

Metallisation

Thermal spray equipment and consumables



Equipment Specification

ARC528E(16)-ICC Arc Spray System

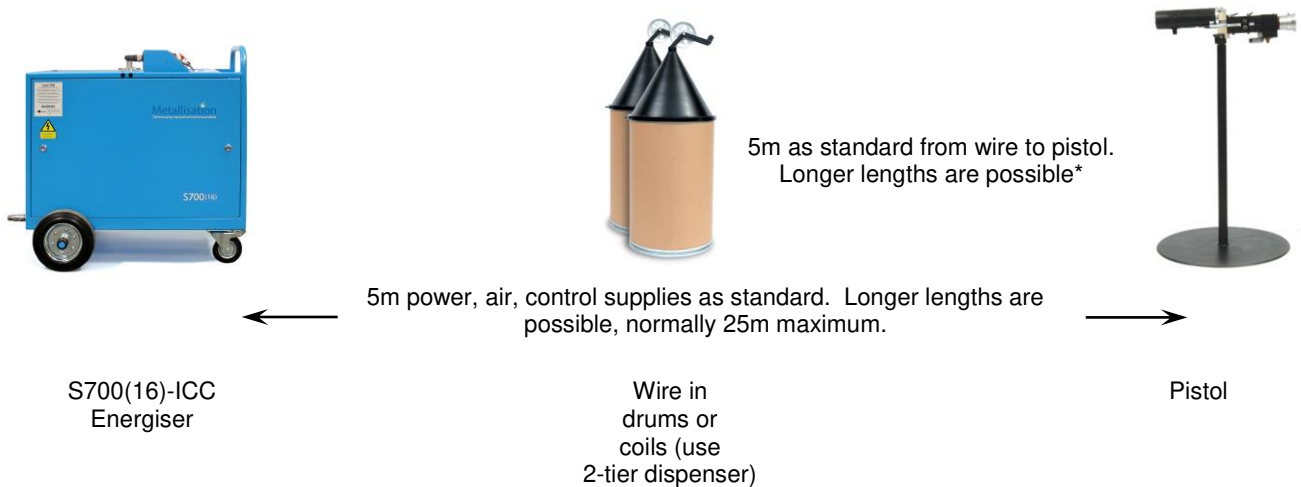
High Throughput

TYPICAL SYSTEM CONFIGURATIONS

Pictured below is a range of typical system configurations. Variations of these configurations may be possible. Contact Metallisation to discuss your specific application requirements.

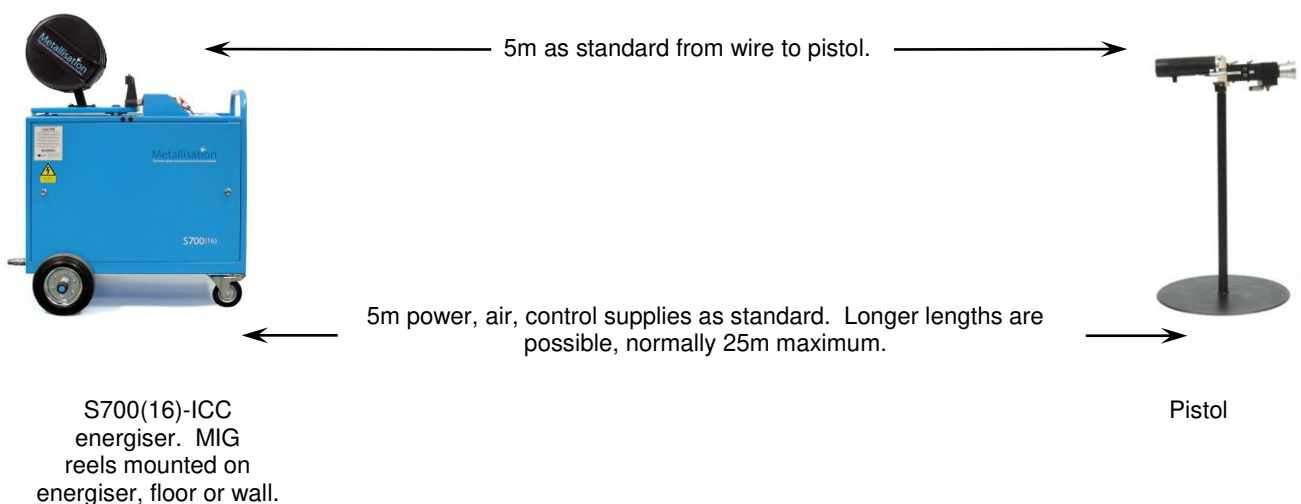
STANDARD CONFIGURATION – PULL WITH WIRE IN DRUMS

Most commonly used for high volume, high spray rate production applications such as LPG cylinders, pipes and risers, railway tracks, construction piles etc. The material in drums minimises downtime due to material changes.



STANDARD CONFIGURATION – PULL WITH WIRE ON MIG REELS

Most commonly used for lower volume production applications and mainly engineering coatings such as paper mill rolls where materials are not available in drums or coils.



* Standard distance from wire to the pistol is 5m. Within the industrial applications, longer lengths are achieved. Consideration must be taken to minimise the drag / resistance of the wire during feeding. In practice, this means keep the wire run as straight as possible and use free running, large diameter pulleys when changing wire direction. When running in conduit, PTFE should be used.

INTRODUCTION

The following specification covers the standard range of ARC528E(16)-ICC HT Arcspray systems. For the specific offer, please refer to a detailed quotation and cross-reference the part numbers for each piece of equipment.

This specification includes a range of recently updated energisers. A number of product improvements have been added to the range based on proven design and latest technology. In summary:

- Digital meters are fitted (as on other proven Arc Spray Systems).
- 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.

Functionally, the spray system will operate in the same way as before.

The new Metallisation ARC528E(16)-ICC HT systems, with the 700 amp energiser, offers the ultimate in reliability and precision for demanding production applications. This includes both anti-corrosion and engineering coatings.

Wire drive is supplied at the heavy-duty pistol by a highly accurate, powerful DC servo motor, driving 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. Alternatively, an AC drive version is available (See ARC528E-ACD systems).

The 528E system can be offered with a quick release supply package option. To further reduce machine downtime, the supplies package can be chosen with a quick release option, enabling the pistol to be removed quickly from the line and either maintained or exchanged for a spare pistol for preventative maintenance routines.

The energisers all have closed loop current control. This enables the operator to set the spray current independent of wire type before starting the job, enabling easier setup and protection of the system from over-current. The control function is now controlled by a simple PLC which ensures improved reliability as less component parts are required. It also makes fault finding simple using a standard multimeter with the I/O for the PLC. All of the control electronics are in a sealed area of the energiser to protect them from the often harsh, production environment.

The ARC528E(16)-ICC HT is offered with the 700 amp energiser. As an alternative, a lower throughput version is also offered with either 250 or 350 amp energisers. For a higher throughput, a 1000 amp energiser is also available. Please refer to the appropriate brochure and specification for more details on these products or consult with Metallisation to determine the most suitable system for your requirements.

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 S700(16)-ICC ENERGISER

- ✦ New for 2016, model (16) Energisers. 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.
- ✦ 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.
- ✦ 700 Amp continuous operation at 100% duty cycle.
- ✦ Easy access energiser panels & external fuse bank for reduced Mean Time to Repair (MTTR).
- ✦ Sealed electrical control circuit - reduces dust ingress 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.

GENERAL BENEFITS

- ✦ Pull system ensuring quality coatings with consistent operation.
- ✦ Proven Arcspray system for automatic production environments.
- ✦ Suitable for Anti-corrosion and Engineering wires, steels, copper and bronzes.
- ✦ Sealed/lubed for life DC Servo motor.
- ✦ 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.
- ✦ Low running costs as compared with gas systems.
- ✦ Soft start for smooth start ups reducing electrical loading on components.
- ✦ Steel reinforced conduits for extended service life with standard 5m package.
- ✦ Safety interlocks.
- ✦ Choice of coating textures.
- ✦ Well over 500 528 systems sold into automatic applications since 1994.

ARC528E PISTOL

Part No.	Description
ARC528E-CG16HT	Arcspray 528E electric drive pistol for 1.6mm wires, high throughput system
ARC528E-CG20HT	Arcspray 528E electric drive pistol for 2.0mm wires, high throughput system
ARC528E-CG23HT	Arcspray 528E Electric Drive Pistol for 2.3mm wires, High Throughput System
ARC528E-CG25HT	Arcspray 528E Electric Drive Pistol for 2.5mm wires, High Throughput System
ARC528ECG32A	Arcspray528E electric drive pistol for 1/8" (3.17mm) Al wires, high throughput system
ARC528ECG32Z	Arcspray528E electric drive pistol for 1/8" (3.17mm) Zn wires, high throughput system
ARC528E-3/16	Arc528E Pistol for 4.76mm wires Hi Throughput



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

TECHNICAL OVERVIEW

- ✦ Designed to spray both anti-corrosion and engineering coatings.
- ✦ Standard 2.3 through to 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.
- ✦ The drive box is factory lubricated for longer life.
- ✦ Closed arc for improved spray conditions and efficiency.
- ✦ Armature voltage feed back for closed loop wire speed control.
- ✦ Tacho feed back for Motor speed display and integration into closed loop production systems.

TECHNICAL DATA

Description	Characteristics
Maximum Current	1000 Amps
Weight	7.5 Kgs
Weight – at a held height of 1.2 M	10.1 Kgs – inc Cables and Hoses
Width	102mm
Length	457mm
Height	229mm

Typical performance figures for the Arc528E HT pistol at current shown

Material	Wire Diameter	Throughput (kg/hr)	Coverage m ² /kg/100μ
Metallisation Wire 02E Zinc	2.3mm 3.17mm 4.76mm	72.0 (@700A)	0.82
Metallisation Wire 01E/17E/25E Aluminium & Alloys	2.3mm 3.17mm 4.76mm	17 (@700A)	2.88
Metallisation Wire 21E Zinc/Aluminium 85/15	2.3mm 3.17mm 4.76mm	62.0 (@700A)	1.00
Metallisation Wire 60E 13% Chrome Steel	2.3mm	39(@700A)	1.02
Metallisation Wire 80E 18/8 Stainless Steel	2.3mm	48(@700A)	1.02

Throughput is assumed to be independent of wire diameter. Preferred wire diameter shown in bold. 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 Arcspray system along with an operating manual in English language.

SUPPLIES PACKAGE

Part No.	Description
SUP528E(16)-5M	ARC528E, S700(16) 5Mtr Supplies Package
SUP528E(16)-10M	ARC528E, S700(16) 10Mtr Supplies Package



STANDARD SUPPLIES PACKAGE INCLUDES

- ✦ Power cables with twist locks at the energiser and lugs at the pistol ends
- ✦ Air hose with snap coupling at energiser and threaded fitting at pistol ends.
- ✦ Motor drive and control cables.

TECHNICAL OVERVIEW

- ✦ 5 or 10 meter supplies package as standard with all fittings appropriate to connect to 528E Pistol and Energisers.
- ✦ Longer power, air and control supplies package options available to suit your application.
- ✦ Protective cover supplied for protection in a workshop environment.
- ✦ Various wire conduits to suit different applications and wire dispensing methods (dedicated conduits for 5m lengths or PTFE tubing for longer lengths and 3.17mm wires).

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
QR-S700(16)-C	Quick Release Power Connectors Only for S700(16) System Supplies (4 Cables)



OPTION 2

This option is desirable 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
QR-S700(16)-P	Quick Release Hose & Power Connections for S700(16) System Supplies (4 Cables)



1m power and air extension with quick release connections

ENERGISER

Part No.	Description
S700(16)-ICC	S700(16) ARC528E Energizer with closed loop current control
S700FV(16)-ICC	S700(16) ARC528E Energizer with closed loop current control (200v-220v Fixed Voltage)



TECHNICAL OVERVIEW

- ✦ Closed Loop Current Control – easy setup / reliable spray rate / over-current protection.
- ✦ PLC control for improved reliability and ease of maintenance / fault finding.
- ✦ 700 amp continuous operation (100% duty cycle).
- ✦ New digital panel meters
 - Easy to read with scale and numerical display.
 - Higher accuracy than traditional gauges.
 - Warning alert status (ammeter turns red if overcurrent).
 - Wide viewing angle with high contrast for ease of viewing inside or out.
 - IP65 rated and Gorilla glass screens.
- ✦ Sealed electrical control circuit - reduces dust ingress for added reliability.
- ✦ Easy access energiser panels & external fuse bank for reduced Mean Time to Repair (MTTR).
- ✦ Switched output voltage control.
- ✦ 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.

NEW FOR 2016 – (16) MODEL ENERGISERS

- ✦ Latest version of Siemens Logo PLC.
 - SD card allows easy program updates.
 - RJ45 communications available (see page 14 for more details).
- ✦ New air regulators with 'lock-off' potential.
- ✦ New digital air pressure switches with display for easy setting and diagnostics.
- ✦ New MCB's to provide additional electrical protection (used in-conjunction with customers own supply/fusing).

S700(16)-ICC ENERGISER SPECIFICATION

Description	Characteristics
Input Power Requirements	380/415V 50-60Hz 3 Phase
Fusing Required	55A/Phase (415V input)
Typical Power Consumption*	28 KVA @ 32v DC on Energiser
Duty	0-700 Amps @ 100% Duty Cycle
Output Voltage @ 440V supply voltage	0-49Vdc (nominal) Switched High/ Low & 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
Weight	282 Kgs
Dimensions (W x L x H)	670mm x 900mm x 889mm

* 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.

DATA KIT FOR (16) SERIES ENERGISERS

Part No.	Description
DATA(16)-K	Data Kit for (16) Series Energizers



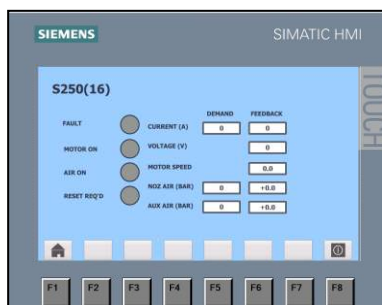
The data kit allows information to be read from the energiser. It connects via an Ethernet cable to a port that is installed on the rear of the energiser.

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).

OPTIONS

REMOTE OPERATION PENDANTS

Part No.	Description
ICC-PENDANT	Remote operation pendant for ICC energisers



Also comes with 10m control cable to connect to energiser (can be longer on request)

TECHNICAL OVERVIEW

- ✦ The 'PENDANT' consists of a remote operation pendant to start/stop the system and also has an E-stop button for safe operation.
- ✦ Allows remote operation of the system for when pistol is mounted to a robot or manipulator.
- ✦ Connects into energiser in a dedicated socket on the rear of the energiser. If remote connection is made, the pistol cannot be operated from the pistol buttons.



NOTES

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