

GAMMA-M

7.1 LOAD CELL-PROCESS-POTENTIOMETER

DESCRIPTION

GAMMA-M instrument designed to measure (weight, load, pressure, displacement, or DC current using external shunts) accepts transducers like Load-Cell, Pressure Transmitter, Linear Potentiometers, Shunts. Etc...

Two scaling ways, manual or teach, levels of filter selectable by key as well as last digit resolution make easy to adapt the instrument to any input signal.

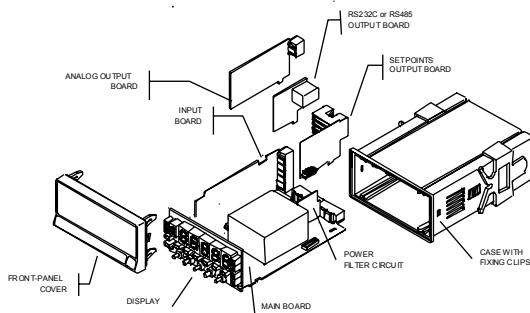
Setpoints with possibility of Latch, Delay or Hysteresis, working related to Peak, Valley or Peak-Peak value.

The serial communication allows, using a especial function, transmitting at **200 readings per second**, during all time this special function is activated.

As standard has four different excitation voltages to supply the transducers: 10 V, 5 V, 2.2 V y 24 V.



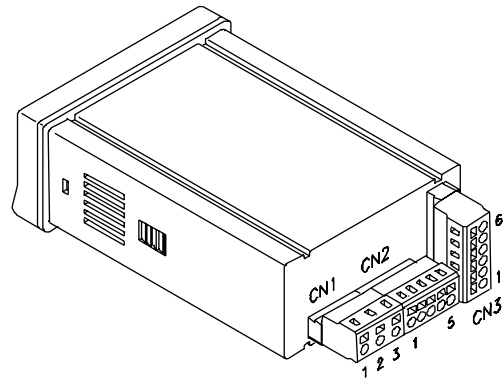
STRUCTURE



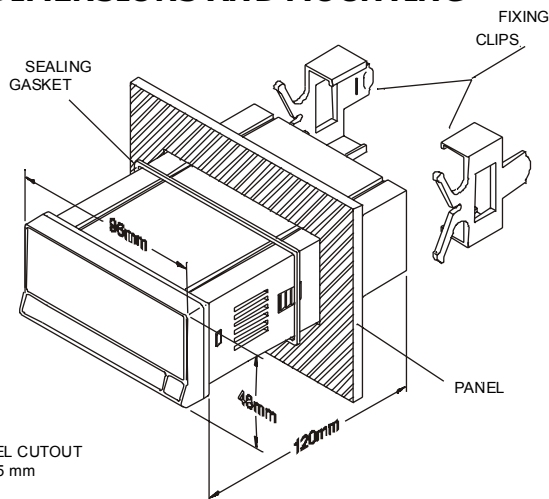
STANDARD

- Case 1/8 DIN 96 x 48 x 120 mm
- Electronics assembly:
 - Base circuit
 - Multiple input circuit
 - Keyboard and display
- Single-part clips for panel mounting
- Front panel sealing gasket
- Plug-in terminal block connectors

CONNECTIONS



DIMENSIONS AND MOUNTING



CN1		POWER SUPPLY	
PIN		AC VERSION	DC VERSION
1		AC HI	+V DC
2		GND (GROUND)	-
3		AC LO	-V DC
CN2		LOGICAL FUNCTIONS	
1		RESET	
2		HOLD	
3		COMMON	
4		TARE	
5		PEAK / VALLEY	
CN3		INPUT SIGNAL	
1		+ mV	
2		+ V	
3		- mV, -V, - mA	
4		+mA	
5		+EXCITATION	
6		- EXCITATION	

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OPTIONS

The GAMMA model can accept a variety of output options which are installed in the meter's main assembly by means of plug-in connectors:

- 2 SPDT Relays rating 8A @ 250V AC / 150V DC
Ref **2RE**

- 4 SPST Relays rating 0.2A @ 250V AC / 50V DC
Ref **4RE**

- 4 NPN Outputs rating 50mA @ max.50V DC
Ref **4OP**

- 4 PNP Outputs rating 50mA @ max.50V DC
Ref **4OPP**

The setpoints are independently programmable for HI or LO action and time delay or hysteresis operation.

- RS232C communication output, 1200 to 19200 baud
Ref **RS2**

- RS485 communication output, 1200 to 19200 baud
Ref **RS4**

Serial communication protocols: standard, ISO1745 and MODBUS RTU.

- Isolated analog output 0-10V / 4-20mA
Ref **ANA**

The analog outputs can be used to drive remote displays or for proportional control purposes and without filter sends the output at 200 / second.

STANDARD FUNCTIONS

TARE

The tare operation is accomplished by a push of the TARE key on the front panel or by applying a low level signal to the corresponding logic input at the CN2 connector.

The tare memory is cleared to zero by a combination of the RESET and TARE keys (also at the CN2 connector).

PEAK & VALLEY, PEAK-PEAK

The instrument detects and memorizes the max and min values reached for the variable after the last reset (peak and valley, peak-peak).

To display the peak value, press the MAX/MIN key. The second push calls up the valley value. The third push makes the display to show peak-peak value.

A falling edge at the corresponding logic inputs of the CN2 connector causes the same effects.

• RESET PEAK, VALLEY and PEAK-PEAK MEMORIES

The peak, valley and peak-peak memories can be reset back to actual value by simultaneously pressing the RESET and MAX/MIN keys.

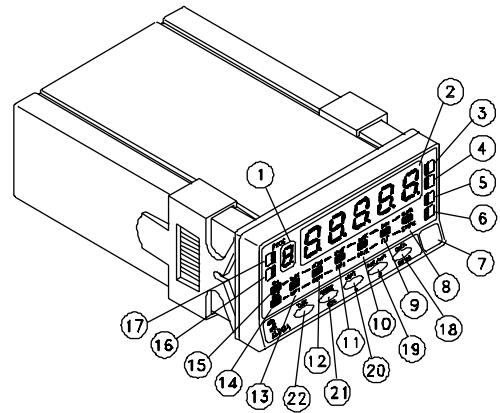
The same function is available at the CN2 connector.

• HOLD

The hold function is only accessible from the CN2 connector.

The hold condition (display frozen) is maintained as long as the corresponding logic input is kept at "0" level.

FRONT PANEL FUNCTIONS



MODE		RUN	PROG
Auxiliary display	1	-	Displays programming
Main display	2	Show measured variable	Show programming parameters
LED 1	3	Relay 1 / Opto 1 status	-
LED2	4	Relay 2 / Opto 2 status	-
LED 3	5	Relay 3 / Opto 3 status	-
LED 4	6	Relay 4 / Opto 4 status	-
Label	7	Measured unit	
LED DATA	8	-	Data memory storage indication
LED MIN	9	Indicates display of a valley value	Filter programming indication
LED MAX.	10	Indicates display of a peak value	Show DISPLAY 2 programming
LED LIMIT	11	Indicates display of a setpoint value	Show INPUT 2 programming
LED HOLD	12	Indicates display hold	Show DISPLAY 1 programming
LED TARE	13	Indicates tare memory	Show INPUT 1 programming
LED PROG	14	-	Programming mode indication
LED RUN	15	Run mode indication	-
LED B	16	-	Indicates program step
LED A	17	-	Indicates program step
ENTER key	18	Enters in PROG mode. Displays data	Accepts data. Advances program
MAX/MIN Key	19	Calls up peak, valley and peak-peak values.	Moves to right
LIMIT Key	20	Calls up the setpoint values	Increments the value of the flashing
RESET Key	21	Delete peak, valley and peak-peak memory.	ESCAPE function
TARE Key	22	Accepts display value as tare	-

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Programmable logic functions (CN2)

The rear connector CN2 provides 4 user programmable optocoupled inputs NPN or PNP that can be operated from external contacts or logic levels supplied by an electronic system. Four different functions may be then added to the functions available from the front-panel keys. Each function is associated to one of the CN2 connector pins (PIN1, PIN2, PIN3, PIN4 and PIN 5) referred to PIN 3. Each PIN can be assigned one of the 31 functions listed on the following table.

(*) Factory default

From 0 to 9: DISPLAY / MEMORY FUNCTIONS

Nº	FUNCTION	DESCRIPTION	ACTION
0	Deactivated	None	-
1	TARE (*)	Adds the current display to the tare memory. The display goes to zero.	Pulse
2	RESET TARE	Adds the tare memory contents to the display value and clears the tare memory.	Pulse
3	PEAK (1)	Display PEAK value.	Fixed level
4	VALLEY (1)	Display VALLEY value.	Fixed level
5	RESET PEAK /VALLEY	Clears the peak or valley memory (if the values are on display)	Pulse
6	PEAK /VALLEY (*)	1 push recalls peak, 2 push recalls valley 3 recalls peak-peak.4 push brings the meter to the indication of the variable being measured.	Pulse
7	RESET (*)	Combined with (1) delete the tare. Combined with (6) delete peak or valley.	Pulse combined with (1) or (6)
8	HOLD1	Holds the display while the outputs remain active.	Fixed level
9	HOLD2 (*)	Holds the display, RS and analog outputs.	Fixed level

From 10 to 12: FUNCTIONS ASSOCIATED WITH THE DISPLAY OF THE INPUT VARIABLE

Nº	Function	Description	Activation
10	INPUT	Displays the actual input signal value in mV (Flashing)	Fixed level
11	GROSS	Displays the measured value + the tare value = gross.	Fixed level
12	TARE	Displays the amount of tare contained in the memory.	Fixed level

From 13 to 16: FUNCTIONS ASSOCIATED TO THE ANALOG OUTPUT

Nº	Function	Description	Activation
13	ANA GROSS	Makes the analog output follow the gross value (measured value+tare)	Fixed level
14	ZERO ANA	Puts the analog output to zero state (0 V for 0-10 V, 4 mA for 4-20 mA)	Fixed level
15	ANA PEAK.	Makes the analog output follow the peak value.	Fixed level
16	ANA VALLEY.	Makes the analog output follow the valley value.	Fixed level

From 17 to 23: FUNCTIONS FOR USE WITH A PRINTER VIA THE RS OUTPUTS

Nº	Function	Description	Activation
17	PRINT NET	Prints the net value	Pulse
18	PRINT GROSS	Prints the gross value	Pulse
19	PRINT TARE	Prints the tare value	Pulse
20	PRINT SET1	Prints setpoint 1 value and its output status.	Pulse
21	PRINT SET2	Prints setpoint 2 value and its output status.	Pulse
22	PRINT SET3	Prints setpoint 3 value and its output status.	Pulse
23	PRINT SET4	Prints setpoint 4 value and its output status.	Pulse

From 24 to 25: FUNCTIONS ASSOCIATED WITH THE SETPOINTS

Nº	Function	Description	Activation
24	FALSE SETPOINTS	Exclusively for instruments WITHOUT relays/transistors control outputs card. Allows programming and operation of 4 setpoints	Fixed level
25	RESET SETPOINTS	Exclusively for instruments with 1 or more setpoints programmed as "latched setpoints" (That is, the setpoints that once energized remain on the ON status although the alarm condition disappears). Deactivates the setpoints output	Pulse

From 26 to 31: SPECIAL FUNCTIONS

Nº	Function	Description	Activation
26	S&H SETPOINTS	Grants the setpoints run during the S&H function activation	Fixed level
27	SAMPLE & HOLD	On activating this function, the measuring values peak, valley, peak-peak and actual value are hold on display as well as analog output, rs output and setpoints except if function 26 is active. View details in the technical manual page 34	Fixed level
28	SEND ASCII	Transmits the four last digits of the display to a remote ASCII indicator. By holding the input to a low level, transmission takes place every second.	Pulse or Fixed level
29	PEAK-PEAK	Display the peak-peak value	Pulse
30	ANALOG PEAK-PEAK	The analog output follows the peak-peak value	Fixed level
31	FAST RS	Sends by serial output RS2 or RS4 the display value at 200 per second. View technical manual page 54.	Fixed level

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INPUT SIGNAL

Process input

- Voltage input (pin 2 versus 3)..... $\pm(0-5/ 0-10)$ V
- Input impedance..... 1 M Ω
- Voltage input (pin 1 versus 3)..... $\pm 0-1$ V
- Input impedance.....100 M Ω
- Current input..... $\pm 0-20$ mA
- Input impedance..... 11,8 Ω

Load cell or mV input

- Input voltage..... $\pm 30, \pm 60, \pm 120, \pm 300, \pm 500$ mV
4-wires, mono polar or bipolar
- Input impedance.....100 M Ω

Potentiometer input

- Min. resistance 120 Ω
- Excitation voltage2.2 V
- Input impedance (pin 1 versus 3) >10 M Ω

Excitation

2,2 V @ 30 mA

24 V @ 30 mA not stabilized.

5 V \pm 100 mV @120 mA with fine tuning (50 ppm/ $^{\circ}$ C)

10 V \pm 100 mV @120 mA with fine tuning (50 ppm/ $^{\circ}$ C)

DISPLAY

- Main display -9999/9999
5 red digits, 7 Segments
- Auxiliary display1 green digits 8 mm
- Decimal point Programmable
- LED's 14 (Functions and outputs)
- Display rate 10/s (100 ms)
- Positive over flow..... OVFL0
- Negative over flow - OVFL0

CONVERSION A/D

- Technical..... $\Sigma\Delta$
- Resolution ± 15 bits
- Rate..... 555/s
- Resolution measured Peak..... ± 15 bits

ACCURACY @ 23 $^{\circ}$ C \pm 5 $^{\circ}$ C

- Error max. $\pm(0.1\%$ reading +2 digits)
- Temperature coefficient 50 ppm/ $^{\circ}$ C
- Warm-up time 10 minutes

POWER SUPPLY

- GAMMA-M.....230/115 V 50/60 Hz
- GAMMA-M2 24/48 V 50/60 Hz
- GAMMA-M1 10-30 V DC
- Consumption 5 W (without options), 10 W (MAX.)

FUSES (DIN 41661) Recommended

- 230/115 V AC F 0.2 A/250 V
- 24/48 V AC F 0.5 A/250 V
- 10 to 30 V DC F 2 A/250 V

ENVIRONMENTAL

- Working temperature -10 $^{\circ}$ C to +60 $^{\circ}$ C (0 $^{\circ}$ C to 50 $^{\circ}$ C) s/UL
- Storage temperature -25 $^{\circ}$ C to 80 $^{\circ}$ C
- Relative humidity..... <95% at 40 $^{\circ}$ C
- Max. Altitude 2000 m
- Sealed front panel.....IP65 (indoor use)

MECHANICAL

- Dimensions 1/8 DIN case, depth 120 mm
- Weight..... 600g
- Case material UL 94 V-0 polycarbonate

ORDERING REFERENCES

- 115/230V AC 50/60Hz powered..... GAMMA-M
- 10-30V DC powered GAMMA-M1
- 24/48V AC 50/60Hz powered GAMMA-M2