

# In-line Refractometer (Intrinsically safe type) Model : GND15 (B)



## Description

The Intrinsically safe In-line Refractometer GND15(B) is designed to detect the Refractive Index of a sample and outputs the Brix(%) value on the display, can also transmit measured data to external devices via 4 to 20mA or RS485. GND15(B) series has the function of automatic temperature compensation according to the temperature of the tested medium, when the tested medium temperature changes, the Brix value (soluble solids) after temperature compensation is displayed and the output changes accordingly.

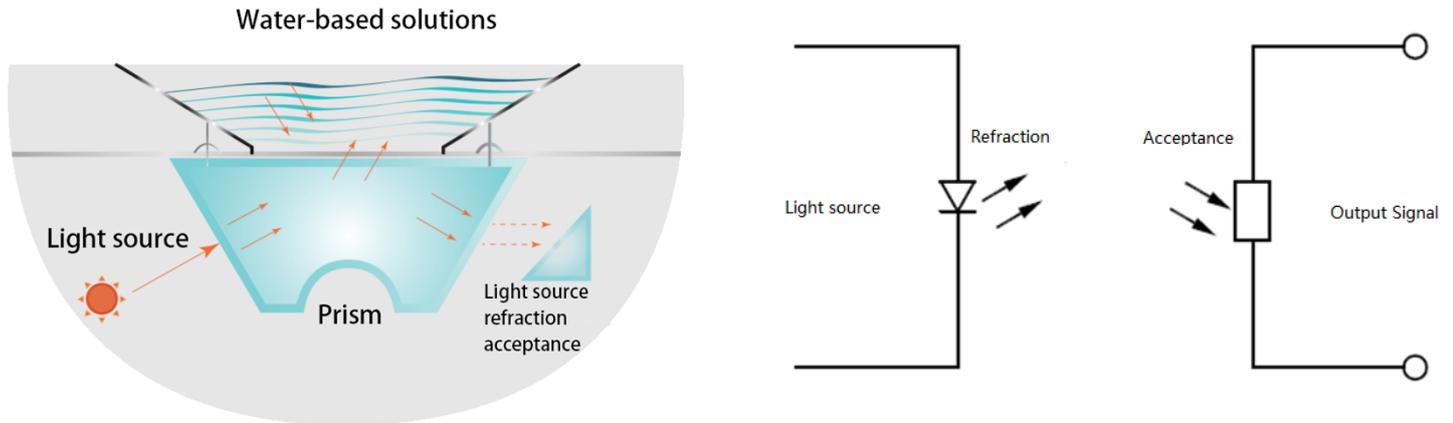


Thank you for purchasing our Intrinsically safe In-line Refractometer. This instruction manual is designed to guide you to understand the functions and characteristics of the sensor. Before using the instrument, please read this manual carefully to ensure safe and correct use. Please keep this manual for future reference

## Working Principle

GND15(B) Intrinsically safe In-line Refractometer, which is composed of light source, sapphire refraction, light receiver and signal modulation circuit. The light source emits a stable light signal through the sapphire to contact the measured medium, and the concentration of the measured medium produces a corresponding signal. The optical receiver calculates the refractive index of the collected refracted light source to obtain the corresponding concentration through the data algorithm. Since the concentration will be affected by temperature, internal temperature calibration is adopted to reduce the influence of temperature drift.

The measuring principle diagram as below:



## Features

Automatic temperature compensation

Sturdy and durable, compact and easy to install

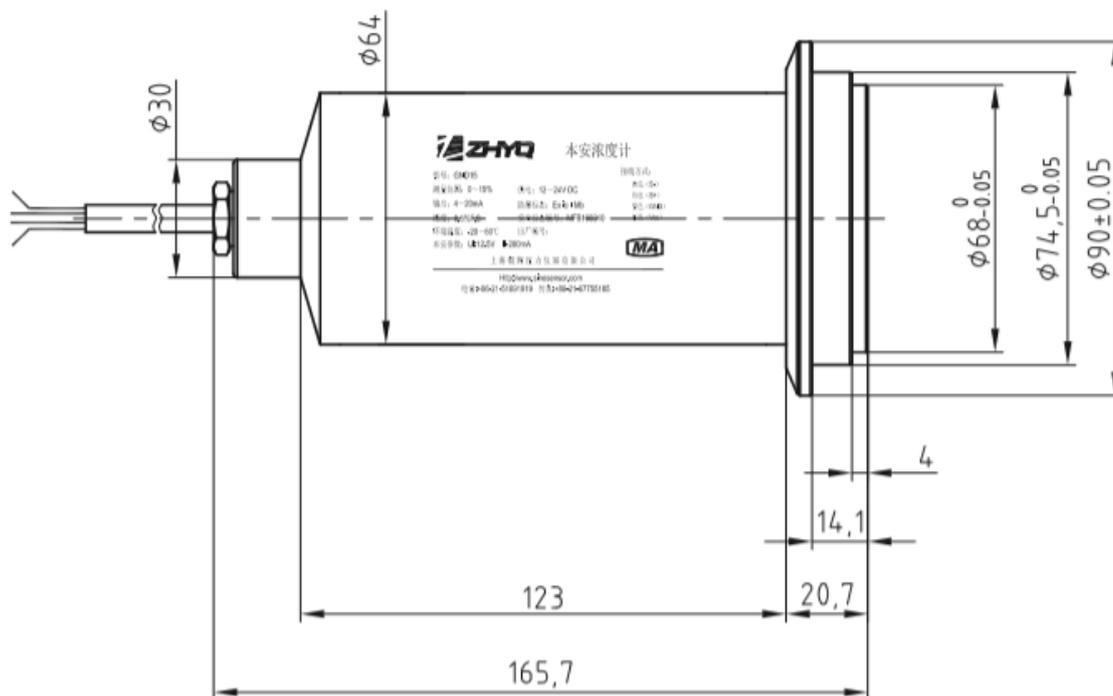
Easy to operate, easy to connect with other devices for automatic control

Inline real-time monitoring and control of liquid substance concentration in various industries

## Applications

The GND15(B) intrinsically safe concentration meter is mainly used for the preparation and detection of the weight percentage concentration of the cooling and cooling emulsion in the machining industry and the M-10 and MDT emulsions commonly used in mines. It provides convenience for safe and economical preparation of emulsions. The method is widely used in mechanical processing, mining selection, underground support and other fields. It is used to detect the weight percentage concentration of water-soluble mine emulsion, which provides great convenience for accurately preparing emulsion-pressed liquefied liquid.

## Dimensions



## Technical Specifications

Measure Parameters:	Refractive index(nD), Brix (%)
Measure range:	0-15% , 0-33% , 0-53% , 93%
Min Resolution Ratio:	Brix: 0.1% ( Range for 15% , 33% & 53% ) Brix: 0.5% ( Range for 93% )
Measurement Accuracy:	Brix:±0.1%, Brix:±0.3% (standard )
Measurement Temperature:	0-85°C(Automatic Temperature Compensation)
Operating current:	≤200mA
Output :	4-20mA , 4-20mA+ RS485 optional
Process connection	Our standard is 3" tri-clamp
Power:	12-24V DC
Wetted parts material:	Prism: sapphire, Prism stage: SS304 , SS316L (can be customized)
Environment Temperature:	0-40°C
Protection grade:	IP67
Electrical connection	Directly cable
Cable length	2M ,3M ,5M,10M are optional

## Installation

Choose a good installation site for easy maintenance and operation, and try to avoid adverse environment damage to the densitometer and impact on the measurement. Its common requirements are as follows:

- ◆ There is enough space around for easy maintenance and adjustment
- ◆ Protected from direct sunlight and strong heat sources
- ◆ Places that are not easily collided
- ◆ Easy wiring and installation

## Wiring

Black electronic wire: GND

Red electronic wire: +12VDC

Blue electronic wire: 4~20 output +

Yellow electronic wire: 4~20 output -

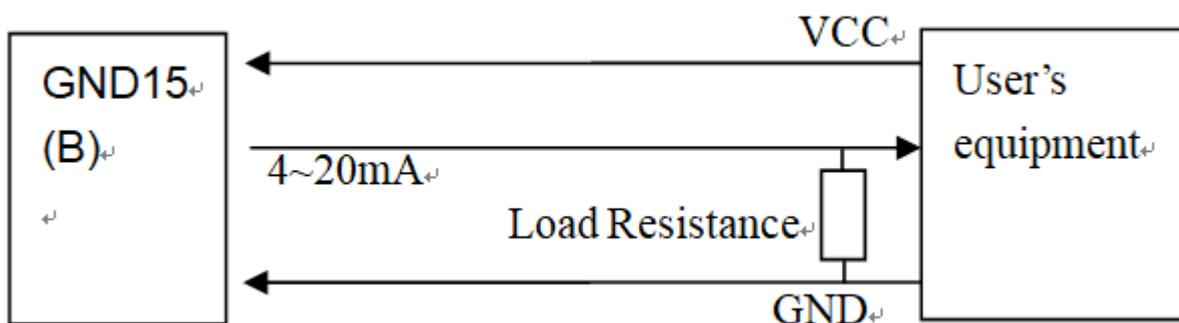
White electronic line: calibration wire

Brown electronic wire: calibration wire

**PS:** Transmission wires should not be passed through conduits or open conduits with other power wires, nor should they be passed near high-power equipment.

## Operation and using

Product connect with the user's equipment



## Normal troubleshooting

1. When there is no signal output from the concentration meter, firstly check the disconnection or short circuit of the extension cable or whether the working voltage of the concentration meter is normal

### 2. If the concentration meter is suspected to be malfunctioning, the following methods can be used

Remove the densitometer, measure water and a certain concentration of medium respectively, measure with the mA current of the multimeter, blue electronic wire: 4~20 output positive and yellow electronic wire: 4~20 output negative, the current signal should be 4mA, and the measured The current output corresponding to the medium is normal, otherwise the concentration meter is faulty.

## Maintenance

### Periodic/timed maintenance (operable by cleaning unit)

**PS: we can also supply Auto or manual washing device for optional, if you need, Please let us know when order.**

Wipe the glass of the densitometer probe clean, add 0.3mL of tap water, if the test value is not equal to 4mA, short-circuit the zero line to clear it.

Concentration meters measuring high temperature, corrosive media or operating under vibration conditions should be calibrated once every six months.

After the concentration meter has been running for 5 years, an insulation resistance test should be performed, and the insulation resistance should be above 500MΩ.

### Concentration value vs. Refractive Index graph

%	$n_D^{20}$								
0	1.33299	20	1.36384	40	1.39986	60	1.44193	80	1.49071
1	1.33442	21	1.36551	41	1.40181	61	1.44420	81	1.49333
2	1.33586	22	1.36720	42	1.40378	62	1.44650	82	1.49597
3	1.33732	23	1.36889	43	1.40576	63	1.44881	83	1.49862
4	1.33879	24	1.37060	44	1.40776	64	1.45113	84	1.50129
5	1.34026	25	1.37233	45	1.40978	65	1.45348	85	1.50398
6	1.34175	26	1.37406	46	1.41181	66	1.45584		
7	1.34325	27	1.37582	47	1.41385	67	1.45822		
8	1.34477	28	1.37758	48	1.41592	68	1.46061		
9	1.34629	29	1.37936	49	1.41799	69	1.46303		
10	1.34782	30	1.38115	50	1.42009	70	1.46546		
11	1.34937	31	1.38296	51	1.42220	71	1.46790		
12	1.35093	32	1.38478	52	1.42432	72	1.47037		
13	1.35250	33	1.38661	53	1.42647	73	1.47285		
14	1.35408	34	1.38846	54	1.42863	74	1.47535		
15	1.35568	35	1.39032	55	1.43080	75	1.47787		
16	1.35729	36	1.39220	56	1.43299	76	1.48040		
17	1.35891	37	1.39409	57	1.43520	77	1.48295		
18	1.36054	38	1.39600	58	1.43743	78	1.48552		
19	1.36218	39	1.39792	59	1.43967	79	1.48811		

## Ordering guide:

with \* are required, with --- is optional

Model	Range (%)	Output	Process connection	Electric connection	Accuracy	Other requirement
GND15 (B)	*	*	*	*	*	---
Example: GND15(B)-15%-4-20mA-3" tri-clamp- Directly cable -0.5%FS						

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