

## Digital Nitrogen Inflation Equipment



89XDB

S P E C I F I C A T I O N S  
A S S E M B L Y  
O P E R A T I O N  
S E R V I C E

*Please read this manual before carrying out any assembly or service procedures.*

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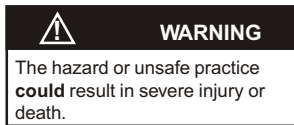
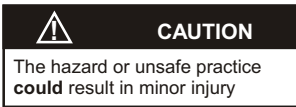
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## 1.0 Introduction

### 1.1 This Manual

Congratulation on selecting a Haltec Digital Nitrogen Inflation Equipment. 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.




### 1.2 Digital Inflation Overview

Your Haltec Digital Nitrogen Inflation Equipment has a dual pneumatic valve controlled by a digital circuit that controls the inflation and deflation process.

### 1.3 General Specifications \*


Operating Temperature (without heater)	0°C to +60°C 32°F to +140°F
Relative Humidity	100%
Max Inlet Air Supply	150 psi, 1035 kPa, 10.3 bar
Recommended Inlet Supply Pressure	10 psi, 70 kPa or 0.7 bar above the maximum set pressure of the unit.
Operating Pressure Minimum	5 psi, 35 kPa, 0.3 bar
Maximum	145 psi, 1000 kPa, 10.0 bar
Accuracy	+/- 0.3 psi, 2 kPa, 0.02 bar
Display Increments	1 psi, 5 kPa, 0.1 bar
Units of Measurement	psi, kPa, bar, kg/cm <sup>2</sup>

 **WARNING**

To avoid the risk of personal injury, especially to the eyes, face or skin DO NOT direct the N2 stream at any person/s.

 **WARNING**


This equipment is not intended for use by children.

 **WARNING**

Do not open battery, dispose of in fire or short circuit - may ignite, explode, leak or becomes hot.

 **CAUTION**

To avoid equipment damage, never exceed the maximum inlet pressure of 150 psi, 1035 kPa or 10.3 bar.

 **CAUTION**

Use only specified battery charger. Use of other chargers or adaptors may cause damage to the battery pack.

\*Note: Specifications may vary for non-standard equipment. Contact service agent for further information.

## 2.0 Installation

### External Mounting

1. Unpack the unit.
2. Hold the unit up and mark where the four (4) holes are to be drilled.
3. Secure the unit using suitable fasteners.
4. Connect the Nitrogen supply to the unit.

## 3.0 Preparation for Use

1. Although the battery is fully charged during manufacture, some discharging may occur during storage and shipping. Prior to the first use, connect the battery charger to the DC input jack on the control panel. Connect to your wall socket and charge the batteries as described in Section 4.3. The recharge time for a fully discharged battery is approximately 6 hours. The battery charger is not weatherproof so the charger should not be used outdoors. The unit cannot be operated while battery is charging.

## 4.0 Control Panel

### 4.1 Switch and Control Functions



- ① ( - ) Reduce final target pressure
- ② ( + ) Increase final pressure
- ③ ( I ) Control circuit switch
- ④ ( ● ) Stop switch
- ⑤ ( OPS / N2P ) Set Over Pressure (OPS) and/or Purge cycles (N2P)  
(Save mode change)
- ⑥ ( ◊ ) Inflation/Deflation start  
(Save OPS and N2P settings and exit)
- ⑦ ( 14-15V== ) Battery charger DC input jack

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## 4.2 Volume Adjustment

1. Turn off the unit.
2. Press and hold the (—) and (◊) key simultaneously.
3. Turn the unit on, VOL will be displayed.
4. Adjust the volume using the (+) and (—) switches.
5. To store the settings press the (◊) key. Further changes can be made by repeating the above procedure.

## 4.3 Battery Charging

The system contains a rechargeable 2100 mAh NiMH battery pack. The smart charger (P/N 42.0002) is equipped with Delta V detection and safety timer function.

Connect the charger to the DC input jack located on the control panel. When charging, the LED indicator is 'RED'. When the battery is fully charged, the charger will switch to trickle charge mode and the LED indicator shows 'GREEN'. When the charger output is shorted, the LED indicator shows 'RED' and will blink.

Disconnect the charger from the AC outlet when the battery pack is full or the charger is not in use.

## 4.4 Auto-Off Power Save

The Digital Nitrogen Inflation Equipment is programmed to switch off after 10 minutes after last usage. Restart by pressing the (Ⓜ) key.

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## 5.0 Operation

### 5.1 Operating Modes

Special operating modes are now selectable via the keypad during the power up sequence.

Available Modes are:

1. Standard Mode 1
2. Manual Mode 2
3. Pressure gauge Mode 3
4. Coin-op Mode 4
5. Tire Shop Mode 5 - Inflate tire first
6. Tire Shop Mode 6

All Digital Nitrogen Inflation Equipment are factory supplied with Mode 6 Selected.

#### Mode Selection

To enter Mode Select, turn on the stop switch and press the control circuit switch. Then press and hold the (+) key during power up. Display will flash the LCD test, sensor output data, software table ID, then '-1-'.

Press plus and minus keys to select the desired mode.

Save your selection by pressing the 'OPS/N2P' key.

Reboot will occur automatically and the selected mode will display momentarily whilst rebooting.

If no selection is made, or you fail to save your selection within 5 seconds, the device will reboot and return to the previously saved mode. The mode selection can be changed again whenever required.

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## Operation within selected modes

### 5.2 Standard Mode 1

The device will operate as a standard Digital Tire Inflator. To operate the Digital Nitrogen Inflator in Standard Mode 1, a single hose with an open-type chuck must be used.

#### Inflation & Deflation

1. Set the desired pressure, refer to Section 4.1 for the function of each Switch.
2. Connect the hose to the tire, ensure the hose is connected securely. Air leaks will cause a error message to be displayed, refer to Section 6.0.
3. The pressure in the tire will be displayed.
4. The unit will inflate or deflate the tire to the set pressure. Periodically the process will stop and display the pressure in the tire.
5. If the pressure in the tire is less than 2.9 psi, 20 kPa or 0.2 bar, the process will not commence until (◊) the key is pressed, refer Section 4.1.
6. The scroll bar will indicate that the unit is inflating or deflating, see below



7. When the set pressure is reached the display will flash and the unit will beep five (5) times. This will continue until the hose is disconnected, during this time the keypad will be disabled.

### 5.3 Manual Mode 2

The device will operate as manual inflator, persistently displaying the actual pressure value. Press the (+) key continuously to inflate, or the (−) key to deflate.

One of the main uses for Manual Mode is for Calibration checking. A test tank can be filled using the manual controls, and a comparison made between the test gauge and the inflator display at varying pressures. This testing is more precise in manual mode, as unlike other automatic modes there is no tolerance around a set point.

Manual mode is not persistent after power down. Device will reboot back to previously selected mode.



#### WARNING

Unlike Standard Mode, in Manual Mode there is no set point. When inflating in Manual Mode, the user must release the '+' key frequently to check that the inflation pressure does not exceed the tire manufacturer's recommended maximum pressure for that tire or the pressure rating of any test tank or vessel.

### 5.4 Pressure Gauge Mode 3

This mode is not used with the 89XDB, Digital Nitrogen Inflation Equipment.

### 5.5 Coin-op Mode 4

This mode is not used with the 89XDB, Digital Nitrogen Inflation Equipment.

### 5.6 Tire Shop Mode 5 - Inflate tire first

This mode includes the Over Pressure (OPS) and Nitrogen Purge (N2P) functions.

To permit selective use of the (◀▶) key, the automatic start is disabled when N2P or OPS setting is greater than zero.

To enable automatic start, set OPS and N2P settings to zero.

The function of the 'OPS/N2P' key also changes. Only the default Unit of Measurement is visible.

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### **Over Pressure Setting (OPS)**

To set the OPS value, press and hold the 'OPS/N2P' key. Display will flash "OPS" and the set value alternately. Press the (+) or (-) keys to change the OPS setting. Save your selection by pressing the (◊) key. The OPS setting can be changed again whenever required.

To inflate without OPS, set the OPS value to zero.

The OPS value adds to the final target pressure setting to give the Over Pressure. For example: A final target of 32 psi, 220 kPa or 2.2 bar with an OPS setting of 16 psi, 110 kPa or 1.1 bar gives a sum of 48 psi, 330 kPa or 3.3 bar. This sum of 48 psi, 330 kPa or 3.3 bar is the Over Pressure setting for the tire. Using this example, the operation is as follows:

Press the (◊) key momentarily. Inflation will commence and the display will flash the sum pressure value (48 psi, 330 kPa or 3.3 bar) then revert to displaying the actual tire pressure. Tire will inflate to the sum value, beep twice and deflate to the final target pressure.

To prevent accidental use of OPS function, the OPS setting is not persistent after power down.

### **Nitrogen Purge (N2P)**

To set the number of purge cycles, press and hold the 'OPS/N2P' key. Display will flash "OPS" and the OPS set value alternately. Press the 'OPS/N2P' key again. Display will flash "N2P" and the N2P set value alternately. Press the (+) or (-) keys to change the N2P setting. Save your selection by pressing the (◊) key. The N2P setting can be changed again when required.

Press and hold the (◊) key for 2 seconds. Inflation will commence and the display will flash N2P. This indicates that the N2P function is activated for this inflation cycle. Release the (◊) key only when you see N2P in the display.

Tire will inflate to the final target pressure, device will beep once and deflate to the N2P deflate lower limit setting, and then inflate to the final target pressure. If 1 N2P cycle was set, then the cycle is now completed. If more than one N2P cycle was set, the purge routine (deflate / inflate) is repeated according to the number of purge cycles set.

The deflate lower limit default setting is 3psi. This setting is only adjustable via factory software. Please contact your distributor for further information.

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To inflate to the final target pressure, without performing the N2P routine, simply press the (◊) key momentarily for less than 1 second. There is no need to reduce the N2P setting to zero to inflate without purging.

The N2P cycles setting will return to the default setting after power down.

The OPS and N2P functions will operate concurrently if set. The OPS occurs on the first inflation cycle only.

### **5.7 Tire Shop Mode 6**

This mode is specifically designed for N2 conversion of single or multiple tires simultaneously. Top-off function can also be performed without changing settings.

The default program will deflate the tire first, fill to set point, deflate again to 3psi, 21 kPa or 0.2 bar and finally refill to set point. The first deflation cycle is additional to the number of N2P cycles that have been set. The auto start function is deactivated in Mode 6.

### **5.8 N2 Filling of New Tires**

When filling new tires with Nitrogen during the fitting process, the first deflate cycle is skipped as the tire is already empty.

## 5.9 N2 Conversion of Existing Tires

Recent tire industry tests reveal that the target percentage concentration of nitrogen (N2) should be 96%. Testing has shown that no significant difference was found by exceeding N2 % of 96%.

When converting existing tires to nitrogen using the same routine, the final percentage concentration can vary. This variation is caused by many factors including variations in the percentage concentration of the source and N2% of the residual gas in the tire after deflation.

The Haltec Digital Nitrogen Inflation Equipment is programmed to achieve 96% (or greater) of N2 concentration in the tire.

Increasing the number of N2P cycles will increase the final percentage concentration of N2 in the tire. Each additional N2P cycle will result in an increase in N2 concentration of approximately 1% (up to the source percentage N2 concentration). This may be required for professional motor racing applications and aircraft tires. This is not required for passenger car, truck or bus tires.

WARNING

When using the OPS function, the sum pressure must not exceed the tire manufacturers maximum inflation pressure.

N2 SOURCE %	PSI	DEFLATE FIRST	NO OF N2P CYCLES	FINAL TARGET N2 % CONCENTRATION
> 99%	35	YES	1	97%
> 99%	35	YES	2	98%
> 99%	35	YES	3	99%

The final N2 percentage concentration can be periodically checked using a N2% concentration meter.

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To convert existing mounted air-filled tires to nitrogen, use one of the following methods for initial deflation.

### 5.9.1 Decide which method you will use to deflate the tires.

#### 1. Lift vehicle and deflate. Manually remove valve cores.

Raise/lift the vehicle and manually remove the valve cores and allow all the air to escape from the tire. Refit the valve cores and connect the 89HCT, Heavy Duty Chuck to the tire and press and hold the (◇) key until 'N2P' is displayed. Both OPS and N2P functions will occur if set. Repeat the procedure for the remaining tires.

#### 2. Clip-on Deflators

Where no lift is available, the valve cores should not be removed manually. You can safely deflate the tires to 4 psi, 30 kPa or 0.3 bar using Clip-on deflators (P/N 44.1050). When you can no longer hear air escaping from the deflator, connect the 89HCT, Heavy Duty Chuck to the tire and press and hold the (◇) key until 'N2P' is displayed. Both OPS and N2P functions will occur. Repeat the procedure for the remaining tires.

#### 3. Core Retracting Inflation Tool

Using the 89CRT core retracting tool accessory, connect the chuck to the tire. Unscrew the valve core, retract the slide. Press and hold the (◇) key until 'N2P' is displayed. Both OPS and N2P functions will occur. Reinsert the valve core and remove the tool. Repeat the procedure for the remaining tires.

#### 4. Using Mode 6 (Automatic Deflation)

To change the operating mode to mode 6, refer to 5.1. In mode 6, the tire will automatically be deflated to 3 psi, 25 kPa or 0.25 bar first, then perform the previously set operations. Although this deflation method is slower, it is a fully automatic operation. The deflation cycle is skipped if the tire pressure is less than threshold pressure.

Press and hold the (◇) key until 'N2P' is displayed. After deflation, N2P function will occur.

Repeat this step for the remaining tires.

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## 5.10 Topping Up of N2 in Mode 6

To top up tires that have previously been inflated with nitrogen, OPS should be set to zero.

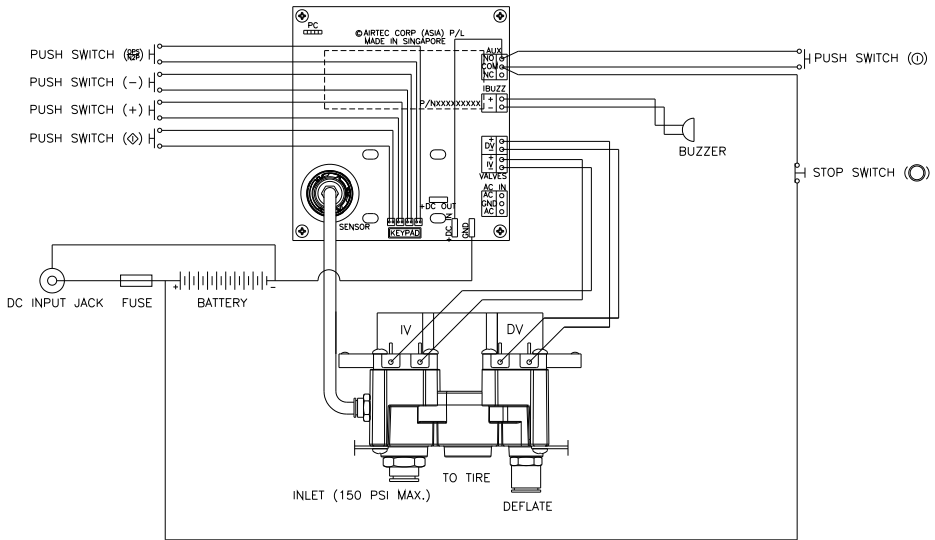
1. Set the final target pressure.
2. Connect hose or hoses to Tires.
3. Press (◀▶) key momentarily. The actual tire pressure will display, the unit will inflate or deflate to the target pressure.
4. When the top up cycle is completed, the unit beeps and the target pressure flashes in the display.
5. As the flow rate of individual tire valves can vary, allow 10 seconds for pressures to equalize before disconnecting hoses from the tires. When topping up a single tire there is no need to wait for pressure equalization to occur.

## 6.0 Troubleshooting

The following chart has been prepared to assist with diagnosis of faults

PROBLEM	POSSIBLE CAUSE	SOLUTION
No display.	Flat battery	Recharge/Replace battery
The inflation process does not commence, even when the pressure is set and the hose is connected to the tire.	The tire is deflated below 3 psi, 20 kPa or 0.2 bar. The hose connector is faulty.	Press (↵)  Replace the hose Connector.
The unit deflates very slowly.	The deflate tubing is blocked.	Remove and clean the silencer plug.
The unit no longer beeps. The inflation process commences but does not complete.	The beeper is damaged. Low or nil supply pressure.	Replace the beeper. Check the supply pressure.
ER1	Unstable pressure, faulty hose connector.	Replace the hose connector.
ER2	Persistent unstable pressure, faulty hose connector. Incorrect supply pressure.	Replace the hose connector. Check the supply pressure.
ER3	Inflate & Deflate valve connections are reversed. Low or nil supply pressure.	Check the valve connections on the PCB. Check the supply pressure.
ER4	Initial or final pressure is too high, exceeding the maximum pressure by more than 20 psi, 140 kPa or 1.4 bar.	Disconnect hose connector, reset processor by switching off the power for a minimum of 5 seconds. If error message reappears, replace PCB.
ER5	Low battery.	Recharge the battery.
ER6	Programme or PCB Error	Reset machine by switching off power for 5 seconds. If error message reappears replace PCB.
ER8	Calibration Error	Unit requires calibration, contact your local distributor or service agent.
ER9	Automatic Calibration Check/ Calibration Error	Reset machine by switching off power for 5 seconds. The ER9 message will clear automatically when the factory calibration is restored. If the ER9 message continues to reappear, replace the PCB.

## 7.0 Wiring Diagram



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## 8.0 Warranty

Your Haltec Digital Inflation Equipment is covered under warranty for 12 months from the date of invoice, subject to the following conditions:

1. **Products**  
Subject to change without notice. Haltec Corporation is not responsible for inadvertent typographical errors or omissions.
2. **Returned Goods**  
No return goods will be accepted unless authorized in writing by Haltec Corporation. All return goods must be shipped prepaid to the factory, and are subject to a restocking charge. Special items are not returnable.
3. **Warranty**  
Except where the product has been damaged by misuse, faulty installation, unauthorised repairs, incorrect maintenance or accidental damage, Haltec will at its own discretion repair or replace the defective product (or pay for the cost of repair or replacement).

Warranty **does not** include battery, air hoses, hose connectors (hose chucks).

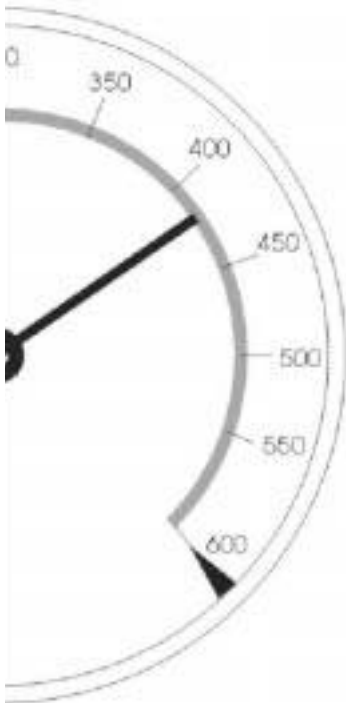
Haltec Corporation expressly excludes all other warranties expressed or implied, including without limitation the implied warranties of merchantability and fitness for any other purpose. Haltec Corporation further excludes liability for consequential and incidental losses including but not limited to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

9.0 Initial Verification Certificate

**PRESSURE GAUGE CALIBRATION**

This equipment was calibrated to the national standard of pressure measurement and conforms to **British Standard (BS) EN 837-1 : 1998**. The calibration equipment used for the test holds a current Acceptance Test Report 37325-S-P according to CL/CAL/SOP-03 : 2004 and BS EN 837-1 & 3 : 1998.

**Manufactured for Haltec Corporation by**  
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67 Ubi Crescent #01-02  
Singapore 408560



Model  
O      89XDB  
  
Serial No. ....  
  
Date .....  
  
Signature .....



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## 10.0 Glossary & Conversions

### Units of Measurement

<b>psi</b>	Pounds per square inch
<b>kPa</b>	Kilopascals
<b>bar</b>	Barometric
<b>atm</b>	Atmospheres
<b>Kg/cm2</b>	Kilograms per square centimetre
<b>IP</b>	International Protection Rating
<b>CFM</b>	Cubic Feet per Minute
<b>LPM</b>	Litres per Minute
<b>PCB</b>	Printed Circuit Board
<b>LCD</b>	Liquid Crystal Display
<b>Sample Tube</b>	Connects the valve block & PCB
<b>OPS</b>	Over Pressure Setting
<b>Target Pressure</b>	Final Set Pressure
<b>Sum Pressure</b>	Sum of OPS & Target Pressures
<b>Threshold Pressure</b>	Minimum Pressure for automatic start

### Conversions

**1 psi =** 6.8947 kPa  
0.0689479 bar  
0.06890459 atm  
0.0703069 kg/cm2

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