



**! IMPORTANT !**  
-FOR YOUR SAFETY-  
READ THIS MANUAL BEFORE  
INSTALLING OR USING EQUIPMENT

# OPERATION MANUAL

## RC250P

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# THANK YOU!!!

... for purchasing **PowCon Incorporated** products. Our commitment to you is to provide an ever expanding family of quality welding and welding/cutting power sources, arc positioning equipment and accessories. Please take a moment to read the following pages as they contain important information regarding proper welding/cutting safety and procedures.

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# SAFETY

## SAFETY

### ! IMPORTANT !

THIS MANUAL HAS BEEN DESIGNED FOR EXPERIENCED WELDING AND CUTTING EQUIPMENT OPERATORS AND MUST BE READ COMPLETELY BEFORE USING THIS EQUIPMENT. IF YOU LACK EXPERIENCE OR ARE UNFAMILIAR WITH THE PRACTICES AND SAFE OPERATION OF WELDING AND CUTTING EQUIPMENT, PLEASE CONSULT YOUR FOREMAN. DO NOT ATTEMPT TO INSTALL, OPERATE, OR PERFORM MAINTENANCE ON THIS EQUIPMENT UNLESS YOU ARE QUALIFIED AND HAVE READ AND UNDERSTOOD THIS MANUAL. IF IN DOUBT ABOUT INSTALLING OR OPERATING THIS EQUIPMENT, CONTACT YOUR DISTRIBUTOR OR THE CUSTOMER SERVICE DEPARTMENT OF PowCon.

### DEFINITIONS

Throughout this manual, NOTE, CAUTION, WARNING and DANGER are inserted to call attention to particular information. The methods used to identify these highlights and the purpose for which each is used, are as follows:

#### NOTE

Operational, procedural, and background information which aids the operator in the use of the machine, helps the service personnel in the performance of maintenance, and prevents damage to the equipment.

#### CAUTION

An operational procedure which, if not followed, may cause minor injury to the operator, service personnel and/or bystanders.

#### WARNING

An operational procedure which, if not followed, may cause severe injury to the operator, service personnel, or others in the operating area.

#### DANGER



An operational procedure which, if not followed, will cause severe injury or even death to the operator, service personnel or bystanders.

## SAFETY INFORMATION

Safety is a combination of good judgement and proper training. Operation and maintenance of any arc welding and cutting equipment involves potential hazards. Individuals who are unfamiliar with cutting and welding equipment, use faulty judgement or lack proper training, may cause injury to themselves and others. Personnel should be alerted to the following potential hazards and the safeguards necessary to avoid possible injury. In addition, before operating this equipment, you should be aware of your employer's safety regulations.

BE SURE TO READ AND FOLLOW ALL AVAILABLE SAFETY REGULATIONS BEFORE USING THIS EQUIPMENT.

### ELECTRIC SHOCK



THE VOLTAGES PRESENT IN THE WELDING AND CUTTING ENVIRONMENT CAN CAUSE SEVERE BURNS TO THE BODY OR FATAL SHOCK. THE SEVERITY OF ELECTRICAL SHOCK IS DETERMINED BY THE PATH AND THE AMOUNT OF CURRENT THROUGH THE BODY.

A) Install and continue to maintain equipment according to USA Standard C1, National Electric Code.

B) Never allow live metal parts to touch bare skin or any wet clothing. Use only dry gloves.

C) When welding or cutting in a damp area, or when standing on metal, make sure you are well insulated by wearing dry gloves, rubber soled shoes, and by standing on a dry board or platform.

D) Do not use worn or damaged welding or torch cables. Do not overload the cables. Use well maintained equipment.

E) When not welding/cutting, turn equipment OFF. Accidental grounding can cause overheating and create a fire hazard. Do not coil or loop the cable around parts of the body.

F) The ground cable should be connected to the workpiece as close to the work area as possible. Grounds connected to building framework or other locations remote to the work area reduce efficiency and increase the potential hazard of electric shock. Avoid the possibility of the cutting current passing through lifting chains, crane cables or other electrical paths.

# SAFETY

G) Keep everything dry you might touch, including clothing, the work area, welding gun, torch and welding or cutting machines. Fix water leaks immediately. Do not operate equipment standing in water.

H) Never use a cutting torch or welding gun which is damaged or contains cracks in its housing.

I) Refer to AWS-Z49.1 for grounding recommendations.

## PERSONAL PROTECTION



**SKIN AND EYE BURNS RESULTING FROM BODY EXPOSURE TO ELECTRIC-ARC WELDING AND CUTTING RAYS OR HOT METAL CAN BE MORE SEVERE THAN SUNBURN.**

A) Use a proper face shield fitted with the correct filter (#10 or greater) and cover plates to protect your eyes, face, neck and ears from the sparks and rays of the cutting/welding arc when cutting/welding or observing cutting/welding. Warn bystanders not to watch the arc and not to expose themselves to the cutting/welding arc rays or to hot metal.

B) Wear flameproof gauntlet-type gloves, a heavy long-sleeve shirt, cuffless trousers, high-topped shoes, and a welding helmet or cap (for hair protection) to protect the skin from arc rays and hot sparks or hot metal.

C) Protect other nearby personnel from arc rays and hot sparks with a suitable non-flammable partition.

D) Always wear safety glasses or goggles when in a cutting or welding area. Use safety glasses with side shields or goggles when chipping slag or grinding. Chipped slag is hot and may travel a considerable distance. Bystanders should also wear safety glasses or goggles.

E) Compressed gas cylinders are potentially dangerous, refer to the suppliers for proper handling procedures.

F) Wear ear plugs or other ear protection devices when operating cutting or welding equipment.

## FIRE SAFETY



**HOT SLAG OR SPARKS CAN CAUSE A SERIOUS FIRE WHEN IN CONTACT WITH COMBUSTIBLE SOLIDS, LIQUIDS OR GASES.**

A) Move all combustible materials well away from the cutting area or completely cover materials with a non-flammable covering. Combustible materials include but are not limited to wood, clothing, sawdust, gasoline, kerosene, paints, solvents, natural gases, acetylene, propane, and similar articles.

B) Do not weld, cut or perform other hot work on used barrels, drums, tanks or other containers until they have been completely cleaned. There must be no substances in the container which might produce flammable or toxic vapors.

C) For fire protection, have suitable extinguishing equipment handy for instant use.



# SAFETY

## VENTILATION



**WELDING AND CUTTING FUMES AND GASES, PARTICULARLY IN CONFINED SPACES, CAN CAUSE DISCOMFORT AND PHYSICAL HARM IF INHALED OVER AN EXTENDED PERIOD OF TIME.**

**A)** At all times, provide adequate ventilation in the welding and cutting area by either natural or mechanical means. Do not weld or cut on galvanized, zinc, lead, beryllium or cadmium materials unless positive mechanical ventilation is provided to prevent inhaling fumes and gases from these materials.

**B)** Do not weld or cut in locations close to chlorinated hydrocarbon vapors coming from degreasing or spraying operations. The heat of arc rays can react with solvent vapors to form phosgene, a highly toxic gas, and other irritant gases.

**C)** If you develop momentary eye, nose or throat irritation during welding or cutting, it is an indication that the ventilation is not adequate. Stop work and take the necessary steps to improve ventilation in the welding or cutting area. Do not continue to weld or cut if physical discomfort persists.

**D)** Use an air supplied respirator if ventilation is not adequate to remove all fumes and gases.

**E)** Beware of gas leaks. Welding or cutting gases containing argon are more dense than air and will replace air when used in confined spaces. Do not locate gas cylinders in confined spaces. When not in use, shut **OFF** the gas supply at its source.

**F)** Refer to AWS Standard Z49.1 for specific ventilation recommendations.

## SAFETY REFERENCES

The following publications provide additional information on important welding safeguards.

**A)** ANSI/ASC Z49.1-1988, American National Standard "Safety in Welding and Cutting".

**B)** Bulletin No. F4-1, "Recommended Safe Practices for the Preparation for Welding and Cutting Containers and Piping that have held Hazardous Substances".

**C)** OSHA Safety and Health Standards, 29CFR 1910, available from the United States Department of Labor, Washington, DC 20210.

**D)** NFPA Standard 51B, "Fire Prevention in Use of Cutting and Welding Processes", available from the National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 00210.

**E)** NEMA Standards Publication/No. EW1-1989, Electric Arc-Welding Apparatus, approved as ANSI C87.1-1989. Available from National Electrical Manufacturers Association, 155 E. 44th Street, New York, NY 10017.

# GENERAL INFORMATION

## GENERAL INFORMATION

### DESCRIPTION OF EQUIPMENT

The PowCon Pulser extends the versatility of PowCon's welding power sources by giving you additional welding process: GMAW (MIG) and GTAW (TIG) pulsing capabilities:

- A. Pulsed GMAW combines the advantages of GMAW spray deposition; spatter free, high weld quality, with the advantages of GMAW short arc low heat input to meet a variety of rigid standards.

Pulsed GMAW has been used to replace SMAW, GTAW, and conventional GMAW spray or short-arc transfer. Successful applications of pulsed GMAW include the out-of-position welding of quenched and tempered steels, joining of sheet metal components and pipe welding of both ferrous and non-ferrous materials.

Pulsed GMAW allows greater deposition rates than SMAW and GTAW and eliminates interpass cleaning associated with SMAW. Thinner materials and larger diameter wires can be used when welding with normal procedures because lower average currents are inherent with pulsed GMAW.

- B. Pulsed gas tungsten arc welding (TIG) has been used successfully for sheet metal, small parts build up, tube and pipe-welding applications in shipbuilding, aircraft and pipe fabrication industries.

The advantages of pulsed GTAW over continuous GTAW include the following:

Uniform weld shrinkage resulting in decreased distortion. Less heat input required for an equal level of penetration.

- C. When not used for pulse GMAW or GTAW this remote can be used for weld power control with SMAW or other non-pulse welding processes.

### WARRANTY

PowCon warrants it's equipment to be free from defects in material and workmanship as of the time and place of delivery by PowCon.

This warranty is limited to the periods listed on the warranty card, provided the equipment is installed and operated according to the instructions in the manual.

The limited warranty is included with every piece of equipment. For this warranty to become valid, you must fill out the attached, postage paid, warranty card and return it to PowCon within 10 days of the purchase date. Do it now before you forget or lose the card.

Table 1 - RC250P Specifications

Applications	Pulsed MIG, pulsed TIG or remote weld level with the pulser OFF
Compatibility	See Figure 1 (Consult PowCon Product Compatibility Manual #201219)
Power Requirements	Three way adaptation to different sources: 1) + 24VDC, P1 - Pin M referenced to analog ground on Pin B 2) + 15VDC, P1 - Pin F referenced to analog ground on Pin B 3) 30VAC, P1 - Pin S referenced to AC return on Pin J
Frequency Range	MIG: 5 to 250 PPS TIG: .5 to 25 PPS
Dimensions (Maximum with safety frame)	11.5" x 6.7" 4.3" 292mm x 170.2mm x 109.2mm
Weight	3.5LBS 1.6 KG

# GENERAL INFORMATION

## RC250P

### MIG/TIG PULSER 250PPS

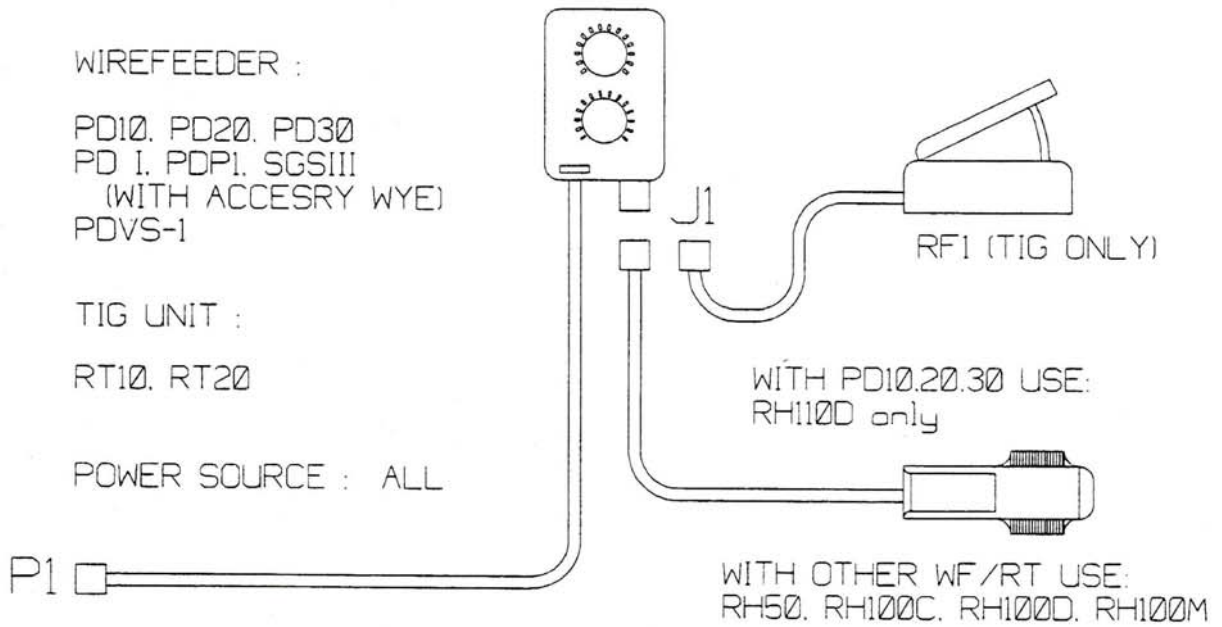


Figure 1 -RC250P



# INSTALLATION

## INSTALLATION

### UNPACKING NEW EQUIPMENT

(Receiving and Handling)

Remove the PowCon Pulser from its shipping carton and inspect for any possible damage that might have occurred during shipping. Make sure that all items on the packing list are accounted for and identified. One copy of the PowCon Operation Manual is packed with each pulser unit.

Any claims for loss or damage that may have occurred in transit must be filed by the PURCHASER with the CARRIER. Copies of the Bill of Lading and Freight Bill will usually be furnished by the CARRIER on request, if the need to file a claim arises.

Before contacting your SUPPLIER or the FACTORY regarding this equipment, have the model number and description, serial number and/or part number readily available.

### EQUIPMENT INSTALLATION

See Figure 1

The purpose of this chapter is to familiarize the operator with the broad application of PowCon's RC250P Pulser. For specific system configuration consult PowCon's Compatibility Manual #201219, in addition, consult the manuals of the individual components comprising your welding system.

#### TIG Applications

The pulser is equipped with a 5 foot, built-in cable, adapted with a 17-pin metal connector (P1) which interfaces:

- a) directly to the 17-pin remote connector on a power supply.
- b) to remote connector on RT (remote arc starter) units.

The pulser is equipped with a bulkhead mounted 17-pin remote connector (J1) for interface with:

- a) Foot current control - RF1.
- b) Hand current control - RH50, RH100C, D or M.
- c) 3 current level selector - RC120S.

#### MIG Applications

The 5 foot metal connector equipped (P1) cable, connects with:

- a) A PDVS, connect pulser's P1 directly to the power source remote connector.
- b) A PD10, PD20 and PD30; The pulser's P1 connector interfaces to PD's front panel remote connector.
- c) An accessory "WYE", interface box #603088-001, which is required to operate a PD1, PDP1 or SGSIII type wire feeder.

The bulkhead connector (J1) on the pulser can interface with:

- a) Remote volts and wire speed controller RH110D.
- b) RC120S can be used to generate 3 voltage and wire speed schedules when used to substitute an RH110D.

#### Remote Extension Cables

The 603088-XXX extension cable, with 17pin mmale and female connectors, is available to extend interface lengths. The dash number indicates length in feet. Standard lengths are -005, -025, -050, -075, -100, -150.

# INSTALLATION

## Front Panel Controls

See Figure 2

Several welding parameters must be controlled for pulsed GTAW or GMAW. By changing these welding parameters the weld power can be pulsed between a minimum (background) level and a maximum (peak) level at a fixed number of pulses per second. In addition, the pulse width or percent "ON" time of the maximum power level can be adjusted.

Front panel controls of the RC250P are:

### 1 > Pulse Power; Weld Power/Pulse-peak Potentiometer:

a) In LOCAL with pulser ON, acts as peak power control during the on-time (high) of the pulse width selected. In REMOTE with pulser ON peak power is dialed from a remote accessory attached to J1 connector.

b) In LOCAL with pulser OFF the potentiometer acts as a remote weld level control. In remote with pulser OFF, weld level can be controlled from an additional accessory attached to J1.

### 2 > Background Control

In LOCAL or REMOTE sets the power level during the off time (low or remaining time until the pulse width goes to a high level again).

a) In MIG mode Background potentiometer controls:

1. With 500SM, 500SM AC/DC and 400 SMT from a minimum of 11.5V to a maximum of 22.5V.

2. With 400SS, 400SM from range minimum to 30% of the power available in that range.

In all cases the background adjustment is independent of peak adjustment and corresponds to a maximum of 30% of the power range available for calibration with the peak adjustment knob.

b) In TIG mode, Background potentiometer is peak level dependent and can be calibrated from 0 to 100% of peak. For example; if background control is placed at 50% of the peak, it would always be at 50%, regardless of the value of the selected peak level.

### 3 > Pulses per Second (PPS)

Pulsing frequency is adjusted by PPS potentiometer.

### 4 > MIG/TIG Selector Switch

Pulses per second (frequency) selector switch is provided to select two frequency ranges:

#### TIG Mode:

From a minimum of .5 PPS to 25 PPS for Tig schedules



#### MIG Mode:

From 5 to 250 PPS for MIG pulsing.



### 5 > % Pulse Width

This control regulates percentage of time peak power is delivered during each pulsing cycle. And is adjustable from 0% to 100%. The 100% setting is equivalent to continuous power or not pulsing.

## NOTE

All of the above controls can be adjusted while welding.

### 6 > Pulser ON/OFF (Toggle Switch)

This switch turns the pulser ON or OFF. In ON position the pulser's output manipulates the weld level as requested by the adjustments of peak, background, frequency and pulse width. In the OFF position pulsing stops. For either position peak/weld power control origin will be determined by LOCAL/REMOTE switch.

### 7 > Local/Remote Switch

This switch governs the source of the pulse/weld power. In the LOCAL mode, pulse power is determined by the setting on the Weld Power dial of the pulser. In the REMOTE mode the pulse/weld power is determined by a remote control device.

### 8 > Wire Feed Speed

a) In LOCAL mode the Wire Feed Speed will control speed of the wire with PD10, PD20 and PD30 wire feeders and will do the same on other wire feeders equipped with remote wire feed speed options.

b) In REMOTE mode wire speed, in addition to peak/weld power, is controlled from a remote accessory such as RH110, RH110D or RC120S.

# INSTALLATION

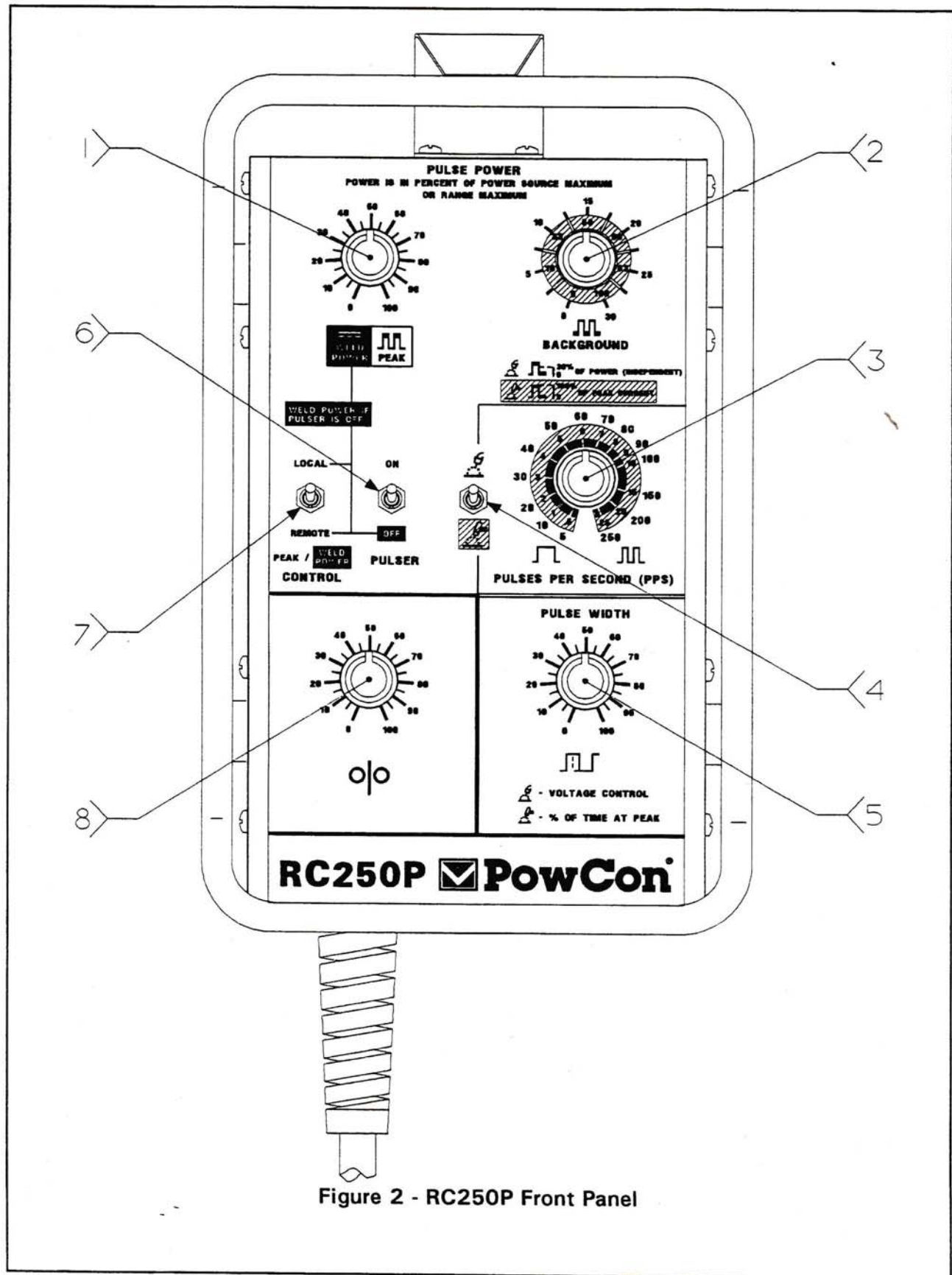


Figure 2 - RC250P Front Panel



# PARTS LIST

PARTS LIST

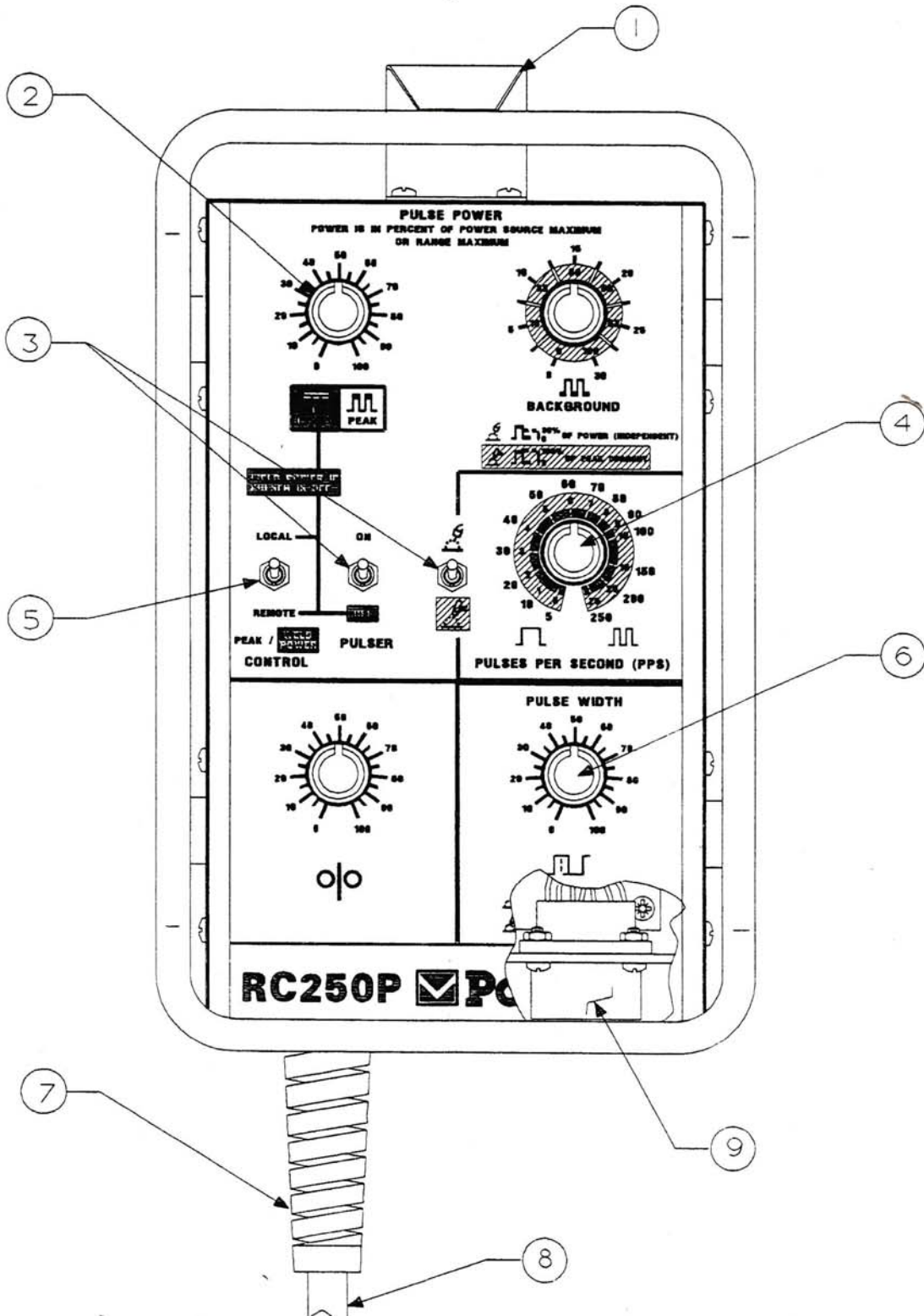


Figure 3 - RC250P Front Panel

# PARTS LIST

Item	Qty	Part Number	Description	Ref.
1	1	121218-001	Hook, Hand Control	
2	5	940024-001	Knob, SM, skirt/lt gray pointer	
3	2	920004-007	Switch, DPDT toggle-on-none-on	S1, 2
4	1	903000-004	Pot, 500K SGL Turn S-shaft 10%	R3
5	1	920004-005	Switch, 4PDT toggle-on-none-on	S3
6	4	903000-005	Pot, 10K SGL turn S-shaft 10%	R1, 2, 4, 5
7	1	940015-005	Strain relief - 13	
8	1	121217-001	Assy, CBL, pigtail - RC250P Pulser	
9	1	121216-002	Assy, Conn. Remote - RC250P Pulser	J1

# SCHEMATIC

SCHEMATIC

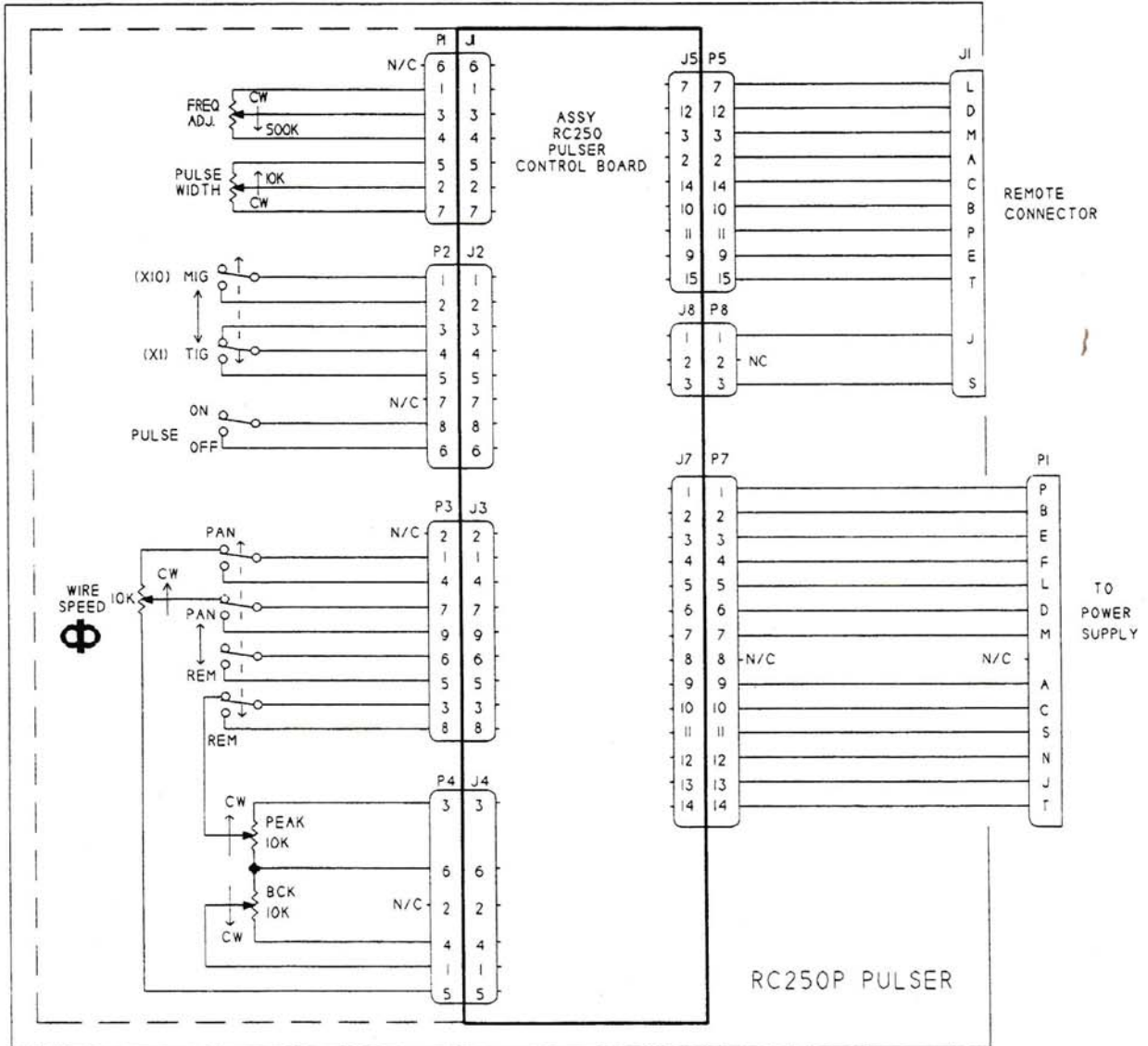


Figure 4 - RC250P Schematic





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COMMENTS:

