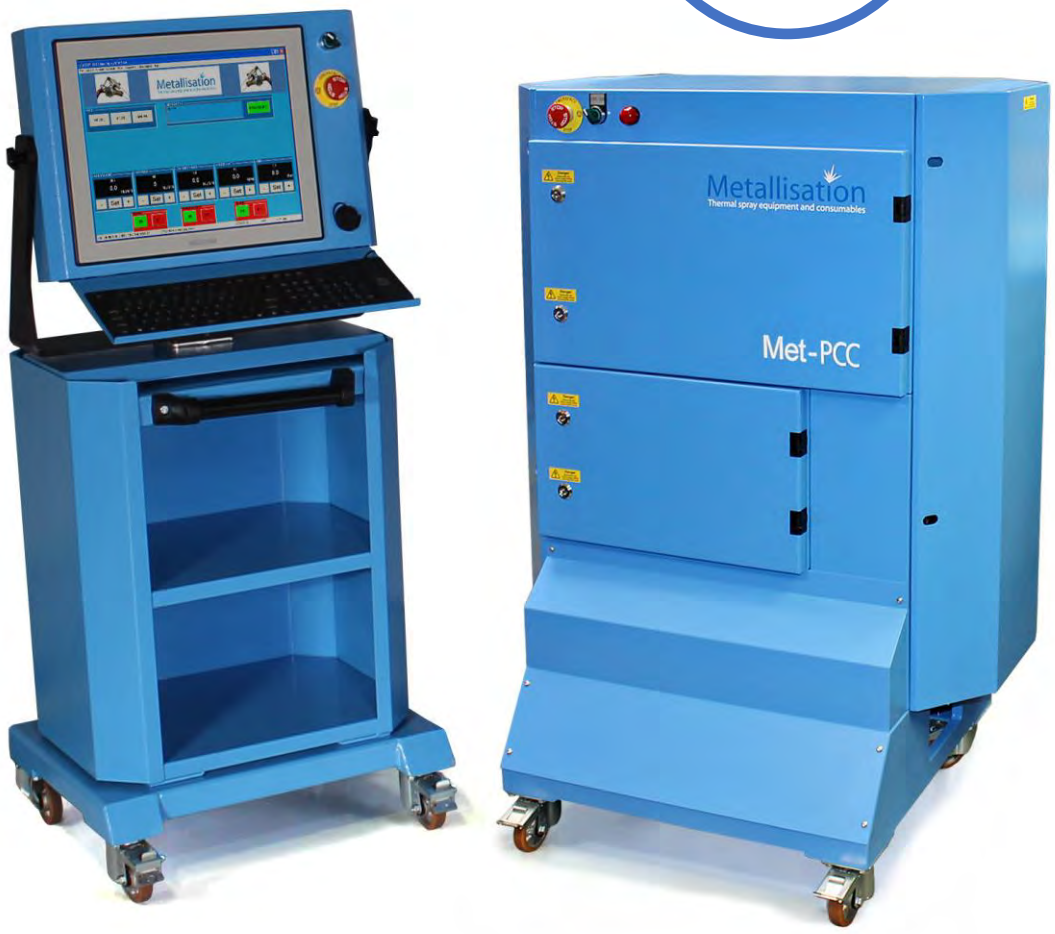
Metallisation

Thermal spray equipment and consumables



Equipment Specification

MK74-PCC Flame Spray System

INTRODUCTION

The following specification covers the standard range of the MK74-PCC flamespray system. For the specific offer, please refer to the attached quotation and cross-reference the part numbers for each piece of equipment.

Safety: The equipment quoted will produce levels of noise and dust that will require safety measures to be taken by those using the equipment. It will use pressurised air and will also use flammable gases. Careful consideration should also be given to the positioning of this equipment. It is the responsibility of the user to ensure that all appropriate measures are taken to ensure safe operation in accordance with local requirements. Metallisation will be pleased to advise as appropriate.

BENEFITS

OVERVIEW

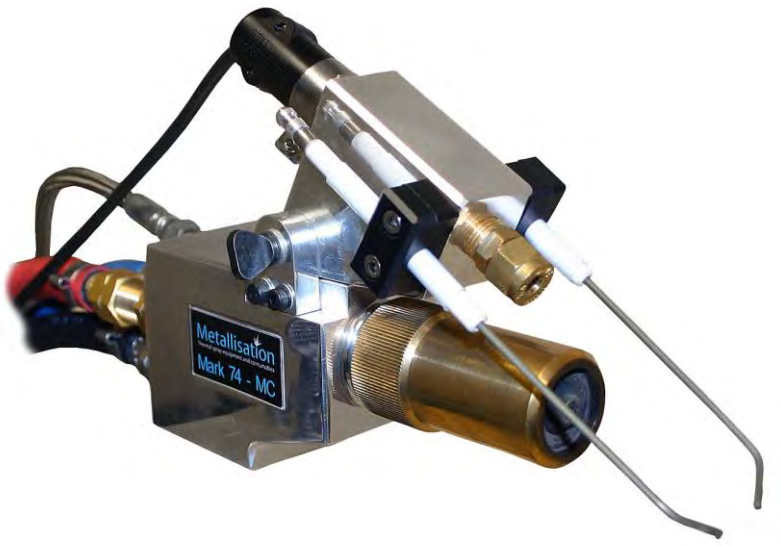
The NEW Metallisation MK74-PCC is a fully automatic flamespray system with mass flow control, which offers the ability to produce the highest quality, repeatable coatings. The system provides a fully automatic sequence of ignition, main flame and wire feed. The wire feed is capable to be stopped during spraying without melting the wire back into the nozzle, even when left for extended periods. Fault sensors check for loss of flame, wire stoppages or wire out and can interlock to external automation to stop production and request assistance. These features ensure continued operation, improved coating quality and minimised downtime.

The system is PC controlled with distributed I/O, for extreme reliability, comprising a touch screen HMI (with optional keyboard), mass flow control gas box, and compact, electric drive pistol.

- Mass flow control of Oxygen, Fuel Gas and Air = repeatability.
- Easy to use, intuitive operator interface.
- PC control with touch screen.
- Optional keyboard control or operator interface unit.
- Unlimited recipes and parameter recording.
- Manual or fully sequenced start-up, operation and shut-down.
- Safety interlocks to prevent running without Nozzle Air.

MK74 PISTOL

Part No.	Description
GAS-MK74-MC	MK74 Machine Mounted Flamespray Pistol



The Metallisation Mark74-MC Powder Spray Pistol is designed to produce coatings from a large range of powders. This pistol is machine mounted with powder delivery from a separate powder feed unit. The pistol is designed for continuous use by the contractor or production user who requires a pistol that is easy to maintain and will give long periods of trouble-free operation with minimum spares requirements.

The Mark74-MC nozzle system provides an excellent flame stability and easy lighting. This design also ensures true axial alignment of the component parts and gives added safety features.

The spreader air cap provides a narrow spray pattern and densifies the coating. This is particularly necessary when spraying ceramics.

The Mark 74-MC Pistol is recommended for numerous coating applications including, thermal barrier, wear resistance and as a dielectric. This pistol utilises oxygen and acetylene fuelled gas mixture to give a pistol that is capable of spraying ceramic coatings as well as all the full range of metal powders

TECHNICAL OVERVIEW

- Primarily for spraying engineering coatings (Self Fluxing Alloys, Bond Coat materials and Ceramics).
- Flame produced by burning Acetylene and Oxygen gases.
- Nozzle designed to provide flame stability and easy lighting.
- Dedicated powder feeder allowing consistent powder feed rate independent of pistol position
- Simple pistol maintenance for reduced downtime when changing consumables.
- Sturdy, robust design for long service life.
- Robot / Manipulator mounting.

Technical data

Description	Characteristics
Weight (excl. hoses)	1.80 Kgs (3.97 lbs)
Width	80mm (3.15”)
Length	230mm (9.1”)
Height	180mm (7.1”)
Compressed air usage	25 m^3/hr @ 1.34 Bar
Single Phase Electricity	230v / 110v 5 / 10 amps
Oxygen Operating with Acetylene	1.20 to 2.60 m^3/hr @ 1.5 to 2.2 Bar
Acetylene	0.90 to 2.28 m^3/hr @ 0.8 to 1.5 Bar

Typical performance figures for the MK74-MC pistol:

Material	Throughput KG/HR	Deposit Efficiency
Metallisation 99325/10 Ni/Cr/B/Si	5.8	87
Metallisation 99205/35 Al/Ti Oxide	1.3	83
Metallisation 99955/18 Ni-C (307-NS)	(N^2) 5.3	80-85
Metallisation 99958/18 Ni-C (308-NS)	(N^2) 5.3	80-85
Metallisation 99636/16 Ni/Al (450-NS)	4.0 – 5.8	82

NOTE: All above figures are approximate as equipment settings and coating parameters / applications can affect the throughput from the pistol.

HOSES

GENERAL SPECIFICATION

Red	Tubing to EN 559:2003 for Acetylene
Blue	Tubing to EN 559:2003 for Oxygen
Black	Tubing to EN 2398 for Compressed Air

INPUT HOSES – SUPPLY TO CONTROL CONSOLE

Part No.	Description
SUP-MK74-PC-IN	**Supplies From Bottles To Console Hoses 6m**

Technical overview

- Standard hose lengths are 6m.
- Non-standard lengths are available upon request.
- Acetylene and Oxygen hose fitted with safety check valves to prevent back-feeding of gases.
- Supplied with fittings appropriate to connect to all Metallisation supplied Flamespray equipment.

OUTPUT HOSES – SUPPLY FROM CONSOLE TO PISTOL

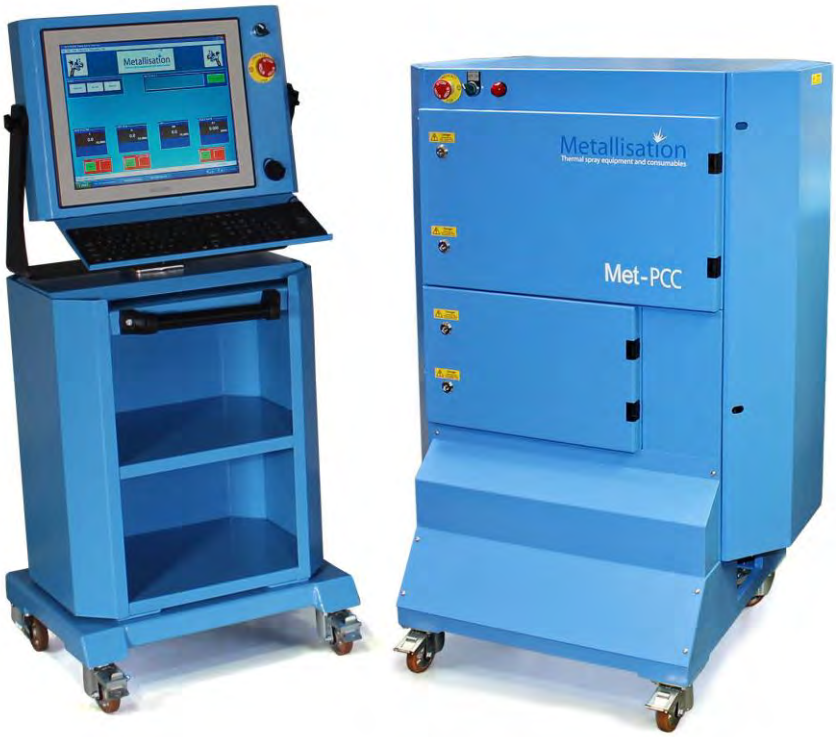
Part No.	Description
SUP-MK74-PC-OUT	**Supplies From Bottles To Console Hoses 6m**

Technical overview

- Standard hose lengths are 6m.
- Non-standard lengths are available on request.
- Maximum safety when hoses with check valves are used together with flame arrestors.
- Supplied with fittings appropriate to connect to all Metallisation supplied Flamespray equipment.

CONTROL SYSTEM

Part No.	Description
PCC(MK74)-CTRL	MK74 Control Interface and Gas Box
MET-TROL	Metallisation Ancillary Trolley



The operator interface is shown next to the gas box for pictorial purposes only. In a typical installation, the gas box would be inside the spray booth. The operator interface would be outside the spray booth.

TECHNICAL OVERVIEW

The control system for the MK74-PCC consists of a PC with a touch-screen operator interface and a gas box.

The PC provides a means of operator interface and overall system control. For reliability of operation, the actual control, of the individual operations of the system are controlled by PLC's in the gas box. The PC and PLC's are all linked by serial bus to minimise wiring and increase reliability.

GAS BOX CONTAINS

- Oxygen, Air and Fuel Gas mass flow controller.
- Control PLC with relevant input/output interface.
- Control valves and switching for sequencing and safe operation of the system.
- E-stop circuit with external interface to integrate into the safety circuit of the spray booth. Signals from the booth door, extraction system, robot, gas detectors etc. can all be linked into the system.
- Interlocks to inhibit system operation unless the following are within preset limits: oxygen pressure and flow; fuel gas pressure and flow; Air pressure and flow.
- Fault indication strobe.
- Interface between the gas box and robot by serial bus interface. Up to 255 items can be interfaced.
- Fixing points to floor or wall mount.

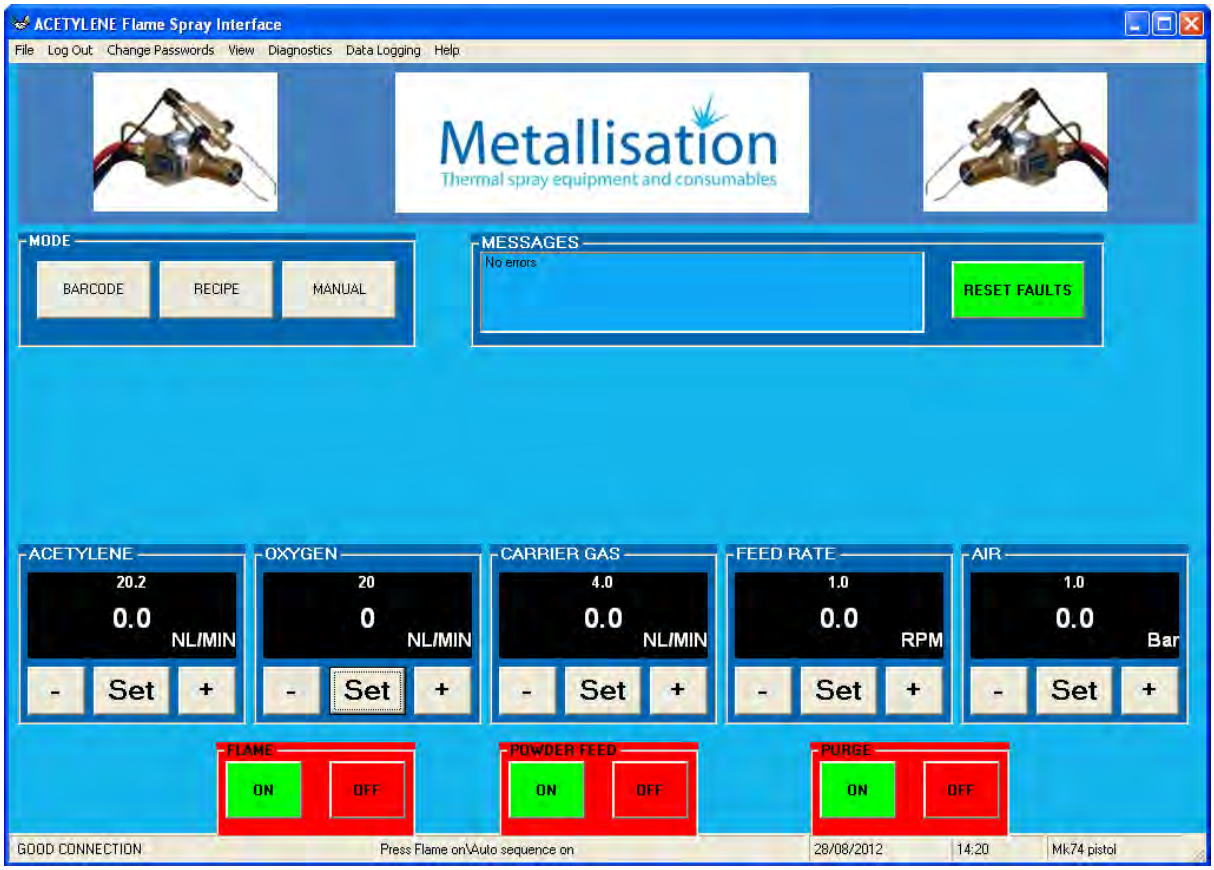
OPERATOR INTERFACE:

- Integrated PC with 17” touch screen, mounted into an industrial enclosure.
- Mounting system for operator interface as shown for wall mounting. Additional or alternative mounting methods are possible.
- Security levels, password protected for operation or programming.
- Comes with Windows XP as an operating system that is widely familiar.
- Real time data logging with programmable intervals. System logs the required parameters and actual operating parameters against time and also logs sequence events and faults.
- Data log output via .csv data format through USB or Ethernet to enable remote SPC analysis.
- If touch screen operation is not desirable, USB interfaces are included to allow connection of a keyboard, mouse or other generic/custom USB input devices.
- Full, on screen diagnostics to advise operator of the system status.

As the operator interface is PC based, it is extremely flexible to control. The functionality can be as complex or as simple as needed. However, as standard, the system can run in 3 modes of operation: manual; recipe or external interface.

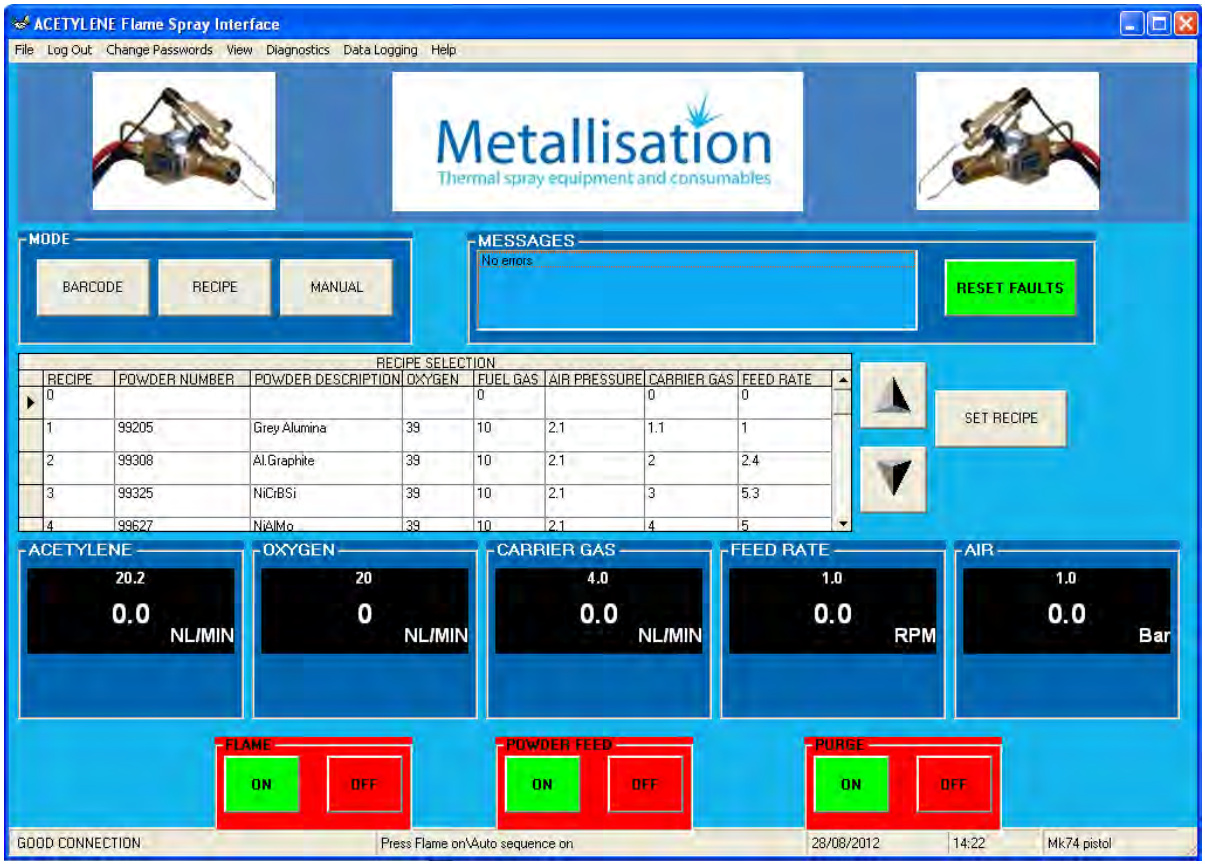
MANUAL OPERATION:

'Manual Mode' enables the operator to manually enter spray parameters prior to spraying. Values are entered into the appropriate fields and then the flame and powder feed control is started on command.



- Operator first selects MANUAL from the 'MODE' box.
- Operator manually sets the desired parameters for Fuel, Oxygen and Air. This can be done with either the + or – buttons or by pressing the Set button which displays a calculator style keypad.
- Once parameters are set, the green buttons are manually sequenced through from left to right.
- The sequence continues from left to right until, if appropriate, the robot sequence is started. Operation of the next button in sequence is inhibited until the interlocks are satisfied, e.g., the main flame cannot be lit until the pilot flame is detected to be lit and stable.
- During running, the gas flow parameters and wire speed can be adjusted.
- To stop the system, the button sequence must be actuated in reverse.
- Operating status and faults are displayed in the messages box.

RECIPE OPERATION:



- Operator first selects RECIPE from the 'MODE' box.
- Operator scrolls the recipe screen (that has a familiar Excel look to it) and selects the required recipe. The recipe selection screen is programmable so it can show recipe numbers or recipe descriptions. For example, the description could be the name of the part being sprayed.
- Once the recipe is chosen, the operator presses the SET RECIPE button. The parameters are loaded.
- Once the operator is happy that the components are ready to spray, the green AUTO SPRAY SEQUENCE button is pressed.
- The system automatically sequences the spraying cycle.
- If manually manipulating the pistol, the system will spray until the operator presses the OFF button.
- If automatically manipulating the pistol, the system will interface with the robot or automation and start the spraying sequence. Once complete, the system will automatically sequence through to shutdown.
- Operating status and faults are displayed in the messages box and data logging can be activated during spraying.
- Pre-loading of up to 10 recipes is included.

EXTERNAL INTERFACE OPERATION:

The system is capable to interface via USB to an external interface source. This could, for example, be a barcode reader, an interlocked signal to production automation or a manual component selection switch box.

If, for example the system is barcode interfaced, once the barcode is scanned, it will set the correct parameters. Once the component is ready to spray, the system is started in an automatic sequence in the same way as recipe operation above.

Data can be logged against individual bar-codes and stored to produce traceability of the coating and component.

External interface integration and programming can be quoted to your exact specification.

REGULATORS

Part No.	Description
21231	3/8" BSP Acetylene Regulator
21247	3/8" BSP Oxygen Regulator
21244	Nitrogen Regulator
21239	Argon Regulator

TECHNICAL OVERVIEW

- High flow regulators with minimal restriction offer reliability of operation and more repeatable lighting of the pistol through optimised gas flow rates.
- Complies with BS5741 and IS02503 standards.

FLAME ARRESTORS

Part No.	Description
21125	3/8" BSP RH Oxygen Flashback Arrestor
21124	3/8" BSP LH Gas Flashback Arrestor

Part number: 21125
Flame arrestor, oxygen

Part number: 21124
Flame arrestor, Propane/acetylene

TECHNICAL OVERVIEW

- Use together with Metallisation regulators and hoses with check valves for maximum safety.
- Mount to the regulator.
- Sintered metal flame arrestor quenches the flame front resulting from a flashback.
- Pressure relief valve safely vents excess pressure and fumes.
- Pressure sensitive cut-off valve, incorporating a tamper-proof reset mechanism, prevents the re-ignition of unburnt gases after a flashback.

POWDER FEEDER

Part No.	Description
2007MF-PF(2800)	Mass flow powder feeder – 2.8L hopper
2007MF-PF(3350)	Mass flow powder feeder – 3.35L hopper
2007MF-PF(2.8)-QR	Mass Flow Powder Feeder, 2.8 Ltr with Quick Release hopper
2007MF-PF(3.35)-QR	Mass Flow Powder Feeder, 3.35 Ltr with Quick Release hopper
QRPFH-2.8	Quick Release Powder Feeder Hopper (2.8 L)
QRPFH-3.35	Quick Release Powder Feeder Hopper (3.35 L)
QRPF-BRKT	Quick Release Powder Feeder Hopper Support Bracket for 2 hoppers
MET-TROL**	Metallisation Ancillary Trolley
6688C	Heater Jacket & Plug Assembly

Technical overview

** Ancillary Trolley sold separately

- Mass flow control of carrier gas = repeatability.
- Volumetric feed via hopper and rotating disc design.
- Two disc variants to allow optimum feeding of a wide range of powders.
- Parameters are displayed on the powder feeder and also relayed to the operator interface unit for display and logging.
- Contains PLC for control and integration to operator interface unit
- Feed disc rotational speed is controlled via a closed loop AC inverter for improved feeding accuracy.
- Control can either be via the operator interface or directly at the powder feeder for stand-alone operation.
- Multiple power feeders can be integrated into the system.
- Powder Feeder comes complete with the connection for a Hopper Heater Jacket.
- Supplied with 1 x Powder Feeder control Ethernet cable from Gas box to Powder Feeder Std 7m, longer lengths available at request.
- 4mm bore Anti-static powder feed hoses (max length of 5m) from powder feeder to the pistol. Optional 2.5mm bore powder feed hose (9641) available.
- Various Powder Feeder options available with various sized hoppers, quick release hoppers or weigh scales to suit specific customer requirements.

SPECIFICATION AND SUPPLY REQUIREMENTS

Description	Characteristics
Canister capacity	2,800cc or larger as indicated
Electrical supply	240/110V 1ph, 5A*
Weight	40kg
Dimensions (mm)	W-400 x D-400 x H-700

* Use a suitable MCB or Motor / T rated fuses

NOTES

Metallisation

Thermal spray equipment and consumables

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