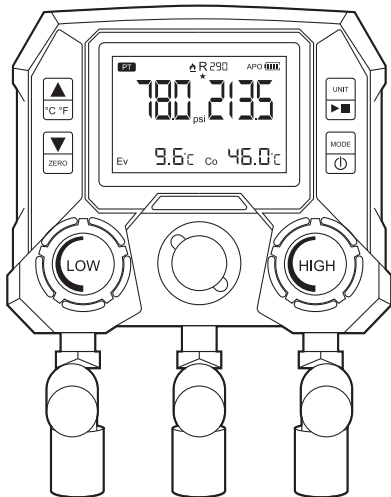


DIGITAL MANIFOLD



OPERATING INSTRUCTIONS



Authorized Distributor

APM, ASIA CO., LTD.

11/126-132 Moo 5 Lam Lukka Rd. 7 Kooekut, A Lam Lukka, Pathumthani 12130 Thailand.

TEL: 0-2965-4401-3, FAX: 0-2965-4464

www.apm.co.th

EMAIL: sales@apm.co.th

LINE@: @APM-ASIA

CONTENTS

1. About this document	2
2. Ensure safety	2
3. Operating environment	3
4. Product description	3
4.1 Overview	3
4.2 Parameter	4
4.3 Button Function	4
4.4 Icon Description	5
5. Using the product	6
5.1 Pressure Temperature Inspection And Refrigerant Filling	6
5.2 Pressure Leak Test	8
5.3 Vacuum measurement	10
6. Maintenance	11
6.1 Cleaning the instrument	11
6.2 Keeping connections clean	11
6.3 Changing batteries	11
7. Available refrigerants	12
8. Assistance and support	13

1. ABOUT THIS DOCUMENT

The instruction manual is an integral part of the instrument. Please read this documentation carefully and familiarize yourself with the product before putting it to use.

Pay particular attention to the safety instructions and warning advice in order to prevent injury and damage to the product.

Symbols



Indicates a reminder or further description of a feature



Warning: Serious physical injury may occur.



Danger: Serious physical injury or damage to the equipment may occur.

2. ENSURE SAFETY

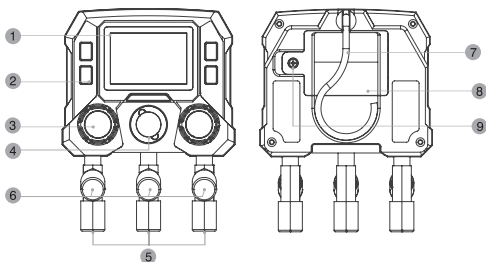
- Do not operate the instrument if there are signs of damage at the housing or hoses.
- Do not perform contact measurements on non-insulated, live parts.
- Do not store the product together with solvents. Do not use any desiccants.
- Dangers may also arise from the refrigeration systems being measured or the measuring environment: Note the safety regulations valid in your area when performing the measurements.
- If the measuring instrument falls or another comparable mechanical load occurs, may cause breakage of the filling tube and damage to the control valve. To ensure safety, replace the filling tube with a new one and check the condition of the instrument.

3. OPERATING ENVIRONMENT

- The instruments are digital refrigerant meters for the maintenance and servicing of refrigeration systems and heat pumps. They should only be carried out by qualified or trained personnel.
- The instruments are compatible with most noncorrosive refrigerants, water and glycol.
- The instruments are not compatible with refrigerants containing ammonia.
- The products must not be used in potentially explosive atmospheres!

4. PRODUCT DESCRIPTION

4.1 Overview



- | | |
|---------------------------|---|
| ① LCD screen | ⑥ Hose bracket for refrigerant hose |
| ② Button | ⑦ Hooks |
| ③ Valve | ⑧ Battery cover |
| ④ Viewing window | ⑨ Screws for securing the battery cover |
| ⑤ Interface ports 1/4 SAE | |

4.2 Parameter

Pressure measurement range	-14.5~800psi
Pressure display resolution	0.5psi
Pressure measurement accuracy	±0.5%FS
Pressure unit	kPa、MPa、psi、inHg、bar、kg/cm ²
Temperature unit	°C、°F
Operating temperature	-10°C~50°C
Storage temperature	-20°C~60°C

- ① The maximum range for pressure measurement is 800psi, the measurement target exceeding the range is displayed as OL.

4.3 Button Function

	PRESS	LONG PRESS
	Switching function modes	ON and OFF
	Setting pressure units	Beginning of Pressure Holding /Stop Pressure Holding
	Setting Refrigerant/ Setting the holding time	Setting temperature units
	Setting Refrigerant/ Setting the holding time	Pressure zeroing
	-	Auto Power Off function on and off

- ① Pressure zeroing should be carried out when the instrument is not connected to the target system and the instrument interface is connected to the atmosphere, incorrect zeroing will make the measurement data inaccurate, if misuse follow the correct method to re-zero can be restored to normal.

4.4 icon Description

	Functionality: Pressure and temperature measurement
	Functionality: Pressure Leak Test
	Functionality: Vacuum measurement
	Refrigerant
	Commonly used refrigerants
	Flammable refrigerants (Refrigerant safety class greater than A2L)
	Auto Power Off
	Battery level Display  when the instrument is almost empty and the battery must be replaced as soon as possible.

- ① The APO icon is illuminated to indicate that the automatic shutdown function has been turned on, and the instrument will automatically shut down after 15 consecutive minutes of no operation.

DANGER :

The use of safety class refrigerants above A2L must always comply with regional standards and interpretations. The presence of hazardous and potentially explosive atmospheres must be recognized when carrying out maintenance and repair work on refrigeration systems with flammable refrigerants. Maintenance, repair, refrigerant removal and system commissioning should only be carried out by qualified personnel.

5. OPERATING INSTRUCTIONS



Warning

Risk of injury caused by refrigerant that is under high pressure, hot, cold, or toxic!

Please take precautions for your safety!

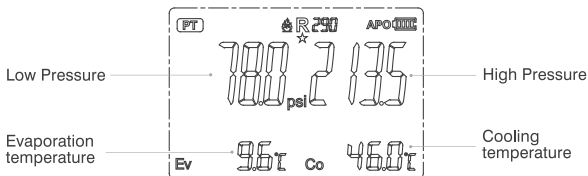
- Wear protective goggles and safety gloves.
- Comply with the permissible measuring range (-14.5 to 800 psi).
- Before each measurement, check the refrigerant hoses are intact and connected properly.
- Before applying pressure to the instrument: Be sure to secure the instrument to prevent it from falling.

The above precautions cannot anticipate the complexities of the actual premises and therefore cannot completely prevent accidental injuries from occurring, so please be proactive in identifying potential hazards and comply with local regulations and standards.

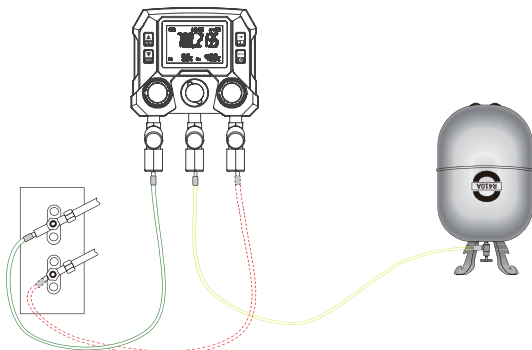
5.1 Pressure Temperature Inspection And Refrigerant Filling

The PT mode measures the following values of the system:

- High pressure and Low pressure
- Refrigerant evaporating and condensation temperatures

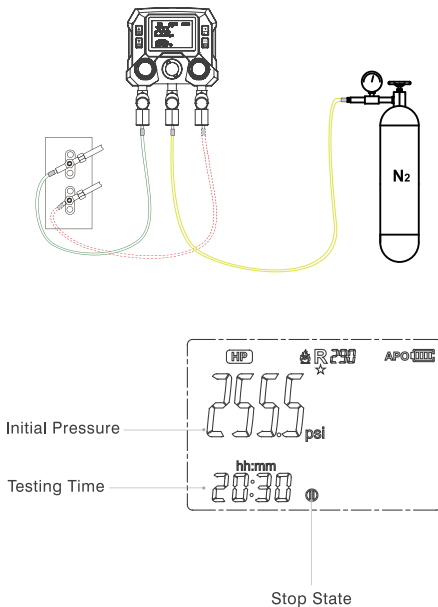


-
1. Short press  to switch the instrument to "PT" mode.
 2. Short press   to select the correct refrigerant.
 3. Setting pressure units and temperature units by short presses  and long presses  .
 4. Keep the instrument connector connected to the atmosphere, long press  to zero the pressure.
 5. Connect the refrigerant hose to the target system to begin testing or filling.



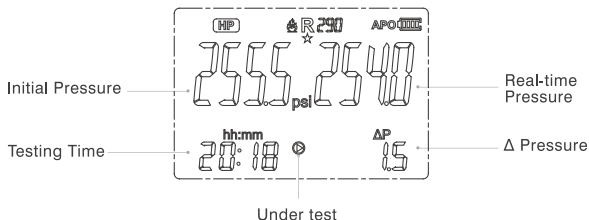
5.2 Pressure Leak Test

1. Short press  to switch the instrument to "HP" mode.
2. Short press  to set pressure unit.
3. Keep the instrument connector connected to the atmosphere, long press  to zero the pressure.
4. Connect the refrigerant hose to the target system and the yellow fluoride hose

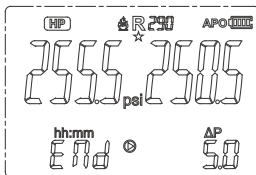


5. Press  and  to set the hold pressure test time, the minimum hold pressure time is 30 minutes the setting step is 30 minutes the maximum can be set up to 24 hours.

6. Press and hold  to start the hold pressure test, the icon  changes to , the initial pressure value is locked, the test time is counted down, and the screen displays the measured real-time pressure and ΔP value.



Timing end, all values are locked display, the time area shows "END", you can judge whether the system is leaking according to the test results. At this time, press any key to end the test.

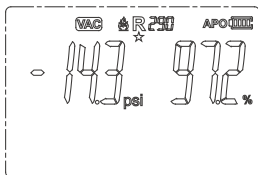
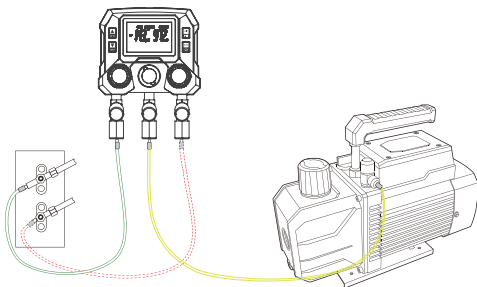


① The hold pressure function compensates for ΔP based on internal temperature sensor measurements to reflect more realistic test results. therefore it is possible that the value of $\Delta P \neq$ initial pressure - current pressure, which is not an instrumental error but a result of temperature compensation.

① Long press  during the test to end the hold pressure test.

5.3 Vacuum Operation

1. Short press  to switch the instrument to "VAC" mode.
2. Short press  to set pressure unit.
3. Keep the instrument connector connected to the atmosphere, long press  to zero the pressure.
4. Connecting refrigerant hose to the target system and the yellow refrigerant hose connects to the vacuum pump.



6. MAINTENANCE

6.1 Cleaning the instrument

Do not use any aggressive cleaning agents or solvents! Mild household cleaning agents and soap suds may be used.

Carefully blow out oil residues in the valve block using compressed air.

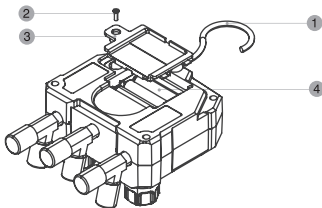
Clean interface bolts with a damp cloth as needed.

6.2 Keeping connections clean

Temporary placement allows the refrigerant hose to be attached to the refrigerant hose holder connector threads to prevent dust from entering the instrument through the refrigerant hose.

Promptly store the instrument in the carrying case after use.

6.3 Changing batteries



- ① Switch off the instrument and fold the hook.
- ② Loosen the fixing screws of the battery compartment cover.
- ③ Snap open the battery compartment cover along the groove at the bottom of the compartment.
- ④ Remove the spent batteries and insert new ones into the battery compartment. Observe the Polarity.

7. AVAILABLE REFRIGERANTS

US NIST standard data for 88 refrigerants

R113	R114	R115	R116	R12	R123	R1233ZD
R1234ZE	R1234YF	R124	R125	R13	R134A	R14
R141b	R143A	R152A	R170	R22	R227EA	R23
R236FA	R245FA	R290	R32	R401A	R401b	R401C
R402A	R402b	R403b	R404A	R406A	R407A	R407b
R407C	R407D	R407F	R408A	R409A	R410A	R410b
R412A	R413A	R414A	R414B	R416A	R417A	R417C
R420A	R421A	R421b	R422A	R422b	R422C	R422d
R424A	R426A	R427A	R428A	R429A	R433B	R434A
R436A	R437A	R438A	R441A	R443A	R448A	R449A
R450A	R452A	R452b	R453A	R454A	R454b	R455A
R458A	R500	R502	R503	R507A	R508A	R508b
R514A	R600	R600A	R601A			

- ① Refrigerants R236FA, R245FA are shown in the instrument as R236F and R245F.
- ① The following 16 refrigerants are commonly used, with ☆ displayed above the icon, and the commonly used refrigerants are arranged in front of the less commonly used refrigerants for quick and easy switching.

R1234yf	R134a	R22	R23	R290	R32	R404A
R407C	R410A	R433B	R436A	R502	R503	R507A
R600	R600A					

8.ASSISTANCE AND SUPPORT

Error Codes

CODE	POSSIBLE CAUSE AND SOLUTION
E 01	Remove the battery and reinsert it into the instrument. If the error persists, contact your dealer.
E 02	Calibration is required, please contact your dealer.
E 03	Please contact the dealer.
E 04	Please contact the dealer.



