



ARC 8830/600-AR TWIN WIRE ARC SPRAY SYSTEM





Prior to operating the equipment, carefully read and fully understand this manual, with particular attention to the safety precautions outlined.

Any modifications to the equipment are strictly prohibited unless prior written authorization has been obtained from IBPS.



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INTRODUCTION ABOUT THE MANUAL

This user's manual is intended to provide adequate information related to the ARC SPRAY SYSTEM to the reader. The information provided in this manual includes installation, operation, and maintenance details of the above system.

Failure to observe the information provided herein may result in risks to personnel health and safety, as well as damage to equipment.

The document must be stored by the person designated to do so. In case of loss or damage, replacement documentation must be requested directly from IBPS-Jodhpur.



- Misuse or modification of this manual may result in personal injury.
- Do not misuse or modify.



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1.0 SAFETY MEASURES

1.1 GRAPHIC SYMBOL DEFINITIONS

This manual uses a system of graphic symbols to alert the user to the presence of important operating instructions, safety consideration, and special instructions. These symbols (along with their definitions) are shown below:

	Additional information of general importance is provided
	Special instructions, safety instructions, etc. are being presented
	Information, instructions, and restrictions necessary to prevent personal injury or damage to equipment are being presented
	Explosive material is present
	Inflammable material or high temperature is present.
	Respiratory equipment must be worn.
	Danger : risk of electric shock
	Toxic material present
	Ear protection must be worn
	Eye protection must be worn



	Face protection must be worn
	Safety gloves must be worn
	Safety overalls must be worn
	Keep hands, hair, clothing and tools away from moving parts
	Magnetic fields from high currents can affect pacemaker operation. Persons wearing electronic life support equipment (pacemaker) should consult with their doctor before going near spray equipment
	Radiation present



1.2 GENERAL

Consult the IBPS Instruction Manual, Material Safety Data Sheet (supplied with materials), and applicable national and local jurisdiction safety and health regulations before using spraying materials. Some individuals may show unusual sensitivity to exposure to these materials. Failure to observe proper practices may result in health hazards.

Spraying can be hazardous because it requires the use of combustible gases, hoses under high pressure, potentially irritating or toxic spray materials, noise, heat, and UV radiation. It may involve air contaminated by dust, fumes, and mists. It is advisable to remove the operator from the process. However, spraying can be a completely safe process when performed by an operator who follows the recommended precautionary measures, exercises care in operation, has a proper understanding of spraying practices, and possesses knowledge of the equipment. When safety becomes a habit, the equipment can be used with confidence.

1.3 USE OF EQUIPMENT

Follow the safety measures outlined below, when working with IBPS spraying equipment:

- Read, understand, and follow the safety and operation instructions provided in the instruction manual.
- Do not operate equipment above recommended pressures and flows.
- IBPS thermal spray equipment has been expressly designed for thermal spraying. Never use it for any other purpose (such as welding, soldering, or brazing).
- Keep hands and other parts of the body away from hot surfaces and objects. Sprayed metal and surfaces are hot.
- IBPS spray equipment is designed to use only IBPS spare parts. The use of other than IBPS parts may pose a safety hazard.

EQUIPMENT HANDLING

Maintain the equipment in first class condition. Follow the maintenance recommendations in the IBPS instruction manuals. Remember that the stream of sprayed metal is hot. Point the gun away from yourself and away from materials that will burn. Carelessness in pointing the gun at paper, wood, or oily rags can result in fire. Be especially careful not to spray on the hoses, when operating the gun. Hoses will burn. Keep them out of the way. All airlines, compressors, regulators, etc., should be inspected regularly for leaks & loose connections.



SPRAY GUN BACKFIRE

Spray gun backfire can be prevented by proper maintenance. Inspect the gun & related equipment before starting to spray. The primary reasons for backfire are leak at the nozzle, dirt in nozzle, use of the wrong air cap, etc.

1.4 REDUCTION OF FIRE AND EXPLOSION HAZARDS

GASES

Fuel gases are highly dangerous. They can asphyxiate, combust, or explode. Oxygen supports combustion and reacts with oil and grease. Follow the safety measures outlined below when working with fuel gases:

- Prevent oil from getting into hoses—especially the oxygen hose. Oil in the oxygen hose will cause a fire.
- Inspect all gas equipment such as fuel gas, oxygen, airlines, compressors, and regulators regularly for leaks and loose connections.
- Maintain proper ventilation where compressed gases are in use.
- Route hoses to prevent strain, damage, or contact with oils or grease.

GAS CYLINDER PRECAUTIONS

The storage, handling, and use of fuel gas cylinders should be in accordance with national and local regulations. In addition, the following safety measures should be observed:

- Charged gas cylinders are potentially dangerous. Never put a gas cylinder in a hazardous position.
- Keep cylinders away from heat and moisture.
- Always chain cylinders to keep them from toppling.
- Put the valve caps on cylinders when they are not connected for use.
- Do not hang a spray gun or hoses on regulators or cylinder valves, as this may result in fire or explosion.
- Do not set gas cylinder regulators above the pressure level recommended by material spray tables in the IBPS instruction manual.
- Before moving any cylinder:
 - Shut the valve
 - Discharge and remove the regulator
 - Put on the valve cap



METAL DUST

All dust having considerable calorific value can be explosive. This dust includes flour, starch, hard rubber dust, wood flour, aluminium dust, and dust of other metals. In addition, note the following safety considerations:

- Aluminium and magnesium dust are particularly hazardous. Exercise extreme care in handling them.
- To minimize the danger of dust explosion resulting from spraying, adequate ventilation must be provided for spray booths and other confined spaces to prevent the accumulation of fumes and dust.
- Inspect and clean regularly to ensure that there is no potentially dangerous accumulation of dust. Good housekeeping in the work area is essential.
- All closed collectors should be provided with blowout holes or relief panels. All fans, pipes, dust arrestors, and motors should be external to the duct system.
- Before cleaning booths, pipes, etc., purge the area using the ventilating exhaust system from hazardous fumes. Ensure that the ventilating exhaust system is off while working on it and that an alternate means of ventilation is used. Also, keep hands, hair, clothing, and tools away from moving parts.
- Non-sparking tools should be used in cleaning and repair operations.
- When cleaning, all sources of ignition in the area around the collector should be eliminated. When making repairs on the ventilating or dust collecting equipment, no welding or cutting should be done before the equipment is washed down and all metal dust removed.

VENTILATION AND EXHAUST SYSTEM

A suitable spray booth and an adequate exhaust system are required to avoid the toxic or noxious effects of dust, fumes, and mists that may be generated by spraying.

For ordinary spray work, air at a velocity of 300 FPM (90 m/min) should pass into the opening of the spray booth. With the gun at the booth opening, the exhaust system must be able to exhaust 300 CFM (9 cubic meters/min) of air for every square foot of booth opening. If the booth has an opening of four square feet (0.37 square meters), a system that will exhaust 4×300 or 1200 CFM (33 cubic meters/min) should be provided.

If there is any question on the effectiveness of the ventilation and exhaust system or the presence of airborne particles that the operator might inhale, consult a competent industrial hygienist.

IBPS can provide a complete line of spray booths, dust collectors, and exhaust units.



HAZARDOUS MATERIAL

All IBPS materials are supplied with a Material Safety Data Sheet. Never spray a material without reading and following the precautions contained in the Material Safety Data Sheet.

Some materials (beryllium, tellurium, and their oxides, for example) are very dangerous to the respiratory system and should not be used at all, except under the supervision of a competent industrial safety engineer.

Blasting, spraying, and finishing all produce dust. These processes should be considered as hazardous as spraying such materials.

The following materials are specifically listed because they are commonly sprayed. Many other hazardous materials are not listed because they are not commonly sprayed. Because standards change and new information becomes available from time to time, it is strongly recommended that the information contained in the Material Safety Data Sheet, which comes with the material being used, be consulted. Complete and current information should be obtained from national and local regulations.

Lead, Lead Alloys, Cadmium, and Chromium

- The fumes of lead, lead alloys (such as solder and lead base babbitt), cadmium alloys, and chromium alloys are extremely hazardous. Consult an industrial hygienist for the proper protection.

Zinc, Zinc Alloys (Zinc, Bronzes, and Brass)

- Fumes of these metals are toxic. Consult an industrial hygienist for the proper protection.

Nickel and Nickel Components

- Fumes of nickel components are potentially hazardous. Consult an industrial hygienist for the proper protection.
- One known highly toxic compound is nickel carbonyl. Under certain conditions, nickel carbonyl can be formed by the combination of nickel and carbon monoxide.

1.6 PERSONAL PROTECTION

Reduction of Respiratory Hazards

Consult the IBPS Instruction Manual, Material Safety Data Sheet, and applicable national and local jurisdiction safety and health regulations (or local standards) before using spray materials.

During the spray process, a respirator approved by applicable national and local regulations should be worn at all times to protect the operator from exposure to dust and fumes. Respirators should also be worn when product handling generates dust.

Possible allergic reactions to dust, fumes and like or other unknown causes of health impairment due to contact with the body cannot be predicted usually. To avoid such reaction, never allow spray dust to enter eyes, mouth, cuts, scratches, or open wounds. Wash hands thoroughly After spraying, and especially before



eating or handling food. Wear fireproof or flame resistant protective clothing.

Any finely divided material may damage the respiratory system in varying degrees. Whenever fume concentration is high enough to cause operator discomfort (dizziness, nausea, etc.), stop spraying. Check the ventilating, exhaust systems and related equipment. Do not resume spraying until all possibilities of discomfort have been eliminated.

In areas distant from spraying, where no respiratory protection seems needed, periodic air sampling is recommended. Air sample should also be taken in the spray area after spraying has been stopped. Respiratory protection is not required when spraying is stopped and area is known to be free of harmful dust and fumes.

REDUCTION OF NOISE HAZARDS

EQUIPMENT	NOISE LEVEL (DbA)
Plasma Gun	134
High Velocity Oxy-Fuel (HVOF) Guns	140
Thermal Powder Guns	111
Wire Combustion Guns	125
Arc Spray Guns	116

The operator and other personnel close to the spray operation must be protected from excessive noise. If possible, the spray operation should be conducted in an approved spray cabinet. Hearing protection (that meets local standards) should be used. Do not rely on wads of cotton for hearing protection, as they are ineffective against high-intensity noise.

Noise levels at any location depend on such factors as equipment operation parameters, background noise, room size, and wall, floor, and ceiling materials. To determine the exact noise level, it is necessary to measure the sound level. The various spray guns can produce the following noise levels.

EYE PROTECTION

The hardened green lens (the eye protection supplied with the IBPS Spray Guns) is within the range recommended for most type of spraying. However, the choice of lens shade may be based on visual sensitivity and sharpness (acuity) and may vary widely from one individual to another. Check with national or local regulations for current and complete shade number recommendations.

Always wear proper eye protection when operating or watching the spray operation. Inspect the lens & cover plates frequently. Lenses & cover plates scratched, pitted, or damaged can impair vision & seriously reduce protection.



1.7 ELECTRIC POWER PRECAUTIONS

Ensure that adequate power line capacity is provided to avoid electric hazards. If a line cord with a ground lead is provided with the equipment for connection to a switchbox, connect the ground lead to the grounded switchbox. If a cable plug is added for connection to a grounded mating receptacle, the ground lead must be connected to a safety ground. If the line cord comes with a three pole plug, connect to a grounded mating receptacle. Never remove the ground from a plug or use a plug with a broken off ground prong

CABLES

Frequently inspect cables for wear, cracks and damage. Immediately replace the excessively worn or damaged insulation to avoid lethal shock from bare cable.

Keep cables dry, free of oil and grease, and protect from hot metal and sparks. Do not walk on or drive vehicles over cables. Terminals, wire raceways, and other exposed parts of electrical units should have insulating covers secured before operation

SAFETY DEVICES

Safety devices such as interlocks and circuit breakers should not be disconnected or shunted out.

Before installation, inspection, or service of equipment, shut off power and remove line fuse (or ensure power switch is locked or red tagged) to prevent accidental turning of power ON.

Do not open power circuit or change polarity while spraying. If, in an emergency, it must be disconnected and guard against shock burns or flash switch arcing.

Before leaving equipment unattended, always shut off and disconnected all power from equipment.

Protection for Wears of Electronic Life Support Devices (Pacemakers)

Magnetic fields from high currents can affect Pacemaker operation. Persons wearing electronic life support equipment (Pacemaker) should consult with their doctor before going near spray equipment



PRECAUTIONS

A heat-degraded fluorocarbon O-ring will look charred or gummy and sticky. To avoid skin burns, observe the precautions given below

1. Use Neoprene or PVC gloves before handling any part contaminated with heat degraded fluorocarbon O-ring residue.
2. Wash the part thoroughly with soap and water. Follow Fluorocarbon rubber manufactures advice for further neutralizing (calcium hydroxide solution) the part

FIRST AID

If heat-degraded fluorocarbon rubber contacts bare skin, do the following immediately.

1. Wash skin thoroughly with soap water.
2. Rub a 2.5% calcium gluconate gel into the skin until any existing irritation disappears. If irritation persists, consult a physician.

FLOUROCARBON MATERIAL (O-RINGS) PRECAUTIONS

IBPS specifies the use of O-Rings made of fluorocarbon synthetic rubber, for use in most IBPS equipment. This material provides a wide range of desirable properties, including high flame and heat resistance, resistance to compression-set and broad chemical compatibility.

At elevated temperatures above 3160C (6000 F) fluorocarbon material may degrade, emitting hydrogen fluoride fumes that, in the presence of water, may react to form highly corrosive hydrofluoric acid. This can cause severe burns on bare skin with delayed symptoms. The excess heat that occurs in gas guns during prolonged backfire, and in plasma guns when nozzle burnout occurs, may cause O-ring degradation



2.0 INTRODUCTION

The IBPS arc spray system is designed for production use and will withstand the severe service conditions associated with the metal spray industry.

It is simple to operate and user friendly since all the controls are easy to set and are preset during manufacturing. It affords a high degree of safety and insulation with only highest quality of material, interlocks are provided for electrical protection. Size and weight is kept to the minimum so that it is conveniently maneuverable.

The equipment consists of five main units:

- ARC GUN 8830-AR
- POWER SOURCE (PS-600)
- WIRE REEL HOLDERS
- GUN STAND
- SET OF AIR HOSES & ELECTRIC CABLES

IBPS's arc spray system is unique in its ability to put on exceptional quality metallic coatings at very high or low deposition rates. Yet at a cost significantly lower than other metallizing techniques.

The advantages offered by the ARC spray system are:

- Significantly lower operating cost
- Stable low and high deposition rates.
- Reduced substrate heating.
- Higher density coatings through higher velocity
- Significantly improved bond strengths
- Thicker coating and more easily finished coatings than can be obtained by other metalizing methods.

The ARC spray process is limited however, to electrical conductive material which can be obtained in the form of wires.

The arc spray system requires only electrical power and compressed air to operate; this system eliminates the need for storage of other fuels like oxygen, Nitrogen, acetylene. ARC spray system does not require water cooling or special cooling provision because the compressed air itself is used to reduce the temperature of the head, which is the only part of ARC system that comes in contact with the heat, generated in the ARC zone. The Arc 8830-AR has an advance feature of cooled head i.e. the spray head remain cooled at high temperature due to the flow of air through the various components of spray head.



The IBPS arc spray system utilizes An air motor driven through the compressed air this drive mechanism acts as a wire feed drive system that is built into the spray gun and is powered by a compressed air. The wire is pulled through flexible wire conduits leading from the wire spools to the Gun. It is then pushed a short distance through the atomizing head to reach the arc zone through contact tubes and tips. Wire for the ARC spray systems is furnished on standard diameter wire spools. some wires are also available in the form of drums/Wire for the ARC spray systems is furnished on standard diameter wire spools. Some wires are also available in the form of drums

2.1 COATING APPLICATIONS

The arc spray process gives uniquely high bond strengths and exceptional high performance coatings, which exceed the performance of many previously available coating processes such as gas wire and gas powder. With this in mind, many times the arc spray coating will work where the coating by the other processes has not. Similarly, the operating economics in many cases may provide economic justification where this was not possible before. On these lines, applications for arc spray metallic coatings are widespread and include almost every industry. Typical applications are outlined as following

CORROSION RESISTANCE - Atmospheric

- Gas Bottles
- Galvanized Weld
- Immersion
- Chemical
- Boilers

ELECTRICAL CONDUCTIVITY & RESISTIVITY - Conductivity

- Capacitors
- Varistors/Thermistors
- Graphite

COATINGS ON PLASTICS

- Bonding
- Decorative
- Wear
- Repair
- Sealing
- Electrical

OXIDATION, HEAT RESISTANCE & THERMAL CONDUCTIVITY

- To High Temperatures
- To Molten Metals



RESTORATION (Buildup & Reclaim)

- Ferrous Substrates
- Nonferrous Substrates
- Automotive Body Repair
- Aircraft Engine Repair

WEAR RESISTANCE – Abrasive Wear

- Soft Bearing Surfaces
- Hard Bearing Surfaces

OPERATOR PROTECTION

The arc spray process is noisy, generates dust and fumes, and produces spatter and radiations similar to the arc welding. When observing or operating the system, BE SURE ADEQUATE eye, ear and respiratory protection are used carefully read the safety instructions of your ARC spray system manual for specific requirements

2.2 INPUT REQUIREMENTS

An ARC spray system installed must have following services for proper installation

ELECTRIC POWER SUPPLY

Electric power is required for power source. Power for the gun is drawn from the power source.

It is recommended that a fused line disconnect switch be installed in the input circuit to the power supply. This provides a safe and convenient means to completely remove all electrical power from the system whenever it is necessary to perform any service on it.

The arc spray system is manufactured for connection to 3 phase 415 volts, 50Hz AC only

AIR REQUIREMENTS

Arc spray system requires approximately 70 cfm clean, dry air at 60 psi. Air regulators are provided with the systems for measuring and monitoring the pressure and flow of air drawn by the gun



USING ARC SPRAY SYSTEM IN HIGH VELOCITY MODE :

The primary differences are as follows:

The flow of 70 CFM compressed air used for atomization in place of 35 CFM; which can be selected through the selector switch "HIGH VELOCITY", a regulator for compressed air on power source.

Spray pattern in narrow due to high velocity,

IN THIS CASE, FIRST START THE SYSTEM IN NORMAL MODE AND THEN CHANGE THE MODE THROUGH SELECTOR SWITCH TO "HIGH VELOCITY"



3.0 EQUIPMENT DESCRIPTION

3.1 ARC 8830-AR GUN

ARC 8830-AR GUN is a new generation, high output Arc spray gun, which has been developed to produce nearly porosity free high quality coatings using an air drive motor. It is designed for tool post mounting in mechanical & automatic conditions. Spray rate is directly proportional to amperage (As fast is the wire feeding more will be the current drawn). The wire feeding is controlled through the valve at the gun.

Additional feature of ARC 8830-AR gun is that it has cooled head which remains cooled at high temperature and at high spray rate due to flow of air through various parts of gun, the compressed air is diverted through the various parts of the head assembly i.e. through protective cap, air cap and nozzle positioner.

The air moves in the protective cap and thus reduces the temperature of it and flows into the air cap, while passing through the air cap it strikes the nozzle positioner and flows away with the molten material thus reduces the temperature of whole head assembly.

The Spray Gun consists of two main units:

Drive unit and wire feed unit

The Drive unit includes a high torque, positive displacement air driven motor and the gear housing. This creates an extremely steady wire feed and as a result, steady spray pattern.

The Wire Feed Unit consists of a air drive motor, and two pair of shafts to each of which a worm gear and wire feed roller is screwed to transfer power to the wire feed rolls. These gears will remain in constant mesh with each other as the drive rolls are under full and constant power whenever they are in motion.

A wire speed control is done through the valve on the gun to vary the wire feed so as to maintain consistent wire feed rate. Each pair of shaft is housed in a yoke assembly, which in turn is arranged to pivot in relation to the axis of the worm shaft.

Since the worm gears remain constantly in mesh with the worm shaft while the pivoting action allows the wire rollers to engage with or to be disengaged from the spray wire. Opposing springs provide the required tension forcing the rollers together onto the spray wire while lever camshaft is provided to open the rollers and release the spray wire.



Spray head

One spray wire is fed through each contact tube, emerges inside the nozzle positioner, and then travels to a point of intersection slightly forward of the nozzle positioner. At this point, an electric arc is formed between the wires and molten metal is created at the tip of each wire. The nozzle positioner accurately locates the contact tips and thus the wires in the atomizing gas stream and directs a jet of compressed air at high velocity across the arc zone entraining the molten metal as fine droplets and forming the spray stream. The protective cap protects the operator from arc glare and ultraviolet radiations.

During operation the wire feed unit is linked to the wire spools by a pair of wire feed tubes, through which the spray wires pass to the spray gun. The tubes besides serving as wire guides also ensure that the wires remain completely insulated thus prevent any short-circuit. The Spray head consists of the close head, nozzle positioner, air cap, protective cap, contact tube, contact tips and terminal assembly.

3.2 POWER SOURCE (PS-600)

The IBPS's arc spray power source i.e. POWER SOURCE (PS-600) is the most important and heart of the ARC WIRE Spray System. It is much lighter in weight and smaller than any other power sources. It uses precious equipment for regulating and measuring the flow of air and flow of current through the output terminals. It can be used for 600 Amps (maximum) of spray rate. It is a flat characteristic rectifier working with 3 Phase, 415 Volts, and 50 Hz. power supply. It has no moving parts except for a ventilating fan mounted inside the system for cooling. Air is drawn from the rear side of the power source and is passed over the transformer, the choke, and rectifier diode thus reduces the heat generated inside the power source. Provision is made for fork lifting or carrying the unit by wheeling.

The front panel of the unit consists of main ON /OFF selector switch for power supply, Emergency switch, An Ammeter, Voltmeter, R, Y, B indicator, regulator for head air control, regulator for motor air control, Selector switches for voltage change (COARSE & FINE), selector switch high velocity mode selection, ready indicator, push button with indicator for OCV check, and fault indicators. This unit is designed to be operated from a three-phase, 50 Hz AC power supply, which has line voltage taps for each output voltages range.

The system is designed, attractive and functional. This unit controls the air and arc power, and featured with gauges and controls for arc voltage, current settings (or wire feed rate) and spray pressure. An internal interlock automatically shuts the system down if the air supply fails.

Remote is provided with the system that plugs into the front of the system so that the operator can activate the system from a remote location. Operation of spray air, arc power is controlled by the operator through the remote. OCV check button is used to test the arc voltage settings.



The POWER selector switch turns the system power ON / OFF. At start up, the main indicators will illuminate, if at any time the fault occurs a FAULT indicator will illuminate and the system stops working. The faults can be of high temperature or of low air, both will be indicated separately.

The arc spray process consists of three main steps: Spray air, arc power and wire feed, in that order the timing sequence of these steps is most important while using the system. The sequence of these steps should happen in such a manner that first of all spray air is released so that it cleans the spray head and remove any blockage in it and keep it cooled during operation.

The power supply is switched ON with the spray air, now the wire feeding is switched ON by valve on the gun to start the operation and when the system is turned OFF air flows for few seconds to remove any blockage and to remove the contacts between the wires at the arc zone so that when the system is turned ON again there should be no loading effect on rectifier diodes.

The power source is maintenance free system with forced cooling to keep the system cool and dust proof during operation. The power source is a single unit having inbuilt power supply and control console.

Features

- The power source is housed in a strong iron frame having Teflon wheel for the convenience of tracking and moving. It has power connectors and hose connectors as per requirement.
- The construction of power source is such that the control panel is mounted over it.
- All the connectors, hose fittings, electrical wires, electrical instruments, measuring instruments are properly designed and meet appropriate standards as per EN standards for safety.
- The power source is built in a small size having more working capacity than a large power source. Hence requires smaller space area.
- Its minimum use of cables, hoses at inlet and outlet makes it simple and easy.
- It has min.-protruded parts and is very robust.
- All piping is of push fitting flexible type.
- Indicators for power, ready and fault are provided on front panel to keep the operator informed with the parameters about the process during spray.
- Pressure gauges for head air and motor air are also provided on the front panel



3.3 SPECIFICATIONS

Power source

- Maximum Current (75% duty cycle): 600 Amps
- Open Circuit Voltage: 19–56 Volts
- Maximum Current (100% duty cycle): 450 Amps (max)
- Input Supply Voltage: 415 Volts, 3-phase, 50 Hz
- Cooling: Forced Air
- Insulation: Class H
- Fuses: 5 Amps
- Approximate Weight: 225 kg
- Wire Feed: Air motor fitted in the gu

AIR REQUIREMENTS

- Normal Coat: For normal coating, air requirement is 55 CFM at 4.2 bar (60-psi) air pressure.
- Super Fine Coat: For super fine coating, air requirement is 70 CFM at 4.2 bar (60-psi) air pressure

3.4 PRINCIPLE OF OPERATION

The ARC-8830-AR spray Gun utilizes electrical energy to melt a metal and compressed air is used to atomize with high velocity and project the molten metal in a super fine spray on to a prepared work surface. During operation, an electric arc is maintained between two metal consumable wires. The wires are continuously fed to the arc position by a drive mechanism operated by an air motor. Metal wires are melted by the heat generated in arc zone. Compressed air directed across the arc. Wires are fed at a small-included angle between them, (about 30°) to get a narrow spray pattern. A narrow angle also increases the cross sectional area of the wire tips exposed to the arc. This allows wires to absorb more heat and maintains a more stable arc.

3.5 FACILITY REQUIREMENT

The following equipment and facilities are recommended for use along with the ARC 8830-AR Metallizing Gun:

EXTENSION NOZZLE

The ARC 8830-AR extension nozzle is a new and greatly improved tool for heavy duty spraying in deep holes and inside diameters. it attaches to the ARC 8830-AR Gun and spray the same wires. Nozzle has 24" length and 52mm dia.



AIRFED HELMET

For the fresh air requirement, visibility and safe working environment while arc spraying metals that produce unpleasant fumes, such as zinc, copper, steel lead and Aluminium. "IBPS" supplies suitably designed Airfed Helmets for this purpose.

SPRAY BOOTHS

When the metal spraying is required to be done continuously for longer period, collection of the dust and toxic fumes created becomes necessary. This not only provides a clean and comfortable working environment but the collected dust may sometimes have a resale value. "IBPS" supplies dry or wet versions of spray booth. Heavier dust particles are trapped at the bottom of the spray booth whereas fine dust particles are carried away to a dust collector.

LATHE EXHAUST UNIT

This consists of a hood which can be fastened to the carriage of a lathe on which Metallizing of shaft, like jobs is being done. A flexible dust connects the hood to a dust collector.

ABRASIVE BLASTERS

These are used for preparing the surface before metal spraying. Portable Abrasive Blaster for large size site work or Cabinet similar sized work is available with "IBPS". These can be made in standard or special designs suitable for specific jobs.

DUST COLLECTORS

Dry Cyclone Type and Wet Water Wash Type Dust Collectors are available to be attached with spray booths or lathe exhaust unit. Use of dust collectors is recommended for keeping the working station environmentally clean and when the collected dust has a sale value.



4.0 INSTALLATION

4.1 UNPACKING:

Remove all packing material and part containers from the cartoon box(s) and check the parts as per order list. The following items are required for a basic system.

- ARC 8830-AR gun
- Power source (PS-600)
- Air hoses for gun to power source
- A pair of supply cables from power source to the gun terminals.



Be Cautious while loading and unloading the equipment.

4.2 INSPECTION:

Inspect the equipment for any physical damage, scratches, dirt etc. Inform IBPS if any unusual problem occurs.

4.3 AIR HOSE CONNECTIONS:

The power source system is supplied with following connection threads:

Air hose connector threads : 1/2 BSP (M) for Head
: 1/4 BSP (M) for motor

4.4 ELECTRICAL CONNECTIONS:

NOTE: All wiring must be done by a qualified electrician, in accordance with the National Electrical code and other local ordinances.

Mains connector is provided at the rear side of the power source for input power supply, the main AC power cord should be brought from a fused disconnect box to the access connector on the rear side of power source. This AC power cord is not supplied with the system.

A ground terminal is also provided with the power source for system grounding so as to keep the system and operator risk free from electrical shocks.



AIR INLET FILTER

An input air filter is furnished as a part of the arc spray system. It has a liquid level drain, which automatically expels liquid as it collects. The automatic drain can be opened during shut downs so that any liquid in the filter bowl drain by gravity. The filter combination is mounted on the rear of the power source. Connect furnished air hose with fittings to compressed air supply at input side of filter.

A lubricator is also provided at the front of the power source; connect the air hose from gun to this lubricator to keep the head air free from moisture and dust particles.

4.5 GUN INSTALLATION

Mount the ARC 8830-AR gun on the gun-mounting stand near to the job to be sprayed, firmly connect two power leads to the output terminals on the power source (polarity not important) and then connect the other end of power leads to the gun terminals.

- Insert the air hoses for atomizing, to the power source and gun.
 - Note: - All hose fittings are of different sizes so it is impossible to make a connection mistake
- Connect the wire conduits to rear side of the gun.
- Fit two wire spools of spraying wires onto the reel holders (spool stand) with the wire playing OFF at the top of the reel (giving a straight run into the conduit holders).
- Make a clean cut at the end of each wire, trim off sharp edges with a cutter and a file.
- Straighten of about twelve inches (12") of the leading end of wire and push them through the conduit by hand until approximately twelve inches (30 cm) emerges from the free end of each wire conduit.
- Pass the wire ends through wire guides at the back of the gun and between the wire drive rollers until flush with air cap.
- Close the wire roller release knob to hold wire firmly in position and then snap wire conduits ends into rear wire guides (if too much wire extends from conduit to permit this, rotate reels to take up excess wire).

4.6 POWER SOURCE (PS-600)

For best operating characteristic and longest unit life, take care in selecting an installation site. Avoid locations exposed to high humidity, dust, high ambient temperature or corrosive fumes. Moisture can condense on electrical components, causing corrosion or shorting of circuits.



Adequate air circulation is needed at all times in order to assure proper operation. The frame of this power source should be grounded for personnel safety.

Use an input-power cable assembly, which includes a grounding conductor to connect this equipment to the input power supply.

This power source operates on a three-phase, AC input, make sure that the power source is connected for the power supply voltage available. The input power cable should be connected to the power supply through the fused disconnect switch. For access to input terminal remove the screws at the rear, which secure the input terminal cover. The input terminal is clearly marked to show the available primary voltage links.

Recheck all connections to make sure that they are tight, well insulated, and that the proper connection has been made.

WARNING: Disconnect line voltage from the unit before attempting any servicing inside unit. Turn off fused disconnect switch that supplies and remove its fuses.

CAUTION: The flow of air through the power source is carefully directed by baffles. Never operate the power source with any of the side or top panels removed or open, as serious damage to the rectifier might result.

4.7 ADJUSTMENTS

CONTACT TUBES & NOZZLES

The contact tubes and tips fixed in the close head body are automatically comes in alignment by help of nozzle positioner and nozzle caps.

NOZZLE AIR PRESSURE

Spray air pressure: It is for spraying the molten metal & can be regulated by adjusting the regulator on power source.

VOLTAGE ADJUSTMENT

Selector Switches on power source, which are marked as COARSE AND FINE, can be used for course and fine adjustments of voltage by rotating the switch knob clockwise for increase in voltage and anticlockwise for decrease in voltage. Wait for about 30 secs and then press the push button switch for OCV CHECK and read the open circuit voltage on the voltmeter. Use the selector switches marked as COURSE and FINE to adjust any required voltage before spraying.



VOLTAGE SETTINGS

The voltage setting should be 4 to 5 volts per 100 Amperes of current higher than that required for spraying. Using an excessive voltage reduces the quality of the deposit.

CURRENT ADJUSTMENT

During operation, current is controlled by the wire speed, an increase in the wire speed results in an increase in amps, which can be viewed on ammeter at the power source; the wire speed can be increased through the air valve on the gun.

Installation check

It is good engineering practice to recheck the installation setup before it is put into operation. Check all electrical and air connections before proceeding with spraying.

Note: Do not change the voltage settings while spraying



5.0 OPERATION

Operator protection

The arc spray process is noisy; generates dust and fumes; produces spatter and radiation similar to arc welding. When observing or operating the ARC spray system, BE SURE ADEQUATE eye, ear and respiratory protection is used.

Pre –spraying Adjustments

The ARC gun aligns itself. The alignment need not be adjusted prior to spraying. Be sure that contact tip diameter matches diameter of wire being sprayed.

1.6mm contact tips are used for 1.6 mm wire.

2.0mm contact tips are used for 2.0 mm wire.

Set up and operation of power source

- Be sure that the gun is always pointed into the spray booth away from yourself and others.
- Hand feed wire through conduits and gun on both sides. Straighten and deburr first 12 inches of wire.
- Switch ON the power supply by the selector switch on the power source.
- Adjust the air pressure to the specified/required parameter through the air regulator.
- Switch on the dust collector and exhaust system.
- Close wire rollers release levers.
- Press the OCV to check the voltage settings and then adjust the voltage by course and fine selector switch.
- The voltmeter will now register the potential on the contact tips and wires; it can be adjusted through the selector switches.

Note: - If wires are touching when spray air is ON, they melt off with slight pop.

Spray settings

The ARC 8830-AR Arc spray gun can reproduce optimum spray patterns for each wire type and thus produce the highest quality coating with the highest density and bond strength. The basic design is keyed to the smallest diameter wires and operates under the lowest possible air pressure 35 CFM at 60 psi and flow rates with low to moderate amperage (spray rates) for each application; i.e., the gun setup is tailored to the specific coating properties.

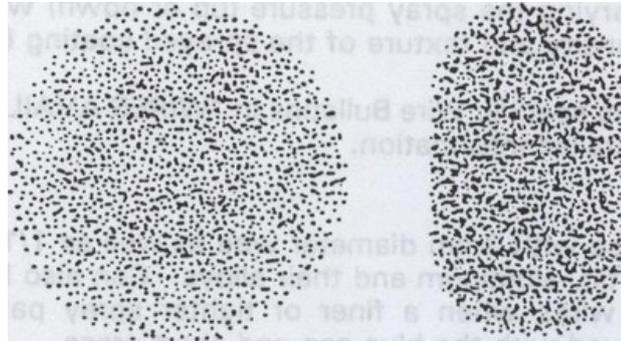


For example, by using the gun's finest spray setting with 1.6 mm aluminum, a dense, smooth coating can be laid down at very reasonable air pressure 60 psi. This lower pressure reduces noise and increases deposit efficiency, while maintaining a consistent coating quality. Finer denser coatings can be achieved by increasing air pressures and shortening spray distance. Fineness and density of the coating can be varied by adjusting spray air regulator. Low pressures give coarse coatings; exceptionally low pressures in the range of 20 to 40 psi produce very rough coatings.

The spray pattern shape can be varied by changing the nozzle/positioner in the spray head. The slot nozzle/positioner gives an oval pattern as shown in figure bellow, while the cross nozzle/positioner produces a circular pattern. Either spray pattern shape can be made fine or coarse by adjusting pressure and nozzle cap diameter as discussed previously. The short cross and slot nozzle positioner are recommended for hard wires.



CIRCULAR PATTERN



OVAL PATTERN

Note that extreme care should be exercised when changing pressures and nozzle caps from recommended settings since coating properties such as hardness, bond strength, oxide content, finishability, density and deposit efficiency can vary widely from the optimum desired.

When in doubt, run test coupons.

5.2 OPERATOR CONTROLS

- P-01: Regulator for gun head air control
- P-02: Emergency switch used to shut down the system in emergency conditions
- P-03: Regulator for motor air control
- P-04: Regulator for high-velocity air control
- P-05: Instrument indicating the DC voltage supplied to the gun for making the arc (voltmeter)
- P-06: Instrument indicating the current used during spray (ammeter)
- P-07: Power indicator for the system supply
- P-08: Ready lamp, illuminates when power is switched ON through the POWER selector switch, indicating the system is ready for spray
- P-09: Fault indicator, glows when the system has any fault
- P-10: Push button for system ON (remote – green colored)
- P-11: Push button for system OFF (remote – red colored)
- P-12: Selector switch for SPRAY ON/OFF (remote)



- P-13: Selector switch with indicator for high-velocity selection; indicates the system is running in high-velocity spraying mode
- P-14: Push button for open circuit voltage (OCV check)
- P-15: Selector switch for coarse voltage change supplied at the output terminal
- P-16: Selector switch for fine voltage change supplied at the output terminal
- P-17: Selector switch to start/stop (ON/OFF) the power source
- P-18: Indicator lamps for main power supply (R, Y, B indicators), illuminate when power is supplied to the power source
- P-19: System fuses, break the power supply when the system is faulty
- P-20: Socket providing connection to the remote via 10-pin connector cable
- P-21: Positive and negative terminals connected to the arc spray gun for maintaining the electric arc via cables
- P-22: Lubricator for air supply to the gun
- P-23: Connector for compressed air to the gun
- P-24: Air inlet filter supplying air to the power source

5.3 STEPS OF OPERATION

NOMINAL SPRAYING PARAMETERS

Sr. No.	Wire Description	Wire Size (mm)	Nozzle Cap	Nozzle Positioner	Volts	Amps	Air Pressure in Bar
01	Aluminium	1.6 - 2.0	Green	Long Slot	29-31	400	5
02	Zinc	1.6 - 2.0	Blue	Cross Slot	21-22	400	5



WARNING



The above coating parameters are for guidance only. Using of the above parameters is at the discretion of operator. If any loss or injury occurs to the operator by using the parameters then IBPS would not be hold responsible.

5.3.1 TO START SPRAYING

- Check that inlet air pressure should be 6 Kg/cm² (95 psi).
- When the power cable is connected to the panel at the rear side, the indicator lamps (P60-17) for phase will illuminate indicating that the power is ON.
- Check that the spray ON/OFF selector switch on remote is in OFF position.
- Switch ON the main selector switch (P60-16) by turning it in any direction. The Ready indicator lamp (P60-07) will glow showing that there is no fault with the system and the system is ready to use.
- Now select the required voltage by selector switches (P60-14) and (P60-15) provided for coarse and fine selection of voltage.
- Switch ON the dust collecting and exhaust system to keep the environment free of metallic dust.
- Push button (P60-13) is provided to check the open circuit voltage (OCV CHECK).
- Adjust the spray voltage by coarse and fine selectors as required for spraying.
- Switch ON the system by push button (P60-09) on remote.
- When the (P60-09) is switched ON the voltmeter, will show the initial voltage and the regulators will show the head air pressure and motor air pressure.
- Check that the pressure gauge reads a minimum pressure 4.5 to 5.2 Kg/cm² (70 to 80 psi).
- Now, switch ON the spray by turning the selector switch (P60-11) on remote, the indicator will show that the spray is ON, the air valve is used to control the wire feed rate.
- When the spray ON selector switch (P60-11) is switched ON the air valve at the gun is used to start/stop the wire feeding through the air motor.
- When the gun is in spraying mode an ammeter (P60-06) will show the current being used.



- Cross = C: Slot = S
- Nozzle Air Cap Gold or Red can be used for thin fine coat or extra thin fine coat.
- In applications where a reduced concentration of spray in center of pattern is desired used short slot nozzle / positioner.
- Short slot or short cross spray shape can be used at discretion of operator.
- When operating over 600 amps with zinc or Aluminium continuously, always use blue nozzle cap and short cross or slot.
- Use short slot fan pattern only on flat areas.
- Bond strength reduced at higher pressure. Use only when fine texture is required for smoother subsequent coats. The above parameters are commonly used for the equipment. A fine adjustment may be necessary to obtain desired coating.



5.3.2 TO STOP SPRAYING (FOR A SHORT PERIOD)

- Turn the valve on gun to stop the wire feeding.
- Turn OFF the spray ON selector switch (on remote).
- Press the red push button (P60-10) on remote to stop the system

5.3.3 TO RESTART SPRAYING (AFTER A SHORT PERIOD)

- Press the push button (P60-09)on remote to start the system
- Turn the selector switch (P60-11) ON to start spraying.
- Turn the air valve on gun to start the air motor and check the air pressure, if it is less than required then increase the pressure through regulators.

5.3.4 TO STOP SPRAYING (FOR A LONG PERIOD)

- Turn the valve on gun to stop the wire feeding.
- Turn the selector switch (P60-11) OFF to stop spraying.
- Press the red push button (P60-10) on remote OFF to stop the system.
- Turn the selector switch "MAIN ON/OFF" (P60-16) clockwise direction to turn OFF the main supply to the system completely.
- Switch OFF the dust collecting and exhaust system
- Turn OFF the power and air at source

PRECAUTIONS

- Before opening panels etc for maintenance the main supply must be disconnected from the unit.
- Switch OFF power at the supply point and remove main supply plug.
- Never point the gun towards personnel or combustible material. It may result in an accident or damage by fire.
- Never spray on the hoses, power cables or instruments.
- Never operate the gun without the use of a face shield and ear protectors. The operator and other nearby personnel must wear eye shield (goggles) fitted with ultra violet filters.
- Never look into the arc zone without first ensuring that the power switch is in the off position, spray ON/OFF selector switch (P-11) is in OFF position.
- Never allow accumulation of loose dust to remain in the metal spray shop, since under certain circumstances it may create a fire hazard.
- Always provide efficient ventilation and the best possible dust collection system for the materials to be handled. In case of any doubt, an advice may be sought, from the IBPS



6.0 MAINTENANCE



Before commencing any major maintenance operation on either the gun, or power source, ensure that the power supply to the power source is isolated by the removal of power supply plug or the supply fuses.

The following maintenance schedule may be followed for an efficient & trouble free service.

EVERY FOUR HOURS

Check contact tips for misalignment or wear. Refer construction and assembly for replacement of tips.

EVERY EIGHT HOURS

Clean outside of the equipment to remove adherent dust. Checkup the drive unit lubricator mounted at the front of the power source. Clean the outside of the gun off any metallic dust and dirt.



Any of the following lubricants may be used for the drive unit lubrications:

IOC - Servo System 311 // HPC - Endo 4 // BPC - Tellus 27

MONTHLY

- Switch off the mains supply and disconnect plug from the supply.
- Remove the equipment side and top covers.
- Use a supply of clean dry air at a pressure of 2 Kg/cm² (30 psi) and with the aid of a soft bristle brush remove accumulated dust.
- Check that all the mechanical and electrical connections are secure.
- Remove any metallic dust deposited on in the framework & on the inside of the panels.
- Inspect all hoses and cables. Replace, badly chinked or worn cables.

HALF-YEARLY

- Carry out full monthly check-up.
- Examine the contact of the primary contactor and if necessary, clean them. Badly pitted or burnt contacts must be replaced.
- It is advisable to overhaul the gun after every six months or 1000 hrs. of operation. In case of any special problems, consult IBPS.



6.1 TROUBLESHOOTING



PROCEDURE FOR RAPID FAULT TRACING & ITS CORRECTION

Min. 3.5 Kg/cm² inlet Air Pressure is required to operate the system.

1. Switch OFF the selector switch (P-12) at the remote to stop spraying.
2. Press push button (P-11) at the remote to stop the power.
3. Check nozzle positioner and contact tips alignment.
4. Switch on the system by push button (P-10) :
 - a. If indicating lamp (P-07) lights up then:
 - b. Switch ON the selector switch (P-12) to start spraying.
 - c. If indicating lamp (P-07) does not light up then the system is not getting power supply. Then Check the power supply line.
5. If (P-07) lights up but the fan do not rotate, check the fuses and replace them if blown. Also check for any mechanical obstruction to the blade.
6. Rotate the selector switch (P-17) to turn the system "ON" and press "ON" button (P-10) at the remote. If pressure gauge on the power source (P-01) and (P-03) registers enough air pressure, 5 to 5.2 Kgs/cm² (65-75 psi) and air is flowing from the nozzle, proceed for spraying.
7. If air pressure is less than 4.5 Kg/cm² (65 psi) with motor running, check that :
 - a. Mains pressure is adequate.
 - b. Filter elements are clean.
 - c. Air hose is of adequate bore size and cleans.
8. If no pressure is registered on the gauge, then:
 - a. Interconnecting plug on power source may not be connected to socket in the system. Connect it.
 - b. No air from source. Check the air supply line.
 - c. Fault in solenoid valve relay or interconnecting circuit. Correct them or replace, if needed.
9. Press power switch (P-09) to ON. If voltmeter indicates an adequate voltage
 - a. If voltage is inadequate & cannot be corrected by voltage selector switch (P-15) & (P-16) then:
 - b. Check that all three main phases and fuses and intact.
 - c. The diode bank may have failed. Replace the faulty diode bank.
10. Turn selector switch to ON position.
11. Turn the air valve at the gun until gun is spraying at the required amperes.



6.2 POSSIBLE FAULTS, THEIR CAUSES AND REMEDIES



Min. 6 Kg/cm² inlet Air Pressure is required to operate the system.

FAULT	CAUSE	REMEDY:
Arc is interrupted, splutters or cuts out.	<ul style="list-style-type: none"> • Wire feed is uneven (check by applying light finger and thumb pressure to moving wire between reel and sleeve). • Misaligned contact tubes and / or nozzle. • Voltage may be insufficient. • Diodes may have failed. • Insufficient air pressure. • Any one of the wires may not be passed smoothly. • Voltage fluctuation in the power supply. 	<ul style="list-style-type: none"> • Check for loose, choked or worn drive rollers and correct them. Check spring tension. Avoid excessive tension. Check that wire reels turn freely. Check that the wires are free of any bends and kinks and pass freely in the wire feed tubes. • Check that nozzle is clear in the bore undamaged and correctly positioned. • Check voltage (Ref. Rec. Spraying Data). Check that cable terminals are clear & tight. • Replace the diodes. • Check that input air pressure is adequate. • Check the wire guides. If there is any obstruction to the wire movement, clean or replace the guides and manually check the smooth movement of wire in the guide. • Avoid the voltage fluctuation in the supply line.
Wire Feed without spraying.	<ul style="list-style-type: none"> • No contact between wires. • Voltage may be insufficient to strike arc. • No voltage. 	<ul style="list-style-type: none"> • Check and rectify tube alignment. • Check voltage. Check the main line power switch. • Check the fuses.
Only one wire feeds	<ul style="list-style-type: none"> • Wire arc stuck in contact tip. • Wire Roller opening lever (24) open. • Loose Wire rollers. 	<ul style="list-style-type: none"> • Replace contact tip. • Close the lever. • Tighten setscrew on the wire rollers.



FAULT	CAUSE	REMEDY:
Coating too coarse.	<ul style="list-style-type: none"> • Insufficient air pressure. • Wrong air cap selection. 	<ul style="list-style-type: none"> • Check that input air pressure is adequate. • Select air cap with smaller air cap.
Coating too fine.	<ul style="list-style-type: none"> • Excessive air pressure 	<ul style="list-style-type: none"> • Check and bring the air pressure to the desired level as per specifications
Power supply light not coming ON	<ul style="list-style-type: none"> • Fuses circuit has blown • Loose connection 	<ul style="list-style-type: none"> • Replace with new one. • Check the circuit continuity.
Pressure Gauge Does not Show Reading.	<ul style="list-style-type: none"> • There may be a leakage at hose or the meter / gauge may damaged. 	<ul style="list-style-type: none"> • Check leakage or replace the meter/gauge.
Fan does not rotate when mains supply is switched on by selector switch.	<ul style="list-style-type: none"> • No main supply. • Defective fuses. • Switch /selector faulty. • Faulty primary cable. • Blown F1 or F2 fuses. • Defective fuse holder. • Defective main contactor. • Loose /broken connections in the fan circuit. 	<ul style="list-style-type: none"> • Check supply • Check and repair • Check and repair • Check and repair • Check and repair • Check and replace • Check and repair • Check and repair
Contactor does not operate.	<ul style="list-style-type: none"> • Open thermostat • Loose and broken connections at contactor coils. • Faulty contactor coil • No supply to contactor coil. 	<ul style="list-style-type: none"> • Check and replace if defective. • Check and repair. • Check and replace. • Check and repair external circuit.
When the man supply is switched ON and the OCV, Check switch operated, voltmeter does not show voltage.	<ul style="list-style-type: none"> • Switches (P-15) & (P-16) are not in correct position. • Defective voltmeter. • Loose connection at voltmeter or at switches (P-15) or at (P-16). 	<ul style="list-style-type: none"> • Check and correct the position. • Check and repair replace if necessary. • Check and repair.
Machine stops abruptly.	<ul style="list-style-type: none"> • Open thermostat due to overheating. • Defective contactor main contactor or Defective auxiliary supply to contactor. 	<ul style="list-style-type: none"> • Wait and allow the system to cool down until it closes. • Check the contactor and replace it if necessary.
Main fuses blow repeatedly when the unit is switched "ON" after making the main contactor "ON".	<ul style="list-style-type: none"> • Defective main rectifier • Shorted primary OR secondary Coils. 	<ul style="list-style-type: none"> • Check and replace defective diodes. • Check and replace.



7.0 CONSTRUCTION AND ASSEMBLY





7.1 ARC-8830-AR GUN



Assembling and dismantling-gun

Warning

Before proceeding further to assembly or repair, be sure the power switch is in 'off' position, and the main power to the unit is disconnected.

Before taking the gun apart prepare a clean work surface and assemble necessary tools, grease and solvents such as kerosene. Additional tools may be required to properly troubleshoot and/or disassemble the ARC gun. Some recommendations are as follows:

Multimeter:

Use a model that is capable of volts (ac & dc), ohms, and amperage (current) at a level of 10 amps dc.

To change contact tips:

- Remove the protective cap by turning it clockwise
- Pull out air cap with fingers.
- Pull out nozzle/positioner with fingers.

Contact tips are now exposed. Use **socket wrench** (furnished), to remove the contact tips by inserting in front on gun and turning counter-clockwise.



Install a new pair of contact tips. (Be sure to use the proper tips for the wire to be sprayed).

- Reinstall nozzle positioner.
- Reinstall air cap.
- Reinstall the protective cap into place.

Caution: Do not over-tighten.

Note: The nozzle/positioner, air cap, and contact tips all have a direct effect on spray performance. So, be sure to use the correct setup for the spray application.

To change or remove contact tubes:

Remove the front cover of gun.

Remove the terminal cap by loosening the screw. (Use hex wrench provided.) It is not necessary to completely remove this screw.

- Remove the protective cap, air cap, and nozzle positioner so that the contact tips are exposed. Pull the contact tubes out of the spray head by grasping the contact tips and pulling. If necessary, push the contact tube from the rear with your fingers until accessible.
- Reverse procedure for assembly. Note that the end of the contact tube comes flush (even) with the end of the buss bar terminal.
- Turn the wire roller release knob 180 degrees (either direction) until the wire rollers are locked in the "open" position. Withdraw the spray wires and flexible wire conduits by unlocking them from the rear of the gun. Lay the conduits down on the floor in a straight line leading away from the console.
- Remove the contact tubes to change or remove contact tubes.
- Pull the spray head away from the gun body.

Assemble spray head onto drive unit:

Reposition spray head onto drive unit. Align the contact tubes as the spray head is being repositioned to allow them to slide into the proper holes contact tubes are inserted into holes that have open passage thru to the inside of spray head.

- Re-insert the contact tips into spray head.
- Re-install nozzle positioner, Air cap, and protective cap.
- Replace the hood.



Contact tip life

The purpose of this section is to provide an estimate of tip life with the model ARC8830-AR Arc spray gun using various wires. It is imperative that you change tips at the recommended intervals to assure consistent high quality coatings.

Two style nozzle-positioners are available - long and short. The short ones are for use with hard wires and allow more tip wear before tips must be changed. The long nozzle-positioners give the finest spray and provide other advantages for soft wires; i.e., zinc, aluminum and tin and for ultra-dense hard wire coatings.

Using long nozzle/positioners:

If the contact tip bore is allowed to wear more than 0.005 inch (125 microns), the wires move out to the nozzle/positioner and cause it to fail. It is imperative that tips be changed before excessive wear occurs (bore enlarged more than 0.005 inches - (125 microns).

Using short nozzle/positioners:

The short nozzle/positioners are designed for hard wire use to permit more tip wear before change is required. Tips for the model ARC 8830-AR gun are very inexpensive. This replacement cost is well worth the investment to assure consistent, quality coatings. For those customers to whom long-term uninterrupted spraying is critical, these should prove to be invaluable.

Note: Wire quality important: wire quality is most important with the model ARC 8830-AR minimize tip wear since precise alignment produces higher quality and more consistent Coatings - use IBPS wires to assure longest tip life.

Tip change frequency:

As a guide, tips should be changed when:

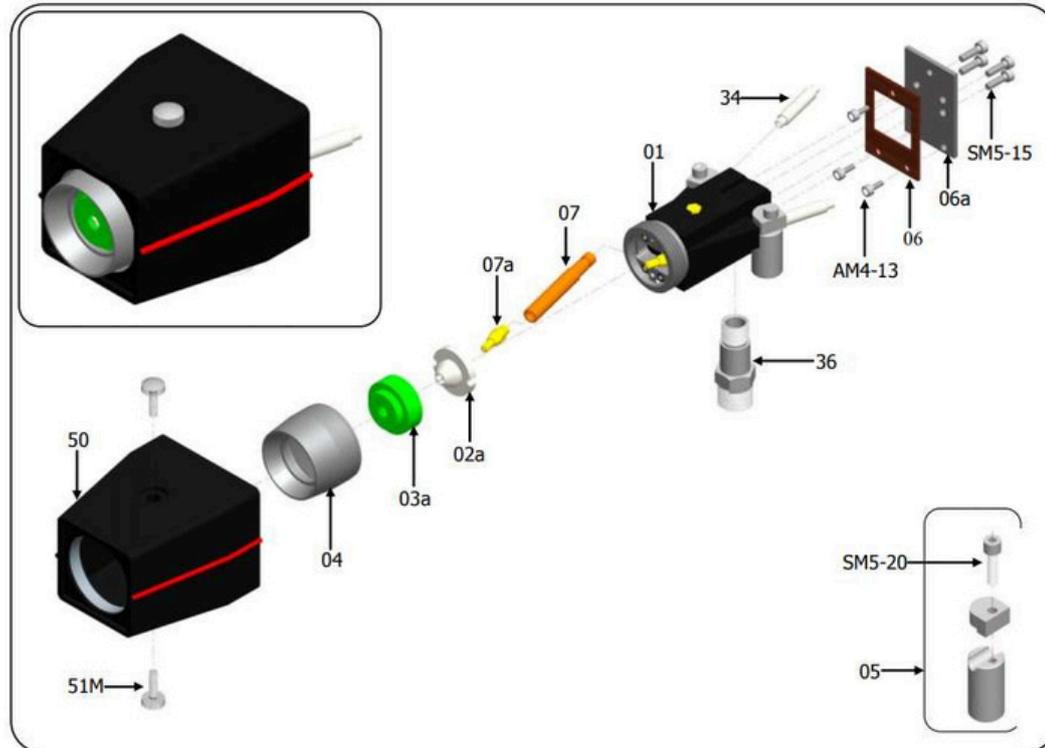
1. A wire hang-up occurs in the contact tips.
2. At the following intervals to assure wear does not exceed recommended levels.

The contact tips wear at the same rate regardless of nozzle-positioner used; however, the short nozzle-positioner allows more wear on the contact tip before replacement is necessary. In some cases the long nozzle/positioner may be used, however, the contact tips must be changed more frequently.

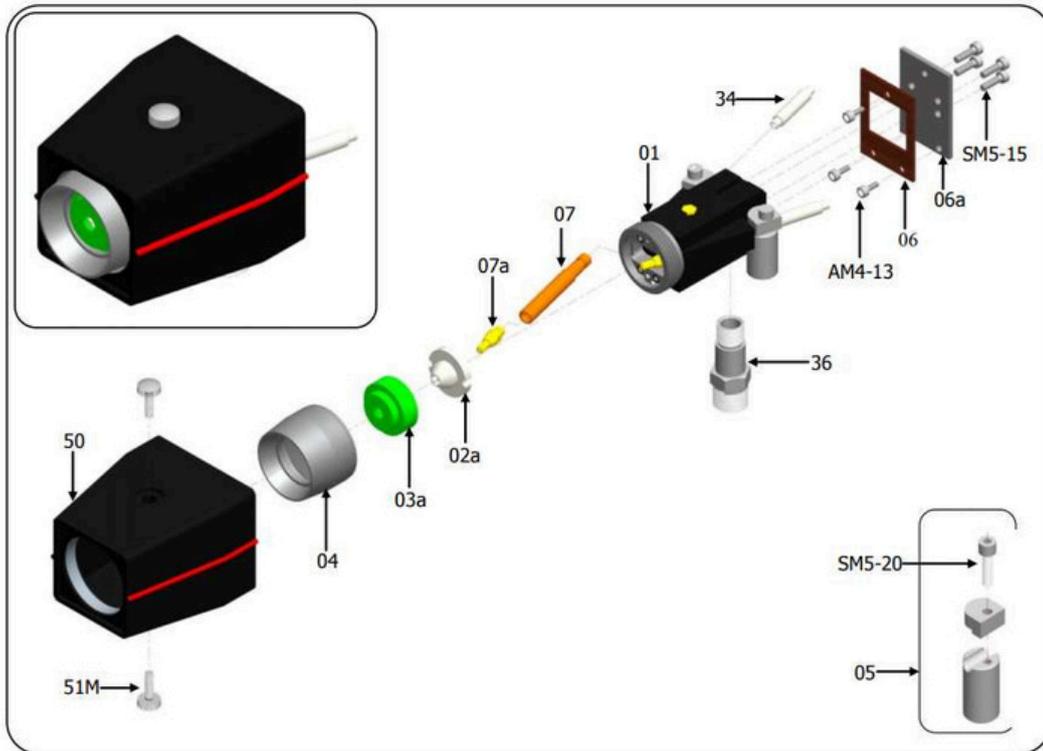


DETAILS OF SPARE PARTS

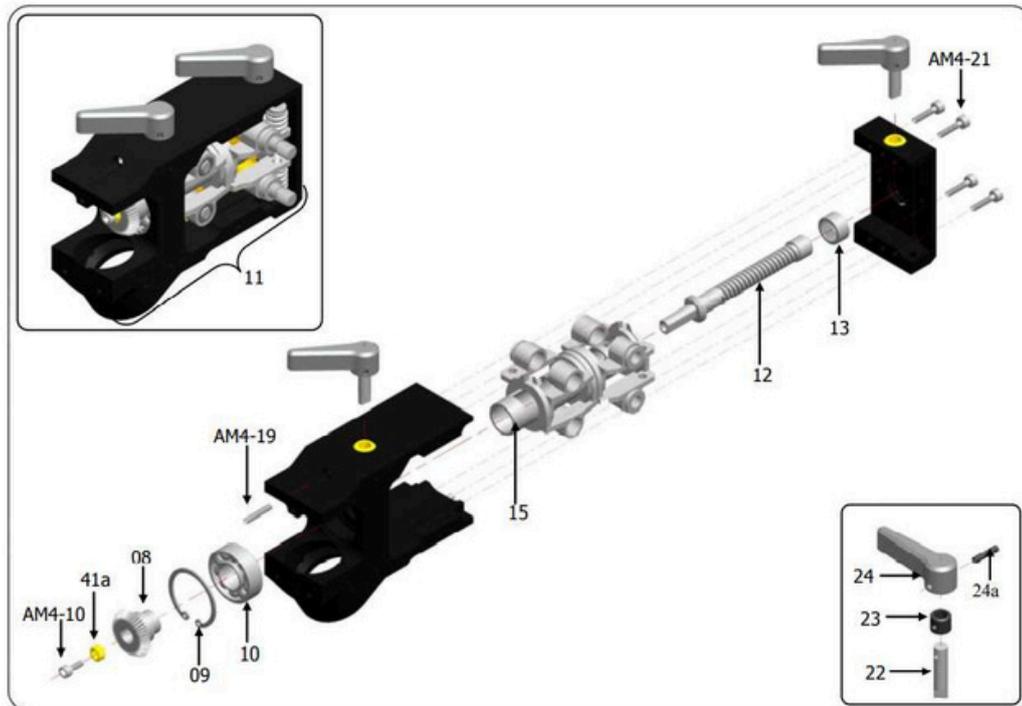




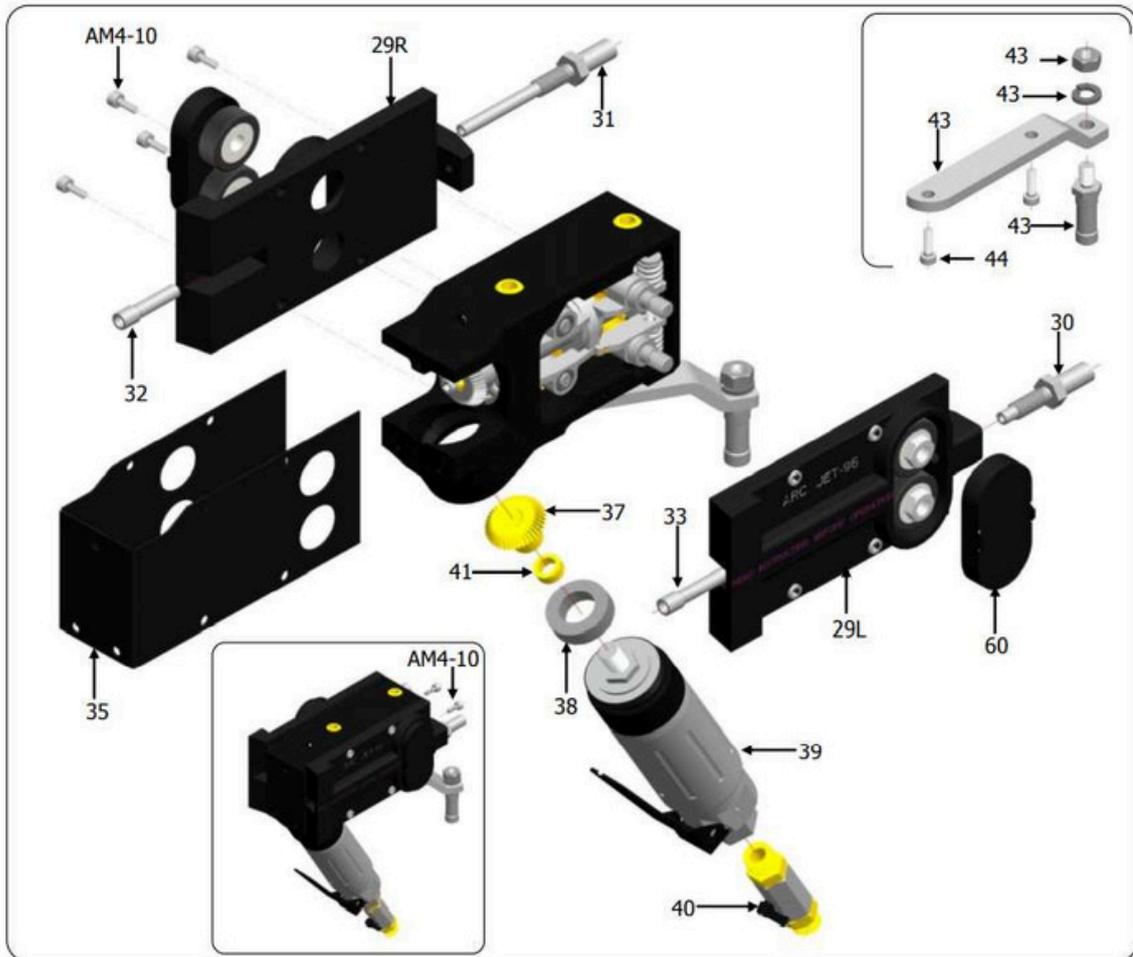
PART No.	PART DESCRIPTION
8830-AR-01	Close Head
8830-AR-02	Nozzle / Positioner - Long Slot
8830-AR-02-A	Nozzle / Positioner - Long Cross Slot
8830-AR-02-B	Nozzle / Positioner - Short Slot
8830-AR-02-C	Nozzle / Positioner - Short Cross Slot
8830-AR-03	Nozzle Cap Golden
8830-AR-03-A	Nozzle Cap Green
8830-AR-03-B	Nozzle Cap Red
8830-AR-03-C	Nozzle Cap Blue
8830-AR-03-S	Nozzle Cap
8830-AR-03-F	Nozzle Cap
8830-AR-04	Protective Cap
8830-AR-05	Terminal Assembly
8830-AR-06	Insulator Seat



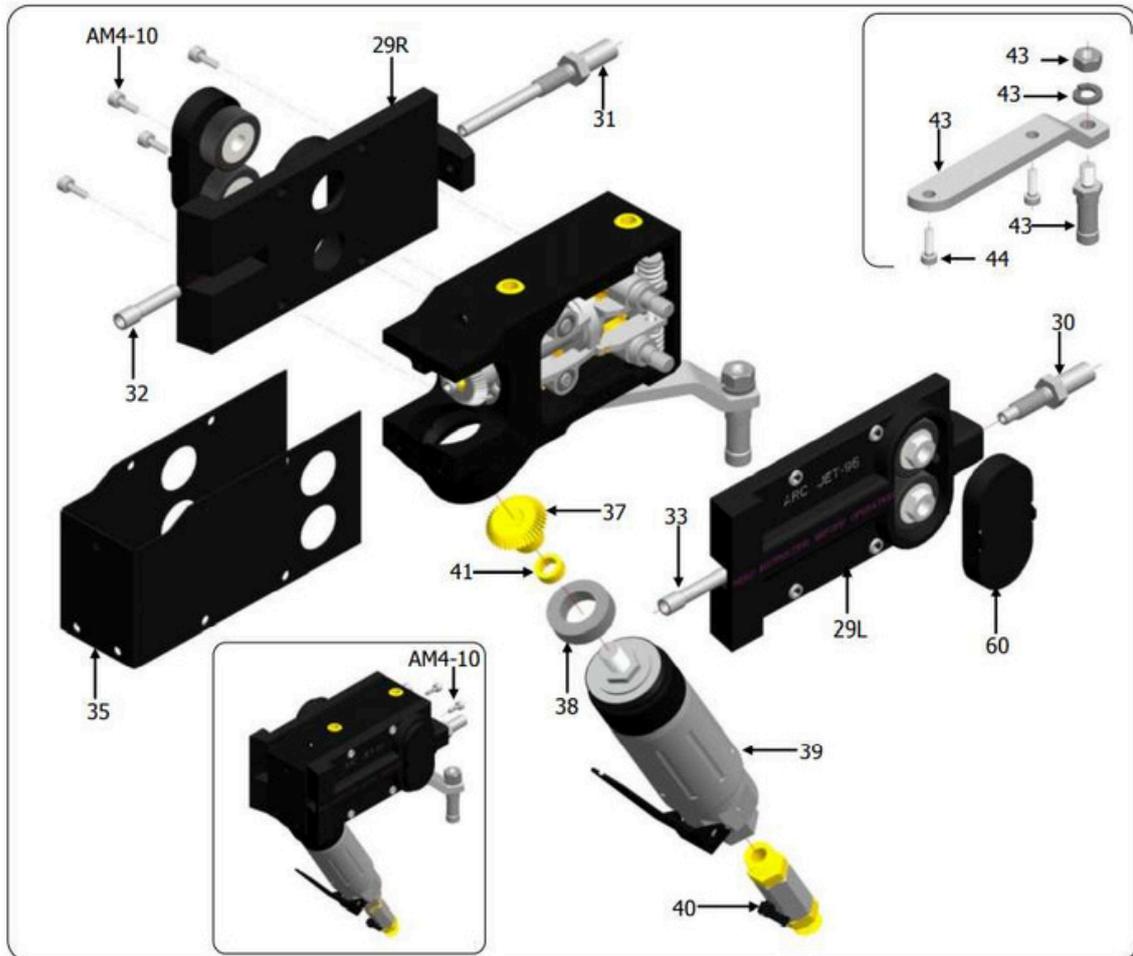
PART No.	PART DESCRIPTION
8830-AR-06-A	Mounting Plate
8830-AR-07	Contact Tube
8830-AR-07-A	Contact Tip - 1.6mm
8830-AR-07-B	Contact Tip - 2mm
8830-AR-36	Connector
8830-AR-50	Hood
8830-AR-51-M	Hood Mounting Screw
8830-AR-SM5-15	Terminal Fixing Screw
8830-AR-SM5-20	Terminal Fixing Screw
8830-AR-AM4-12	Head Mounting Screw
8830-AR-100	Chuck Nut
8830-AR-101A	Lug for Power cable (P-600)
8830-AR-101B	Lug for Power Cable (P-400)
8830-AR-101C	Lug for Power Cable (P-300)



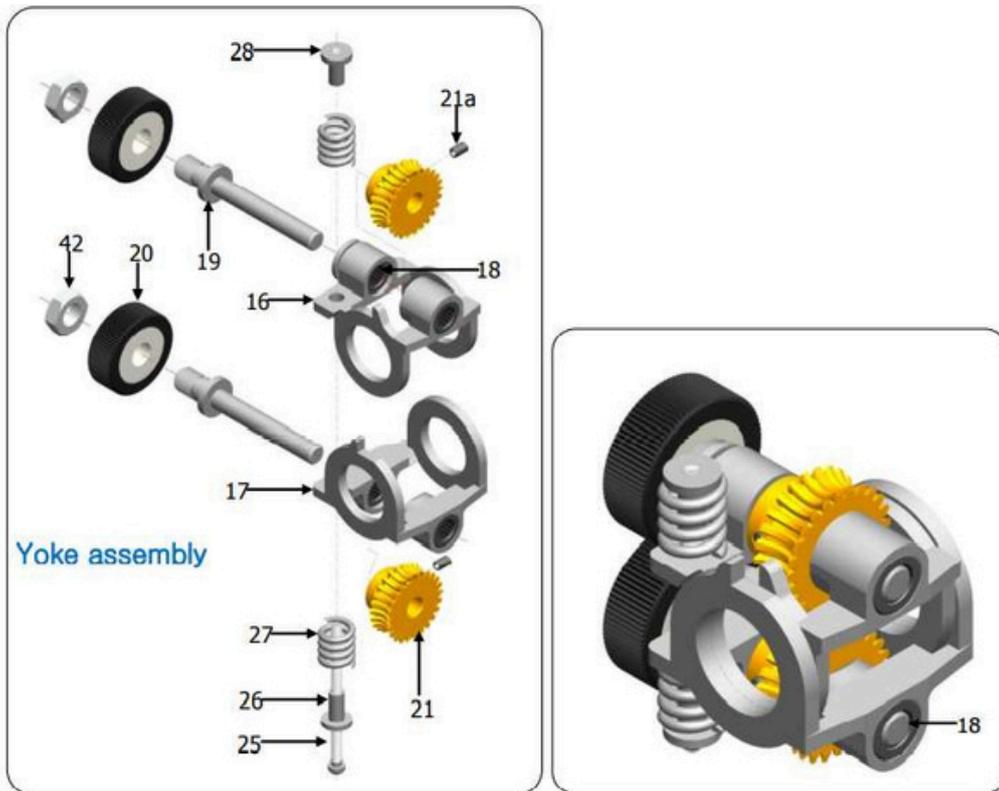
PART No.	PART DESCRIPTION
8830-AR-08	Driven Gear (Steel)
8830-AR-09	Front Bearing Retainer
8830-AR-10	Front Bearing
8830-AR-11	Bevel Gear Drive Box
8830-AR-12	Worm Shaft
8830-AR-13	Rear Bearing
8830-AR-14	Dowel For Supporting Yoke
8830-AR-14-A	Dowel For Locking Lever Cam Shaft
8830-AR-15	Dowel For Yoke Supporting Tube
8830-AR-22	Lever Cam Shaft
8830-AR-23	Lever Bush
8830-AR-24	Roller Opening Lever
8830-AR-24-A	Lever Locating Pin
8830-AR-41-A	Drive Gear Screw Washer
8830-AR-AM4-10	Drive Gear Screw
8830-AR-AM4-20	Screw
8830-AR-AM4-19	Lever Locking Screw
8830-AR-AM6-5	Screw



PART No.	PART DESCRIPTION
8830-AR-29R	Right Hand Side Cover Plate
8830-AR-29L	Left Hand Side Cover Plate
8830-AR-30	Short Rear Wire Guide
8830-AR-31	Long Rear Wire Guide
8830-AR-32	Short Front Wire Guide
8830-AR-33	Long Front Wire Guide
8830-AR-35	Gasket
8830-AR-37	Drive Gear
8830-AR-38	Exhaust Ring
8830-AR-39	Air Motor 2500 rpm
8830-AR-39-A	Air Motor 1000 rpm



PART No.	PART DESCRIPTION
8830-AR-40	Air Lock
8830-AR-41	Washer
8830-AR-43-ED	Gun Holding Plate
8830-AR-43-A	Mounting Stud
8830-AR-43-B	Mounting Stud Lock Washer
8830-AR-43-C	Nut
8830-AR-44	Clamp Fixing Screw
8830-AR-60	Roller Cover
8830-AR-AM-20	Side Cover Plate Screw
8830-AR-GS5-12	Front Wire Guide Holding Screw
8830-AR-AM4-20	Side Cover Screw

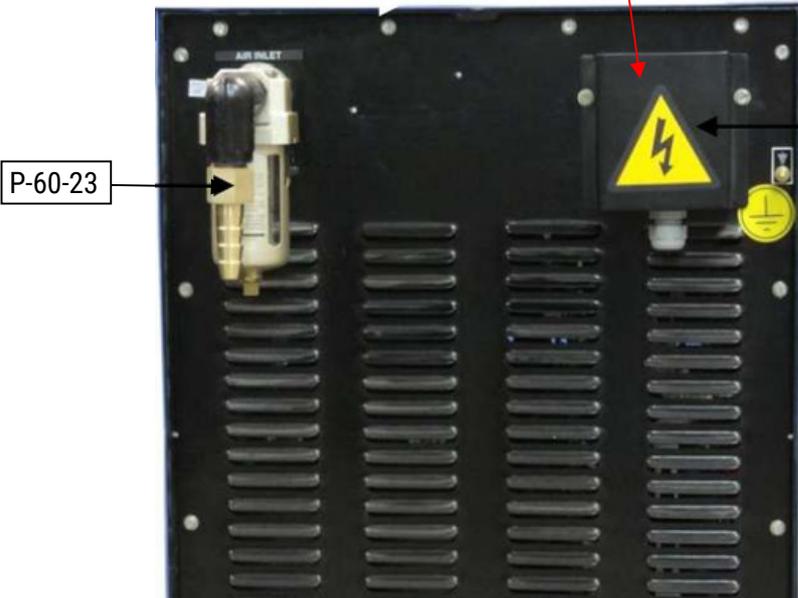
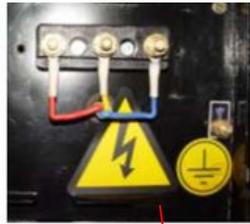
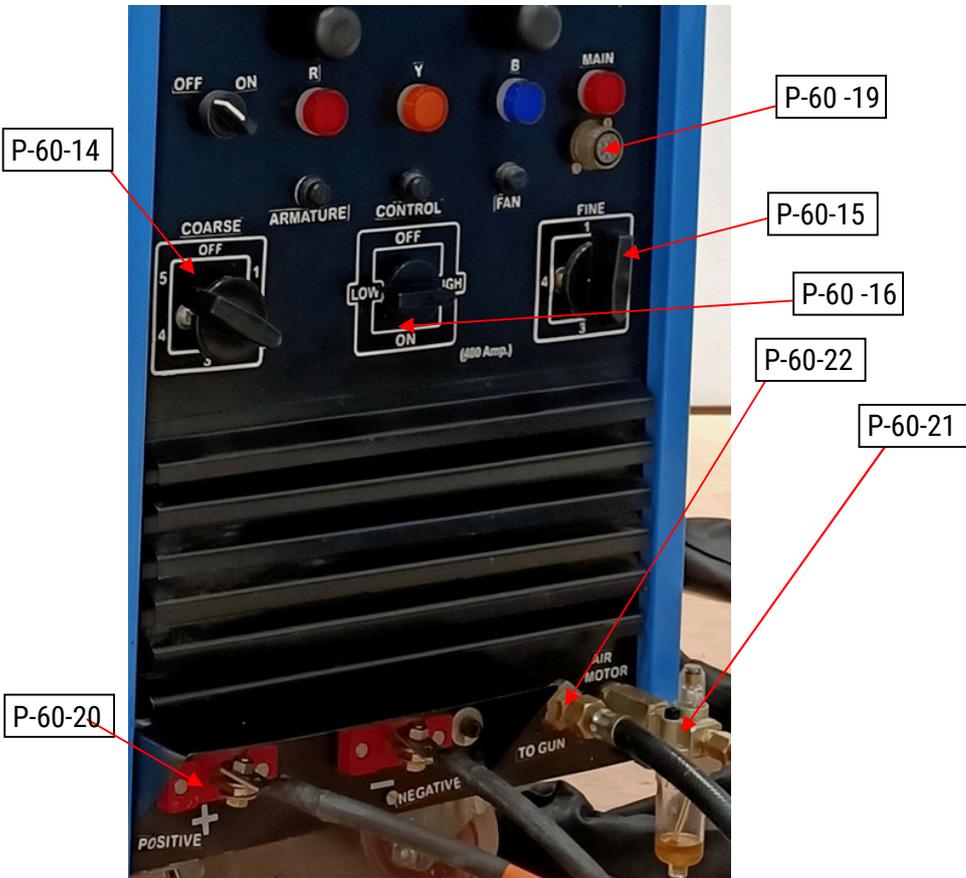


PART No.	PART DESCRIPTION
8830-AR-16	Inner Yoke
8830-AR-17	Outer Yoke
8830-AR-18	Yoke Bearing
8830-AR-19	Roller Shaft
8830-AR-20	Wire Roller
8830-AR-20-V	V Groove Wire Roller
8830-AR-21	Worm Wheel
8830-AR-21-A	Worm Wheel Retaining Pin
8830-AR-25	Tension Screw
8830-AR-26	Plain Spring Support
8830-AR-27	Tension Spring
8830-AR-28	Threaded Spraying Support
8830-AR-42	Fixing nut for wire roller



PART LIST OF POWER SOURCE (PS-600)





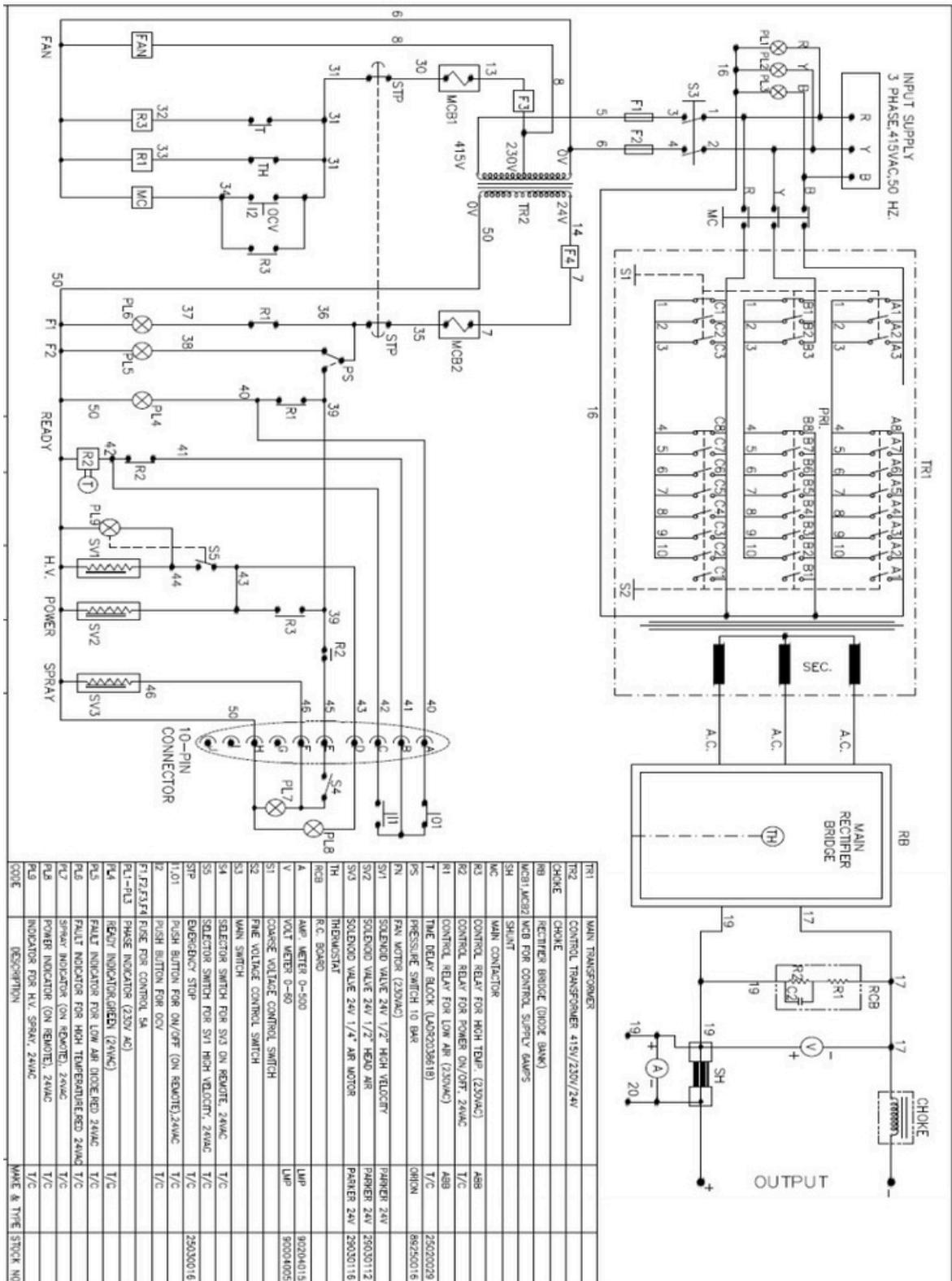


SR.NO.	PART NO.	DESCRIPTION
01	P60-01	Regulator For Head Air Control
02	P60-02	Emergency Stop Switch
03	P60-03	Regulator For Motor Air Control
04	P60-04	Regulator For High Velocity Air Control
05	P60-05	Voltmeter(0-100 Volts)
06	P60-06	Ammeter (0-500amps)
07	P60-07	Ready Indicator
08	P60-08, 08A	Fault Indicator
09	P60-09	Push Button For Spray On (On Remote)
10	P60-10	Push Button For Spray Off (On Remote)
11	P60-11	Selector Switch For Spray (On Remote)
12	P60-12	High Velocity Selector Switch
13	P60-13	OCV Check Push Button
14	P60-14	Selector Switch For Coarse Voltage
15	P60-15	Selector Switch For Fine Voltage
16	P60-16	Main on/OFF selector switch
17	P60-17	Main Indicator
18	P60-18	System Fuses
19	P60-19	10 -Pin Connector For Remote
20	P60-20	Positive /Negative Terminal
21	P60-21	Lubricator
22	P60-22	Connector for compressed air to the gun
23	P60-23	Air Inlet Filter
24	P60-24	Main Transformer

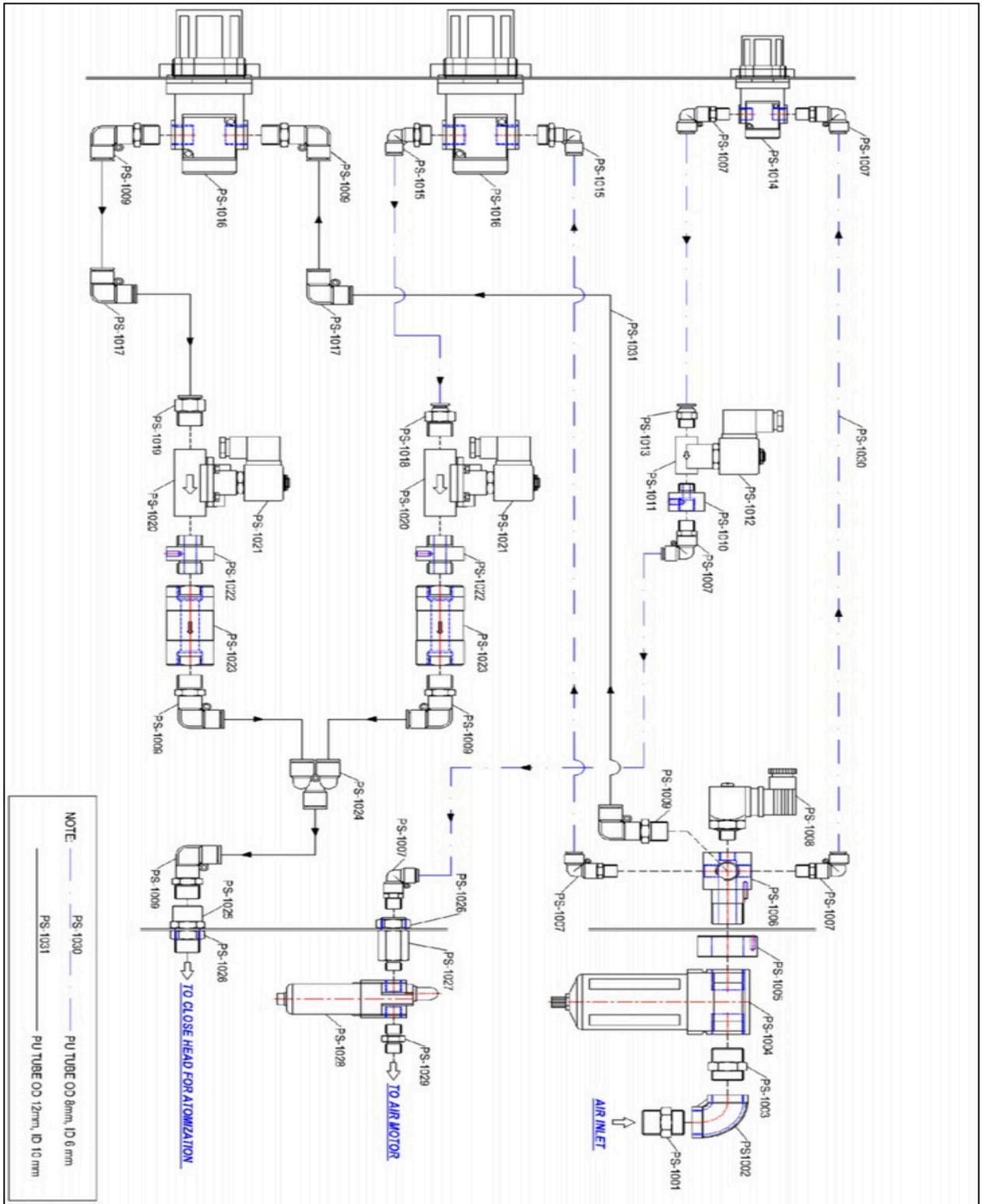


RECOMMENDED SPRAYING DATA FOR POWER SOURCE 600

Wire description	Rec. wire Size (mm)	Normal coat				
		Nozzle cap	Nozzle positioner	Volts	Amps	Air press. (bar)
IBPS-699(Aluminium)	1.6-2.0	Green	Long C	28-30	50-300	4.2
IBPS-540(Zinc)	1.6-2.0	Green	Long C	20-21	50-300	4.2
IBPS-599(Copper)	1.6-2.0	Green	Long C	28-30	50-300	3.5-4.2
IBPS-821(Ni / Cr 80/ 20)	1.6	Blue	Short C	29-30	50-300	3.5
IBPS-542(Babbitt)	2.0	Green	Long C	21-23	50-300	4.2
IBPS-568(Brass)	1.6	Green	Long C	28-30	50-300	3.5-4.2
IBPS-899(Molybdenum)	1.6	Blue	Short C	33-35	50-300	3.5
IBPS-10(Spray Steel 10)	1.6	Blue	Short C	29-30	50-300	3.5
IBPS-25(Spray Steel 25)	1.6	Blue	Short C	29-30	50-300	3.5
IBPS-80(Spray Steel 80)	1.6	Blue	Short C	29-30	50-300	3.5
IBPS-903(Monel)	1.6	Blue	Short C	30-32	100-200	3.5
IBPS-885(Ni-Al 95/5)	1.6	Blue	Short C	30-32	100-200	3.5
IBPS-710(Stainless St. 304)	1.6	Blue	Short C	30-32	100-200	3.5
IBPS-720(Stainless St. 420)	1.6	Blue	Short C	29-30	50-300	3.5
IBPS-730(Stainless St. 316)	1.6	Blue	Short C	29-30	50-300	3.5



TR1	MAIN TRANSFORMER	
TR2	CONTROL TRANSFORMER 415V/230V/24V	
CH1	CHOKE	
RB	RECTIFIER BRIDGE (DIODE BANK)	
MCB1/MCB2	MCB FOR CONTROL SUPPLY / MAINS	
SH	SHUNT	
MC	MAIN CONTACTOR	
R3	CONTROL RELAY FOR HIGH TEMP. (230VAC)	48B
R2	CONTROL RELAY FOR POWER ON/OFF. 24VAC	T/C
R1	CONTROL RELAY FOR LOW AIR (230VAC)	48B
T	TIME DELAY BLOCK (L40R2038618)	250200229
PS	PRESSURE SWITCH 10 BAR	867500116
FM	FAN MOTOR (230VAC)	
SV1	SOLENOID VALVE 24V 1/2" HIGH VELOCITY	PARNER 24V
SV2	SOLENOID VALVE 24V 1/2" HEAD AIR	PARNER 24V
SV3	SOLENOID VALVE 24V 1/4" AIR MOTOR	PARNER 24V
TH	THERMISTAT	250200116
RCB	R.C BOARD	
A	AMP. METER 0-500	90204015
V	VOLT METER 0-60	LMP
S1	COARSE VOLTAGE CONTROL SWITCH	90204005
S2	FINE VOLTAGE CONTROL SWITCH	
S3	MAIN SWITCH	
S4	SELECTOR SWITCH FOR SV3 ON REMOTE. 24VAC	T/C
S5	SELECTOR SWITCH FOR SV1 HIGH VELOCITY. 24VAC	T/C
STP	EMERGENCY STOP	T/C
L01	PUSH BUTTON FOR ON/OFF (ON REMOTE). 24VAC	250200116
Z	PUSH BUTTON FOR OCV	T/C
F1/F2/F3/F4	FUSE FOR CONTROL SA	
PL1-PL8	PHASE INDICATOR (230V AC)	
R4	RELAY INDICATOR/REDN. (24VAC)	T/C
PL6	FAULT INDICATOR FOR LOW AIR DIODE RED. 24VAC	T/C
PL7	FAULT INDICATOR FOR HIGH TEMPERATURE RED. 24VAC	T/C
PL8	SPRAY INDICATOR (ON REMOTE). 24VAC	T/C
PL9	POWER INDICATOR (ON REMOTE). 24VAC	T/C
PL9	INDICATOR FOR H.V. SPRAY. 24VAC	T/C
CODE	DESCRIPTION	MAKE & TYPE STOCK NO.





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