



# Metallisation

Thermal spray equipment and consumables

EXCELLENCE AND SUPPORT SINCE 1922



## NATIONAL ALLOY SOLUTIONS



## Equipment Specification

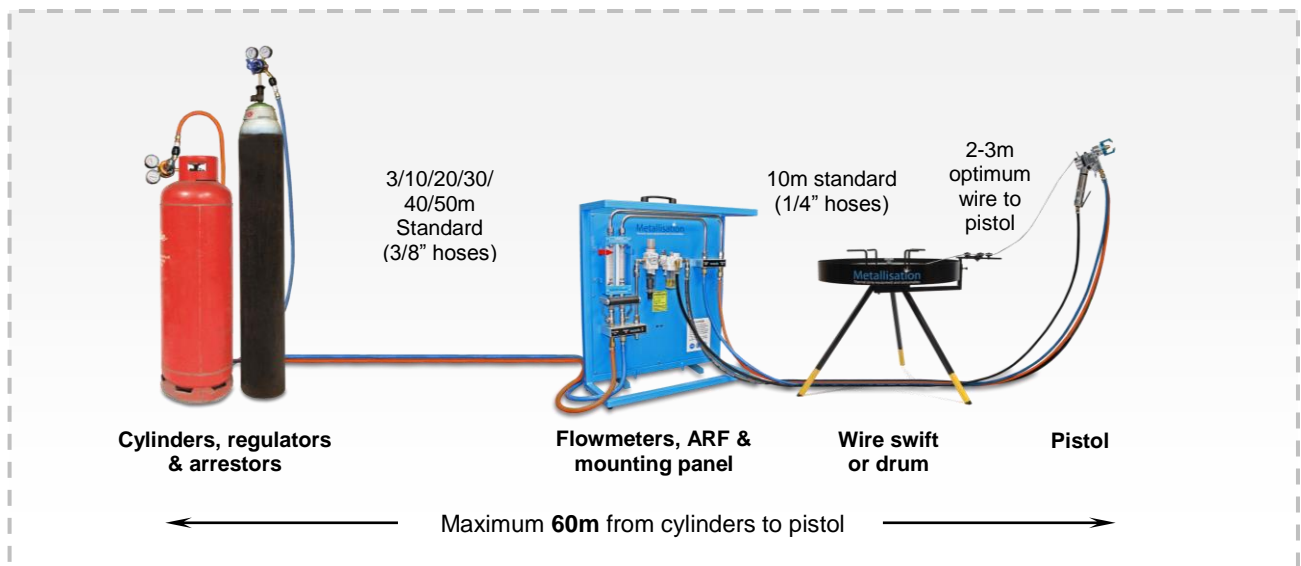
MK73 FS Flame Spray System

## TYPICAL SYSTEM CONFIGURATIONS

Pictured below is a range of typical system configurations. Variations of these configurations may be possible. For some applications, longer supplies packs can also be offered (up to 80m from cylinders to pistol). Contact Metallisation to discuss your specific application requirements.

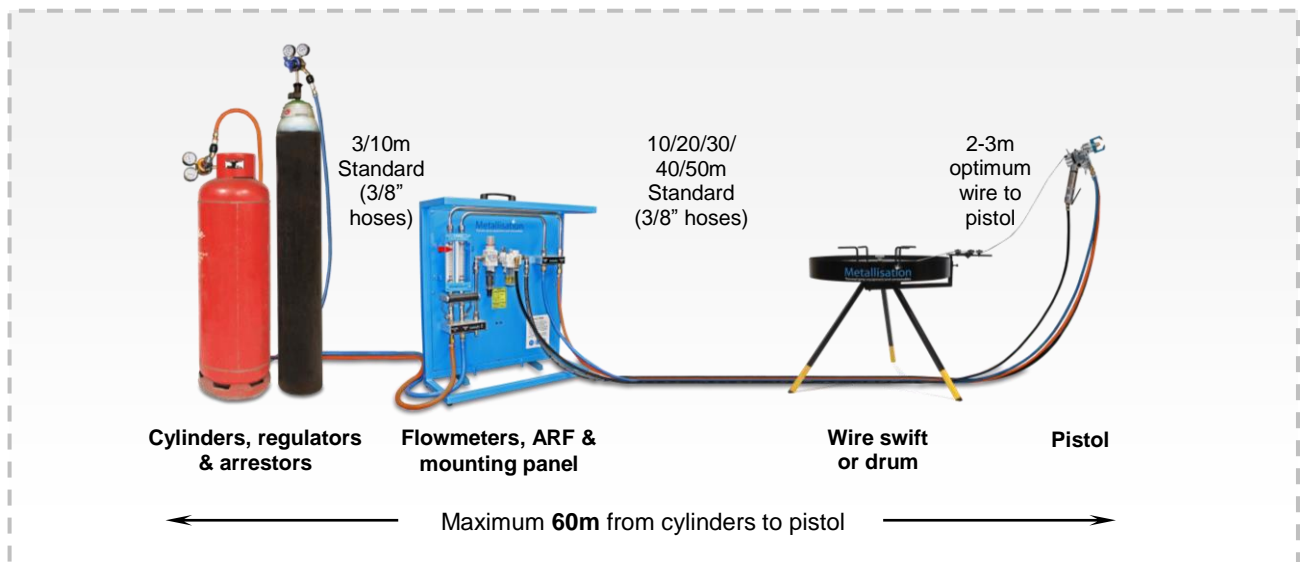
### STANDARD CONFIGURATION

Most commonly used for spraying materials from coils. This is the preferred configuration with long supplies packs as the flowmeter board is closely accessible to the operator.



### 'REVERSED' EXTENDED SUPPLIES CONFIGURATION

For some applications, it may be required to have long supplies between the flowmeter board and the pistol. In this case, 3/8" hoses will be supplied for the entire length and the 'L' version of the pistol is also required.



**NB:** Cylinders not supplied

## INTRODUCTION

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The following specification covers the entire standard range of MK73 FS flamespray system. For the specific offer, please refer to the attached quotation and cross reference the part numbers for each piece of equipment.

The Metallisation MK73 FS is an oxygen-propane fuelled flamespray system giving un-rivalled anti-corrosion coatings. The 'FS' stands for Free-Standing as the new control board can be free standing or wall mounted.

The lightweight, well-balanced, robust pistol offers the quickest spray rates on the market, saving you both time and money. Systems can be supplied as continuous spray or, more commonly, with a unique stop/start function that allows the operator to stop spraying but keep the flame lit without damage to the pistol.

New in 2014 is a more 'site friendly' control panel. It is more robust and offers further protection to the flowmeter and ARF unit. It can be wall mounted or will free-stand on the floor. The flow of hoses is neater than the previous unit.

The new control panel is also better suited to using in long supplies format, which is becoming an increasing requirement for site installations. See 'Supplies Packs and 'Control Board' section for more details.

The pistol can be further enhanced by fitting a deflected spray extension. This unit allows the operator to spray at right angles and get into difficult to access spray areas, such as between pipes or close to brackets. This enables more areas to be sprayed and with a better quality coating than may have previously been possible. The extension uses the same consumable parts as a standard pistol.

**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

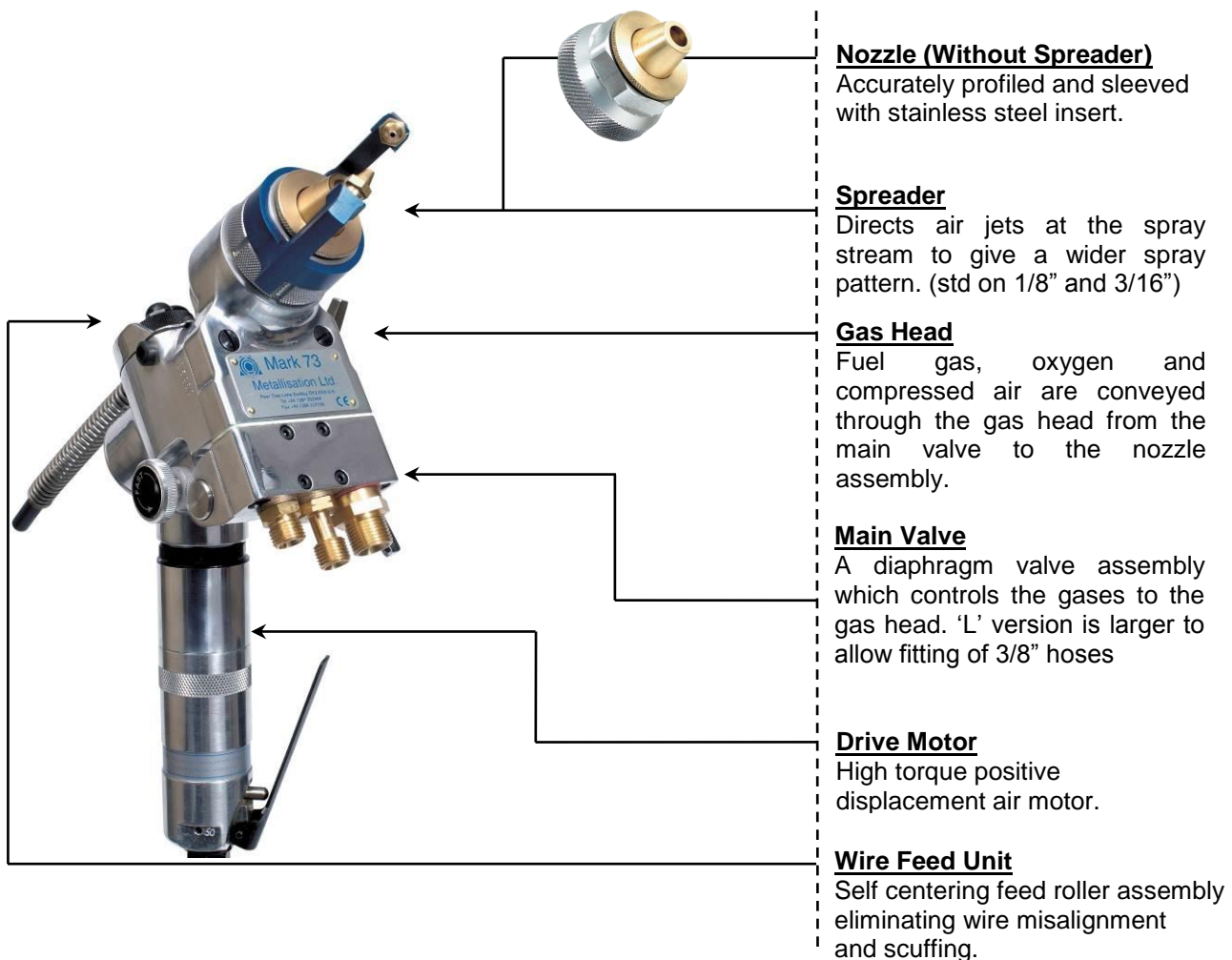
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- ✦ Fastest pistols on the market (up to 50kg/hr for continuous zinc)
- ✦ Stop/start version allows operator to stop spraying and leave the flame lit (e.g., whilst inspecting or moving the work piece)
- ✦ Wide range of wire sizes to suit many application and coating requirements
- ✦ Spreader and non-spreader versions to allow detail work or larger areas to be sprayed efficiently
- ✦ New, free standing or wall mounted control panel
- ✦ Safety shut-off valve
- ✦ Optional panel mounted oxygen regulator for long supplies setups
- ✦ Variable wire speed control
- ✦ Suitable for anti-corrosion wires plus some steels, copper and bronzes.
- ✦ Two stage air cap gives optimal setting for lighting and spraying
- ✦ Rugged construction combined with light-weight and balance for ease of handling
- ✦ Hanging hook for temporary storage or connection to spring balance
- ✦ Variety of hose lengths to suit each application
- ✦ Flow meters for optimal setting of parameters and fault finding
- ✦ Flow meters include large pointers for ease of checking from a distance
- ✦ Air Regulator and Filter (A.R.F.) unit supplies motor air, nozzle air.
- ✦ Optional deflected extensions for access to difficult to spray areas.

## MK73 PISTOL

Part No.	Description
<b>GAS73-1.6MM</b>	<b>MK73 flamespray pistol for 1.6mm wires</b>
<b>GAS73-2MM</b>	<b>MK73 flamespray pistol for 2mm wires</b>
<b>GAS73-2.3MM</b>	<b>MK73 flamespray pistol for 2.3mm wires</b>
<b>GAS73-3MM</b>	<b>MK73 flamespray pistol for 3mm wires</b>
<b>GAS73-4MM</b>	<b>MK73 flamespray pistol for 4mm wires</b>
<b>GAS73-1/8</b>	<b>MK73 flamespray pistol for 1/8" wires</b>
<b>GAS73-3/16</b>	<b>MK73 flamespray pistol for 3/16" wires</b>
<b>GAS73-3/16"F</b>	<b>MK73 flamespray pistol for 3/16" wires (fast)</b>
<b>GAS73L-1/8</b>	<b>MK73 Pistol 1/8" wires for 3/8" hose supplies</b>
<b>GAS73L-3/16</b>	<b>MK73 Pistol 3/16" wires for 3/8" hose supplies</b>

Pistols vary dependant on the wire size that is to be sprayed. The Pistol shown is for a standard 3/16" System. The table above this illustration gives the variant pistol part numbers for the relevant wire size that is used:



## TECHNICAL OVERVIEW

- Primarily for spraying anti-corrosion coatings (zinc, aluminium and their alloys).
- Flame produced by burning propane and oxygen gases.
- High output (see table over for typical spray rates).
- Most commonly used variant is 3/16" stop/start pistol as it maximises spray rate whilst giving the benefits of being able to stop and start spraying and keep the main flame alight.
- Wire drive via high torque, positive displacement air motor that also doubles as the handle.
- The 'L' variant of pistol (e.g. GAS73L-3/16) is used only when 3/8" hoses are needed to be supplied to the pistol, e.g. 60m+ setups or when the control board is >10m from the operator.

## TECHNICAL DATA

Description	Characteristics
Weight – at a held height of 1.2 M	3.18 Kgs – inc hoses
Width	95mm
Length	257mm
Height	286mm
Compressed air usage	50m³/hr @ 5.5 bar (minimum) 6.5 bar (max motor torque)
Oxygen usage	1.36-7.9 m³/hr @ 1.5-4.8 bar
Propane usage	0.62-1.59 m³/hr @ 1.7-4.1 bar

The gas and oxygen pressure and consumption figures shown cover the full range of possible nozzle assemblies which could be used, e.g. 1.6mm lowest, 3/16" highest consumption.

## TYPICAL PERFORMANCE FIGURES FOR THE MK73 PISTOL

Material	Wire Diameter	Throughput kg/hr	Coverage m²/kg/100µ
Metallisation Wire 01E ) Aluminium ) Stop/Start Mode ) Continuous Mode )	3/16" 1/8" 2mm 3/16"	7.5 3.6 2.3 12.5	3.57
Metallisation Wire 02E ) Zinc ) Stop/Start Mode ) Continuous Mode )	3/16" 1/8" 2mm 3/16"	32.0 16.0 8.2 50.0	0.91
Metallisation Wire 21E ) Zinc/Aluminium 85/15 ) Stop/Start Mode ) Continuous Mode )	3/16" 1/8" 2mm 3/16"	25.0 12.5 7.5 38.0	1.11
Metallisation Wire 07E, 08E, 09E Tin Zinc Alloys	1/8" 2mm	21.3 9.1	0.91
Metallisation Wire 06E – Nickel	1/8"	3.6	1.02

All data provided is an approximation and is offered as guidance only as performance can vary depending on application and parameters.



## TOOLKIT



Appropriate hand tools are supplied with the Flame spray pistol along with an operating manual and pistol case.

## SUPPLIES PACKS

### GENERAL SPECIFICATION

Orange	Tubing to EN 559 for Propane
Blue	Tubing to EN 559 for Oxygen
Black	Tubing for Compressed Air



Supplies from regulators to flowmeters



Propane Hose



Oxygen Hose

Supplies from flowmeters to Pistol



Propane Hose



Oxygen Hose



Nozzle air Hose



Motor Air Hose

## **‘STANDARD’ SETUP**

In our standard setup, we would expect the flowmeter to pistol length to be 10m maximum and extended supplies would have longer hoses between the cylinders and the flowmeters.

## **SUPPLIES PACKS FROM REGULATORS TO FLOWMETERS**

Consists of 1 oxygen and 1 propane hose of the stated length with appropriate fittings. All hoses are 3/8" diameter.

Part No.	Description
<b>SUP73-FS-IN-3M</b>	<b>Mk73 F/S Board System, 3M Supplies Package from Regulators to Board</b>
<b>SUP73-FS-IN-10M</b>	<b>Mk73 F/S Board System, 10M Supplies Package from Regulators to Board</b>
<b>SUP73-FS-IN-20M</b>	<b>Mk73 F/S Board System, 20M Supplies Package from Regulators to Board</b>
<b>SUP73-FS-IN-30M</b>	<b>Mk73 F/S Board System, 30M Supplies Package from Regulators to Board</b>
<b>SUP73-FS-IN-40M</b>	<b>Mk73 F/S Board System, 40M Supplies Package from Regulators to Board</b>
<b>SUP73-FS-IN-50M</b>	<b>Mk73 F/S Board System, 50M Supplies Package from Regulators to Board</b>

## **SUPPLIES PACKS FROM FLOWMETERS TO PISTOL**

Consists of 1 oxygen, 1 propane, 1 nozzle air and 1 motor air hose of the stated length with appropriate fittings. Gas hoses are all 1/4" diameter. Propane and oxygen hoses are fitted with safety check valves to minimise the possibility of back-feeding of gases.

Part No.	Description
<b>SUP73-FS-OUT-10M</b>	<b>Mk73 F/S Board System, 10M Supplies Package from Board to Pistol</b>



### ‘REVERSED’ EXTENDED SUPPLIES SETUP

In some applications, the site requirements may need longer hoses between the flowmeters and the pistol. This setup we call a ‘reversed’ extended supplies setup and 3/8” hoses are required for the full length of the supplies package. This requires that an ‘L’ type pistol is also used which enables the 3/8” hoses to be fitted.

### SUPPLIES PACKS FROM REGULATORS TO FLOWMETERS

Consists of 1 oxygen and 1 propane hose of the stated length with appropriate fittings. All hoses are 3/8” diameter.

Part No.	Description
SUP73-FS-IN-3M	Mk73 F/S Board System, 3M Supplies Package from Regulators to Board
SUP73-FS-IN-10M	Mk73 F/S Board System, 10M Supplies Package from Regulators to Board

### SUPPLIES PACKS FROM FLOWMETERS TO PISTOL

Consists of 1 oxygen, 1 propane, 1 nozzle air and 1 motor air hose of the stated length with appropriate fittings. Gas hoses are all 1/4” diameter. Propane and oxygen hoses are fitted with safety check valves to minimise the possibility of back-feeding of gases.

Part No.	Description
SUP73L-FS-OUT-10M	Mk73 F/S Board System, 10M Supplies Package from Board to Pistol (Long supplies)
SUP73L-FS-OUT-20M	Mk73 F/S Board System, 20M Supplies Package from Board to Pistol (Long supplies)
SUP73L-FS-OUT-30M	Mk73 F/S Board System, 30M Supplies Package from Board to Pistol (Long supplies)
SUP73L-FS-OUT-40M	Mk73 F/S Board System, 40M Supplies Package from Board to Pistol (Long supplies)
SUP73L-FS-OUT-50M	Mk73 F/S Board System, 50M Supplies Package from Board to Pistol (Long supplies)

## CONTROL BOARD AND ANCILLARIES

Part No.	Description
27000-FS	Freestanding Flamespray Control Board - Mk73/Mk61
27030-FS	Panel Mount Oxygen Regulator for freestanding Flamespray Control Board - Mk73/Mk61



27000-FS complete



27000-FS with 27030-FS fitted.  
Also shows optional flashback arrestors fitted.

### TECHNICAL OVERVIEW

- For standard longer hose setups, the panel mounted oxygen regulator (p/n 27030-FS) is offered. This unit allows the operator to make adjustments to the oxygen at the panel when the cylinder regulators are a long distance from the panel. Note that the fuel should only need to be set once and the flows are balanced with the oxygen regulator, hence no fuel regulator is offered at the panel.
- For some sites, safety regulations request a method of rapid shut-off of the gas supply so the safety shut-off valve is included.
- Flowmeters (p/n 21130) are used with Metallisation regulators to ensure correct mixture of propane and oxygen is fed to the pistol to give the optimum flame for the material sprayed. They are used as a primary diagnosis tool for fault finding and are mounted in a robust steel/Perspex case.
- The high flow Air Regulation and Filtration unit (ARF, p/n 27020-FS) is made up of an input regulator, filter bowl, lubricator and output regulator for the nozzle air. A single supply feeds both the motor air (lubricated) and nozzle air (dry). The unit can be expanded to allow attachment of a third output to feed the optional deflected extension.

## REGULATORS AND ARRESTORS

Part No.	Description
21246	3/8" BSP Propane Regulator (long supplies)
21247	3/8" BSP Oxygen Regulator (long supplies)
21124	3/8" BSP LH Gas Flashback Arrestor
21125	3/8" BSP RH Oxygen Flashback Arrestor
21126	3/8" BSP LH Propane Hose Failure Valve



21246



21247



21124



21125



21126

### TECHNICAL OVERVIEW - REGULATORS

- High flow regulators with minimal restriction offer reliability of operation and more repeatable lighting of the pistol through optimised gas flow rates.
- Complies with BS EN ISO 2503 standards.

### TECHNICAL OVERVIEW – FLASHBACK ARRESTORS / PROPANE HOSE FAILURE VALVE

- Use together with Metallisation regulators and hoses with check valves for maximum safety.
- 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.
- Complies with BS EN 730-1 standards.
- Propane Hose Failure Valve – This is an optional additional safety valve that shuts off if the propane hose gets a split or cut and there is an excess flow through the system.

## WIRE DISPENSE

### WIRE SWIFT

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



#### 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
<b>21252</b>	<b>Wire Dispensing Cones – variable position</b>



#### 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.

## DEFLECTED FLAME SPRAY EXTENSION

Part No.	Description
<b>GAS-EXT-150</b>	<b>Gas Extension Deflector 150mm</b>
<b>GAS-EXT-300</b>	<b>Gas Extension Deflector 300mm</b>
<b>GAS-EXT-450</b>	<b>Gas Extension Deflector 450mm</b>



### TECHNICAL OVERVIEW

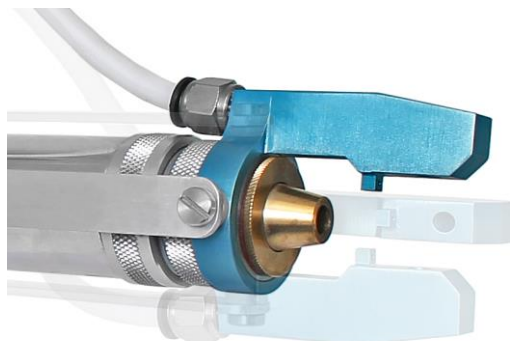
- ✦ Fits directly to Metallisation MK73 (oxy-propane) or MK61 (oxy-acetylene) flame spray pistols.
- ✦ Will spray from 0° to 90° deflection.
- ✦ For use with 1/8" (3.17mm) or 3/16" (4.76mm) wires.
- ✦ Requires additional regulated air supply (see ARF section).
- ✦ Coating characteristics with the extension are in line with standard flame sprayed coating characteristics (adhesion, surface finish)

### TECHNICAL DATA

Description	Characteristics		
	150mm	300mm	450mm
<b>Weight</b>	<b>1.1kg</b>	<b>1.3kg</b>	<b>1.5kg</b>
<b>Overall length</b>	<b>270mm</b>	<b>420mm</b>	<b>570mm</b>
<b>Typical access envelope (head diameter + spray stream formation)</b>	<b>75mm</b>		
<b>Compressed air usage</b>	<b>Approx. same as standard gas pistol</b>		
<b>Oxygen usage</b>	<b>Same as standard gas pistol</b>		
<b>Fuel gas usage</b>	<b>Same as standard gas pistol</b>		

## SPRAY DEFLECTION

The spray head will deflect the spray stream from 0° up to 90° by varying the air pressure either at the regulated air supply or the ball valve on the extension. The deflector is able to rotate through 180° using the rotator, ensuring that spraying into almost any area is possible.



## FITTING THE EXTENSION

As standard, the extension will fit directly onto any Metallisation MK73 or MK61 pistol that is already spraying 1/8" or 3/16" wire.

The front end of the standard pistol will be removed and the air nipple, nozzle, insert, mixing block, O-rings, air nipple lock ring, lock ring washer and flexible washer are retained.

The extension unit is screwed onto the front of the pistol in the same manner as the standard air cover would be fitted.

The standard consumable parts retained are then assembled into the front of the extension. Alternatively, a full set of parts can be supplied that will be dedicated to the extension (see below)

Different parameters are used when spraying with the extension unit and the gas, oxygen and air pressures will need to be changed as appropriate.

### Front end parts kit

Part No.	Description
<b>GAS-EXT-1/8 KIT</b>	<b>Front end parts for 1/8" wire on gas extension</b>
<b>GAS-EXT-3/16 KIT</b>	<b>Front end parts for 3/16" wire on gas extension</b>

## ARF CONVERSION

Part No.	Description
<b>GAS-EXT-ARF KIT</b>	Parts to modify ARF to add deflector air reg

## TECHNICAL OVERVIEW

- ✦ The existing ARF unit is made up of a filter bowl, lubricator, regulator
- ✦ The GAS-EXT-ARF KIT includes all items to add an additional regulated outlet for the deflector air supply.
- ✦ Picture shows the kit fitted to the standard ARF.





## USEFUL INFORMATION

### MATERIAL USAGE

The table below shows approximate material throughput and coverage assuming a spray rate using 3/16" diameter wire.

MATERIAL	THROUGHPUT KG/HR stop-start / continuous	COVERAGE (KG/M <sup>2</sup> /100μ)
Metallisation Wire 02E Zinc	32 / 50	1.10
Metallisation Wire 01E/17E/25E Aluminium & Alloys	8 / 12.5	0.28
Metallisation Wire 21E Zinc/Aluminium 85/15	25 / 39	0.90

### TIME TO SPRAY

The table below shows the approximate time it would take to spray a given area with 100 μm coating thickness.

MATERIAL	AREA (m <sup>2</sup> @100μ)	TIME stop-start / continuous
Metallisation Wire 02E Zinc	1	2 / 1.3 mins
	10	20 / 13 mins
	100	3h 20m / 2h 10m
Metallisation Wire 01E/17E/25E Aluminium & Alloys	1	2 / 1.4 mins
	10	20 / 14 mins
	100	3h 20m / 2h 20m
Metallisation Wire 21E Zinc/Aluminium 85/15	1	2 / 1.4 mins
	10	20 / 14 mins
	100	3h 20m / 2h 20m

For thicker or thinner coatings, the spraying time varies in proportion to the thickness. For example, it takes approximately 2 minutes to spray a 1m<sup>2</sup> area of zinc at 100μ. It would take 4 minutes to spray the same area at 200μ.

The given times are approximate 'gun-on' spray times and do not make any allowance for stoppages, wire changes, part manipulation etc.

**Note:** The information given above is intended for guidance purpose only. Material usage and time taken will depend on a number of factors, these including the quality of the prepared substrate and the shape and size of the job.



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