

User Manual

2900 Capacitive Series Electronic Indicator



IP67

2900-3-1
2900-3M-25
2900-3ME-25
2900-5-1
2900-5M-25
2900-5ME-25

Table of Contents

Guidelines for Indicator Care	2
2900 Capacitive Series Indicator Models.....	3
Button Functions.....	4
Indicator Components, Dimensions & Layout	5
Operating Instructions.....	5
Setting the PRESET Function*	6
Setting MIN/MAX Limits (Go/No Go)*	6
Displaying MIN/MAX/TIR Values*	8
Data Output Connection	8
Battery Installation.....	9
Parts & Accessories	9
Appendix A: Technical Specifications.....	10
Appendix B: Serial Output Connector.....	11

*Available on 2900-5 Advanced Features Models

Guidelines for Indicator Care

1. Avoid dropping the indicator.
2. Avoid extreme temperatures and direct sunlight for extended periods.
3. Avoid shocks to the contact point and spindle.
4. Do not apply radial force to the spindle.
5. If the indicator is stem-mounted, protect it from being hit or bumped to avoid stem/case mechanical alignment damage.
6. Do not over-tighten the mounting mechanism. If possible, use clamp mounting rather than set screws to prevent damage to the spindle.
7. Clean the spindle frequently with 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 lubricant to the spindle or use solvents.
8. Do not disassemble or modify the indicator.

2900 Capacitive Indicator Models, Feature Level, Resolution & Range

Cat. No.	EDP	Description	Resolution	Range	Stem Diameter
2900-3-1	09963	Standard Features English	.0005"/.01mm	1"/25mm	.375"
2900-3M-25	09964	Standard Features Metric	.01mm	25mm	8mm
2900-3ME-25	09975	Standard Features English/Metric	.0005"/.01mm	1"/25mm	8mm
2900-5-1	09967	Advanced Features English	.0005"/.01mm	1"/25mm	.375"
2900-5M-25	09968	Advanced Features Metric	.01mm	25mm	8mm
2900-5ME-25	09978	Advanced Features English/Metric	.0005"/.01mm	1"/25mm	8mm



Button Functions

The functions printed in yellow; LIMITS and PRESET are used in conjunction with the SHIFT/SET button (also yellow).

To enable these functions press the SHIFT/SET button first. The SET (S) icon will appear in the top left corner. Then press the button for the required function.



1	ON/OFF	Power button. Press and release to turn on, and press and hold for three seconds to turn off.
2	+/-	Plus/Minus sets the direction of the reading
3	ZERO	Press and release the ZERO button and the display will zero. The spindle must not be moved from its zero location until after two seconds have elapsed.
4	IN/mm	Toggles the display between English or Metric modes.
5	SHIFT/SET	Dual function button used to enable the, Preset and the Limits (Go/No Go) function. When enabled the SET (S) icon will be displayed on the top left corner of the display.
6	LIMITS	Press the SHIFT/SET button, then press the LIMITS button to enable the Go/No Go function. This sets the Min and Max values for the Go/No Go function.
7	PRESET	Press the SHIFT/SET button then press the PRESET button to enable the PRESET function.
8	ZERO/ABS	Dual Function. Press and hold for two seconds to activate the ABS mode or to exit the ABS mode. To zero the display, see #3 above.
9	MIN/MAX/TIR	Displays the minimum or maximum values captured during setting the min/max limits operation. The TIR function displays the difference between the two captured readings.

Indicator Components, Dimensions & Layout



Operating Instructions


1. Install batteries (included with indicator).
2. Lightly clean the contact point.
3. Secure the indicator to an appropriate holding device.
4. Press the ON/OFF button (or move the spindle) to turn the indicator on.
5. Select the unit of measure (inch or mm) by pressing the IN/mm button. ME indicators have this function but standard metric indicator models do not.
6. Place the indicator perpendicular to the reference surface being measured. Allow enough movement to be able to take a higher or lower measurement.
7. Press the ZERO button to reset the display.
8. Lift the spindle and remove the reference surface. Then, place the work piece and carefully position the spindle on to its surface. The measured value will be shown on the LCD.
9. Press and hold the ON/OFF button to turn the indicator off. If left unattended, it will turn off automatically in 30 minutes.


Setting the PRESET Function*

1. To set a value, press and hold the ZERO/ABS button until the ABS icon appears in the upper right corner of the LCD (right). The values can be SET to: +/-99.99999" or +/-9999.999mm.
2. Press the SHIFT/SET followed by the PRESET button. The SET (S) and PRESET (P) icons will appear in the upper left corner of the LCD. The PRESET icon will be flashing (middle right).
3. To move from the PRESET icon to a digit, press the SHIFT/SET button. A flashing digit indicates that it is ready to be SET (lower right). Press the PRESET button to increment the value. To set, press the SHIFT/SET button.
4. To move to the next digit press the SHIFT/SET button and repeat step 3. Repeat steps 2 and 3 until all the digits are SET.
5. To set a negative value, press PRESET when the plus/minus sign icon is flashing.
6. To exit the PRESET function, press the PRESET button when the PRESET icon is flashing. The SET value will remain displayed.
7. Press and hold the ZERO/ABS button to return to the active measuring mode.



Press  Then  to enter Preset Mode

Press  to cycle from digit to digit and back to preset

Press  to increment the value of the digit or the plus/minus sign

* Available on 2900-5 Advanced Features Models

Setting MIN/MAX Limits (Go/No Go Function)*

1. Select the units to be displayed.
2. Press the SHIFT/SET button. The SET icon will appear in the upper left (right).
3. Press the LIMITS button. The MIN LIMIT icon will appear in the upper middle of the display.
4. Press the SHIFT/SET button. The LIMIT icon will flash on/off.
5. Adjust the spindle to the desired minimum value.



6. Press the SHIFT/SET button to capture the minimum value. The LIMIT icon will stop flashing.
7. Press the LIMITS button. The MAX LIMIT icon will appear on the LCD (right).
8. Press the SHIFT/SET button. The LIMIT icon will flash on/off.
9. Adjust the spindle to the desired maximum value.
10. Press the SHIFT/SET button to capture the maximum value. The LIMIT icon will stop flashing.
11. Press the LIMITS button go/no go function. If the reading is not within the set range, the display will flash and 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 and the MIN or MAX LIMIT icon will indicate the direction the limit has been exceeded. To exit Press the LIMITS button.



Press  Then  to enter Min Limit Mode

Press  The LIMIT icon will flash on/off

Press  adjust the spindle to the desired minimum value. →



Then press  To capture the minimum value. The LIMIT icon will stop flashing.


Press  The MAX icon will appear.

Press  The LIMIT icon will flash on/off.

Press  Adjust the spindle to the desired value →



Then press  To capture the maximum limit. The LIMIT icon will stop flashing.

Press  The Indicator is now set up with a maximum and minimum limit range

Press  To exit the LIMIT mode.

* Available on 2900-5 Advanced Features Models

Displaying MIN/MAX/TIR Values*

(TIR is "Total Indicator Reading")

Pressing the MIN/MAX/TIR button displays the MIN/MAX/TIR values most recently measured.

Press once for MIN (above right), twice for MAX (middle right) and three times for TIR (lower right).

Press a fourth time to exit. The MIN/MAX/TIR values may be zeroed by pressing the ZERO button.



* Available on 2900-5 Advanced Features Models

Data Output Connection

To connect an output cable, remove the screws securing the output cover, then remove the cover.

Orient the data cable plug as shown below, plug it in, then secure it with the same screws that held the cover.

When not using output, be sure to keep the output cover on the indicator to protect the electronics



Battery Replacement

To replace the batteries, remove the two Phillips screws that secure the battery drawer, slide out and remove the battery drawer and discard the old batteries.

Place two new CR2032 batteries into the tray with the positive (+) side facing up. Slide the tray carefully into the indicator and secure with the two screws.

To order CR2032 batteries, specify: PT99492. EDP 65650



Parts & Accessories

2900 Series indicators include a Lug-On-Center back. It is interchangeable with a number of separately available backs including Lug-Off-Center, Flat, Adjustable Bracket, Post-Type Lug, and the Screw-type Lug. Be sure to only remove the back cover in a clean environment.

Several other styles of contact points are also available as are replacement screws, spindle, spindle bellows and stem caps. For available accessories and parts, refer to starrett.com online or the Starrett Catalog.



Appendix A: Technical Specifications**Power Requirements and Current Consumption**

Battery	2 – CR2032 Lithium Coin Cells
	Capacity 240 mAh
Automatic Sleep Time	30 minutes of non-use

SPC Serial Output

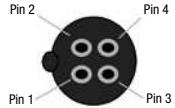
18 ASCII Characters	1 Space character
	2 Status characters indicating the operating mode
	BLANK Normal mode
	OL Displacement outside Lower Limit
	OU Displacement is outside the Upper Limit
	MN Displacement is minimum peak displacement stored
	MX Displacement is maximum peak displacement stored
	TR Displacement is the T.I.R. stored
	LL Displacement is the lower or minimum limit setting
	LU Displacement is the upper or maximum limit setting
	HL Displacement is a held displacement
	1 Sign character (minus but no plus)
	1 Space character (IN mode only)
	6 Digits
	1 Decimal point
	2 Spaces
	2 Character strings to indicate units “IN” or “mm”
	1 Carriage return
1 Line feed	

Communication Protocol

Baud Rate	4800
Data Bits	8
Parity	None
Stop Bits	2
Flow Control	None
Data Request and Response Timing	Receive High to Low Momentary
	Response Time Delay 120 ms
	Transmit Time 45 ms

Appendix B: Serial Output Connector

Pin 1	GND – Signal return
Pin 2	Serial Receive Data Input (RX/RQST)
Pin 3	Serial Transmit Data Output (TX/DATA)
Pin 4	Remote Zero – Special Order Only State Change High to Low

**Serial Input Voltage Level Specification**

Logic "0" $V_{in} < 1.30$ Volts

Logic "1" $V_{in} > 1.98$ Volts

Serial Output Voltage Level Specification

	Minimum	Maximum
Low Level	V_{ss}	$V_{ss} + 0.25$ @ -1.5mA Load
High Level	$V_{dd} - 0.25$ @ 1.25 mA Load	V_{dd}

Note: $V_{ss} = 0$ Volts, $V_{dd} = 2.7$ to 3.6 Volts

Environmental Consideration

Temperature	10-30 °C,
Humidity	30-85%RH (no condensation)
Atmosphere	Non-corrosive, Non-flammable

IP67 Rating (Ingress Protection Rating)

6	No ingress of dust
7	No ingress of water when submerged to 1m deep for 30 minutes
IP67 rating assured only if all parts listed right are attached and tightly secured	Spindle Bellows Back-lug with Gasket Stem Cap Data Output Cover or Data Cable with Gasket Battery Door with Gasket

Starrett®



The L.S. Starrett Company
121 Crescent Street
Athol, MA 01331
Tel: (978) 249-3551
starrett.com

2900
Form 978
1M/T 10/12
The L.S. Starrett Company 2012®
Specifications subject to change.