Operating Manual

ALTAIR® Pump Probe

Order No.: 10158948/06

CR: 800000066543

US

MSAsafety.com

WARNING!

These instructions must be provided to users before use of the product and retained for ready reference by the user. Read this manual carefully before using or maintaining the device. The device will perform as designed only if it is used and maintained in accordance with the manufacturer's instructions. Otherwise, it could fail to perform as designed, and persons who rely on this device could sustain serious injury or death.

The warranties made by MSA with respect to the product are voided if the product is not installed and used in accordance with the instructions in this manual. Please protect yourself and your employees by following the instructions.

Please read and observe the WARNINGS and CAUTIONS inside. For additional information relative to use or repair, call 1-800-MSA-2222 during regular working hours.

The Safety Company

MSA Suzhou
No. 8 Rui En Lane, Xingpu Road, Suzhou Industrial Park
Jiangsu Province
China

For your local MSA contacts, please go to our website www.MSAsafety.com

Contents

1 Safety Regulations

1.1 Correct Use

This device is intended for use by trained and qualified personnel.

⚠ WARNING!

- Read and follow all instructions carefully.
- Check pump for proper operation before each day's use.
- Do not place end of sample line in liquids.
- Do not charge in a combustible atmosphere.
- Do not alter or modify device.
- Use only MSA-approved sampling lines.
- Do not use silicone tubing for sampling lines.
- Wait sufficient time for the reading; response times vary, based on gas and length of sampling line.
- Do not use if function test is unsuccessful, the device is damaged, improperly serviced/maintained, or genuine MSA spare parts have not been used.

Failure to follow these warnings can result in serious personal injury or death.

It is imperative that all users of this product read and follow this operating manual. In particular, the safety instructions, as well as the information for the use and operation of the product, must be carefully read and observed. Furthermore, the national regulations applicable in the user's country must be taken into account to promote safe use.

Alternative use, or use outside these regulations is considered as non-compliant. This also applies especially to unauthorised alterations to the product and to commissioning work that has not been carried out by MSA or authorised persons.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

NOTICE

This is a class A product in accordance with CISPR 22. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

This Class A digital apparatus complies with Canadian ICES-003.

1.2 Liability Information

MSA accepts no liability in cases where the product has been used inappropriately or not as intended. The selection and use of the product are the exclusive responsibility of the individual operator.

Product liability claims, warranties also as guarantees made by MSA with respect to the product are voided, if it is not used, serviced or maintained in accordance with the instructions in this manual.

1.3 Safety and Precautionary Measures to be Adopted

⚠ WARNING!

Carefully review the following safety limitations and precautions before placing this device in service.

Failure to follow this warning can result in serious personal injury or death.

1. Perform the following check before each day's use to verify proper device operation:
   a. Check pump for proper operations (see 1.1 Using the ALTAIR Pump Probe).
   b. Have pump serviced if necessary.
2. Keep the probe tip above liquid surfaces; otherwise, liquid may enter the system and block sample flow, causing internal damage.
3. Charge device in non-hazardous areas only.
4. Do not alter this device or make any repairs beyond those specificed in this manual. Only MSA-authorized personnel may repair this unit; otherwise damage may result.

Filter Maintenance

Visually examine the external dust and water filter before each use. Replace filter with a new one if it is dirty.

Environmental Conditions

A number of environmental factors such as temperature and humidity may affect the flow rate, run time and charge time.

Procedures for Handling Electrostatically Sensitive - Electronics

The device contains electrostatically sensitive components. Do not open or repair the device without using appropriate electrostatic discharge [ESD] protection. The warranty does not cover damage caused by electrostatic discharges.

Product Regulations

Follow all relevant national regulations applicable in the country of use.

Warranty Regulations

The warranties made by Mine Safety Appliances Company with respect to the product are voided if the product is not used and maintained in accordance with the instructions in this manual. Please protect yourself and others by following them. We encourage our customers to write or call regarding this equipment prior to use or for any additional information relative to use or service.

1.4 Warranty

ITEM WARRANTY	PERIOD
Chassis and Electronics	Three years
Pump and Drive Unit	Three years

This warranty does not cover filters, fuses, etc. As the battery ages, there will be a reduction in usable device run time. Certain other accessories not specifically listed here may have different warranty periods. This warranty is valid only if the product is maintained and used in accordance with Seller's instructions and/or recommendations.

The Seller shall be released from all obligations under this warranty in the event repairs or modifications are made by persons other than its own authorized service personnel or if the warranty claim results from physical abuse or misuse of the product. No agent, employee or representative of the seller has any authority to bind the Seller to any affirmation, representation or warranty concerning this product. Seller makes no warranty convering components or accessories not manufactured by the Seller, but will pass on to the Purchaser all warranties of manufacturers of such components.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, IMPLIED OR STATUTORY, AND IS STRICLY LIMITED TO THE TERMS HEREOF. SELLER SPECIFICALLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICUALR PURPOSE.

Exclusive Remedy

It is expressly agreed that Purchaser's sole and exclusive remedy for breach of the above warranty, for any tortuous conduct of Seller, or for any other cause of action, shall be the replacement at Seller's option, of any equipment or parts thereof, which after examination by Seller is proven to be defective.

Replacement equipment and/or parts will be provided at no cost to Purchaser, F.O.B. Seller's Plant. Failure of Seller to successfully replace any nonconforming equipment or parts shall not cause the remedy established hereby to fail of its essential purpose.

Exclusion of Consequential Damage

Purchaser specifically understands and agrees that under no circumstances will seller be liable to purchaser for economic, special, incidental or consequential damages or losses of any kind whatsoever, including but not limited to, loss of anticipated profits and any other loss caused by reason of non-operation of the goods. This exclusion is applicable to claims for breach of warranty, tortuous conduct or any other cause of action against seller.

2 Description

2.1 Overview

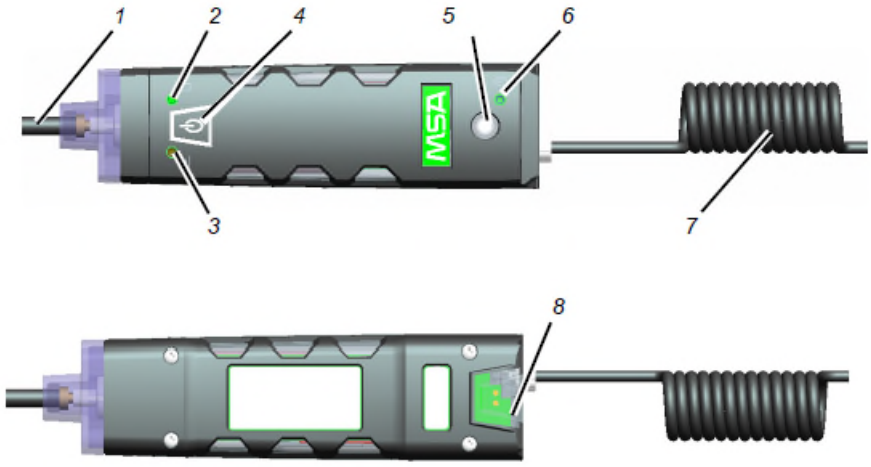

Figure 1 Device Overview

1	*Wand/Sample inlet*	*5*	*Horn*
2	*Battery LED*	*6*	*Charge LED*
3	*Flow LED*	*7*	*Coupling Hose*
4	*POWER ON/OFF button*	*8*	*Charge port*

The ALTAIR Pump Probe is a hand held portable gas sampling pump integrated with rechargeable Li-ion battery and has audible and visual alarms, which indicate blocked flow, low battery power and charge status. Pump inlet connects with a 0,3 m [1 ft] wand or sample line while the pump outlet connects with other portable gas detection equipment through a 1 m [3 ft] coiled tube. The rubber over-mold of the main body is constructed of static dissipative plastic. The clear top portion of the case is designed to observe the filter status.

Device to be used with Altair 2X, 4X, 4XR, and io4 only.

⚠ CAUTION!

Combustible gas performance approved per CSA C22.2 No 152 with Altair 4X.

Failure to follow this caution can result in minor or moderate injury.

NOTE: While the Pump Probe is designed to be used with the Altair 4XR and Altair io4 gas detectors, the gas performance approvals do not include use of the pump.

2.2 Device Hardware Interfaces

LED Definitions

LED	Description
Flow LED	• RED: flow fault • FLASHING GREEN: operating properly
Battery LED	• FLASHING RED: low battery warning • RED: low battery shut down
Charge LED	• RED: charging

LED	Description
	• GREEN: charge complete • ORANGE: charge fault

3 Operation

3.1 Using the ALTAIR Pump Probe

1. Press the POWER ON/OFF button.

   The audible alarm sounds.

   The pump motor starts fast and then slows down as the pump speed is automatically adjusted.

   Once the pump is ready for use, the green LED flashes every two seconds.

2. Check the pump by blocking the free end of the sample line or probe.

   The pump motor shuts down.

   The audible alarm sounds.

   The Flow LED turns red, indicating a flow fault.

3. When the pump inlet, sample line, probe or pump outlet is blocked, the pump alarm must activate. If the alarm does not activate:

   Check the pump, sample line, and probe for leaks and pump outlet for blockage.

   Once the leak is fixed and/or the outlet blockage removed, recheck the pump alarm by blocking the flow.

4. Check the pump before each day's use.

⚠ WARNING!

- DO NOT use the pump, sample line, or probe unless the pump alarm activates when the flow is blocked. Lack of an alarm is an indication that the sample may not be drawn to the sensors, which could cause inaccurate readings.
- Never allow the end of the sample line to touch or go under any liquid surface. If liquid is drawn into the device, readings will be inaccurate and the device could be damaged.

Failure to follow this warning can result in serious personal injury or death.

5. Press POWER ON/OFF button to reset alarm and restart pump.

During operation, a pump alarm may occur when the:

- Flow system is blocked.
- Pump is inoperative.
- Sample line is attached or removed.
- Filters become clogged with excessive dirt or debris.

3.2 To Clear an Alarm

1. Correct any flow blockage.
2. Press the POWER ON/OFF button to restart the pump.

3.3 Turning OFF

1. Press and hold the POWER ON/OFF button for about three seconds.

   Flow LED should turn red.

   The pump shuts down.

   The audible alarm sounds.

3.4 Low Battery Warning

A Low Battery Warning indicates that a nominal 30 minutes of operation remain before device batteries are completely depleted.

WARNING!

If experiencing a "low battery warning" condition, exit the work area and go to safe location. The age of batteries, ambient temperature, and other conditions can reduce the duration of time that the unit remains operable prior to a "low battery shutdown" condition.

Failure to follow this warning can result in serious personal injury or death.

When the device switches into Low Battery Warning:

- Red Battery LED will flash every two seconds.
- The pump continues to operate until the device is turned OFF or Low Battery Shut Down occurs.

3.5 Low Battery Shut Down

When the batteries can no longer operate the device, the device goes into Low Battery Shut Down:

- Battery LED is solid red.
- Audible alarm sounds.
- Pump shuts down.

WARNING!

When Low Battery Shut Down condition occurs, stop using the device and immediately follow the steps listed below:

1. Leave the area and go to a safe location.
2. Turn OFF the device if it is ON.
3. Report to the person responsible for maintenance.
4. Charge the device in safe area.

Failure to follow this warning can result in serious personal injury or death.

3.6 Battery Charging

The ALTAIR Pump Probe uses a non-user serviceable rechargeable Lithium Ion battery.

WARNING!

- Risk of explosion: Do not recharge device in hazardous area.
- Use of any charger, other than a MSA qualified charging device, may damage or improperly charge the batteries.

Failure to follow these warnings can result in serious personal injury or death.

For users in Australia/New Zealand: The charge cradle is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take adequate measures.

The charger is capable of charging a completely depleted pack in less than four hours in normal, room-temperature environments.

Allow extremely hot or cold devices outside the charging temperature range to stabilize for one hour at room temperature before attempting to charge.

- Minimum and maximum ambient temperature to charge the device is 10°C [50°F] and 35°C [95°F], respectively.

- For best results, charge the device at room temperature 23°C [73,4°F].

To Charge the Device

1. Firmly insert the charger connector into the charge port on the back of the device.
2. The Charge LED is used to indicate the charge status.

   Red = Charging

   Green = Charged

   Orange = Fault
3. If a problem is detected during charging [Charge LED turns Orange]: Disconnect the charger momentarilty to reset the charge cycle.
4. The charger must be disconnected for the device to operate.
5. During periods of non-use, the charger may remain connected to the device.

To Charge Device using Charging Cradle Accessory

1. Rotate the coiled tubing connector counter-clockwise and pull.
2. Firmly insert the device into the ALTAIR Pump Probe 4/4X charging cradle.
3. The Charge LED is used to indicate the charge status.

   Red = Charging

   Green = Charged

   Orange = Fault
4. If a problem is detected during charging [Charge LED turns Orange]: Remove the device from the charger cradle momentarily to reset the charge cycle.
5. The charger must be disconnected for the device to operate.
6. During periods of non-use, the charger may remain connected to the device.

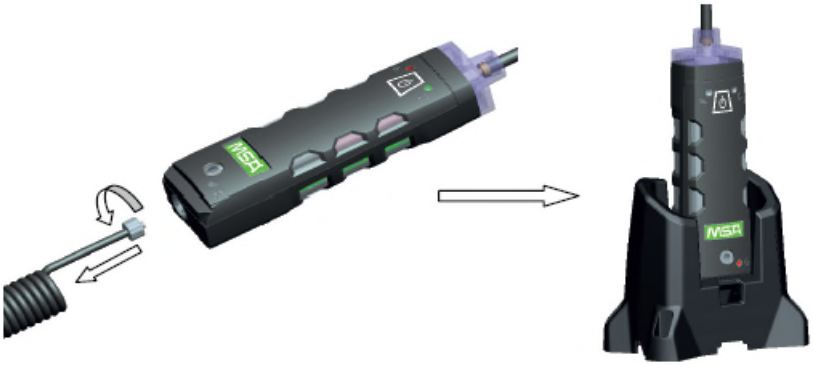

Figure 2 Charging Device in Charging Cradle

4 Maintenance

4.1 Cleaning and Periodic Checks

As with all electronic equipment, the ALTAIR Pump Probe will operate only if it is properly maintained.

⚠ WARNING!

- Substitution of components can seriously impair device performance, alter intrinsic safety characteristics or void agency approvals.
- Repair or alteration of the ALTAIR Pump Probe, beyond the procedures described in this manual or by anyone other than a person authorized by MSA, could cause the device to fail to perform properly. Use only genuine MSA replacement parts when performing any maintenance procedures described in this manual.

Failure to follow these warnings can result in serious personal injury or death.

4.2 Cleaning and Routine Care

Periodically clean the ALTAIR Pump Probe case with a soft damp cloth.

4.3 Checking The Pump Inlet Filter

The ALTAIR Pump Probe contains a filtering system to protect the pump from particulate and water in the sample air. If the filter becomes clogged, the sample flow may be blocked, or an extra load may be placed on the pump. Visually check the filter regularly. The frequency of checks should depend on amount of pump usage and concentration of particles that enter the pump.

4.4 Replacing the Filters

⚠ WARNING!

When replacing external dust and water filters, prevent any dust or dirt around the filter housing from entering the pump housing. Dust or dirt in the pump unit may impede pump operation.

Failure to follow this warning can result in serious personal injury or death.

External Filter

The ALTAIR Pump Probe contains a filter to:

- block dust and dirt
- block the passage of water

If the probe tip is accidentally submerged in water, the filter prevents the water from reaching the internal pump. The filter is not designed to stop other liquids, such as gasoline or alcohols.

To Replace the Probe Filter

Figure 3 Replacing Probe Filter

1. Rotate the cap counterclockwise and pull.
2. Remove the filter (P/N 10151021) and replace.
3. Check the pump operation after filter replacement (see 1.1 Using the ALTAIR Pump Probe).

4.5 Use with Sample Line

1. Rotate the cap counterclockwise and pull the cap and wand.
2. Remove the wand assembly.
3. Insert sample line assembly through the cap and reattach the cap.

4.6 Storage

When not in use, store your device in a safe, dry place between -5°C and 40°C [23°F and 104°F].

4.7 Shipment

Pack the ALTAIR Pump Probe in its original shipping container with suitable padding. If the original container is unavailable, an equivalent container may be substituted. Seal Pump Probe in a plastic bag to protect it from moisture. Use sufficient padding to protect it from the rigors of handling. Damage due to improper packaging or damage in shipment is not covered by the device's warranty.

4.8 Troubleshooting

The ALTAIR Pump Probe will operate reliably for years when cared for and maintained properly. If the device becomes inoperative, you may return inoperative devices to MSA for repair. Visit www.MSAsafety.com for additional information.

5 Technical Specification/Certification

5.1 Technical Specifications

Weight	260 g (9.2 Oz)
Dimensions	185 mm x 48 mm x 33 mm (7.3 inch x 1.9 inch x 1.3 inch)
Alarm	Flow LED, Battery Low LED, Charge Indicator LED, Audible alarm
Audible Alarm	>90 dB typical
Flow Rate	250 mL/min (Typical)
Sample Line	3 m (10 ft), 8 m (25 ft), 15 m (50 ft) long sample line (optional)
Sample Delay Time	1 sec per 0.3 m (1 ft)
Battery Type	Rechargeable Li-ion battery
Operation Time	30+ hours @ 25°C
Charge Time	< 4 hours
Temperature Range	-20°C ~ 50°C [-4°F ~ 122°F] , Normal: Operation range 10°C ~ 35°C [10°F ~ 95°F], Charging -5°C ~ 40°C [23°F ~ 104°F], Storage
Humidity Range	15% ~ 90% relative humidity, non-condensing
Atmospheric Pressure	86 kPa ~ 106 kPa (mm)
Ingress Protection	IP65

5.2 Certification

China EX

Ex ia IIC T4 Ga, Ta = -20 °C ~ +50 °C

CSA for C-US

CLASS I, GROUP A,B,C,D, Tcode T4, Ta = -20 °C ~ +50 °C

EAC

1Ex ia IIC T4 Gb, Ta = -20 °C ~ +50 °C

INMETRO

Ex ia IIC T4 Gb, Ta = -20 °C ~ +50 °C

TIIS

Ex ia IIC T4, Ta = -20 °C ~ +50 °C

Marking, Certificates and Approvals According to the Directive 2014/34/EU [ATEX]

Manufacturer	MSA (China) Safety Equipment Co, Ltd No.8, Rui En Lane, Xingpu Road Suzhou Industrial Park, Jiangsu, China 215126
Product	ALTAIR Pump Probe
EC-Type Examination Certificate	FTZU 13 ATEX 0109 X
Type of protection	EN 60079-0:2018, EN 60079-11:2012
Performance	none
Marking	 II 2G Ex ia IIC T4 Gb -20°C ≤ Ta ≤ +50°C
Li-Ion	Um = 6,7 V
Special Conditions	The equipment shall be charged only in no-hazardous locations by manufacturer's chargers only. The charging voltage shall not exceed 6.7 V.
Quality Assurance Notification	0158
Year of Manufacture	see Label
Serial Number	see Label

Marking, Certificates and Approvals According to IECEx

Manufacturer	MSA (China) Safety Equipment Co,Ltd No.8, Rui En Lane, Xingpu Road Suzhou Industrial Park, Jiangsu, China 215126
Product	ALTAIR Pump Probe
IECEx-Type Examination Certificate	IECEx FTZU 13.0018X
Type of protection	IEC 60079-0:2017 , IEC 60079-11:2011
Performance	none
Marking	 Ex ia IIC T4 Gb -20°C ≤ Ta ≤ +50°C
Li-Ion	Um = 6,7 V
Special Conditions	The equipment shall be charged only in no-hazardous locations by manufacturer's chargers only. The charging voltage shall not exceed 6.7 V.

6 Accessories and Replacement Parts

Accessories

Part	Part Number
SPARE FILTERS,ALTAIR PUMP PROBE(5PCS/BAG)	10151021
TUBING,SAMPLE LINE,PU,CONDUCTIVE,3M	10151096
TUBING,SAMPLE LINE,PU,CONDUCTIVE,8M	10151104
TUBING,SAMPLE LINE,PU,CONDUCTIVE,15M	10151097
TUBING, SAMPLE LINE, PU, 10FT	10153103
TUBING, SAMPLE LINE, PU, 25FT	10153104
TUBING, SAMPLE LINE, PU, 50FT	10153105
NORTH AMERICAN POWER SUPPLY	10087913
NORTH AMERICAN CHARGING CRADLE	10092233
EUROPEAN CHARGING CRADLE	10086638
AUSTRALIAN CHARGING CRADLE	10089487
VEHICLE CHARGER	10095774
ALTAIR 4X CALIBRATION CAP	10085781
CD MANUAL, ALTAIR PUMP PROBE	10151098

Replacement Parts

Item	Description	Part Number
1	NORTH AMERICAN SAMPLE WAND	10153076
2	CAP, ALTAIR PUMP PROBE	10147727-SP
3	SAMPLE WAND/LINE GASKET	10148472-SP
4	SPARE FILTERS, ALTAIR PUMP PROBE (5PCS/BAG)	10151021
5	UPPER HOUSING, ALTAIR PUMP PROBE	10153075
7	BUZZER GASKET, ALTAIR PUMP PROBE	10148473-SP
8	COUPLING HOSE, ALTAIR PUMP PROBE	10153073

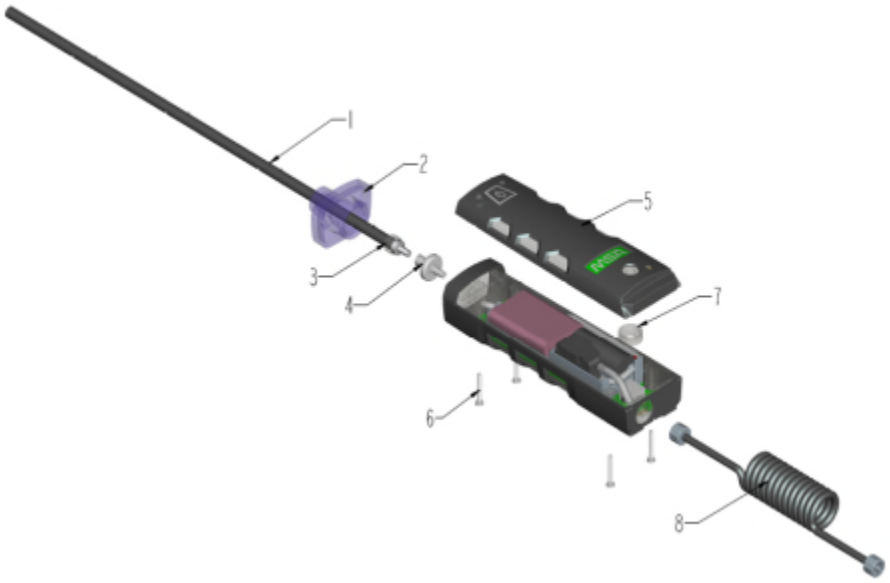

Figure 4 Replacement Parts