OPERATION MANUAL

89NAH Series

89NAH

Handheld Nitrogen Analyser

Contents

CAUTION

This equipment must always be used by trained personnel. Read and understand this operation manual before use.

Please read this manual before you start

Congratulations on purchasing your Airtec Handheld Nitrogen Analyser. The NAH has been specially designed for measuring the percentage of Nitrogen (N^2) in tyres, ideal for demonstrating to customers that their tyres have been filled with the correct nitrogen amount.

Made of polycarbonate and santoprene, the NAH is high-impact and weather resistant. Fitted with 150 mm-length dual foot air chuck, as an alternative to the standard air chuck, making the process faster and easier.

It is simple, practical and portable.

This equipment has a number of unique features that are explained in this manual. Throughout the manual the following symbols will be used, this information is for your safety and to prevent damage to this product.

CAUTION

The hazardous or unsafe practice could result in possible injury.

WARNING

The hazardous or unsafe practice could result in severe injury or death.

1 | Introduction

1.1 This Manual

Congratulations on selecting an Airtec Handheld Nitrogen Percentage Indicator.
Throughout the manual the following symbols will be used, this information is for your safety and to prevent damage to this product.

1.2 Overview of Handheld Nitrogen Percentage Indicator

Your Nitrogen Percentage Indicator is a hand-held instrument for indicating the Nitrogen percentage of the Nitrogen source. It is designed for use for the automotive industry.
The unit is compact and ergonomic in design with easy-to-use, one button operation.

CAUTION

Do not dip the Handheld Nitrogen Percentage Indicator into any liquids

CAUTION

Do not expose the Handheld Nitrogen Percentage Indicator into excessive heat.

CAUTION

Do not connect the Handheld Nitrogen Percentage Indicator to closed pressure systems above 175 psi, 1200 kPs or 12 bar

CAUTION

Do not open sensor it contains caustic.

CAUTION

Use only alkaline batteries.

1.3 General Specifications - 89NAH-3001 Model

All product specifications are applicable at standard conditions: 1013 hPa, 25° C dry ambient air.

Construction	High impact polycarbonate / santoprene
Degree of Protection	IP40
Unit Dimensions (Excluding packaging)	244L x BOW x 43H mm
Power	9VDC alkaline battery
Unit of Measurement	Nitrogen percentage
Operating Rage	0 - 100% Nitrogen
Accuracy ±	± 0.1 vol %
Measurement Cycle	0.5 secs
Response time 90%	Less than 2 seconds
Auto Off time delay	5 mins
Storage temperature Optimal Maximum	5 to 25 °C -5 to 60 ° C
Shipping Weight	0.83 kg
Sensor Type	N-33
Sensor Life	24 months
Sensor Cable	0.25 m
Battery Cable	0.15 m

2 | Assembly

Unpack the carton and identify the components.

PART NO.	DESCRIPTION	QTY
44.1051	Handheld Nitrogen Percentage Indicator	1
44.1020	Sensor, Oxygen Sensor, Class N33	1
46.0005	Battery, 9V Alkaline	1
91.0211	Twin Chuck, Open	1
	Hose Assembly, 480mm	1

3 | Installation

3.1 Battery Installation

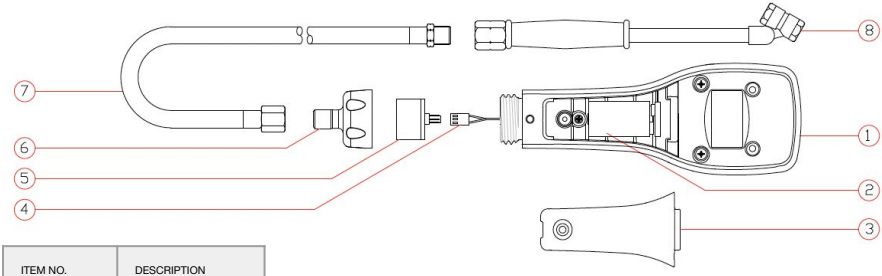
3.1.1 Hold the instrument face down.
3.1.2 Remove the screw on the battery cover (refer to Fig 1).
3.1.3 Lift cover and pull out.
3.1.4 Install one 9V alkaline battery observing proper polarity.

3.2 Sensor Installation

3.2.1 Sensor contains caustic, which causes severe burns and may be fatal if swallowed. Refer to Section 1 O - Material Safety Data Sheet for correct handling.
3.2.2 Remove the sensor from its protective package.
3.2.3 Remove the sensor cap by turning it anti-clockwise.
3.2.4 Connect the sensor plug to the matting connector on the sensor housing.
3.2.5 Install the sensor in the housing and rotate it so the wires are not pinched between the sensor and the housing.
3.2.6 Replace the sensor cap.

3.2 Hose Installation

3.3.1 Connect the hose assembly to the ¼" NPT end of the sensor cap.
3.3.2 Connect the hose chuck to the hose assembly.



ITEM NO.	DESCRIPTION
1	HANDHELD NITROGEN PERCENTAGE INDICATOR
2	BATTERY
3	BATTERY COVER
4	MATTING CONNECTOR
5	SENSOR
6	SENSOR CAP
7	HOSE, ASSEMBLED
9	TWIN CHUCK

4 | Calibration

4.1 On initial start up with a new sensor, allow the unit to stabilise for about 10 minutes before proceeding to the next step.

4.2 With the chuck exposed to air, press and hold ((9) key down until the LCD starts to count down from 3 to 0. Release the ((!)) key and wait for the LCD to read 79.1 (calibration point) plus or minus 0.1. Excluding factors such as temperature,humidity and traces of other gases, the air we breathe contains 78.084% Nitrogen, 20.946% Oxygen, 0.934% Argon and 0.033% Carbon Dioxide.

Note: Excess Nitrogen in the sensing head during calibration will lead to low readings during sampling. For best results, calibrate the instrument each day before sampling begins. This will ensure the sensing head is exposed to air for accurate calibration. If calibration is needed during normal use, leave the sensing head exposed to air for about 10 minutes or until the readings stabilise before commencing with the calibration.

5.0 Gas Sampling

Press and hold chuck onto the valve stem and allow the gas to flow until a stable reading is achieved. Depending on the tyre pressure, sample time is about 1 O seconds. Repeat the sampling process as needed.

Note : It is not necessary for the reading to return to the calibration point (79.1) between samples.

6.0 Turning the unit OFF

To switch off immediately, press and hold the ((9) key for 1 second, then release the (9) key. To extend battery life, the unit has an auto-off function after 5 minutes.

7.0 Freezing of Gas Sampling Reading

To freeze the gas sampling reading, make a quick press and release the ((9) key. When the reading is put on freeze, the display will flash. To resume the gas sampling, make another quick press and release the ((9) key. The display will stop flashing, showing the corresponding gas reading.

8 | Troubleshooting

The following chart has been prepared to assist with diagnosis of faults, for further information please contact Airtec Corporation.

PROBLEM	POSSIBLE CAUSE	SOLUTION
CAL	The unit has not been calibrated.	Press and hold ((l)) key to perform calibration.
ER1	Sensor is not connected or the sensor has reached its end of life.	Check the connection of the sensor and reset unit. If error message persists, replace sensor and reset unit.
ER2	Improper calibration. Calibration was not performed under ambient air.	Press and hold (<!.)) key to perform calibration at ambient air and reset unit. If error message persists, replace sensor, perform calibration and reset unit.

9 | Warranty

Your Airtec product is covered under limited warranty for 12 months from the date of invoice, subject to the following conditions:

1. Except where the product has been damaged by misuse, faulty installation, unauthorised repairs, incorrect maintenance or accidental damage Airtec will at its discretion repair or replace the defective product (or pay for the cost of repair or replacement).

2. Warranty does not cover air hoses, hose chuck, membrane keypads, retractable reels and built-in compressors.

Airtec Corporation expressly excludes all other warranties, express or implied, including without limitation the implied warranties of merchantability and fitness for any other purpose. Airtec Corporation further excludes liability for consequential and incidental losses including but not limited to the loss of profits which may arise out of the breakdown or failure of any product.

Note: All faulty PCBs that are within the warranty period are to be returned to Airtec Corporation for assessment and repairs. PCBs which are found to be burnt due to water damage will not be covered under any warranty.

Airtec Corporation reserves the right to change specifications, modify designs and discontinue items without incurring obligation and whilst every effort is made to ensure descriptions, specifications and other information in this manual is correct, no warranty is given in respect thereof and the company shall not be liable for any error therein.

4 | Material Safety Data Sheet

Product Identification	
Product Name	Oxygen Sensor Micro-Fuel Cells and Super Cells, all classes except A-2C, A-3, and A-5 Electrochemical Oxygen Sensors, all classes except R-19 Mini-Micro-Fuel Cells, all classes
Manufacturer	Teledyne Instruments/Analytical Instruments
Address	B16830 Chestnut Street, City of Industry, CA 91748
Phone	(626) 961-9221
Environment, Health and Safety	(626) 934-1592
Date Prepared	10/19/99
Revision Date	6n/05

Hazardous Ingredients/Composition

Material or Component	C.A.S.#	Quantity	OSHA PEL	ACGIH
Lead (Pb)	7439-92-1	5-20 gms	0.05 mglm'	0.15 mgim'
Potassium Hydroxide (KOH)	1310-58-3	1-5ml (10%-15% KOH in water)	2 mg/m'(ceil)	2 mg/m'(ceil)

Health Hazard Data	
Routes of Entry	Inhalation : Highly unlikely. Ingestion : May be fatal if allowed. Skin : The electrolyte (potassium hydroxide) is corrosive; skin contact may cause irritation or severe chemical burns. Eyes : The electrolyte (potassium hydroxide) is corrosive; skin contact may cause irritation or severe chemical burns.
Acute Effects	The electrolyte is harmful if swallowed, inhaled or absorbed through the skin. It is extremely destructive to tissue of the mucous membranes, stomach, mouth, upper respiratory tract, eyes and skin.
Chronic Effects	Prolonged exposure with the electrolyte has a destructive effect on tissue. Chronic exposure to lead may cause disease of the blood and blood forming organs, kidneys and liver, damage to the reproductive systems and decrease in fertility in men and women, and damage to the foetus of a pregnant woman. Chronic exposure from the lead contained in this product is extremely unlikely.
Signs and Symptoms of Exposure	Contact of electrolyte with skin or eyes will cause a burning sensation and/or feel soapy or slippery to touch. Other symptoms of exposure to lead include loss of sleep, loss of appetite, metallic taste and fatigue. For additional exposure information, refer to 29 CFR 1910.1025, Appendix A - Substance Data Sheet for Occupational Exposure to Lead.
Carcinogenicity	Lead is classified by the IARC as a class 28 carcinogen (possibly carcinogenic to humans).
OSHA	Where airborne lead exposures exceed the OSHA action level, refer to OSHA Lead Standard 1910.1025
NTP	NA
Medical Conditions Generally Aggravated by Exposure	Lead exposure may aggravate disease of the blood and blood forming organs, hypertension, kidneys, nervous and possibly reproductive systems. Those with pre-existing skin disorders or eye problems may be more susceptible to the effects of the electrolyte.

Emergency First Aid Procedures

In case of contact with the skin or eyes, immediately flush with plenty of water for at least 15 minutes and remove all contaminated clothing. Get medical attention immediately.

If ingested, give large amounts of water and DO NOT INDUCE VOMITING. Obtain medical attention immediately.

If inhaled, remove to fresh air and obtain medical attention immediately.

Fire and Explosion Hazard Data

Flash Point: NA	Flammable Limits: NA	LEL: NA	UEL: NA
Extinguishing Media	Use extinguishing media appropriate to surrounding fire conditions. No specific agents recommended.		
Special Fire Fighting Equipment	Wear NIOSH/OSHA approved self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.		
Unusual Fire and Explosion Hazards	Not applicable.		

Cleanup Procedures

Wipe down the area several times with a wet paper towel. Use a fresh towel each time. Contaminated paper towels are considered hazardous waste.

Precautions for Safe Handling and Use

Note: The oxygen sensors are sealed and under normal circumstances the contents of the sensors do not present a health hazard. The following information is given as a guide in the event of a cell leaks.

Caution : If you see signs of moisture or liquid in the protective bag, DO NOT OPEN the package

Protective Measures During Cell Replacement: Before opening the bag containing the sensor cell, check the sensor cell for leakage. If the sensor cell leaks, do not open the bag. If there is liquid around the cell while in the instrument, wear eye and hand protection.

Exposure Controls/Personal Protection

Eye Protection	Chemical splash goggles
Hand Protection	Rubber gloves
Other Protective Clothing	Apron, face shield
Ventilation	NA

Physical/Chemical Characteristics

Material or Component	Boiling Point	Specific Gravity	Vapor Pressure	Melting Point °C	Density	Evap Rate	Solubility in water	Odour/Appearance Physical State
Lead	1744	11.34	NA	328	NA	NA	Insoluble	Solid, silver gray, odourless
Potassium Hydroxide	1320	2.04	NA	360	NA	NA	Complete	White or slightly yellow. No odour

Stability and Reactivity

Stability	Stable
Incompatibilities	Aluminium, organic materials, acid chlorides, acid anhydrides, magnesium, copper. Avoid contact with acids and hydrogen peroxide >52%
Hazardous Decomposition	Toxic fumes
Hazardous Polymerisation	Will not occur

Toxicological and Ecological Information

Toxicity to Animals	Acute oral toxicity (LD50): 2730 mg/kg (Rat) (Calculated value for the KOH solution.)
Mutagenicity	Lead tested positive as a mutagen in the Ames test.
Ecotoxicity	The LC50 of lead for the daphnia magna is 3.6 mg/l, and 5.1 mg/l for the daphnia pulex.
Environmental Fate	Lead is bio-accumulative in most aquatic life and mammals. It is highly mobile as lead dust or fume, yet forms complexes with organic material which limits its mobility.

Disposal Considerations

Waste must be disposed of in accordance with Federal, State and Local environmental control regulations. If discarded in its purchased form, this product is hazardous by its characteristics of toxicity and corrosivity under RCRA.

EPA Waste Number	D00B, D002
DOT Information	Corrosive liquid, basic, inorganic, n.o.s. (Potassium hydroxide, lead), 8, UN 3266, II.

Follow all Federal, State and Local regulations.

Transport Information

DOT	Regulated. Refer to Small Quantity Exceptions: 49 CFR 173.4
IATA	Regulated. Refer to IATA Dangerous Goods in Excepted Quantities, Sec. 2.7

Regulatory Information

US Federal Regulations

1) OSHA - Hazardous by definition of Haz Com Std. 29 CFR 1910.1200
2) SAFA Title III

- Sec 302 (40 CFR Part 355)

Chemical Name	CAS #	%	TPQ lbs	RQ
None	NA	NA	NA	NA

- Sec 311 & 31)

Chemical Name	Acute Health Haz	Chronic Health Haz	Fire Hazard	Sudden Release of Pressure Haz	Reactive
Lead	Yes	Yes	No	No	No
Potassium Hydroxide	Yes	Yes	No	No	No

- Sec 313 (40 CFR Part 372): This product contains the following toxic chemicals subject to the reporting requirements of Section 313, of Title III of the Superfund Amendments and Reauthorisation Act of 1986 and 40 CFR Part 372.

Chemical Name	CAS #	Lead Content
Lead	7439-92-1	5-20 gms

3) TACA (Toxic Substances Control Act)

Components of this product are listed on the TSCA Inventory.

4) CERCLA Section 102 (A) (40 CFR Part 302) Hazardous Substances and Reportable Quantities:

Chemical Name	CAS #	Lead Content
Lead*	7439-92-1	10 lbs.
Potassium Hydroxide (solid)	1310-58-3	1,000 lbs

- No reporting of releases of this hazardous substance is require if the diameter of the pieces of the solid metal released is equal to or exceeds 100 micrometers (0.004 inches)

State Regulations

California Proposition 65: WARNING: This product contains lead, a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

Massachusetts: Potassium Hydroxide is a listed chemical.
Pennsylvania: Potassium Hydroxide is a listed chemical.

International Regulations

Canada:

Canadian Environmental Protection Act (CEPA): Potassium Hydroxide, liquid, is on the Domestic Substances List (DSL) and is acceptable for use under the provisions of CEPA.
WHMIS: Potassium Hydroxide (liquid)

Class D-2A : Material causing other toxic effects (VERY TOXIC)
Class E : Corrosive liquid.
Lead

EEC: Class D-2A
Potassium Hydroxide {liquid)
R35 - Causes severe burns.
R42 - May cause sensitization by inhalation R36/37/38 - Irritating to eyes, respiratory system

Other Information

All chemicals may pose unknown hazards and should be used with caution. While the information contained in this Material Safety Data Sheet is believed to be correct and is offered for your information, consideration and investigation, Teledyne Analytical Instruments assumes no responsibility for the completeness or accuracy of the Information contained herein.

A2 | Measurement Units

psi	Pounds per square inch
kPa	Kilo Pascals
bar	Barometric
atm	Atmospheres
Kg/cm2	Kilograms per square centimetre
CFM	Cubic Feet per Minute
LPM	Litres per Minute

A3 | Conversions

	pascal	kilo pascal	bar	Standard atmosphere	Pound per square inch
	Pa	kPa	bar	atm	psi
1 Pa	1 N/m2	10^{-3}	10^{-5}	$9.8692x10^{-6}$	$1.450377x\ 10^{-4}$
1 kPa	10^{3}	$1kN/m^{2}$	10^{-2}	$9.8692x10^{-3}$	0.1450377
1 bar	10^{5}	10^{2}	$10^{-6}dyn/cm^{2}$	0.98692	14.50377
1 atm	$1.01325x10^{5}$	$1.01325x10^{2}$	1.01325	Po	14.69595
1 psi	$6.8948x10^{3}$	6.8948	$6.8948x10^{-2}$	$6.8046x10^{-2}$	1 lb p/in^{2}

Note: Specifications may vary for non standard equipment.
Contact authorized representative agent for further information.

Certificate of Conformance

Initial Verification Certificate

Compliance Statement:

This equipment before its release is checked and tested, and calibrated on test equipment that has a traceable accuracy exceeding EC-Directive 86/217/EEC and is managed under ISO9001 requirements.

This equipment also complies to the relevant sections of EC-directive 86/217/EEC (tyre pressure gauges for motor vehicles) and BSEN 12645:1999 (pressure gauges: Apparatus for inspection of pressure and/or inflation of tyres for motor vehicles) applicable to digital equipment.

In addition this equipment complies where relevant to the following EC-directives:
2004/108/EC (EMC Directive)
2006/95/EC (Low Voltage Directive)

This compliance has been verified and tested by accredited laboratories to the following standards:

Emission: AS/NZ CISPR 14.1:2003, AS/NZ 61000.3.3:1998, CISPR14.1:2000 Inc A1:2001, CISPR14.1:2005 inc A1:2008 & C1:2009, CISPR 14.2:2006, EN 55014.1:2000 Inc A1:2001, EN 55014.1:2006, EN 55014.1:2007, EN 61000-3-2:1995 inc A13:1999 , EN 61000-3-2:2006, IEC 61000-3-3:1994, EN 61000-3-3:1995 inc A1:1998, A1:2001, A2:2002, & A3:2006,

Immunity: CISPR 14.2:1997 Inc A1:2001, CISPR 14.2:1997 Inc A1:2006 & A1:2008, CISPR 14.2:2003, EN 55014.2:1997 Inc A1:2001, EN 55014.2:1997 Inc A1:1998, A2:2002 & A3:2007, EN 61000-3-3:1995 Inc A1:2001

Further testing and approval information is available upon request.

Model.....

Product Serial No. .....

PCB Serial No. .....

Signature.....

Date..... Verification.....

Manufactured by:
Airtec Corporation (Asia) Pte Ltd
67 Ubi Crescent #01-02
Singapore 408560

Parts & Service:
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40 George Street
Thebarton
Australia 5831

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AIRTEC CORPORATION
ABN: 14 122 444 277
THEBARTON SA 5031

Airtec Corporation RCM Number is E8292
This product displays the Regulatory Compliance Mark (RCM) to show that it complies with relevant Australian and New Zealand Standards

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