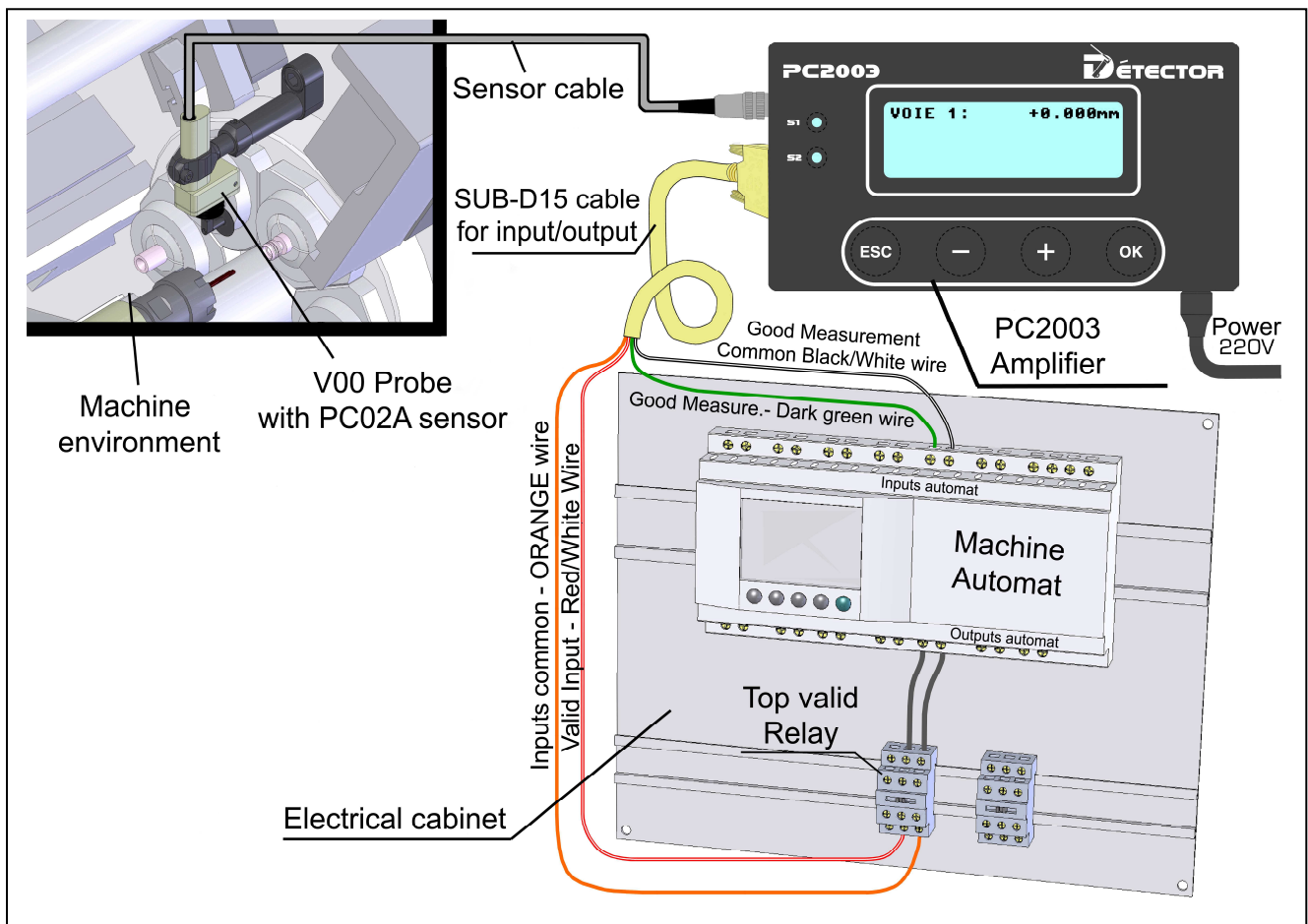


Electrical Installation manual for PC2003 Amplifier



1 ELECTRICAL INSTALLATION	2
<u>1.1 Installing the amplifier</u>	2
<u>1.2 Description of the rear panel</u>	3
1.2.A - Power supply	3
1.2.B - SUB-D 15 female-pin connections for Input/Output	4
1.2.C - SUB-D 5 male pin connections for Sensor	7
1.2.D - SUB-D 9 male pin connections points for RS232 link	7
<u>1.3 Electricals drawings</u>	8
1.3.A - Principle croquis	8
1.3.B - Electrical wiring	8
1.3.C - Timing diagram of a cycle	9
2 DESCRIPTION OF THE FRONT PANEL	10
3 CORRESPONDENCE OF THE SUB-D15 CONNECTOR WIRES PC300 AND PC2003	BETWEEN 11

1. Electrical Installation

1.1 Installing the amplifier

The amplifier must be placed outside the machine environment, such as on the electric cabinet's front panel. However, if the amplifier cannot be installed in the electric cabinet, it must be placed in a protection enclosure to protect it from the aggressive workshop environment (oil vapors, steam, etc.). A protection enclosure (optional) is also provided for this purpose. It is referenced in our catalog under **PC10**.

The amplifier must be installed more than 10 cm from all switches, relays or other electric gear liable to disturb its operation.

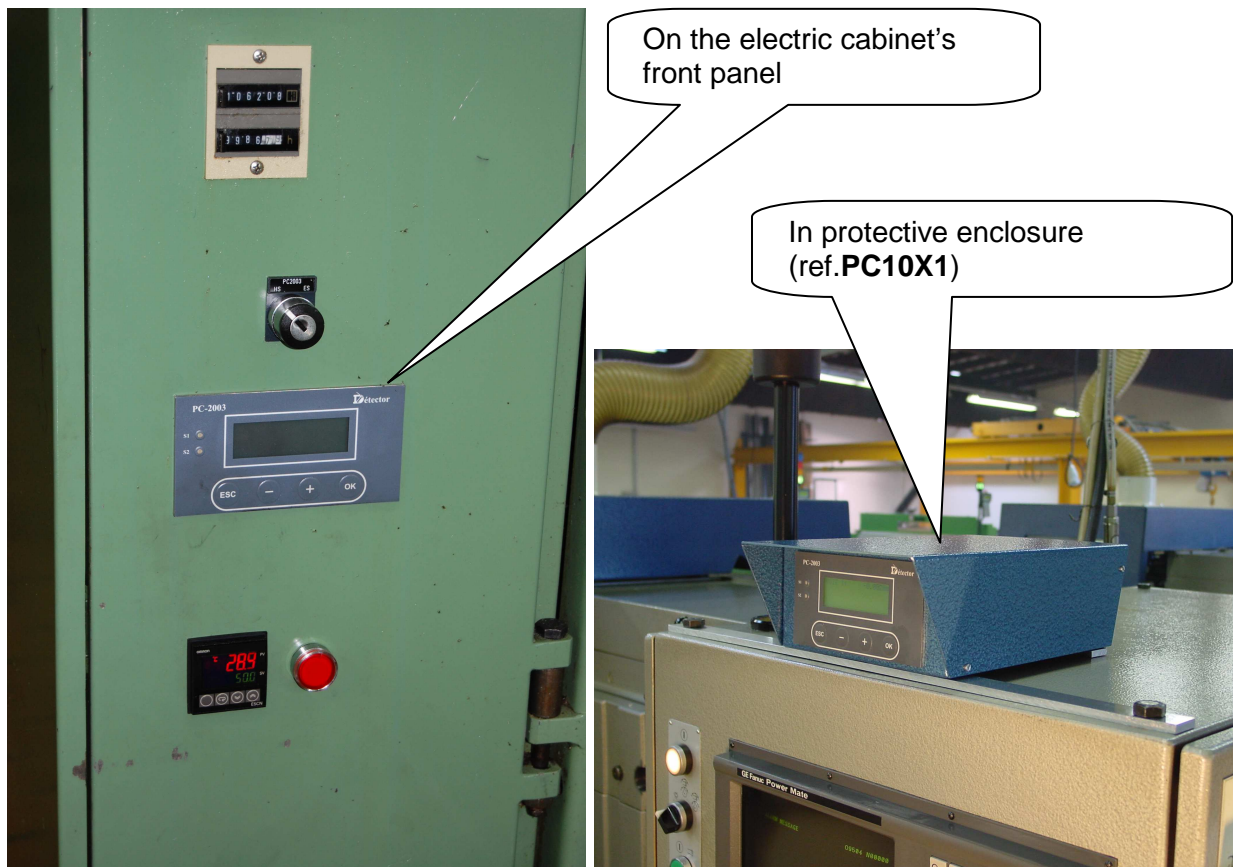
Since the sensor cable is 4 meters long, the amplifier should not be placed too far from the station where the measurement is taken. However, 1.5 to 10 meter cable extensions are available. Don't hesitate to contact us.

The device's operating temperature must not be greater than +50°C and not less than 0°C.

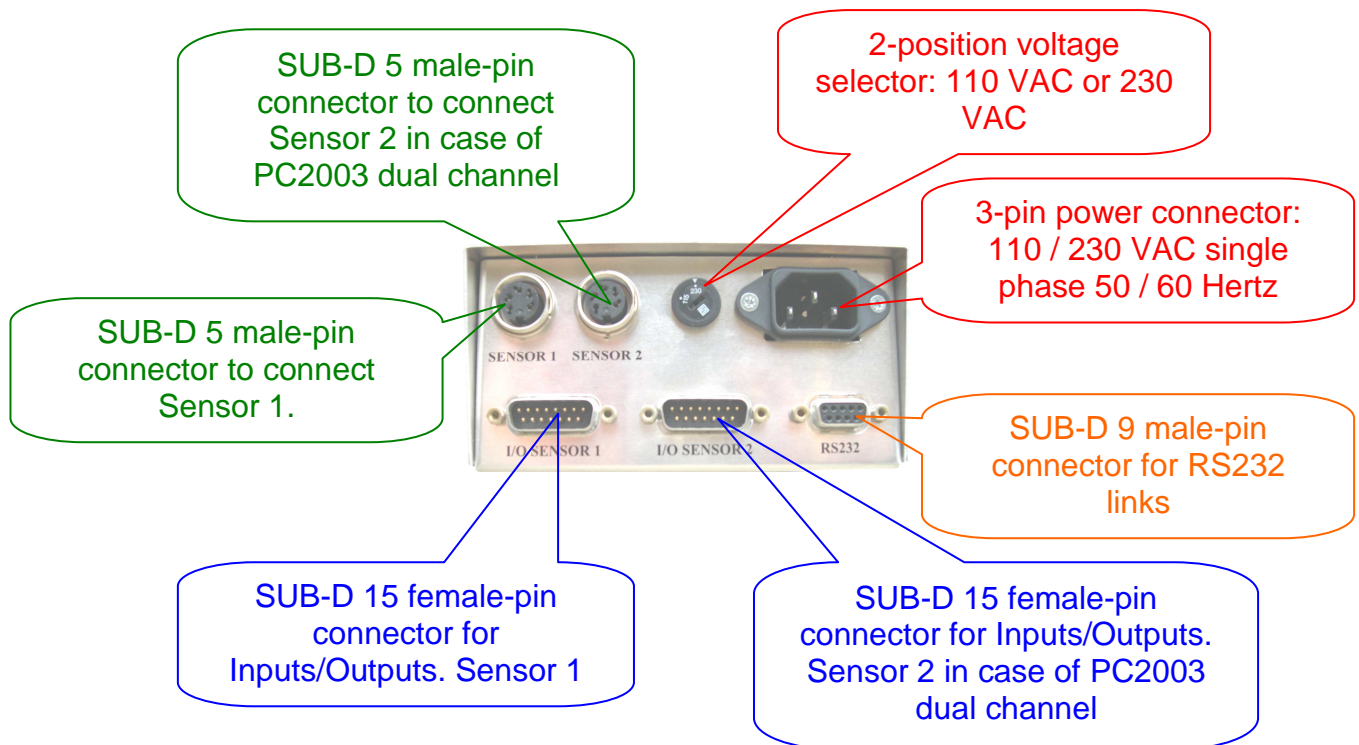
The device's storage temperature (not in operation) must not be greater than +85°C and not less than -20°C.

Amplifier's external dimensions excluding front panel (embedded part) : L / 135 mm, H / 67.5 mm and D / 145 mm (IP 30).

Front panel's dimensions (part outside cabinet) : L / 144 mm, H / 76 mm and Th / 3 mm (IP 65)



1.2 Description of the rear panel



Power supply

The amplifier must be powered in 110/230 Volts AC, single phase 50/60 Hertz by the 3-pin power connector located at the rear of the amplifier. A power cable is delivered with the device. 110 Volts AC or 230 Volts AC is selected by setting the voltage selector located at the rear of the amplifier accordingly. The amplifier remains constantly turned on and does not have a Power On/Off switch.

The PC2003 complies with and respects the standards described below:
 Electromagnetic Compatibility – Requirements for home appliances, electric toolings and analog devices -

- Part 1 : Emission : NF EN 55014-1 February 2002.
- Part 2 : Immunity : NF EN 55014-2 April 2002.

Information processing devices – Radio interference characteristics – Limits and measurement methods. NF EN 55022 April 2001.

Low voltage standard NF EN 61010-1 June 2001.

1.2.B - SUB-D 15 female-pin connections for Input/Output

The SUB-D15 connector or connectors – because 2 sensors may be connected to the same amplifier in case of PC2003 dual channel – allow two-way communication with the machine:

- The machine sends information to the amplifier (Amplifier's Inputs) of the type "Valid Signal", "Reset Signal" or "Masking Signal".
- The amplifier sends information to the machine (Amplifier's Outputs) of the type "Oversize Measurement", "Undersize measurement", "Good Measurement" or "Machine Shutdown".

For a PC2003 dual channel, there are 2 SUB-D15 connectors, which are completely independent, just like in the case where 2 separate PC2003 single channel are used.

1 cable per channel is included with each kit. This cable is equipped with a SUB-D15 male-pin connector at one end and no connector at the other end. These 15 pins correspond to 15 wires, but only 14 are used.

- **Input pinlist**

PINS	SENSOR 1 OR 2 SIGNAL	WIRE COLOR
4	INPUT COMMON	ORANGE
14	RESET TO ZERO RT0 (ESC button on front panel)	BROWN / WHITE
7	MASKING	BLUE
15	VALID	RED / WHITE

INPUT COMMON (4) has a potential of 0 volts and is only used for inputs.

RESET TO ZERO RT0 (14) allows resetting the measurement to zero and therefore canceling an out-of-tolerance state. The connection of this input is optional because the measurement may be reset manually by pressing the ESC button on the amplifier's front panel. This means that if this input is not wired, when a bad part is detected – the machine will be shutdown in a controlled "end of cycle" shutdown – the operator should manually reset by pressing the ESC button. On the contrary, if this input is wired, the operator will not have to press the ESC button because the reset will be done automatically.

This input should be connected to **a dry contact**.

MASKING (7) allows not taking into account a part's measurement (good or bad) and ignoring it. The connection of this input is optional because it doesn't prevent the device from operating correctly. But if this input is not connected, you may not use this function, and it will be useless to set its parameters. This function is fully detailed in **subsection 3.1 Masking a measurement, page 8 in PROPC2003EN manual**.

This input should be connected to **a dry contact**.

The **VALID (15)** must be wired to activate the functionality of the amplifier because it synchronizes the analysis of each measurement with the machine cycle.

The activation of this input through the PLC or switch must be made after the taking of each measurement every cycle. This input should be connected to **a dry contact**.

If you do not have a process controller or programmable track on your machine to send these signals, you can obtain a signal via a mechanical switch placed (limit switch) at the cam shaft; this signal will be triggered when the cam passes by the switch.

IMPORTANT : The signals required for these inputs must be pulsed signals (momentary) and must not be continuous signals.

- **Output pinlist**

SIGNAL	PINS	RELAYS	WIRE COLOR
MIN 48V DC MAX 1A MAX	1	NORMALLY OPEN (NO)	BLACK
	2	NORMALLY CLOSED (NC)	BROWN
	9	COMMON	GRAY
MAX 48V DC MAX 1A MAX	11	NORMALLY OPEN (NO)	PINK
	10	NORMALLY CLOSED (NC)	WHITE
	3	COMMON	RED
GOOD MEASUREMENT 48V DC MAX 100 mA MAX	6	NORMALLY OPEN (NO)	DARK GREEN
	13	COMMON	BLACK / WHITE
MACHINE SHUTDOWN 48V DC MAX 100 mA MAX	5	NORMALLY CLOSED (NC)	YELLOW
	12	COMMON	LIGHT GREEN

The **MIN** output through a “make+break” relay can be wired either **Normally Open (NO)** using pins **1** and **9** (Black and Gray wires) or **Normally Closed (NC)** using pins **2** and **9** (Brown and Gray wires). When a measurement is not within min. tolerance, this output switches as soon as the VALID input closes (if no masking activated). It remains switched for a minimum time of 50 ms until the reset takes place because the RT0 input is closed or the ESC button on the front panel is pressed.

The **MAX** output through a “make+break” relay can be wired either **Normally Open (NO)** using pins **11** and **3** (Pink and Red wires) or **Normally Closed (NC)** using pins **10** and **3** (White and Red wires). When a measurement is not within max. tolerance, this output switches as soon as the VALID input closes (if no masking activated). It remains switched for a minimum time of 50 ms until the reset takes place because the RT0 input is closed or the ESC button on the front panel is pressed.

IMPORTANT: The voltage used for these outputs (min. and max.) must not exceed **48V DC** with a max. current of **1 A**.

The **GOOD MEASUREMENT** output through a static relay (opto-MOS) can be wired only **Normally Open (NO)** using pins **6** and **13** (Dark Green and Black/White wires). When a measurement is not within the min. or max. tolerances, this output is closed as soon as the VALID closes (if no masking activated). It remains closed for a minimum time of 50 ms until the next VALID signal or until reset because the RT0 input is closed or the ESC button on the front panel is pressed.

The **MACHINE SHUTDOWN** output through a static relay (opto-MOS) can be wired only **Normally Closed (NC)** using pins **5** and **12** (Yellow and Light Green wires). When a measurement is not within tolerance, this output is opened as soon as the VALID closes (if no masking activated). It remains opened for a minimum time of 50 ms until the next VALID signal or until reset because the RT0 input is closed or the ESC button on the front panel is pressed.

IMPORTANT: The voltage used for these outputs (Good Measurement and Machine Shutdown) must not exceed **48V DC** with a max. current of **100mA**.

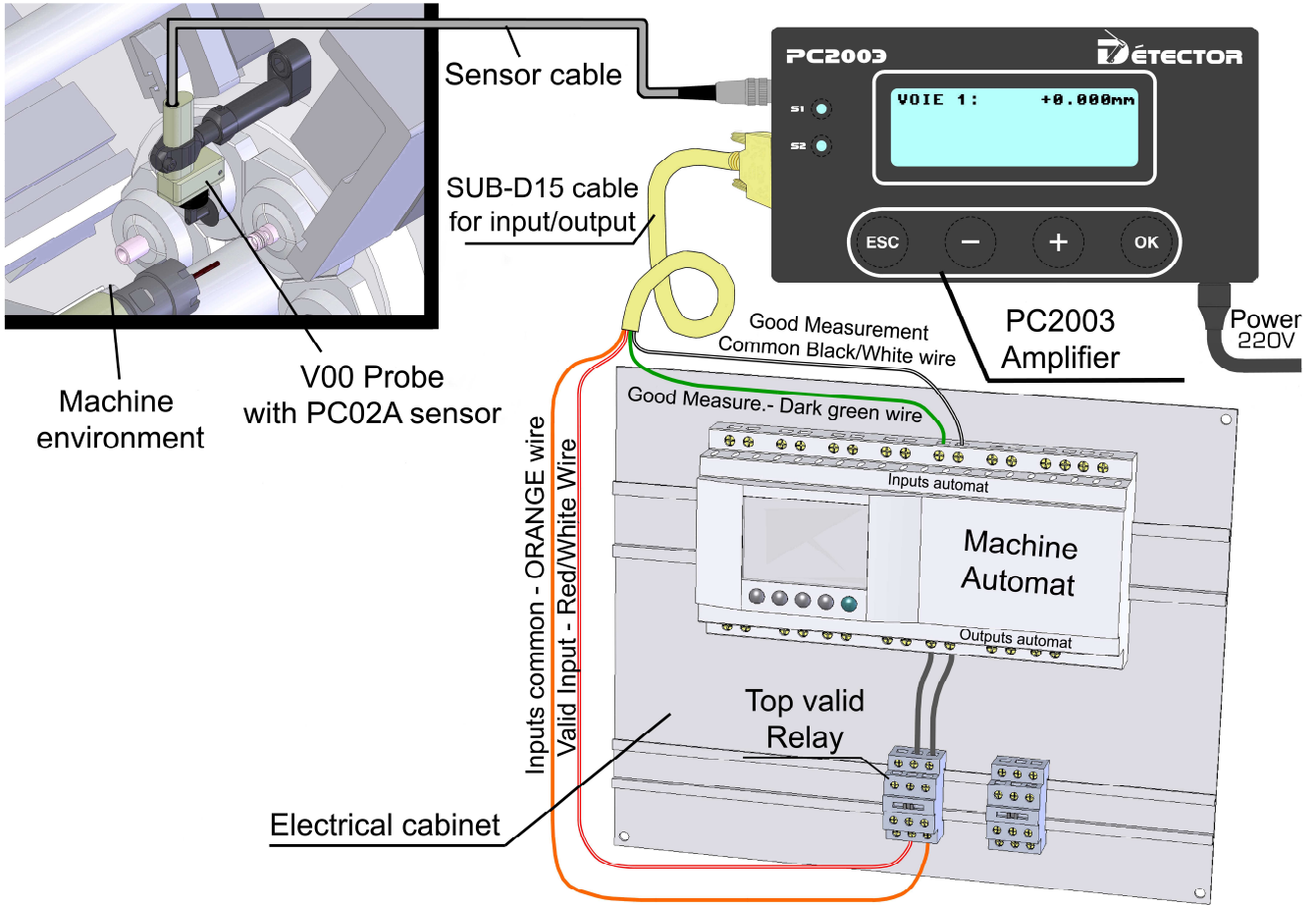
1.2.C - SUB-D 5 male pin connections for sensor

The SUB-D5 connector or connectors (2 for PC2003 dual channel) allow connecting the sensor(s) and locking them with the lock ring.

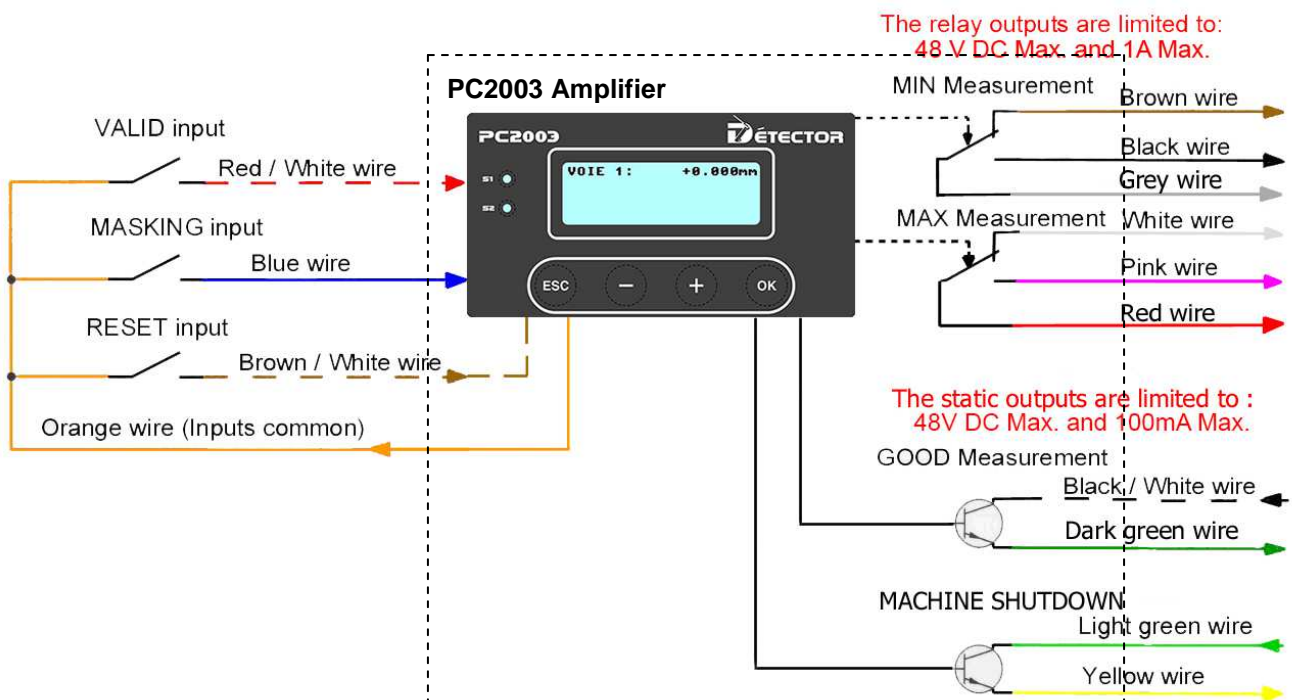
1.2.D - SUB-D 9 male pin connections points for RS232 link

This connector allows connecting the amplifier to an interface such as a computer via its serial port (COM). This link offers the possibility of outputting the measurements from the box to format them, analyze them, etc.

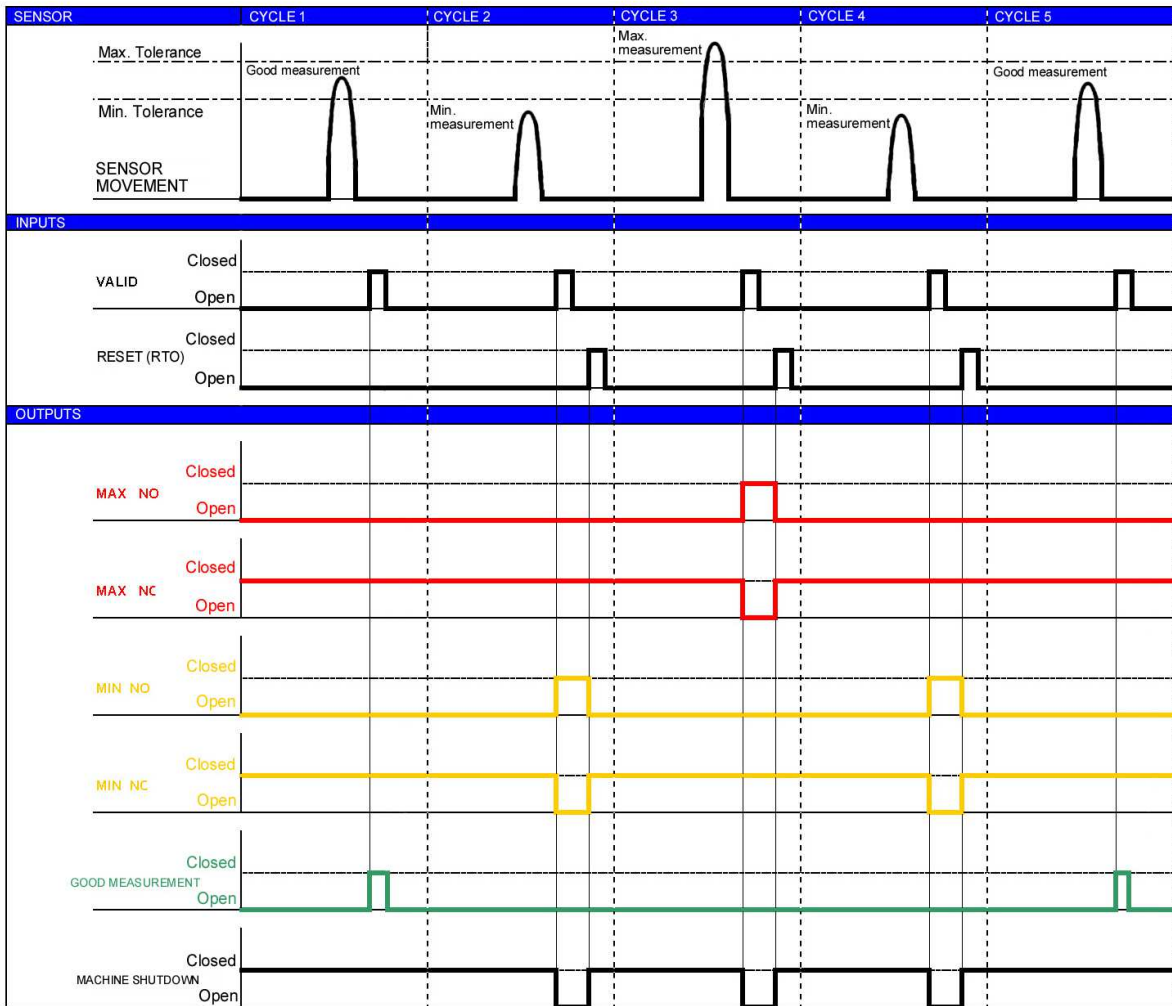
1.3 Electricals drawings
1.3.A – Principle croquis



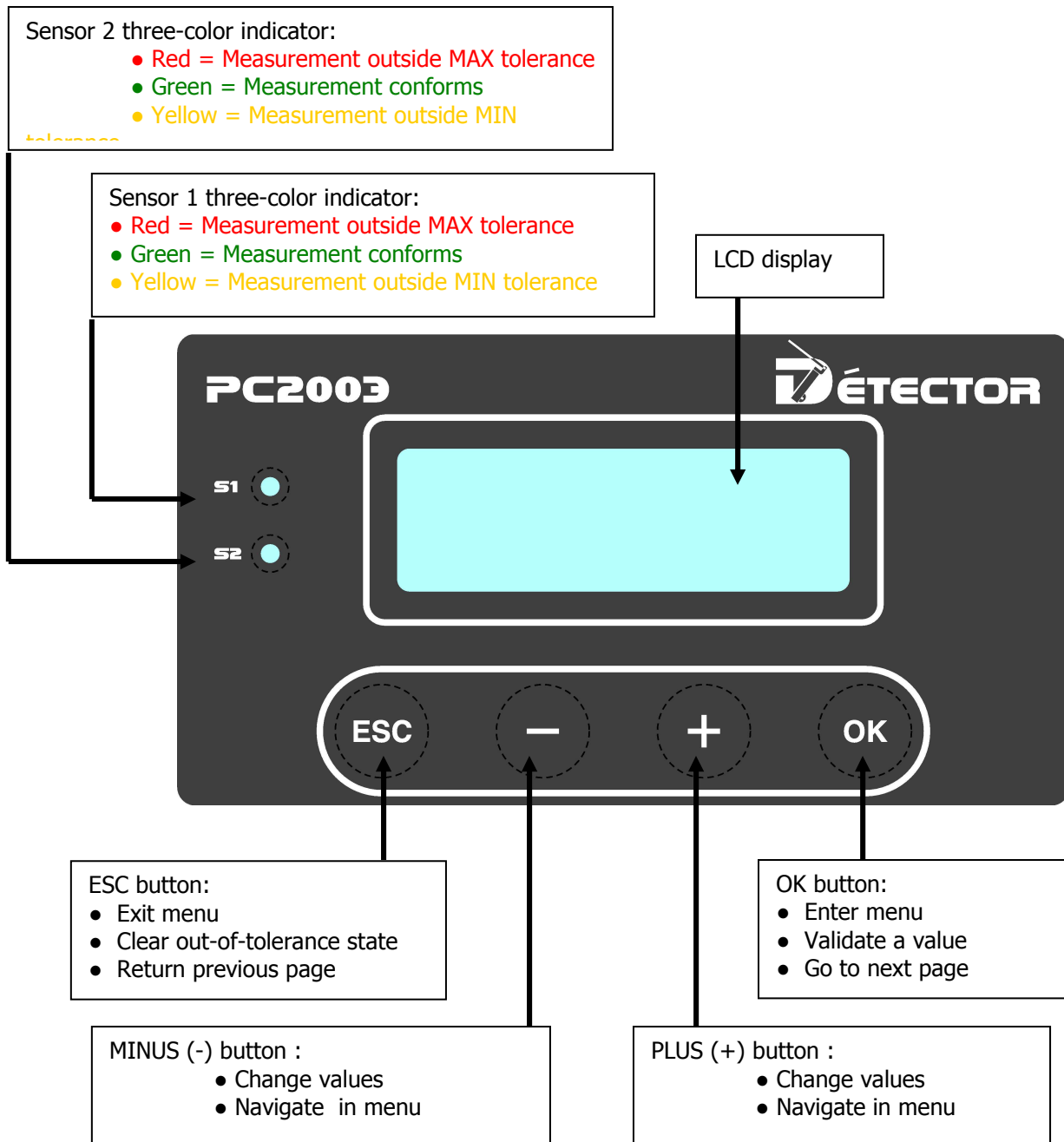
1.3.B – Electrical wiring



1.3.B – Timing diagram of a cycle



2. DESCRIPTION OF THE FRONT PANEL



Three-color indicators

For both the sensor connectors and the Input/output connectors, the three-color indicators correspond to 2 completely independent sensors (except 2 coupled sensors or Hirth configuration)

These indicators can take a total of 4 states; 3 of them are described above on the front panel drawing (Red, Green and Yellow). The last of them appears when you enter the programming mode; the indicators flash then simultaneously in red and yellow to indicate that the device is no longer taking measurements.

3. Correspondence of the SUB-D15 connector wires between PC300 and PC2003

The PC300 (old amplifier) and the PC2003 (new box) are completely compatible ; however, to use the new functions available on the new amplifier PC2003, a new cable has to be used.

The new cable to be used with PC2003 is presented to you in the right column of the table below.

PINS	INPUT / OUTPUT	WIRE COLOR OLD CABLE <u>PC300 BOX</u>	WIRE COLOR NEW CABLE <u>PC2003 BOX</u>
1	Min. measurement NO contact	WHITE	BLACK
9	Min. measurement common	BROWN	GRAY
2	Min. measurement NC contact	GREEN	BROWN
10	Max. measurement NC contact	YELLOW	WHITE
3	Max. measurement common	GRAY	RED
11	Max. measurement NO contact	PINK	PINK
6	Good measurement NO contact	-	DARK GREEN
13	Good measurement common	-	BLACK / WHITE
5	Machine shutdown NC contact	-	YELLOW
12	Machine shutdown common	RED	LIGHT GREEN
4	Inputs common	BLUE	ORANGE
14	RT0 input	BLACK	BROWN / WHITE
7	MASKING input	VIOLET	BLUE
15	VALID input	GRAY/PINK	RED / WHITE
8	NOT USED	-	VIOLET

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INSELECPC2003EN – index A

