Metallisation

Thermal spray equipment and consumables

Equipment Specification

ARC528E(17)-ACD Arc Spray System

INTRODUCTION

The following specification covers the standard range of ARC528E-ACD(17) Arcspray system. For the specific offer, please refer to the attached quotation and cross-reference the part numbers for each piece of equipment.

This specification includes the recently updated energiser (identifiable as having (17) in its title). A number of product improvements have been added to the energiser based on proven design and latest technology. In summary:

- High contrast digital display.
- Featuring the latest version of PLC.
- New, digital air pressure switches are fitted (as on other proven Arc Spray Systems).
- Featuring the latest air pressure regulators.
- MCB's are fitted to the incoming power supply as additional protection if the correct fusing is not fitted to the electrical supply.
- New Data Kit option giving the possibility of remote monitoring and logging of certain Energiser data at a customer's HMI via a Siemens S7-1200 series CPU.

The Metallisation Arc528E-ACD(17) system offers the ultimate in reliability and precision for ultra-high throughput, demanding production applications with anti-corrosion coatings. Wire drive is supplied at the heavy-duty pistol by a highly accurate, powerful AC Inverter motor, through a robust gearbox and drive roller system. The high-performance pistol incorporates proven Metallisation technology, including a unique, constant geometry (CG) head. This ensures smooth and consistent spray quality and minimal downtime when changing consumable spares. Supreme flexibility is also a keynote of the Arc528E-ACD. The pistol connects to Metallisation energisers, either 1000A or 1500A rated, with the drive unit controller internally mounted. In addition, the system can easily be integrated into other production equipment such as ductile iron pipe processing plants, with the spray rate linked to production speed, to ensure perfect coating at all times. Please discuss your specific requirements with Metallisation.

ENERGISER

The energiser continues with proven engineering principles to offer extreme reliability at 100% duty cycle. The technology within the energiser is specifically designed to smooth the power required to give the optimum arcspray coating.

A new but widely used industrial PLC controller within the energiser has further simplified the internal controls, improving reliability and making fault diagnosis considerably easier. A further benefit is that the systems can be very easily integrated into production lines.

The high power components within the energiser have also been significantly over-rated with very high capacity diode banks, chokes and transformer – all in order to provide the ultimate in reliability and longevity in harsh environments.

In combination, the new high throughput pistol and 1000 amp or 1500 amp energisers will benefit your production long into the future.

Safety: The equipment quoted will produce levels of noise, ultra violet light and dust that will require safety measures to be taken by those using the equipment. It may use pressurised 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

NEW 1000A AND 1500A (17) MODEL YEAR ENERGISER

- New for 2017, model (17) Energiser. See Energiser section of this specification for more details.
- Closed Loop Current Control – easy setup / reliable spray rate / over-current protection.
- Easy setup – set the spray current before starting to spray.
- New style diodes provide massive overcapacity and long life.
- Over-current limit protection – protects all parts of spray system from over-current, regardless of wire type.
- PLC control for improved reliability and ease of maintenance / fault finding with program supplied on a Micro SD Card in case the PLC needs reprogramming.
- E-stop integration to link from and / or to production equipment.
- Remote stop/start linking for control by production equipment.
- Speed control link to production line to vary spray rate with production speed. Enables even coatings to be applied during ramp-up, shut down or production variances. 4-20mA signals as standard, 0-10v optional.
- Easy access energiser panels & external fuse bank for reduced Mean Time to Repair (MTTR).
- Sealed electrical control circuit - reduces dust ingression for added reliability.
- Clear digital displays and large controls give ease of operation.
- Integrated Arc current monitor - Stops pistol and supplies an output signal linked to production equipment if arc current stops i.e. due to wire out.
- 24v Safety relay circuit for external interlocks, extraction, acoustic, door locks etc.
- All inputs and outputs are available for external use via sockets at the rear of the energizer. Hence the system is extremely easy to integrate into automatic machinery.

GENERAL BENEFITS

- Designed specifically for use in high demanding, high volume production environments where reliability is paramount
- Pull system ensuring quality coatings with consistent operation.
- Proven Arcspray system for automatic production environments
- High Throughputs reduce spraying times.
- Sealed/lubricated for life AC electric drive motor with inverter controller
- Uses 2.3mm to 4.76mm wire sizes without changing feed rollers.
- Easy to maintain, less than 3 minutes to change contact tubes and nozzles.
- Variable wire speed control allows spray rate to change with production requirements.
- Soft start for smooth start-ups reducing electrical loading on components.
- Safety interlocks.
- High current capacity pistol and supplies pack variants available to run at high ambient temperatures at 100% duty cycle.

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ARC528E PISTOL

Part No.	Description
ARC528E-ACD-CG23HT	Arcspray 528E AC Drive Pistol for 2.3mm wires, High Throughput System
ARC528E-ACD-HA-1/8	Arc528E AC Drive Pistol for 1/8" Wires (High Ambient Conditions)
ARC528E-ACD-4MM	Arc528E AC Drive pistol for 4mm wires
ARC528E-ACD-3/16	Arc528E AC Drive pistol for 3/16" wires

6438	Auxiliary Spreader Assembly - High Throughput
21606/6	3/4" Auxiliary Air Hose 6Mtr
21606/26	3/4" Auxiliary Air Hose 26Mtr

The Pistol has been designed to give consistent throughputs with high coating quality. It is a heavy-duty unit with a robust construction.
Standard head is shown.

Auxiliary spreader assembly option to give wider spread and better control – See Page 5 for examples.

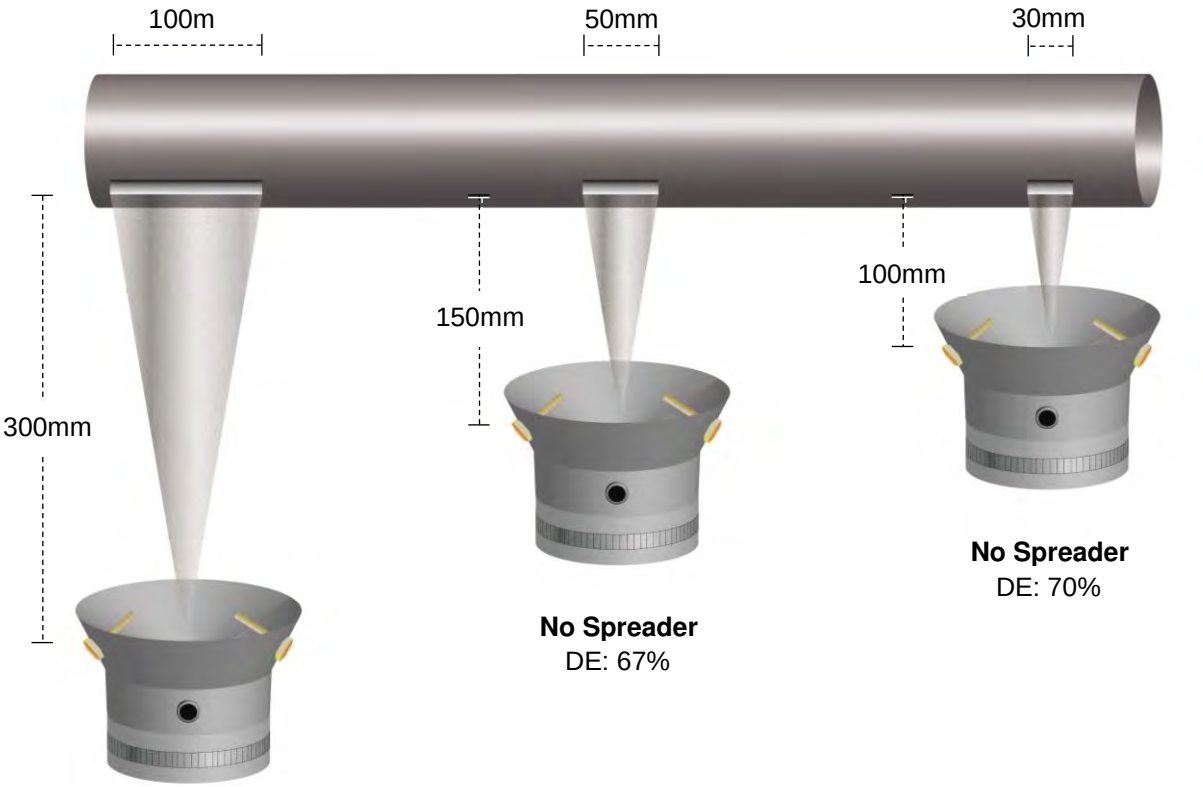
TECHNICAL OVERVIEW

- Designed to spray Anti-corrosion coatings.
- Standard 2.3mm, 3.17mm, 4mm and 4.76mm wire size.
- No requirement to change feed rollers when changing wire sizes.
- CG (constant geometry head) ensuring smooth feed, repeatable wire alignment and no adjustment of contact tubes required.
- Can be fitted with an Auxiliary Spreader Assembly - High Throughput (p/n 6438 and appropriate length supply hose (p/n 21606/XX)
- Closed arc for improved spray conditions and efficiency.
- Motor speed feedback for display and integration into closed loop production systems.

TECHNICAL DATA

Description	Characteristics	
Size	2.3 and 1/8"	HA-1/8, 4mm and 3/16"
Maximum Current	1000 Amps	1500 Amps
Weight	9.25 Kg	10.5 Kg
Width	120mm	165mm
Length	530mm	530mm
Height	283mm	283mm

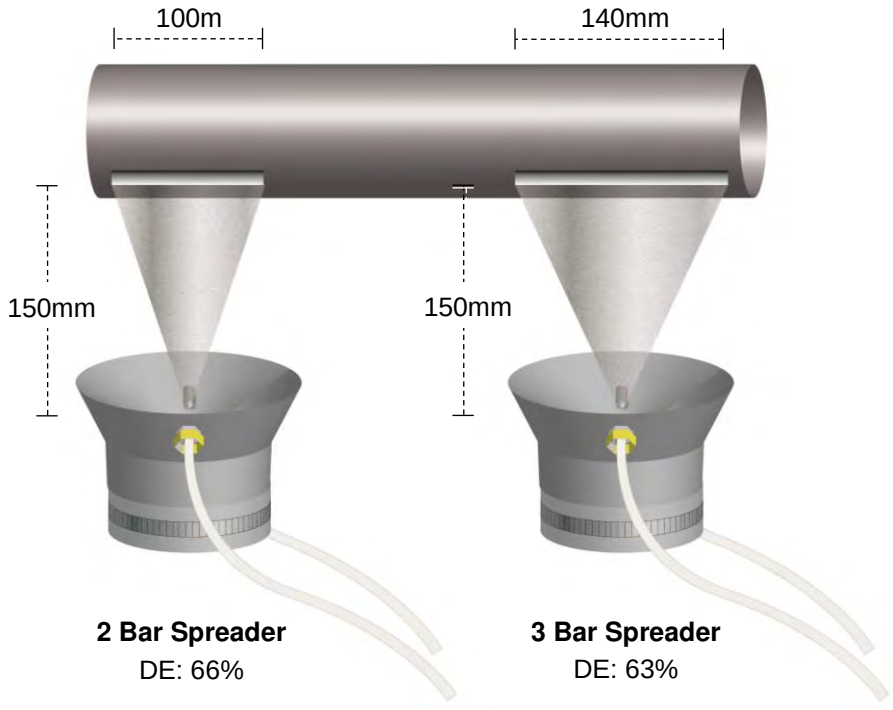
AUXILIARY SPREADER EXAMPLES



No Spreader
DE: 55%

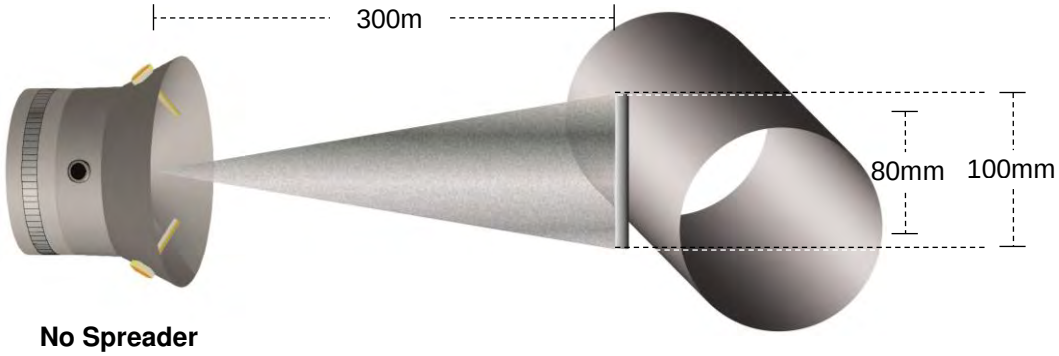
No Spreader
DE: 67%

No Spreader
DE: 70%

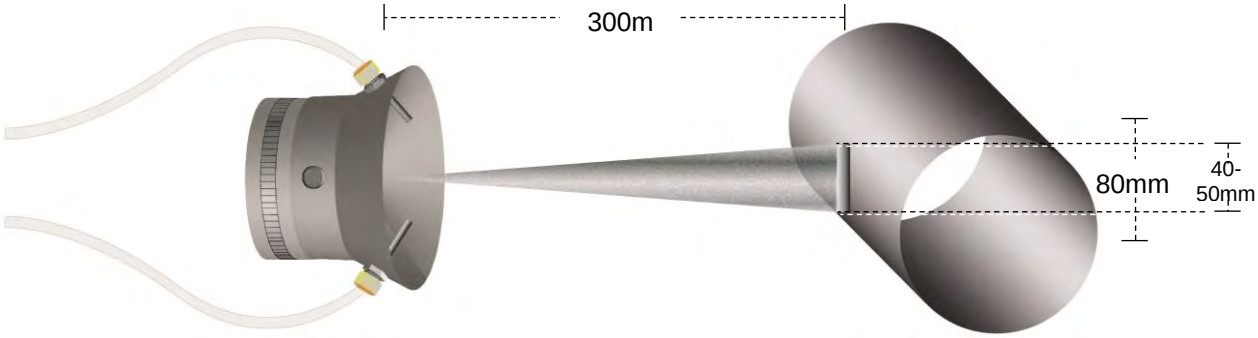


2 Bar Spreader
DE: 66%

3 Bar Spreader
DE: 63%



No Spreader



Spreader

Less overspray
on small Ø Pipes

Deposit Efficiency depends on:

- Spray voltage – the lowest possible to maintain a stable arc.
- Air pressures – Nozzle air: 4-5 bar, Auxiliary air: 2-3 bar.
- Stand-off distance – see diagram above.
- Spray angle – as close to 90º as possible.
- Suface finish and temperature – 350ºC is ideal.

NOTE: All DE's are approximate and based on specific testing undertaken in lab conditions at Metallisation.

Typical performance figures for the Arc528E-ACD pistol

Material	Wire Diameter	Throughput (kg/hr)	Coverage m^2/kg/100µ
Metallisation Wire 02E Zinc	**3.17mm**	**103.3 (@ 1000A)**	**0.82**
Metallisation Wire 02E Zinc	**4mm**	**168 (@ 1500A)**	**0.82**
Metallisation Wire 01E/17E/25E Aluminium & Alloys	**3.17mm**	**27.3 (@ 1000A)**	**2.88**
Metallisation Wire 21E Zinc/Aluminium 85/15	**3.17mm**	**82 (@800A)**	**1.00**
Metallisation Wire 21E Zinc/Aluminium 85/15	**4mm**	**124 (@1200A)**	**1.00**

Throughput is assumed to be independent of wire diameter. All data provided is an approximation and is offered as guidance only as performance can vary depending on application and parameters.

SUPPLIES PACKAGE

Part No.	Description
SUP528E-S1000(17)-XXM	**XXm Supplies Package for S1000(17)-ACD System**
SUP528E-S1500(17)-XXM	**XXm Supplies Package for S1500(17)-ACD System**
7144	**1/2" Dia PTFE Tubing**

XX = 5m, 25 or 30m variants of supplies pack lengths available

STANDARD SUPPLIES PACKAGE INCLUDES

- Power cables with threaded connections at the energiser and lugs at the pistol ends
- Air hose with threaded fittings at energiser and pistol ends.
- Motor drive and control cables.

Technical overview

- 5, 25 and 30 meter supplies packages for integration to Energisers as standard.
- Other lengths of power, air and control cables possible to meet your requirements.
- 5 meter wire feed from wire dispenser to ARC528E-ACD Pistol as standard.
- Longer wire feed runs possible depending on application. Check with Metallisation.
- 7144 PTFE tubing used for dispensing wires from drums if required.

QUICK RELEASE SUPPLIES

Quick release fittings are supplied for the power and control cables plus the air hose. These are located approximately 1m from the pistol. This option is particularly useful for continuous production plants where downtime is costly, enabling the rapid disconnection and reconnection of the pistol.

There are two options available:

OPTION 1

In this instance cables / hoses are not provided with the quick release kits unless ordered with a complete supplies pack. Parts as standard are the **Cable Sockets and the Cable Plugs ONLY.**

Part No.	Description
QR528E-S1000(17)-C	Quick Release Power Connectors Only for S1000(17) System Supplies (4 Pairs of Power Cables)
QR528E-S1500(17)-C	Quick Release Power Connectors Only for S1500(17) System Supplies (6 Pairs of Power Cables)

OPTION 2

If a spare pistol is ordered and the user requires the second pistol to have its own quick release cables / hoses attached. With these kits cables, hoses and other necessary fittings **are included**.

Part No.	Description
QR528E-S1000(17)-P	Quick Release Hose & Power Connectors for S1000(17) System Supplies (4 Pairs of Power Cables)
QR528E-S1500(17)-P	Quick Release Hose & Power Connectors for S1500(17) System Supplies (6 Pairs of Power Cables)

ENERGISER

Part No.	Description
S1000(17)-EIR-AUX	S1000(17) Energiser for ACD pistol with auxiliary air supply
S1000FV(17)-EIR-AUX	S1000FV(17) Energiser for ACD pistol with auxiliary air supply 200-220v
S1500(17)-EIR-AUX	S1500(17) Energiser for ACD pistol with auxiliary air supply
S1500FV(17)-EIR-AUX	S1500FV(17) Energiser for ACD pistol with auxiliary air supply 200-220v

The new harting connectors are rugged and better suited to harsh spraying environments.

I ECHNICAL OVERVIEW

- PLC control for improved reliability and ease of maintenance / fault finding.
- Remote stop/start and E-stop linking for control by or of production equipment.
- Speed control link to production line to vary spray rate with production speed. Enables even coatings to be applied during ramp-up, shut down or production variances.
- All variants work at the given current at 100% duty cycle.
- 1000 Amp system has 4 power cable connections.
- 1500 Amp system has 6 power cable connections (as pictured).
- Over-current limit protection – protects all parts of spray system from over-current, regardless of wire size or type.
- Sealed electrical control circuit - reduces dust ingression for added reliability.
- New style diodes provide massive overcapacity and long life.
- Easy access energiser panels & external fuse bank for reduced Mean Time to Repair (MTTR).
- Integrated Arc current monitor - Stops pistol and supplies an output signal linked to production equipment if arc current stops i.e. due to wire out.
- 24v Safety relay circuit for external interlocks, extraction, acoustic, door locks etc.

- All inputs and outputs are available for external use via sockets at the rear of the energizer. Hence the system is extremely easy to integrate into automatic machinery.
- System reset after fault is simplified and can be remotely connected for instance to the main machine PLC on the plant to which it is fitted.
- The –AUX variants have a regulated auxiliary air supply to enable the fitting and control of a super-spreader attachment (the S700 variant has this as standard).

NEW FOR 2017 – (17) MODEL ENERGISERS

- Rugged harting connectors.
- High throughput air connections.
- Low maintenance electrical power connections.
- Push buttons with improved ingress protection.
- Latest version of Siemens Logo PLC.
  - SD card allows easy program updates.
  - RJ45 communications available (see page 14 for more details).
- New MCB's to provide additional electrical protection (used in-conjunction with customers own supply/fusing).
- New high contrast digital display:
  - Easy to read with numerical display.
  - Higher accuracy than traditional gauges.
  - Spray current easily controlled the from the Set Demand screen. This is achieved via the touch buttons either side of the % figure.
  - Warning alert status (ammeter turns red if overcurrent).
  - Wide viewing angle with high contrast for ease of viewing inside or out.

The MAIN SCREEN displays energiser values and provides access to the SET DEMAND screen.

The SET DEMAND screen allows the user to control the spray current.

ALARM INDICATIONS display on all screens.

Pressing the ALARMS icon on any screen diplays a list of the most recent alarms.

DATA MONITORING (17) SERIES ENERGISERS

There is a data monitoring function that allows information to be read from the energiser. It connects via an Ethernet cable to a port that is installed on the rear of the energiser.

The Ethernet cable can then be connected to one of the following:

- Directly into a Siemens PLC.
- An HMI screen (either programmable or not) that has an Ethernet port (for example, Proface or Simatic screen).
- A web browser on a laptop.

Once connected, the values from the energiser will be written to specified registers.

The screenshots below are examples of screens that can be used to monitor these values:

HMI screen specifically designed to monitor values

Web browser screen accessed via a laptop

The following data is available on the ARC528E system:

- **Motor ON Indication** (on when power is supplied).
- **Air ON indication** (on when the air solenoid is open).
- **Reset Required Indication** (on when a reset is required).
- **Spray Current**: output value = actual spray current.
- **Spray Voltage**: output value = actual spray voltage.
- **Motor Speed:** output value = actual motor speed feedback.
- **Nozzle Air Pressure:** output value = nozzle air pressure in bar.
- **Auxiliary Air Pressure**: output value = auxiliary air pressure in bar.
- **Fault indications** (over temperature, low air pressure, over current).

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engineering Anti-Corrosion

ENERGISER SPECIFICATIONS

Description	Characteristics	
	1000A	1500A
Input Power Requirements	200/220V 3 phase 50/60hz plus Earth 380/415V 3 phase 50/60hz plus Earth	
Fusing Required	80A/Phase @ 1000 Amps 415V input 87A/Phase @ 1000 Amps 380V input 150A/Phase @ 1000 Amps 220V input 160A/Phase @ 1000 Amps 200V input	125A/Phase @ 1500 Amps 415V input 134A/Phase @ 1500 Amps 380V input 232A/Phase @ 1500 Amps 220V input 250A/Phase @ 1500 Amps 200V input
*Max Power Consumption	43.5 kVA	67.5 kVA
Duty	0-1000 Amps @ 100% Duty Cycle, 45°C ambient	0-1500 Amps @ 100% Duty Cycle, 45°C ambient
Output Voltage	0-45Vdc (nominal), Manual H/L, Switched 1 - 5	
**Typical air consumption	2m³/min @ 5.5bar (4.5 Bar Nozzle pressure), with Super Spreader (@ 2.5 bar) a further 0.35m³/min is required.	
**Max air consumption	2.5m³/min @ 6.5bar (5.5 Bar Nozzle pressure), with Super Spreader (@ 5.5 bar) a further 0.7m³/min is required.	
Pressure Switch Setting	29 psi (2.0 bar)	
Weight	519 Kgs	549kg (1210lbs)
Dimensions (W x L x H)	700mm x 1080mm x 1000mm	
Indicators	On HMI Display	
Switches	Panel/Remote, Motor Start, Motor Stop, Air On/Off, Power On/Off, Reset	
Additional interface	All inputs and outputs are available for external use via sockets at the rear of the energizer	

*THE KVA IS BASED ON A STANDARD SUPPLIES PACKAGE LENGTH, NOTE THAT IF SUPPLIES LENGTHS INCREASE, THE VOLTAGE MUST ALSO BE INCREASED, THUS AFFECTING KVA.

** AIR CONSUMPTION FIGURES ARE FOR GUIDANCE ONLY AND WILL VARY DEPENDING ON PISTOL HEAD SET UP

WIRE DISPENSE

WIRE DISPENSING CONES (PULLEY)

Part No.	Description
21252	Wire Dispensing Cones – variable position (2 required)
7144	PTFE Wire Conduits (Supplied by the meter)
6274/5	½" Clamp Pads for PTFE Tubing

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:

- Suitable for dispensing Zinc, Aluminium and Zinc/Aluminium wire.
- Specifically designed to suit Arcspraying with the each drum being individually insulated from each other.
- Variable position clamp assembly allows the clamp to be rotated to give the smoothest wire transfer path from the drum to the pistol.
- Drums available in 250 Kg for Zinc, 200kg for Zinc/Aluminium and 60Kg for Aluminium.
- 4.76mm aluminium not available in drums.

TWO TIER WIRE DISPENSER

Part No.	Description
2006-2T	2-Tier Wire Stand - Without Wire Straighteners
5006A	Wire Straightener (Arc) Pair

TECHNICAL OVERVIEW

- Suitable for dispensing raw materials that are only available in coil form.
- Can fit MIG reels to centre core
- Includes 6m of conduit to feed to the drive unit and clamp pads
- Specifically designed to suit Arcspraying with each coil being individually insulated.
- Variable brake tension to ensure wire does not uncoil.
- Designed to ensure a smooth wire feed to the pistol.
- Rigid construction
- Lower tier swings out for ease of loading and unloading of the coils.
- Castors fitted to the bottom of the dispenser allowing excellent manoeuvrability.
- Optional wire straightener can be supplied for use with stiff wires (typically 2.3mm engineering wires or 3/16" anti-corrosion wires)

MIG REEL WIRE DISPENSER

Part No.	Description
2008-ICC-MIG	MIG Dispenser for ICC style energisers

TECHNICAL OVERVIEW

- Specifically designed to suit Arcspraying with the MIG reels being 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.

NOTES

Metallisation

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