1000 Series

Clear plastic case fronts come with a molded-in, ribbed lower section to conceal movement, 100 degree movements and knife edge pointer. Mirror scales and color in the ribbed portion of the case is available.

2000 Series

Long, flat arc scales and knife edge pointers for excellent readability. Most 1-1/2" to 6" meters are supplied with the self shielded accuring movements. Bezel or surface mounting. Special Dials are available with following options: additional colors, scales, special legends, logos and mirrors.

3100 Series

Consists of a popular industrial styled, high impact acrylic case that is available for surface, window, or bezel mounting applications in four sizes. Polycarbonate case available. This series is equal in mounting and specifications to similar styled meters of other manufacturers.

Hoyt Window (HW) & Bezel (HB) Series.

4000 Series

Styled to meet the most demanding appearance requirements, these series conform to the standards for mounting similar size meters.

5000 Series

Offers gasket sealing design and dustproof polycarbonate construction. Seals out dust and other air-suspended damaging particles. The 5000 series is made with UL 94V material, ideal where impact and strength is required in harsh environments.

Edgewise Meters

Edgewise meters have high visibility scales and straightforward design. They come supplied with bezel and mounting hardware. The 685 Series has been designed without any barrel projection and is fully shielded to allow vertical or horizontal stacking without interaction between movements for other external magnetic fields. Also available; TEM 42/45 E, E-20, CK 256/257, CK-150 & CK-160. (pgs. 23-25)
Hoyt 250° meters utilize a highly damped, spring loaded pivot & jewel movement; mechanically interlocked, negating the use of adhesives and develops very high torque. Available with or without illumination. Available with Chrome or Black Bezels.

Industrial Panel Meters
Phenolic and Metal
Round and Rectangular

Hoyt Electrical Instrument Works, Inc. Penacook, NH (800) 258-3652 Fax (603) 753-9592 WWW.HOYTMETER.COM

Percent load meters pg. 29, AC Frequency meters pg. 30, Elapsed time indicators pg. 31

Low cost options pg.34
Ultra low cost pg. 35
FIRST ANALOG/DIGITAL PANEL METER

- ADVANTAGES OF BOTH ANALOG AND DIGITAL IN ONE PANEL METER
- SAME PRECISION ANALOG METER MOVEMENT
- 3 - 1/2 DIGIT, BRIGHT RED, DIGITAL DISPLAY WITH 0.37” HIGH DIGITS
- COMPLETELY COMPATIBLE WITH EXISTING ANALOG-ONLY OR DIGITAL PANEL METER APPLICATIONS

SIGNAL- AND AUXILIARY-POWERED

- METERS ARE AUXILIARY OR SELF-POWERED DEPENDING ON INPUT
- NEVER ANY GROUNDING OR SIGNAL-REFERENCE QUESTIONS

SIGNIFICANT SPACE SAVINGS

- FAST & EASY WITH ONLY TWO CONNECTIONS PER INPUT
- UPGRADE VIRTUALLY ANY ANALOG METER APPLICATION AND ACHIEVE ADDED BENEFIT OF DIGITAL WITH HOYT COMBO SERIES METERS

Large, bright red LED digital displays are available in Combo Series meters to monitor a wide variety of AC & DC voltage, AC & DC current, and frequency ranges. Hour meters are available in the Combo Series with LCD digital displays. With the most popular signals and ranges addressed, Hoyt has a Combo Series meter to meet your specifications.

Digital Meter Specifications

**General**
- Digital Display: 0.37”/9.4 digits; bright red LED
- Sampling Rate: 2.5 reading/second
- Measurement Type: half-wave average, rms; calibrated for sinusoidal input
- DC: Standard “+”; Ground “-”
- Accuracy: 1% At 25°C unless noted otherwise
- Temperature Drift: ±0.15V/C max.; -25°C to +60°C
- DC Volts: ±0.3 counts/°C maximum
- Current Consumption: 50mA Maximum; range dependent
- Environmental Operating: -25°C to +60°C
- Storage Temp.: -40°C to +75°C
- Humidity: 0 to 95%

**AC Line Voltage**
- Input Voltage Range: 85 to 600V
- Input Frequency Range: 47 to 63Hz; 350-450Hz
- Input Overboard Protection: 300VAC (Overvoltage Catagory II)
- Accuracy: ±1V typical; ±2V maximum
- Resolution: 1V

**AC Line Frequency**
- Input Voltage Range: 85 to 140VAC
- Input Frequency Range: 47 to 99Hz; 350 to 450Hz
- Input Overboard Protection: 200VAC maximum for 120V; 300VAC maximum for 240V
- Sample: 4 reading/second
- Accuracy: ±0.15V, -25°C to +60°C
- Display: 0.4”/10.1mm bright red LED

**Hour Meter**
- Input Voltage Range: 4.5 to 19VAC
- Resolution: 0.1 Hour
- Accuracy: ±0.1% Hours, ±1 count
- Non-Volatile Memory: -40°C to +69°F, SAE
- Display: 5mm; 6 digits (99,999.9 Hours)LCD

**DC Voltage**
- Input Range: 2 to 6VDC
- Resolution: 1 Count
- Accuracy: ±1%
- Shunts: External; 50 or 100mVDC compatible; Field adjustable
- Scaling: Application-specific

**DC Amperes**
- Source Voltage: 5VDC Minimum-40VDC
- Input Voltage Range: 0 to 50mVDC to 0 to 100mVDC
- Resolution: 1 Count
- Accuracy: ±0.05%, ±1 count
- Resolution: 0.01mA minimum; scale dependent
- Zero: Field adjustable
- Gain: Field adjustable
- Scaling: Between 0 to 1999; DIP selectable

**4-20mA Current Loop**
- Input Range: 4mA minimum; 20mA maximum
- Voltage Drop: 5VDC
- Accuracy: ±0.05%, ±1 count
- Resolution: 0.01mA minimum; scale dependent
- Zero: Field adjustable
- Gain: Field adjustable
- Scaling: Between 0 to 1999; DIP selectable

Analog Meter Specifications

**All Meters 5035/5036 Series**

- Accuracy: ±2% of full scale
- Overload: 20% sustained
- Ranges: AC and DC; many options available

*Other 3-1/2 cases styles available for special order
For Pricing, reference Analog/Digital Combo Price List.
Special dials are produced in the Hoyt art and printing departments to exact customer specifications. Ten standard Sun-fast colors are offered at an extra charge to cover printing cost only. Special colors are available for an additional charge for ink formulation. All standard dials are lithographed on hard flat aluminum pans with white backgrounds.

**ELumination**

Hoyt ELumination features bright white, even backlighting with no hot spots or shadowing. Just bright white, electro-luminescent (EL) light for a clearly visible scale with unmatched readability, functionality, and style. And, Hoyt panel meters with the new lighting technology installed are completely compatible with existing applications.

**Lighting Kit Specifications:**

*Inverter Power Requirements*
- Input Voltage: 3-18 VDC
- Input Current: 60 mA maximum

**Light Output**
- Color: White; Standard
- Others - optional
- Intensity: 10-13 Ft-L

**ELumination Lighting Kit Ordering Information:**

*Hoyt Meter 3100 Series*
- Size: EL Light Kit Part Number
  - 1-1/2": 3115EL15
  - 2-1/2": 3125EL25
  - 3-1/2": 3135EL35
  - 4-1/2": 3145EL45

*Hoyt Meter 5000 Series*
- Size: EL Light Kit Part Number
  - 2-1/2": 5025EL25
  - 3-1/2": 5035EL35

Please contact the factory for custom ELumination lighting kits.
The Hoyt C-8033 Shunt is designed for non electronic applications where extreme accuracy is important. This low cost shunt has an accuracy ±5%. Extra heavy terminals allow for easy mounting of heavy cables and are molded into a solid Phenolic base as a support for a mounting block.

### C-8033 SHUNT

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### Model AMP A B C D F G H J

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</table>
There are models of various shapes, sizes, and VA ratings to fit every application. In sizes from .4” to 11.75” id. Standard ANSI class. Models include: Specialty, Solid Core, Specific Mounting, Rectangular, Wound Primary, Flexible (Split Core), Three Phase, Multi Ratio & Potential.

**Features & Benefits**
- Fully encapsulated, rubber molded
- Indoor or outdoor applications
- UL & CUL Recognize Standards
- Standard Output: 5A
- Optional 0.100A, 0.200A or 1.0A secondary for electronic devices
- Custom designs available

**Applications**
- 600 Volt Instrument Transformers
- Voltage Transformers
- Current Transformers
- Flexible Split Core
- Wound Primary

---

**DONUT TYPE HIGH CURRENT TRANSFORMERS**

These transformers may be used with any 5 AC ampere Hoyt meter. They have a 5 ampere secondary and are made in primary ranges up to 600 amperes for mounting over the bus bar or high current wire to be measured. Connecting leads are 24” long. Capacity is 2VA insulated to 4500 volts. CT’s up to 600 amperes size is 4” in diameter with a 1-1/4” hole; 700 to 1000 amperes have an overall diameter of 4” with 1-3/4” hole. Higher current available.
Model 2735/36, clear plastic meter with polycarbonate is available in AC or DC. This unique case style yields maximum visibility and dust proof seal on the panel surface. Three hole mounting on the meter front allows for easy panel mounting.

Hoyt Meter Movements DC/AC/250 Degrees

METER MOVEMENTS
Self-Shielded Accu-Ring
Now standard in all series of panel meters. This completely self-shielded pivot and jewel high torque movement is constructed with high density sintered iron ring and pole piece which provides the best possible flux distribution through the entire 100 degree swing of the coil. This unique feature coupled with the strong Alnico V Bar magnet offers exceptionally high torque with minimum lag for fast response and quick accurate readings, spring-loaded jewels are standard for use in rugged applications. Virtually any damping and electrical specifications can be met with a wide variety of bar magnets. Other features include all those listed for the #17 external magnet movement. Hoyt Accu-Ring movement is standard in all panel meter cases. The #22 movement is smaller, less powerful version of the #19 movement. Accuracy of 2% is standard. 1% accuracy is available in most ranges.

EXTERNAL MAGNET #17
These movements, accurate within 2% are built on the D’Arsonval principle according to the best methods of meter manufacture. Features include Alnico V Magnets for high torque movement, soft iron pole pieces electronically bonded to the magnetic system for long life, microscopically inspected and selected jeweled bearings, hardened pivots specially cemented and baked to short-proof anodized coil forms for trouble free life. Strong tubular pointers—either lance or knife edgetypes, ceramic pointer stops, hair springs for quick response and good damping are incorporated into all our movements. Spring loaded jewels are standard with sapphire jewels available as an option.

AC REPULSION
Hoyt AC Repulsion movements are made with an accuracy of 2%. Jeweled bearings, insulated or Bakelite zero adjusters, Hoyt cross arm balance, special constructed viscous damping and choice of lance or knife edge pointers. The Hoyt AC Movements are manufactured with brass movement support to match the moving element. This feature enables the Hoyt AC meter to maintain accurate readings over a wider temperature range. The AC meters can be used with corresponding size DC instruments where matching meters are wanted.

250 DEGREE
The Hoyt once-patented 250 degree meter movement is a self-shielded pivot and spring loaded jewel meter. Built for rugged industrial applications and shock resistant, this movement incorporates precision aligned, mechanically interlocked construction with very high torque. The movement is good down to 200 microamps with ample resistance. Airplane or knife edge pointers are available in different lengths to accommodate a variety of case styles and sizes.
Offered in three sizes from 2-1/2” to 4-1/2”, this popular line features long easy-to-read dials. The clear plastic case fronts come with a molded-in, ribbed lower section to conceal movement. All three sizes are produced as matching AC or DC meters. Most DC Meters are supplied with 100 degree movements and knife edge pointers. Mirror scales and color in the ribbed portion of the case can be provided in quantity orders at additional cost.
These attractively styled meters are produced in five sizes from 1-1/2” to 6”. All models have long, flat arc scales and knife edge pointers for excellent readability. Most 1-1/2” to 6” meters are supplied with the self shielded Accuring movements. The standard AC repulsion movement is also available in 2-1/2” to 6” meter cases. Features for the 2000 series include matching AC and DC models, bezel or surface mounting, and choice of standard colors on the lower front cover at additional cost. Standard ranges for this series of meters, both AC and DC, are listed on the Hoyt price sheet and include DC Microamps, Milliamps, Millivolts, Volts, and Amps; AC Milliamps, Amps and Volts. Special dials are available with the following options: additional colors, special legends, logos and mirrors.

Bezel Mount Meters
Bezels for mounting rectangular custom series models 2018, 2025/26, 2035/36, and 2045/46 behind the panel are sturdy, die cast black metal. Bezel mount meters may be ordered with optional quick mount positive locking tabs. This series has clear polystyrene cases standard, but acrylic or high impact polycarbonate case are available in some models.
### 2000 Series

#### DIMENSIONS:

**MODELS**

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<th>MODELS</th>
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<th>B</th>
<th>C</th>
<th>D</th>
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#### DIMENSIONS:

**MODELS**

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<td>-</td>
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</table>
The 3100 Hoyt panel meter series consists of a popular industrial styled, high impact plastic case that is available for surface, window, or bezel mounting applications in four sizes: 1-1/2”, 2-1/2”, 3-1/2”, and 4-1/2”. This series of meters is equal in mounting and specifications to similar styled meters of other manufacturers.

**SPECIFICATIONS**

**Accuracy:** ±2% full scale value.

**Resistance:** ±15%

**Dials:** 100 or 90 degree arc, black lettering on white background. Special dial colors and artwork are available as an option.

**Movement:** Spring loaded pivot and jewel movement that assures maximum torque and readability.

**D.C. Ranges:** Microammeters, Milliammeters, Ammeters, Millivoltmeters and Voltmeters.

**A.C. Ranges:** Milliammeters, Ammeters, and Voltmeters.

**Mounting:** Specify (HS) Surface mount, (HW) Window mount or (HB) Bezel mount.

**Standard Options:** Optional colors available on lower front cover, mirror dials, acrylic case materials, suppressed zero ranges, VU meters.

**UL Recognized meters available, add -UL to model**

**DIMENSIONS:**

<table>
<thead>
<tr>
<th>MODELS</th>
<th>AA</th>
<th>BB</th>
<th>CC</th>
<th>DD</th>
<th>EE</th>
<th>FF</th>
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<th>JJ</th>
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<td>1.310</td>
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</tbody>
</table>

*3145 Shown*
Window (HW) & Bezel (HB) Series

**Window Mount**

The window mount design is available in sizes (1-1/2", 2-1/2", 3-1/2", and 4-1/2"). This series is industrially styled and universally accepted with maximum dial visibility. The outside edges of the "window" that project through the panel are clear which yields maximum readability. All specifications and options are identical to those on previous page.

**Bezel Mount**

The Hoyt bezels are available in sizes 2-1/2",3-1/2", and 4-1/2" and offer a custom look to the panel surface. The bezel is molded from high strength plastic material which protects the meter from damage. This design features the zero adjuster within the window envelope therefore negating the requirement for drilling an additional hole. The optional bezel is available for use with the surface case styles and includes necessary mounting hardware.

**When Ordering:**

C-8041 (overall size 1 - 3/4" x 1 - 5/32") for 3125/26
C-8370 (overall size 2 - 5/16" x 3 - 27/32") for 3135/36
G-8397 (overall size 3" x 5 - 1/4") for 3145/46

**DIMENSIONS: 3100 Series**

<table>
<thead>
<tr>
<th>MODELS</th>
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<th>C</th>
<th>D</th>
<th>E</th>
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<th>G</th>
<th>H</th>
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<th>M</th>
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<th>P</th>
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<td>0.52</td>
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<td>6-32</td>
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<td>0.97</td>
<td>10-32</td>
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<td>0.24</td>
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**SURFACE MOUNT**

**MODELS**

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<td>.86</td>
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</table>
DIMENSIONS:

Our policy is one of continuous development and we reserve the right to supply products different in design and appearance from those described. As development is continuous, we reserve the right to alter specifications without notice.
HOYT 3135/36-2 SERIES OFFERS THESE ADVANTAGES...

- Small barrel for tight space application
- Viscosity damping to control overshoot & oscillation
- Optional custom dials with your name, scale, logo, etc.
- AC iron vane repulsion movement
- Special ranges and resistances to match your equipment design
- 4 way mounting including 2, 3, 4 holes
- Pivot & jewel movement
- High impact plastic case
- Color fast metal dials
- DC moving coil movement
- 1 year limited warranty
- 1% & 2% accuracy available

MOUNTING IN YOUR PRESENT PANEL OPENING...

STUD MOUNTING OPTIONS

-2 (2 STUD) -3 (3 STUD) -4 (4 STUD)

2.18 DIA.

1.12

.92

2.25

1.37

.97

2.37

2.74

2.25

2.18 DIA.

1.12

.92

2.25

1.37

.97

2.37

2.74

2.25

METER TYPES AVAILABLE:

**DC**
- Microammeters
- Milliammeters
- Ammeters
- Millivoltmeters
- Voltmeters

**AC**
- Rectifier type voltmeters
- Ammeters
- Voltmeters
- Frequency meters

SPECIFICATIONS:

#10 terminals standard, 1/4-28 available

90 degree pointer deflection AC

100 degree pointer deflection DC

HOW TO ORDER...

1. To order the Hoyt 3135/36-2 series meter, use the appropriate ranges from the price sheet. AC Meters require part number 3136-2-____ and DC Meters require part number 3135-2-____

2. Decide which mounting option is required and add to - ____

3. Add range and scale from price list as examples below.

EXAMPLE:

3136-2-4, 0-5AAC, 100AAC (5 ACC meter with 4 stud mounting)

(100 AAC Dial)
**4000 Series Phenolic and Glass Meters**

Handsomely styled to meet the most demanding appearance requirements, this series conforms to the standards for 2-1/2" to 4-hole mounting to provide for interchanging with other similar size meters. These are high quality instruments, available in AC and DC models including D'Arsonval 2% accuracy DC, AC repulsion and rectifier type movements. NOTE: UL RECOGNIZED VERSION AVAILABLE. TO ORDER ADD -UL TO MODEL.

### Dimensions:

![Diagram of 4000 Series Phenolic and Glass Meters](image)

### Models:

<table>
<thead>
<tr>
<th>MODELS</th>
<th>A</th>
<th>B</th>
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<th>D</th>
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<td>0.47</td>
<td>0.62</td>
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<td>4045/46</td>
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<td>2.69</td>
<td>1.12</td>
<td>0.47</td>
<td>0.62</td>
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</tbody>
</table>

**2100 Series Low Profile Phenolic Meters**

The low profile series of non-static phenolic and glass meters is especially suited for applications where plastic meters are unsuitable or where low, rectangular styling is a must. This series features a clean, uncluttered scale for excellent readability, smooth satin finish front and fast, two stud mounting. While shielded Accuring movement is standard in most ranges, these meters can be ordered with any Hoyt movement. Matching AC versions are available as are rectifiers and VU models.

### Dimensions:

![Diagram of 2100 Series Low Profile Phenolic Meters](image)

### Models:

<table>
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<th>A</th>
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<td>1.08</td>
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<td>0.66</td>
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<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>O</th>
<th>P</th>
<th>Q</th>
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<td>6-32</td>
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<td>0.97</td>
<td>10-32</td>
<td>1.25</td>
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<td>0.57</td>
<td>0.50</td>
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<tr>
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<td>0.48</td>
<td>0.97</td>
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<td>1.25</td>
<td>0.24</td>
<td>0.57</td>
<td>0.50</td>
<td>2.75</td>
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</tbody>
</table>
**LS-110 & LS-80 Series**

**Switchboard Meters**

- The LS-110 is 4.5” Square
- The LS-80 is 3.25” Square
- All AC moving coil rectifier ammeters and voltmeters are ±1%
- DC Moving coil ammeters and voltmeters ±1%
- Frequency meters ±0.15Hz (50Hz & 60Hz), and all power meters are ±1%.
- All AC & DC voltmeters - 50% momentary /20% prolonged
- AC & DC ammeters - 50% momentary/20% prolonged
- Frequency meters - 20% maximum; and power meters - 20% maximum. All ammeters and power meters <0.5V maximum
- Meters are ANSI C39.1

*Some available options include custom artwork, colored dials, traceable calibration, custom logos, panel gaskets, and anti-glare window.*

---

**LS-110 Dimensions**

![LS-110 Dimensions Diagram]

**LS-80 Dimensions**

![LS-80 Dimensions Diagram]
5000 Series

5015 - D.C. Moving Coil
5016R - A.C. Rectifier

5025 - D.C. Moving Coil
5026 - A.C. Repulsion

5035 - D.C. Moving Coil
5036 - A.C. Repulsion

MODELS | A  | B  | C  | D  | E  | F  | G  | H  | I  | J  | K  | L  | M  | N  | O  | P
-------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----
5015/16R | 1.76 | 1.76 | 1.31 | 1.31 | 1.50 | 1.08 | 0.48 | 0.50 | 0.50 | 0.48 | 0.97 | -0.22 | - | - | - | 10-32
5025/26 | 2.71 | 2.71 | 1.88 | 1.88 | 2.08 | 1.06 | 0.47 | 0.50 | 0.50 | 0.48 | 0.97 | 0.00 | 0.61 | 1.22 | 2.11 | 1/4-28
5035/36 | 3.50 | 3.50 | 2.25 | 2.25 | 2.60 | 1.05 | 0.50 | 0.50 | 0.50 | 0.48 | 0.97 | 0.13 | 0.79 | 1.58 | 2.74 | 1/4-28

DIMENSIONS:

Our policy is one of continuous development and we reserve the right to supply products different in design and appearance from those described. As development is continuous, we reserve the right to alter specifications without notice.
**Gasket Sealing Design.**

Dust resistant construction is a standard feature in the 5000 Series panel instruments. This unique sealing design provides exceptional gasket sealing while allowing for quick modification and scale changes while maintaining the integrity of the instrument.

*External panel gasket available.

**Dustproof Lexan® Construction**

5000 series panel meters feature gasketed construction to seal out dust and other air-suspended damaging particles. The 5000 series is made with UL 94V material. Ideal where impact and strength is required in harsh environments.

### Mounting In Your Present Panel Opening...

The mounting studs on the 5000 series can be ordered to fit your existing panel openings at no extra cost. The 5000 series cases are interchangeable with a wide variety of competitive instruments. Optional stud placement configurations are shown above. This built-in interchangeability eliminates the need for drawing changes, setups, and redrilling of panels...and it solves your instrument replacement problems.

### METER TYPES AVAILABLE

**DC**
- Microammeters
- Milliammeters
- Ammeters
- Millivoltmeters
- Voltmeters
- Pyrometers
- Hourmeters

**AC**
- Frequency Meters - Pointer type
- Iron Vane or Rectifier type
- Voltmeters
- Ammeters
- Hourmeters

**ANSI Specifications:**
All meters meet ANSI Specifications C39.1

**Overload:**
Voltmeters (AC and DC) - 50% momentary
20% sustained. Ammeters (AC and DC) momentary: 10 times the rated current for 10 consecutive intervals of .5 seconds with a 1 minute interval between successive applications; 20% for six hours.

**Scale Data:**
90 degree rotation.

**Insulation Level:**
All meters 2600 V RMS

**How To Order...**
To order the Hoyt 5000 panel meters use the appropriate ranges from the price sheet. AC meters require part numbers 5026 or 5036. DC Part numbers 5025 or 5035.

**ORDERING EXAMPLES:**
1. 2-1/2", 300 VDC Voltmeter, zero left
   Example: 5025, 0-300 VDC
2. 3-1/2", 300 AAC Ammeter, zero left
   Example: 5036, 5 AAC, 300 AAC

**NOTE:**
Severe Duty meters are available to meet UL 1437 requirements. To order add “UL” after catalog number.

---

**Hoyt Electrical Instrument Works, Inc. Penacook, NH**
(800) 258-3652 Fax (603) 753-9592 WWW.HOYTMETER.COM
Industrial Panel Meters
Round and Rectangular / Phenolic and Metal

This series was designed to meet industrial requirements and for other applications where rugged metal or phenolic cases with glass fronts provide long service under adverse conditions. Round models ranging in size from 2-1/2” to 4-1/2” are produced in either the ±2% of full scale AC repulsion or DC Moving Coil version. AC ranges are standard up to 50 amperes self contained and 600 AC volts. Ranges down 10 milliamperes AC are also standard.

Both round and square models come in DC ranges from 20 microamperes to 50 millivolts to 750 volts DC. High current ammeter ranges with external shunt are available, as are special or non-standard ranges. The industrial meters shown here and on the following pages represent the many case styles and options in this series. For exact specifications and certified dimensions, please contact the factory.

**PHENOLIC**
*option code -P

17/3 - D.C. Moving Coil
552 - A.C. Repulsion

582 - D.C. Moving Coil
584 - A.C. Repulsion

**DIMENSIONS:**

<table>
<thead>
<tr>
<th>MODELS</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
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<td>0.50</td>
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**STRAIGHT SIDE METAL CASE**
*option code -SS

17/3 - D.C. Moving Coil
552 - A.C. Repulsion

17/L - D.C. Moving Coil
560 - A.C. Repulsion

574 - D.C. Moving Coil
617 - A.C. Repulsion

**DIMENSIONS:**

<table>
<thead>
<tr>
<th>MODELS</th>
<th>E</th>
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<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
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<td>0.48</td>
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<td>0.69</td>
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</table>
## Industrial Metal Cases

**CASE OPTIONS:**
- Wide & Narrow
- Flush Mounted
- Semi-Masked
- Metal Cases

*option codes:
- Wide Rim 3-Hole - WR
- Narrow Rim U-Clamp - NR
- 3-Hole Semi Mask - SM
- Wide Rim Semi Mask - WRSM
- Narrow Rim Semi Mask - NRSM

### METAL DIMENSIONS:

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<tr>
<th>MODELS</th>
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<th>D</th>
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Hoyt Electrical Instrument Works, Inc.  Penacook, NH  
(800) 258-3652 Fax (603) 753-9592 WWW.HOYTMETER.COM
Industrial Panel Meters-Phenolic

635 - D.C Moving Coil
636 - A.C. Repulsion

597 - D.C Moving Coil
598 - A.C. Repulsion

2-1/2 & 3”

<table>
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<th>C</th>
<th>D</th>
<th>E</th>
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<td>0.48</td>
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</table>

680 - D.C Moving Coil
681 - A.C. Repulsion

647 - D.C Moving Coil
648 - A.C. Repulsion

4-1/2”

DIMENSIONS:
The 6351/2 Industrial Panel meters are designed for extreme duty applications where high degree of resistance to environment is required. They are dustproof and waterproof, meeting NEMA 4 and ANSI C39.1 specifications and performance standards. These meters have a ±2% accuracy, ±2% repeatability and a resistance of ±20%. Response time is 1.5 seconds and a temperature range of -50°F to 150°F. Custom meter ranges and scales are available to meet customer specifications.

*Case and Composition:* Thermoplastic window, steel base, ruggedized, gasket sealed.

*Movement:* DC Moving Coil or AC Repulsion, all with Pivot and Jewel movements, Heavy Damping.

**DIMENSIONS:**

*Model dependant*
DIMENSIONS:

<table>
<thead>
<tr>
<th>MODELS</th>
<th>A</th>
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<th>C</th>
<th>D</th>
<th>E</th>
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<th>G</th>
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<td>1.09</td>
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<td>0.78</td>
<td>0.94</td>
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<td>1.47</td>
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<td>0.97</td>
<td>0.63</td>
<td>&quot;L&quot;</td>
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*250-45-For Case Style & ommited dimensions, refer to Model 574, page 21

The Hoyt 250° meters utilize a highly damped, spring loaded pivot & jewel movement; mechanically interlocked, negating the use of adhesives and develops very high torque. The meters are desirable for the following applications:

- Emergency Vehicles
- Marine Instrumentation
- Speed (RPM)
- Pressure and Flow
- Pyrometers
- Diesel and Gas Instrumentations

Our policy is one of continuous development and we reserve the right to supply products different in design and appearance from those described. As development is continuous, we reserve the right to alter specifications without notice.
HOYT 250 Degree Series Offers These Advantages...

- SPECIAL RANGES AND RESISTANCES TO MATCH YOUR EQUIPMENT DESIGN
- ELECTRICAL DAMPING TO CONTROL OVERSHOOT & OSCILLATION
- OPTIONAL CUSTOM DIALS WITH YOUR NAME, LOGO, ETC.
- LONG 250 DEGREE POINTER SWING
- PIVOT & JEWEL MOVEMENT

- THREE SIZES AVAILABLE FOR YOUR APPLICATION
- NOW AVAILABLE WITH OR WITHOUT ILLUMINATION
- AVAILABLE WITH CHROME OR BLACK BEZELS

SPECIFICATIONS:

- #10 TERMINALS STANDARD, 1/4-28 AVAILABLE
- 250 DEGREE POINTER DEFLECTION DC
- IRON CASE STANDARD
- BRASS CASE AVAILABLE (EXTRA COST)

METER TYPES AVAILABLE:

- DC: MICROAMMETERS, MILLIAMMETERS, AMMETERS, MILLIVOLTMMETERS, VOLTMMETERS, PYROMETERS, CUSTOM GAUGES

HOW TO ORDER...

1. To order the Hoyt 250 degree series meter, use the appropriate ranges from the price sheet. Select part number 250-20 for 2” meters, select part number 250-30 for 3” meters, and 250-375 for 3-3/8” meter.

2. Decide which bezel option is required and add to - _____.

3. Use “I” for Illuminated and “N” for Non-illuminated.

4. Add range and scale from price list as examples below.

   EXAMPLE:

   250-375, CHROME, 4-20 MADC SPECIAL dial D-1292325

TOP AVAILABILITY CHART

<table>
<thead>
<tr>
<th>MODELS</th>
<th>C</th>
<th>F</th>
<th>S</th>
<th>P</th>
<th>L</th>
<th>K</th>
<th>W</th>
<th>V</th>
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<tbody>
<tr>
<td>17/3</td>
<td></td>
<td>O</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Z</td>
</tr>
<tr>
<td>250-20</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>O</td>
<td>X</td>
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<td>250-30</td>
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<tr>
<td>570</td>
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<td>O</td>
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<td>O</td>
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</table>

0 = STANDARD TOPS (BLACK)
X = SPECIAL TOPS (EXTRA COST)
Z = REQUIRES SPECIAL BASE (EXTRA COST)
OPTIONAL MATERIALS AND FINISH AVAILABLE (EXTRA COST)
The E-20 and CK-150 Series edgewise meter are suitable for many applications requiring a low cost solution. The standard case is polystyrene, but UL Polycarbonate is available. Accuracy is ±5% of full scale and most AC/DC ranges are available. Typical uses include test equipment, power supplies, emergency lighting chargers, recreational equipment, etc. Features quick snap in ears...no brackets required!
Hoyt 2-1/2” Edgewise Meters

Model 685 2-1/2” edgewise has been designed without any barrel projection and is fully shielded to allow vertical or horizontal stacking without interaction between movements or other external magnetic fields. The specially engineered, rugged D’Arsonval movement with high torque-to-weight ratio provides excellent response and damping characteristics. The 685 is offered in DC, AC rectifier-type and VU meter versions. The 685 can be ordered in single, dual, or triple stack versions. Supplied bezel and mounting hardware enable quick, trouble-free installation.

MODEL 685

Please specify when ordering as 685-1, 685-2, 685-3.

DIMENSIONS
MODEL 685
Bezel Units 1, 2, & 3

Hoyt Electrical Instrument Works, Inc. Penacook, NH
(800) 258-3652 Fax (603) 753-9592 WWW.HOYTMETER.COM
2-1/2” Edgewise Meters

These compact edgewise panel meters require a minimum of panel space and have an attractive appearance. Available in DC only, this unique D’Arsonal mechanism provides 2% accuracy with either vertical or horizontal mounting.

Special resistance, accuracy, pointers and ranges available.

TEM-42E, TEM-45E

These compact edgewise panel meters require a minimum of panel space and have an attractive appearance. Available in DC only, this unique D’Arsonal mechanism provides 2% accuracy with either vertical or horizontal mounting.

Special resistance, accuracy, pointers and ranges available.

673/S

Hoyt edgewise meters have high visibility scales and straightforward design that make them especially suited to small, limited space, rack mounted power supplies and allied equipment. Supplied bezel and mounting hardware enable quick, trouble-free installation.

Model 673/S has a small projection required to enclose the D’Arsonvale movement. It is also available in DC ranges and in AC rectifier and VU models.

DIMENSIONS: MODEL 673/S
Percent Motor Load Meters

Hoyt Percent Motor Load Meters provide a visual analog display of AC motor load while in operation. Meter scale illustrates percent load from 0-150%. Color bands indicate the segment as follows:

<table>
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<tr>
<th>Color</th>
<th>Range</th>
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<tbody>
<tr>
<td>Green</td>
<td>0-100%</td>
</tr>
<tr>
<td>Yellow</td>
<td>100-125%</td>
</tr>
<tr>
<td>Red</td>
<td>125-150%</td>
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</tbody>
</table>

AC load meters can be utilized with all AC motors of any horsepower, voltage, frequency or phase. Application of these meters can prevent overloading and motor burn-out, optimize operating load conditions or indicate the need for maintenance or replacement. Highly damped movements are used, which delay full scale pointer excursion, to avoid meter overload due to in-rush (starting) current.

Size and Model

<table>
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<th>3-1/2&quot;</th>
<th>4-1/2&quot;</th>
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<td>1038</td>
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<td>2046</td>
</tr>
<tr>
<td></td>
<td>3126</td>
<td>3136</td>
<td>3146</td>
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<td>-</td>
<td>2136</td>
<td>2146</td>
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</table>

* UL RECOGNIZED METERS AVAILABLE
* When ordering, please specify maximum motor amps.

* REFER TO MODEL SERIES FOR DIMENSIONAL CHARACTERISTICS AND DEFINITION OF CASE STYLE.

Hoyt Electrical Instrument Works, Inc. Penacook, NH (800) 258-3652 Fax (603) 753-9592 WWW.HOYTMETER.COM
The Hoyt AC Frequency meters available in 2-1/2”, 3-1/2”, & 4-1/2” models utilize the high torque bar-ring pivot and jewel mechanism with a solid-state frequency network that yields ±2% accuracy of the span. The unit was designed to be less susceptible to errors caused by waveform distortion. All frequency meters are self contained with zero and span adjustments accessible for final adjustments.

AC frequency meters are designed to match Hoyt ammeters and voltmeters. Seven different case styles are available in: Acrylic, Phenolic, Polystyrene or high impact Polycarbonate. Case styles are available for surface, bezel, or window mounting.

NOTE: Special ranges and voltages available upon request.

*UL RECOGNIZED METERS AVAILABLE

<table>
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<tr>
<td>552</td>
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<td>-</td>
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</tbody>
</table>

| **RANGES** |
| 45-55 Hz |
| 45-65 Hz |
| 55-65 Hz |
| 360-440 Hz SPECIAL |
| 120 OR 240 VAC |
3100 & 5000 Series Elapsed Time Indicators

**DIMENSIONS:**

The solid state electronic drive circuitry in the 502 & 503 HRM/HRD series effects longer life with no motor and less moving parts. Electronic actuation assures accuracy by eliminating delicate springs and mechanical clock mechanisms that can be affected by vibration and temperature.

**Accuracy:** Matches frequency control of power system. ±1% Quartz accuracy
**Vibration Shock:** Meets ANSI specification C39.1
**Case Construction:** Lexan case construction, brass terminal studs
**Ranges Available:** All meters available to operate 120, 240 VAC, 50 or 60 Hertz
**Weather Resistant:** All 5000 Series meters are weather resistant. Gasket between base and cover protect counter
**Display:** Easy to read 10,000 or 100,000 hour numeric display
**Power Rating:** 0.6 watts
**Operating Temperature:** From -25° to 185°F (-32° to 80°C)

**MODELS**

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<thead>
<tr>
<th>A</th>
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<th>C</th>
<th>D</th>
<th>E</th>
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<td>1.58</td>
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</table>

Hoyt Electrical Instrument Works, Inc. Penacook, NH
(800) 258-3652 Fax (603) 753-9592 WWW.HOYTMETER.COM
These window mount meters are a low cost alternative to a space saving and high visibility meter requirement. These "v" shaped meters provided more front panel space and space savings behind the panel. Standard features include pivot and jewel movement, DC and AC rectified meters, self shielded and high impact plastic front and back. Some custom options available are special dials and calibration; zero left, zero right, zero center, offset zero; special ranges and resistance; and optional mounting studs.

**DIMENSIONS:**

![Diagram of meter dimensions]

<table>
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<tr>
<th>MODEL</th>
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<th>B</th>
<th>C</th>
<th>D</th>
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<th>J</th>
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<td>.115</td>
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</table>
Very popular for marine & VU applications, the CK-910, CK-920 & CK-930 Series Panel Meters are low cost and have 2-5% accuracy. This series is designed for “drop-in” replacements to many competitors models. Available in most AC/DC ranges and easily installed with window or surface mounting. The CK-900 Series also features high impact translucent cases, operating zero adjusters and illumination options to enhance the backlighting of the instrument. Connections are made through the 1/4” quick disconnect terminals which may also serve as solder tabs.

**Dimensions:**

<table>
<thead>
<tr>
<th>MODELS</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
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<td>.115</td>
<td>.330</td>
<td>.510</td>
<td>.055</td>
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Notes:
1. 4-40 Mounting studs are optional. If mounting studs are required part number must have a -S. Example; CK-920-S when studs are required.
2. Model CK-930 has 10 -32 terminals with spade as standard, if just spades are required order as CK-930-T.
Hoyt 5% Moving Magnet Meters

These meters are especially suited for applications requiring high durability at low cost. They feature rugged steel backs, U-clamp for mounting, fade proof lithographed metal dials, and static-free polystyrene or glass fronts. This series comes in a wide variety of case styles and colors and in special ranges to meet customer specifications. Current ranges up to 50 amps self-contained are available for intermittent use. Voltage ranges start as low as 50 millivolts. Ranges up to 300 volts DC are available.

DIMENSIONS:

825 & 826

640 Flush Mount

795 & 795B
Designed for economy, these rugged and dependable low cost meters come in a variety of AC and DC ranges and feature easy installation and an accuracy of ±5% of full scale.

<table>
<thead>
<tr>
<th>Model</th>
<th>mA</th>
<th>DC Volts</th>
<th>DC Amps</th>
<th>MOUNTING CLAMP</th>
<th>6#-32 SCREWS</th>
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<td>CK-550</td>
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<td>CK-580</td>
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<td>CK-610</td>
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<td>CK-796</td>
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</tbody>
</table>
GENERAL
The VU meter has become the universal standard level indicator for practically all audio frequency transmission systems. VU meters are for the measurement of sound or noise levels - including broadcast monitoring, use with public address of communication systems, and in all instances where volume level measurements are to be made. It is also being used for the measurement of noise level and other audio frequency energy where established dynamic characteristics of the instrument give a common result for measurements taken in different laboratories.

VU INSTRUMENT DETAILS
The VU meter is designed to read zero VU or 100% with 1.228 volts applied to the instrument and the 3600 ohm series resistance; this represents 4 DB above 1 milliwatt in 600 ohms. The combination of a special copper oxide rectifier and an extremely sensitive movement with special magnetic system gives very high sensitivity.

STANDARDIZED INSTRUMENT SCALE
The VU instrument has become so universally accepted that numerous requests have been received to add other scale ranges to the VU Scale for special purposes.

TYPE A SCALE
The “A” Scale reads “-20 to +3” in type on the top of the arc, with “0-100” on the bottom of the arc in type.

TYPE B SCALE
The “B” Scale reads “0-100” in type on the top of the arc, with “-20 to +3” in type on the bottom of the arc.

Available in these series:

![2000 Series](image1)
![3100 Series](image2)
![Industrial Panel Meters](image3)

**BOTH SHOWN ARE TYPE “A”**
HoynT ELECTRICAL INSTRUMENT WORKS, the leading manufacturer of analog panel meters for over 100 years, produces a complete line of the highest quality electrical indicating panel meters available today. The Penacook, N.H. plant was designed specifically for the processing and production of Analog Panel Meters. Our production facilities include dial printing, CAD, tool and die shop, metal stamping, production painting, meter coil winding and assembly.

QUALITY CONTROL is the responsibility of each and every production worker and the results reflect the lowest warranty return available.

We specialize in custom instruments. Many of our customers purchase Hoyt Panel Meters because their needs are:

- CUSTOM DIALS
- CUSTOM CASES
- CUSTOM ELECTRICAL SPECIFICATIONS
- CUSTOM RANGES
- CUSTOM ACCURACY
- CUSTOM RESISTANCE AND DAMPING

When custom panel meters are required with maximum emphasis on QUALITY contact a factory representative who will assist you to properly select the meter for your application.

GLOSSARY OF TERMS

ACCURACY: Expressed in percent of end scale rating and indicates the maximum deviation to be obtained from the actual input value. The percent is always of end scale value and, if the zero is at a point other than one end of the scale, the sum of the end-scale readings will be the considered the end scale value.

ANSI C39.1 STANDARD: American National Standards Institute Inc. Standard C39.1 applies to analog instruments, defining nomenclature, test conditions, and procedures, general construction requirements, mounting dimensions, and performance requirements.

DAMPING: Term applied to the characteristics of the pointer movement once electrical energy is applied and specifically to the ability of the pointer to indicate properly, quickly with a minimum amount of overshoot or oscillation before coming to rest.

REPEATABILITY: Usually expressed as a percent of full scale, repeatability is the ability of an instrument to read over and over again the same input.

SELF-SHIELDING: Inherent in the construction, unaffected by stray magnetic fields.

TRACKING: The ability of an instrument to indicate at the division line being checked, when energized by corresponding proportional value of actual end-scale excitation, expressed as a percentage of actual end-scale value. For zero center meters, tracking from each end-scale point to the zero point should be checked independently and expressed as a percentage of the end-scale value. For offset zero meters, the larger end-scale value should be used.

VU METERS - VOLUME LEVEL INDICATORS: Hoyt VU meters are for measurement of sound or noise levels including all instances where volume level measurements are to be made. This instrument is essentially a low range rectifier type voltmeter using the D’Arsonval type movement. Hoyt VU meters can be ordered with a type “A” or “B” scale, in a variety of case styles, ranging from 1-1/2”, 2-1/2”, 3-1/2” & 4-1/2” in 2000 and 3100 series meters. Special options available at extra cost include LED for peak measurements and illumination provisions.

TERMS AND CONDITIONS

TERMS - NET 30 DAYS ON APPROVED CREDIT

INVOICE MINIMUM - $100.00

SHIPMENTS - F.O.B. PENACOOK, N.H.

Hoyt Electrical Instrument Works, Inc. Penacook, NH
(800) 258-3652 Fax (603) 753-9592 WWW.HOYTMETER.COM

HOYT WARRANTY AND REPAIR

Hoyt Electrical Instrument Works, Inc. warrants its products to be free of defective materials and workmanship for a period of (1) year after shipment to the original purchaser. This warranty shall be limited to defective materials and workmanship, it will not cover those products which have been damaged due to improper handling, storage, installation or operation by the purchaser or any third party. At Hoyt's discretion, defective products may be repaired or replaced and the products returned to proper working condition. All warranty claims must be made in writing prior to returning products to Hoyt. All products must be returned prepaid to Hoyt Electrical Instrument Works, Inc., with RMA # 23 Meter Street, Penacook, NH 03303. (Return authorization request form may be downloaded from www.HOYTMETER.com)

Return shipments must be made in the original packaging or packaging of equal quality that will provide appropriate protection during shipping. Hoyt will not be responsible for the warranty repair of products returned via inadequate containers and packaging, nor for missing components.

Hoyt shall not be liable for any special, punitive, incidental or consequential damages made by the buyer or any third party. This statement of warranty is in lieu of all other warranties, guarantees, liabilities and obligations, statutory or implied to the original purchaser or to any other party.
For Hundreds of years, New England craftsmen have lived by the rule that anything worth doing is worth doing well. At HOYT, that rule is honored today as it was in previous generations who founded and fostered a company exclusively to making a better line of analog panel meters. From the HOYT family members who have manufactured meters since 1890 and have owned and actively operated the business since 1904, to the skilled production workers in the plant, HOYT people apply their special skills to the design and manufacture of panel meters that meet and exceed industry standards.

Personal pride, yankee ingenuity, and uncommon commitment to tradition and reputation are reflected in every meter that leaves the modern, 30,000 square foot facility in Penacook, New Hampshire.

The HOYT custom product line includes rectifier type AC meters, 50-2000 cycle calibrated AC meters and suppressed zero DC meters. All of HOYT meters used rugged pivot and jewel movements, tested and proven for many years in industrial environments. HOYT also offers a wide selection of case styles, colors and materials. Special dial colors and layouts for non-standard range dials also available.

Price and specifications, including colors and materials, are subject to change without notice. Products may be withdrawn at any time at the option of the manufacturer. Catalog dimensions are for reference only. Contact the factory for certified dimension.

HOYT ELECTRICAL INSTRUMENT WORKS, INC.
23 METER ST., PO BOX 8798
PENACOOK, NH 03303
(603) 753-6321 FAX (603) 753-9592
TOLL FREE (800) 258-3652
e-mail: info@hoytmeter.com

WWW.HOYTMETER.COM