

BETA-M

PROCESS / LOAD CELL / TEMPERATURE

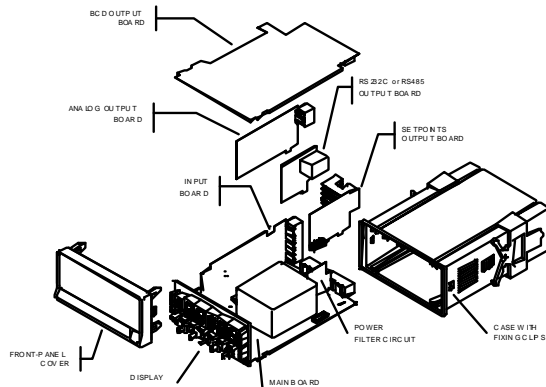
DESCRIPTION

The BETA-M model is a multifunction instrument that offers input availability for virtually all types of process measurements. It accepts the following inputs:
 Process variables (mV, V or mA).
 Pt100 Temperature sensors or Thermocouples J,K,T,R,S,E.
 Weight, load, force, torque with bridge sensor up to 300mV.
 Linear displacement potentiometer.

Key features:

- Programmable transducer type, input level and transducer excitation.
- 2 scaling methods
- 2 filter types with 10 levels each.
- Average up to 200 readings
- 3 rates of display
- Automatic volume calculation in spherical or cylindrical tanks
- Totalization and batch counting (simultaneous display)
- Analogue integrator
- Selective lockout of the programming parameters
- 36 logical functions
- 30 linearization points
- 3 TARE MODE
- FAIL SAFE
- Sensor Break Alarm
- r.o.C. (Rate Of Change)
- doSE Function

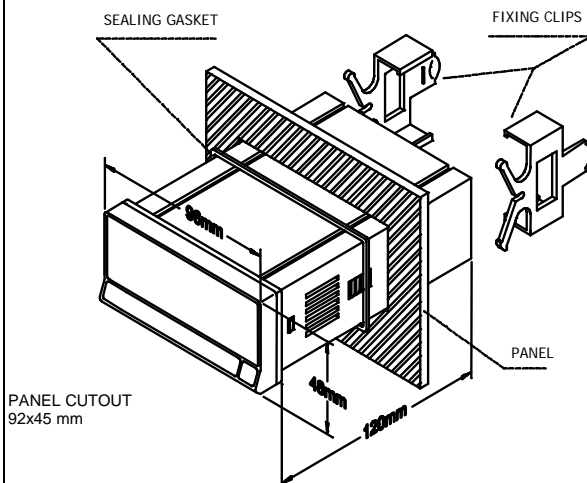
STRUCTURE



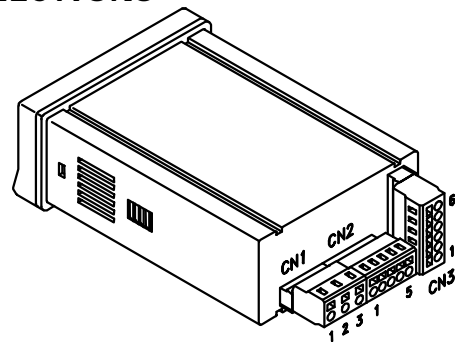
STANDARD

- Panel-mounting 1/8 DIN case, depth 120 mm
- Single-part clips for panel mounting.
- Front panel sealing gasket.
- Plug-in terminal block connectors.

DIMENSIONS AND MOUNTING



CONNECTIONS



CN1	POWER SUPPLY			
PIN	AC VERSION			
1	AC PHASE			
2	GND (GROUND)			
3	AC NEUTRAL			
CN2	REMOTE FUNCTIONS			
	Process/ Load/ Pot.	Thermometers		
1	RESET	RESET		
2	HOLD	HOLD		
3	COMMON	COMMON		
4	TARE	-		
5	PEAK/VALLEY	PEAK/VALLEY		
CN3	INPUT SIGNAL			
	Process	Load cell	Poten.	Thermo.
1	-	+ In mV	-	Pt100 / +TC
2	+ In V	-	POT central	-
3	- In	- In mV	POT LO	Pt100 / -TC
4	+ In mA	-	-	-
5	+ EXC	+ EXC	POT HI	Pt100 Comm
6	- EXC	- EXC	- EXC	-

BETA-M

OPTIONS

The BETA-M 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 5A @ 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. They can also be made to track one another by a programmable or automatic offset.

- RS232C communication output, 1200 to 19200 baud
Ref **RS2**
 - RS485 communication output, 1200 to 19200 baud
Ref **RS4**
- Serial communication protocols: standard, ISO1745, Modbus
- Isolated analog output 0-10V / 4-20mA
Ref **ANA**

The analog outputs can be used to drive remote displays or for proportional control purposes.

- BCD parallel outputs with TTL/24V DC logic
Ref **BCD**

STANDARD FUNCTIONS

PEAK & VALLEY
RESET PEAK & VALLEY MEMORY
HOLD

NEW FUNCTIONS

TARE MODE: **Tare 1**, standard function when press key TARE the value is stored into the memory and the display shows the difference between gross value and tare in memory = **net** value.

Tare 2, The TARE value is programmed by keyboard.

Tare 3, In this case the **NET** value is programmed by keyboard.

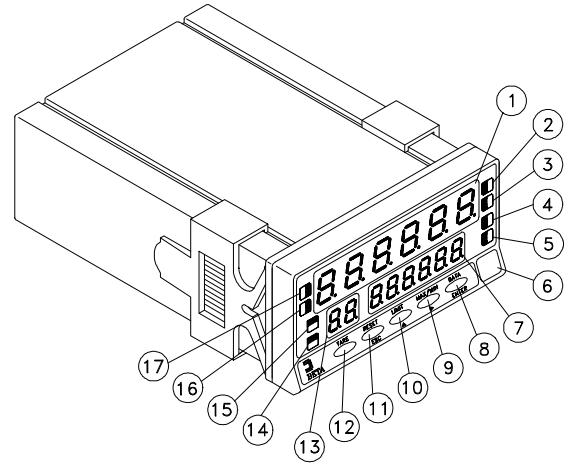
FAIL SAFE: Setpoints can be programmed individually to work normally open or normally closed (Fail Safe mode).

SENSOR BREAK: Allows detecting any broken wire connected to the sensor (Load Cell) The scan is done every 1.5 seconds and the response of Relays and ANA (if used) will be the same if it were an overflow situation.

r.o.C (Rate Of Change): The function **r.o.C.** is useful to detect the changing speed of display value, depending on programmed setpoint polarity we detect the increasing or decreasing.

doSE Function: Each time the display increases or decreases in a value equal to the programmed on setpoint 1 will activate the output, should be useful to fill cans, bottles, etc. from a container that we know the actual value of material inside (Example: 1 liter Oil bottles). Additionally using the logical function 30 the instrument stores the accumulated number of produced bottles.

FRONT-PANEL FUNCTIONS



	MODE	RUN	PROG
Main display	1	Displays the input variable	Displays programming
LED 1	2	Relay1 / Opto1 status	-
LED 2	3	Relay2 / Opto2 status	-
LED 3	4	Relay3 / Opto3 status	-
LED 4	5	Relay4 / Opto4 status	-
Label	6	Measurement unit	
Secondary display	7	Displays peak/valley and setpoint values	Displays programming
ENTER key	8	Enters in PROG mode Displays data	Accepts data. Advances
MAX/MIN key	9	Recalls the peak/valley values	Moves to the right
LIMIT key	10	Recalls the setpoint values	Increments the value of the
RESET key	11	Resets the peak/valley memories	ESCAPE function
TARE key	12	Takes on the display value as tare	-
Auxiliary Display	13	Defines the secondary display indications	Displays programming
LED TARE	14	Indicates tare memory	-
LED HOLD	15	Indicates display hold	-
LED MIN	16	Indicates detection of a valley value	-
LED MAX	17	Indicates detection of a peak value	-

Remote functions (CN2)

The rear connector CN2 provides 4 user programmable optocoupled inputs 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 (PIN 1, PIN 2, PIN 4 and PIN 5) and is activated by applying a falling edge or a low level pulse to the corresponding pin with respect to common (PIN 3). Each pin can be assigned one of the 36 functions listed on the following pages.

DISPLAY AND MEMORY FUNCTIONS

Nº	Name	Function	Action
0	NO	None	-
1	TARE (*)	Adds the current display value to the tare memory	Edge
2	RESET TARE	Clears the tare memory	Edge
3	PEAK	Recalls the peak value	Level
4	VALLEY	Recalls the valley value	Level
5	RESET PEAK/VALLEY	Resets peak and valley readings	Edge
6	VISUAL (*)	Recalls various parameters to the second display; Peak, Valley, Tare or Offset and, if they are active, the Totalizer and the Batch counters. The last action blanks the second display.	Edge
7	RESET (*)	In combination with function (1) clears the tare memory. In combination with function (6) clears the peak or valley memories, or the totalizer or the batch counter	Edge
8	HOLD1	Holds the display	Level
9	HOLD2 (*)	Holds the display and the analog and BCD outputs	Level

FUNCTIONS ASSOCIATED WITH THE MEASUREMENT DISPLAY

10	INPUT	Displays the signal input value in V or mA, mV or mV from TC or ohms from Pt100	Level
11	GROSS	Displays the gross value (measurement value + tare subtracted)	Level
12	TARE	Displays the value of the tare memory	Level

FUNCTIONS ASSOCIATED TO THE ANALOG OUTPUT

13	ANA GROSS	The analog output follows the gross value (measured value + tare).	Level
14	ANA ZERO	Puts the analog output to the zero state (0V or 4mA)	Level
15	ANA PEAK	The analog output follows the peak value	Level
16	ANA VALLEY	The analog output follows the valley value	Level

PRINT FUNCTIONS TO USE WITH RS232C or RS485 OUTPUTS

17	PRINT NET	Prints the net value	Edge
18	PRINT GROSS	Prints the gross value	Edge
19	PRINT TARE	Prints the value of the tare	Edge
20	PRINT SET1	Prints the value and the state of the setpoint 1	Edge
21	PRINT SET2	Prints the value and the state of the setpoint 2	Edge
22	PRINT SET3	Prints the value and the state of the setpoint 3	Edge
23	PRINT SET4	Prints the value and the state of the setpoint 4	Edge

FUNCTIONS ASSOCIATED WITH THE SETPOINT OUTPUTS

24	FALSE SETPOINTS	Allows programming and operation of four setpoints without setpoint card installed	Level
25	RESET SETPOINTS	Unlocks the setpoint latched outputs	Edge

SPECIAL FUNCTIONS

26	ROUND RS	Makes the serial output transmit the internal display value, without filters nor rounding	Level
27	ROUND BCD	Makes the BCD output drive out the display value without rounding	Level
28	ASCII	Envío de los cuatro últimos dígitos de display a un indicador Micra-S	Edge
29	SETS INHIBIT	Suspends setpoint operations and keeps the outputs to their OFF state	Level
30	BATCH	Adds the current display value to the totalizer and increments the batch counter in one unit. If the integrator is enabled (menu 23), this function does not work	Edge
31	VIEW TOTAL	Calls the totalizer value to the second display	Level
32	VIEW BATCH	Calls the batch counter to the second display	Level
33	RESET TOTAL+ BATCH	Resets the totalizer and the batch counter	Edge
34	STOP TOTAL	Inhibits the integrator operation	Level
35	PRINT TOTAL+ BATCH	Prints out the totalizer value and the batch counter value. If the integrator is enabled, only the totalizer value is printed.	Edge
36	PRINT PEAK	Hold and print max reading. When this function is programmed the peak value detection is stopped. In the activation edge, the peak register is cleared from the memory and the unit starts reading new peak values. In the deactivation edge, the peak value registered during the time the function was active is printed out through the serial output	Level

BETA-M

ACCURACY

- Temperature coefficient..... 100 ppm/ °C
- Warm-up time 10 min

FUSES (DIN 41661) (Recommended)

- Beta-M (230/115V AC) F 0.2 A / 250 V
- Beta-M2 (24/48V AC) F 0.5 A / 250 V

POWER SUPPLY

- AC voltages 230/115 V, 24/48 V (±10%) 50/60 Hz
- Consumption ... 5W (without options), 10W (max)

A/D CONVERSION

- Technique Sigma-Delta
- Resolution 24 bit)
- Rate 18/s

DISPLAY

- Main -99999/ +99999, red LED 14 mm
- Secondary 6 digits green LED 8 mm
- Auxiliary 2 digits green LED 8 mm
- Decimal point programmable
- LEDs 4 functions and 4 output status
- Reading rate 55.5 ms/ 250 ms/ 1 s
- Positive over range oVFLo
- Negative over range -oVFLo
- Sensor Break "-----"

ENVIRONMENTAL

- Operating temperature -10 °C to +60 °C
- Storage temperature -25 °C to +85 °C
- Relative humidity <95 % at 40 °C
- Max. altitude 2000 meters

MECHANICAL

- Dimensions 96x48x120 mm
- Panel cutout 92x45 mm
- Weight 600 g
- Case material UL 94 V-0 rated polycarbonate
- Front Sealed IP65

ORDERING REFERENCES

- 115/230V AC 50/60Hz powered BETA-M
- 24/48V AC 50/60Hz powered BETA-M2

INPUT SIGNAL

Configuration differential asymmetrical

Process input

- | | Voltage | Current |
|------------------------------------|------------------------------------|----------|
| • Voltage | ±10V DC | ±20mA DC |
| • Max. resolution | 0.1mV | 1µA |
| • Input impedance | 1MΩ | 15Ω |
| • Excitation | 24V (30mA), 10/ 5V (120mA) | |
| • Max error | ± (0.1% of the reading + 3 digits) | |
| • Coeficiente de temperatura | 100 ppm/ °C | |

Load cell input

- Voltage ±300 mV DC
- Max. resolution 0.15 µV
- Input impedance 100 MΩ
- Excitation 10/ 5V (120 mA)
- Max error ± (0.1% of the reading + 6 digits)
- Temperature coefficient 100 ppm/ °C

Potentiometer input

- Voltage ±10V DC
- Input impedance 1MΩ
- Display resolution 0.001%
- Max error ± (0.1% of the reading + 3 digits)
- Temperature coefficient 100 ppm/ °C

Temperature input

- Cold junction compensation -10 °C to +60 °C
- Cold junction ±(0.05 °C/ °C + 0.1 °C)
- Pt100 excitation current < 1 mA DC
- Max. cable resistance 40 Ω/ cable (balanced)
- Temperature coefficient 100 ppm/ °C

Input	Range (0.1 °)	Accuracy (0.1°)	Range (1°)	Accuracy (1°)
TC J	-200.0 to +1100.0 °C	0.4% R ±0.6 °C	-200 to +1100 °C	0.4% R ±1 °C
	-328.0 to +2012.0 °F	0.4% R ±1 °F	-328 to +1472 °F	0.4% R ±2 °F
TC K	-200.0 to +1200.0 °C	0.4% R ±0.6 °C	-200 to +1200 °C	0.4% R ±1 °C
	-328.0 to +2192.0 °F	0.4% R ±1 °F	-328 to +2192 °F	0.4% R ±2 °F
TC T	-150.0 to +400.0 °C	0.4% R ±0.6 °C	-150 to +400 °C	0.4% R ±1 °C
	-302.0 to +752.0 °F	0.4% R ±1 °F	-302 to +752 °F	0.4% R ±2 °F
TC R	-50.0 to 1700.0 °C	0.5% R ±2 °C	-50 to 1700 °C	0.5% R ±4 °C
	-58.0 to +3092.0 °F	0.5% R ±4 °F	-58 to +3092 °F	0.5% R ±7 °F
TC S	-50.0 to 1700.0 °C	0.5% R ±2 °C	-50 to 1700 °C	0.5% R ±4 °C
	-58.0 to +3092.0 °F	0.5% R ±4 °F	-58 to +3092 °F	0.5% R ±7 °F
TC E	-200.0 to 1000.0 °C	0.4% R ±1 °C	-200 to 1000 °C	0.4% R ±2 °C
	-328.0 to +1832.0 °F	0.4% R ±2 °F	-328 to +1832 °F	0.4% R ±4 °F
Pt100	-100.0 to +800.0 °C	0.2% R ±0.6 °C	-100 to +800 °C	0.2% R ±1 °C
	-148.0 to +1472.0 °F	0.2% R ±1 °F	-148 to +1472 °F	0.2% R ±2 °F