

Making Your Job More Enjoyable

VRM-2SN
Digital Manifold Gauge II



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 **Warning**
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

1. Preface

The VRM-2SN Digital Manifold Gauge integrates high-precision pressure, vacuum, and temperature measurement. It features a built-in refrigerant database, Bluetooth pairing with temperature clamps, automatic subcooling/superheat calculation, and wireless report generation via APP, enabling fully digitalized refrigerant charging and fault diagnosis.

Equipped with a 6.67-inch full-color touchscreen (vs. traditional monochrome segmented displays and mechanical buttons), it delivers intuitive visual feedback and seamless operation. The high-precision pressure conditioning chip ensures stability across full ranges with automatic temperature compensation. With 100 built-in refrigerants and expandable library via APP, it guarantees accurate, convenient measurements under varying conditions.

Please read this manual carefully before operating, servicing, or maintaining the product. Doing so will help ensure long term stable performance and provide a comprehensive understanding of the safety considerations and precautions associated with its use and operation.

Please carefully check if the product you received matches the one you ordered and ensure that the accessories and instruction manual are included. In addition, inspect for any damage that may have occurred during transportation. If you notice any of these issues, kindly contact our marketing department or local distributor promptly.

Reading the manual carefully and following the correct operating procedures will help ensure safe usage and extend the equipment's service life.

Only qualified personnel trained in the maintenance and installation of air conditioning and/or refrigeration equipment may use this product.

 **Warning**
This product operates under high pressure. Follow all safety guidelines regarding refrigerant handling including wearing Personal Protective Equipment such as safety glasses, and gloves.

2. Product Overview



3. Technical Specification

Model	VRM-2SN
Accessory	2 Temperature Clamps, Charging Cable, Carry Case
100 Refrigerant Types	R-11, R-12, R-13, R-22, R-32, R-113, R-114, R-115, R-116, R-123, R-124, R-125, R134a, R-236fa, R-245fa, R-290, R-401A, R-401B, R-402A, R-402B, R-403B, R-404A, R-406A, R-407A, R-407B, R-407C, R-408A, R-409A, R-410A, R-413A, R-414A, R-414B, R-416A, R-417A, R-417C, R-420A, R-421A, R-421B, R-422A, R-422B, R-422C, R-422D, R-424A, R-427A, R-428A, R-434A, R-437A, R-438A, R-448A, R-449A, R-450A, R-452A, R-452B, R-453A, R-454B, R-454C, R-458A, R-500, R-501, R-502, R-503, R-507A, R-508B, R-513A, R-600, R-600a, R-601, R-601a, R-1233zd, R-1234yf, R-1234ze.
Pressure Range	0~50 bar, 0~720 psi, 0~5 MPa, 0~51 kgf/cm ² , 0~5000 Kpa (Relative pressure)
Max. Over Pressure	-29.9inHg ~ 725psi
Pressure Unit	bar, Mpa, -Kpa, psi, kgf/cm ²
Vacuum Unit	Pa, micron, mBar, mmHg
Temperature Unit	°C, °F
Pressure Scale	±0.5% Full range
Resolution	0.01 bar, 0.001Mpa, 1Kpa, 0.1psi, 0.01kgf/cm ²
Discharge Temperature	-10~55°C, ≤75% RH
Charging Temperature	0~40°C, ≤75% RH
Battery	4000 mAh Li-polymer
Connection	7/16"-20 UNF
Sensor	Digital Sensor
Unit Dimension	194x195x68mm
Unit Weight	1.3 kg

4. Indicator Light

Always on/ Flashing	Power on
	Fully charged
	Charging
	Battery Below 10%
	Bluetooth Connected
	Bluetooth Disconnected

5. Icons



Four modes available: **Manifold Gauge Mode**, **Leak Test Mode**, **Evacuation Mode**, and **Settings Mode**. Tap icons to switch.

6. Manifold Gauge Mode



VSAT: Vapor saturation temperature.
LSAT: Liquid saturation temperature.
SLT: Suction line temperature.
LLT: Liquid line temperature.
SH: Superheat value $SH = SLT - VSAT$.
SC: Subcooling value $SC = LSAT - LLT$.
SLT - LLT: temperature difference.

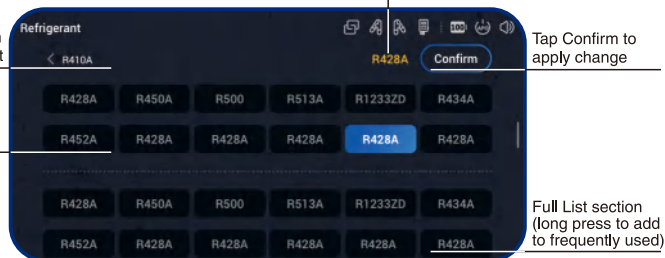
Tap icon **Zero** to change to **Reset** , tap again to reset pressure values.
(Do not use during pressure measurement).

Tap **R-1234ZE** to enter refrigerant type selection interface:

Pre-selected
refrigerant types

Tap Back to retain
original refrigerant

Frequently Used
section
(long press to
remove)



7. Leak Test Mode



1



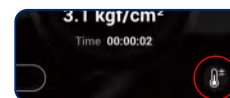
2



3

Function introduction: Used to record the pressure difference over a period of time.

- 1 Click "Start" will record the current pressure value, start timing, ΔP begins calculation;
- 2 Click "Stop" will pause timing, pause retains all calculation content;
- 3 Click "Wait" clears all content



1



2

Function introduction: Eliminates errors caused by gas expansion and contraction due to temperature changes.

- 1 Can only be used for pressure testing of sealed containers. After activation, real-time pressure values will be directly replaced with temperature-compensated pressure values.
- 2 The temperature compensation function can only be clicked in the "Wait" state, and cannot be clicked in the "Start" and "Stop" states.

8. Evacuation Mode



This mode can only be used when connected to a vacuum gauge. After connecting to the vacuum gauge, the digital manifold gauge will receive the "TARGET", "DECAY", and "TIMER" set values from the vacuum gauge and display them in the corresponding positions on the screen.

Function introduction 1:

Simulate the time required for vacuuming based on numerical changes, recorded in "Evacuation Time".

- (1) Timing starts when the vacuum value decreases.
- (2) Timing pauses when the vacuum value increases.

Function introduction 2:

Test the leakage rate of the vacuum system based on the set target values and time.

"**Vacuum Target**": The target value that the system's vacuum level needs to reach during vacuuming.

"**Decay Target**": The maximum allowable leakage value that the system must not exceed after vacuuming is completed.

"**Decay Time**": The required testing time.

Normal operation procedure:

- (1) Set the three parameters "Vacuum Target", "Decay Target", and "Decay Time" to the values required for testing.
- (2) Start vacuuming until the measured equipment's vacuum level is less than "Vacuum Target".
- (3) Stop vacuuming. The system now begins to leak. When the vacuum level exceeds "Vacuum Target", the equipment starts timing;
- (4) When the timing reaches the time set by "Decay Time", if the vacuum level has not exceeded "Decay Target", the equipment will display "PASS", otherwise it will display "FAIL".
- (5) After the result appears, controls will simultaneously appear on the screen. Clicking will clear all timing.

9. Setting Mode



Primary Settings Options	Secondary Settings Options
Manifold Gauge Mode	Refrigerant types: 100 types (OTA update supported) Temperature unit: °F, °C Pressure unit: psi, MPa, bar, kgf/cm², kPa
Evacuation Mode	Vacuum unit: microns, Pa, mbar, mmHg Vacuum target value: Corresponds to vacuum unit, fixed gear corresponds to fixed value Decay target value: Corresponds to vacuum unit, fixed gear corresponds to fixed value Decay time: 0-99min
Settings	Auto screen-off time: OFF, 2min, 10min, 1h Auto shutdown time: OFF, 10min, 1h Sound: ON, OFF Brightness: 50%-100% (half brightness to maximum brightness)
Bluetooth Pairing	Manage Bluetooth device connection and disconnection
Firmware Information	Display device-related information
Language Selection	Switch the device's current language
Modes	Switch device display style (no functional impact)
E-Manual	Scan QR code to view device function manual

10. Bluetooth Connection



- 1 Click "Connection" to scan for nearby Bluetooth devices.
- 2 Click "+" to connect Bluetooth. After successful connection, record the slave device name and MAC address.
- 3 Click "-" to disconnect Bluetooth.
- 4 Click "-" to clear the slave device name and MAC address.

11. Common Troubleshooting

Atmospheric pressure reading not zero when open to atmosphere	Perform a pressure zero calibration operation
Abnormal device operation, unable to power on/off normally	Press and hold the power button for 10 seconds to force restart

12. Maintenance and Care

- (1) Avoid charging at high temperatures ($>40^{\circ}\text{C}$) or low temperatures ($<0^{\circ}\text{C}$). High temperatures may cause thermal runaway, while low temperatures may lead to lithium-ion deposition, damaging the battery;
- (2) If you cannot troubleshoot the device yourself, promptly contact the after-sales service center and provide detailed descriptions of the malfunction to professional technicians so they can provide accurate technical support and repair services quickly.

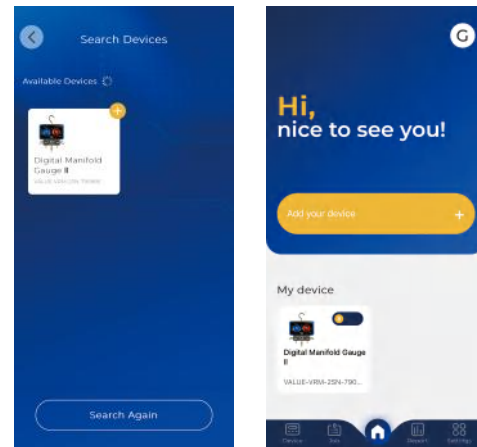
Proper Disposal Methods for This Product



This mark indicates that this product should not be disposed of with other household waste. It is important to prevent uncontrolled waste disposal that may be harmful to the environment or human health, please use a return and collection system or contact the retailer from whom you purchased the product. They can recycle this product in an environmentally safe manner.

13. Page Introduction

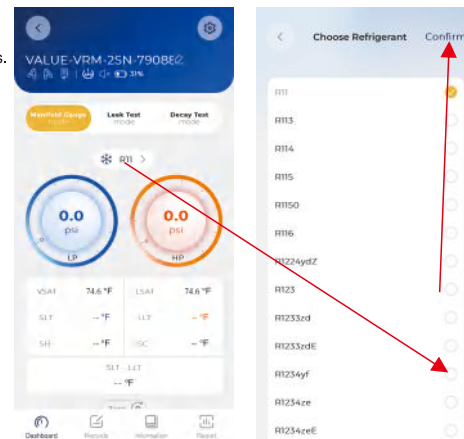
13.1 Add Device and Connect



13.2 Device Functions

(1) Manifold Gauge Mode Set Refrigerant Type

The page displays low-pressure and high-pressure side pressure values. Based on the current refrigerant type and pressure values, it calculates and displays refrigerant temperatures VSAT and LSAT. When the digital manifold gauge connects to large/small temperature clamps, the page simultaneously displays temperature values measured by the clamps. It also calculates subcooling and superheat values, eliminating the inconvenience of manual calculations.





Temperature clamp not connected Temperature clamp connected

The digital manifold gauge supports pressure zero calibration. On the app, click the Zero key and confirm by clicking Zero again within 5 seconds to perform zero calibration (if not confirmed within 5 seconds, zero calibration will not occur).



Not clicked



Button illuminated
after clicking

(2) Leak Test Mode

Leak Test Mode: Click to select whether to use low-pressure side or high-pressure side pressure values for detection.

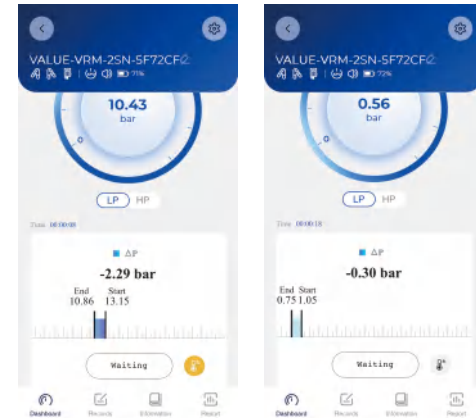


Low-pressure side

High-pressure side

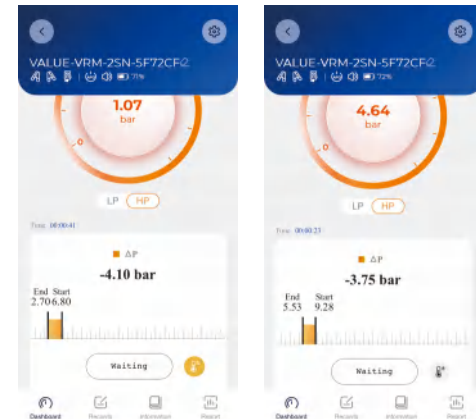
Perform Leak Test:

Click start button to begin leak test (button changes to stop). The app displays the initial pressure at test start and shows the real-time difference ΔP between current pressure and initial pressure. When needing to end the leak test, click stop (button changes to waiting), displaying the end pressure value. ΔP then shows the difference between end pressure and initial pressure. Click waiting, and the button reverts to start. If further leak testing is needed, repeat start, stop, waiting operations for subsequent test segments.



Low-pressure side -
After clicking start

Low-pressure side -
After clicking stop



High-pressure side -
After clicking start

High-pressure side -
After clicking stop

Leak test supports temperature compensation. Before starting the leak test, click the temperature compensation button to enable or disable this function. When the switch is illuminated, temperature compensation is enabled; when not illuminated, it is disabled. During leak test, clicking the temperature compensation button does not respond. (Temperature compensation button cannot be operated during leak test)



Temperature compensation off

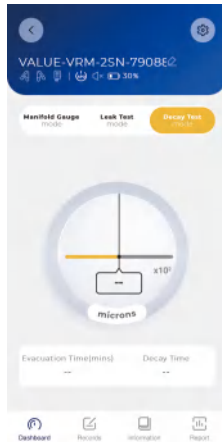


Temperature compensation on

(3) Evacuation Mode

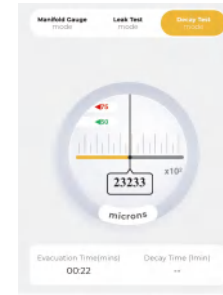
Vacuum Level Display:

After connecting the digital manifold gauge to the vacuum gauge, it displays the vacuum level measured by the vacuum gauge in real-time. When the vacuum gauge is not connected or the vacuum level exceeds the range, -- is displayed.

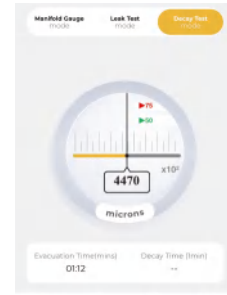


Vacuuming/Pressure Holding:

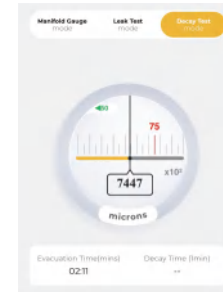
During vacuuming, the app displays the duration of vacuuming. When the vacuum level drops below the target value and rebounds above it, the pressure holding process begins. The pressure holding timer starts, and if the vacuum level does not exceed the pressure holding target value within the set time, a pass result is displayed upon completion. If the vacuum level exceeds the pressure holding target value within the set time, a fail result is immediately displayed. After confirming the pressure holding result by clicking OK on the device or app, the result is no longer shown.



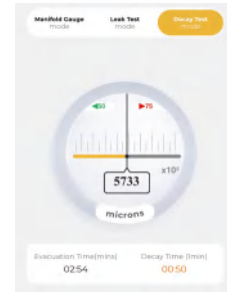
Vacuum level within range and above pressure holding value



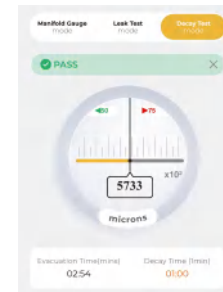
Vacuum level between target value and pressure holding value



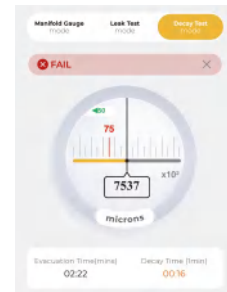
Vacuum level pumped below target value



During pressure holding



Pressure holding successful



Pressure holding failed

13.3 Unit Settings

The app can set the digital manifold gauge's pressure unit, temperature unit, vacuum unit, vacuum target value, and pressure holding target value. It can also configure auto-shutdown time, sound, and auto screen-off time according to your preferences.

The history parameters display the most recent three pressure, temperature, and vacuum unit setting records. You can select and reuse historical parameters.



13.4 Chart Recording

Manifold Gauge Mode

Manifold Gauge Mode displays low-pressure side and high-pressure side pressures, refrigerant temperature, temperature clamp measured temperature, superheat or subcooling in real-time. Pull down below the chart to view high or low-pressure side data.

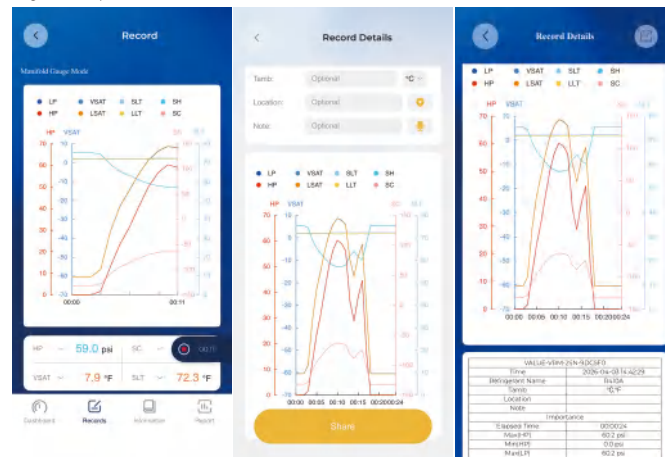


Chart recording in progress

Share record

Saved record data

Leak Test Mode

Leak Test Mode displays the pressure change chart in real-time, and this chart page also supports leak test operations.

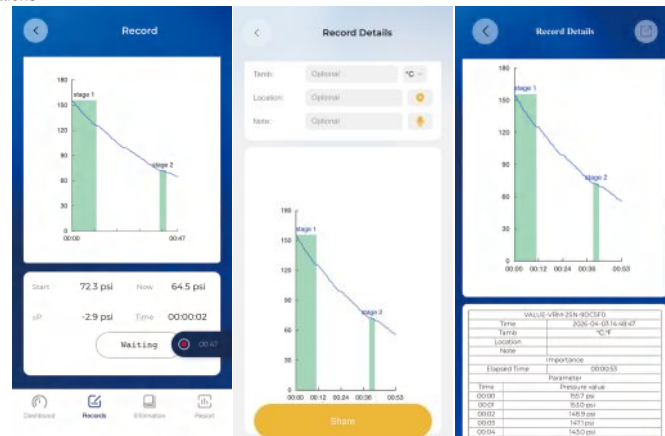


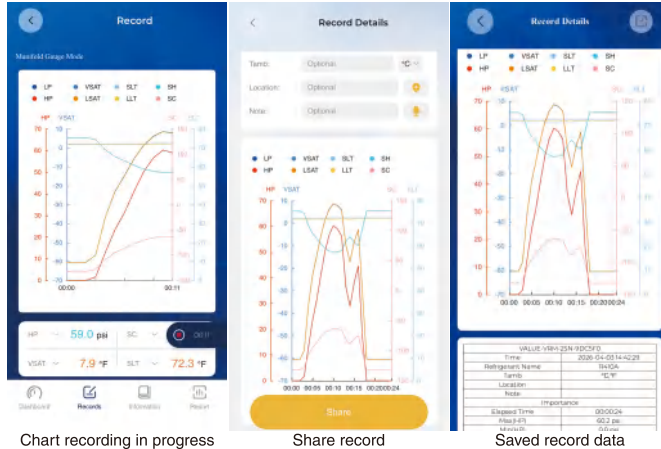
Chart recording in progress

Share record

Saved record data

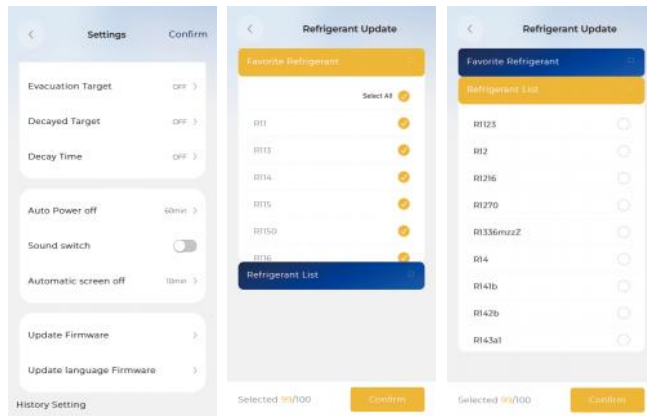
Evacuation Mode

Vacuum mode displays the vacuum level change chart in real-time, showing current vacuum level and set pressure holding target value and vacuum target value.



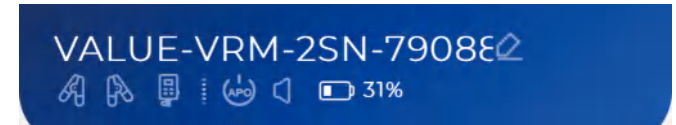
13.6 Refrigerant Update

Features refrigerant update function. Enter the refrigerant update page from the settings page. Frequently used refrigerants display refrigerant types currently in the device, and the refrigerant library shows refrigerants not currently selected in the device. To change the device's refrigerant type, check the desired refrigerants. Do not check refrigerants you do not want displayed in the device.

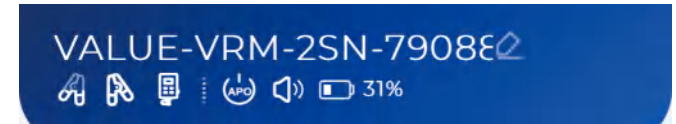


13.7 Status Bar Display

Below the device name, connection status of temperature clamps and vacuum gauge, as well as whether APO/sound is enabled and battery level of the digital manifold gauge can be displayed. Refer to UI for details; battery simulation is difficult on device side.



Temperature clamps and vacuum gauge not connected, VRM-2SN's APO and sound off/battery 98%.



Temperature clamps and vacuum gauge connected, VRM-2SN's APO and sound on.