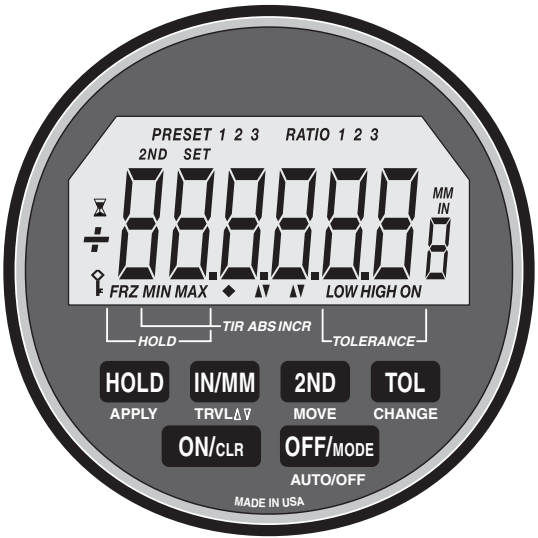

Electronic Indicator

Operating Manual Non-Analog Digital Display

3 Programmable Presets and 3 Programmable Ratios

Extra-Large Number Display
Incremental Measuring Mode
SPC Cables USB, MTI, RS232
Measuring System in English or Metric
Travel Reverse
Auto Off
Floating Zero
Rotating Bezel
Internal and External Serial Numbers
T.I.R. with Low & High Storage Recall
Power with Batteries
Additonal Power Through AC Jack or Data Output
Programmable Lock Combination
User Tolerance Settings (high & low)
Up to 4 User Changeable Resolutions
Inch/Metric Display Conversion
Large LCD Display
Maximum Reading Hold
Display/Freeze Reading Hold
Minimum Reading Hold
Absolute/Preset Measuring Mode

Animated Video Instruction on CD

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CHOICE OF THREE POWER SOURCES

1. Batteries
The lithium battery used in this indicator is an IEC standard, type CR2450. The indicators are shipped with the batteries installed.

Note: This indicator has an ***AUTO-OFF*** feature to conserve battery life. After 10 minutes of "no activity" (no key presses or spindle movement), the gage will turn itself off. This feature may be disabled if continuous operation is desired; see ***AUTO-OFF*** On/Off instructions in this book.

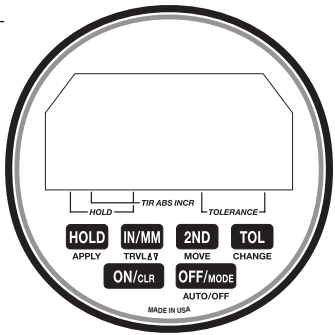
Installing Batteries
Using a narrow screwdriver, gently pry under the tab on the left side of plastic bezel and slide out the battery tray as you turn the indicator face side down.
Insert two batteries, "+" side up, into tray cavities, then slide the tray back into its bezel slot, taking care that the batteries stay in proper position.

2. AC Adapter
Remove the rubber plug from the socket on the lower right side of the bezel. Insert the mini-plug into the socket then plug the adapter into a wall outlet.

3. Data I/O Connector
Power also may be provided through the data I/O connector, for special fixturing or applications where the indicator is integrated with another piece of equipment. A ripple-free 5 VDC regulated voltage source is required.

BUTTON FUNCTIONS

Key	Function Controlled
OFF/MODE	*Off* – turns indicator off *MODE* – controls absolute numbers & display setup
ON/CLR	*On* – turns indicator on *CLR* – resets the ***Lock Toggle***, ***Data I/O Type***, ***gage resolution***, and ***Display*** setup mode
HOLD	Allows you to hold the value on the display according to the specified Mode (***MAX***, ***MIN***, ***FRZ***)
IN/MM	Controls the display units (default is English)
2ND	Controls the ***Lock Toggle***, ***Data I/O Type, gage resolution***, ***Travel Reverse***, ***Auto Off*** and ***Display*** setup mode
TOL	Controls ***Low***, ***High*** and ***On*** tolerance settings



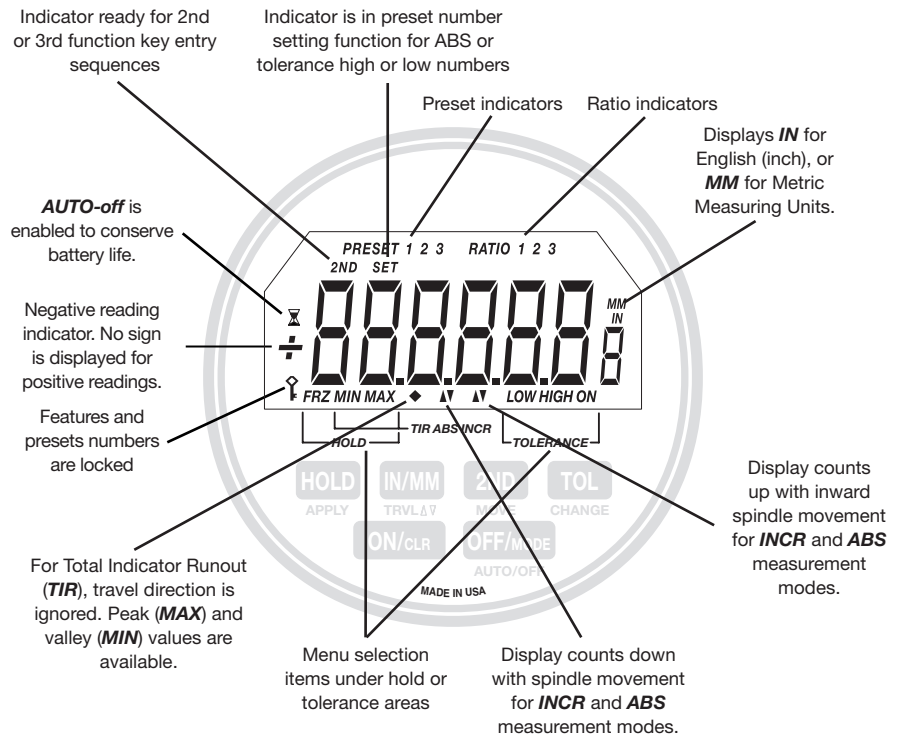
SUMMARY CHART FOR DIGITAL BUTTON ACTIONS

Button actions should occur on the press of the button whenever possible. Some button presses will have the action occur on the release of the button press. For example, when the 'ON/CLR' button is used to clear the display, the action is to happen on the release of the button. When the 'ON/CLR' button is used as the 2nd function in a sequence of button pushes, the action can be on the press of the button. Whenever a button press requires a continuous press to scroll through some selection process, the action of the button needs to be on the release of the button.

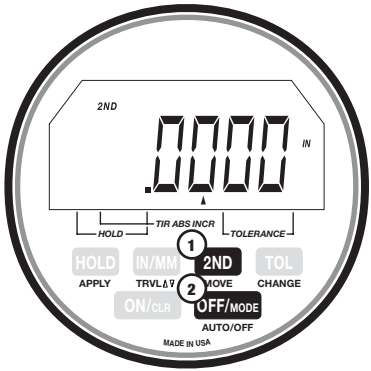
BUTTON	FUNCTION			
	PRIMARY	SUBSIDIARY	2ND FUNCTION	3RD FUNCTION
HOLD	• Toggle on/off	• Select hold type (MAX, MIN, FRZ) press and hold to step through selection • Apply function	• Enter setting process for ratios*	• Enter resolution select process* • (2ND, ON/CLR, HOLD)
IN/MM	• Toggles between inches, millimeters and *X*		• Toggles travel reverse (normal/reverse)	• Resets to factory default settings • (2ND, ON/CLR, IN/MM)
2ND	• Enables 2ND functions	• Move function		• Verify data out put • (2ND, ON/CLR, 2ND)
TOL	• Toggles tolerance on or off	• Select high or low to view or set numbers* • Change function	• Enter preset setting process*	• Toggles lock on and off; press and release (2ND, ON/CLR, TOL) • Enters user lock combination setting mode (press and hold to access setting mode)*
ON/CLR	• Turn gage on	• Clears/resets display to '0' or spindle position, or 'abs' number or 'abs' +/- spindle position	• Enables 3RD function	
OFF/MODE	• Turns gage off	• Select measurement mode (INCR, ABS, TIR) press and hold to step through selection	• Toggles auto-off on and off	• To turn on RATIO feature and select RATIO 2ND, ON/CLR, OFF/MODE. Press and release to turn on, during button sequence hold down OFF/MODE to select RATIO position

** Note: apply, move and change are automatically active when in preset, lock and tolerance setting modes. Apply and change are automatically active when in resolution set mode.*

DISPLAY-OPERATING PROMPTS & CONDITIONS



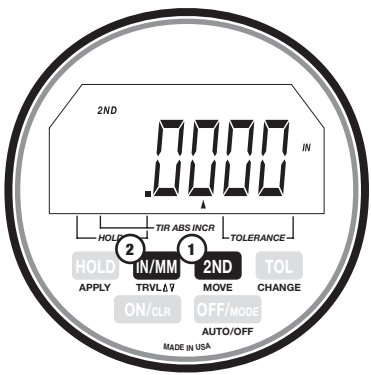
OPERATING INSTRUCTIONS



Power On/Off
To turn the unit on, press and hold ***ON/CLR*** until indicator turns on. To turn off, press ***OFF/MODE***.

Auto-Off Toggle
To turn the ***Auto-Off*** function on or off, press the ***2ND*** button (***2ND ICON*** should appear on the display). Press the ***OFF/MODE***.

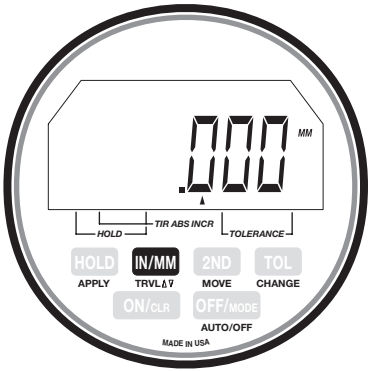
An hour glass appears at the left side of the display if ***AUTO OFF*** is active. If ***AUTO OFF*** is active the indicator will power off in 10 minutes with no activity (button press or spindle movement).



Travel Reverse Toggle
To change count direction:
Press ***2ND*** button, then press the ***IN/MM*** button.
Note: When arrow is pointed down ▼, the display counts down with inward spindle movement for ***INCR*** and ***ABS***.

When the arrow is pointed up ▲, display counts up with inward spindle movement. For most applications this is the normal setting.

OPERATING INSTRUCTIONS



Change Units
To change the display units, press the ***IN/MM*** button.

Default unit of measure is set at the factory for English or metric scales.

Hold Mode
Allows you to hold the value on the display according to the specified mode.

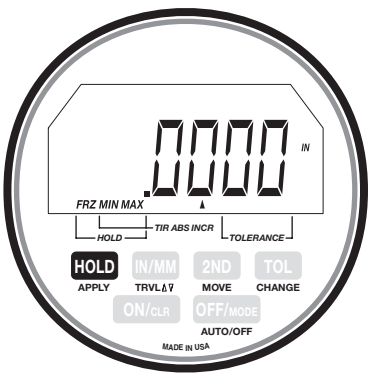
Press ***HOLD*** to toggle hold mode on and off.

MAX – Holds and displays the highest reading attained.

MIN – Holds and displays the lowest reading attained.

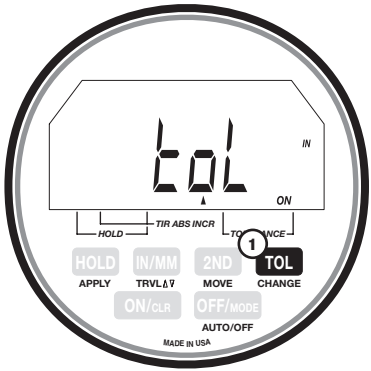
FRZ – Holds and displays the reading displayed when ***HOLD*** is engaged.

To select type of ***HOLD*** (***MAX***, ***MIN***, ***FRZ***): Press ***HOLD*** until desired feature is flashing, then release ***HOLD.***



Note: Pressing ***ON/CLR*** button resets indicator to spindle position except in FRZ; resets to zero

OPERATING INSTRUCTIONS



Tolerance On/Off
Press ***TOL*** to toggle tolerance mode on and off. If no tolerances are programmed into the gage, then ***tol*** is displayed to indicate an invalid tolerance setting and the ***HIGH*** and/or ***LOW*** icons flash on and off.

When the tolerance settings are incorrect (high, low, or both) the corresponding icon or icons will flash.

Tolerance Settings
Press and hold the ***TOL*** button to activate the tolerance menu (***LOW***, ***HIGH***, ***ON***) and view the low and high tolerance settings.

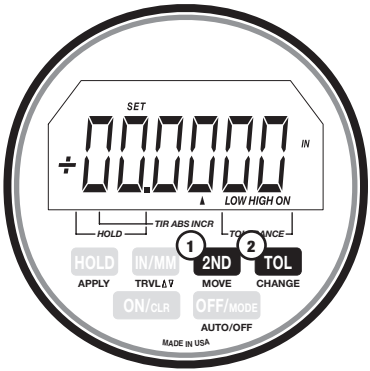
If no preset tolerance number is set into the gage then zero will be displayed.

When viewing low or high, that icon will flash.

OPERATING INSTRUCTIONS

Set High Tolerance Number
To change to high tolerance settings:
Press ***2ND*** button (***2ND*** icon should appear on the display). Press the ***TOL*** (***CHANGE***) button. High icon will be flashing.

Use the secondary function buttons, ***CHANGE*** and ***MOVE*** to set your tolerance setting. After you have set your high tolerance setting, press ***APPLY*** to store numbers to memory.

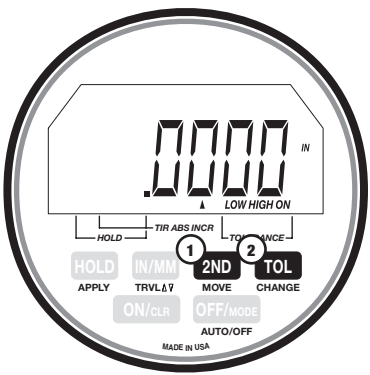


Set Low Tolerance Number
To change to low tolerance settings: Press ***2ND*** button (***2ND*** icon should appear on the display). Press the ***TOL*** (***CHANGE***) button. Low icon will be flashing.

Use the secondary function buttons, ***CHANGE*** and ***MOVE*** to set your tolerance setting. After you have set your low tolerance setting, press ***APPLY*** to store numbers to memory.

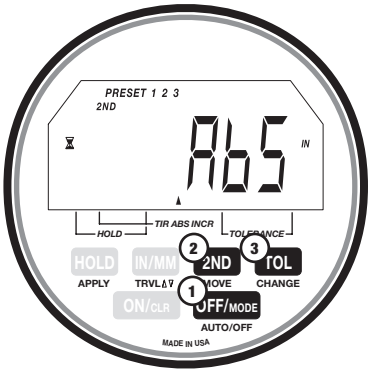
Note: once high and low tolerances are set, the numeric readings will flash when your readings are out of tolerance.

The ***LOW*** or ***HIGH*** icon will flash indicating if the reading is under or over the tolerance.



OPERATING INSTRUCTIONS

Absolute /Preset Mode
Press and hold the ***OFF/MODE*** button until the ▲ icon appears and flashes above the ***ABS*** lettering, then release the ***OFF/MODE*** button. If no preset number is stored in indicator ***ABS*** will show on display.



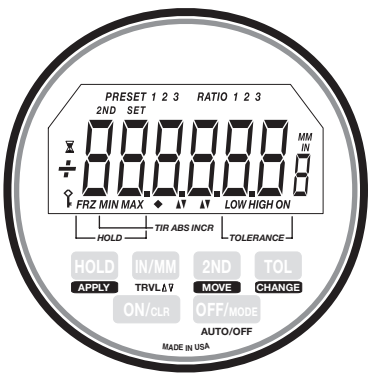
To change to absolute number (preset number), press ***2ND*** button; ***2ND*** icon should appear on the display. Press the ***TOL*** (***CHANGE***) button.

To step through ***PRESET 1 2 3*** press the ***MOVE (2ND)*** button.

Use the secondary function buttons, ***CHANGE*** and ***MOVE***, to set your absolute number. Press ***MOVE*** until the ***+/-*** or digit to be set is blinking.

Press the ***CHANGE*** button to reverse the ***+/-*** sign or change the value of the blinking digit. Repeat until the desired number is entered. Press ***APPLY*** to store absolute number to memory.

To exit Absolute/Preset mode, press and hold ***OFF/MODE*** button until the icon flashes above the mode you wish to be in (***INCR***, ***ABS***, or ***TIR***).

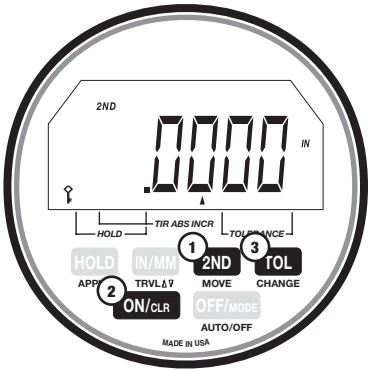


OPERATING INSTRUCTIONS

Lock Toggle Without Combination
When the ***LOCK*** is on, a key icon is displayed. When the ***LOCK*** is on, all of the setting modes are disabled, and all 2nd and 3rd functions are disabled except the lock/unlock sequence.

Press the ***2ND*** button (***2ND*** icon should appear on the display). Press ***ON/CLR***. Press ***TOL***. A key symbol will appear on the display when features are locked.

To undo the ***LOCK***, follow the same steps you did to lock it.

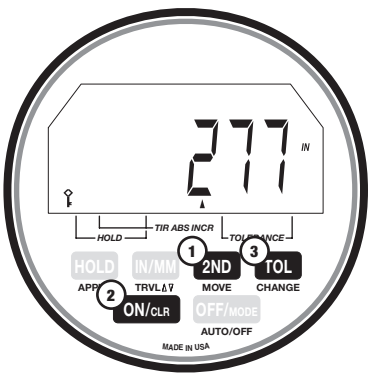


Lock Toggle With Combination
Press the ***2ND*** button (***2ND*** icon should appear on the display), then press ***ON/CLR***. Press and hold ***TOL*** until ***000*** appears on the display.

Use the ***CHANGE*** and ***MOVE*** button to set your lock combination. After you have set your 3 digit lock combination press ***APPLY***. A key symbol will appear on the display and your 3 digit combination is stored in memory.

WARNING: To change functions after the indicator has been locked with a combination, the correct combination must be applied.

To undo the ***LOCK***, follow the same steps you did to lock it.



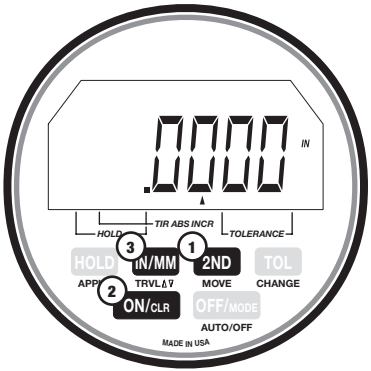
Please contact the factory if the Lock Combination is lost.

OPERATING INSTRUCTIONS

Reset to Factory Defaults
This will set all features and functions back to the factory default settings.

Press the ***2ND*** button (***2ND*** icon should appear on the display), followed by ***ON/CLR***, then press ***IN/MM***.

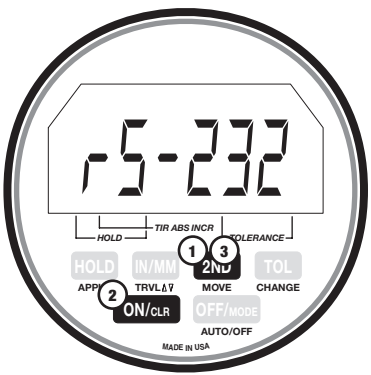
Note: Factory defaults cannot be reset if the ***LOCK*** feature is on.



Verify Data I/O Type
To view the Data I/O Type Output, press the ***2ND*** button. The ***2ND*** icon will appear on the display. Press ***ON/CLR***. Press ***2ND***. Format information is displayed on the LCD.

All digits of the display are turned off; characters displayed represent data modes as ***RS-232***, ***MITUTOYO*** serial output, ***USB*** or ***BYPASS*** mode.

To exit: Repeat button sequence.



OPERATING INSTRUCTIONS

Set Gage Resolution

For the change resolution feature: Press ***2ND***, press ***ON/CLR***, then press ***HOLD***.

After that, each press of the ***CHANGE*** Button (***TOL***) steps through the available resolution options: ***.001˝***, ***.0005˝***, ***.0001˝*** or ***.00005˝*** *

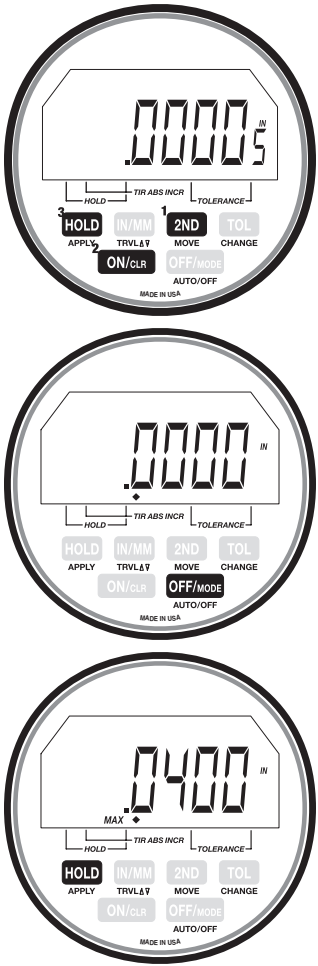
Press the ***APPLY*** button to store the resolution setting. Display returns to measuring mode at desired resolution, but does not change displayed value.

TIR Mode

Total Indicator Runout (***TIR***) mode ignores travel direction, instead measuring the difference between peak and valley (***MAX*** and ***MIN***) values. To enter TIR Mode, press and hold the ***OFF/MODE*** button until the diamond icon appears and flashes above the TIR function. In TIR mode, the Freeze (***FRZ***) is the only hold function available.

To view the Peak (***MAX***) Value or the Valley (***MIN***) Value, use the ***HOLD*** button. Press ***HOLD*** button down until the ***MIN*** or ***MAX*** is displayed. The difference between the ***MIN*** and ***MAX*** Values equals the TIR Value.

To exit ***TIR*** mode, press and hold ***OFF/MODE*** button until the icon flashes above the mode you wish to be in (***INCR***, ***ABS***, or ***TIR***).



**This resolution only available on a .00005˝ resolution gage.*

OPERATING INSTRUCTIONS

Ratio Mode
Press ***2ND***, ***ON/CLR***, and ***OFF/MODE*** to turn the ration feature on and off.

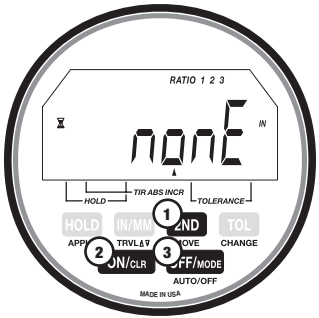
Press ***2ND*** then ***ON/CLR***, then press and hold the ***OFF/MODE*** button to step through the three ratio positions.

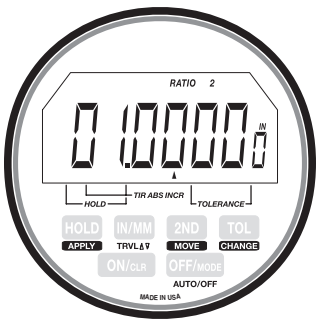
If no ratios have been set previously, the display will show ***NONE***. The gage will not operate until a ratio is entered or you exit the ratio feature.

In this case, a ratio of 2.000 will display 2 inches on the indicator for every 1 inch of travel, or 2mm on the display for every 1mm of travel.

To set or change a ratio, press ***2ND*** then press ***HOLD***. Use the ***MOVE***, ***CHANGE*** and ***APPLY*** buttons to program or change ratio.

There are three ratio settings that can be stored. For the ratio feature to work properly, the current ratio must be set to a value other than ***NONE***.





CUSTOM APPLICATIONS

Custom LCDs and graphics can be provided for almost any application. We can help you design a gage for your exacting requirements.

Keypads and features can be customized to meet most needs. For example, a gage can be programmed for T.I.R. only, or a gage can be programmed so only selected features are available.

With our programmable software and flexible microchip, the possibilities are limited only by your imagination.

Custom hardware is available to fit your specifications. For example, a gage can be made without a return spring or with a custom spring. Special length stems, threaded stems, backs, and contact points, are also available.

Digital Indicators are available in the following travels and resolutions:

Range/Travel	**Resolution** (operator changeable)
.250"	.0001"/.002mm; .00005"/.001mm
.600"	.0005"/.01mm; .0001"/.002mm; .00005"/.001mm
1.0"	.0005"/.01mm; .0001"/.002mm; .00005"/.001mm
2.0"	.001"/.02mm; .0005"/.01mm; .0001"/.002mm
4.0"	.001"/.02mm; .0005"/.01mm; .0001"/.002mm

Animated Video Instruction on CD

Part No. K04-0103
RVSD 4/2013