

# Heaters Controls & Sensors Ltd

## DigitAN™ - EM 6400 Series v3.03



- Digital & Analog display ■ Compact ■ Smart
- Global ; CE, UL marks ■ Universal



### Features

- Global: UL, C UL Listed, CE, C- Tick certified
- Accuracy Class 1.0 (0.5S & 0.2S Optional)
- True RMS, Accurate on Distorted waveforms
- Simultaneous sampling of Volts & Amps
- Low PT, CT burden
- Wide range of Auxiliary Supply (Control power)
- Programmable CT, PT ratios
- Built-in phase analyzer
- Quick and easy installation
- Auto Scrolling
- Communication with PCs, PLCs, DCS through RS 485 Serial Port (Built-in for EM 6434 & EM 6433 and optional for EM6436, EM 6400)
- 10 year back-up of integrated data
- Turbo Key for 'One Touch' operation and setup
- Measures 4 Quadrant Power & 2 Quadrant Energy (IE Optional measures 4 Quadrant Energy in EM6400)
- CT reversal: auto-correction for Energy Integration in star(wye) mode *New!*
- Demand Monitoring (Optional)
- PF per phase and 3 phase
- Sealed dust - proof construction
- Touch safe terminals
- Easy set up through Front Panel keys
- Keypad lock

### Display Features

- Patented Alpha numeric bright display
- Brilliant 3 line, 4 digit per line, (digit height 14mm) LED display with auto-scaling capability for Kilo, Mega, Giga)
- View 3 Parameters together
- Password protection for setup parameters
- User selectable default display page through key pad lock

### Benefits

#### EM 6459

- Displays Volts, Amps, Frequency/PF simultaneously
- Monitors generator speed (RPM)
- Monitors generator loading efficiency

#### EM 6434

- Displays all power and energy parameters, Run hours, ON hours & number of power interruptions
- Monitors loading characteristics of motors

#### EM 6433

- Monitors active/apparent power & energy consumption, load current, Run hours, ON hours in a single meter
- Displays Amps, Power simultaneously

#### EM 6436: All benefits of EM 6433 and more

- Displays Volts, Amps, Frequency/PF simultaneously
- Displays Amps, Power, PF simultaneously

#### EM 6400: All benefits of the above models and more

- Monitors all instantaneous, integrated and demand parameters
- Analyses power quality
- Helps energy balancing

### User Programmable

- Delta / Star (Wye) / 2 Phase / 1 Phase *New!*
- PT, CT Ratios Primary & Secondary
- User selectable VAh/Wh (EM6436, EM6433)

### Applications

- Control Panels
- Motor Control Centers
- Power Distribution Panels
- Connection to Plant Monitoring & Control Systems
- Genset Panels
- Original Equipment Manufactures (OEMs)
- Building Management System

### Rugged Construction

#### Conforms to

Emission	:CISPR22
Fast Transient	:4kV IEC 61000-4-4
Burst	:IEEE 62.41:1991
Surge withstand	:IEEE C37.90.1:2002
ESD	:IEC 61000-4-2
Impulse voltage	:6kV, IEC 60060, 1.2/50µSec
Safety Construction	:Self extinguishable VO plastic
Protection against dust & water	:Front IP 51 Rear IP 40

ISO 14001:2004 Certified  
ISO 9001:2000 Certified



www.hcs77.com 800 279 9912

# Heaters Controls & Sensors Ltd

## Technical Specification

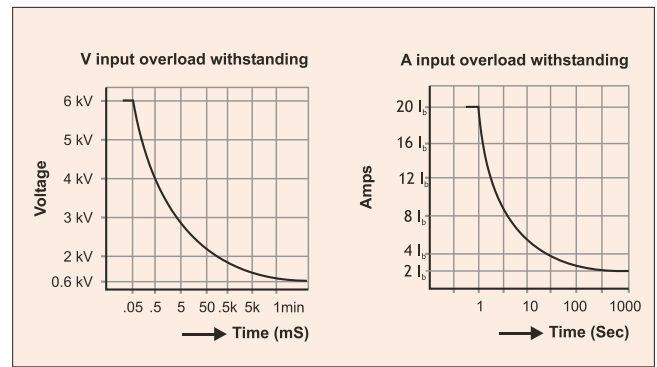
Sensing/ Measurement	True RMS, 1 sec update time 4 Quadrant Power & Energy
Accuracy	Class 1.0 as per IEC 62052-11 and IEC 62053-21 Class 0.5S (optional) as per IEC 62052-11, 62053-22 and ANSIC12.20 <b>Class 0.2S (optional) as per IEC 62052-11 and IEC 62053-22</b> <i>New!</i>
Aux Supply (Control Power)	44 to 300 Vac/dc
Input voltage	4 Voltage inputs (V1, V2, V3, VN) 110 or 415 Vac LL nominal(Range 80 to 600Vac LL)
Input current (Energy Measurement)	Current inputs (A1, A2, A3) 5A Class 1.0 0.5: 5mA (Starting) to 6A* 5A Class 0.5S 0.2S: 5mA (Starting) to 6A 1A Class 0.5S 0.2S: 1mA (Starting) to 1.2A
Overload	5A meter : 10A max continuous 1A meter : 2A max continuous
Burden	0.2VA max for each phase input voltage and current 3VA max on Aux Supply
Frequency	45 to 65 Hz
Resolution	RMS 4 digit, INTG 8 digit
Communication	RS 485 serial channel connection Industry standard Modbus RTU protocol
Isolation	2kV ac isolation for one min between all isolated circuits including communication port
Safety	Measurement category III, Pollution Degree 2, Protection against shock by double insulation at user accessible area
Environmental	Operating Temperature -10°C to 60°C (14°F to 140°F) Storage Temperature -25°C to +70°C (13°F to 158°F) Humidity 5% to 95% non condensing
Weight	400 gms approx. Unpacked 500 gms approx. Shipping
Warranty	<b>3 Years from date of Invoice</b> <i>New!</i>

Note: \* For 5A universal meter additional error of 0.05% of full scale, for meter input current below 100mA

## Accuracy

Measurement	Accuracy % of Reading		
	CI 1.0	CI 0.5S	CI 0.2S
Volts LN per phase & Avg	1.0	0.5	0.2
Volts LL per phase & Avg	1.0	0.5	0.2
Amps per phase & Avg	1.0	0.5	0.2
Amps phase angle per phase	2°	1°	1°
Frequency	0.1	0.1	0.1
Active Power per phase & total	1.0	0.5	0.2
Reactive Power per phase & total	2.0	1.0	0.5
Apparent Power per phase & total	1.0	0.5	0.2
Active Energy Import/Export	1.0	0.5	0.2
Reactive Energy (Inductive/Capacitive)	2.0	1.0	0.5
Apparent Energy	1.0	0.5	0.2
RPM	1.0	0.5	0.2

## Overload



## Models

v3.03

Parameter	EM 6459	EM 6433	EM 6434	EM 6436	EM 6400
V V1 V2 V3 V12 V23 V31	●			●	●
A A1 A2 A3	●	●		●	●
An Neutral Current <i>New!</i>	C				C
F	●			●	●
% Load	●				●
%A Unbal %V Unbal <i>New!</i>	●				●
PF PF1 PF2 PF3	●		●	●	●
%AFS Analog color coded load bar	●	●	●	●	●
RPM	●				●
A° Phase Angle A°1 A°2 A°3	●				●
W W1 W2 W3		⊙	●	⊙	●
VA VA1 VA2 VA3		⊙	●	⊙	●
VAR VAR1 VAR2 VAR3			●		●
V%1 V%2 V%3					THD □
A%1 A%2 A%3					
Demand VA/ W/ A <i>New!</i>					DM □
Rising demand					
Time remaining					
MD Maximum demand					
Hr MD occurred					
Wh		⊙	●	⊙	●
VAh		⊙	●	⊙	●
VARh			●		●
-VARh			●		●
Run hours		●	●	●	●
ON hours	●	●	●	●	●
INTR	●	●	●	●	●
R.Wh					
R.VAh					
R.VARh					
-R.VARh					
Run hours					IE □
Wh		⊙	●	⊙	●
VAh		⊙	●	⊙	●
VARh			●		●
-VARh			●		●
Run hours		●	●	●	●
R.Wh					
R.VAh					
R.VARh					
-R.VARh					
Run hours					IE □

Note: ● = Standard □ = Option specified while ordering

c = Only through communication

⊙ = User selectable VAh/Wh through setup mode ( EM6436, EM6433)

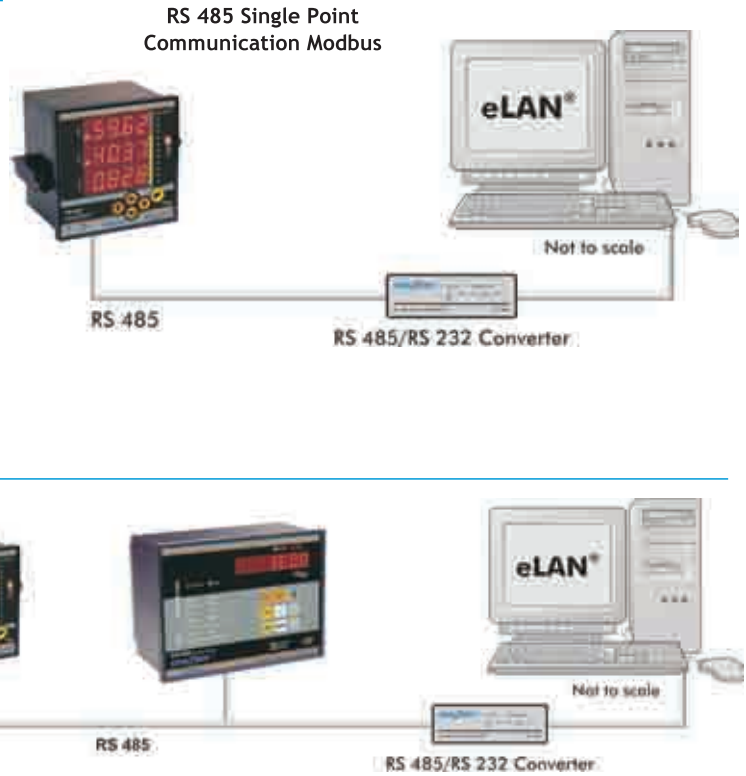
## Digital Communication

RS 485 standard, communication capability using open Modbus RTU protocol. The meters can be multi-dropped using RS 485 twisted pair. The baud rate can be set from 1200 bps to 19200 bps. (Preferred settings is 9600 bps.) RS 485 Half duplex isolated serial channel connection.

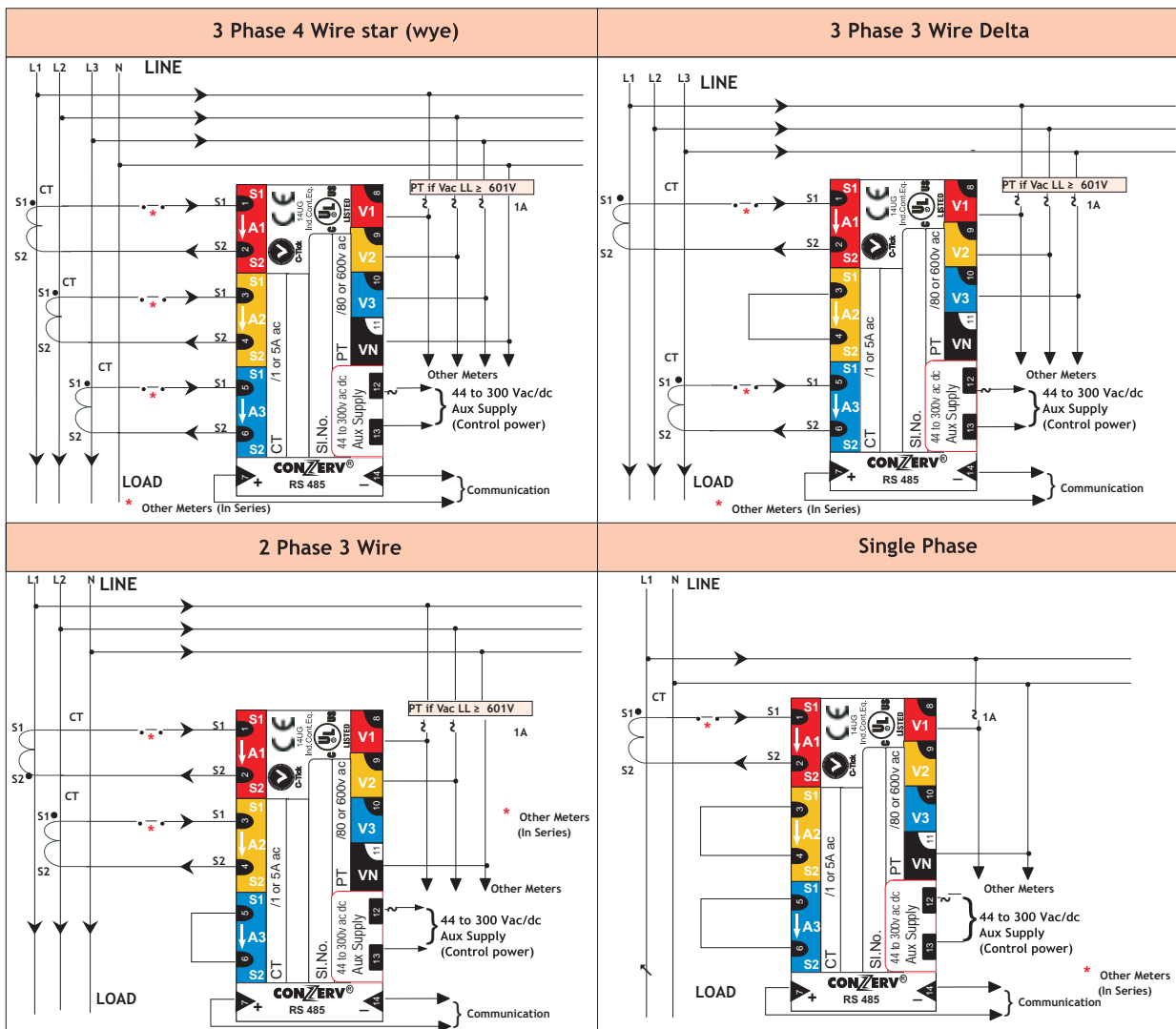
## BMS Compatible

Access of either single (individual) parameter or block of parameters through RS 485 communication port. Integrates with Honeywell, Siemens Building Technologies and other BMS packages.

## RS 485 Multi-Point Communication Modbus



## Wiring Diagram



## “3d” VA measurement


- EM 6400, EM 6433, EM 6436 is equipped with “3d VA Measurement” capability. This accurately include Distortion power (D) per IEEE 100, into the VA Calculation
- $$\text{So, } VA_{3d} = \sqrt{W^2 + VAR^2 + D^2}$$
- However Arithmetic VA=VA1+VA2+VA3 is also available as a set-up option

## Demand Parameters Optional (for EM 6400 only)

- Monitors Demand - Present, Rising & Maximum, Time remaining
- VA or W or A demand is selectable through setup table
- User selectable demand interval through set up in steps of 5 minutes(5,10,15, 20, 25 & 30)
- Demand may be Sliding window (auto) or Fixed window (User), selectable through setup mode
- The time of occurrence for the Maximum Demand is based on “ ON hrs” of the system
- Maximum Demand can be cleared independently or along with the integrators through the CLR function

## Ordering Information

Specify

Model No.	RS 485 COM Port	
<input type="checkbox"/> EM 6459		
<input type="checkbox"/> EM 6433	✓ Built-in	
<input type="checkbox"/> EM 6434	✓ Built-in	<input type="checkbox"/>
<input type="checkbox"/> EM 6436	<input type="checkbox"/>	
<input type="checkbox"/> EM 6400	<input type="checkbox"/>	
<input type="checkbox"/> Demand <input type="checkbox"/> Import/Export <input type="checkbox"/> THD	<input type="checkbox"/>	

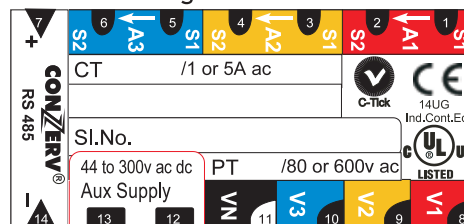
Input Current	Accuracy
<input type="checkbox"/> 5A Universal	<input type="checkbox"/> C11.0 <input type="checkbox"/> C10.5
<input type="checkbox"/> 5A	<input type="checkbox"/> C10.5S <input type="checkbox"/> C10.2S
<input type="checkbox"/> 1A	<input type="checkbox"/> C10.5S <input type="checkbox"/> C10 2S

## Integrated Parameters

- Import / Export is optional. Factory selectable on order ( For EM 6400 only)
- Energy Parameter (kWh, kVAh, kVARh inductive and kVARh Capacitive) (Total, Import & Export)
- Separate Run hrs for Import, Export and Total
- Run hrs, ON hrs, No of interruptions

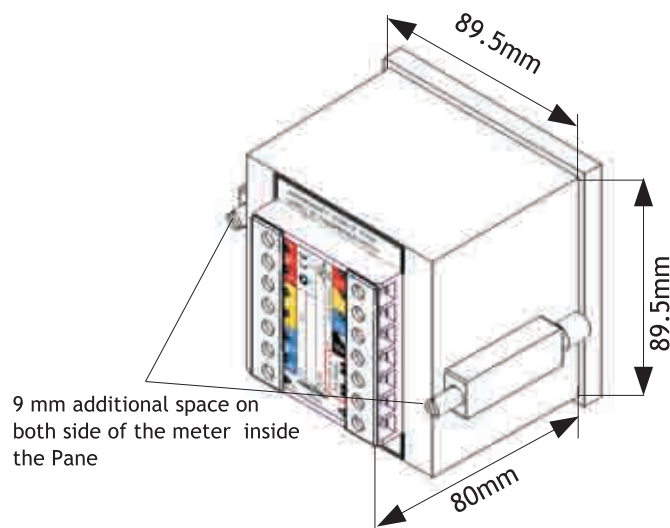
## Colour Coded TB label

Terminals are numbered, coloured and grouped such that defect free wiring is ensured.



## Dimensions

- Bezel : 96 x 96 mm
- Depth : 80 mm behind Bezel
- Panel Cutout : 92<sup>+0.5</sup> x 92<sup>+0.5</sup> mm



## Accessories (optional)

- Fused Voltage Probes & Clamp-on Current Probes for portable use
- Connector Kit

## ConPAD Setup Utility\* (optional)

- A GUI based software tool for programing meters
- Downloadable from website on registration

\*for meters with RS 485 port only