SERIES HB 548

Quality in Electronic Manufacturing

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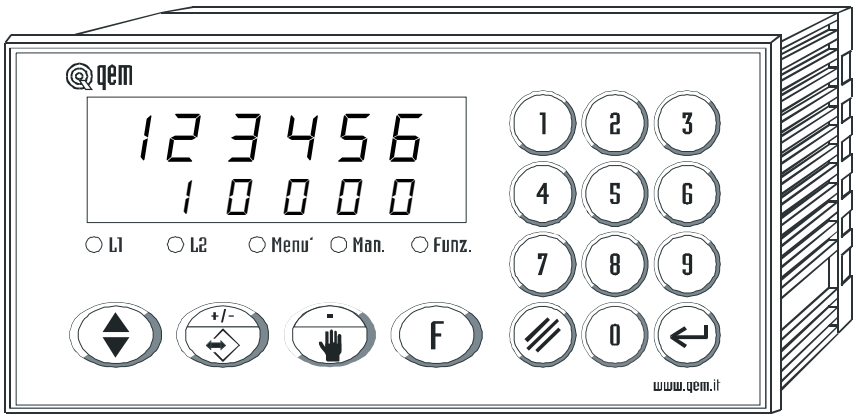
Hardware structure



Installation guide

WARNINGS

- This manual is a complement ot the “User’s Manual”; it is necessary to get all information here indicated. We recommend then a careful reading and, in case of misunderstandings, please contact QEM for any further information by sending the assistance fax which you shall find enclosed to the manual of installation, maintenance and assistance.

- QEM is free from any responsibility for damages to people or things due to unobservance of the instructions and prescriptions contained in this leaflet. We also state that the customer/purchaser must use the instrument according to the instructions supplied by QEM. Any authorization for further use and replacement shall be deemed as valid by QEM, in case of contestation, only if it has been written by QEM

- No reprinting or republishing or delivery to third parties of this manual or of its parts is authorized unless a written authorization is provided by QEM. Any infraction shall provoke a request of indemnization for damages on behalf of QEM.

- All rights generated by patents or models are reserved.

- QEM reserves the right to partially or integrally modify the characteristics of the instrument described and the enclosed documentation

- This document is integrally valid except for mistakes or omissions.

Manual release	***Modifications to the manual***	***Modification date***
100	New manual	16 / 10 / 01

Issuance and Approval

Issued by the Person in Charge for the Documentation: .....

Approved by:- Person in Charge of Technical Office: .....

- Person in Charge of Commercial Office: .....

- Person in Charge for the Product: .....

AVAILABLE OPTION LEGEND

Version	*Description*
.	Basic version.
A	Output U1 and U2 for stepper motors control.
B	Bi-directional counter 12V - 100KHz.
C	Bi-directional counter 5V - 20KHz.
D	No bi-directional counter and zero pulse.

Option	*Description*
A	Step analog output with +/-15 bits resolution.
C	CNC analog output with +/- 15 bits resolution.
P	Epicicloidal CNC analog output with +/- 15 bits resolution
L20	20 digital output.
U8	8 power digital output.
U12	12 power digital output.
U16	16 power digital output.
U20	20 power digital output.
E	5 digital output and 4 digital input.
RS	RS 232C.
DF	RS 422.
MD	RS 485.

CARATTERISTICHE TECNICHE, ELETTRICHE E MECCANICHE

OPERATION ENVIROMENT

Temperature: ..... 0÷50 °C
Humidity: ..... 90% without condensate
Max. altitude: ..... 2000 m on sea level
Atmosphere: ..... No corrosive gas
Temperature of transport and storage: ..... -25÷70 °C
Degree of protection of the container. ..... IP41 (Conform to EN 60529)
Degree of frontal protection: ..... IP51 (Conform to EN 60529)
Resistance to vibrations: ..... Conform to IEC 68-2-6 (Theoretical data)
Resistance to shocks: ..... Conform to IEC 68-2-27 (Theoretical data)
Immunity to interferences: ..... Conform to EN 50082-2
Emission levels: ..... Conform to EN 50081-2

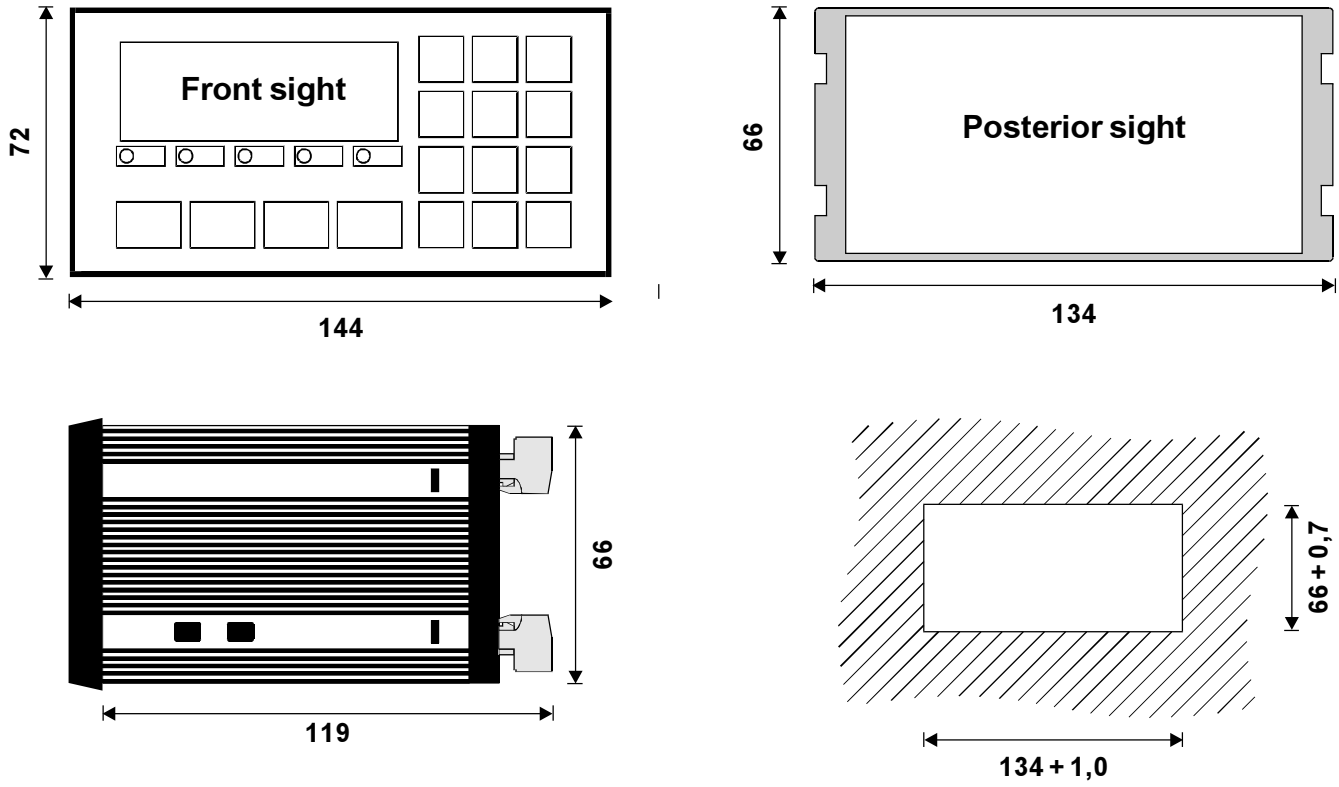
The technical characteristics specified are valid if you observed all instructions of the "Manual of installation, maintenance and assistance".

GENERAL ELECTRICAL SPECIFICATIONS

Instrument's power supply:..... Choice between 24-115-230 Vac ± 15% 50/60 Hz
Absorption in maximum hardware configuration:..... 16 VA
Display:..... 6 display h=10 mm + 9 display h=8 mm high luminosity red colour
Memory:..... Non volatile by semiconductor
Microprocessor:..... H8-520 16 bit - 20 MHz
Power supply issued by the instrument:..... 12 Vdc - 150 mA +/- 4%

Attention: the dates related to the current supplied by the instrument are to be considered as maximum values.
You must perform a careful check of the absorption and forecast if necessary some auxiliary feeders external to the instrument.

MECHANICAL SPECIFICATIONS



The overall size, the drilling hole and everything described in this paragraph must be deemed as valid for those instruments having hardware configurations being different from those int he figure

N.B. All sizes are in millimeters.

Type of instrument: ..... In a closed container, size according to DIN 43700 72 x 144 x 119 mm

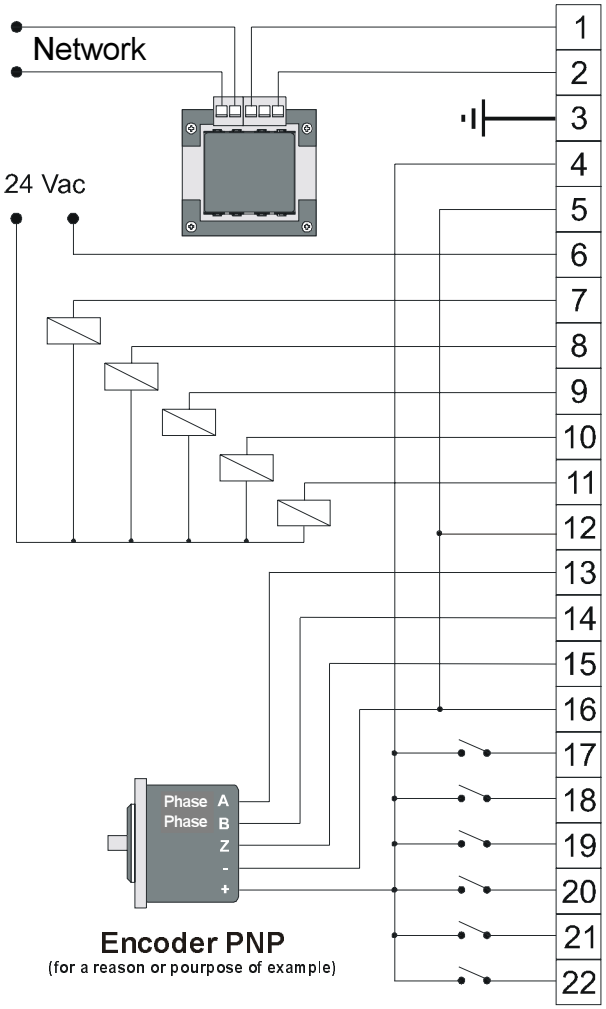
Electric connections: ..... Extractable polarized terminalboard with screw fixations.
∅ of stiff and flexible wires: 0.2÷2.5 mm
serial connection: male 9 PIN

Keyboard: ..... In plexiglass covered with antiscratch polyester with 16 mechanical keys and 5 red signalling leds.

Weight:..... 1050 gr (in the maximum hardware configuration)

ELECTRICAL CONNECTIONS

LOGIC CARD: TERMINAL DESCRIPTION - ELECTRICAL CONNECTION EXAMPLE



1	**XXX**	Power supply voltage
2	**XXX**	Power supply voltage
3	**GND**	Ground wiring
4	**+**	Positive transductor power supply
5	**-**	Negative transductor power supply
6	**C1**	Common terminal for outputs U1÷U5
7	**U1**	Output U1
8	**U2**	OutputU2
9	**U3**	OutputU3
10	**U4**	OutputU4
11	**U5**	OutputU5
12	**PE**	Terminal for tranductor polarization
13	**PH**	Input phase 1 transductor
14	**PH**	Input phase 2 transductor
15	**Z**	Zero pulse for transductior
16	**P1**	Terminal for input I1÷I6 polarization
17	**I1**	Input I1
18	**I2**	InputI2
19	**I3**	InputI3
20	**I4**	InputI4
21	**I5**	InputI5
22	**I6**	Ingresso Input

Important: read carefully notes at page 13 and 14

Note: terminal 12 must be always connected, otherwise the insturment will not read the encoder pulses. The connection depends on the encoder type:

a) Encoder NPN --> terminal 12 must be connected to the positive of the transductor supply (terminal 4)

b) Encoder PNP--> terminal 12 must be connected to the positive of the transductor supply (terminal 5)

c) Encoder Push-Pull --> terminal 12 must be connected to the positive or to the negative of the transductor supply (morsetto 4 o 5)

ELECTRICAL SPECIFICATIONS OF THE LOGICAL CARD

Digital inputs

Optoisolation ..... 2500 V rms
Polarization type ..... NPN - PNP
Nominal working voltage ..... 12 Vdc
Voltage in logical state 0 ..... 0÷1,5 V
Voltage in logical state 1 ..... 10,5 V÷26,5 V
Input resistance ..... 1.5 KΩ
Internal voltage drop ..... 1.2 V
Minimum acquisition time ..... 500 μs
Minimum acquisition time (interrupt = I1) ..... 50 μs

Note: minimum acquisition time are a hardware specification. For the functionality of the input please refer to the USER MANUAL of your instrument.

Bi-directional counting inputs (version ".")

Maximum frequency ..... 20 KHz
Optoisolation ..... 2500 V rms
Polarization type ..... NPN - PNP
Nominal working voltage ..... 12 Vdc
Voltage in logical state 0 ..... 0÷1.5 V
Voltage in logical state 1 ..... 10.5÷13 V
Input resistance ..... 1,5 kΩ
Internal voltage drop ..... 1.2 V

Bi-directional counting inputs (version B)

Like the standard with the following exception:
Maximum frequency: ..... 100 KHz

Bi-directional counting inputs (version C)

Like the standard with the following exception:
Nomina working voltage ..... 5 Vdc
Voltage in logical state 0 ..... 0÷1V
Voltage in logical state 1 ..... 3.5÷5.5 V

Bi-directional counting inputs (version D)

Counting inputs and zero pulse are not installed.

Static outputs

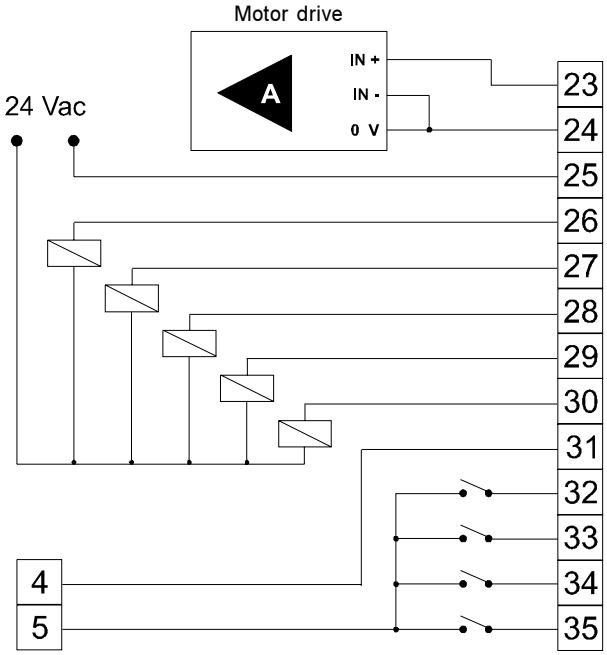
Optoisolation ..... 2500 V rms
Commutable load ..... AC - DC (NPN - PNP)
Maximum working voltage ..... 24 Vac/dc
Internal voltage drop ..... 2.5 V
Maximum current ..... 70 mA
Dispersion current ..... 20 μA
ON-OFF commutation time ..... max 120 μs
OFF-ON commutation time ..... max 8 μs
Note: commutaiton time depends on the load type; data indicated are reffered to resistive loads.

Static outputs (version A)

Like the standard static outputs with the following exception:
Output U1 and U2 are designed to control a stepper motor with maximum frequency of 20 KHz.

Note: with version A, outputs in the logical card can be only NPN.

EXPANSION CARD (OPTIONS E, C, A, P): TERMINAL DESCRIPTION - ELECTRICAL CONNECTION EXAMPLE



23	**A1**	Analog output
24	**GA**	Common for analog output
25	**C2**	Common terminal for outputs U6÷U10
26	**U6**	Output U6
27	**U7**	OutputU7
28	**U8**	OutputU8
29	**U9**	OutputU9
30	**U10**	OutputU10
31	**P2**	Polarization terminal for inputs I7÷I10.
32	**I7**	Input I7
33	**I8**	Input I8
34	**I9**	Input I9
35	**I10**	Input I10

Important: read carefully notes at page 13 and 14

ELECTRICAL FEATRES FOR EXPANSION CARD (OPTIONS E, C, A, P)

Digital Inputs (option E)

Optoisolation ..... 2500 V rms
Polarization type ..... NPN - PNP
Nominal working voltage ..... 12 Vdc
Voltage in logical state 0 ..... 0÷1,5 V
Voltage in logical state 1 ..... 10,5 V÷26,5 V
Input resistance ..... 1.5 KΩ
Internal voltage drop ..... 1.2 V
Minimum acquisition time ..... 500 μs

Note: minimum acquisition time are a hardware specification. For the functionality of the input please refer to the USER MANUAL of your instrument.

Static outputs (option E)

Optoisolation ..... 2500 V rms
Commutable load ..... AC - DC (NPN - PNP)
Maximum working voltage ..... 24 Vac/dc
Internal voltage drop ..... 2.5 V
Maximum current ..... 70 mA
Dispersion current ..... 20 μA
ON-OFF commutation time ..... max 120 μs
OFF-ON commutation time ..... max 8 μs

Note: commutaiton time depends on the load type; data indicated are reffered to resistive loads.

Analog outputs CNC (option C)

Voltage range	± 10 V
Resolution	16 bit
Isolation	2500 V
Maximum current	1 mA
ΔV f.s. : ΔI	95 mV/mA

Step analog outputs (option A)

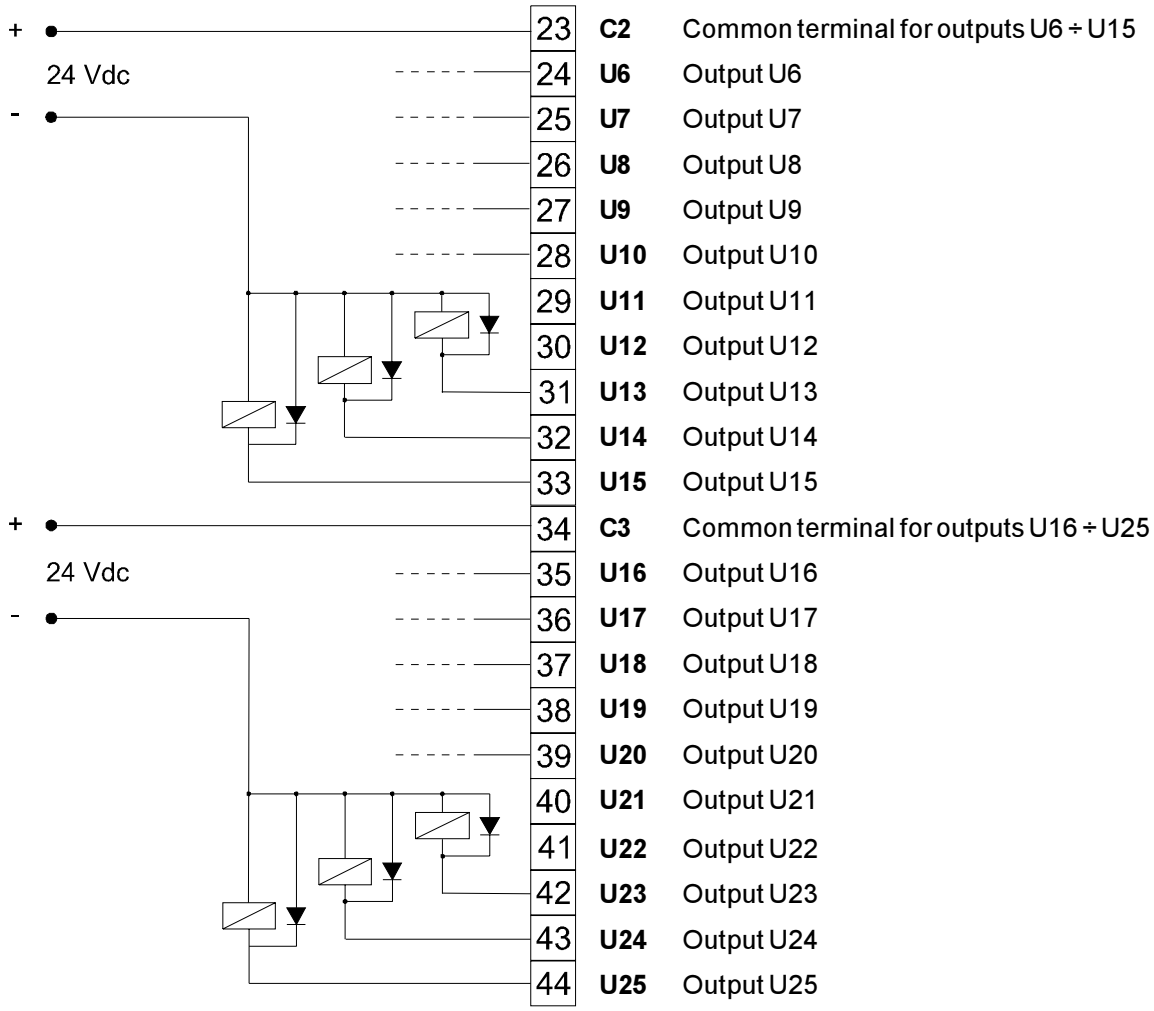
Analog output with step outline. Specifications like analog outputs CNC (option C).

Epicicloidal analog outputs (option P)

Analog output with epicicloidal outline to prevent mechanical stress. Specifications like analog outputs CNC (option C).

EXPANSION CARD (OPTIONS Lx, Ux): TERMINAL DESCRIPTION - ELECTRICAL CONNECTION EXAMPLE

Electricla connections for cards Ux and Lx are the same; the only dofference is the maximum voltage and current commutable value.
The terminal in figure below shows the card U20 (or L20); for the cards U8, outputs are available till terminal number31, for cards U12 till number 36, for cards U16 till number 40, for cards U20 till number 44.



Important: read carefully notes at page 13 and 14

ELECTRICAL SPECIFICATIONS FOR EXPANSION CARD (OPTIONS Lx, Ux)

Static outputs L20 - L12 and L16 OUT OF PRODUCTION.

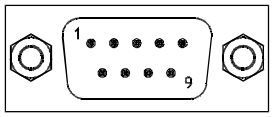
Optoisolation ..... 2500 V rms
Commutable load ..... AC - DC (NPN - PNP)
Maximum working voltage ..... 24 Vac/dc
Internal voltage drop ..... 2.5 V
Maximum current ..... 70 mA
Dispersion current ..... 20 μA
ON-OFF commutation time ..... max 120 μs
OFF-ON commutation time ..... max 8 μs
Note: commutaiton time depends on the load type; data indicated are reffered to resistive loads.

Static power outputs (options U8, U12, U16, U20)

Cards with 8, 12, 16, or 20 static outputs. Specifications like the standard outputs with the following exceptions:
Maximum working voltage ..... 110 Vac/dc
Maximum current ..... 200 mA
Dispersion current ..... 1 μA

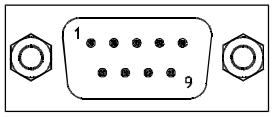
SERIAL INTERFACE CARD: TERMINAL DESCRIPTION

Option RS



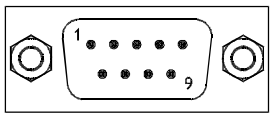
Pin 2 = RX = Reception
Pin 3 = TX = Transmission
Pin 5 = GND = Common serial port

Option DF



Pin 2 = RX = Reception
Pin 3 = $\overline{TX}$ = Transmission
Pin 4 = $\overline{RX}$ = Reception
Pin 8 = $\overline{TX}$ = Transmission

Option MD

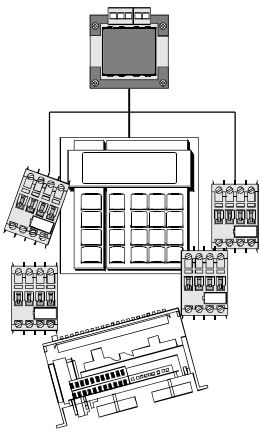


Pin 2 = A
Pin 8 = B

Serial RS 232C - RS 422 - RS 485
Corresponding to the electrical standards defined by the serial type. Maximum transmission speed is 9600 baud. For the RS 232C, the maximum cable length is 15 m; for RS 422 and RS 485 maximum length is 1200 m

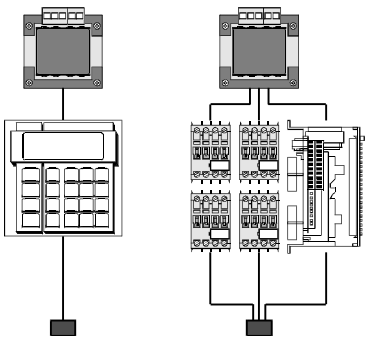
DIRECTIONS FOR CABLING

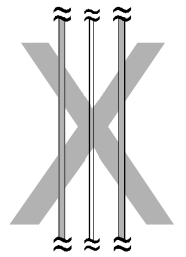
This is an extraction from out Installation, mantainance and assistance manual. Please refer to that manual for designing and execution of the cablings.

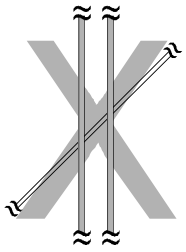


PLACING

In cabling, separate the power part from the command part.
The structure must allow a correct air flow for cooling.
The installation site must be dry and without vibrations; the enviroment temperature must be stable or anyway between the specified limits (see technical specifications).
The instrument position inside the board must be separated from the power components and from the cables connected to the power components (relais, drivers, inverters, brakes, ...).







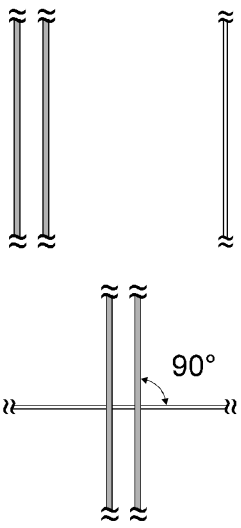
CABLES

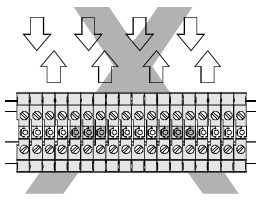
During the cabling separate phisically the power conductors from the command ones.

If the cables must cross each others, the angle between them must be closer to 90 degrees.

For the command signals, we suggest to use shielded cables with interlaced conductors; it's strongly suggested the use of shielded cables for transductors, analog IN/OUT, serials. The use of shielded cables for digital IN/OUT increase the reliability of the system.

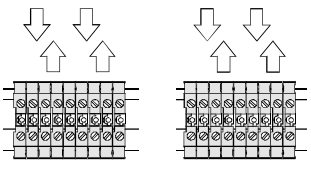
We suggest the use of terminal junctions.

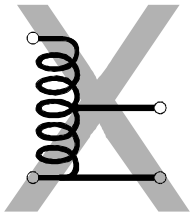




TERMINAL

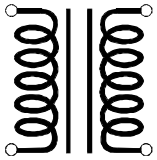
Do not use the same terminal for power cables (relais, drivers, inverters, brakes, ...) and signal cables (digital and analog signals IN/OUT, transductor signals,...).





POWER SUPPLY

We prescribe the use of transformers with the CE logo for the supply of **the only** instrument; the secondary must NOT be connected to ground (thes eare secondary NOT corrected: 55 - 0 - 55, 0 - 24 with 0 to ground ...)
Do not use auto-transformers (even if followed by normal transformers) because this solution does not allow a complete galvanic separation from primay to secondary.
Separate the supply of the electronic circuits from the power one.



Verify that the transformer power is enough to supply the circuits and verify the transformer gives the nominal power without voltage losses.
The same indications are valid for the outputs supply (polarization voltage).

FILTERS

If working in a medium disturber enviroment, the QEM instrumentation does not need filters; the use of theese devices (preferrable of second order), is suggested in presence of power supply with strong noise.
All relais, elettrovalve, coils, brakes, ... in the system must be equipped with suppressors.
For loads in AC use RC suppressors.
For loads in DC use diods in antiparallel.

GROUND

Use short ground connection. The maximum resistance for the ground connection is 0.2-0.3 Ohm.

RELAIS

Dispose the connections parallel to the frame plane.
For the inputs machanical/elettromechanical, we suggest the use of relais closed in inert atmosphere with contacs designed for 0.1 mA currents.
Use, if possible, the N.A. contact. The suggestion gived for the relais must be used for all the ather contacs type.

NOTE

NOTE

Il presente prodotto è uno strumento elettronico e quindi non deve essere considerato una macchina. Di conseguenza non deve sottostare ai requisiti fissati dalla Direttiva CEE 89/392 (Direttiva Macchine). Pertanto si afferma che se lo strumento QEM viene utilizzato come parte componente di una macchina, non può essere acceso se la macchina non soddisfa i requisiti della Direttiva Macchine.

La marcatura dello strumento non solleva il Cliente dall'adempimento degli obblighi di legge relativi al proprio prodotto finito.