

SAGE UMT™ Universal Mobile Tester Operating Manual



Please read and save these instructions

263-EN V2.3



valvesgo.com

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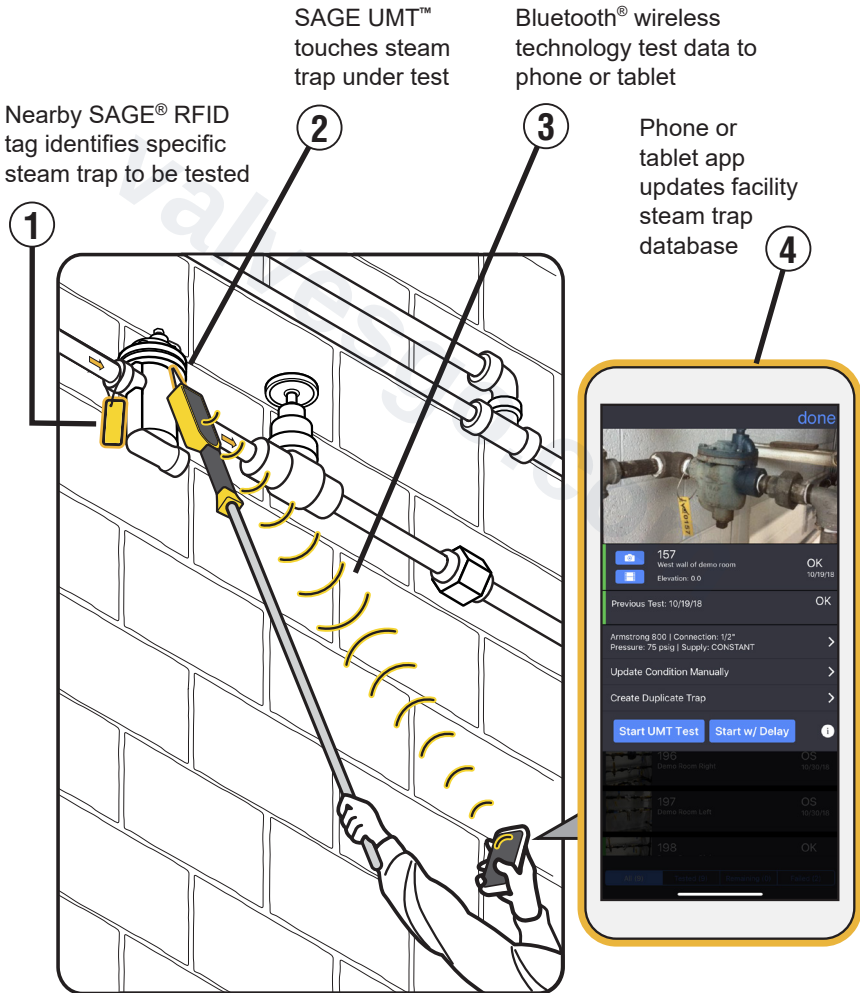
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System Overview

The SAGE® Universal Mobile Tester (SAGE UMT™) is a wireless hand-held steam trap testing tool. The SAGE UMT™ utilizes innovative wireless features combined with state of the art temperature and acoustics sensing technology. Features include:

- An RFID scanner for assigning and identifying each specific steam trap with proper RFID tags
- A Bluetooth® wireless connection to a phone or tablet running the SAGE® mobile app



Safety



WARNING! Injury or death and property damage are possible



CAUTION! Potential property damage, expensive repairs, and/or voiding the equipment warranty may result



BURN HAZARD! Direct exposure to steam, hot water, or hot metal surfaces can cause severe skin burns. Skin contact with 140°F (60°C) water or metal for only five (5) seconds may cause a second-degree burn.

Failure to comply with instructions following a safety icon may result in adverse consequences including, property damage, personal injury, or, in extreme cases, death

General Safety Guidelines:

1. Inappropriate use (beyond typical, intended use) could cause damage to the product and other property. It may also result in personal injury or, in extreme cases, death.
2. Only designated, qualified, and competent personnel should operate, maintain, and service this device in accordance with the directions in this product instruction manual. The SAGE UMT™ is NOT serviceable by non-Armstrong personnel.
3. Improper set-up, operation, or maintenance may void the product warranty.
4. When operating and maintaining this product:
 - a. ALWAYS select and wear appropriate personal protective equipment (PPE) before carrying out any physical work at the job site. Appropriate PPE may include hard hats, safety glasses, gloves, boots or shoes w/ non-slip soles and toe guards, and protective overalls.
 - b. ALWAYS scan the work area and take note of potential hazards before entering. Adjust your travel path or work position to avoid hazards and personal injury.
 - c. ALWAYS observe designated safety procedures when working in hazardous locations (areas containing explosive and combustible gases, vapors, and dusts) and confined spaces (locations where the breathable air supply is limited or variable, or where entrapment could occur).
 - d. use proper lockout-tagout procedures to disconnect power sources and de-energize machinery before conducting installation, service, and repair.
 - e. ALWAYS use great care and appropriate safety gear when working above ground level, especially on ladders and platforms or in the presence of overhead, electrical power lines.
 - f. ALWAYS shut off all "live" steam, water supply, and condensate return lines before breaking or loosening any plumbing joints.
 - g. ALWAYS carefully relieve any residual internal pressure in the system or connecting pipe work before breaking or loosening any plumbing joints.
 - h. ALWAYS allow hot parts to cool before servicing to avoid the risk of skin burns.
5. Only use the SAGE UMT™ in strict accordance with all applicable local, national, and international codes and practices.

Warnings and Cautions



WARNING! DO NOT Use SAGE UMT™ in Designated Hazardous Locations

The SAGE UMT™ is not designed for safe use in areas where explosive and combustible atmospheres (air containing flammable mixtures of dusts or gases) exist, either continuously, intermittently, or under abnormal circumstances.



WARNING! Follow Safety Precautions

To avoid personal injury and property damage, follow standard industrial, safety protocol when taking measurements and working around or near electrical devices, process and heating equipment, piping, rotating equipment, and pressure control or pressurized equipment. Such equipment would include, at a minimum, steam traps, relief valves, and heated or pressurized steam or condensate piping.



WARNING! Explosion, Fire, and Severe Burn Hazard – On-Board Li-ion, Battery Pack

The SAGE UMT™ contains an internal, rechargeable, Li-ion, battery pack.

The battery pack is not field serviceable. Avoid overcharging, heating, crushing, or piercing the handle of the SAGE UMT™. These actions could result in physical damage to the on-board, Li-ion, battery pack. A damaged battery pack can cause an explosion or fire to start within the SAGE UMT™.

Do Not:

- Remove the battery pack
- Crush battery pack
- Disassemble battery pack or expose battery pack contents to water
- Heat battery pack above 185°F (85°C)
- Incinerate battery pack

Contact Armstrong to arrange for service and replacement of the battery pack.



WARNING! DO NOT use if Handle, Housing or Charging Cords Are Hot or Damaged.

If any of these conditions occur, unplug the adapter, and turn off the SAGE UMT™ at once. Contact the Armstrong Smart Services Group for product service and replacement.



WARNING! DO NOT Throw. Avoid Drops.

Severe personal injury may occur. Impacts or drops may damage the SAGE UMT™. When the SAGE UMT™ is not in use, always store or transport it within the carrying case or holster.



WARNING! DO NOT Use Near High-Voltage Lines and Equipment.

Accidental contact or passing close to “live”, high tension, electrical power sources or equipment (such as electrical lines, transformers, motors, switch gear, etc.) could induce an electrical arc to jump between the high voltage source and earth ground. The SAGE UMT™, or the extension pole, and the end user may form a current path to ground.

In areas wherein high-voltage is present, always use a non-conductive, extension pole to reduce risk of electrical shock.

Continued on next page



BURN HAZARD! Hot Probe Tip May Cause Burn.

Frequent or prolonged contact of the metal probe tip of the SAGE UMT™ with high temperature surfaces, e.g. active steam traps and steam piping, will heat the probe tip. Avoid touching the probe tip to bare skin during or immediately after SAGE UMT™ usage. Allow the probe tip to cool.



CAUTION! SAGE UMT™ Device is NOT Field Repairable

If the SAGE UMT™ device fails to function or becomes damaged, discontinue use immediately. DO NOT attempt physical repair or maintenance. To arrange for service, contact the Armstrong Smart Services Group at:

Armstrong International, Inc.
816 Maple Street
Three Rivers, MI 49093
Ph. + 1-269-273-1415



CAUTION! Use ONLY Electrical Adapter to Recharge Battery Pack.

A 12-VDC electrical adapter is supplied with the SAGE UMT™. The adapter is equipped with a special plug that mates with a receptacle in the SAGE UMT™ handle. Use only this adapter to recharge the battery pack. DO NOT try to recharge the battery pack w/ other adapters or connect the SAGE UMT™ directly to a standard VAC power source. The wall outlet powering the adapter must be electrically grounded.



CAUTION! DO NOT Rinse or Immerse In Water or Other Cleaning Solutions. DO NOT Clean or Dry With Compressed Air.

If needed, clean the enclosure with only a mild detergent and warm water solution using a damp towel or sponge. Dry the SAGE UMT™ by hand. Clean the IR lens cover using a cotton swab w/ alcohol or a moist wipe to gently remove dirt and debris. DO NOT use abrasive cleaners or materials on the lens cover.

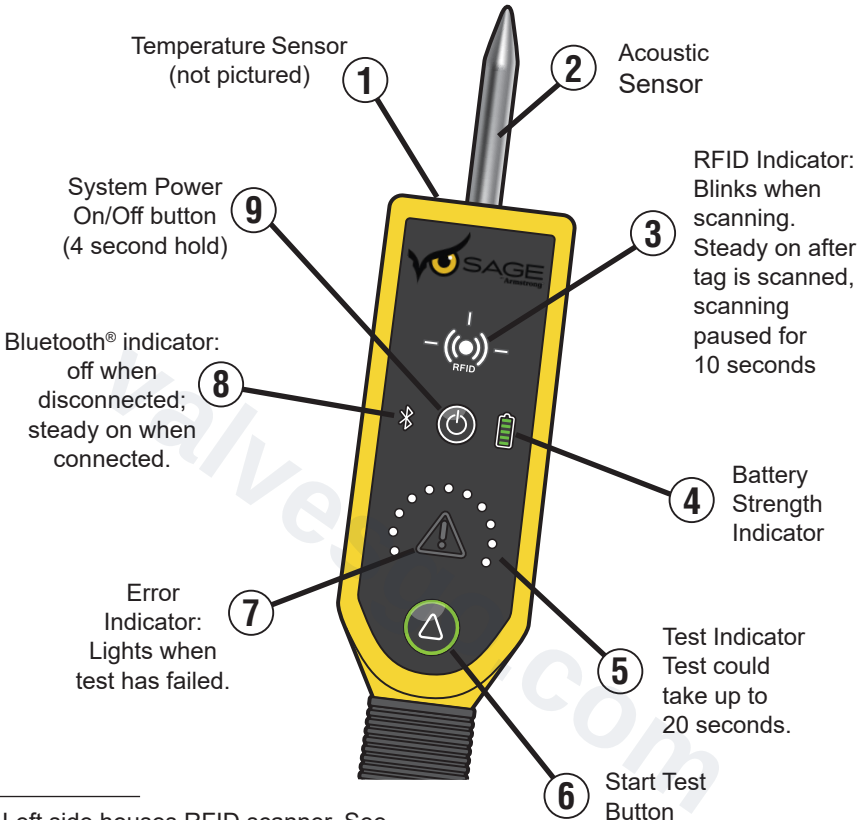
Notice: SAGE UMT™ Device is EMC Compliant

The SAGE UMT™ device complies with US, Canadian, and EU electromagnetic emissions and immunity (EMC) requirements. Operation complies w/ the following conditions:

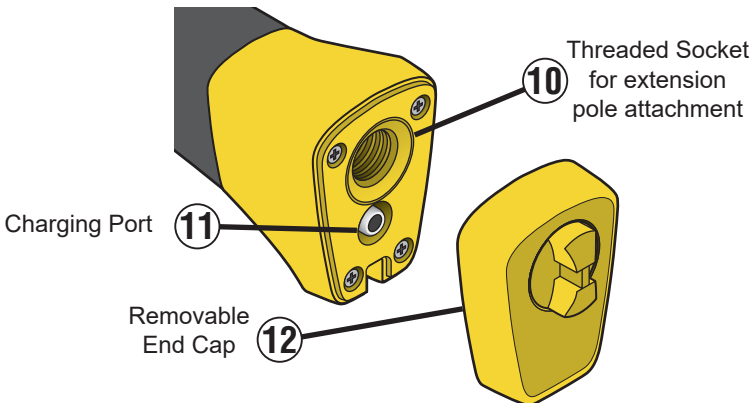
- This device may not cause harmful radio interference.
- This device must function under radio interference conditions, including interference that may cause undesired operations.

Controls and Connections

SAGE UMT™ controls, connections and indicators:



Left side houses RFID scanner. See RFID section for more information.

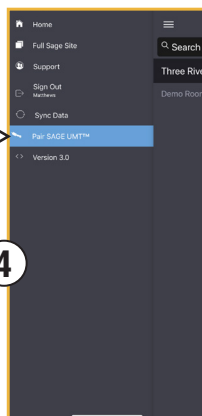


Pairing SAGE UMT™ with SAGE® App

SAGE® Username and Password Required

In order to pair the SAGE UMT™ with phone or tablet app, the user must have an active SAGE® account with specific SAGE® username and password.

Contact either system administrator or Armstrong representative to obtain necessary SAGE® credentials.



1. Download and Install Sage® App



On phone or tablet from either the App Store or Google Play, search for "SAGE® by Armstrong". Download and install using assigned username and password.

2. Power on SAGE UMT™

On selected SAGE UMT™, press power button for 3-5 seconds until power lights display.

3. Sign into SAGE®

4. From SAGE® app, bring up "Pair SAGE UMT™"

From Main SAGE® app screen, touch three lines at upper left corner. From option list, select "Pair SAGE UMT™"

5

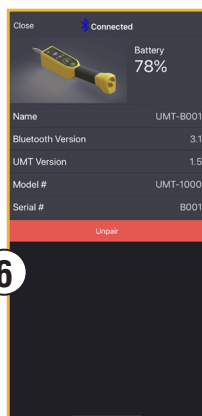


5. Verify SAGE UMT™ Serial Number and Complete Pairing

Verify that serial number on app screen matches number on back of SAGE UMT™ unit. If they match, press app screen to initiate pairing. App screen shows "Pairing SAGE UMT™".

6. Screen shows SAGE UMT™ is paired.

6



SAGE® RFID Overview

The left side of the SAGE UMT™ contains an RFID reader. The RFID reader enables the user to quickly scan an RFID tag which will automatically bring up the record in the SAGE® app of the steam trap to be tested.

The RFID tags greatly increase user efficiency, but are not required. Alternatively the user can search for a specific trap record in the SAGE® app.

RFID Hot Spot

To read the SAGE® RFID tag, touch it to the center of the left side of the SAGE UMT™. When the tag is successfully scanned the RFID indicator light will remain steady on for 10 seconds.

Note: RFID scanning is paused while the RFID indicator is steady on. RFID scanning resumes when the RFID indicator begins blinking.



Adding a Steam Trap to the SAGE® Database

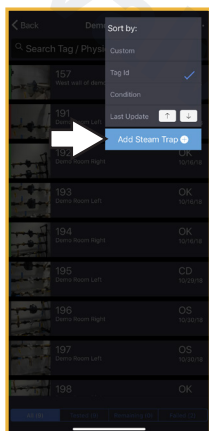
1. Bring up the SAGE® app on the phone or tablet. There are two ways to add a trap:

- Add a new trap (*see option A*).
- Create a duplicate of an existing trap (*see option B*).

A. ADD A NEW TRAP

On the SAGE® app, touch the 3 dot menu icon at upper right corner.

- From the drop-down menu, select "Add Steam Trap."

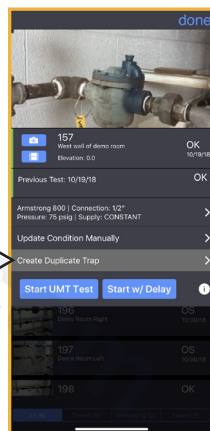


B. CREATE A DUPLICATE OF AN EXISTING TRAP

From the app screen of an existing trap, select "Create Duplicate Trap" at bottom of display.

Note: All properties of the duplicated trap are copied except:

- Tag number
- RFID tag
- Condition



2. Complete or confirm steam trap information, including the tag number of the new steam trap. Note: To ensure accurate testing, verify that the "surface finish" is appropriate to the test location
3. If using RFID tags - scan tag to assign to the steam trap record.
4. Install the new SAGE® RFID tag in a location near the steam trap where it can be physically touched by the left side of the SAGE UMT™. For resurveys, scan the SAGE® RFID tag with the SAGE UMT™ to retrieve the trap information.



CAUTION! The tag must not touch surfaces above 150°F (65°C). Hot surfaces will damage the tag.

Steam Trap Testing Procedure Using RFID Tag

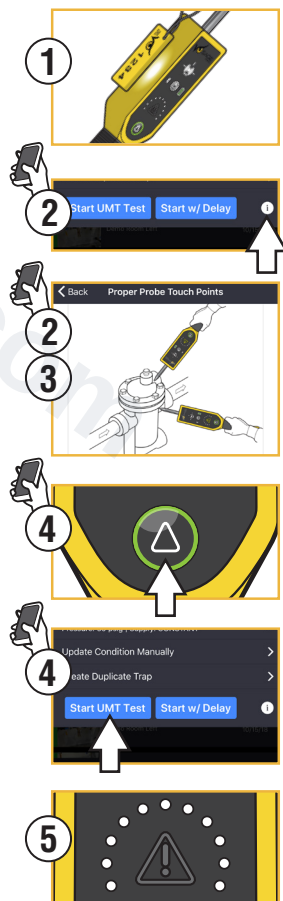
The Steam trap testing procedure that follows assumes that the steam trap to be tested, has an assigned SAGE® RFID tag, and is already in the facility database.

Pre-scan Checklist

Here are the things you need to check ahead of a scan.

- ☒ SAGE UMT™ powered on
- ☒ SAGE UMT™ showing adequate battery power
- ☒ RFID tag installed near steam trap
- ☒ Phone or tablet powered on and logged into the SAGE® app
- ☒ SAGE UMT™ is paired with the SAGE® app

1. **Hold SAGE UMT™ so that left side touches the RFID tag installed at the steam trap.** RFID indicator light will blink, then go steady on after the tag is read successfully. The app will display the trap information screen.
2. **Determine proper probe touch point.** ⓘ
The testing location will vary depending upon the particular steam trap model, and type. ***Proper probe placement is indicated on pages 15 and 16 of this manual, as well as in the app.*** Touch the ⓘ symbol at bottom right of SAGE® app screen. This will show the proper touch point.
3. **Move SAGE UMT™ to firmly hold probe against the touch point for duration of test.**
It is important to maintain about **5 pounds (2.25 kgf)** of pressure throughout the test.
4. **Start steam trap test by pressing the "Start Test" button on the SAGE UMT™, or for remote activation, press the start test button in the SAGE® app.**
5. **Test Indicator lights show that the test is in progress.**
The test will take between 1 and 20 seconds
6. **SAGE® app shows result of test.**



Steam Trap Testing Without RFID Tag

If the steam trap to be tested does not have an RFID tag, the user must manually bring up the steam trap file from the SAGE® database on the handheld device.

Pre-scan Checklist

Here are the things you need to check ahead of a scan.

- ✓ SAGE UMT™ powered on
- ✓ SAGE UMT™ showing adequate battery power
- ✓ Phone or tablet powered on and showing SAGE® app

1. Select the trap to be tested and bring up the record.

2. Determine proper probe touch point. ⓘ

Depending upon the particular steam trap model, the probe needs to touch either the trap itself or the inlet piping close to the trap. Touch the ⓘ symbol at bottom right of SAGE® app screen. This will bring up a visual of the proper touch point. **Use SAGE UMT™ app, or see PAGES 15-16** to determine probe position. Note that Float and Thermostatic traps have three touch points.

3. Move SAGE UMT™ to firmly hold probe against the touch point for duration of test.

It is important to maintain about **5 pounds (2.25 kgf)** of pressure throughout the test.

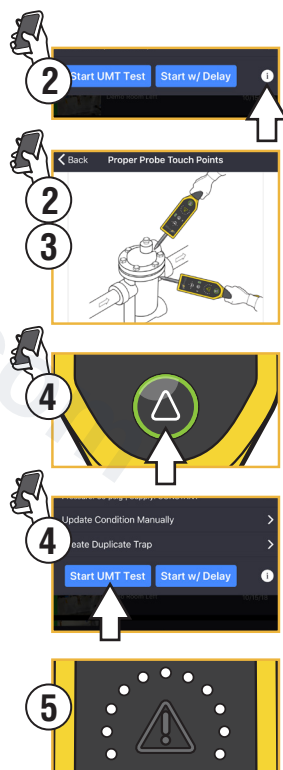
4. Start steam trap test by pressing the "Start Test" button on the SAGE UMT™, or for remote activation, press the start test button in the SAGE® app.

Press triangle button to start test.

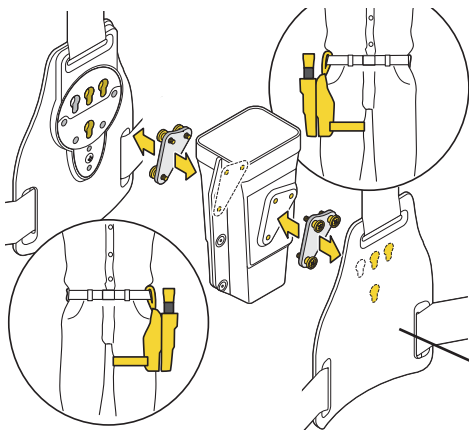
5. Test Indicator lights show that the test is in progress.

The test will take between 1 and 20 seconds

6. SAGE® app shows result of test.



SAGE UMT™ Accessories



SAGE UMT™ Holster

The SAGE UMT™ package includes a hip holster for convenient transport storage of the SAGE UMT™. The illustration shows how to set up the holster to carry the SAGE UMT™ unit on either left or right hip.

Insert hanger into the carrier keyways and press down into place. Slide over locking tab to secure

Squeeze tabs together and push in to unlock



LOCKED

Push tab in to lock

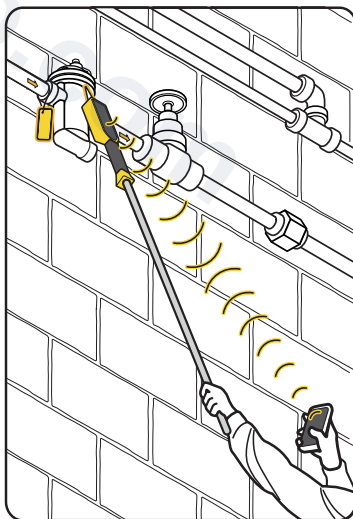


UNLOCKED

Pole Connection

The base of the SAGE UMT™ features a threaded socket. For testing of steam traps that are out of convenient reach, connect a standard non-conductive extension pole. The Bluetooth® connection will continue to work up to 30ft (9m).

No pole included in package



WARNING! To prevent risk of electrical shock, extension pole must not be made of metal or other conductive material

Troubleshooting



WARNING! DO NOT use the SAGE UMT™ if the handle feels hot or appears to be deformed or misshapen. DO NOT use the electrical adapter if the housing or the charging cord is hot or damaged. If either condition occurs, unplug the adapter, and turn off the SAGE UMT™. Contact the Armstrong Smart Services Group for product service or replacement. If SAGE UMT™ is broken or does not work properly, contact the Armstrong Smart Services Group for guidance, validation, and possible return authorization for product service or replacement.



CAUTION! DO NOT immerse the SAGE UMT™ under a stream of running water or within a bath of water. Do NOT use compressed air to clean or dry the SAGE UMT™. Only clean the enclosure with a mild detergent and warm water solution using a damp towel or sponge. Dry the SAGE UMT™ by hand. For the IR lens cover, use a cotton swab with alcohol or a moist wipe to gently clean the lens. Do not use abrasive cleaners or materials on the lens.

IMPORTANT: There are no user serviceable parts or components in the SAGE UMT™. For any operating problems that are not clearly covered in this troubleshooting section, contact your Armstrong dealer or representative to arrange factory service. For further information, see armstronginternational.com or call 269-273-1415 for assistance.

Typical Questions and Answers

Q: SAGE UMT™ not connecting to phone or tablet.

A: Confirm that you have turned on the Bluetooth® communication in your phone or tablet. The SAGE UMT™ can only be paired to your phone or tablet in the SAGE® app. Please see page 8 of this manual for detailed pairing instructions.

Q: SAGE UMT™ is not powering on.

A: Press and hold the power button for 5 seconds. If none of the lights turn on plug into the charger and wait up to 15 seconds to see if battery light confirms charging. If battery lights confirm charging let device charge for 30 minutes. Then disconnect from power and attempt to power again. If unit still will not power on contact Armstrong or your local Representative.

Q: SAGE UMT™ will not charge.

A: Confirm that you are using the charger that came with your SAGE UMT™. Confirm there is no debris inside the charging port. Confirm power adapter is plugged into a known good outlet then press barrel plug into charging port. Let device charge for 30 minutes if no lights come on contact Armstrong or your local Representative.

Continued on next page

Typical Questions and Answers Continued

Q: SAGE UMT™ not powering down.

A: Press and hold power button for 5 seconds. Confirm all lights have turned off before releasing the power button. If any lights remain on contact Armstrong or your local Representative.

Q: SAGE UMT™ caution light is blinking.

A: If the caution light is blinking the SAGE UMT™ has lost Bluetooth® connection with your phone or tablet during a test. Confirm that your Bluetooth® is still enabled on your phone or tablet. Confirm pair status in SAGE® Mobile. If you have confirmed Bluetooth® is enabled and SAGE UMT™ is not showing up in pair screen, power cycle the SAGE UMT™ and restart SAGE® mobile. After you have launched app and powered up SAGE UMT™ confirm they pair. If any issues persist contact Armstrong or your local Representative.

Q: SAGE UMT™ is not reading RFID tag.

A: Confirm you are holding RFID tag to the center of the left side of the SAGE UMT™. If available test with a known good tag to see if RFID tag has malfunctioned. Confirm RFID light is flashing at the top of the display, if RFID indicator is solid wait 10 seconds for scanning to be active again.

Q: SAGE UMT™ reading RFID tag but not pulling up a trap.

A: Confirm tag has been assigned by searching for tag number and tap trap details. The top field is the RFID field under the trap details and should show a random string of 16 characters. If the text "Touch RFID tag with SAGE UMT™ to assign" is present, simply tap the tag to assign to the trap. If tag is assigned, enter a group in the location to then be able to pull up assigned tag.

Q: SAGE UMT™ shows Temp condition menu right away when testing a trap.

A: This is a menu that needs technician input to confirm the condition of the trap. A trap with low temperature could be caused by several things. (ex. closed valves, or a failed trap). The technician is required to input the most applicable condition information.

Q: SAGE UMT™ is presenting Temp Condition menu on known hot trap.

A: Three possible answers:

- The surface finish may need to be changed in the trap details. In SAGE® mobile there are three different surface finishes to adjust the measurement with shiny surfaces that can alter IR readings. Under trap details locate "Surface" and change to a surface finish that best describes the test location.
- The IR lens cover may be dirty. Clean the lens with a soft clean cloth and retry the test.
- Correct the value in the "Pressure In" field if it does not accurately describe the pressure at the steam trap.

Q: SAGE UMT™ shutoff during testing (unrelated to low battery charge).

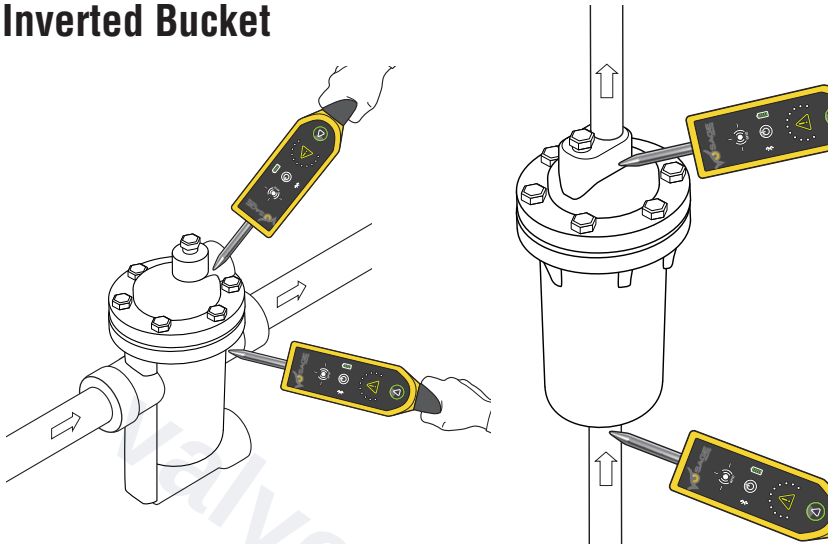
A: Under some conditions (usually when the ambient air is cold and dry), a significant electrostatic charge can develop on objects and even human beings. Bringing the SAGE UMT™, probe tip close to, or in contact with, metal objects (e.g., piping and steam traps) may cause an electrostatic discharge to occur. The discharge can temporarily interrupt electrical circuits in the SAGE UMT™ device. If the Device shuts down, simply depress and hold the Start Test Button pushbutton to power-up the SAGE UMT™ again and then continue testing.

Q: SAGE UMT™ indicates a cold trap on some traps mounted downstream of a heat exchanger.

A: Running tests on traps installed downstream of heat exchangers poses a special challenge to the SAGE UMT™ device. In some cases, the condensate leaving a heat exchanger has cooled well below the boiling point of water at that steam pressure. The Device expects to read a condensate temperature that is reasonably close to the saturated steam pressure stored w/in the SAGE® database. If the Device reads a temperature significantly lower than it expects, it will read the trap as cold, stop the test, and report it as cold and possibly defective. Under these conditions, the end user may need to use alternate methods to effectively test traps operating with subcooled condensate.

Proper Probe Touch Points

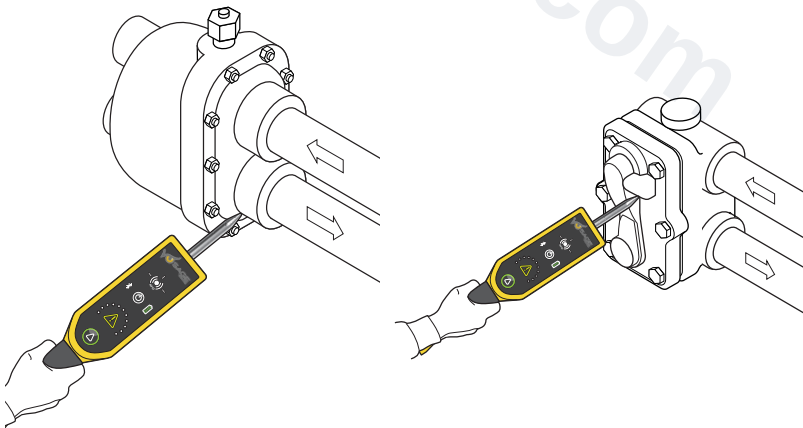
Inverted Bucket



Float & Thermostatic

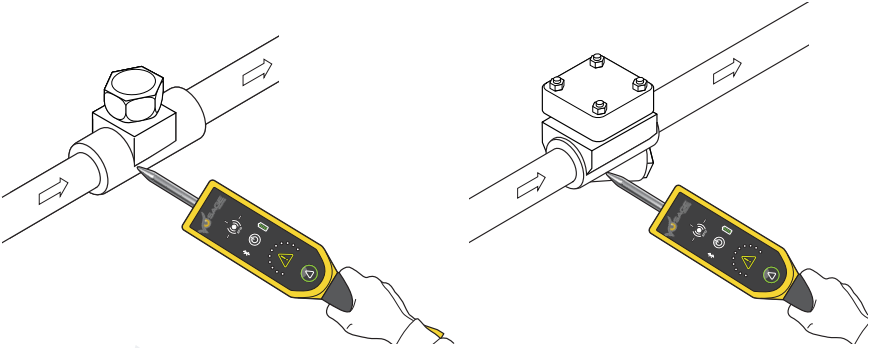
Thermal element

Outlet pipe (for process traps with heavy loads)

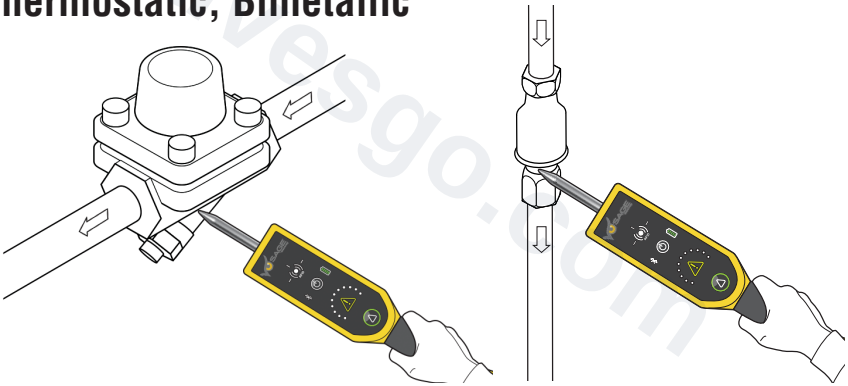


Proper Probe Touch Points

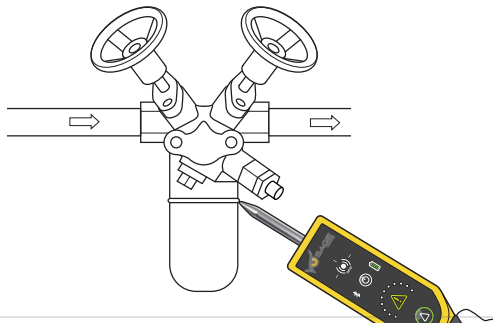
Thermodynamic/Disc Traps



Thermostatic, Bimetallic



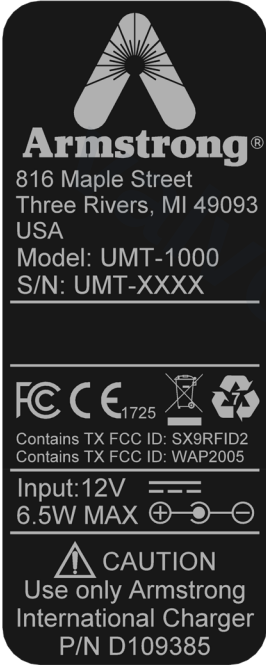
Traps on connector blocks or trap valve stations



Product Specifications and Certifications

EMC Compliance (North America)

FCC Part 15 Subpart B,
Sec.15.107a & 15.109a (Class B
Digital Device); ICES-003, Issue 6
Class B



Maximum Operating Conditions	
Minimum steam pressure	2 psig (0.14 barg)
Maximum steam pressure	3200 psig (221 barg)
Temperature Operating Range	-4°F to 140°F (-20°C to 60°C)
Battery Charging ambient temperature	32°F to 113°F (0°C to 45°C)

Specifications	
Ingress Protection Rating	IP64
Output Signal	RFID: 13.56MHz BLE: 4.2MHz
Infrared sensor	Optical grade, coated germanium lens 40°F to 716°F (-40°C to 380°C)
Materials of Construction	Housing - ABS Grip - Rubberized Paint Seal - Silicon Rubber Probe - 304SS Nameplate - PVC
Battery Type	Two (2) Lithium Ion Cells
Weight	1.3lbs (0.57Kg)
Voltage	7.2 Volts DC
Charging Voltage	12 Volts DC (6.5 W max.)

CE Mark - 	
EU Directives	Test Standards
LVD 2014/35/EU	IEC61010-1, IEC60529
RED 2014/53/EU	(ETSI) EN 300 328 V2.1.1 (ETSI) EN 301 489-17 V3.1.1 (2016-11, 2017-02) (ETSI) EN 300 330 V2.2.1 (2017-02) (ETSI) EN 301 489-3 V2.1.1 (2017-3)

Appendix: International Approvals

Australia

Supplier's Declaration of Conformity (SDOC) to Radiocommunications EMC Std. 2017, Short Range Devices Std. 2014, and EMR-Human Exposure Std. 2014.



Eurasian Economic Union

Declaration of Conformity (DoC) to TR CU 004/2011 and TR CU 020/2011.



India

Equipment Type Approval, Reg. No. ETA-SD-20190501204.

Kuwait

Certificate of Conformity (CoC), Type Approval, Ref: 3686.

Malaysia

Certificate of Conformity (CoC), Approval No. RFDQ/13A/1219/S(19-5343).



New Zealand

Supplier's Declaration of Conformity (SDOC) to New Zealand Radiocommunications Act 1989, Sec 134 (1) (g).

R-NZ

Oman

Type Approval Certificate for Telecommunications Equipment, Approval No. TRA/TA-R/8464/19.

OMAN - TRA
R/8464/19
D182437

Philippines

Type Acceptance Certificate, No. ESD-1921179C.

Qatar

Certificate of Type Approval for Telecom Equipment, Approval Ref: CRA/SM/2019/R-8266.

International Approvals - Continued

Singapore

Equipment Registration Under Telecommunications (Dealer) Regulations, Reg. Nos: N5199-19 & N5200-19.

Complies with
IMDA Standards
DA108440

Thailand

Suppliers Declaration of Conformity (DoC) for the UMT-1000.



เครื่องวิทยุคมนาคมนี้ ได้รับยกเว้น ไม่ต้องได้รับ
ใบอนุญาตให้มี ใช้ซึ่งเครื่องวิทยุคมนาคม
หรือตั้งสถานีวิทยุคมนาคมตามประกาศ กสทช.
เรื่อง เครื่องวิทยุคมนาคม และสถานีวิทยุ
คมนาคมที่ได้รับยกเว้นไม่ต้องได้รับใบอนุญาต
วิทยุคมนาคม ตามพระราชบัญญัติวิทยุ
คมนาคม พ.ศ. 2498



nab. | โทรคมนาคม
กำกับดูแลเพื่อประชาชน
Call Center 1200 (Insw5)

(Translation of content: This radiocommunication equipment is exempted to possess license, user license, or radiocommunication station license as per N BTC notification regarding radiocommunication equipment and radiocommunication station has been exempted for license according to radio communication act B.E.2498)

International Approvals - Continued

UAE Telecom Equipment Registration Certificate, Auth. No: ER75945/19.		
	TRA - United Arab Emirates Dealer ID : 0014005/09 TA RTTE : ER75945/19 Model : UMT - 1000 Type : SAGE UMT™	

valvesgo.com

Notes:

valvesgo.com

Notes:

valvesgo.com

SAGE UMT™ Universal Mobile Tester Operating Manual

Limited Warranty and Remedy

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SAGE® Universal Mobile Tester (SAGE UMT™)

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