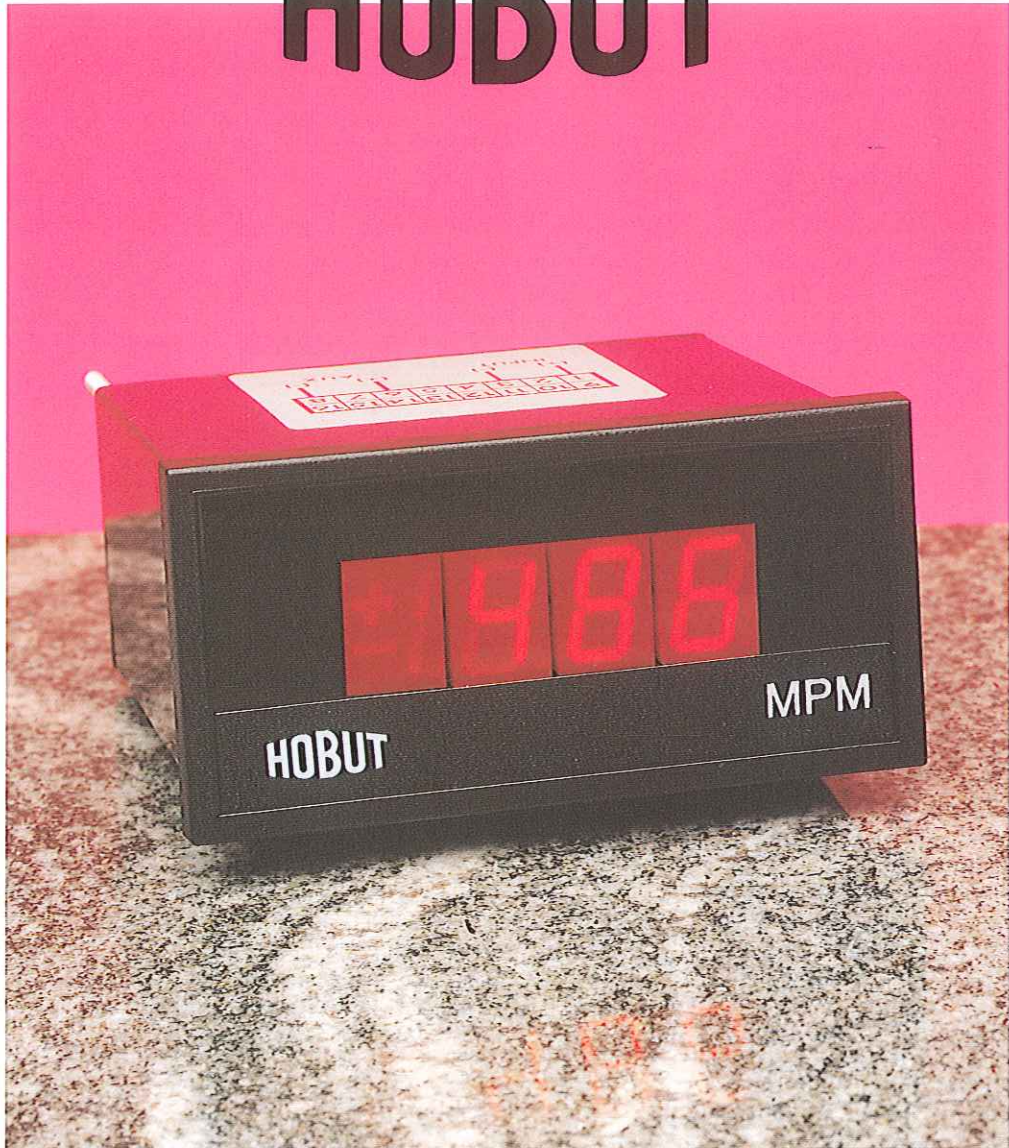
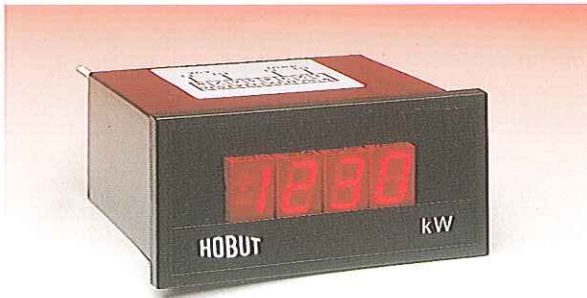


# HOBUT



**DIGITAL PANEL METERS**



## THE PRODUCTS

The digital panel meter range, known as the M300 series is primarily designed for use in the power industry, but offers a wide range of both AC and DC input parameters. The applications are limitless.

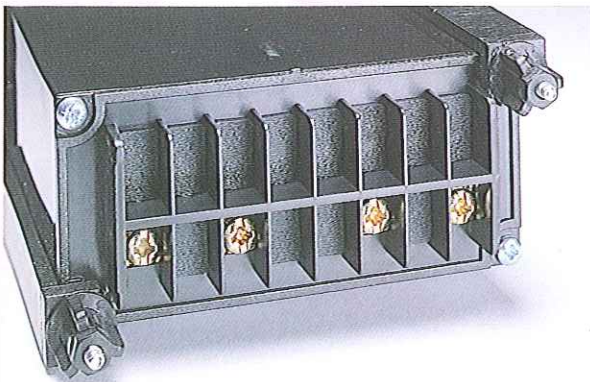
Essentially there are 3 main product types:-  
 AC Volts, Amps, Millamps.  
 DC Volts, Amps, Milliamps, Millivolts.  
 Frequency.

With the combination of a mA input M300-AD1 and the M100 series Power transducers, parameters such as kW, kVAr etc. Can be measured and displayed.

Customer adjustment of both "ZERO" and "SPAN" is permissible via potentiometers, accessible from the rear of the product.

The meters are 3° digit with a digit size of 14.2mm (0.56") high, 7 segment matched red LED's allow viewing from a wide range of angles and distance.

## METER REAR VIEW



The 96 x 48mm case is designed for fast and simple installation, using corner brackets for panel mounting. The M3.5 terminals allow the use of traditional termination and no extra terminal kits or soldering to PCB's are required.

## THEORY OF OPERATION

### AC INPUTS

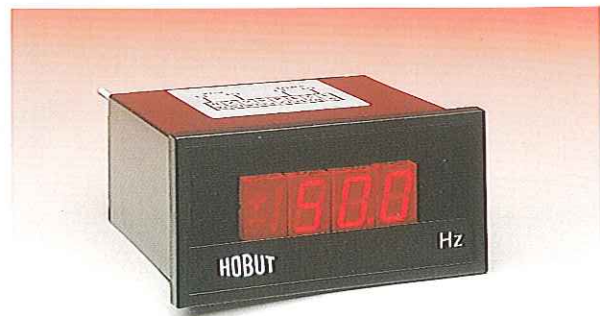
Both AC Voltage and Current circuits are average sensing RMS calibrated. The input signal is transformed to a low level of AC. The transformer secondary voltage is fed to a precision active rectifier, the resulting DC signal is presented to a analogue to digital A/D. The A/D converter use's the dual convertor slope integration method of conversion. The resulting digital information is used to drive the LED display.

### DC INPUTS

DC Voltage and Current inputs are fed into high stability ranging components. The ranging components reduce the input signal to a 2 Volt level. If the input is below 2 Volts an amplifier is employed to derive 2 Volts. The 2 Volt signal is then presented to the A/D converter which provides the digital information to drive the LED display.

### FREQUENCY INPUTS

A Frequency to Voltage F/V converter is used to convert the input signal to a DC signal. The resulting DC signal is fed in to the A/D converter and the same process as in the AC and DC circuits described above takes place.



## GENERAL SPECIFICATIONS

INPUT	TYPE	RANGE	AUXILIARY POWER SUPPLY	
AC VOLTS	M300-VAD	0.....600V	AC Voltage	115 / 230 / 400 Volts (+/- 25%) 45 to 65 Hz. Burden < 2VA
DC VOLTS	M300-VD1	+/- 50/60/75/100/150mV	DC Voltage	24 / 48 / 110 Volts (+/-20%) Galvanic isolation. Burden < 3W
DC VOLTS	M300-VD2	+/- 50mV.....1999mV		
DC VOLTS	M300-VD3	+/- 2V.....199.9V		
DC VOLTS	M300-VD4	+/- 200V.....600V		
AC AMPS	M300-AAD	1 or 5 AC (0.2 to 10A)	<b>DISPLAY</b>	
DC AMPS	M300-AD1	+/- 1 / 5 / 10 / 20mA		
DC AMPS	M300-AD2	+/- 100µA.....199.9µA		
DC AMPS	M300-AD3	+/- 20mA.....10A		
DC AMPS	M300-AD4	4/20mA		
FREQUENCY	M300-HZD	35Hz.....199.9Hz	Digits	1999 Full scale
			Size	14.2mm (0.56") 7 segment red
			Decimal point	Internally selectable
			Overrange indication	Displays "1" or "-1"
			Update response time	< 1 second
			Polarity	Automatic with (-) indicating negative inputs

### PERFORMANCE

#### IMPEDANCE:-

M300-VAD	10k Ohm/V
M300-VD1/2	>100k Ohm
M300-VD3/4	10k Ohm/V

#### BURDEN

M300-AAD	< 2VA
M300-AD1/2/3/4	20mV drop

#### OVERLOAD

Current	4 x continuous 25 x 1 second
Voltage	1.5 x continuous 4 x 1 second

Accuracy	+/- 0.05% of reading +/- 1 digits
Resolution	0.05%
Linearity	+/- 1 digit roll over error +/- 2 digits
Conversion	Dual slope integration
CMR	AC 50dB 50 to 60Hz DC 25 1k Ohm source unbalanced.

Normal mode rejection 25dB 50 to 60Hz

### ENVIRONMENTAL

Working Temperature	0 - 60 deg C
Function Temperature	-25 to +70 deg C
Storage Temperature	-55 to +85 deg C
Temperature Coefficient	0.01% per deg C
Relative humidity	0-95% non condensing
Warm up time	1 min.
Shock	30g in 3 planes

### INSULATION

Test Voltage	4kV RMS 50Hz 1 min
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### ENCLOSURE

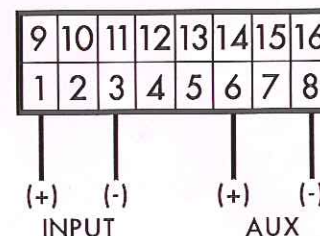
DIN case	Dimensions 96 x 48 x 98mm
Material	Black Polycarbonate Complying with UL94VO
Terminals	Screw type for 2 x 0.5 - 3.5mm
Weight	0.4kg
Enclosure code	IP54 NEMA 12 Optional IP65 NEMA 4

### GENERAL & SAFETY INSTRUCTIONS

All units are built and tested for safety, accuracy, quality and reliability. Units are delivered fully calibrated, however adjustments to "ZERO" and "SPAN" can be made by removing the appropriate covers on the rear of the instrument. Note on some models the zero pot, is not present as the unit has an auto zero facility.

These products must be installed by a qualified engineer. VOLTAGE dangerous to human life may be present at some of the terminals of this unit. Exercise extreme caution during installation.

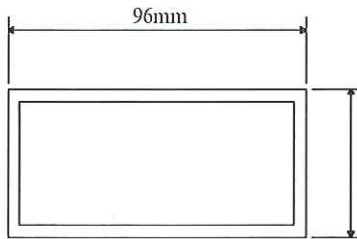
### WIRING DIAGRAMS



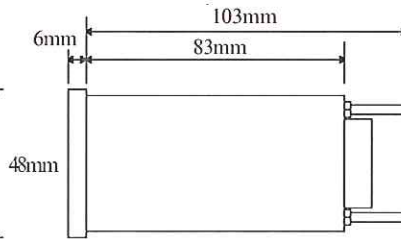
- All inputs (AC or DC) are connected via terminals 1 & 3
- All Auxiliary supplies (AC or DC) are connected via terminals 6 & 8
- Access to the "ZERO" & "SPAN" adjustment. Remove terminal blanks in position 9 & 10. ZERO = 10 SPAN = 9
- Optional externally selectable decimal point. 16 = common 15 = 1.999 14 = 19.99 13 = 199.9 Link 16 to as reqd.

## CASE DIMENSIONS

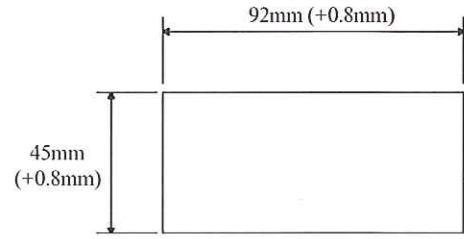
FRONT



SIDE

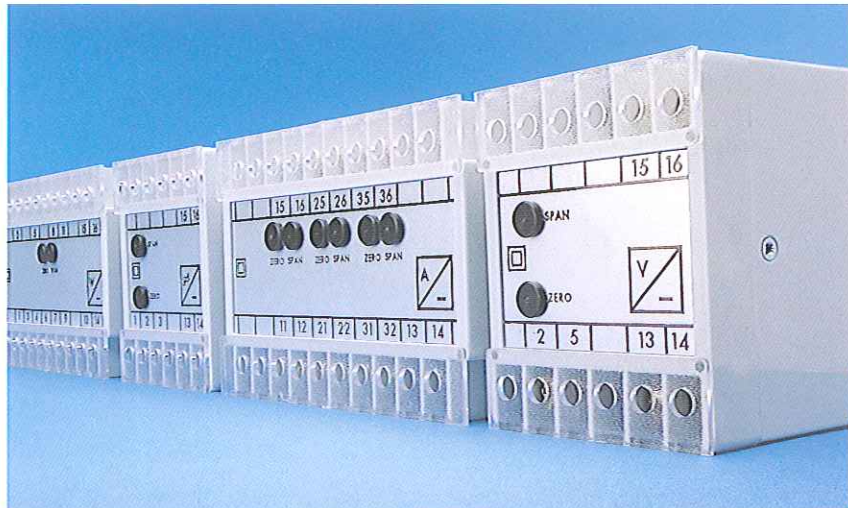


PANEL CUTOUT

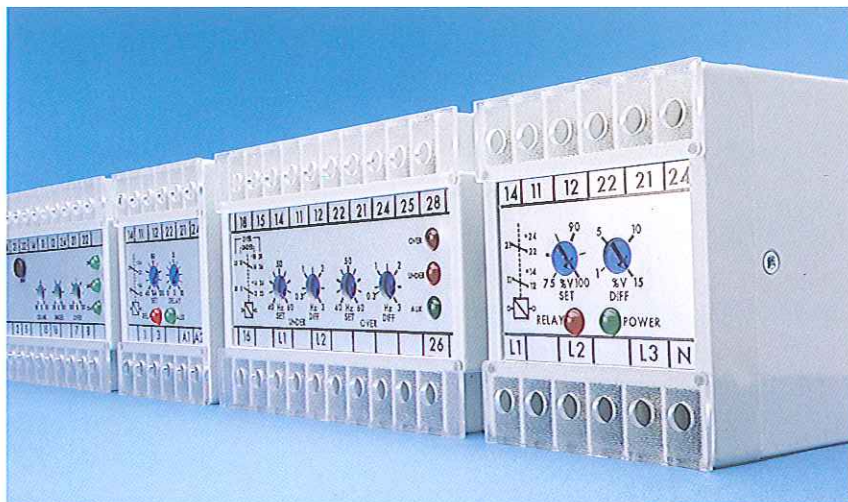


## PRODUCTS ALSO AVAILABLE IN THE HOBUT RANGE

*M100 TRANSDUCER SERIES.* These transducers convert AC & DC signals to DC milliamps and voltage outputs. High accuracy of 0.2%, combined with isolation voltage of 4 kV, make Hobut leaders in the transducer market.



*M200 PROTECTION RELAY SERIES.* These relays are designed to monitor AC & DC parameters and provide a relay contact signal, when the parameter deviates from a preset limit.



# HOBUT

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