



OPERATOR'S GUIDE

Impulse³
Random Tumble Pilling
Tester

UniController

James Heal's
Signature user interface

Covering Serial Numbers
1466/14/1001
& upwards

Extraordinary Testing

Solutions

James H. Heal & Co. Ltd.
Halifax, England



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Setting the Standard

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JAMES HEAL

At James Heal, we are dedicated to designing and developing high precision testing instruments and test materials for physical and colour fastness testing. Our worldwide Service and Calibration division and expert technical assistance complement our product range, adding real value to your laboratory testing activities.

Setting The Standard

We are committed to forming close relationships and have established numerous partnerships within the textile industry, from trade and standards organizations, to test houses, customers and distribution partners.

With a heritage spanning more than 140 years, we have evolved and grown through a culture of continuous improvement, resulting in a thorough understanding of the applications, operating conditions and requirements of customers worldwide – from independent testing Laboratories and test houses, to fabric suppliers, manufacturers and retailers.

Using knowledge and expertise, we consistently set the industry standard through product innovation and technology, with customer and user needs, present and future, driving our technological advancements. You can be assured that with James Heal, you will always receive the highest levels of product quality and customer service. We have Agents and Distribution partners all over the globe, ensuring locally available product whenever, and wherever you need it.

Areas of Expertise

Textile: Colour Fastness

- Chlorinated Water
- Dry Cleaning
- Dry Heat
- Hot Pressing
- Laundering
- Light
- Perspiration
- Phenolic Yellowing
- Print Durability
- Rubbing
- Washing
- Water

Textile: Physical

- Abrasion
- Bursting Strength
- Compression and Puncture
- Crease and Wrinkle Recovery
- Crimp
- Drape
- Durability
- Flammability
- Mass per unit area
- Pilling and Fuzzing
- Security of Attachments
- Seam Slippage
- Shrinkage
- Snagging
- Spray Rating
- Stretch and Recovery
- Surface Deterioration
- Tear Strength
- Tensile Strength
- Washing and Drying

Non-Textile

- Bursting strength of nonwovens, plastics, paper and medical products
- Micro-scratching of laminates, wooden, painted, automotive and high gloss surfaces
- Physical and colour fastness testing of leather
- Rubbing fastness of laminates and wooden surfaces
- Tear strength of paper and plastics

INTRODUCTION

Impulse³ Random Tumble Pilling Tester

Impulse³ has been designed with James Heal's unique product signature and has been produced completely with the user in mind. We have combined James Heal's technical and performance expertise, with intuitive design and operation to produce the most ergonomic and user friendly instrument.

Key Features

- Sleek, ergonomic design
- James Heal's unique UniController user interface for incredible ease of use
- Pre-set counter for running in of new Neoprene liners (ISO 12945-3)
- Interchangeable impellers
- Lint collection Filter

Service & Calibration

- Worldwide Service
- ISO 17025 based Calibration Service
- 18 Months' Warranty

Technical Assistance

- Operator Training
- Knowledge Transfer
- Applications Support
- Engineering Support

Standards

- ASTM D3512
- JIS L 1076 Method D
- NF G 07-121
- NF G 07-132
- EN ISO 12945-3
- DIN 53867
- SANS 6116
- GB/T 4802.4

The Definition Of Pilling

Pilling is the formation of small balls of entangled fibres on the surface of the fabric. Such surface deterioration is generally unacceptable to the consumer.

The amount of pilling that develops is governed by the rate of fibre entanglement, the rate of surface fibre development and the rate of fibre and pills wear-off.

These rates depend on the fibre, yarn and fabric properties.

Many pilling tests now include assessment of fabric fuzzing, which can be a precursor to pill formation.

HEALTH & SAFETY

- Read this manual carefully before operating the instrument.
- **Impulse³** has a mass of approximately 30kg, therefore assistance from a colleague or suitable lifting apparatus is recommended.
- Ensure all test chambers are secure before commencing a test.
- **Impulse³** complies with the [CE regulations](#) in full
- Ensure the instrument is isolated from the electrical supply before removing any covers. Covers should only be removed by a qualified Engineer or Electrician.
- Have the instrument serviced and calibrated at least once a year by a James Heal Service and Calibration Engineer.
- **Impulse³** utilises [compressed air](#). Compressed air is potentially dangerous if misused. Never apply compressed air to the surface of the human body.

FIRST TIME INSTALLATION

If you are commissioning the **Impulse³** unit, please read the following sections in the following order.

Note: They may not necessarily appear in the same order in the manual as listed below. If you are using a softcopy of the manual, you can click on each section in turn in the contents menu or on the links below and the document will automatically skip to the correct page.

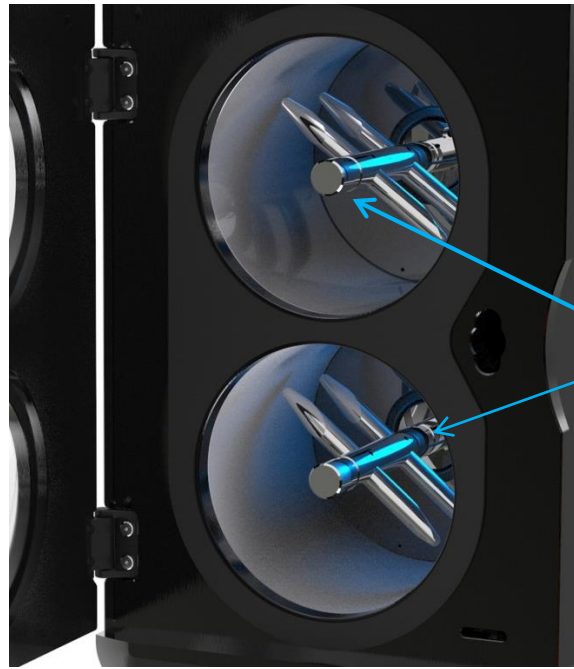
- [Unpacking](#)
- [Installation](#)
- [Electrical](#)
- [Compressed Air](#)

Once the **Impulse³** is commissioned, follow these sections:

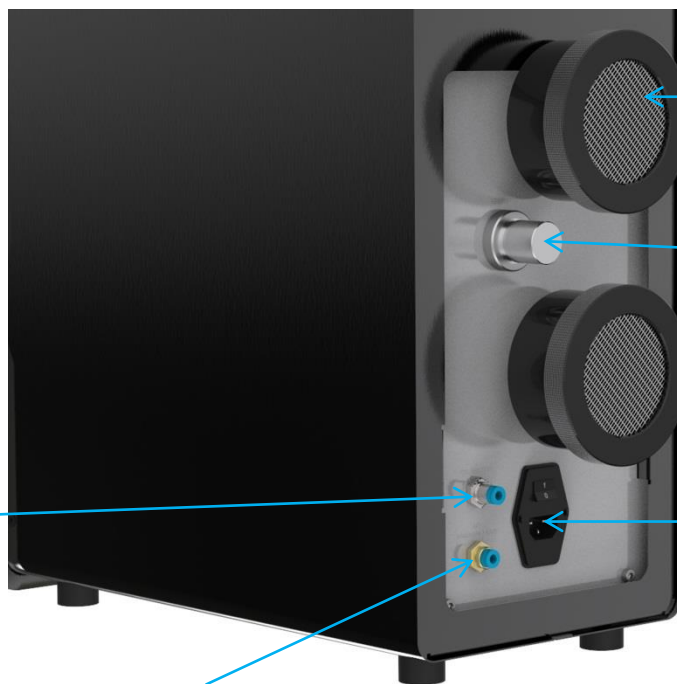
- [The Essential Features Of Impulse³](#)
- [Introduction To UniController](#)
- [Starting a Test](#)

THE ESSENTIAL FEATURES OF IMPULSE³





Interchangeable Impellers



Lint Collection Filter

Regulator

On/Off Switch
Electrical Input

Calibration Port

Compressed Air Input

Interchangeable Impellers



ASTM D 3512
SANS 6116
GB/T 4802.4



NF G 07-121
NF G 07-132
ISO 12945-3



JIS L 1076 method D

JAMES HEAL SERVICE & CALIBRATION

James Heal Service & Calibration is a totally comprehensive, worldwide support programme.

When you buy instrumentation from us, it is the beginning rather than the end of an association.

Our aim is simple:

To provide precisely the services you need to maintain and protect the value of your investment.

For any enquires you may have regarding your instrument please contact James Heal Service & Calibration by e-mail, phone or fax.

In all communications please quote the serial number of your instrument and the software version number

For example: 1466/14/1001 and V1.00.

James Heal Service & Calibration contact details:

E-mail support@james-heal.co.uk

Telephone +44 (0) 1422 366355

Fax +44 (0) 1422 352440

UNPACKING

- Remove the tape from the packing case lid and open the lid.
- Carefully remove the packaging and contents from the packing case. Note that any accessories ordered with the instrument are packed with the instrument.
- Remove the sleeve and then very carefully lift the instrument and place it on a firm flat surface.
- Do not dispose of any packaging material until all standard and optional accessories ordered are fully accounted for. If there are any discrepancies, please contact your supplier immediately.

Unpacking Checklist

Please check the serial number plate to confirm that the supply voltage and frequency are in accordance with your order. Also, check the items listed in the tables below are present

Item number	Item name	Quantity
906-505	Impulse3 Random Tumble Pilling Tester	1
297-025	CD Operators guide, Impulse 3	1
142-304	Mains Lead Set Straight	1
794-819	Pneumatic Adaptor	1
789-368	Spatula	1
785-116	Specimen Edge Glue	1
772-285	Specimen Template 105 mm x 105 mm	1
785-509	Grey Cotton Sliver	1
794-637	Lint collection filter	2

HOW TO ORDER SUPPLIES

	<u>Impellers</u>
794-650	<u>ASTM impeller</u> <u>Complies with ASTM D3512, SANS 6116 and GB/T 4802.4</u>
794-652	<u>ISO impeller</u> <u>Complies with EN ISO 12945-3:2014, NF G 07-121 and NF G 07-132</u>
794-656	<u>JIS impeller</u> <u>Complies with JIS L 1076 method D</u>
	<u>DIN impeller - available on special request</u> <u>Complies with DIN 53867</u>
	<u>Accessories</u>
772-285	Specimen Template 105 mm x 105 mm
794-637	Lint Collection Filter (x2 per instrument)
766-450	ASTM D 3512 Photographic Standards consists of 5 photographs, 105 mm square, graded no.1 (very severe pilling) to no. 5 (no pilling)
	<u>Certification</u>
202-816	<i>UKAS Certificate of Calibration for Impulse or Random Tumble Pilling Tester</i> <i>(up to 4 chambers)</i>

Consumables

393-527	Cork Liner - per pack (50)
393-527	Cork Liner - per 5 packs (50)
393-527	Cork Liner - per 10 packs (50)
393-527	Cork Liner - per 20 packs (50)

Cork Liner 393-527 is suitable for Impulse and machines made by Atlas.
The dimensions of the Liner are: 457± 2mm long x 146 mm wide.

393-533	Cork Liner (Extra Long) - per pack (50) Length 460 mm ± 1 mm
758-566	Neoprene Liner for EN ISO 12945-3 and NF GO7-121 - per pack (5)
785-509	Grey Cotton Sliver - per pack (approx.1 m)
785-509	Grey Cotton Sliver - per 10 packs (approx.1 m)
794-654	Specimen Edge Glue - per pack (4 bottles - each 180ml)

1466-
spares

2-year Spares Kit

Comprising:

390-270	1 x Air Filter
390-289	1 x 3/2 Solenoid Valve 1/8" Port 1Mpa c/w foot bracket fitted
195-347	3 x VOLTAGE SURGE SUPPRESSOR
130-825	1 x Fuse 1A 5 X 20mm T
130-870	1 x FUSE, ANTISURGE, 6.3A
144-403	2 x LED Spotlight Assembly
383-362	1 x Timing Belt 278F0057 OBS
394-786	1 x Door Gasket

Spare Parts

390-270	Air Filter
390-289	3/2 Solenoid Valve 1/8" Port 1Mpa c/w foot bracket fitted
195-347	VOLTAGE SURGE SUPPRESSOR
130-825	Fuse 1A 5 X 20mm T
130-870	FUSE, ANTISURGE, 6.3A
144-403	LED Spotlight Assembly
383-362	Timing Belt 278F0057 OBS
394-786	Door Gasket

GETTING STARTED

Lining Test Chambers

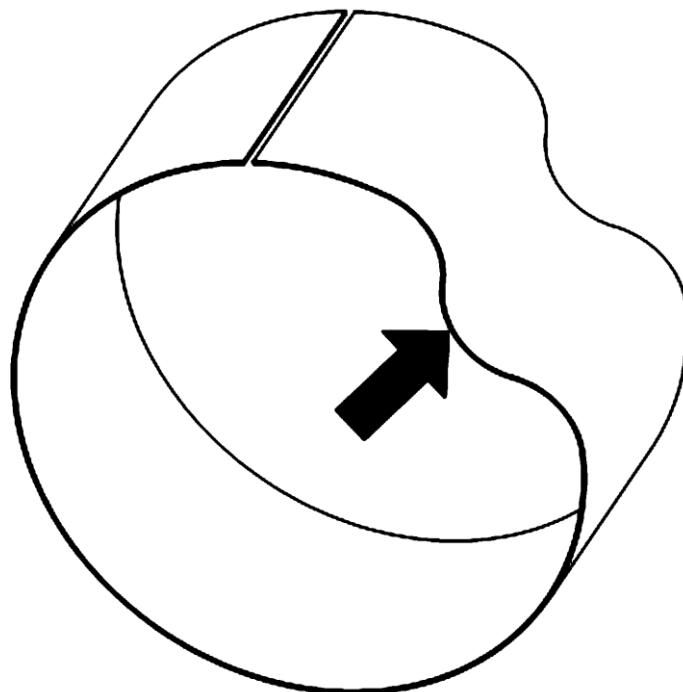
Select either the cork or neoprene liner as specified by your chosen test method.

Roll the liner into an overlapping tube and insert into the chamber, as shown below.

Once positioned in the chamber extend the liner tube so that the edges butt together against the chamber wall.

Ensure the liner is secure and flat against the chamber walls.

Butt the edges together then apply even pressure in direction shown.

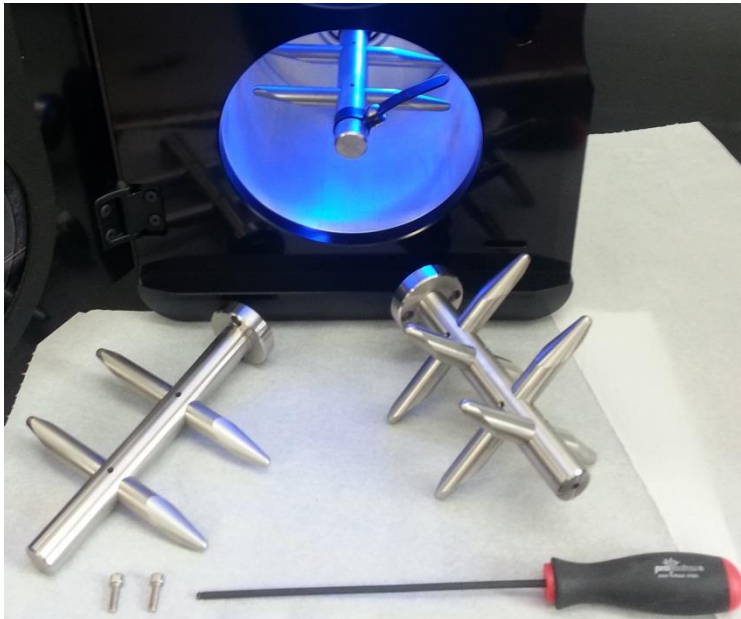


Changing the Impellers

We recommend that the instrument is isolated from the electrical power supply



Removing the Existing Impeller



Using the ball driver, remove the two (2) screws from the connecting flange.





Clean the connecting flanges of the Impeller and Test Chamber using a soft, clean lint free cloth.





Fitting an Alternative Impeller

Place the two (2) screws through the holes in the connecting flange of the Impeller.

Locate the screws over the holes in the rear of the Test Chamber and fir the screws loosely at the start.

Then alternately tighten each screw a little at a time (gradually) until both are tight.

This is important so that the Impeller locates centrally.

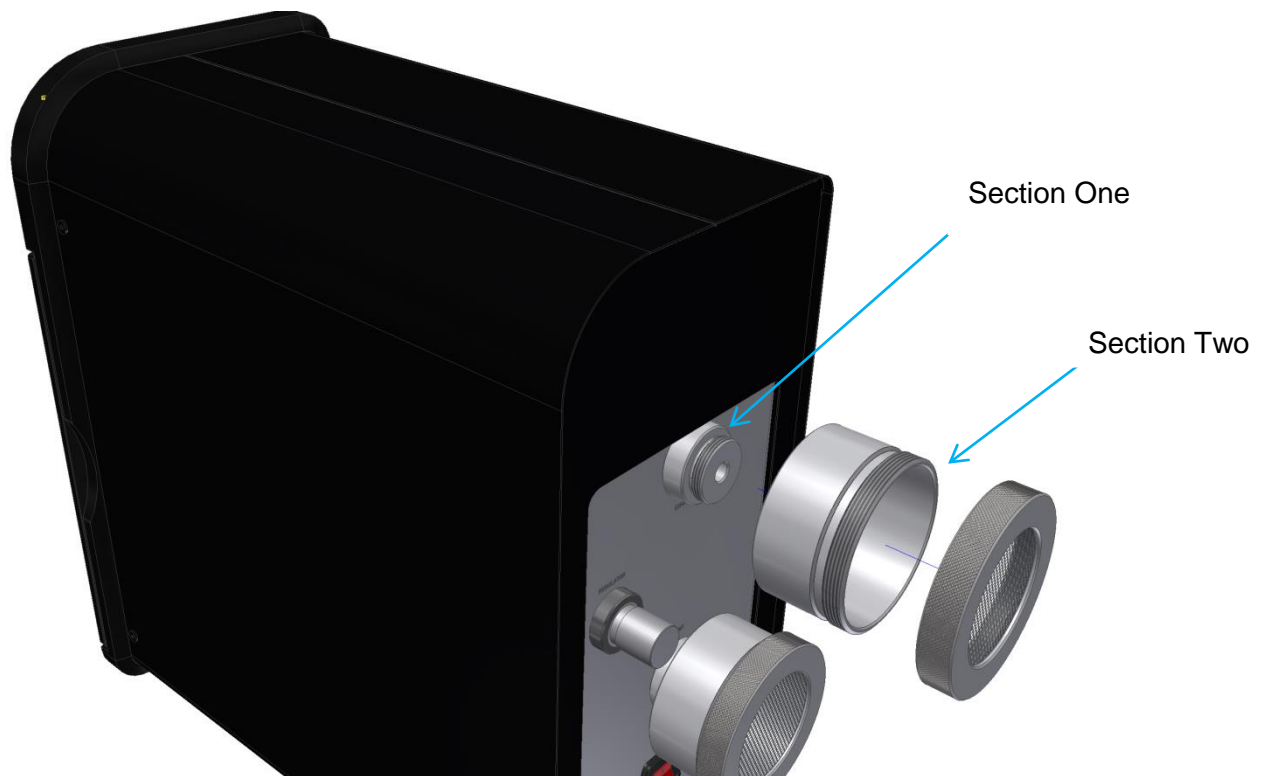


Before fitting the liner (neoprene or cork) to the Test Chamber, start the impeller for a few moments to ensure it runs smoothly and without vibration.

If vibration occurs, slacken (untighten) the screws and tighten them again, tightening each gradually and alternately.

Do not apply any oil or grease to the screws.

Cleaning the Lint Filters



Impulse³ now features a lint collection filter (794-637) which is located on the exhaust at the rear of the instrument.

To clean the Filter, simple un-screw section one from the instrument then un-screw section two & empty the lint over a dust bin.

UNICONTROLLER

Introduction

The **UniController** is our all new, signature user interface.

The **UniController** brings new levels of ease of use and functionality.

Elegantly designed, the **UniController** will reduce training times and can be used by all levels of Operator.

Amongst its many features are:

- Fast, easy editing of cycle time
- Neoprene liner run-in setting
- Display of current air pressure
- IP 64 Rated to ensure waterproofness.



The **UniController** allows the user to control all aspects of the test in a simple and intuitive way.

The James Heal **UniController** consists of

- LCD Display
- 2 selection buttons
- Push-Rotate Selector

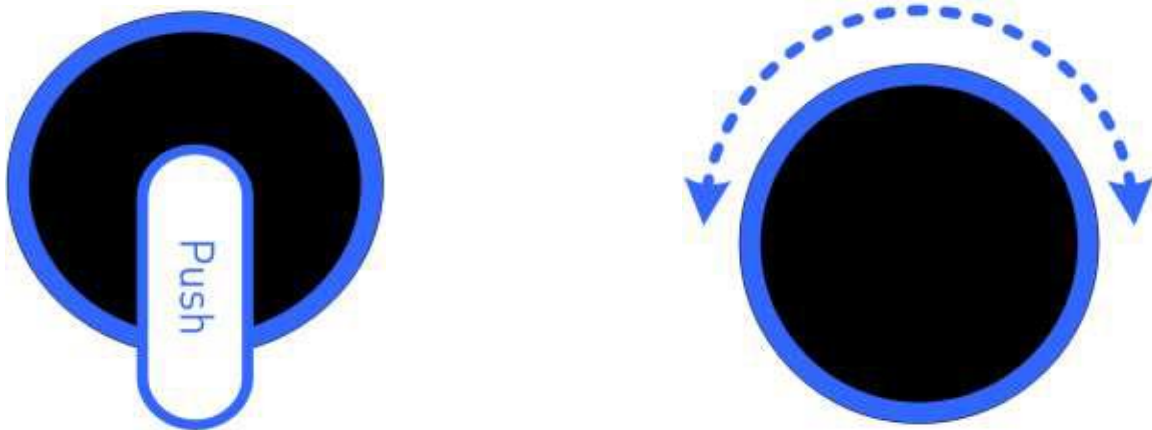
Using the UniController

When **Impulse³** is initially powered up, the James Heal icon will be briefly displayed followed by a brief display of the Firmware version number. These are only displayed when the unit is powered up.

The Push-Rotate (PR) Selector

The Push-Rotate (PR) Selector has two main modes of operation:

- **Push** to Start, Select or Enter
- **Rotate** to cycle through the options.



At the end of a test, the blue LED illumination will pulse on and off to indicate the **Impulse³** requires attention from the Operator.

Buttons

For the purposes of this Operators Guide, the top selection button will be called 'Button1' and the bottom selection button will be called 'Button 2'

The function of the Button 1 and Button 2 can change throughout the testing process.

Normal Options

Using the **UniController** for **Impulse³** you can set or change the following:

- Time
- Neoprene liner run- in Setting

Additional Options

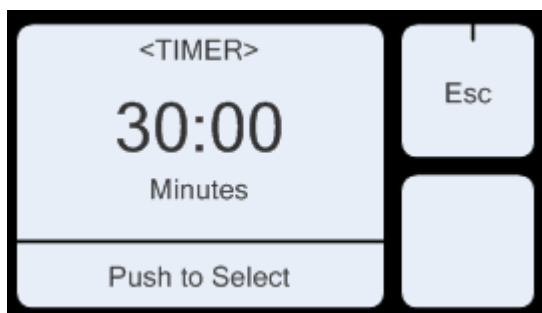
Note: To make this selection, you must turn the PR Selector in the first 30 seconds after powering up the **Impulse³** in order to access these settings.

- Change Pressure units
- Air pressures warning Limits
- Volume

Setting the Timer

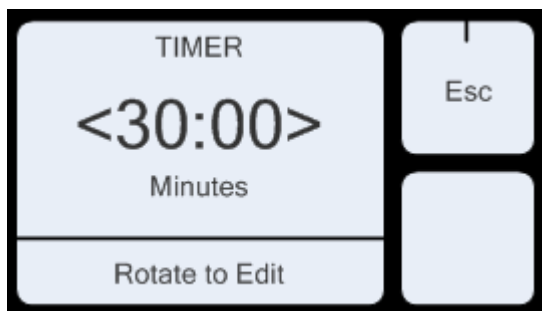


While **Impulse³** is not running, turn the PR selector clockwise.



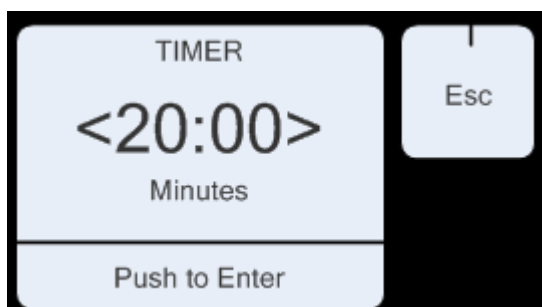
The display changes.

Push the PR Selector to move to Edit mode.



Rotate the PR Selector to change the cycle time required.

Rotate clockwise to increase and counter clockwise to decrease



When the correct time is displayed, push the PR Selector to Enter the new value.

Neoprene Liners



While **Impulse³** is not running, turn the PR selector clockwise.



The display changes.

The new liners feature automatically sets the correct time to run in new Neoprene Liners

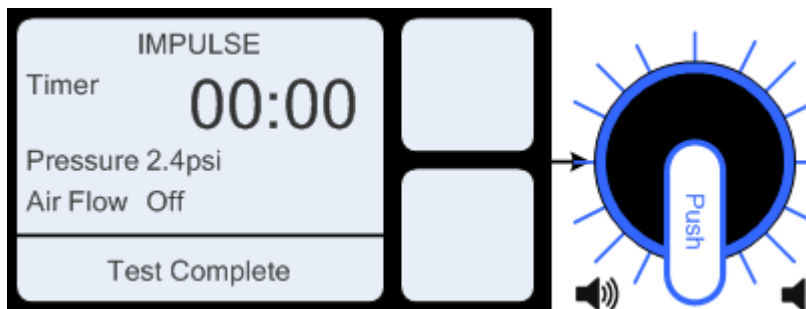
Starting a Test



Push the PR Selector to Start the test.

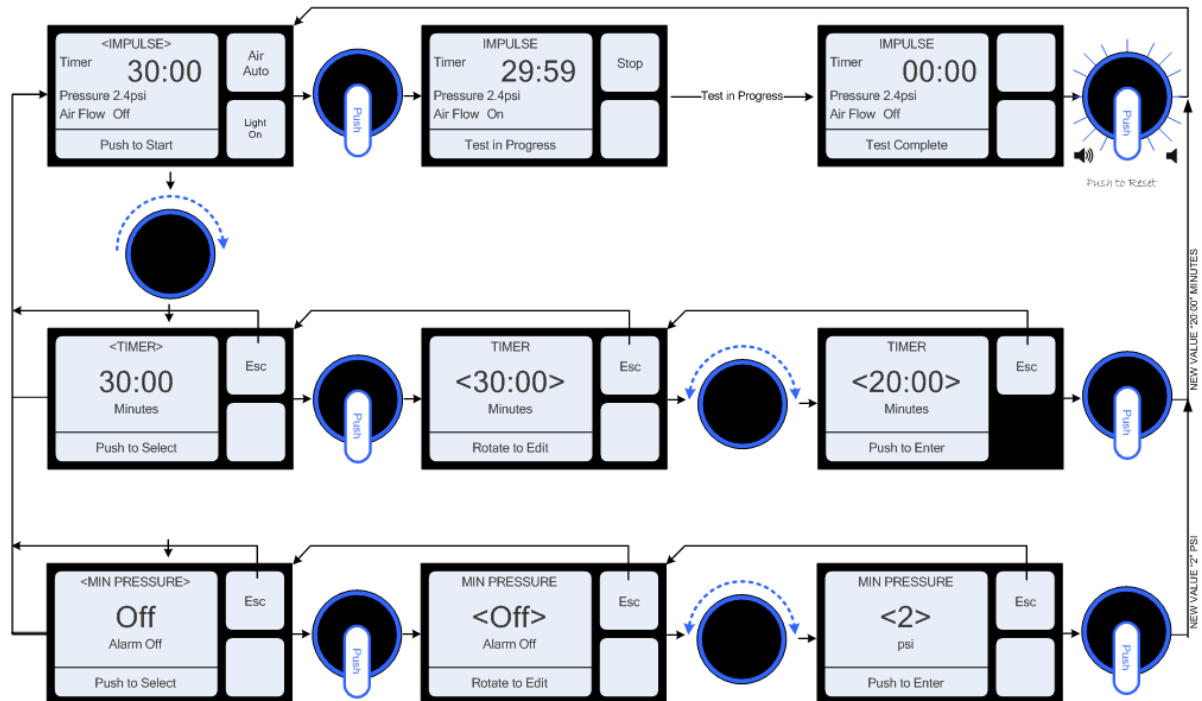


The counter will count-down to zero.



At the end of a test, the blue LED illumination will pulse on and off to indicate the **Impulse³** requires attention from the Operator.

Overview of the UniController for Impulse³



INSTALLATION

The **Impulse³** is delivered on a wooden palette. Use a forklift truck or hydraulic pump trolley to move the packing case as near as possible to the final location.

Once in position, follow the instructions in the Unpacking Section to remove the outer case.

The **Impulse³** can now be lifted from its palette and in to location using a pump truck if available, or a by hand. If lifting by hand a minimum of 3 people will be required.

These instruments are heavy and should be moved with care.

Do not dispose of any packaging material until everything is accounted for.

Electrical

- Stand the instrument on a firm and level surface.
- Connect the electrical power supply to the mains input using the lead provided.
- The power rating for **Impulse³** is 110W.

Fuses

Two (2) fuses are fitted, located at the rear of the machine beneath the mains lead socket.

To replace a fuse, isolate from the mains supply, place a screw driver blade in the slot of the fuse holder, then press and turn anti-clockwise approximately $\frac{1}{4}$ of a turn. The fuse holder complete with fuse is now released.

Compressed Air

- If Air Injection is to be used with the instrument, connect the air supply to the Compressed Air Input socket on the rear of the instrument (see Picture below)
- **Impulse³** requires a pressure of 2 - 8 bar
- **Impulse³** has an air consumption of 84 l/min
- The pneumatic connection to the instrument is 6mm diameter. An adaptor is supplied to convert 6mm to 1/4 inch BSP
- The air supply should be capable of delivering air filtered to 5 microns or better
- Oil lubrication of the factory air supply is not required nor recommended
- **Impulse³** is supplied with a 1m length of 6mm Nylon hose for connection to a suitable air supply
- Ensure all equipment used for connection, including pipes and fittings have a safe working pressure greater than that of supply.
- **WARNING** – do not attempt to disconnect any pneumatic pipe without first expelling the excess air from the instrument. To do this, shut off the air supply to the instrument and run **Impulse³** with Air Injection On, until all air has been expelled.
- When removing the pipe fully depress the locking ring on the pneumatic fitting, towards the instrument while simultaneously withdrawing the pipe.
DO NOT FORCE THE PIPE



TECHNICAL DATA

Instrument Specification

Impeller Stainless steel.

Rotational Speed: 1200 rpm.

Calibration Service UKAS accredited (based on ISO 17025)

Dimensions W: 270mm x D: 580mm x H: 320mm

Weight 30 kg (approx)

Power Supply 85 – 264 VAC 50/60 Hz Power Rating 110 W maximum

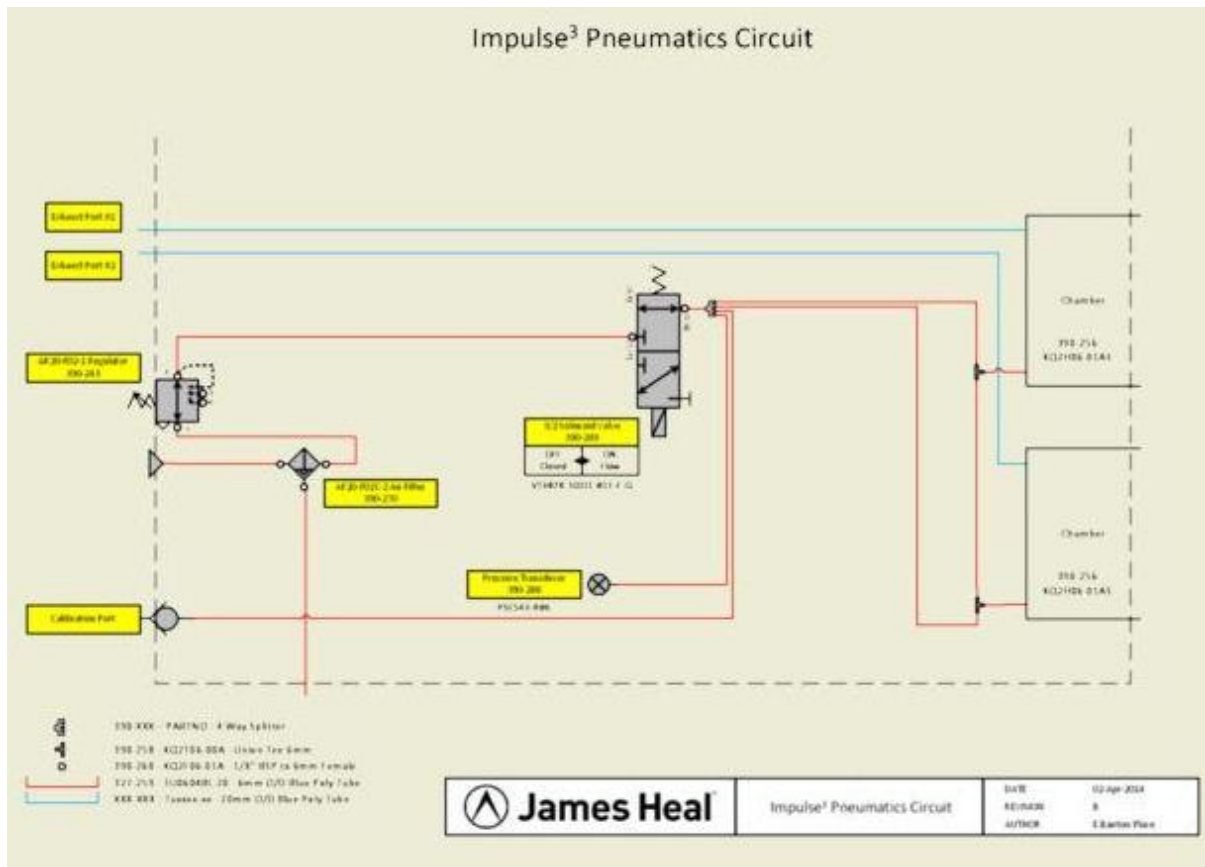
CE Conformity

Impulse³ is CE marked.

It therefore complies with the following directives:

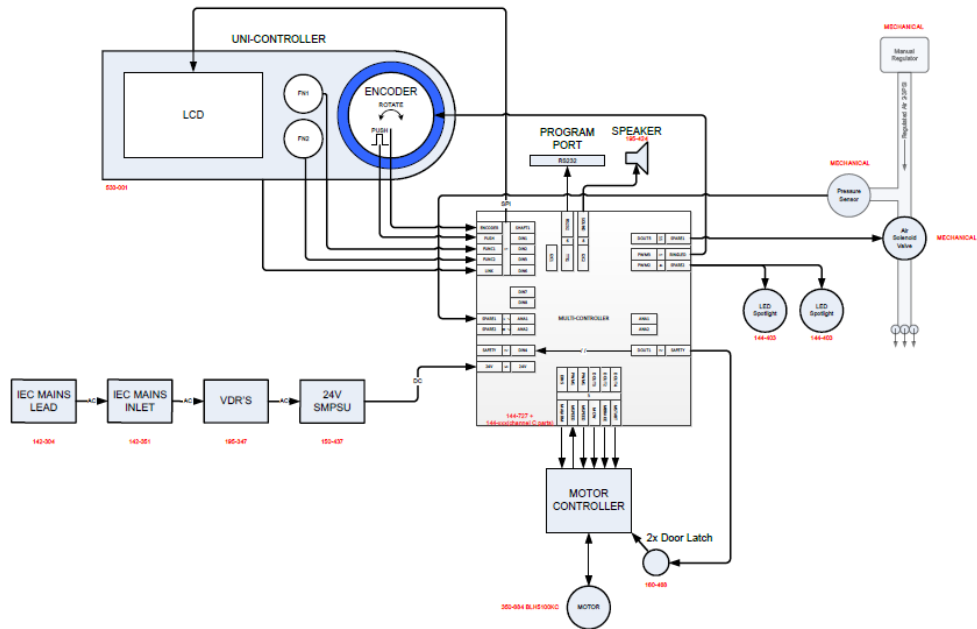
- Machinery Directive 2006/42/EC
- Low Voltage Directive 2006/95/EC
- Electromagnetic Compatibility Directive 2004/108/EC

Pneumatic Scheme



Electrical Scheme

Impulse³ 1466
Functional Block Diagram



REVISION HISTORY

See front cover for Publication number, e.g., 290-1466-1

Revision	Date	Originator	Details Of Revision
1	03/06/2014	LW	