5.2.1 Pressure measurement

● The steps described in “Preparation for Measurement” have been completed.

1. Press the Pres button.
   - Turn on the power, and then the pressure measurement screen appears by default. In case of not being the pressure measurement screen, press the [Pres] button to display the pressure measurement screen.
2. Apply pressure to the gauge. 3. Read the measured value.

● Measured value and display light flash in the following cases:

1. The maximum allowable pressure of 60 bar has been exceeded;
2. In case that the measurable pressure range is exceeded, “HHHH” is displayed on the screen; and
3. If a pressure below the measurable pressure range is entered, “LLLL” is displayed on the screen.

5.2.2 Pressure measurement using the temperature probe

1. Press the Temp button.
   - The real-time temperature value measured by the temperature clamp is displayed.
2. By the left/right arrow button, the temperature display screen is switched sequentially in the following order.
   - (Real-time temperature measurement)-(Difference between optimum temperature and real-time measurement value)
   - [◀]or[▶] : Changing the measurement value display.

Display 1. Displaying the optimum temperature
(displayed by default all the time on the pressure measurement screen)

Evaporating pressure / optimum temperature (refrigerant evaporation temperature): To	Condensation pressure / optimum temperature (refrigerant condensation temperature): Tc

Display 2. Displaying the real-time measured temperature
(displayed if pressing the [Temp] button when connecting the temperature clamp)

Evaporation pressure / measured temperature: T1	Condensation pressure / measured temperature: T2

Display 3. Display of the difference between the optimum temperature and the measured temperature (when connecting the temperature clamp)

Evaporation pressure / temperature difference (superheat): Δt	Condensation pressure / temperature difference (subcooling): Δt

5.2.3 Vacuum measurement

1. Press the Vac button, and close Vac-Lock valve.
2. Connect vacuum pump and start vacuum process.
(Do not open Vac-Lock valve at the beginning to protect vacuum sensor from the oil and dust inside of copper tubing or outdoor units.)
3. Open Vac-Lock valve and read the measured vacuum value.
4. Before turning off the vacuum pump, close the valve connected with vacuum pump to provent back flow of vacuum pump oil.
5. Close the Vac-Lock valve after vacuum process is completed.

! If the vacuum measurement does not work, check that the Vac-Lock valve is opened.

5.2.4 Setting the target vacuum

1. Press the Vac target button.
2. Select the target vacuum value using the [Arrow] button.
   Ex) In case of Torr unit, the following value changes sequentially each time the arrow button is pressed.(OFF)-(0.200)-(0.300)-(0.400)-(0.500)-(0.750)-(1.000)
3. Press the Vac target button to confirm the value and exit to the previous screen.
4. At the time of the vacuum operation, if the vacuum level reaches the target vacuum value, the machine beeps and sounds an alarm.
5. When the alarm is sounding, press the left/right arrow button to stop the alarm.

5.2.5 Pressure Leak Test & Vacuum Leak Test

1. Press the Pres Leak or Vac Leak button to enter the leak test mode.
   - Test timer and ΔP are displayed.
2. Press either the left or the right arrow button to start the leak test.
   - Time is measured in minutes while ":" of the timer blinks.
   - The initial pressure value is displayed on the left side of the screen, and the real-time measured value is displayed on the right side.
   - The difference (ΔP) between the initial pressure and the real-time measured value is displayed on the upper right of the screen.
   - Press the left or right arrow button during measurement, and then ":" of the timer stops blinking and measurement is paused. Press the arrow button again to resume measurement.
3. Press the [Pres] or other function button to end the leak test mode and enter the function screen of the relevant button.

6. How to Use Bluetooth

Connection to the smartphone

This equipment can be connected to the smartphone which makes the measured value checked, saved and sent to the outside.
For this, you need to install an application (the app) on your smartphone.
(Android smartphone: Google Play Store, Apple iPhone: App Store)

6.1 Installation of smartphone application (app)

Install the MICRODAM MDi app on Google Play Store of the Android phone and App Store of Apple iPhone
(Store search term : MICRODAM MDi)

MICRODAM MDi

6.2 Connection of manifold gauge to the smartphone

6.2.1 Prepare for the Bluetooth connection by pressing the Link button on the manifold gauge.

1. If you press the Link button, the Bluetooth mark on the top of the LCD blinks, making the equipment ready to be connected to the smartphone.
2. When the equipment is connected to a smartphone, the Bluetooth mark stops blinking.

Display	Description	Button
[Bluetooth mark] blinking	Ready for getting connected to the smartphone	[Link] button (Bluetooth function ON/OFF)
[Bluetooth mark] ON	Connected to the smartphone	
[Bluetooth mark] OFF	Connection to the smartphone ended	[Link] button (Bluetooth function ON/OFF)

6.2.2 Turn on the Bluetooth function of the smartphone.

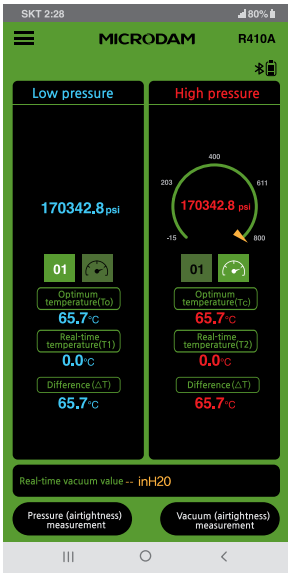
6.2.3 Implement the MICRODAM MDi app on your smartphone.

6.2.4 Connecting the manifold gauge to the smartphone.

1. When you implement the app, the list of manifold gauges that can be connected automatically is displayed on the screen in green.
2. Touch the manifold gauge marked in green on the device list, and then the manifold gauge will be connected to the app.

- Selecting the manifold gauge to connect

- When connected, the pressure measurement screen is displayed.



7.1 Replacing refrigerant hoses regularly

Warning

If the gauge has been dropped or a serious machine problem has occurred, it is possible that the pipe area of the refrigerant hose has been damaged.
The valve positioner can also be damaged, and it is difficult to identify in appearance the inside damage of the gauge.

- To check the technical problem of the gauge, please send it to the Customer Center of Sungshin Hasco or local agent.
- Whenever the gauge is broken or damaged, the refrigerant hose should be replaced with a new one.

7.2 Removing oil residues

Carefully remove the oil residue on the valve block using the compressed air or Vacuum Pump.

7.3 Securing measurement accuracy

Please contact **Sungshin Hasco Ltd.** to periodically check the followings.
- Periodic gauge calibration (recommended on annual basis)

7.4 Battery/ Rechargeable Battery Replacement

● Turn of the equipment.
1. Open the battery compartment cover.
2. Remove the used batteries/rechargeable batteries and insert new batteries / rechargeable batteries (4 × 1.5V, AA type) into the battery compartment. Pay attention to the polarity.
3. Close the battery cover.
4. Turn on the gauge.

7.5 Changing the valve or valve handle

Warning

It is strongly recommended that the user do not replace the valve or the valve handle by himself/herself.

- Please send the gauge to Sungshin Hasco Ltd.

8.1 Q & A

Details of display	Possible causes and solutions
 Blinking, Lo blinking	The battery power level is low. • Replace the battery.
Gauge turns off by itself	The battery power level is low. • Replace the battery. The Auto Off function is turned ON in [Setting]. • Set the Auto Off function to OFF.
HHHH blinking	Pressure is higher than the measurable pressure. • Maintain the allowed measuring range. Check for any leakage in the vacuum measurement mode. • After removing the cause of the leakage, measure the pressure again.
LLLL blinking	Pressure is lower than the measurable pressure. • Maintain the allowed measuring range.
Err blinking	Pressure sensor is damaged. • Please contact the sales agent or Sungshin Hasco Ltd.

8.2 Measuring parameters

Name		Description
Δt	SH	Degree of superheat, Evaporation pressure
	SC	Degree of subcooling, Condensation pressure
To	Ev	Refrigerant evaporation temperature
Tc	Co	Refrigerant condensation temperature
T1	T1	Measured temperature of evaporator (Exterior Clamp)
T2	T2	Measured temperature of condensor (Exterior Clamp)

FCC Warning
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) this device must accept any interference
received, including interference that may cause undesired operation.
Any Changes or modifications not expressly approved by the party responsible for compliance could
void the user's authority to operate the equipment.
Note: This equipment has been tested and found to comply with the limits for a Class B digital device,
pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection
against harmful interference in a residential installation. This equipment generates uses and can radiate
radio frequency energy and, if not installed and used in accordance with the instructions, may cause
harmful interference to radio communications. However, there is no guarantee that interference will not
occur in a particular installation. If this equipment does cause harmful interference to radio or television
reception, which can be determined by turning the equipment off and on, the user is encouraged to try to
correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.
-Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is
connected.
-Consult the dealer or an experienced radio/TV technician for help.
The device has been evaluated to meet general RF exposure requirement. The device can be used in
portable exposure condition without restriction.

MICRODAM

Digital Manifold

MDM009A Prime

www.microdam.co.kr

MICRODAM 04/2023

SUNGSHIN HASCO

Head Office I Gyeongsan Factory :
65, Gongdan 7-ro, Jillyang-eup, Gyeongsan-si, Gyeongbuk, Korea, 38465
Gimpo Factory : 21, Hagunsandan 2-ro, Yangchon-eup, Gimpo-si,Gyeonggi-do, 10049
www.microdam.co.kr **Tel.** +82-53-853-8826, 8827 **Fax.** +82-53-853-8828