ANALOG SIGNAL DISPLAY Q-DISP-VI

CE

USER's MANUAL

The displays **Q-DISP-VI**, prepared for mounting on the back panel, 96x48mm, will allow you to view analog signals, voltage and current. It is possible to have high power or low voltage AC / DC supply and have up to three configurable outputs of relay outputs and analog outputs

Q-DISP-VI-x-x-x-x

Q-DISP-VI-L (Low Voltage Supply)
Q-DISP-VI-H (High Voltage Supply)

Q-DISP-VI-x-R (n°1 Relay output)
Q-DISP-VI-x-R-R (n°2 Relays output)
Q-DISP-VI-x-R-R-R (n°3 Relays output)
Q-DISP-VI-x-AO (n°1 Analog Output)
Q-DISP-VI-x-AO-R (n°1 AO, n°1 Relay)
Q-DISP-VI-x-AO-R-R (n°1AO, n°2 Relays)
Q-DISP-VI-x-AO-AO (n°2 AO)
Q-DISP-VI-x-AO-AO-R (n°2 AO, n°1 Relay)
Q-DISP-VI-x-AO-AO-AO (n°3 AO)

Q-DISP-VI ANALOG SIGNAL DISPLAY

DEM SPA - Z.I. Villanova, 20 -32013 Longarone (BL) Italy - tel. +39 0437 761021 -fax +39 0437 760024 - P.Iva 00691730253

1. Meter Q-DISP-VI

Panel meter 96x48mm size for process signals

Panel meter for process signals in mA and Vdc, active and passive, monopolar and bipolar, from 2 or 3 wire transducers. Provides up to +20Vdc excitation voltage (max. 35mA, selectable from +5Vdc up to +20Vdc) to power-up the transducer when needed. Scalable reading. 10 segment linearization.

Instrument with 96x48mm standard DIN size. Resolution 4 digits plus negative sign ("*9999*"/"*-9999*"). Additional right digit configurable to zero ("*99990*"/"*-99990*").

Management for up to 3 alarms with 1 or 2 setpoints each, with hysteresis and delays. Provides memory for maximum and minimum, left zeros, display on selectable steps, fixed digits, recursive display filter, password, brightness control, "*measure*" function (visualizes input signal without scaling), offset and signal high autocorrection (assigns the actual signal to the low or high reading), "*peak&hold*" function and password.

Power options with universal AC and DC ranges, and space for 3 additional control and/or signal retransmission modules.

Standard IP54 front protection, with optional upgrade to IP65 protection.

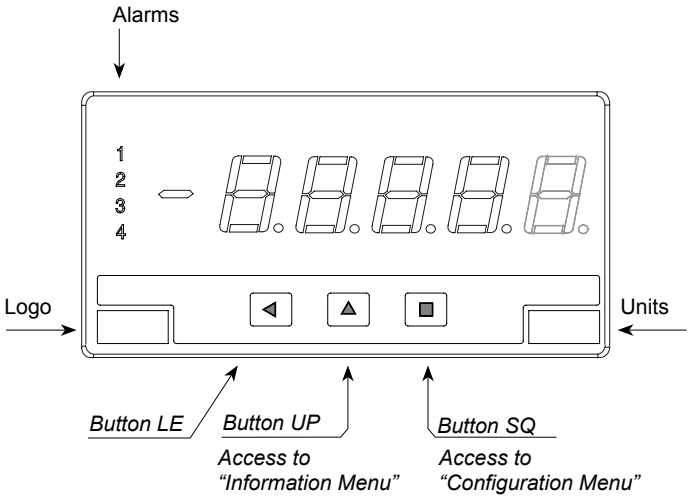
Connections via plug-in screw terminals and configuration via three front push-buttons. For application on industrial environments.

1.1 Order reference

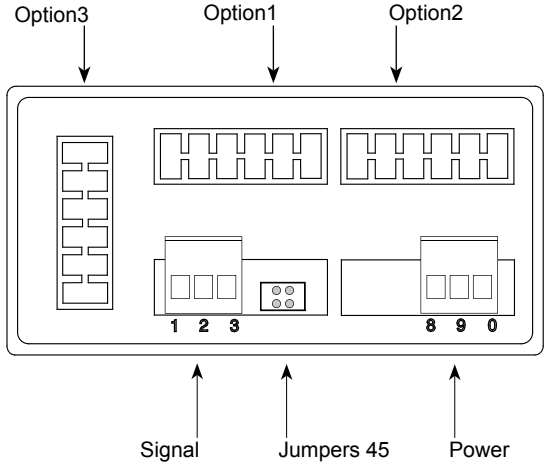
	Model	Power	Option1	Option2	Option3
Q-DISP -	**VI** -	**H** -	**---** -	**---** -	**---**
		-H *(85-265 Vac/dc)*	-R *(1 relay)*	-R *(1 relay)*	-R *(1 relay)*
		-L *(11-60 Vdc and 24/48 Vac)*	-AO *(Analogue output)*	-AO *(Analogue output)*	-AO *(Analogue output)*
			- *(empty)*	- *(empty)*	- *(empty)*

Index

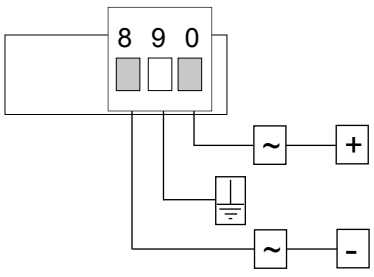
1.2 Front View



1.3 Rear View



1.4 Power Connections



Earth connection - Although a terminal is offered for earth connection, the connection is optional. The instrument does not need this connection for correct functioning nor for compliance with the security regulations.

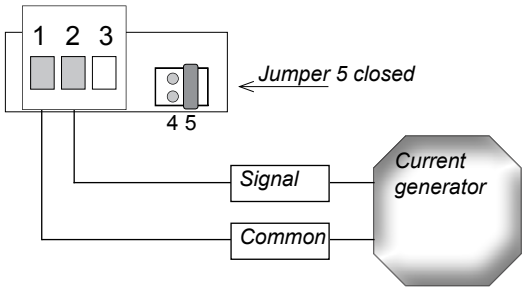
Fuse - To comply with security regulation 61010-1, add to the power line a protection fuse acting as disconnection element, easily accessible to the operator and identified as a protection device.

Power "H" fuse 250mA time-lag

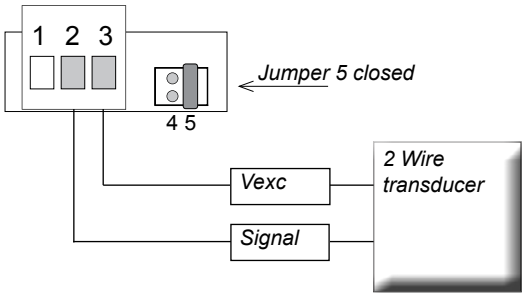
Power "L" fuse 400mA time-lag

1.5 Input signal connections

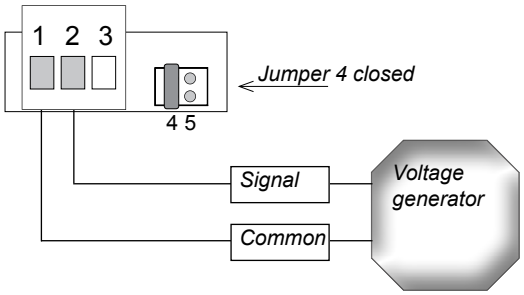
Active current loop 4/20mA / ±20mA



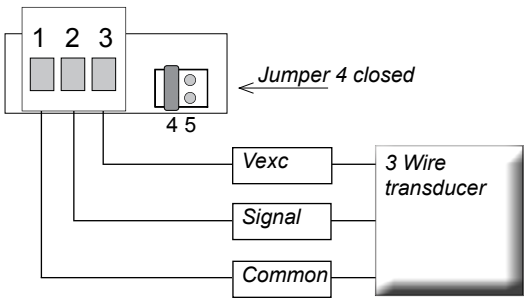
Passive current loop 4/20mA / ±20mA



Active voltage signal 0/10Vdc / ±10Vdc



Passive voltage signal 0/10Vdc / ±10Vdc



1.6 Technical data

Digits	4 (or 5 with last digit fixed to zero)
Type	7 segments, red
Height	14 mm
Display maximum	9999 (99990)
Display minimum	-9999 (-99990)
Decimal point	selectable 8.8.8.8.
Overrange	9999 flashing
Underrange	-9999 flashing
Signals accepted	mA, Vdc
Ranges selectable	4/20mA, 0/10Vdc, ±20mA, ±10Vdc
Connections	2 or 3 wire
Types	active or passive signals (the instrument provides the excitation voltage if needed)
Input impedance	11R in mA, 932K in Vdc
Maximum input signal	10.5Vdc, 27mA
Oversignal	max. 100mA, max. 100Vdc
Excitation voltage	menu selectable
Voltage output	+20Vdc, +15Vdc, +10Vdc, +5Vdc
Accuracy	±5%
Max. current	35mA
Protection	against short-circuit
Accuracy at 25ºC	
in mA	0.05% F.S. ±1 digit
in Vdc	0.05% F.S. ±1 digit
Acquisitions	15 acquisitions / second
Display refresh	15 display refresh / second
Step response time	<120mSec (0% to 99% signal)
Power	
Power "H"	85 to 265 Vac/dc
Power "L"	11 to 60 Vdc and 24/48Vac
Consumption	<4W
Isolation	3500Veff for power "H" 2000Veff for power "L" all levels tested for 60 seconds
Configuration	3 frontal push buttons

(and rear jumper for signal selection in Vdc or mA)

Functions available	
Segment linearization	10 segments
Fixed digits	yes, configurable
Filter on display	yes, recursive, configurable
Steps	yes, configurable
Memory of maximum	yes
Memory of minimum	yes
Zeros to the left	yes, configurable
Add zero to the right	yes, configurable

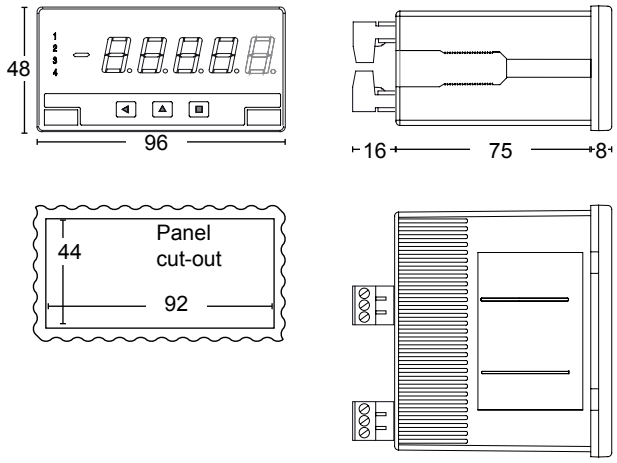
1.6 Technical data (cont.)

Password	yes, configurable
"Measure" function	yes
Auto correction high	yes
Auto correction low	yes
Peak & Hold	yes
Double setpoints	yes
Brightness control	yes, 5 levels
Thermal stability	
offset	10 ppm/ºC
span*	25 ppm/ºC

**span drift includes the offset drift*

Optional boards	maximum 3
Mechanical	
Mounting	panel
Connections	plug-in screw terminals
Weight	<150 grams
Housing materials	ABS, polycarbonate
Front size	96x48mm
Panel cut-out	92x44mm
Deep from panel	91mm (including terminal)
Protection	IP54 standard IP65 optional (Front sealed. Opening the front breaks the seal)
Temperature Operation	0 to 50ºC
Temperature Storage	–20 to +70ºC
Warm-up	15 minutes

1.7 Mechanical dimensions (mm)



1.8 Operating the menus

The instrument has two menus accessible to the user :

"*Configuration Menu"* (key SQ)
"*Information Menu"* (key UP)

The *"Configuration Menu"* allows to change the configuration of the instrument. Access to the *"Configuration Menu"* can be password protected with the function "*PASSWORD*". During operation with the *"Configuration Menu"* the alarms are kept "*on-hold*". When leaving the *"Configuration Menu"* the instrument performs a restart, and new configuration is applied. On restart of the instrument, also the control output modules are restarted (relays, analogue outputs, ...).

The *"Information Menu"* is for information only, and it does not accept changes on the displayed information. To enter the *"Information Menu"* press the "*UP*" button. It is not affected by the "PASSWORD" function. Leaving the *"Information Menu"* returns to the measuring state of the instrument, without restart of the unit.

Rollback - After 30 seconds without interaction from the operator, the instrument leaves the menu and returns to the previous working mode. In case of configuration menu, all changes are discarded.

Button SQ - Selects the menu entry currently displayed. When entering a numeric value (for example a setpoint value) validates the value on display.

Button UP - Moves vertically on the menu entries. When entering a numeric value (for example a setpoint value) modifies the current digit by increasing its value up from 0 to 1, 2, 3, 4, 5, 6, 7, 8, 9.

Button LE - Leaves the current menu. Pressing LE several times will leave all menus. When leaving all menus in the configuration menu, changes will be saved . When entering a numeric value (for example a setpoint value) it moves from one digit to the next. Each digit value can then be modified with the UP button.

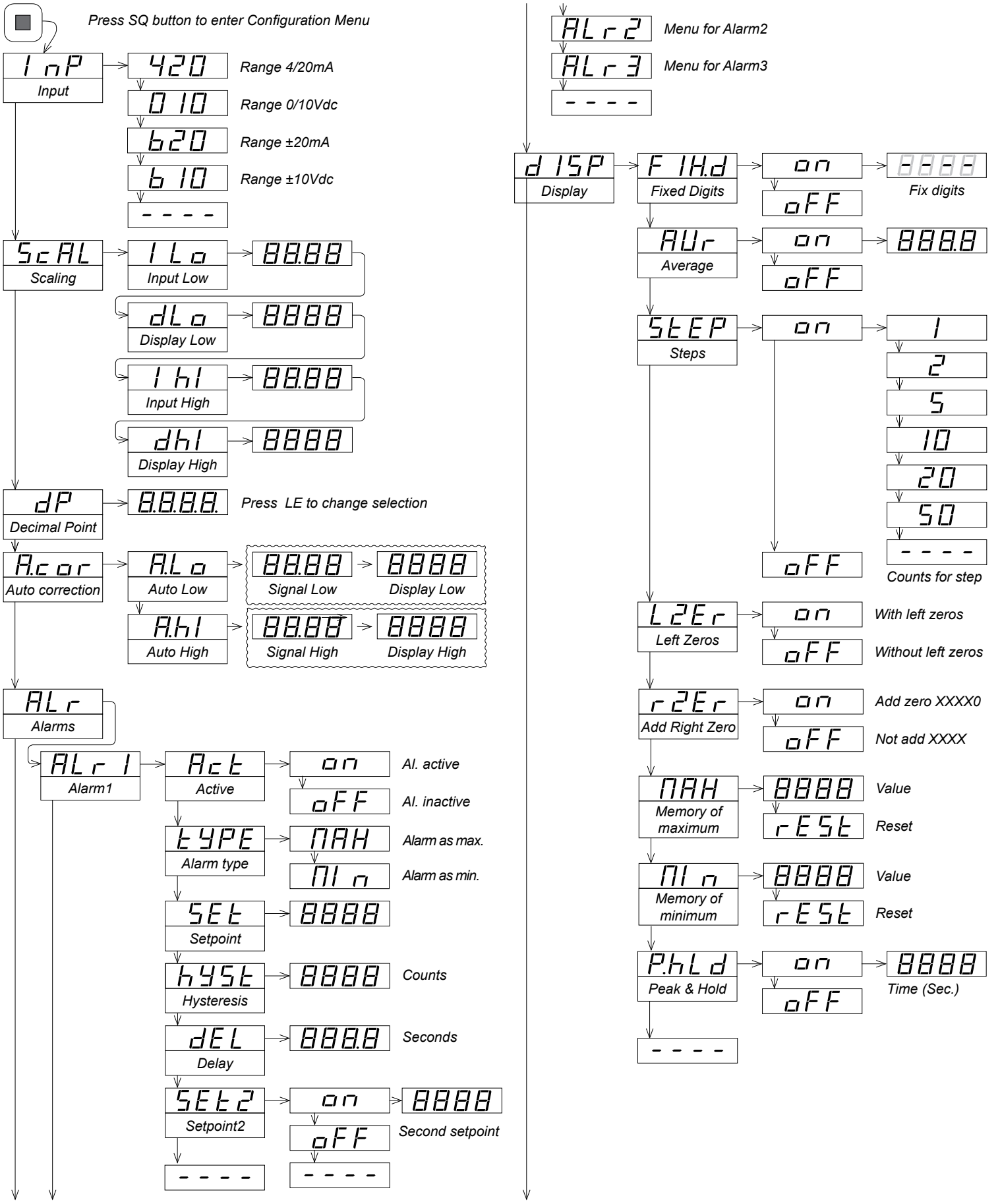
1.9 Default factory configuration

Range and scaling	0/20mA = 0/9000
Decimal point	without decimal point
Alarms 1,2 and 3	
Active	Off (not managed)
Type	maximum
Setpoint	1000
Hysteresis	0 counts
Delay	0.0 seconds
Setpoint2	Off
Display	
Fixed digits	Off
Average	Off
Steps	Off
Left zeros	Off
Add zero to the right	Off
Memory of maximum	-9999
Memory of minimum	9999
Peak & Hold	Off
Tools	
Segments	Off
Password	Off
Brightness	3
Vexc	+20Vdc

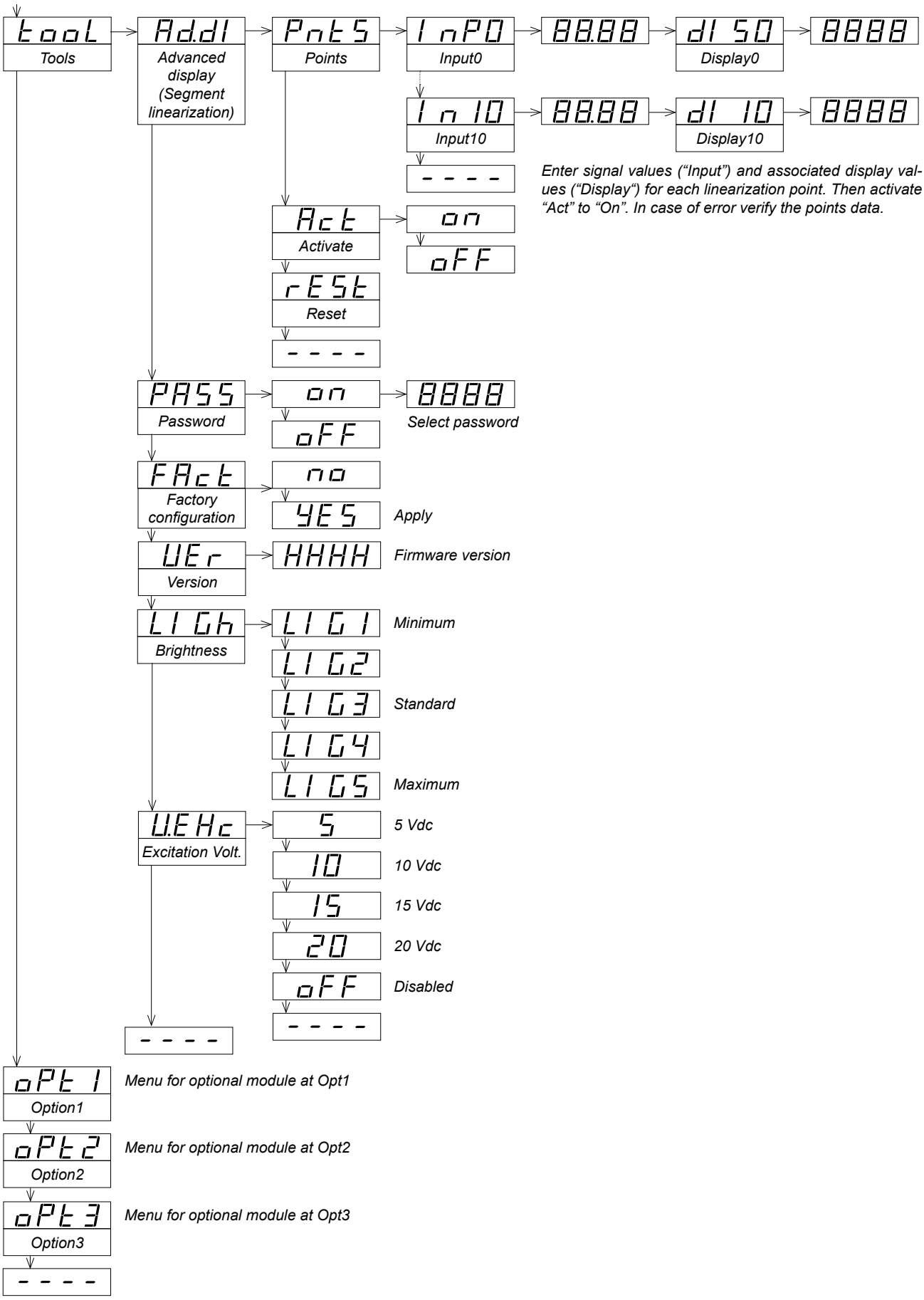
Note - Selecting an input range (Input) scales to the following values :

4/20 mA	= 0/1000	±20mA	= ±1000
0/10 Vdc	= 0/1000	±10 Vdc	= ±1000

1.10 Configuration menu



1.10 Configuration menu (cont.)



1.10.1 Input menu

The input menu allows for selection of the input signal range. Options are 4/20mA, 0/10Vdc, ±20mA and ±10Vdc.

Jumpers 4 (Vdc) or 5 (mA) at the rear of the instrument must be closed according to the range selected. Otherwise, the display will show erratical behavior.

1.10.2 Scaling

The display scaling is based on 4 parameters. These parameters define the two points of the straight line "signal / display".

Input Low ("ILO")	Signal input low
Display Low ("DLO")	Display low
Input High ("IHI")	Signal input high
Display High ("DHI")	Display high

1.10.3 Decimal point

Select the position for the decimal point. Modify with the LE button and validate with the SQ button.

1.10.4 Auto correction

Assigns the current input signal value to the Input Low or Input High configuration parameters. The new values for Input and Display are displayed.

Auto Low (A.LO) - Select "A.LO" to set the current input signal value to the Input Low configuration parameter.

Auto High (A.HI) - Select "A.HI" to set the current input signal value to the Input High configuration parameter.

1.10.5 Alarms

The instrument can manage up to 3 alarms. These alarms control optional relays R (see section 2.1) which can be installed at slots Opt1, Opt2 and Opt3.

Active (ACT) - Value "ON/OFF". Defines if the instrument has to manage this alarm or not. Select "OFF" for alarm not managed.

Type (TYPE) - Value "MAX/MIN". Defines the behavior of the alarm as maximum or minimum alarm. The alarms configured as maximum are activated when the display value is equal or higher than the setpoint. The alarms configured as maximum are deactivated when the display is lower than the setpoint. The alarms configured as minimum have the inverse behavior.

Setpoint (SET) - Value from "9999" to "-9999". Alarm set point.

Hysteresis (HYST) - Value from "0" to "9999". Points of hysteresis. The hysteresis applies on the deactivation of the alarm.

Delay (DEL) - Value from "0.0" to "99.9" seconds. Delay to be applied to the relay activation and deactivation. Relays are activated and deactivated X seconds after the activation / deactivation of the alarm. The delay affects only to the relays. The delay does not affect to the front leds.

Setpoint2 (SET2) - Value from "-9999" to "9999". Second setpoint. The second setpoint allows for the creation of activation windows. If the alarm is configured as maximum with setpoint 1000 and setpoint2 is configured at 1500, the alarm will be activated between 1000 and 1500 and the alarm will be deactivated when display is <1000 and >1500. Setpoint2 is affected on the same way as the setpoint with hysteresis and delays.

1.10.6 Display

Functions on this menu allow for configuration of the display.

Fixed Digits (FIX.D) - Allows a digit to be fixed to a predefined value (for example, least significant digit fixed to "0"). It is a condition to fix a digit that all digits to its right are also fixed. Value "-" shows that the digit is not fixed.

Average (AVR) - Recursive filter applied to display. Value from "0.0" to "99.9". The severity of the filter increases with the value selected. Increasing the severity of the filter makes the display response slower.

Steps (STEP) - Display changes on predefined steps. Values are 1, 2, 5, 10, 20 and 50. The display is made in steps of X counts. For example, select a step of 20 will make the display to change in steps of 20 (1420, 1440, 1460, ...).

Left Zero (LZER) - Value "On/Off". Select "On" to visualize zeros to the left.

Add Right Zero (RZER) - Add a zero to the right. Value "On/Off". Select "On" to light a fifth digit on the display, placed to the right (LSD position) and fixed to a value of "0". Maximum display reading is now 99990 and minimum -99990.

Maximum (MAX) - Memory of maximum display. Indicates the maximum value of display since the last reset of the memory. Memory is reset on the following cases : manual reset from the Configuration Menu (Maximum), change on the input signal (Input), modification on the scaling (Scaling), change on the decimal point (dP), modification of the linearization segments, or instrument power-down.

Minimum (MIN) - Memory of minimum display. Indicates the minimum value of display since the last reset of the memory. Memory is reset on the following cases : manual reset from the Configuration Menu (minimum), change on the input signal (Input), modification on the scaling (Scaling), change on the decimal point (dP), modification of the linearization segments, or instrument power-down.

Peak & Hold (P.HLD) - Peak & Hold function detects sharp drops in the displayed value, and holds the display if a display drop is detected. To disable the hold function for a moment, press any of the front buttons or wait for a predefined time :

Time 0	hold disabled (Off)
Time 1 a 3999	seconds, before disabling the hold
Time 4000	infinite hold

The counting of seconds is started each time there is an increase in the display value. Alarms will follow the input signal while hold is active.

1.10.7 Tools

Advanced Display (AD.DI) - Segments linearization. The instrument has 10 linearization segments (11 points). Each linearization points is formed of a signal input value ("INPX") and an associated display value ("DISPX"). Enter the values for each point from the Points menu ("PNTS"). It is required that the input signal values "INPX" must increase for each new point. When all points are entered, select "ACT" value to "ON" in the activation menu. A check is automatically performed when entering the points and when activating the points. In case of error verify the data entered on the points. Leave the menu pressing "LE" button. Reset option "REST" deletes all existing points.

Password (PASS) - Select a number to act as password. This password will be requested when entering the Configuration Menu. To deactivate the password select "Off".

Factory Settings (FACT) - Factory default configuration. Select "yES" to activate the factory default configuration.

Version (VER) - Firmware version installed.

Light (LIGH) - Brightness. Select between 5 predefined levels of brightness.

Excitation Voltage (V.EXC) - Excitation voltage provided by the instrument. Select 5Vdc, 10Vdc, 15Vdc or 20Vdc. Select "oFF" to disable the excitation voltage.

1.10.8 Menu OptX - Options

Menu options OPT1, OPT2 and OPT3 give access to the configuration menus of the options installed at slots Opt1, Opt2 and Opt3. This menu depends on the installed option. If there is no option installed the instrument shows "*NONE*". Control modules R are controlled from the standard alarm menu (see section 1.12.7).

1.11 Messages and errors

When the instrument detects that the displayed value does not correspond to the expected value, the display will flash and alternate with a message.

"**h.udr**" Hardware underrange. The instrument is reading the lowest possible signal, and can not follow lower signals.

"**h.oVr**" Hardware overrange. The instrument is reading the highest possible signal and can not follow higher signals.

"**d.udr**" Display underrange. The instrument is displaying the minimum value (-9999) and can not display below.

"**d.oVr**" Display overrange. The instrument is displaying the maximum value (9999) and can not display above.

"**hoLd**" The instrument is showing the value present when the hold function was activated. Hold function is active.

"**Min**" The instrument displays the minimum displayed value in memory. The minimum visualization is active.

"**MAX**" The instrument displays the maximum displayed value in memory. The maximum visualization is active.

"**P.hLd**" The instrument displays the peak value. Function Peak&Hold is active.

"**Err.0**" Values introduced on the "ScAL" menu are not valid. Default values are activated. The slope defined by the two points is almost vertical (higher than 5000):

"**Err.1**" Password incorrect.

"**Err.2**" The instrument has detected an installed option but was unable to communicate.

"**Err.3**" Related to the edition of a linearization point. Returns to the point for further edition. The value of "InPX" of the edited point is lower than "InPX" of the previous point.

"**Err.4**" Related to the activation ("Act") of the linearization segments ("Ad.dI"). Activation is not allowed. The value "InPX" of one of the points is higher than "InPX" of the next point.

"**Err.5**" Related to the activation ("Act") of the linearization segments ("Ad.dI"). Activation is not allowed. The slope defined by one of the segments is almost vertical.

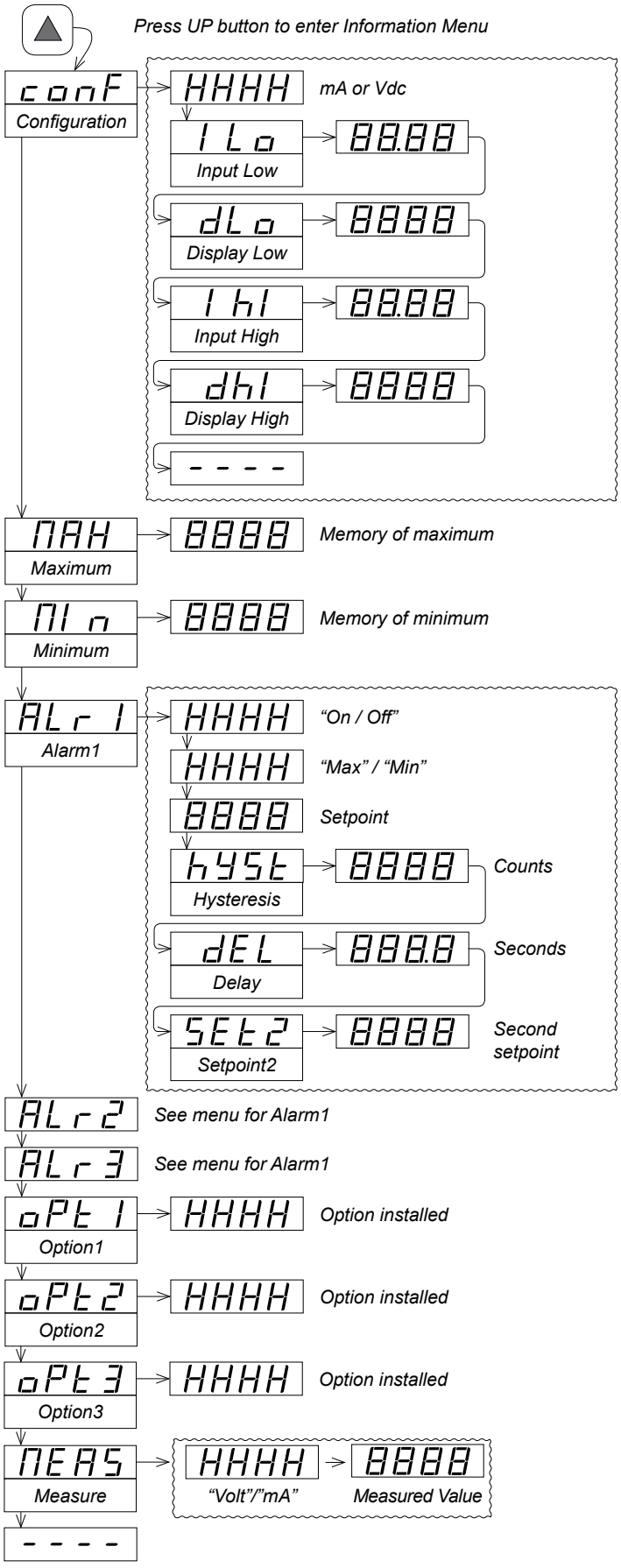
Slope condition for Err.0 and Err5

$$\frac{(dhI\text{-}dLo)\ [Counts]}{(IhI\text{-}ILo)\ [mA\ or\ Vdc]} < 5000$$

"**Err.8**" Excitation voltage overloaded. Excessive current is being demanded to the excitation voltage.

"**E.101**" Option is installed but the type can not be recognized.

1.12 Information menu



1.12.1 Information menu

Configuration (Conf) - Informs the configured input signal range (4/20mA, 0/10Vdc, ...), and the values for input low "ILo", display low "dLo", input high "IhI" and display high "dhI".

Maximum (MAX) - Value of the maximum display.

Minimum (MIn) - Value of the minimum display

AlarmX (ALX) - Configuration of alarm X. The sequence of information shows if the alarm is being managed ("On/Off"), the alarm type ("Max/Min"), the setpoint, the hysteresis value, the activation delay and the value of setpoint2 ("Off" or the setpoint2 value).

OptionX (OptX) - Type of module installed. If there is no module shows "nonE".

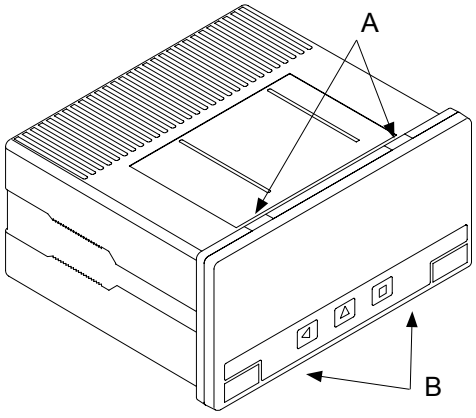
Measure (MEAS)- Multimeter function. Shows the value of the input signal without scaling. This is the real value the instrument is receiving on terminals, in Vdc or mA.

1.13 Accessing the instrument

You may need to access the inside of the instrument to insert additional modules. Use a flat screwdriver to unlock the upper clips marked with "A". Then unlock the lower clips marked with "B" and move out the front filter. Let the inside of the instrument slide out of the housing.

To reinsert the instrument make sure that all modules are correctly connected to the pins on the display module. Place all the set into the housing, assuring that the modules correctly fit into the internal guiding slides of the housing. Once introduced, place again the front filter by clipping first the upper clips "A" and then the lower clips "B".

Important - If your instrument was delivered with the IP65 front seal option, accessing the inside of the instrument will permanently break the IP65 seal on the areas of clips "A" and "B".



1.14 Warranty

All instruments are warranted against all manufacturing defects for a period of 24 MONTHS from the shipment date. This warranty does not apply in case of misuse, accident or manipulation by non-authorized personnel. In case of malfunction get in contact with your local provider to arrange for repair. Within the warranty period and after examination by the manufacturer, the unit will be repaired or substituted when found to be defective. The scope of this warranty is limited to the repair cost of the instrument, not being the manufacturer eligible for responsibility on additional damages or costs. .

1.15 Installation precautions

Risk of electrical shock. Instrument terminals can be connected to dangerous voltage.

Instrument protected with double isolation. No earth connection required.

Instrument is in conformity with CE rules and regulations. See "CE Declaration of Conformity" further in this document.

This instrument has been designed and verified according to the 61010-1 CE security regulation, and is designed for applications on industrial environments. See the "CE Declaration of Conformity" further in this document for information on the category of measure and the degree of pollution levels that apply.

Installation of this instrument must be performed by qualified personnel only. This manual contains the appropriate information for the installation. Using the instrument in ways not specified by the manufacturer may lead to a reduction on the specified protection level. Disconnect the instrument from power before starting any maintenance and / or installation action.

The instrument does not have a general switch and will start operation as soon as power is connected. The instrument does not have protection fuse, the fuse must be added during installation.

The instrument is designed to be panel mounted. An appropriate ventilation of the instrument must be assured. Do not expose the instrument to excess of humidity. Maintain clean by using a humid rag and do NOT use abrasive products such as alcohols, solvents, etc.

General recommendations for electrical installations apply, and for proper functionality we recommend : if possible, install the instrument far from electrical noise or magnetic field generators such as power relays, electrical motors, speed variators, ... If possible, do not install along the same conduits power cables (power, motor controllers, electrovalves, ...) together with signal and/or control cables.

Before proceeding to the power connection, verify that the voltage level available matches the power levels indicated in the label on the instrument.

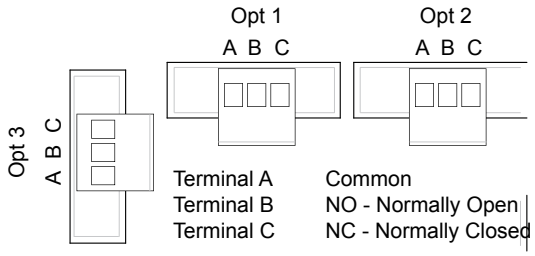
In case of fire, disconnect the instrument from the power line, fire alarm according to local rules, disconnect the air conditioning, attack fire with carbonic snow, never with water.

2. Control modules

2.1 Module R

Module with 1 relay. Up to a maximum of three R modules can be installed in one Q-DISP panel meter.

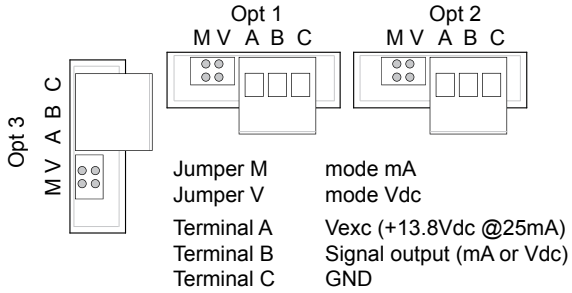
Relay type	3 contacts (Common, NC, NO)
Maximum current	8A (resistive load)
Voltage	250 Vac continuously
Installable at	Option1 and/or Option2 and/or Option3

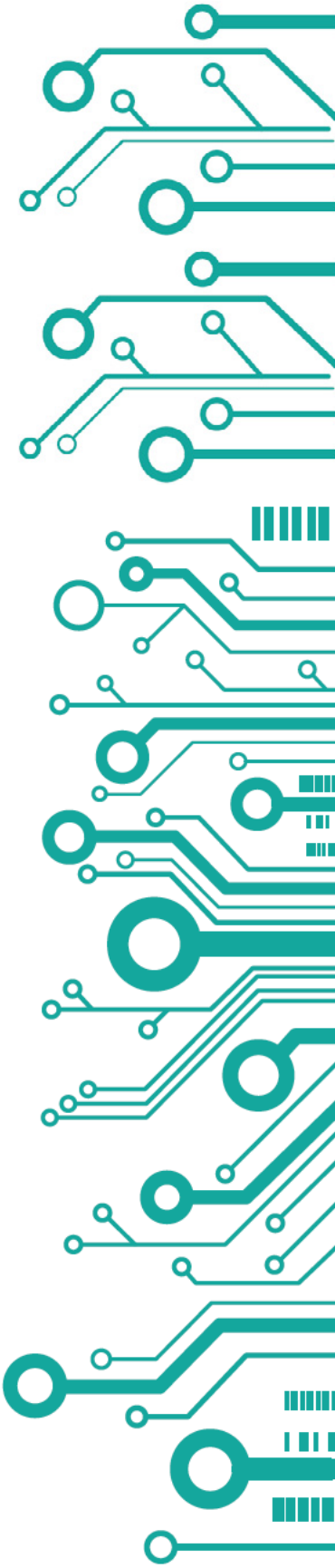


2.2 Module AO

Module with 1 analogue output. Configurable 4/20mA or 0/10Vdc. Output signal proportional to the reading. Scaling through the frontal keypad. Up to a maximum of three AO modules can be installed in one Q-DISP panel meter.

Output	4/20mA, 0/10Vdc selectable
Accuracy	0.1% FS
Isolated	yes, 1000Vdc
Thermal drift	50 ppm/ºC for Vdc 60 ppm/ºC for mA
Installable at	Option1 and/or Option2 and/or Option3





www.qeed.it info@qeed.it

Sales department..... sales@qeed.it

Technical department.....technical@qeed.it

Z.I. Villanova, 20 - 32013 Longarone (BL), Italy

Ph. +39 0437 761021
Fax +39 0437 760024

September 2013