



FOX
R744

Digital manifold

User's Manual
ENGLISH

 **WIGAM**

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WARNING

Safety precautions

- a) **This equipment is designed for trained personnel only, who must know the refrigeration fundamentals, cooling systems, refrigerants and possible damage that pressurized equipment may cause.**
- b) Carefully read the instructions contained in this manual; strict observance of the procedures described is fundamental to the operator's safety, the perfect state of the unit and constant performances as declared.
- c) Before performing any operation, make sure that the hoses used for connections have been previously evacuated and that they do not contain non-condensable gases .
- d) Avoid skin contact; the low boiling temperature of the refrigerant (about -30°C) can cause freezing
- e) Avoid breathing refrigerant vapours.
- f) It is recommended to wear suitable protections like safety glasses and gloves; contact with refrigerant may cause blindness and other personal injuries.
- g) Remove the battery in case of long periods of non-use.
- h) Do not keep a low battery inside the instrument
- i) Operate the unit only in locations with suitable ventilation and a high number of air changes.
- j) Protect the unit from dripping.
- k) Do not modify the calibration of safety valves and control systems.
- l) If you recover refrigerant from a cooling system equipped with a water evaporator and/or condenser, it is necessary to drain water from the evaporator and/or condenser or to keep the circulation pump running during the entire recovery operation in order to avoid frosting.
- m) The maximum working pressure of the instrument is 160bar. If this value of pressure is exceeded , the message "Over" will appear on the display. However the instrument is able to stand a pressure of MAXIMUM 200 bar (not displayed by the pressure transducers).

1. Introduction to FOX Digital manifold FOX-R744

FOX-R744 enables to make the HVAC and A/C systems maintenance in a quick and easy way and also to make their diagnosis with calculation of Superheating and Subcooling.

1.1 TECHNICAL FEATURES

| | |
|----------------------------|--------------------------------|
| Model | FOX-R744 |
| Refrigerant | R744 CO ₂ |
| Power supply | 9 V (DC) |
| Working temperature | -10 ÷ + 60 °C |
| Stocking temperature | -10 ÷ + 60°C |
| Working pressure | -0.99 ÷ + 160 bar (MAX 200bar) |
| Temperature range | -99.9 ÷ +400°C |
| Instrument precision class | ≤ 1% F.S. |

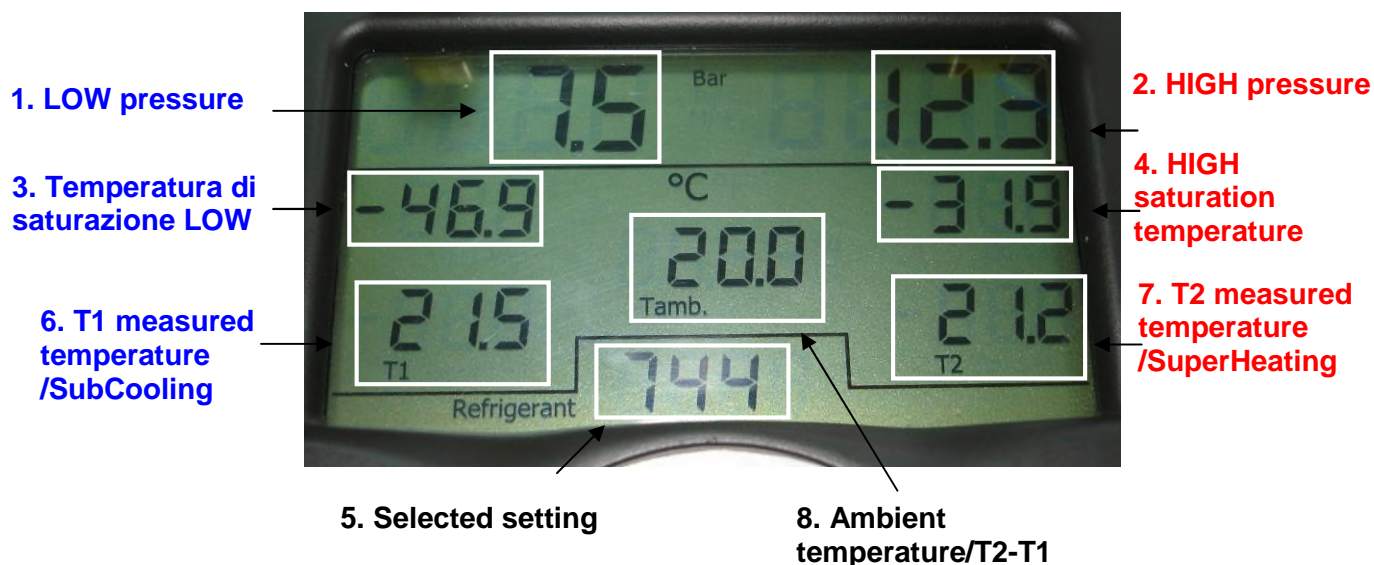
2. Components description and standard equipment

2.1 DISPLAY

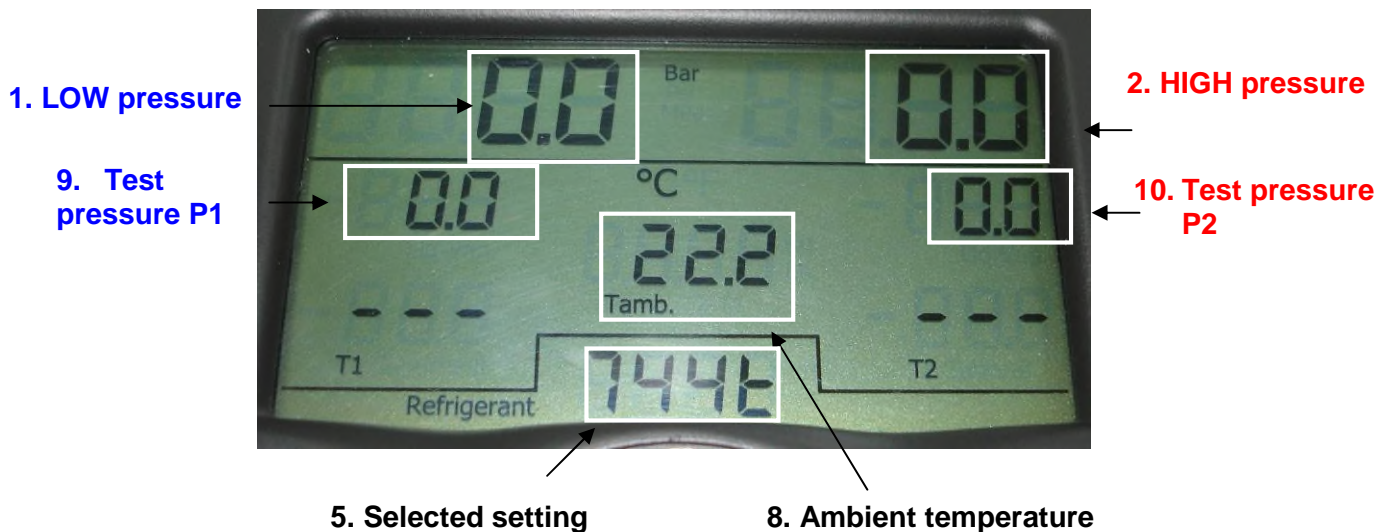
The display, with possibility to light on the backlight, shows the following information:

1. LOW side pressure
2. HIGH side pressure
3. LOW side saturation temperature
4. HIGH side saturation temperature
5. Selected setting ("744" subcritical cycle / "744t" trans-critical cycle)
6. T1 measured temperature / SubCooling
7. T2 measured temperature / SuperHeating
8. Ambient temperature / T2-T1
9. Pressure test (memorized) P1
10. Pressure test (memorized) P2

"744" setting (systems with subcritical cycle)



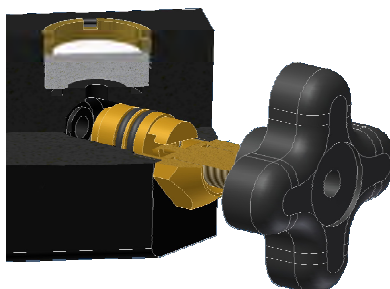
“744t” setting (systems with trans-critical cycle)



2.2 MANIFOLD

2-way piston manifold (LOW – HIGH) with double O-ring to maintain tightness in any functioning condition.

Inside the manifold there are 2 pressure transducers with precision class $\leq 1\%$ B.S. range 0÷160bar. Above a pressure of 160 bar, the message “Over” appears on the display.



2.3 CONTROL KEYPAD

The 5 keys enable a perfect control of the instrument. The sticker serigraphy enables an easy use during any operation.



2.4 TEMPERATURE PROBES

The instrument features 2 probes (K type) supplied in the kit with a 3 meters' cable. Another probe for measuring the ambient temperature is inside the instrument.

2.5 FLEXIBLE HOSES

Their flexibility assures easy connection in any situation. They withstand the cooling system operating pressures and keep the section passage intact even when operating in vacuum.

2.6 SUPPORT HOOK

In order to make the use of FOX-744 easier with hoses and other connecting places, you can use the support hook, which can be set in the 4 angular positions.

IMPORTANT

Please be careful when putting the hook in its rest position. Give a slight pressure on the outer side of the hook without damaging the instrument protection shell while positioning the hook at rest.

2.7 BATTERY HOLDER SPACE

On the rear of FOX-744, there is the battery holder space. When batteries must be replaced, remove the protection screw to open the cover.

3. Preparing FOX-R744 for use

WARNING

The presence of the synoptic sticker does not exempt the user from reading carefully this user's manual and from observing the illustrated procedures.

3.1 INSTALLING THE 9V BATTERY


A 9V battery is supplied in the FOX-744 packaging. Before effecting any operation, it is necessary to install the battery inside the instrument. Please proceed as follows:

- Remove the screw from the battery space.
- Remove the battery cover.
- Place the battery inside the space taking care to connect the connector
- Close the cover and fix it with the screw again.

IMPORTANT

When the battery is run down, the message "batt" will blink on the display alternating with the selected refrigerant. When the lowest possible voltage level is reached, the instrument will turn off automatically.

3.2 TURNING ON/TURNING OFF OF FOX-744

To turn FOX-744 on, keep the  central key pressed for more than 1 second. The display will resume the operator's latest settings.

To turn FOX-744 off, keep the  central key pressed for more than 3 seconds.

3.3 CONNECTING T1 AND T2 TEMPERATURE PROBES

In the package, there are 2 temperature probes (type K thermocouple) that must be connected before use (see picture below)

Connect them in the special spaces (check the thermocouples polarity), wait a few seconds for the correct temperature value to appear on the display. The absence of connection of the thermocouples is indicated on the display by the symbol "- - -".



Connecting temperature probes

3.4 CONNECTING FOX-744 TO THE SYSTEM






- a) Connect the blue hose to the LOW connection
- b) Connect the red hose to the HIGH connection

3.5 VACUUM CYCLE










IMPORTANT

Before using the instrument, make sure you have evacuated the hoses and all the inside circuit properly with a vacuum cycle of at least 5 minutes (in order to make a vacuum, we suggest the use of a Wigam vacuum pump, model RS3D or a bigger one)

3.6 INSTRUMENT SETTING SELECTION


- Press the  and  keys at the same time; when you release them, the latest refrigerant used will appear on the display
 - Select the setting by means of the  and  keys.
 - After the selection, you can confirm with the  central key.
- "744" (Subcritical cycle) Possibility to have the refrigerant saturation temperatures, the Subcooling and Superheating calculations displayed.
 - "744t" (Trans-critical cycle) Possibility to store the P1 and P2 pressures to perform system's test under pressure

3.7 UNIT OF MEASUREMENT SELECTION


- Press the  and  keys at the same time; when you release them, the pressure unit of measurement will blink on the display.
- Select the pressure unit of measurement (MPa – bar – psi) by means of the  and  keys.
- Move to the temperature unit of measurement (° C - ° F) by means of the  or  keys and modify the value by means of  and .
- Confirm the effected modification pressing the  central key.

4. Using FOX-R744 unit (“744” setting – subcritical cycle)


4.1 SETTING SUPERHEATING

By means of the  key, it is possible to display alternately the value of the temperature measured by **T1** probe or the value of **SuperHeating** calculation.



4.2 SETTING SUBCOOLING

By means of the  key, it is possible to display alternately the value of the temperature measured by **T2** probe or the value of **SubCooling** calculation.

4.3 SETTING T2-T1


By means of the  key, it is possible to display alternately the value of the temperature measured by **Tamb** probe or the value of **T2-T1** calculation.

4.4 DISPLAY BACK-LIGHTING

By means of the  key, you can activate the display back-lighting. The device turns off automatically after 16 seconds (this parameter may be set by the user, see chapter 5 for more information), or by pressing the  key a second time.

4.5 “ZERO PLUS” FUNCTION - ATMOSPHERIC PRESSURE CALIBRATION

FOX-744 manifold has a special function called “Zero Plus” - Atmospheric Pressure Calibration. This function must be used when one wants to know with the utmost accuracy the reading values of pressure near zero.


To perform this operation, it is necessary to bring the inner pressure of FOX to the atmospheric value and press the  key for more than 4 seconds; the message “done” on the display means that the operation has been successful. .

WARNING


*If the above function is performed with a different instrument inner pressure than the atmospheric one, this could cause an incorrect calibration of the instrument.
Therefore, perform this function with open knobs, in connection with the atmosphere.*

5. Using FOX-R744 unit (“744t” setting – trans-critical cycle)


5.1 SETTING P1 PRESSURE TEST

By means of the  key, it is possible to store the pressure value of the LOW side. This value is stored inside the instrument and must be used to perform the test under pressure with Nitrogen in the system.



5.2 SETTING P2 PRESSURE TEST

By means of the  key, it is possible to store the pressure value of the HIGH side. This value is stored inside the instrument and must be used to perform the test under pressure with Nitrogen in the system.

5.3 SETTING T2-T1


By means of the  key, it is possible to display alternately the value of the temperature measured by **Tamb** probe or the value of **T2-T1** calculation.

5.4 DISPLAY BACK-LIGHTING

By means of the  key, you can activate the display back-lighting. The device turns off automatically after 16 seconds (this parameter may be set by the user, see chapter 5 for more information), or by pressing the  key a second time.

5.5 “ZERO PLUS” FUNCTION - ATMOSPHERIC PRESSURE CALIBRATION

FOX-744 manifold has a special function called “Zero Plus” - Atmospheric Pressure Calibration. This function must be used when one wants to know with the utmost accuracy the reading values of pressure near zero.




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WARNING

*If the above function is performed with a different instrument inner pressure than the atmospheric one, this could cause an incorrect calibration of the instrument.
Therefore, perform this function with open knobs, in connection with the atmosphere*

5.6 PRESSURIZATION WITH NITROGEN

The instrument can check the system’s tightness through pressurization with Nitrogen. After the system’s pressurization and after having waited for the pressures stabilization (about 5

minutes), perform the storage of the systems’ pressures by means of the  and  keys. At this moment, it is possible to turn off the instrument. When the time for testing is completed, turn on the instrument by means of the  key and compare the stored pressures with the pressures you read. It will be possible to check if there are any leaks inside the system.

WARNING

The maximum working pressure of the instrument is 160bar. If this value of pressure is exceeded , the message “Over” will appear on the display.

6. Service operations

6.1 MODIFYING FOX PARAMETERS

FOX-744 has an inner series of parameters, that handle its functioning. These parameters can be modified by the user in order to personalize the instrument according to his own needs.

To enter the menu of parameters configuration, press the key for more than 3 seconds. The message "tOFF" in the refrigerant range means that you are inside the parameters menu.

| Parameter name | Description | Default value | Range |
|-----------------------|--|----------------------|-----------------|
| tOFF | Time of instrument self-turning off | 300 seconds | (OFF) 10 ÷ 3600 |
| t bL | Time of display back-lighting self-turning off | 16 seconds | (OFF) 10 ÷ 255 |
| tLOG | Time of data transfer to Data logger | 16 seconds | 10 ÷ 3600 |

Select the parameter you would like to modify by means of the key. Then, modify the value by means of the arrow keys. When the wanted value is reached, confirm by pressing the central key. If you scroll the complete list of parameters by means of the key, the display will go back to the standby screen when the list is over. "tOFF" and "t bL" parameters can be deactivated if positioned on OFF.

7. Spare parts and accessories

7.1 SPARE PARTS

| Code | Model | Description |
|-------------|--------------|-----------------------------|
| 04111016 | PWP-CO2 | Complete piston |
| 14021027001 | PWKG-CO2 L | LOW knob kit |
| 14021028001 | PWKG-CO2 H | HIGH knob kit |
| 14012057 | | Nylon hook for FOX -R744 |
| 09012013 | TK 109 | Universal temperature probe |
| | | |

7.2 ACCESSORIES

| Code | Model | Description |
|-------------|--------------|---|
| 09012018 | TK 102 | Immersion probe |
| 09012015 | TK 103 | Contact probe |
| 09012019 | TK 104 | Air probe |
| 09012020 | TK 105 | Surface probe |
| 09012016 | TK 106 | Insertion probe |
| 09012017 | TK 107 | Clamp-on probe |
| 06103001 | COSS/4-4/60 | Flexible hose 1500mm per CO2 |
| 06103002 | 3COSS/4-4/60 | Kit of 3 flexible hoses 1500mm per CO2 |
| 14029048 | VP/B8 | Blue plastic case with inside "shape" for FOX -R744 |

8. Available FOX models

| Code | Model | Description |
|-------------|-------------------------------|---|
| 04080001001 | FOX-100 | Digital manifold in plastic case with 2 probes TK109 |
| 04080001002 | FOX-200 | Digital manifold in plastic case with 2 probes TK109, 4 hoses CSA/4-4/60 and 2 adapters RG180-5/4 |
| 04080001003 | FOX- 300 | Digital manifold in plastic case with 2 probes TK109, 2 hoses WSS/4-4/60, 2 hoses WSA/4-4/56V4 and 2 adapters RG180-5/4 |
| 04080001004 | FOX-R717 (ammonia) | Digital manifold in plastic case with 2 probes TK109 and 4 hoses HDSS/4-4/60-R717 |
| 04080001005 | FOX-500 | Digital manifold in plastic case with 2 probes TK109, 2 hoses WSS/4-4/60, 2 hoses WSS/4-6/60 and 2 quick couplers AVS134-B6 and AVS134-R6 |
| 04080001006 | FOX-R744 | Digital manifold for CO2 in plastic case with 2 probes TK109 |

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