical power supply

Power supply voltage ∗:	100-120 V; 0,16 A
	200-240 V; 0,08 A
Frequency:	50-60 Hz
Max absorbed power:	20 W

∗The voltage value of your system is indicated in the power supply plate (reference T2 in Figure 4 on page 13).

8.2 Operation characteristics

Acquisition time of the background noise with AGC	≤250ms
Adjustment AGC 	60dB
Fixed gain  adjustment	60dB
Response time at the output	≤5ms
LED Display	20 segments

Characteristics of the output relay

Max. load for each contact (on resistive load) - Iout	2A
Max. voltage on the contacts - Vout	34V

Frequency ranges

Band 1	60-120 KHZ
Band 2	170-270 KHZ

8.3 Environment characteristics

Operating conditions

Ambient temperature:	da 0 °C a 45 °C
State of the atmosphere:	Relative humidity 75% in normal conditions Relative humidity 95% in a short term (30 days)

Carriage and storage

Temperature:	-20°C to 60°C

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