IPRM-M Series Inline Refractometer

Compact Size | Easy Installation | High Cost-Effectiveness | High Reliability

CHUYI
Built for Precision

Ethylene glycol Inline refractomter IPRM-M-EG

Product Overview:

The ethylene glycol specialized concentration analyzer (IPRM-M-EG) features an integrated, compact design with measurement, display and control functions combined in one unit. It can be installed directly on the tank wall and delivers excellent performance, suitable for concentration detection of media below 60 °C.

Product Features:

Compact size, easy installation, high cost-effectiveness, high reliability, and selectable host unit.

Measuring substances:

Real-time automatic detection of ethylene glycol solution concentration.

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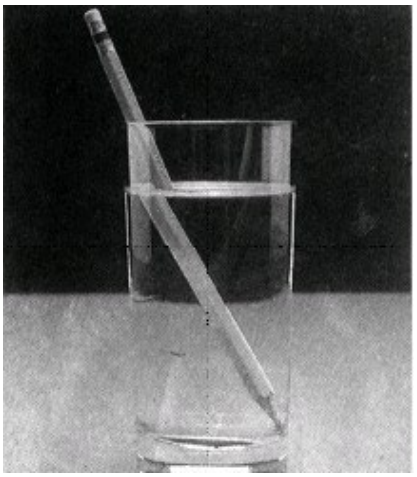
Product Advantages

No Pre-treatment, Measurement in Seconds No sample pre-treatment or reagents/consumables required; the entire measurement takes just seconds.	**Ultra-long-life Light Source** A light source with a service life of up to 100,000 hours cuts usage and maintenance costs.	**Fully Automatic Cleaning** An optional assembly provides fully automatic cleaning of the optical window, preventing contamination from biasing measurement results.	**Unaffected by Color and Turbidity** Not affected by the color, turbidity or viscosity of the sample.
Unaffected by Air Bubbles and Particles Excellent algorithms keep measurement results unaffected by air bubbles, solid impurities or crystals in the sample.	**Unaffected by Pressure and Flow Rate** Unaffected by pressure changes, sudden flow fluctuations or turbulence in the sample.	**No Moving Parts during Measurement** The instrument performs measurement without mechanical movement, ensuring long-term stability.	**Fully Flat Optical Window** The fully flat prism structure prevents dirt from accumulating on the optical window.
Factory Calibration and ATC Factory calibration and automatic temperature compensation make the instrument ready for use immediately.	**Analog and Digital Communication** Supports communication with a host PC, with 4-20 mA and RS485 signal outputs.	**Alarm and Control Output** Supports switching signal outputs for alarms and control.	**Support for Customized Modeling** Supports data modeling, with customizable data models.

Measurement Principle

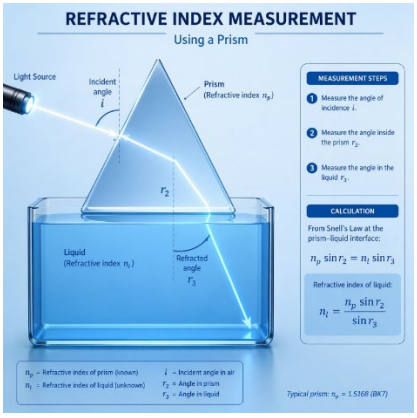
For ethylene glycol, concentration can be determined by the refractive index method. Refractive index has an excellent linear relationship with sample concentration. By measuring the refractive index of samples at different concentrations and temperatures and writing the data into the sensor's internal chipset, automatic detection of sample concentration is realized.

Light refraction is a physical phenomenon in which the direction of light changes when it enters a different medium. This phenomenon can also be observed in everyday life, where the change in light direction makes objects appear 'bent' (see the figure on the right).



Refractive index indicates the degree of light refraction and is proportional to the concentration of the medium. Therefore, compared with a 100 ml aqueous solution containing 10 g of sugar, a solution containing 20 g of sugar has a higher refractive index. Refractive index differences caused by concentration changes have also been confirmed in solutions other than sucrose.

Internal Structure Diagram:



As shown in the internal structure diagram above, light from the LED light source enters the sapphire prism from one side through an optical fiber and reaches the interface between the prism and the liquid medium. Depending on the refractive index of the liquid at the interface, part of the light is totally reflected to the other side of the prism. The position of the totally reflected light shifts with the critical angle (which varies with the refractive index of the liquid). A CCD array precisely detects the position of the reflected light, and each position corresponds to a different refractive index.

Technical Specifications of the Ethylene Glycol Inline Refractometer

Series Type	IPRM-M Mini Series
Product Model	IPRM-M-EG
Product Image	
Measured Parameters	Solution concentration, temperature, refractive index
Measurement Range	Ethylene glycol: 0 to 100.0% w/w Refractive index: 1.3200 to 1.5170 RI
Resolution	0.01%
Measurement Accuracy	±0.2%
Displayed Parameters	Sample concentration, sample temperature, refractive index, mainboard temperature, mainboard humidity
Ambient Temperature	-20 to +50 °C
Measurement Temperature	-20 °C to +60 °C
Prism Material	Optical-grade sapphire
Key Materials	Wetted parts: 316L stainless steel; housing: aluminum alloy
Power Supply	DC 24V or AC 220V
Signal Output	DC 4-20 mA; RS-485; 2 switching signal outputs
Protection Rating	IP65
Process Pressure	≤1.0 MPa (10 bar); higher pressure ratings available on request
Cleaning Options	Optional automatic cleaning assembly
Installation Options	Clamp, flange and pipe adapters, small-bore adapters, etc.
Other Functions	The operating panel displays concentration, temperature, refractive index and other data, and supports fault code prompts, one-key zero calibration and factory reset.

Applications

Data Center Liquid Cooling Systems:

CDU supply/return: Real-time monitoring of coolant concentration in the CDU supply and return headers for real-time insight into the mixing ratio and concentration drift;

Cabinet and server branches: Real-time monitoring of coolant concentration in cabinet supply branches verifies coolant consistency across branches; monitoring points on key loops can be configured for high-heat-density cabinets as required;

Mixing and replenishment systems: Real-time monitoring of concentration at the automatic mixing outlet provides feedback control of the water/ethylene glycol or propylene glycol ratio; concentration verification on the replenishment line prevents abnormal coolant from entering the main loop;

Circulation and storage systems: continuous monitoring of system coolant concentration at the circulation pump outlet or storage tank bypass provides a basis for replenishment, water makeup and operation maintenance.

Industrial Refrigeration and Secondary Coolant Systems:

Chillers and heat exchangers: Real-time monitoring of concentration at the inlet and outlet on the secondary coolant side of evaporators and plate heat exchangers ensures antifreeze and heat-transfer performance;

Secondary coolant circulation systems: Real-time monitoring of concentration at the circulation pump outlet, return header and storage tank prevents abnormal mixing ratios, freezing risk, and increased viscosity and energy consumption caused by high concentration;

Low-temperature process users: Real-time monitoring of supply/return concentration for cold rooms, ice storage, reactors and low-temperature process equipment ensures stable operation of the circulation system;

Antifreeze/secondary coolant production and mixing: Real-time monitoring of concentration during the mixing of ethylene glycol, propylene glycol, water and corrosion inhibitors enables automatic ratio control and final inspection of product concentration.

Product Image

CY-MFI Multi-function Host (Optional Accessory)

Product Overview:

The CY-MFI series consists of the housing, HMI, mainboard, power module and interface module (4G module optional). Through real-time data exchange with the sensor, sensor parameters can be configured, including calibration, high/low alarm limits and auto-cleaning parameters. It also supports viewing of real-time data, historical data and data curves, as well as data export.

This optional product extends the functionality of existing concentration analyzers when installed.

Product Features:

High protection rating, die-cast aluminum housing, 7-inch true-color screen, wide voltage input, multi-channel I/O

Technical Specifications

Display content	Concentration, temperature, time, real-time curves, historical curves, historical data, alarm status, etc.
Data storage	128 MB storage; supports data export via USB drive
Input power	DC 24V or AC 220V
Signal output	Max.: 4 channels of DC 4-20 mA; 1 RS485; 4 switching signal outputs
Ambient temperature	-20 to 55 °C
Human-machine interface	Interactive 7-inch HD true-color screen
Protection rating	IP65
Installation options	Wall-mounting or bracket mounting
Case dimensions	280 (W) x 270 (H) x 124 (D) mm
Optional modules	4G module
Other features	Supports multi-level permission management, factory reset and other functions

IPRM-Wiper Mechanical Brush Cleaning Assembly (Recommended Accessory)

Pneumatic brush cleaning assembly

Electric brush cleaning assembly

Product Overview:

The IPRM-Wiper series consists of a control section, drive section (pneumatic/electric), transmission section and brush body. Cleaning parameters are set via the control section, and the brush body fully automatically cleans the optical window, preventing contamination from biasing measurement results.

This optional product is suitable for applications where the medium is relatively dirty.

Product Features:

Automatic operation, low maintenance, adjustable cleaning parameters, strong corrosion resistance, and compliance with explosion-proof requirements (Ex db IIC T6 Gb)

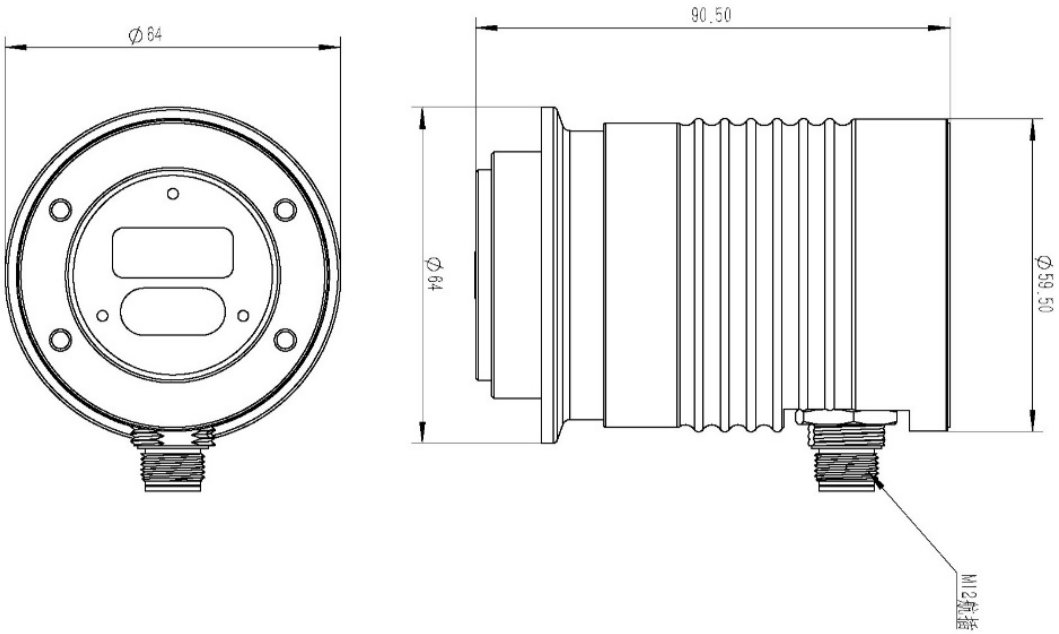
Technical Specifications

Model	IPRM-Wiper	IPRM-Wiper-E
Drive Motor	Pneumatic	Electric
Power Supply	DC 24V	DC 24V
Rated Power	3W	10W
Air Supply Pressure	0.4 to 0.5 MPa	None
Medium Pressure	≤1.0 MPa	≤1.0 MPa
Temperature Range	0 to 100 °C	0 to 100 °C
Key Materials	Stainless steel, alloy and non-metallic materials	Stainless steel, alloy and non-metallic materials
Cable Length	None	5 m as standard
Protection Rating	IP65	IP65
Mounting Method	ISO quick-clamp or flange	ISO quick-clamp or flange

Product Images and Dimensions

Display side of the analyzer

Measuring side of the analyzer



Dimension drawing of the analyzer (unit: mm)

Installation Diagram

Installation diagram for small pipe diameter

Company Profile

An Innovation-driven High-tech Enterprise

Founded in 2008, HUNAN CHUYI M&C CO.,LTD. (CHUYI M&C) is a national high-tech enterprise, a specialized, refined, distinctive and innovative small and medium-sized enterprise, a drafting unit of national standards, and a formulating unit of national metrological calibration specifications. The company is mainly engaged in the R&D, production, sales and service of solution concentration analyzers and control systems, with a core technical team from the National University of Defense Technology. Its product measurement principles cover spectroscopy, refractometry, densitometry and conductometry.

The company's marketing network covers the whole country, and products are exported to Europe, the Americas and Southeast Asia.

Diversified Industry Application Solutions

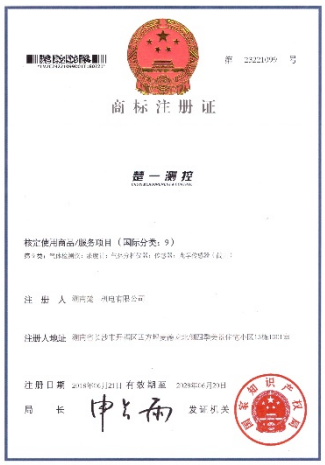
Our products are used in petrochemical, precision machining, food & beverage, biochemical pharmaceutical, new energy and semiconductor industries. Since its establishment, the company has accumulated rich experience in various industries and developed complete industry solutions, serving more than 2,000 enterprises, optimizing process control, reducing labor intensity and improving cost-effectiveness.

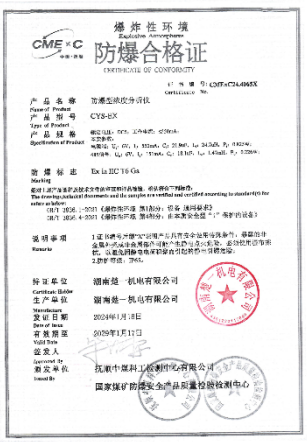
More Than a Decade of Dedication to Building a National Brand

As the first domestic manufacturer of inline refractometers, we have focused on product R&D for more than a decade and obtained a number of invention patents, bringing product stability and measurement accuracy to a leading level in China. We have solved the 'chokepoint' problem of Real-time concentration measurement and control products for wet electronic chemicals in the semiconductor industry, committed to building a trustworthy national brand!

Company Photos

Certifications and Awards





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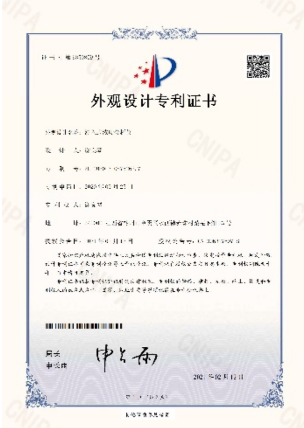
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Based on measurement principles including spectroscopy, refractometry and densitometry

- Concentration analysis of acids, bases, salts, solvents and chemicals
- Trace water, oil-in-water, water-in-oil and moisture content analysis
- Concentration analysis of wet electronic chemicals for the semiconductor industry
- Near-infrared spectral composition analysis in reaction systems
- Color, turbidity and concentration analysis in solutions

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