DewTracer mini CRDS-H_2O

Cavity Ring Down Spectroscopy Trace Moisture Analyser

- ✓ Newly developed trace moisture analyser with miniaturised cavity ring -down spectroscopy sensor based on innovative spectrum analysis technology.
- ✓ Accurate measurement in the trace moisture range (12 to 20000 ppbv, -100 to -55 °C DP) using an absolute measurement method.
- ✓ Fast response to rapid changes in trace moisture.
- ✓ High long-term stability with corrosion resistant gases contacting design.

DewTracer mini CRDS-H_2O has been developed with cooperation of the National Institute of Advanced Industrial and Technology (AIST).

Applications

[Manufacturing Process and R&D]

- High-purity gases for Semiconductors, Medical use, etc.
- Lithium-ion batteries (LiB)
- All solid-state batteries
- Electric double layer capacitors (EDLC)
- Organic electro-luminescence (OEL)
- Flat panel displays

etc.

DewTracer mini CRDS-H_2O is an innovative miniaturised Cavity Ring-Down Spectroscopy (CRDS) trace moisture analyser that can measure trace moisture in the range of 12 ~ 20000 ppbv (-100 ~ 55 °C DP) with fast response and high accuracy.

Based on an absolute measurement method with high long-term reliability, **DewTracer mini CRDS-H_2O** provides reliable trace moisture control for R&D and manufacturing with advanced technology.

SHINYEI

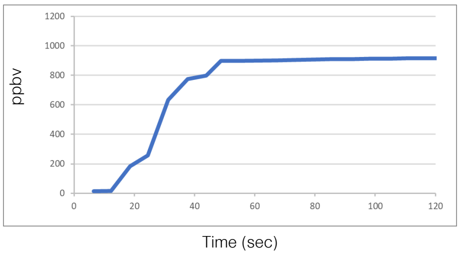
https://www.shinyei.co.jp/stc/eng/

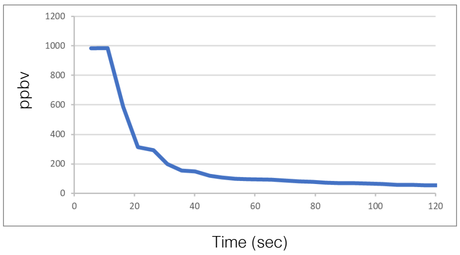
DewTracer mini CRDS-H_2O with innovative miniaturised CRDS sensor technology

In collaboration with the National Institute of Advanced Industrial and Technology (AIST), the world leader in R&D for trace moisture measurement, SHINYEI has succeeded in developing a miniaturised CRDS sensor with unique spectrum analysis technology. **DewTracer mini CRDS-H_2O** with mini CRDS sensor technology is an innovative trace moisture analyser with both compact size and high performance, providing a new solution for trace moisture measurement.

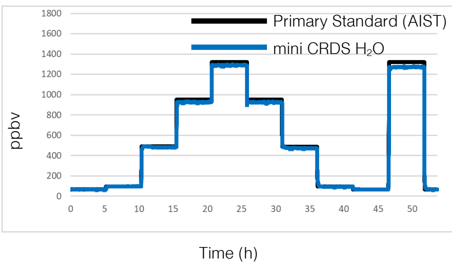
Fast and accurate trace moisture measurement

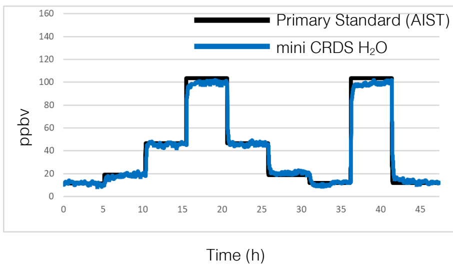
DewTracer mini CRDS-H_2O sensor has small cavity volume which means that gases in this cavity are replaced quickly, and its measurement can rapidly trace sudden changes in trace moisture with SHINYEI unique spectral analysis.





The measurement accuracy and stability of **DewTracer mini CRDS-H_2O** is verified by AIST through comparative evaluation with primary standards.





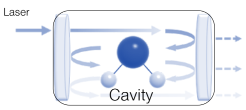
Cavity ring-down spectroscopy technology for trace moisture measurement

Cavity Ring-Down Spectroscopy (CRDS) trace moisture analyser is an absolute measurement method and can measure trace moisture with fast response, high accuracy, and long-term reliability.

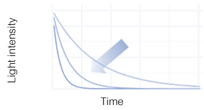
Measuring principle

In CRDS, the beam from the laser diode enters a cavity with two high reflectivity mirrors to detect the amount of laser absorption by moisture in the sample gases in the cavity. When the laser is on, the cavity rapidly fills with circulating laser light, and the moisture in the cavity can be analysed by detecting small amount of light leaking from one of the mirrors in the cavity and measuring the time it takes for the light in the cavity to decay to 1/e of its initial intensity (ring-down time).

Laser light is absorbed by trace moisture during reflection in cavity.



Light intensity decay time becomes faster with high trace moisture.



Absolute measurement method

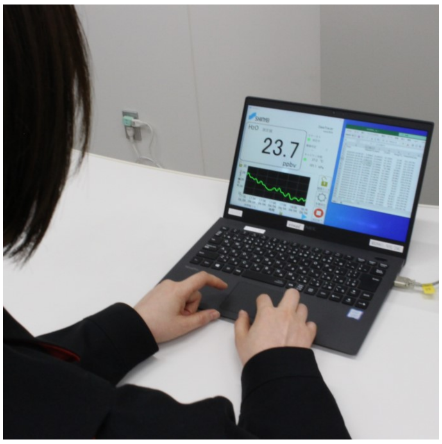
Trace moisture mete that use the moisture adsorption and desorption principle (e.g. capacitive, aluminum oxide etc.) calculate amount of moisture based on calibration curve that is set independently by each manufacturer. The deviation of the calibration curve due to sensor dispersion, changes in use or over time must be adjusted each time based on the results of a comparison calibration with a standard.

CRDS is called an absolute measurement method because it can be calculated directly from measured values of known physical constants without a calibration curve. The light decay time, which is the measuring principle of CRDS, does not depend on the light intensity of the incident light, so even if the light intensity decreases due to the ageing of the laser, the measurement accuracy is not affected. Therefore, it has the advantage of high reliability of long-term measurement and the frequency of periodic calibration can be reduced.

Selectable installation options

Sensor unit and monitor unit can be separated, or a PC with the bundled software installed also can be used instead of the monitor unit. This provides the best installation options for applications and locations.

- Sensor Unit + PC



- Benchtop

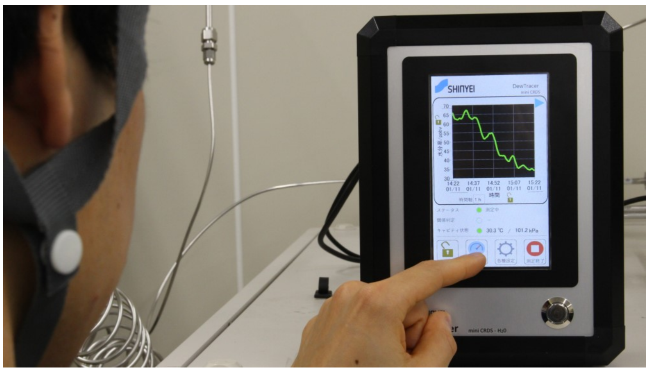
- Wall mount

User-friendly design

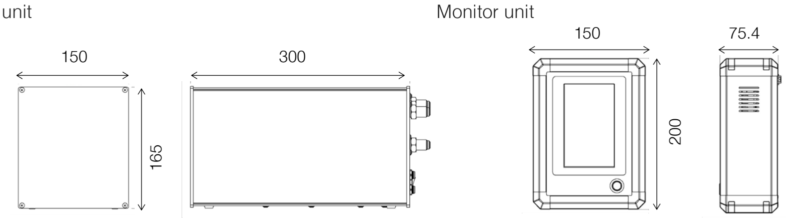
Monitor unit with 5-inch colour touch panel for starting and stopping measurements, and making various settings. The monitor screen displays measurements and trend graphs. It also has screen lock function to prevent malfunction, a status function to check the instrument's operating status, and an alarm function to determine the set threshold value. When a PC is used instead of the monitor unit, the same functions as the monitor unit can be used with the bundled software.

Digital (RS-232C), analogue (4 - 20 mA, option), or alarm (MOS FET relay, option) are available.

UJR / VCR fittings are used for sample gas IN-OUT. Additional ports for purging the inside of the sensor unit with nitrogen, etc. are also available as options.



Specifications

Environmental Conditions	Operation	10 ~ 40 °C / 35 ~ 80 %rh (w/o condensation)
	Storage	-10 ~ 40 °C / 35 ~ 80 %rh (w/o condensation)
Measurement [H_2O]	Range	12 ppbv ~20 ppmv（Dew point : -100 ~ -55 °C) ＊in N_2
	Response	Approx. 60 sec (50 ppbv ⇔ 1000 ppbv / 90% Response)
	Accuracy	±4% or LDL (12 ppbv)
Sample Gas	Type	Air, N_2, O_2, Ar etc. * Please ask us for other gases.
	Temperature	5 ~ 60 °C
	Flow Rate	< 2.0 L / min
	Pressure	86 ~ 106 kPaA (w/ Option CRDS-002 : 50 ~ 900 kPaA , w/ Option CRDS-003 : 50 ~ 550 kPaA)
Units	Measurement	ppbv / ppmv (H_2O) , °C (Sample Gas Temperature) , PaA (Sample Gas Pressure)
	Calculation	°C (Dew point / Frost point)
Output	Digital	RS-232C
	Analogue	4 ~ 20 mA * w/ Option (CRDS-005)
	Alarm	MOS FET relay (100 V / 300 mA) * w/ Option (CRDS-006)
Fittings		IN-OUT : 1/4 inch (UJR-RP / FUJIKIN)
Power Supply		AC Adapter (100 ~ 240 VAC, 50 / 60 Hz , 1.4 A max)
Weight		Sensor unit : Approx. 5 kg , Monitor unit : Approx. 1.7 kg
Dimensions [mm]		Sensor unit Monitor unit 

Order Code

Sensor unit	Order Code
w/ Purge Port	mini CRDS–H2OBN0D00
w/o Purge Port	mini CRDS–H2OBN0D02

Monitor unit	Order Code
	mini CRDS PC–D0V1

Options	Order Code
Rack Mount Adapter (19 inch)	CRDS-001
Pressure Regulator + Orifice Plate	CRDS-002
Orifice Plate	CRDS-003
Sintered Metal Filter (15 μm)	CRDS-004
Analogue Output (4 ~ 20 mA)	CRDS-005
MOS FET Relay	CRDS-006
Carrying Case	CRDS-007
Sampling Pump	CRDS-008

SHINYEI TECHNOLOGY CO., LTD

6-5-2 Minatojima-Minamimachi, Chuo-ku, Kobe 650-0047 Japan

Phone : +81-78-304-6790 Fax : +81-78-302-1225

Contact : https://www.shinyei.co.jp/stc/eng/contact.html

SHINYEI

https://www.shinyei.co.jp/stc/eng/

V 1.0 _ Jan 2024