

# IR-M2000 SERIES FIBER OPTIC INFRARED MOISTURE/THICKNESS METER



The IR-M2000 series is a reflection system on-line moisture/thickness meter utilizing the infrared absorption.

The fiber optic sensor can be placed at narrow places or in high temperature environment.

Converting capabilities are built into the compact designed detector unit for easy installation and operation. Maximum 99 calibration curves can be stored into the detector memory for numerous measurement applications. The detector can be used by itself or connected to a PC/plant control system, as both analog and digital outputs are provided.

A remote setting display unit, connectable up to 9 detector units, can be used to set various detector functions and also displays measured values.



## ■ FEATURES

### ● High sensitive fiber optics

The measurement is stable by high sensitive fiber optics. Reflection type fiber optics with lens can measure objects at long measuring distance.

### ● Compact sensing part

The compact and lightweight sensing part using fiber optics can be used at narrow spaces and places with difficulty for direct sighting.

### ● For places in environment at 150°C

Any water-cooling in the environment at 150°C is not required by heat-resistive fiber optics.

### ● All-in-one

The detector unit with function keys and digital display function can be used itself. In addition, calibration and creation of calibration curves at site are easy.

### ● Measurement with high-speed and high-sensitivity

With a high-performance CPU, high speed (output renewal cycle: 28ms) measurement can be performed.

### ● Setting display unit

The setting display unit has a front panel of 96 x 96mm. Since it can connect with up to 9 sets of the detector unit, the total cost on designing a moisture measurement system can be reduce substantially.

### ● Easy configuration for various systems

Single use or combination use with computer offers various system configurations.

## ■ MODELS

### ● DETECTOR UNIT

IR-M2□□□□

- Type
  - 1: General moisture meter
  - 2: High moisture meter
  - 7: Thickness meter
- Fiber type
  - 0: Standard
  - 5: Absorption type
- External input/output
  - 0: Moisture output  
4 to 20mADC (standard)
  - 5: Compensation input  
4 to 20mADC
  - 8: Compensation input  
Pt100
- Communications interface
  - S: RS-485 (standard)
  - R: RS-232C
  - A: RS-422A
  - \* S for connection with setting display unit
- Special specification
  - Blank: None
  - X: Other special specifications

- Refraction type fiber optics **IR-WCRN**
- Checking plate for the above **IR-WCRNB**
- Reflection type fiber optics with lens **IR-WCRE**
- Checking plate for the above **IR-WCREB**

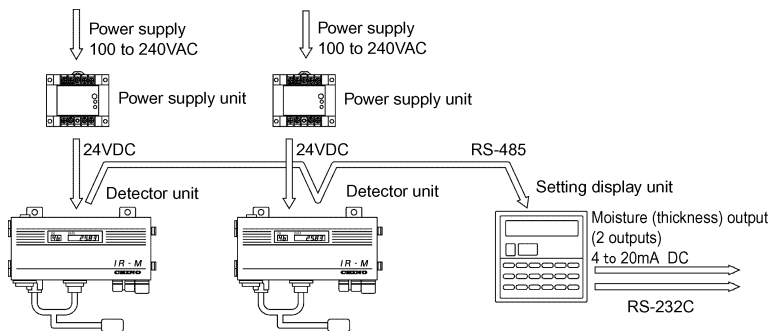
### ● Setting display unit

IR-GMEG1□□

- External output
  - 1: 4 to 20mADC (standard)
- Communication interface
  - R: RS-232C (standard)
  - A: RS-422A
  - S: RS-485
- Special specification
  - Blank: None
  - X: Other special specifications

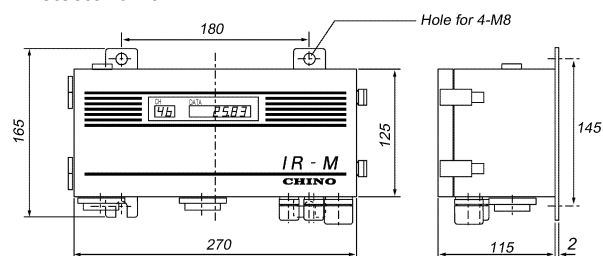
## ■ CONFIGURATION EXAMPLE

- Combination with setting display unit  
(For multiple detector units)

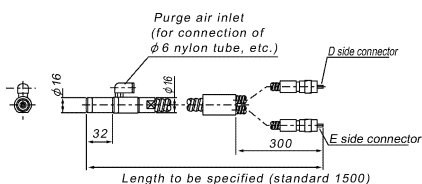


## ■ OUTSIDE DIMENSIONS

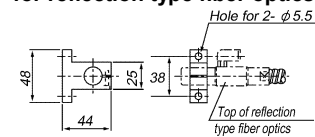
- Detector unit



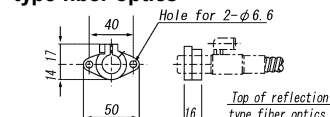
- Reflection type fiber optics



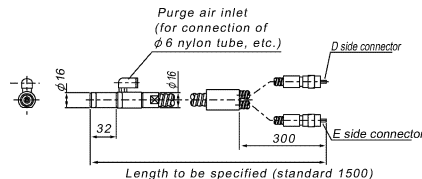
- Horizontal mounting holder for reflection type fiber optics



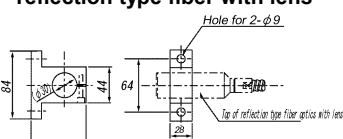
- Flange holder for reflection type fiber optics



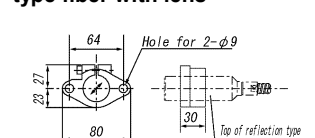
- Reflection type fiber optics with lens



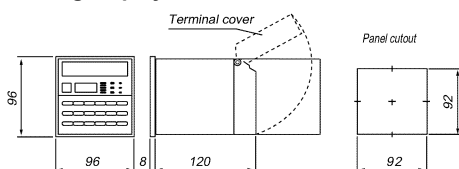
- Vertical mounting holder for reflection type fiber with lens



- Flange holder for reflection type fiber with lens



- Setting display unit



Unit: mm

## ■ GENERAL SPECIFICATIONS

- DETECTOR UNIT

Measuring system: Infrared reflection type 3-wave-length system (2 wave-length for thickness meter)  
 Moisture (thickness) output: 4 to 20mADC (Load resistance: 500Ω or lower)  
 Compensation input: 4 to 20mADC, Pt100 3-wire (option) (For sample temperature, measuring distance, etc.)  
 A unit with compensation input has no moisture (thickness) output.  
 Communications output: RS-485, RS-232C or RS-422A (to be specified), RS-485 for combination with the setting display unit  
 Output renewal cycle: 28 ms  
 Reproducibility: Within [detector unit output (x) ± 0.003] by an output checking plate (under the same condition of ambient temperature and humidity)  
 Note: As the above reproducibility is by the output checking plate, the reproducibility on exact measurement differs.

Display: Data LED 5-digit  
 Calibration. curve number LED 2-digit

Setting: By keys or communications  
 Calibration curve: Linear to cubic expression or broken line  
 Number of calibration curve: 99 curves  
 Calibration curve creation: Regression calculation  
 Smoothing: 0 to 99 seconds  
 Calibration: By output checking plate  
 Working temperature range: 0 to 50°C  
 Rated supply voltage: 24VDC  
 Power consumption: Max. 36VA  
 Allowable vibration: 3G or lower  
 Connection: Fiber optics ... Connector  
 Power/signal wires ... terminals

Casing: Aluminum casing, drip-proof structure (conforming to IEC529 IP65)

Mounting: Suspension system using four M8 bots

Weight: About 4kg

Accessories: Power supply unit

- FIBER OPTICS

- Reflection type fiber

Measuring distance and measuring diameter: ø20/15mm to ø50/50mm  
 Fiber length: Standard 1.5m (up to 10m)  
 Minimum bending radius: R100mm  
 Working temperature range: Maximum 150°C  
 Fiber protection: Stainless steel snake tube  
 Purge air flow: 5 to 20 Nl/min  
 Accessories: Horizontal mounting holder, Flange holder

- Reflection type fiber optics with lens

Measuring distance and measuring diameter: ø20/25mm to ø40/100mm  
 Air purge function: Not provided  
 Other specifications are same as the reflection type fiber optics.  
 Note: Fiber optics is not a drip-proof specification.

- SETTING DISPLAY UNIT

Detector unit input: RS-485, Connectable up to 9 detector units  
 Analog output: 4 to 20mADC (Load resistance: 500Ω or lower) 2 outputs  
 Communications output: RS-232C, RS-485 or RS-422A (to be specified)  
 Output renewal cycle: 28ms x (Number of detector unit connected)  
 Display: Data LED 5-digit  
 Calibration curve number LED 2-digit  
 Detector unit number LED 1-digit

External setting: Settings of detector unit number, calibration curve number, calibration, present output and hold by external contact.

Alarm: High/low limits alarm, 2 contact outputs (H-C-L)

Working ambient temperature: 0 to 50°C

Rated supply voltage: 100 to 240VAC, 50Hz/60Hz

Power consumption: Max. 15VA

Casing: ABS resin

Front panel: Drip-proof structure (conforming to IP-65)

Weight: About 0.6kg

- POWER SUPPLY UNIT

Output voltage: 24VDC  
 Output electric current: 2.1A  
 Working temperature range: -10°C to 50°C  
 Rated supply voltage: 100 to 240VAC, 47 to 450Hz  
 Power consumption: Max.160VA  
 Weight: Approx. 380g

Specifications subject to change without notice. Printed in Japan (I) 2002. 5

## CHINO CORPORATION

32-8, KUMANO-CHO, ITABASHI-KU, TOKYO 173-8632

PHONE: +81-3-3956-2171

FAX: +81-3-3956-0915

E-mail: inter@chino.co.jp

Website: http://www.chino.co.jp