If you have not found what you are looking for or you have further questions, please feel free to call us at 217-753-7797 or fax us at 217-753-7789. It will help us process your request more efficiently and effectively if you can provide as much detailed information about your requirements/application as possible.

Thanks for considering Hobbs meters from Honeywell!

MANUFACTURING

Honeywell Hobbs’ commitment to the customer in past years and present is what has helped us develop our world-class manufacturing systems. Some of the methods by which we continuously improve our products and processes are as follows:

- **Six Sigma methodology** is a strategy used to accelerate improvements in our processes, products and services, and to reduce manufacturing costs and improve quality. It achieves this by relentlessly focusing on eliminating waste and reducing defects and variations.
- **Continuous Flow Process utilizing “Rabbit Chase” concepts** are used in the focused factories in order to achieve the lowest total cost, defect-free product.
- **Single Minute Exchange of Dies (SMED method)** provides reduced time in molding cell.
- **Statistical Process Control** is used for measuring critical dimensions and controlling manufacturing processes.
- **Poka-Yoke method and computerized test equipment** are utilized to eliminate scrap and rework.
- **Kanban cards** are used to pull raw material and piece parts through the factory.
- **Bar coding and electronic data interchange (EDI)** are available.

QUALITY SYSTEMS

It is the goal of Honeywell Hobbs to meet customer value needs through continuously improved products and processes. That is the basis by which we work to create a partnership with our customers. Evidence of our commitment is proven by a goal of a Shipped Product Quality Level (SPQL) of 100 ppm. We utilize Advanced Quality Planning and QS9000 based quality systems.

Honeywell

Sensing and Control
www.honeywell.com/hobbs
email: www.honeywellhobbs.marketing@honeywell.com
Honeywell
P.O. Box 19424
Springfield, IL 62794-9424
USA
Catalog 28-118, SLG Printed in the USA
The Hobbs brand is well known worldwide for the development of quality electro-mechanical products. The invention of the first electrically wound automobile clock in 1938 created what is now known as Honeywell Hobbs. John Weston Hobbs was the inventor that cultivated this electrically-wound vehicle clock into a company that has over the years expanded to include hour meters, pressure and vacuum switches, halogen lamps, transmission shifters, and other custom electro-mechanical products. Honeywell’s broad customer and market base includes industries such as automotive, agricultural, material handling, construction, marine, medical, heavy truck, lawn and garden, recreational, generators, compressors and aviation. Honeywell’s commitment to continuous improvement and total quality management will allow for further expansion of its product lines and customer base while maintaining the highest standards of excellence.

www.honeywell.com/hobbs

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- D.C. ................. P. 6-7
- A.C. .................. P. 8-11
- Accessories .......... P. 11
- Warranty ............. P. 11

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**Other AC and DC Meters Available**

- **Round Flush with Retainer Mount**
- **Round Slotted 3 screw**

**Hour Meter Accessories**

- **Mounting brackets.** For mounting hour meters in any location when panel installation is not practical. Multiple holes allow positioning for easy reading. Foot of bracket can be bent when necessary. Part Number M-329 (2 13/16” x 4”) for meter only. Part Number M-558 (4” x 5 1/8”) when meter and damper are used together.

- **Damper.** Protects meter from severe vibration. Use on panel or with Part Number M-558 bracket. Part Number M-3088 (3 7/8” dia) for three-screw type DC meters.

- **Panel mounting bracket.** Designed to bolt to a flat surface area 2 13/16” x 5 3/4”. Provides easy-to-read meter position. Part Number M-486 for three-screw type DC meter only.

- **Angle bracket.** For two-screw flange AC and DC rectangular meters only, when panel mounting is not practical. Part Number M-3944.

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**Warranty Periods:**

- **98000 Series..................2 years**
- **85000 Series..................2 years**
- **20000 Series..................2 years**

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**Custom Instrument Panel Clusters**

Let Hobbs custom design your display panel saving you time and money. We can assemble a panel to your specifications that frees up your engineering resources, reduces parts counts and reduces your vendor base.

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**Warranty and remedy**

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace without charge those items it finds defective. The foregoing is Buyer’s sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose.

While we provide application assistance, personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change at any time without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

**Sales and Service**

Honeywell serves its customers through a worldwide network of sales offices and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact a nearby sales office or

INTERNET: www.honeywell.com/hobbs

Email: honeywellhobbs.marketing@honeywell.com

**Warranty Periods:**

The products listed are warranted for the periods shown:

- **98000 Series..................2 years**
- **85000 Series..................2 years**
- **20000 Series..................2 years**
28100 Series

Unlike conventional AC hour meters that are limited to one primary voltage and frequency, the Hobbs Multi-Range Quartz hour meter will operate over a full range of voltages and frequencies. The meters will work accurately over a voltage range of 90 VAC to 264 VAC and at frequencies of either 50 Hz or 60 Hz. This unique feature means that one hour meter will work for virtually any application anywhere in the world!

Specifications:
- Operating Voltage: 90 to 264 VAC
- Frequencies: 50 to 60 Hz
- Temperature Range: -40˚F to +185˚F

Features:
- Records time 0 to 99,999.9 hours
- Accuracy ±0.02%
- UL Recognized
- CSA (UL)
- CE Mark
- Totally sealed from dirt and moisture
- Termination: 1/4” spade

Benefits:
- Reduced parts count
- Reduced inventories
- Fewer purchase orders
- Eliminate production line errors
- Reduce service parts

Options:
- Wire leads
- Custom lens
- Terminals (up, down, straight)

WARNING!
Applied voltage not to exceed 264 Vac RMS. This meter was not intended to be used in applications where excessive transient voltages are present. It is the responsibility of the customer to determine the suitability of this device for use in their system.

98000 Series

The Hobbs 98000 Series LCD hour meters provide a large easy-to-read display in a conventional size package. The hour meters are available in a variety of mounting styles and voltage ranges that will fit virtually any application.

Specifications:
- Run Accuracy ±200ppm ±0.2%
- Start Time: maximum 1 second
- 6 Digit Display
- Digit Height: 6mm
- Power draw: ≤ 8 mA at 12 VDC (Power Terminal)
- Terminations: 1/4” knobs
- Temperature Range: Operating: -40˚C to +85˚C
- Vibration: 20 g’s per SAE J1378
- Shock: 55 g’s per SAE J1378
- Operating ranges: 4.5 to 16 VDC (optional)
- 9 to 64 VDC
- >64 VDC Contact Factory
- Display: 0 to 99,999.9 Hours
- 0 to 999,999 Counter
- Transient Voltage Protection
- Lead Dump Inductive
- E MI Reverse Polarity

Options:
- Wire leads
- Custom lens
- Terminals (up, down, straight)

WARNING!
Applied voltage not to exceed 64 VDC RMS. This meter was not intended to be used in applications where excessive transient voltages are present. It is the responsibility of the customer to determine the suitability of this device for use in their system.
**Retainer Mount**

<table>
<thead>
<tr>
<th>Operating Voltage</th>
<th>Terminals</th>
<th>Part #</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 to 64 VDC</td>
<td>2 terminal</td>
<td>98311</td>
</tr>
<tr>
<td>9 to 64 VDC</td>
<td>3 terminal with enable</td>
<td>98321</td>
</tr>
<tr>
<td>9 to 64 VDC</td>
<td>4 terminal resettable</td>
<td>98301</td>
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</table>

**Round Chrome Bezel**

<table>
<thead>
<tr>
<th>Operating Voltage</th>
<th>Terminals</th>
<th>Part #</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 to 64 VDC</td>
<td>2 terminal</td>
<td>98314</td>
</tr>
<tr>
<td>9 to 64 VDC</td>
<td>3 terminal with enable</td>
<td>98324</td>
</tr>
<tr>
<td>9 to 64 VDC</td>
<td>4 terminal resettable</td>
<td>98304</td>
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**Round Black Bezel**

<table>
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<th>Part #</th>
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</thead>
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<tr>
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<td>2 terminal</td>
<td>98312</td>
</tr>
<tr>
<td>9 to 64 VDC</td>
<td>3 terminal with enable</td>
<td>98322</td>
</tr>
<tr>
<td>9 to 64 VDC</td>
<td>4 terminal resettable</td>
<td>98302</td>
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**Rectangular Retainer Mount**

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<thead>
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<th>Termination</th>
<th>Part #</th>
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</thead>
<tbody>
<tr>
<td>108-132 VAC</td>
<td>50</td>
<td>Screw*</td>
<td>20174</td>
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<tr>
<td>108-132 VAC</td>
<td>60</td>
<td>Screw*</td>
<td>20115</td>
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<tr>
<td>108-132 VAC</td>
<td>60</td>
<td>Blade**</td>
<td>20176</td>
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<tr>
<td>216-264 VAC</td>
<td>50</td>
<td>Screw*</td>
<td>20172</td>
</tr>
<tr>
<td>216-264 VAC</td>
<td>60</td>
<td>Screw*</td>
<td>20177</td>
</tr>
</tbody>
</table>

**Square Retainer Mount**

<table>
<thead>
<tr>
<th>Operating Voltage</th>
<th>Hertz</th>
<th>Termination</th>
<th>Part #</th>
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<tbody>
<tr>
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<td>Screw*</td>
<td>20176</td>
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<tr>
<td>108-132 VAC</td>
<td>60</td>
<td>Screw*</td>
<td>20115</td>
</tr>
<tr>
<td>216-264 VAC</td>
<td>50</td>
<td>Screw*</td>
<td>20172</td>
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<tr>
<td>216-264 VAC</td>
<td>60</td>
<td>Screw*</td>
<td>20179</td>
</tr>
</tbody>
</table>

**20000 Series Deluxe AC Hour Meters**

**Retainer Mount:**

- Panel cutout: 1.45 x 0.95 rectangular opening

**Flush Mount (Retainer) 2.27**:

- Panel cutout: 2.00 diameter opening

**Square Retainer Mount:**

- Panel cutout: 1.45 x 0.95 rectangular opening

* UL Listed, CSA Certified and CE Mark
** UL Recognized, CSA Certified and CE Mark

**20000 Series Wiring Diagrams**

- Single phase, 2 wire, 120V system: Connect power wire to one terminal and neutral wire to opposite terminal.
- Single phase, 3 wire, 120/240V system: Connect any one power wire to one terminal and the neutral wire to the opposite terminal.
- Three phase, 4 wire wye, 120/208V system: Connect any one power wire to one terminal of the meter and the neutral wire to the opposite terminal. Do not connect the high leg (208V) to the meter.
- Three phase, 4 wire delta with a high leg, 120/240V system: Connect any one of the two available 120V power wires to one terminal of the meter and the neutral wire to the opposite terminal. Do not connect the high leg (240V) to the meter.

**240VAC Meter Applications**

- Single phase, 2 wire, 240V system: Connect power wire to one terminal and neutral wire to opposite terminal.
- Single phase, 3 wire, 120/240V system: Connect meter across two high sides of the line. Do not connect the neutral wire to the meter.
- Three phase, 3 wire delta, 240V system: Connect meter across any two power lines.
- Three phase, 4 wire delta with a high leg, 120/240V system: Connect any one power wire to one terminal of the meter. Connect one of the remaining two power lines to the opposite terminal. Do not connect the neutral wire to the meter.

**CAUTION:** Always make sure power is removed from equipment before working on electrical circuits. Only qualified personnel should make electrical connections. Damage to equipment and/or serious bodily injury can result from improperly made electrical connections, or a failure to adhere to normal electrical safety guidelines.
The Hobbs LCD hour meter module is a custom engineered elapsed time meter designed to be mounted directly to your printed circuit board (PCB). It can be used in a variety of AC or DC applications that require an hour meter, counter or odometer for preventive maintenance, warranty verification, renting and leasing.

**Specifications**

- 6 digit/6mm display
- ±0.02% Accuracy
- Vibration tested per MIL-M-3971D at 10 g’s and SAE J1378 at 20 g’s
- Shock tested per MIL-M-3971D at 75 g’s and SAE J1378 at 55 g’s
- Operating temp. range -40˚C to +85˚C
- Operating voltage range 9 to 64 VDC (optional 4.5 to 16 VDC)
- Transient Voltage Protected
  - Over Voltage
  - Load Dump
  - Inductive
  - EMI
  - Reverse Polarity
- Power Consumption .8 ma max at 12V (power terminal)
- Start time: maximum 1 second

All Hobbs modules have crucial components exposed. The module must be sufficiently protected if used in an environment other than specified. Consult Hobbs marketing department when suitability of application is questioned.

### LCD Hour Meter Module

#### D.C. Version

<table>
<thead>
<tr>
<th>Operating Voltage</th>
<th>Hertz</th>
<th>Termination</th>
<th>Part #</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 to 64 VDC</td>
<td></td>
<td>4 pin</td>
<td>98706</td>
</tr>
<tr>
<td>9 to 64 VDC</td>
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<td>4 terminal</td>
<td>98707</td>
</tr>
</tbody>
</table>

#### Counter Version

<table>
<thead>
<tr>
<th>Operating Voltage</th>
<th>Hertz</th>
<th>Terminal</th>
<th>Part #</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 to 64 VDC</td>
<td></td>
<td>4 pin</td>
<td>98704</td>
</tr>
<tr>
<td>9 to 64 VDC</td>
<td></td>
<td>2 terminal</td>
<td>98705</td>
</tr>
</tbody>
</table>

#### Options

- 9 to 64 VDC with reset
- 4.5 to 16 VDC

### AC APPLICATIONS

- Business machines
- Control panels
- Air conditioning
- Lighting systems
- Generators
- System controls
- Sun tracking equipment
- Compressors & pumps
- Oxygen concentrators
- Refrigeration
- Many more!

### Specifications

- 6 digit/6mm display
- ±0.02% Accuracy
- Vibration tested per MIL-M-3971D at 10 g’s and SAE J1378 at 20 g’s
- Shock tested per MIL-M-3971D at 75 g’s and SAE J1378 at 55 g’s
- Operating temp. range -40˚C to +85˚C
- Operating voltage range 9 to 64 VDC (optional 4.5 to 16 VDC)
- Transient Voltage Protected
  - Over Voltage
  - Load Dump
  - Inductive
  - EMI
  - Reverse Polarity
- Power Consumption .8 ma max at 12V (power terminal)
- Start time: maximum 1 second

### LCD module applications

- Medical
- Vending Machines
- Floor Cleaning Equipment
- Electronic Panels
- Instrument Panels
- Recreational
- Office Equipment
The 85000 Series provides legendary Hobbs performance and reliability in a technically advanced quartz package. The Quartz Plus features a highly reliable drive mechanism, an improved odometer gear train, and a snap-together integrated chassis. The chassis fits into a shockproof, totally-sealed case made of an engineered plastic that is impervious to acids and solvents.

To ensure our high standards of quality, all parts are in-process inspected. Every Quartz Plus meter must pass 100% function, burn-in, and timing accuracy test before shipping.

Specifications
- 10,000 hour version standard, with automatic recycle to zero
- Temperature range: -40° F to +185° F
  -40° C to +85° C
- Quartz accuracy: ±200ppm, ±0.02%
  (entire voltage and temperature range)
- Operating voltage range: 5-110 VDC
  (Voltage range covered by 85000 Series line)
- Precision built relay driven odometer
- Excellent vibration & shock resistance:
  - Vibration: 20 g’s @ 10-80Hz (SAE J1378)
  - 10 g’s (per MIL-M-3971)
  - Shock: 55 g’s @ 9-13msec (SAE J1378)
  - 75 g’s (per MIL-M-3971)
- Transient Voltage Protection
  - Alternator load dump: 150V
  - Inductive switching and reverse polarity
- Standard terminals: 1/4” male blade
- Lens material: Glass
- Case material: Polyester
- Number size: 0.12” (3mm)

Features
- Custom CMOS integrated circuit
- Indicates operating time in hours and tenths, plus has a running indicator
- Totally-sealed
- Battery system voltages: 6,12,24,36,48,60,72 and 80 VDC
- UL Recognized (File number AU1774)
- CSA Certified (File number UH42455-12)
- Conforms to MIL-M-3971

Options:
- Custom logos, polycarbonate lenses, and various bezels. Wire, stud, blade, and screw terminals. 100,000 hour, tiltable and filtered versions available too.

Applications:
- Lawn Tractors
- Garden Tractors
- Farm Equipment
- Gen Sets
- Construction Equipment
- Utility Vehicles
- Industrial Equipment
- Recreational Vehicles
- Golf Carts
- Aircraft
- Medical Equipment
- Office Equipment
- Any application requiring a very accurate and dependable hour meter.

85000 Series Wiring Diagrams (Polarity Sensitive)

CAUTION: Always make sure power is removed from equipment before working on electrical circuit! Only qualified personnel should make electrical connections. Damage to equipment and/or serious bodily injury can result from improperly made electrical connections, or a failure to adhere to normal electrical safety guidelines.

DC APPLICATIONS
- Lawn Tractors
- Garden Tractors
- Farm Equipment
- Gen Sets
- Construction Equipment
- Utility Vehicles
- Industrial Equipment
- Recreational Vehicles
- Golf Carts
- Aircraft
- Medical Equipment
- Office Equipment
- Any application requiring a very accurate and dependable hour meter.