VIRASENSE® GEN 1

3-IN-1 DIFFERENTIAL PRESSURE, TEMPERATURE & HUMIDITY MONITOR FOR CLEANROOM AND HVAC APPLICATIONS

CLEANROOM SOLUTION
FANAVARAN VIRA PHARMED ENGINEERING CO.
IN SEARCH OF INNOVATION

INTRODUCTION

Modern cleanroom facilities rely on accurate environmental monitoring to maintain product quality, process integrity, and regulatory compliance. Among all environmental parameters, temperature, relative humidity, and differential pressure are three of the most critical indicators of cleanroom performance. Proper control of these parameters helps maintain stable environmental conditions, prevent contamination transfer between adjacent areas, ensure directional airflow, and protect controlled manufacturing environments from external contamination. In pharmaceutical production facilities, biotechnology laboratories, healthcare environments, and medical device manufacturing plants, maintaining the correct temperature, relative humidity, and pressure differential is essential for compliance with GMP guidelines and ISO 14644 cleanroom standards. Even small deviations from specified operating limits may affect product quality, process performance, environmental conditions, or HVAC system operation and may require immediate corrective action. ViraSense® Gen 1 has been developed as an integrated environmental monitoring solution for cleanroom and controlled-environment applications. Designed with both functionality and aesthetics in mind, the device features a flush-mounted architecture that integrates seamlessly into cleanroom wall systems while providing continuous real-time monitoring of room temperature, relative humidity, and differential pressure. The instrument measures differential pressure across a range of ±125 Pa with an accuracy of ±2 Pa, while temperature is measured over a range of -10 to +70 °C with an accuracy of ±0.5 °C, and relative humidity from 0 to 100 %RH with an accuracy of ±5 %RH. These specifications make ViraSense® Gen 1 particularly suitable for pharmaceutical, healthcare, biotechnology, and other controlled environments where precise monitoring of critical environmental parameters is required. Real-time values for temperature, relative humidity, and differential pressure are displayed on a high-resolution 2.8-inch full-color TFT-LCD display with a resolution of 240 × 320 pixels, allowing operators to quickly assess room status and identify deviations from specified operating conditions. The device also supports Modbus communication, enabling integration with centralized BMS/EMS monitoring systems for continuous data acquisition, remote monitoring, alarm management, and centralized supervision of critical environmental conditions.

APPLICATIONS

ViraSense DPT-RHT devices are designed for a wide range of applications in HVAC/R, cleanroom, and air-handling systems, providing simultaneous monitoring of differential pressure, temperature, and relative humidity. Typical applications include cleanroom differential pressure monitoring; monitoring of temperature and relative humidity in controlled environments; continuous monitoring of pressure cascades between adjacent rooms; environmental condition monitoring in pharmaceutical, biotechnology, healthcare, and medical device facilities; monitoring of temperature and humidity in air-handling units (AHUs); monitoring of critical environmental parameters in cleanrooms and controlled areas; monitoring of pressure, temperature, and humidity conditions in laboratories and critical process areas; integration with BMS/EMS systems for centralized monitoring, data acquisition, and alarm management; and continuous monitoring and control of environmental conditions in ventilation and clean air distribution systems.

TECHNICAL SPECIFICATIONS

PARAMETER	SPECIFICATION
PRODUCT MODEL	RHT - DPT - MOD
MEASUREMENT RANGE	±125 PA -10TO70°C-0 TO100%
MEASUREMENT ACCURACY	±2PA / ±0.5C
SENSOR TECHNOLOGY	CMO SENS®
DISPLAY TYPE	TFT LCD
DISPLAY SIZE	2.8 INCH
RESOLUTION	240 × 320 PIXELS
COLOR DEPTH	65K COLORS
DISPLAY CONNECTION	FPC
DISPLAY INTERFACE	SPI / PARALLEL
COMMUNICATION	RS485 MODBUS RTU
BAUD RATE	9600–115200 BPS
ADDRESS	1–128
POWER SUPPLY	12-24 VDC
PROTECTION CLASS	IP54
HOUSING MATERIAL	ABS
HOUSING COLOR	MATTE WHITE
OPERATING TEMPERATURE	-15 °C TO +75°C
BODY DIMENSIONS	100 × 110 MM
FRONT FRAME DIMENSIONS	130 × 120 MM
TERMINAL TYPE	SCREW TERMINAL
REFERENCE TUBE LENGTH	UPTO 80 CM
PRESSURE FITTINGS	5.0 MM
MOUNTING TYPE	FLUSH MOUNTED
WEIGHT	350 G
COMPANY WITH MANAGEMENT SYSTEM CERTIFIED BY DNV GL ISO 9001 = ISO 14001	CE

INSTALLATION, CONFIGURATION

1. Panel Preparation Before installation, switch OFF the power supply. Prepare a panel cut-out of 105 × 112 mm. After cutting, carefully remove all burrs and sharp edges from the cut-out area. Thoroughly clean the cut surface and surrounding area from dust, oil, grease, and other contaminants using a suitable degreasing cleaner compatible with the panel material. Allow the surface to dry completely before installation.
2. Sensor Installation :Install the ViraSense sensor into the prepared panel cut-out and ensure that it is securely and properly positioned.
3. Modbus Address ConfigurationSet the required Modbus slave address using the Modbus Configuration DIP Switch according to the binary addressing scheme and the assigned address in the control system.
4. Baud Rate Configuration Set The Required RS-485 Baud Rate Using The Dedicated Baud Rate DIP Switch (W01).

The Default Configuration Is:

0-1	0-2	Baud Rate
OFF	OFF	1200 bps
ON	ON	9600 bps
ON	OFF	19200 bps
OFF	ON	56000 bps

After Changing The Baud Rate, Switch The Device OFF And ON To Apply The New Setting.

5. Modbus Connection
Connect The RS-485 Communication Lines To The Corresponding Terminals:

• A	RS-485	A
• B	RS-485	B

Ensure That The A And B Connections Are Correctly Wired And Securely Tightened.

6. Power Connection Connect The 24 VDC Power Supply To The Designated Power Terminals :

+24V	Positive
GND	Negative

Always Verify The Power Supply Voltage And Polarity Before Energizing The Device.

7. Final Check & Commissioning Before Powering On The Device, Verify That The Sensor Is Securely Installed And That The Modbus Address, Baud Rate, A/B Communication Lines, And Power Connections Are Correctly Configured.
After Powering On The Device, Verify The Displayed Measurement And Confirm Successful Modbus RTU Communication With The Monitoring Or Control System.

IMPORTANT SAFETY INSTRUCTIONS

Read All Instructions Before Installation Or Use.
Disconnect Power Before Installation, Wiring, Maintenance, Or Servicing. Use Cables Rated For The Device's Maximum Operating Voltage. Do Not Use In Explosive Or Flammable Environments Unless Specifically Approved.
Installation And Servicing Must Be Performed By Qualified Personnel. Follow All Applicable Standards, Regulations, And Installation Requirements.Keep This Manual For Future Reference.Vira Pharmed Is Not Responsible For Improper Installation, System Design, Or Use Outside The Specified Requirements.

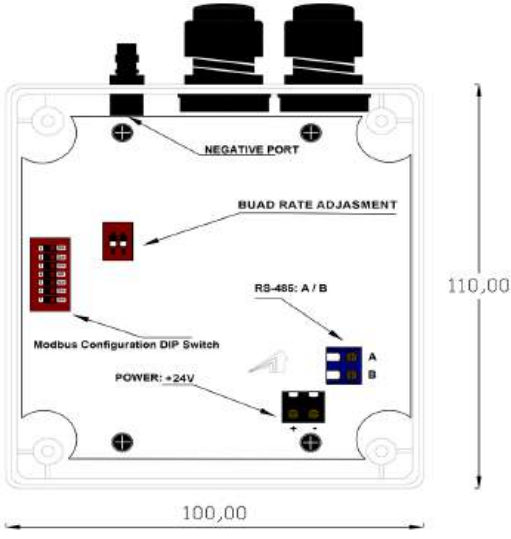
⚠ WARNING:

Disconnect The Power Supply Before Installation, Wiring, Or Servicing. Incorrect Wiring, Reversed Polarity, Or Omproper Configuration May Result In Malfunction Or Damage To The Device.

SCHEMATICS



DIMENSIONAL DRAWINGS



CONTACT US

Vira Phramed Co.
No. 11, Innovation 1 Alley, Pardis Technology Park, Tehran, Iran
Tel.: +98 21 7625 0272
Fax: +98 21 7625 0272
Website: www.virapharmed.com