

Three Phase Meter Qualification Board

MQB3

Apply true **three phase voltage and current** to electric meters, enabling them to be tested under all possible conditions that may be encountered in the field.



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FUNCTIONS

The MQB3 facilitates the following meter shop functions in high volume:

- New AMI/AMR meters settings check-out
- Meter program updates
- Software revision checking for both the meter and the communications module
- Communications module troubleshooting
- Checking of problem meters for open/shorted elements

With the MQB3, the user has the ability to check meter response to:

- Varying loads over long periods of time to simulate brown out and surge conditions
- Harmonic waveforms (can download custom harmonic waveforms through PC interface)
- Meter power on/off cycling
- Phasor distortion

FEATURES of MQB3

- ◇ Simple, electronically-controlled loading of meters
- ◇ Voltage and Current routed to the proper locations on the meter socket based on form selected
- ◇ Voltage and Current amplitude adjustable per phase at the keypad
- ◇ Current Drive: single range 0.01 to 50A(rms), 70A (peak)
- ◇ Back voltage sensing during disconnect testing
- ◇ Standard services selectable at the keypad
- ◇ User friendly 7" diagonal, 800x480, TFT color display and keypad for setup
- ◇ Phasor relationship between channels (i.e. A to B phase angle) adjustable at the keypad
- ◇ Power Factor (phase angle) adjustable at the keypad
- ◇ Service disconnect testing through keypad selection
- ◇ IR port, radio, and PLC communications testing can be completely checked out for all meters loaded into the board
- ◇ Each MQB3 comes with a PC program that can be loaded onto a computer connected to the MQB3's Ethernet port to replicate the functionality of the display and keyboard on multiple chassis

Additional details on the back of this brochure.

MQB3 SPECIFICATIONS



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MQM-100 MASTER CONTROLLER MODULE

- ◇ Includes three independent pairs (voltage and current) of waveform generators
- ◇ Includes electronic socket controls, potential routing relays, user interface display and keypad, and service disconnect load side power indicating lamps.

MSM Socket Modules

Two different socket modules configurations are available:

- ◇ MSM-100 (one socket in a 10" high panel): Includes one set of electronic socket controls, potential routing relays, and service disconnect, load side power indicating lamps.
- ◇ Either can be placed above or below the MQM-100 in the rack.

Line-powered Service Disconnect test power source

- ◇ Each MQB3 includes an independent Service Disconnect Test power source, capable of supplying 120V-240V power to forms 1S, 2S, and 12S meters
- ◇ This source is automatically switched in to replace the waveform generator source when the service disconnect test configuration is selected at the keypad.
- ◇ Systems are assembled in various combinations from MQM-100 modules, MSM-100 or MSM-200 socket modules, welded steel MT-25 rack cabinets (chassis), and service disconnect supplies.
- ◇ Standard system configurations include:
 - ◇ MQB3-12C (master on bottom)
 - ◇ MQB3-21 (two masters)
 - ◇ MQB3-30 (three masters)

MQM-100 SPECIFICATIONS

- ◇ Digital Waveform Generators (per phase)
- ⇒ **Synthesizer**
 1. Fundamental frequency adjustable from 45 to 60 Hz

⇒ Waveforms

- ◇ Sinusoidal (THD <0.5%) (<0.1% typical)
- ◇ Defined by harmonic amplitudes
- ◇ Harmonic indices (1 through 25)
- ◇ Either amplitude and phase or Fourier coefficients (a, b)
- ◇ ANSI C12.20-2015 test waveforms
- ◇ Dropped cycle waveforms: 1:1, 2:2, 4:4 any combination m:n where m+n=8
- ◇ Arbitrary waveforms: defined by an array of 4096 points representing 8 cycles

⇒ Voltage Drive

- ◇ Three Channel, one side of each at ground
- ◇ Dual range: (1) 30 to 250V(rms), 353V(peak), (2) 200 to 500V(rms), 707V(peak)
- ◇ Adjustment resolution: 0.2% of full scale (approx. 0.1V)
- ◇ Accuracy: 0.5%
- ◇ Output power: 100VA at 240V or 480V

⇒ Current Drive

- ◇ Three Channel, fully isolated
- ◇ Single range 0.01 to 50A(rms), 70A (peak)
- ◇ Adjustment resolution: 0.02% of full scale (approx. 0.1V)
- ◇ Accuracy: 0.5%
- ◇ Compliance voltage: 1.5V

METER SOCKET CONTROLLER (VRM-3PH)

- ◇ Universal socket with automatic closure on insertion of device
- ◇ Four point detection of meter in place
- ◇ Detection of meter bypass in place
- ◇ Automatic routing of voltages to the correct stabs for the following meter forms:
1S, 2S, 3S, 4S, 5S, 6S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 25S, 26S, 29S, 32S, 35S, 36S, 45S, 46S, 56S, 66S, 76S, 103S, 106S, 109S, 112S, 116S, 125S, 135S, 136S, 145S, 166S
- ◇ Load side current disconnect

POWER LINE COMMUNICATIONS TESTING

- ◇ Meters can be powered by a 240V autotransformer for disconnect and communications testing allowing powerline signals to easily be transmitted from the meter through the unit to the wall power circuit

METER DISCONNECT SWITCH TESTING

- ◇ Disconnect test mode powered by high current auxiliary transformer
- ◇ Test disconnect under any load current
- ◇ Disconnect mode indicator LED
- ◇ Voltage present LEDs for stab 2 and stab 4
- ◇ Software detection of voltage present on stab 2 and stab 4
- ◇ Ability to apply back voltage to stabs 2 and/or 4 for reconnect testing

PHYSICAL SPECIFICATIONS

- ◇ MQB3 systems are built up from standard subsystems mounted in a custom rack enclosure
- ◇ MT-25 Rack Enclosure is 25.54"W x 25.62"D x 70.5"H and has a front work surface of 15" deep
- ◇ Each unit is equipped with four casters and four adjustable leveling feet

Electric power

- ◇ Each rack requires a 120V at 20A or less (configuration dependent)
- ◇ Note: These units contain large switching power supplies with high inrush currents
- ◇ A minimum of 12 inches should be allowed behind the unit for proper ventilation

External Connections

Rear:

- ◇ Power inlet (120V at 20A) Hubble L5-20S
- ◇ Ethernet connection to internal network segment

Front:

- ◇ Main power breaker
 - ◇ Ethernet connection to internal network segment
 - ◇ Duplex convenience outlet (2A max)
- Service access:

- ◇ For easy service access we recommend no more than two racks be permanently bolted together so the left, right and rear sides of the units are accessible



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