

11. The displayed speed reading is held by simply releasing the **Operating Button**. This **Hold Feature** maintains the displayed number for approximately **One Minute**, then the system automatically shuts off all power and stores that last measurement in the **Memory**.

**CAUTIONS:** Repeated dropping of the instrument could cause damage to the Microprocessor controlled electronic system or the PC board connections; resulting in extremely erratic readings or the word **ERROR** to appear on the display.

When storing the instrument for a long period of time, we suggest removal of the batteries. Discharged batteries could corrode the instrument's terminal contacts or leak into the PC board area.

Keep the instrument and accessories clean, and stored in the carrying case (PIN T-27). Do not use this instrument for any purpose other than its intended use.

*Do not attempt to use or repair a defective or damaged instrument; return it to us for examination and repair, with a written explanation of the trouble.*

#### WARRANTY

All products supplied by Biddle Instruments are warranted against all defects in material and workmanship for a period of one year following shipment. Our liability is specifically limited to replacing or repairing, at our option, defective equipment. Equipment returned to the factory for repair will be shipped Prepaid and Insured. The warranty does not include batteries, lamps, or tubes, where the original manufacturer's warranty shall apply. **WE MAKE NO OTHER WARRANTY.** The warranty is void in the event of abuse or failure by the customer to perform specified maintenance as indicated in **CAUTION** notations in this manual.

#### REPAIRS

Biddle Instruments maintains a complete instrument repair service. Should this instrument ever require repairs, we recommend that it be returned to the factory for repair by our instrument specialists. When returning instruments for repairs, either in or out of warranty, they should be shipped Prepaid and Insured, and marked for the attention of the Instrument Service Manager.

*For complete list of accessories and other Speed Measuring Instruments, please contact:*

**BIDDLE INSTRUMENTS**  
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BLUE BELL, PA 19422  
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### INSTRUCTIONS 35-J-81 BIDDLE HAND TACHOMETER LCD DIGITAL DIRECT CONTACT STYLE

The Biddle Digital Contact Hand Tachometer is a Microprocessor controlled precision speed indicating instrument in a compact, lightweight, drawn aluminum body; capable of measuring speeds of rotating objects to **19,999 RPM** using contact style accessory tips, and to **2000 FPM** using the supplied 6-inch circumference wheel.

#### WARNING

*Contact any moving surface with extreme care and utilize face protection. For speeds over 15,000 RPM or in awkward contact positions, non-contact style tachometers are recommended; DO NOT USE OVER 19,999 RPM! Surface speed measurements are accomplished with the wheel perpendicular to, and in alignment with, the moving surface. See Page 4 for Wheel Speed Ratings.*

Catalog No.	Display System	Measuring Ranges
359981	4 1/2 digit 3/16" (8 mm) 7-segment LCD; leading zero suppression. Locks and indicates the word UNDER at 10.00; OVER at 19999.	Automatic selection: 10.00 to 99.99 100.0 to 999.9 1000 to 19999

**CAUTIONS:** This instrument has a splash-proof fitted case and display lens, however, it is not a sealed unit. Do not use in an explosive atmosphere; IT IS NOT CLASSIFIED AS INTRINSICALLY SAFE. Usage in high humidity areas could cause shorting of the internal circuitry.

The Microprocessor controlled electronic system is guarded against electromagnetic field influence and the metal body assists in guarding normal electrostatic discharges from fabric, pulp and paper processing equipment. Grounding and bonding of the machinery against electrostatic discharge is the responsibility of the user.

**THIS INSTRUMENT DOES NOT  
REQUIRE LUBRICATION**  
Refer to Page 6 for **WARRANTY** and  
**REPAIRS** statements.

## OPERATION FEATURES

- Measuring Accuracy:\***
  - from 10.00 to 99.99 ± 0.01
  - from 100.0 to 999.9 ± 0.1
  - from 1000 to 19999 ± 1.0
- Sensing Period (Gate Time):\***
  - from 10.00 to 50.00 within 6-seconds.
  - from 50.00 to 99.99 within 1-second.
  - from 100.0 to 19999 within 0.7 second.

*\*Accuracy and Sensing stability are subject to the care taken in contacting the moving surface and the condition of that surface. For speeds over 20.00, allow at least one Sensing Period for the system to accumulate data and stabilize its readings.*

- Display Indicators UNDER and OVER:**  
Speeds under 10.00 lock the display at 10.00 and the word **UNDER** appears above the display. Speeds over 19999 lock the display at 19999; the word **OVER** appears above the display and the display blinks on and off.
- Low Battery Indicator:**  
Battery low voltage will produce the word **BATT**, above the digits, in the center of the display, however accurate measuring can continue until the display becomes dim.
- Battery Life** of supplied Alkaline batteries is approximately 100-hours under continuous operation.
- The instrument's **Hold Feature** may be utilized at any time during a speed measurement by simply releasing the **Operating Button**. The displayed number will remain for approximately **One Minute**, when the system shuts off all power. That last measurement stores in the system's **Memory**.
- A single very brief pressure on the Operating Button**, recalls and displays the last measurement stored in **Memory** and remains displayed for about one minute.  
A second very brief pressure on the **Operating Button**, would not cancel the stored **Memory**, but should produce a full display of **Indicators** and **888.8.8** within three seconds; verifying that the electronic system is functioning correctly. If faulty, the word **ERROR** appears. **Constant pressure** proceeds with new measuring.
- Operating Temperature:** 32° to 122°F (0° to 50°C).  
**Storage Temperature:** -4° to 140°F (-20° to 60°C).

*CAUTION: Store in dry, well ventilated area, not subject to direct sunlight.*

## OPERATION PROCEDURES

- Remove battery compartment **Coverplate** by inserting fingernail under forward portion of latch flange, press towards the rear and slightly upward. **Coverplate** will release from its recessed compartment. *No tool or coin required.*
- Install three (3) supplied **1.5V AA size Alkaline Batteries**, with **polarity as marked in the compartment**.

*CAUTION: Improperly installed batteries will not activate the display and should be immediately corrected to prevent possible damage to the circuitry.*

- Position rear tab of **Coverplate** into recess and press down on latch end until **Coverplate** "clicks" into place.
- The **initial display could be incomplete digits and Indicators**. A single very brief pressure on the **Operating Button**, should produce a full display of **Indicators** and **888.8.8** within three seconds; verifying that the electronic system is functioning correctly. If faulty, the word **ERROR** appears. A continuous display of the word **BATT** indicates **Low Battery**.
- Select an **Accessory driver tip or wheel** and place on the instrument's shaft, matching the keying slot with the **keying pin** in the shaft.

*CAUTION: Do not use an accessory with a damaged shank.*

### RPM Measurement:

- S-3 Optional Triangular Steel Tip.
- S-4 Supplied Small (3/16") Conical Rubber Tip Complete.
- S-8 Supplied Large (1/2") Conical Rubber Tip Complete.
- S-9 Supplied Large (1/2") Concave Rubber Tip Complete.
- S-1 Supplied 3-inch Extension Bar for above accessories.

### DO NOT USE EXTENSION BAR WITH ANY WHEEL!

- S-11 Supplied 6-inch Circumference Rubber Tired Fiber Disc Wheel Complete, used on shaft's outer surface; calculate RPM from formula:

$$\text{RPM} = \text{Displayed Reading} \times \frac{\text{Wheel Circumference}}{\text{Shaft's Circumference}}$$

*WARNING: S-11 WHEEL HAS MAXIMUM SPEED RATING OF 4000 RPM.*

*S-12 WHEEL HAS MAXIMUM SPEED RATING OF 2000 RPM.*

### SURFACE SPEED Measurement and Wheel Speed Ratings:

- S-11 Supplied 6-inch Circumference Rubber Tired Fiber Disc Wheel Complete; **FPM = Displayed Reading ÷ 2. Maximum Displayed Speed Reading of 4000.**
- S-11-1 Optional 6" Wheel as above, with set-screw lock hub. **Maximum Displayed Speed Reading of 4000.\***
- S-12 Optional 12-inch Circumference Rubber Tired Fiber Disc Wheel Complete for **Direct Reading FPM**. **Maximum Displayed Speed Reading of 2000.**
- S-12-1 Optional 12" Wheel as above, with set-screw lock hub. **Maximum Displayed Speed Reading of 2000.\***

*\*Set-screw locking hubs provide additional security if properly installed, therefore, Speed Ratings could be increased by 50%.*

- HB-11M Optional 10cm Circumference Rubber Tired Disc "Meter" Wheel Complete; **MPM = Displayed Reading ÷ 10. Maximum Displayed Speed Reading of 8000. Maximum Speed Rating of 8000 RPM.**

*WARNING: DO NOT USE EXTENSION BAR WITH ANY WHEEL!*

*CAUTION: Contact any surface with extreme care and utilize face protection.*

- Place the driver tip or wheel in contact with the moving equipment and allow it to rotate evenly.
- Depress and hold the Operating Button**. The electronic Sensing System and the Digital Display are now activated; prepared to receive measuring data.
- The digital display will indicate the speed, and will continue to indicate any change in that speed within the **Sensing Period**, as long as the **Operating Button** is kept depressed.
- Extremely erratic readings** could be due to the tested equipment's own speed variations or abuse to the instrument's Microprocessor controlled electronic system.
- If in doubt, verify the instrument's speed reading against a constant RPM source, such as an 1800 RPM synchronous electric motor.