

INSTRUCTION AND MAINTENANCE

BU8830 Arc Spray Gun - Air Drive

Operating and maintenance manual for the BU8830 air-drive arc spray gun and system.



MANUAL

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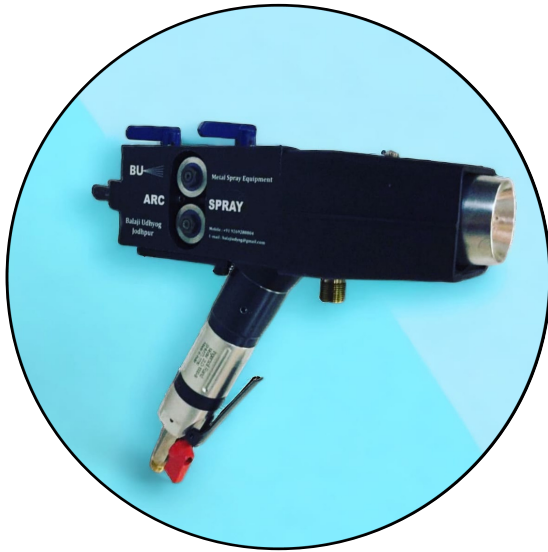
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INSTRUCTION & MAINTENANCE MANUAL



Arc Spray Gun (Air Drive)
Model: BU8830



Power Source with Control
Console Model: 600 AMP
Suitable for both DC Drive & Air
Drive Arc Spray Gun

ARC SPRAY SYSTEM (AIR DRIVE) 600 AMP

ADVICE

Before using the equipment, read & understand this operating manual. In particular, refer to the Safety precautions.

Under No circumstances should any modifications be made to the equipment.

ATTENTION

Follow this Manual strictly while operation the equipment particularly safety precautions.

Modifications in the equipment is not advisable.

Any risk involved due to modification is solely the responsibility of user

INTRODUCTION ABOUT THE MANUAL

This user's manual is intended to provide adequate information related to ARC SPRAY SYSTEM to the reader. The details provided in the manual is for Installation / Operation / Maintenance of equipment. Failure to observe the information provided herein may result in risk to personnel health and safety, as well as damage to equipment.

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SAFETY MEASURES

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	

GENERAL

Consult the 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.

USE OF EQUIPMENT

Follow the safety measures outlined below:

- **Read, understand, and follow the safety and operation instructions provided in the instruction manual.**
- Do not operate equipment above recommended pressures and flows.
- 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.

Equipment Handling

Maintain the equipment in first class condition. Follow the maintenance recommendations in the 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 air lines, compressors, regulators, etc., should be inspected regularly for leaks & loose connections.

Maintain the Arc Spray equipment in first class condition. Follow the maintenance recommendations in the Power Source with Control Console Manual.

METAL DUSTS

All dust having considerable calorific value can be explosive. This dust includes: flour, starch, hard rubber dust, wool flour, Aluminium dust and the dust of other metals. Aluminium and magnesium dusts are particularly hazardous.

The greatest care should be used in handling them. To minimize the danger of dust explosion resulting from flame spraying, adequate ventilation must be provided for spray booths and other confined spaces, to prevent the accumulation of fumes and dust. Good housekeeping in the work area is essential. Inspect and clean regularly to assure that there is no potentially dangerous accumulation of dust.

Bag or filter type collectors are not suitable for metal spray dust. A water wash wet collector should be used. All of the dust must be wetted down and remain immersed in water. No accumulation of dry or partially wet dust should be permitted. All closed collectors should be provided with blow out holes or relief panels. All fans, pipes, dust arresters and motors should be electrically grounded.

REDUCTION OF RESPIRATORY HAZARDS

Fumes or dusts of POWDERS can be toxic and hazardous. Efficient spray booth and exhaust system are therefore essential while spraying these. Besides, if the operator feels any discomfort a suitable mask with respiration facility may be used.

REDUCTION OF NOISE HAZARD

The operator and other personnel close to the arc spray operation should be protected from prolonged exposure to noise.

EYE PROTECTION

Always wear eye protectors when operating, or watching the arc spray operation. Inspect the eye protectors frequently. Lenses and over plates, which are scratched, pitted or damaged, can impair vision and seriously reduce protection.

HAZARDOUS MATERIAL

All 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. Blasting, spraying, and finishing should be considered as hazardous as spraying such materials.

The following materials are specifically listed because they are commonly sprayed. There are many other hazardous materials that 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 babbits), cadmium alloys, and chromium alloys are extremely hazardous. Consult an industrial hygienist for the proper protection.

Zinc, Zinc Alloys, (Zinc, Bronzes and Brasses)

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.

Reduction of Respiratory Hazards

Refer to 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 can not 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.



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.



INTRODUCTION

ARC SPRAY SYSTEM is a new generation spray technique, which has been developed to produce nearly porosity free high quality coatings using an air controlled motor. It is designed for tool post mounting in mechanical & automatic conditions.

Recent finds have shown that coating obtained from Arc spray are similar and in few cases is superior to Air Plasma in terms of:

- ❖ Lower Porosity High
- ❖ Bond Strength Good
- ❖ Surface Finish Build
- ❖ Up Thickness High
- ❖ Deposition Rate

The operation cost of Arc spray is lowest among all the available thermal spray technique with highest spray rate and quality result.

Operation of the equipment is simple; this manual intended to serve as a guide for the installation, operation and maintenance of the Arc Spray System. After getting conversant, the user will normally encounter the difficulty in the operation of Arc Spray System.

PRINCIPLE OF OPERATION

The Arc Spray System of Balaji Udyog Gun utilizes electrical energy to melt a metal which is in the wire form and compressed air is used to atomize the molten metal 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 head compressed air directed across the arc. Wires are fed at a small-included angle between them, (about 30 Degree) 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.

EQUIPMENT DESCRIPTION

A complete Arc Spray installation requires equipment to supply and control compressed air, wire to be sprayed on to the substrate. The Arc spray system consists of the following main parts:

- Arc Spray Gun
- Power Source with Control Console
- Twin wire spool with Stand
- Gun Stand
- Air compressor
- Metallizing Wire

ARC SPRAY GUN



The Spray Gun consists of two main units, the front end assembly & drive mechanism assembly.

❖ Front End Assembly

The Spraying Head consists of the close head, nozzle positioner, nozzle cap, protective cap, contact tube and terminal assembly. One spray wire feeds through each of the contact tube tips from which they emerge to a point of intersection, slightly ahead of the nozzle. At this point an electric arc is formed owing to the short circuit created by the wires and a small pool of molten metal results at the tip of each wire.

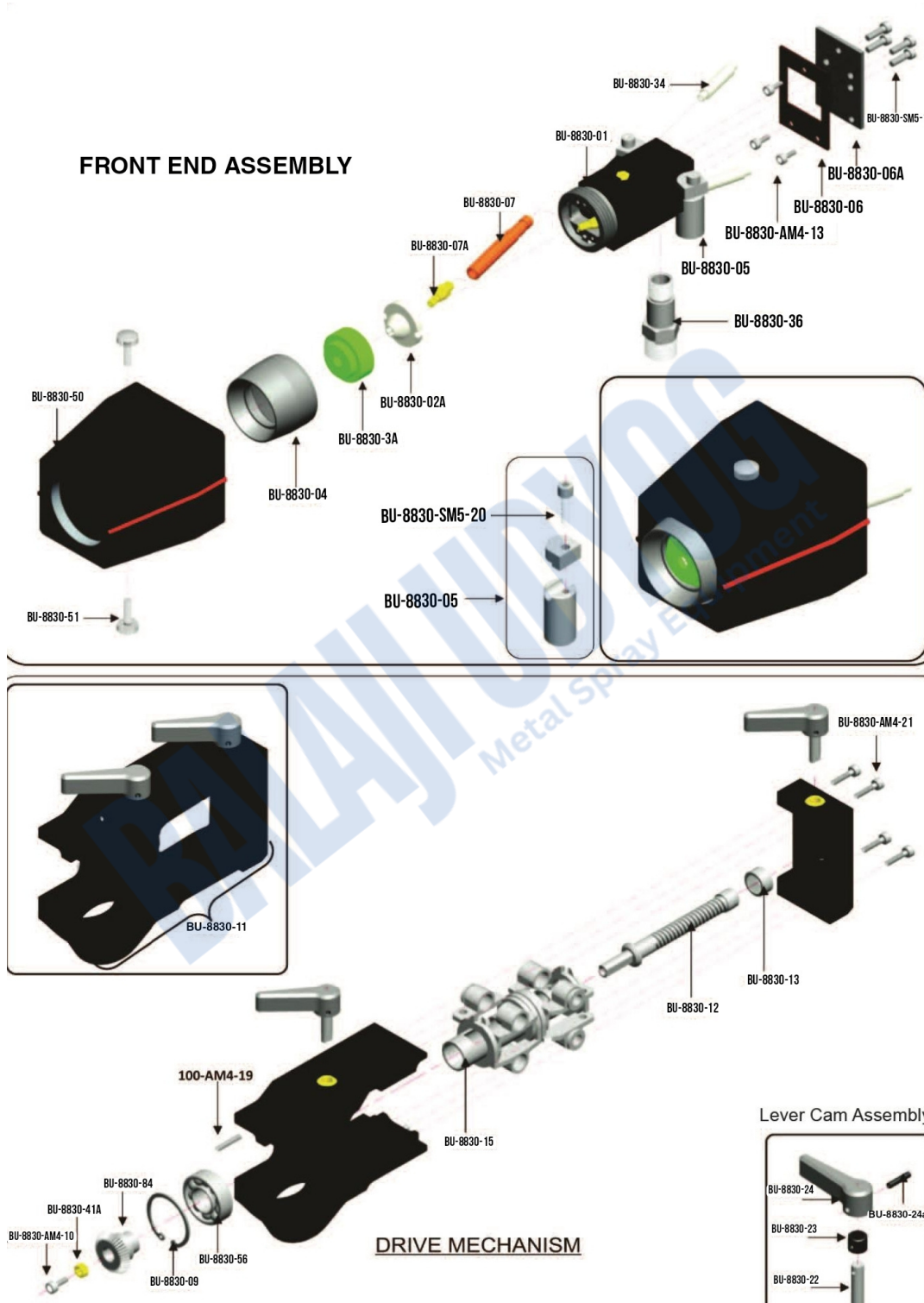
The nozzle directs a jet of compressed air at high velocity across the arc zone, entraining the molten metal as fine droplets and forming the spray system.

❖ Drive Mechanism

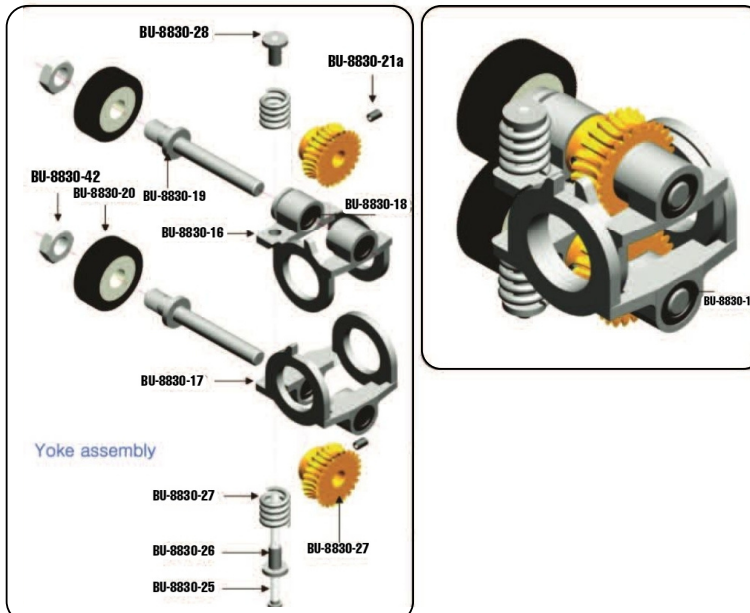
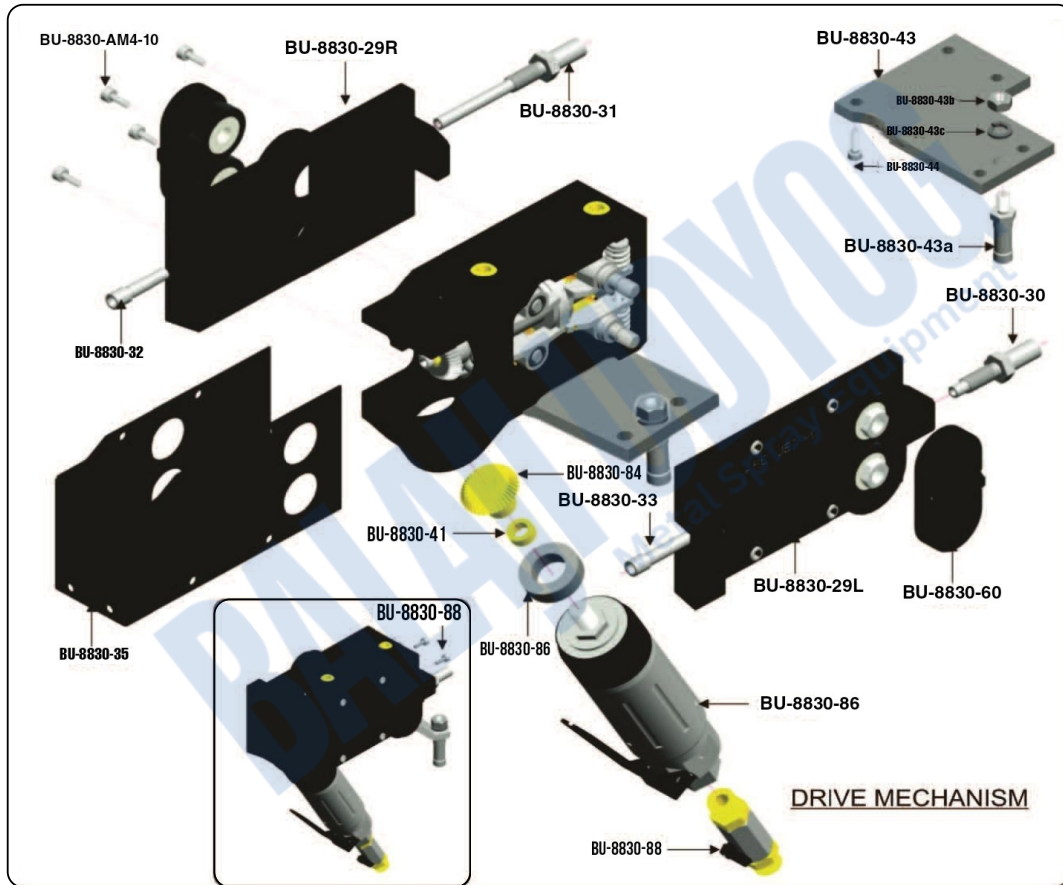
The Drive unit includes a high torque, positive displacement Air motor and the gear housing. The motor drives the gears and which cause the rotation of the worm shaft.

The Wire Feed Unit consists of two pairs of Shaft to each of which a worm gear and wire feed roller is screwed. 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. The worm gears remain constantly in mesh with the worm shaft while the pivoting action allows the wire rollers to engage with or to get disengaged from the spray wire. Tension (Opposing) springs provide the required tension forcing the rollers together onto the spray wire while lever cam shaft (lever bush) is provided to open the rollers and release the spray wire. 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-circuiting.

ARC SPRAY GUN (AIR DRIVE), MODEL: BU-8830
SPARE PARTS



ARC SPRAY GUN (AIR DRIVE), MODEL: BU-8830
SPARE PARTS



SPARE PARTS LIST

ARC SPRAY GUN (AIR DRIVE), MODEL: BU-8830

PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION	ITEM
BU-8830-01	CLOSE HEAD		BU-8830-AM4-10	SIDE COVER PLATE SCREW	
BU-8830-01-ASSY	CLOSE HEAD ASSEMBLY		BU-8830-AM4-10	DRIVE GEAR SCREW	
BU-8830-02	NOZZLE POSITIONER LONG SLOT		BU-8830-09	CIRCLIP	
BU-8830-02	NOZZLE POSITIONER LONG CROSS		BU-8830-11	BEVEL GEAR DRIVE BOX (AIR DRIVE)	
BU-8830-02S	NOZZLE POSITIONER SHORT SLOT		BU-8830-12	MOTOR MOUNTING SCREW	
BU-8830-02S	NOZZLE POSITIONER SHORT CROSS		BU-8830-AM4-12	SCREW FOR GEAR BOX ASSEMBLY	
BU-8830-03	NOZZLE CAP GOLDEN (Extra Fine/Medium)		BU-8830-12	WORM SHAFT (Standard Speed)	
BU-8830-03	NOZZLE CAP GREEN (Medium / Coarse)		BU-8830-12	WORM SHAFT (High Speed)	
BU-8830-03	NOZZLE CAP BLUE (Medium / Coarse)		BU-8830-13	REAR BEARING WARM SHAFT	
BU-8830-03	NOZZLE CAP RED (Extra Fine Spray)		BU-8830-14	YOKE SUPPORT TUBE DOWEL	
BU-8830-04	PROTECTIVE CAP		BU-8830-15	YOKE SUPPORT TUBE	
BU-8830-05	TERMINAL ASSEMBLY		BU-8830-SM5-15	HEAD FIXING SCREW	
BU-8830-06	INSULATOR SHEET		BU-8830-AM4-16	HEAD MOUNTING SCREW	
BU-8830-06A	MOUNTING PLATE		BU-8830-16	INNER YOKE	
BU-8830-07	CONTACT TUBE		BU-8830-17	OUTER YOKE	
BU-8830-07A	CONTACT TIP 1.6MM (BRASS)		BU-8830-18	YOKE BEARING	
BU-8830-07A	CONTACT TIP 2.0MM (BRASS)		BU-8830-19	ROLLER SHAFT	
BU-8830-07A	CONTACT TIP 2.5MM (BRASS)		BU-8830-AM4-19	LEVER LOCKING SCREW	
BU-8830-07A	CONTACT TIP 3.17MM (BRASS)		BU-8830-20	WIRE ROLLER ASSEMBLY	
BU-8830-07B	CONTACT TIP 1.6MM (COPPER)		BU-8830-AM5-20	TERMINAL FIXING SCREW	
BU-8830-07B	CONTACT TIP 2.00MM (COPPER)		BU-8830-21	WORM WHEEL (Standard Speed)	
BU-8830-07B	CONTACT TIP 2.5MM (COPPER)		BU-8830-21	WORM WHEEL (High Speed)	
BU-8830-07B	CONTACT TIP 3.17MM (COPPER)		BU-8830-21A	WORM WHEEL RETAINING SCREW	
BU-8830-08	MOTOR GEAR MOUNTING SCREW				

SPARE PARTS LIST

ARC SPRAY GUN (AIR DRIVE), MODEL: BU-8830

PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION	ITEM
BU-8830-22	LEVER CAM SHAFT		BU-8830-50	HOOD	
BU-8830-24	ROLLER OPENING LEVER		BU-8830-51	HOOD SCREW	
BU-8830-24A	LEVER LOCATING PIN		BU-8830-56	BEARING FRONT (WORM SHAFT)	
BU-8830-24B	ASSEMBLY ROLLER OPENING (Incl. Part No. 22/24/24A)		BU-8830-57	WASHER FOR GEAR	
BU-8830-25	TENSION SCREW		BU-8830-60	ROLLER COVER	
BU-8830-26	PLAIN SPRING SUPPORT		BU-8830-84	DRIVEN BEVEL GEAR (STEEL)	
BU-8830-27	TENSION SPRING		BU-8830-85	DRIVEN BEVEL GEAR (BRASS)	
BU-8830-28	THREADED SPRING SUPPORT		BU-8830-86	MOTOR EXHAUST RING	
BU-8830-29R	RIGHT HAND SIDE COVER PLATE		BU-8830-86	AIR MOTOR (SLOW SPEED 1000 RPM)	
BU-8830-29L	LEFT HAND SIDE COVER PLATE			AIR MOTOR (HIGH SPEED 2500 RPM)	
BU-8830-30AD	SHORT REAR WIRE GUIDE		BU-8830-87	DRIVEN GEAR RETAINING SCREW	
BU-8830-31AD	LONG REAR WIRE GUIDE		BU-8830-88	AIR BALL VALVE	
BU-8830-32	SHORT FRONT WIRE GUIDE		BU-8830-95	CURRENT CABLE (70 Sq. mm Cable for 400 AMP)	
BU-8830-33	LONG FRONT WIRE GUIDE			REMOTE CONTROL	
BU-8830-34	FLEXIBLE WIRE GUIDE (TEFLON)		BU-8830-96	CONNECTING AIR HOSE (STD. LENGTH - 5 MTR.)	
BU-8830-AM4-35	SCREW FOR HOLDING DRIVE UNIT		BU-8830-97	TEFLON TUBE WITH FITTING (3 MTR. LENGTH)	
BU-8830-35	GAS KET		BU-8830-98	HOSE FOR CONTROL CONSOLE TO AIR MOTOR (STD. LENGTH - 5 MTR.)	
BU-8830-36	AIR CONNECTOR		BU-8830-100	ARC SMC FITTING	
BU-8830-42	FIXING NUT FOR WIRE ROLLER				
BU-8830-43	GUN HOLDING PLATE				
BU-8830-43A	MOUNTING STUD				
BU-8830-43B	MOUNTING STUD LOCK WASHER				
BU-8830-43C	NUT				
BU-8830-44	CLAMP FIXING SCREW				