

Metallisation

Thermal spray equipment and consumables



Equipment Specification

Met-PCC(MK66E)

Propane/Acetylene Flame Spray System

INTRODUCTION

The following specification covers the standard range of the Met-PCC(MK66E) 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

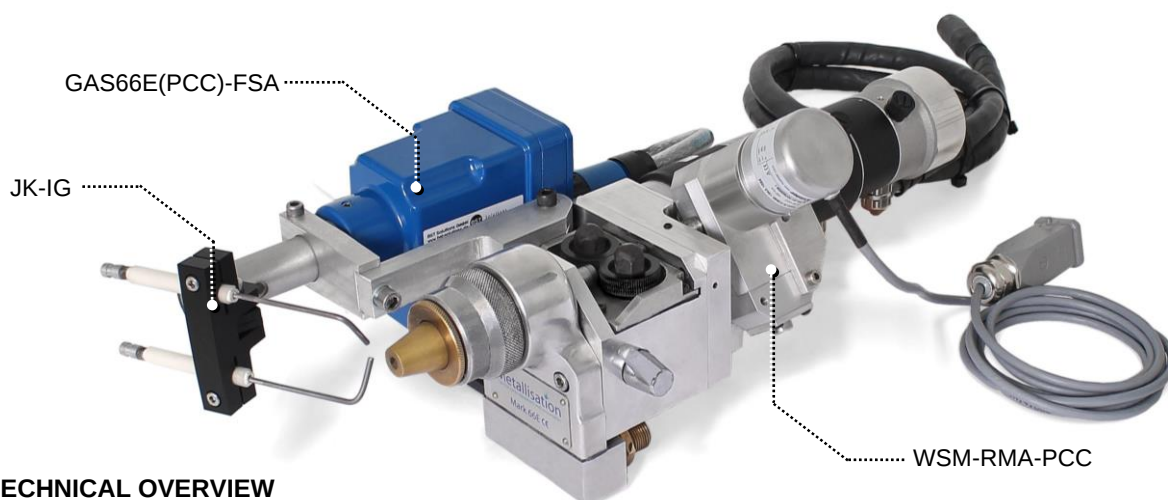
The NEW Metallisation Met-PCC(MK66E) is a fully automatic flamespray system with mass flow control, which offers the ability to produce the highest quality, repeatable coatings. The system provides a fully automatic sequence of ignition, main flame and wire feed. The wire feed is capable to be stopped 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, Propane Fuel Gas and Atomising 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.
- ✦ Interface to external control systems/robot automation.

MK66E PISTOL

Part No.	Description
GAS66E(PCC)-1.6	Gas Mk66E (PCC) Pistol for 1.6mm wires
GAS66E(PCC)-1/8-A	Gas Mk66E (PCC) Pistol for 1/8" wires - Acetylene
GAS66E(PCC)-FSA	Gas66E-PCC Flame Sense Assembly
WSM-RMA-PCC	Wire Speed Reader Module Assembly (GAS66E-PCC Systems)
JK-IG	Pistol Mount Ignition Assembly



TECHNICAL OVERVIEW

- ✦ Primarily for spraying anticorrosion coatings (Aluminium and Zinc).
- ✦ Flame produced by burning Propane and Oxygen gases.
- ✦ Wire drive via DC Electric drive motor with Tacho feedback for closed loop control.
- ✦ Simple pistol maintenance for reduced downtime when changing consumables.
- ✦ Sturdy, robust design for long service life.
- ✦ Can be robot or toolpost/automation mounted.
- ✦ GAS66E(PCC)-FSA – This robust Flame Sense Assembly mounts on the side of the Gas66E. It carries a flame sensor to detect if a flame is present (in conjunction with a suitable interface).
- ✦ JK-IG - A pair of ignition electrodes (these can be used to light the pistol when connected to a suitable ignition transformer).
- ✦ WSM-RMA-PCC - When the WSM-RMA-PCC is attached, the true wire speed (in mm/min) will be displayed on the HMI and is available for data logging and export.

Technical data (Dimensions not including Flame Sense or Wire Speed Monitor):

Description	Characteristics
Weight	5kg
Width	130mm
Length	380mm
Height	200mm
Compressed air usage	50 m³/hr @ 5.5 bar
Single Phase Electricity	230v / 110v 5 / 10 amps

HOSES

GENERAL SPECIFICATION

Orange	Tubing to EN 559:2003 for Propane or
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
SUP66E(PCC)-IN	Mk66E (PCC) Input Supplies Package 6Mtr
SUP66E(PCC)-IN-A	Mk66E (PCC) Input Supplies Package 6Mtr - Acetylene

TECHNICAL OVERVIEW

- Standard hose lengths are 6m.
- Non-standard lengths are available upon request.
- Fuel gas 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
SUP66E(PCC)-OUT	Mk66E (PCC) Output Supplies Package 6Mtr
SUP66E(PCC)-OUT-A	Mk66E (PCC) Output Supplies Package 6Mtr - Acetylene

TECHNICAL OVERVIEW

- SUP66E(PCC)-OUT is used from the control console to the remote interface box mounted close to the pistol. Standard length is 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(MK66E)-CTRL	Met-PCC(MK66E) Gas Box Console
MET-TROL	Metallisation Ancillary Trolley



The operator interface is shown connected 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 Met-PCC(MK66E) 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.

The remote interconnection box(es) include safety solenoids mounted locally to the pistol to allow safe shutdown in an emergency. The dual pistol version allows the controller to sequence between the two pistols.

GAS BOX CONTAINS

- ✦ Oxygen, Atomising 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.

SPECIFICATION AND SUPPLY REQUIREMENTS:

Description	Characteristics
Oxygen	60 l/min (max) @ 4-8 bar
Propane	20 l/min (max) @ 4-8 bar
Acetylene	20 l/min (max) @ 1.5 bar
Air	1000 l/min (max) @ 4-6 bar
Electrical - console	240/110V 1ph, 8A/15A
Weight	Gas box – 100kg : HMI Operator interface – 20kg
Dimensions (mm)	Gas box - W-860 x D-560 x H-1250 Operator interface - W-560 x D-175 x H-410

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 10 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.

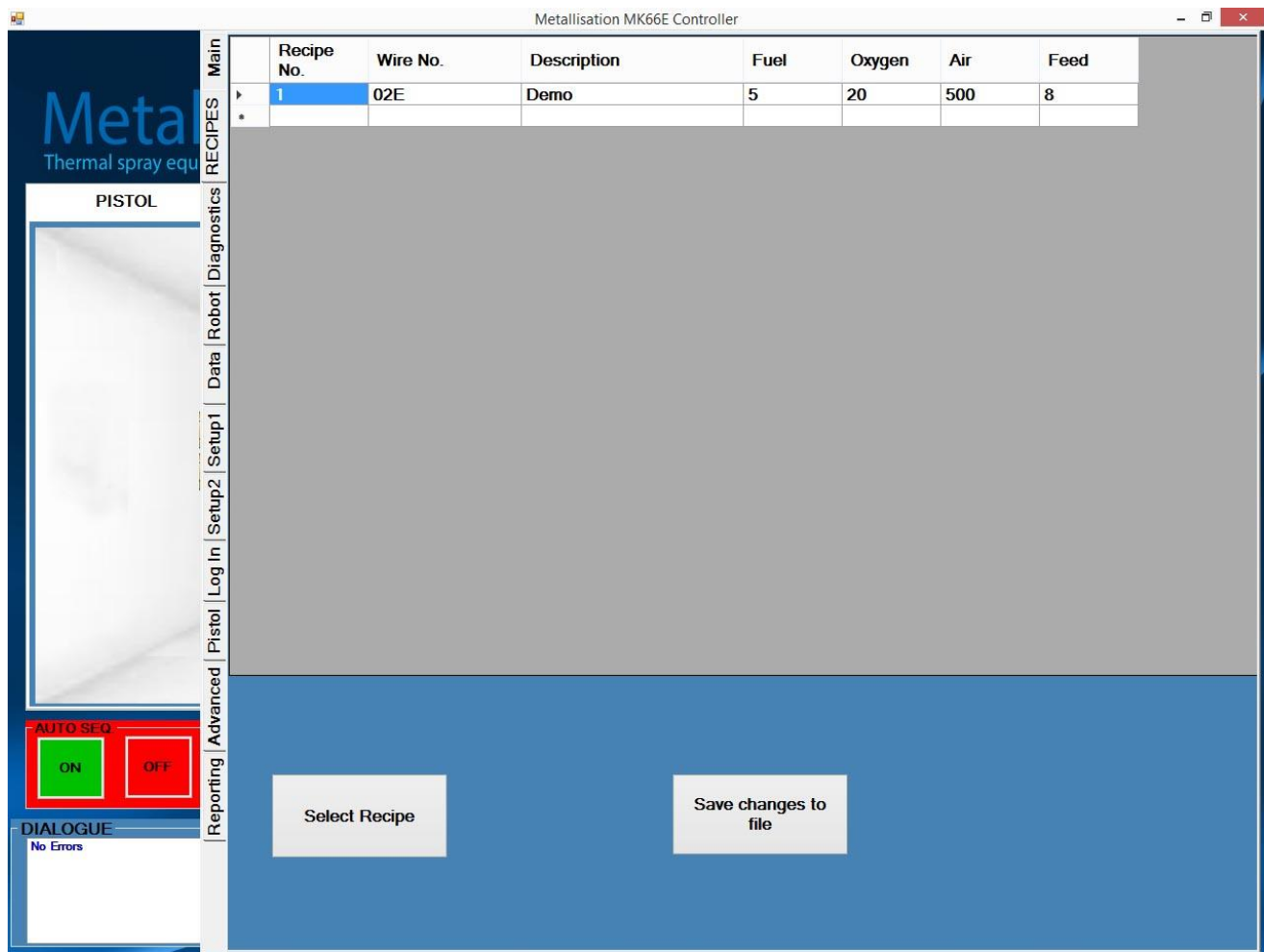
As the operator interface is PC based, it is extremely flexible to control. The functionality can be as complex or as simple as needed. However, as standard, the system can run in 3 modes of operation: manual; recipe or external interface.

MANUAL OPERATION



- ✦ Operator first selects MANUAL from the 'MODE' box.
- ✦ Operator manually sets the desired parameters for Acetylene or Propane, Oxygen and Air This is done by double clicking on the parameter boxes on the right hand side which brings up a keypad to enter the desired values.
- ✦ Once parameters are set, the green buttons are manually sequenced through from left to right, first starting the flame.
- ✦ Once the coolant is flowing and the system detects that coolant flow, pressure and temperature are within limits, the pilot light button can be pressed.
- ✦ 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.
- ✦ 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.
- ✦ At each change of sequence, the animated pistol image will change to graphically show the status.

RECIPE OPERATION



- ✦ Operator first selects RECIPE from the tabbed menu 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.
- ✦ If the operator has logged in with the appropriate permissions, they can create new recipes and save them on this screen.
- ✦ Once the parameters are selected, the system can either be manually sequenced as described on the previous page or automatically sequence as described on the following page.
- ✦ Pre-loading of up to 10 recipes is included.

AUTOMATIC SEQUENCING



- ✦ Instead of manually sequencing through the process, a single button auto sequencing option is available.
- ✦ Once the operator is happy that the components are ready to spray, the green AUTO SEQUENCE ON button is pressed.
- ✦ The system automatically sequences the spraying cycle, starting the flame, feed and automation.
- ✦ 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.

ROBOT/AUTOMATION INTERFACE (ROBOT MASTER)

As standard, the spray controller will act as the slave (robot master). The robot program will call the pistol to light and once it is stable, the spray controller will indicate back to the robot that the flame is lit. Once again, when stable, a spray OK signal is given to the robot.

Any faults in the spray controller or robot are also communicated between the two systems as a single fault signal (not detail of fault reason).

The system can be programmed on request with the supply of some additional hardware for the robot to be slave to the spray system. If the robot is programmed in such way, the spray system can select the appropriate robot program and number of passes for the robot to make for a given spray job.

ROBOT/AUTOMATION INTERFACE (ROBOT MASTER) CONTAINS:

- ✦ Contains a PLC mounted on a DIN rail which would be installed within the robot/external automation controller
- ✦ 4 off inputs: flame on/off, robot fault and air jets on/off
- ✦ 4 off outputs: flame OK, spray OK, air jets OK and fault signal
- ✦ PLC requires a 25vDC, 1.2 amps supply from the robot/external automation controller

ADDITIONAL FEATURES

- Full on-screen **diagnostics** are included to enable easy fault-finding and calibration. Within the diagnostics screen, certain job-specific functions can also be set, e.g. parameter ramps, robot interface,



- All typical spray parameters are monitored and a **trending** screen is included. This enables the system to check that operation remains within expected limits and report if the system strays outside of these limits during operation.



- There is also a **video** input and specific screen tab available to display the video input. This is useful for some spray sites where the access to the spray room is limited. A small webcam or CCTV camera can be installed in the booth and displayed on the spray controller screen.



- Data logging** is a feature which allows the system to log the flow data during spraying for quality control purposes. An administrator can adjust the logging interval and once changed save the logging interval to disk for all future processes.

	A	B	C	D	E	F
	TIME	COOLANT FLOW	COOLANT PRESSURE	TEMP IN	TEMP OUT	CHAMBER PRESS
1	20/10/2015 11:00	28.5	5.6	11.6	52.0	7.8
2	20/10/2015 11:00	28.5	5.6	11.6	52.0	7.8
3	20/10/2015 11:00	28.5	5.6	11.6	52.0	7.8
4	20/10/2015 11:01	28.5	5.6	11.6	52.0	7.8
5	20/10/2015 11:01	28.5	5.6	11.6	52.0	7.8
6	20/10/2015 11:01	28.5	5.6	11.6	52.0	7.8
7	20/10/2015 11:01	28.5	5.6	11.6	52.0	7.8
8	20/10/2015 11:01	28.5	5.6	11.6	52.0	7.8
9	20/10/2015 11:01	28.5	5.6	11.6	52.0	7.8
10	20/10/2015 11:01	28.5	5.6	11.6	52.0	7.8
11	20/10/2015 11:02	28.5	5.6	11.6	52.0	7.8
12	20/10/2015 11:02	28.5	5.6	11.6	52.0	7.8
13	20/10/2015 11:02	28.5	5.6	11.3	52.0	7.8
14	20/10/2015 11:02	28.5	5.6	11.6	52.0	7.8
15	20/10/2015 11:02	28.5	5.6	11.6	52.0	7.8
16	20/10/2015 11:02	28.5	5.6	11.6	52.0	7.8
17	20/10/2015 11:03	28.5	5.6	11.6	52.0	7.8
18	20/10/2015 11:03	28.5	5.6	11.6	52.0	7.8
19	20/10/2015 11:03	28.5	5.6	11.6	52.0	7.7
20	20/10/2015 11:03	28.5	5.7	11.6	52.0	7.6

- The **reporting** feature allows the user to produce a process report which details the spray data from any given time.



- The Metallisation Panel PC HMI can be **connected to a company network or internet connection**. This can be done through a dedicated industrial network to control automated equipment or through a spare network adaptor which can be configured to use on a company network or internet.



REGULATORS

Part No.	Description
21231	3/8" BSP Acetylene Regulator
<i>or 21246</i>	3/8" BSP Propane Regulator
21247	3/8" BSP Oxygen Regulator



Part number: 21231
Acetylene regulator



Part number: 21246
Propane regulator



Part number: 21247
Oxygen 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 ISO2503 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.

WIRE DISPENSE

WIRE SWIFT

Part No.	Description
24750A	Wire Swift – Wire Dispenser/Straightener



TECHNICAL OVERVIEW

- ✦ Tripod base giving stability and strength and ball race thrust bearing for continued free rotation with adjustable brake preventing over-run of wires
- ✦ Easily adjusted wire retention arms which may be used for dispensing from coils or removed for dispensing from MIG or LAYER reels
- ✦ Ability to carry wire coils of diameters from 10" (250mm) - 30" (750mm) inside diameter
- ✦ Provision for a wire straightener for stiff materials such as 1/8" steels etc

WIRE DISPENSING CONES

Part No.	Description
21252	Wire Dispensing Cones – variable position



TECHNICAL OVERVIEW:

The Metallisation wire dispensing cone offers the ability to conveniently dispense anti-corrosion wires from production packs (drums). The wire is neatly guided to a dispense point, then over the pulley to give a free passage of wire from the drum to pistol. Benefits include:

- ✦ Fitted Pulley to ensure a smooth wire feed to the pistol.
- ✦ Variable position clamp assembly allows the clamp to be rotated to give the smoothest wire transfer path from the drum to the pistol.

WIRE DISPENSE

MIG REEL WIRE DISPENSER

Part No.	Description
2006-MIG-RHA-R	MIG Reel Hub & Bracket Assembly Kit for IRB2600 Robot Mounting



TECHNICAL OVERVIEW

- ✦ MIG reels are individually insulated from each other.
- ✦ Brake tension to ensure wire does not uncoil.
- ✦ MIG reel dust cover to ensure more consistent spraying.
- ✦ All common anti-corrosion materials and most engineering materials available on MIG reels.
- ✦ Designed to ensure a smooth wire feed to the pistol.
- ✦ Bracket suitable to mount to ABB IRB 2600 robot arm base.

NOTES:

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