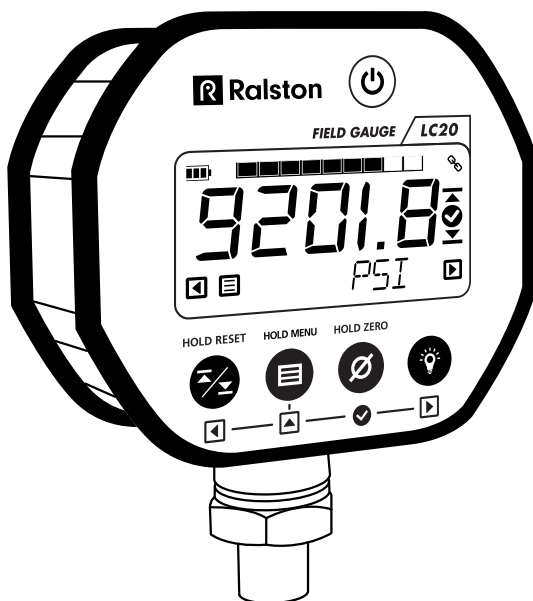


Ralston Field Gauge LC20 (LC20)

Operation Manual



For all models of Ralston Field Gauge LC20 Digital Pressure or Temperature Gauges

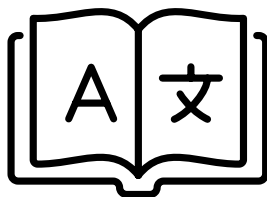


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Included Items

Items included in the package. If any items are missing, please contact your Ralston Instruments distributor.

- **LC20 Pressure or Temperature gauge**
- **2 x AA batteries**
- **2 meter USB Micro-B cord**
- **Bluetooth antenna***

* Note: Only for Bluetooth-enabled LC20s with model numbers ending in "B1"

Need Accessories?

Accessories can be found at ralstoninst.com/LC20-accessories

Important Safety Notices

⚠ WARNING: Do not operate in hazardous locations.

⚠ WARNING: Do not use LC20 until you have read and fully understand the instructions and hazards of the product.

⚠ WARNING: Contents may be under high pressure or temperature.

⚠ WARNING: Any modifications to this product with custom parts can result in hazardous operation of the product.

⚠ WARNING: Use eye protection while using this device.

⚠ WARNING: Do not overpressure LC20 or damage may result.

⚠ WARNING: This product can expose you to chemicals including Lead, which is known to the State of California to cause cancer, and is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

⚠ CAUTION: Installation of LC20 must be in accordance with Ralston Instruments installation instructions.

⚠ CAUTION: Installation of LC20 must be in accordance with applicable local, national and international standards and electrical codes.

⚠ CAUTION: Batteries are not rechargeable and will not be recharged via USB.

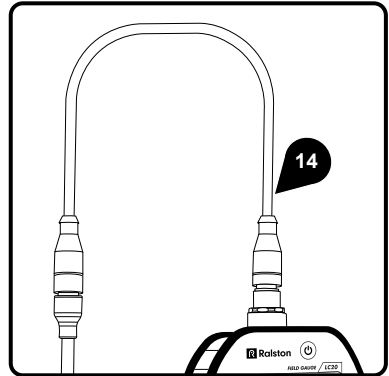
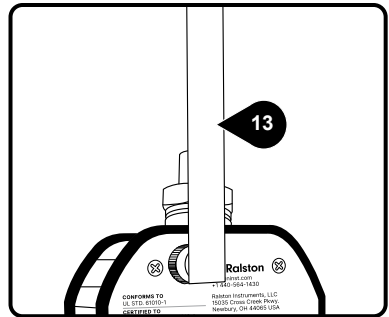
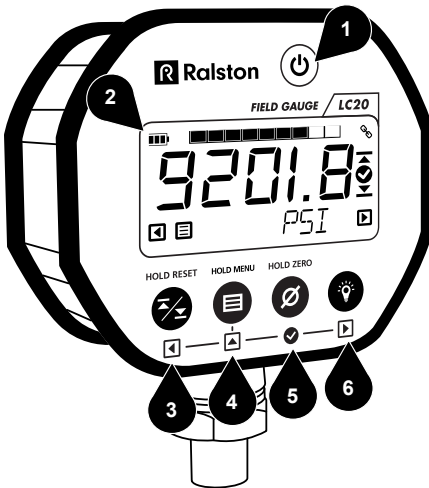
⚠ CAUTION: Use only approved AC/DC power adapter model D-000410.

⚠ CAUTION: Protection impairment may occur if used in a manner not specified by Ralston Instruments.

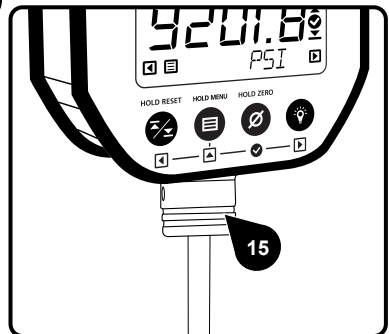
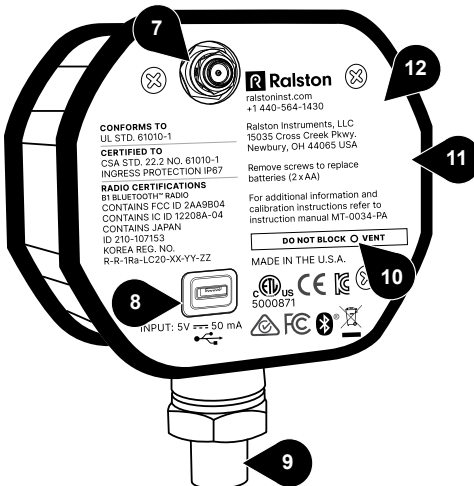
⚠ CAUTION: Only those personnel trained in the use of this device shall operate it.

LC20 Features Overview

Front



Back



1. Power
2. LCD display
3. Left arrow / High/Low/Reset
4. Up Arrow / Menu
5. Accept / Zero
6. Right Arrow / Backlight
7. Bluetooth antenna port*
8. Micro USB port
9. Pressure sensor option

10. Pressure equalizing vent
11. Battery access door
12. Warning label
13. Bluetooth antenna*
14. External temperature probe (LC20 models that contain the letters "TX" in the model number.)
15. Temperature sensor option (LC20 models that contain the letters "TA" in the model number.)

* Only for Bluetooth-enabled LC20s with model numbers ending in "B1"

LCD display



- | | |
|---|--------------------------------------|
| 1. Battery indicator | 5. High and low arrows |
| 2. Graphical pressure/temperature meter | 6. Main pressure/temperature display |
| 3. Connection symbol (USB or wireless) | 7. Secondary display |
| 4. Check mark to indicate success | |



Power Management

Configure display and power management to maximize battery life in the field using FieldLab Desktop software.



Graphic Pressure or Temperature Meter

See pressure or temperature graphically.



High / Low Readings

See continuous Maximum and Minimum pressure or temperature readings over a span of time.



Easily Change Engineering Units

Change to any of the 18 standard pressure engineering units or 4 standard temperature units on the fly. Manage frequently used units or remove unused units with FieldLab Desktop.



Custom Engineering Units

Create custom engineering units using FieldLab Desktop and add them to any LC20 gauge.



View Live Readings on Your PC

View real-time pressure and/or temperature readings on your PC from your LC20 gauge using FieldLab Desktop via USB or wireless.



Log Data on Your PC

Log pressure and/or temperature data on your PC from your LC20 gauge using FieldLab Desktop via USB or wireless.

Use Your LC20 with a PC

Ralston FieldLab Desktop software enables you to:

- Log data directly to your PC from one or multiple LC20s.
- Export data sets in .csv format.
- Export well-presented data sets in PDF format with graphs.
- Update LC20 firmware to access new features as they are released.
- Calibrate your LC20.
- Create custom engineering units.
- Customize settings on your gauge.

1 Download & Install FieldLab Desktop

Visit **[RalstonFieldLab.com](https://www.ralstonfieldlab.com)** to download and install FieldLab Desktop on your Windows PC

2 Open & Follow onscreen instructions in FieldLab Desktop software

3 You're ready to begin!

Find detailed support articles for changing settings, viewing live readings and logging data at **support.ralstoninst.com**

Update the LC20 and FieldLab Desktop

Update the FieldLab Desktop Software

Open FieldLab Desktop on your computer, select “FieldLab Desktop” from the text menu at the top, and select “Check for Updates” from the menu.

Updating your LC20

1. Open FieldLab Desktop on the computer you use to manage your LC20.
2. Connect the LC20 to your computer with a micro USB cable.
3. Select the LC20 from the Devices screen in FieldLab Desktop. Any available updates will be displayed.

Use Your Mobile Device with Your LC20

Note: Only for Bluetooth-enabled LC20s with model numbers ending in “B1”.



Install FieldLab Mobile App

Scan the QR code with your mobile device to install the FieldLab Mobile app, or:

If you have an Apple iPad or iPhone, download it from the Apple App Store.

If you have an Android phone or tablet, download it from the Google Play Store.

Establish Bluetooth Connection to LC20

1. Connect Bluetooth antenna to the LC20.
2. With the LC20 powered on, open the FieldLab Mobile app on your mobile device. If prompted, allow Bluetooth and Location services.
3. Tap the [Scan] button to find your LC20.
4. When your LC20 appears on the screen in the mobile app, select [Connect].

You can connect multiple LC20 gauges to the FieldLab Mobile app.

Set Logging Interval and Measurement Units

Before you start logging, set your desired logging interval and measurement units in the mobile app.

Start and Stop Logging on LC20

Start Logging

While the LC20 is connected to FieldLab Mobile, select [Start Logging] in the FieldLab Mobile app.

What Happens When You Leave Bluetooth Range While Logging

Once you start logging, data is saved locally to the LC20.

You can monitor live readings from your mobile device in the FieldLab Mobile app while connected and within Bluetooth range, which is 100 meters max.

If your mobile device leaves Bluetooth range, it will lose its connection with the LC20, and FieldLab Mobile will be unable to display live readings. Regardless, the LC20 will continue to log data for as long as it has battery/USB power or until the LC20 memory is full.

Stop Logging

Select [Stop Logging] in the FieldLab Mobile app.

Once you stop logging, the FieldLab Mobile app will automatically import the data set from the LC20 and save it to the Data Sets section of FieldLab Mobile.

View Data Sets

Select the [Data Sets] button in the FieldLab Mobile app.

Export and Share Data Sets

1. Select the [Data Sets] button in the FieldLab Mobile app.
2. Select the data set you want to share.
3. Select the [Share] button.

Conditions of Use

- **Environment:** Indoor use or temporary outdoor use. For long term or permanent outdoor use, a suitable enclosure may be required.
- **IP67 Rating:** LC gauges with external thermal probes must have the thermal probe cable installed in M12 connector on gauge to maintain IP67 rating. Note: Only for models with detachable thermal probes that include the letters “TX” in the model number.
- LC gauge requires (2) AA Batteries, power from a PC via USB or power from AC power adapter D-000410 via USB to operate.
- **RF Exposure Statement:** The LC20 device when used with approved antenna complies with the FCC and IC portable RF Exposure limits set forth for an uncontrolled environment and is safe for intended operation as described in the user manual. To comply with RF exposure limits established in the ANSI C95.1 standard, the distance between the antenna and the user should not be less than 25 cm (10 inches) for USA and 34 cm for Canada. Further RF exposure reduction can be achieved if the product can be kept as far as possible from the user's body.

Installation Instructions

- Ensure that gauge is oriented in such a way that the “Power” button is always easily accessible.
- If pressure sensor option is installed, then seal pressure connection with thread sealant prior to assembling it in any pressure system.
- If temperature sensor option is installed, then connect thermal probe using a rated thermal well or other approved device.
- Place gauge in area that is protected from damage from weather, excessive temperature, impact or humidity.

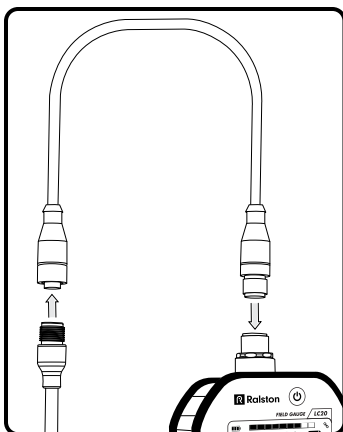
Connecting to Accessories or Other Equipment

Connect to a PC via USB cable

- Use only approved USB cable P/N D-000040

Connect to AC Mains

- Use only approved power adapter P/N D-000410 and approved USB cable P/N D-000040



Note: Only for models with detachable thermal probes that include the letters “TX” in the model number.

Connect to External Thermal Probe

Note: Only for models with detachable thermal probes with the letters “TX” in the model number

- Connect thermal probe cable to gauge using male end of thermal probe cable.
- Connect thermal probe to cable using female end of thermal probe cable.
- If cable is being installed permanently, then secure cable following all applicable electrical standards.
- Use only approved thermal probe P/N D-000403 that has been calibrated with this device.
- Use only approved thermal probe cable P/N D-0000404.
- External thermal probe is calibrated with the base unit. If thermal probe is changed, then use FieldLab Desktop to update the serial number and calibration coefficients of the new thermal probe.



Note: Only for Bluetooth-enabled LC20s with model numbers ending in “B1”.

Connection of Antenna

Note: Only for Bluetooth-enabled LC20s with model numbers ending in “B1”. Use only approved antenna P/N D-000041.

- Use only approved antenna.
- Thread approved antenna into gauge Bluetooth port.
- Align antenna vertically for best signal reception.
- Do not obstruct line of sight between antenna and receiver with metal or dense materials or a reduction or loss of signal may result.

Instructions for Cleaning or Decontamination

- Clean enclosure with mild water-based cleaner. Do not use aggressive solvent.
- Flush pressure sensor or thermal probe with alcohol based cleaner (or other cleaner compatible with 316 Stainless steel) if toxic or other hazardous substance is used.

Button Functions



Power

- Press and hold to turn on.
- When LC20 is on, press and hold to turn off.

Note: The LC20 will power off automatically after 10 minutes of no use unless it is logging data. If it is logging data, it will never power off automatically. You can adjust Auto Power Off settings in FieldLab Desktop software.



Hi/Low/ Reset

- Press button once to display highest pressure or temperature reached.
- Press button again to display lowest pressure or temperature reached.
- Press and hold button to clear high and low values.
- Hi/Low/Reset applies to the Active Sensor. If there are 2 sensors, then change sensors to use Hi/Low/Reset for the other sensor.



Menu

- If 2 sensors, quick press to change sensors.
- Long press initiates MENU and follow prompts.



Zero Pressure

- With no pressure applied, press and hold button to zero reading.



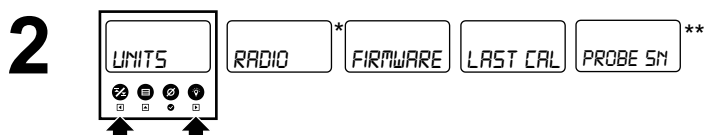
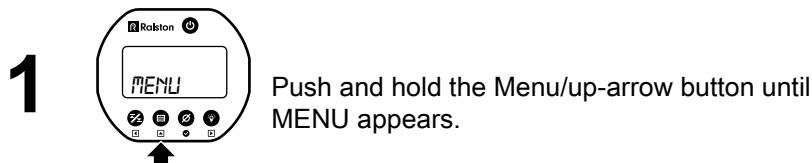
Backlight

- Press button to illuminate backlight.

Note: Light will turn off after a set time. Both time and brightness can be adjusted in FieldLab Desktop software.

Menu Functions

Menu

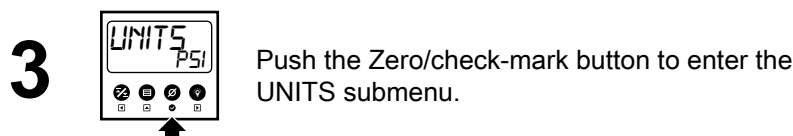
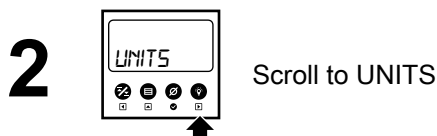
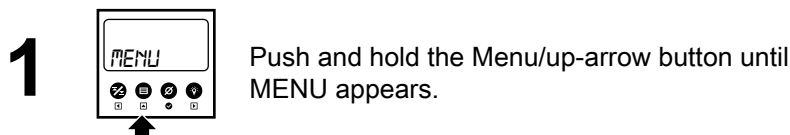


Push the Right and Left Arrow buttons to scroll through the menu items.

* Note: Only for Bluetooth-enabled LC20s with model numbers ending in "B1".

**Note: Only for models with detachable thermal probes that include the letters "TX" in the model number.

Change Units



4



Scroll to your desired measurement unit.

5



Press the Zero/check-mark button to change to the displayed engineering unit.

Turn Off/On Bluetooth Radio

Note: Only for Bluetooth-enabled LC20s with model numbers ending in "B1".

Note: Bluetooth radio is always on by default when you power on the LC20.

1



Push and hold the Menu/up-arrow button until MENU appears.

2



Scroll to RADIO

3



Push the Zero/check-mark button to enter the Radio submenu.

4



Push the Zero/check-mark button to toggle the radio power.

View Firmware Version

1



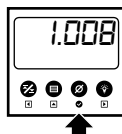
Push and hold the Menu/up-arrow button until "MENU" appears.

2



Scroll to FIRMWARE.

3



Press the Zero/check-mark button to view firmware version.

View Last Calibration Date

1



Push and hold the Menu/up-arrow button until MENU appears.

2



Scroll to LAST CAL.

3



Press the Zero/check-mark button to view last calibration date.

View Temperature Probe Serial Number

Note: Only for models with detachable thermal probes that include the letters "TX" in the model number.

1



Press and hold the Menu/up-arrow button until MENU appears.

2



Scroll to PROBE SN.

3



Press the Zero/check-mark button to enter the Probe submenu and view the serial number.

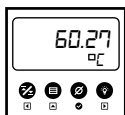
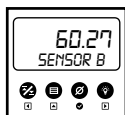
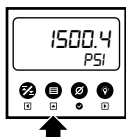
4



Press the Menu/up-arrow button to exit.

Change the Sensor Displayed on the Screen

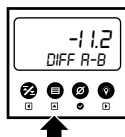
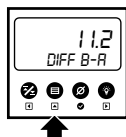
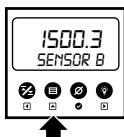
Note: Only for LC20s with two sensors.



Press the Menu/up-arrow button to change the sensor shown on the LC20 screen.

View Differential Pressure

Note: Only for LC20s with two pressure sensors that have the same max pressure.



Press the Menu/up-arrow button.

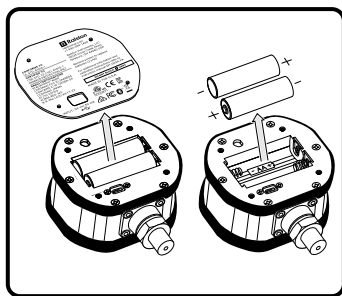
Each time you press the Menu/up-arrow button, you will advance to the next view.

Battery Installation

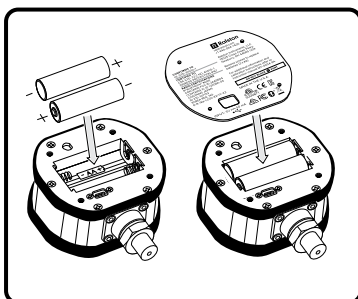
1



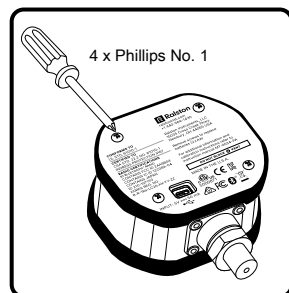
2



3



4



Recommended Alkaline AA Batteries (2X) (ANSI 15A, IEC LR6)

- Duracell MN1500
- Energizer EN91
- Energizer E91
- Rayovac Max Plus 815

Calibration

- Download the FieldLab Desktop software at **RalstonFieldLab.com**
- Follow instructions in software on how to calibrate pressure or temperature

Specifications

Antenna (for LC20 model numbers ending in "B1")	D-000041 antenna
Batteries	2 x AA (LR6)
Battery Life	1,500 hours typical
Digital Interface	USB Micro-B (on back)
Dimensions (not including temp. probe)	3.5 x 4.1 x 2.2 in (8.9 x 10.4 x 5.6 cm)
Display	5 x 0.5 in (12.7 mm) upper digits 8 x 0.2 in (5 mm) lower digits
Electrical Rating	USB Mode - 5 VDC, 0.25W Battery Mode - 3 VDC, 0.25W Power Adapter - 90 ~ 264 VAC Input, 5 VDC @ 1 Amp Output
Environment	Indoor use Temporary outdoor use
Ingress Protection	IP67 (1 meter submersion for 30 minutes)
Materials of Construction	Polycarbonate, Aluminum, 316L Stainless Steel
Media Compatibility	Gases and liquids compatible with 316L S.S.
Operating Altitude (max)	10,000 ft (3050 m)
Operating Temperature Range (Enclosure)	-4 to 122°F (-10 to 50°C)
Power	2 x AA batteries, D-000040 power adapter (optional)

Protection Class	Pollution Degree 2
Relative Humidity	90% RH 14 to 95°F (-10 to 35°C) 75% RH 95 to 104°F (35 to 40°C) 45% RH 104 to 122°F (40 to 50°C)
Storage Temperature Range	-40 to 167°F (-40 to 75°C)
USB Cable	USB Micro, 2 meter, shielded
Weight	12 oz (340 g)

Pressure Specifications

(for all models with pressure connection, if included)

Pressure Accuracy	+/-0.1% of full scale (ASME Grade 4A / ISO Class 0,1)
Pressure Connection	¼" Male NPT

Temperature Specifications

(for all models with thermal probe, if included)

External Temperature Probe	M12 female, A Code, Silicone seal, IP67
External Thermal Probe Temperature Range	-22 to 302°F (-30 to 150°C)
Internal Temperature Probe	Permanently mounted - dimensions vary with model, IP67
Temperature Accuracy	+/- (0.27 + 0.004* t) °F +/- (0.15 + 0.002* t) °C

Bluetooth Radio Specifications

Note: Only for Bluetooth-enabled LC20s with model numbers ending in "B1".

- Contains FCC ID 2AA9B04
- Contains IC ID 12208A-04
- Contains Japan ID 210-107153

Bluetooth Radio Information

Note: Only for Bluetooth-enabled LC20s with model numbers ending in “B1”.

FCC Declaration of Conformity

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Declaration of Conformity

This device complies with Industry Canada's licence-exempt RSS standards. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation of the device.

KCC Notice of EMC Compliance (Republic of Korea Only)

- It is verified that this equipment has been registered under the Radio Waves Act (Article 58-2, Clause 3)
- Registration Number R-R-1Ra-LC20-XX-YY-ZZ

Standards and Agency Approvals

This product complies with the following standards. Refer to EC Declaration of Conformity for specific details

- CAN/CSA-C22.2 No 61010-1-12: 3rd Edition
- UL 61010-1: 3rd Edition
- EN/IEC 61010-1:2010
- AS 61010-1, 3rd Edition
- IEC 61326-1:2012 2nd Edition
- Pressure Equipment Directive (PED) 2014/68/EU
- Electromagnetic Compatibility Directive (EMC) 2014/30/EU

Electromagnetic Specifications

Conducted RF	IEC 61000-4-6, performance criterion B
DC Power Burst	IEC 61000-4-4, performance criterion B
DC Power Surge	IEC 61000-4-5, performance criterion B
Electro-static Discharge Immunity	IEC 61000-4-2:2008, performance criterion B
Radiated Emissions	CISPR 11:2009, Group 1, Class B
Radiated, Radio-Frequency Electromagnetic Immunity	IEC 61000-4-3:2006, performance criterion A
RF Field effects on Measurement Accuracy	Accuracy of Pressure and Temperature is not specified for RF fields > 3V/m

Support

Online Support

For step-by-step instructions about how to use LC20, install accessories, and troubleshooting, go to: **support.ralstoninst.com**

Customer Service

Contact Customer service directly

Hours: **Monday–Friday 8:30am-5:00pm EST**

Phone: **+1 440-564-1430 | +1 800-347-6575 (US and Canada)**

Email: **support@ralstoninst.com**

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Ralston Field Gauge LC20 (LC20)

Operation Manual

For all models of Ralston Field Gauge LC20 Digital Pressure or Temperature Gauges



ralstoninst.com

Hours: 8:30 am – 5:00 pm EST

Phone: 1 440-564-1430

Toll Free: 1 800-347-6575 (US and Canada)

Support, Parts, and Service: support.ralstoninst.com

Email: support@ralstoninst.com