

IMMERSION PROCESS REFRACTOMETER USER MANUAL

Model: CZ-LQ



SINCE 1999

Thank you for purchasing process refractometer. The manual is specifically designed to guide you in understanding the refractometer functions and characteristics. Please read this manual carefully before using the instrument to ensure safe and correct operation. Please keep this manual safe for future reference.

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Safety Matters

- When measuring substances harmful to human body, please pay attention to protective measures;
- If the instrument starts to overheat, smoke or emit abnormal smell, please turn off the power immediately;
- Do not disassemble or modify this instrument;
- Do not apply water or samples to parts of the instrument other than the prism surface;
- Do not measure corrosive media;
- When not in use for a long time, the power should be turned off.

Please read this manual carefully, fully understand the function and operation of each part of the instrument before use, and check whether each part of the instrument works properly before use.

Use Instructions

- Use the instrument at an altitude below 2000 meters (altitude);
- Use the instrument indoors;
- The operating temperature is between 10℃ and 60℃;
- Do not change the ambient temperature of the instrument suddenly;
- Do not use the instrument in a place with a lot of dust and strong vibration;
- Do not place the instrument in a damp place;
- Do not place heavy objects on the instrument;
- Do not install the instrument in direct sunlight or near a heat source, nor in dusty or corrosive gas environments.

Table of Content

1 Woring Principle..... 4

2 Typical Application 5

3 Product Features 4

4 Drawing 4

5 Technical Specifications..... 4

5.1.Parameters.....4

5.2.Wiring Definition6

6 Product Installation Method and Precautions 6

6.1.Product Installation Diagram.....6

6.2.Installation Precautions.....7

7 Maintenance and Troubleshooting 7

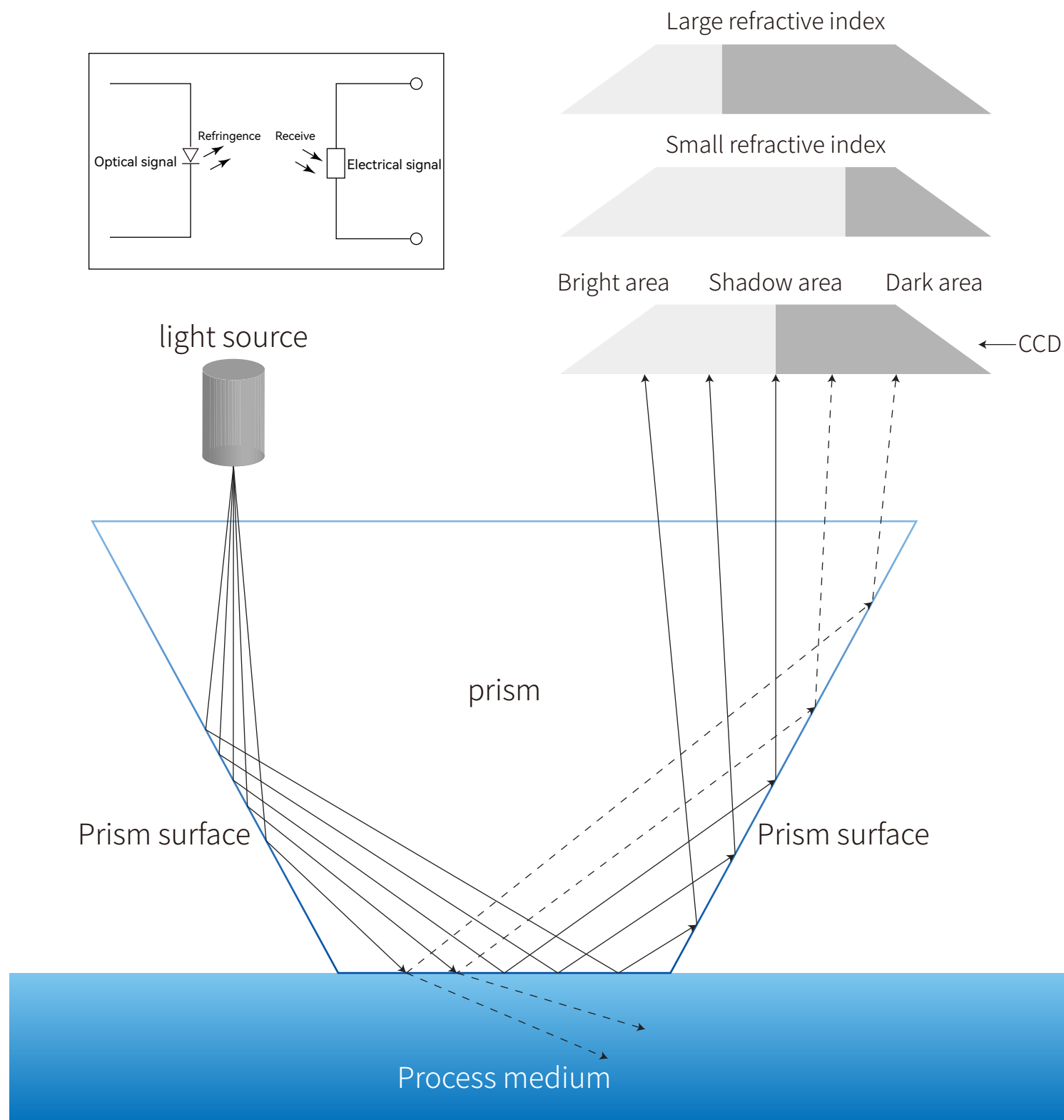
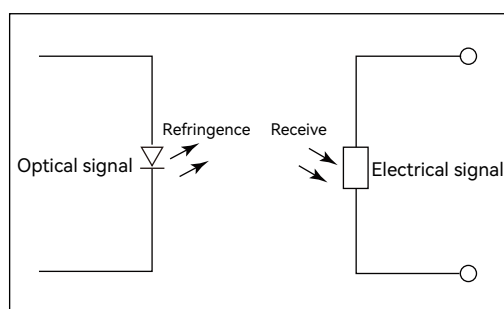
7.1. Daily Maintenance7

7.2.Regular/Scheduled Maintenance.....7

7.3.General Troubleshooting7

8 Product Accessories..... 7

1. Working Principle



The process refractometer consists of a light source, sapphire prism, receiver, and signal modulation circuit. The light source emits a fixed wavelength light signal that passes through the sapphire prism to contact the measured medium. Part of the light signal is reflected and received by the receiver. The receiver calculates the refractive index of the measured medium based on the position of the received light signal, thereby obtaining the corresponding concentration through data algorithms. The transmitter internally employs temperature compensation to reduce the impact of temperature drift.

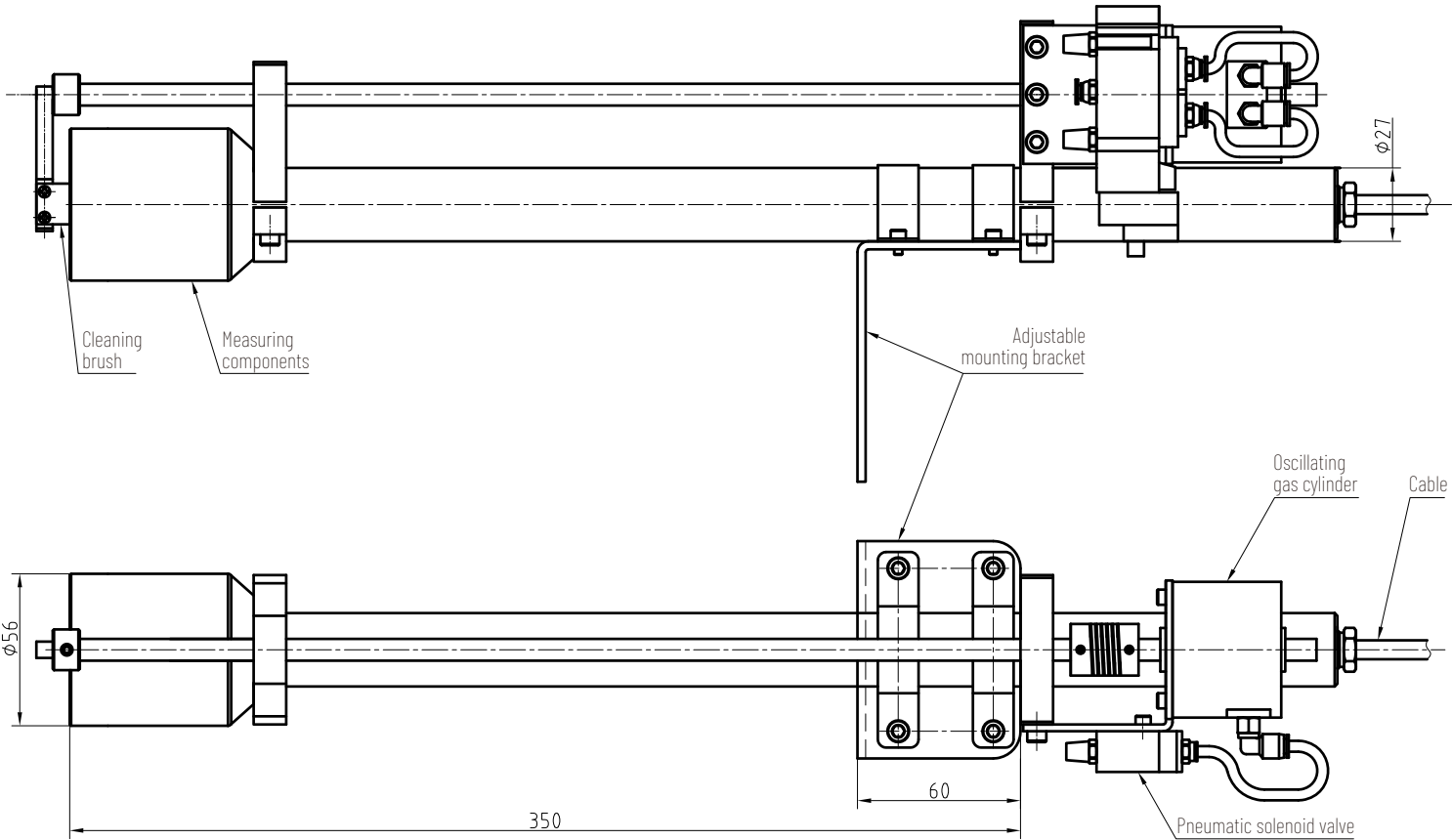
2. Typical Application

- Food and beverage industry
- Fruit processing industry
- Sugar, starch, sweeteners
- Water-based solutions
- Emulsion preparation systems

3. Product Features

- Accurate, fast, stable and reliable
- It has a self-cleaning function
- 4-20mA / RS485 dual output

4. Drawing



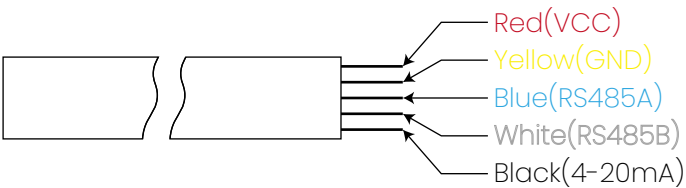
5. Technical Specifications

5.1. Parameters

Product model	CZ-LQ150	CZ-LQ200
Measuring parameters	Temperature (T), Brix(%)	
Measuring range	Brix: 0.0~15.0%	Brix: 0.0~20.0%
Resolution	Brix:0.1% / T:0.1℃	
Accuracy	Brix:±0.3% / T:±1℃	
Temperature compensation	10~40℃	
Power supply	Refractometer: 12~24V DC ; Solenoid valve/controller: 24V DC	

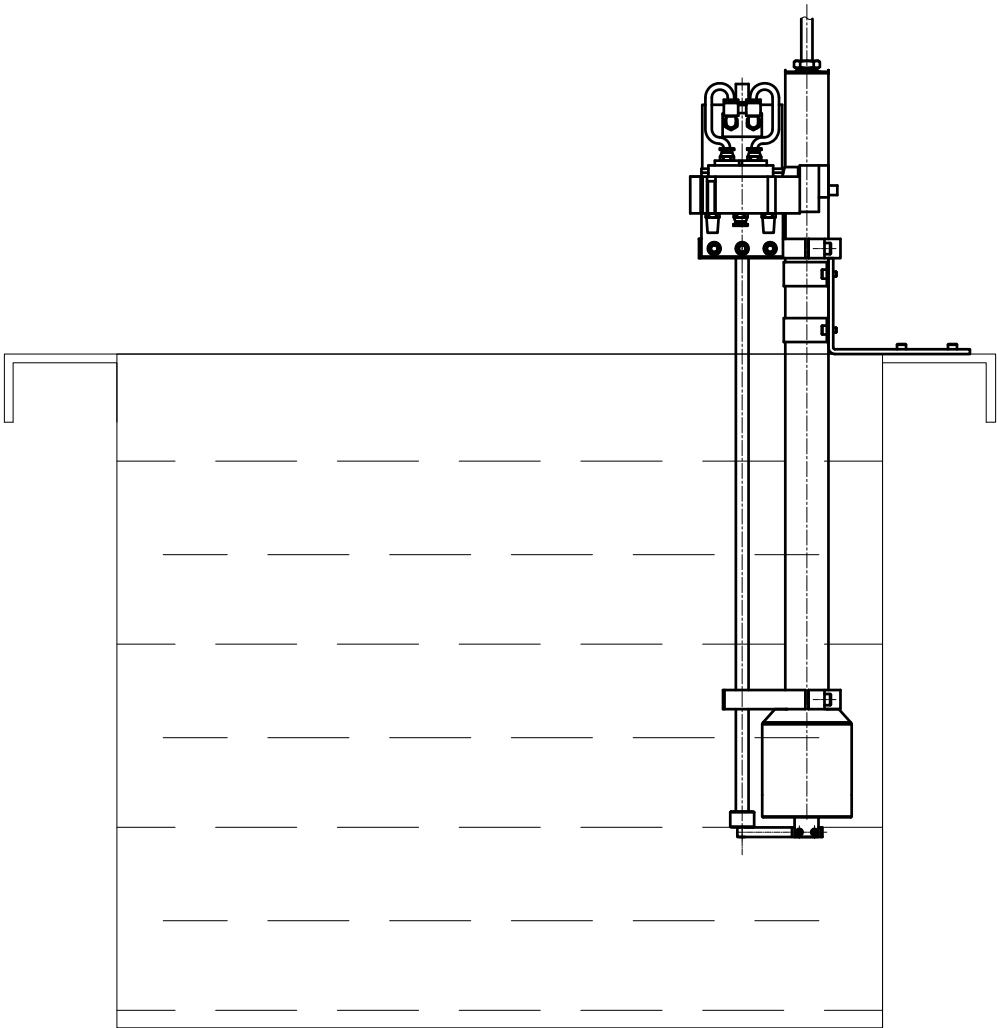
Signal output	DC 4~20mA or RS485
Ambient temperature	10~50 ℃
Protection grade	IP67
Operating pressure	Maximum tolerance 1Mpa
Wetted material	Standard: SS316L (optional: 2205; Hastelloy C-276)
Process medium	Cutting oil; emulsion; sugar content; juice
Installation type	Immersion
Communication Protocol	Standard: modbus (protocol can be customized)
Reset function	Protocol clear (RS485 output)

5.2. Wiring Definition



6.Product Installation Method and Precautions

6.1. Product Installation Diagram



6.2. Installation Precautions

6.2.1 This product is installed via immersion.

6.2.2 During installation, please take special care not to scratch the prism and probe.

6.2.3 During installation, please take special care to avoid subjecting the instrument to strong impacts.

6.2.4 Ensure the cable is connected correctly.

6.2.5 The product should be installed away from the pump outlet to avoid turbulent flow at the outlet causing measurement abnormalities.

6.2.6 The product should not be installed near right-angle bends in the pipeline, as this may cause measurement abnormalities.

6.2.7 Power should only be applied after the product is properly installed.

6.2.8 If the cleaning effect is unsatisfactory after long-term use, the equipment can be disassembled to check the wear of the brushes. If the cleaning requirements are not met, the brushes need to be replaced.

7. Maintenance and Troubleshooting

7.1. Daily Maintenance

If the instrument becomes dirty, wipe it with a soft cloth and do not use gasoline/paint/thinner etc. to clean the instrument.

7.2. Regular/Scheduled Maintenance

- 7.2.1. Every month or so, clean the prism of the concentration transmitter probe, add pure water for testing. If the value is not equal to 4mA, send a zeroing command via RS485 communication to zero the transmitter.
- 7.2.2. Concentration transmitters measuring high-temperature, corrosive media, or operating under vibration conditions should be calibrated every six months.
- 7.2.3. After five years of operation, the concentration transmitter should undergo an insulation resistance test.

7.3. General Troubleshooting

- 7.3.1. If the concentration transmitter has no signal output, first check if the cable is broken or short-circuited. If so, replace the cable.
- 7.3.2. If the concentration transmitter is malfunctioning, first check if there is a power supply input. If the power supply is normal, check if the transmitter's measuring window is contaminated or covered, and ensure that the measuring window is in good contact with the solution being measured. If not, the transmitter is faulty and should be returned to the factory for repair.
- 7.3.3. If the concentration deviation exceeds the accuracy range, it may be due to misoperation causing the original concentration value to be zeroed. The product needs to be removed, the probe inserted into pure water, and a zeroing command sent via the RS485 port, followed by retesting for confirmation.

8. Product Accessories

Process refractometer	1 unit
Instruction manual	1 copy
Certificate of conformity	1 piece
M5*16 screw	4 pieces
M5 spring pad	4 pieces
M5 flat pad	4 pieces

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