2900 Electronic Indicator

User Guide

2900-3 Series & 2900-5 Series

with Rechargeable Battery

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Section 1 General Information

1.0 Caution

- Remember, only charge your Indicator when the battery symbol is shown on the display, see page 11.
- Avoid extreme temperatures, direct sunlight or below freezing for extended periods.
- Avoid dropping the Indicator. Avoid shocks to the contact point and spindle. Do not apply any radial force to the spindle.
- If the indicator is stem-mounted, protect the indicator from being struck or bumped to prevent stem/case mechanical alignment damage.
- Do not over-tighten the mounting mechanism and use clamp mounting rather then set screws, if possible, to prevent damage to the spindle.
- Frequently clean the spindle using a dry cloth or a chamois to prevent sluggish or sticky movement. Isopropyl alcohol may be used to remove gummy deposits on metallic parts. Do not apply any type of lubricant to the spindle and do not use solvents.
- Avoid any disassembly or modification of the indicator, other than what is outlined in "Accessories" on page 14.
- Avoid using anything that might damage the buttons when pressing the buttons.
- Use the appropriate gage stand or indicator holder for the job intended.

1.1 Basic Operating Instructions

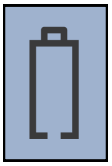

Fig.1A

1. Turn on your tool, check the upper left of the display to see if the battery symbol is showing. If the battery symbol is showing (Fig.1A) then go to the "Rechargeable Battery Care and Maintenance" section, on page 11. If there is no battery symbol visible then the battery is charged.
2. Lightly clean the contact point.
3. Fasten the indicator into the appropriate holding device.
4. You can turn the indicator on by either pressing the **ON/OFF** button or moving the spindle.
5. If applicable, pick the unit of measure, inch or millimeter by pressing the **IN/mm** button. **Note:** standard metric indicators do not have this function available.
6. Place the indicator perpendicular to the reference surface being measured. Allow enough movement to be able to take a higher or lower measurement. **Note:** This is one of many possible ways to use the tool.
7. **Zero Sequence:** Zero the tool by pressing the **ZERO** Button. When you press the **ZERO** button the display will show a dashed line as seen in (Fig.1B). The dashed line will incrementally disappear from left to right (Fig.1C); Make sure not to move the spindle during this time. This is a visual reminder to wait for the tool to zero out. This will happen each time the tool is zeroed, and takes less than a second to complete.

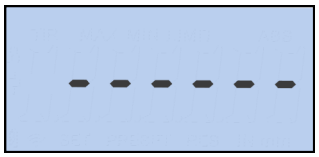

Fig.1B

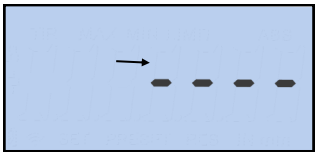

Fig.1C

8. Lift the spindle to remove the reference surface, and carefully place the piece to be measured under the spindle making contact with the surface. The value measured on the display will be the difference between the reference and the measured piece.
9. The indicator can be turned off by pressing and holding the **ON/OFF** button for 3 seconds.

   Note: the unit will automatically enter sleep mode in 30 minutes, if left unattended.

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1.2 Button Descriptions and Functions

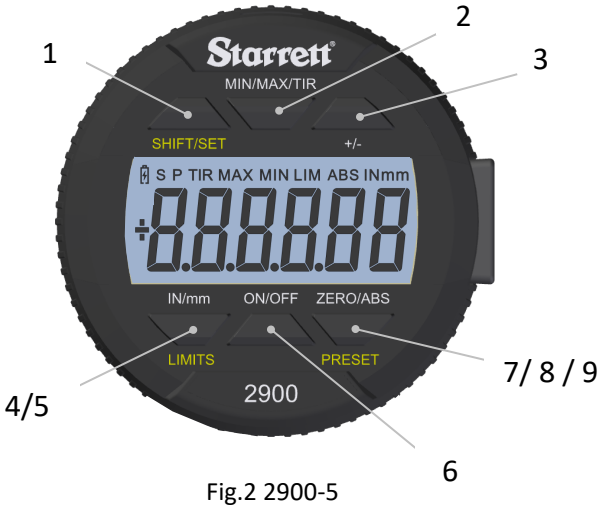

Fig.2 2900-5

The functions printed in yellow; LIMITS and PRESET, are used in conjunction with the SHIFT/SET button. To enable these functions press the SHIFT/SET button first. The SET icon will appear on the bottom left corner, then press the button for the required function.		
1	**SHIFT/SET**	Dual function button used to enable the, Preset and the Limits function. When enabled the SET (S) icon will be displayed on the top left corner of the display.
2	**MIN/MAX/TIR**	Displays the minimum or maximum values captured during the movement of the spindle while in the min/ max limits operation. The TIR function displays the difference of the two readings. See “Setting the Min/ Max/TIR” on page 8.
3	**+/-**	Plus/Minus sets the direction (polarity) of the reading
4	**IN/mm**	Toggles the display between English or Metric units.
5	**LIMITS**	Press the **SHIFT/SET** button then press the **LIMITS** button to enable the function. Refer to the section, “Setting the Limits” on page 6.
6	**ON/OFF**	Power button. Press and release to turn on, and Press and hold for 3 seconds to turn off.
7	**ZERO**	Press and release the **ZERO** button and the display will zero. The spindle must not be moved until the Zero Sequence has elapsed. See “Zero Sequence” on page 3, instruction #7.
8	**ABS**	Enables the ABS mode. Press and hold for 2 seconds to activate the ABS mode, Press and hold for 2 seconds to exit the ABS mode.
9	**PRESET**	Press the **SHIFT/SET** button then press the **PRESET** button to enable the function. Refer to the section “Setting Preset” on page 5.

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Section 2 Functions

2.0 Setting Preset

Note: This function is available with some of the 6 button indicators. To set the value, follow the steps below:

1. Press and hold the **ZERO/ABS** button for 2 seconds to activate the ABS mode. The ABS icon will appear in the upper right corner of the LCD, Fig.3.
2. Press the ***SHIFT/SET*** followed by the **PRESET** button. The SET and PRESET icons will appear in the bottom left hand side of the LCD. The PRESET icon should be flashing, Fig.4A. Fig.4B shows an alternative display where the (**S**)ET and (**P**)RESET icons appear in the top left side of the LCD.
3. Press the ***SHIFT/SET*** button to cycle thru the plus/minus sign, and each digit place. The flashing item indicates that the item is ready to be SET/Changed, Fig.5.
4. Press the **PRESET** button to increment the digit value from 1-9. Press the ***SHIFT/SET*** button to set the digit and move to next digit.
5. To set a negative value press the **PRESET** button when the plus/minus sign icon is flashing. Fig.5.
6. Repeat steps 4 and 5 until all the digits are SET.
7. Use the **SHIFT/SET** button to cycle through the digits back to the PRESET icon.
8. To exit the PRESET function, Press the **PRESET** button when the PRESET icon is flashing. The SET value will remain displayed.
9. Press and hold the **ZERO/ABS** button to exit the Preset function.

Fig.3

Fig.4

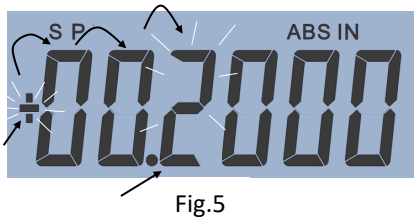

Fig.5

1 - To enter into Preset mode;

Press  Then 

2 - To cycle from digit to digit and back to preset;

Press 

3 - To increment the value of the digit or the plus/minus sign;

Press 

4 - To exit the Preset function;

Pres  When Preset is flashing;

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2.1 Setting the Limits (Go/No Go Function)

Note: This function is only available with the 6 button indicators.

1. Select the units to be displayed with the ***IN/mm*** button.
2. Press the ***SHIFT/SET*** button. The SET icon will appear in the upper left corner Fig.6A.
3. Press the **LIMITS** button. The MIN LIMIT icon (MIN LIM) will appear in the upper middle of the display Fig.6B.
4. Press the ***SHIFT/SET*** button. The LIMIT icon will flash on/off.
5. Adjust the gauge using a reference surface to the desired minimum value.
6. Press the ***SHIFT/SET*** button to capture the minimum value. The LIMIT icon will stop flashing. Continued on next page...

Fig.6A

1 - To enter Min Limit mode.

Press *SHIFT/SET Button* Then *LIMITS Button*

2 - To enter the Min value.

Press *SHIFT/SET Button* The LIMIT icon will start flashing.

Adjust the gauge using a reference surface to the desired minimum value.

Fig.6B

3 - To capture the minimum value

Press *SHIFT/SET Button* The LIMIT icon will stop flashing

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8. Press the **LIMITS** button. The MAX LIMIT icon will appear in the top middle of the display, see Fig.7.
9. Press the ***SHIFT/SET*** button. The LIMIT icon will flash on/off.
10. Adjust the gauge using a reference surface (gage block) to the desired maximum value.
11. Press the ***SHIFT/SET*** button to capture the maximum value. The LIMIT icon will stop flashing.
12. Press the **LIMITS** button to use the go/no go function. The display will flash unless the reading is within the range that you set your limits to. The SET icon will remain on. The MAX and MIN icons will stay off as long as the reading is within the set limits. If the measurement is beyond the set limits, the display will flash either the MIN or MAX LIMIT icon to indicate the direction the limit has been exceeded. To exit Press the **LIMITS** button.

1 - To enter Max Limit mode.

Press *LIMITS Button* The MAX LIMIT icon will appear.

2 - To enter the Max value.

Press *SHIFT/SET Button* The LIMIT icon will start flashing.

Adjust the gauge using a reference surface (gage block) to the desired maximum value.

Fig.7

3 - To capture the maximum value;

Press *SHIFT/SET Button* The LIMIT icon will stop flashing

Press *LIMITS Button* The Indicator is now set up with a maximum and minimum limit range.

Press *LIMITS Button* To exit Limit mode when you have completed your measurements

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2.2 Setting the MIN/MAX/TIR Function

The Min/Max/TIR (Total Indicator Reading or Run-out) function measures the minimum and the maximum values of a surface (usually rotating) and then calculates the difference between them. (TIR),
Note: This function is only available with the advanced type indicators.

1. Select the units to be displayed.
2. Bring the indicator down to the part being measured, to a point that is around half the travel of the indicator.
3. Lock in the indicator at this height.

Note: Care must be taken; to make sure the difference between the high and low measurements are not outside of the travel of the indicator as setup. Either your low measurement will be wrong or your high measurement might jam the spindle and damage your indicator.

4. Press the ***MIN/MAX/TIR*** button. The *MIN* icon will appear on the display.
5. Press the **ZERO/ABS** button to measure the part.
6. Move the part under the indicator to find the low spot.
   You will know because the value will not change.
7. Press the ***MIN/MAX/TIR*** button. The *MAX* icon will appear on the display.
8. Press the **ZERO/ABS** button to measure the part.
9. Move the part under the indicator to find the high spot.
   You will know because the value will not change.
10. Press the **MIN/MAX/TIR** button. The *TIR* icon will appear on the display, and the display will show the value of the TIR.
11. Replace the part being measured, and repeat the sequence starting at step two.

Fig.8A

1 - To start measuring in Min mode;

Press MIN/ MAX/TIR Then ZERO ABS

2 - Next, to start measuring in Max mode;

Press MIN/ MAX/TIR Then ZERO ABS

3 - To display the TIR value;

Press MIN/ MAX/TIR

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Section 3 Rechargeable Battery

3.0 2900 Rechargeable Battery Care and Maintenance

The rechargeable battery in your tool will last far longer when maintained properly. When the charge on the battery is getting low, a battery symbol will be visible on the middle left side of the display (Fig.13C). When you see this icon, charge the battery at the next opportunity. Fig.12 shows where to attach the USB Micro B side of the cable into the tool. The USB cable is keyed to plug in only one way, check the orientation of the cable end and the USB port before plugging in the cable. The tool may be used while it is plugged in. See Fig.13A-E for information about the changes to the battery icon and what they mean.

If you wait to long to recharge the battery, the tool will automatically shut down completely to conserve the remaining charge on the battery. The battery must have a minimum charge to be recharged. If the tool will not turn on with the on/off button, then you must charge the tool. When the tool is plugged in after being completely shutdown, the tool will go through an initialization startup phase, See "Startup Sequence" in this manual, Pg. 10. We recommend that the tool only be charged when the battery icon is visible to help prolong battery life. Depending on use, the time between charges could be weekly under heavy use or monthly under light use.

Fig.12

The USB Micro B side of the charging cable plugs into the USB port at the top of the Indicator as shown.

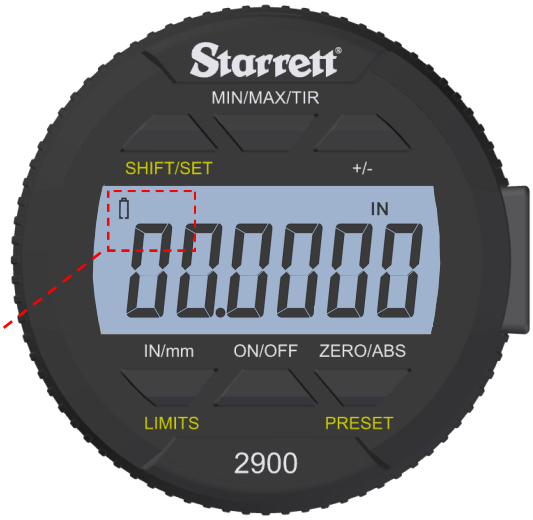

Fig.13A

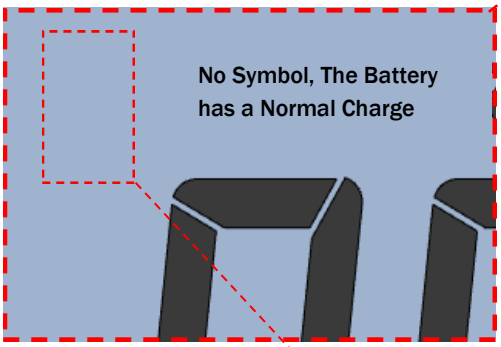

Fig.13B

NOTE: The tool may be used while charging.

Battery Charge is Low

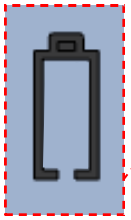

Fig.13C

Battery is Charging

Fig.13D

Blinking

Battery is Charged, and the USB cable is still attached

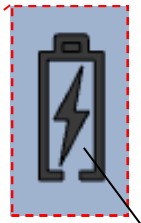

Fig.13E

Stops Blinking

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3.1 Startup Sequence

1. After the tool has shut down completely, and you have plugged it in to charge, the tool will flash a sequence of information on the display, see the examples below (Fig's.14-17). This is normal for the indicator and a description of the screens is shown.
2. At the end of the sequence you will re-initialize the measurement system. When "CAL" is displayed (Fig.18), move the spindle slowly in and out, until the display starts to show measurements. This movement will calibrate the indicator.

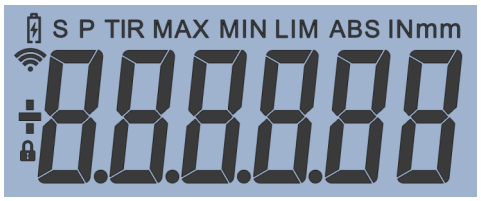

Fig.14 Full Lamp, shows all characters.

Fig.15 Catalog Number

Fig.16 2900 Series

Fig.17 Firmware Version

Note: The information displayed above will change depending on the indicator you are using and is only intended to serve as an example.

3.2 Calibrate

3. If you don't move the spindle, "Cal" will stay on the display for about 10 seconds and the display will go blank.
4. To return to "Cal" mode move the spindle or quickly press the on/off button.
5. If you move the spindle to fast it will take longer for the tool to initialize.

Fig.18 Calibrate the Indicator

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Section 4 Specifications and Accessories

4.0 2900 Specifications

CAT#	RESOLUTION	SIZE	STEM
2900-3-1	.0005"/ .01mm	1”/25 mm	.375” DIA
2900-3M-25	.01mm	25 mm	8mm DIA
2900-3ME-25	.0005"/ .01mm	1”/25 mm	.375” DIA
2900-5-1	.00005"/ .001mm	1”/25 mm	.375” DIA
2900-5M-25	.001mm	25 mm	8mm DIA
2900-5ME-25	.00005"/ .001mm	1”/25 mm	.375” DIA

Environmental Consideration		
Temperature		10-30 °C, 50-86 °F
Humidity		30-85%RH (no condensation)
Atmosphere		Non-corrosive, Nonflammable
IP67 Rating		Ingress Protection
6	Dust Tight	No ingress of dust, complete protection against dust.
7	Immersion up to 1 Meter	Up to 1m of submersion for up to 30 minutes

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Note: Remember, to ensure the specified IP67 performance, the following items will need to be intact and securely
assembled onto the indicator.

- Spindle Bellows
- Back lug with Gasket
- Stem Cap
- Data Output Cover or Data Cable with Gasket
- Note: All items that have screws will need to be secured at least finger tight.

4.1 Accessories

The 2900 series comes standard with a Lug-On-Center back. The back is easily removed by unscrewing the four screws as shown in Fig.19.

Do not touch any of the inner workings of the indicator, and protect them from liquids, dust, and any other foreign matter. Replace the back-lug as soon as possible. Some examples of the different back-lugs are listed below.

The Contact Point is another one of the parts on your indicator that is interchangeable. The contact point can be removed by carefully while holding the spindle firmly with one hand and then unscrewing it counter- clockwise with your other hand. Replace the contact point the same way, turning the tip on clockwise. Remember to tighten the tip finger tight. Excessive radial rotation of the spindle shaft may cause your indicator to stop functioning properly. Special contact points are listed on the next page.

These backs, contact points and all of the available indicator accessories can be found in your Starrett catalog or online at:
https://www.starrett.com/catalogs

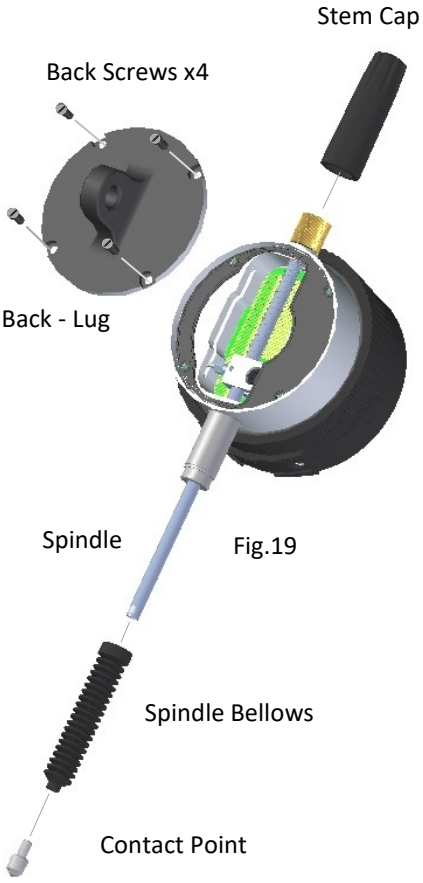

Fig.19

4.2 AGD DIAL INDICATOR BACKS

Part Number	Description	EDP#
PT06608-1	LUG OFF CENTER, #25	70770
PT06608M	ADJUSTABLE BRACKET, #25	70776
PT24076	SCREW-TYPE LUG BACK 1/4-20 THREAD	72483
PT06608E	SCREW-TYPE LUG BACK 3/8-24 THREAD	70772
PT24075	SCREW-TYPE LUG BACK 1/4-28 THREAD	72487
PT06608F	POST-TYPE LUG BACK, #25	70773
PT06608J	FLAT BACK, #25	70774
PT26160	FLAT BACK PLASTIC, #25	67405

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4.3 Contact Points, Adaptor and Extensions

Part Number	Description	EDP#
PT06632-2	CONTACT POINT , #2 	70790
PT06632-3	CONTACT POINT, #3 	70791
PT06632-4	CONTACT POINT, #4 	70792
PT06632-5	CONTACT POINT, #5 	70793
PT06632-6	CONTACT POINT, #6 	70794
PT06632-7	CONTACT POINT, #7 	70795
PT06632-8	CONTACT POINT, #8 	70796
PT06632-9	CONTACT POINT, #9 	70797
PT06632-10	CONTACT POINT, #10 	70798
PT06632-11	CONTACT POINT, #11 	70799

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Part Number	Description	EDP#
PT06632-12	CONTACT POINT, #12 	70800
PT06632-13	CONTACT POINT, #13 	70801
PT06632-14	CONTACT POINT, #14 	70802
PT06632-15	CONTACT POINT, #15 	70803
25W	ROLLER CONTACT POINT -----	53916
25R	CONTACT POINT SET OF 14 POINTS -----	50153
PT24728	CONTACT POINT ADAPTOR, MM TO INCH 	64963
PT24729	CONTACT POINT ADAPTOR, INCH TO MM 	64964
PT21697-1/2	CONTACT POINT EXTENSION, ½” 	64632
PT21697-1	CONTACT POINT EXTENSION, 1” 	64633
PT21697-2	CONTACT POINT EXTENSION, 2” 	64634
PT21697-3	CONTACT POINT EXTENSION, 3” 	64635
PT21697-4	CONTACT POINT EXTENSION, 4” 	64636

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