MSA
The Safety Company

Operating Manual

CONTROL UNIT

MODELS 9010 and 9020 LCD

Order No. 10093590/02

MSA AUER GmbH
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Germany

Declaration of Conformity

The manufacturer or his in the community established authorized representative

MSA AUER GmbH
Thiemannstraße 1
D-12059 Berlin

declares that the product:

CONTROL UNIT 9010 and 9020 LCD

based on the EC-Type Examination Certificate:

INERIS 00 ATEX 0028 X

Standards: EN 60079-29-1 :2007, EN 50104 :2010
EN 50271:2010, EN 50 402 :2009
EN 45544-1 :1999, EN 45544-2 :1999

complies with the ATEX directive 94/9/EC, Annex III. Quality Assurance Notification complying with Annex IV of the ATEX Directive 94/9/EC has been issued by Ineris of France, Notified Body number:

0080

The product is in conformance with the directive 2004/108/EC, (EMC):

EN 50270 :2006 Type 2, EN 61000- 6- 4 :2007

The product is in conformance with the directive 2006/95/EC (LVD):

EN 61010-1 :2010

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R&D Instruments

Berlin, September 2013

Contents

1 Safety Regulations

1.1 Correct Use

The Control Unit Models 9010 LCD and 9020 LCD [hereinafter referred to as control unit] is particularly intended to detect the presence of gas and specific vapours in accordance with the data provided by the User to the Manufacturer. In no case can it be used for other functions. The operators must be perfectly aware of the actions to undertake if the concentration of gas should exceed the alarm set-points.

Warning!

In the case of operation with catalytic combustion sensors: To guarantee the unambiguity of catalytic combustion sensor operation it must be made sure [e.g. by checking with hand-held test instruments] each time before turning on the sensors and the system that the environmental atmosphere to be monitored by the sensors is free of combustible gases.

It is imperative that this operating manual be read and observed when using the control unit. In particular, the safety instructions, as well as the information for the use and operation of the device, must be carefully read and observed. Furthermore, the national regulations applicable in the user's country must be taken into account for a safe use.

Danger!

This product is supporting life and health. Inappropriate use, maintenance or servicing may affect the function of the device and thereby seriously compromise the user’s life.

Before use the product operability must be verified. The product must not be used, if the function test is unsuccessful, it is damaged, a competent servicing/maintenance has not been made, genuine MSA spare parts have not been used.

Alternative use, or use outside these specifications will be considered as non-compliance. This also applies especially to unauthorised alterations to the apparatus and to commissioning work that has not been carried out by MSA or authorised persons.

1.2 Liability Information

MSA accepts no liability in cases where the product has been used inappropriately or not as intended. The selection and use of the product are the exclusive responsibility of the individual operator.

Product liability claims, warranties also as guarantees made by MSA with respect to the product are voided, if it is not used, serviced or maintained in accordance with the instructions in this manual.

2 Overview of the different types

Fig. 1 9010 rack board version

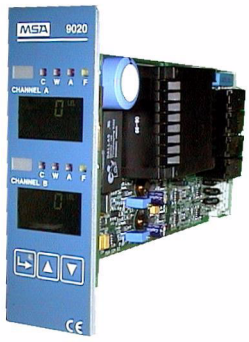


Fig. 2 9020 rack board version

Fig. 3 9010 wall mount version

Fig. 4 9020 wall mount version

Fig. 5 9020-4 wall mount version

Fig. 6 9010/20 wall mount version in ABS container

Fig. 7 9010/20 LCD in anti-deflagration container for installation in a dangerous area

3 General Information

3.1 Technical characteristics of the control module

Electrical power supply	115/230 VAC ± 15% 50/60 Hz	
	24 VDC +15% -20%	
No-load consumption	**Model 9010**	**Model 9020**
AC power supply with 24 VAC	13 VAC	15 VAC
Power supply in dc of 24 VDC	3 W	4 W
Sensors/transmitters power supply		
Constant current	5÷500 mA	5÷500 mA
Constant voltage	3÷24 VDC	3÷24 VDC
Connection mode of the sensors/transmitters	2, 3 and 4 conductors	
Terminal board	for conductors up to 2.5 sq. mm	
Input signals	10÷200 mV DC	
	4÷20 mA	
Analogue output signals		
In regular operation	0÷20 / 4÷20 mA [selectable]	
In non-regular operation	0 / 2 / 4 / 20 mA / frozen [selectable]	
	Signal isolated to ground	
Serial interface	RS485 Half duplex with dedicated protocol Mod-Bus RTU	
Alarm Set points	No. 3 [CAUTION - WARNING - ALARM]	
Electrical characteristics related to the remote repetition of the alarms		
Via relay contacts	5A@ 24 VDC / 250 VAC, resistive load	
Via common collector/emitter opto-isolators	30 mA, 24 VDC max, resistive load	
Failure and negative drift indication		
Via relay common to the two channels with model 9020		
Via individual opto-isolators for each channel		
Alarm management		
Reset	mode 1 or 2 - automatic or manual	
Activation delay	0÷9999 seconds	
Automatic blocking	Within the Access Codes	
Manual blocking	Via the related Access Code	
Response speed [without sensor]	< 0.5 sec. for the 100 % f.s.	
Zero and span drift [without sensor]	< ±0.5 % f.s. ±1 digit/month	
Precision [without sensor]	±1 % f.s. ±1 digit	
Operating temperature	-10 °C ÷ +50 °C	
Storage temperature	-20 °C ÷ +75 °C	
Humidity	90 % RH non condensing	
Vibration	10 ÷ 55 Hz; 0.15 mm	

Display	back-lit LCD
	4 digit; 7 segments
Pilot lights	High luminosity LED's
Warm-up and display time	60 sec./channel
Time-out function	2 ÷ 6 min.
Default and configuration data	Memorised in EEPROM
Protections	
AC/DC commutation because of absent mains voltage	Automatic electronics
Protections from accidental tampering	via Access Code and password Watchdog and checksum electronic diagnostics
A/D converter	
For controls	16 bit ± 1 - 25 °C with 4 multiplexed inputs
For analogue signal	16 bit ±1 - 25 °C with 2 multiplexed signals
Dimensions of the front panel	3 U x 8 T. E
Weight	720 g
Electrical installation category	II

3.2 Guide for using the manual

Reading and understanding this **Instruction manual** enables the proper management of the Control Unit 9010/20 LCD.

The control units are normally furnished already predisposed in operation, configured and calibrated by MSA in relation to the sensor/transmitter that will be connected and in conformity with the specific needs of the end User. In this case, it is recommended to take a look at the **Calibration Data Sheet** attached to the Control Unit in order to verify the effective correspondence of the data to the real needs.

In the event that the Control Units are not predisposed to satisfy the specific requirements of the User, consult our technical support department or make the modifications to the Control Unit related to the defects discovered only after having read and understand the Instruction Manual. The personnel that makes the modifications will have to be adequately prepared and aware of the modifications that they will make.

The Technical Support Department of MSA is at the disposal of the customers in order to supply information and clarifications.

3.3 General Description

The function of the Control Unit 9010/20 LCD designed and built with SMD parts for the purpose of improving performance and reliability and managing many types of sensors and transmitters that are suitable, in the most frequent applications, for monitoring the limits of flammability and ambient toxicity of gases and vapours as well as for the measure of the oxygen in order to announce the possible deficiency.

In the planned cases, the Control Unit is configured in order to satisfy directive 94/9 EC, better known as the ATEX directive. For different needs it is possible to configure it to satisfy the particular specifications of the analysis systems.

The Control Units 9010/20 LCD enable the management, respectively, of one or two sensors/transmitters [single or double channel].

Depending on the function of the applications, the sensors/transmitters can be connected via 2, 3 or 4 conductors.

Normally, beyond managing the input signal by current or voltage, the Control Units provide for feeding every sensor/transmitter by current or voltage.

The Control Units have a display [LCD], backlit for each channel.
Moreover, any time an alarm set-point is exceeded, this is indicated by other pilot lights.

Three alarm set-points are available for each channel with the designations **C [Caution], W [Warning] and A [Alarm]**, it is possible to use an additional indication of **Overrange** if the full scale value is exceeded [the display shows EEEE].

The indications of output alarms, which can be transmitted remotely, can be realised via relay contacts, de-energised, or via opto-isolators, depending on the configuration modalities of the Control Unit.

Passwords and access codes for the various functions prevent accidental or unwanted tampering; specific messages on the display inform and identify any operational anomalies and any erroneous data setting.

The following analogue output signals can be selected as desired with the possibility of also effecting their linearisation: 0 *20 mA, 4 *20 mA, 20*0 mA, 20*4 mA. Moreover, an interactive serial interface RS485 is available.

The board is available in four versions:

board 9010 LCD	with one channel for inputs dedicated to the single two or three wire 4/20 mA transmitters
board 9020 LCD	with two channels for inputs dedicated to the single two or three wire 4/20 mA transmitters
board 9010 LCD	with one channel for general purpose inputs [passive sensors, transmitters, semiconductors, etc.]
board 9020 LCD	with two channels for general purpose inputs [passive sensors, transmitters, semiconductors, etc.]

The 9010/20 LCD boards offer numerous installation solutions for rack mounting, wall mounting in ABS containers or in anti-deflagration containers for dangerous zones.

The control modules connected to sensors or transmitters that operate in potentially hazardous zones for detecting combustible gases or oxygen will be configured according to the operational modalities provided by the ATEX Directive.

4 Installation

4.1 Mechanical installation

The control units 9010/20 LCD are constructed to be installed in various configurations; versions are available for mounting in 3HE racks, in wall-mount versions in one- or two-point ABS containers or 4-point metal containers or in ADPE containers for installations in hazardous zones; custom solutions can be implemented by customer request.

A correct installation must avoid environments that are particularly humid, oxidising, corrosive, subject to notable vibrations or in which the excursions of temperature exceed the limits indicated in the TECHNICAL CHARACTERISTICS section.

In the cases in which the installation is planned in cabinets, heed the prevailing standards that govern the maximum permissible temperature inside these same cabinets, in any case the installation of the racks in the cabinets must be carried out in such a way as not to impede the natural ventilation of the various electronic components of the boards.

It is helpful is there is adequate space between one rack and another.

Sufficient space needs to be left at the back of the rack to allow for correct connection of the conductors to the back terminal boards.

The dimensions of the containers and the weights are recorded in the diagrams and drawings section.

4.2 Electrical installation

Attention!

The electrical installation needs to be carried out by qualified personnel in compliance with the prevailing standards, especially in areas where there is an explosion and fire hazard.

Make the various electrical connections [power supply, sensors, alarms, etc.] to the back terminal of the Control Unit consulting the specific EXTERNAL CONNECTIONS DIAGRAM with relay or opto-isolated output.

Use electrical conductors suitable for the power values recorded in the TECHNICAL CHARACTERISTICS; the rack, in the rear part, is equipped with two bars for affixing and supporting the cables connected to the back terminal boards of the Control Unit.

Power supply from electrical mains

The Control Units 9010/20 LCD can be fed in alternating current from the electrical mains at a voltage of 115 VAC ±15 % or 230 VAC ±15 % depending on the predisposition represented below, which is carried out using the appropriate selector.

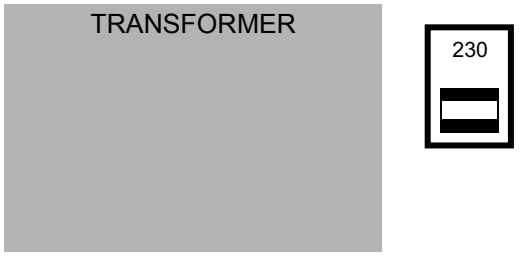


Fig. 8 Power Supply 230 VAC

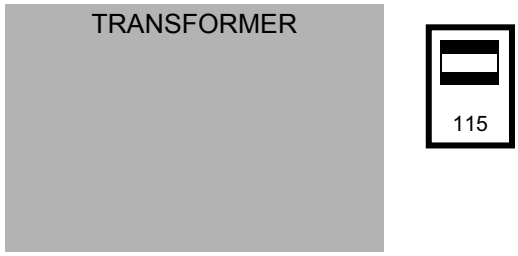


Fig. 9 Power Supply 115 VAC

Check the ELECTRICAL CONNECTIONS DIAGRAM in order to identify the line connection terminals L, N and EARTH. The Control Unit 9010/20 LCD is protected on the supply line by fuse F1 whose value is determined by the feed voltage, and in particular:

Fuse F1 - 250 mA for 230 VAC supply

Fuse F1 - 500 mA for 115 VAC supply

The electrical supply must not present variations in voltage greater than those indicated, sudden flickers of voltage due to the connection of electrical loads of substantial magnitude, electrical disturbances caused by inductive and capacitive loads and incorrect contacts.

MSA shall not be held liable for malfunctions and/or damage caused by electrical disturbances that are due to natural phenomena [e.g. lightning strikes].

We recommend protecting the equipment using appropriate external switches [automatic switches, differential switches] as close as possible to the equipment; the switches should be identified by their function and should conform to the standards IEC 60947-1 and IEC 60947-3.

The 9010/20 LCD boards were tested and developed in compliance with the EMC directives and the prevailing standards EMC [EN 50270]. In order to guarantee conformity with the EMC standards, several rules need to be observed during the installation phase:

- Provide an earth connection or an equipotential connection without defects.
- Use an external energy source conforming to the EMC directives, use split EMC mains filters for AC voltage feeds [115/230] and/or DC voltage feeds [24].
- Use diagrammed cables for DC supply [24 VDC] and for the sensors/transmitters, also the control cables [reset, output 4/20 mA, RS485] need to be shielded.
- Use cables diagrammed with a minimum shielding of 80%, avoid junctions, use boxes of the shielded type.
- Keep the signal cables separate from the supply cables, with a distance of at least 30 cm.
- External devices used [horns, flashers, motors, etc.] must by shielded from the radio frequencies and conform to the EMC directives.
- Avoid installations in areas with a presence of strong electromagnetic fields.

DC power supply

Predisposition for 24 VDC power supply from external sources

The appropriately configured Control Units 9010/20 LCD can be supplied with either AC or DC current. If both of the feeds are present, the DC current automatically takes over for AC when the latter is lacking and vice-versa, without any discontinuity in operation.

Make the DC connections at terminals 4 [+] and 5 [-] of the back terminal board following the polarity indicated on the CONNECTION DIAGRAM.

When the Control Units are connected with external battery backups, make sure that the voltage remains within the values recorded in the TECHNICAL CHARACTERISTICS; the board is equipped with appropriate indications for power outage at the mains or battery.

For 24 VDC power supplies from external sources [e.g.: battery backup, power supply modules, etc.] the CV-18 Control Unit jumper needs to be predisposed in pos. 2-3 on terminals 4 and 5 as represented below.

This input is protected by 2-amp fuse F3.

Attention!

Control Unit 9010/20 LCD is not predisposed for battery backup charging; this function needs to be implemented by external devices.

Predisposition for supplying auxiliary external circuits via the Control Unit

In the cases in which direct current is not available and makes it necessary to supply the auxiliary circuits external to the Control Unit [e.g. relays, interfaces, transmitters, etc.], it is possible to provide 24 VDC at the heads of the terminals 4 [+] e 5 [-] predisposing jumper CV18 in position 1-2. The maximum power that can be connected depended on the transformer mounted on the Control Unit and on the sensors/transmitters used. This exit is protected by a 2-amp fuse F3.

For any technical problem, please contact the MSA Technical Support Department.

Fig. 10 24 VDC Power Supply from internal source

Fig. 11 24 VDC Power Supply from external source

Sensor or transmitter connections

In the cases in which the Control Units are supplied in a pre-calibrated state for the required gas, it is necessary for each sensor, identified by a serial number, to be connected to the Control Unit or to the channel [A or B in the case of model 9020] which records the same number.

When the Control Units are connected to transmitters 4/20 mA, they can be freely connected with respect to the particular configurations.

The connection of the sensor to the Control Unit must be carried out, unless there are different instructions on the part of MSA, via shielded cable.

The number of conductors necessary for the connection of the sensor, planned during configuration, is indicated on the CALIBRATION DATA SHEET attached to the Instruction Manual while, in order to know the minimum section that must be used, depending on the current consumed by the sensor and on the length of the line, consult the diagrams attached to the manual.

The shielding of the connection cable to the sensor must be uniquely connected to the screw or to the faston earth terminal adjacent to the back terminal board for connection of the Control Unit, it is important that the shielding from the sensor side be carefully isolated and absolutely not be connected to the earthing screw that is located inside the sensor case. The case must be connected to earth via a different conductor to be fixed to the screw predisposed on the outside of the box.

If it were necessary to employ more lengths of cable between the Control Unit and sensor, it is necessary to make the joints via welds; it is a good rule of thumb to make welds also on the wire terminals.

Warning!

In the case of operation with catalytic combustion sensors: To guarantee the unambiguity of catalytic combustion sensor operation it must be made sure [e.g. by checking with hand-held test instruments] each time before turning on the sensors and the system that the environmental atmosphere to be monitored by the sensors is free of combustible gases.

5 Configuration

5.1 Control Unit Configurations

The board was designed and certified to satisfy Directive 94/9CE, better known as **ATEX Directive**, in order to be suitable for monitoring gas and/or flammable vapours in the field of the Lower Limit of Explosiveness [LIE] and in order to detect the deficiency or enrichment of oxygen.

The directive imposes some functional links of the Control Unit with the aim of guaranteeing the safety of the monitored area and therefore of the persons that operate it.

When jumper CV23 is done, the board operates in ATEX mode [default configuration].

In this case, the functioning of the Control Unit turns out to be very rigid and some modes of operation, available when the board is used for other aims, cannot be set.

IMPORTANT

With the functioning mode according to the **ATEX Directive**, particular importance is attributed to the FAILURE function that, via the relative opto-isolator or relay, signals any out-of-service condition of the Control Unit, even if not attributable to a failure.

This prerogative, resulting from an exasperated operating condition as a function of safety, must be kept in the debit account by the Designers of the installations monitored via the Control Unit if, resulting from the FAILURE condition, is made to correspond to an important action in the operation of the installations themselves.

Among the situations that provoke the FAILURE condition, the following should be remembered:

- Entry in any of the Access Codes.
- Blocking of the alarms

5.2 Front Panel

Located on the front panel are:

- 4-digit back-lit LCD display [no. 2 in the case of model 9020]. On the display, beyond the value of the concentration, different information is available, such as the engineering unit, delay alarms, their possible blocking, the calibration and TIME OUT states, as well as the symbols of reference to possible conditions of operational irregularity.
- 3 LED [C; W, A] for the optical indication of reaching the alarm levels.
- LED [F] for the optical indication of a possible failure or out-of-service condition.
- Pockets suitable for containing the identification of the type of gas that is monitored.
- 3 buttons, as represented below, to enable all of the operations necessary for managing the Control Unit.

Enter key used in order to select the access codes and confirm the settings of the data.
A green LED is inserted in the button that signals by continuous light that the device is turned on and by flashing light the entry of an access code.

UP key for increasing the data to be modified in the access codes or for silencing and resetting the alarms

Down key for decreasing the data to be modified in the access codes or for silencing and resetting the alarms

5.3 Configuration with relay outputs

The Control Units 9010 and 9020 are furnished with 4 indication relays, respectively, **alarm, warning, failure** and **horn**, while the **caution** output is normally opto-isolated [default configuration] at which reference is made to the EXTERNAL CONNECTIONS DIAGRAM for the back terminal board connections.

The use of the voltage-free contacts must be done in accordance with the electrical characteristics of the contacts themselves recorded in the TECHNICAL CHARACTERISTICS. The relays used are single exchange [SPDT] for the Alarm and Warning outputs, while only the contact [SPST] is available for the Horn and Failure outputs.

The failure relay mounted on the board is a double exchange relay with the contacts in series in order to satisfy the safety needs of the ATEX directive.

The board with the relay outputs provides the following predispositions:

- Relays installed and alarm configuration in access code 4
- Configuration via step 1 of access code 52: indication 1
- If utilised, the opto-isolated CAUTION in absence of the 24 VDC external power supply: CV22 in position 2-3 a CV18 in position 1-2.

On model 9020 LCD, the relay outputs are in common with the two channels.

5.4 Configuration with opto-isolated outputs

In substitution for the relays, all of the outputs related to the alarm set-points [C, W and A], to the indication of possible failures or of the out-of-service states predicted if the Control Unit operates according to the ATEX Directive as well as to the activation of the possible external acoustic alarm device can be predisposed with opto-isolated outputs.

These outputs are independent for each channel, even with model 9020, with the exception of the output related to the activation of the external acoustic device [HORN].

Opto-isolated outputs are available with a common transmitter [MSA 173 card] or common collector [MSA 174 card].

The electrical characteristics of the opto-isolators are recorded in the TECHNICAL CHARACTERISTICS section while, for the connections, see the EXTERNAL CONNECTIONS DIAGRAM, which provide the power supply of the opto-isolators and therefore of the relays via an internal or external 24 VDC power source.

The 9010/20 LCD with the opto-isolated outputs provides the following predispositions:

- Remove the relays from the respective sockets, mount the circuit with the opto-isolators having a common transmitter or collector depending on the application
- Configuration via step 1 of access code 52: indication 2
- In order to use the opto-isolators with the 24 VDC power supply supplied by the board, connect the jumpers:
  - ▷ Cv18 pos. 1-2, Cv22 of the base board without any solder points in pos. 1-2 or 2-3
  - ▷ Cv1 pos. 2-3 on opto-isolator board
- In order to use the opto-isolators with the 24V dc power supply supplied by an external source, connect the jumpers:
  - ▷ Cv18 pos. 2-3, Cv22 of the base board without any solder points in pos. 1-2 or 2-3
  - ▷ Cv1 pos. 1-2 on opto-isolator board

For applicable examples, see drawing E07-3497 attached.

The MSA Technical Support Department is at your service for any technical questions.

Remember that these configurations are normally made in the factory in accordance with the specifications of the customer.

5.5 Predisposed for input signal

The Control Unit 9010/20 LCD general purpose version, depending on the sensor or transmitter to be connected, can be configured to receive signals in mV or in mA, check table for the hardware predisposition of the Control Unit.

The software predisposition is made in Access Code 52, step 3:

- setting datum 1 selects an input signal in mV [ex. catalytic sensors].
- setting datum 2 accepts a 4/20 mA input signal for two-wire transmitters [ex. electrochemical sensors]
- setting datum 3 accepts a 4/20 input signal for three-wire transmitters [ex. infrared detectors, field transmitters].

The Control Units configured by setting data 2, 3 are automatically calibrated between 4 and 20 mA and do not need further checks.

Control Unit 9010/20 LCD version 4/20 mA article no. 10093585 / 10093584 is predisposed to accept in inputs only signals 4/20 mA from 2- or 3-wire transmitters, the calibration is automatically made on the 4/20 mA input signal.

5.6 Output Signals

Analogue signals

The selection of the analogue type signal, relative to the condition of regular operation, is performed with Access Code 4, step 19.

0*20 mA, 4*20 mA, 20*0 mA and 20*4 mA signals are available.

The indication of the analogue type signal in the event of a failure is done with Access Code 4, step 20.

The following signals are available: 0 mA, 2 mA, 4 mA, 20 mA or h [corresponding to the value of the signal frozen at the moment of the failure].

It is possible to make corrections of the 4-20 mA analogue signal via steps 23 and 24 of access code 4; in this way, the alignment with other purchased systems will be possible.

The behaviour of the analogue signal in correspondence to the various access codes is shown for each of these.

RS485 signal

The serial output RS485, of the interactive type, can be utilised for the connection with Supervision Systems, PLC, DCS, etc.

The data transmitted on a RS485 HALF DUPLEX type serial bus with MODBUS protocol, connected to a Supervision System are as follows:

configuration of the current Control Unit with the possibility of modification, concentration values of the monitored substance, alarm and failure conditions, execution of the horn cut-out and reset of the alarm state.

Upon request it is possible to furnish output RS485 in a redundant form.

5.7 Failure function

Beyond the red alarm LED's, the Control Units are equipped with a yellow LED [FAILURE] which signals possible individual malfunctioning states [individual for each channel with 9020].

The nature of the failures, a listing of which is recorded in Section 9, is shown via the display.

The indication in a remote zone is accomplished via the related relay [FAILURE], which is equipped with two free voltage-free N/O contacts [SPST] connected in series to each other in order to guarantee the signalling.

In the ATEX version, the relay coil is normally energised.
With model 9020, the failure indication is common to the two channels when the indication is predisposed with the relays or individual when predisposed with opto-isolated outputs.

A pre-existing alarm condition remains as such if the failure is subsequently detected, while they are automatically blocked if the failure precedes the event that would have caused it.

5.8 Alarms and overrange functions

Alarm Set points

The alarm set-points are designated as:

- **Caution [C]** caution level
- **Warning [W]** warning level
- **Alarm [A]** alarm level
- **Overrange [EEEE]** indication on the display of the full scale being exceeded

The exceeding of the alarm set-points will be displayed on the front panel via the red LED's and causes the status of the opto-isolators and of the relays connected thereto to change.

The alarms can be configured via the various steps of Access Code 4, which, beyond setting the intervention levels, enable the following choices:

- alarms for rising signals or falling ones.
- coils of the excited relays or unexcited ones in the non-alarm state.
- resetting of the manual alarm state, as per mode 1M or 2M, or automatic with mode 1A or 2A. [see the attachment].

The horn cut-out and the manual reset of the alarms is carried out the same using the UP and DOWN keys of the front panel or with the external pushbutton, possibly connected to the back terminal board, see EXTERNAL CONNECTIONS DIAGRAM.

When the offset and full-scale values change, the Control Unit 9010/20 configures the sets of alarms as default ones; the default values of the sets of alarms should be considered in a percentage of the range of measure.

In a manner limited to the ATEX version, the alarm set-points A and W are set from 1 to 80 % of full scale, while the alarm set-point C is set from 1 to 100 % of full scale; the indication of overrange is always connected and the alarms are configurable only on the rise.

The oxygen analysis can also occur in ATEX mode [%Vol], with a full scale 0-25%Vol and with alarms without setting; the input signal in ATEX mode must originate from a 4/20 mA transmitter, likewise ATEX certified [e.g. MSA/AUER DF 9500 transmitter].

In the non-ATEX version, with the unit of measure PPM it is possible to set average alarms on 15 min [STEL] and/or on 8 hours [TWA].

The value of the STEL average will be available after 15 minutes from start-up or after 15 minutes from the STEL setting in Access Code 4, step 14 [and/or step 18]. The sampling time for the calculation of the averages is 1 minute.

STEL average CALCULATION = sum of last 15 readings /15 [any negative values are considered 0 ppm].

The value of the TWA average will be available after 480 minutes [8 hours] from start-up or after 480 minutes from the setting. TWA in Access Code 4, step 14 [and/or step 18]. The sampling time for the calculation of the averages is 1 minute.

TWA average CALCULATION = sum of last 480 readings /480 [any negative values are considered 0 ppm].

Overrange

The purpose of the **OVER RANGE** function is to indicate when 100 % of the full scale is exceeded, and, if activated, this exceeding causes the symbol **EEEE** to be displayed and the external acoustic device to be activated, which can then be silenced by pressing one of the UP or DOWN keys.

In the ATEX version, the OVER RANGE indication is always activated.

The reset of all the alarm set-points is commutated automatically into **1M** mode, independently of the previously made choice, except that it is already in **2M** mode.

The EEEE indication will persist until the signal remains greater than the full scale value.

When the signal falls back below the full scale, the EEEE symbol alternates with the current indication of the concentration [4 sec.: EEEE; 1 sec.: display of the concentration] and the acoustic device is activated anew.

When the concentration falls back below the alarm levels and in concurrence with the manual reset of one or more set-points, the cancellation of EEEE occurs and the reset modes return as per configuration.

If necessary, the CAUTION set-point, whose intervention value will be set to 100 % of full scale, can be used for the remote indication of OVER RANGE.

5.9 Starting the Control Unit

Before energising the Control Unit, make sure that:

- the mechanical and electrical installation conforms to what is described in section 4 and nevertheless conforms to the prevailing standards.
- that the setting of the jumpers related to the voltage change and those of the hardware configuration conform to the CALIBRATION DATA SHEET included with the Instruction Manual.
- that the serial number of the Control Unit corresponds to that of the sensor or of the connected sensor.

After having applied voltage, the Control Unit for about 1 minute performs the self-diagnostics for each channel in order to check the correct operation of the various circuits and of the signalling devices.

During this phase, the alarms are blocked, and the 4/20 mA analogue output is placed as per the configuration of Access Code 4, step 20; the failure indication for the ATEX version is active.

At the end of the self-diagnostics, the Control Unit is placed in regular operating mode.

5.10 Jumpers predisposition

BASE BOARD - HARDWARE CONFIGURATIONS [normally performed in the factory]

		Function	Component side / solder side	NOTES
CV 13 A and B	pos. 1-2	RS485 redundant	Drop of solder [component side]	
CV 13 A and B	pos. 2-3		Drop of solder [component side]	Configurations reserved for MSA - default: closed
CV 14	pos. 1-2			Configurations reserved for MSA - default: open
Cv 15	pos. 1-2	Open - gen. purp. board Closed - 4/20 mA board	Drop of solder [component side]	Depending on the board
CV 16	pos. 1-2	Open - 38400 baud Closed - 9600 baud	Drop of solder [component side]	Default: open - [x RS485]
CV 17	pos. 1-2		Drop of solder [component side]	Configurations reserved for MSA - default: open
CV 18	pos. 1-2	24 VDC power supply generated within board	Jumper, component side	e.g. for services
CV 18	pos 2-3	24 VDC power supply from outside board	Jumper, component side	e.g. for battery backup Default
CV 19	pos. 1-2	Horn contact n.c.	Drop of solder [solder side]	Default: open
CV 19	pos. 2-3	Horn contact n.o.	Drop of solder [solder side]	Default: closed
CV 20	pos. 1-2		Drop of solder [component side]	Configurations reserved for MSA - default: open
CV 22	pos. 1-2	Opto-isolated caution output	Drop of solder [component side]	Needs an external negative on terminal 7
CV 22	pos. 2-3	Opto-isolated caution output	Drop of solder [component side]	The negative is common to the default board
CV 23	pos. 1-2	Closed - ATEX version Open - non-ATEX version	Drop of solder [component side]	Default: closed
CV 24	pos. 1-2	Closed - UC 9010 Open - UC 9020	Drop of solder [component side]	
CV 25	pos. 1-2	Watch-dog activation	Jumper, component side	Default: closed

The horn relay is normally unexcited with a normally open contact; if a normally closed contact is desired, the track of CV 19, pos 2-3 needs to be cut and a drop of solder needs to be inserted in pos.1-2.

MSA OPTO-ISOLATOR BOARDS 173 and 174 [board installed by request]

CV 1	pos. 1-2	External power supplies	Drop of solder [component side]	For applications with separate external power supplies
CV 1	pos. 2-3	Internal power supplies	Drop of solder [component side]	Default configuration

CONFIGURATION 9010/20 LCD FOR SENSORS/TRANSMITTERS FOR GENERAL PURPOSE BOARD

Connection type		**CURRENT LOOP TWO-WIRE**	**CURRENT LOOP THREE-WIRE**	**SENSOR THREE-WIRE**	**SENSOR THREE-WIRE**
Type of transmitter		Series 27 Df 9500 UltimaXE [2-wire]	Ultima XE/XIR/XI RG-3LCD	Catalytic Thermocondu.	
Sensor/trasm. power supply		VOLTAGE	VOLTAGE	CURRENT	VOLTAGE
Input signal		mA	mA	mV	mV
Points to short circuit					
CH A	**CH B**				
CV1	CV1	pos. 2-3	pos. 2-3	pos. 1-2	pos. 2-3
CV2	CV2			●	●
CV3	CV3	●	●	●	●
CV4	CV4	●	●		
CV5	CV5			●	●
CV6	CV6	●	●		
CV7	CV7	●	●	●	●
CV8	CV8				
CV9	CV9	pos. 1-2	pos. 1-2	pos. 1-2	pos. 1-2
CV10	CV10				
CV11	CV11				
CV12	CV12				

CONFIGURATION 9010/20 LCD FOR SENSORS/TRANSMITTERS FOR GENERAL PURPOSE BOARD [continued]

Connection type		FOUR-WIRE SENSOR	FOUR-WIRE SENSOR	SENSOR THREE-WIRE
Type of transmitter		Catalytic Thermoconduct.	Oxygen cell Thermoc. Cell For analysers	Semiconductor D-8201
Sensor/trasm. power supply		CURRENT	VOLTAGE	CURRENT
Input signal		mV	mV	mV
Points to short circuit				
CH A	**CH B**			
CV1	CV1	pos. 1-2	pos. 2-3	pos. 1-2
CV2	CV2			
CV3	CV3	●	●	●
CV4	CV4			
CV5	CV5			●
CV6	CV6			
CV7	CV7	●	●	*
CV8	CV8			
CV9	CV9	pos. 1-2	pos. 1-2	pos. 2-3
CV10	CV10			
CV11	CV11			*
CV12	CV12			●
		NOTES ● bridge closed		* depending on the range and the gas

For the location of the jumpers, consult the accompanying topographical diagram.

Board 9010/20 LCD with article no. 10093585 / 10093584 for individual 2-wire or 3-wire 4/20 mA inputs, has the following hardware predispositions, which are recommended not to be modified: Cv3, Cv4, Cv 6, Cv8, Cv9 pos 1-2, Cv10.

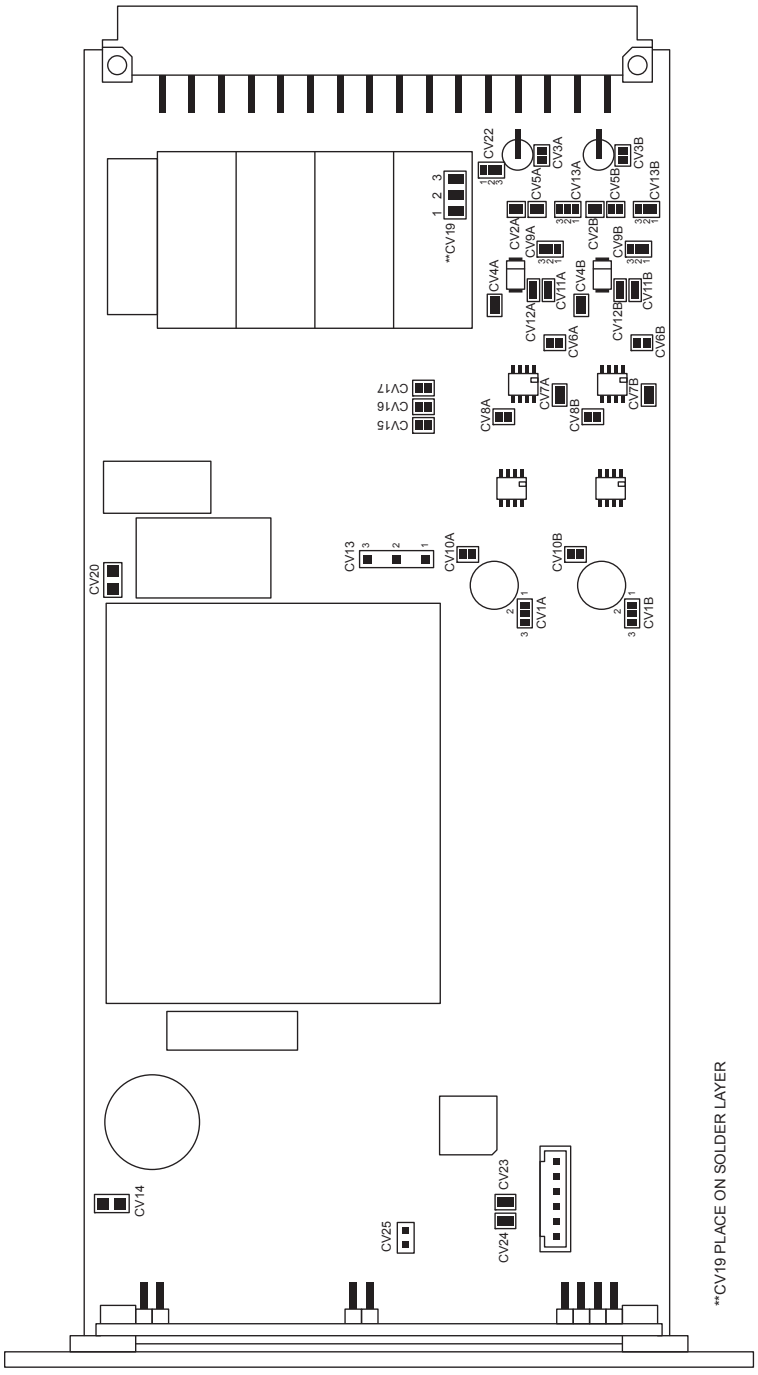


Fig. 12 Jumpers

6 Setting Parameters

As a rule, the Control Units are delivered already configured and calibrated by MSA based on the specifications provided by the customer.

The CALIBRATION DATA SHEET, in which the main configuration data are recorded, accompanies the Instruction Manual delivered with the Control Unit.

Modifications can be made via the various steps in each of the Access Codes recorded below.

To identify the various steps contained in each Access Code, consult the INDEX in Section 6.

Access Code 1	Calibration operations
Access Code 2	Settings for particular operating conditions
Access Code 3	Simulation and functionality operations
Access Code 4	Configuration operations
Access Code 7	Setting the address of the peripherals
Access Code 52	Initialisation operations
Access Code 53	Default settings
Access Code 123	Acceptance of the following Access Codes protected without de-energisation: 2, 4, 7, 52, 53
Access Code 223	Operations for the setting, the use and the modification of the password

6.1 Use of the buttons for access to the codes

Access to the Access Codes 1, 3, 5, 123 and 223 is accomplished by holding down the ENTER button with the board energised for approximately 3 seconds until the green LED incorporated in the button itself flashes.

For all of the other Codes, for the purpose of ensuring greater protection against unwanted access, the button needs to already be pressed before the Control Unit is turned on or via Access Code 123 if the Control Unit is already turned on.

Mod. 9010 - Example for use of the buttons for access to the Access Codes

a. Hold down the ENTER button until the incorporated green LED flashes.
b. Next, press the UP button one or more times until the desired number related to the Access Code is selected.
c. Confirm the selection by pressing the ENTER only once.
d. P1 appears.
e. Press the ENTER only once if you want to enter into the P1 step or press the UP button one or more times until the desired step is selected.
f. Press the ENTER button only once to confirm the selection.
g. Press the UP or DOWN buttons to modify the indication in the display if necessary.
h. Once the modification has occurred, confirm the new indication by pressing the ENTER button only once.
i. In order to exit any Access Code, press the ENTER button two times in a row within two seconds. Depending on the position within an Access Code, it may be necessary to repeat the manoeuvre another two or three times.

The Control Unit automatically returns step by step to regular operation if the buttons are not pushed within two minutes. [TIME-OUT function]

The TIME-OUT function may possibly be disabled [see item Section 6.3]

Mod. 9020 - Example for use of the buttons for use of the Access Codes

a. Hold down the ENTER button until the incorporated green LED flashes.
b. Next, press the UP button one or more times until the desired number related to the Access Code is selected.
c. Confirm the selection by pressing the ENTER only once.
d. CHa appears in the upper display.
e. Press ENTER to operate with channel A.
f. P1 appears in the upper display.
g. Proceed as described in item e] in the example related to model 9010.

or:

h. Press the UP button to operate with channel B
i. CHb appears; Press the ENTER button to confirm the choice.
j. P1 appears in the lower display.
k. Proceed as described in item e) in the example related to model 9010.

ATEX version – Operating modes of the Control Unit with one of the Access Codes entered

When the **ENTER** button is released:

- the **ALARM INHIBIT** tag flashes in the displays for both of the channels.
- All of the alarm set-points are blocked and frozen in the state in which they are found when the button is released.
- The horn, if already activated, is silenced with the exception of the **EEEE** condition.
- The FAILURE relay is in a state of failure.
- The value of the analogue signals of both the channels is a function of the preselection made with the step.
- P 20 of Access Code 4 with the exception of step P11 of Access Code 3. [Simulation test of unblocked alarms]

Standard version – Operating modes of the Control Unit with one of the Access Codes entered

When the **ENTER** button is released:

- in the display of both the channels, the ALARM INHIBIT tag flashes
- All of the alarm set-points are blocked and frozen in the state in which they are found when the button is released.
- The horn, if activated, is deactivated by the Control Unit with the exception of the EEEE condition.

The state of analogue output signals are as follows, depending on the preselected Access Code:

Access Code 1:

channel being calibrated as set in step P2 of Access Code 2

of the other channel: fluctuating

Access Code 2, 7, 123 and 223:

fluctuating for both the channels if the selection was made via Access Code 123, while they are equal to 0 mA if the selection occurred via the ENTER button when the Control Unit is turned on.

Access codes 3 and 5:

fluctuating for both channels.

Access codes 4, 52 and 53:

- selected channel: 0 mA
- the other channel: fluctuating if the selection was made via Access Code 123, while it is equal to 0 mA if the selection occurred via the ENTER button when the Control Unit is turned on.

6.2 Access Code 1 - Calibration operations

Press the Enter ↳button until the respective green LED flashes, set 1 with the Up ▲ button, confirm with Enter, select channel A or B [only for model 9020 LCD] with the Up and Down buttons, therefore confirm with Enter.

Step	Function	NOTES
P1	Zeroing - [to be carried out in clean air] – confirm with Enter, no adjustment is necessary	Blocked alarms - 4/20 mA analogue output as per configuration in Access Code 2, step 2. **Caution** with a board in the ATEX version, the 4/20 mA analogue output is set at 2 mA
P2	Setting of the concentration of the calibration gas contained in the cylinder with the Up and Down [the default value is 50 for a scale from 0 – 100 %] - confirm with Enter	
P3	Span calibration, make the gas in the sensor flow - confirmation of making the calibration at the concentration value provided in P2 - confirm with Enter	
P4	Viewing the concentration detected by the sensor after the calibration - confirm with Enter	
P5	Viewing the magnitude of the input signal related to the performance of the Control Unit. Confirm with Enter [valuation range: 0 mV = minimal signal; 200 mV = maximum signal]	
P6	Setting of the time interval between two calibrations [Values that can be set: 0÷999 days] - Confirm with Enter If the time interval set for the P6 step has expired, the CAL tag flashes in the display.	
P7	Calibration enabled / disabled only for 4/20 mA configured boards A=enabled, nA=disabled – select with Up and Down, confirm with Enter	
P8	Indication enabled / disabled with the CAL tag for reduction of the sensor signal under 50% with respect to the preceding calibration. A=enabled , nA=disabled - the CAL tag will be fixed	
P20	Memorisation of board configuration as per customer calibration data sheet	Selective for channel

To exit from the access code, press the Enter button twice quickly.

6.3 Access code 2 - Settings for particular operating conditions

The Access Code is accepted if the ENTER button is kept pressed when the Control Unit is turned on, or first typing the Access Code 123.

Step	Function	NOTES
P1	Disabling/enabling of the TIME OUT function A= enabled [Tag TIME-OUT spent] d= disabled [TIME-OUT tag flashing]	Common to both channels
P2	Setting the type of analogue output of the selected channel for the calibration and programming h = frozen, F = fluctuating, 0 = zero mA, 4 = four mA, 20 = valves mA	The boards in the ATEX version are not configurable; the output is equal to the configuration in Access Code 4, P20.
P3	Blocking the alarms related to the selected channel A = unblocked alarms, nA = blocked alarms The flashing ALARM INHIBIT tag is shown in the display of the channel with blocked alarms. The 4-20 mA analogue signal is active.	In the ATEX version, the FAILURE relay remains in a failure state, even after exiting the Access Code, while the Horn output for the acoustic device is activated only when the OVER RANGE set-point is exceeded concurrently with showing the EEEE in the display.
P4	Enabling / disabling indication of low external 24 VDC power supply with failure relay intervention and display in the LOU 1 display - the display alternates between concentration and LOU 1.	Available only with primary 115/230 VAC power supply
P5	Enabling / disabling indication of low external 115/ 230 VAC power supply with failure relay intervention and display in the LOU 2 display - the display alternates between concentration and LOU 2.	Available only with external 24 VDC power supply

To exit from the access code, press the Enter button twice quickly

6.4 Access code 3 - Simulation and functionality operations

Press the Enter button until the respective green LED flashes, set 3 with the Up button, confirm with Enter, select channel A or B [only for model 9020 LCD] with the Up and Down buttons, therefore confirm with Enter.

Step	Function	NOTES
P1	Test of functionality of the LCD display. Check the efficiency of all the segments of the display	
P2	Simulation of the increase in concentration via the UP and DOWN buttons with alarms blocked. In correspondence to the various alarm set-points, the corresponding LED's light up, but the relays are not activated.	Press the ENTER button twice in succession in order to exit
P3	Viewing the value of the current set for supplying power to the sensor. If the configuration provides for constant voltage power supply, VOL is shown.	
P4	Viewing the effective value of the supply current of the sensor. The value of the current is displayed even in the case that the sensor is powered with constant voltage.	
P5	Display in automatic sequence of the following information: - set offset value - set full-scale value - set sensor feed current value [if stabilised in voltage, the indication VOL appears] - current value consumed by the sensor - current value at the output of the power supply the following displays, in automatic sequence, referred to the alarm set-points with the LED lit: - direction of alarm activation [in the ATEX version only provided for rising value] - alarm set-point value - reset mode [1A; 1M; 2A; 2M] - relay state: energised [E] / non-energised [dE] [in the ATEX version, the Failure relay is energised during regular operation] - value of the alarm activation delay [in seconds] range of the analogue output signal during regular operation: 0÷20; 4÷20; 20÷0; 20÷4 mA range of the analogue output signal in the case of a failure: 0, 2, 4, 20 mA or h [frozen]	To continuously display one of the data, the ENTER button must be held down.
P6	Viewing the average Stel or TWA value associated with the Warning alarm	Available only with the unit of measure PPM
P7	Viewing the average TWA or Stel value associated with the Alarm alarm	Available only with the unit of measure PPM
P8		
P9		
P10		

Step	Function	NOTES
P11	Simulation of the increase in concentration via the UP and DOWN buttons with alarms unblocked. In addition to the LED's, the alarm relays [unless they are blocked in Access Code 2, step 3] are activated in correspondence to the various alarm set-points.	To silence the acoustic alarm, press the ENTER button. Press two times in succession in order to exit.
P12	Efficiency test of the digital outputs A change of state of all the opto-isolators and therefore of the relays connected thereto is detected [even if the alarms were blocked in Access Code 2, step 3] Indication 1 = state of the opto-isolators as in the configuration performed via Access Code 4 Indication 2 = obtained by pressing the Up button: All of the opto-isolators change in state compared to condition 1. n.b.: Upon exit from step 12, the state of the opto-isolators will be automatically re-comutated back into condition 1	[In the ATEX version, the FAILURE state does not change] if it has already commutated automatically when any Access Code is entered.

6.5 Access code 4 - Configuration operations

The Access Code is accepted if the ENTER button is kept pressed when the Control Unit is turned on, or first typing the Access Code 123.

Step	Function	NOTES
P1	Setting of the supply current of the catalytic sensor. Individual for each channel. Admissible values 5÷500 mA The step is automatically skipped if the power supply is provided as constant voltage	Only for passive sensors
P2	Setting of the FAILURE current for power supply interruptions. Individual for each channel. Permissible values 1÷500 mA	Reaching the preset value activates the Failure relay
P3	Setting the value related to the negative drift of the analogue signal. Permissible value 0 ÷ -10 % of the full scale	Reaching the preset value activates the FAILURE relay and d1 is displayed
P4	Selection of the Unit of Measure: LEL, LELm, PPM, %VOL, g/m^3, no unit of measure [In the ATEX version, the Units of Measure LEL , LELm and %VOL [oxygen] are the only ones that can be selected; the selection % Vol for oxygen analysis is possible only after the configuration of Access Code 52, step 3 with setting 2 or 3, depending on the type of transmitter]	
P5	Setting the offset value [Permissible values 0÷9000] - Individual for each channel	In the ATEX version, the offset value is zero
P6	Setting the full scale value. [Permissible values: 0÷9000] - Individual for each channel. The variation of the full scale value modifies the set-point values of the alarms and the calibration setting datum at Step 2 of Access Code 1. The precision of the control module of 1% is guaranteed to be compatible with the range of measurement, offset value [P5] and full scale value [P6] selected.	In the ATEX version, the permissible values are between 1 and 100 for the combustible gas and 0-25 % for oxygen]

Step	Function	NOTES
SETTINGS OF THE ALARM SET-POINT “C” [CAUTION] - OUTPUT WITH OPTO-ISOLATOR		
P7	Settings of the alarm set-point Selection of the direction of activation of the alarms U: rising, d: falling Setting the intervention threshold Permissible values: 0÷100 % of the full scale	Also valid in the ATEX version to allow remote indication of the EEEE indication if set at 100 % of the full scale
P8	Selection of the opto-isolator state in regular operation E: conducting / Energised dE: not conducting / not Energised	
P9	Selection of the reset mode. Sequences: 1A; 1M; 2A; 2M	[see attachment 1]
P10	Setting the delay time for the indication of the alarm Permissible values: 0÷9999 sec	
SETTINGS OF THE ALARM SET-POINT “W” [WARNING] - OUTPUT WITH RELAY		
P11	Settings of the alarm set-point Selection of the direction of activation of the alarms U: rising, d: falling Setting the intervention threshold	In the ATEX version, the permissible values are 0÷80 % of the full scale.
P12	Selection of the opto-isolator/relay state in regular operation E: conducting / Energised, dE: not conducting / not Energised	
P13	Selection of the reset mode. Sequences: 1A; 1M; 2A; 2M	[see attachment 1]
P14	Setting the delay time for the indication of the alarm Permissible values: 0÷9999 sec With the Unit of Measure PPM, the Control Unit shows the selection SteL, TuA [TWA] and norM; by selecting norM it is possible to set the delay.	
SETTINGS OF THE ALARM SET-POINT “A” [ALARM] - OUTPUT WITH RELAY		
P15	Settings of the alarm set-point Selection of the direction of activation of the alarms U: rising, d: falling Setting the intervention threshold	In the ATEX version, the permissible values are 0÷80 % of the full scale.
P16	Selection of the opto-isolator/relay state in regular operation E: conducting / Energised, dE: not conducting / not Energised	
P17	Selection of the reset mode. Sequences: 1A; 1M; 2A; 2M	[see attachment 1]
P18	Setting the delay time for the indication of the alarm Permissible values: 0÷9999 sec With the Unit of Measure PPM, the Control Unit shows the selection SteL, TuA [TWA] and norM; by selecting norM it is possible to set the delay.	
P19	Selection of the analogue output signal range 0÷20; 4÷20; 20÷0; 20÷4 mA	
P20	Selection of the analogue output signal value in the case of failure 0; 2; 4; 20 mA or h [frozen]	

Step	Function	NOTES
P21	Reducing the setting of places after the decimal. The decimal places are referred to the display of the concentration	The decimal places depend on the full scale.
P22	Configuration for output failure manual reset [1M]	Default is automatic selective reset per channel
P23	Regulation of 4 mA analogue output - use Up and Down buttons	
P24	Regulation of 20 mA analogue output - use Up and Down buttons	

6.6 Access code 7 - Setting the address of the peripherals

The Access Code is accepted if the ENTER key is kept pressed when the Control Module is turned on or by first typing Access Code 123.

Step	Function	NOTES
P1	Setting the address of peripherals Can be set from 0 to 255	Address common to channel A and B
P2	Setting the zone Can be set from 1 to 60	Individual for each channel
P3	Redundancy RS 485: A [enabled], nA [disabled]	Common to the board

For couplings with boards 9010/20 LCD version 2, set the baud rate at 9600 [see Table Cv16]. To be performed only if the serial output RS485 is used.

6.7 Access code 52 - Initialisation operations

The Access Code is accepted if the ENTER button is kept pressed when the Control Unit is turned on, or first typing the Access Code 123.

Step	Function	NOTES
P1	Setting of the presence of the relays or the opto-isolators 1 = Relay 2 = Opto-isolators	[Common for both of the channels]
P2	Setting the type of power supply of the sensor related to the selected channel 1 = Constant current 2 = Constant voltage	
P3	Setting the type of input signal related to the selected channel 1 = Analogue with input in mV 2 = Analogue with input 4÷20 mA equivalent from 0 to 100 % of the full scale for two-wire transmitters 3 = Analogue with input 4÷20 mA equivalent from 0 to 100 % of the full scale for three-wire transmitters	ATTENTION: In the ATEX version, when passing from a 2 or 3 setting to 1, it is necessary to check in Access Code 4 P4 that the Unit of Measure is Lel or LEL/m.

6.8 Access Code 53 - Default settings

The Access Code is accepted if the ENTER button is kept pressed when the Control Unit is turned on, or first typing the Access Code 123.

Step	General purpose board	Board 4/20 mA	NOTES
	General factory default [related to the selected channel]		
	The Control Unit is configured as specified below:		
P1	Unit of measure: LEL	Unit of measure: LEL	Selective for each channel
	Full scale value: 100	Full scale value: 100	
	Value in Access Code 1 P2: 50 % full scale	Value in Access Code 1, P2: 50 % full scale	The display shows “def”
	Type of sensor power feed: Constant current	Type of sensor power feed: Constant voltage	
	Value of the sensor feed current: 0 mA		
	Value of the Failure current: 25 mA		
	Negative drift indication value: -10	Value of the Failure current: 25 mA	
	Type of input signal accepted: analogue [mV]	Negative drift indication value: -10	
	Provided input signal value: 30 mV	Type of input signal accepted: analogue [mA]	
	Analogue signal provided: Linear	Provided input signal value: 4-20 mA	
	Masking value of the negative indication: -5 %	Analogue signal provided: Linear	
	Masking value of the positive indication: +5 %	Masking value of the negative indication: -5 %	
	Analogue output signal with regular operation: 4÷20 mA	Masking value of the positive indication: +5 %	
	Analogue output signal in the event of a failure: 2 mA	Analogue output signal with regular operation: 4÷20 mA	
	Analogue output signal in Access Code 1: h [only normal version]	Analogue output signal in the event of a failure: 2 mA	
	Relays present: YES	Analogue output signal in Access Code 1: h [only normal version]	
	Activation direction of the alarms: U	Relays present: SI	
	Alarm set-points blocking: Excluded	Activation direction of the alarms: U	
	Activation delay of the alarms: C=0, W=0, A=0	Alarm set-points blocking: Excluded	
	Relay state related to the alarm threshold during regular operation: C=E, W=E, A=E	Activation delay of the alarms: C=0, W=0, A=0	
	Intervention values of the alarm thresholds: C=15, W=15, A=30	Relay state related to the alarm threshold during regular operation: C=E, W=E, A=E	
	Rest mode: C=1°, W=1°, A=1M		
	EEEE function: enabled		
	Operation of the CAUTION opto-isolator: CAUTION		
	Operation of the FAILURE relay: FAILURE		
	State of the FAILURE relay: And:		
	Operation of the HORN relay: Acoustic adviser for exceeding the alarm set-points and EEEE		
	State of the HORN relay: dE		

Step	General purpose board	Board 4/20 mA	NOTES
P1	TIME-OUT OFF function: enabled Days of interval between one calibration and the subsequent calibration: 0 [Alert function not used] Peripherals address: 1 Zone: 1 Memorisation of the events: disabled Password: None	Intervention values of the alarm thresholds: C=15, W=15, A=30 Rest mode: C=1°, W=1°, A=1M EEEE function: enabled Operation of the CAUTION opto-isolator: CAUTION Operation of the FAILURE relay: FAILURE State of the FAILURE relay: And: Operation of the HORN relay: Acoustic adviser for exceeding the alarm set-points and EEEE State of the HORN relay: dE TIME-OUT OFF function: enabled Days of interval between one calibration and the subsequent calibration: 0 [Alert function not used] Peripherals address: 1 Zone:1 Memorisation of the events: disabled Password: None	Selective for each channel The display shows “def”
P2	Recovery of configuration as per Customer Calibration Data Sheet. The original configuration required by the customer as recorded on the Calibration Data Sheet is set on the board	Recovery of configuration as per Customer Calibration Data Sheet. The original configuration required by the customer as recorded on the Calibration Data Sheet is set on the board	

6.9 Access code 123 - Acceptance of protecting access codes [n° 2; 4; 7; 52; 53]

- Hold down the ENTER button until the green LED flashes.
- Set Access Code 123 using the UP button.
- Confirm by pressing ENTER: The display shows - - -
- Press the ENTER button: The display shows 0
- With the UP button, set the desired access code.
- Confirm by pressing ENTER

6.10 Operations for the setting, the use and the modification of the password

The use of the PASSWORD enables further protection from tampering with the set data.

Once inserted, the operator must first enter the password in order to access any of the Access Codes.

Access code 223 - Setting of the password

- Hold down the ENTER button until the green LED flashes.
- Enter Access Code 223 using the UP button.
- Press ENTER: The display shows P1.
- Press ENTER: The display shows 0000.
- Using the UP/DOWN keys, enter the desired password [permissible values: 1*9999].
- Press ENTER to confirm.
- Press ENTER 2 times in succession within 2 seconds to exit.

The password, set in this way, cannot be displayed unless the same password is re-entered, or via the super password, known only by the MSA Technical Support Department and not divulgible to others. With model 9020 it is sufficient to set the password uniquely corresponding to channel A.

Mode of use of the password

If one of the Access Cods is desired, the pre-set password needs to be entered as specified below if, after having pressed the ENTER button until the green LED flashes, the display shows 0000.

If instead it shows 0, this means it is sufficient to proceed in the usual manner.
Enter the reset password using the UP/DOWN buttons.
Press ENTER to confirm and then access the desired Access Code.

Modifying the set password

- Hold down the ENTER button until the green LED flashes.
- Using the UP/DOWN buttons, enter the pre-set password and press ENTER.
- Type in Access Code 223 and press ENTER.
- Press ENTER again after the display has shown P1.
- The pre-set password appears.
- Modify the password using the UP/DOWN buttons.
- Press ENTER to confirm.
- Press ENTER 2 times in succession within 2 seconds to exit.

7 Calibration Procedures

7.1 Calibrations

Attention!

The Control Unit 9010/20 LCD configured for receiving 4/20 mA input signals from 2-wire or 3-wire transmitters does not need any calibration. Check the Calibration Data Sheet to recognise the sensor / transmitter connected to the Control Unit.

The procedure for the calibration is carried out using Access Code 1 and consists of 4 steps:

P1: Zero

P2: Setting the gas concentration calibration value

P3: Calibration of the full scale

P4: Viewing and checking the calibration

It may occur that during the calibration operations, or when they are completed, the display shows messages whose meaning is indicated in Section 9.

The periodic execution of the calibration or the substitution of the sensor is performed with Access Code 1, the heating time before performing the calibration must be at least 30 min. for the catalytic sensors and 1 hour for the electrochemical sensors, the calibration is performed via the following procedure:

- Hold down the ENTER button until the green LED flashes.
- Enter Access Code 1 using the UP button and confirm by pressing ENTER.
- With model 9010, the display shows P1, while with model 9020 it shows Cha.
- In the latter case, press ENTER if you want to operate with channel A or press UP if you desire to operate with channel B.
- Press ENTER to confirm the choice made: The display shows P1 as per model 9010.
- Make sure that the sensor/transmitter is in the required conditions for the zero-setting [zero gas or with the cap for performing the zero-setting using the appropriate adapter contained in the calibration kit].
- Press the ENTER key to confirm the intention to carry out the zero-setting: The display alternates showing P1 and the indication related to the signal transmitted by the sensor.
- Press the ENTER button to perform the zero-setting: The display shows P2.
- Press the ENTER button to confirm that the set value effectively corresponds to the concentration of the gas contained in the calibration cylinder: the display alternates showing P2 and this value. If the value indicated does not coincide with the effective concentration, modify it using the UP/DOWN buttons.

- Confirm the set value by pressing ENTER: The display shows P3 [calibration of the full scale].
- Press the ENTER key to confirm the intention to carry out the calibration: The display alternates showing P3 and the indication related to the signal transmitted by the sensor.
- Cause the calibration gas to flow until the indication in the display is stabilised.
- Confirm by pressing ENTER: The display shows P4.
- Press the ENTER button: The display alternates showing P4 and the indication related to the signal transmitted by the sensor.
- After confirming that the calibration has been performed, remove the gas from the sensor and wait until the indication goes back below the values corresponding to the various alarm thresholds so as not to trigger false alarms.
- Press ENTER 2 times in succession within 2 seconds in order to exit from Access Code 1 with model 9010 or to view Cha with model 9020.- Press ENTER 2 times in succession within 2 seconds in order to exit from Access Code 1 with model 9010 or to view Cha with model 9020.

8 Maintenance

The apparatus does not need particular special maintenance if occasional operations for cleaning the dust and periodic functional checks are excluded [SEE PROCEDURE AT SECTION 6.2, Access Code 1, SECTION 6.4, Access Code 3, step 12].

For applications with sensors / transmitters of SIL 2, the calibration intervals should be reduced in an appropriate manner.

Check the calibration of the sensors / transmitters connected to the inputs of the Control Unit three times a year or more frequently in the event that hazardous conditions are detected in the working conditions of the installation. Use the appropriate calibration gas as specified in the Calibration Data Sheet.

The following checks need to be made with the same frequency: The efficiency of the FAILURE relay contacts and the WARNING and ALARM relays.

These checks also need to be carried out with the board with opto-isolated outputs, in the case in which the relays are installed outside the Control Unit.

In the event of a failure, the Control Unit will have to return to MSA for tests.

MSA ITALY shall not be held liable for damage to items or persons if such checks are not made periodically as indicated above.

For general applications, the calibration checks can be done twice a year.

9 Failure and Error messages

9.1 Failure indications

Control Unit 9010/20 LCD in the presence of anomalies shows the following messages in the display:

F1	For failures in the power supply circuit, interruption of the connection conductors of the sensor and for interruption of the sensor itself. **ATTENTION:** The indication F1 can be output as a requirement of zero function in the commissioning phase or change in the length of the length of the cable of the sensor. The display of this failure has priority over all the other types listed below
F2	If the input signal is too high or the input amplifier is broken, check the input signal or have the board checked by MSA
F3	At initial start-up if the EEPROM has not been programmed or is broken, the board goes to a default of both channels. Have the board checked out by MSA
F4	When switching the Module back on after it was turned off in any of the Access Codes except for 5, press the Enter key, the board will before a new self-diagnosis, then type the Access Code and finish the programming
F5	For failure of the A/D Converter related to the analogue signal; in this case, have the board checked out by MSA
F6	For a malfunction in the internal RAM of the microprocessor, in this case, have the board checked out by MSA
F7	Irregularity detected in checking the EPROM; in this case, replace the EPROM
F8	Irregularity detected in checking the buffered RAM of the microprocessor; in this case perform a default
F9	When switching from the normal configuration to the ATEX configuration, after the confirmation with the Enter key, the board performs a general default
d1	Indication of negative drift [adjustable from zero to 10 % of the full scale], in order to eliminate this anomaly, perform a zero setting of the Control Unit
LOU 1	Power supply 24 VDC external applied to terminals 4 and 5 less than 18 VDC
LOU 2	Primary power supply 115/230 VAC missing

Furthermore, for the ATEX version signals come with the failure relay and the associated LED:

- Taking the Control Unit out of regular service by entering any of the Access Codes.
- Blocking of the alarm set-points

9.2 Error indications

These error messages are shown in the display during the calibration or upon completion thereof.

E1	If the difference between the zero signal and the full scale signal is < at 2 mV [the calibration will not be accepted, the previous one remains and the indication alternates with E1 and the Failure triggers only for the ATEX version]
E2	If the difference between the zero signal and the full scale signal is ≥ 200 mV [the calibration will be accepted and the indication alternates with E2]
E3	If the difference between the zero signal and the full scale signal is between 2 and 3 mV [the calibration will be accepted and the indication alternates with E3]
E4	If the signal exceeds the field of +300 mV with the calibration referred to the full scale, but while performing the calibration with zero and span signals within the 300 mV [e.g. zero signal 280 mV, span signal 10 mV, calibration setting 20] *[the calibration will be accepted and the indication alternates with E4]*
E10	Appears when the same value is erroneously set for offset value and full scale value

10 Marking, Certificates and Approvals According to the Directive 94/9/EC (ATEX)

Manufacturer:	MSA AUER GmbH Thiemannstrasse 1 D-12059 Berlin
Product:	**Control Unit Models 9010 LCD and 9020 LCD**
Type of protection:	see Remote Sensor, the control system must be installed outside of the hazardous area
Performance	EN 60079-29-1 :2007 EN 50104 :2010 EN 50271:2010 EN 50 402 :2009
Marking:	 II (1) G Remote sensor has to be connected with intrinsic safe supply to the 9010/9020 II (2) G
EC-Type Examination Certificate	INERIS 00 ATEX 0028 X
Quality Assurance Notification:	0080
Year of Manufacture :	see label
Serial Nr. :	see label

11 Ordering Information

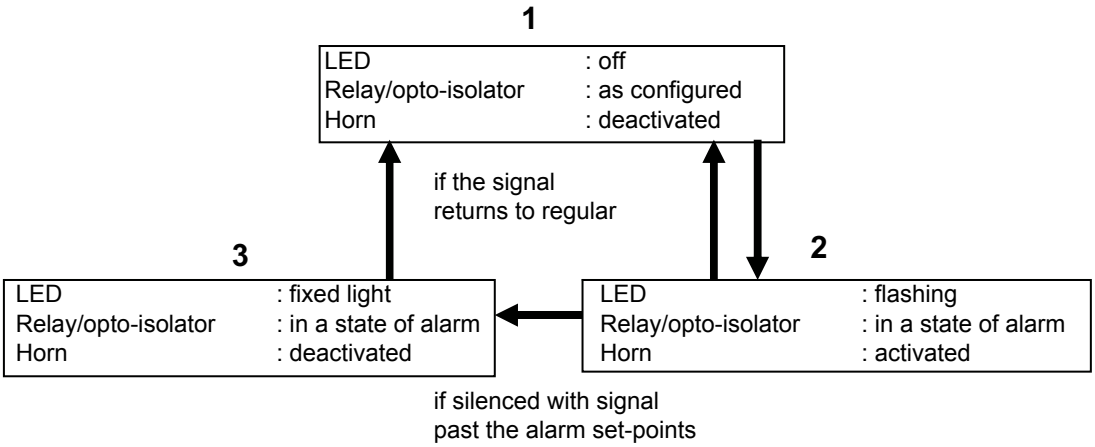
Description		SAP-P/N
Control unit 9010 LCD general purpose	10093583	
Control unit 9010 LCD 4/20 mA	10093585	
Control unit 9020 LCD general purpose	10093582	
Control unit 9020 LCD 4/20 mA	10093584	
Control unit 9010 LCD wall mount	10093662	
Control unit 9020LCD wall mount	10093663	
Control unit 9020-4	10093664	
Front panel 9010 LCD for rack version board		10029768
Front panel 9020 LCD for rack version board		10029769
Front panel 9010 LCD PCB with header		10061926
Front panel 9020 LCD PCB with header		10061927
Fuse F1 - 250 mA [for 230 VAC supply]		
Fuse F1 - 500 mA [for 115 VAC supply]		
Fuse F3 - 2 A [for 24 VDC supply]		10029845
Fuse F2 - 1 Amp [secondary transformer]		10029844
Standard back terminal board		10029373
Rear terminal board for flat cable		10029843
Rear terminal wall mount version		10061934
Failure relay		10029842
Alarm, Warning, Horn relays		10029841
Jumpers p.5.08		10029840
Optional components		
Opto-isolated card common emitter	10094047	
Opto-isolated card common collector	10094046	

12 Appendix

12.1 Appendix 1- ISA sequence - Reset modes

1 A - Automatic reset

Horn cut-out and reset are performed using one of the Up ▲ and/or Down ▼ buttons



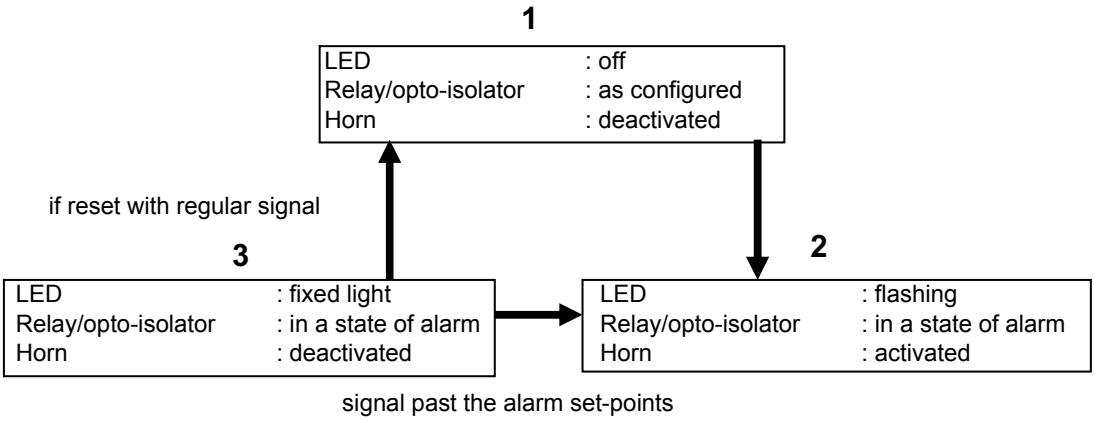
1 Condition with regular signal

2 Condition with signal past the alarm set-point

3 Same as above, but with alarm silenced

1 M - Manual Reset

Horn cut-out and reset are performed using one of the Up ▲ and/or Down ▼ buttons



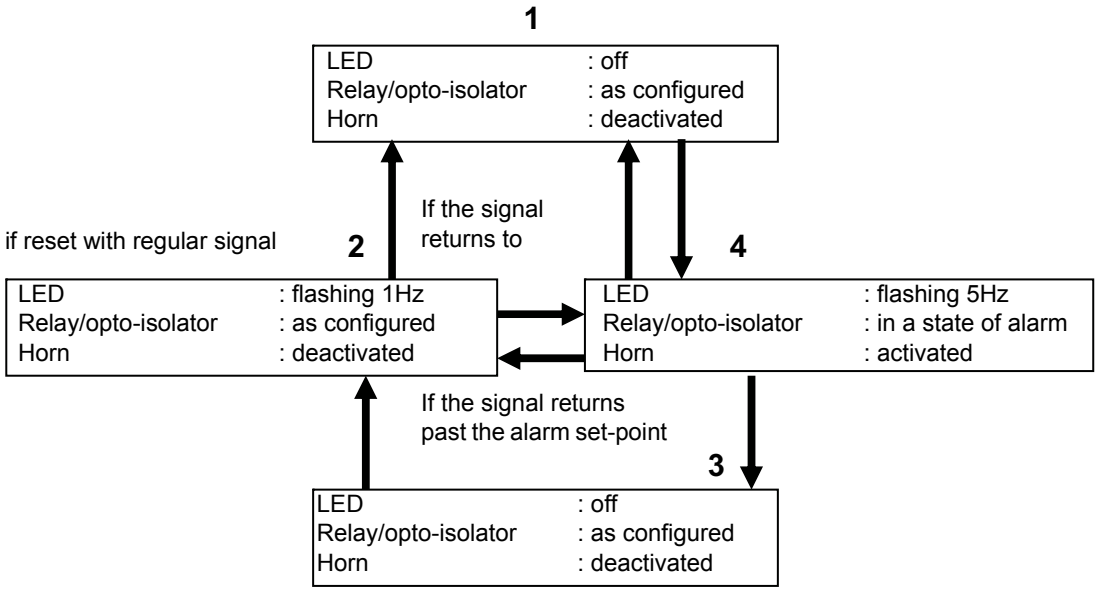
1 Condition with regular signal

2 Condition with signal past the alarm set-point

3 Same as above, but with acoustic alarm silenced or with regular signal waiting for reset

2 A - Automatic reset with memorisation of the alarm event

Horn cut-out and reset are performed using one of Up ▲ and/or Down ▼ buttons



1 Condition with regular signal

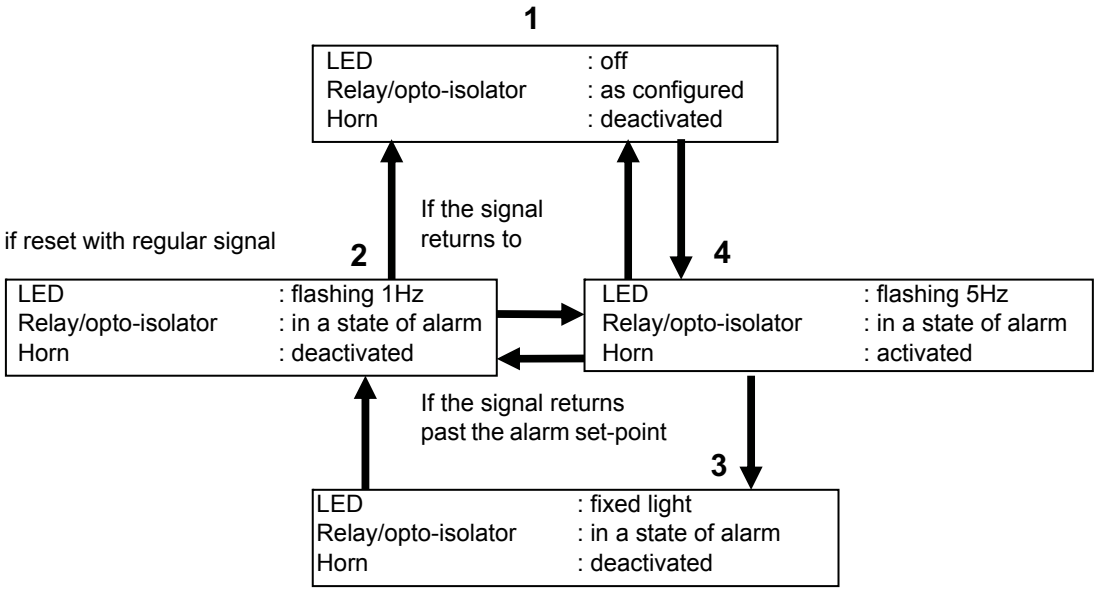
2 Condition with signal past the alarm set-point

3 Same as above, but with acoustic alarmsilenced

4 Condition with regular signal waiting for reset of the flashing

2 M - Manual reset with memorisation of the alarm event

Silencing and reset are performed using one of the Up ▲ and/or Down ▼ buttons



1 Condition with regular signal

2 Condition with signal past the alarm set-point

3 Same as above, but with acoustic alarm silenced

4 Condition with regular signal waiting for reset

12.2 Appendix 2

Control Unit 9010/20 LCD

Control Units 9010 LCD and 9020 LCD can accept, respectively one or two input signals originating from sensors/transmitters. These sensors/transmitters, with a 4-20 mA circuit will have to have the right CE [EC] type certificate and will have to conform to Section 1.5 of Attachment II of Directive 94/9/CE.

Control unit channels A and B configured for an input signal of 4-20 mA

Measurement range 0-100 % LEL

Input 4/20 mA	Theoretical reading	Display reading 9020 LCD	
		Ch A	Ch B
2	-12,5	d1	d1
4	0	0	0
6	12,5	12	12
8	25	25	25
10	37,5	37	37
12	50	50	50
14	62,5	62	62
16	75	75	75
18	87,5	87	87
20	100	100	100

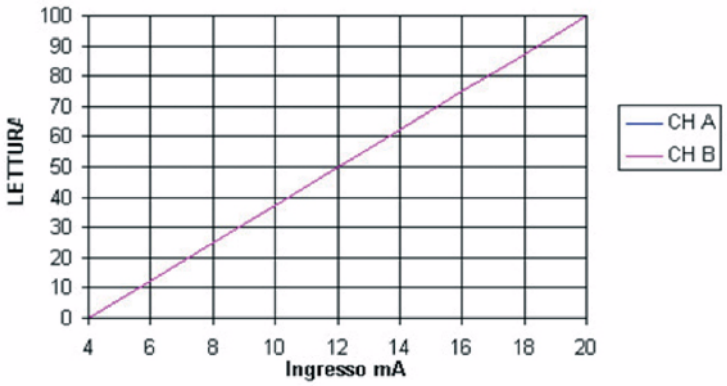


Fig. 13 Response curve for mA input

12.3 Appendix 3

Control Unit 9010/20 LCD

Control unit channels A and B configured for an input signal of 4-20 mA

Measurement range 0-100 % full scale

Input 4/20 mA	Theoretical reading	Display reading 9020 LCD	
		Ch A	Ch B
2	-12,5	d1	d1
4	0	0	0
6	12,5	12	12
8	25	25	25
10	37,5	37	37
12	50	50	50
14	62,5	62	62
16	75	75	75
18	87,5	87	87
20	100	100	100

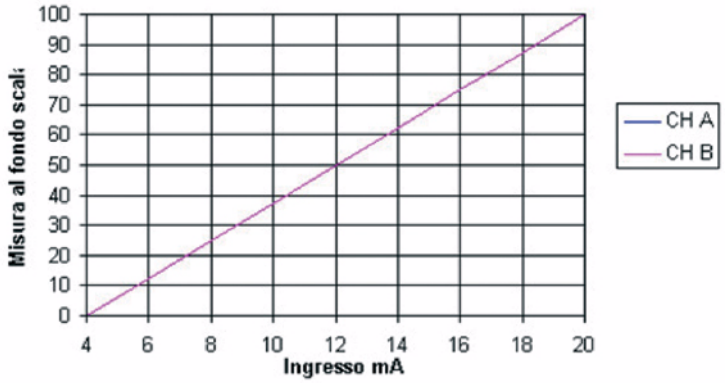
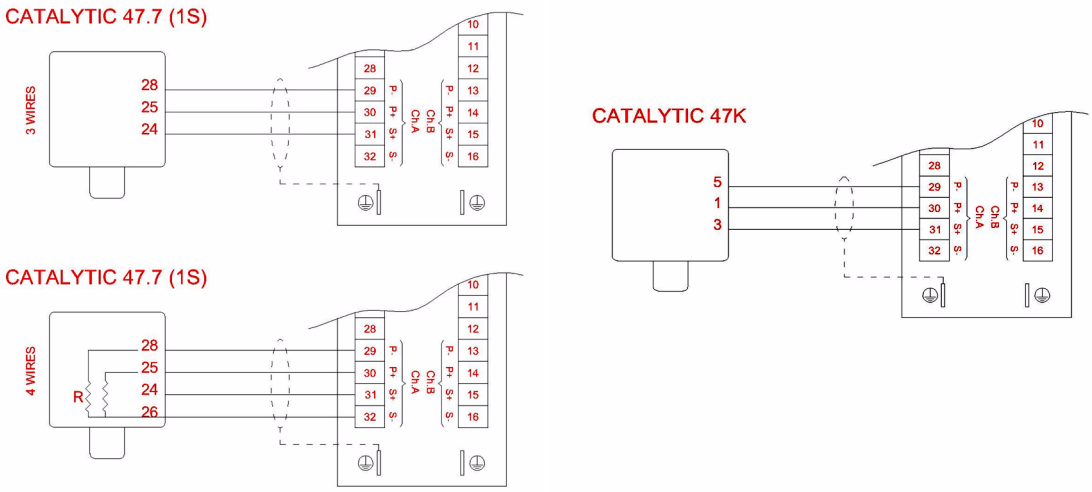


Fig. 14 Response curve for mA input

12.4 Appendix 4

9010/20 LCD rev3 Connections with catalytic sensor



Configuration 9010/20 LCD

	Board 9010 LCD rev 3	Board 9020 LCD rev 3
General purpose board article no.	10093583	10093582
Simulation module article no.	10063805	
Hardware configuration	The configuration of the jumpers on the board is done in the factory as per Tables 2 and 3	
Config. software	The configuration of the board has been done in the factory, recalling the configuration as per the Calibration Data Sheet is accomplished with Access Code 53 P2 .	

Catalytic sensor data

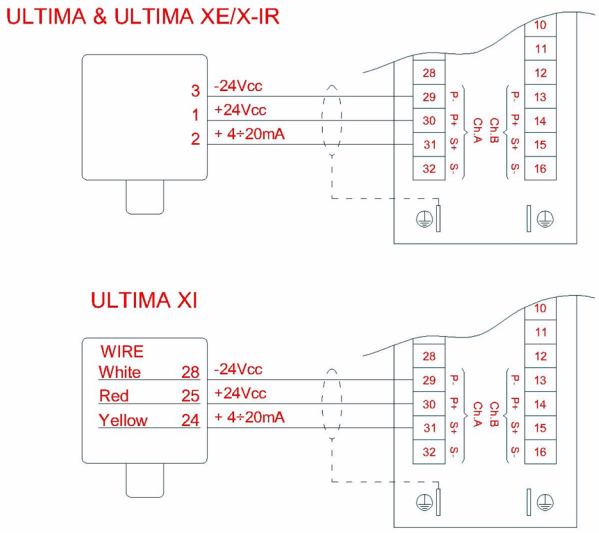
	Series 47.7 [1S poison]	Series 47K [standard]	NOTES
Power supply in current	375 mA	310 mA	280 mA 47K-HT
Voltage power supply at the bridge	3 VDC approximately		
Typical power	1 W		
Exit into the air signal	Max +/- 60 mV		
Operating temperature	-40°C to +90°C -40°C to +160°C series HT		
Weight	approx. 0.3 kg		
Dimensions	36x56 [just sensor]		
Sensor material	Stainless steel/ aluminium	Stainless steel	
Connection cable data			
Cable type	Shielded at least 80 %		
Max. section permitted for the terminals	2.5 mm²		

Maximum connection distance as a function of the electrical power supply

	Board power supply 115/230 VAC		Power supply 24 VDC
	U.C. 9010 LCD rev3	U.C. 9020 LCD rev.3	U.C 9010/20 LCDrev 3
Sensor Power Supply			
Sensor 47.7 [375 mA]	1200 m	900 m	1400 meters
Sensor 47K [310 mA]	1500 m	1200 m	1700 meters

The data refer to the nominal voltages and with a wire having a 1.5mm² section Distances must be derated by 25-30 % approx. if nominal voltages drop by 15-20 %
For other data or more details, consult the specific manual or contact the Technical Support Department

9010/20 LCD rev3-Connections with Ultima X transmitters



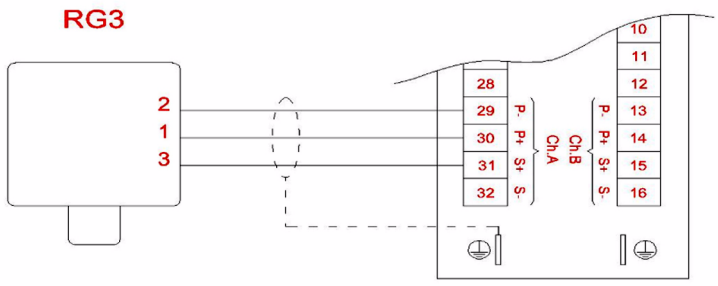
Configuration 9010/20 LCD

	Board 9010 LCD rev 3	Board 9020 LCD rev 3
4/20 mA board article no.	10093585	10093584
General purpose board article no.	10093583	10093582
Simulation module article no.	10063804	
Hardware configuration	The 4/20 mA board does not require any configuration and is predisposed for connection with 2-wire and/or 3-wire MSA transmitters. The configuration of the jumpers on the general purpose board is done in the factory as per Tables 2 and 3.	
Config. software	The configuration of the board has been done in the factory, recalling the configuration as per the Calibration Data Sheet is accomplished with Access Code 53 P2.	

Typical data of the transmitters Ultima XE,Ultima XIR,Ultima XI

	XE [catalytic]	XIR	XI	NOTES
Power supply	7-30 VDC	7-30 VDC	7-30 VDC	
Number of conductors	3	3	3	
24VDC current consumption - typical	150 mA	200 mA	200 mA	
Output signal	4-20 mA	4-20 mA	4-20 mA	Source type
Operating temperature		-40 °C to +60 °C		
Weight	Approx. 5 kg	5 kg	3 kg	
Dimensions	262x162x100 mm	150x320x100 mm	Ø 64x203 mm	
Material	Stainless steel			
Connection cable data				
Cable type		Shielded at least 80%		
Max line length with 9010	900 m [with relay]	500 m [with relay]	500 m	With 1.5 mm² wire
Max line length with 9020	700 m	250 m	350 m	
Max load at 4-20 mA	600 Ohms	600 Ohms	600 Ohms	At 24 VDC
The data refer to the nominal voltages and with a wire having a 1.5 mm² section Distances must be derated by 25-30 % approx. if nominal voltages drop by 15-20 %				
For other data or more details, consult the specific manual or contact the Technical Support Department				

9010/20 LCD rev3-Connections with RG3 transmitter



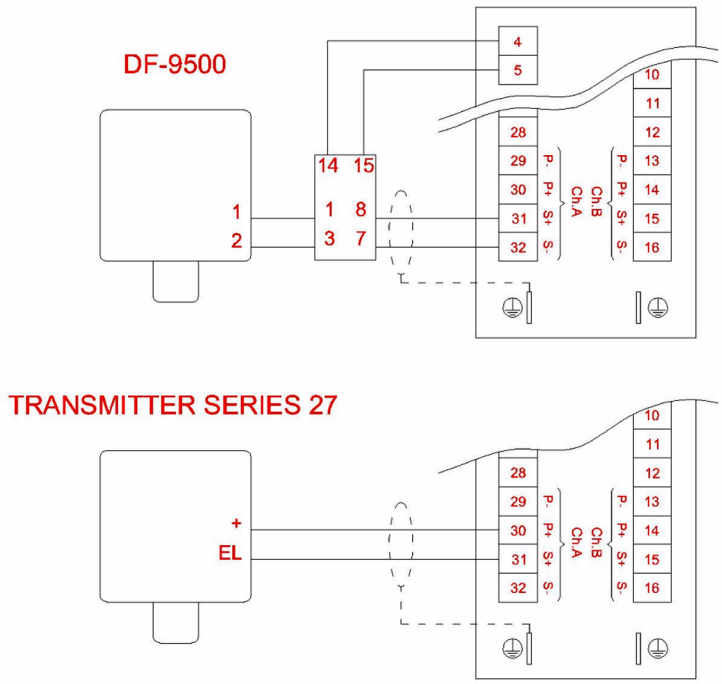
Configuration 9010/20 LCD

	Board 9010 LCD rev 3	Board 9020 LCD rev 3
4/20 mA board article no.	10093585	10093584
General purpose board article no.	10093583	10093582
Simulation module article no.	10063804	
Hardware configuration	The 4/20 mA board does not require any configuration and is predisposed for connection with 2-wire and/or 3-wire MSA transmitters. The configuration of the jumpers on the general purpose board is done in the factory as per Tables 2 and 3	
Config. software	The configuration of the board has been done in the factory, recalling the configuration as per the Calibration Data Sheet is accomplished with Access Code 53 P2.	

Typical data of RG3 transmitter

	RG3		NOTES
Power supply	10 ÷ 30 VDC		
24 VDC current consumption	Approx. 130 mA		With catalytic sensor
Output signal	4 - 20 mA and Rs 485		4/20 mA source type output
St. operating temperature	-20 °C ÷ +55 °C		
Transmitter weight	2500 g		
Dimensions	119x119x125		
Container material	Aluminium		
Connection cable data			
Cable type	Shielded at least 80 %		
Max. load at output 4-20 mA	600 Ohms		24 VDC
Maximum connection distance as a function of the electrical power supply			
	Board power supply 115/230 VAC / 24 VDC		
	U.C. 9010 LCD rev3	U.C. 9020 LCD rev.3	
RG-3 relay board and catalytic sensor 47.7	1000 m	750 m	
The data refer to the nominal voltages and with a wire having a 1.5 mm² section			
Distances must be derated by 25-30 % approx. if nominal voltages drop by 15-20 %			
For other data or more details, consult the specific manual or contact the Technical Support Department			

9010/20 LCD rev3-Connections with electro-chemical transmitters



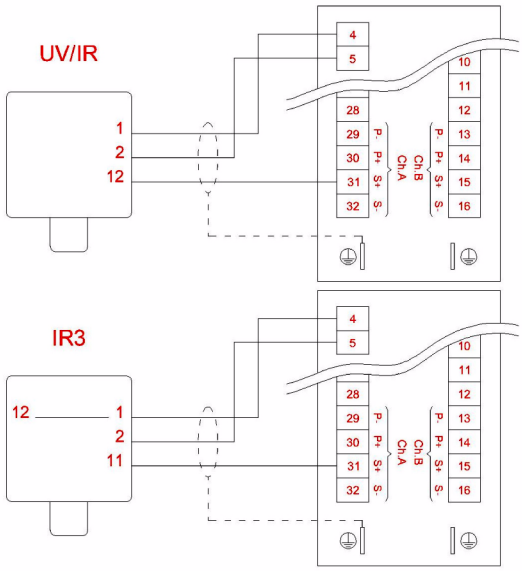
Configuration 9010/20 LCD

	Board 9010 LCD rev 3	Board 9020 LCD rev 3
4/20 mA board article no.	10093585	10093584
General purpose board article no.	10093583	10093582
Simulation module article no.	10063804	
Isolated barrier KFD2-STC4 for DF 9500	10056093	
Hardware configuration	The 4/20 mA board does not require any configuration and is predisposed for connection with 2-wire and/or 3-wire MSA transmitters. The configuration of the jumpers on the general purpose board is done in the factory as per Tables 2 and 3	
Config. software	The configuration of the board has been done in the factory, recalling the configuration as per the Calibration Data Sheet is accomplished with Access Code 53 P2.	

Typical data of electrochemical transmitters

	Series 27	DF9500	NOTES
Power supply	13-28 VDC	13-30 VDC	
Number of conductors	2	2	
Output signal	4-20 mA	4-20 mA	Source type output
Operating temperature	-20°C to +40/50°C*	-20°C to +40°C*	*Depending on the analysis
Weight	Approx. 3 kg	Approx. 1 kg	
Dimensions	119x200x120	122x153x81 mm	
Material	Aluminium/steel	Plastic	
Connection cable data			
Cable type	Shielded at least 80%		
Max line length with 9010	1500 m	1500 m	With 1.5 mm² wire
Max line length with 9020	1500 m	1500 m	With 1.5 mm² wire
Max load at 4-20 mA	600 Ohms	600 Ohms	24 VDC
The data refer to the nominal voltages and with a wire having a 1.5 mm² section			
Distances must be derated by 25-30 % approx. if nominal voltages drop by 15-20 %			
For other data or more details, consult the specific manual or contact the Technical Support Department			

9010/20 LCD rev3-Connections with Flame Detector Transmitters



Configuration 9010/20 LCD

	Board 9010 LCD rev 3	Board 9020 LCD rev 3
4/20 mA board article no.	10093585	10093584
General purpose board article no.	10093583	10093582
Simulation module article no.	10063804	
Hardware configuration	The 4/20 mA board does not require any configuration and is predisposed for connection with 2-wire and/or 3-wire MSA transmitters. The configuration of the jumpers on the general purpose board is done in the factory as per Tables 2 and 3 Both the versions are configured with internal power supply [Cv 18 item 1-2]	
Config. software	The configuration of the board has been done in the factory, recalling the configuration as per the Calibration Data Sheet is accomplished with Access Code 53 P2 .	
NOTES	The Ir3 detector model 20/20 requires an internal jumper between terminals 1 and 12 for the 4/20 mA source type output	

Typical data of the flame detectors UV-IR and IR3

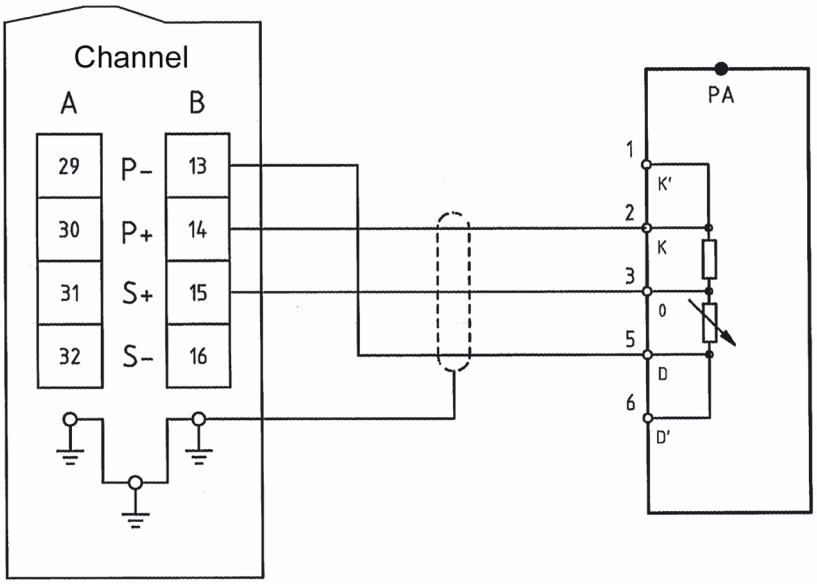
	UV-IR	IR3	NOTES
Power supply	18-32 VDC	18-32 VDC	
24 VDC current consumption	250 mA	250 mA	
Output signal	4-20 mA source	4-20 mA source*	*sink also available
St. operating temperature	-40°C at +70°C	-40°C at +70°C	
Weight of aluminium cont.	Approx. 3.7 kg	3.5 kg	
Dimensions	132x132x120	132x132x120	
Material	Aluminium/ stainless steel	Aluminium/ stainless steel	
Connection cable data			
Cable type	Shielded at least 80 %	Shielded at least 80 %	
Max line length with 9010	500 m	500 m	
Max line length with 9020	500 m	500 m	
Max load at 4-20 mA	600 Ohms	600 Ohms	24 VDC
The data refer to the nominal voltages and with a wire having a 1.5 mm² section			
Distances must be derated by 25-30 % approx. if nominal voltages drop by 15-20 %			
For other data or more details, consult the specific manual or contact the Technical Support Department			

Connection data sheets for sensors

9010/20 LCD	Sensor data sheet D-7100	Part No.: D0791610

Terminal Block
9010/9020

Sensor Type D-7100



Caution: **Before connecting the measuring head bridge current, check hardware and software settings.**
On the 9010/9020 LCD, the cable shield is applied on one side.

Sensor type: Catalytic/passive/constant current supply [3 wire passive]

Connection data:

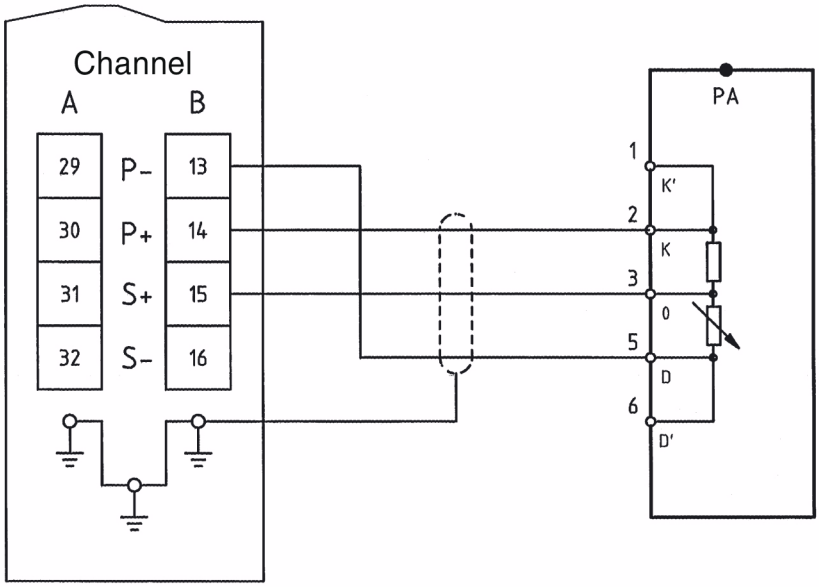
Bridge current:	270 mA/310 mA, for methane only
Maximum rated current:	350 mA
Maximum rated voltage:	≤ 2.8 V
Power requirement:	≤ 1.0 W [excluding cable lengths]
Connection cable:	3-lead, 80 % shielded
Maximum loop resistance:	32 Ohm
Maximum cable length:	1,000 m [with 1.5 mm^2 cross-section]
Cable diameter:	8...13 mm
Permitted cable cross-section:	0.75 – 2.5 mm^2
Cable gland thread:	M 20 x 1,5

Conditions for use:

Assembly:	Wall-mounted
Ingress protection:	IP 54/EN 60529
Explosion protection:	Ex II 2G EEx d e IIC T5 /T6
Approval:	DMT 98 ATEX E016 X
Temperature:	-20 °C to + 40 °C [T6] /-20 °C to +55 °C [T5]
Humidity:	5–95% rel. humidity; non-condensing
Atmospheric Pressure:	950 – 1,100 hPa
Weight:	Approximately 1.24 kg
Dimensions W x D x H:	150 mm x 88 mm x 158 mm
Housing material:	Cast aluminium [polyester-coated]

9010/20 LCD	**Sensor data sheet D-7010**	**Art.-Nr.: D0791601**

Terminal Block
9010/9020 Sensor Type D-7010



Caution: **Before connecting the measuring head bridge current, check hardware and software settings.**
On the 9010/9020 LCD, the cable shield is applied on one side.

Sensor type: Catalytic/passive/constant current supply

Connection data:

Bridge current:	270 mA/300 mA, for methane only
Maximum rated current:	330 mA
Maximum rated voltage:	≤ 6.2 V
Power requirement:	≤ 1.8 W [excluding cable lengths]
Connection cable:	3-lead, 80% shielded
Maximum loop resistance:	26 Ohm
Maximum cable length:	600 m [with 1.5 mm^2 cross-section]
Cable diameter:	8 – 13 mm
Permitted cable cross-section:	0.75 – 2.5 mm^2
Cable gland thread:	M 20 x 1,5

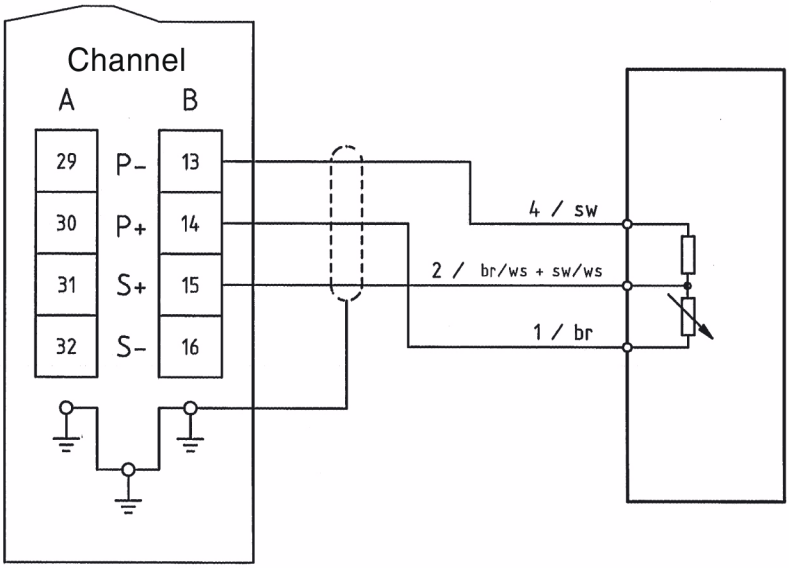
Conditions for use:

Assembly:	Wall-mounted
Ingress protection:	IP 54/EN 60529
Explosion protection:	Ex II 2G EEx d e IIC T5 /T6
Approval:	DMT 98 ATEX E016 X
Temperature:	-20 °C to +40 °C [T6] /-20 °C to +55 °C [T5]
Humidity:	5 – 95% rel. humidity; non-condensing
Pressure:	950 – 1,100 hPa
Weight:	Approximately 1.24 kg
Dimensions W x D x H:	150 mm x 88 mm x 158 mm
Housing material:	Cast aluminium [polyester-coated]

9010/20 LCD	Sensor data sheet TYPE 410	Part No.: 10000135 [Alu] M25 Part No.: 10000137 [St.St.] M20

Terminal Block
9010/9020

Sensor Type 410



Caution: **Before connecting the measuring head bridge current, check hardware and software settings.**

On the 9010/9020 LCD, the cable shield is applied on one side.

Sensor type: Catalytic/passive/constant current supply [3 wire passive]

Connection data:

Bridge current:	270 mA/310 mA, for methane only
Maximum rated current:	350 mA
Maximum rated voltage:	≤ 3.0 V
Power requirement:	≤ 1.0 W [excluding cable lengths]
Connection cable:	3-lead, 80 % shielded
Maximum loop resistance:	12 Ohm
Maximum cable length:	500 m [with 1.5 mm^2 lead cross-section]
Cable diameter:	8 – 13 mm
Permitted lead cross-section:	0.75 – 2.5 mm^2
Cable insertion:	M25 x 1.5 / M20 x 1.5

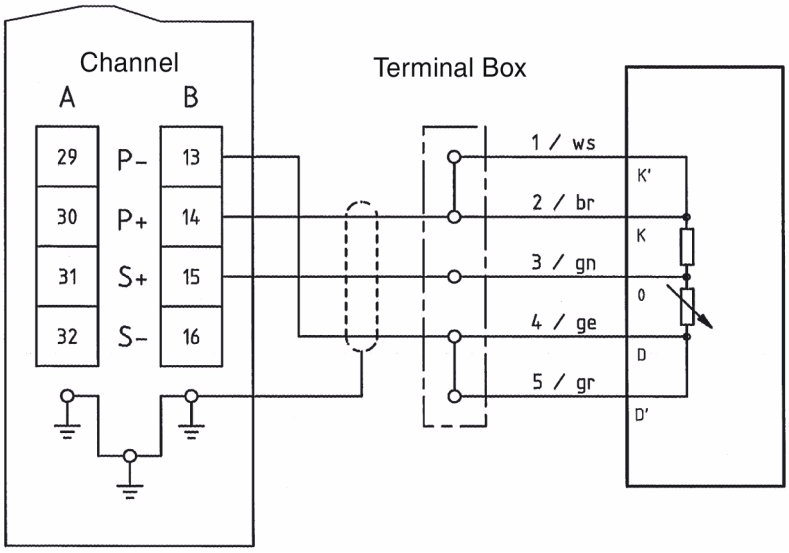
Conditions for use:

Assembly:	Wall-mounted
Protection:	IP 54/EN 60529
Explosion protection:	Ex II 2G EEx d IIC T6
Approval:	Basefa 04ATEX0117X
Temperature:	-20 °C to +60 °C
Humidity:	5 – 95% rel. humidity; non-condensing
Pressure:	950 – 1,100 hPa
Weight:	approx. 1.24 kg
Dimensions W x D x H:	120 mm x 72 mm x 140 mm
Housing material:	Cast aluminium [polyester-coated]

9010/20 LCD	Sensor data sheet D-715 K	Part No.: D0715601

Terminal Block
9010/9020

Sensor Type D-715 K



Caution: **Before connecting the measuring head bridge current, check hardware and software settings.**

On the 9010/9020 LCD, the cable shield is applied on one side.

Sensor type: Catalytic [passive/constant current supply [3 wire passive]

Connection data:

Bridge current:	270 mA/300 mA, for methane only
Maximum rated current:	330 mA
Power requirement:	≤ 0.6 W [excluding cable lengths]
Connection cable:	3-lead, 80 % shielded
Maximum loop resistance:	36 Ohm
Maximum cable length:	1,000 m [with 1.5 mm^2 lead cross-section]
Cable diameter:	8.5 mm
Lead cross-section:	1.5mm^2
Terminal box:	EEx e [Part No.: D0715205]

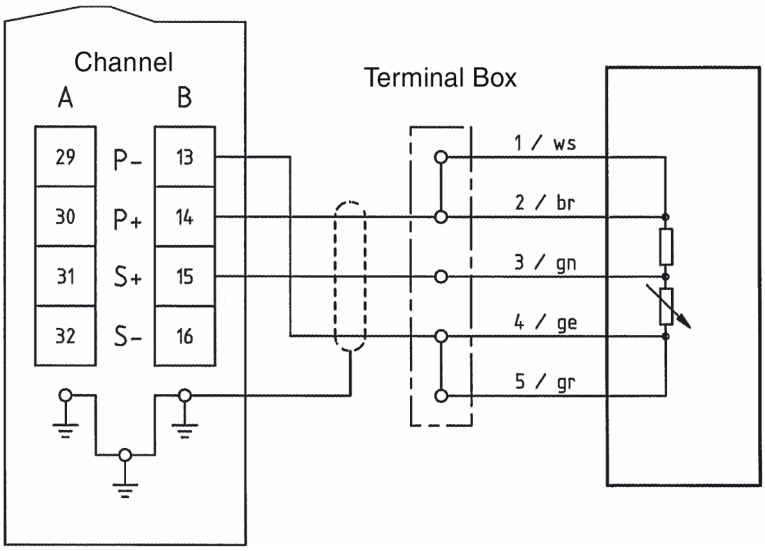
Conditions for use:

Assembly:	Wall-mounted
Protection:	IP 42 nach DIN 400 50
Explosion protection:	Ex II 2G EEx d IIC T6 -40 °C ≤ Ta ≤ +60 °C
Approvals:	PTB 01 ATEX 1152 X
Temperature:	-25 °C to +55 °C [methane to +60 °C]
Humidity:	5–95% rel. humidity/40 °C; non-condensing
Pressure:	800 – 1,100 hPa
Weight:	approx.0.72 kg
Dimensions W x D x H:	50 mm x 40 mm x 50 mm
Housing material:	1.4305, V2A
Heat-up time:	≤ 60 s
Response time t_{90}:	Methane ≤ 10 s Hydrogen ≤ 10 s Propane ≤ 14 s Acetone ≤ 18 s Ethanol ≤ 20 s Toluol ≤ 25 s Ethane ≤ 20 s

9010/20 LCD	Sensor data sheet D-7152 K	Part No.: D0715685

Terminal Block
9010/9020

Sensor Type D-7152 K



Caution: **Before connecting the measuring head bridge current, check hardware and software settings.**

On the 9010/9020 LCD, the cable shield is applied on one side.

Sensor type: Catalytic/passive/constant current supply [3 wire passive]

Connection data:

Bridge current:	310 mA for all measuring components
Maximum rated current:	330 mA
Power requirement:	≤ 0.6 W [excluding cable lengths]
Connection cable:	3-lead, 80 % shielded
Maximum loop resistance:	36 Ohm
Maximum cable length:	1,000 m [with 1.5 mm^2 lead cross-section]
Cable diameter:	8.5 mm
Lead cross-section:	1.5mm^2
Terminal box:	EEx e [Part No.: D0715205]

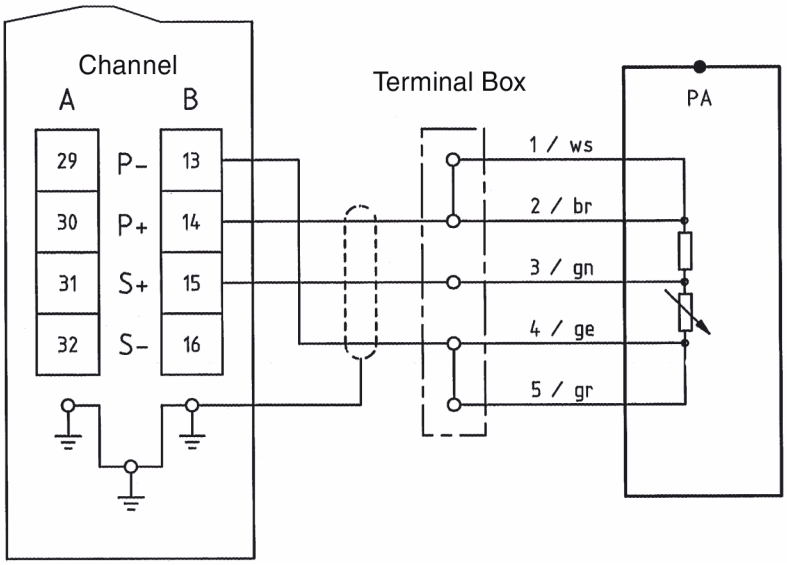
Conditions for use:

Assembly:	Wall-mounted
Protection:	IP 42 to DIN 400 50
Explosion protection:	Ex II 2G EEx d IIC T6 ≤ -40 °C ≤ Ta ≤ +60 °C
Approvals:	PTB 01 ATEX 1152 X
Temperature:	-15 °C to +55 °C [methane to +60 °C]
Humidity:	5–95% relative humidity; non-condensing
Pressure:	900 – 1,100 hPa
Weight:	approx.0.72 kg
Dimensions W x D x H:	50 mm x 40 mm x 50 mm
Housing material:	Stainless Steel [DIN 1.4305, V2A]
Heat-up time:	≤ 60 s
Response time t_{90}:	Methane ≤ 10 s Hydrogen ≤ 10 s Propane ≤ 14 s Acetone ≤ 18 s Ethanol ≤ 20 s Toluol ≤ 25 s Ethane ≤ 20 s

9010/20 LCD	Sensor data sheet D-7711 K	Part No.: D0715642

Terminal Block
9010/9020

Sensor Type D-7711 K



Caution: **Before connecting the measuring head bridge current, check hardware and software settings.**
On the 9010/9020 LCD, the cable shield is applied on one side.

Sensor type: Catalytic/passive/constant current supply [3 wire passive]

Connection data:

Bridge current:	300 mA, for all measuring components
Maximum rated current:	350 mA
Power requirement:	approx. 0.6 W [excluding cable lengths]
Connection cable:	3-lead, 80 % shielded
Maximum loop resistance:	36 Ohm
Maximum cable length:	1,000 m [with 1.5 mm^2 lead cross-section]
Cable diameter:	5,5 mm
Lead cross-section:	1.5mm^2
Terminal box:	EEx e [Part No.: D0715205]

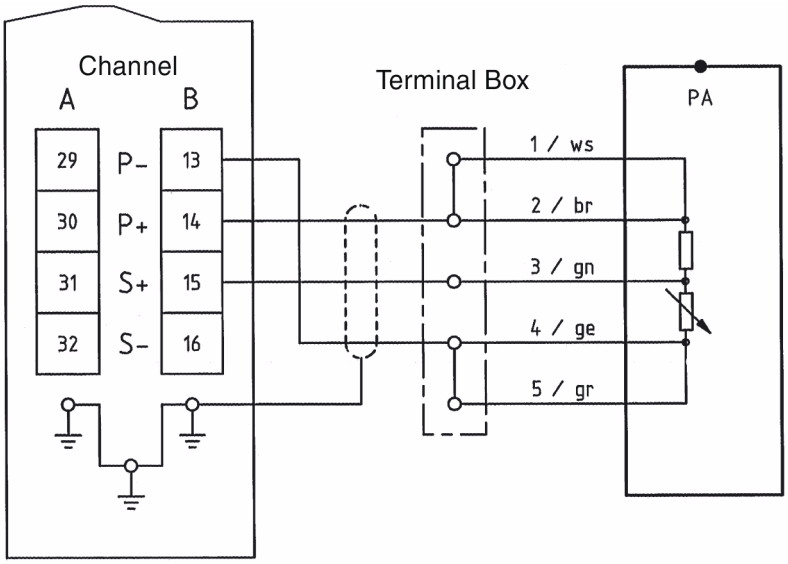
Conditions for use:

Assembly:	Wall-mounted
Protection:	IP 42 [housing] to DIN 400 50
Explosion protection:	Ex II 2G EEx d IIC T6 -40 °C ≤ Ta ≤ +60 °C
Approvals:	PTB 01 ATEX 1152 X
Temperature:	-40 °C to +55 °C [methane to +80 °C]
Humidity:	5–95% relative humidity; non-condensing
Pressure:	800 – 1,100 hPa
Weight:	approx. 0.72 kg
Dimensions W x D x H:	50 mm x 40 mm x 50 mm
Housing material:	Stainless Steel [DIN 1.4305, V2A]
Heat-up time:	≤ 60 s
Response time t_{90}:	Methane ≤ 10 s Hydrogen ≤ 10 s Propane ≤ 14 s Acetone ≤ 18 s Ethanol ≤ 20 s Toluol ≤ 25 s Ethane ≤ 20 s

9010/20 LCD	Sensor data sheet D-7711 K-PR	Part No.: 10046889

Terminal Block
9010/9020

Sensor Type D-7711 K-PR



Caution: **Before connecting the measuring head bridge current, check hardware and software settings.**

On the 9010/9020 LCD, the cable shield is applied on one side.

Sensor type: Catalytic/passive/constant current supply [3 wire passive]

Connection data:

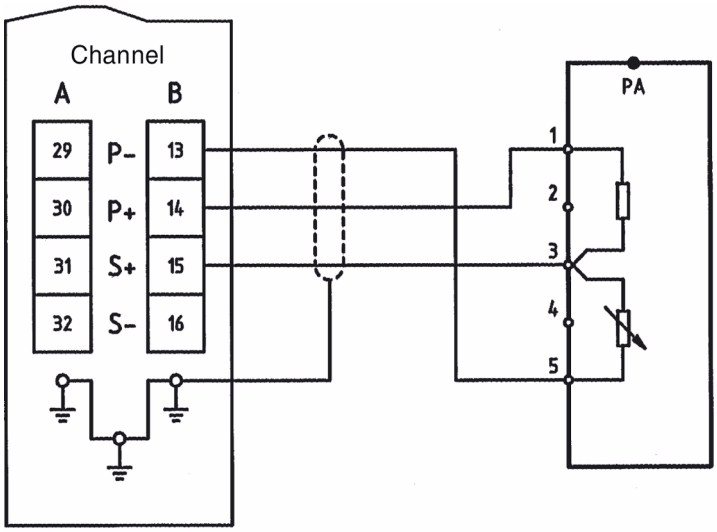
Bridge current:	310 mA, for all measuring components
Maximum rated current:	300 mA
Power requirement:	approx. 0,6 W [excluding cable lengths]
Connection cable:	3-lead, 80 % shielded
Maximum loop resistance:	36 Ohm
Maximum cable length:	1,000 m [with 1.5 mm^2 lead cross-section]
Cable diameter:	8.5 mm
Lead cross-section:	1.5 mm^2
Terminal box:	EEx e [Part No.: D0715205]

Conditions for use:

Assembly:	Wall-mounted
Protection:	IP 42 [housing] to DIN 400 50
Explosion protection:	Ex II 2G EEx d IIC T4 ≤ -40 °C ≤ Ta ≤ +100 °C
Approvals:	PTB 01 ATEX 1152 X N1
Temperature:	-20 °C to +55 °C [methane to +100 °C]
Humidity:	5–95% relative humidity; non-condensing
Atmospheric Pressure:	900 – 1,100 hPa
Weight:	approx. 0.72 kg
Dimensions W x D x H:	50 mm x 40 mm x 50 mm
Housing material:	Stainless Steel [DIN 1.4305, V2A]
Heat-up time:	≤ 60 s
Response time t90:	Methane ≤ 10 s Hydrogen ≤ 10 s Propane ≤ 14 s Acetone ≤ 18 s Ethanol ≤ 20 s Hydrogen ≤ 25 s Ethane ≤ 20 s

9010/20 LCD	Sensor data sheet Series 47 K-ST and PRP	Part No.: as per ordering information

Terminal Block 9010/9020 Series 47 K Standard & PRP



Caution: **Before connecting the measuring head bridge current, check hardware and software settings.**
On the 9010/9020 LCD, the cable shield is applied on one side.

Sensor type: Catalytic/passive/constant current supply [3 wire passive]

Connection data:

Bridge current:	310 mA
Maximum rated current:	350 mA
Maximum rated voltage:	≤ 3.0 V
Power requirement:	≤ 1.0 W [excluding cable lengths]
Connection cable:	3-lead, 80% shielded
Maximum loop resistance:	36 Ohm
Maximum cable length:	1,000 m [with 1.5 mm^2 lead cross-section]
Cable diameter:	8...13.5 mm
Permitted lead cross-section:	1.0-2.5 mm^2
Cable insertion:	e-housing; d-housing
Terminal box: EExd 2 x 3/4“ NPT	Part No.: 10046464
Terminal box: EExe 2 x M25 x 1,5	Part No.: 10048198

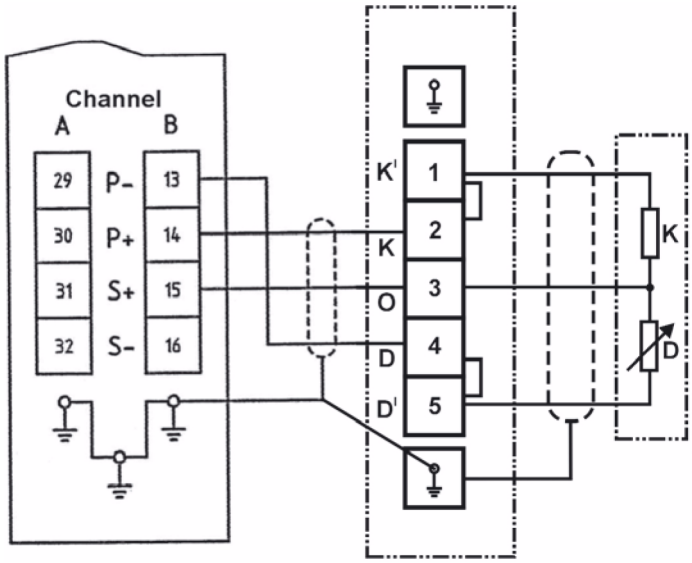
Conditions for use:

Assembly:	Wall-mounted
Protection:	IP 42 [Gehäuse] nach DIN 400 50
Explosion protection:	Ex II 2G EEx d IICT4 [-40 °C bis +90°C] Ex II 2G EEx d IICT6 [-40 °C bis +40°C]
Approvals:	INERIS 03 ATEX 0208
Temperature:	-20 °C to +40 °C
Humidity:	5 – 95 % relative humidity; non-condensing
Pressure:	47 K-ST: 900-1,100 hPa, 47K-PRP: 1,000 +/- 50 hPa
Weight:	720 g
Dimensions W x D x H:	80 mm x 55 mm x 125 mm
Housing material:	Stainless steel
Further details in the Operating and Maintenance Instructions [Part No.: 10052472]	

9010/20 LCD	Sensor data sheet Serie 47 K-HT	Part No.: 10048199

Terminal Block
9010/9020

Series 47 K-HT



Caution: **Before connecting the measuring head bridge current, check hardware and software settings.**

On the 9010/9020 LCD, the cable shield is applied on one side.

Sensor type: Catalytic/passive/constant current supply [3 wire passive]

Connection data:

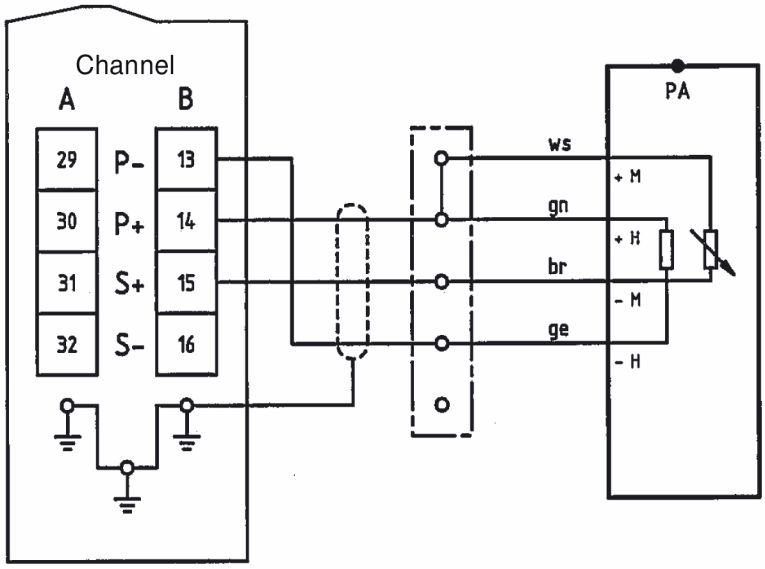
Bridge current:	280 mA
Maximum rated current:	350 mA
Maximum rated voltage:	≤ 3.0 V
Power requirement:	≤ 1.0 W [excluding cable lengths]
Connection cable:	3-lead, 80% shielded
Maximum loop resistance:	32 Ohm
Maximum cable length:	1,000 m [with 1.5 mm^2 lead cross-section]
Cable diameter:	5,4 mm
Permitted lead cross-section:	1.0 – 2.5 mm^2
Terminal box: HT11 [100 °C]	Part No.: D0715154

Conditions for use:

Assembly:	Wall-mounted
Protection:	
Explosion protection:	Ex II 2G EEx d IIC T3 [-40 °C to +160 °C]
Approvals:	INERIS 03 ATEX 0208
Temperature:	-40 °C to +160 °C
Humidity:	5 – 95 % rel. humidity; non-condensing
Pressure:	800 – 1,200 hPa
Weight/sensor:	230 g
Dimensions, dia. x H:	36 mm x 56 mm
Housing material:	Stainless steel
Further details in the Operating and Maintenance Instructions [Part No.: 10052472]	

9010/20 LCD	**Sensor data sheet D-8201**	**Part No.: D0715643**

Terminal Block
9010/9020 Sensor Type D-8201



Caution: **Before connecting the measuring head bridge current, check hardware and software settings.**
On the 9010/9020 LCD, the cable shield is applied on one side.

Sensor type: [3 wire semiconductor]/passive/linear/constant current supply

Connection data:

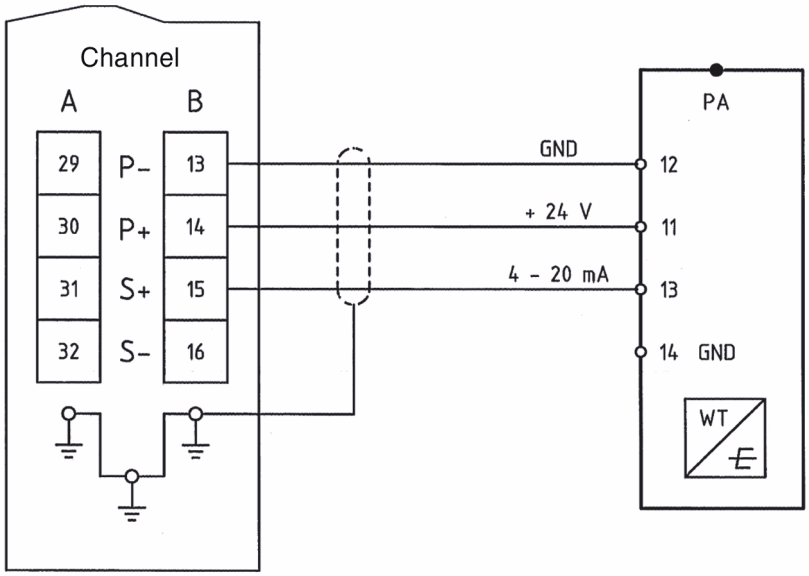
Bridge current:	118 mA ± 2 mA
Maximum rated current:	150 mA
Maximum rated voltage:	10 V
Power requirement:	approx. 0.6 W [excluding cable lengths]
Connection cable:	3-lead, 80 % shielded
Maximum loop resistance:	36 Ohm
Maximum cable length:	1,200 m [with 1.5 mm^2 lead cross-section]
Cable diameter:	8.5 mm
Lead cross-section:	1.5 mm^2
Terminal box: HT11 [100 °C]	Part No.: D0715154

Conditions for use:

Assembly:	Wall-mounted
Protection:	IP 42 to DIN 400 50
Explosion protection:	Ex II 2G EEx d IIC T4/T6
Approvals:	PTB 01 ATEX 1152 X N1
Temperature:	-40 °C to +100 °C
Humidity:	10 – 95% relative humidity/ 40 °C; non-condensing
Pressure:	900 – 1,100 hPa
Weight:	0.72 kg
Dimensions W x D x H:	50 mm x 40 mm x 50 mm
Housing material:	Stainless Steel [DIN 1.4305, V2A]
Heat-up time:	≤ 60 s
Response time: 20…90 s, depending on material and measuring range	

9010/20 LCD	Sensor data sheet DF-7010	Part No.: D0792602

Terminal Block
9010/9020 Sensor Type DF-7010



Caution: **Before connecting the measuring head, check hardware and software settings.**

Sensor type: Catalytic/active/3-wire/4–20 mA linear/current source [3 wire active]

Connection data:

Supply voltage:	16 – 32 V DC
Maximum current draw:	120 mA
Power requirement:	4.0 W [excluding cable length]
Connection cable:	3-lead, 80% shielded
Maximum resistance:	200 Ohm
Maximum cable length:	1,000 m [with 1.5 mm^2 lead cross-section]
Cable diameter:	8 – 13 mm
Permitted lead cross-section:	0.5 – 2.5 mm^2
Cable entry:	M20 x 1.5

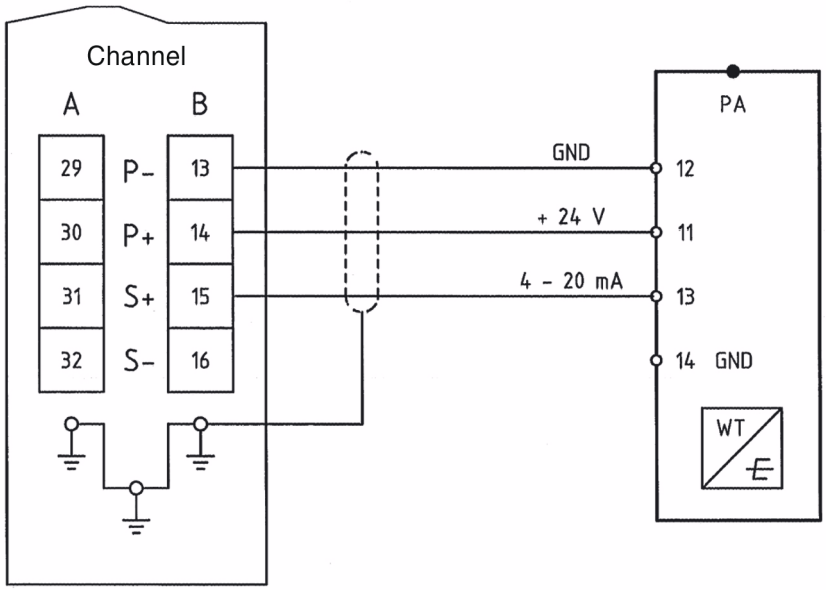
Conditions for use:

Assembly:	Wall-mounted
Protection:	IP 42 to EN 60529
Explosion protection:	II 2G EEx d m e ib IIC T6
Approvals:	DMT 99 ATEX E 023 X
Temperature:	-20 °C to +40 °C
Humidity:	5 – 95 % rel. humidity; non-condensing
Pressure:	950 – 1,100 hPa
Weight:	approx. 1.5 kg
Dimensions W x D x H:	150 mm x 88 mm x 158 mm
For further details see the Operating and Maintenance Instructions. [Art.Nr. D0792151]	

Start-up:	The DF-7010 performs a self-test once the operating voltage as been connected. Ia = 3 mA [adjustable];→ After 5 minutes the device switches to measuring mode. Ia = 4 mA
	In the Ex-area: Before the terminal section is opened, the measuring head must be isolated from the voltage supply.
Status signals:	Calibration → 3 mA; fault → 2 mA: Cable break → 0 mA [standard]
Function test:	Test gas function via: Integrated test gas nozzles at 0.5 l/min [for standard test gas] or test cap at 1.0 l/ min, [Part No.D6079762] or splash water housing SG 70 at 1 l/min or pump adapter PA 70 at 1.0 l/min
Calibration:	The unit is freshly calibrated or re-calibrated onsite using the AUER CONTROL module. Operating Instruction AUER-CONTROL Part No.: D0792125. Current output in calibration mode → 3 mA [standard].
	Approved measuring components, calibration conditions, measuring ranges, alarm points and linearization tables according to materials list: D0792420. Other measuring components available on request.

9010/20 LCD	Sensor data sheet DF-7100	Part No.: D0792611

Terminal Block
9010/9020 Sensor Type DF-7100



Caution: **Before connecting the measuring head, check hardware and software settings.**

Sensor type: Catalytic/active/3-wire/4–20 mA linear/current source [3 wire active]

Connection data:

Supply voltage:	16 –32 V DC
Maximum current draw:	100 mA
Power requirement:	2.5 W [excluding cable length]
Connection cable:	3-lead, 80% shielded
Maximum resistance:	200 Ohm
Maximum cable length:	1,000 m [with 1.5 mm^2 lead cross-section]
Cable diameter:	8 – 13 mm
Permitted lead cross-section:	0.75 – 2.5 mm^2
Cable entry:	M20 x 1.5

Conditions for use:

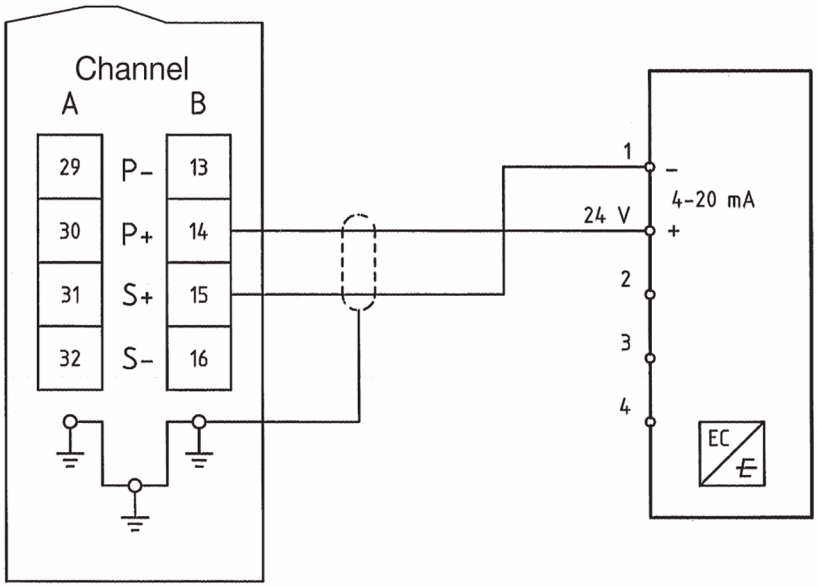
Assembly:	Wall-mounted
Protection:	IP 54 to EN 60529
Explosion protection:	II 2G EEx d m e ib IIC T6
Approvals:	DMT 99 ATEX E 023 X
Temperature:	-20 °C to +40 °C
Humidity:	5 – 95 % relative humidity; non-condensing
Pressure:	950 – 1,100 hPa
Weight:	approx. 1.5 kg
Dimensions W x D x H:	150 mm x 88 mm x 158 mm
For further details see the Operating and Maintenance Instructions. [Part No. D0792151]	

Start-up:	The DF-7010 performs a self-test once the operating voltage as been connected. Ia = 3 mA [adjustable]; → After 5 minutes the device switches to measuring mode.
	In the Ex-area: Before the terminal section is opened, the measuring head must be isolated from the voltage supply.
Status signals:	Calibration → 3 mA; fault → 2 mA: Cable break → 0 mA [standard]
Function test:	Test gas function via: Integrated test gas nozzles at 0.5 l/min [for standard test gas] or test cap at 1.0 l/ min, [Part No. D6079762] or splash water housing SG 70 at 1 l/min or pump adapter PA 70 at 1.0 l/min
Calibration:	The unit is freshly calibrated or re-calibrated onsite using the AUER CONTROL module. Operating Instruction AUER-CONTROL Part No.: D0792125.
	Approved measuring components, calibration conditions, measuring ranges, alarm points and linearization tables according to materials list: D0792421. Other measuring components available on request.

9010/20 LCD	Sensor data sheet DF-9200	Part No.: D07156xxx xxx – according to materials list

Terminal Block
9010/9020

Sensor Type DF-9200



Caution: **Before connecting the measuring head, check hardware and software settings.**

Sensor type: EC cell/active/2-wire/4–20 mA linear/current sink [2 wire active]

Connection data:

Supply voltage:	10 – 32 V DC
Maximum current draw:	40 mA
Power requirement:	1 W [excluding cable length]
Connection cable:	2-lead, 80% shielded
Maximum resistance:	500 Ohm
Maximum cable length:	1,500 m [with 1.5 mm^2 lead cross-section]
Cable diameter:	8 –12 mm
Permitted lead cross section:	0.75 – 2.5 mm^2
Cable entry:	Cable gland Pg 13.5 mm

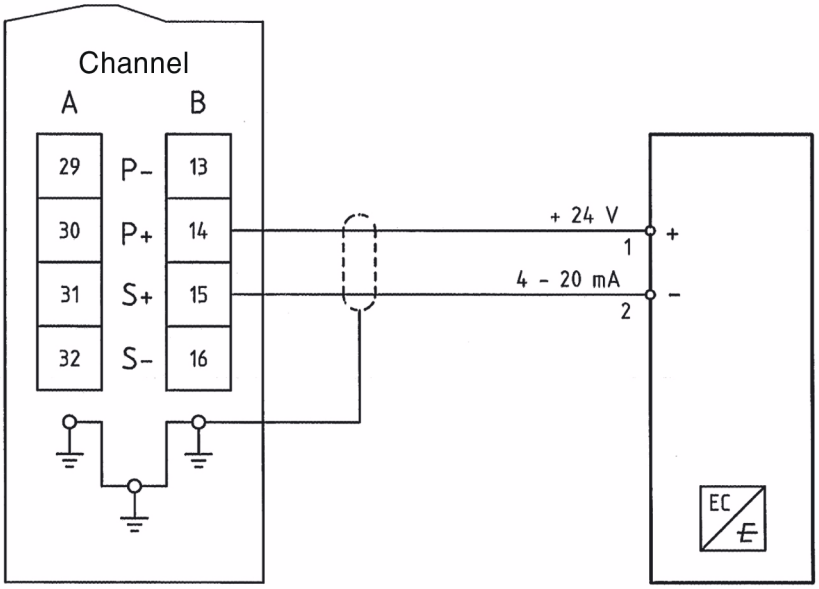
Conditions for use:

Assembly:	Wall-mounted
Protection:	IP42
Explosion protection:	None
Approvals:	None
Temperature:	-10 °C to +40 °C [material-dependent]
Humidity:	5 – 95 % rel. humidity; non-condensing
Pressure:	950 – 1,100 hPa
Weight:	approx. 0.65 kg
Dimensions W x D x H:	100 mm x 95 mm x 165 mm

9010/20 LCD	Sensor data sheet DF-9500	Part No.: D0742xxx xxx – according to materials list

Terminal Block
9010/9020

Sensor Type DF-9500



Caution: **Before connecting the measuring head , check hardware and software settings.**

Sensor type: EC cell/active/2-lead/4–20 mA linear/current sink [2 wire active]

Conditions for use:

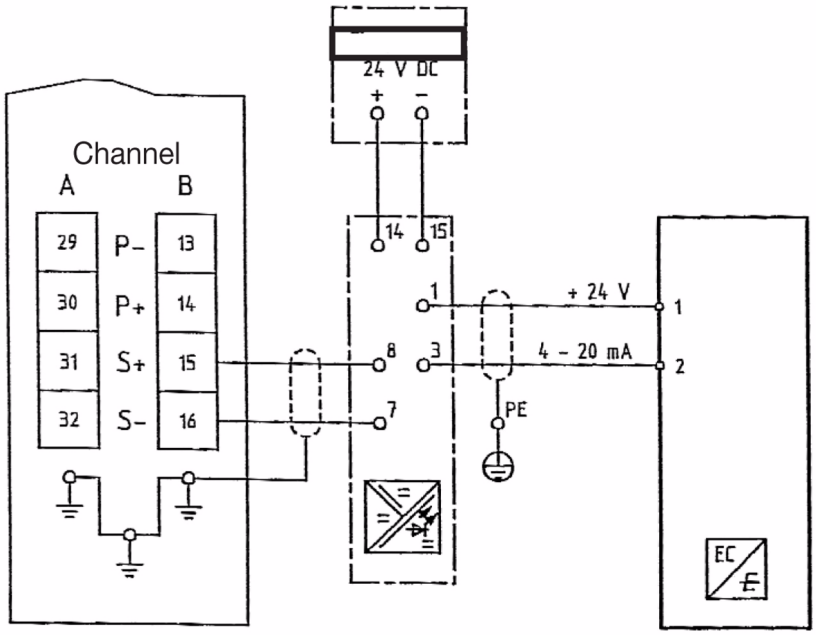
Assembly:	Wall-mounted
Protection:	IP 42 [sensor] IP 63 [housing]
Explosion protection:	Ex II 2G EEx ia IIC T6
Approvals:	DMT 01 ATEX E 152 X
Temperature:	min –20 °C to +45 °C [material-dependent]
Humidity:	5 – 95 % relative humidity; non-condensing
Pressure:	950 – 1,100 hPa
Weight:	approx. 0.65 kg
Dimensions:	100 mm x 95 mm x 165 mm

Connection data:

Supply voltage:	14 – 28 V DC
Maximum current draw:	50 mA
Power requirement:	1 W [excluding cable length]
Connection cable:	2-lead, 80 % shielded
Maximum resistance:	500 Ohm
Maximum cable length:	1.500 m [with 1.5 mm^2 lead cross-section]
Cable diameter:	8 – 12 mm
Permitted lead cross-section:	0.75 – 2.5 mm^2
Cable entry:	M20 x 1.5

9010/20 LCD	Sensor data sheet DF-9500 with safety barrier	Part No.: D0742xxx xxx – according to materials list

Terminal Block 9010/9020 | External power supply | Sensor Type DF-9500



Safety barrier

Caution: **Before connecting the measuring head, check hardware and software settings.**

Sensor type: EC cell/active/2-lead/4–20 mA linear/current sink [2 wire active]

Connection data:

Supply voltage:	14 – 28 V DC
Maximum current draw:	50 mA
Power requirement:	1 W [excluding cable length]
Connection cable:	2-lead, 80 % shielded
Maximum resistance:	500 Ohm
Maximum cable length:	1.500 m [with 1.5 mm^2 lead cross-section]
Cable diameter:	8 – 12 mm
Permitted lead cross-section:	0.75 – 2.5 mm^2
Cable entry:	M20 x 1.5

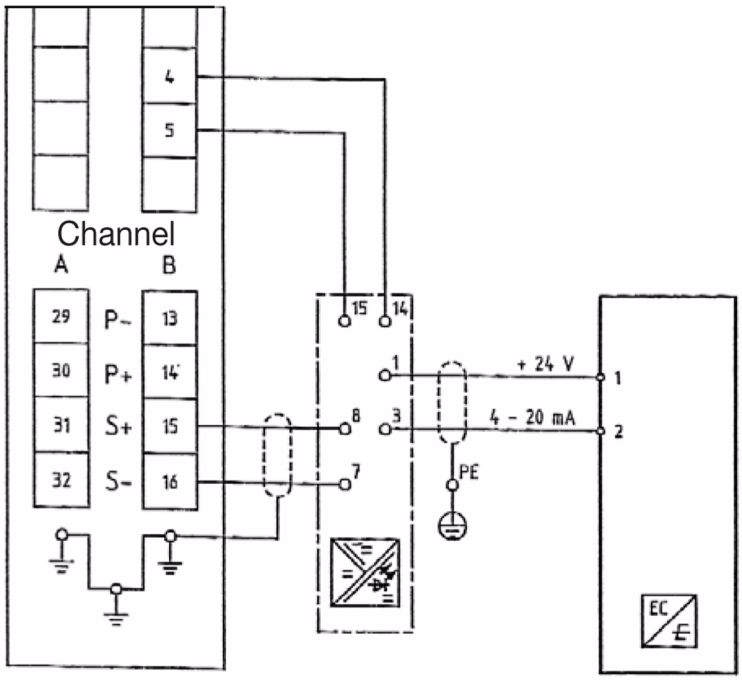
Conditions for use:

Assembly:	Wall-mounted
Protection:	IP 42 [sensor] IP 63 [housing]
Explosion protection:	Ex II 2G EEx ia IIC T6
Approvals:	DMT 01 ATEX E 152 X
Temperature:	min –20 °C to +45 °C [material-dependent]
Humidity:	5 – 95 % relative humidity; non-condensing
Pressure:	950 – 1,100 hPa
Weight:	approx. 0.65 kg
Dimensions:	100 mm x 95 mm x 165 mm

9010/20 LCD	Sensor data sheet DF-9500 with safety barrier	Part No.: D0742xxx xxx – according to materials list

Terminal Block 9010/9020

Sensor Type DF-9500



Safety barrier

Caution: **Before connecting the measuring head, check hardware and software settings.**

Sensor type: EC cell/active/2-lead/4–20 mA linear/current sink [2 wire active]

Connection data:

Supply voltage:	14 – 28 V DC
Maximum current draw:	50 mA
Power requirement:	1 W [excluding cable length]
Connection cable:	2-lead, 80 % shielded
Maximum resistance:	500 Ohm
Maximum cable length:	1.500 m [with 1.5 mm^2 lead cross-section]
Cable diameter:	8 – 12 mm
Permitted lead cross-section:	0.75 – 2.5 mm^2
Cable entry:	M20 x 1.5

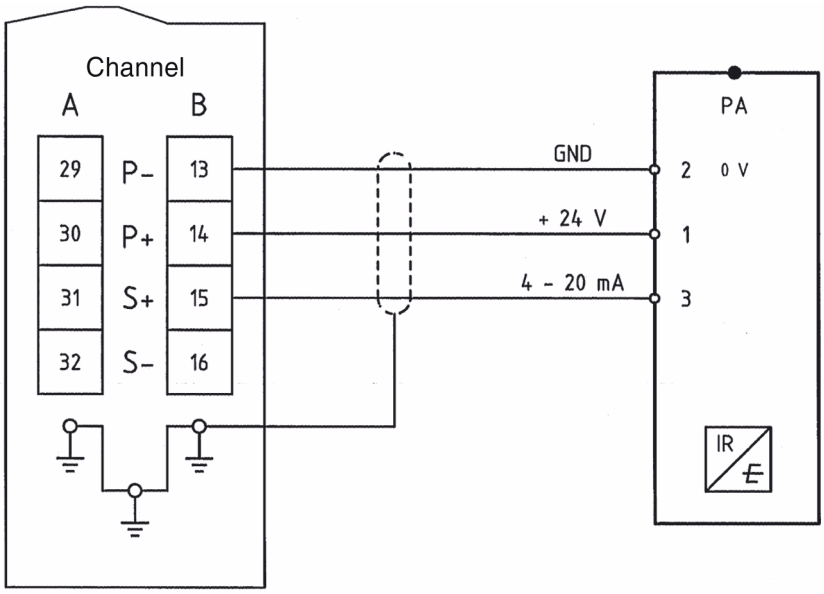
Conditions for use:

Assembly:	Wall-mounted
Protection:	IP 42 [sensor] IP 63 [housing]
Explosion protection:	Ex II 2G EEx ia IIC T6
Approvals:	DMT 01 ATEX E 152 X
Temperature:	min –20 °C to +45 °C [material-dependent]
Humidity:	5 – 95 % relative humidity; non-condensing
Pressure:	950 – 1,100 hPa
Weight:	approx. 0.65 kg
Dimensions:	100 mm x 95 mm x 165 mm

9010/20 LCD	**Sensor data sheet GD 10**	**Part No.: D0770731 Standard methane** **Part No.: D0770732 Standard ethane** **Part No.: D0770733 Standard propane** **Part No.: D0770603 Special calibration**

Terminal Block
9010/9020

Sensor Type GD10



Caution: **Before connecting the measuring head, check hardware and software settings.**

Sensor type: IR/active/3-wire/4–20 mA/current source [3 wire active]

Connection data:

Bridge current:	18–32 V DC
Switch-on current:	0.3 A for 0.3 seconds
Power requirement:	3.5 W [excluding cable lengths]
Connection cable:	3-lead, 80 % shielded
Maximum resistance:	500 Ohm
Maximum cable length:	750 m [with 1.5 mm^2 lead cross-section]
Cable diameter:	8 – 12 mm
Permitted lead cross-section:	0.75 – 2.5 mm^2
Cable entry:	Possible both sides / M20 x 1.5
For use in Ex-area:	Approved cable entries and blind plugs required, EEx e [M20 x 1.5]

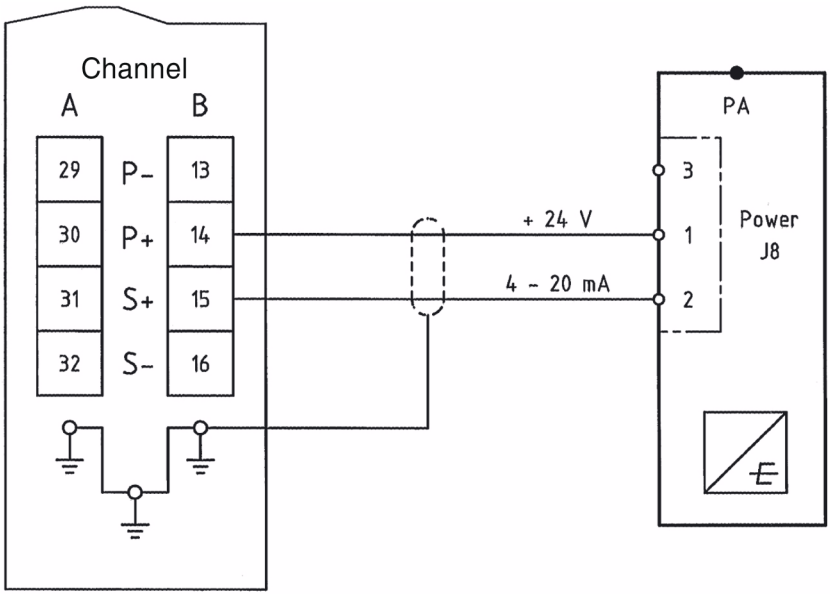
Conditions for use:

Assembly:	Wall-mounted/or Flange
Protection:	IP 66/IP 67 EN 60529
Explosion protection:	Ex II 2G EEx de IIC T6 [EEx e for cable connection]
Approval:	Nemko 01ATEX282
Temperature:	-20 °C to +55 °C
Humidity:	5 – 95% rel. humidity; non-condensing
Pressure:	800 – 1,100 hPa
Weight:	approx. 2.9 kg
Dimensions:	Dia. approx. 100 mm, length approx. 250 mm
Housing material:	Stainless steel [ASMT 316/DIN 1.4401]
Further details in the Operating and Maintenance Instructions. [Part.No. D0770041] Measuring component list: 0770-405/Other measuring components on request	

9010/20 LCD	Sensor data sheet Ultima XE [2-wire]	Part No.: 10044xxx xxx as per ordering

Terminal Block
9010/9020

Ultima X
[2-wire]



Caution: **Before connecting the measuring head, check hardware and software settings.**

Sensor type: EC/active/2-wire/4–20 mA linear/current sink [2 wire active]

Connection data:

Supply voltage:	12 – 30 V DC
Power requirement:	Upto 1 W [excluding cable length]
Connection cable:	2-lead, 80% shielded
Maximum resistance:	600 Ohm at 24 V DC
Maximum cable length:	1.200 m [with 1.5 mm^2 lead cross-section]
Cable diameter:	8 – 12 mm
Permitted lead cross-section:	0.75 – 2.5 mm^2
Cable entry:	Possible on both sides/M20 x 1,5 or 3/4“ NPT
For use in Ex-area:	Approved cable entries and blind plugs required EEx d IIC, M25

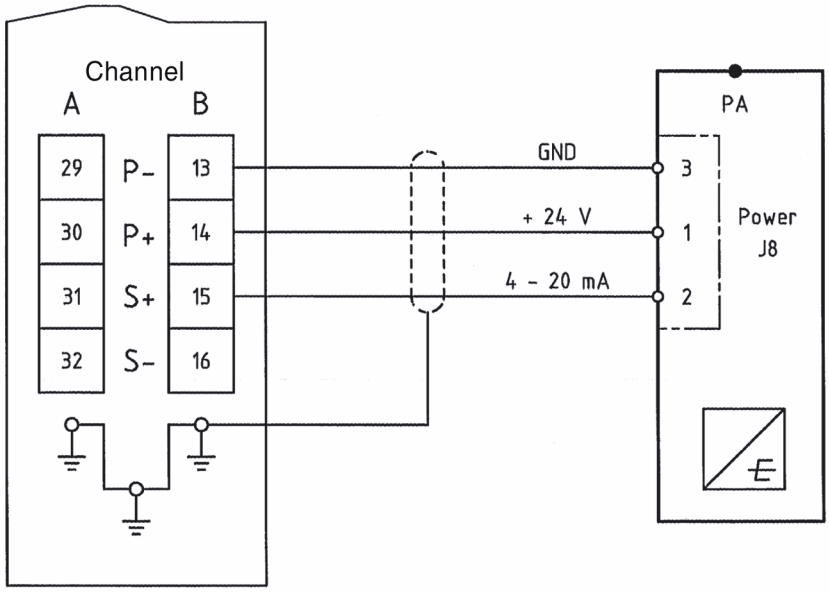
Conditions for use:

Assembly:	Wall-mounted/assembly clip Sensor can be remote sensor
Protection:	IP 66/IP 67 EN 60529
Approvals:	DMT 02 ATEX E 202 X / Ex II 2G EEx d IIC T4 -40 °C < Ta +60 °C/+45 °C
Temperature:	-40 °C to +60 °C type-specific
Humidity:	15 – 95 % relative humidity; non-condensing
Pressure:	950 – 1,100 hPa
Weight:	approx. 4.7 kg
Dimensions W x D x H:	160.3 x 99.3 x 261.1 mm
Housing material:	Stainless steel [ASMT 316/DIN 1.4401]
For further details see the Operating and Maintenance Instructions. Part No.: 10046690	

9010/20 LCD	Sensor data sheet Ultima XE [3-wire]	Part No.: 10044xxx xxx as per ordering information

Terminal Block
9010/9020

Ultima X
[3-wire]



Caution: **Before connecting the measuring head, check hardware and software settings.**

Sensor type: EEC, Catalytic or IR/active/3-wire/4–20 mA linear/current source
[3 wire active]

Connection data:		
	Supply voltage:	12 – 30 V DC
	Power requirement:	Up to 5 W [excluding cable length]
	Connection cable:	3-lead, 80 % shielded
	Maximum resistance:	600 Ohm at 24 V DC
	Maximum cable length:	1.000 m [with 1.5 mm^2 lead cross-section]
	Cable diameter:	8 – 12 mm
	Permitted lead cross-section:	0.75 – 2.5 mm^2
	Cable entry:	Possible on both sides/M20 oder 3/4“ NPT
	For use in Ex-area:	Approved cable entries and blind plugs required EEx d IIC, M25

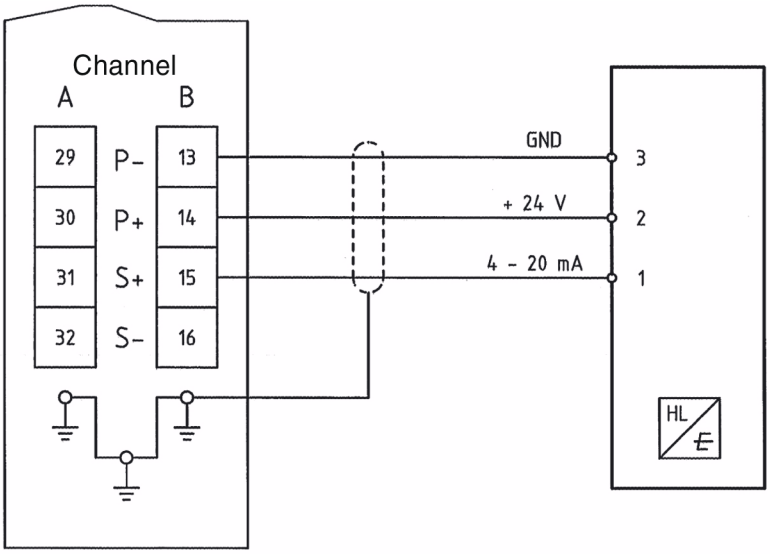
Conditions for use:

Assembly:	Wall-mounted/assembly clip Sensor can be remote sensor
Protection:	IP 66/IP 67 EN 60529
Explosion protection: Housing	DMT 02 ATEX E 202 X Ex II 2G EEx d IIC T5 –40 °C < Ta +60 °C/+45 °C
Explosion protection: Sensor	DMT 02 ATEX E 202 X Ex II 2G EEx d IIC T4 -40 °C < Ta +60 °C/+45 °C
Temperature:	-40 °C bis +60 °C type-specific
Humidity:	15 – 95 % relative humidity; non-condensing
Pressure:	950 – 1,100 hPa
Weight:	approx. 4.7 kg
Dimensions [W x D x H]:	160.3 x 99.3 x 261.1 mm
Housing material:	Stainless steel [ASMT 316/DIN 1.4401]
For further details see the Operating and Maintenance Instructions. Part No.: 10046690	

9010/20 LCD	Sensor data sheet DF-8401	Part No.: D0745720

Terminal Block
9010/9020

Sensor Type DF-8401



Caution: **Before connecting the measuring head, check hardware and software settings.**

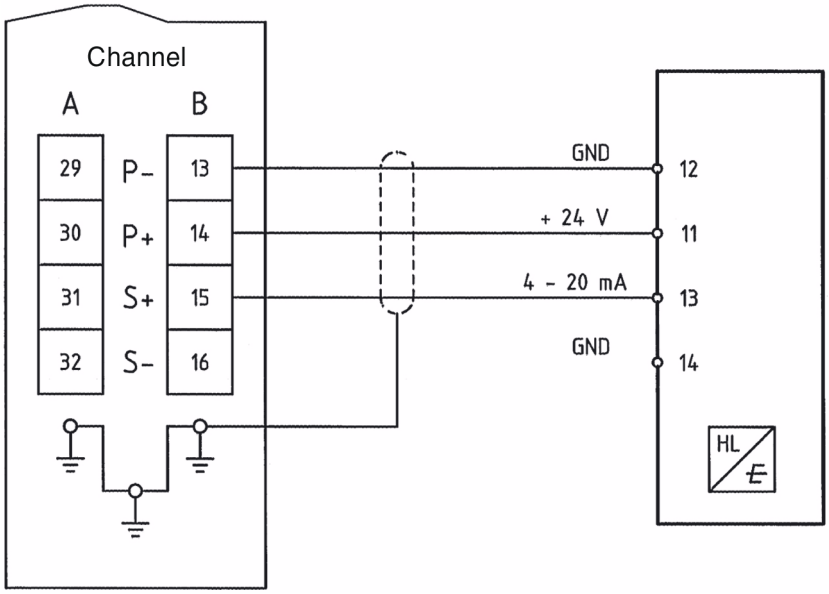
Sensor type: semiconcuctor/active/3-wire/4–20 mA/current source

Connection data:		
	Supply voltage:	16 – 32 V DC
	Maximum current draw:	200 mA [switch-on current 400 mA, brief]
	Power requirement:	5 W [excluding cable lengths]
	Connection cable:	3-lead, 80 % shielded
	Maximum resistance:	400 Ohm
	Maximum cable length:	1.000 m [with 1.5 mm^2 lead cross-section]
	Cable diameter:	8 – 12 mm
	Permitted lead cross-section:	0.75 – 2.5 mm^2
	Cable entry:	M20 X 1,5

Conditions for use:		
	Assembly:	Wall-mounted
	Protection:	IP 54 to EN 60529
	Explosion protection:	None
	Approvals:	None
	Temperature:	–20 °C to +40 °C
	Humidity:	5 – 90 % relative humidity; non-condensing
	Pressure:	900 – 1,100 hPa
	Weight:	approx. 1.1 kg
	Dimensions W x D x H:	120 mm x 82 mm x 130 mm

9010/20 LCD	Sensor data sheet DF-8603/[DF-8601] Part No.: 10044123

Terminal Block
9010/9020 Sensor Type DF-8603



Caution: **Before connecting the measuring head, check hardware and software settings.**

Sensor type: semiconductor/active/3-wire/4–20 mA/current source

Connection data:

Supply Voltage:	16–32 V DC
Maximum current draw:	120 mA
Connection cable:	3-lead, 80 % shielded
Maximum resistance:	200 Ohm
Maximum cable length:	1.000 m [with 1.5 mm^2 lead cross-section]
Cable diameter:	6 – 12 mm
Permitted lead cross-section:	0.5 – 2.5 mm^2
Cable entry:	M20 x 1.5

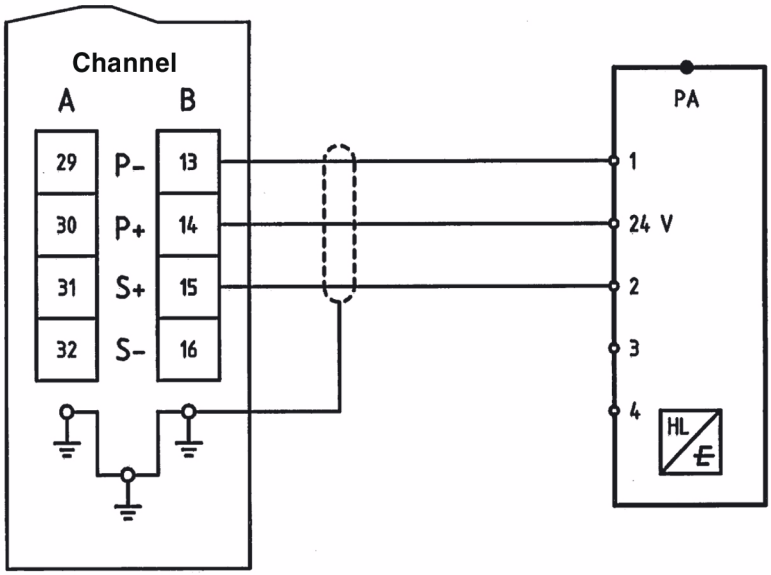
Conditions for use:

Assembly:	Wall-mounted
Protection:	IP 54 to EN 60529
Explosion protection:	Ex II 2G EEx d m e ib IIC T6
Approvals:	DMT 99 ATEX E021X
Temperature:	-20 °C to +40 °C
Humidity:	20–95 % relative humidity; non-condensing
Pressure:	900 – 1,100 hPa
Weight:	approx. 1.5 kg
Dimensions W x D x H:	150 mm x 88 mm x 158 mm
Housing material:	Cast aluminium [polyester-coated]
Further details in the Operating and Maintenance Instructions [Part No. 100 12 792]	

9010/20 LCD	Sensor data sheet DF-8201	Part No.: D0756661

Terminal Block
9010/9020

Sensor Type DF-8201



Caution: **Before connecting the measuring head, check hardware and software settings.**

Sensor type: semiconductor/active/3-wire/4-20 mA non-linear/current source

Connection data:

Supply voltage:	13–30 V DC
Maximum current draw:	50 mA
Power requirement:	1.5 W [excluding cable length]
Connection cable:	3-lead, 80 % shielded
Maximum resistance:	200 Ohm
Maximum cable length:	1.000 m [with 1.5 mm^2 lead cross-section]
Cable diameter:	8 – 13.5 mm
Permitted lead cross-section:	0.5 – 2.5 mm^2 spring clamps
Cable entry:	Cable gland Pg 13.5 mm

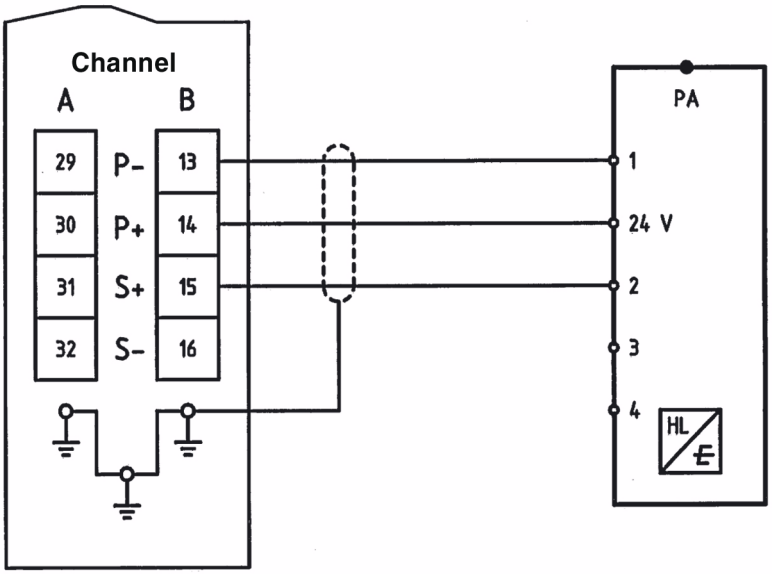
Conditions for use:

Assembly:	Wall-mounted
Protection:	IP42/EN 60529
Explosion protection:	None
Approvals:	None
Temperature:	-20 °C to +40 °C
Humidity:	10 to 90 % relative humidity.
Pressure:	950 – 1,100 hPa
Weight:	approx. 0.65 kg
Dimensions W x D x H:	100 mm x 95 mm x 165 mm
Housing material:	Stainless steel plate

9010/20 LCD	Sensor data sheet DF-8250	Part No.: D0756662

Terminal Block
9010/9020

Sensor Type DF-8250



Caution: **Before connecting the measuring head, check hardware and software settings.**

Sensor type: semiconductor/active/3-lead/4–20 mA/current source

Connection data:

Supply voltage:	13–30 V DC
Maximum current draw:	50 mA
Power requirement:	1.5 W [excluding cable length]
Connection cable:	3-lead, 80 % shielded
Maximum resistance:	200 Ohm
Maximum cable length:	1.000 m [with 1.5 mm^2 lead cross-section]
Cable diameter:	8 – 13.5 mm
Permitted lead cross section:	0.5 – 1.5 mm^2 spring clamps
Cable entry:	Cable gland Pg 13.5 mm

Conditions for use:

Assembly:	Wall-mounted
Protection:	IP42/EN 60529
Explosion protection:	None
Approvals:	None
Temperature:	-20 °C to +40 °C
Humidity:	10 – 90 % relative humidity
Pressure:	950 – 1,100 hPa
Weight:	approx. 0.65 kg
Dimensions W x D x H:	100 mm x 95 mm x 165 mm
Housing material:	Stainless steel plate

12.5 Appendix 5 Description of Control Unit 9020-4

analysis of combustible gases and oxygen in the ATEX realm. However, the mixed applications with toxic and combustible gases within the ATEX realm are possible.

Control Unit model 9020-4 uses 2 9020 LCD boards with the frontal circuits of the Control Unit located remotely on the door of the container, the connection was made via flat cable and the channels are called A-B-C-D.

The functions, use and software and hardware configurations of the 9020 LCD boards are recorded in the Instruction Manual, article no. 0756.167/168.

Inside the container a terminal board is available for the management of the common alarms of the 2 9020 LCD modules. The configuration of the Control Units must be identical in the state of the alarm relays [excited for everyone]; the default configuration was suggested; the internal configuration of the voltage on the Control Unit for supplying power to the caution and failure relays of the terminal board is indispensable; when an external 24 VDC power supply is provided, jumpers J1 e J2 need to be installed on the back terminal board, and the selection of the Control Unit between internal and external is uninfluential. The caution alarm is available with an open relay contact [it closes in the alarm state]; the failure indication is available with an exchange contact; the Warning and Alarm alarms are available with a closed or open contact [as a function of jumpers J4 and 5]. The main power supply [115 or 230 VAC] is available on 3x3 terminals in order to possibly use service voltages for lamps or horns. The secondary feed [24 VDC] is available on 2x2 terminals.

Mechanical Installation

The metal container is made of painted sheet steel with thermosetting powder for installations in industrial environments. The device has passed the vibration tests according to the Rina Specification, but it is good to check the magnitude of possible vibrations during the installation because over time they could prove to be malfunctions.

The dimensions of the container are: 400 x 300 x 150

Cable input from below with plate

Certifications of the container: IP 65, UL and CSA

Colour: Ral 7032

Opening: to the right

Consult accompanying drawing 5060

Electrical installation

The electrical installation needs to be carried out by qualified personnel in compliance with the prevailing standards, especially in areas where there is an explosion hazard.

The configurations of the 9020 LCD boards for the connections with the sensors/transmitters are identical to the use of the individual 9010/20 LCD boards; consult the 9010/20 LCD Instruction Manual and attached drawing 5080.

Table for identifying the terminals on the terminal board

Clamp	Function	NOTES
M 1-2-3	Main power supply 115 or 230 VAC	One connector for the power supply; the others are service cables
M4	Secondary 24 VDC power supply	
M5	Sensor channel A	
M6	Sensor channel B	
M7A	N.C. relay contact of the caution alarm	In operation it will be n.o.
M7B 1-2	N.C. relay contact of the Warning alarm	Only with J5 closed - in operation it will be n.o.
M7B 3-4	N.O. relay contact of Warning alarm	Only with J5 open - in operation it will be n.c.
M7C 1-2	N.C. relay contact of Alarm alarm	Only with J4 closed - in operation it will be n.o.
M7C 3-4	N.O. relay contact of Alarm alarm	Only with J4 open - in operation it will be n.c.
M7D	N.O. relay contact of Horn	In operation it will be n.o.
M7E	Exchange relay contact for Failure	
M8	Sensor channel C	
M9	Sensor channel D	
M10	4/20 mA output channels A and B	
M11	4/20 mA output channels C and D	
M12	RS485 output	

Jumper Description Table [solder points] on the terminal board

Jumper	Function	Default configuration
J1	The jumper is connected when the 24 VDC board is externally powered	Not connected
J2	The jumper is connected when the 24 VDC board is externally powered	Not connected
J3	The negatives of the 24 VDC power supplies are in common	Connected
J4	When the Alarm contact is connected, M7C 1-2 is normally closed [n.o. in operation]	Connected
J5	When the Warning contact is connected, M7B 1-2 is n.c. [in operation n.o.]	Connected

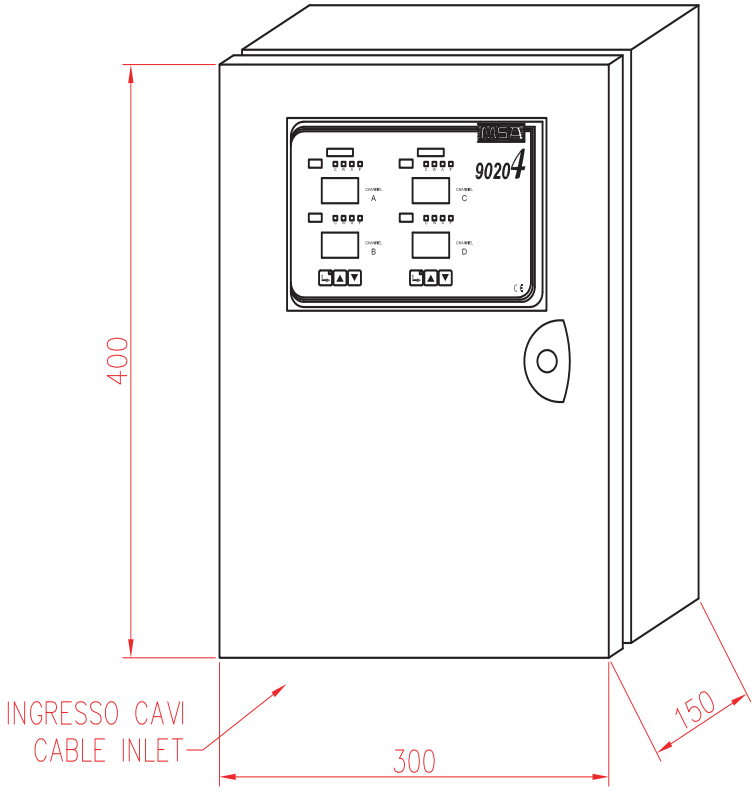
Caution: the protection of the main line [115 or 230 VAC] is done externally.

Caution: the protection of the secondary line [24 VDC] is done externally.

Consult the instruction manual 9010/20 LCD for further information related to the installation

Particular approvals

Vibrations according to Rina specification, test report NEMKO 2172-1/03

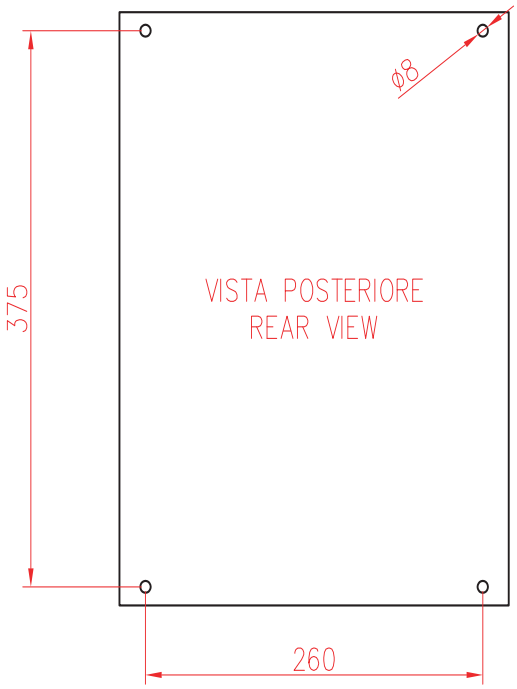


DIMENSIONI DI INGOMBRO

OVERALL DIMENSIONS

PESO: 10 kg

WEIGHT: 10kg



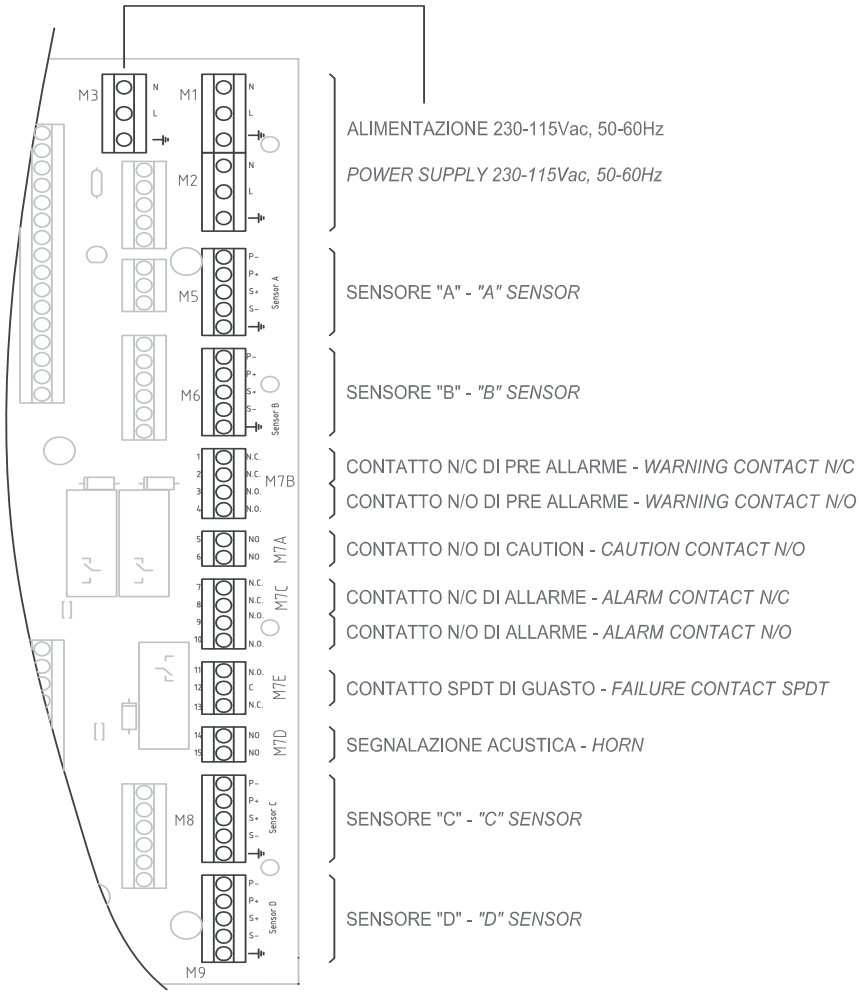
FORI DI FISSAGGIO ø8

FIXING HOLES ø8

1	26-11-04	**Added holes diameter**		A.Ciocca
N° - part no.	DATA - DATE	REVISIONI - REVISIONS	PREPARATO - PREPARED BY	APPROVATO - APPROVED BY

REVISIONE - REVISION

Disegnato - Drawn by Approvato - Approved by	MSA ITALIANA S.p.A. Via Po, 13/17 20089 Rozzano (MI)		
Scala - Scale 1:5	Materiale - Material //	Tolleranza - Tolerance ±0.1	Codice - Code //
Emissione - Issue 0	Descrizione - Description DIMENSIONI DI INGOMBRO 9020-4		DIS. N° - Drawing no. 005060
Data - Date 13-10-03	CU 9020-4 OVERALL DIMENSIONS		



ALIMENTAZIONE 230-115Vac, 50-60Hz

POWER SUPPLY 230-115Vac, 50-60Hz

SENSORE "A" - *"A" SENSOR*

SENSORE "B" - *"B" SENSOR*

CONTATTO N/C DI PRE ALLARME - *WARNING CONTACT N/C*

CONTATTO N/O DI PRE ALLARME - *WARNING CONTACT N/O*

CONTATTO N/O DI CAUTION - *CAUTION CONTACT N/O*

CONTATTO N/C DI ALLARME - *ALARM CONTACT N/C*

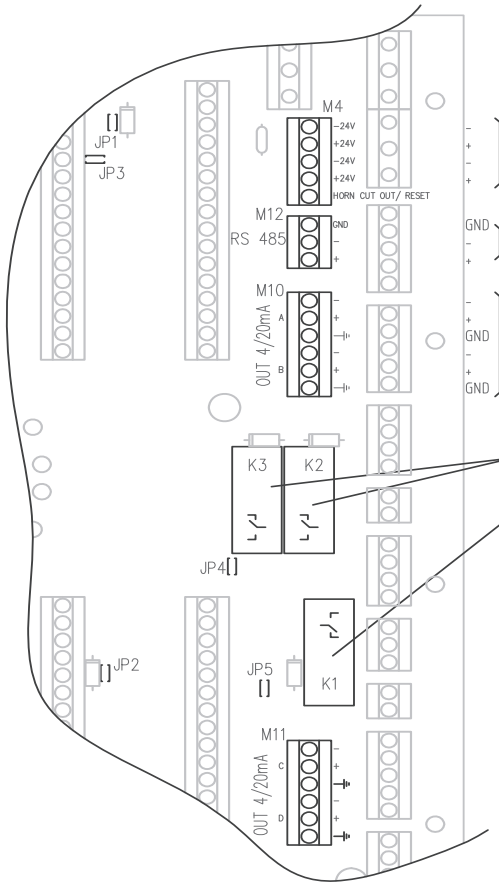
CONTATTO N/O DI ALLARME - *ALARM CONTACT N/O*

CONTATTO SPDT DI GUASTO - *FAILURE CONTACT SPDT*

SEGNALAZIONE ACUSTICA - *HORN*

SENSORE "C" - *"C" SENSOR*

SENSORE "D" - *"D" SENSOR*



24Vcc

RS 485

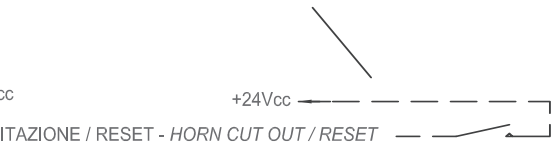
USCITA 4÷20mA CANALE A / B - *A / B CHANNELS 4÷20mA OUTPUT*

RELE' DI CAUTION - CAUTION RELAYS

RELE' DI GUASTO- FAILURE RELAY

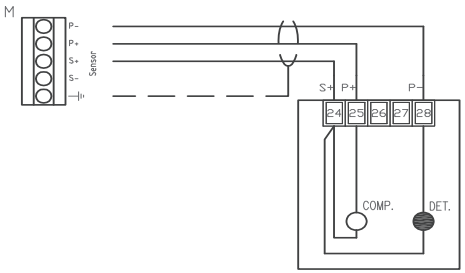
COLLEGAMENTO TIPICO PULSANTE TACITAZIONE REMOTO

HORN CUT OUT REMOTE PUSH BUTTON TYPICAL WIRING CONNECTION



COLLEGAMENTO TIPICO UNITA' - SENSORE

SENSOR - UNIT TYPICAL WIRING CONNECTION



LE INDICAZIONI DELLO STATO DEI CONTATTI DI ALLARME SI INTENDE CON UNITA' NON ALIMENTATA O IN ALLARME.

THE ALARM AND WARNING CONTACTS ARE INDICATED WHEN THE UNIT IS SWITCHED OFF OR IN ALARM CONDITION

JUMPER	DESCRIZIONE - DESCRIPTION	DEFAULT
J1	scheda alimentata a 24Vcc - *C.U. powered 24Vdc*	no
J2	scheda alimentata a 24Vcc - *C.U. powered 24Vdc*	no
J3	negativi alimentazioni 24Vcc in comune - *Common 24Vdc negatives*	yes
J4	contatto di allarme (morsetto M7C 1-2) Norm.Chiuso - *alarm contact N/C (M7C 1-2 Terminal)*	yes
J5	contatto di pre allarme (morsetto M7B 1-2) Norm.Chiuso - *warning contact N/C (M7B 1-2 Terminal)*	yes

1	27-02-06	Corretto stato eccitato di caution	A.Ciocca
N° - part no.	DATA - DATE	DESCRIZIONE - DESCRIPTION	PREPARATO - PREPARED BY / APPROVATO - APPROVED BY
		REVISIONE - REVISION	

Disegnato - Drawn by

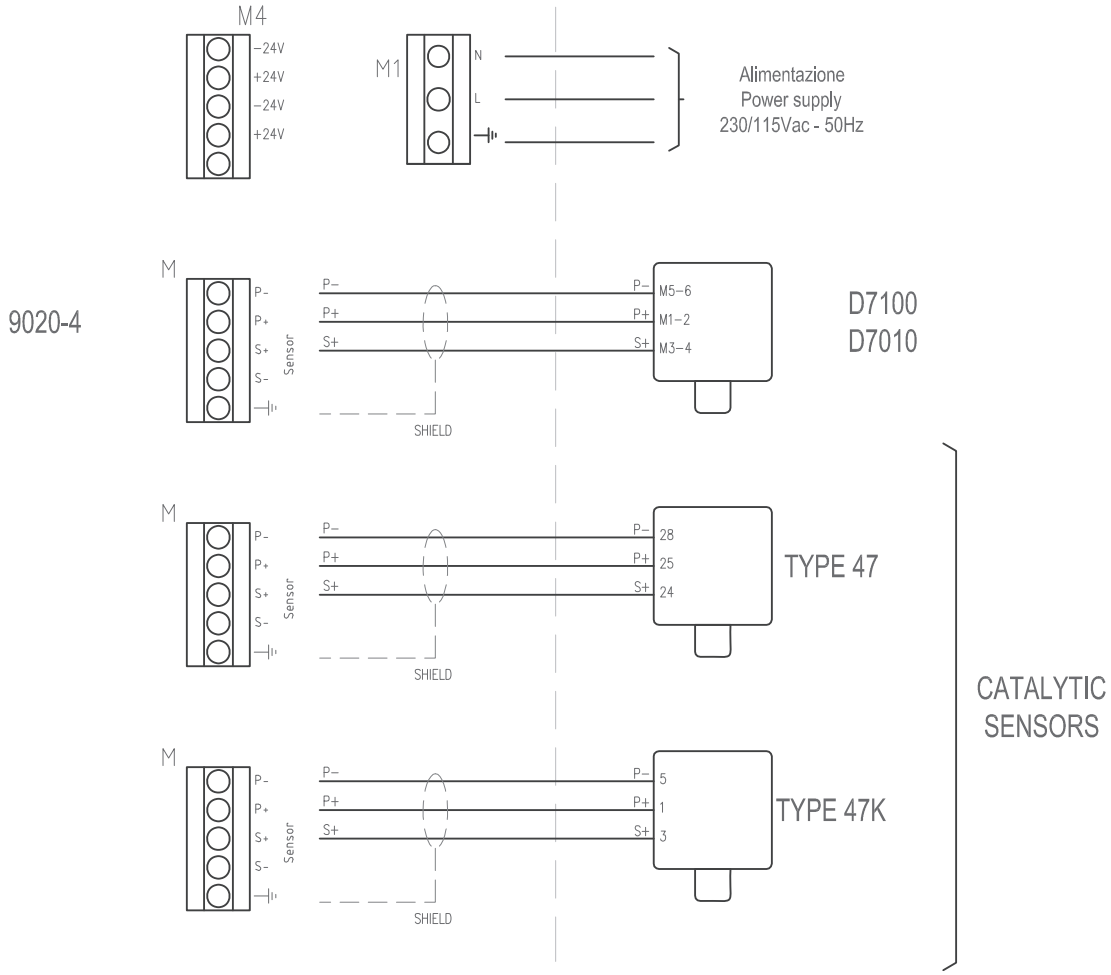
Approvato - Approved by

MSA ITALIANA S.p.A.
Via Po, 13/17 20089
Rozzano (MI)

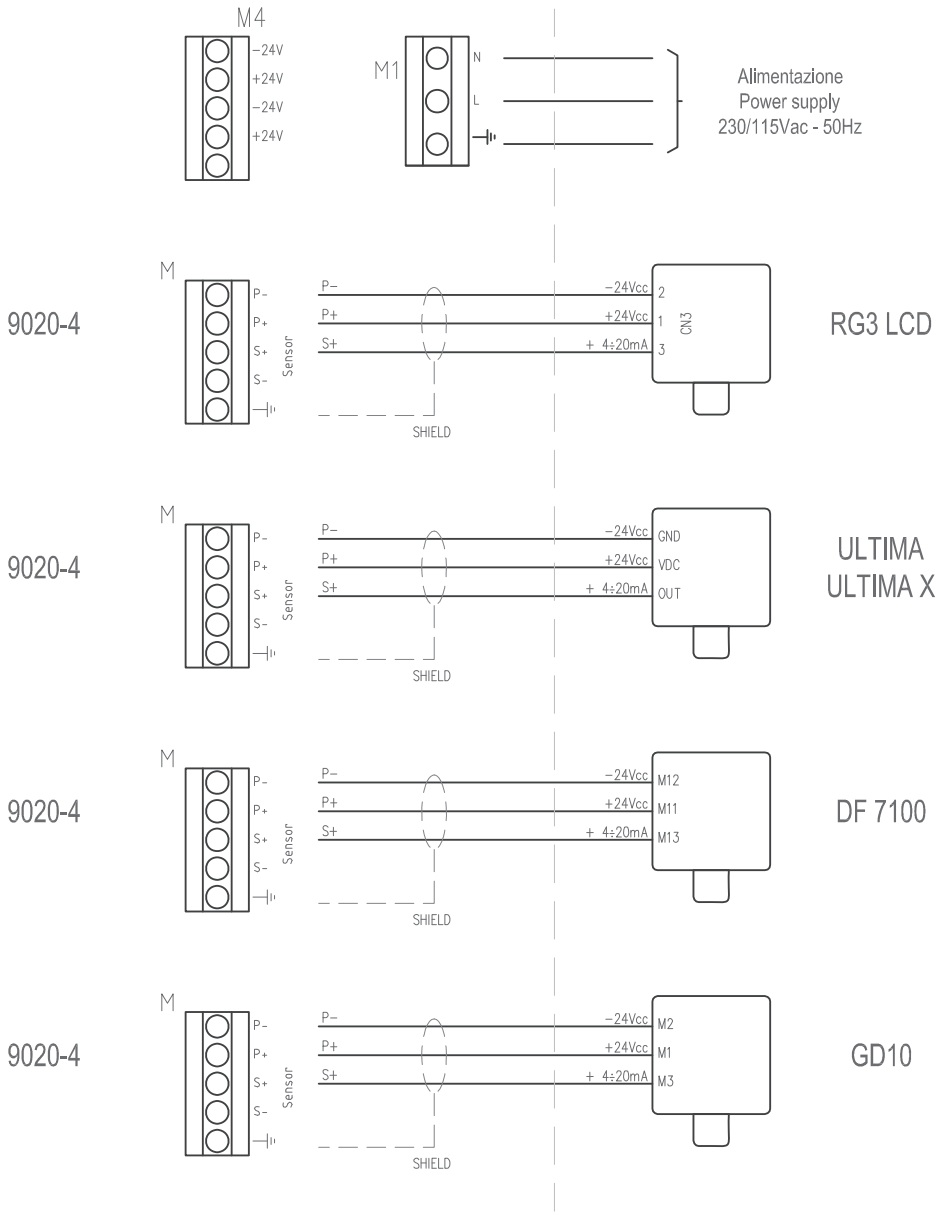
Scala - Scale	Materiale - Material	Tolleranza - Tolerance	Codice - Code
\\	\\	\\	\\

Emissione - Issue	Descrizione - Description	DIS. N° - Drawing no.
0	SCHEMA MORSETTIERA 9020-4	005080
Data - Date 19-02-04	9020-4 TERMINAL BOARD	

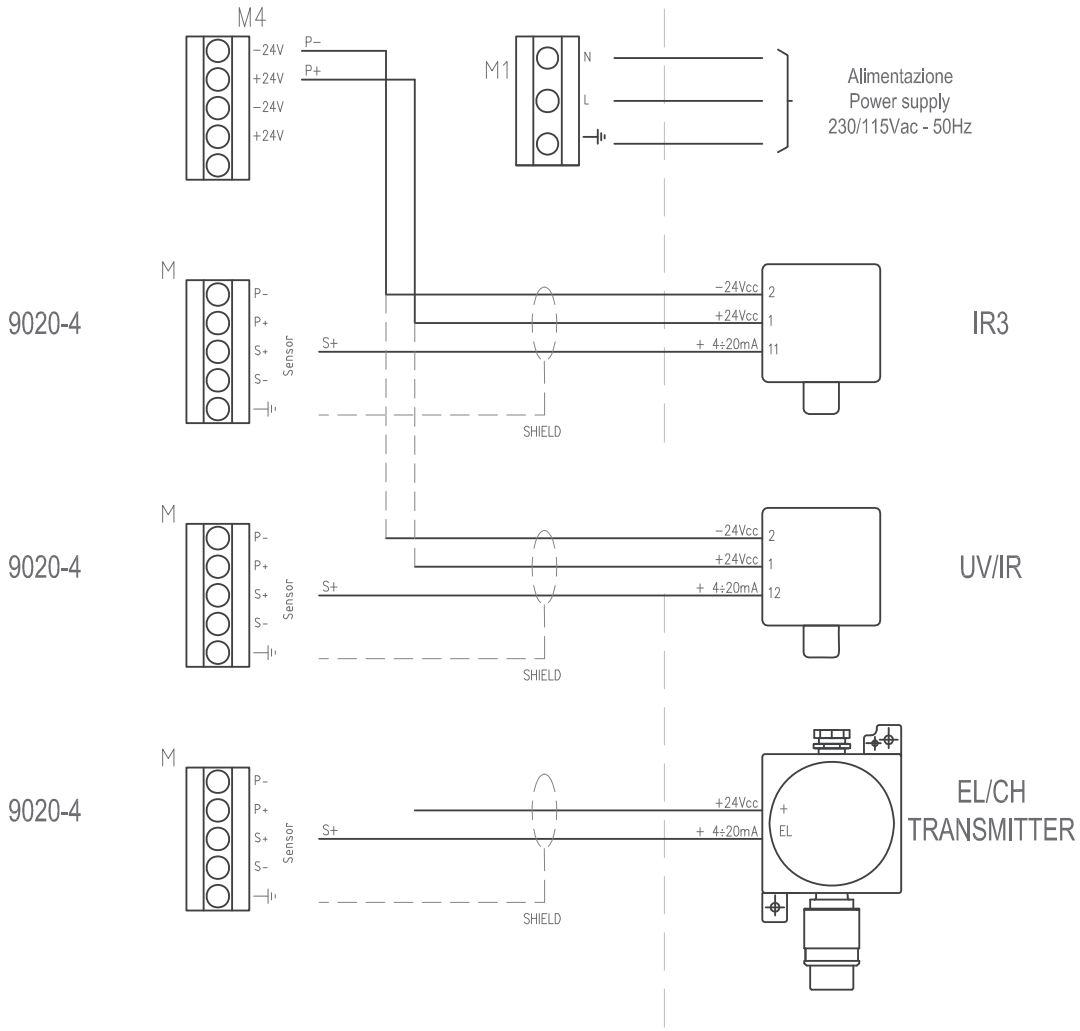
3 WIRES SENSOR

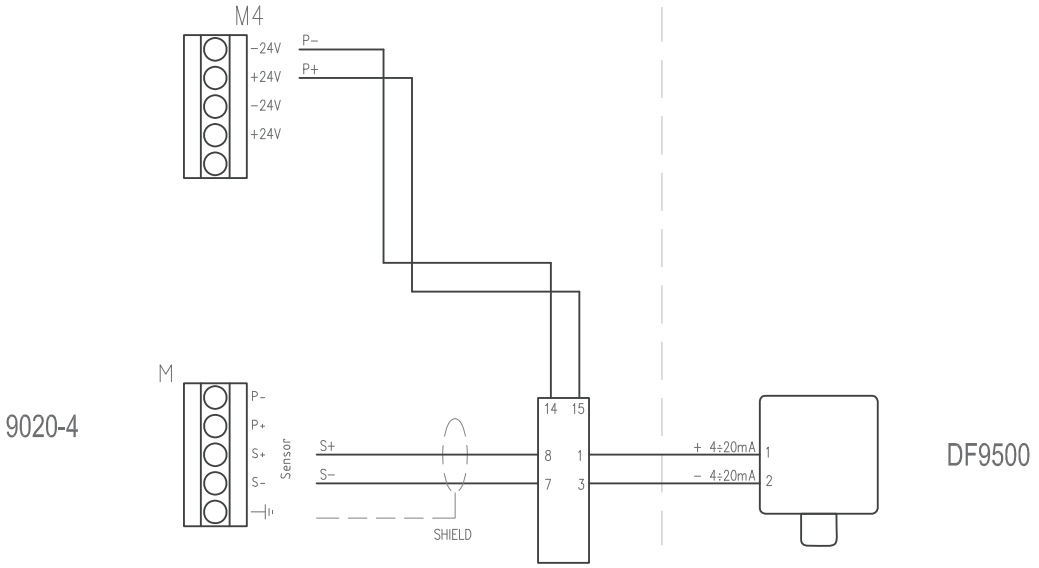


3 CURRENT LOOP CONFIGURATION



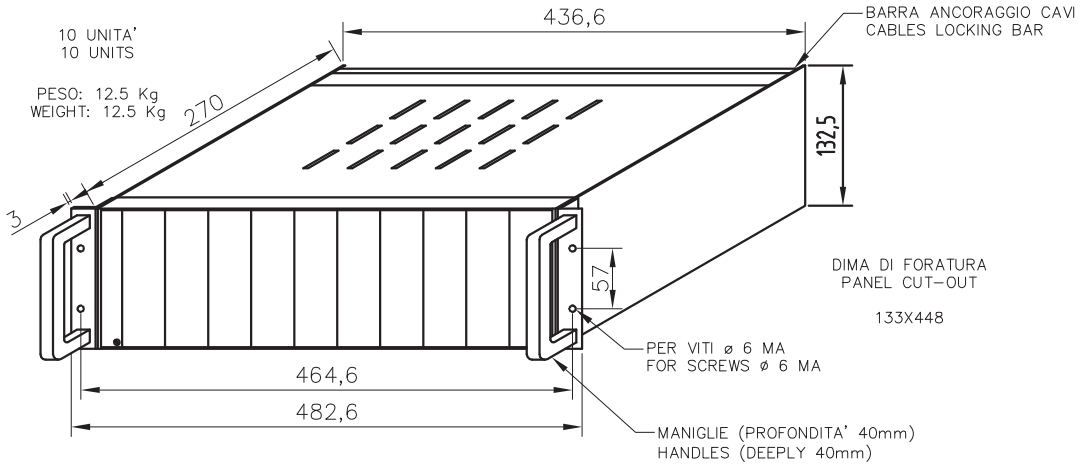
2 CURRENT LOOP CONFIGURATION

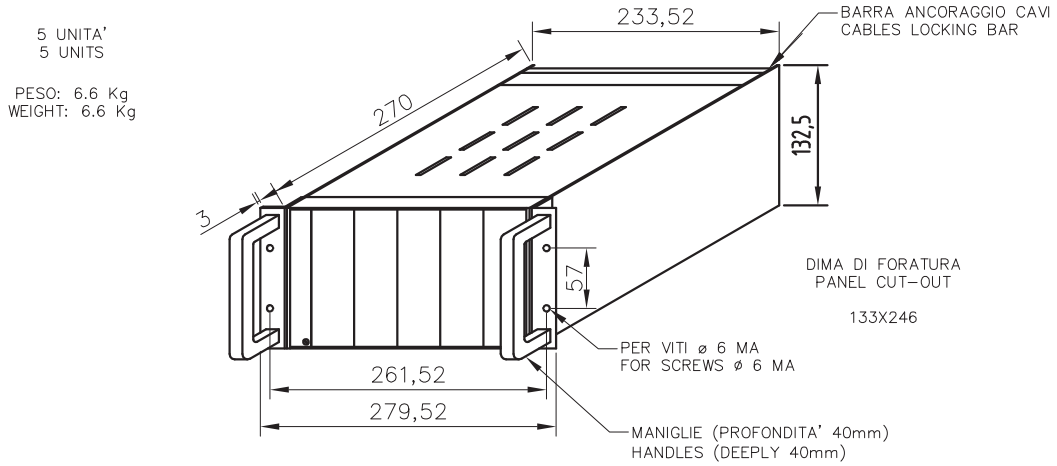


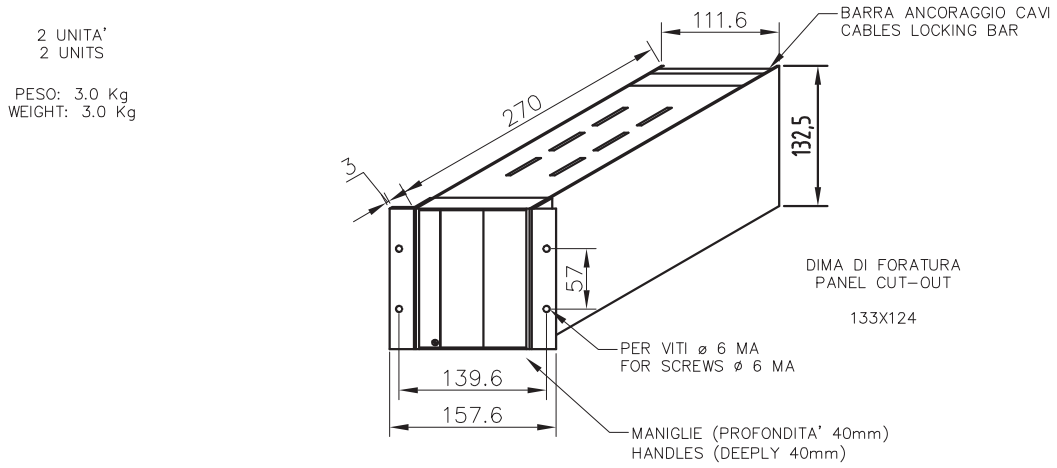


P+F Elcon KFD2−STC4 Ex.1: 1 ch. (max)
P+F Elcon KFD2−STC4 Ex.2: 2 ch. (max)

P:\SETTORIALE\Uff.Tecnico\WSKETCH\Autocad\Elettrici AutoCAD\E07-3462.dwg

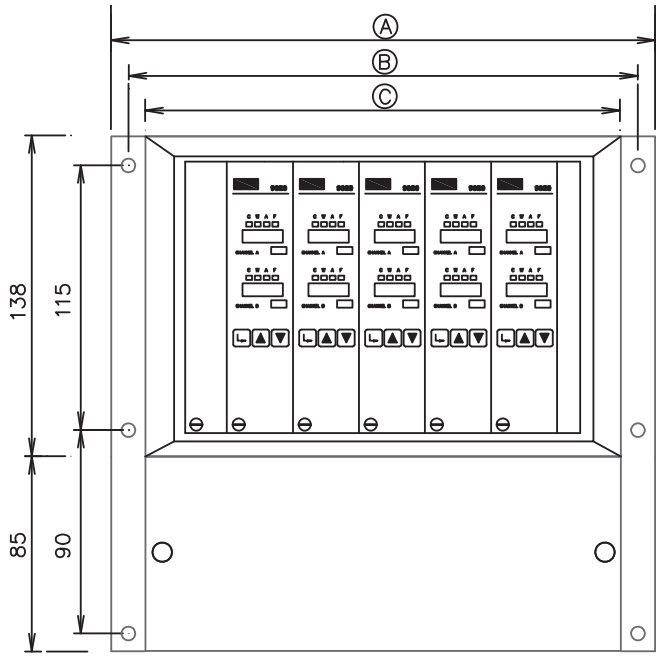






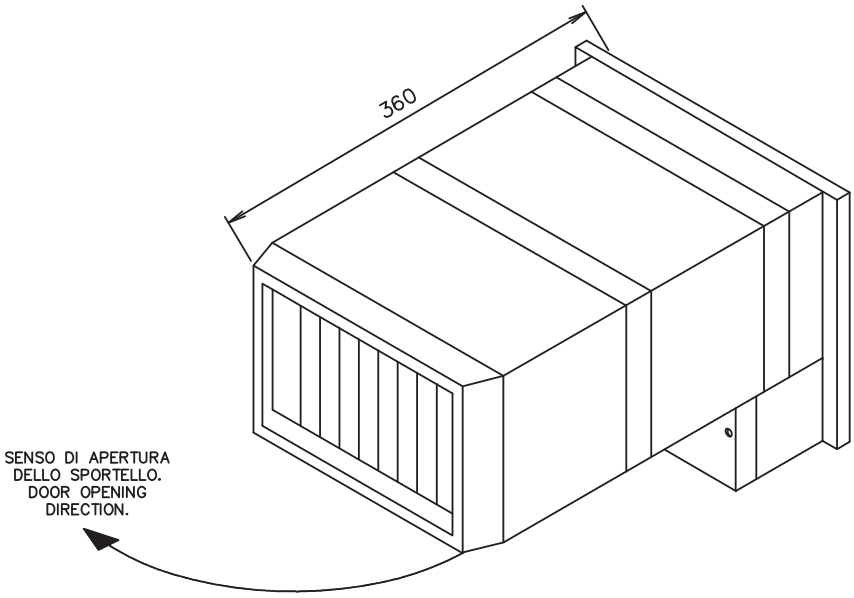
N° - part no.	DATA - DATE	REVISIONI - REVISIONS	PREPARATO - PREPARED BY	APPROVATO - APPROVED BY
		REVISIONE - REVISION		

Disegnato - Drawn by: F.C.	MSA	
Approvato - Approved by: M.G.	DIVISIONE STRUMENTI	
Scala - Scale: ÷	MSA ITALIANA S.p.A. Via Po, 13/17 20089 – Rozzano (MI)	
Emissione - Issue: 0	PESI E DIMENSIONI RACK A 2, 5 E 10 POSTI PER 9010/20	DIS. N° - Drawing no. 004989
Data - Date: 06–08–02	RACK 2, 5 AND 10 PLACE OVERALL DIMENSION FOR 9010/20	



INGRESSO CAVI – CABLES INLET

VISTA FRONTALE
FRONT VIEW



MISURE ESPRESSE IN mm
MEASURE IN mm

CONTENITORE – ENCLOSURE	DIMENSIONI DIMENSIONS Ⓐ	Ⓑ	Ⓒ	PESI (conten.+retromors.) WEIGHTS (enclosure+terminal board)	TOTALE TOTAL
MAX. n°2 U.C. 9010/9020 MAX. n°2 C.U. 9010/9020	205	190	180	3 kg	+ U.C. 9010/20 + C.U. 9010/20 (*)
MAX. n°5 U.C. 9010/9020 MAX. n°5 C.U. 9010/9020	355	340	320	4,5 kg	

(*) U.C. 9010/9020 CAD. = 700g
(*) C.U. 9010/9020 = 700g EACH

0	08/02/00	Emissione - Issue	M.I.
	DATA - DATE	DESCRIZIONE REVISIONE - DESCRIPTION OF REVISION	FIRMA - SIGNATURE

Disegnato - Drawn by: M. Cerutti

Approvato - Approved by:

Scala - Scale: 1:1

DIVISIONE STRUMENTI - TOOLS DIVISION

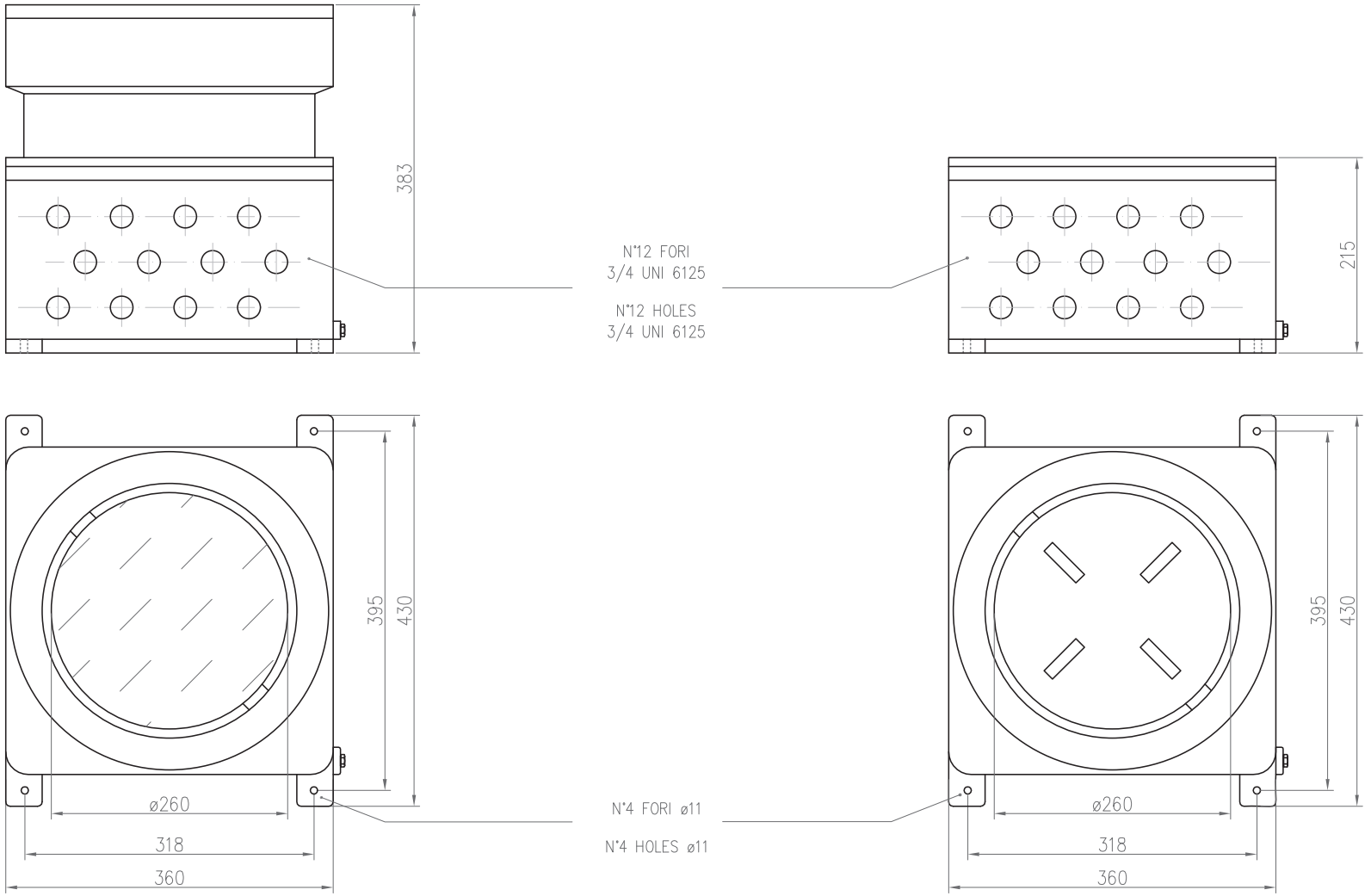
MSA ITALIANA S.p.A. – 20089 Quinto Stampi – Rozzano (MI)

PESI E DIMENSIONI CONT. ABS PER 9010/20
WEIGHT AND DIM. OF ABS ENCL. FOR 9010/20

DIS. N° - Drawing no.
004590

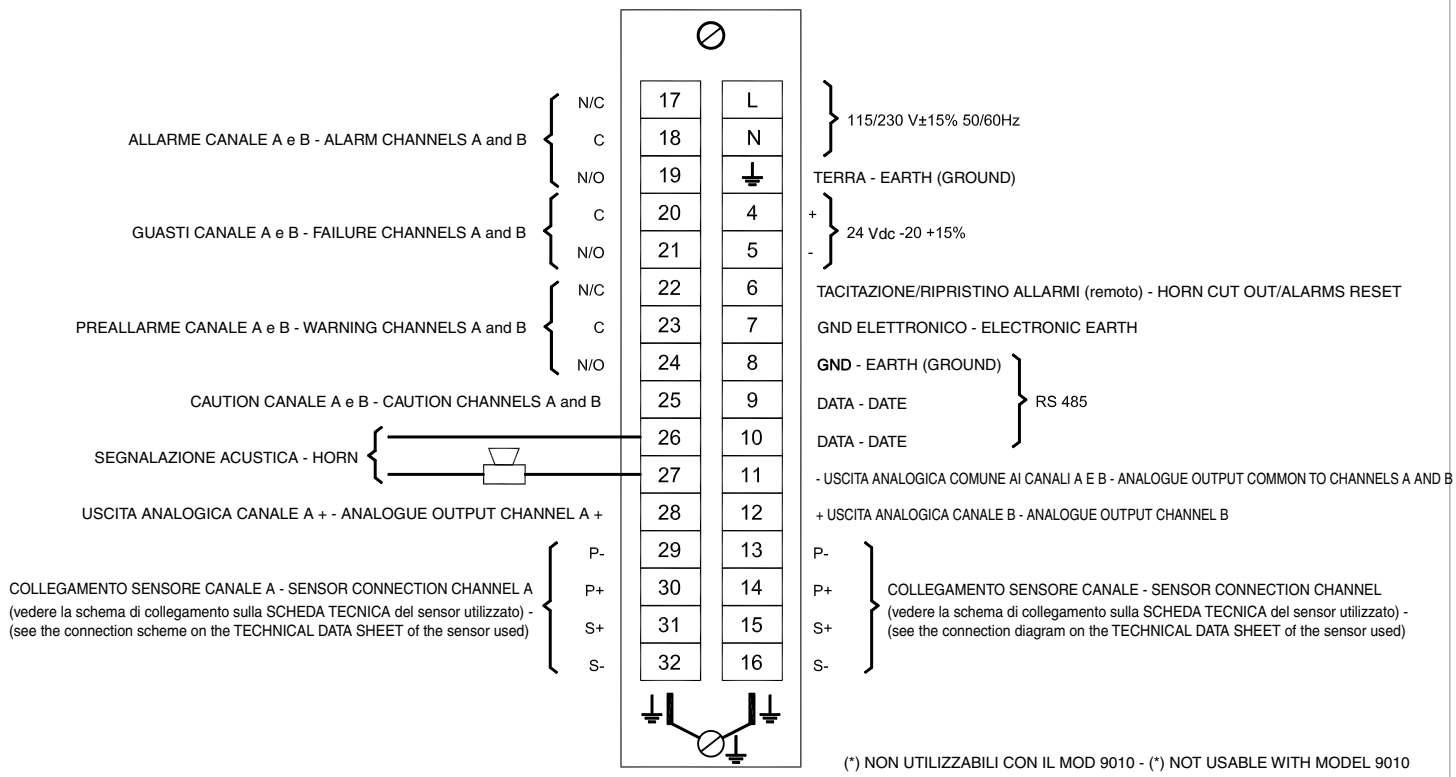
CODICE - CODE:0753030

CODICE - CODE:0753031



1	20-03-03	Aggiunta 4 fori ø11		Ciocca A.
N°- part no.	DATA - DATE	REVISIONE - REVISION	PREPARATO - PREPARED BY	APPROVATO - APPROVED BY
REVISIONE - REVISION				

Disegnato - Drawn by / Approvato - Approved by	MSA	MSA ITALIANA S.p.A. Via Po, 13/17 20089 Rozzano (MI)	
Scala - Scale 1:5	Materiale - Material ALLUMINIO - ALUMINIUM	Tolleranza - Tolerance ±0.5	Codice - Code
Emissione - Issue 0	Descrizione - Description CUSTODIA AD PER UC 9010/20		DIS. N° - Drawing no. 005019
Data - Date 03-03-03	CU 9010/20 EX-PROOF ENCLOSURE		

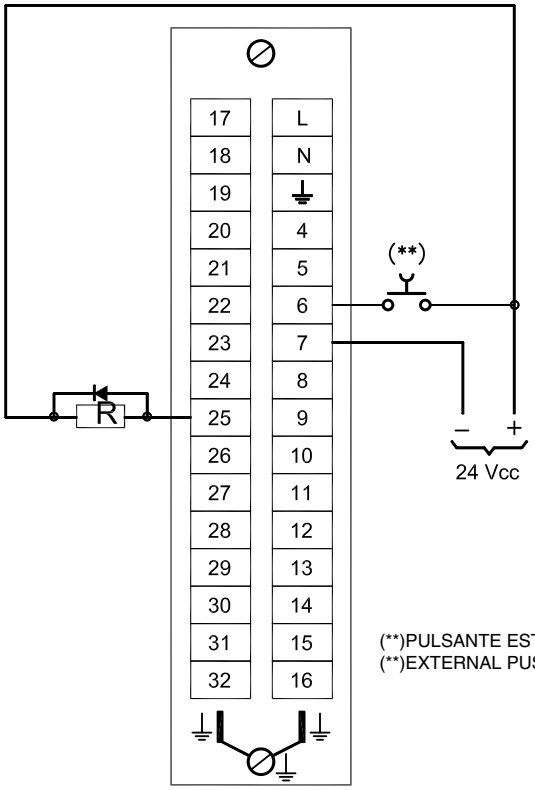


(*) NON UTILIZZABILI CON IL MOD 9010 - (*) NOT USABLE WITH MODEL 9010

CIRCUITI AUSILIARI - AUXILIARY CIRCUITS
(esempi di collegamento) - (connection examples)

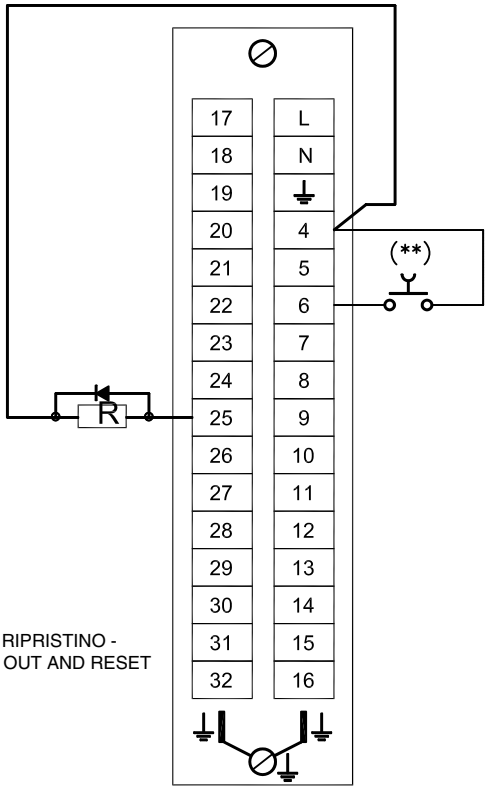
Alimentazione del rele R (CAUTION) - Power supply of relay R (CAUTION)
da fonte esterna — from external source

RELE 24Vcc Imax. - 24Vdc Imax Relay = 30mA



Alimentazione del rele R (CAUTION) - Power supply of relay R (CAUTION)
tramite l'unita di controllo — via the control module

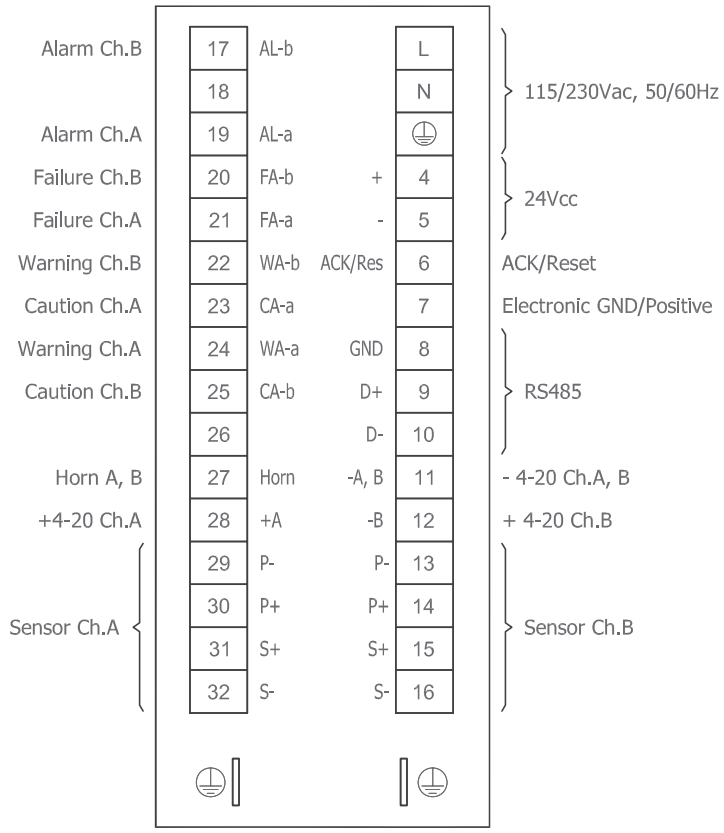
RELE 24Vcc Imax. - 24Vdc Imax Relay = 30mA



(**)PULSANTE ESTERNO PER TACITAZIONE E RIPRISTINO -
(**)EXTERNAL PUSHBUTTON FOR HORN CUT OUT AND RESET

M. Galli	MSA	
/	MSA ITALIANA S.p.A. 20089 Quinto Stampi – Rozzano (MI)	
1		
8.2.00		E07 3074

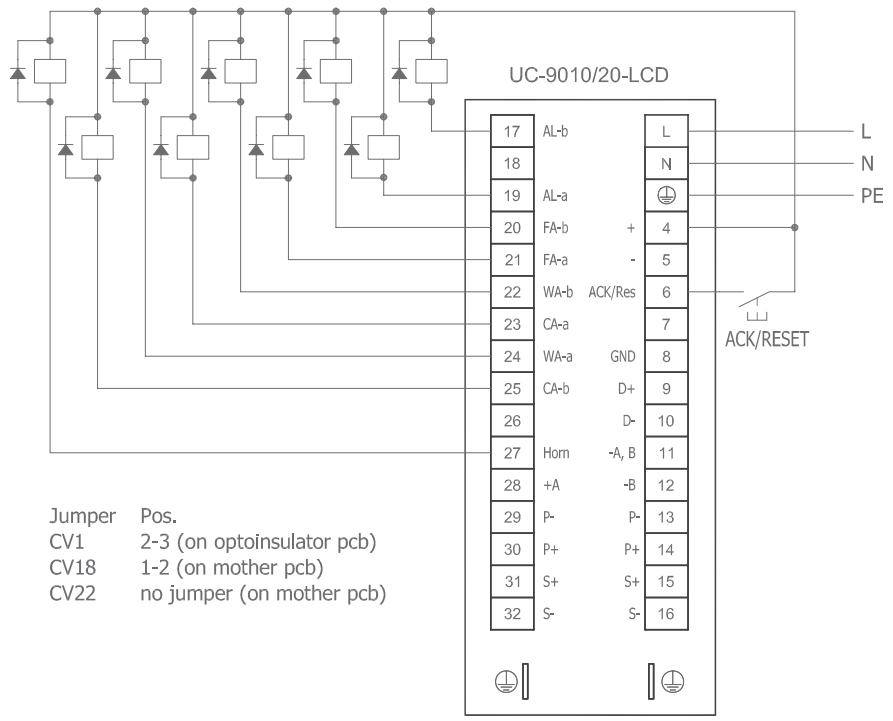
UC-9010/20-LCD



Le funzioni del canale B sono utilizzabili solo con la scheda modello 9020 LCD

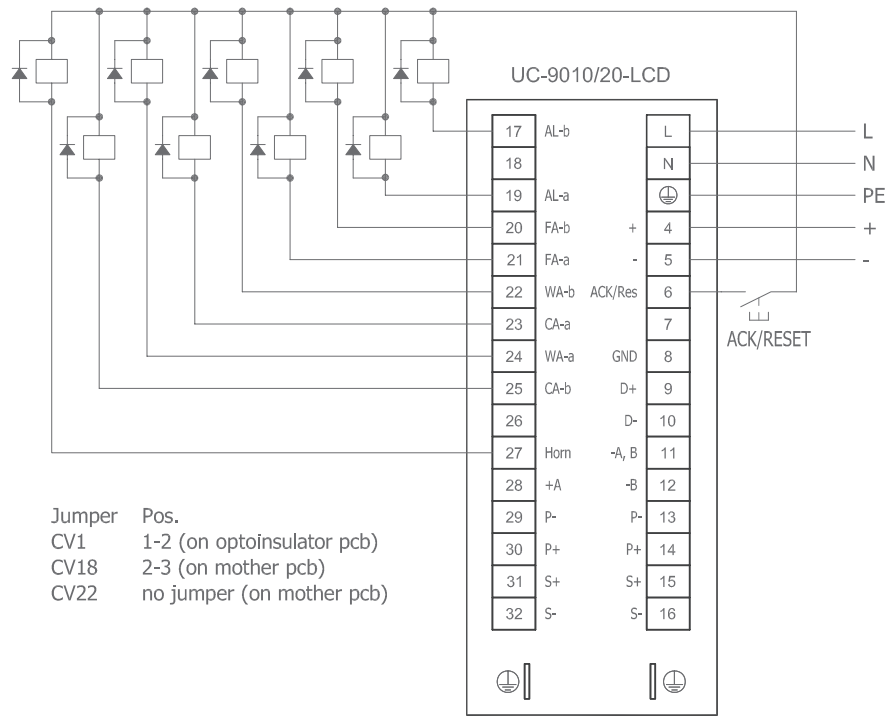
The function of the Channel B are available only by the control unit model 9020 LCD

OPTOISOLATORI AD EMETTITORE COMUNE, ALIMENTAZIONE INTERNA
COMMON EMITTER OPTOINSULATOR, INTERNAL POWERS SUPPLY



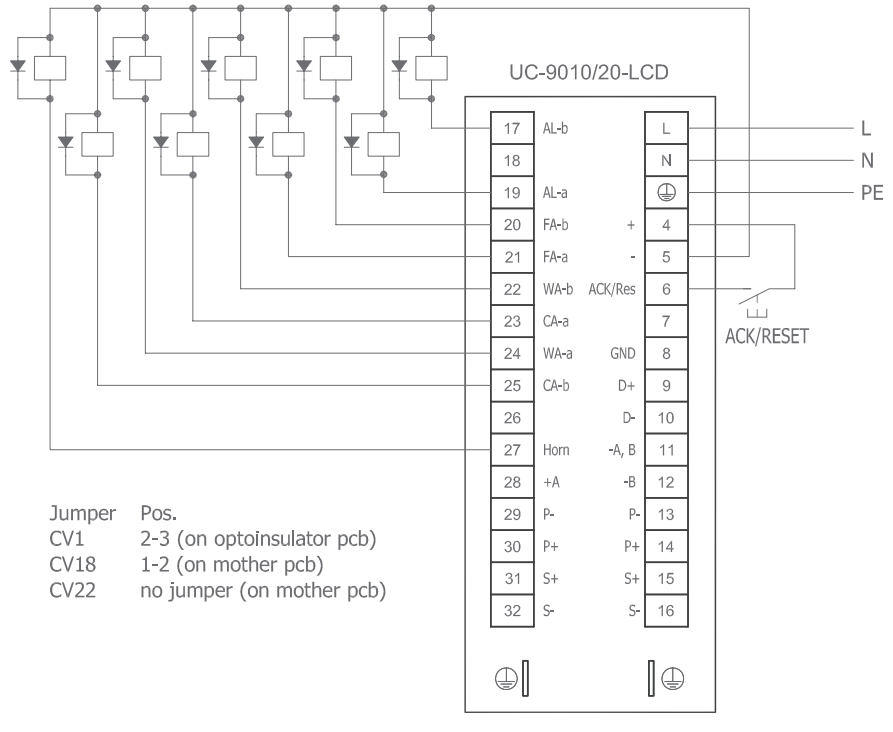
Jumper	Pos.
CV1	2-3 (on optoinsulator pcb)
CV18	1-2 (on mother pcb)
CV22	no jumper (on mother pcb)

OPTOISOLATORI AD EMETTITORE COMUNE, ALIMENTAZIONE ESTERNA
COMMON EMITTER OPTOINSULATOR, EXTERNAL POWERS SUPPLY



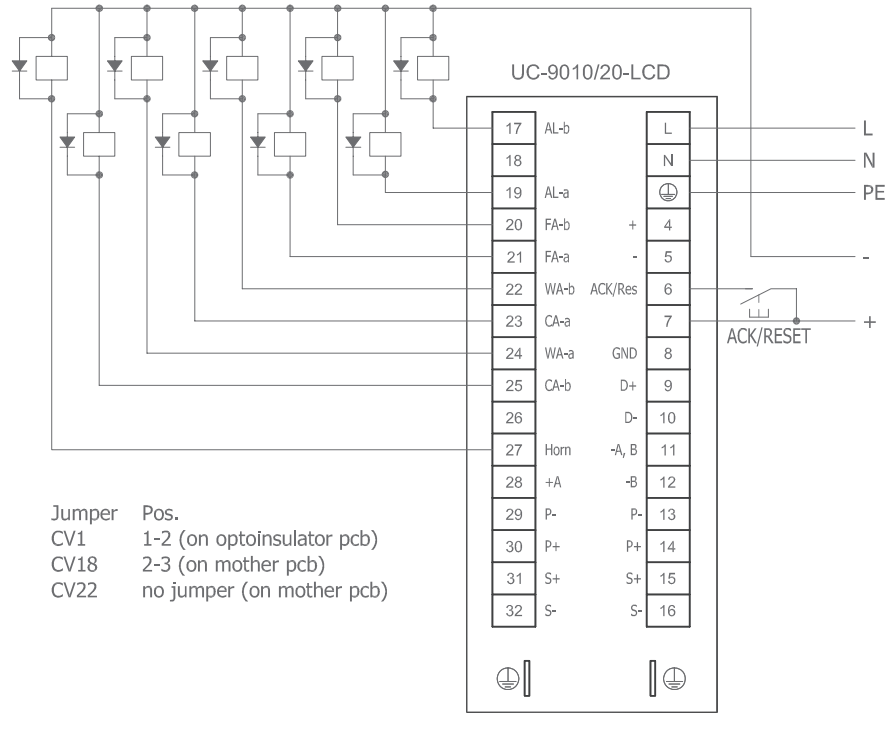
Jumper	Pos.
CV1	1-2 (on optoinsulator pcb)
CV18	2-3 (on mother pcb)
CV22	no jumper (on mother pcb)

OPTOISOLATORI A COLLETTORE COMUNE, ALIMENTAZIONE INTERNA
COMMON COLLECTOR OPTOINSULATOR, INTERNAL POWERS SUPPLY



Jumper	Pos.
CV1	2-3 (on optoinsulator pcb)
CV18	1-2 (on mother pcb)
CV22	no jumper (on mother pcb)

OPTOISOLATORI A COLLETTORE COMUNE, ALIMENTAZIONE ESTERNA
COMMON COLLECTOR OPTOINSULATOR, EXTERNAL POWERS SUPPLY



Jumper	Pos.
CV1	1-2 (on optoinsulator pcb)
CV18	2-3 (on mother pcb)
CV22	no jumper (on mother pcb)

Rev.Nr	Date	Description	Draftsman	Approved

P/N: //

Note: //

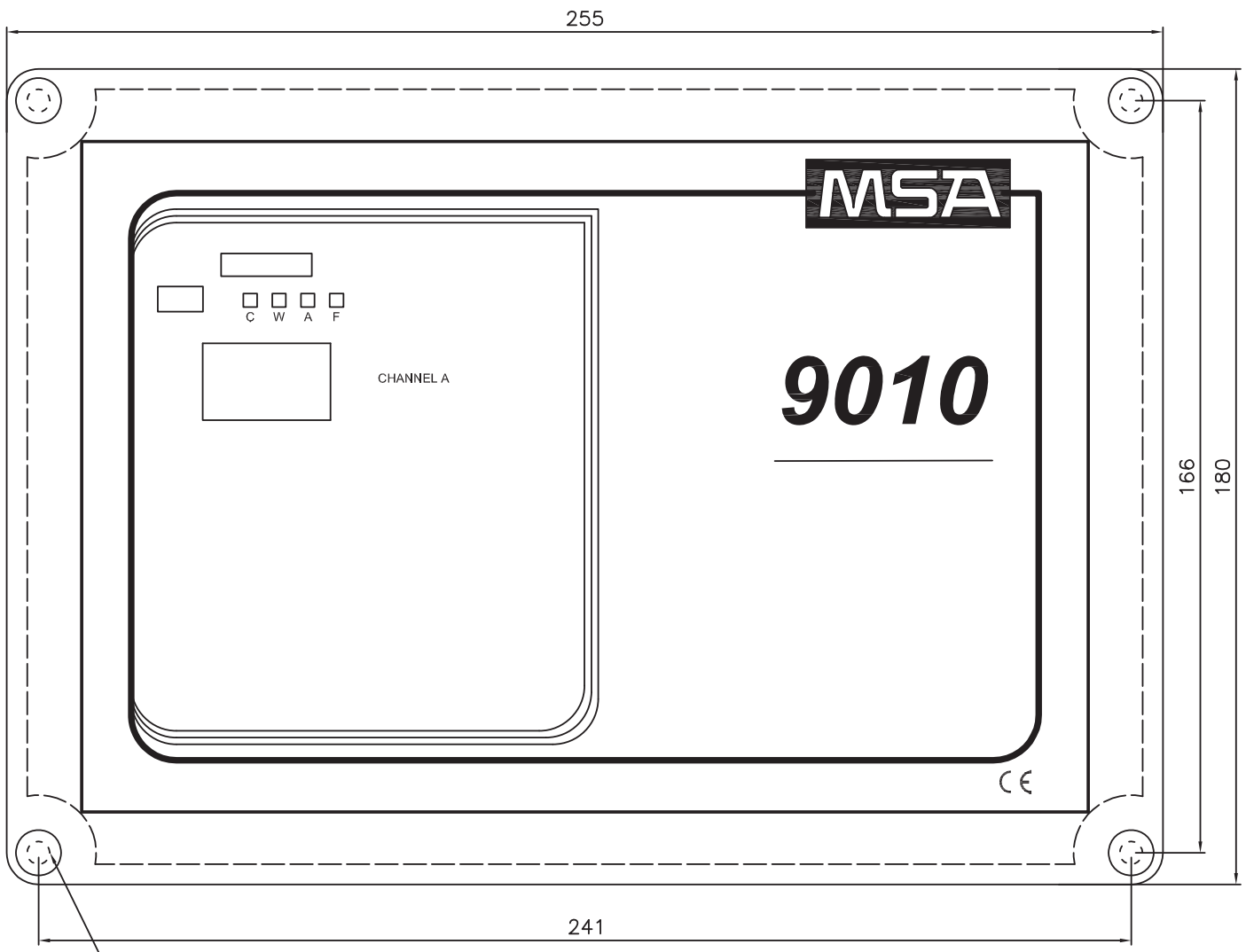
Draftsman	Approved	Date	Material
C.Fecarotta	A.Ciocca	10-10-06	

Italiana S.p.A.
Via Po 13/17
20089 - Rozzano
Milano

Nr. Dwg	Scale	Sheet	Tolerance
E07-3497	//	1/1	//

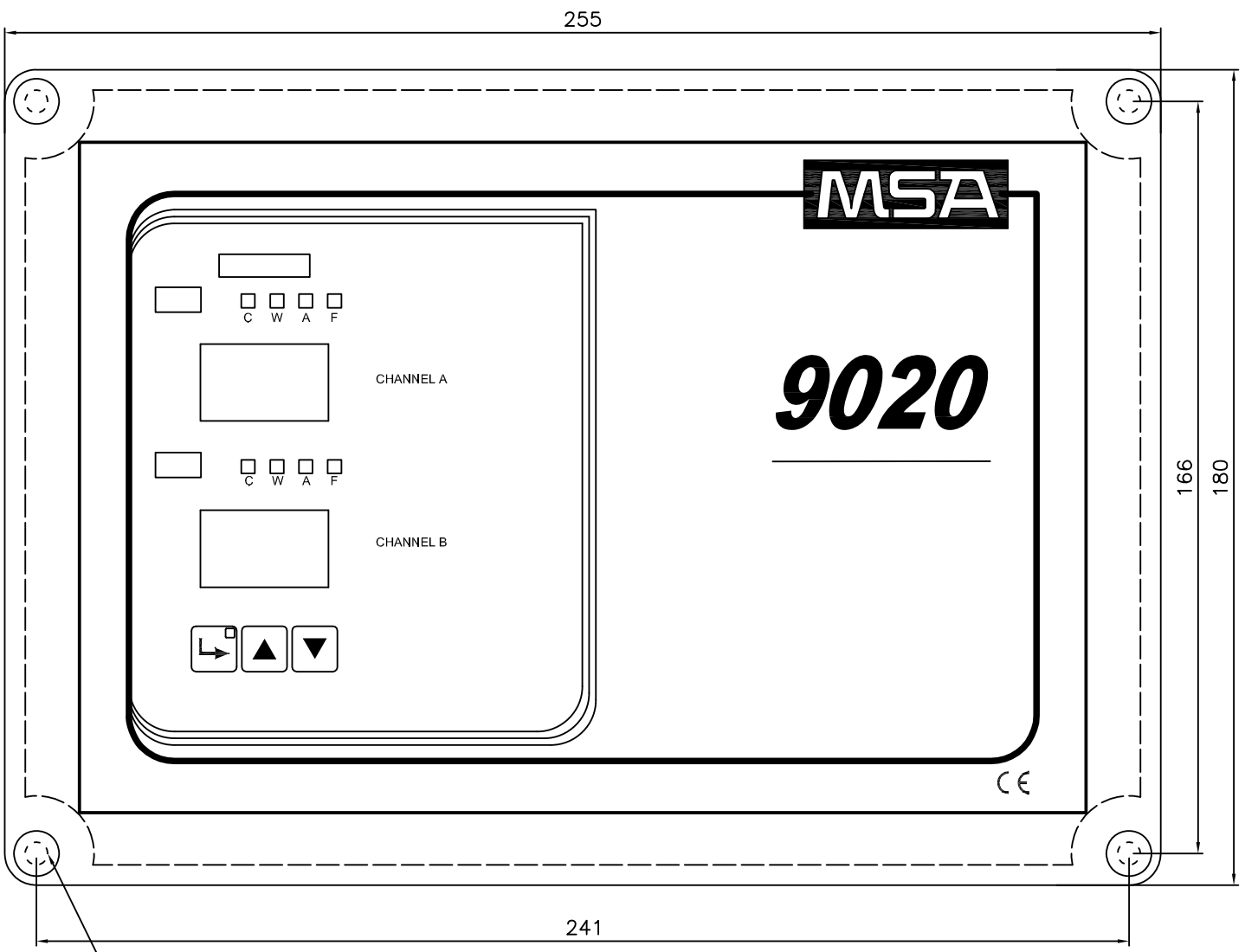
Description: RETROMORSETTIERA OPTOISOLATORI
OPTOINSULATORI REAR TERMINAL BOARD

P:\SETTORIALE\Uff.Tecnico\WSKETCH\Autocad\Elettrici AutoCAD\E07-3497.dwg



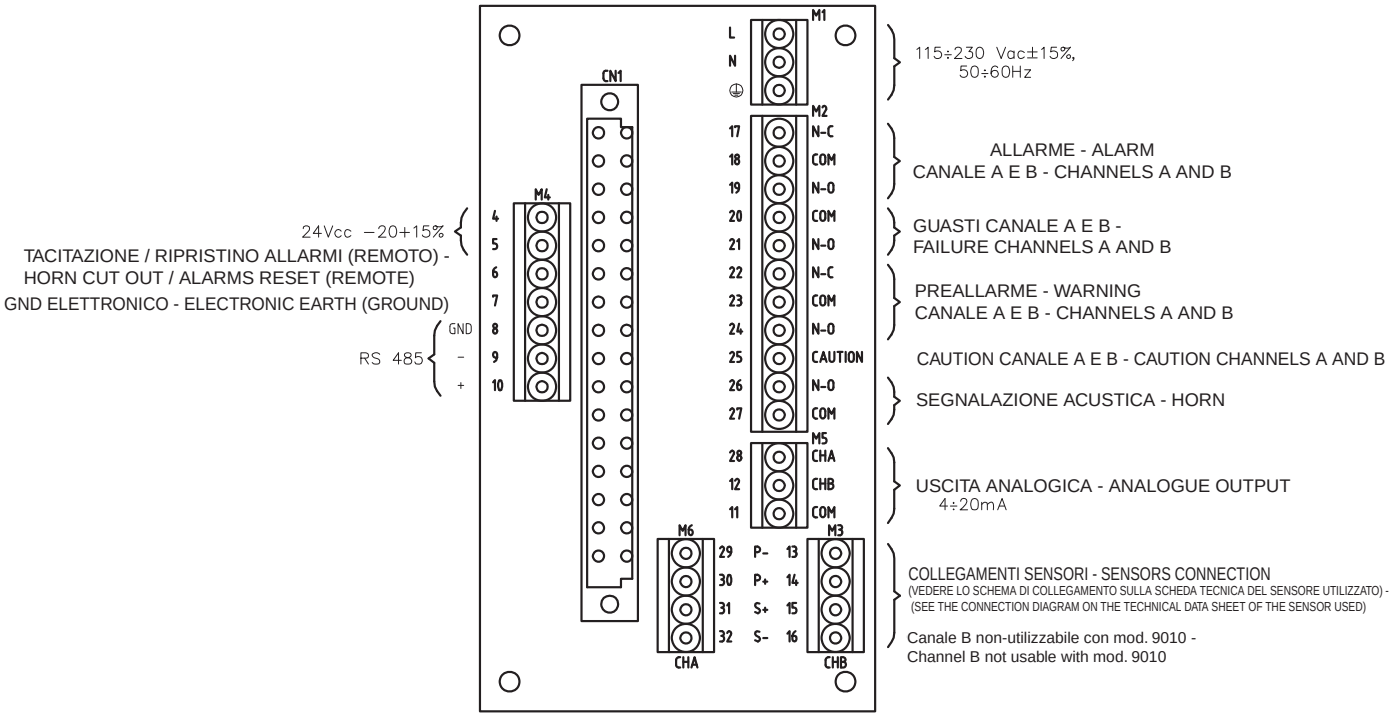
N° - part no.	DATA - DATE	REVISIONE - REVISION	PREPARATO - PREPARED BY	APPROVATO - APPROVED BY
		REVISIONE - REVISION		

Disegnato - Drawn by	MSA	MSA ITALIANA S.p.A. Via Po, 13/17 20089 Rozzano (MI)		
Approvato - Approved by				
Scala - Scale	Materiale - Material	Tolleranza - Tolerance	Codice - Code	0705713
÷	÷	÷		
Emissione - Issue	Descrizione - Description		DIS. N° - Drawing no.	
0	MISURE D'INGOMBRO 9010 DA MURO			
Data - Date	9010 WALL MOUNT OVERALL DIMENSION			005032
07-07-03				

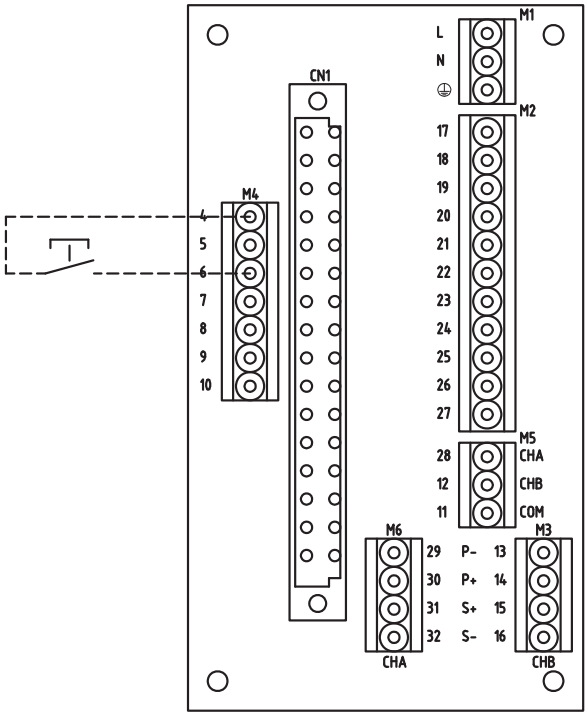


1	04-07-03	Modificata profondità da 95 a 90		Ciocca A.
N° - part no.	DATA - DATE	REVISIONE - REVISION	PREPARATO - PREPARED BY	APPROVATO - APPROVED BY
		REVISIONE - REVISION		

Disegnato - Drawn by	MSA	MSA ITALIANA S.p.A. Via Po, 13/17 20089 Rozzano (MI)	
Approvato - Approved by			
Scala - Scale	Materiale - Material	Tolleranza - Tolerance	Codice - Code
+	+	+	0705723
Emissione - Issue	Descrizione - Description		DIS. N° - Drawing no.
0	MISURE D'INGOMBRO 9020 DA MURO		004973
Data - Date	9020 WALL MOUNT OVERALL DIMENSION		
17-05-02			



COLLEGAMENTO PULSANTE - PUSH BUTTON CONNECTION
TACITAZIONE/RIPRISTINO REMOTO - HORN CUT OUT/REMOTE RESET

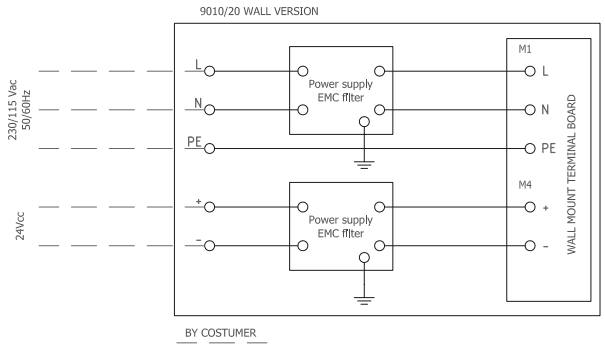


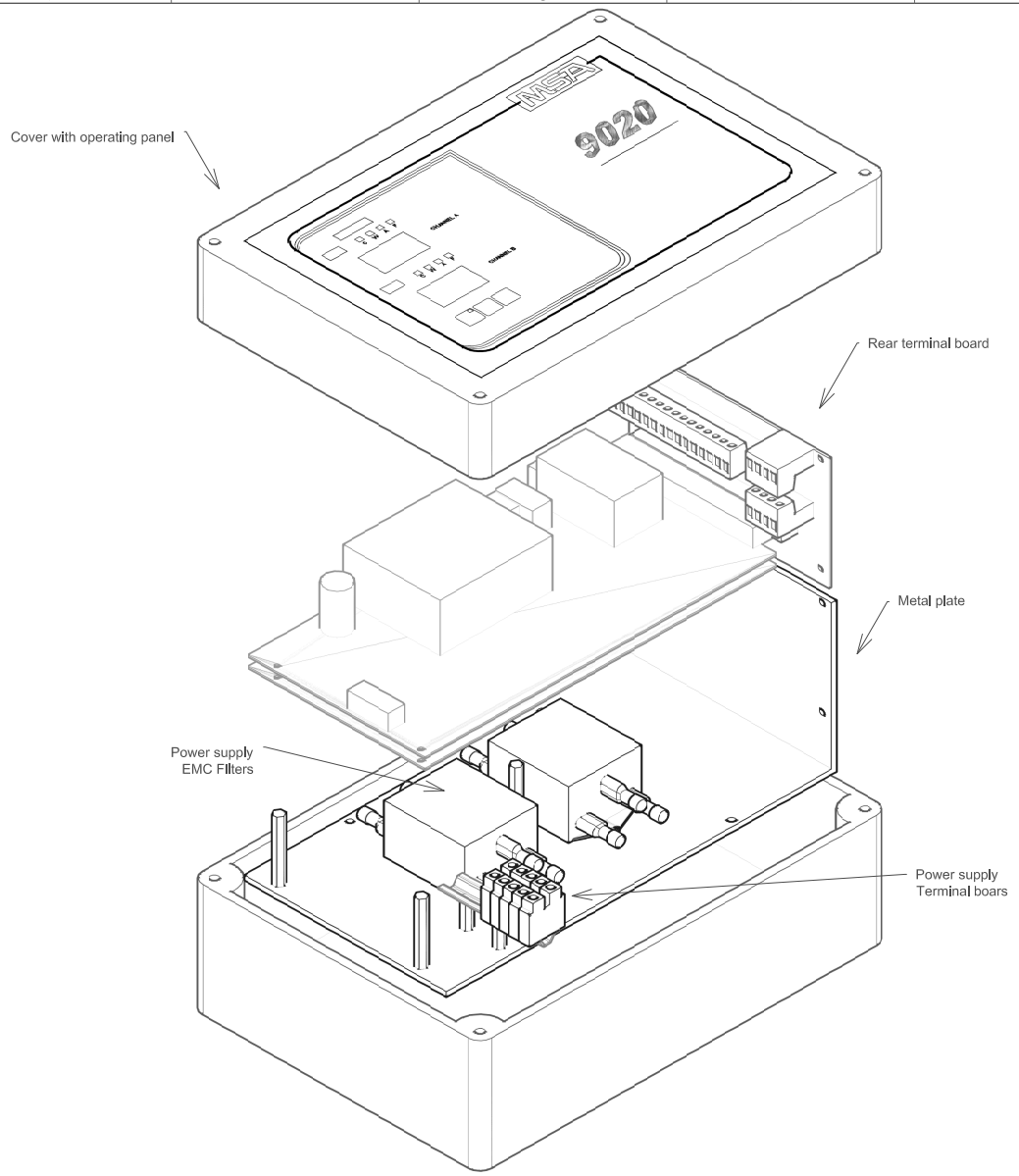
CV4 in posizione 2-3 -
CV4 in position 2-3

N° - part no.	DATA - DATE	REVISIONI - REVISIONS	PREPARATO - PREPARED BY	APPROVATO - APPROVED BY

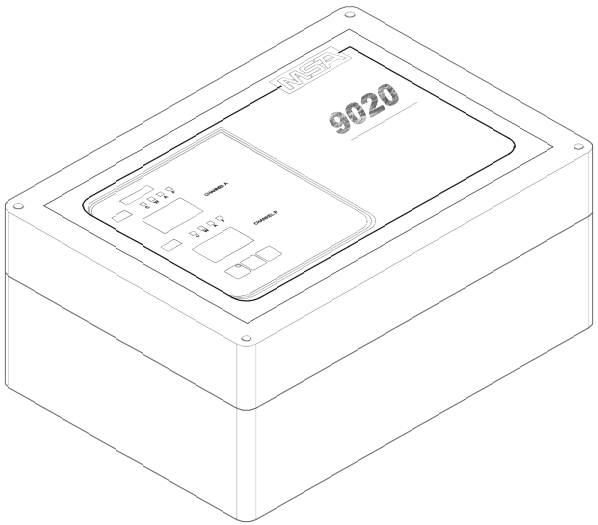
REVISIONE - REVISION

Disegnato - Drawn by	MSA ITALIANA S.p.A. Via Po, 13/17 20089 Rozzano (MI)		
Approvato - Approved by			
Scala - Scale ÷	Materiale - Material	Tolleranza - Tolerance ±0.1	Codice - Code 0705509
Emissione - Issue 0	Descrizione - Description RETROMORSETTIERA 9020 DA MURO		DIS. N° - Drawing no.
Data - Date 14-06-02	9020 WALL MOUNT TERMINAL BOARD		004904





9010 or 9020
Control unit - wall version



P/N: //		Note: //			
Draftsman M.Tusino	Approved C.Fecarotta	Date 30-3-12	Material //	THIS DRAWING IS THE PROPERTY OF MSA AND IS MADE AVAILABLE TO YOU IN CONFIDANCE AND SUBJECT TO THE FOLLOWING: NO PERMISSION IS GRANTED TO PUBLISH, USE, REPRODUCE, TRANSMIT OR DISCLOSE THIS DRAWING, OR ANY INFORMATION CONTAINED THERE IN TO OTHERS WITHOUT THE PRIOR WRITTEN CONSENT OF MSA.	
MSA The Safety Company MSA Itallana S.p.A. Via Po 13/17 20089 - Rozzano Milano			Nr. Dwg DG0749701	Scale //	Sheet 1/2	Tolerance //
			Description 9010-20 Wall layout			

Rev.Nr	Date	Description	Draftsman	Approved

\\Ito-fs01\Wsketch\Autocad\Lay-out AutoCAD\DG0749701.dwg

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