



**WARD-BECK SYSTEMS LTD.**  
841 PROGRESS AVENUE, SCARBOROUGH, ONTARIO M1H 2X4  
TELEX: 065-25399 TELEPHONE: 416/438-6550

## **M405**

**PORTABLE EXTENDED RANGE  
VU METER**

**AND**

## **M405D**

**RACK MOUNT EXTENDED RANGE  
VU/PPM METER**



## WARD-BECK SYSTEMS LTD.

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### WARRANTY

All Ward-Beck Systems Ltd., products are warranted against defective materials and workmanship for a period of one year from the date of shipment.

Ward-Beck Systems Ltd., will repair or replace, at its option and without charge, all said products or parts thereof which upon factory inspection prove to be defective during the warranty period, provided that:

- 1) the original serial numbers are intact and have not been tampered with,
- 2) the purchaser shall return any equipment or parts thereof to Ward-Beck Systems Ltd., only after obtaining prior authorization and shipping instructions from the factory (Ward-Beck Systems Ltd., reserves the right to inspect or repair equipment on the purchaser's premises), and
- 3) the purchaser assumes the obligation for all expenses incurred in connection with the shipping and return of such goods, once authorization has been obtained.

This warranty does not cover items normally considered expendable, such as fuses and lamps.

This warranty does not cover damages caused by misuse, accident, neglect, unauthorized alteration, repair by unauthorized personnel, or damage caused by act of God, war, or civil insurrection.

In no event shall Ward-Beck Systems Ltd., be liable for consequential damages. Ward-Beck Systems Ltd., shall have the right to final determination as to the applicability of this warranty.

Ward-Beck Systems Ltd., reserves the right, at any time and without notice, to make changes in its equipment, component specifications, or designs, as may be warranted by progress in state-of-the-art or technology.

The warranty set forth herein is in lieu of all other warranties, expressed or implied, including the warranties of merchantability and fitness.



GENERAL

M405 PORTABLE EXTENDED RANGE VU METER

The WBS M405 Extended Range VU Meter is a battery operated, portable instrument, designed for the measurement of transmission, noise, and vu levels throughout an audio system. The instrument produces a 0 vu indication on a 4.5-inch meter for input levels from -50 dBm to +30 dBm, from 20 Hz to 20,000 Hz.

An input attenuator, calibrated in 2 dB steps, accommodates the full 80 dB range in one continuous 300 degree rotation. Front panel selector switches are provided to permit the M405 to operate in the MATCHING or BRIDGING mode, for use with unterminated or terminated transmission lines, and to convert the instrument meter indication to operate directly with 150 or 600 ohms system impedances. In addition, a 60 Hz notch filter may be switched in to permit measurements to be obtained in the presence of hum.

The active circuitry utilizes FET semiconductor devices to achieve high impedance operation with minimum current demand of less than 1 mA. The M405 may be operated continuously from the internal nickel-cadmium cells for more than 40 hours, typically 30 days intermittent use, before recharging. Measurements can be made while the instrument is connected to the ac line, during which time it is automatically on charge.

Input connections to the meter may be via binding post terminals or a telephone-type jack (ADC PJ339) conveniently located on the front panel. An output jack provides an independent 0 dBm (approx.) 600 ohms output level for use as a headset monitor or auxiliary line amplifier.

TECHNICAL DATA

M405 PORTABLE EXTENDED RANGE VU METER

Range:	-50 dBm to +30 dBm, in 2 dB steps, for 0 VU reading.
Frequency Response:	+/- 0.25 dB from 20 Hz to 20,000 Hz.
Notch Filter:	-30 dB down with 60 Hz filter switched in.
Noise:	Signal to noise ratio better than 50 dB measured from 0 VU meter reading.
Total Harmonic Distortion:	Less than 1% from 20 Hz to 20,000 Hz, measured with any calibrated input level, and at 0 VU output level.
Source Impedance:	150 or 600 ohms.
Input Impedance:	Selectable, 150/600/20,000 ohms +/- 5%, unbalanced, floating from ground.
Attenuator Tracking:	+/- 0.25 dB per step, non cumulative.
Meter Ballistics:	Complies with ANSI C16.5 vu meter standards.
Headset Output:	0 dBm (approx.) at 600 ohms.
Power Requirements:	Selfcontained rechargeable batteries. Line cord supplied to operate from 115 Volts ac and to recharge cells.
Battery Life:	More than 40 hours continuous use. Typically 30 days, at 2 hours per day, intermittent use.
Dimensions:	8.75 inches high by 5.13 inches wide by 5.00 inches deep. 214 mm high by 126 mm wide by 123 mm deep.
Weight:	7 lbs. complete.



GENERAL

M405D EXTENDED RANGE VU AND PEAK PROGRAM METER

The M405D has been designed to measure average and peak program levels of audio signals. This instrument is self-contained and mounts in a standard 19" equipment rack. It is powered from a 115 volts, 50/60 Hz power source.

A "Range" attenuator, providing 48 steps of 2 dB each, accommodates audio input levels from -50 dBm to +30 dBm for a 0 meter reading.

The M405D accepts two inputs (A or B) at the rear of the instrument. Selection between the A or B inputs may be made by a pushbutton selector on the front of the unit. A PJ339A type jack receptacle on the front panel provides a direct input to the instrument. Pushbuttons on the front panel allow the selection between 600 or 150 ohm source impedances, as well as presenting a matching or a bridging load to the source.

An active high pass filter in the M405D provides a 24 dB per octave roll-off with its -3 dB point set to 250 Hz. When this filter is inserted, it provides a 60 Hz hum rejection in excess of 40 dB.

A headset jack receptacle on the front panel permits the user to listen to the signal being metered. This headset output is also extended to the rear terminal strip and may be utilized as a line feed for miscellaneous monitoring equipment. An unbalanced 8 ohm speaker output allows a small monitor speaker to be driven directly from the M405D (the maximum output is 3 watts).



TECHNICAL DATA

M405D EXTENDED RANGE VU AND PEAK PROGRAM METER

Range: -50 dBm to +30 dBm in 2 dB steps for 0 VU or 0 PPM readings.

Input Selection: Pushbutton selects between two sources. ADC PJ339A type jack on front panel provides direct input.

Source Impedance: 600 ohms or 150 ohms.

Input Impedance: 600 ohms, 150 ohms or 20k ohms.

Attenuator Tracking: +/- 0.25 dB per step (non accumulative).

Meter Ballistics:

VU: Complies with ANSI C16.5

PPM: Complies with BSI BS4297.

High Pass Filter: -3 dB at 250 Hz.  
-24 dB at 120 Hz.

Frequency Response:

Metering: +/- 0.25 dB from 30 Hz to 15 kHz.

Monitoring Outputs: +/- 0.5 dB from 50 Hz to 10 kHz.

Total Harmonic Distortion:

Headset Output: Less than 1%, 50 Hz to 10 kHz (measured at any input level and at +24 dBm output level).

Speaker Output: Less than 1%, 50 Hz to 10 kHz (measured at any input level and at 3 watts, 8 ohms output level).

Noise: 40 dB below 0 VU or 0 PPM reference.

Output Impedance:

Headset Output: 150 ohms.

Speaker Output: 2 ohms.

TECHNICAL DATA

M405D EXTENDED RANGE VU AND PEAK PROGRAM METER

Load Impedance:            Headset Output: 600 ohms, balanced.  
                                 Speaker Output: 8 ohms.

Output Level:

    Headset Output:    +8 dBm nominal into a 600 ohm load (for 0 VU  
                                 or 0 PPM reference).  
                                 +24 dBm max.

    Speaker Output:    3 watts into 8 ohms max.

Power Requirements:    105 to 125 volts, 50/60 Hz.

Dimensions:            19" wide x 10" deep x 3-1/2" high.  
                                 (483 mm x 254 mm x 89 mm)

Weight:                 13 lb. (6 kg.)



