



User's Guide

CE



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CCT-05

Frequency Input Signal Conditioners

M2216/1201

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WARNING: These products are not designed for use in, and should not be used for, patient connected applications.

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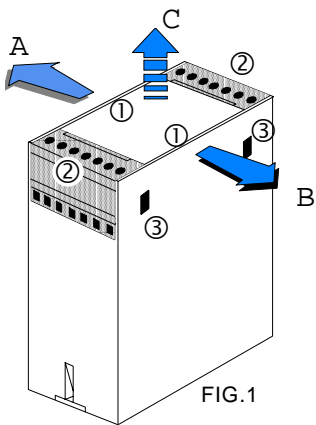
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OPEN THE HOUSING PROCEDURE

1. Insert a screwdriver or similar tool in the points marked ①.
2. Turn the screwdriver until the case walls begin to separate towards **A** and **B**, so the two side lugs ③, are free.
3. Grab the Signal Conditioner body, at the points marked ②, and pull it towards **C**, until the two side lugs ③ are out of their housing and the internal circuits are visible. See the sketch below for the disassembly of the circuit boards.
4. Before reinserting the Signal Conditioner body into the case, the following must be checked :

-The front label (blue color) must be in its correct position, with terminals 1 and 7 (power supply) separated from the other terminals.

-The three internal modules must be inserted correctly in their internal case guides.



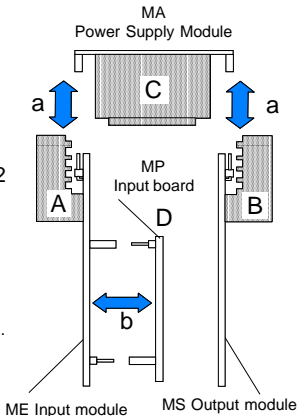
INTERNAL OVERVIEW

- A. "ME" Input module.
B. "MS" Output module.
C. "MA" Power supply module.
D. "MP" Input Board.

FIG.2

PROCEDURE FOR DISASSEMBLY

1. Pull out the "ME" input module towards "a".
2. Pull out the "MS" output module towards "a".
3. Pull out the "MP" input board towards "b".
4. To assemble reverse the procedure.



POWER SUPPLY

RECOMENDED WIRING

The power supply must be connected to terminals 1 and 7. The characteristics of the power supply are shown on the side label.

WARNING.- If the power supply is dc voltage, be careful with the polarity indicated for each terminal.

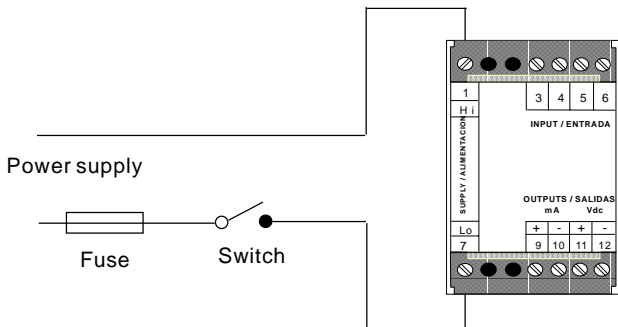


FIG. 3

PRECAUTIONS

The installation must incorporate safety devices to protect the operator and the process when using the Transmitter to control a machine or process where injury to personnel or damage to equipment or process, may occur as a result of failure of the Transmitter.

PROTECTIONS

See on table 1 the recommended value of the fuse for the different power supply availables.

Power supply	Fuse value
230 Vac	50 mA
115 Vac	100 mA
48 Vac	150 mA
24 Vac	300 mA
24 Vdc	300 mA

TABLE 1

CHANGING THE POWER SUPPLY

The unit is not provided with a system to change the power supply. Therefore if the power supply must be modified to other value, please replace the module MA for another one appropriate to the new characteristics. Contact your local distributor for instructions.

FIG.4

SIGNAL OUTPUT module MS

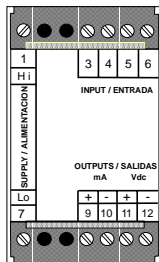
The signal conditioner provides two different analog output signals, both proportional to the signal input.

Output in Current : 4 to 20 mA, terminals 9 - 10

Output in Voltage : 0 to 10 Vdc, terminals 11 - 12

Do not use both outputs simultaneously. Only one selection can be made.

The side label shows which one is selected.



CHANGING THE SIGNAL OUTPUT

All signal conditioners are delivered as a standard version, with the analog output selected as 4 to 20 mA, unless specified otherwise. To select a 0 to 10 V output, remove jumpers E and F as shown in Figure 6. Other non-standard output voltage and current ranges may be obtained by adding and/or replacing resistors given in Tables 2 and 3.

FIG.5

NON STANDARD OUTPUT VOLTAGES

TABLE 2

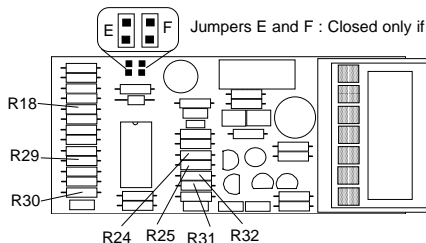
Output in V.	Value in K Ω for :			
	R29	R30	R31	R32
± 10	49.9	----	200	----
0 to 1	----	----	11	100
0 to 5	----	----	100	100
1 to 5	----	100	66.5	100

NON STANDARD OUTPUT CURRENTS

TABLE 3

Output in mA.	Value in Ω for :		
	R18	R24	R25
0 to 5	----	100	----
0 to 10	----	49.9	----
1 to 5	100 K	124	----
0 to 20	----	-----	24.9

"----" means "Resistor must not be installed"



Jumpers E and F : Closed only if the output is 4 to 20 mA.

Replace or add the indicated resistors with the values shown in Tables 2 and 3 for the desired output.

FIG.6

SIGNAL INPUT, module ME

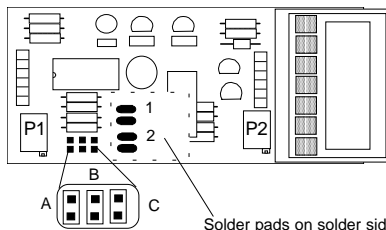
OVERVIEW

This module together with the "MP" input board, performs the signal input conditioner (see Fig. 2). This module contains the trimmers and jumpers for the amplifier gain and the low level output (offset).

The signal input connections are made at Terminals 3, 4, 5 and 6.

Each signal type use some of these terminals.

FIG.7



P1 : Output zero adjustment.

P2 : Gain amplifier adjustment.

OFFSET ADJUST

Solder pad 1 if closed : Adjust the low range level of the output (Offset positive coarse).

Solder pad 2 if closed : Adjust the low range level of the output (Offset negative coarse).

Jumper A if closed : Adjust the low range level of the output (Offset negative fine).

AMPLIFIER GAIN

Jumper B if closed : Gain at maximum level

Jumper C if closed : Gain at medium level.

Jumpers B and C opened : Gain at minimum level.

SENSOR TYPE SELECTION

TABLE 4

This signal conditioner can connect to standard sensors such as PNP, NPN, Namur or ac signals. See the Connections Section.

The signal conditioner provides two excitation voltages for the sensors, 24 Vdc for PNP or NPN sensors and 8.2 Vdc for NAMUR sensors. Table 4 indicates which jumpers must be selected for each type of sensor. The jumpers are located on the "MP" input board. See Fig. 8.

Sensor type selection (Selector A)	close jumper
NAMUR	10 & 9
NPN/PNP (3 wires)	10
NPN (Open collector)	10 & 7
PNP (Open collector)	10 & 8
Vac \leq 100	10
Vac \geq 100	----

CCT-05 ELECTRICAL FEATURES

INPUT

SIGNAL TYPE	PNP, NPN, Namur, Vac
FREQUENCY	Min. 10 Hz. Max. 40 KHz.
AUXILIARY POWER SUPPLY	+24 Vdc @ 25 mA. for PNP, NPN. 8.2 Vdc for Namur

OUTPUT

0 to 20 mA or 4 to 20 mA	$R_L < 600 \Omega$ max. 22 mA \pm 3%
0 to 10 Vdc	$R_L > 1000 \Omega$ max. 11 V \pm 3%
ACCURACY	$\leq 0.2\%$ FS
RESPONSE TIME	≤ 250 mS
GALVANIC ISOLATION	Input, Output and Power Supply are all isolated to 2 kVeff. 50 Hz/1 m.

GENERAL SPECIFICATIONS

RIPPLE	$\leq 0.5\%$
BAND PASS	1.5 Hz (-3 dB)
STORAGE TEMPERATURE	-30° to +80°C
OPERATING TEMPERATURE	-10° to +60°C
TEMPERATURE COEFFICIENT	$\leq 0.015\%/^{\circ}\text{C}$
STANDARD POWER SUPPLY	115 Vac (\pm 10%) 50/60 Hz
POWER CONSUMPTION	≤ 1.5 VA
TEST VOLTAGE	4 kVeff. 50 Hz/1m.

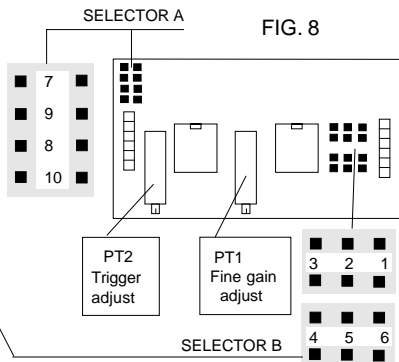
SIGNAL INPUT RANGE SELECTION

Set the jumpers to the position indicated in Table 5 for each range. The jumpers are located on the "MP" input board.

If the signal input is modified, follow the adjustment and calibration procedure.

TABLE 5

FREQUENCY RANGE (Selector B)	CLOSE JUMPER
0 to 40/70 Hz	3
0 to 70/125 Hz	3 & 4
0 to 125/225 Hz	3 & 5
0 to 225/400 Hz	3 & 6
0 to 400/700 Hz	2
0 to 700/1250 Hz	2 & 4
0 to 1.25/2.25 KHz	2 & 5
0 to 2.25/4 KHz	2 & 6
0 to 4/7 KHz	1
0 to 7/12.5 KHz	1 & 4
0 to 12.5/22.5 KHz	1 & 5
0 to 22.5/40 KHz	1 & 6



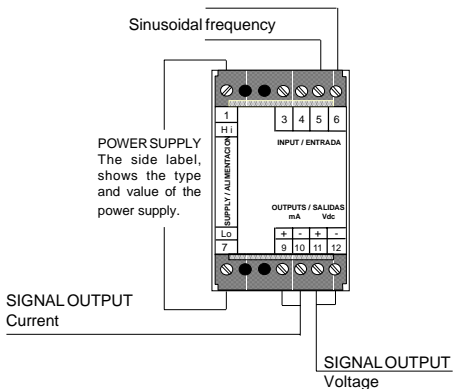
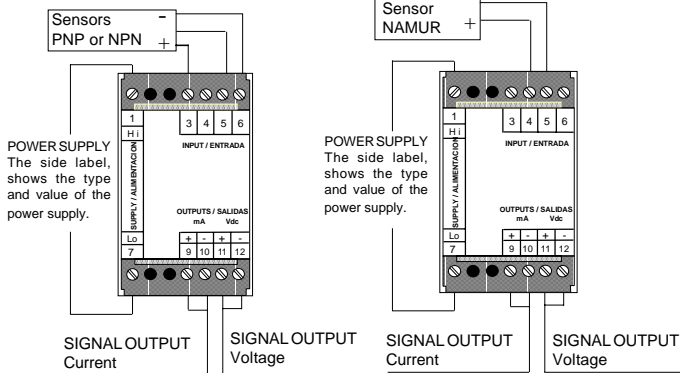
The frequency ranges are interpreted as follow : Range A (0 to 40/70 Hz.) which means that the minimum range is from 0 to 40 Hz, and the maximum range from 0 to 70 Hz. The high level of the signal output can be adjusted for any value between 40 to 70 Hz.

ADJUSTMENT AND CALIBRATION PROCEDURE

1. When input and output signal values are determined, remove the conditioner case. (Fig.2)
2. Check on the "MA" module, if the selected power supply is correct. (Table 1).
3. Select on the input board the desired Frequency range, according to Table 5, using jumpers "1", "2", "3", "4", "5" and "6". (Fig. 8).
Set jumpers "7" to "10", for the corresponding signal type (Table 4).
Select on the "MS" output module the desired output (voltage or current), using jumpers "E" and "F". (Fig. 6).
4. Connect a pulse generator to the conditioner input terminals 5 and 6
5. Connect a digital multimeter to the signal output terminals : 11 and 12 for Voltage output.
: 9 and 10 for Current output.
6. Power up the conditioner with the appropriate power supply.
7. Adjust the pulse generator until it generates the low signal level.
8. Turn the "ZERO" trimmer (P1), located on the "ME" input module, until the multimeter shows the desired low signal output level. (For example: 0 Vdc).
9. Adjust the pulse generator until it generates the high signal level.
10. Turn the "GAIN" trimmer (P2), located on the "ME" input module, until the multimeter shows the desired high output level. (For example: 10 Vdc).
11. Repeat steps 7 to 10, until the two values are correct.

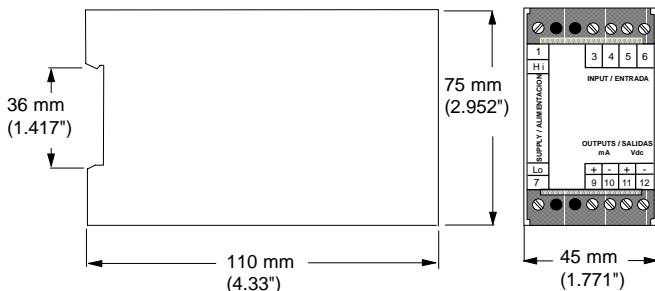
CONNECTIONS

FIG.9



MECHANICAL

DIMENSIONS



TECHNICAL DATA

WEIGHT 270 g.

HOUSING BASE Polycarbonate, RAL 7032, UL 94 V-1 light grey, IP-40

TERMINAL HOUSING, COVER

AND BLIND PLUGS Polycarbonate, UL 94 V-2 dark grey, IP-20

WIRE CROSS SECTION : 4 mm²

Provided with a snap fastener for attaching to DIN 46277 and DIN EN 50022 (35 x 7.5 mm) assembly rails.

NOTES



WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of 13 months from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal one (1) year product warranty to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit should malfunction, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

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3. Repair instructions and/or specific problems relative to the product.

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