Mastercool® Inc.
"World Class Quality"

English

OPERATING MANUAL
A/C SYSTEM ANALYZER

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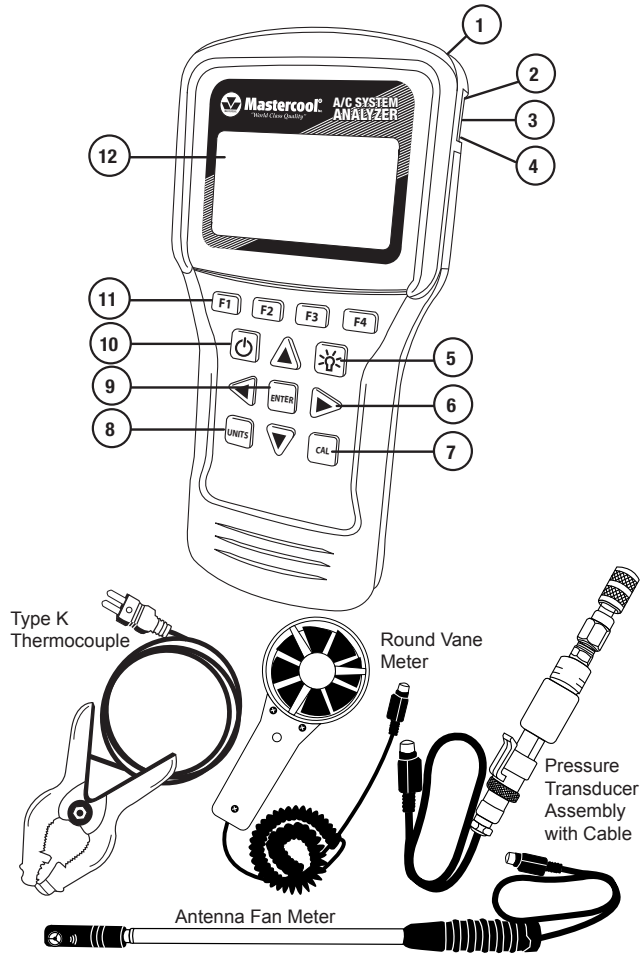

	DESCRIPTION	USE
1	Round Vane Meter/Antenna Fan Meter Socket	Insert round vane meter or antenna fan meter into socket to use
2	Pressure Transducer Socket	Insert pressure transducer cable into socket to use
3	USB Port	Insert USB cable to upload stored information
4	Type K Thermocouple Socket	Insert thermocouple into socket to use
5	Back Light Button	Toggles back light on and off
6	Arrow Buttons	Navigates screen
7	Calibration Button	Use to calibrate pressure transducer and thermocouple
8	Units Button	Toggles between Imperial and Metric units
9	Enter Button	Selects highlighted value
10	Power Button	Toggles power on and off
11	Function Buttons	Select operation on screen directly above keys (F1, F2, F3, F4)
12	Screen	Displays information

FIRST TIME USE

Set the Time

- Use **POWER** button to turn on A/C Analyzer.
- Use the ▼ or ▲ buttons to highlight the time.
- Press **ENTER.**
- Use the ◄ or ► buttons to highlight the hours, minutes, and AM/PM or 24 hrs.
- Use the ▲ or ▼ buttons to change the values.
  NOTE: to change to AM or PM, add or subtract 12 hours.
- When correct, press **F1** to SAVE.
  NOTE: Press **F4** to EXIT without saving.

Set the Date

• Use **POWER** button to turn on A/C Analyzer.

• Use ▼ or ▲ buttons to highlight the date.

• Press **ENTER.**

• Use the ◄ or ► buttons to highlight the Day, Month, Year and Format.

• Use the ▲ or ▼ buttons to change the values.
NOTE: The format can be MM/DD/YYYY or DD/MM/YYYY.

• When correct press **F1** to SAVE.
NOTE: Press **F4** to EXIT without saving.

Set the Units

• Press the **UNITS** button at any time to toggle between Imperial and Metric units.

QUICK START

General Functions
(in most screens:)

• Press **F3** (T/S) to go to the Test Selection screen.

• Press **F4** (EXIT) to go to the Main Menu screen.

Testing using Quick Start

Quick Start allows you to use the A/C System Analyzer without entering a customer or technician.

NOTE: Testing done in Quick Start mode will only be saved until the test is redone.

• Use power button to turn on A/C analyzer.

• Use the ▲ or ▼ buttons to highlight Quick Start.

• Press **ENTER**.

• Use ▼ or ▲ buttons to highlight the desired test.

• Press **ENTER**.

DB (DRY BULB)/WB (WET BULB)/RH (RELATIVE HUMIDITY)/ DP (DEW POINT)/ AIR VEL (AIR VELOCITY) WITH AIR VOLUME OPTION TESTING

• For round vane meter, twist sensor cover to the Open position. For antenna fan meter, go to next step.

• Insert cable into socket (it may take a few seconds for readings to appear).

• Place round vane meter or antenna fan meter perpendicular to airflow.

AIR VOLUME TESTING

• When in DB/WB/RH/DP/Air Vel testing screen Press **ENTER.**

• Use **F2** (RECT/DIA) to toggle between rectangular and round duct.

• Use ► or ◄ buttons to highlight digit and ▲ or ▼ buttons to change digit value.

• Press **ENTER** to toggle between Height and Width.
NOTE: Be sure to press **ENTER** for both Height and Width before pressing done.
NOTE: In **RECT** mode you will enter Height and Width, but in **DIA** mode you will enter the diameter only.

• Press **F1** when DONE entering duct size.

• Place round vane meter or antenna fan meter perpendicular to air flow to read volume.

TARGET SUPERHEAT TESTING

• Target Superheat Testing uses the round vane meter or antenna fan meter. For round vane meter, twist sensor cover to the Open position. For antenna fan meter, go to next step.

• Insert cable into socket (it may take a few seconds for readings to appear).

• Follow Target Superheat 1 screen instructions on where to place round vane meter or antenna fan meter.

• When values have stabilized, press **ENTER** to save.

• Press **F2** (NEXT).

• Follow Target Superheat 2 screen instructions on where to place round vane meter or antenna fan meter.

• When values have stabilized, press **ENTER** to save.

• Press **F2** (NEXT).

• Target Superheat will be displayed on the screen.

• If Actual Superheat has been tested, Press **F1** (ANYL) for analysis.

TEMPERATURE SPLIT TESTING

• Temperature (TEMP) Split Testing uses the round vane meter or antenna fan meter. For round vane meter, twist sensor cover to the Open position. For antenna fan meter, go to next step.

• Insert cable into socket (it may take a few seconds for readings to appear).

- Follow Temp Split 1 screen instructions on where to place round vane meter or antenna fan meter.
- When values have stabilized, press **ENTER** to save.
- Press **F2** (NEXT).
- Follow Temp Split 2 screen instructions on where to place round vane meter or antenna fan meter.
- When values have stabilized, press **ENTER** to save.
- Press **F2** (ANYL).
- Target Temperature Split and Actual Temperature Split with analysis will be displayed on the screen.

ACTUAL SUPERHEAT TESTING

- Use ▲ or ▼ buttons to highlight Actual Superheat.
- Press ENTER.

To Input Pressure Manually

- Use ▲ or ▼ buttons and highlight Input Manually.
- Press **ENTER.**
- Use ▲ or ▼ buttons to highlight refrigerant.
- Press **ENTER.**
- Use ► and ◄, buttons to highlight unit and ▲ and ▼ buttons to adjust unit value to input low-side saturated pressure.
- Press **ENTER.**
- Saturated vapor temperature will be displayed.
- Press **F2** (NEXT).
- Insert plug for clamp-on thermocouple into type K thermocouple socket.
- Follow screen instructions to place clamp-on thermocouple.
- When temperature has stabilized, press **ENTER.**
- Press **F2** (NEXT).
- Actual Superheat will be displayed.
- If Target Superheat test has been done, press **F1** (ANLY) for analysis.

To use Pressure Transducer to Calculate Superheat

- Use ▲ or ▼ buttons to highlight Calculate.
- Press **ENTER.**
- Use ▲ or ▼ buttons to select refrigerant.
- Press **ENTER.**
- Insert plug from pressure transducer into pressure transducer socket.
- Follow screen instructions to connect pressure transducer to system.
- When saturated temperature stabilizes, press **F2** (NEXT).
- Insert plug from clamp-on thermocouple into type K thermocouple socket.
- Follow screen instructions to place clamp-on thermocouple.
- When temperature has stabilized, press **ENTER.**
- Press **F2** (NEXT).
- Actual Superheat will be displayed.
- If Target Superheat test has been done, press **F1** (ANLY) for analysis.

ACTUAL SUBCOOL TESTING

- Use ▲ or ▼ buttons to highlight Actual Subcool.
- Press ENTER.

To Input Pressure Manually

- Use ▲ or ▼ buttons and highlight Input Manually.
- Press **ENTER.**
- Use ▲ or ▼ Buttons to select refrigerant.
- Press **ENTER.**
- Use ► and ◄, buttons to highlight unit and ▲ and ▼ buttons to adjust unit value to input high-side saturated pressure.
- Press **ENTER.**
- Saturated vapor temperature will be displayed.
- Press **F2** (NEXT).
- Insert plug for clamp-on thermocouple into type K thermocouple socket.
- Follow screen instructions to place clamp-on thermocouple.
- When temperature has stabilized, press **ENTER.**
- Press **F2** (NEXT).
- Actual Subcool will be displayed.

To use Pressure Transducer to Calculate Subcool

- Use ▲ or ▼ button to highlight Calculate.
- Press **ENTER.**
- Use ▲ or ▼ button to select refrigerant.
- Press **ENTER.**
- Insert plug from pressure transducer into pressure transducer socket.
- Follow screen instructions to connect pressure transducer to system.
- When saturated temperature stabilizes, press **ENTER.**
- Press **F2** (NEXT).
- Insert plug from clamp-on thermocouple into type K thermocouple socket.
- Follow screen instructions to place clamp-on thermocouple.
- When temperature has stabilized, press **ENTER.**
- Press **F2** (NEXT).
- Actual Subcool will be displayed.

SAVING TEST INFORMATION (NEW ENTRY)

- Use NEW ENTRY to save testing information under Customer, Technician, and Date.

To enter a New Customer

- Use power button to turn on A/C Analyzer.
- Use ▲ or ▼ buttons to highlight NEW ENTRY.
- Press **ENTER.**
- New Customer will be highlighted.
- Press **ENTER.**
- Use ▲ or ▼ buttons to adjust letter or number.
  NOTE: Using ▼ button will go directly to numbers.
- Use ► or ◄ buttons to highlight next space.
- When done press **ENTER.**
- Use ▲, ▼, ►, or ◄ buttons to enter Technician.
- When done press **ENTER.**
- Press **F1** (DONE).
- NEW TEST will be highlighted.
- Press **ENTER.**
- Any testing will be recorded under the current date. For instructions on how to do the testing see Quick Start.
- To see the testing summary press **F2** (DATA) at the end of each test except DB/WB/RH/DP/Air Vel.

To add a test to an Existing Customer

- Use **POWER** button to turn on A/C Analyzer.
- Use ▲ or ▼ buttons to highlight NEW ENTRY.
- Use ▼ or ▲ buttons to highlight existing Customer.
- Press **ENTER.**
- NEW TEST will be highlighted.
- Press **ENTER.**
- Any testing will be recorded under the current date and time. For instructions on how to do the testing see Quick Start.
- To see the testing summary press **F2** (DATA) at the end of each test except DB/WB/RH/DP/Air Vel.

LOOKING AT PREVIOUSLY SAVED INFORMATION

- Use **POWER** button to turn on A/C Analyzer.
- Use ▲ or ▼ buttons to highlight Customer Search.
- Press **ENTER.**
- Use ▲ or ▼ buttons to highlight Customer.
- Press **ENTER.**
- Use ▲ or ▼ buttons to highlight Test Number.
- Press **ENTER.**
- Saved test data will be displayed.

NOTE: The Customer or Test can be deleted by pressing **F2** (DEL) when they are highlighted.

CALIBRATION

- Use **POWER** button to turn on A/C Analyzer.
- From MAIN MENU press **CAL** button.

For Thermocouple Calibration

NOTE: Press **F4** (EXIT) in Thermocouple Cal 1 Screen to return to MAIN MENU without saving, or **F2** (PT) to calibrate the pressure transducer.

- Insert thermocouple into thermocouple socket.
- Place thermocouple at known temperature and allow temperature to stabilize.

NOTE: Use crushed ice and just enough water to cover and calibrate to 32˚F or 0˚C, or place thermocouple clamp on a heavy wall copper pipe and clamp a calibrated meter next to it.

- Use ► and ◄, buttons to highlight unit and ▲ and ▼ buttons to adjust unit value to input calibration temperature.
- Press **F1** (CAL) button.
- If thermocouple has correct reading, press **F4** (EXIT) to save.
- If thermocouple reading is off, Press **F1** (REDO) to redo the calibration.

For Pressure Transducer Calibration

CAUTION: To calibrate the pressure transducer you will need a source of high-pressure gas with a highly accurate calibrated gauge. Do not start calibrating the pressure transducer without it. For best results, calibrate sensor at close to its maximum value.

NOTE: Press **F4** (EXIT) in Pressure Transducer 1 and Pressure Transducer 2 Screens to return to MAIN MENU without saving, or **F2** (TC) to calibrate the thermocouple.

- If in Thermocouple 1 screen, Press **F2** (PT) button to display Pressure Transducer 1 screen.
- Two pressures are required, one low and one high. Atmospheric (0) is OK for the low pressure.
- With the pressure transducer at low pressure, use ► or ◄, buttons to highlight unit and ▲ or ▼ buttons to adjust unit value to input the low pressure.
- Press **F1** (NEXT).
- With the pressure transducer at the high pressure, use ► or ◄, buttons to highlight unit and ▲ or ▼ buttons to adjust unit value to input the high pressure.
- Press **F1** (CAL).
- If pressure transducer reading is correct, Press **F4** (EXIT) to save and return to MAIN MENU.
- If pressure transducer reading is off, press **F1** (REDO) to redo the high pressure setting.

SPECIFICATIONS:

System Analyzer

- Operating Temperature: 0 to 50˚C (32 to 122˚F), humidity <80%
- Storage Temperature: -20 to 50˚C (-4 to 122˚F), humidity <90%
- Dimensions with boot: 191mm x 93mm x 41mm
- Weight: (meter w/ batteries & round vane) 500g
- Temperature Display: ˚F and ˚C
- Pressure Display: PSI and Bar
- Backlit LCD Display
- Low battery indicator
- K-type thermocouple connection
- USB connection
- 6 AA batteries

Round Vane

Temp. Range/Resolution/Accuracy:

- -20 to 60˚C (-4 to 140˚F)
- 0.1˚C (0.2˚F)
- ±0.6˚C (1.1˚F) (-20 to 50˚C (-4 to 122˚F)), ±1.2˚C (2.2˚F) at other range

Humidity Range/Resolution/Accuracy:

- 0.1% to 99.9% RH
- 0.1% RH
- ±3% RH (at 25˚C (77˚F), 10 to 90% RH), ±5% RH at other range

Windspeed Range/Resolution/Accuracy:

- 0.6 to 32 m/s
- 0.1 m/s
- ±2% of full scale

Antenna Type Meter

Temp. Range/Resolution/Accuracy:

- -20 to 60˚C (-4 to 140˚F)
- 0.1˚C (0.2˚F)
- ±0.6˚C (1.1˚F) (-20 to 50˚C (-4 to 122˚F)), ±1.2˚C (2.2˚F) at other range

Humidity Range/Resolution/Accuracy:

- 0.1% to 99.9% RH
- 0.1% RH
- ±3% RH (at 25˚C (77˚F), 10 to 90% RH), ±5% RH at other range

Windspeed Range/Resolution/Accuracy:

• 0.5 to 25 m/s
• 0.1 m/s
• ±(2% of reading +0.3 m/s)

Pressure Transducer
• Operating Pressure Range: 0-750 psi (0-52 bar)
• 1/4FL Swivel nut connection
• Accuracy: ±0.5, ±1% F.S.
• Operating Temperature: -40 to 100˚C (-40 to 212˚F)

Clamp-on Thermocouple
Temp. Range/Resolution
• -40 to 121˚C (-40 to 250˚F)
• 0.1˚C (0.2˚F)