



UNIVERSAL SAFE INSTALLATION GUIDE

JAMES H. HEAL & CO. LTD.
RICHMOND WORKS
HALIFAX
WEST YORKSHIRE HX3 6EP
ENGLAND

Telephone	+44 (0) 1422 366355
E-mail	info@james-heal.co.uk
Website	http://www.james-heal.co.uk

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INTRODUCTION

This guide provides information regarding the safety, installation and technical details for James Heal instruments.

The appropriate Operator's Guide must be read carefully before operating the instrument; refer to Operator Safety section where applicable.

The full Operator's Guides can be accessed here in our KnowledgeHub:
<http://appsupport.james-heal.co.uk/support/solutions/>

You are advised to carry out your own risk assessment for use in conjunction with this document.

James Heal instruments conform to EU requirements where required.

EU Conformity

- Machinery Directive 2006/42/EC
- Low Voltage Directive (LVD) 2014/35/EU
- Electromagnetic Compatibility (EMC) Directive 2014/30/EU
- Waste Electrical and Electronic Equipment recycling (WEEE) Directive 2012/19/EU
- Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU

ACCUDRY 1717



Safety

- Read the full manual carefully before operating the instrument.
- AccuDry has a mass of approximately 40kg, therefore assistance from a colleague or suitable lifting apparatus is recommended.
- AccuDry complies with the EU 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.
- AccuDry is designed to be vented through to the open air. It should have its own ventilation system which should not be joined with any other ventilation system or connected to any other appliance.
- Care must be taken to ensure that the instrument does not stand on the electrical supply cable
- Never tumble dry: rubber, foam rubber, plastic, plastic foam, nappy pants or liners, polythene, paper, dry cleaned garments, large or very bulky items including duvets and sleeping bags. Items not recommended for tumble drying may be marked with a symbol such as:



Installation

AccuDry 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.

AccuDry 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 2 people will be required.

These instruments are heavy and should be moved with care.

Unpacking

- Remove the tape from the packing case lid and open.
- Carefully remove the packaging and contents from the packing case.
- 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.
- Please check the serial number plate to confirm that the supply voltage and frequency are in accordance with your order.

Levelling

To keep vibration and noise to a minimum when the dryer is in use, it should be placed on a firm, level surface. The machine must be perfectly level to ensure safe and proper operation. Once in its permanent operating position, check that the dryer is absolutely level with the aid of a spirit level. If it is not, raise or lower the two adjustable feet at the front of the machine until it is.

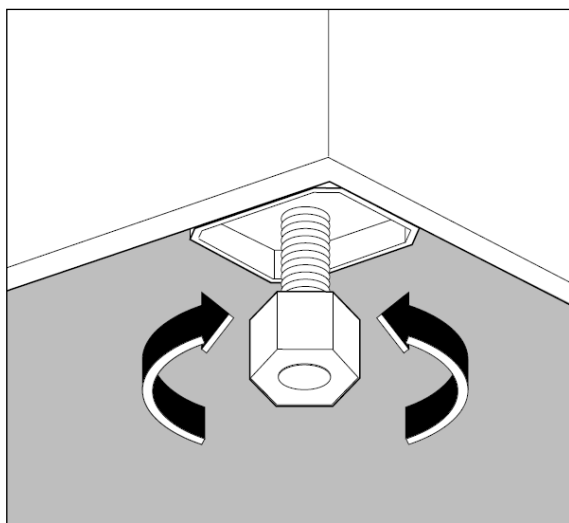


Figure 1: Adjust the levelling feet

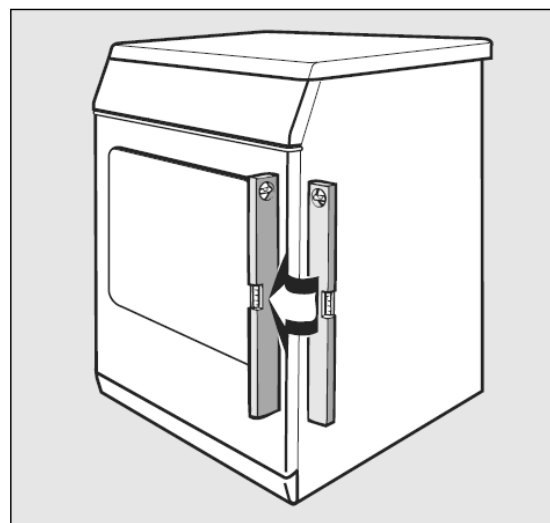


Figure 2: Checking with spirit level

The feet must never be removed. Do not restrict the floor clearance through deep pile carpets, strips of wood or similar. This might cause heat build-up which would interfere with the operation of the appliance.

Venting

To simplify the installation, there is a choice of vent outlets: one at the back, the others in the left and right-hand side. Connect the hose to whichever is the more convenient by pulling the ring nut (A) from the vent outlet at the back, screwing it on to the hose and pushing it firmly back into place. The unused vents should be sealed with the special snap covers provided.

The exhaust air must not be vented into a chimney or vent flue which is in use, nor should it be connected to ducting which ventilates rooms with fuel burning appliances.

If the hose is long and the room temperature low, moisture may condense to water inside the hose. To prevent this water from lying in the hose or flowing back into the tumble dryer, it is advisable to drill a small hole (approximate diameter 3 mm) in the lowest point of the hose and to place a small collecting container below it. (See figure 4, point B).

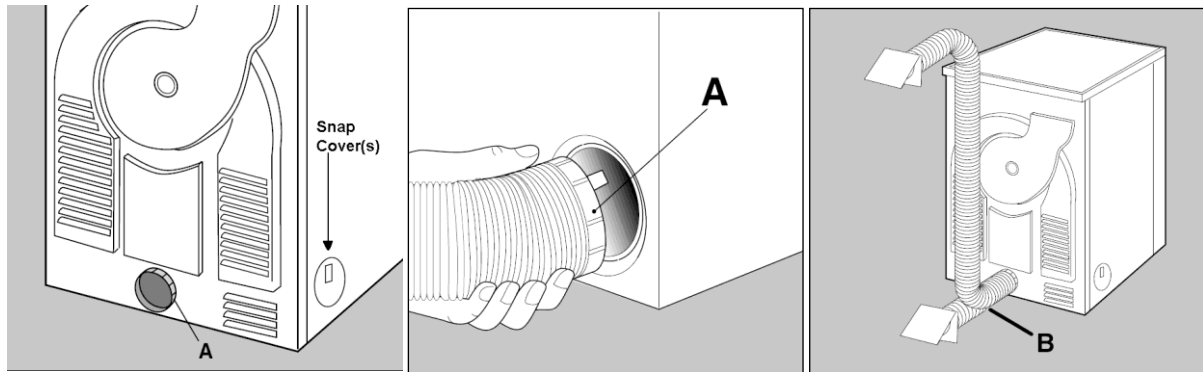


Figure 3: Vent ring nut

Figure 4: Draining hole

Once connected to the dryer, run the vent hose to the desired outlet point, ensuring that the overall length is less than 2 metres, and that it contains no more than two (2) bends.

In order to prevent the tumble dryer from overheating, it is important that the exhaust is unobstructed. Therefore, in case of a permanent hose fitted to an exterior wall, it must be ensured an exhaust capacity of at least 150m³/h.

Ensure that the vent hose is not obstructed or compressed. If the hose is partially obstructed, drying efficiency will be reduced, resulting in longer drying times and higher energy consumption. If the hose is completely obstructed, the safety cut-outs within the machine may operate.

Electrical Connection

- Connect the electrical power supply to the mains input using the lead provided.
- Any electrical work required to install this appliance should be carried out by a qualified electrician or competent person.
- **WARNING: THIS APPLIANCE MUST BE EARTHED. The manufacturer declines any liability should this safety measure not be observed.**
- Before switching on, make sure the electricity supply voltage is the same as that indicated on the serial number label on the tumble dryer.
- AccuDry is supplied with a removable UK 13A plug. In the event of having to change the fuse in the plug supplied, a 13amp ASTA approved (BS 1362) fuse must be used.
- The appliance is also supplied with Standard euro & standard Chinese removable plug, these are non-fused.

Technical Information

Dimensions, excluding packaging	Height Width Depth	850 mm 600 mm 625 mm
Mass	Net	40 kg
Power supply voltage Total power adsorbed		Single Phase 230V ± 10%, 50/60 Hz 2600 W (13A)
Power consumption	Maximum	4.25 kWh
Maximum recommended load	Cellulosic Synthetic	6.0 kg 2.5 kg
Drum reversal		Non-reversing
Drum	Diameter Depth Volume	580 mm 410 mm 108 litres
Peripheral centrifugal acceleration		0.75g
Rotational velocity		52 rpm
Lifting vanes	Number Spacing Dimensions Length Width – base Width – peak Height	3 120° 300 mm 40 mm 15 mm 75 mm
Heating period	Maximum	2 hours 59 seconds
Temperature settings	Minimum	20°C
	Maximum	80°C
Cool down period	Minimum	5 minutes
	Maximum	30 minutes
Ambient temperature	Minimum	5°C
	Maximum	35°C
Warranty	18 months	
Life expectancy	12000 hours usage subject to a service at least every 12 months	

AQUABRASION 1819



Safety

- The instrument is very heavy, therefore do not attempt to lift without suitable lifting apparatus or use two or more able-bodied people.

AquAbrasion 150 kg

- AquAbrasion has been specifically designed with operator health and safety in mind. Our instruments ensure the minimum of operator stress and fatigue, and is virtually silent in operation to suit the laboratory environment.
- Care should be taken when lifting the Top Plate.
- Care should be taken to prevent anything heavy (e.g., weights) from impacting on the Control Panel.
- Care should be taken to avoid placing the hand between the Abrading Stations and the Top Plate whilst in motion.
- Leave sufficient space around the instruments to allow unrestricted and safe operator access.

Installation

- Do not dispose of any packaging material until all standard and optional accessories are accounted for. If there are any discrepancies, please contact your supplier or Local Agent immediately.
- Remove any staples, wire strapping and adhesive tape.
- Lift out the top box, containing the accessories.
- Remove the adhesive tape and ensure that all accessories are present.

- Using both hands remove the outer sleeve.
- Carefully remove the instrument from its packing case and place it on a firm, flat surface - lifting equipment may be required.
- Lower the top plate so that each of the three (3) Drive Pegs locates into the three (3) Drive Slots.
- Ensure the Top Plate is resting on the three (3) Bearing Pads.
- Connect the instrument to the correct electrical supply using the mains lead supplied.

Technical Information

Power Requirements	110-230 V \pm 10%, 50/60 Hz, 60 W (mains electricity must be free from spikes and surges exceeding 10% of nominal voltage) (Universal Voltage & Frequency)
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	Depth	Height	Width	Weight
AquaAbrasion	850 mm	1200 mm	1570 mm	150 kg

CREASE RECOVERY ANGLE TESTER 150

Safety

SPECIFIC RISKS: NONE

Installation

- Check all packaging and contents from the case.
- Do not dispose of any packaging material until all items are accounted for.
- Place the Crease Recovery Angle Tester and accessories on a suitable bench or table.
- The bench/table must not be subject to vibration or draughts which may influence the test.

Technical Information

Summary of Test Methods & Accessories:

Test Method:	EN 22313 / ISO 2313	M & S P22	AATCC TM 66
Specimen size (mm)	40 x 15	50 x 25	40 x 15
Loading weight	10 N (A)	2 kg (A + B)	500 \pm 5g (AATCC)
Applied area (mm)	15 x 15	20 x 25	15 x 15
Loading time (seconds)	5 min \pm 5 s	60 s.	5 min \pm 5 s
Recovery Time	5 min \pm 5 s	60 s.	5 min \pm 5 s
Method of handling	Forceps & rubber finger stall	Forceps & surgical glove	Forceps Metal for loading Plastic for handling

CROCKMASTER

Hand Driven 670



Safety

Read this manual thoroughly before operating the unit.

Keep clear of all moving parts when the instrument is in operation.

Handle the specimen clamp carefully, the sample holding pins are very sharp !

When loading a test specimen always rest the clamp with the pins pointing down, the clamp should remain in position on the instrument at all other times.

Installation

Unpacking

Do not dispose of any packaging material until all standard and optional accessories are accounted for. If there are any discrepancies, please contact your supplier immediately.

Technical Data

Dimensions : 665mm (width) x 175mm (depth) x 215mm (height)

Weight : 4.1 kg (including 9N weight piece)

Motor Driven 680



Safety

Read this manual thoroughly before operating the unit.

Keep clear of all moving parts when the instrument is in operation.

Handle the specimen clamp carefully, the sample holding pins are very sharp !

When loading a test specimen always rest the clamp with the pins pointing down, the clamp should remain in position on the instrument at all other times.

The instrument weighs approximately 17kg. Only attempt to lift the instrument if you feel it is within your ability or preferably ask a colleague for assistance.

Ensure the machine is isolated from the electrical supply before removing **any** covers.

Fuses of the correct type and with the correct amperage rating must be used.

Never use *CrockMaster* for anything other than what it is designed for.

The instrument is fitted with a safety overload device to prevent injury to the operator or damage to the instrument should the motion of the arm be stalled by an obstruction.

Installation

Unpacking

Do not dispose of any packaging material until all standard and optional accessories are accounted for. If there are any discrepancies, please contact your supplier immediately.

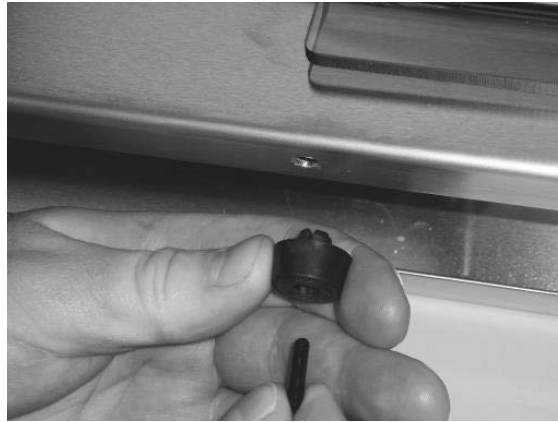
Positioning the instrument

Stand the machine on a firm, level surface such as a bench or table. The instrument is fitted with levelling feet that can be adjusted by rotating them, to suit an uneven surface.

Procedure for repositioning the feet

Carefully lay the instrument on its side to expose the feet. The feet are held in place by means of a threaded bolt attached to the foot, secured with a lock-nut. To remove the feet, first slacken

the lock-nut securing the adjusting foot. Turn the foot anti-clockwise, removing it from the instrument. Re-assemble the foot midway along the instrument, inserting the threaded bolt into the threaded hole, turning it clockwise. Set the instrument level by adjusting the height of the foot and lock the lock-nut. Adjust the remaining feet if necessary.



Connecting to electrical supply

IMPORTANT !

A label is fixed over the mains input socket when the instrument is despatched from James Heal. Before connecting the instrument to an electric supply, check these instructions and set the voltage selector in accordance with your local supply. The selector switch can be found at the rear of the instrument. If in doubt seek advice from a qualified electrician. Failure to adhere to these instructions may permanently damage the unit and immediately invalidate the warranty. Connect the power supply to the mains input.

Technical Information

Dimensions : 660mm (width) x 320mm (depth) x 230mm (height)

Weight : 17.3 kg (including 22N weight piece)

Power : 150 watts, 0.7 amps at 230V or 1.4 amps at 115V

Speed : 60 r.p.m. and 15 r.p.m.

Fuse : 5A anti-surge fuse

DYNAWASH 1626 & DYNAWASH DUO 1625



Safety

DynaWash and DynaWash Duo have masses of approximately 80Kg and 140Kg respectively, therefore suitable lifting apparatus is recommended during installation.

The instruments are large and heavy and should be moved and handled with care by suitably trained personnel.

Before use, read the 'Operator Safety' section in the full guide.

Installation

Siting & Unpacking

DynaWash and DynaWash Duo are both delivered on a wooden pallet inside a crate. Move the instrument to its final location whilst still inside the crate using either a forklift truck, hydraulic pump truck or other suitable mechanical method.

These instruments should be located in an appropriate space to accommodate their size. DynaWash and DynaWash Duo require a supply of electricity, water and drain facilities. See Services section.

Check for external damage of the case, record any damage with photographs and report immediately. Do not install or use a damaged instrument.

Identify the top and front of the crate by locating the screws. Unscrew the top and front and ensure all screws are removed fully before attempting to remove the instrument.

Transport brackets are designed to secure the DynaWash and DynaWash Duo to the wooden pallet during shipping. One transport bracket is fitted at each end of the instrument using M8 stainless steel button head screws at the time of dispatch. A layer of cardboard is placed between the transport bracket and the DynaWash and DynaWash Duo to prevent marking. They are painted yellow for identification and can be discarded on unpacking (see image below). The brackets are then fastened to the pallet base with wood screws. On arrival the wood screws should be removed first to prevent damage to the instrument.



After removal of the transport bracket, the M8 screws can be refitted into the holes in the instrument base to blank off the holes (for appearance only).



The contents of the order will be inside the instrument. Carefully remove the packaging and contents. Note that the order is complete. If there are any discrepancies, contact your supplier immediately. Once satisfied, dispose of any packaging materials safely and responsibly.

Services

Electrical

DynaWash

Volts: 220-240V

Hz: 50/60Hz

Phase: 1Ph + N + PE

Watts: 2500W

Amps: 11A

DynaWash Duo

Volts: 220-240V

Hz: 50Hz

Phase: 1Ph + N + PE

Watts: 2650W

Amps: 14A

Before connecting, ensure that the electricity supply voltage and frequency matches the information on the serial number label.

DynaWash and DynaWash Duo are supplied with an industrial style IEC 60309 plug for the mains connections, attached at the rear. Connect to a power supply only after installation is complete. Do not use an extension lead.

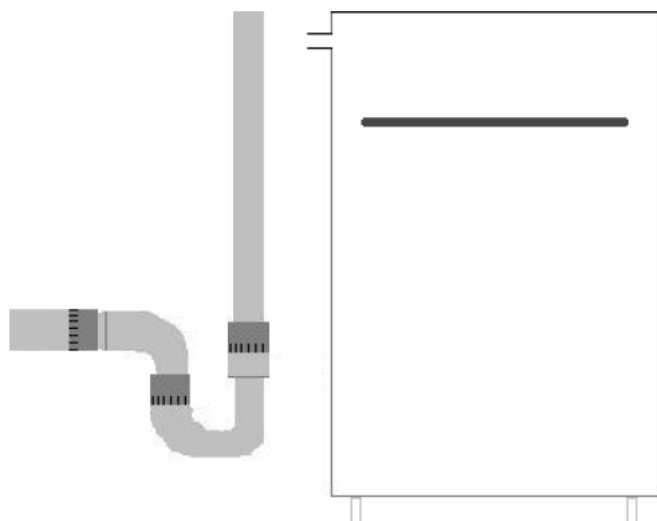
Electrical safety can only be guaranteed when continuity is complete between the instrument and an effective earthing system which complies with local and national regulations. The manufacturer cannot be held liable for the consequences of an inadequate earthing system (e.g. electric shock).

Isolate from the electricity supply during maintenance or cleaning.

Water & Drainage

DynaWash and DynaWash Duo should be connected to a mains water supply in accordance with local and national safety regulations, to a maximum of 60°C. The water inlet is fitted with a 3/4" BSP non-return inlet valve.

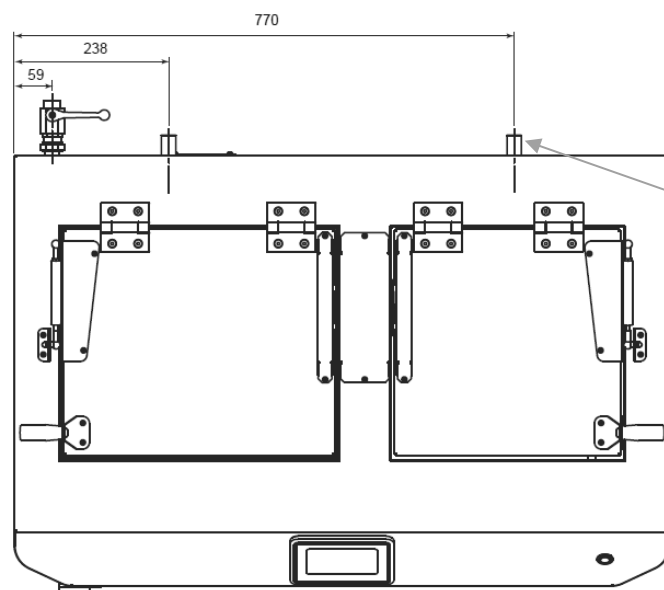
If the water pressure is higher than 1000kPa (approx. 10 bar) a pressure reducing valve must be fitted. Using the blue hose provided, connect to the mains water supply incorporating a mains stopcock with a 3/4" BSP thread. The stopcock should be fitted by a qualified plumber.



At the rear of the bath is a 22mm drain connection for emptying via the pump. Connect the hose and clamp and ensure that the drain pipe is higher than the water level in the bath to prevent the water siphoning from the bath.

To enable the pump, select 'Drain' on the touchscreen; 40 litres will be pumped out in approx. 90 seconds. The duration can be altered in 'Settings.'

To drain into a sink, hook the hose over the edge and secure. Ensure that the water can flow freely or there is a risk of the water being sucked back in.



DynaWash Duo, has a second 22mm drain connection for carrying away the excess water from the spin dryer.

Connect the second waste hose and clamp to the instrument and the other end to a drain for the collection of the waste water from the spin dryer.

There is no risk of siphoning from the spin dryer.

Ensure that the drain and filling hoses are not obstructed or compressed.

Technical Information

DynaWash

Height* (mm)	Width (mm)	Depth^ (mm)	Approx Weight (kg)
1240	560	759	80.0

* Height with lid up. ^ Depth includes water input fitting

DynaWash	
Item	Comment
Electricity	230V 50Hz Phase: 1Ph + N + PE Watts: 2650W Amps: 11A
Air	Not required
Bench or Floor Standing	DynaWash is designed to be floor standing
Water Supply	Hot or Cold Water Feed: ¾ inch BSP
Drainage	Drain: ¾ inch BSP
Air Extraction	Not required
Conditioning	It is not recommended that this instrument is operated in a conditioned atmosphere.

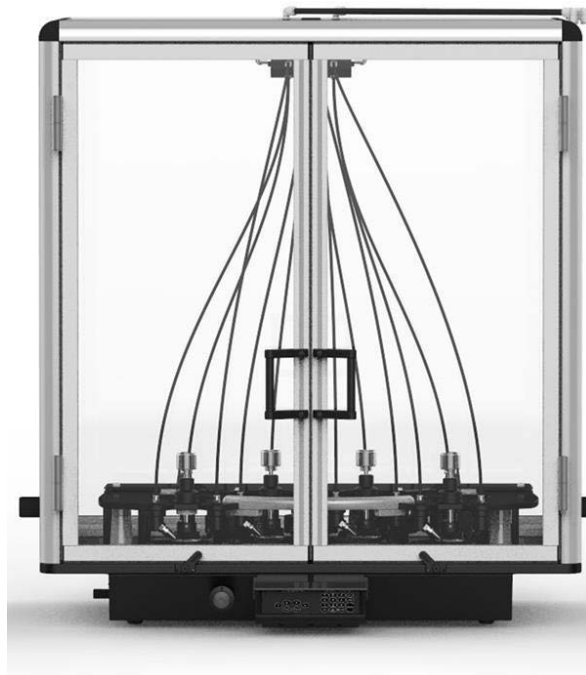
DynaWash Duo

Height* (mm)	Width (mm)	Depth^ (mm)	Approx Weight (kg)
1240	1010	759	140.0

* Height with lid up. ^ Depth includes water input fitting

DynaWash Duo	
Item	Comment
Electricity	230V 50/60Hz Phase: 1Ph + N + PE Watts: 2650W Amps: 11A
Air	Not required
Bench or Floor Standing	DynaWash Duo is designed to be floor standing
Water Supply	Hot or Cold Water Feed: ¾ inch BSP
Drainage	Drain: x2 ¾ inch BSP
Air Extraction	Not required
Conditioning	It is not recommended that this instrument is operated in a conditioned atmosphere.

ELASTABRASION 1804



Safety

ElastAbrasion has a mass of approximately 160kg, therefore suitable lifting apparatus is recommended during installation. This instrument is large and very heavy and should be moved and handled with care.

Position ElastAbrasion at an ergonomic height for the user to avoid any unnecessary straining whilst accessing the instrument.

Do not use this instrument for any other purpose.

Ensure the instrument is stable and secure before commencing testing.

ElastAbrasion will stop automatically when the doors are opened.

Push the doors back fully to allow safe access when dressing the instrument.

Using a vacuum hose on one of the 2 connectors located on each side of the cabinet will extract any fine debris from the test chamber whilst in use. Use only one of these connectors and leave the other side unblocked to allow air flow.

Ensure that the lid is pushed back fully before letting go.

Installation

Siting & Unpacking

ElastAbrasion is delivered on a wooden pallet in a crate. Move the instrument to its final location whilst still inside the crate using either a forklift truck, hydraulic pump truck or other suitable mechanical method.

Check for external damage of the case. Record any damage with photographs and report immediately.

Identify the top and front of the crate by locating the screws. Unscrew the top and front and ensure all screws are removed fully before attempting to remove the instrument.

Remove **ElastAbrasion** from the crate using a suitable mechanical lifting device with the palette underneath the instrument as a means of lifting; please note that the instrument is not bolted to the palette. Lift the palette and reverse the lifting device backwards in a straight line taking care not to catch the sides of the instrument on the crate. A person situated either side of the crate can offer direction and stability to the crate.

Once the instrument is safely on the floor, carefully remove the packaging materials; take care as mishandling may result in scratching the instrument.

Do not dispose of any packaging material until all standard and optional accessories are fully accounted for. If there are any discrepancies, please contact your supplier immediately.

Lift **ElastAbrasion** from its palette and into location using a suitable mechanical method, or by hand. If lifting by hand, a minimum of 4 people is required, holding the machine at each corner.

ElastAbrasion should be situated at an ergonomic height on a firm level surface stable and strong enough to withhold the 160Kg weight without movement; it should also contain an electrical supply and compressed air supply.

Read this manual carefully before operating the instrument.

Please check the serial number plate to confirm that the supply voltage and frequency are in accordance with your order.

Connecting to Services

Electrical Connection

Electrical Power Requirements: 85-264 VAC; 2 A; 50/60 Hz; 60W.
Mains electricity must be free from spikes and surges exceeding 10% of nominal voltage.
Connect the electrical power supply to the mains input using the lead provided.

Vacuum Extraction

A vacuum hose can be connected to the **ElastAbrasion** cabinet to extract any fine debris from the test chamber whilst in use.



Connect the vacuum hose to either of the 2 connectors located towards the front on both sides of the cabinet.

Only use one of these connectors and leave the other side unblocked to allow air to enter the cabinet.

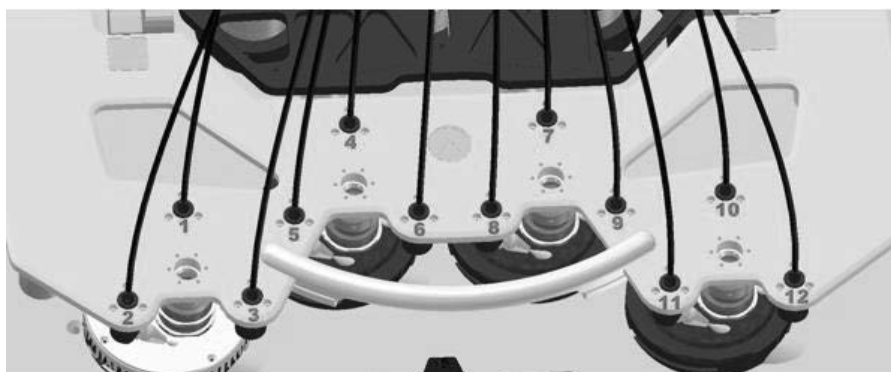
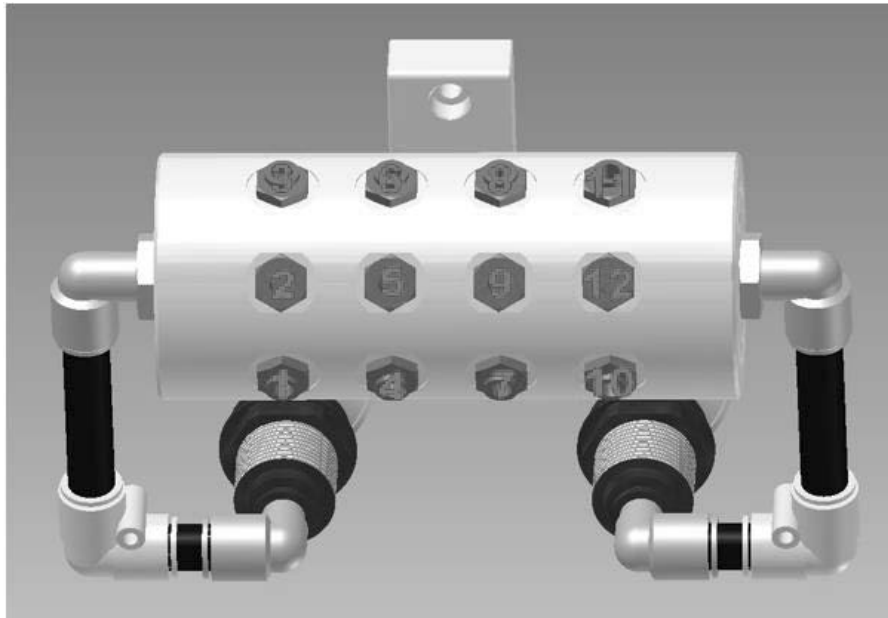
If a vacuum hose is not used, ensure that the cabinet is cleaned more frequently.

The vacuum cleaner can be adapted to enable it to start and stop automatically with the instrument. The vacuum wiring must be fitted with an IEC connector which is supplied with the instrument; this can then

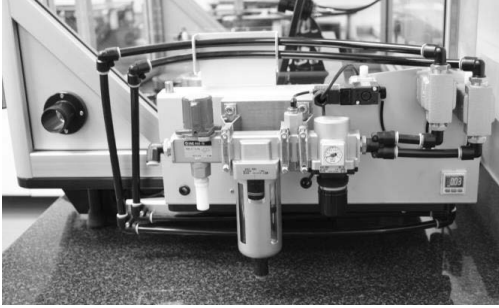
be plugged into the IEC socket in the right hand side of the base of *ElastAbrasion*.

Airline Layout

If the airlines are disconnected, ensure that they are reconnected in the correct positions as indicated.



Compressed Air



The compressed air inlet is situated on the right hand side of the instrument.



Connect the factory air supply to the compressed air input socket using the push-fit fitting.

After this is complete, allow the factory air supply into ElastAbrasion.



The air pressure to the instrument is monitored here.

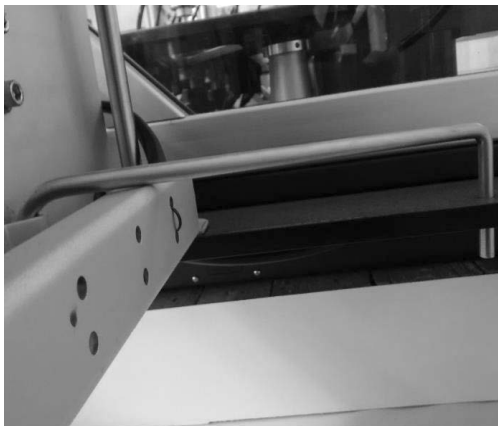
The air supply must be capable of supplying 750L/min.



ElastAbrasion requires a pressure of 1 ± 0.1 bar.

The regulator will be pre-set to 1 bar – as stated in the standard.

1 bar = 0.1MPa.



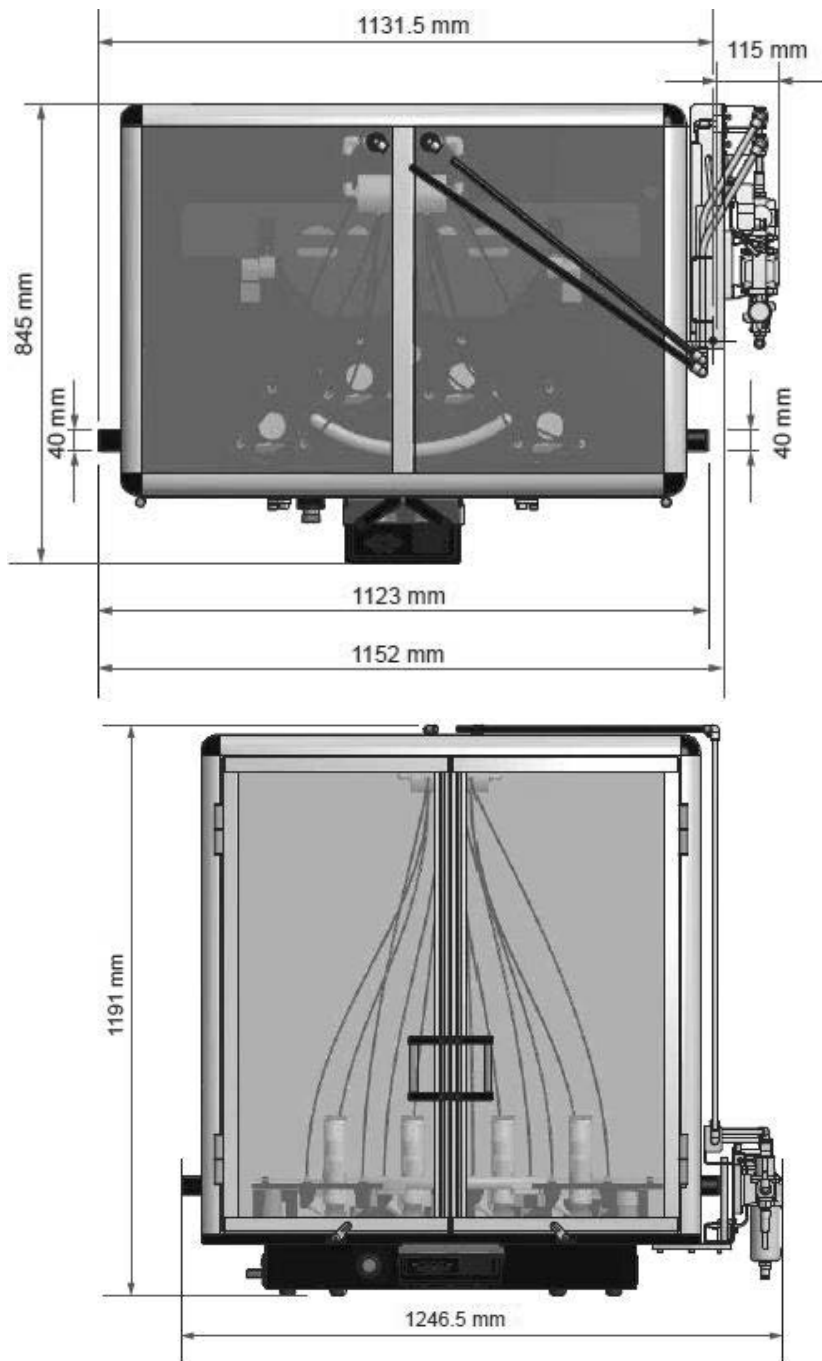
The air regulator is situated on the right side of the instrument. The mechanism can be flush against the cabinet or face front using the support bar located behind the panel.

ElastAbrasion consumes compressed air economically.

Once connected, the air supply automatically starts when the instruments starts, and stops at the end of the test.

Technical Information

- Weight 160 kg (approx.)
- Power Supply 110-230 V \pm 10%, 50/60 Hz, 60 W
- Mains electricity must be free from spikes and surges exceeding 10% of nominal voltage - Universal Voltage & Frequency
- ElastAbrasion utilises factory supplied compressed air - the air supply must be capable of supplying 750L/min
- Compressed air is required at 1 \pm 0.1 bar (0.1MPa).



Dimensions (mm)	Height	Width	Depth	Weight (kg)
ElastAbrasion	1191	1246.5*	845	160

* This width is with the pneumatics kit folded in to the side of the instrument.

ELMATEAR 1555



Safety

ElmaTear has a mass of approximately 50Kg, therefore assistance from a colleague and suitable lifting apparatus is recommended. ElmaTear is delivered on a wooden pallet. Use a forklift truck or hydraulic pump trolley to move the packing case as near as possible to the final location. ElmaTear can now be lifted from its pallet and into location using a pump truck if available. If lifting by hand a minimum of 3 people will be required.

Once in position, follow the instructions in the *Unpacking* section below to remove the outer case.

Before removing any covers, ensure the instrument is isolated from the electrical supply; these 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.

Installation

Unpacking

Remove the tape from the packing case lid and open. 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 by the base and place it on a firm flat surface. **It is imperative that the surface is stable and level as the instrument will lose energy with any movement.**

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.

Securing to Work Surface

Due to the unique rapid arresting mechanism it is not necessary to fix the instrument to the work surface. However, when testing using Pendulum E, the instrument may move.

If the instrument moves the results will not be correct as energy will be lost. In this case, we recommend the instrument is firmly secured to a sturdy workbench.

Two holes are provided for this purpose. The bolts and wing-nuts are also supplied with the instrument for securing. The distance between the holes is 460mm (centre to centre) and the required hole size is 9mm. Recheck the level of the instrument after fixing to a work surface and correct if required.

Levelling

The levelling procedure is twofold:

Firstly, level the instrument widthways. To do this, loosen the 17mm hexagon nuts on the front handwheels using the spanner supplied and adjust the height by rotating the handwheels until the levelling bubble is central. Re-tighten the locking nuts.

Secondly, level the instrument lengthways using the back handwheels as above, until the levelling bubble is fully centralised within the black circle.

When using a different pendulum, it is advisable to check the level and repeat the above procedure if required. As a matter of routine, we advise the instrument level is checked at least weekly.

Electrical Connection

A single phase 85-264VAC, 50/60Hz supply is required. The instrument is rated at 60W. A 1.0 amp, 20mm anti-surge fuse is fitted. The instrument is supplied with a mains lead which connects into the left side.

Preparing for Use

The V shaped pendulum arm is secured by 2 pegs above, and a red transit screw below. Before use, remove the transit screw using an allen key, or the arm will not be able to swing freely. The 2 uppermost pegs remain in place.



Once this is complete, ElmaTear is ready for use.

Technical Information

Standard Pendulum Weights	2N (¼ A) 4N (½ A) 8N (A) 16N (B) 32N (C) 64N (D)
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Optional Pendulum Weight	128N (E)
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Standards	40 freely programmable standards: 10 x Textile, 10 x Nonwoven, 10 x Paper, 10 x Plastic
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Pre-Programmed Standards :

Textile :

AS 2001.2.8:2001
ASTM D 1424:09(2013)
BIS IS 6489-1:2011
CAN/CGSB 4.2 No.12.3:2005
EN ISO 13937-1:2000
GB/T 3917.1:1997
ISO 4674-2:1998
M&S P 29:2009
NEXT 17:2006
JIS L 1096 D

Paper :

AS 1301.400s:1998(2013)
GB/T 455:2002
ISO 1974:2012
NZS 1301.400s:1998(2013)
PAPTAC D9:1993
TAPPI T 414 om-12

Plastic :

ASTM D 1922:2009
BIS IS 13360-5-23:1996
GB/T 16578.2-2009
ISO 6383-2:2004
JIS K 7128-2:1998

Statistics	Individual Results Mean, Maximum Minimum, Range Standard Deviation Co-efficient of Variation 95% Confidence Limits Tear Index
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Range Warning	Off, 15%-85%, 20%-60%, 20%-75%, 20%-80%
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Calibration	Built-in calibration guide Automatic pendulum detection and calibration angle Verification check-weights for each pendulum
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Encoder	Digital non-contact, zero friction encoder
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Measurement Units	N, cN, mN, kgf, gf, lbf, ozf
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Number of Tests	Up to 100 tests in each direction Combined X and Y direction tests on one report
Number of Ply	1 to 16
Maximum Specimen Thickness	5 mm
Cutting Blade	Titanium nitride coated
Cut Length	15 to 20 mm
Weight	50 kg
Dimensions	620 (L) x 365 (W) x 635 (H) mm
Power	85 to 264 VAC, 50/60Hz, 60W
User Interface	7" Capacitive Colour TFT touchscreen
PC Interface PC Software	USB port TestWise for ElmaTear PC Application
Safety	Interlocked 2-handed pendulum release Automatic pendulum arrest after initial swing

FLEXIBURN 1880

The FlexiBurn is packed in a large wooden case. Any optional accessories will be packed around the instrument. Remove the case lid and unpack the optional accessories and loose items first. The instrument is fixed to the base of the case as two separate items, 1) the instrument, and 2) the base leg unit. To remove the instrument the case must be stood upright first then remove the brackets which secure the instrument to the base. Remove the sides. Finally lift the FlexiBurn out of the case. Please check that all of your accessories and consumables are present before disposal of any packaging material and report any discrepancy to the manufacturer.

These are the standard items packed with the Flexiburn:-

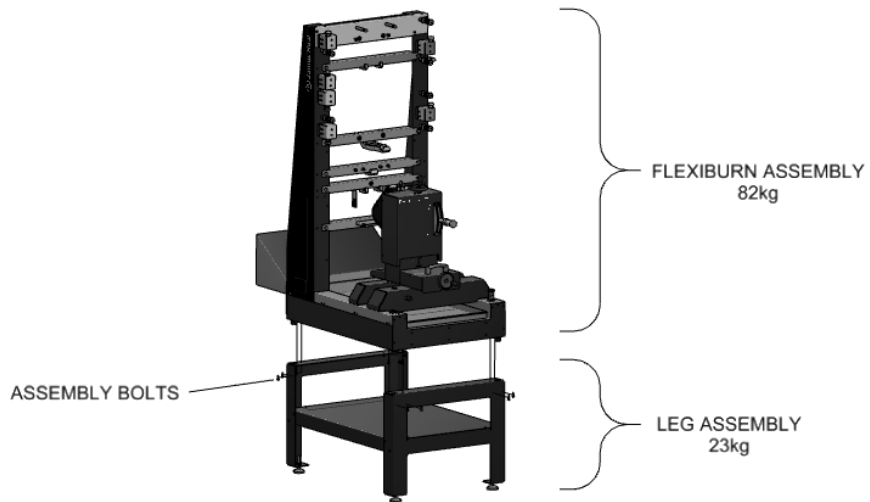
- 1 Mains Lead
- 1 17 mm Spacer (Burner tip to fabric face)
- 1 20 mm Spacer (Burner tip to fabric edge)
- 1 Wire Brush
- 1 TestWise software installed on a dongle
- 1 Burner Removal Tool
- 1 Pack of 6 Burner O Ring Seals
- 1 Cotton Trip Thread

Also check that the specimen frames and templates specified on your order are also present and any other optional equipment ordered.

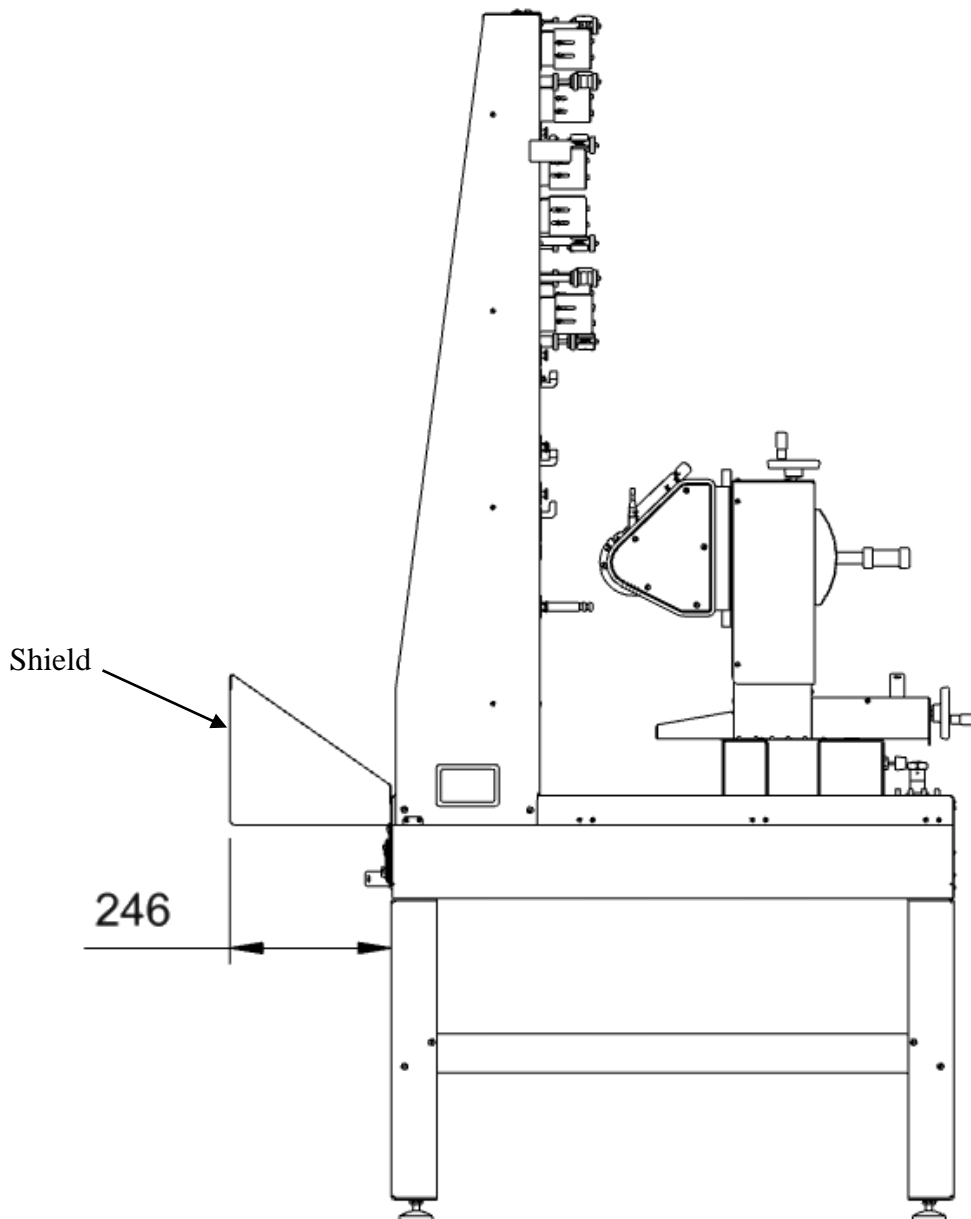
Check the operating voltage stamped on the serial number plate is the same as your electrical supply.

INSTALLATION

- The FlexiBurn can be installed on the base leg unit provided, or it can be installed on a suitable table or work surface provided by the user.
- If using the base leg unit provided, carefully lift the Flexiburn onto the leg unit and secure using the 8off M6x16 bolts provided.



- The FlexiBurn must be located in a separate room, or in part of a room which has been fully partitioned to accommodate it.
- On the rear of the machine a shield can be fitted which can be used to space the FlexiBurn from the Test Chamber wall and also cover the gas pipes and electrical cables to protect them from debris. The figure below shows the FlexiBurn with the shield fitted and the distance to the wall.



- The testing room must have a minimum volume of 4 m³.
- The construction of the room must be such to allow location of the rig inside and the control module outside. The rig must be clearly visible from the outside from the control module location.
- The atmosphere within the room must be within the following limits :
 - Temperature 15 - 30 °C
 - Relative Humidity 20 - 65 %RH
- Fireproof materials must be used in the construction of the testing room.

- The room must be fitted with an extractor fan or other means of ventilation to facilitate the clearance of smoke and fumes after a test. In certain situations, a sprung-loaded vent located low down on the wall opposite the fan will help to clear the atmosphere by allowing the ingress of fresh air when the fan is operating.
- Connect the gas supply/supplies to the gas inlet on the left hand side of the FlexiBurn. Two gas supplies can be connected at the same time. (See Fig below).



Details of gas supply

a	GAS TYPE	Commercial Butane to BS 4250 Commercial Propane for ISO 6940/1
b	SUPPLIER	Calor gas stockist
c	CYLINDER	Either 16 or 32 lb. type
d	REGULATOR	Calor engineering high pressure regulator or similar
e	PIPING	Calor engineering High pressure pipe of 3/16 inch (4.68 mm) internal diameter and complying with BS 3212

The gas cylinder should be placed outside the building/chamber.

The gas cylinder, regulator and piping are not supplied with the equipment.

FlexiBurn is not designed to be connected directly to a gas supply and a Regulator must be included in the connection between the cylinder and the FlexiBurn. The regulator is precisely set by the manufacturer to control the pressure of the supply and must not be adjusted. If a Regulator shows signs of wear, it should be replaced. Regulators must be marked BS 3016 or EN 12864.

For commercial propane, a typical bottle pressure is 20 bar – this must be Regulated down to 37 mbar.

For commercial butane, a typical bottle pressure is 2 bar – this must be Regulated down to 28 mbar.



Propane Regulator (Normally Red)



Butane Regulator (Normally Blue)

- For further information and/or advice on any of these points, consult the building safety officer and/or the local fire prevention officer.
- The FlexiBurn should be levelled using the four adjustable
- To prepare the rig for testing, insert the debris tray into the slot at the base of the rig.
- Ensure the correct burner is in place. Should the burner require changing, the tool on the left hand side of the rig (See Fig 1 – ref. 20), fits over the burner and can be used as a spanner.
- The rig is now ready to carry out tests.

SAFETY RECOMMENDATIONS

- If a gas leak is suspected, disconnect the equipment from the gas supply and check it thoroughly. If in doubt, do not use the equipment until it has been checked by the manufacturer or other competent authority.
- Do not enter the test room or cabinet until the test is completed and the smoke and fumes have cleared.
- Always place the specimen frame on the rig before igniting the gas.
- Do not allow debris to accumulate on the rig or specimen frames. Check them and empty the debris tray regularly.
- Always turn off the gas supply at the cylinder after use.
- The rig has been designed for testing textile materials in the vertical plane. Materials with a large mass, with the potential to create a severe fire, must not be tested on this apparatus. E.g. Large toys, large pieces of flammable foams etc.

FLEXIFRAME 1511



Safety

Assistance from a colleague or suitable lifting apparatus is recommended when handling this instrument.

Position FlexiFrame away from high traffic areas to avoid interference with testing.

It is recommended that FlexiFrame is serviced and calibrated annually by a James Heal Service and Calibration Engineer.

Never use FlexiFrame for anything other than what it is designed for.

The user may choose to wear safety shoes and to mark the footprint of the wall mounted FlexiFrame onto the floor in the event of the weights being dropped.

FlexiFrame must be placed in a safe working environment away from heavy foot traffic.

In the event of the weights being accidentally dropped, the user may choose to wear safety shoes and to mark the footprint of FlexiFrame onto the floor.

Avoid placing fingers in the clamps.

Installation

FlexiFrame does not require any electrical, water or air supplies.

Unpacking

Remove the tape from the packing case lid and open. Carefully remove the packaging and contents from the packing case.

Note that any accessories ordered with the instrument are packed with the instrument. 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.

The 3 station frame comes ready assembled with wall brackets attached. Carefully lift the instrument and place it upright against a firm surface, or lay on the floor.

The edges of the jaws faces are set 500mm apart using the distance stoppers. The pointers should align with the top of the scale. If these have been moved, ensure they are re-aligned with zero before use (where required). The top clamps are fixed to the column and do not move.

Wall Mounted FlexiFrame



This instrument (without accessories) has a mass of approximately 16kg, therefore assistance from a colleague or suitable lifting apparatus is recommended.

FlexiFrame is available as a 3 station ready assembled unit. This may be mounted on the wall using the 2 brackets attached to the top of the instrument.

The type of fixings required will depend upon the type of wall. Please choose the most appropriate wall fixings for holding at least 30Kg.

Fasten the FlexiFrame at an ergonomic height appropriate for the intended user. The uppermost bracket should be around or above eye level.

Position the timers on their corresponding stations.

In the event of the weights being accidentally dropped, the user may choose to wear safety shoes and to mark the footprint of FlexiFrame onto the floor.

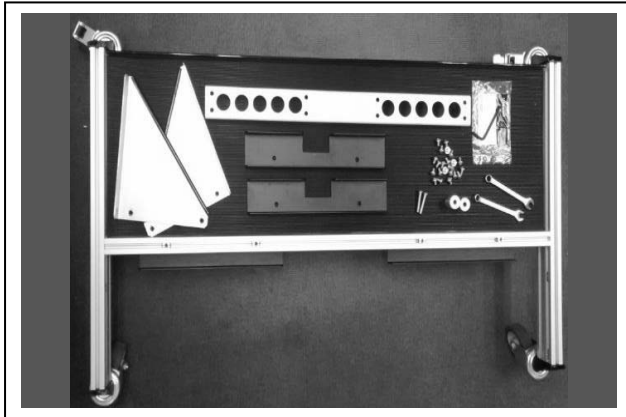
FlexiFrame is now ready to be set up for the chosen test method.

Wheeled Base FlexiFrame

FlexiFrame is available as a 6 station unit with a wheeled base. This comprises:

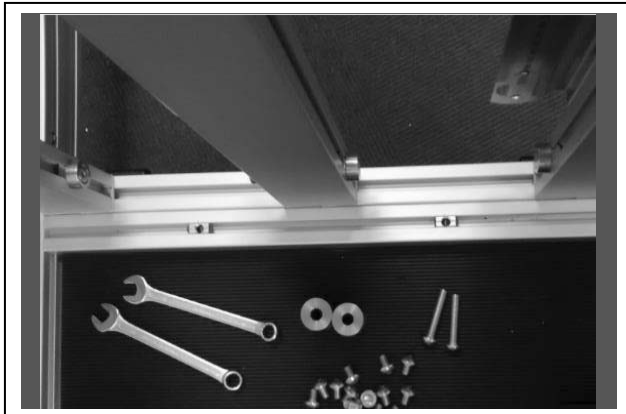
- 2X 3 station units
- wheeled base
- tools and accessories (see unpacking checklist)

It has a total weight of approximately 42Kg without additional weights.



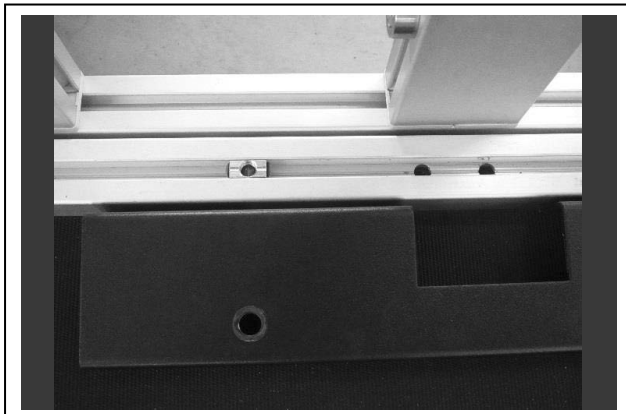
The wheeled base is already assembled - place this on the floor.

Prepare for the simple assembly of the 6 station unit by spreading all accessories onto the base.



With the frames and base facing you, choose the frame which has the bottom left end cap removed. Locate this into the left hand side in the wheeled base. Push down firmly until the unit sits flush inside the bottom black clamp.

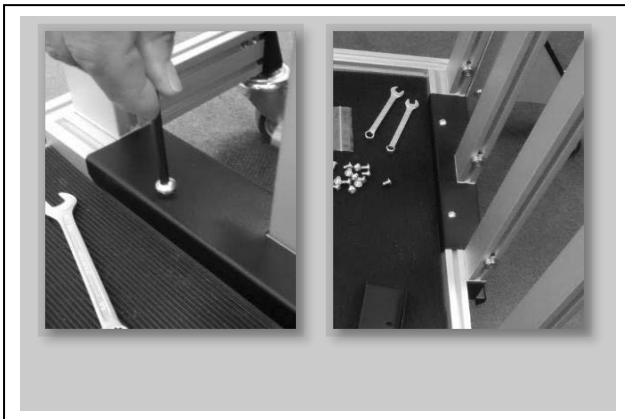
Using a rubber hammer gently tap the frame until it is completely positioned on the left hand side and the holes for the nuts are aligned.



Lay the top black clamp next to the frame and ensure that the sliding T nuts are in alignment with the holes in the clamp.



Place top black clamp over the bottom of the wheel base and gently tap with a rubber hammer to ensure that the holes on the top and sides are lined up for the nuts.



Fit the clamp over the join and screw down using short screws with the 5mm hex key.

There are 3 screws underneath the bottom black clamp that can be secured once the top clamp is in place

Repeat the above steps for the right hand side with the frame with the right hand cap removed.



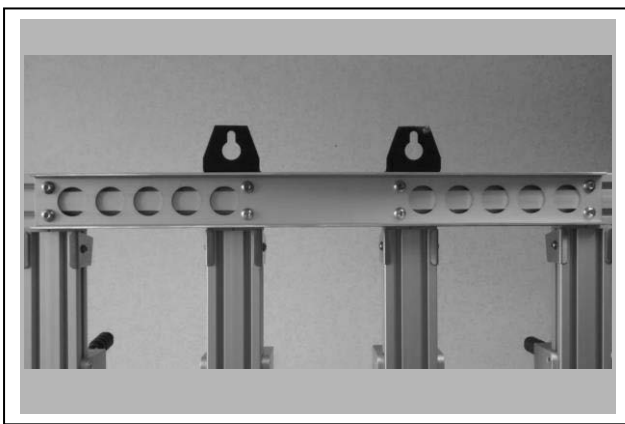
Space the left hand web away from the base using the spacers. Use the long screws and 5mm hex key to fasten onto the base.

Using the short screws, fasten to the frame with the 5mm hex key provided.

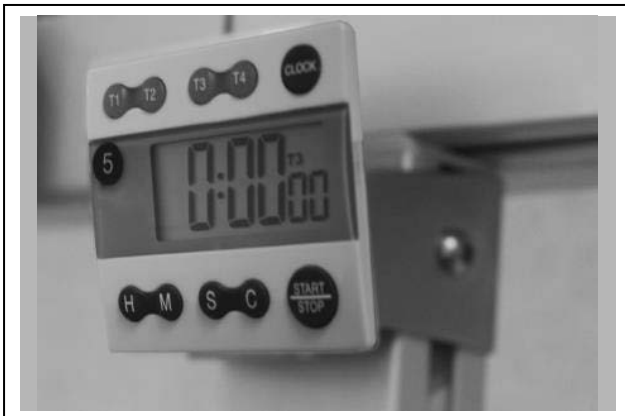


The right hand web fits flush with the edge of the frame and the edge of the base.

Position, then fasten using the short screws with the 5mm hex key provided.



Fasten the bridge onto the back of the 2 frames using 8 short screws with the 5mm hex key provided.



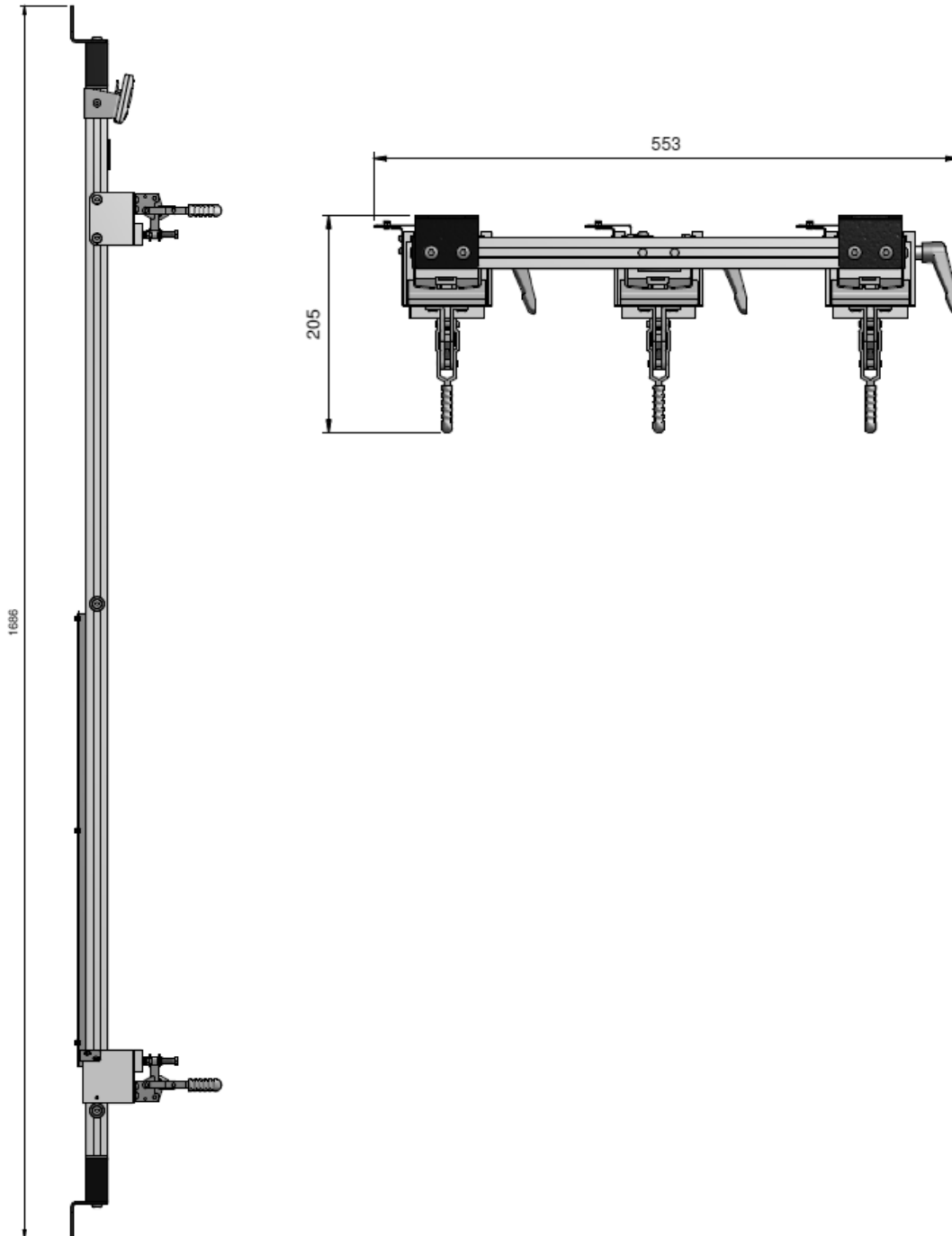
Position the timers on each of the corresponding stations.

Once FlexiFrame is placed in a safe working environment, it is ready for use.

Technical Information

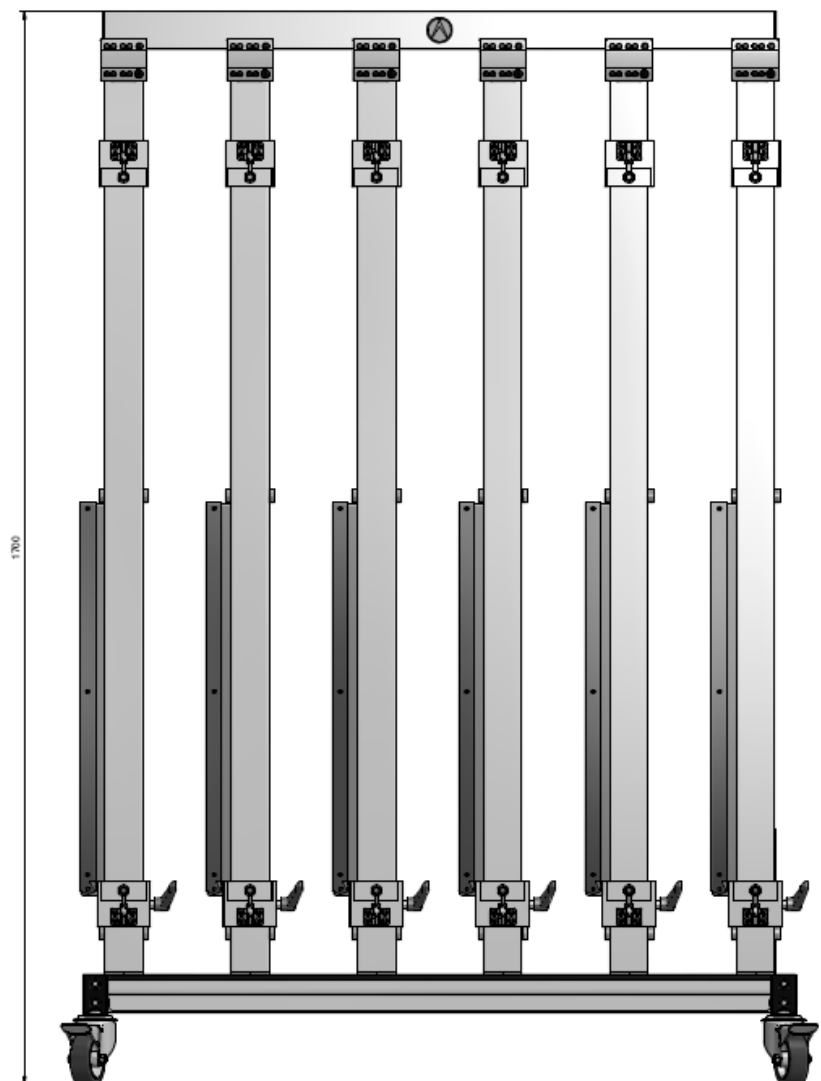
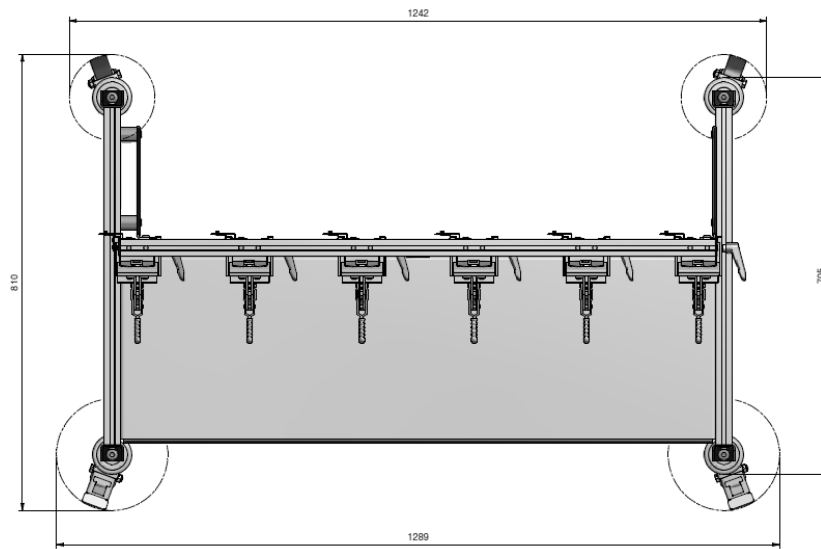
Wall Mounted FlexiFrame

Weight approx. 16kg



Wheeled Base FlexiFrame

Weight approx. 42kg



GYROWASH 1615

Safety

GyroWash has been specifically designed with the operator's health and safety in mind. All touch points are engineered to give an excellent and safe user experience.

To ensure your safety, please observe the following points at all times:

- These instruments are heavy and must be moved with care.
- Read this manual carefully before unpacking and operating the machine.
- Observe the installation requirements for correct machine performance.
- When handling test vessels at 60°C and above, the high temperature lid developed for use at high temperatures should be used.
- Take care when opening the test vessels as heat will cause the contents to become pressurised. When the test vessel is opened, small particles of liquid may be ejected, therefore eye protection is recommended.
- It is also recommended that water proof and heat resistant protective gloves are worn to protect hands and arms when loading and unloading the instrument at high temperatures.
- GyroWash can achieve bath temperatures (up to 95°C) that could cause injury if operated incorrectly. In addition to the recommended personal safety equipment, operators must always stand to one side when opening the lid of the instrument to avoid any hot water vapour or steam from the bath.
- GyroWash is not suitable for temperatures above 95°C.
- The GyroWash bath should be filled with water only, it is not suitable for any other heating medium.
- Many different solutions can be used in the test vessels. The operator should refer to the safety instructions for the solution being used, either from the testing standard or any associated Material Safety Data Sheet (MSDS).
- Have the machine serviced and calibrated at least once a year by a James Heal Service and Calibration Engineer.

Installation

Siting & Unpacking

GyroWash is delivered on a wooden palette. Move the instrument to its final location whilst still inside the crate using either a forklift truck or other suitable mechanical method.

GyroWash should be located in an appropriate space to accommodate its size. The instrument requires a supply of electricity, water and drain facilities.

Check for external damage of the case, record any damage with photographs and report immediately. Do not install or use a damaged instrument.

Identify the top and front of the crate by locating the screws. Unscrew the top and front and ensure all screws are removed fully before attempting to remove the instrument. GyroWash is bolted to a wooden pallet for shipping. Remove the pallet from the crate with a forklift truck, or other suitable mechanical method. Unwrap the film. It is not possible to remove the stand supplied.

Remove the carton of accessories from under the instrument. Note that the order is complete. If there are any discrepancies, please contact your supplier immediately. Once satisfied, please dispose of any packaging materials safely and responsibly.

To allow access for ventilation, the rear of the instrument should be a minimum of 100 mm from a wall.

Connecting to Services

Electrical supply

GyroWash has been fitted with an industrial style IEC 60309 plug for mains connection, attached at the rear.

Before connecting, ensure that the electricity supply voltage and frequency matches the information on the serial number label. Please check the serial number plate to confirm that the supply voltage and frequency are in accordance with your order.

Connect to a power supply only after installation is complete.

Do not use an extension lead.

Isolate from the electricity supply during maintenance or cleaning.

Water supply and drain

We recommend **GyroWash** is permanently connected to a mains water supply and drain. **GyroWash** can also be operated independent of a mains water supply and drain if appropriate.

The **GyroWash** water supply connection is a $\frac{3}{4}$ " BSP male fitting, commonly found on European domestic washing machines.

Fitting a mains water shut-off valve local to the **GyroWash** is strongly recommended. If splashing occurs when filling an empty bath, reduce the inlet pressure to an acceptable level using the shut-off valve.

GyroWash has one drain and one overflow per bath. Using the hose clamps connect the flexible reinforced hose supplied to the hose tail connectors and the other end into an appropriately sized waste pipe. Any additional pipe-work for the drain or overflow must have a bore diameter of at least 19 mm to prevent the flow from being restricted.

An air gap should be maintained between the drain pipe and the sewer drain to prevent any contamination of the instrument from the sewer.

Technical Information

EXTERIOR DIMENSIONS	Width	Depth	Height Inc. Legs	Height With Lid Open	Weight
1615/8	876mm (34.5 in)	731mm (28.8 in)	1041mm (41.0 in)	1445mm (56.9 in)	135Kg
1615/20	1150mm (45.3 in)	731mm (28.8 in)	1040mm (40.9 in)	1445mm (56.9 in)	238Kg
BATH DIMENSIONS	Width	Depth	Height	Bath Volume	Liquid Medium
1615/8	370mm (14.6in)	490mm (19.3in)	515mm (20.3in)	35 Litres	Water
1615/20	760mm (29.9in)	490mm (19.3in)	515mm (20.3in)	70 Litres	Water
ELECTRICAL OPTIONS					
1615/8	220-240V	1P+N+E	50Hz/60Hz	4.5kW	19.5A
1615/20	220-240V	3P+E	50Hz/60Hz	9.0kW	22.6A/Phase
1615/20	380-420V	3P+N+E	50Hz/60Hz	9.0kW	16A/Phase
IEC 60309 plug for mains connection.					
INSTALLATION					
Cold water connection	¾ inch BSP				
Drain	¾ inch BSP Hose Tail				
Overflow	¾ inch BSP Hose Tail				
OPERATION					
Temperature Units	°C or °F				
Temperature Settings Range	20-95°C (68-203°F)				
Temperature Accuracy	±1°C (±1.8°F)				
Temperature Rate of Rise	1.5°C/Min (2.7°F/Min)				
Timer Setting Range	1 minute to 23 hours 59 minutes				
Rotational Speed	40 ±2 rpm				
User Interface	Touchscreen				
TEST VESSELS (CANISTERS)					
Small (Type 1)	500ml				
Large (Type 2)	1200ml				
SAFETY	Lid interlocking system				

IMPULSE 1666



Safety

- Please read the manuals carefully before operating the instrument.
- The 2 chamber Impulse has a mass of approximately 30kg. The 4 chamber Impulse has a mass of approximately 46kg, therefore assistance from a colleague or suitable lifting apparatus is recommended.
- Ensure all test chambers are secure before commencing a test.
- Never run the instrument without covers. Covers should only be removed by a qualified engineer or electrician when the instrument is isolated from the electrical supply.
- Have the instrument serviced and calibrated at least once a year by a James Heal service and calibration engineer.
- Impulse utilises compressed air. Compressed air is potentially dangerous if misused. Never apply compressed air to the surface of the human body.
- Never use Impulse for anything other than what it is designed for.

Installation

Unpacking

- These instruments are heavy and should be moved with care.
- Impulse 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.
- 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.
- The instrument can now be lifted from the palette and in to location using a pump truck if available, or by hand. If lifting by hand a minimum of 4 people will be required to 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.
- Please check the serial number plate to confirm that the supply voltage and frequency are in accordance with your order.

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 2 chambered Impulse is 110W and 140W for 4 chambered Impulse.

Fuses

Two fuses are fitted in the instrument and are located at the rear of the instrument beneath the mains lead socket. To replace a fuse, isolate from the mains supply, place a screwdriver 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.

- Impulse requires a pressure of 2 – 8 bar.
- Impulse has an air consumption of 84 l/min.
- A pneumatic connection of 6mm diameter and an adaptor are supplied to convert 6mm to $\frac{1}{4}$ inch BSP (female) or $\frac{1}{4}$ inch NPT (male) for the 2 chamber version. A

pneumatic connection of 8mm diameter and an adapter supplied to convert 8mm to ¼ inch BSP (female) or ¼ inch NPT (male) for the 4 chamber version.

- 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.
- Impulse 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.
- 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.

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 with Auto Air on, until all the air has been expelled.

Technical Information

2 Chamber Instrument

Impeller - Stainless steel

Rotational Speed - 1200 rpm

Calibration Service - UKAS accredited (based on ISO 17025)

Dimensions - W 267mm x D: 575mm (Including filters) x H: 523mm

Weight - 30 kg (approximately)

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

4 Chamber Instrument

Impeller - Stainless steel

Rotational Speed - 1200 rpm

Calibration Service - UKAS accredited (based on ISO 17025)

Dimensions - W 410mm x D 575mm (including filters) x H 523mm

Weight - 46 kg (approximately)

Power Supply - 85 – 264 VAC 50/60 Hz Power Rating 140 W maximum

MARTINDALE 1600 SERIES



Safety

- The instruments are very heavy, therefore do not attempt to lift without suitable lifting apparatus or use two or more able-bodied people.

Mini-Martindale 1602	45 kg
Midi-Martindale 1605	65 kg
Maxi-Martindale 1609	85 kg

- The 1600 Series Martindales have been specifically designed with operator health and safety in mind. These instruments ensure the minimum of operator stress and fatigue, and is virtually silent in operation to suit the laboratory environment.
- Care should be taken when lifting the Top Plate.
- Care should be taken to prevent anything heavy (e.g., weights) from impacting on the Control Panel.
- Care should be taken to avoid placing the hand between the Abrading Stations and the Top Plate whilst in motion.
- Leave sufficient space around the instruments to allow unrestricted and safe operator access.

Installation

- Do not dispose of any packaging material until all standard and optional accessories are accounted for. If there are any discrepancies, please contact your supplier or Local Agent immediately.
- Remove any staples, wire strapping and adhesive tape.
- Lift out the top box, containing the accessories.
- Remove the adhesive tape and ensure that all accessories are present.
- Using both hands remove the outer sleeve.
- Carefully remove the instrument from its packing case and place it on a firm, flat surface - lifting equipment may be required.
- Lower the top plate so that each of the three (3) Drive Pegs locates into the three (3) Drive Slots.
- Ensure the Top Plate is resting on the three (3) Bearing Pads.
- Connect the instrument to the correct electrical supply using the mains lead supplied.

Technical Information

Power Requirements	110-230 V \pm 10%, 50/60 Hz, 60 W (mains electricity must be free from spikes and surges exceeding 10% of nominal voltage) (Universal Voltage & Frequency)
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	Depth	Height	Width	Weight
Mini-Martindale 1602	730 mm	246 mm	500 mm	45 kg
Mini-Martindale 1602S	748mm	246mm	498mm	Dependent on application
Midi-Martindale 1605	637 mm	246 mm	674 mm	65 kg
Maxi-Martindale 1609	670 mm	309 mm	877 mm	85 kg

Mode of Operation	Abrasion	Pilling	Sock Abrasion
Standard	EN ISO 12947	EN ISO 12945-2	EN 13770
Number of specimens	Model 1602 – up to 2 Model 1605 – up to 5 Model 1609 – up to 9		
Exposed area of test specimen	6.45 cm ²	64.5 cm ²	3.14 cm ²
Working pressure on test specimen	9 kPa (apparel) 12 kPa (upholstery)	2.5 cN/cm ² (knitted) 6.5 cN/cm ² (woven)	23.86 kPa
Rotational speed	47.5 \pm 2.5 rpm (optional but non-standard x1.5 speed)		
Total stroke of drive units	60.5 \pm 0.5 mm	24.0 \pm 0.5 mm	60.5 \pm 0.5 mm
Parallelism of top plate to abrading tables	0.05 mm		
Maximum circumferential parallelism of sample holders to abrading tables	0.05 mm		

ORBITOR 1616



Safety

- Assistance from a colleague or suitable lifting apparatus is recommended.
- For safety reasons, Orbitor features a common drive system, therefore it is not possible to run test chambers at different speeds simultaneously.
- Ensure all test chambers are secure before commencing a test.
- Ensure all lids to the test chambers are securely closed and locked before commencing a test.
- Keep clear of all moving parts when the test chambers are rotating.
- A torque limiter causes the test chambers to stall if their rotation is impeded.
- Slow ramp up to full speed allowing user to identify any issues
- Ensure the instrument is isolated from the electrical supply before removing any covers. Covers should only be removed by a qualified Engineer or Electrician.

NEVER operate Orbitor 1616 with any of the covers removed.

- Fuse with the correct amperage rating must be used.
- Never use Orbitor for anything other than what it is designed for.
- For Care and Maintenance requirements please refer to the appropriate section of the Operator's Guide.

Installation

- Please check the instrument serial number plate corresponds with your delivery note. The serial number plate is located on the side of the instrument.

- The following standard accessories are included with each instrument, either 2 position or 4 position.
- Remove the tape from the packing case lid and open.
- 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 stand Orbitor on a firm, level 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.
- Connect Orbitor to the electricity supply using the appropriate electrical lead supplied.

Technical Information

Item	Comment
Electricity	85 to 264V AC 50/60Hz Single Phase 0.5 / 1 A 40 W
Air	Not required
Bench or Floor Standing	Orbitor is designed to be placed upon a bench
Water Supply	Not required
Drainage	Not required
Air Extraction	Not required
Conditioning	It is recommended the instruments are located within a conditioned atmosphere.

4 STATION ORBITOR

Dimensions (mm)	Height	Width	Depth	Approx Weight (kg)
	972	550	578	31 (without boxes)

2 STATION ORBITOR

Dimensions (mm)	Height	Width	Depth	Approx Weight (kg)
	595	550	578	23.5 (without boxes)

SPRAY RATING TESTER 513



Safety

Keep equipment clean and dry when not in use.
Keep the surrounding area clean and dry to avoid slipping.

Installation

Unpacking

- Remove the tape from the packing case and open the lid.
- Carefully remove the packaging from around the instrument and lift the instrument out of its case and place it on a firm flat surface, preferably in near to a sink, although not essential.
- Do not dispose of any packaging material until all standard and optional accessories are fully accounted for. If there are any discrepancies, please contact your supplier immediately.
- Please check the instrument serial number plate corresponds with your delivery note. The serial number plate is located on the rear of the instrument.
- If a Spray Rating Drip Tray is being used, place the Spray Rating Tester in drip tray. Ensure that the pipe is attached to the outlet nozzle of the tray.
- Place the other end of the pipe in a bucket or suitable receptacle, at a height lower than the spray rating unit and tray.

Technical Information

The nozzle has a convex face with an array of nineteen holes comprising a central hole surrounded by two concentric rings of 6 and 12 holes.

The specimen holder consists of two metal rings which fit into each other, one of 150mm inside diameter and one of 150mm outside diameter, into which the specimen can be secured. The rings are positioned on the apparatus at an angle of 45°, with the centre of the test area 150 mm below the centre of the spray nozzle face.

Having primed the nozzle pour 250ml through the instrument, the **flow should be complete within 25-30 seconds.**

PROMACE 1722



Safety

- Please read this manual carefully before operating the instrument.
- ProMace has a mass of approximately 75kg, therefore assistance from a colleague or suitable lifting apparatus is recommended.
- ProMace complies with the EU regulations in full.
- Ensure the test chamber is secure before commencing a test.
- Never run the instrument without covers. Covers should only be removed by a qualified engineer or electrician when the instrument is isolated from the electrical supply.
- Have the instrument serviced and calibrated at least once a year by a James Heal Service and Calibration Engineer.
- Use the mace ball inspection holder when examining the points on the ProMace ball and wear protective gloves when removing fibres and yarns from the mace points.
- Never allow the mace ball to swing freely, always hold the mace ball by the chain attachment.
- When the instrument is not in use store the mace balls in the mace ball cups above each cylinder.
- Take extra care with the sharp cutting blade when removing the worn felt sleeves from the rollers.
- Remove rollers from the machine to wet out the felt sleeves.
- Wear safety shoes when changing & inspecting the mace ball.
- DO NOT attempt to catch the mace ball if dropped.
- DO NOT use ProMace for anything other than what it is designed for.

Installation

- This instrument is heavy and should be moved with care.
- Use a forklift or hydraulic pump truck to move the packing case as near as possible to the final location.
- 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.
- The instrument can now be lifted from the palette and into location using a pump truck if available, or by hand. If lifting by hand a minimum of 2 people will be required to 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.
- 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 ProMace is 20W.
- Please check the serial number plate to confirm that the supply voltage and frequency are in accordance with your order.
- Check all items relating to your order are present.

Technical Information

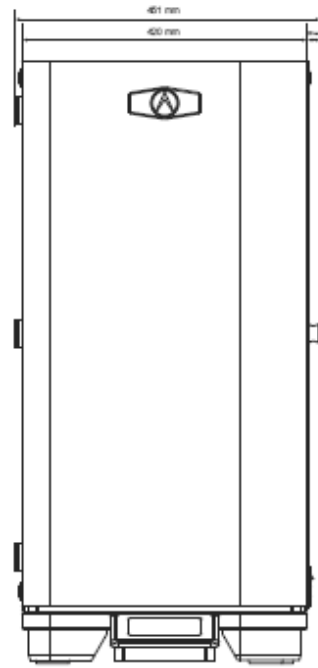
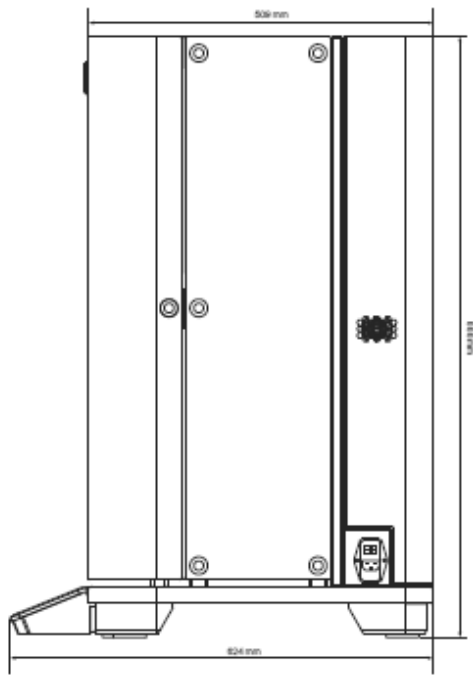
Instrument Specification

- Power Supply 85 to 264 VAC, 50/60 Hz, 20W
- Rotational Speed: 60 rpm \pm 2 rpm
- Calibration Service UKAS accredited (based on ISO 17025)

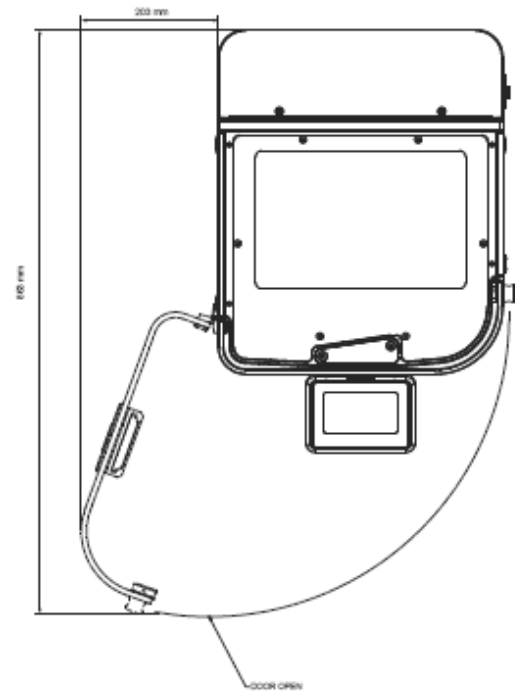
Fuses

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.

Dimensions & Weights



Dimensions (mm)	Height	Width	Depth	Weight (kg)
ProMace	888	451	624	73



PROVIEW 1523



Safety

- Read this manual carefully before operating the instrument.
- ProView has a mass of approximately 20kg, therefore assistance from a colleague or suitable lifting apparatus is recommended.
- 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.

Installation

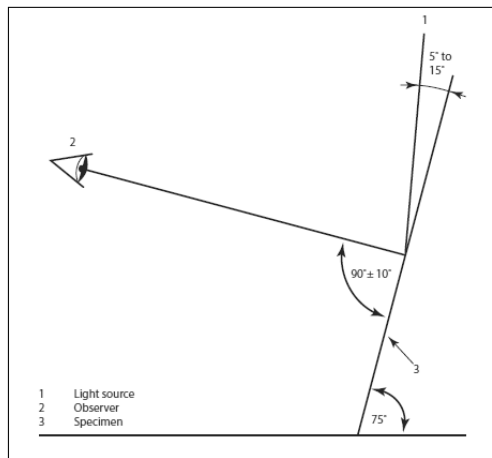
ProView is delivered on a wooden palette. Use a forklift truck or hydraulic pump trolley to move the packing case as near as possible to the final location. Once in position, follow the instructions below.

Unpacking

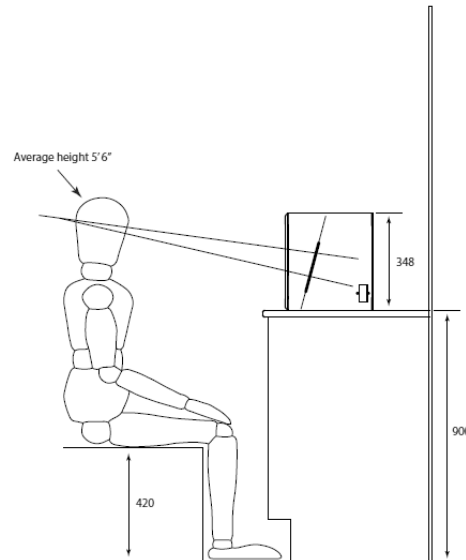
- Remove the tape from the packing case lid and open.
- Carefully remove the packaging and contents from the packing case. Note that any accessories ordered with the instrument are packed with the instrument. Do not dispose of any packaging material until all standard and optional accessories ordered are fully accounted for. If there are any discrepancies, please contact your supplier immediately.
- Remove the sleeve
- ProView can now be lifted carefully from its palette and onto a firm flat surface using a pump truck if available, or a by hand. If lifting by hand a minimum of 2 people will be required.
- These instruments are heavy and should be moved with care.

Setting the Correct Height

Use the below illustration as a guide for setting the correct viewing height



Promace Viewing Cabinet
Viewing angle



Drawing scale 1:10, dimensions are in mm unless otherwise stated

Electrical

- Connect the electrical power supply to the mains input using the lead provided.
- The power rating for **ProView** is 10W.

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.

Technical Information

Light Source	Cool white linear LED
User Interface	7" Capacitive Colour TFT Touchscreen
Weight	20 kg
Dimensions	520 x 320 x 374 mm (W x D x H)
Power	85 to 264 VAC, 50/60 Hz, 10 W

THERMAPLATE 1720



Safety

- Keep clear of the heater plates while the instrument is in use and after the instrument has been turned off. A warning light on the instrument fascia will illuminate when the heater plates are above 60°C, providing the machine is turned on. After use, close the lid covering any exposed hot surfaces and allow the instrument to cool down slowly. Note: the heater plates takes approximately 2 hours to cool down from 220°C to 60°C with the fan running.
- Open the lid using only the attached handle. Avoid touching the metal case.
- It is possible, if a specimen is left in the instrument for longer than the stated length of time or at a higher temperature than that required by the test method, for the specimen to scorch or even ignite. The heater plates are capable of generating temperatures up to 220°C. As a precaution it is recommend that a suitable fire extinguisher, i.e., dry powder is readily available.
- Do not accelerate cooling of the instrument, other than by using the fan. Allow the instrument to cool slowly by radiating heat to the atmosphere.
- The instrument is suitable for wet testing of fabric; however, water should not be poured directly onto the instrument. Water or other liquids should be added to the specimen before it is placed on the instrument.
- The instrument weighs approximately 15.9 kg. Only attempt to lift the instrument if you feel it is within your ability or preferably ask a colleague for assistance.
- Covers should not be removed other than by a qualified engineer, in which case ensure the machine is isolated from the electrical supply before removing.
- Fuses of the correct type and with the correct amperage rating must be used.
- Never use ThermoPlate for anything other than what it is designed for.
- The heaters will turn off after 2 hours of inactivity.
- Should the internal compartment of the instrument base overheat, a thermal trip (cut-out) will activate, preventing damage to the instrument. This may occur if the cooling fan fails

or if cooling air is restricted from entering / exhausting from the instrument. Activation of the thermal trip will be noticeable by the heater plates failing to maintain temperature. Should this occur, turn the heaters off and allow the instrument to cool down. Check the cooling fan is operating correctly.

- The thermal trip will reset automatically once the temperature inside the instrument base compartment has fallen to the correct operating temperature. Resetting is automatic and requires no intervention from the operator.

Installation

- Do not dispose of any packaging material until the order has been checked.
- Cut the plastic strapping with scissors. We recommend wearing goggles and gloves to avoid damage to the eyes and hands. Remove the packing tape.
- Lift out the accessories box. Remove the tape and ensure that the contents are correct as per your order. Report any anomalies immediately.
- Using both hands, remove the cardboard layer from the lower section to reveal the instrument below. The instrument weighs approximately 15.9 kg. Only attempt to lift the instrument if you feel it is within your ability or preferably ask a colleague for assistance. Grasp ThermaPlate by the front and back and lift out carefully.
- Stand the instrument on a firm, level surface such as a bench or table. This should be situated in the environment as recommended by the chosen test method.
- Unwrap ThermaPlate and remove the paper insert from between the plates.
- Level the instrument using the levelling feet - these can be adjusted by rotating them.
- Important: position the instrument so that the cooling fan at the rear of the instrument is not obstructed. Ensure the air intake duct underneath the instrument is not restricted.
- A conditioned environment will be required once the testing is complete.
- Before operating ThermaPlate please read and follow the safety instructions.

Connecting to an Electrical Supply

Connect to mains electricity with the lead provided and switch on.

IMPORTANT: THIS INSTRUMENT MUST BE EARTHED

The mains inlet and fuse holders are located at the rear of the instrument.

The mains lead wires are coloured in accordance with the following code:

Green/Yellow Earth

Blue Neutral

Brown Live

Technical Information

Standards	AATCC 117, AATCC 133 adidas 5.09 ISO 105-P01, ISO 105-X11 M&S P010, M&S C13 JIS L 0879, JIS L 0850 GB 5718, GB 6152
Temperature Range	20°C to 220°C (68°F to 428°F)
Temperature Units	°C or °F
Temperature Accuracy	± 1°C
Timer Range	1s to 59min 59s
Languages	English, French, German, Spanish, Italian, Turkish, Chinese, Hindi
User Interface	Touchscreen User Interface
Hot Plates	210 x 210 mm, top plate 4 kg
Specimen Thickness	15 mm (max)
Weight	15.9 kg
Dimensions (Open)	360 x 590 x 436 mm (W x D x H)
Safety	Over-temperature thermostats
Power	230V ±10%, 1P+N+E, 50/60Hz, 890W 5A 110V ±10%, 1P+N+E, 50/60Hz, 890W 10A
Energy Saving	Power save feature automatically turns the heaters off after 2 hours of inactivity

TITAN⁵ 1410



Safety

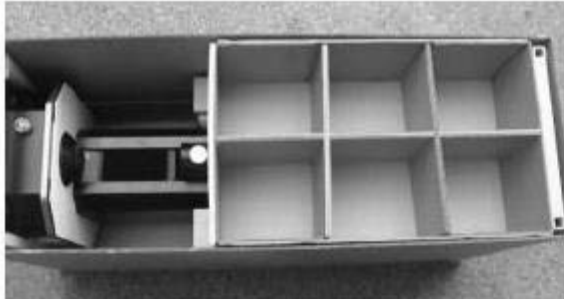
Titan has been specifically designed with the Operator's health and safety in mind. This ensures the minimum Operator stress and fatigue. Titan is virtually silent in operation to suit the laboratory environment. Please observe the following points at all times:

- Take extreme care when moving the machine. Never attempt to manoeuvre Titan without the appropriate lifting gear. Without jaws, Titan weighs approximately 85kg.
- Always remove both hands from the specimen area before starting a test.
- Take care when changing grips and load cell assemblies. Ensure they are always firmly and securely attached to the machine.
- Never place any obstruction in the path of the carriage.
- Always ensure the jaw faces are correctly seated.
- Always ensure pneumatic connections are secure when changing jaws.
- Some materials when tested to rupture can leave the test area either by a whipping action or as fragments. A risk assessment should be made for these types of uncommon materials.

Installation

Unpacking & Siting

Titan⁴ is attached to a wooden pallet and metal transport frame. These must be removed before use.



Read all of these instructions before beginning to un-pack the instrument.

Before un-packing, transport the box to the room where the instrument is to be located.

Remove the outer top cover to reveal the Accessories Tray.



Remove any additional internal packaging.

Then carefully remove the outer cardboard packaging to reveal the Yellow Transport Frame.



Before moving the instrument, remove the bolts (tools provided) which secure the Yellow Transport Frame to the wood pallet.

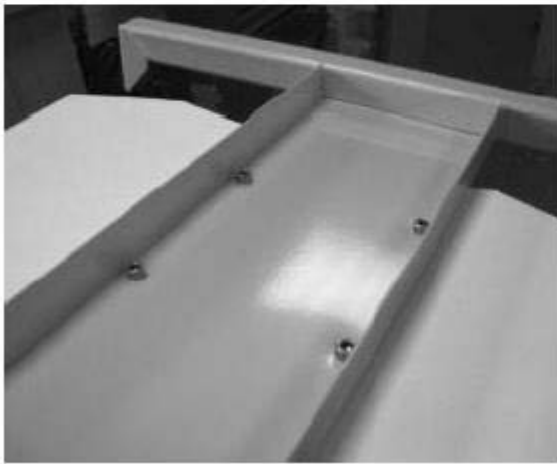
With the instrument still lying on its back, lift into the upright position. The 'curved heel' on the bottom lifting frame is designed to ease this lifting procedure.



Once raised into the upright position, the bottom Yellow Transport Frame can be removed from the base by unbolting the front cross member (unscrew the bolts on the left and right as indicated by the red circle).

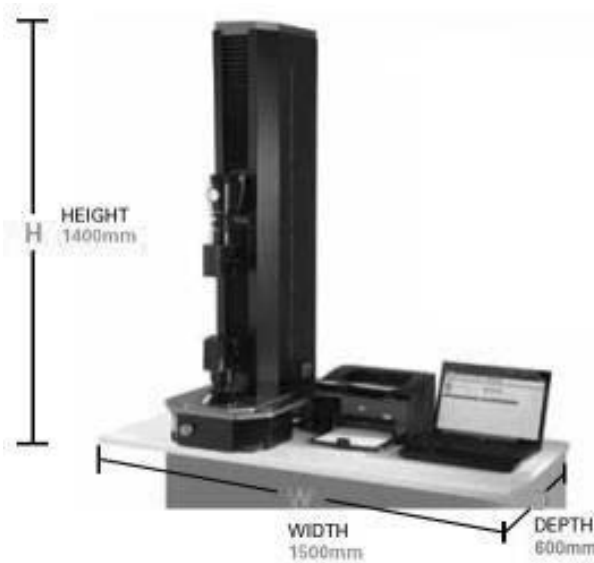


Then unbolt the remaining left and right sides of the bottom frame from the base of the instrument.



The top Yellow Transport Frame can now be removed from the instrument.

Desk depth: 750mm recommended, 600 mm absolute minimum.
Desk length: 1500mm to allow for Titan, PC (laptop or desktop), monitor & printer.



Electrical Supply

Machine single phase 110 - 230Va.c. +/-10% at 10A maximum, 50/60Hz, 500W.
Provision must also be made for the PC, monitor and optional printer.

Compressed Air Supply



It is recommended the air supply has a minimum Free Air Delivery (FAD) of 11 litres per minute at 8 bar (116psi) and must be filtered to 5 microns (absolute) or better to remove excess particulates, oil and moisture. Minimum air supply 7 bar.

Note: Titan is fitted with onboard filtering. However, a contaminated air supply (not filtered) will result in early blockage of the onboard filter element.

For laboratories without a dedicated compressed air supply, we can offer the choice of a 110V (60Hz) or 230V (50Hz) silent laboratory compressor.

Environment

As with all physical testing, tests should be carried out in a standard atmosphere for testing textiles, i.e., 20°C and 65% RH. However, the instrument will operate satisfactorily providing temperature and humidity levels are relatively stable. The humidity conditions must be non-condensing. The surrounding area should be electrically and magnetically stable.

Technical Information

Measuring Principle	Constant Rate of Extension (CRE)
Capacity (Tension & Compression)	5000N, 5kN, 500kgf and 1100lbf
Load Cells	5000N, 1000N, 500N, 200N, 100N Quick-change cartridge, auto-recognition "S" beam cells
Test / Return / Jog Speed	1 - 2000mm/min
Accuracy of Load Cells Class	0.5 (±0.5%) from 2 - 100% of load cell capacity
Speed Accuracy	± 0.005%
Maximum Stroke	560mm with T27 grips fitted
Total Vertical Space	700mm with no grips fitted
Positional Accuracy	± 0.00125mm
Calibration	Load cells: ISO 7500-1 (UKAS accredited) and ASTM E4 Instrument: ISO 7500-1 and ASTM D76
Safety	CE marked (complies with Machinery, Low Voltage and EMC Directives)
Warranty	18 months

TITAN¹⁰ 1710



Safety

Titan has been specifically designed with the Operator's health and safety in mind. This ensures the minimum Operator stress and fatigue. Please observe the following at all times:

- Take extreme care when moving the machine. Never attempt to manoeuvre Titan without the appropriate lifting gear. Without jaws, Titan¹⁰ weighs approx. 150kg.
- Always remove both hands from the specimen area before starting a test.
- Take care when changing grips and load cell assemblies. Ensure they are always firmly and securely attached to the machine.
- Never place any obstruction in the path of the carriage.
- Always ensure the jaw faces are correctly seated.
- Always ensure pneumatic connections are secure when changing jaws.
- Some materials when tested to rupture can leave the test area either by a whipping action or as fragments. A risk assessment should be made for these types of uncommon materials.

Emergency Stop Button

Familiarise yourself with the location of the large red Emergency Stop Button at bottom left of the instrument. Use this button only in case of emergency to completely stop Titan.

Crash Protection

The Operator should set the crash protection at the start of every test. This prevents the jaws or tooling from crashing together and damaging the load cell, grips or tooling. Always be vigilant. Never obstruct the motion of the jaw. If in doubt hit the Emergency Stop Button.

After the **standard** has been selected and the carriage has returned, unscrew the clamping handle and slide up the bar until it sits just below the cross beam.

When setting up a test that requires a **manual set-up** of the jaw or tooling distances, set the crash protection so that the jaws do not meet.

For **compression** tests, set the crash protection low enough so that it will not impede the test, but high enough so that it will not to activate before the test is complete.

Soft Closing Jaws

When loading a sample, only a low pressure is applied to the jaws which helps to prevent serious injury. Full pressure is applied when the start button is pressed. The Operator should never place fingers between the jaw faces. If in doubt hit the Emergency Stop Button.

Installation

Equipment

We recommend you use suitable PPE when working with this instrument - Non-Slip Safety Gloves and Safety Footwear. There is reasonable risk of the instrument toppling, trapping or cutting of fingers and toes or muscular skeletal issues if not handled correctly.

It is recommended that **ONLY** competent personnel with the correct skills should be handling this instrument. Lifting frames can be heavy, these must be handled with caution, when removed, to prevent damage to users and the instrument.

Equipment required:

- Packing Block Supports - 1 x End Frame Support / 2 x Foot Support
- 381-109 - 5mm Allen Key
- 381-512 - 13mm Spanner
- Suitable lift equipment suitable for lifting a **170KG** load

Unpacking & Siting

Wherever possible, move the instrument near to the final location before unpacking.

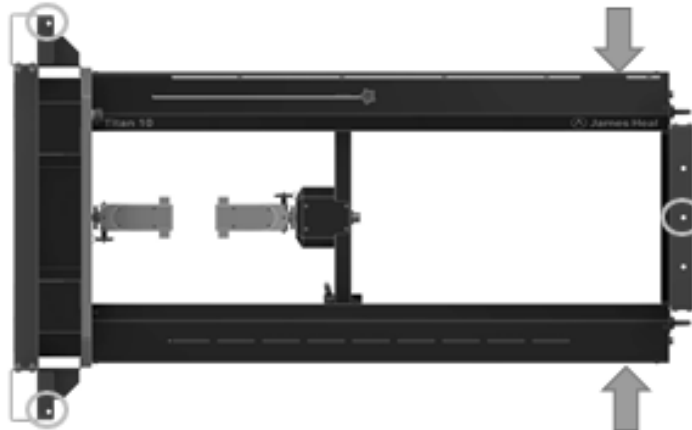
Desk depth 750 mm recommended, 600 mm absolute minimum.

Space is required to turn the instrument whilst on the desk.

Desk length 1500 mm to allow for Titan, PC (laptop or desktop), monitor and printer.

Remove top and sides of crate, leaving only the pallet.

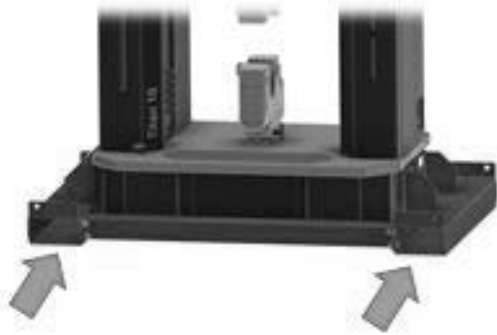
Unbolt the retaining bolts from the location shown in the image below:



With two people, from the recommended lifting locations identified by the arrows in the image above, gently lift the instrument into the vertical position. This will require some gentle walking to allow the Titan to rest firmly on its shipping pallet.

Whilst the Titan is on the floor, the top section of lifting frame can be freed by removing the eye bolts. Caution should be used as the lifting frames can be heavy.





It is recommended to use the fork inlets on the bottom lifting frame to navigate the instrument safely onto the worktop.



STEP 1: Using a 5mm Allen Key and a 13mm Spanner to unfasten the front stabilisers, leaving the Instrument feet exposed for easy access with Foot Support



STEP 2: Have one person, gently push on one side of the Instrument to raise the feet, this will allow another person to slide the Foot Supports into place. Push from the SIDE to avoid any finger trap situation.



Ensure each of the Foot Supports are securely located under each foot. Gently allow the weight onto the Foot Supports, this will allow freedom to the side frame



Using a 13mm Spanner remove the fixings for the side frame, it may be useful to use the End Frame Support to take the weight of the side frame



Remove the side frame and gently push on one side of the Instrument again to raise the feet to remove each of the Foot Supports



STEP 3: Follow the same procedure in STEP 2 to remove the remaining side frame

Retain all packaging until the order has been checked and everything is satisfactory.

Check that the contents match the order.

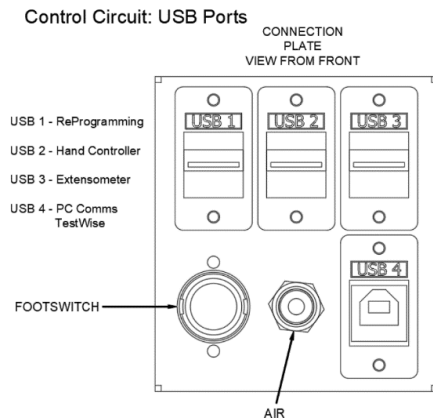
Environment

As with all physical testing, tests should be carried out in a standard atmosphere for testing textiles, i.e. 20°C and 65% RH. However, the instrument will operate satisfactorily providing temperature and humidity levels are relatively stable. The humidity conditions must be non-condensing. The surrounding area should be electrically and magnetically stable.

Electrical Supply

Single phase 110 - 230Va.c. +/-10% at 10A maximum, 50/60Hz, 500W.

Provision must also be made for the PC, monitor and optional printer.



This control circuit is situated on the right hand side of Titan¹⁰.

Each port has a specific function. Please use the diagram for correct installation of the instrument.

Compressed Air Supply



It is recommended the air supply has a minimum Free Air Delivery (FAD) of 11 litres per minute at 8 bar (116psi) and must be filtered to 5 microns (absolute) or better to remove excess particulates, oil and moisture. Minimum air supply 7 bar.

Note: Titan is fitted with onboard filtering. However, a contaminated air supply (not filtered) will result in early blockage of the onboard filter element.

For laboratories without a dedicated compressed air supply, we can offer the choice of a 110V (60Hz) or 230V (50Hz) silent laboratory compressor.

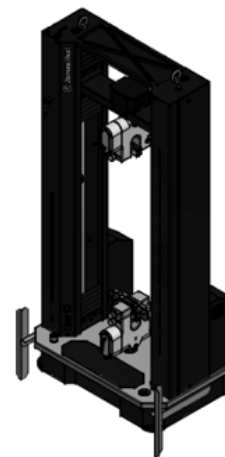
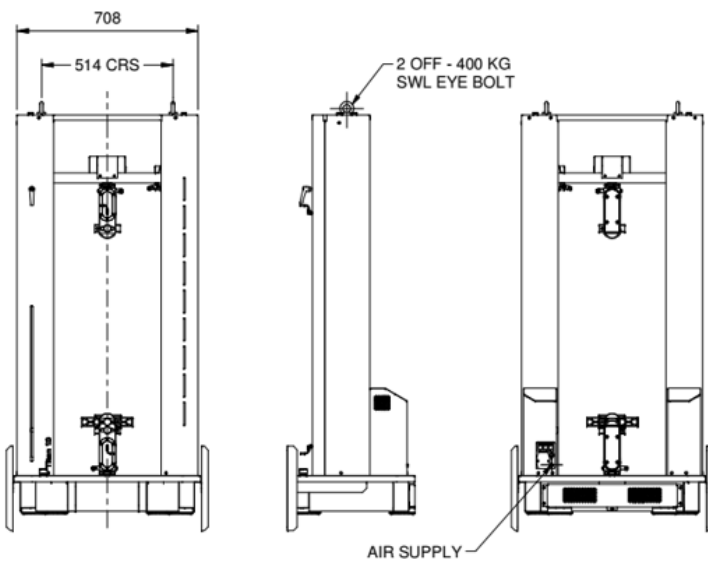
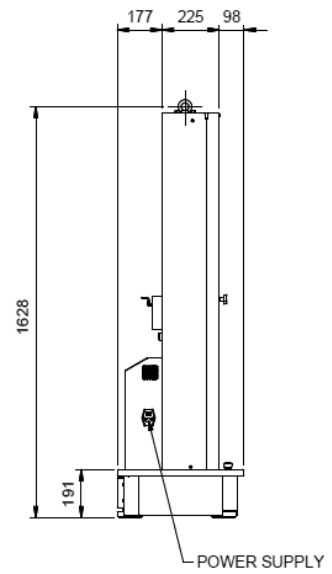
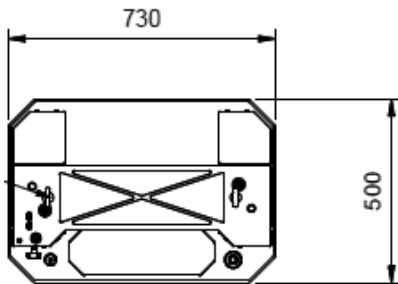
Technical Specification

Measuring Principle	Constant Rate of Extension (CRE)
Capacity (Tension & Compression)	10000 N, 10 kN, 1000 kgf and 2200 lbf
Load Cells	10kN pancake load cell 5000N, 1000N, 500N, 200N, 100N Quick-change cartridge, auto-recognition "S" beam cells
Test / Return / Jog Speed	1 - 1500mm/min
Accuracy of Load Cells Class	0.5 ($\pm 0.5\%$) from 2 - 100% of load cell capacity
Maximum Stroke	710mm with T37 grips fitted
Total Vertical Space	1200mm with no grips fitted
Calibration	Load cells: ISO 7500-1 (UKAS accredited) and ASTM E4 Instrument: ISO 7500-1 and ASTM D76
Safety	CE marked (complies with Machinery, Low Voltage and EMC Directives)
Warranty	18 months

Weights & Dimensions

DIMENSIONS

Dimensions (mm)	Weight (kg)
Height: 1628	150 *
Width: 730	
Depth: 500	*Excluding Transit Frame



APPROX. MASS = 170KG

TRUFADE 1800



Safety

TruFade has been specifically designed with the Operator's health and safety in mind. All touch points are engineered to give an excellent and safe user experience.

To ensure your safety, please observe the following points at all times:

- Read and refer to the guides for this instrument
- Observe the installation requirements for correct machine performance
- Items in the test chamber can become hot during a test – exercise caution when handling and use gloves where necessary
- Always allow the machine to cool down sufficiently before handling the lamp or optical filters
- Never place flammable or explosive materials in the test chamber
- Never operate the machine without a full complement of optical filters, specimen holders and borosilicate cylinder
- Only use the manufacturer's approved spare parts and consumables
- Have the machine serviced at least once a year by a James Heal Service and Calibration Engineer.
- Following good health and safety practice, before removing or replacing the Lantern assembly, Optical Filters or Xenon Lamp, always isolate the electrical supply to avoid danger of electrical shock

Installation

Unpacking

- See Technical information for dimensions and weight.
- Read all of these instructions before beginning to unpack the instrument.

- Before unpacking, transport the box to the room where the instrument is to be located.
- Sufficient free space must be allowed at the front of the TruFade to allow the chamber door to open to inset or remove specimen holders.
- The user must allow sufficient free height about the TruFade to replace the Xenon Lamp.

Read all of these instructions before beginning to unpack the instrument.
Before unpacking, transport the box to the room where the instrument is to be located.



Remove this side of the pallet first



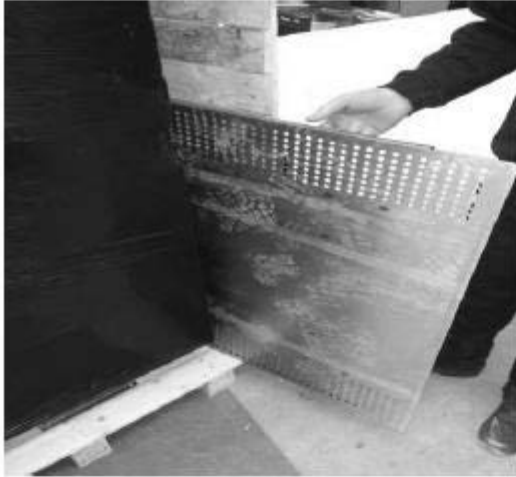
Using a power tool or screw driver remove the screws

Screws can be found down both edges of the pallet.

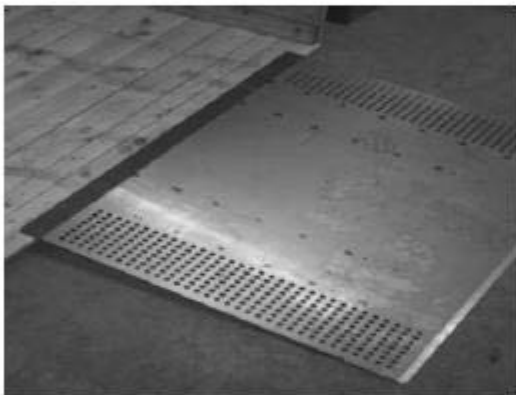


Once the first side has been removed,

Go around to the back of the wooden container and remove the opposite side



Inside the wooden container we have supplied a metal ramp.



The metal ramp has to be positioned at the front of the wooden container.

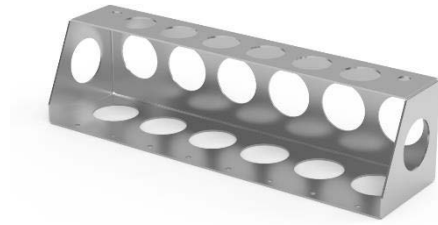


Fix the metal ramp to the wooden container with screws using a power tool or screw driver.



Once the metal ramp is in place,

Remove the transportation brackets from each side of the TruFade. These are highlighted in the blue rectangle on the picture opposite.



Carefully Wheel the TruFade down the ramp

PLEASE BE AWARE THIS INSTUMENT WEIGHS 340 kg AND MOST OF THIS WEIGHT IS AT THE TOP.

DO NOT ATTEMPT TO ROLL THIS UNIT DOWN THE RAMP ALONE AS IT MAY TOPPLE OVER AND CAUSE INJURY.



Remove all of the protective wrapping.



Place the feet of the air outlet into the slots on the top of the machine



Slide the air outlet in the slot to secure it in place.

Electrical Connection

The unit is designed for a single-phase mains supply of nominally 230V 50/60 Hz with a maximum power consumption of 3.25kW. Where 110V is the nominal supply voltage, TruFade must be connected across two phases to achieve 220V.

One single-phase 110V supply is not suitable.

Attach the mains inlet cable to a fused isolator rated at 16A. A plug and socket can be used in addition to the fused isolator if required.

It is advisable to discuss these requirements with your works electrician.

Prior to installation, check the serial number plate on the rear of the unit to confirm the voltage, frequency and phase are in accordance with your local requirements.

Heat Output

The xenon lamp is air-cooled and the heat generated is exhausted at the rear of the TruFade.

The warm air is discharged at a rate of 340 m³/h at approximately 50°C.

The discharge does not contain ozone and is not detrimental to health.

When an air conditioning unit cannot accommodate the 2kW heat output, the exhaust should be vented outside the room with 100mm internal diameter hose. Ensure there are no tight bends in the tube.

A 1.5m length of flexible hose is available as an optional extra – order code **327-290**. Where an exhaust hose of greater than 1.5m is required, the heat discharge must be fan assisted.

Water Supply



A continuous supply of distilled water or water complying with ISO 3696, minimum Grade 3 is required. For example, ISO 3696 Grade 3, 2 & 1 are all acceptable. It may be piped directly into the TruFade via the water inlet or through the internal water reservoir.

Water consumption is dependent on ambient humidity and the desired effective humidity. The maximum water consumption is 1.6 litres/hour when using humidification only. Under normal laboratory conditions, consumption is approximately 200 ml/hour to achieve ISO 105-B02 normal humidity conditions.



TruFade has 2 overflow outlets for the internal water reservoir and the humidity tank. These require connection to a drain. If a nominal 32mm (1¼") diameter free drain is not available a container can be used, but this will need emptying periodically.

The internal water reservoir can hold up to 32 litres of deionised water. Access and filling instructions are in the full Operator's Guide for TruFade.

Should you require water purification equipment, we can offer details of a suitable package, which satisfies the requirements of TruFade.

TruFade utilises common push-fit connections for which 5 metres of 8mm and 5m of 12mm tube are supplied.

Technical Information

LIGHT SOURCE

2200W Air-cooled ozone free xenon lamp
Adjustable from 1400W to 2200W

Cooling: Centrifugal blower 340m³/h

IRRADIANCE

SolarSens UV radiometer and BST
300-400nm Sensor: 25.0 to 200.0 W/m²

Automatic selection via test parameters

Optical filter arrangement utilising KG1 heat absorbing glass.

Automatic prompt when lamp or optical filters require changing.

STANDARDS

10 Fully Programmable standards (including the following pre-programmed standards):

AATCC TM16- 2003 Option 3

ISO 105-B02:1999 – Controlled Irradiance Method

ISO 105-B02:1999 – Nominal Power Method

M&S C9/C9A:2009 – Controlled Irradiance Method

M&S C9/C9A:2009 – Nominal Power Method Plus 5 user defined.

TEST CHAMBER ENVIRONMENT

Fully automatic setting and control of all test parameters, including:

Temperature and humidity, turntable speed, turning mode and irradiance.

Programmable monitoring of test conditions.

Automatic re-start after a power failure and lamp cool-down timer at end of test.

CHAMBER TEMPERATURE

Cooling:

Variable speed waterproof centrifugal fan

Variable position air-vane to re-circulate air in chamber to stabilise conditions.

Measurement:

Chamber Temperature Sensor 0 to 100°C

Readability:0.1°C Accuracy:±0.4°C.

Interchangeable sensor.

Black Standard Thermometer (BST) 0 to 100°C.

Readability: 0.1°C.

CHAMBER HUMIDITY

Humidification:

2 x Ultrasonic transducers, Oscillating @1.6MHz.

Mist Output ratio 0 to 950ml/h.

Measurement:

Chamber Relative Humidity Sensor.

0 to 100%RH ± 1.5%RH.

Readability 0.1%RH Accuracy: ± 1.5%RH.

Interchangeable sensor.

Water consumption: 0.9l/hr max.

TURNTABLE (CAROUSEL)

9 position platen giving a 1640cm² test area.

Programmable 2 to 7 rpm in 1rpm steps.

Accuracy: Self tuning speed adjustment.

SPECIMEN EXPOSURE

9 x Tri-Sided specimen holders (maximum 135 x 45mm each side).

8 x Programmable test timers for your favourite exposure durations.

Run continuously setting for manual checking.

Automatically calculates irradiation dosage.

SOFTWARE

User configurable Languages:

English, French, German, Spanish and Italian.

Data Logger.

SAFETY

Safety interlock on all access doors.
Toughened NG4 Neutral density viewing window for safe viewing.
Built-in self-diagnostics & warnings.
Machine complies CE Directives for machine safety, low voltage and EMC.
Machinery Directive 2006/42/EC
Low Voltage Directive 2006/95/EC
EMC Directive 2004/108/EC
WEEE Directive 2002/96/EC (under review in 2012)
RoHS Directive 2002/95/EC
ELECTROMAGNETIC COMPATIBILITY (EMC) DIRECTIVE 2004/108/CE

ELECTRICAL RATING

3.5KW max. 230V \pm 15% 50-60Hz.
Low electrical running cost due to high efficiency PFC lamp power supply.

DIMENSIONS / WEIGHT

Width:760mm Depth:740mm Height:1750mm
Weight: 270Kg Unpacked Weight

AMBIENT CONDITIONS

20°C and 65%RH recommended

DIAGNOSTICS

Comprehensive built-in service utilities for James Heal Service and Calibration engineers only

TRUBURST 1440



Safety

- Read this manual carefully before operating the instrument.
- TruBurst has a mass of approximately 70kg, therefore assistance from a colleague or suitable lifting apparatus is recommended.
- 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.
- TruBurst utilises compressed air. Compressed air is potentially dangerous if misused. Never apply compressed air to the surface of the human body.
- Do not use any compressed gasses other than compressed air.
- Never use oxygen, nitrogen, argon, helium, hydrogen, acetylene, propane or butane.
- Never tamper with the interlocked safety guard or attempt to use TruBurst without the safety guard in place. Tampering with the safety guard will expose the operator to serious risk from injury.
- Never use TruBurst for anything other than what it is designed for.

Installation

- These instruments are heavy and should be moved with care.
- TruBurst is delivered on a wooden palette. Use a forklift truck, hydraulic pump trolley or other suitable devices to move the packing case as near as possible to the final location.

- TruBurst will need to be positioned near to an electrical supply, air supply and computer.
- Once near to the final location, remove the tape from the packing case lid and open.
- 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.
- Very carefully lift TruBurst from its palette and into location using a pump truck if available, or by hand. If lifting by hand, a minimum of 3 people will be required.
- 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.
- Check the serial number plate to confirm that the supply voltage and frequency are in accordance with your order.

Connecting to an Electrical Supply

The instrument is wired for a universal mains input: single phase 85-264VAC 50-60 Hz.

TruBurst will automatically adjust for the above voltages.

Connect the instrument to the correct electrical supply using the mains lead supplied. The power rating for TruBurst (excluding Printer and PC) is 60 watts.



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 Supply

Air consumption will vary according to the type and frequency of testing being carried out.

The following compressed air supply is recommended for normal continuous testing in accordance with ISO 13938-2:

Free Air Delivery:	33 litres/min
Maximum pressure:	10 bar (145psi) regulated
Minimum pressure:	6 bar
Filtration:	5 microns (absolute) or better to remove excess particulates, oil and moisture

The target pressure, test duration and frequency will dramatically affect the compressed air consumption. The compressed air supply should be sized to satisfy testing requirements.

The capacity of TruBurst will be limited to the pressure of the compressed air supply. The air supply should be clean and dry.

Using the Laboratory or Factory Compressed Air Supply

TruBurst is fitted with on-board filtering. However, a heavily contaminated compressed air supply (not filtered) will result in early blockage of the on-board filter element.

The use of an air compressor expands the upper limit of available pressure from typical factory airlines to 1000kPa/145psi and are supplied with a filter and regulator.

Using an Air Compressor

The air compressor is supplied with a filter and regulator fitted as standard. The compressor has sufficient air delivery for normal testing in accordance with ISO 13938-2 with a 50% duty cycle. This is equivalent to one burst every 60 seconds for continuous use. An air compressor delivers optimal testing conditions for both conventional burst and cyclic testing.

Connecting the Air Supply to TruBurst

- Ensure all equipment used for connection, including pipes and fittings have a safe working pressure greater than that of supply.
- Connect the air supply to the compressed air input socket on the rear of the instrument.
- The pneumatic connection to the instrument is 6mm diameter. An adaptor is supplied to convert 6mm to 1/4 inch BSP.
- **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 TruBurst 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**

Connecting TruBurst to a PC

The requirements for connecting TruBurst to a Personal Computer are:

- TruBurst datalogger software on CD-Rom (with dongle if purchased)
- USB2 Lead A-B transparent 2m Right Angled
- PC with a spare USB port running Windows 7 or later operating system - *not supplied*

With the power off, connect one end of the cable into the back of TruBurst and the other end to a spare USB port on your PC.
Power up the PC then TruBurst.

Technical Information

COMPRESSED AIR	Free air delivery	33	l/min
	Maximum pressure	10	bar
		145	psi
	Minimum pressure	6	bar
	Filtration	≤5	micron

PRESSURE RANGE	10 bar <small>Subject to suitable air supply</small>		
	Accuracy +/- 0.5% of full scale		
	0.2	-	1000.0 kPa
	0.002	-	10.197 kg/cm ²
	0.04	-	145.04 PSI
	0.002	-	10.000 bar
	0.2	-	1000.0 kN/m ²

PRESSURE INFLATION RATE	0.1	-	100.0 kPa/s
	0.002	-	1.020 kg/cm ² /s
	0.04	-	14.50 PSI/s
	0.002	-	1.000 bar/s
	0.2	-	100.0 kN/m ² /s

DISTENSION RANGE	Non-contact Class 2 laser measurement		
	Accuracy +/- 0.5% of full scale		
	0.1	-	70.0 mm
	0.01	-	7.00 cm
	0.001	-	2.756 inches

SPECIMEN	Area	Diameter	Height
	7.3cm ²	30.5mm	30mm
	7.8cm ²	31.5mm	30mm
	10cm ²	35.7mm	30mm
	50cm ²	79.8mm	70mm
	100cm ²	112.8mm	70mm

STATISTICS Mean, maximum, minimum, range, standard deviation, coefficient of variation, 95% confidence limits, burst factor/index and % decay analysis for up to 500 tests

SERIAL INTERFACE RS232 9-way male 'D' type connector
38400-baud, 8-data bits, 1-stop bit, no parity
Data logger software supplied on CD-ROM for PC

DIMENSIONS 520mm x 400mm x 633mm

WEIGHT 70kg

ELECTRICAL Single Phase 85-264Vac 50-60Hz 60W max

WRINKLE RECOVERY ANGLE TESTER 155

Safety

SPECIFIC RISKS: NONE

Installation

- Check all packaging and contents from the case.
- Do not dispose of any packaging material until all items are accounted for.
- Place the Wrinkle Recovery Angle Tester and accessories on a suitable bench or table.
- The bench/table must not be subject to vibration or draughts which may influence the test.

Technical Information

The items received will vary according to the requirements of each customer.

- Check the items against the original order.
- Please notify the manufacturer immediately in the event of discrepancies.

Weight Set (AATCC & ISO)

1 x 0.2 kg (addition to top flange)
1 x 0.5 kg
1 x 1.0 kg
1 x 2.0 kg

Weight Set (ENKA)

1 x 0.5 kg
2 x 2.0 kg

Weight Set (M & S)

1 x 1.5 kg

3-D Wrinkle Recovery Replicas (AATCC and ISO)

3-D Wrinkle Recovery Replicas (M & S)

Set (8) Photographic Standards (ENKA)

