



Spraybooth, Spraybooth Oven & Paint Mix Room

Operation & Maintenance Manual

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1.0 GENERAL

1.02 CONTACT INFORMATION

General

This guide provides operator instructions for the correct use and operation of the Spraybooth, Spraybooth Oven and Paint Mix Room and contains maintenance information on any items or components that require a maintenance procedure.

The equipment owner must comply with the Health and Safety at Work Act 1974 and we advise clients to ensure all personnel associated with the equipment are familiar with this manual.

WARNING - Only competent and experienced engineers should maintain or repair the spraybooth. It is an offence for any person to carry out work on a gas appliance if they are not Gas Safe® registered.

We strongly recommend that main plant items are serviced by the manufacturer or a specialist approved company.

Contact Information

In the event of equipment failure please contact JUNAIR in the first instance and they will advise you of the best course of action. Engineers are on call for a fast response to client's needs. Technical support is provided over the telephone during normal working hours and is free of charge. On larger systems a remote dial in Modem is supplied to allow remote software access

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Use

The spraybooth oven is designed to provide a controlled environment in which paints are sprayed either manually or automatically. The spraybooth has controlled airflow to provide extraction for fumes and overspray paint particulates generated during the painting process, and to exhaust fumes generated during the post paint flash off and curing process.

The spraybooth may incorporate a forced air replacement system to provide a balanced airflow to match the exhaust volume, and may include a heating system to bring replacement air to a workable temperature.

The spraybooth may include a recirculation mode which allows an efficient raising of cabin temperature to force cure paints.

The Paint Mix Room is designed as an area to contain fumes generated during the mixing and preparation of paint materials prior to the painting operation.

The equipment should only be used by trained personnel.

List of certifications provided:

The equipment Operation & Maintenance Manual will be issued with the additional information and certification as noted below

Equipment summary	A list and brief specification of the equipment supplied within the contract and covered by this O&M manual
Commissioning Report	Confirming that the equipment supplied is working within the parameters of its design.



Certificate of Compliance	Confirming equipment compliance with emission limits set out in the Industrial Emissions Directive (Directive 2010/75/EU), which is implemented into UK law by: PG6/34 (11) 2013 - Secretary of State's Guidance for the Re-Spraying of Road Vehicles PG6/23 (11) 2014 - Statutory guidance for coating of metal and plastic processes
Temperature Calibration Certificate	The control thermostat on the spraybooth oven(s) has been checked using an anemometer calibrated in accordance with the requirements of BS EN ISO 10012:2003. (A copy of the instruments calibration certificate is available on request).
Particulate Emission Test	Please note the report provided is a generic report on equivalent equipment tested to EN13284 standards for sampling of particulate.
Electrical Test Certificate	Confirming equipment has been wired in accordance with EN 60204-1 (2016)



1.0 GENERAL

1.02 DOCUMENT REVISION

Revision Control

Reference	Released	Author	Comments
<i>Revision 1</i>	<i>30-03-2022</i>	<i>AT</i>	<i>Draft</i>
<i>Revision 2</i>	<i>28-04-2022</i>	<i>AT</i>	<i>Draft</i>
<i>Revision 3</i>	<i>26-05-2022</i>	<i>AT</i>	<i>Final</i>
Revision 4	02-09-2022	AT	Updates to RSD / Burner / Control panel filters / Exhaust filter fitting

1.03 TRAINING RECORD

Record persons who have been trained for operation & maintenance of booth

OPERATOR TRAINING

Name	Signature	Date

MAINTENANCE TRAINING

Name	Signature	Date

Trained by:



1.0 GENERAL

1.03 SAFETY NOTICES

This manual uses the following standards to identify conditions related to safety hazards and equipment damage.

Table 1. Safety notices

Symbol	Description
DANGER	Indicates an imminent hazard that will result in death.
WARNING	Indicates a hazard that can result in serious personal injury or death
CAUTION	Indicates a hazard that can result in personal injury
NOTICE	Indicates a situation that can result in equipment or property damage, but poses no risk of personal injury

Information notices

In addition to the safety notices described above, this manual uses a boldface keyword to identify certain other types of information.

Table 2. Information notices

Keyword	Description
NOTE	Denotes general information that provides additional context or guidance
Important	Denotes information to which you should pay special attention
Reference	Directs you to related content in a separate document
Prerequisites	Specifies other tasks that must be completed or conditions that must exist before you perform the current task.
Scope	Describes limitations to the current task or conditions under which the task applies or does not apply to the procedure

- WARNING** There are inherent hazards associated with the operation and service of this equipment. For your personal safety, observe all safety information. Failure to observe these safety practices can result in personal injury or death.
- WARNING** Operation and maintenance of this product must be performed properly by qualified personnel who observe the warnings in all documentation and notes provided with and on the product.
- WARNING** Follow all general standards for installation and safety for work on installations. Follow all good practices for the proper use of lifting tackle and equipment. The use of protective equipment such as safety goggles and protective footwear must be considered.
- WARNING** All persons who will operate, service, inspect, or otherwise handle this product must read and understand the safe operating practices, safety precautions, and warning messages in this documentation.
- WARNING** Comply with all applicable local electrical, safety, and fire codes and standards.
- WARNING** All field wiring provided must comply with IEC 60204-1: Safety of machinery - Electrical equipment of machines: 2016 or in the absence of local codes, the National Electrical Code (BS EN 7671 18th Edition Wiring regulations).
- WARNING** Electrical installation should be completed by a qualified electrician. Installation must meet all applicable national, state, and local electrical codes.
- WARNING** Ensure that all electrical components are grounded to a central ground.
- WARNING** Disconnect and lock out the main electrical service before installing, adjusting, or servicing the product.
- WARNING** Lockout the main gas shut off valve before maintenance or inspection of the air heater.



WARNING	Guards and covers that prevent contact with electrically energized or moving parts are required and must not be removed or left open during operation.
WARNING	Local fire and building codes require fire protection. Check with local inspector authorities for requirements. We recommend that suitable fire fighting equipment is provided in the vicinity of the Spraybooth and Paint Mixing Room.
CAUTION	Read and save these instructions before attempting to assemble, install, operate, or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage. Retain these instructions for future reference.
CAUTION	This manual contains statements that relate to worker safety. Read this manual thoroughly and comply as directed. Operate this equipment in accordance with the guidelines set forth in this manual. It is impossible to list all potential hazards of this equipment. Instruct all personnel involved with this equipment in the safe conduct and operation of the system. JUNAIR recommends that only qualified personnel operate and maintain this equipment.
CAUTION	Safety signs, panels, and labels that are normally affixed to the product must be replaced immediately if illegible or missing. Supply of general signage and warning references is the responsibility of the user.
CAUTION	New or replacement parts that are installed during repair or maintenance must include all safety signs, panels, and labels as specified by the manufacturer. These must be affixed to the new or replacement parts as specified by the manufacturer.
CAUTION	Where applicable, use earplugs or take other safety measures for hearing protection.
NOTICE	The product must be installed and serviced only by a trained, qualified service technician. Incorrect installation may void the warranty.
NOTICE	If you have questions about the warranty, please contact JUNAIR.
DANGER	The spraybooth roof is calculated for weight loading of 0.1 kN/m ² . Additional loading for maintenance must use temporary platforms that span at least two structural frames. Do not walk on or apply any pressure to lights or explosion (deflagration) relief panels.
WARNING	All equipment must be operated and maintained in accordance with local and national requirements governing occupational safety, fire protection, and booth operations. Operators must read and understand JUNAIR and included independent equipment and/or component manufacturer's instructions prior to use. Disclaimer: JUNAIR is not responsible for any injury, illness, or property damage that results from not abiding by local, or national requirements that govern occupational safety, fire protection, spray booth, and oven operations. JUNAIR is also not responsible for any injury, illness, or property damage that is the result of not adhering to JUNAIR and/or independent equipment/component operating, service, maintenance, and/or installation requirements or directives.
WARNING	Do not allow overspray to accumulate on the inside of the paint booth walls. When overspray accumulates, remove it as soon as possible to prevent a possible fire hazard. Use a non-ferrous, non-sparking scraper to eliminate any possibilities of igniting combustible material.
WARNING	Do not leave piles of paint sweepings in the booth as it creates a possible fire hazard.
WARNING	Treat used filters and any other paint-contaminated items as flammable products and dispose of them safely.
WARNING	If coatings containing nitrocellulose are sprayed in the booth, all residues must be removed from exhaust diffuser components and all exhaust filters must be changed at least once a day.
WARNING	Improper disposal of used filters may cause spontaneous combustion. You must consult local authorities for proper storage and disposal requirements. Guidelines include: <ul style="list-style-type: none">• Immediately remove all filters from the booth.• Discard filters to a safe, detached location, place them in a non-combustible container with tight-fitting lid, or place them in a water-filled metal container to prevent a possible fire hazard.• Disposal varies depending on the type of paint that is being captured. Consult local authorities for storage and disposal requirements.



WARNING	Duct the exhaust air from the fan away from the working environment to the outdoors. Do not operate the booth unless exhaust has been ducted properly.
WARNING	Ensure the exhaust duct discharge is located away from air-conditioning intakes, windows, and any other equipment that may recirculate the exhaust fumes back inside.
WARNING	Turn on the exhaust fan before using the spray booth. Ensure that the exhaust fan is operating correctly and that the booth achieves negative cabin pressure before entering the booth.
WARNING	Some spray activities may require the use of respiratory protection.
WARNING	Use an approved paint spray respirator or air fed breathing air mask when spraying in the booth, and for the duration of the mist clearance time
WARNING	This equipment is designed for the removal of particulate matter only. Reduction of volatile organic compounds (VOCs) requires either coating reformulation or optional, additional exhaust abatement equipment.
WARNING	Fall Hazard: Do not walk or drive over the pit without the floor grids in place.
WARNING	Fall Hazard: Do not drive over the floor grids in a vehicle that exceeds the maximum wheel load listed in the floor grid Specification table on the Pit Details page of the Design Drawings.
WARNING	Fall Hazard: Do not remove floor grids from the pit unless authorized to do so. The pit presents a fall hazard when the floor grids are not installed.
CAUTION	Become familiar with all controls before operating or servicing this booth.
CAUTION	Proper door alignment is critical to the operation of the booth. Ensure that there is equal space around the doors. Move the bottom of the door jamb to the left or right or in and out until the doors are sealed and plumb.
IMPORTANT	Ensure that the velocity of disturbing air drafts around the booth shall be less than 0,1 m/s

END OF LIFE:

At the equipment end of life please contact Junair for detailed instruction on safe de-commissioning, dismantling and safe disposal. The booth may contain harmful paint dusts and build-up which needs special consideration when removing.

OPERATOR SAFETY:

For operator safety, compressed air may only enter the spray gun when the booth is in Spray mode, the spraybooth is operating at negative pressure, the fans are operating, and airflow switches are satisfied. The following safety features are included with every booth:

- Exhaust Air Proving Switch: Exhaust air proving switch monitors differential air pressure of the exhaust fan. The switch will activate when the fan is in operation and proving the minimum amount of differential air pressure.
- Change over damper limit switch: change over damper limit switch monitors change over damper position for SPRAY or BAKE position
- Spraybooth cabin air pressure sensor: the air pressure sensor monitors cabin air pressure and will only allow spray when the cabin is operating under negative pressure
- Air Solenoid Valve (ASV): The air solenoid valve is located in the compressed air supply line to the spray equipment. All safety features listed must be functioning and not faulted before the air solenoid valve is activated.
- Mist Clearance: Adjacent to each access door the cabin smoke / mist clearance time is displayed with a clear warning label

The following *additional safety features* are available (not fitted as standard):

- Mist clearance indicator lamp: Fitted next to each access door, the mist clearance indicator lamp will flash whilst painting is taking place and for the duration of the mist clearance time
- Door switches: on opening a door it is not possible to spray
- Fire alarm interface: when the fire alarm is activated the booth will not operate
- Emergency Stop: when activated the spraybooth will not operate



- Emergency lighting: if there is a power failure lighting close to exit points will remain illuminated for > 60 minutes to allow safe access
- Fire alarm strobe: located at high level the fire alarm strobe is connected to the client factory fire alarm system to warn of fire alarm activation
- Active earth monitoring: Spraying can only take place when the product is connected to the earth cable and earth resistance is proved < 10 Ω

1.0 GENERAL

1.04 EXPLOSIVE ATMOSPHERES & ATEX

A common query is the ATEX classification of the spraybooth & spraybooth oven supplied and whether these items of equipment should be ATEX rated. The ATEX directive provides clear advice:

ATEX Directive 2014/34/EU

4.1.2.2. Paint Spray Booths


These products are an enclosed area, where an operator may work inside or outside, and may be described as a "simple box". The "box", with no ignition source and not intended for use in a potentially explosive atmosphere, does not fall within the scope of the ATEX Directive 2014/34/EU.

Under operating conditions a potentially explosive atmosphere is created and the enclosed area, openings and recovery systems are normally assessed with regard to the explosion risk. The equipment, protective systems and components intended for use in this assessed potentially explosive atmosphere including safety and controlling devices outside, but contributing to their safe functioning, are within the scope of the ATEX Directive 2014/34/EU.

In summary, paint spray booths, as an integral whole, do not fall under scope of the ATEX Directive 2014/34/EU and as such cannot be affixed with the special marking for explosion protection and other marking detailed at Annex II, EHSR 1.0. of the Directive

BS EN 16985:2018 Spray booths for organic coating material - Safety requirements

Annex B informs examples of classification of hazardous areas:


For $C_{LEL\ LIQUID} < 25\%$ of the internal volume of the spraybooth, the internal volume of the spraybooth, and the internal volume of the exhaust air cleaning system will be considered ATEX Zone 2 and as such any equipment installed within these areas should be specified to meet or exceed the requirements of  II 3 G E Ex IIA c T5

Where $C_{LEL\ LIQUID}$ = Average concentration of flammable solvents (in air) in the spray booth as a percentage of LEL

Junair can provide the LEL calculation on request.

NOTE – according to ATEX-norm & under the Dangerous Substances and Explosive Atmospheres Regulations 2002 it is the responsibility of the user of the equipment to define the ATEX zone according to intended use, however it is unusual for the requirements of EN 16985:2018 to be exceeded. Junair equipment is designed around the internal volume of the spraybooth being classified as ATEX Zone 2

Paint Mix Room

In the absence of specific guidance, Junair apply the above criteria to also cover Paint Mix Rooms. The internal volume of the paint mix room and the internal volume of the exhaust air system will be considered ATEX Zone 2 and as such any equipment installed within these areas should be specified to meet or exceed the requirements of  II 2 G IIB T3

NOTE – according to ATEX-norm & under the Dangerous Substances and Explosive Atmospheres Regulations 2002 it is the responsibility of the user of the equipment to define the ATEX zone according to intended use, however it is unusual for the requirements of EN 16985:2018 to be exceeded. Junair equipment is designed around the internal volume of the Paint Mix Room being classified as ATEX Zone 2



1.0 GENERAL

1.05 STANDARDS

Junair equipment is manufactured and installed in accordance with the following standards and Guidance Notes:

EN 16985:2018	Spray booths for organic coating material - Safety requirements
EN 746-2:2010	Industrial thermo processing equipment — Part 2: Safety requirements for combustion and fuel handling systems
EN 13849-1:2015	Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design
EN 1127-1:2011	Explosive atmospheres — Explosion prevention and protection — Part 1: Basic concepts and methodology
EN 1539:2015	Dryers and ovens, in which flammable substances are released — Safety requirements
EN 14986:2017	Design of fans working in potentially explosive atmospheres
EN 60204-1:2006	Safety of machinery — Electrical equipment of machines — Part 1: General requirements
EN ISO 12100:2010	Safety of machinery — General principles for design — Risk assessment and risk reduction
EN ISO 14120:2015	Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards

The Health & Safety at Work Act: 1974

The Environmental Protection Act 1990 & relevant Process & Technical Guidance Notes:

PG6/20(11)	Paint application in vehicle manufacturing
PG6/23(11)	Coating of metal and plastic
PG6/34(11)	Re-spraying of road vehicles

The Gas Safety (Installation and Use) Regulations: 1998

COSHH: 2002 HSE Control of Substances Hazardous to Health

2006/42/EC	EC Machinery Directive
2014/30/EU	EC Electromagnetic Directive
2014/35/EU	EC Low Voltage Equipment Directive
2014/34/EU	ATEX Workplace Directive

UK Health and Safety Executive (HSE) Guidelines:

(many of these are now outdated but continue to provide useful guidance):

HS(G) 51:2021	The Storage of Flammable Liquids in Containers
HS(G) 67: 2009	Health and safety in motor vehicle repair and associated industries
PM25: 1987	Vehicle Finishing Units: Fire and Explosion Hazards
HS(G) 178: 1998	Spraying of flammable liquids
HS(G) 261: 2009	Health and safety in motor vehicle repair and associated industries

NOTE – a common question is whether Junair equipment is installed in accordance with BS 7671: 2018 Requirements for Electrical Installations (IEE Regulations, 18th Edition. We note that BS 7671:2018 is not the correct electrical wiring regulations for machines. The correct wiring standard for spraybooths is EN60204-1:2006 as defined in EN16985:2018 section 2, Normative references)

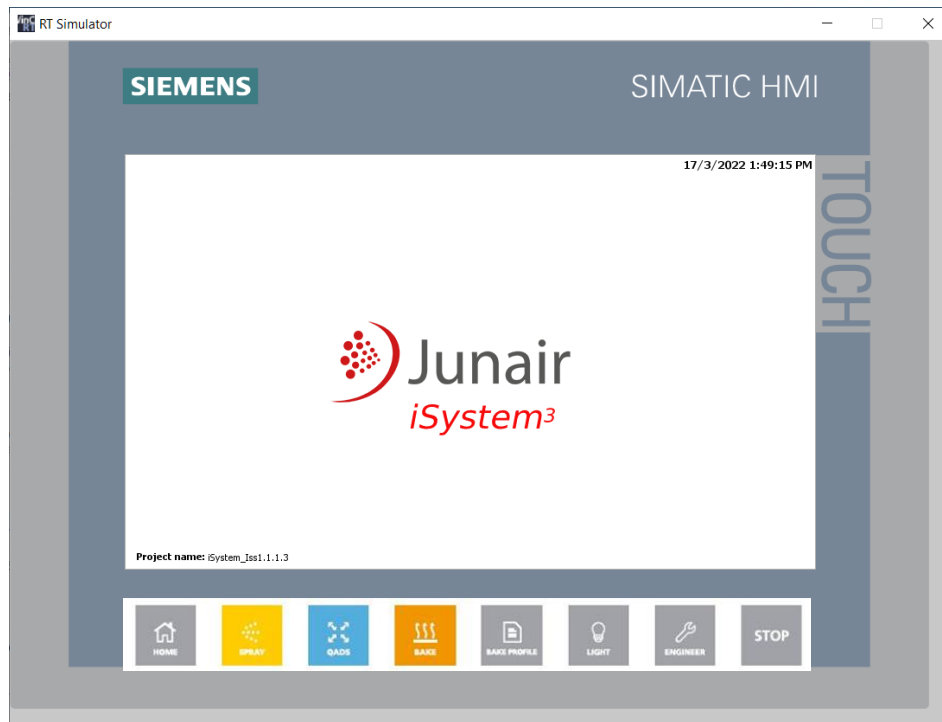
Also note that within BS7671:2018 section 110.2 Exclusions from Scope: (xi) Electrical equipment of machines covered by BS EN 60204



2.0 SPRAYBOOTH
2.1 CONTROL SYSTEM
2.11 OPERATION GUIDE – iSystem³

IMPORTANT - To maintain the equipment warranty and the Hazardous Area Certification, the instructions contained within this manual must be complied with in full

Version used xxxxxxxxxxxxxxxx

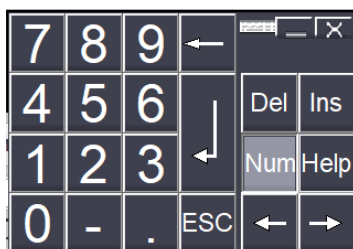


iSystem³ uses a Siemens 7" KPT700 colour touchscreen for all operator actions and for parameter adjustment.

NOTE – the function keys at the bottom of the screen F1 to F8 are configured for direct access to each screen

NOTE - Change a value on the HMI by pressing on a white text box, which will bring up an on screen keyboard.

- Use the back button to delete the value, enter a new value using the keypad then press Enter. The screen keyboard will disappear
- Press the 'Num' button to switch from numbers to text



The HMI device is designed for maintenance-free operation. You should still clean the HMI device regularly

NOTICE - Damage to the HMI device caused by impermissible cleaning agents Impermissible and unsuitable cleaning agents may cause damage to the HMI device. Use dish soap or foaming screen cleaner only as cleaning agents. Do not use the following cleaning agents:

- Aggressive solvents or scouring powder
- Steam jets
- Compressed air



Procedure:

1. Spray cleaning agent onto a cleaning cloth.
Do not spray cleaning agent directly onto the HMI device.
2. Clean the HMI device.
When cleaning the display, wipe inwards from the edge of screen

Protective films

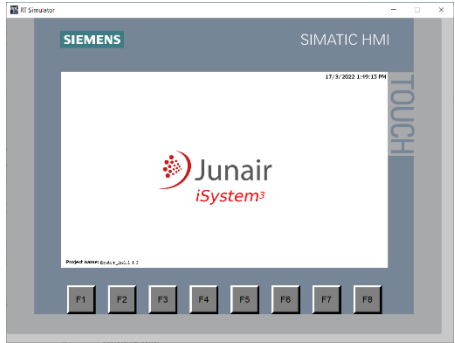
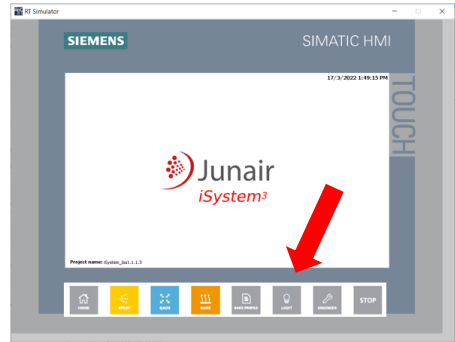
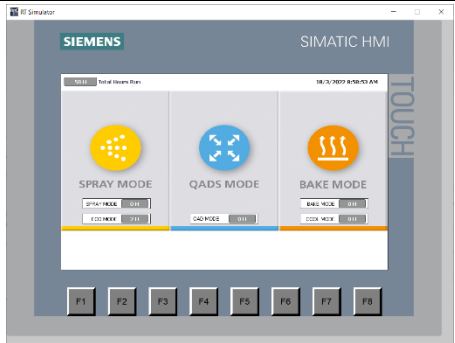

The protective film prevents the touch screen from getting scratched and dirty during operation. One set of protective film contains 10 protective films.

- Protective film 7" touch devices, type 13
- Not supplied as standard



ID	DESCRIPTION	IMAGE
1	<p>To operate the system:</p> <ol style="list-style-type: none"> 1. Ensure mains power is live 2. Switch on the main panel isolator to the 1 position <p>NOTE - The main panel is usually mounted on top of or near the air handling plant</p> <p>NOTE - The booth needs a compressed air supply to be able to operate. An error message will appear on initial START if damper check is not complete due to lack of compressed air</p>	
2	<p>NOTE – Operator actions are via the Control Bezel normally mounted on the front of the booth or by the side access door</p> <ol style="list-style-type: none"> 1. Press Control Reset button once for at least one second, button will illuminate blue. 2. Wait a couple of seconds then press Control Reset button a second time for at least one second. 3. Button is illuminated Blue when the control system has been reset and is healthy 4. If Control Reset button doesn't illuminate check: <ol style="list-style-type: none"> a. The E-Stop red mushroom button on the main control panel has been pressed – twist to release b. Client fire alarm (if fitted) isn't active 	

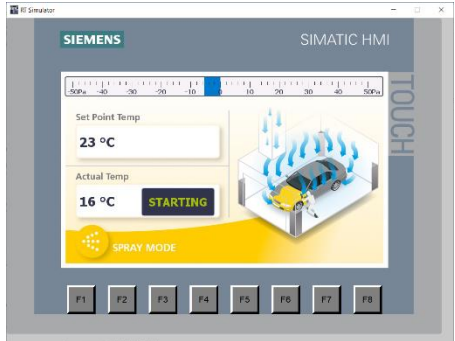
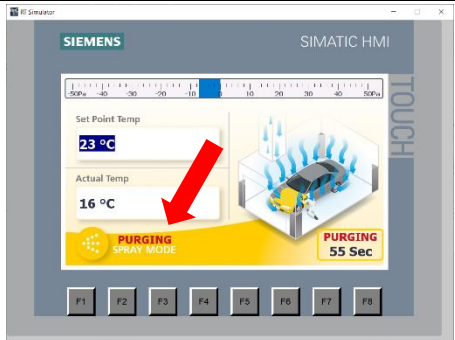


ID	DESCRIPTION	IMAGE
3	<p>On initial start up the screen will move through a series of standard start screens, and will display as shown</p> <p>Any active alarms will show in a box in the top right hand corner.</p> <p>NOTE - Alarms should be cleared before the system will start</p> <p>Pressing anywhere on the Start Up Screen will move to the following page</p>	 The image shows the SIMATIC HMI Start Up Screen. It features the Junair iSystem3 logo in the center. At the bottom, there is a row of function keys labeled F1 through F8. The screen is titled 'SIEMENS SIMATIC HMI' at the top.
4	<p>Lights can be turned ON and OFF by pressing the LIGHT button</p> <p>NOTE - lights are automatically turned OFF during BAKE cycle and will come on again at the end of cycle</p>	 The image shows the SIMATIC HMI Start Up Screen, similar to the previous one. A red arrow points to the 'LIGHT' button located in the bottom right corner of the function key row.
4	<p>The HOME page acts as the main navigation page to the SPRAY, QADs and BAKE mode pages</p> <p>These pages can also be accessed via the function keys across the bottom of the screen).</p> <p>The text bar at the top of the screen shows the current operation mode</p> <p>NOTE - QADs mode button will not be available on booths with no QADs system installed.</p> <p>NOTE – Booth running hours are displayed on this screen. Separate running hours are listed for: ECO SPRAY QADs (if fitted) BAKE TOTAL RUNNING HOURS</p> <p>This information should be recorded whenever maintenance or filter change is required. The data can be useful for spraybooth operational efficiency analysis</p> <p>NOTE – should the iSystem3 operating software need updating then the hours run data should be written down and recorded before uploading new software</p>	 The image shows the SIMATIC HMI HOME Screen. It displays three main mode buttons: SPRAY MODE, QADs MODE, and BAKE MODE. Each mode button has a corresponding icon and a status indicator. The screen also shows 'Total Running Hours' for each mode. The bottom row of function keys is visible.
5	<p>The following buttons will always appear at the bottom of the screen when active:</p> <ul style="list-style-type: none">• Burner Lockout Alarm,• Burner Lockout Reset,• Heater Thermal cut-out Alarm,• Fault alarm• Alarm reset• Alarm silence button <p>Press to reset the burner lockout, reset any standing alarms and silence the alarm sounder if sounding.</p>	 The image shows the SIMATIC HMI HOME Screen. A red arrow points to the 'ALARM' button located in the bottom right corner of the function key row.



ID	DESCRIPTION	IMAGE
	<p>Electric heater thermal cut out required a manual reset at the heater by pressing the red button on the thermal cut-out</p> <p>This also applies to all the other major pages.</p>	
6	<p>The STOP function button can be pressed at any time to bring the spraybooth to a controlled stop.</p> <p>NOTE – it is advised to allow the booth to complete the pre-defined BAKE cycle before pressing stop</p>	
7	<p>Emergency Stop / Reset Procedure Red mushroom head button is located on the main control panel Optional additional Red mushroom head button on operator HMI bezel (if fitted) Activation of client Fire Alarm system has same effect as pressing the Emergency Stop button (if fitted)</p> <p>The Red emergency stop mushroom head button can be pressed in the event of an emergency. The entire plant associated with the control panel will have power removed and fans will come to a stop.</p> <p>WARNING – fans may take 60 seconds to come to a stop after pressing an E-Stop. Fans should be stationary before attempting a restart</p> <p>Following an emergency stop the main panel will need to be reset. The reason for the emergency stop should be investigated and addressed prior to the booth being reset</p> <p>To reset first ensure the isolator is switched to the on position, then turn the mushroom head emergency stop to release and then press the blue control reset button for at least one second.</p> <p>NOTICE – do not use the E-Stop for regular stopping of booth. Always use the process STOP on the HMI as this allows the booth to complete the cycle and come to a controlled stop. Activation of the E-Stop is an un-controlled event that may result in fan drives tripping.</p>	
8	<p>SPRAY MODE Overview Screen</p> <p>Press function button 2 'SPRAY' to access the SPRAY screen</p> <p>This screen allows the operator to start and stop the booth in SPRAY mode.</p> <p>SPRAY temperature can be changed by pressing the 'Set Point Temperature' text. A pop up keypad will appear to allow the temperature to be changed. The temperature set points are limited within the software.</p> <p>When running the actual booth temperature is displayed below</p> <p>To start the booth press the green START button</p> <p>To stop the booth whilst running in SPRAY mode press the STOP function button</p>	



ID	DESCRIPTION	IMAGE
9	<p>After pressing START the green START button will change to a black box reading STARTING</p> <p>The banner at the top of the screen will appears in orange saying 'SPRAY MODE</p> <p>The booth will then go through an initial damper check. The changeover damper will fully close then fully open again to check limit switch operation. Operator may hear a BANG-BANG noise.</p> <p>The fans will begin to ramp up in speed and the airflow arrows on the screen will begin to move</p> <p>The heater will start, and the booth will come to temperature</p> <p>NOTE – during summer months when the external air temperature is higher than the set point the burner / heater will not operate. The cabin temperature will be the same as the external air temperature. When external air temperature reduces below the set point, the heater will start again</p> <p>NOTE – there may be a small smell of gas on initial light up due to the burner purge cycle. This is entirely normal and expected. Direct Gas fired heater only.</p>	
10	<p>The booth will purge air for a pre-set time, indicated as red flashing text above the spray mode icon in the bottom left of the screen</p> <p>The purge time remaining is indicated in the bottom right hand side of the screen</p> <p>NOTE – The Purge time is pre-set within Engineer Settings, and is the same for the SPRAY, QADs and BAKE screens.</p> <p>At the top of this screen there is a pressure indicator bar to show the current spraybooth cabin pressure.</p> <p>CAUTION – the painter should only start painting if the pressure indicator bar shows that the booth is operating in negative pressure</p> <p>NOTE – the spraybooth cabin pressure will automatically adjust to compensate for filter blinding. Once the filter is saturated the booth will not be able to maintain a negative pressure. An alarm for 'Booth Not Achieved Auto-balance Within Time' may be displayed. Advise that exhaust filters are changed</p> <p>NOTE – The painter can't spray until purge time is complete.</p> <p>The painter will be able to spray when the following conditions have been met:</p> <ul style="list-style-type: none">• Change over damper in SPRAY position• Input and extract fans running and pressure switches made• Spraybooth cabin pressure negative• (if fitted) all spraybooth doors closed <p>When the above are all OK then the compressed air solenoid valve will open</p>	

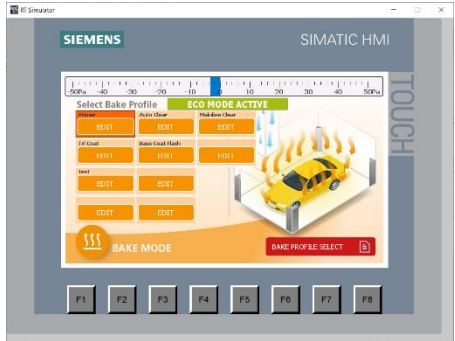
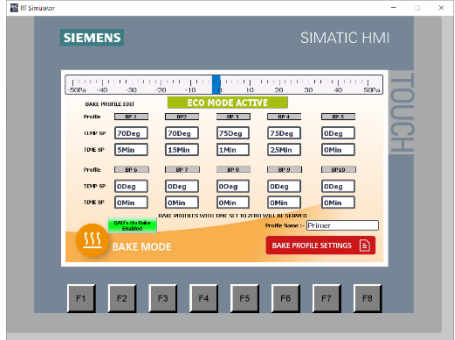


ID	DESCRIPTION	IMAGE
10a	<p>During painting operation the system will monitor compressed air use through the spray gun.</p> <p>During this time (if fitted) the red mist clearance lamps will flash outside access doors to warn that there is a potential risk of paint overspray within the cabin</p> <p>On completion of painting the booth will continue in SPRAY mode and the screen will show the Mist Clearance count down timer. During this time the mist clearance lamp continues to flash</p> <p>On completion of the timer the booth will automatically move to ECO mode</p>	
11	<p>ECO MODE overview screen</p> <p>After a period of inactivity in the booth (no spraying taking place) the booth will run through the Mist Clearance time (pre-set time) and the booth will automatically move to ECO mode. A green banner will appears saying ECO MODE ACTIVE.</p> <p>Fans will slow down and the changeover damper will move position and the booth will recirculate airflow. Temperature remains at the same set point as for SPRAY mode. NOTE – for electric heated booths the heating elements have increased lag and the temperature may rise for a short period when moving into ECO mode, and may drop for a short period when moving back to SPRAY mode.</p> <p>Periodically (approx. every 5 minutes) the changeover damper will open for a short time to purge and allow some fresh air then will revert to recirculation mode.</p> <p>Triggering the spray gun will automatically move the booth back into SPRAY mode after a short delay. The changeover damper will revert to SPRAY position and the fans will ramp back to full speed.</p> <p>During ECO mode the booth will maintain the pre-set cabin pressure by auto balancing the fans</p> <p>To stop the booth whilst running in ECO mode press the STOP function button</p> <p>NOTE – always STOP the booth before opening the main doors to load and unload product or vehicles. If the doors are left open whilst the booth is running in ECO mode the fans will run up to the maximum pre-set level, which will result in a large negative cabin pressure when the doors are closed.</p> <p>If the spraybooth doors have been fitted with limit switches then the auto balance will hold the cabin pressure settings whilst the doors are open.</p> <p>CAUTION - If the door closers are not correctly set or maintained the doors may slam. This may cause damage to the cabin structure.</p> <p>NOTICE - If doors are closed after a prolonged period of running in ECO mode the fans may take 10-15 seconds to auto-balance to the correct pre-set negative cabin pressure. The painter may not be able to push open the door for 5-10 seconds</p>	

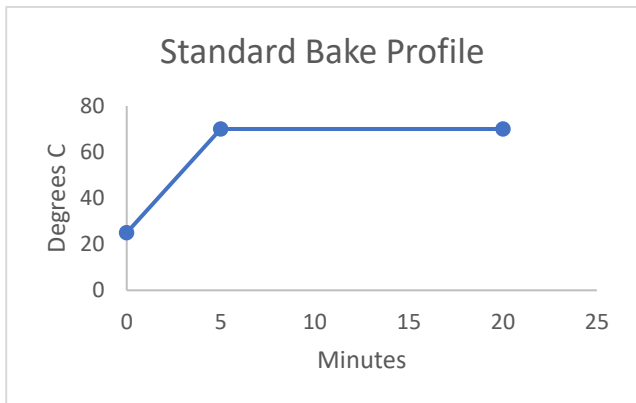


ID	DESCRIPTION	IMAGE
12	<p>QADs MODE Overview Screen</p> <p>The QADs screen is similar to the SPRAY screen but instead shows the QADs mode.</p> <p>When the booth is in SPRAY or ECO mode the operator can press function button 3 'QADs' below the screen to access the QADs screen.</p> <p>Press the green START button to initiate a QADs cycle. The air movement arrows will turn red and the banner at the top of the screen will turn blue and say 'QADs MODE ACTIVE'.</p> <p>Fan speed and cabin temperature will change to the pre-set values (typically 38 deg C). The booth will run with just airflow and temperature for a short period (typically 3-4 minutes) then the QADs doors will open and the QADs fans will start for the duration of the QADs cycle.</p> <p>In QADs mode the time and temperature are pre-set. These can be adjusted within Engineers Settings.</p>	
13	<p>The time remaining for the QADs cycle is shown.</p> <p>The painter can stop the QADs cycle pressing the Cycle Stop button (replaces the start button) if they wish the cycle to end early. The booth will return to SPRAY or ECO mode.</p> <p>To stop the booth whilst running in QADs mode press the STOP function button.</p> <p>NOTE – QADs blower activation can be disabled during QADs cycle if required within the Engineers Settings. If QADs blowers are disabled the QADs cycle will still operate with elevated temperature for the pre-set time.</p>	
14	<p>If QADs are not installed on the booth then upon pressing the QADs function button below the screen the screen will show a "QADs not installed" message.</p>	
15	<p>BAKE PROFILE Load Screen</p> <p>Press function button 5 'BAKE PROFILE' to access the BAKE PROFILE screen</p> <p>This screen is used to load a BAKE PROFILE. The selected BAKE PROFILE is highlighted in a darker orange (RED arrow).</p> <p>NOTE - while a BAKE PROFILE is running different bake profiles cannot be loaded or their settings viewed or changed. Changes to BAKE PROFILES can be made whilst the booth is stopped, running in SPRAY, ECO or QADs modes.</p> <p>To change BAKE PROFILE simply press on the required profile and it will become selected and turn a darker orange</p> <p>To adjust or view the individual BAKE PROFILES press the 'BAKE PROFILE SETTING' button on the bottom right hand corner of the screen (GREEN arrow). The next screen will appear</p>	

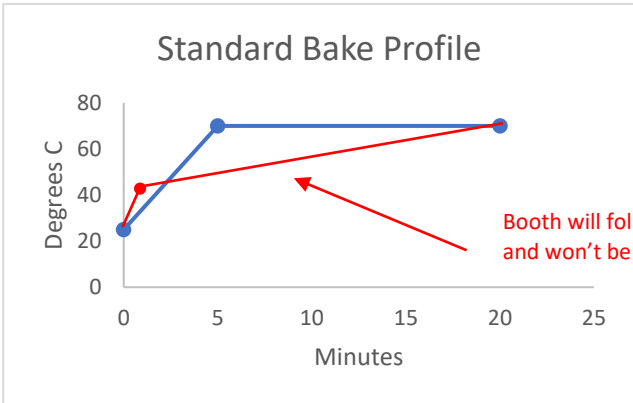


ID	DESCRIPTION	IMAGE
16	Press the recipe that needs to be edited and the next screen will appear	
17	<p>NOTE – values in the recipes can only be changed by MANAGER level login and not OPERATOR level</p> <p>Each bake profile or recipe runs through the sequence BP1 then BP2, BP3 etc through to BP10</p> <p>This allows a controlled temperature RAMP to set point and then DWELL at temperature and a controlled COOL if required. Advanced aerospace coatings may require a more advanced, dynamic profile</p> <p>NOTE - If only a simple bake profile is required, then set the 'TIME SP' to zero in the unwanted segments which will force the system to skip over the bake profile.</p> <p>NOTE – do not leave a value in a later 'TIME SP' following a zero segment. This may confuse the system</p> <p>To adjust the time and temperature set points, press on the number and a pop-up box will appear to allow changes to be made. Time is in minutes.</p> <p>Bake profile names can be edited and set to suit client requirements. Select the required bake profile for editing and the profile name can be viewed within the box on the bottom right hand side of the screen. Press the box and a pop-up box will appear allowing the text to be changed.</p> <p>If QADs are fitted to the booth they will automatically be activated during BAKE cycles to aid drying. If QADs air movement is not required in BAKE they can be turned off by pressing the 'QADs on Bake' button on the screen. QADs blower operation will toggle on and off as the button is pressed.</p>	
18	<p>NOTE –setting BAKE profiles.</p> <p>The booth will not immediately jump to the temperature set point. It will ramp the cabin temperature in a controlled way over the time period entered. Temperature will rise from the previous segment temperature to the next. Note that all bake profiles start from the spray temperature of (typically) 22 deg C</p> <p>The first segment is always a RAMP segment</p> <p>e.g. BP1 segment is set to 70 deg C and 5 min. The booth temperature will slowly rise from 22 deg C to 70 deg over 5 minutes</p> <p>in this case temp rise is $(70-22) = 48 \text{ deg C over } 5 \text{ min} = 9.6 \text{ deg per min}$</p> <p>To DWELL at a temperature the next segment should be set with the IDENTICAL temperature as the previous segment, and the time set point for the required BAKE duration</p> <p>e.g. BP2 segment is set to 70 deg C and 15 min. The booth temperature will stay at 70 deg C for 15 minutes.</p>	

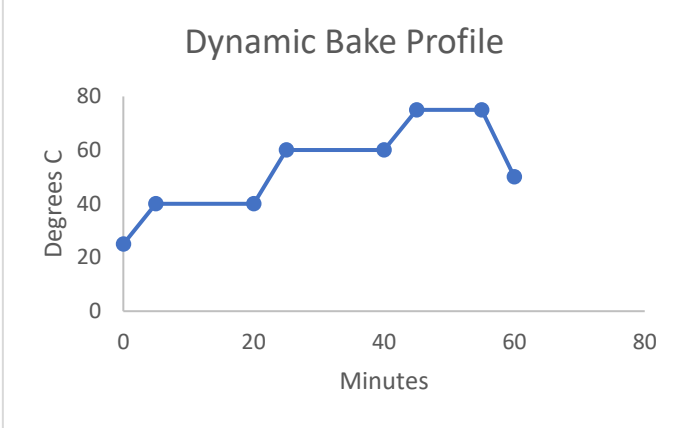
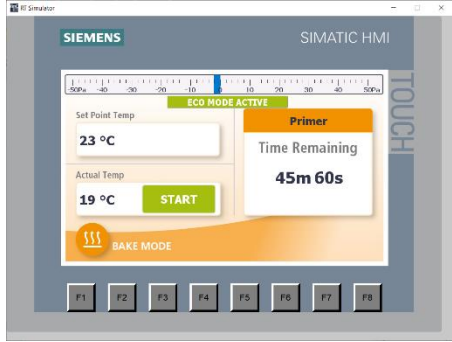
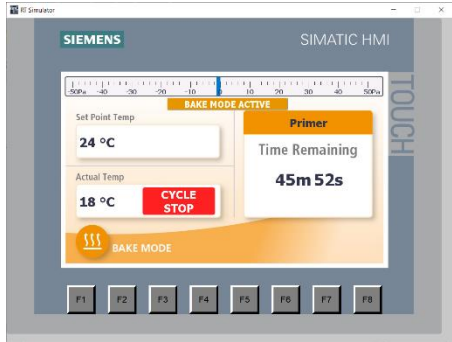


ID	DESCRIPTION	IMAGE																		
	<p>A COOL segment can be incorporated by having the next segment at (say) 30 deg C and 5 minutes. The booth temperature set point will reduce along the 5 minutes.</p> <p>After the final segment the booth will move to an automatic COOL mode with pre-set time and will revert to SPRAY or ECO mode</p> <p>NOTE – If the time set point for the segment is set too low (too fast) then the booth won’t be able to achieve the desired temperature at the end of the period. For example, if the temperature set point is 50 deg C and the time set point is only 1 min, the booth simply won’t be able to heat up fast enough. The booth may only achieve 50 deg C after 1 minute. This will impact the following DWELL segment because instead of starting at 70 deg C, it will start at 50 deg C. Instead of a steady dwell at 70 deg C, the booth will slowly ramp from 50 to 70 deg C over the time period. The fastest rate a booth can heat up will vary from one booth to another depending on booth size, airflow, heater size and product (vehicle) size. An empty cabin will heat up faster than a cabin full of painted product.</p> <p>Maximum time value is 99 minutes in each segment</p> <p>The temperature set points are limited within the software</p> <p>NOTE – It is generally better to have a slow and steady rise to temperature rather than rushing the temperature rise. This prevents ‘shocking’ the paint, and also minimises heat loads within the heater, ductwork and cabin</p> <p>NOTE – if segments are set to COOL, the cabin temperature may not fall as fast as expected because the airflow is recirculated. A very well insulated spraybooth will loose heat very slowly. If the bake needs to end, generally setting all remaining segments to zero will end the BAKE cycle</p> <p>NOTE – cabin air temperature may differ from panel temperature. Tests and trials should be undertaken to establish the correct BAKE temperature set points to suit the client paint and product. For example air temperature may need to be set at 70 deg C to achieve a panel temperature of 60 deg C. JUNAIR can provide additional training support if required.</p> <p>NOTE – bake temperature may vary throughout the cabin and tests should be made to check for hot and cold spots. QADs auxiliary air blowers will help to achieve a more consistent and even cabin temperature. Aerospace applications can be set up to achieve specific cabin temperature uniformity at additional cost, depending on cabin airflow configuration.</p>																			
19	<p><u>STANDARD</u> bake profile e.g. paint system requires 70 deg C for 15 minutes</p> <p>BP1 should be set for a 5 minute RAMP to 70 deg C, then BP2 set for DWELL for 15 minutes at 70 deg C</p> <table><tr><th>Profile</th><th>BP1</th><th>BP2</th><th>BP3</th><th>BP4</th><th>BP5</th></tr><tr><td>TEMP SP</td><td>70 deg C</td><td>70 deg C</td><td>0 deg C</td><td>0 deg C</td><td>0 deg C</td></tr><tr><td>TIME SP</td><td>5 min</td><td>15 min</td><td>0 min</td><td>0 min</td><td>0 min</td></tr></table> <div><p>Standard Bake Profile</p></div>	Profile	BP1	BP2	BP3	BP4	BP5	TEMP SP	70 deg C	70 deg C	0 deg C	0 deg C	0 deg C	TIME SP	5 min	15 min	0 min	0 min	0 min	
Profile	BP1	BP2	BP3	BP4	BP5															
TEMP SP	70 deg C	70 deg C	0 deg C	0 deg C	0 deg C															
TIME SP	5 min	15 min	0 min	0 min	0 min															

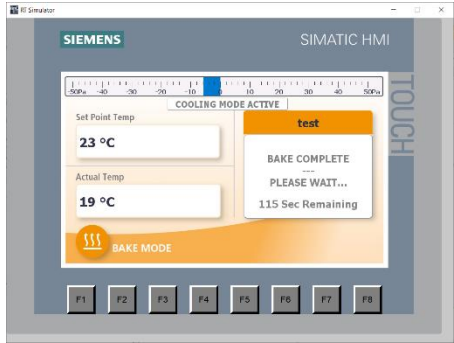
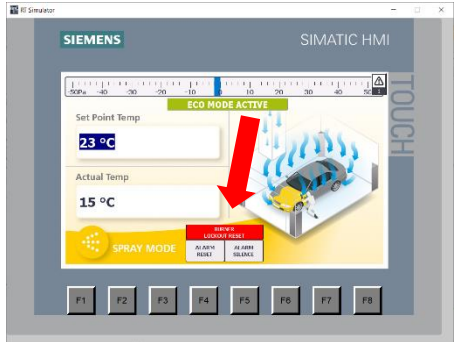
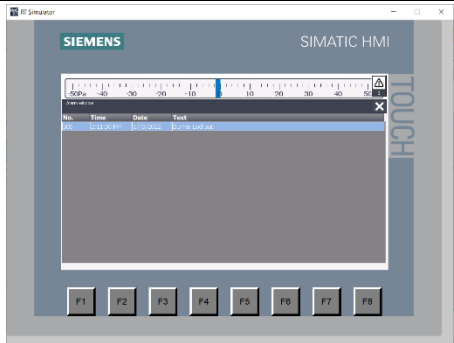
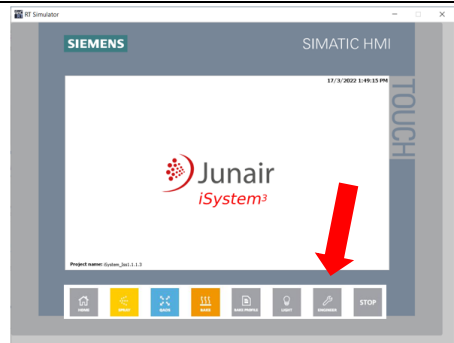


ID	DESCRIPTION	IMAGE																																				
20	<p><u>EXAMPLE of INCORRECT</u> bake profile</p> <p>e.g. required bake profile is 70 deg C for 15 minutes</p> <p>BP1 should be set for a 5 minute RAMP to 70 deg C but has been set at only 1 minute. After 1 minute the booth has only reached 40 deg C. This means the following segment now starts at 40 deg C and not 70 deg C. Instead of a stable steady 70 deg C for 15 minutes the booth temperature will slowly rise from 40 deg C to 70 deg C over the 15 minute time period</p> <table><tr><th>Profile</th><th>BP1</th><th>BP2</th><th>BP3</th><th>BP4</th><th>BP5</th></tr><tr><td>TEMP SP</td><td>70 deg C</td><td>70 deg C</td><td>0 deg C</td><td>0 deg C</td><td>0 deg C</td></tr><tr><td>TIME SP</td><td>1 min</td><td>15 min</td><td>0 min</td><td>0 min</td><td>0 min</td></tr></table> <div><p>Standard Bake Profile</p></div>	Profile	BP1	BP2	BP3	BP4	BP5	TEMP SP	70 deg C	70 deg C	0 deg C	0 deg C	0 deg C	TIME SP	1 min	15 min	0 min	0 min	0 min																			
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TIME SP	1 min	15 min	0 min	0 min	0 min																																	
21	<p><u>DYNAMIC</u> bake profile</p> <p>e.g. the aerospace paint system needs the following cue schedule:</p> <ol style="list-style-type: none">1. RAMP 5 min to 40 deg C2. DWELL 40 deg C for 15 minutes3. RAMP 5 min ramp to 60 deg C4. DWELL 60 deg C for 40 minutes5. RAMP 5 min ramp to 80 deg C6. DWELL 80 deg C for 40 minutes <table><tr><th>Profile</th><th>BP1</th><th>BP2</th><th>BP3</th><th>BP4</th><th>BP5</th></tr><tr><td>TEMP SP</td><td>40 deg C</td><td>40 deg C</td><td>60 deg C</td><td>60 deg C</td><td>80 deg C</td></tr><tr><td>TIME SP</td><td>5 min</td><td>15 min</td><td>5 min</td><td>15 min</td><td>5 min</td></tr></table> <table><tr><th>Profile</th><th>BP6</th><th>BP7</th><th>BP8</th><th>BP9</th><th>BP10</th></tr><tr><td>TEMP SP</td><td>80 deg C</td><td>40 deg C</td><td>0 deg C</td><td>0 deg C</td><td>0 deg C</td></tr><tr><td>TIME SP</td><td>15 min</td><td>5 min</td><td>0 min</td><td>0 min</td><td>0 min</td></tr></table>	Profile	BP1	BP2	BP3	BP4	BP5	TEMP SP	40 deg C	40 deg C	60 deg C	60 deg C	80 deg C	TIME SP	5 min	15 min	5 min	15 min	5 min	Profile	BP6	BP7	BP8	BP9	BP10	TEMP SP	80 deg C	40 deg C	0 deg C	0 deg C	0 deg C	TIME SP	15 min	5 min	0 min	0 min	0 min	
Profile	BP1	BP2	BP3	BP4	BP5																																	
TEMP SP	40 deg C	40 deg C	60 deg C	60 deg C	80 deg C																																	
TIME SP	5 min	15 min	5 min	15 min	5 min																																	
Profile	BP6	BP7	BP8	BP9	BP10																																	
TEMP SP	80 deg C	40 deg C	0 deg C	0 deg C	0 deg C																																	
TIME SP	15 min	5 min	0 min	0 min	0 min																																	



ID	DESCRIPTION	IMAGE
	<div><div>Dynamic Bake Profile</div></div>	
22	<p>BAKE Overview Screen</p> <p>Pressing function button 5 will access the BAKE screen.</p> <p>The BAKE overview screen is similar to the SPRAY SCREEN</p> <p>When the booth is in SPRAY or ECO mode the painter can press the green START button to initiate the pre-selected bake cycle.</p> <p>When running in BAKE mode the banner at the top of the screen will say 'BAKE MODE ACTIVE'.</p> <p>NOTE - Lights will automatically be turned off at the start of a bake cycle.</p> <p>During operation the temperature cannot be adjusted or set by the painter.</p> <p>The current booth temperature, set point temperature, currently loaded bake profile and time remaining on that bake profile is shown.</p> <p>At the end of the bake cycle the booth will run in cool for a set time duration then shutdown. The banner at the top of the screen will say 'COOLING MODE ACTIVE'</p>	
23	<p>To interrupt the BAKE cycle press the RED 'Cycle Stop' button on the screen. The booth will move to COOL down mode (see next screen)</p> <p>or press the STOP function button below the screen</p> <p>NOTE – we recommend that the BAKE cycle is allowed to run its full duration and come to an automatic stop. Stopping the bake cycle midway through may cause timer errors.</p> <p>NOTE – if the BAKE cycle is not following the correct sequence, it is likely due to having been interrupted or stopped in the wrong way. We recommend the control system undergoes a power cycle to reset (turn it off, wait 10 seconds then restart)</p>	



ID	DESCRIPTION	IMAGE									
24	<p>BAKE end of cycle</p> <p>At the end of the BAKE cycle this screen will appear. The banner at the top of the screen will say 'COOLING MODE ACTIVE'</p> <p>The sounder will alarm for a short period of time then stop.</p> <p>NOTICE - This is the COOL down mode and allows the burner system to cool before switching off. This part of the process should not be skipped</p> <p>NOTE – lights will automatically turn ON on completion of the BAKE cycle</p>										
25	<p>Burner / Heater Fault</p> <p>If a burner or heater fault occurs a pop-up box will appear at the bottom of the screen.</p> <p>The alarm can be silenced by pressing the 'Alarm Silence' button.</p> <p>If the heater system is fitted with a remote reset facility, then the operator can press 'Burner Lockout Reset' to reset the burner. Systems without remote reset facility will have a similar box that requests reset on the heater itself.</p> <p>Once the heater is functioning the alarm will reset</p> <p>NOTICE – in the event of repeated Burner Lockouts we would recommend attention at the heater itself.</p> <p>If the fault persists, please call JUNAIR</p>										
26	<p>Alarm Screen</p> <p>If an alarm occurs, it will appear in a pop up window on the top right-hand corner of the screen.</p> <p>Pressing the alarm box will bring up the alarm screen where all current and precious faults are displayed and logged.</p> <p>To acknowledge an alarm, select it and press the tick on the lower right of the window. Press the X on the upper right to hide the window</p> <p>Alarm codes, their cause and the required action are detailed in the next section</p>										
27	<p>Engineering parameters</p> <p>Parameters can be adjusted within this screen</p> <p>To access this page press the Function key for ENGINEER</p> <p>A pop up box will appear prompting for the LOG-IN and PASSWORD</p> <p>NOTE – there are several levels of access according to use:</p> <table><tr><td>OPERATOR</td><td>standard</td><td>Temperature adjustment</td></tr><tr><td>MANAGER</td><td>manager / 1234</td><td>Recipe editing</td></tr><tr><td>ENGINEER</td><td>xxxx</td><td>Advanced engineer functions</td></tr></table> <p>DANGER – at engineer level the control of the spraybooth can be changed including safety related items. This level should only be accessed with Junair express permission</p> <p>User name and password held by JUNAIR for security</p>	OPERATOR	standard	Temperature adjustment	MANAGER	manager / 1234	Recipe editing	ENGINEER	xxxx	Advanced engineer functions	
OPERATOR	standard	Temperature adjustment									
MANAGER	manager / 1234	Recipe editing									
ENGINEER	xxxx	Advanced engineer functions									



2.0 SPRAYBOOTH

2.1 CONTROL SYSTEM

2.12 FAULT GUIDE – iSystem³

When an alarm appears on the screen the below tables show the summary, possible cause and action required

General fault – in the event of an unexpected operation of the spraybooth, it is advisable to make a full power cycle to reset the system. Full power off, wait 10 seconds then power on and restart.

GENERAL

Control panel

EVENT No.	EVENT	POSSIBLE CAUSE	ACTION
xx	Cooling fan continuously running	<ul style="list-style-type: none">Control panel front filter blindedInternal thermostat temperature set too low	<ul style="list-style-type: none">Remove filter and clean or replaceCheck thermostat (top right hand corner) and set to 30 deg C+

CATEGORY 1 ALARMS

Emergency stop, System Shutdown

EVENT No.	EVENT	POSSIBLE CAUSE	ACTION
100	Emergency Stop Operated	<ul style="list-style-type: none">E-Stop pressed	<ul style="list-style-type: none">Reset E-Stop by pressing Control Reset button

CATEGORY 2 ALARMS

Major Faults, System Shutdown

EVENT No.	EVENT NAME	POSSIBLE CAUSE	ACTION
200	Input Drive Fault / OL Tripped (20U1 / 1Q2)	<ul style="list-style-type: none">Look at display screen on VSD	<ul style="list-style-type: none">Reset VSDTurn power off, wait 10 sec then power on
201	Extract Drive Fault / OL Tripped (21U1 / 1Q3)	<ul style="list-style-type: none">Look at display screen on VSD	<ul style="list-style-type: none">Reset VSDTurn power off, wait 10 sec then power on



EVENT No.	EVENT NAME	POSSIBLE CAUSE	ACTION
208	Damper Failed to Close On Start Up	<ul style="list-style-type: none">Damper position limit switch faulty,Pneumatic cylinder failed or end attachments loose / failedChangeover damper stuck or restricted movementNo compressed air or Compressed air low	<ul style="list-style-type: none">Check or replace damper position limit switchCheck damper movement,Check pneumatic cylinder,Check compressed air
209	Damper Failed to Open On Start Up		
210	Damper Failed to Close When Running		
211	Damper Failed to Open When Running		
212	Booth: Pressure Transmitter Out of Range	<ul style="list-style-type: none">Faulty pressure transducer	<ul style="list-style-type: none">Check pressure transducer and replace
213	Booth Not Achieved Auto-balance Within Time	<ul style="list-style-type: none">Extract filters binding,Booth has been started with doors open	<ul style="list-style-type: none">Replace extract filters,Start booth with doors closed
214	Booth Pressure Too High	<ul style="list-style-type: none">Extract filters binding	<ul style="list-style-type: none">Check and replace extract filters
202	QAD Fan 1 OL Tripped (2Q1)	<ul style="list-style-type: none">Faulty QAD motor	<ul style="list-style-type: none">Check Overload settingsCheck QADs motor
207	Extract Fan PS Failed When Running	<ul style="list-style-type: none">Pressure switch set point set too low	<ul style="list-style-type: none">Check and adjust
206	Input Fan PS Failed When Running	<ul style="list-style-type: none">Pressure switch set point set to low	<ul style="list-style-type: none">Check and adjust
205	Extract Air Flow Failed On Start Up	<ul style="list-style-type: none">Extract VSD not running	<ul style="list-style-type: none">Check extract VSD
203	QAD Fan 2 OL Tripped (2Q2)	<ul style="list-style-type: none">Faulty QAD motor	<ul style="list-style-type: none">Check Overload settingsCheck QADs motor
204	Input Air Flow Failed On Start Up	<ul style="list-style-type: none">Input VSD not running	<ul style="list-style-type: none">Check input VSD
215	Booth Pressure Too Low	<ul style="list-style-type: none">Incorrect parameters set for Low Pressure warning and trip trigger pointIncorrect parameters for fan speedsIncorrect parameters for fan ramp speedsPID control loop for auto balance not correctly setFaulty pressure transducer	<ul style="list-style-type: none">Investigate parameter set points on HMI Engineers Settings and also VSD and adjust as requiredCheck Pressure transducer operation

CATEGORY 3 ALARMS



Standard Faults, Display and alert only, System Running

EVENT No.	EVENT NAME	POSSIBLE CAUSE	ACTION
303	Burner / Heater High Temperature Stat Fault	<ul style="list-style-type: none">Over temperature stat has triggered	<ul style="list-style-type: none">Check temperature of ductwork at the High Temp Stat locationCheck set point on over temp statReset thermal switch (electric heater)
306	Pressure Switch Active on Start Up - Allow Fans to stop.	<ul style="list-style-type: none">Fans still running when attempting to start,Pressure switches made with fans offPressure switch terminals welded closed	<ul style="list-style-type: none">Allow fans to stop before pressing re-starting boothPressure switch set too highReplace pressure switchCheck and clean pressure switch tubes for kinks and blockages
301	Booth: Temperature Sensor Out of Range	<ul style="list-style-type: none">Faulty PT100 temperature probe	<ul style="list-style-type: none">Check and replace PT100 sensorCheck PT100 sensor cable
307	Humidity Error - See Humidity Control	<ul style="list-style-type: none">Faulty Humidifier	<ul style="list-style-type: none">Check humidifier. Once fault is reset on humidifier the fault code will disappear
308	Humidity Service - See Humidity Control	<ul style="list-style-type: none">Humidifier requires service	<ul style="list-style-type: none">Service Humidifier – once Humidifier is reset the fault code will disappear

CATEGORY 4 ALARMS

Warnings, Display Warning on HMI, No Sound, No action required

EVENT No.	EVENT NAME	POSSIBLE CAUSE	ACTION
402	Temperature 100deg C or Over Warning	<ul style="list-style-type: none">Faulty PT control temperature probe,Faulty gas train	<ul style="list-style-type: none">Check and replace
401	Booth Low Pressure Warning	<ul style="list-style-type: none">Booth Pressure settings incorrectExtreme weather eventExhaust filters changed but inlet filters blinded meaning inlet air is restricted	<ul style="list-style-type: none">Check and adjustWait for nicer weatherCheck inlet filter condition and change as required



400	Booth High Pressure Warning	<ul style="list-style-type: none">• Booth Pressure settings incorrect• Extreme weather event	<ul style="list-style-type: none">• Check and adjust• Wait for nicer weather

2.0 SPRAYBOOTH
2.1 CONTROL SYSTEM
2.13 OPERATION GUIDE - eSystem

IMPORTANT - To maintain the equipment warranty and the Hazardous Area Certification, the instructions contained within this manual must be complied with in full



Version used V2.0.00

eSystem uses several discrete push buttons to allow booth operations, with a Siemens LODO TDE HMI display for all display actions and for parameter adjustment. Control is via a Siemens LOGO PLC

The HMI device is designed for maintenance-free operation. You should still clean the HMI device regularly

NOTICE - Damage to the HMI device caused by impermissible cleaning agents Impermissible and unsuitable cleaning agents may cause damage to the HMI device.

Use dish soap or foaming screen cleaner only as cleaning agents. Do not use the following cleaning agents:

- Aggressive solvents or scouring powder
- Steam jets
- Compressed air

Procedure:

1. Spray cleaning agent onto a cleaning cloth.
Do not spray cleaning agent directly onto the HMI device.



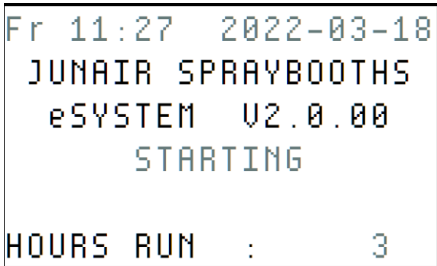
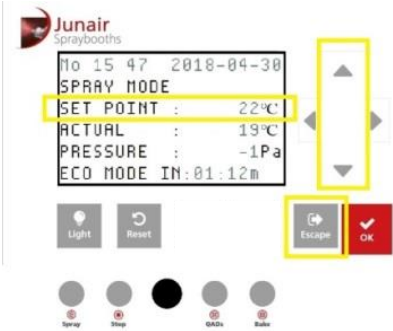


2. Clean the HMI device.
When cleaning the display, wipe inwards from the edge of screen

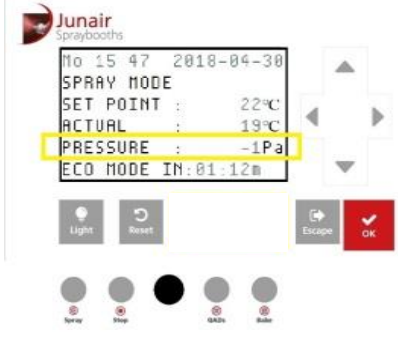
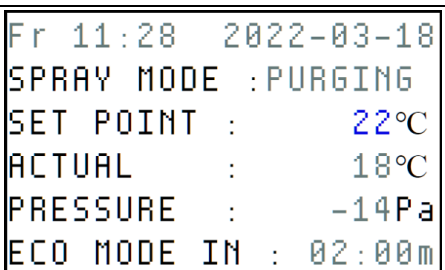
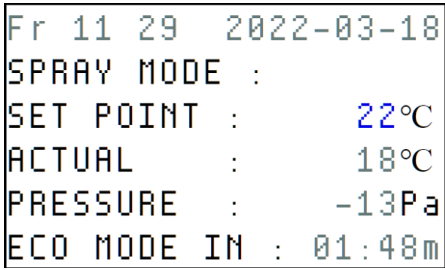
QADs button is only installed when the equipment has been supplied with QADs.

ID	DESCRIPTION	IMAGE
1	<p>To operate the systems:</p> <ol style="list-style-type: none"> a. Ensure mains power is live b. Switch on the main panel isolator to the 1 position <p>NOTE - The main panel is usually mounted on top of or near the air handling plant</p> <p>NOTE - The booth needs a compressed air supply to be able to operate. An error message will appear on initial START if damper check is not complete due to lack of compressed air</p>	
2	<p>NOTE – Operator actions are via the Control Bezel normally mounted on the front of the booth or by the side access door</p> <p>The screen will take a couple of seconds to come live after initial start up</p> <p>On initial start up the screen will move through a series of standard start screens, and will display as shown</p> <p>Any active alarms will appear on the screen.</p> <p>NOTE - Alarms should be cleared before the system will start</p>	
3	<p>Lights can be turned ON and OFF by pressing the LIGHT button</p> <p>NOTE - lights are automatically turned OFF during BAKE cycle and will come on again at the end of cycle</p>	
4	<p>After system power on this screen will show</p> <p>The software version is shown (V2.0.00 in the example)</p> <p>The spraybooth running hours are displayed</p> <p>NOTE – if the software version is updated remember to log the previous running hours</p>	

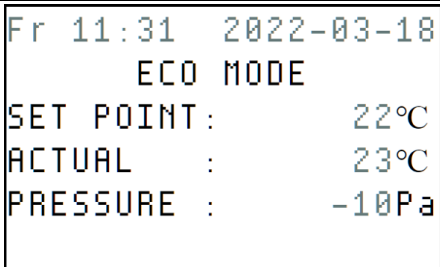



ID	DESCRIPTION	IMAGE
5	<p><u>SPRAY MODE</u></p> <p>To START the booth press the SPRAY button</p> <p>The booth will go through an initial damper check. The changeover damper will fully close then fully open again to check limit switch operation. Operator may hear a BANG-BANG noise.</p> <p>During start up the screen will display STARTING</p> <p>The fans will begin to ramp up in speed</p> <p>The heater will start and the booth will come to temperature</p> <p>To stop the booth whilst running in SPRAY mode press the STOP function button</p> <p>NOTE – there may be a small smell of gas on initial light up due to the burner purge cycle. This is entirely normal and expected.</p>	  
6	<p><u>Spraybooth Temperature Adjustment</u></p> <p>To adjust the set point temperature in SPRAY mode, use the UP and DOWN arrows to move the cursor to the SET POINT line, press ESC and use the UP & Down arrows keys to increase or decrease the set point temperature in 1°C increments. The temperature set point is displayed on the screen.</p> <p>NOTE - Need to hold the ESC key down whilst pressing the UP or DOWN key to change the setting</p> <p>The actual temperature inside the booth is displayed.</p> <p>NOTE – Temperature in SPRAY mode can only be adjusted when the booth is operating in spray mode</p> <p>After a short period of operation, the set point and actual temperature readings should be the same. In SPRAY mode the temperatures will equalise more quickly than in ECO mode.</p> <p>NOTE – during summer months when the external air temperature is higher than the set point the burner will not fire. The cabin temperature will be the same as the external air temperature. When external air temperature reduces below the set point, the heater will start again</p>	



ID	DESCRIPTION	IMAGE
6	<p><u>Spraybooth cabin pressure balance</u></p> <p>On start up the cabin pressure is displayed</p> <p>Pressure set point is typically set at -10 pa</p> <p>The spraybooth will auto balance cabin pressure. If your booth will not balance it is likely the extract filters need replacing.</p> <p>NOTE – the spraybooth cabin pressure will automatically adjust to compensate for filter blinding. Once the filter is saturated the booth will not be able to maintain a negative pressure. An alarm for ‘Booth Over Pressure’ may be displayed. Advise that exhaust filters are changed</p> <p>When the cabin pressure is either too high or too low and alarm will sound and the spraybooth will automatically shut down. The spraybooth can be restarted.</p> <p>If the exhaust filters are blocked or blinded, they should be changed for new filters and the booth re-balanced. If the fault reoccurs only then please contact JUNAIR.</p> <p>CAUTION – the painter should only start painting if the pressure indicator shows that the booth is operating in negative pressure</p>	
7	<p>The booth will purge air for a pre-set time. The screen will display ‘Purging’.</p> <p>The remaining purge time is indicated on the screen as ‘ECO MODE IN’</p> <p>NOTE – The Purge time is pre-set within Engineer Settings, and is the same in all modes SPRAY, QADs and BAKE.</p> <p>NOTE – The painter can’t spray until purge time is complete</p>	
8	<p>The painter will be able to spray when the following conditions have been met:</p> <ul style="list-style-type: none">• Change over damper in SPRAY position• Input and extract fans are running and pressure switches made• Spraybooth cabin pressure negative• (if fitted) all spraybooth doors closed <p>When the above are all OK then the compressed air solenoid valve will open</p> <p>During painting operation, the system will monitor compressed air use through the spray gun.</p> <p>During this time (if fitted) the red mist clearance lamps will flash outside access doors to warn that there is a potential risk of paint overspray within the cabin</p> <p>On completion of painting the booth will continue in SPRAY mode and the screen will show the Mist Clearance count down timer displayed at ‘ECO MODE IN’ time. During this time the mist clearance lamp continues to flash</p> <p>On completion of the timer the booth will automatically move to ECO mode</p>	

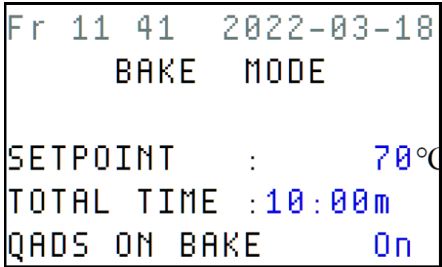
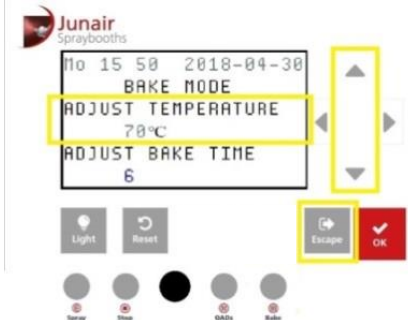
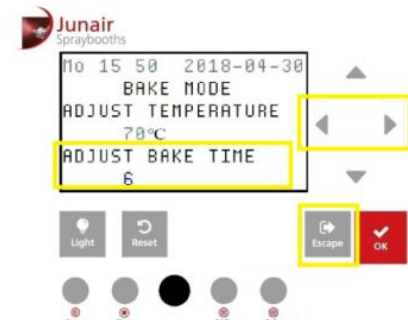
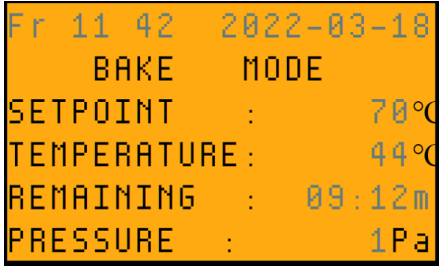


ID	DESCRIPTION	IMAGE
9	<p>ECO MODE overview screen</p> <p>After a period of inactivity in the booth (no spraying taking place) the booth will run through the Mist Clearance time (pre-set time) and the booth will automatically move to ECO mode. The screen will display 'ECO MODE'.</p> <p>The changeover damper will move position and the booth will recirculate airflow. Temperature remains at the same set point as for SPRAY mode. NOTE - for electric heated booths the heating elements have increased lag and the temperature may rise for a short period when moving into ECO mode, and may drop for a short period when moving back to SPRAY mode.</p> <p>Periodically (approx. every 5 minutes) the changeover damper will open for a short time to purge and allow some fresh air then will revert to recirculation mode.</p> <p>Triggering the spray gun will automatically move the booth back into SPRAY mode after a short delay. The changeover damper will revert to SPRAY position.</p> <p>During ECO mode the booth will maintain the pre-set cabin pressure by auto balancing the fans</p> <p>To stop the booth whilst running in ECO mode press the STOP button</p> <p>NOTE – always STOP the booth before opening the main doors to load and unload product or vehicles. If the doors are left open whilst the booth is running in ECO mode the fans will run up to the maximum pre-set level, which will result in a large negative cabin pressure when the doors are closed.</p> <p>If the spraybooth doors have been fitted with limit switches then the auto balance will hold the cabin pressure settings whilst the doors are open.</p> <p>CAUTION - If the door closers are not correctly set or maintained the doors may slam. This may cause damage to the cabin structure.</p> <p>NOTICE - If doors are closed after a prolonged period of running in ECO mode the fans may take 10-15 seconds to auto-balance to the correct pre-set negative cabin pressure. The painter may not be able to push open the door for 5-10 seconds</p>	
10	<p>QADs MODE</p> <p>If QADs are fitted one of the buttons is labelled 'QADs'</p> <p>When the booth is in SPRAY or ECO mode the operator can press the QADs button below the screen to access the QADs screen. Press the button once.</p> <p>The screen will read 'QAD MODE'.</p> <p>Cabin temperature will change to the pre-set value (typically 38 deg C). The booth will run with just airflow and temperature for a short period (typically 3-4 minutes) then the QADs doors will open and the QADs fans will start for the duration of the QADs cycle.</p> <p>To adjust the set point use the UP and DOWN arrow keys to move the cursor to the parameter to be adjusted. Then press ESC and the UP or Down arrows at the same time to increase or decrease in 1°C increments, the temperature set point is displayed on the screen.</p>	

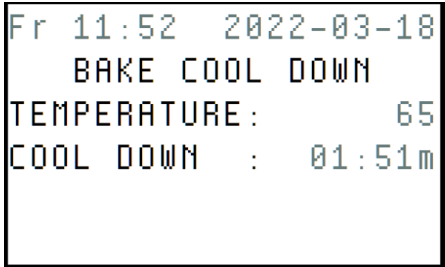
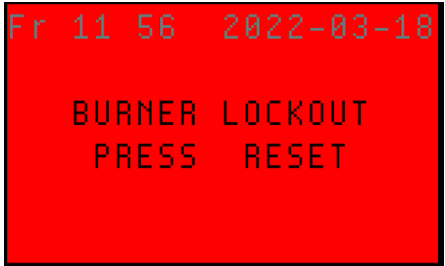


ID	DESCRIPTION	IMAGE
	<p>Press the QADs button again to activate. The screen will turn Orange during QDs mode</p> <p>Pressing the QAD button a further 2 times will stop the QAD mode and put the spraybooth into ECO mode</p> <p>To stop the booth whilst running in QADs mode press the STOP button.</p> <p>NOTE - The system will default to the last settings used in QADs mode so always check</p> <p>NOTE – QADs blower activation can be disabled during QADs cycle if required within the Engineers Settings. If QADs blowers are disabled then the QADs cycle will still operate with elevated temperature for the pre-set time.</p>	
11	The time remaining for the QADs cycle is displayed.	
12	<p>On completion of the QADs cycle the system will automatically run through a short QADs COOL mode and will the return to SPRAY or ECO mode.</p> <p>Remaining time for QADs COOL is displayed</p> <p>Pressing the QAD button 2 times will stop the QAD mode and put the spraybooth into ECO mode</p> <p>On completion of QAD mode the sounder will alarm for a short period of time and will then go off</p>	
13	<p>BAKE MODE</p> <p>To start the bake mode press the “BAKE” button once and check the time and temperature settings are as required then press bake button again to start the cycle.</p> <p>NOTE – booth lights are automatically turned OFF during BAKE mode</p> <p>NOTE - The system will default to the last settings used in bake mode so always check.</p>	



ID	DESCRIPTION	IMAGE
		
14	<p><u>Adjusting the BAKE Cycle Temperature</u></p> <p>To adjust the set point temperature, use the UP and DOWN arrows to move the cursor to the parameter to be adjusted. Then press ESC and the UP or Down arrows keys at the same time to increase or decrease in 1°C increments</p> <p>The system has limits for max and min BAKE temperature set points</p> <p>The temperature set point is displayed on the screen.</p> <p>NOTE - If the temperature is adjusted the operator will need to press the “BAKE” button again to confirm the changes and start the cycle.</p> <p>NOTE - The system will default to the last settings used in BAKE mode so always check</p>	
15	<p><u>Adjusting the Bake Cycle Time</u></p> <p>To adjust the bake cycle time, use the UP and DOWN arrows to move the cursor to the parameter to be adjusted. Then press the ESC button and LEFT or RIGHT arrow keys at the same time.</p> <p>The system has a limit for the maximum BAKE time (99 minutes). Please contact JUNAIR if longer bake times are required</p> <p>The BAKE time is displayed on the screen.</p> <p>NOTE - If the time is adjusted the operator will need to press the “BAKE” button again to confirm the changes and start the cycle.</p> <p>NOTE - The system will default to the last settings used in BAKE mode so always check</p>	
16	<p>During BAKE mode the screen will turn orange and remaining time is displayed on the screen</p>	



ID	DESCRIPTION	IMAGE
17	<p>On completion of the BAKE time, or if the painter presses the STOP button, the booth will move to a cool down mode and this screen will be displayed.</p> <p>The sounder will alarm for a short period of time then stop.</p> <p>The Heater will switch off and the booth temperature will reduce.</p> <p>The timer is adjustable within engineers' settings</p> <p>NOTE – booth lights will automatically be turned back ON on completion of the BAKE mode</p> <p>NOTICE – always allow the booth to come to a controlled stop and allow the COOL DOWN cycle to complete before switching off</p>	
18	<p><u>Fault indication</u></p> <p>Fault indication is provided for burner failure, cabin pressure issues and temperature</p> <p>In the event the spraybooth runs over temperature an alarm will sound and the screen will register over temp fault. This can be reset by pressing the reset button. If the fault re-occurs please call JUNAIR</p>	
19	<p><u>Burner Lockout</u></p> <p>If a burner fault the screen will turn red and will display 'BURNER LOCKOUT' and the alarm will sound.</p> <p>The alarm can be silenced by pressing the 'Reset' button.</p> <p>If the heater system is fitted with a remote reset facility, then the operator can press 'Reset' to reset the burner. Systems without remote reset facility will have a similar box that requests reset on the heater itself.</p> <p>Once the heater is functioning the alarm will reset</p> <p>NOTICE – in the event of repeated Burner Lockouts we would recommend attention at the heater itself.</p> <p>If the fault persists, please call JUNAIR</p> <p>If the booth has an electric heater fitted, w=this fault will be the thermal cut-out having tripped. This needs a local reset by pressing the red button on the thermal cut-out switch.</p>	



2.0 SPRAYBOOTH

2.1 CONTROL SYSTEM

2.14 FAULT GUIDE - eSystem

When an alarm appears on the screen the below tables show the summary, possible cause and action required

EVENT	POSSIBLE CAUSE	ACTION
Fans will not start	<ul style="list-style-type: none">No power to panelFan isolator turned off	<ul style="list-style-type: none">Check main isolator is ONCheck power supply to panel is liveCheck fan isolators are ON
	<ul style="list-style-type: none">Damper failed start sequence	<ul style="list-style-type: none">Check compressed air connection to change over damper solenoid, set at 4 barCheck change over damper flow restrictors are not set closedCheck speed of operation of change over damperCheck security of fixings on change over damper
Control panel fan continuously running	<ul style="list-style-type: none">Control panel door filter blindedControl panel thermostat set too low	<ul style="list-style-type: none">Remove filter and clean or replaceAdjust stat to a correct set point. Typically 30 deg C
Booth over pressure	<ul style="list-style-type: none">Spraybooth exhaust filters need changing	<ul style="list-style-type: none">Change exhaust filters
	<ul style="list-style-type: none">Insufficient 'head room' on exhaust fan speed	<ul style="list-style-type: none">Set input fan speed to reduced speed to allow exhaust fan to ramp to required level to balance cabin pressure at the required level
	<ul style="list-style-type: none">Inlet air too free flowing	<ul style="list-style-type: none">Inlet air may require restriction plate or throttling
	<ul style="list-style-type: none">Exhaust duct restricted	<ul style="list-style-type: none">Check rain flap is opening
Cabin doors blowing open on start up	<ul style="list-style-type: none">Fan VSD ramp speeds set incorrectlyFan operating speeds set incorrectlyObstruction or restriction in	<ul style="list-style-type: none">Adjust and set parameters correctly
Cabin doors blowing open during mode change from SPRAY-BAKE-ECO	<ul style="list-style-type: none">Fan VSD ramp speeds set incorrectly	<ul style="list-style-type: none">Adjust and set parameters correctly
Spraybooth not achieving required temperature	<ul style="list-style-type: none">Gas supply insufficient or turned OFF	<ul style="list-style-type: none">Check gas supply is healthyCheck location of control temperature probe



	<ul style="list-style-type: none">• Temperature control thermostat not correctly located	
	<ul style="list-style-type: none">• Over temp stat set too low	<ul style="list-style-type: none">• Check and adjust over temperature stat setting



2.0 SPRAYBOOTH

2.1 CONTROL SYSTEM

2.15 MAINTENANCE – iSystem & eSystem

General	<ul style="list-style-type: none">• Equipment shall be checked regularly for any dust accumulation which must be removed from all surfaces• Before and whilst any maintenance activity is carried out, it must be ensured that there are no hazardous gases or dusts present.• Equipment is to be fully isolated from the electrical supply before and whilst any work is being carried out• Fan impellers must have come to a complete stop before maintenance operations• Ensure all access hatches are correctly refitted before equipment start-up• Ensure correct use and maintenance of exhaust filters• Any damage or faults should be notified to Junair Spraybooths Ltd immediately• Any replacement parts required must be obtained directly from Junair Spraybooths Ltd. The use of any other parts will void any certification and warranty		
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Service Interval / Operating Hours	Control of	To be inspected / tested	Test result / Method	Date	Initial Responsible person
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Daily					
12 months	General	Control panel ventilation filter	Change if required		
		Vacuum dust from within control panel	Visual inspection		
		Check security of electrical terminal screws			
		Check condition of cabling inside panel and field wiring			
		Check integrity of glands and cable containment			
		Check motor currents			
		Also see Air Handling unit section			



2.0 SPRAYBOOTH

2.1 CONTROLS

2.16 RESET ROLLOWING E-STOP OR LOSS OF POWER

NOTE – Only control systems fitted as iSystem have a safety relay and Red Mushroom Emergency Stop button. eSystem does not have a safety relay or Red Mushroom Emergency Stop button

NOTICE - The EMERGENCY STOP button on the main panel is to be used only in an emergency. To perform a controlled stop of the spraybooth the stop button on the HMI can be pressed at any time.

The main panel has an emergency stop mushroom head button that can be pressed in the event of an emergency. The entire plant associated with that panel will stop.

Following an emergency stop the main panel will need to be reset. The reason for the emergency stop should be investigated and addressed prior to the booth being reset.

NOTE - A loss of power will have the same effect as the e-stop and requires the same reset procedure.

NOTE – stopping a booth with an electric heater without the correct cool down sequence may result in the heater thermal cut-out tripping. This requires a local reset by pressing the red button on the thermal cut-out sensor on the heater

Reset Procedure

- If applicable, twist the mushroom head emergency stop to release it. The button head will spring back out from its locked position.
- 'E-STOP ACTIVATED' will appear as a message on the HMI screen and the inverters will display an error showing either 'SFA' or 'SFB' safety relay has tripped.
- **NOTE** – warning, fans may take seconds to come to a stop and operator should allow the fans to fully stop before attempting to reset or re-start the system.
- On the HMI bezel, press the blue reset button for at least 1 second.
- Press the blue reset button a second time for at least 1 second
- Reset Button is illuminated Blue when the control system has been reset and is healthy
- The sounder will stop, the inverters will reset and the HMI will display the home screen
- The spray booth is now ready to use again.
- **NOTE** – under normal circumstances, the variable speed drives VSD (inverters) will reset. However, if they do not reset, please follow the below procedure.
- **NOTE** – on resetting the E-Stop the booth will need to be restarted

Reset Procedure if Inverters Do Not Reset

- **WARNING** – live electric supply 240V & 415V when control panel is open. Task only to be undertaken by a competent person
- Open the control panel then switch the power on at the isolator. This is to ensure that the fault code will display on the VSD.
- Note the fault code indicated on the VSD display and cross reference the code with the inverter VSD instructions.
- If safe, press the stop/reset button on the inverter keypad.
- **NOTE** - It is now necessary to have another person available to monitor the drive display whilst the booth is re-started.
 - Press the alarm silence button on the HMI touch screen.
 - Press the alarm button on the HMI touch screen to clear the alarm.
 - Re-start the booth and monitor the inverter display panel.
 - If no fault occurs, then close the control panel and continue to use the spray booth as normal.






Fire Alarm

If either iSystem or eSystem controls have been installed with a client fire alarm interface, neither system will operate unless the Fire alarm signal is healthy.

NOTE – client Fire Alarm system status is not shown on the Junair control in any way. Operator should check with building fire alarm system for system status



2.0 SPRAYBOOTH
2.2 FILTERS
2.21 MAINTENANCE

Filters Options:	Exhaust	<p>Polymat^{EX} High-quality G4 (EN 779) synthetic paint arrestor with M5 safety barrier Thickness 45mm Initial pressure drop 69 pa. Final pressure loss 250 pa Supplied as rolls 20m x 1.0m / 0.9m / 0.7m / 0.5m width</p>	
	Exhaust	<p>High Capacity Box Filter Columbus Industries R35 / PC Pleat 490mm x 490mm x 290mm Grade G4 (EN779) Supplied as packs of 4</p>	
	Exhaust	<p>Pleated paper with secondary Polyester Primary Pleated paper 'Binks' filter Pressure differential: Initial 30 pa, maximum 130-250 pa Secondary polyester PST290 grade G4 (EN779) Initial pressure drop 41 pa Binks Supplied per box, 30' x 3' (9.1m x 0.915m) PST290 supplied as rolls 20m x 1m (2m width on special request)</p>	
	Inlet	<p>TA600 M5 (EN 779) premium ceiling filter with tackifier and scrim for high requirements Thickness 22mm Initial pressure drop 32 Pa Supplied in rolls 20m x 1m / 2m or pre-cut pads</p>	
	QADs	<p>TA600 M5 (EN 779) premium filter Thickness 22mm Initial pressure drop 32 Pa Supplied as unit items</p>	



Control Panel	G3 grade (EN 779) Thickness 17mm Supplied individually
Panel & bag filters	Pre-filters Grade G4 pleated panel Dimensions 595mm x 595mm x 50mm deep Bag filters to suit grade M5 / F7 Dimensions to suit application, typically 595mm x 595mm x 500mm deep Supplied individually



General	<ul style="list-style-type: none">• The build-up of paint overspray on the exhaust filters must be monitored by an effective inspection program• All filters should fit tightly in filter frames. If filters do not make a proper seal with the filter frames, unfiltered air and paint overspray will pass to the next part of the system <p>NOTICE – paint overspray bypass due to poorly fitted filters allowing filter bypass will result in paint overspray build up on the air handling unit fan impellers which will go out of balance and will run the bearings within the motor</p> <p>NOTICE – fan impellor balance and motors bearings which are damaged due to overspray build up are not covered under the standard equipment warranty</p> <ul style="list-style-type: none">• Take extreme care to make sure intake filters are installed properly. Improperly installed intake filters will allow unfiltered air into the booth's work area. This unfiltered air may deposit visible dirt particles on the work surface and item being painted.• Keep a set of replacement filters on hand <p>WARNING - Treat used filters and any other paint-contaminated items as flammable products and dispose of them safely</p> <p>WARNING - Improper disposal of used filters may cause spontaneous combustion. You must consult local authorities for proper storage and disposal requirements. Guidelines include:</p> <ul style="list-style-type: none">• Immediately remove all filters from the booth.• Discard filters to a safe, detached location, place them in a non-combustible container with tight-fitting lid, or place them in a water-filled metal container to prevent a possible fire hazard.• Disposal varies depending on the type of paint that is being captured. Consult local authorities for storage and disposal requirements. <p>IMPORTANT – To maintain the equipment warranty and the Hazardous Area Certification the equipment must be used with the filters originally specified by JUNAIR (unless agreed in writing by JUNAIR)</p>		
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Where filter loss gauges are supplied these may be fitted with a RED / GREEN band to provide visual indication for required filter change. Alternatively, the gauge may have a simple scale, and the maintenance person should note the change point at the time of first required change.

Filter loss gauges will either be magnehelic circular dial type, or inclined tube manometers



Service Interval / Operating Hours	Control of	To be inspected / tested	Test result / Method	Date	Initial Responsible person
Daily	General	Check the inlet and exhaust filters are correctly installed with no gaps	Visual inspection No gaps allowed Re-fit filters if incorrectly fitted		
		Check the filters ⁺ are not blinded and at the end of service life ⁺ especially exhaust filters	Visual inspection Magnehelic pressure gauge (if fitted) Change at indicated level of pressure loss		
		Check the spraybooth cabin is operating at negative pressure whilst in spray mode and before painting commences	Visual inspection of cabin pressure indication on operation screen Recommended cabin pressure should be in the range -20 pa to -5 pa		
Every 50-70 Paint Jobs*		Change Exhaust filters	Change filters according to use Change filters immediately if they become saturated sooner than the recommended replacement interval Log running hours Check baffle balance plates are correctly located		
		Paint build-up on exhaust filter frames	Clean overspray from filter retaining frames		
		Debris and dust build up within exhaust filter plenum / chest / pit	Cleaning of all loose dust and debris		
3 months		Check Control panel filter	Replace as required		
6 months / 1500 – 1800 hours operation		Replace Inlet filters	Replacement of inlet filter media Change filters immediately if they become saturated sooner than the recommended replacement interval		
		Replace QADs filters	Replacement of QADs filter media		
Annually		Filter pressure loss gauges	Test operation Check security of air tubes Check zero calibration		
		Sub-floor structure	Check the security and tightness of all sub-floor support structure		
		Control Panel filter	Replacement of control panel filters Change filters immediately if they become saturated sooner than the recommended replacement interval		




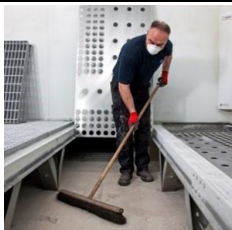


NOTE - * Life expectancy of exhaust filters will vary according to paint system used, frequency of booth use & paint transfer efficiency. JUNAIR do not make a recommendation for expected filter life which may vary according to use and which may vary from the filter manufacturers statements.





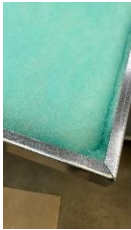








2.0 SPRAYBOOTH
2.2 FILTERS
2.22 SERVICE GUIDE – EXHAUST - POLYMAT^{EX} CONCEALED



IMPORTANT - To maintain the equipment warranty and the Hazardous Area Certification, the instructions contained within this manual must be complied with in full

FILTER REMOVAL – EXHAUST - POLYMAT ^{EX} CONCEALED		
1		<p>NOTICE - Only change filters with the fans turned OFF</p> <p>Remove extract filter access door using an 8mm hex key to release compression lock, then lift handle</p> <p>WARNING – with access doors and filter frames removed there is direct access to fans and rotating elements</p>
2		<p>CAUTION – risk of harmful dusts. Recommend FFP3 face mask be worn, eye protection and gloves</p> <p>Remove filter retaining frame by lifting frame UP, slide bottom of frame FORWARD, move frame DOWN, lean top of frame FORWARD and remove from housing</p> <p>NOTICE – if a build up of overspray paint on the exposed metal faces is difficult to remove, after cleaning and when fitting new filters the exposed metal can be covered with masking tape</p>
3		<p>Loosely roll dirty filters</p> <p>CAUTION - *Do not roll tightly as spontaneous combustion can occur with certain types of paint residue</p> <p>Place in a plastic bag, seal and label as special waste</p> <p>Dispose filters according to the waste disposal authority</p>
4		<p>Sweep and vacuum around the area</p> <p>Clean filter retaining frames and top and bottom retaining channels as required. Scrape of excess paint</p> <p>NB if paint build up is a concern then the exposed faces of the filter frames and retaining channels can be covered with masking tape to facilitate easier future cleaning</p>



FILTER REPLACEMENT – EXHAUST - POLYMAT ^{EX} CONCEALED		
5	 	<p>Cut the filter media to the correct length</p> <p>Filter is supplied on 20m length roll</p> <p>Available width is 1.0m / 0.9m / 0.7m / 0.5m</p> <p>Filter should be cut 10-20mm larger than retaining frame to allow the filter to be slightly 'squashed' when installing to ensure no gaps</p>
6	    	<p>Filter installed with Green / Blue face upstream, and the dense white face downstream (closest to fans)</p> <p>Filter should be laid over the Fast-Fit frame and the edges pushed into the gap. The serrated edge will secure the filter</p> <p>CAUTION – wear gloves due to sharp edges on retaining frame</p> <p>Ensure filter is well held on all sides with no gaps. When the filter is to the correct size and slightly oversized it is a tight fit and needs to be slightly squashed</p> <p>For filters installed beyond 90 deg vertical a security bar is fitted across the face of the filter to prevent sagging. This is inserted across the full width</p>
7	<p>(a) </p> <p>(b) </p> <p>(c) </p> <p>(d) </p>	<p>(a) Fit filter retaining frame into housing</p> <p>Push BOTTOM of frame onto floor inside housing in front of retaining channel</p> <p>Push TOP of frame forward and UP into top retaining channel</p> <p>LIFT bottom of frame UP to top of upper retaining channel, and then push into bottom retaining channel and allow frame to drop DOWN. Frame should be securely held within the top and bottom retaining channels</p> <p>(b) Slide filter frame across to side position and into side retaining channel</p> <p>(c) Repeat for remaining filter frames. The last frame to be installed will be a central frame.</p> <p>(d) With all frames installed push all towards the centre to close any gaps and to ensure no paint bypass.</p> <p>e) In the event of any paint bypass between the frames we recommend the joints are covered with masking tape</p>



8		<p>Replace extract filter access door</p> <p>Place door into lower lip, using handle push into location then using an 8mm hex key to tighten the compression lock</p>
9		<p>On Booth start-up check the booth is balanced - the pressure should be in the -ve pressure zone between -20 pa and -5 pa</p>
10		<p>Record filter change on maintenance log with date and equipment running hours</p> <p>Adjust filter change frequency within maintenance schedule to suit filter life</p>









2.0 SPRAYBOOTH



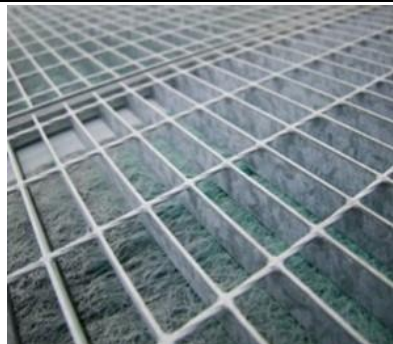


2.2 FILTERS

2.23 SERVICE GUIDE – EXHAUST – POLYMAT^{EX} EVAC / LEVAC / CENTRAL PIT

IMPORTANT - To maintain the equipment warranty and the Hazardous Area Certification, the instructions contained within this manual must be complied with in full

FILTER REMOVAL – EXHAUST - POLYMAT ^{EX} EVAC / LEVAC / CENTRAL PIT		
1		<p>NOTICE - Only change filters with the fans turned OFF</p> <p>CAUTION - Carefully remove the floor grids. The floor grids are heavy (up to 20 kg); operators should check manual handling restrictions before lifting</p> <p>WARNING – with access doors and filter frames removed there is direct access to fans and rotating elements</p>
2		<p>CAUTION – risk of harmful dusts. Recommend FFP3 face mask be worn, eye protection and gloves</p> <p>Remove filter</p> <p>WARNING - Do not walk or drive over the pit or filter baffles while the floor grids are removed</p> <p>NOTICE – if a build-up of overspray paint on the exposed metal faces is difficult to remove, after cleaning and when fitting new filters the exposed metal can be covered with masking tape</p>
3	  	<p>Loosely roll dirty filters</p> <p>CAUTION - *Do not roll tightly as spontaneous combustion can occur with certain types of paint residue</p> <p>Place in a plastic bag, seal and label as special waste</p> <p>Dispose filters according to the waste disposal authority</p>
4		<p>Sweep and vacuum around the area</p> <p>Clean filter retaining frames and top and bottom retaining channels as required. Scrape of excess paint</p> <p>NB if paint build up is a concern then the exposed faces of the top hat support beams or filter frames and retaining channels can be covered with masking tape to facilitate easier future cleaning</p>



FILTER REPLACEMENT – EXHAUST - POLYMAT ^{EX} EVAC / LEVAC / CENTRAL PIT		
5		<p>Measure the required filter length and cut the filter media to the correct length</p> <p>Filter is supplied on 20m length roll</p> <p>Available width is 1.0m / 0.9m / 0.7m / 0.5m.</p> <p>NOTE – replacement filter should be ordered at the nearest size to minimise cost and to minimise trimming required</p> <p>Filter should be cut 10-20mm larger than available filter area</p> <p>IMPORTANT – if the filter is cut too short, do not overlap sections. Cut a fresh section of filter to the correct length</p>
6		<p>Filter is installed with the Green / Blue face upstream, and the dense white face downstream (closest to fans)</p> <p>Ensure filter is well fitted on all sides with no gaps. When the filter is to the correct size and slightly oversized it is a tight fit and needs to be slightly squashed</p> <p>NOTE – filter should be fitted tightly between the top hat floor supports, and not under the floor grids</p>
7		<p>Carefully replace the floor grids ensuring the flat bars are supported by the load bearing struts</p> <p>WARNING - When replacing the floor grids please ensure the flat bars are supported by the support beams. Incorrect replacement can cause the grids to fail.</p> <p>NOTE – where floor grids are square they will be fitted with a security tab to one side. The tab should not rest on the top hat supports.</p> <p>CAUTION – if a tab is not fitting or damaged care required to ensure floor grid is in correct orientation</p> <p>Floor grids for heavier weight application are rectangular so will only fit in one orientation</p>
8		<p>Replace extract filter access door</p> <p>Place door into lower lip, using handle push into location then using an 8mm hex key to tighten the compression lock</p>
9		<p>On Booth start-up check the booth is balanced - the pressure should be in the -ve pressure zone between -20 pa and -5 pa</p>



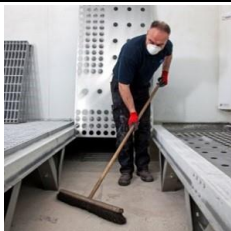





10		<p>Record filter change on maintenance log with date and equipment running hours</p> <p>Adjust filter change frequency within maintenance schedule to suit filter life</p>
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2.0 SPRAYBOOTH
2.2 FILTERS
2.24 SERVICE GUIDE – EXHAUST – HIGH CAPACITY BOX FILTER

IMPORTANT - To maintain the equipment warranty and the Hazardous Area Certification, the instructions contained within this manual must be complied with in full

FILTER CHANGE – EXHAUST – HIGH CAPACITY BOX FILTER		
1		<p>NOTICE - Only change filters with the fans turned OFF</p> <p>CAUTION – risk of harmful dusts. Recommend FFP3 face mask be worn, eye protection and gloves</p>
2		<p>Remove masking tape and withdraw filter</p> <p>Place in a plastic bag, seal and label as special waste</p> <p>Dispose filters according to the waste disposal authority</p> <p>CAUTION – care required with old paint laden filters as spontaneous combustion can occur with certain types of paint residue</p>
3		<p>Sweep and vacuum around the area</p> <p>Clean filter retaining frames and top and bottom retaining channels as required. Scrape of excess paint</p> <p>NB if paint build up is a concern then the exposed faces of the filter frames and surrounding channels can be covered with masking tape to facilitate easier future cleaning</p>
4		<p>Slide new filter into retaining frame, ensuring polyester scrim is to the rear</p> <p>NOTE – filters to be installed with the pleats in the VERTICAL orientation</p>
5		<p>Apply 50mm wide masking tape over joints to prevent particulate bypass</p>
6		<p>On Booth start-up check the booth is balanced - the pressure should be in the -ve pressure zone between -20 pa and -5 pa</p> <p>Adjust filter change frequency within maintenance schedule to suit filter life</p>



2.0 SPRAYBOOTH





2.2 FILTERS

2.25 SERVICE GUIDE – EXHAUST – PLEATED PAPER CONCERTINA FILTER

IMPORTANT - To maintain the equipment warranty and the Hazardous Area Certification, the instructions contained within this manual must be complied with in full

NOTICE – Filter system must be installed with primary Binks pleated paper and secondary polyester PST290 filter. If secondary filter is not fitted, then the exhaust filter is not compliant with exhaust emissions standards. JUNAIR exhaust filter system is designed for use with Standard BINKS filter with a separate polyester media. We do not recommend the use of BINKS super efficiency filter which has integral secondary filter scrim

NOTE – JUNAIR recommend the use of BINKS brand filter rather than other brands.

FILTER CHANGE – EXHAUST – PLEATED PAPER CONCERTINA FILTER		
1		<p>NOTICE - Only change filters with the fans turned OFF</p> <p>CAUTION – risk of harmful dusts. Recommend FFP3 face mask be worn, eye protection and gloves</p>
2		<p>NOTE – for some paint types the filter life for primary filter BINKS pleated can be extended.</p> <p>With fans turned OFF the bang the face of the filter which will release internal deposits. Pull the bottom of the filter away and loose deposits will fall to the floor to be collected for disposal</p>
3	 	<p>Release trapped sides, gather concertina filter together and place in a plastic bag, seal and label as special waste</p> <p>Remove Polyester secondary media, place in a plastic bag, seal and label as special waste</p> <p>Dispose filters according to the waste disposal authority</p> <p>CAUTION – care required with old paint laden filters as spontaneous combustion can occur with certain types of paint residue</p>
4		<p>Sweep and vacuum around the area</p> <p>Clean filter retaining frames and top and bottom retaining channels as required. Scrape of excess paint</p> <p>NB if paint build up is a concern, then the exposed faces of the filter frames and surrounding channels can be covered with masking tape to facilitate easier future cleaning</p>



5	 	<p>For secondary filter media measure the required filter length and cut the filter media to the correct length</p> <p>Filter is supplied on 20m length roll</p> <p>Available width is 1.0m. For secondary filter behind standard pleated paper concertina filter, the required width is 915mm. The top edge can be folded into the retaining frame which aids filter retention</p> <p>Filter should be cut 10-20mm larger than available filter area</p> <p>IMPORTANT – if the filter is cut too short, do not overlap sections. Cut a fresh section of filter to the correct length</p>
6	  	<p>Fit secondary filter media. Ensure filter is well retained on all four sides to prevent particulate bypass</p> <p>NOTE – filter should be installed blue side visible and white (dense) side to the rear.</p>
7	 	<p>BINKS Filter is supplied in a 30' (9m) length. Use scissors to cut to the correct length</p> <p>Pleated paper filter. Ensure sides of filter are trapped in the side retaining angles</p> <p>NOTE – Filter must be installed the correct way up – see arrows printed on the filter for guide</p> <p>NOTE – filter must be stretched to correct width. There is a strap on the rear that should be pulled tight.</p> <p>NOTE – correct pleat spacing is 8 pleats over 12" or each pleat 1 1/2" (8 pleats per 300mm or each pleat 37mm)</p>
8		<p>On Booth start-up check the booth is balanced - the pressure should be in the -ve pressure zone between -20 pa and -5 pa</p> <p>Adjust filter change frequency within maintenance schedule to suit filter life</p>

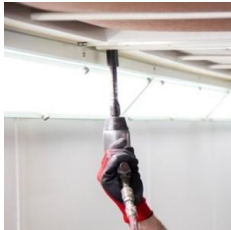







2.0 SPRAYBOOTH






2.2 FILTERS

2.26 SERVICE GUIDE – INLET - CEILING FILTERS


IMPORTANT - To maintain the equipment warranty, the instructions contained within this manual must be complied with in full

FILTER REMOVAL – INLET - CEILING FILTER		
1		<p>NOTICE - Only change filters with the fans turned OFF</p> <p>WARNING – filter change may require working at height. Please ensure necessary precautions are required for safe working at height</p> <p>Back off the retaining screws by 100mm with a 17mm socket. The filter frame does not hinge – the complete frame is lowered by 100mm</p> <p>NOTE – retaining screws are fitted with a captive lock nut to prevent complete removal</p>
		<p>CAUTION – risk of harmful dusts. Recommend FFP3 face mask be worn, eye protection and gloves</p> <p>Remove the old filter media by pulling through from one end</p>
3	 	<p>Loosely roll dirty filters</p> <p>NOTE – inlet filters are not special waste and can be disposed of normally</p>
4		<p>Clean the filter frame and housing before fitting the new filter media</p>
5		<p>If QADs* are fitted it is a good idea to replace the QAD filter at this stage. See section for QADs Filter replacement</p>



FILTER REPLACEMENT – INLET - CEILING FILTERS		
5		<p>Measure the required filter length and cut the filter media to the correct length</p> <p>Filter is supplied on 20m length roll and is available width is 1.0m.</p> <p>NOTE – replacement filter can be ordered to the required exact size to minimise cost and to minimise trimming required</p> <p>Filter should be cut to correct size which is filter frame dimension+0mm / -10mm</p> <p>IMPORTANT – if the filter is cut too short, do not overlap sections. Cut a fresh section of filter to the correct length</p> <p>NOTE - Do not contaminate the new filters with dust or dirty hands. For absolute cleanliness these can be removed using a tack rag by gently wiping the lower scrim face</p>
6		<p>Insert the new filter media by pulling through from one end</p>
7		<p>Tighten the filter clamp screws</p> <p>NOTE – do not overtighten the retaining screws</p>
8		<p>Ensure that a good seal is achieved all-round the filter frame edges</p>
9		<p>NOTE - The over printing on the filter should be visible on the lower face when correctly installed</p>




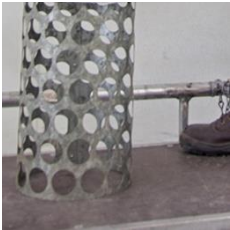





10		On Booth start-up check the booth is balanced - the pressure should be in the -ve pressure zone between -20 pa and -5 pa
11		NOTE – after changing INLET filters we recommend the booth is run for a short period of time to allow any airborne contamination to clear
12		Record filter change on maintenance log with date and equipment running hours Adjust filter change frequency within maintenance schedule to suit filter life



2.0 SPRAYBOOTH
2.2 FILTERS
2.27 SERVICE GUIDE – INLET - QADs FILTERS

IMPORTANT - To maintain the equipment warranty, the instructions contained within this manual must be complied with in full

FILTER REMOVAL & REPLACEMENT – INLET - QADs FILTER		
1		Follow the steps on changing air inlet filters to step 4
2		CAUTION – risk of harmful dusts. Recommend FFP3 face mask be worn, eye protection and gloves Unclip the toggle band retaining the QADs filter sock
3		Remove the filter cage and then remove the filter media from the cage
4		Clean the filter cage and surrounding area
5		Fit new filters onto the cage and re-fit toggle band Ensure filter is tightly locked onto the cage
6	 	Re-fit cage once the filter is fitted The over printing on the filter should be visible on the outer face when correctly installed





2.0 SPRAYBOOTH

2.2 FILTERS

2.28 SERVICE GUIDE – CONTROL PANEL FILTER

IMPORTANT - To maintain the equipment warranty, the instructions contained within this manual must be complied with in full

FILTER REMOVAL & REPLACEMENT – CONTROL PANEL FILTER		
1		<p>DANGER – Ensure control panel is switched off and isolated before filter change</p> <p>Only change the filter mat while the fan rotor is stationary.</p> <p>Never insert your fingers into the fan rotor</p>
2		<p>CAUTION – risk of harmful dusts. Recommend FFP3 face mask be worn, eye protection and gloves</p> <ul style="list-style-type: none">• Pull the top of the grill away from the control panel• Once it is released, the louvred grille can be dropped open by approx. 70° or 90°• If necessary, first place the fine filter mat into the housing• Ensure that the open (roughened) side faces towards the louvred grille• Then insert the enclosed standard filter mat• Now push the louvred grille back onto the enclosure until it snaps audibly into position

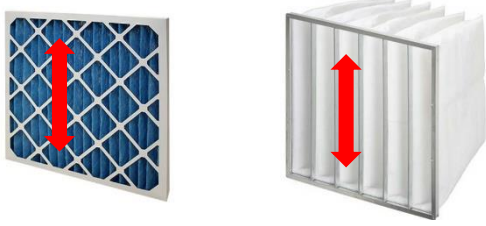
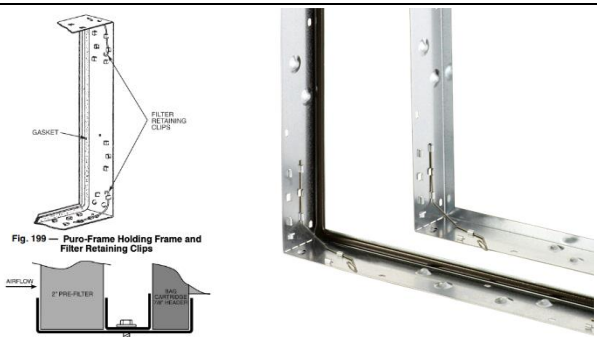


2.0 SPRAYBOOTH

2.2 FILTERS

2.28 SERVICE GUIDE – PANEL & BAG FILTERS

IMPORTANT - To maintain the equipment warranty, the instructions contained within this manual must be complied with in full


FILTER REMOVAL & REPLACEMENT –PANEL & BAG FILTER		
1		DANGER – Ensure control panel is switched off and isolated before filter change Only change the filter mat while the fan rotor is stationary. Never insert your fingers into the fan rotor
2		CAUTION – risk of harmful dusts. Recommend FFP3 face mask be worn, eye protection and gloves
3		Install filters with pleats and pockets vertical to prevent premature dust loading
4		Ensure rubber seal is in good condition Ensure retaining clips are fitted to 4 corners and filter is held securely with no bypass



2.0 SPRAYBOOTH

2.2 FILTERS

2.29 FAULT GUIDE

SYMPTOM	ACTION
Spraybooth cabin running positive or over-pressure or “over pressure alarm” on HMI display	<ul style="list-style-type: none">• Most likely exhaust filters are blinded• Change exhaust filters for fresh filters
Spraybooth cabin running excessive under-pressure	<ul style="list-style-type: none">• Check exhaust filters are correctly installed with no gaps
Excessive paint build-up in exhaust filter plenum	<ul style="list-style-type: none">• Possible exhaust filter bypass• Check exhaust filters are correctly installed with no gaps  <ul style="list-style-type: none">• When the filter is to the correct size and slightly oversized it is a tight fit and needs to be slightly squashed
Exhaust fan impellor vibration	<ul style="list-style-type: none">• Possible overspray build -up on fan impellor due to exhaust filter bypass• Check exhaust filters are correctly installed with no gaps
Exhaust filters binding prematurely or before expected life	<ul style="list-style-type: none">• Check transfer efficiency for painting operation• Check suitability of filter for paints being used in booth• Confirm filter life recommendation from filter supplier
Inlet filters banging or flapping	<ul style="list-style-type: none">• Filter not fitted tight across frame• Filter not correctly trapped to one side• Filter type incorrect and supplied without strengthening scrim to rear• Inlet air baffle needs adjustment – filters flapping is typically due to an area of high speed air movement. Adjust baffle to remove area of high speed air
Dirt inclusions in booth	<ul style="list-style-type: none">• Check inlet filters are correctly installed with no gaps or tears





Airflow being drawn to one side of booth / filters loading in one particular area first	<ul style="list-style-type: none">• Check input & exhaust plenum baffling is installed correctly• If filters have a low pressure loss characteristic when new, then air will preferentially be drawn through the path of least resistance which may be to one side of the booth. After some use paint overspray will be captured in these areas first which will provide a more even pressure loss across the filter and will encourage more even filter loading. In other words, once one area of filter becomes blinded air will be drawn to other areas. Changing filters before they are correctly loaded will exaggerate this – changing filter too frequently can be detrimental to airflow performance• Most booths will have improved airflow performance once inlet and exhaust filters have a level of blinding as this encourages more even flow through the cabin• Airflow readings for LEV should be determined through stack monitoring and not filter air speeds due to the above effects
Filter loss gauge not showing reading	<ul style="list-style-type: none">• Check air connection tubes are connected and not kinked or blocked• Filter fitted may have a very low pressure drop and hence show a small reading• Filter loss gauge may need to be correctly zeroed• Note that the filter pressure loss gauge will only show the correct reading when the spraybooth is operating in full speed SPRAY mode. If the booth is operating in ECO mode the reading will be far lower and will not correctly show
Control panel cooling fan continuously running	<ul style="list-style-type: none">• Likely cause is that the filters on the control panel door are blinded. With the panel switched OFF, remove the filters and clean or replace



2.0 SPRAYBOOTH

2.3 AIR HANDLING UNIT & FANS

2.31 MAINTENANCE

ACCESS	<p>Access to fans is via secure removable access covers which are secured with lockable Hex keys</p> <p>NOTE – access hatch with 4 locks are fitted to pressure side of fans. Negative pressure side of fan hatches have 2 locks</p> <p>Alternative fan access by withdrawing motor and impellor plug from casing</p> <p>WARNING – ensure fan impellor has come to a stop before attempting access</p>		
FANS	<p>Exhaust fans are built to ATEX standard according to EN 14986:2007 and are designed for use only in areas where the Flammable Solvent Vapour Concentration is limited to <25% of LEL</p>		
	<p>The below label will be fitted in a prominent place on the fan case and will be engraved to show the specific Atex operating conditions the fan is rated to run in. These should be observed at all times</p> <div data-bbox="286 778 696 1046"><p>Junair Spraybooths Ltd Southgate Industrial Park Cross Street Heywood Lancashire OL10 1PW</p><p>File Reference: CDxxxx</p><p>  II 3 G E Ex IIA c T5</p><p>Size - 560mm Fan Unit – Spray Booth (Exhaust) Serial No. CDxxxx – AP – xxxx/01 Year xxxx Maximum Speed xxx rpm Motor Power xx kW</p></div> <p>Impeller and casing clearances have been set during manufacture and should not be altered. This should never need adjusting during the serviceable life of the blower.</p> <p>Fans should not be run above the maximum speed as noted on the serial label plate</p> <p>Before installation fans are check for any damage to the packaging or the fan.</p> <ul style="list-style-type: none">Fans should be stored in the original packaging in a dry area protected from the weather or protect it from dirt or weather until final installation. With temperature between -20 deg C and +40 deg C.Avoid exposure to extreme heat and cold.Avoid excessive storage periods (we recommend one year max.) and inspect the motor bearings for proper operation and check the gaps of rotating parts prior to installation.		



	<ul style="list-style-type: none">• Check that anti-spark rubbing bolts and strips are securely and correctly fastened before fan installation• On motors > 15.0 kW check the additional end of shaft locking washer / bush is fixed correctly• Fan sets for exhaust operation should be suitably earthed <p>Fan performance curves are detailed in Appendix 1</p>		
	<p>Inlet fans are built to a similar standard as Exhaust fans, but without ATEX consideration</p> <p>All fan units are tested to the correct supply voltage and running speed prior to them being despatched</p> <p>Do not allow foreign bodies within the fan casing as this may cause impellor and casing damage or cause a spark event</p> <p>Performance data and curves for standard JUNAIR fan systems are listed in Appendix 1 for fan duties: 12,000 m³/hr, 20,000 m³/hr, 25,000 m³/hr, 35,000 m³/hr, Paint Mix Room exhaust</p>		
MOTORS	<p>Motors installed are TEFC motors, Class EFF1 efficiency, class F insulation, Duty S1</p> <ul style="list-style-type: none">• Generally, B5 flange mount. Motors > 11.0kW are B35 mount• Air temperature in area of operation -30 deg C to +40 deg C, site location <1000m above sea level• VENTILATION/COOLING - Motors are surface cooled by means of an external radial flow fan which ventilates the motor irrespective of rotation. The flow of cooling-air over the motor should NOT be obstructed. Special protective measures have to be taken against extremely severe out-door climatic conditions in case of motors installed vertically, or, if motors are exposed to direct sun-ray• LUBRICATION – Sealed for life bearings• Motors are installed outside the hazardous area• Motors over 3.0 kW generally fitted with variable speed drive		
DAMPER	<p>On start of SPRAY cycle the damper will perform an automatic operation check: OPEN then CLOSE. Operator should hear a bang-bang noise</p> <p>Air pressure set point is 4 bar</p> <p>Damper change over speed set using pneumatic cylinder exhaust flow restrictors. Time for position change should be set to 2-3 seconds</p> <p>An electrical limit switch determines damper position in SPARY cycle and not in spray cycle</p> <p>The damper blade has a foam strip to top and bottom for improved seal and noise reduction</p>		
AIR INLET GRILL	<p>The air handling unit has an auxiliary air inlet grill to the side to provide supplementary air during BAKE and ECO modes. The grill should be clear of dust and should be secured during commissioning. If it has moved it should be reset</p>		
HEATER	<p>Air handling unit fitted with either electric heater, direct gas fired heater or heat exchanger. Refer to individual maintenance sections for further advice</p>		
PRESSURE SWITCH	<p>Fans are fitted with airflow proving switches; manufacturer Honeywell, Type DPS200, control voltage 24V DC</p> <ul style="list-style-type: none">• Control system for pressure switches monitors for change of state on start up and also includes de-bounce timer to prevent nuisance triggering• Pressure switches connected to air pick up points using flexible plastic tubing 8mm diameter, and also rigid copper tube 6mm diameter• Set point noted on commissioning sheets• Pressure switch to be mounted in vertical orientation• Pressure switch for exhaust fans to be connected to negative pressure side only		



DUCTWORK	<p>Inlet, exhaust and recirculation ductwork is formed from galvanised mild steel with either slip joints or flanged joints. Construction to DW144 standard</p> <p>CAUTION – sections of ductwork and the air handling unit may become hot to touch during operation. Junair can provide insulation panels if requested, as additional cost</p> <p>Exhaust duct is fitted with a water ingress damper comprising two flaps which open with exhaust flow. With no flow the flaps close and a central and circumferential gutter prevent water ingress to the duct. On start up the flaps will open bang-bang, and also bang.bang on shut down</p> <p>Inlet duct is fitted with an inverted cowl. No mesh fitted as standard to prevent nuisance blocking from leaves</p>		
AIRFLOW testing & LEV	<ul style="list-style-type: none">• The spraybooth cabin falls under the requirements of Local Exhaust Ventilation. According to The Control of Substances Hazardous to Health Regulations 2002, section 9-2, a thorough examination and test of Local Exhaust Ventilation systems should be carried out at least every 14 months (12 months + 2 months leeway)• Procedures for LEV testing is set out in HDG258: Controlling airborne contaminants at work: A guide to local exhaust ventilation (LEV)• The standard LEV test for spraybooths is a Mist Clearance test using smoke clearance as a measure. The results of the annual Mist Clearance test should be clearly displayed by each entrance to the spraybooth• Additional optional warning lamps are available that will flash during the period of spraying and for the duration of the mist clearance test <p>NOTICE – Junair spraybooths may need to be set to a ‘TEST’ mode before undertaking a Mist Clearance test. The standard booth start up when used with iSystem has an extended ramp up to full fan speed in order that we maintain a correct pressure balance in the cabin during this time. The TEST mode allows a faster start up and hence a more realistic Mist Clearance time. Undertaking a Mist Clearance test without TEST mode will result in an extended Mist Clearance time</p> <p>NOTICE – after a Mist Clearance test has been performed, any mist clearance time parameter within the control system should be suitably adjusted</p> <p>NOTICE – ECO mode may need to be disabled for the duration of the mist clearance test</p>		

General	<ul style="list-style-type: none">• Equipment shall be checked regularly for any dust accumulation which must be removed from all surfaces• Before and whilst any maintenance activity is carried out, it must be ensured that there are no hazardous gases or dusts present.• Equipment is to be fully isolated from the electrical supply before and whilst any work is being carried out• Fan impellers must have come to a complete stop before maintenance operations• Ensure all access hatches are correctly refitted before equipment start-up		
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	<ul style="list-style-type: none"> • Ensure correct use and maintenance of exhaust filters • Any damage or faults should be notified to Junair Spraybooths Ltd immediately • Any replacement parts required must be obtained directly from Junair Spraybooths Ltd. The use of any other parts will void any certification and warranty 		
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Service Interval / Operating Hours	Control of	To be inspected / tested	Test result / Method	Date	Initial Responsible person
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Daily					
3 months	General	Check for paint overspray deposits on fan impellers and within fan casing & clean if required	Scrape off any accumulated oil and dust from the fan, inlet, wheel, and other moving parts.		
		Check for paint overspray on control dampers and clean if required	Visual inspection		
		Change over damper	Check air pressure and drain filter regulator		
1000 hrs		Remove dust and debris build up within fan casing			
		Change over damper operation	<ul style="list-style-type: none"> • Full travel • Speed of travel • Air pressure • Correct seating of damper and condition of seals • Limit switch securely fixed & check operation • Check foam seal on damper blade top & bottom 		
		AHU casing, exhaust ductwork, input ductwork checked for leaks			
		AHU Air Inlet grill	Clean dust build up Check security of fixings and check position		
		Pressure switch operation, correct functioning, tubes well secured, tubes blown	Visual inspection, blow through tubes		
		Fan impellor location tightness	Check taper lock bush for tightness Check impellor location correct		
Annually	Fan systems	Check fan shaft seals	Visual inspection		
		Check fan / motor bearings for excessive play			
		Check motor insulation of each phase	Minimum limit 10 MΩ		




		Check motor electrical connections	Cables in good condition, no nicks or signs of overheating Terminal nuts and locknuts tight Earth connection tight		
		Check motor terminal box	Seals and glands correctly fitted and sealing to protection IP65		
		Anti-Spark features	Check anti-spark rubbing strips and screws for security		
	Air Handling Unit	Check all fixings for security			
		Air Handling Unit casing checked for integrity	Check for cracks and broken seals		
	Ductwork	Check inside of exhaust duct for paint build up	Light dusting is acceptable. Heavy deposits to be removed.		
		Check joints for leaks	Inspection of all ducting joints on inlet and exhaust for leaks or splits. Repair as required		
	Airflow	Annual airflow examination	Local Exhaust Ventilation testing in accordance with the requirements as laid out in HSG 258		


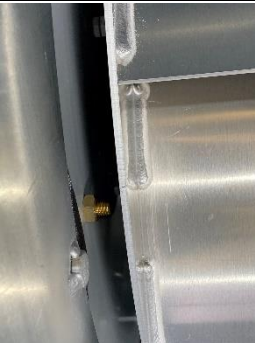


2.0 SPRAYBOOTH
2.3 AIR HANDING UNIT & FANS
2.32 SERVICE GUIDE

To maintain the equipment warranty and the Hazardous Area Certification, the instructions contained within this manual must be complied with in full

1	Access to fan impellor	<p>CAUTION – allow fan impellor to come to a stop before accessing and maintaining</p> <p>CAUTION – isolate compressed air before accessing AHU to prevent unexpected damper movement</p> <p>NOTE – do not over-tighten access hatch fixings as the casing or access door may become deformed</p> <p>Check access door seals for tightness. Replace if worn or damaged or not sealing</p> <p>NOTE – access doors fitted to pressure side of fan (direct fan access) have 4 locks.</p>  <p>Door to left has direct fan access (positive pressure) and is fitted with 4 locks</p>
2	Cleaning Fan Impellor & fan casing	<p>CAUTION – risk of harmful dusts. Recommend FFP3 face mask be worn, eye protection and gloves</p> <p>Scrape off any accumulated oil and dust from the fan, inlet, wheel, and other moving parts. Dispose of any waste safely.</p> <p>NOTE - Accumulated oil and dust can cause an imbalance in the fan's rotation. If the fan is installed in a corrosive or dirty location, you may need to inspect and clean the impellor and other moving parts more often than monthly.</p>
3	Fan belt tension (if applicable)	Check fan belt tension
4	Cleaning fan motors	<p>CAUTION – fan motors which have just been shut down may be hot to touch</p> <p>CAUTION – risk of harmful dusts. Recommend FFP3 face mask be worn, eye protection and gloves</p> <p>Clean exterior surfaces only. Use a rag to remove dust and grease from the motor housing to ensure proper motor cooling</p>
5	Fan removal & refitting	<p>WARNING – Isolate, discontend and make safe electric supply before fan removal</p> <p>CAUTION – equipment weight is > 20 kg so suitable lifting precautions required</p> <p>CAUTION - DO NOT lift the fan and impellor set with a base-plate using the motor eye-bolt. Ensure the lifting gear has the carry capacity.</p> <p>Use engine hoist with sufficient weight capacity and suitably rated slings. Ensure area is clear</p>



		<p>NOTICE – on refitting ensure gasket seal is intact and in good condition. Replace if required</p> <p>NOTICE – after installing fan spin the impellor freely by hand to check for clear rotation</p> <p>NOTICE – after installing fan check fan rotation direction. Note: If the fan rotates backwards, it will still operate but with a reduced performance of around 60% max</p>
6	Pressure switch checking and cleaning	<p>Remove flexible tube from pressure switch noting -ve or +ve connection Blow through tube to ensure no blockages Check all connects to pressure switch, flexible and rigid pipe are secure and intact Check end of rigid tube is not blocked or with build-up of paint material</p> 
7	Cleaning	<p>Remove inspection hatches Sweep out dust and debris Scrape off any paint deposits</p>
8	Anti-spark rubbing screws	 <p>Brass set screws should be checked for security and cleanliness. Ensure sufficient clearance to the impellor</p>



ADJUST BELT TENSION

Belt tension is very important to the proper operation of a fan and to the service life of a V-belt drive. The belts on a new fan are properly adjusted; however, all V-belts stretch in the first few hours of operation. It is necessary to readjust the belt tension after eight hours of running. After approximately 100 hours of running, the belts should be adjusted again. Thereafter, tracking the number of hours the booth is in use and periodic inspection are recommended so belts may be adjusted or replaced when necessary.

WARNING - Operating drives without guards in place can result in severe injury or death. If you remove any guards, make sure you replace them before removing locks and restoring power.

WARNING - Before servicing, lockout/tagout the main electrical service to the device.

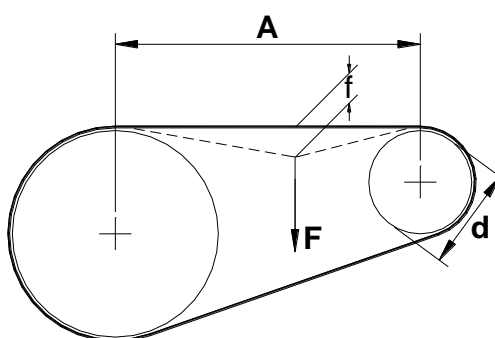
CAUTION - Do not tighten belts by changing the setting of the motor pulley as this changes the fan speed and may damage the motor.

NOTE – Junair recommends the use of anti-static Vee belts when used with exhaust fans

NOTICE - Over-tightening results in too much tension, causing excessive belt wear and noise. Under-tightening results in too little tension, causing slippage at start-up and uneven wear.

- To service an air heater fan: Disconnect and lock out the main electrical service to the air heater.
 - To service an exhaust fan: Disconnect and lock out the main electrical service to the exhaust fan.
1. Check that pulley alignment has not been effected during transport or installation. Pulley misalignment should not exceed $\frac{1}{8}^\circ$ angular and 10mm per meter of drive centre distance axially.
 2. Tension the belts to 1.25* setting force from the table.
 3. Run the drive under load for 20 minutes.
 4. Check the tension and reset to the basic setting value if necessary.
Apply a force “F” as indicated on the sketch, which, if the tension is correct, will give a deflection “f” = 16mm for each 1000mm between pulley centres “A”
The force “F” changes according to the belt section and the size of the smaller pulley (see table)

Belt Section	d (mm)	F (kg)
SPZ	67 to 95	1.0 to 1.5
	100 to 140	1.5 to 2.0
SPA	100 to 132	2.0 to 2.7
	140 to 200	2.8 to 3.5
SPB	160 to 224	3.5 to 5.1
	236 to 315	5.1 to 5.5
SPC	224 to 355	6.1 to 9.4
	375 to 500	9.2 to 12.2





2.0 SPRAYBOOTH
2.3 AIR HANDLING UNIT & FANS
2.33 FAULT GUIDE

PROBLEM	SOLUTION
Fan duty is underperforming	<ul style="list-style-type: none">Check that the rotation of the blower is in accordance with the arrow on the unit. Note: If the fan rotates backwards, it will still operate but with a reduced performance of around 60% max
Fan is noisy and/or vibrating	<ul style="list-style-type: none">Check impellor & casing for damage in shipping or installationCheck fan impellor for loose or missing fixingsCheck fan impellor is tight on drive shaft and is set to correct back plate spacing and inlet cone spacingcheck anti-spark brass screws are tight and not catchingCheck for paint build up on impellor – clean if required using scraper and/or solvent wipe <p>NOTICE – care required when cleaning fan impellor to ensure balance weights are not dislodged and that impellor remains in balance. If in doubt JUNAIR recommend a new impellor is fitted and the dirty impellor is sent for shot blast cleaning and re-balance if required</p>
Fan motor is whining	<ul style="list-style-type: none">Fan motor with control via Variable Frequency Drive (VFD) will whine when running due to the carrier frequency for the control voltage. This is as expected.JUNAIR manufacture a range of acoustic silencers that are available at additional cost if noise is an issue
Change Over damper does not complete start-up check	<ul style="list-style-type: none">Check Compressed air is turned ON and pressure is set to 4 barCheck pneumatic cylinder attachments (Clevis rod end) is securely attachedCheck limit switch is securely attached, and limit switch is correctly aligned to cam profile, and that the limit switch is making and breaking according to the cam positionCheck for internal obstruction of damper movement (access hatch securing screws too long)Check for external obstruction of pneumatic cylinder movement (cylinder cover catching cylinder or arm)Check for pneumatic cylinder speed adjustment. If changeover speed is too slow the control system will TIME-OUT and go to FAULT
Noise on change over damper	<ul style="list-style-type: none">Check foam strip is in good conditionCheck speed of operation
Spraybooth will not achieve BAKE temperature	<ul style="list-style-type: none">Check change over damper has moved fully to BAKE position
Fan Pressure switch failure on start-up	<ul style="list-style-type: none">Check fan isolator is turned to ON positionCheck fan is running with correct rotation directionCheck pressure tube is intact and securely connectedCheck pressure tube is not blocked – blow through as requiredTapping the pressure switch may release a sticky contactCheck pressure setting for switch according to fan speeds and operating temperatures<ul style="list-style-type: none">If fan speed for ECO mode is set too low the fan will generate insufficient pressure to activate switchIf temperature is too high then air density will be too low to activate switchIf switch is set too high then regular fan operation will not activate switch



	<ul style="list-style-type: none">○ If switch is set too low then on stopping the fan the pressure switch will not de-activate and the 'change of state' check will not be made upon subsequent start-up
Water ingress to exhaust duct	<ul style="list-style-type: none">• Check flaps in cowl are not stuck in open position• Check circumferential gutter is well sealed and outlets are not blocked



2.0 SPRAYBOOTH
2.4 LIGHTING
2.41 MAINTENANCE

Lighting Junair UltraLuxLED / SmartluxLED

installed to BS16985:2018 – Harmonised safety standard for spray booths

Wattage: 75 W
Illuminance: 165 lm/w
Photometric value: 84 cri
Power: 500 mA, 75W @ 230V AC, FLC = 0.33A per unit

NOTE – lighting will switch off automatically when the spraybooth is in BAKE mode

NOTE – lighting will remain illuminated in the event of Emergency Stop or fire alarm activation

Glass Transparent impact resistant panels formed with a Glass cover 6mm Toughened safety glass to EN 12150-2 / EN 14449, frosted Glass standard etched to face of glass in visible location

Gasket Die Cut Polyethylene foam, seal > IP54

Glass can be removed from within the spraybooth for luminaire removal, secured with M4 stainless knurled thumb screw caps fitted with nylon washers to prevent overtightening

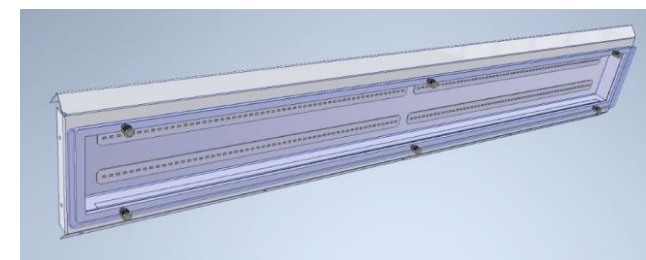
Australian specification lighting is fastened with tamper proof fixings, and the lighting has an external duct cover

WARNING – glass is fixed using thumbscrews. To be tightened finger tight and checked for tightness after 24 hrs as foam can compress

WARNING – do not operate spraybooth with glass covers removed or with damaged seal

The spray booth operates under negative pressure during normal operating conditions therefore no egress of solvent is possible. The spray booth will cut-out if a pressure fault occurs i.e. over pressure ensuring that no solvent release is possible

The light units are non-ATEX rated, and spray booths are [outside the scope of the ATEX directive](#). Mechanical installers are competent and trained on how to install the Junair UltraLuxLED light unit and installation is checked against Junair QC checklist upon completion. There is no requirement for COMPEX training to undertake the installation or maintenance of the light unit, gasket or glass, as long as these instructions are followed.





Emergency Lighting

Where installed emergency lighting will provide > 60 minutes illumination
Design criteria minimum 15 lux for 60 min duration
Refer to BS EN 5266-8 / EN 50172 and BS EN 5266-1: (Code of practice for the emergency lighting of premises)
Test can be performed either with local test switch (if fitted) or alternatively by disconnecting the main electrical supply (turn main isolator OFF)
Emergency lighting will activate upon failure or removal of the normal power source


Mist Clearance Indicator

Optional equipment

- *Flashing red lamp adjacent to each personnel door*
- *Flashes during spray operations and for the duration of the Mist Clearance time*
- *Mist clearance lamp is activated via the spray air flow switch*
- *Run -on timer for mist clearance time can be set and adjusted within the operator HMI screen, and should only be changed by trained maintenance personnel*

Andon Lamp Stack

Where an Andon Lamp Stack is installed it will have colours according to the below table, extract from EN 60204-1

Colour	Meaning	Explanation	Action by operator	Additional description
RED	Emergency	Hazardous Condition	Immediate action to deal with hazardous conditions (for example switching off the machine supply, being alert to the hazardous condition and staying clear of the machine)	<div>Indication: to attract the operators attention or to indicate that a certain task should be performed.</div> <div>The colours RED, YELLOW, BLUE and GREEN are normally used in this mode; for flashing indicator lights and displays.</div> <div>Confirmation: to confirm a command, or a condition, or to confirm the termination of a change or transition period</div> <div>The colour BLUE and WHITE are notmally used in this mode and GREEN may be used in some cases</div> 
YELLOW	Abnormal	Abnormal condition Impending critical condition	Monitoring and/or interention (for example by re-establishing the intended function)	
BLUE	Mandatory	Indication of a condition that requires action by the operator	Mandatory action	
GREEN	Normal	Normal conditions	Optional	
WHITE	Neutral	Other conditions may be used whenever doubt exists about the application of RED, YELLOW, GREEN, BLUE	Monitoring	



General	<ul style="list-style-type: none">• Equipment shall be checked regularly for any dust accumulation which must be removed from all surfaces• Before and whilst any maintenance activity is carried out, it must be ensured that there are no hazardous gases or dusts present.• Equipment is to be fully isolated from the electrical supply before and whilst any work is being carried out• Any damage or faults should be notified to Junair Spraybooths Ltd immediately• Any replacement parts required must be obtained directly from Junair Spraybooths Ltd. The use of any other parts will void any certification and warranty		
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Service Interval / Operating Hours	Control of	To be inspected / tested	Test result / Method	Date	Initial Responsible person
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Daily	Emergency lighting	Indicators of central power supply shall be visually inspected for correct operation	This is a visual inspection of indicators to identify that the system is in a ready condition and does not require a test of operation		
Monthly		Tests shall be carried out as follows:	Switch on in the emergency mode each luminaire and each internally illuminated exit sign (if fitted) from its battery by simulation of a failure of the supply to normal lighting for a period sufficient to ensure that each lamp is illuminated During this period all luminaires and signs shall be checked to ensure they are present, clean and functioning correctly At the end of the test period, the supply to the normal lighting should be restored and any indicator lamps or device checked to ensure that it is showing that the normal supply has been restored		
Annually		As per monthly, with the addition of	Tested to the full rated duration		
Daily	Lighting	Glass covers	Check all glass covers are in place and seals intact		



Monthly		Glass covers - cleaning	Clean any paint overspray from glass covers The gasket will settle after a short period. Re-tighten the screws during installation to ensure a tight seal - check thumbscrews are finger tight		
Annually		Mist Clearance lamp	Undertake LEV test to ascertain booth mist clearance time and reset mist clearance timer within control system		



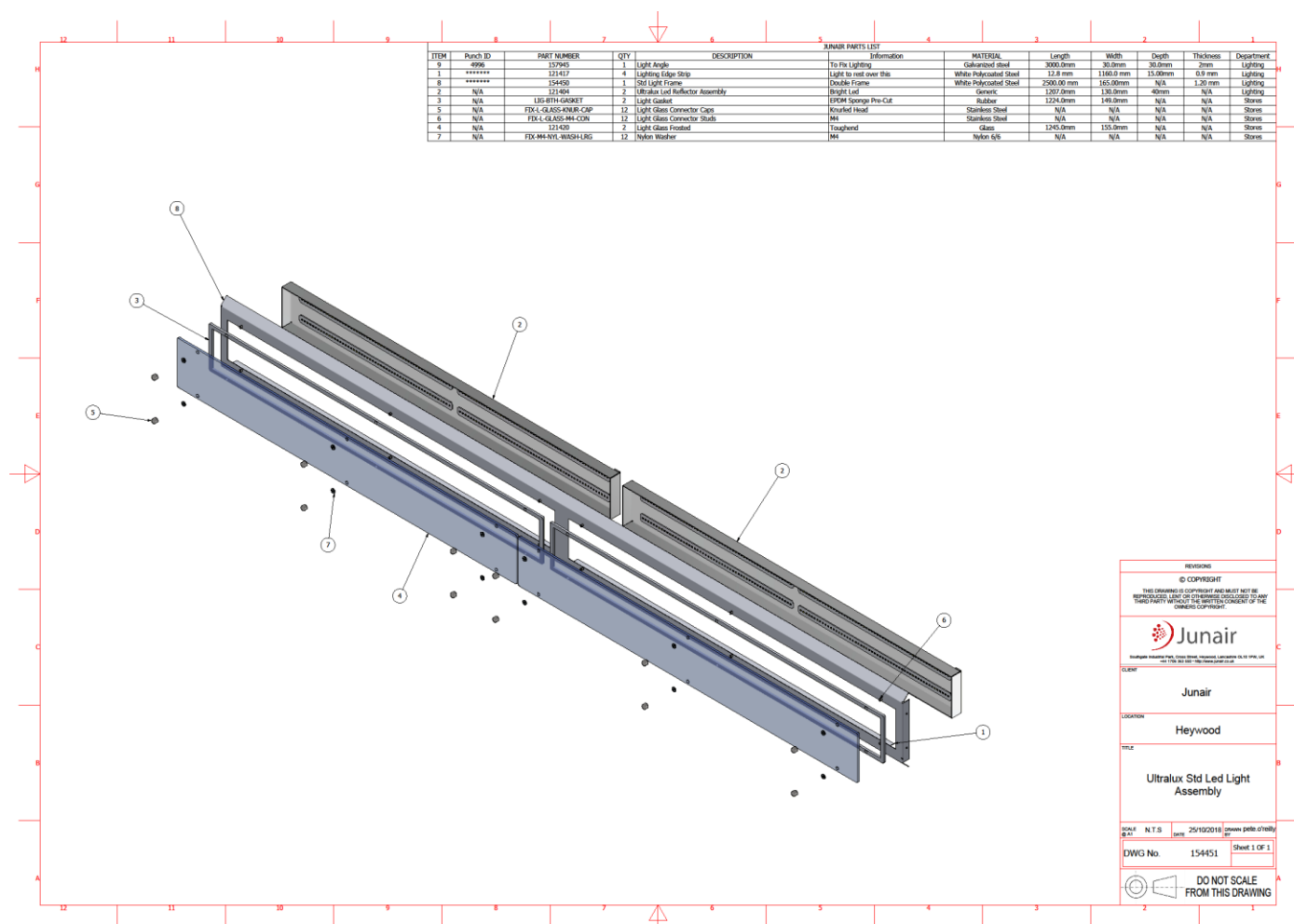
2.0 SPRAYBOOTH

2.4 LIGHTING

2.42 SERVICE GUIDE

To maintain the equipment warranty and the Hazardous Area Certification, the instructions contained within this manual must be complied with in full

1	Glass removal and refitting	<p>WARNING – only undertake glass removal once booth is clear of dusts and fumes</p> <p>Care required when removing fixing screws to ensure parts are not lost</p> <p>Care required with glass due to fragile nature and potential sharp edges</p> <p>Check condition of lighting gasket and replace if damaged in any way</p> <p>When refitting glass panel take care to ensure even tightening of screws.</p> <p>Check security and tightness of screws 24 hrs after fitting</p> <p>WARNING – do not spray solvents with the glass covers removed or cracked</p>
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**2.0 SPRAYBOOTH****2.4 LIGHTING****2.43 FAULT GUIDE**

FAULT	SOLUTION
Lighting won't illuminate	<ul style="list-style-type: none">• Check mains power is turned on• Check booth is not in BAKE mode• Check lighting is switched ON on operator HMI screen• Check fuse (Circuit breaker) within control panel
Single lamp not illuminated	<ul style="list-style-type: none">• Check connection plug for secure fitting• Check cable for damage
Mist clearance lamp does not flash when spraying	<ul style="list-style-type: none">• Check spray gun is connected to compressed air feed that flow switch assembly is connected to• Check flow switch is set to correct set point – if set point is too high then switch will not activate
Mist clearance lamp flashing for incorrect time after spraying	Adjust mist clearance time within operator HMI



2.0 SPRAYBOOTH
2.5 ENCLOSURE & DOORS
2.51 MAINTENANCE

Service Interval / Operating Hours	Control of	To be inspected / tested	Test result / Method	Date	Initial Responsible person
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General	<ul style="list-style-type: none">Equipment shall be checked regularly for any dust accumulation which must be removed from all surfacesBefore and whilst any maintenance activity is carried out, it must be ensured that there are no hazardous gases or dusts present.Equipment is to be fully isolated from the electrical supply before and whilst any work is being carried outAny damage or faults should be notified to Junair Spraybooths Ltd immediatelyAny replacement parts required must be obtained directly from Junair Spraybooths Ltd. The use of any other parts will void any certification and warranty				
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WARNING – any electrical or pipework penetration through the wall or ceiling of the Spraybooth should be sealed to minimum rating IP54

NOTE – Main access door is fitted with a hold open arm are designed to be used only to hold the door in the open position. Strong winds or an uneven location may result in less secure hold open. The hold open arm IS NOT designed to be used as a forceful back stop for door open position. The door leaf acts as a large lever and excessive force acting on the hold open door closer arm WILL BREAK the arm.

Junair recommend that the booth walls and doors are fitted with some form of paint protection to prevent long term build up of overspray paint deposits on the booth. This is a client responsibility and should be installed before first painting operation within the booth. Suitable protective coatings include peelable plastic sticky film, peelable and washable coatings.

In the case of all coatings, the wall surfaces may need a degrease wipe to promote adhesion of the protective film system used.

In the case of peelable or washable coatings, care is required to ensure the coating does not cross-link or bond irreversibly to the booth paint finish. We recommend a small area is tested first

Clear coating systems are available for glass panels (Lighting / doors / windows)

NOTE – doors fitted with hold open devices – the hold open device is a simple system to assist with holding the door in an open position. Its is not a back check. Care is required when operating not to over stress the door closer at the fully open position

BS EN 16985:2018 recognises that spraybooths are not 100% sealed and requires that the booth operates under negative pressure when spraying. As such JUNAIR do not require a 100% seal at door openings.



Service Interval / Operating Hours	Control of	To be inspected / tested	Test result / Method	Date	Initial Responsible person
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ROLLER SHUTTER DOORS

- **CAUTION** - All types of roller shutter doors have counterbalance spring mechanisms under tension. Adjustment or repair must only be carried out by trained personnel.
- Always keep the door opening clear of obstacles when operating.
- Open and close the door using only the handles, chains or electrical controls provided.
- **CAUTION** - Do not operate a door that is obviously damaged. Secure it, place warning signs on both sides of the door opening and contact a suitably qualified maintenance company.
- Do not lean against the door.
- **CAUTION** - Stand clear of the door when in operation and always ensure line of sight when closing to prevent trap hazard
- Any work on electrical equipment must be by a competent electrician who must ensure that the equipment is isolated prior to commencing any work.

To Open	Press the UP button on the starter-unit. The dor may have been configured for 'single touch open' in which case the door will open to full extent after one press on the UP button. In all other cases the UP button must be continuously pressed to open the door The shutter will open to its full height and stop automatically on reaching its limit.
To Close	Ensure clear line of sight and no obstructions in the path of the door Press and hold the DOWN button. The shutter will automatically stop on reaching its bottom limit. When additional safety systems (light beams and lower safety rail) are fitted then the 'Impulse Operation' may be possible. The down button can be pressed and released, and the door will return to its closed position.
To Stop	Press the red "Stop" button.
Adjustment	The standard control unit is GfA TS970. The controller has a function for 'micro-adjustment' of door lathe position for the open and closed position. This is a simple change and can be made by the maintenance person according to the instructions below

In the event of a power failure the motor is fitted with an emergency hand chain mechanism.

To engage hand chain operation the motor should be isolated and then the hauling chain should be lifted onto the chain wheel at high level. The shutter can then be operated by pulling on the chain. It should be noted that the door travel will be very slow due to the gearing of the motor.

When the power is restored the hauling chain will need to be lifted off the chain wheel and onto the interlock switch before the motor can be re-engaged.



Service Interval / Operating Hours	Control of	To be inspected / tested	Test result / Method	Date	Initial Responsible person
Daily	General	Fire escape	Check all fire exits are not blocked and are free to open		
		Roller Shutter operation	Check door operates freely Check any damage to lathes or seals are reported and action taken to carry out necessary repairs. Clean any paint debris from lathes to prevent contamination		
3 months	General	Hinges	Check security of fixings Oil / lubricate if required (silicone free)		
		Door Closer (Briton 2130)	Check that the door closer closes the door correctly and fixing screws are tight. Periodically apply light oil to arm knuckle joints and door hinges		
		Roller Shutter Doors	Check security of seals		
	Wall Coatings	Check all booth internal surfaces are adequately protected from paint overspray	Renew coatings as required		
6 months		Booth protective wall coverings	Change as required		
		Door Closer	Adjust power and closing speed		
		Roller Shutter	Annual maintenance per specific roller shutter door instructions a) Secure and loose fixings. b) Fully inspect all mechanical points. c) Apply lubricants to all relevant parts. d) Check and adjust the spring tension where required. e) Check the motor fixings. f) Check the sprocket / gear alignment. g) Run the shutter and check the limit settings. See summary page 84		
Annually		Booth structure	Check for integrity, security and any gaps Input and exhaust plenums should be checked for air leaks and any defects rectified immediately		
		Door seals	Check for integrity, replace if required		




Service Interval / Operating Hours	Control of	To be inspected / tested	Test result / Method	Date	Initial Responsible person
		Sub-floor	Check the security of all sub-floor structure and fixings		



2.0	SPRAYBOOTH
2.5	ENCLOSURE & DOORS
2.52	SERVICE GUIDE

To maintain the equipment warranty and the Hazardous Area Certification, the instructions contained within this manual must be complied with in full

1		Door rubber Knock on with hammer Replace if worn or ripped
2	Hinges	Door hinges should not need lubricating in normal use An occasional application of Silicone-free lubricant may be required to prevent squeaking

DOOR CLOSERS

Often set up to operate differently depending on the door and surroundings they are situated in, the correct set up of these products is imperative if you are to avoid issues such as doors slamming shut or failing to latch when closed.

The following points cover the main adjustments commonly required and the most common ways in which these changes can be carried out in order to achieve the best results.

Adjusting Valves

To adjust a door closer, it will need to be installed and have the closing arm positioned correctly. If the door closer has a cover, this will need to be removed in order to make adjustments.

To adjust a door closer, you will first need to locate the appropriate hydraulic valve by consulting the instructions or specifications. Next, take the tool needed (this may vary depending upon the design of the door closer) to make the change and turn the valve; this will usually be clockwise to decrease the speed and anticlockwise to increase it. Make sure that you do not completely unscrew any valves as this could cause damage to your door closer, causing it to malfunction or break down completely.

Keep in mind that there isn't an optimum valve configuration, as doors will usually be different widths, sizes and placed in a variety of environments.

After adjusting the valves on your door closer, always check the doors function to ensure that it is opening and closing in a safe and controlled way.

Sweep speed

The sweep speed of a door is the speed taken for the door to move between 150 degrees and 18 degrees. If the door is closing too quickly or slowly, the door closers sweep speed can be adjusted to offer a more suitable pace.

To adjust a door closer with this function, locate the sweep speed valve on the door closer and rotate the valve clockwise to decrease the speed, or anticlockwise to increase it (always consult your door closer's instructions as methods of adjustment may vary). Ensure that you take time to test its functionality until the correct rate at which it opens and closes, is found.

Latching speed

The latching speed of a door is the speed taken for the door to close and latch shut over the last 15 to 0 degrees of its closing phase. As one of the most crucial stages of the closing process, if this phase is too slow the door may not latch, whilst allowing it to close too fast could create a finger-trapping hazard.



To adjust this you will need to locate the latch speed valve and turn it to increase or decrease the latching speed until the door latches safely. When adjusted, the door should allow traffic to safely pass through the door, whilst also latching effectively.

Power setting

If a door closer has a power setting, it will allow you to increase the amount of power exerted through the door to make it close effectively. This is often required if a door is positioned outside in a windy environment, or inside where there is a pressure difference between rooms.

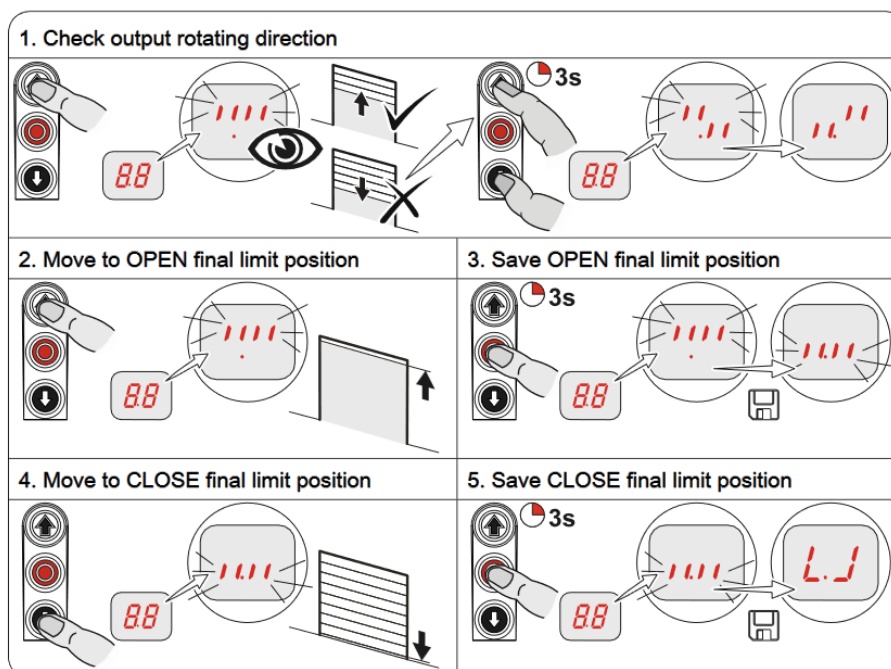
To adjust the power setting, locate the power valve and increase or decrease the power setting until the door closes effectively. Be aware that the latch closing speed and sweep speed may be altered by changing this feature.

Back check

If a door closer has a back check function, the resistance of the door closer can be made proportional to the speed of the opening. For example, if the door was opened quickly there would be a high level of resistance to slow the door's movement down.

To adjust this feature, turn the back check valve to increase or decrease the amount of resistance the door will provide, testing as you go to ensure you achieve the correct speed.

Roller shutter door - Rapid adjustment of final limit positions



Roller Shutter door CLEANING METHODS

- Plastisol Faced Steel / painted finish
 - Some door sections are manufactured from HP 200 plastisol coated steel, which require little maintenance under normal conditions. Any general build up of dust or grime should be removed with a damp cloth using a proprietary soap and water mixture.
- Floor Guide Channels
 - Guide channels should be kept clear of debris build up on a daily basis. Build up may cause the door to jam or not close properly. Simple brushing will suffice.
- Winding Gear, Motor Unit, Barrel Assemblies
 - Winding gear, motor units (electric doors), and barrel assemblies are generally under cover at high level and do not require regular cleaning between planned maintenance periods.
- Cleaning Materials, Solvents etc.
 - Heavy industrial cleaners such as trichloroethylene, paint thinners, formaldehyde, petrol, diesel, sodium bicarbonate or "Gunk" should not be used. Nor should sand or shot blasting techniques, nor oxidizing agents. White spirit may be used to remove graffiti but the door should be thoroughly washed and rinsed using a proprietary soap and water mix afterwards.



Roller Shutter door Service Summary:

CAUTION – work on the roller shutter door will involve working at heights and necessary precautions must be made for safe access

WARNING – always isolate and lock off electrical power before any maintenance activity

NOTE – do not use silicone based lubricants as these will cause paint quality problems

- Securing / supporting bolts checked tightened and replaced where necessary.
- Guide runners removed for inspection of end-caps and integrity of rivets.
- Side guide rails lubricated with appropriate oils (silicone free)
- Guide splays checked for smooth running of shutter curtain.
- Remove underside of canopy cover and check and tighten curtain fixing cleats.
- Retention of the steel spring system applicable if required to manual shutters.
- Check and lubricate all 'Security Bullet Locks'.
- Check and lubricate all 'Central Locks', 'Keep Plates' and 'Locking Bars'.
- Re-set top and bottom 'Stop-Limits' on motors if required.
- Inspect 'Key-switches/Rocker-switches' and clean 'Contacts'. Look for water ingress
- Wiring to shutter motors to Key-switch units inspected and tested for safety.
- Lubricate 'Dummy-end Bearings' on barrel assembly.
- Check and tighten fixings in barrel bearings
- If applicable, Lubricate steel spring shaft system on barrel assembly.
- Provision of all screws, fasteners, fixing bolts and lubricants are included.
- The service should include the submission of a complete Engineers Report, detailing the general condition of roller shutters and appropriate recommendations for repair. Any issues relating to potential Health & Safety Hazards must be reported immediately.



2.0 SPRAYBOOTH
2.5 ENCLOSURE & DOORS
2.53 FAULT GUIDE

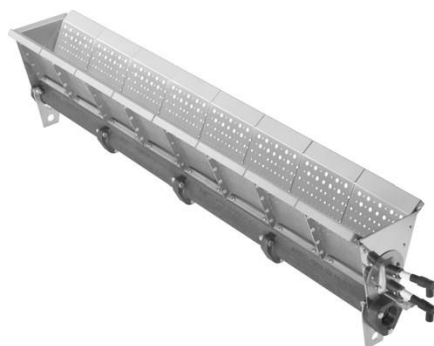
Fault	Symptom	Action
Gaps in door seals	<ul style="list-style-type: none">• Door seal worn• Doors not seated correctly	<ul style="list-style-type: none">• Replace seals as required• Adjust door position
Doors with incorrect gaps / dragging on floor	<ul style="list-style-type: none">• Hinge worn or incorrectly set	<ul style="list-style-type: none">• Replace hinge• Reset hinge positions
Door hinges squeaking	<ul style="list-style-type: none">• Lack of lubrication• Hinge misaligned	<ul style="list-style-type: none">• Lubricate as required (silicone free)• Adjust hinges if required
Door slamming closed	<ul style="list-style-type: none">• Door closer set up incorrect	<ul style="list-style-type: none">• Adjust door closer to suit
Door closer back check snapped	<ul style="list-style-type: none">• Doors being opened too aggressively	<ul style="list-style-type: none">• Care required when operating doors – the door leaf acts as a large lever arm and it is relatively easy to over stress the door closer mechanism
Door closer top-mount failed	<ul style="list-style-type: none">• Doors being opened too aggressively	<ul style="list-style-type: none">• Care required when operating doors – the door leaf acts as a large lever arm and it is relatively easy to over stress the door closer mechanism
Roller shutter fail to open	<ul style="list-style-type: none">• No power to door controller	<ul style="list-style-type: none">• Check power supply
Roller shutter close position incorrect with lathes bunched	<ul style="list-style-type: none">• Close position requires adjustment	<ul style="list-style-type: none">• Make micro-adjustment to close position
Roller shutter open position incorrect	<ul style="list-style-type: none">• Open position requires adjustment	<ul style="list-style-type: none">• Make micro-adjustment to open position
Roller shutter side seals failed or fallen off	<ul style="list-style-type: none">• Securing detail requires attention	<ul style="list-style-type: none">• Add additional glue to seals and replace
Roller shutter dislodging debris to product underneath	<ul style="list-style-type: none">• Cleanliness of shutter• Upper seal set incorrectly	<ul style="list-style-type: none">• Clean lathes as required• Reset top seal – NB position of lathe in relation to seal is different in door open and closed positions and should be set and tested with door in both positions



2.0 SPRAYBOOTH
2.6 HEATER
2.61 BURNER MAINTENANCE

Service Interval / Operating Hours	Control of	To be inspected / tested	Test result / Method	Date	Initial Responsible person
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JUNAIR air heating burners are designed to provide a high efficiency, high turndown, low emission solution for air replacement or “make-up” air heating applications.



Junair Spraybooths Ltd Southgate Industrial Park Cross Street Heywood Lancashire OL10 1PW		File Reference: CD xxxx Serial No. CD xxxx / 0x Manufactured: mm/yyyy
Model: Midco xxx"		Control Circuit: 230 V / 1 Ph / 50 Hz
Fuel: Natural gas		Calorific Value: 38-39 MJ/m ³
Heat Input: xxx kW		Fuel Input: 27 Nm ³ /hr
Fuel Supply Pressure Min:	20 mbar	
Fuel Supply pressure Max:	50 mbar	
Operating head pressure max:	10.5 mbar	
Manufactured in UK	EN 746-2	

The burners are available for both Natural Gas and Propane (LPG) Gas with the fuel only being modulated to achieve a maximum possible turndown ratio of 30:1 dependant on the maximum burner capacity.

Short flame lengths and exceptional flame stability are achieved by the unique combustion head design.

JUNAIR burners operate directly within the heated air flow and can be located either upstream or downstream of the main circulation fan.

JUNAIR air heating burners are generally constructed in accordance with: EN746 Part 2: Safety Requirements for Combustion and Fuel Handling Systems of Industrial Thermoprocessing Equipment.

A date plate will be fitted to the heater similar to noted above which details: maximum and minimum fuel supply pressure, fuel supply type, operating head pressure, burner output

NOTE – If fuel supply pressure is greater than 100 mbar then in accordance with EN746-2 5.2.2.5.2 a high gas pressure switch must be fitted, which Junair can supply as an optional additional heater control upgrade. Details on application to Junair technical department

NOTE – as standard the burner is supplied for use with NATURAL GAS unless specified at the time of order for use with LPG / PROPANE. The burners can be converted following installation and require a replacement Pilot Assembly and recommission. When moving from LPG to Natural gas the size of the gas train should be assessed.



Service Interval / Operating Hours	Control of	To be inspected / tested	Test result / Method	Date	Initial Responsible person
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General	<ul style="list-style-type: none">Equipment shall be checked regularly for any dust accumulation which must be removed from all surfacesBefore and whilst any maintenance activity is carried out, it must be ensured that there are no hazardous gases or dusts present.Equipment is to be fully isolated from the electrical supply before and whilst any work is being carried outAny damage or faults should be notified to Junair Spraybooths Ltd immediatelyAny replacement parts required must be obtained directly from Junair Spraybooths Ltd. The use of any other parts will void any certification and warrantyIt is UK law that JUNAIR air heating burners are installed, commissioned and maintained by competent persons only, e.g. A.C.S. and GAS SAFE registered installers only. In other countries local gas regulations must be observed.				
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Each burner must be fitted with a suitable gas valve train and burner control system conforming to individual local requirements.
In Europe the requirements of EN746 Part 2 should be observed.

Before the burner is connected to a new or existing gas supply, the Local Gas Supply Service Provider must be consulted to ensure that the gas meter and supply are of adequate size for the load required.
JUNAIR's standard gas valve train assembly (available on request) is supplied with a union to enable the quick and safe removal of the gas valve train assembly for maintenance or component replacement.

NOTE – when assembling the union ensure the pipework is correctly aligned and supported to ensure the union washer (if fitted) is not pinched)

The pipework final connections should be made such that it is possible to isolate the gas supply and remove the burner for servicing without removing any gas pipework. Consideration may be given to making the final connection in an armoured flexible gas hose that complies with current standards. The gas supply pipework should be designed and installed in accordance with all relevant standards.

Annually	General	See detailed burner inspection manual	<ol style="list-style-type: none">1. Inspect the flame sensing devices for good condition and cleanliness.2. Check for proper air and gas pressures3. Test all the system alarms for proper response signals.4. Check and clean igniter electrodes.5. Check valve motors and control valves for free, smooth action and adjustment.6. Check for the proper operation of ventilating equipment.7. Test the interlock sequence on all safety equipment.		
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Service Interval / Operating Hours	Control of	To be inspected / tested	Test result / Method	Date	Initial Responsible person
			<ol style="list-style-type: none">8. Manually force each interlock to intentionally fail while at the same time noting if related equipment closes or stops as specified by the manufacturer. Test the flame safeguard by manually shutting off the gas to the burner.9. Test the manual gas shut off cocks for proper operation.10. Clean and/or replace the combustion air blower filter if applicable.		
			<ol style="list-style-type: none">1. Leak test the safety shut-off valves for tightness of closure.2. Test the pressure switch settings by checking the switch movements against pressure settings and comparing these with the actual impulse pressure.3. Visually check igniter cable and connectors.4. Be sure the following components are not damaged or distorted:<ol style="list-style-type: none">a. the burner bodies and air wings.b. the igniter.c. the flame sensors		
			Leave the burner working without interruptions for 10 min. and set rightly all the components stated in this manual. Then carry out a combustion check verifying: <ul style="list-style-type: none">• Content of CO₂ (%)• Content of CO (ppm)• Flue gas temperature (°C)		
		Gas Valve	Check for internal tightness If flow rate has dropped clean the strainer		



2.0 SPRAYBOOTH
2.6 HEATER
2.62 BURNER SERVICE GUIDE

To maintain the equipment warranty, the instructions contained within this manual must be complied with in full

BURNER HEAD PARTS - ISOMETRIC VIEW

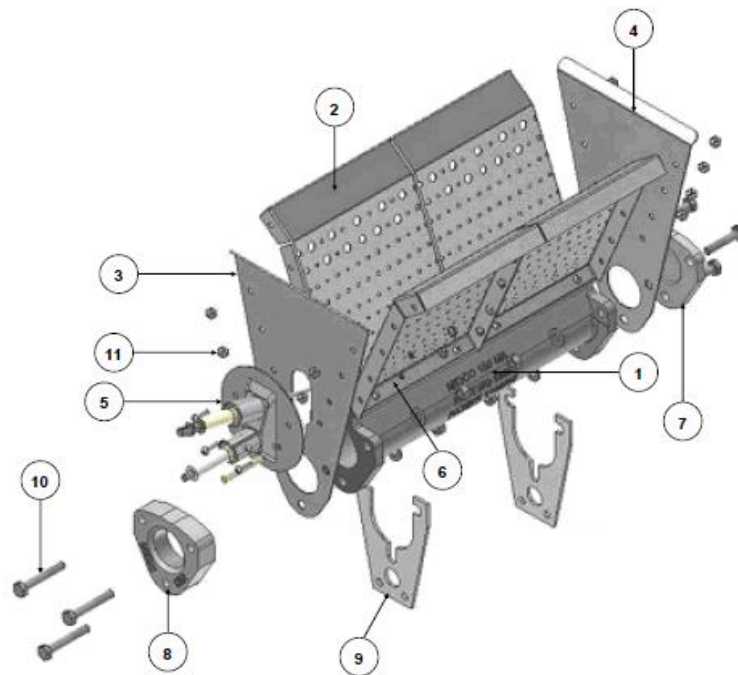


Figure 5 shows typical HMA2A Burner Head Parts

- | | | |
|-----|-----------------------------------|---|
| 1. | Burner Casting | 8" & 12" , Cast Iron & Aluminium Sections |
| 2. | HMA2 6" Baffle | Part M1393-10 |
| 3. | HMA Pilot End Plate | Part M1393-60 |
| 4. | HMA Blank End Plate | Part M1354-50 |
| 5. | Pilot Assembly | Various options are available. |
| 6. | Baffle Clamp | Part M1356-00 |
| 7. | Blank Flange | Part M1372-02 |
| 8. | Inlet Flange | Part M1352-20 (1.1/2" BSP) |
| 9. | Support Bracket | Part M1234-02 |
| 10. | 5/16-18x1 1/2" Hex Head Cap Screw | |
| 11. | S62 Steel Rivet Body | |

N.B. Repair kits are available for 8" & 12" baffle sections.

- | | |
|-----------------------------|---------------|
| HMA2A 6" Baffle Repair Kit | Part M1234-37 |
| HMA2A 12" Baffle Repair Kit | Part M1234-38 |



PILOT ASSEMBLY - MOUNTING DETAILS

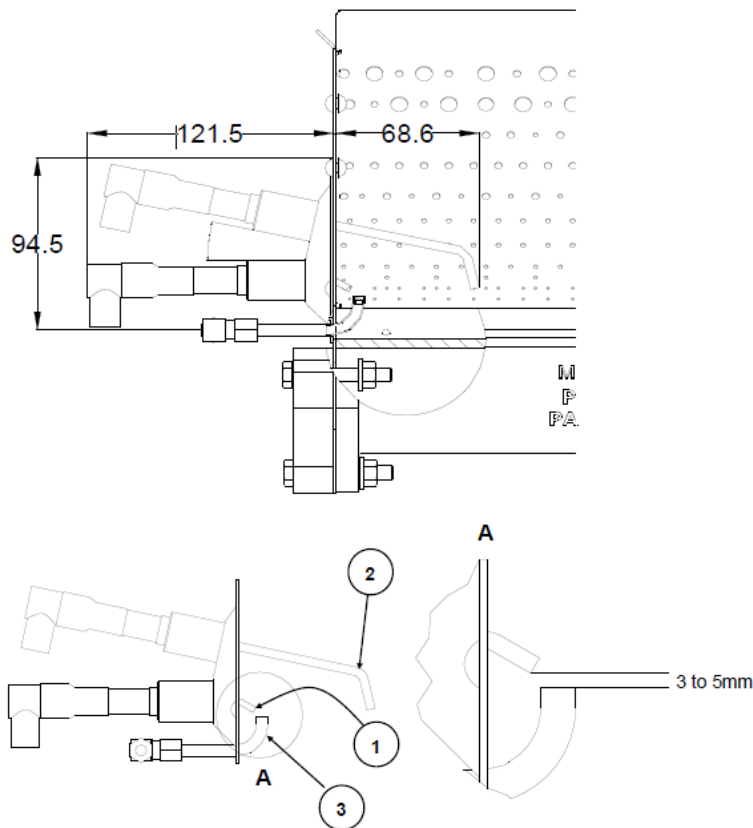


Figure 6 shows the HMA2A Pilot Assembly mounting details including:

1. Ignition Electrode - Electrode Assembly is Part No. M1342 -95
2. Flame Sensing Electrode - Electrode Assembly is Part No. M1360-05 N.B. A UV cell is available as an option.
3. Pilot Gas Burner - Various options are available.

HMA2A SERIES BURNER HEAD

To clean and inspect the burner head assembly the following instructions should be followed:

- Isolate the gas and electrical supply to the burner.
- Remove the duct access hatch to enable work to be completed on the burner head assembly in its current position.
- The burner head will typically have a light covering of dust on the baffles and any associated pipework. This should be removed with a lint free cloth or a soft brush and vacuumed up as necessary. The dust must be treated with care and a disposable mask and safety goggles should be worn to prevent irritation.
- The burner electrodes should be checked for their serviceability and if found faulty they must be replaced.
- The ignition and flame sensing electrodes should be set as shown in figure 6 section 2. A U.V. Cell may be used as an alternative method of flame sensing and if installed, should be cleaned to remove any dust particles.
- Upon completion of the cleaning process, all services and supplies to the burner should be reinstated.

IGNITION/ FLAME SENSING ELECTRODES

To replace the ignition electrode and/or the flame sensing electrode/U.V. Cell the following instructions should be followed:

- Isolate the gas supply and electrical supply to the burner.
- Remove the duct access hatch to enable work to be completed on the burner head assembly in its current position.
- If a U.V. Cell is fitted, remove the unit from the fixing collar.
- Individual electrodes can be replaced in situ providing there is adequate space to access the burner pilot assembly. The fixing screw located on the electrode fixing collar will need to be loosened so that the required electrode can be withdrawn from its position. The complete pilot assembly can also be removed if required. The position of the electrodes should be set as shown in figure 6 Section 2.



- The performance of the electrode(s) and U.V. Cell (if fitted) should be checked by starting the burner and checking for satisfactory ignition and flame detection signal.

HMA2A BURNER HEAD ASSEMBLY

To replace the burner head assembly the following instructions should be followed:

- Isolate the gas supply and electrical supply to the burner.
- The burner head assembly can be extracted from the duct once the associated gas valve train has been suitably removed (this can usually be done by breaking the union on the gas valve train assembly). It should now be possible to remove the burner head assembly.
- If the burner is to be left unattended then the incoming gas supply must be capped off, it must not be left isolated at the isolating gas ball valve alone.
- The burner head assembly can now be removed from any associated support pipework and the replacement can now be installed.
- The position of the electrodes should be checked and set as shown in figure 6 Section 2.
- The burner head assembly can now be re-installed into the duct with the gas connection being re-instated and checked for its integrity.
- The burner settings must be checked, set and recorded accordingly

RECOMMENDED BURNER HEAD PRESSURES

Natural Gas

Air Handling Unit Model	Burner	Operating Burner Head Pressure (mbar)	Maximum Burner Head Pressure (mbar)
4,000 m ³ /hr	6" (88kW capacity) 37kW running	2.2	12.5
12,000 m ³ /hr	12" (176kW capacity) 110kW running	4.9	12.5
20,000 m ³ /hr	18" (264kW capacity) 183kW running	6.1	12.5
25,000 m ³ /hr	18" (264kW capacity) 229kW running	9.4	12.5
35,000 m ³ /hr	24" (352kW capacity) 319kW running	10.3	12.5
45,000 m ³ /hr	30" (440kW capacity) 410kW running	10.9	12.5

**2.0 SPRAYBOOTH****2.6 HEATER****2.63 BURNER FAULT GUIDE**

SYMPTOM	CAUSE	REMEDY
Burner light up sequence does not start	No electrical supply	<ul style="list-style-type: none">• Check electrical supply at local isolator• Check the control fuse
	Burner electrical control circuits are not in 'start up' condition.	<ul style="list-style-type: none">• Check controls and switches in control circuit.• Check all pressure switches and micro-switches.
	Airflow pressure switch not made.	<ul style="list-style-type: none">• Check setting on switch if this is correct check the airflow
	Low gas pressure switch not made	<ul style="list-style-type: none">• Check setting on switch.• If this is correct check the gas pressure.
Start Cycle begins but burner locks out or shuts down before initiating the ignition sequence.	Low combustion air pressure differential	<ul style="list-style-type: none">• Reset burner pressure switch P1• If pressure switch P1 is set correctly open the air damper on the combustion air fan.• Check that the combustion air fan motor is rotating in the correct direction.• Check that the combustion air fan is running, if not check the overload or circuit breakers.
Pilot does not light	No spark	<ul style="list-style-type: none">• Check electrical supply to ignition transformer• Check electrical connection to spark plug• Check operation of ignition transformer.• Check condition of spark plug and clean, reset or replace.
	No pilot gas	<ul style="list-style-type: none">• Check manual valve open• Check that pilot solenoid valve opens• Ensure gas is available at burner
	Not enough pilot gas	<ul style="list-style-type: none">• Check pilot gas flow adjuster and pilot gas regulator
	Pilot blown out	<ul style="list-style-type: none">• Reduce process air flow if possible• Increase pilot gas rate
Pilot lights but locks out when ignition de-energised	Pilot gas rate too low	<ul style="list-style-type: none">• Adjust pilot gas rate



Pilot lights but the burner locks out before the main valves are energised	Flame sensor not detecting the flame Faulty sensor	<ul style="list-style-type: none"> • Check sensor for damage or moisture. • Clean flame sensor • Check flame sensor installation and position • Replace sensor
Main flame does not light and burner locks out at the end of the pilot phase.	Faulty main shut off valve.	<ul style="list-style-type: none"> • Check electrical supply to valve. • Check condition of the valve, if faulty, replace
	No main gas	<ul style="list-style-type: none"> • Check manual valve open • Check the adjustment of the gas control valve. • Ensure gas is available at burner
	Not enough main gas	<ul style="list-style-type: none"> • Check main gas flow adjuster and main gas regulator
Main flame lights but shuts down after a short period of time	Pilot gas rate too high	<ul style="list-style-type: none"> • Adjust pilot gas rate
	Control circuit operating	<ul style="list-style-type: none"> • Check control circuit, over temperature limits etc.
	Burner gas or air-ports blocked	<ul style="list-style-type: none"> • Check and clean. • Identify source of blockage and rectify
	Flame sensor not detecting the flame	<ul style="list-style-type: none"> • Over firing and flame is 'lifting off' reset main flame firing rate • Check flame sensor installation and position • Check the main gas pressure governor
Flame failure (lockout) during normal main flame operation.	Faulty main shut off valve.	<ul style="list-style-type: none"> • Check electrical supply to valve. • Check condition of the valve if faulty, replace.
	No main gas	<ul style="list-style-type: none"> • Check manual valve open • Check the adjustment of the gas control valve. • Ensure gas is available at burner
	Not enough main gas	<ul style="list-style-type: none"> • Check main gas flow adjuster and main gas regulator
	Low fire set too low	<ul style="list-style-type: none"> • Check and adjust
	Control circuit operating	<ul style="list-style-type: none"> • Check control circuit, over temperature limits etc
	Burner gas or air ports blocked	<ul style="list-style-type: none"> • Check and clean. • Identify source of blockage and rectify



	Flame sensor not detecting the flame Combustion air failure	<ul style="list-style-type: none">• Over firing and flame is 'lifting off' reset main flame firing rate• Check flame sensor installation and position• Inspect combustion air fan for damage• Check fan overloads• Check air filter (if fitted) and clean if necessary
Flame failure (lockout) at low fire	Faulty low fire bypass valve (high low burners only).	<ul style="list-style-type: none">• Check electrical supply to valve.• Check condition of the valve if faulty, replace.
	Low fire flame set too low.	<ul style="list-style-type: none">• Check the adjustment of the gas control valve.• Ensure gas is available at burner
	Too much air	<ul style="list-style-type: none">• Check and reset air at high and low fire
	Low fire air set too low (modulating gas and air burners only)	<ul style="list-style-type: none">• Check and adjust
	Control circuit operating due to temperature 'creep'	<ul style="list-style-type: none">• Check control circuit, over temperature limits and low fire settings.
	Flame sensor not detecting the flame	<ul style="list-style-type: none">• Check flame sensor installation and position
Main flame too long	Too much gas	<ul style="list-style-type: none">• Check main gas pressure and reset• Check gas control valve and reset• Check fuel type
	Combustion air set too low	<ul style="list-style-type: none">• Check air dampers, linkages and air filter (where fitted)



2.0 SPRAYBOOTH

2.6 HEATER

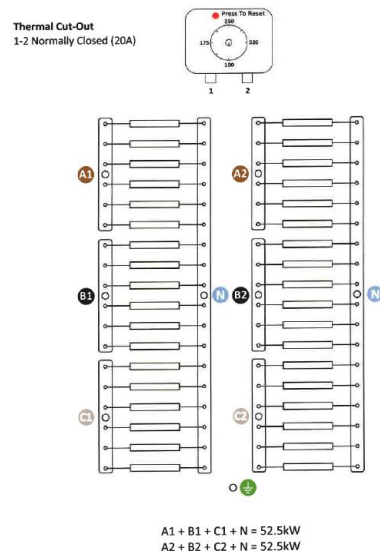
2.64 ELECTRIC HEATER

The heating system installed can be with electric heating (Junair eBooth)

In this case the gas burner duct section is removed and an electric heater battery is installed within a duct section in place of the gas heater duct section.

- The fans are fitted with a run-on timer to dissipate any residual heat when the system switches off
- **NOTE** – in the event of a power outage or emergency stop event the residual heat in the elements might trip the thermal cut out sensor, which will need to be manually reset once the system has cooled
- The heater is installed with the thermal cut-out sensor above the elements
- The thermal cut-out is wired into the safety circuit so that the electrical supply to the heater is isolated in the event of the thermal cut out operating
- **NOTE** – in cases where the airflow is not laminar over the elements, an air deflector local to the thermal cut-out sensor may be required to ensure the sensor is not located in an area of no airflow
- The heaters are suitable for 3 or 4 wire operation as the phases are balanced. They have a neutral connection which forms the 'star point', but it is not necessary to wire to the neutral
- Heaters used by Junair are commonly split across two stages, for example a 105 kW rated heater will have two sets of connections and is configured as 2 x 52.5 kw heaters within the same common housing
- Allowable tolerance on the heater is 7%

Terminal Layout Diagram



- The Thermal cut out is linked to the control system and will alarm on the operator panel in the event of it being activated. Reset is always by manually pressing the red button to reset, once the heater has cooled and the thermal cut out reset

Maintenance Instructions

1. **WARNING** - Isolate from mains supply. This may require the main control panel to be isolated
2. Allow the system to cool before working on it
3. Check the heating elements for damage (i.e. cracks and ruptures)
4. Check all metalwork for damage (i.e. cracks and distortion)
5. Check the element support and check that the fixing screws are tight
6. Remove the terminal cover
7. Remove any accumulation of dust and/or moisture
8. Check that the incoming cables are in good condition. Make sure that they are firmly fixed and that the nuts are tight
9. Check the condition of the element terminations and ensure that the nuts are tight (do not overtighten. Check the nuts with fingers and if any are loose, tighten down lightly with a spanner)
10. If everything is satisfactory. Refit the terminal enclosure cover and switch on



2.0 SPRAYBOOTH
2.7 QADs
2.71 MAINTENANCE

Service Interval / Operating Hours	Control of	To be inspected / tested	Test result / Method	Date	Initial Responsible person
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Junair Quality Air Drying Systems (QADs) complete with On-Bake option comprise of 4 modules, one mounted in each corner.

- Fully automatic control system. Adjustable temperature and blowing timer at the control panel.
- Each QADS™ system having two roof mounted fans with inlet filters. Front set of modules are served by fan number 1, back modules are served by fan number 2.
- Each module incorporates 8 No. fully adjustable high velocity jet nozzles. An adjustment tool has been supplied for accurate positioning of nozzles to give optimum air flow direction.

The airflow from the QADs System is designed to disrupt the air moving over a painted surface during flash off and bake cycles. During the “flash off” cycle this air disruption speeds up the removal of solvent or water from the coating. During the “baking” cycle the auxiliary air movement speeds up the increase in panel temperature, thus shortening the baking process. The direction of the auxiliary air movement is key to the efficiency of the flash off and baking performance.

Heated air is taken from the spraybooth plenum chamber, via the fan units, and is delivered to the cabin through a system of steel ductwork connecting to the four QADs towers. There are 2 no. high pressure centrifugal fan units each rated at 2,000 m³/hr.

Each tower has 8 No. adjustable nozzles to direct this airflow against the painted surface.

OPERATION

You must follow your paint manufactures technical painting procedures correctly and ensure that gun set-ups are correct for the material being applied.

- When activated the Junair QADs draw clean air from the roof plenum chamber through a 10-micron filter down to several towers located within the spray booth each tower having several directional nozzles.
- A QAD adjuster bar provided will help you set up the nozzles correctly.
- The only compressed air required is to automatically open and close the QAD doors, a unique feature of the Junair QADs.

NOTE – care should be taken NOT to get tacky booth coating on the pneumatic rams on the bottom of the QADS towers or the operation of the doors can be affected.

1. Always ensure that the masking is tight to the job to prevent the sheeting flapping into wet paint when the QADs are activated.
2. All dirt and dust must be blown off the job outside the Booth and prior to the QADs being activated, otherwise the air turbulence from the QADs could blow loose dirt into the wet paint film.
3. QAD nozzles and the area around the automatic QAD doors must always be regularly wiped down with a tacky rag to keep the area dust free. Once daily is recommended.
4. Always check that the QAD nozzles are set up for the job you are about to paint, every job could have a different area to concentrate the nozzles on.
5. Never aim the nozzles directly at the floor



Service Interval / Operating Hours	Control of	To be inspected / tested	Test result / Method	Date	Initial Responsible person
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6. Panel stands must be as clean as possible, loose dirt can be blown onto your painted panels.
7. Roofs dry better if you aim the nozzles to the centre of the screens – this causes the most effective “shearing” of the downward airflow.

QADs on Bake

When you turn your spraybooth onto bake the Junair QADs will start automatically.

This ensures you get an even temperature all around the cabin and eliminates cold spots. Panel temperatures will also be even, ensuring thorough curing and faster baking times.

This will help you achieve more throughputs from your spraybooth oven, ensuring all procedures are adhered to from Junair and your paint suppliers


General	<ul style="list-style-type: none">Equipment shall be checked regularly for any dust accumulation which must be removed from all surfacesBefore and whilst any maintenance activity is carried out, it must be ensured that there are no hazardous gases or dusts present.Equipment is to be fully isolated from the electrical supply before and whilst any work is being carried outAny damage or faults should be notified to Junair Spraybooths Ltd immediatelyAny replacement parts required must be obtained directly from Junair Spraybooths Ltd. The use of any other parts will void any certification and warranty		
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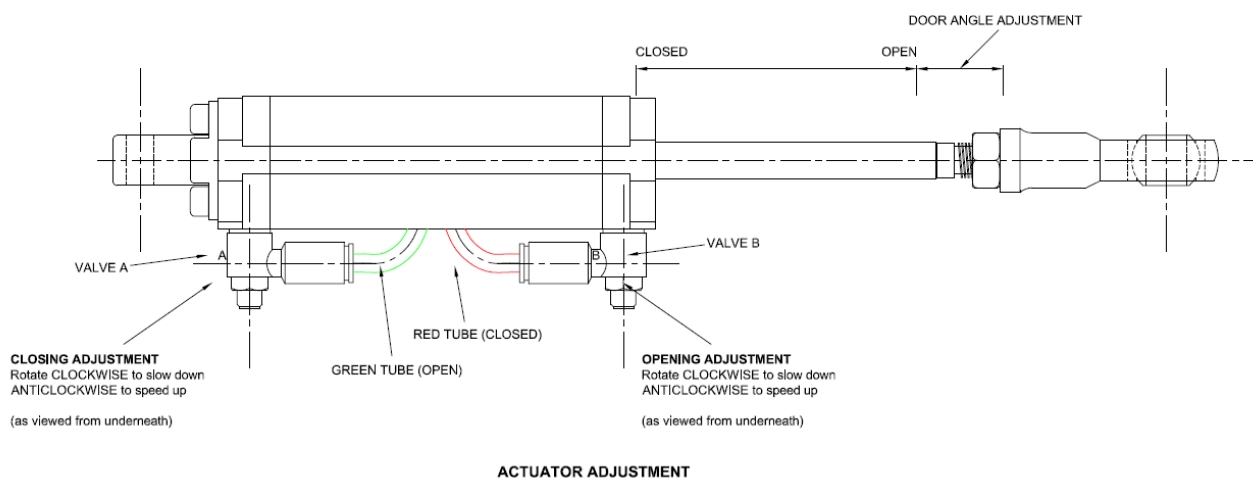
Daily	General	Obstructions in front of QADs	Remove any obstructions		
Weekly	General	Cleanliness	Clean QADs nozzles & any paint build up on QADs door and pneumatic cylinder		
		QADs effectiveness	Check QADs nozzles are pointing in the right direction, adjust using QAD bar as required		
Annually					



2.0 SPRAYBOOTH
2.7 QADs
2.72 SERVICE GUIDE

To maintain the equipment warranty and the Hazardous Area Certification, the instructions contained within this manual must be complied with in full

1		<p>QAD cylinder</p> <p>Clean off dirt from exposed cylinder shaft</p> <p>Check full opening & closing and adjust rod clevis position as required</p> <p>Clean nozzles</p> <p>Check nylon tubes are OK</p> <p>Check air pressure</p>
2	QADs Nozzle Adjustment	<p>Before operating the equipment check that the QADs nozzles are adjusted correctly.</p> <p>The QADs nozzles should be adjusted - using the bar provided - as per the diagram in the drawing section of this manual.</p> <p>NOTE - None of the QADs nozzles should be positioned where the airflow is directed towards the floor as this is likely to cause possible dirt contamination.</p>
3		Change QADs Filter




**2.0 SPRAYBOOTH****2.7 QADs****2.73 FAULT GUIDE**

Fault	Symptom	Corrective action
Excessive dust movement within the cabin	<ul style="list-style-type: none">• Bottom nozzles set or angled too low – angle them up slightly (not below horizontal)	<ul style="list-style-type: none">• Readjust nozzles
Paint blistering	<ul style="list-style-type: none">• QADs ON-delay too short	<ul style="list-style-type: none">• Adjust timer
QADs Door not opening	<ul style="list-style-type: none">• No Air pressure• Pneumatic cylinder linkage failed	<ul style="list-style-type: none">• Check air pressure – set to 3 bar• Check linkage is secure and correct
QADs Doors not correctly opening	<ul style="list-style-type: none">• Pneumatic cylinder linkage not set correctly	<ul style="list-style-type: none">• Check linkages and end clevis settings
No Air movement	<ul style="list-style-type: none">• QADs activation switched OFF• QADs fan tripped	<ul style="list-style-type: none">• Check control settings• Check control panel for fan contactor tripping
Low air movement	<ul style="list-style-type: none">• QADs filter blocked• QADs fan running in incorrect direction	<ul style="list-style-type: none">• Change QADs filters• Check fan rotation



2.0 SPRAYBOOTH
2.9 FILTER REGULATOR & COMPRESSED AIR FLOW SWITCH
2.91 MAINTENANCE

Service Interval / Operating Hours	Control of	To be inspected / tested	Test result / Method	Date	Initial Responsible person
Model:	Filter Regulator DeVilbiss: Pro-Air 3	 Air supply connection Air outlet connections Gauge Port Gauge range Maximum: Flow Rate Air supply pressure Regulated air pressure Operating temperature Degree of filtration Output air quality class Element life Condensate drain Suitable for use in hazardous area Protection level	 ½" BSP Female ¼" BSP Male x 2 with shut off valve 1/8" BSP female 0-11 bar (0-160 psi) 900 l/min 13 bar 8 bar 80 deg C ISO 8573-1: 1.7.1 1000 hrs Semi-Automatic zone 1 II 2G IIB D c T5		
General	<ul style="list-style-type: none">Equipment shall be checked regularly for any dust accumulation which must be removed from all surfacesBefore and whilst any maintenance activity is carried out, it must be ensured that there are no hazardous gases or dusts present.Equipment is to be fully isolated from the electrical supply before and whilst any work is being carried outAny damage or faults should be notified to Junair Spraybooths Ltd immediatelyAny replacement parts required must be obtained directly from Junair Spraybooths Ltd. The use of any other parts will void any certification and warranty				

CAUTION – Filter regulator should be connected to a suitable earth

CAUTION - Failure to de-energise, disconnect, lock out and tagout all power sources including compressed air before performing equipment maintenance could cause injury

CAUTION - PROJECTILE HAZARD. You may be injured by venting liquids or gases that are released under pressure, or flying debris. PRESSURE RELIEF PROCEDURE. Always follow the pressure relief procedure in the equipment instruction manual.

CAUTION - WEAR SAFETY GLASSES. Failure to wear safety glasses with side shields could result in serious eye injury or blindness



Service Interval / Operating Hours	Control of	To be inspected / tested	Test result / Method	Date	Initial Responsible person
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OPERATION

1. Do not exceed the maximum working pressures and temperatures.
2. When regulating the pressure always adjust from a lower pressure increasing to the desired pressure, rather than from a higher pressure down.
3. To lock the set pressure depress the knob which prevents it being adjusted. To release the lock lift the knob up.
4. The drain valve on the bottom of the filter and coalescer can be used manually or semiautomatically
 - a. Semi-Automatic - The valve push button is rotated to the left, in this mode when the air pressure is exhausted from the unit the push button opens under spring operation.
 - b. Manually - The valve push button rotated to the right shuts off the drain permanently, until it is rotated to the left when it can be pushed up to drain even when the unit is pressurised.

3 months	General	Breathing air quality testing	BS EN 12021 states that breathing air quality to Air Fed Respiratory Devices must be tested every 3 months, or more frequently when the quality of the air supplied cannot be assured		
Annually		N/A			



2.0 SPRAYBOOTH
2.9 FILTER REGULATOR & COMPRESSED AIR
2.92 SERVICE GUIDE

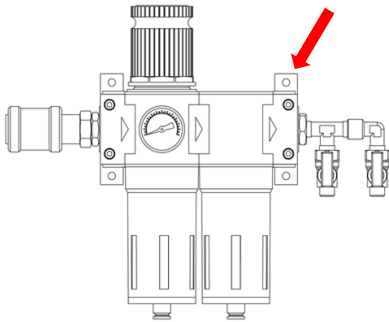
To maintain the equipment warranty and the Hazardous Area Certification, the instructions contained within this manual must be complied with in full

MAINTENANCE

1. Always de-pressurise the whole unit prior to carrying out any maintenance work, ensuring no pressure is locked in the unit or items attached to it. The regulator knob should be wound fully counter clockwise to exhaust all pressure after isolating.
2. Ensure earthing of the unit is not affected by maintenance activities, see installation on previous page.
3. Filter - To replace these items unscrew and remove bowl, unscrew the central bolt and pull the filter down.
4. Coalescer/ Activated carbon filter - To replace this item, unscrew and remove the bowl, then unscrew the filter element. Care should be taken when replacing the element not to cross the threads.
5. Gauge - When replacing this item, screw a new gauge in by hand only, do not use a spanner. Seal the thread using a liquid sealant, do not use PTFE tape.

Filter/ Coalescer/ Activated carbon filter periods for replacement

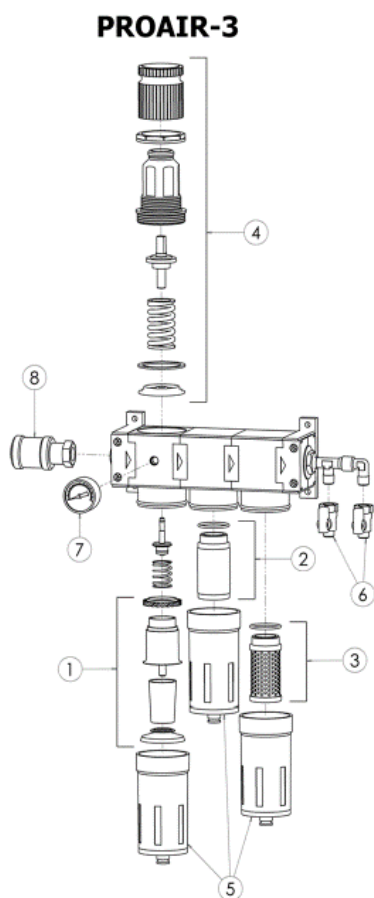
6. It is recommended that filter elements are replaced periodically i.e. when a drop in pressure is noticeable through the unit or every 6 months or 1000 hours use.
7. Do not use solvents or aggressive chemicals to clean the unit, which may affect the materials of construction.
8. Always use recommended and original parts and accessories.

1		An isolation valve is fitted (8) to the inlet of the PRO AIR 2 & 3 for convenience when maintaining and to release condensate and oil from bowl. (see operation) Slide to the right towards the regulator to open. Slide to the left to close.
2		Ensure the regulator is correctly earthed using the marked wall bracket on the outlet side of the unit as the earthing point as shown and verify continuity from each Ball Valve (6) to another known earth point. A resistance of less than 1 K ohms should be achieved for dissipation of electrostatic charge.
3		



2.0 SPRAYBOOTH
2.9 FILTER REGULATOR & COMPRESSED AIR
2.93 FAULT GUIDE

FAULT	SOLUTION
No Compressed air at gun	<ul style="list-style-type: none">• Check compressed air isn't isolated at entry or exit of filter regulator• Check air pressure is set correctly• Check spraybooth is in spray mode and in a healthy condition and that compressed air solenoid is open



Ref.	Part No.	Description	Quantity
1	PROAIR-51	FILTER ELEMENT (5µm)	1
2	PROAIR-52	COALESCAR FILTER ELEMENT (0.01µm)	1
3a	PROAIR-53	ACTIVATED CARBON FILTER ELEMENT	1
3b	PROAIR-63	KIT OF PROAIR-63 PROAIR-51, 52 & 53	1
4	PROAIR-71	UPPER COVER ASSEMBLY	1
5	PROAIR-72	METAL FILTER BOWL WITH DRAIN VALVE	3
6	SER-3414-MF	BALL VALVE 1/4" BSP (M) & (F)	2
7	GA-319	PRESSURE GAUGE 0-160 psi	1
8	DV-8000035	ISOLATION VALVE 1/2"	1



3.0 PAINT MIX ROOM

3.1 PAINT MIX ROOM GENERAL

3.11 MAINTENANCE

Service Interval / Operating Hours	Control of	To be inspected / tested	Test result / Method	Date	Initial Responsible person
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Lighting and extraction in the Paint mix room is switched on using the single gang switch located next to the access door. When switched ON lighting will illuminate, and the exhaust fans will start. Lighting operation is interlocked through the exhaust fan

The paint mix room is designed as an ATEX zone 2 area, and any equipment within the area should be supplied to a minimum rating of ATEX II 2 G IIB T3

Optional air conditioning can be installed to the paint mix room to maintain a stable temperature for cooling and heating. See separate operation and maintenance guide

Optional addition of exhaust fan pressure switch with alarm to warn of extraction failure.

REFERENCE – see [Air Handling Unit section](#) for further guidance on fan systems

General	<ul style="list-style-type: none">Equipment shall be checked regularly for any dust accumulation which must be removed from all surfacesBefore and whilst any maintenance activity is carried out, it must be ensured that there are no hazardous gases or dusts present.Equipment is to be fully isolated from the electrical supply before and whilst any work is being carried outAny damage or faults should be notified to Junair Spraybooths Ltd immediatelyAny replacement parts required must be obtained directly from Junair Spraybooths Ltd. The use of any other parts will void any certification and warrantyIEC/EN 60079-17 for inspection and maintenance of electric apparatus for use in potentially explosive atmospheresDue to the risk posed by the accumulation of solvent vapor from a solvent spillage it should be ensured that spillage kits are available in the Paint Store and mixing room and the drip trays are emptied and dried at the end of every day.		
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WARNING – any electrical or pipework penetration through the wall or ceiling of the Paint Mix Room should be sealed to minimum rating IP54

Daily	General	Housekeeping	Keep all paint tins, solvent tins, waste receptacles closed when not in use to minimise the fumes released		
		Housekeeping	Due to the risk posed by the accumulation of solvent vapor from a solvent spillage it should be ensured that spillage kits are available in		



Service Interval / Operating Hours	Control of	To be inspected / tested	Test result / Method	Date	Initial Responsible person
			the Paint Store and mixing room and the drip trays are emptied and dried at the end of every day.		
3 months	General	Cleanliness	Visual inspection, remove all dirt, dust and debris		
		Airflow obstruction	Check for blockages to exhaust ventilation ports on extraction system, clean as required		
		Air Inlet filter	Inspect the air input filter media located in the ceiling below the slam shut fire damper and change as necessary. Changing will ensure free air flow under normal conditions. The filter media is PST 290 Blue/White 25mm thick. The blue face is visible within the paint mixing room		
6 months					
Annually		Local Exhaust Ventilation	Annual airflow testing according to HSG258 requirements		
		Earth bonding	Inspect all earth bonding for continuity and condition, replace as required		
		Fire Damper inspection and testing in accordance with BS 9999:2017			



3.0 PAINT MIX ROOM
3.1 PAINT MIX ROOM GENERAL
3.12 SERVICE GUIDE

To maintain the equipment warranty and the Hazardous Area Certification, the instructions contained within this manual must be complied with in full

Fire Shutter Maintenance

1. In accordance with BS 9999 Annex W.1, inspection should be undertaken annually. Local regulations/conditions may override this with periodic Inspection being carried out more frequently where corrosive or dirty conditions prevail. The maintenance log should be reviewed at each inspection and the frequency adjusted as required dependent upon findings. (JUNAIR recommend a maximum of 1 year between inspections and to start more frequently initially and reduce frequencies only if conditions are proven to allow).
2. Remove access door of required to reveal damper's internal elements.
3. Visually inspect the internal damper elements for signs of corrosion, obstruction or accumulated dirt/dust.
4. If there are any obstructions or if the damper's blades, side springs, case side seals are dirty, they need to be cleaned.
5. Use a soft cloth with a light application of light lubricant. (Connect Duck Oil recommended).
6. There should be no more than a thin film of lubricant applied. Remove all excess lubricant. It is particularly important as excess oil will tend to collect dirt and dust which will have a negative effect on dampers remaining clean.
7. Replace access doors if required, ensuring the damper is left open.
8. Record all work that has been undertaken in the maintenance log.
9. It is important to record, and review maintenance frequency based on inspections and test history



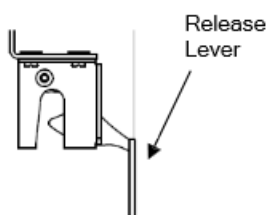
3.0 PAINT MIX ROOM

3.1 PAINT MIX ROOM GENERAL

3.13 FAULT GUIDE

Symptom	Fault	Action
Light will not switch on	<ul style="list-style-type: none">Fan contactor tripped	<ul style="list-style-type: none">Check fan contactor is not tripped
	<ul style="list-style-type: none">No power	<ul style="list-style-type: none">Check electrical power is live
Strong smell solvent	<ul style="list-style-type: none">Exhaust fan not runningDuctwork blockedDamper closed	<ul style="list-style-type: none">Check extraction fan is runningCheck extraction system duct for blockages
Damper does not close properly when drop tested	<ul style="list-style-type: none">Foreign object impeding blades	<ul style="list-style-type: none">Remove item
	<ul style="list-style-type: none">Build-up of dirt / dust / corrosion impeding blades	<ul style="list-style-type: none">Remove / clean case & blades as required
	<ul style="list-style-type: none">Springs twisted / kinked	<ul style="list-style-type: none">Springs will require replacement. Refer to JUNAIR technical sales office.
Gate Latch link not retained when releasing blade pack via the release lever.	<ul style="list-style-type: none">Release lever bent inwards allowing fusible link to come into contact when blades are released	<ul style="list-style-type: none">Bend lever by hand to 90° with damper case. See figure 14 below
Damper closed when open state is expected	<ul style="list-style-type: none">Fusible link releasedAir Temperature of the link has been exceeded.	<ul style="list-style-type: none">Replace link.Refer to JUNAIR technical sales office.
	<ul style="list-style-type: none">Fusible link missing or not fitted correctly	<ul style="list-style-type: none">Fit Link

Figure 14






3.0 PAINT MIX ROOM

3.2 PAINT MIX ROOM HEATER

3.21 MAINTENANCE

Service Interval / Operating Hours	Control of	To be inspected / tested	Test result / Method	Date	Initial Responsible person
Model	Heater: Manufacturer Model:	EXHEAT FAW 1500			
	Thermostat: Manufacturer Model	Electro Controls EC-2			
General	<ul style="list-style-type: none">Equipment shall be checked regularly for any dust accumulation which must be removed from all surfacesBefore and whilst any maintenance activity is carried out, it must be ensured that there are no hazardous gases or dusts present.Equipment is to be fully isolated from the electrical supply before and whilst any work is being carried outAny damage or faults should be notified to Junair Spraybooths Ltd immediatelyAny replacement parts required must be obtained directly from Junair Spraybooths Ltd. The use of any other parts will void any certification and warrantyIEC/EN 60079-17 for inspection and maintenance of electric apparatus for use in potentially explosive atmospheres				
3 months	General	Generally inspect the equipment for external damage	Visual inspection		
		Ensure the thermostat is remains clear and unobstructed	Visual inspection		
		Ensure that any spaces between the element fins, remains clear and that the airflow remains unrestricted	Visual inspection		
6 months		Isolate electrical supply & remove cover Internals should be clean and dry Ensure earth terminals are intact & secure	The covers of the FAW range can be removed by unscrewing the bolts around the outside of the lids. Refit cover with new gasket or ‘O’ ring if required and re-tighten using only the socket head screws provided		





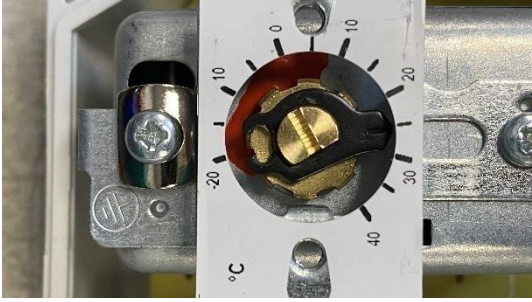
Service Interval / Operating Hours	Control of	To be inspected / tested	Test result / Method	Date	Initial Responsible person
		Heating element insulation resistance to be at least 2MΩ	Insulation Resistance (Megger) The 'Megger' should be applied between the phases and earth. A reading of greater than 2MΩ at 500 volts dc should be recorded. Should the whole heater be below this value each element would need to be checked to ascertain which one was low in resistance. Use the continuity (Ohms) setting on the elements and check the resistance of each element matches or is approximately equal to the results as per the electrical test certificate that would have been sent with the heater		
		Earth continuity must be maintained between all earth points and main structure			
Annually		Carry out 3 monthly and 6 monthly checks as above			
		Check for element failure or low insulation resistance			
		If equipment is being left unused for a period greater than 3 months, carry out 6 monthly maintenance before energizing			



3.0 PAINT MIX ROOM
3.2 PAINT MIX ROOM HEATER
3.22 SERVICE GUIDE

To maintain the equipment warranty and the Hazardous Area Certification, the instructions contained within this manual must be complied with in full

The Paint Mix Room thermostat controls the temperature output for the heater, and temperature set point is adjusted as below

1		<p>Paint Mix Room Heater Thermostat Control Box</p> <p>Normally located on top of paint mix room ceiling, close to internal heater location</p> <p>CAUTION - required when accessing roof area due to potential fall hazard</p>
2		<p>Remove screws on fascia to gain access</p> <p>WARNING – Isolate before access – live 240C AC</p>
3		<p>Adjust required temperature using slotted screwdriver by rotating the dial shown. Caution not to over rotate</p> <p>Picture shows the temperature set at approx. -2 deg C</p> <p>Recommended set point for Paint Mix Room would be +22 deg C</p> <p>Replace cover</p> <p>Make electric supply live</p> <p>Heater will turn on and off according to the thermostat set point</p> <p>Ensure the tip of the thermostat is not covered or obscured</p>

**3.0 PAINT MIX ROOM****3.2 PAINT MIX ROOM HEATER****3.23 FAULT GUIDE**

1	Heater not working	<ul style="list-style-type: none">• Check electrical supply to heater is switched ON• Check RCBO breaker has not tripped, reset if required• Check temperature set point. If set point is too low then heater will not come on
2	Room too hot	<ul style="list-style-type: none">• Heater set point too high• Extraction rate set too low• Extraction system
3	Room too cold	<ul style="list-style-type: none">• Heater not working• Extraction rate set too higher



5.0 WARRANTY

Service intervals: The first service is due when 1000 running hours have been recorded, unless otherwise stated in the Junair O&M Manual, or annually to comply with legislation, whichever is sooner.

Ancillary equipment such as dust extraction systems, paint mixing & gun cleaning rooms, as listed in your maintenance agreement, will be serviced in conjunction with your spraybooth/oven at the time intervals shown.

We will contact you in advance of the service being due to agree convenient dates for the work to be carried out and to see if there are any additional requirements you have.

A 12-month warranty is activated when your new spraybooth oven has been commissioned, however, this only applies if the equipment does not exceed 1000 running hours between services (unless otherwise stated in the Junair O&M Manual). If hours exceed the stipulated running hours, and a breakdown occurs due to this, the warranty will no longer be valid, and charges will be occurred.

Warranty terms are subject to the normal exclusion of wear and tear, consumable items and damage, accidental or otherwise.

This 12-month warranty is also subject to equipment being serviced and maintained to the standards laid out in the operating and maintenance manual.

JUNAIR can offer a comprehensive extended warranty for limited equipment. To qualify for the extended warranty period (years 2 & 3) a service contract must be maintained with JUNAIR. For the first and second years, parts and labour costs for equipment repair are covered by the extended warranty. Parts only are covered in the third year.

Period covered - 3 Years or 6000 running hours whichever is the earlier.

The warranty is only available within the UK Mainland.

NOTE - for the whole of the warranty term the equipment must be serviced and maintained by JUNAIR in accordance with the instructions detailed within the operating and maintenance manual. JUNAIR may sub-contract elements of the service work to third party service providers who specialise in different parts of the equipment. If the client has the JUNAIR equipment serviced directly by any these parties the warranty will be void unless agreed in writing by JUNAIR.

NOTE – it is the client responsibility to ensure that ALL parts of the equipment have been adequately serviced. Common practice for spraybooth service providers is to provide an abbreviated service plan that may not include all of the service tasks and may not cover all of the equipment provided with the Junair package. For example, the Roller Shutter Door may not be inspected within a standard service. It is the client responsibility to ensure that the service provider has covered all the equipment service needs.

Spares

JUNAIR can supply a comprehensive spares list to cover CONSUMABLE and BREAKDOWN spares. Unless otherwise stated in the contract all spares will be costed at the time of order and are chargeable. JUNAIR recommend customers purchase a CRITICAL breakdown spares package to prevent potential spares supply delays. The spares package can be advised upon enquiry. JUNAIR carry all standard booth components as factory stock, however your equipment may have been supplied with components which we consider to be non-standard or specialised in nature. These parts may be on an extended lead time. In all cases Junair will have no liability for any delays due to long lead time spares availability.

The extended warranty is restricted to cover the replacement of the following components due to failure and does not include any other costs such as loss of production, consequential loss, damage or liability of any nature

Included items:

- Electric fan motors
- Electric damper motors
- Control panel PLC processor and screen
- Volume control dampers.
- Variable speed drives
- Burner control box, motor, transformer and fan.
- Gas train valves and modulating governor
- Fan shafts and bearings
- Fan impellers



Items specifically not covered by warranty include consumable items such as:

- Door Seals
- Light Tubes
- Filter Media
- Fan Belts
- Burner Electrodes (flame proving and ignition)
- Oils and lubricants

In the event of a warranty event, JUNAIR require the client to provide a purchase order to cover the cost of the replacement equipment and/or site attendance. This will not be charged in the event of a genuine warranty claim. Common spurious reasons for site attendance call-outs include: no power to the equipment, filters blinded, operator error.

In the event of a parts only warranty claim, the failed part must be returned to JUNAIR to allow ongoing QC checks

NOTE – the following exclusions apply in all instances.

- Damage, accidental or otherwise, or by external effect of flood, fire, electrical failure, fuel failure and such like.
- JUNAIR will not accept liability for any loss (including consequential loss) resulting from defective components or breakdowns which are attributed directly or indirectly to our services. We shall respond as quickly as possible to reasonable requests from clients to replace defective components and rectify any service work faults.
- Items not listed above or items having fair wear and tear.
- The cost of maintenance or service generally.
- Repairs carried out by non-authorised persons.
- Consumables e.g. light tube, filters, fan belt, burner flame proving electrode, burner spark plug, door seals
- Minor adjustment or cleaning which do not necessitate a component replacement.
- Equipment that is outside the recommended servicing tolerances
- Additional equipment e.g. QADS, SN system, Roller shutter doors etc.
- Equipment over 3 years old or over 6000 hours run.
- Equipment supplied with the package but not manufactured by Junair, such as roller shutter doors etc, which will be covered by the manufacturer standard warranty
- Access equipment required to undertake the service or warranty work – in all cases this must be provided by the customer

Lighting:

A five year warranty is provided on Junair UltraLuxLED and SmartluxLED and SiriusLED LED lighting based on the following:

- Years one and two – parts and labour are included.
- Years three to five – parts only are included.
- Where parts are replaced under warranty, the 5-year warranty still runs from the original installation date.

When the warranty covers parts only there are several client options:

- Where the client wants a supply only replacement.
 - Customer to raise an order to cover the new parts, then Junair sends new parts to client.
 - Customer sends faulty parts back to Junair at their own expense.
 - Junair tests the faulty part. If the part is defective and has not been subject to damage, then no invoice to be raised for the parts.
 - If the fault has been caused by impact damage or water ingress, then the customer will be charged for the replacement parts.
- Where the client wants JUNAIR to rectify the lighting fault:
 - Customer to raise an order to cover the engineer visit.
 - Customer to be informed that the labour, travelling expenses and access equipment will be chargeable and the order is to cover this.
 - Engineer on site to evaluate the faulty parts and subject to no physical damage will replace the components. Parts will be Free Of Charge.
 - Any sign of damage other than normal component failure needs to be raised on site and agreement reached reference charge for replacement parts.

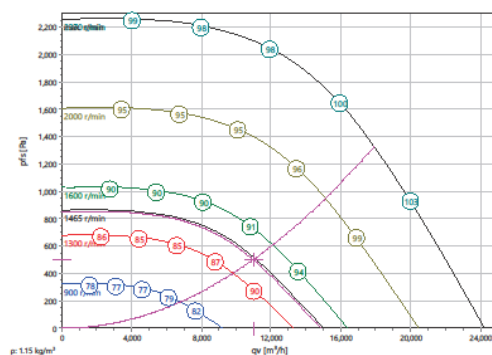


APPENDIX 1 FAN CURVES - 12k AHU



Plug Fan
Type: **DKNB4A16W-560_09**
Art.-No.:

Curve:



Operating Point:

Qv	11000	m³/h
Pst	500	Pa
Pst	57	Pa
η _{stat}	58	%
η _{stat}	64	%
P _a	2.66	kW
P _a	2.44	kW
n	1455	r/min
LwA _{A,out}	90	dB(A)
f _{ru}	49	Hz
v	9.98	m/s
SFP	874	Ws/m³
FEI	1.3	
f _{ru (max)}	81	Hz

Intersections:

Curve	Qv [m³/h]	Pst [Pa]	P _a [kW]	P _a [kW]	n _u [r/min]	LwA _{A,out} [dB(A)]
max. U/min	17912	1326	11.04	10.09	2370	101
2370 U/min	17912	1326	11.04	10.09	2370	101
2000 U/min	15116	945	6.794	6.202	2000	97
1600 U/min	12093	605	3.538	3.234	1600	92
1465 U/min	11072	507	2.728	2.494	1465	90
1300 U/min	9825	399	1.916	1.752	1300	88
900 U/min	6802	192	0.641	0.586	900	80

Nominal Data:

U [V]	f [Hz]	C [μF]	P _a [kW]	I _a [A]	n _u [r/min]	t _a [°C]	k ₁₂ [m³/s/h]	I _a / I _n	IP	m [kg]
400 / 690	50	-	11	21.2	1465	40	220	-	IP55	-

Motor Data:

Art.-No.	Manufacturer	Size	Poles	Eff.-Rating	Design	Mot.Prot.	η [%]	Ø [mm]	m [kg]
MCDU16002010	AC	160	4	IE3	B3	KL	91.4	42	147

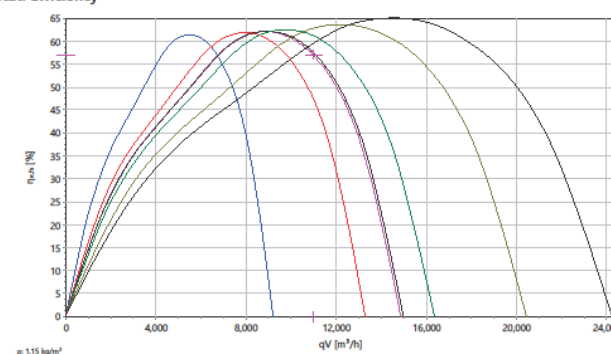
Sound Data:

Frequency	Σ	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Distances	1 m	4 m
LwA(A,n) [dB(A)]	87	74	81	84	80	79	76	72	65	LpA(A,n) [dB(A)]	80	69
LwA(A,out) [dB(A)]	90	80	83	89	87	86	82	77	70	LpA(A,out) [dB(A)]	83	72

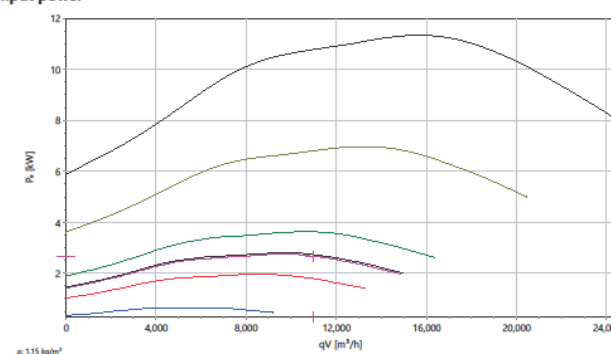


Plug Fan
Type: **DKNB4A16W-560_09**
Art.-No.:

stat. Efficiency



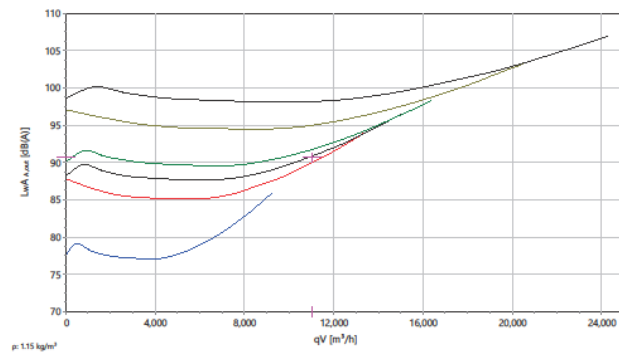
Input power





Plug Fan
Type: DKNB4A16W-560_09
Art.-No.:

Sound power



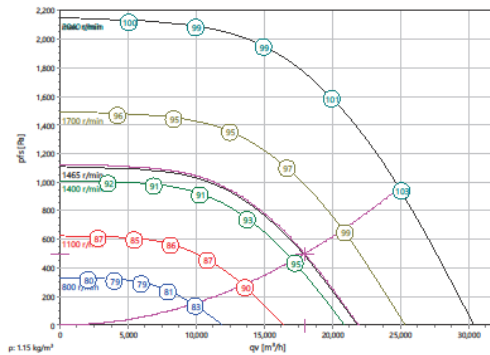


APPENDIX 1 FAN CURVES - 20k AHU



Plug Fan
Type: **DKNB4B16W-630_09**
Art.-No.:

Curve:



Operating Point:

Qv	18000	m³/h
Pst	500	Pa
Pst	94	Pa
η _{stat}	51	%
η _{stat}	61	%
P _a	4.92	kW
P _a	4.54	kW
n	1475	r/min
L _{WA} A _{out}	95	dB(A)
f _{ru}	50	Hz
v	12.8	m/s
SFP	986	W/m³
FEI	1.2	
f _{ru} (max)	70	Hz

Intersections:

Curve	Qv (m³/h)	Pst (Pa)	P _a (kW)	P _a (kW)	n ₀ (r/min)	L _{WA} A _{out} (dB(A))
max. U/min	24896	957	12.72	11.71	2040	102
2040 U/min	24896	957	12.72	11.71	2040	102
1700 U/min	20749	665	7.482	6.892	1700	98
1465 U/min	17880	494	4.834	4.452	1465	95
1400 U/min	17087	451	4.228	3.894	1400	94
1100 U/min	13426	279	2.07	1.906	1100	89
800 U/min	9764	148	0.801	0.738	800	82

Nominal Data:

U [V]	f [Hz]	C [μF]	P _a [kW]	I _a [A]	n ₀ [r/min]	t _a [°C]	k ₁₀ [m³/s/h]	I _a / I _a	IP	m [kg]
400 / 690	50	-	15	28.7	1465	40	287	-	IP55	-

Motor Data:

Art.-No.	Manufacturer	Size	Poles	Eff.-Rating	Design	Mot.Proct.	η [%]	Ø [mm]	m [kg]
MCDU16002011	AC	160	4	IE3	B3	KL	92.1	42	182

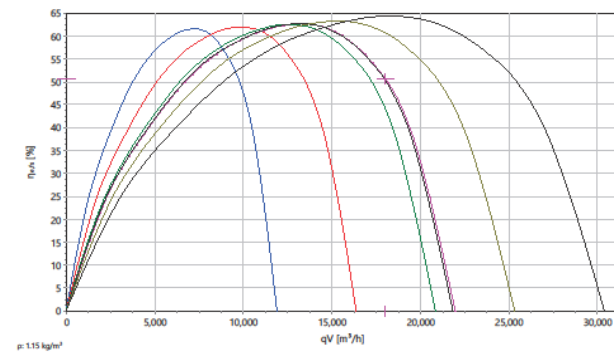
Sound Data:

Frequency	1	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Distances	1 m	4 m
L _{WA} (A _{in}) [dB(A)]	92	79	87	90	84	84	82	77	70	L _{pA} (A _{in}) [dB(A)]	85	74
L _{WA} (A _{out}) [dB(A)]	95	85	92	95	91	90	88	83	75	L _{pA} (A _{out}) [dB(A)]	88	77

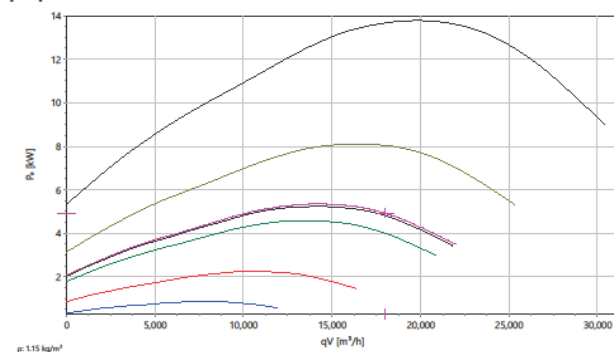


Plug Fan
Type: **DKNB4B16W-630_09**
Art.-No.:

stat. Efficiency



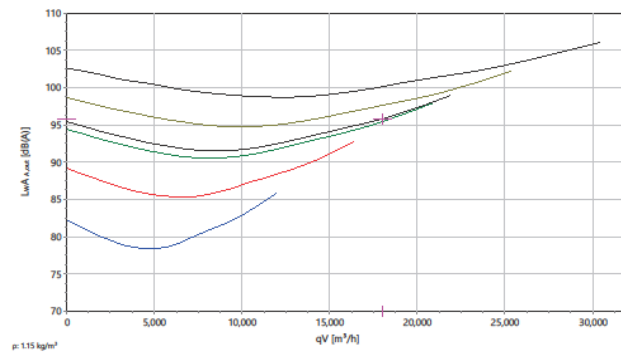
Input power





Plug Fan
Type: DKNB4B16W-630_09
Art.-No.:

Sound power



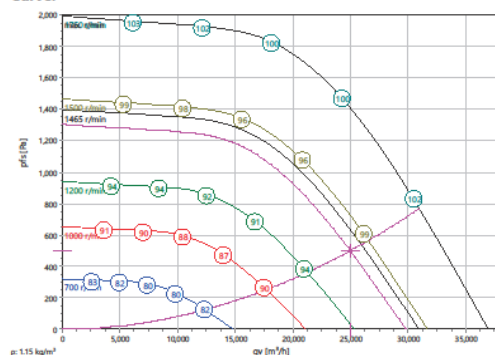


APPENDIX 1 FAN CURVES - 25k AHU



Plug Fan
Type: **DKNB4B16W-710_09**
Art.-No.:

Curve:



Operating Point:

q _v	25000	m³/h
p _{st}	500	Pa
p _{st2}	114	Pa
η _{stat}	47	%
η _{stat2}	57	%
P _s	7.48	kW
P _{s2}	6.88	kW
n	1414	r/min
L _{WA} A _{out}	97	dB(A)
f _{ru}	48	Hz
v	14.1	m/s
SFP	1077	Ws/m³
FEI	1.0	
f _{ru max}	60	Hz

Intersections:

Curve	q _v [m³/h]	p _{st} [Pa]	P _s [kW]	P _{s2} [kW]	n _e [r/min]	L _{WA} A _{out} [dB(A)]
max. U/min	30936	766	13.83	12.74	1750	102
1750 U/min	30936	766	13.83	12.74	1750	102
1500 U/min	26517	563	8.874	8.173	1500	99
1465 U/min	25898	537	8.286	7.632	1465	98
1200 U/min	21213	360	4.622	4.256	1200	94
1000 U/min	17678	250	2.698	2.484	1000	90
700 U/min	12375	123	0.933	0.859	700	82

Nominal Data:

U [V]	f [Hz]	C [μF]	P _s [kW]	I _s [A]	n _e [r/min]	t _s [°C]	k _{vs} [m³/s/h]	I _s / I _n	IP	m [kg]
400 / 690	50	-	15	28.7	1465	40	370	-	IP55	-

Motor Data:

Art.-No.	Manufacturer	Size	Poles	Eff.-Rating	Design	Mot.Prot.	η [%]	Ø [mm]	m [kg]
MCDU16002011	AC	160	4	IE3	B3	KL	92.1	42	182

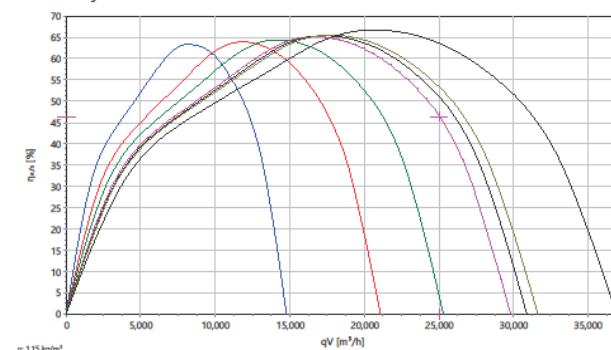
Sound Data:

Frequency	1	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Distances	1 m	4 m
L _{WA} (A _{in}) [dB(A)]	94	88	92	87	86	89	80	74	67	L _{pA} (A _{in}) [dB(A)]	87	76
L _{WA} (A _{out}) [dB(A)]	97	95	97	93	92	95	86	80	72	L _{pA} (A _{out}) [dB(A)]	90	79

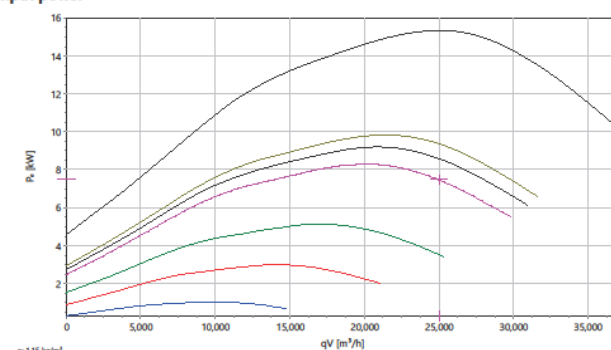


Plug Fan
Type: **DKNB4B16W-710_09**
Art.-No.:

stat. Efficiency



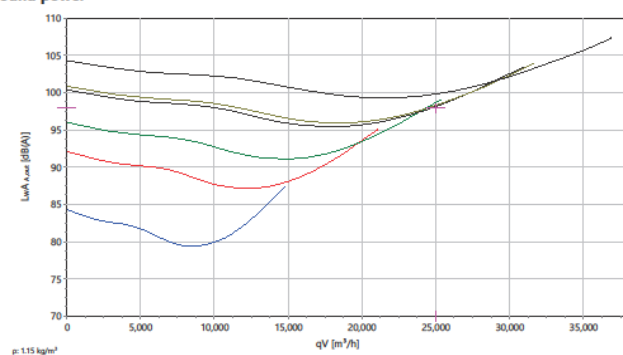
Input power





Plug Fan
Type: DKNB4B16W-710_09
Art.-No.:

Sound power



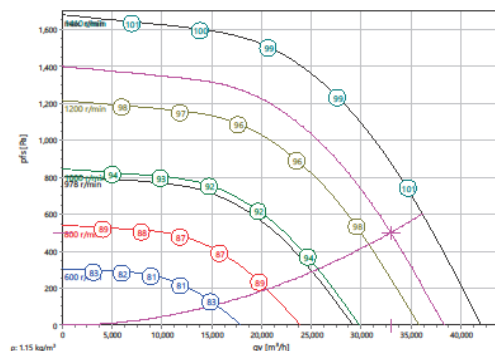


APPENDIX 1 FAN CURVES - 35k AHU



Plug Fan
Type: **DKNB6A18W-800_09**
Art.-No.:

Curve:



Operating Point:

q _v	33000	m³/h
p _{st}	500	Pa
p _{st}	124	Pa
η _{stat}	46	%
η _{stat}	57	%
P _s	10	kW
P _s	9.14	kW
n	1287	r/min
L _{WA} A _{out}	99	dB(A)
f _{ru}	65	Hz
v	14.7	m/s
SFP	1091	Ws/m³
FEI	1.0	
f _{ru} max	72	Hz

Intersections:

Curve	q _v [m³/h]	p _{st} [Pa]	P _s [kW]	P _s [kW]	n _s [r/min]	L _{WA} A _{out} [dB(A)]
max. U/min	36159	601	13.09	11.94	1410	102
1410 U/min	36159	601	13.09	11.94	1410	102
1200 U/min	30773	435	8.166	7.446	1200	98
1000 U/min	25645	302	4.768	4.348	1000	94
978 U/min	25080	289	4.464	4.07	978	94
800 U/min	20516	194	2.458	2.242	800	89
600 U/min	15387	109	1.042	0.95	600	83

Nominal Data:

U [V]	f [Hz]	C [μF]	P _s [kW]	I _s [A]	n _s [r/min]	t _s [°C]	k _{vs} [m³/s/h]	I _s / I _n	IP	m [kg]
400 / 690	50	-	15	29.3	978	40	475	-	IP55	-

Motor Data:

Art.-No.	Manufacturer	Size	Poles	Eff.-Rating	Design	MotProt.	η [%]	Ø [mm]	m [kg]
MCDU18003010	AC	180	6	IE3	B3	KL	91.2	48	250

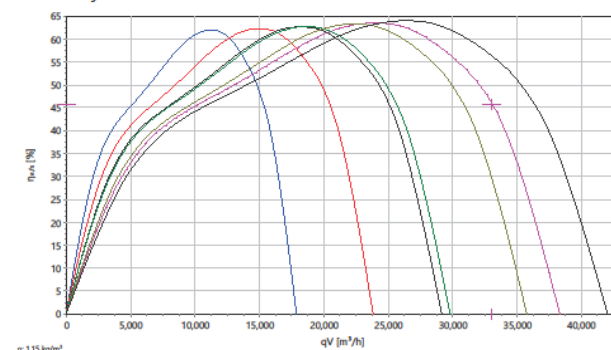
Sound Data:

Frequency	1	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Distances	1 m	4 m
L _{WA} (A _{in}) [dB(A)]	96	90	94	89	88	91	82	76	69	L _{pA} (A _{in}) [dB(A)]	89	78
L _{WA} (A _{out}) [dB(A)]	99	97	99	95	94	97	88	82	75	L _{pA} (A _{out}) [dB(A)]	92	81

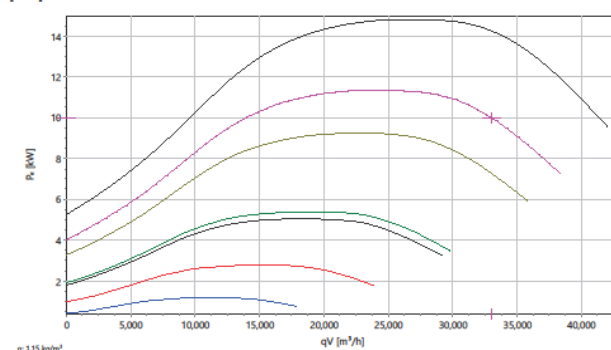


Plug Fan
Type: **DKNB6A18W-800_09**
Art.-No.:

stat. Efficiency



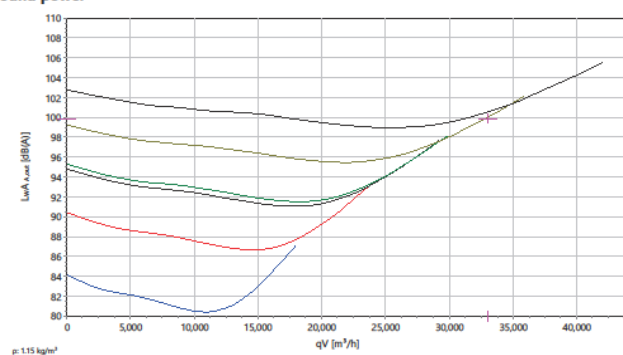
Input power





Plug Fan
Type: DKNB6A18W-800_09
Art.-No.:

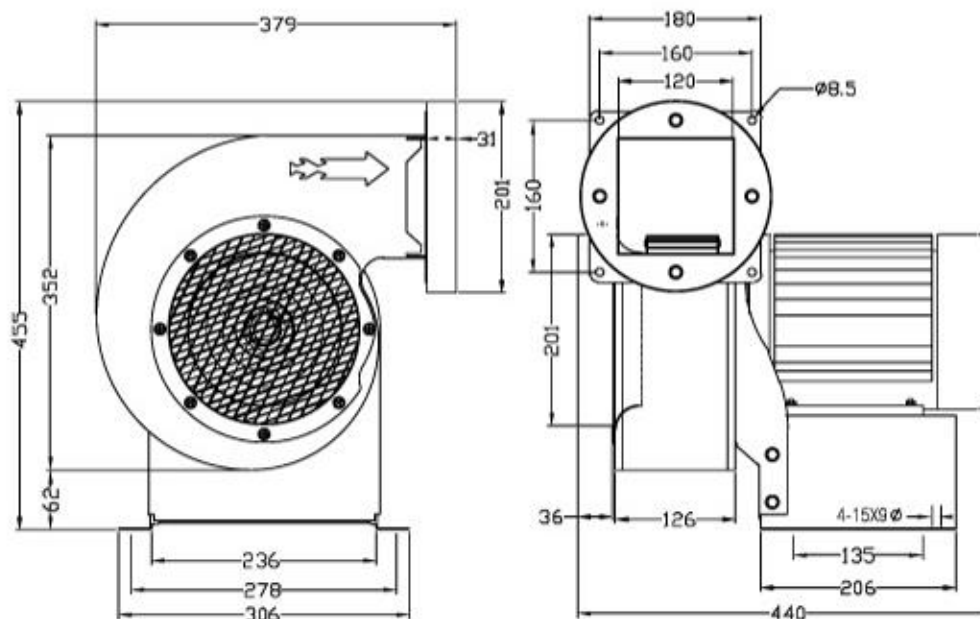
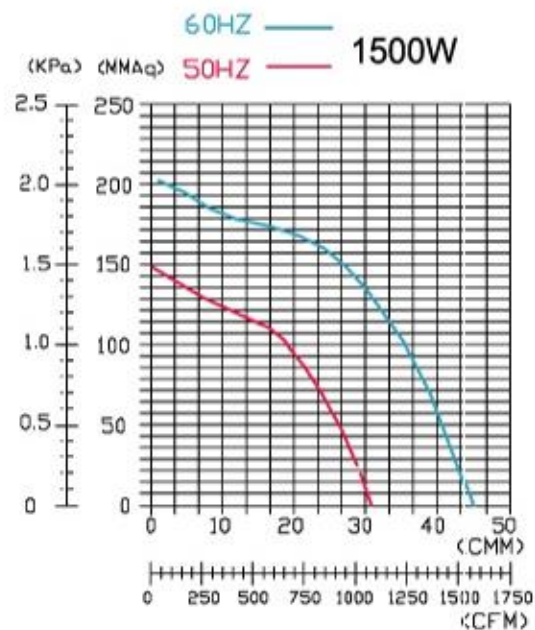
Sound power





APPENDIX 1

FAN CURVES – 1K PAINT MIX ROOM EXHAUST FAN



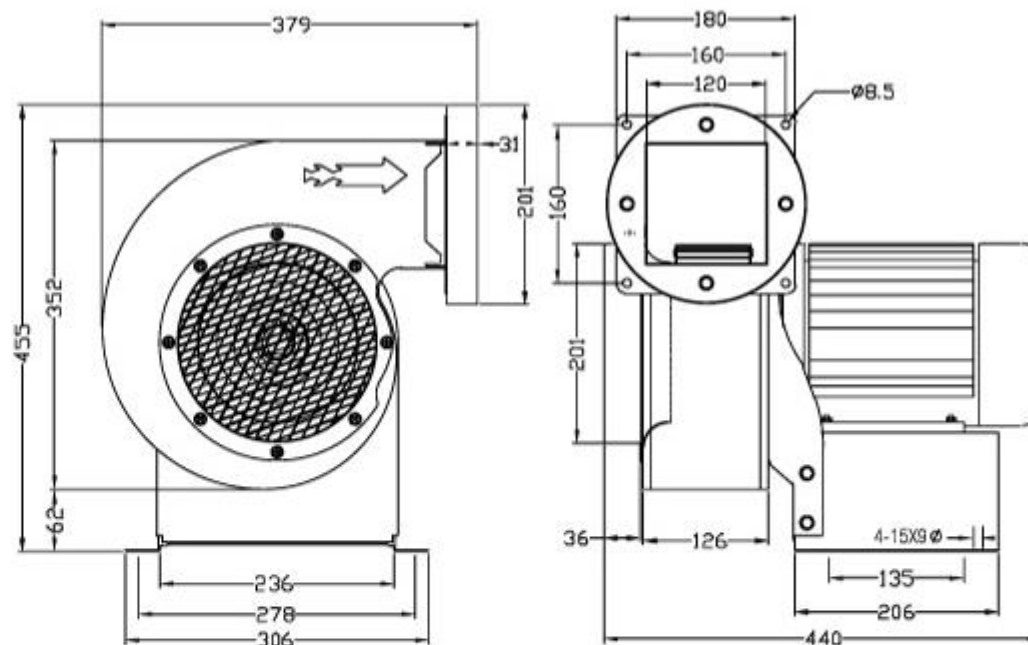
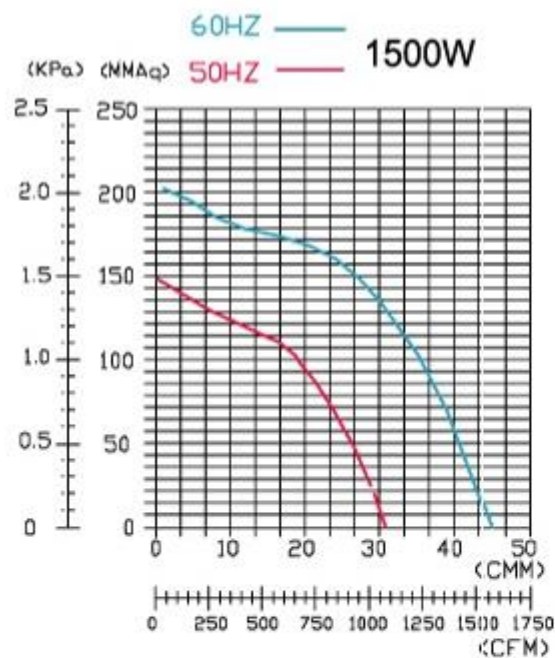
Specification:

model	voltage V	frequency HZ	phase Φ	current A	pole P	power W	Max. air pressure		Max. air flow		rpm
							mm/Aq	pa	m3/min.	cfm	
AD200-H	220	60	3	8.1	2	1500	205	2091	44.0	1553.6	3320
	380	50	3	3.0	2	1500	145	1480	31	1094.6	2820



APPENDIX 1

FAN CURVES – 2K PAINT MIX ROOM EXHAUST FAN



Specification:

model	voltage V	frequency HZ	phase Φ	current A	pole P	power W	Max. air pressure		Max. air flow		rpm
							mm/Aq	pa	m3/min.	cfm	
AD200-H	220	60	3	8.1	2	1500	205	2091	44.0	1553.6	3320
	380	50	3	3.0	2	1500	145	1480	31	1094.6	2820



APPENDIX 2 BURNER DATA

Figure 1 HMA2A FLAME LENGTHS (mm)

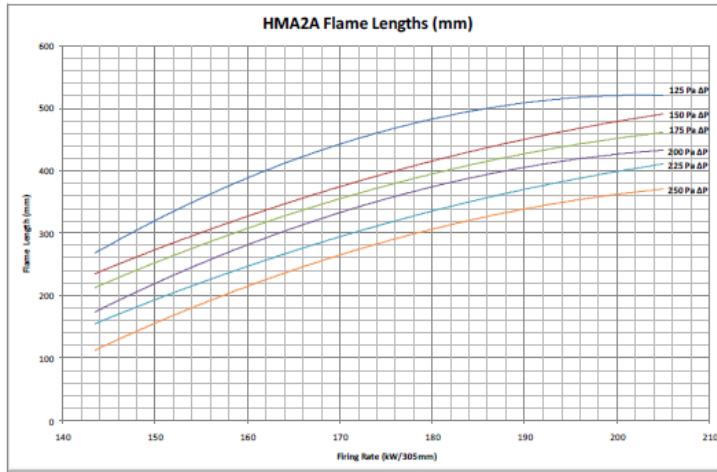


Figure 3 HMA2A INLET GAS PRESSURES (mbar)

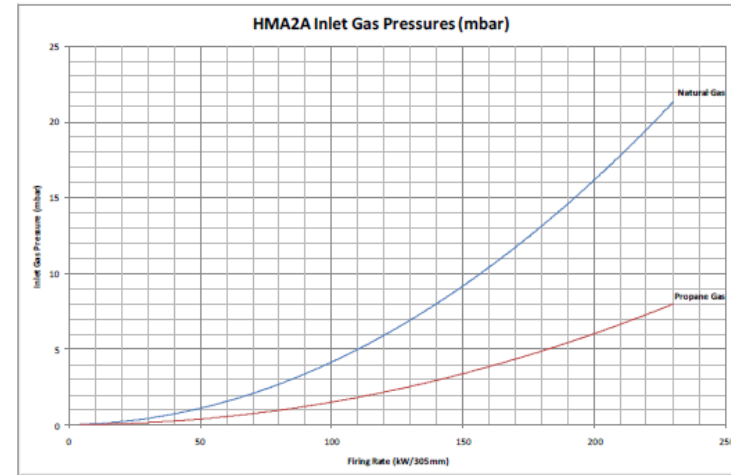


Figure 2 HMA2A AIR PRESSURE DROPS (Pa)

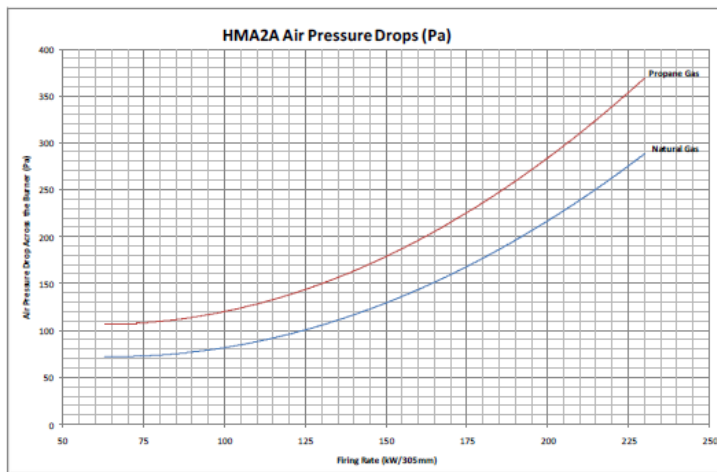


Figure 4 HMA2A PROFILE VELOCITIES (m/s)

