

CYPRESS WELDING EQUIPMENT

A Subsidiary of Weld Tooling Corporation
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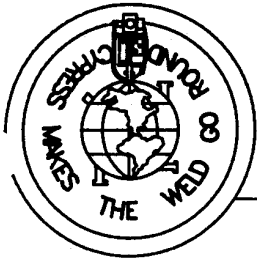
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SE-4P PROGRAMMABLE CUTTER

PRELIMINARY INSTRUCTIONS AND PARTS MANUAL

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SE-4P PROGRAMMABLE SADDLE AND ELBOW CUTTER

DESCRIPTION OF THE SE-4P:

The SE-4P is a machine that automates the end preparation of pipes for fabrication. It rotates a pipe held in its 3 jaw chuck while driving a cutting torch back and forth along the pipe axis, so that the torch traces a path that is the intersection of the pipe with another pipe of larger diameter.

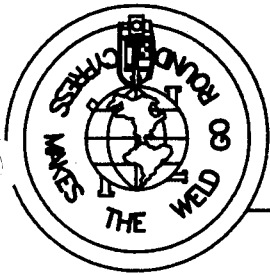
Configuration:

1. The machine is designed to sit on a work table.
2. The machine can be used with oxy-fuel torches or plasma.
3. If the machine is set up for oxy-fuel cutting, the 3-hose cutting torch is connected to the solenoid manifold located on the left hand side of the machine. Input power for oxy-fuel is 115 VAC.
4. If the machine is set up for plasma, it will be equipped with rotary ground, plasma torch, leads, and power source. Method of plasma cutting will be air plasma. Power requirements are 220 VAC single phase and a clean air supply, for the plasma source, and 115 VAC from a separate line to the SE-4P.
5. Panel controls include Start, Stop, and Reset push buttons, joystick for manual positioning, and speed control knob, all explained under panel controls. All programming is done with a hand held terminal, with keypad and display.

SET-UP

Place the SE-4P machine on a work-table, preferably bolting it down through its mounting holes. Plug the power cord into the power line. The torch arm should be already inserted into the machine. If it is not, then throw the power switch on, and carefully insert the slide into the wheels inside the linear drive (on top of the SE-4P) from the chuck end. Slide the arm in until the rack teeth touch the drive gear, then using the manual joystick control drive the arm back into the machine. Push the reset button so the machine holds it's position.

CON'T ON PAGE TWO



SE-4P PROGRAMMABLE SADDLE AND ELBOW CUTTER

Insert the cutting torch in the torch-holder; loosen the clamp holding the torch-holder and adjust its position so that the torch is centered in line with the chuck axis; then clamp it in place.

For Oxy-fuel cutting, use a 3-hose torch and run the hose to the quick-action manifold with solenoid; the solenoid controls the cutting oxygen.

For Plasma, mount the relay contact box on the machine and plug it into the contact output. Wire the trigger leads for the plasma machine to the supplied connector and plug into the relay box.

PROGRAMMING:

For programming, the following keys on the keypad are used:

Push A: To select type of cut and enter dimensions

B: To enter time delay for plasma cutting

C: To change Cut No. in memory (Nos. 0 to 99)

D: To display type and dimensions of cut

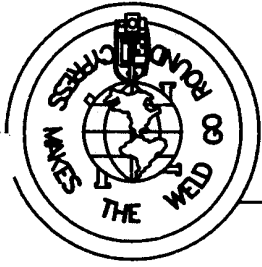
To program a cut, select one of four types as follows:

TYPE 1: Saddle cut on centerline

TYPE 2: Saddle cut offset (hillside)

TYPE 3: Lateral, offset or on centerline
(for centerline, put offset =0)

TYPE 4: Miter



SE-4P PROGRAMMABLE SADDLE AND ELBOW CUTTER

DATA ENTRY:

When entering data on the keypad, multiply inches, degrees, or seconds by 100 and enter the number without a decimal point. For example, 350 for 3.5 inches, 1500 for 15°. Press the Return button when number is entered.

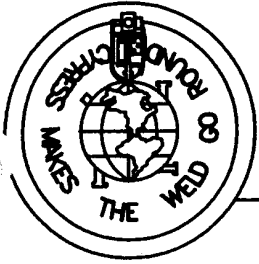
DATA REQUIRED:

- TYPE 1: Requires
1. Small diameter (pipe being cut)
 2. Large diameter (pipe it fits on)
- TYPE 2: Requires
1. Small diameter
 2. Large diameter
 3. Offset distance between centerlines.
- TYPE 3: Requires
1. Small diameter
 2. Large diameter
 3. Offset
 4. Angle between pipes
- TYPE 4: Requires
1. Small diameter
 2. Cutback distance
 3. Angle of miter cut.

For plasma cutting a value for time delay is also required to allow for the delay in striking the arc. Commonly used delay is 3 seconds (enter 300 on terminal) .

When entering diameters, use the diameters of the surfaces along whose intersection the cut has to be made. Usually they will be the inside diameter of the pipe being cut, and the outside diameter of the pipe it fits on. This will also allow for any bevel if necessary.

In TYPE 4, cutback refers to the distance on centerline when making 2 cuts opposed to each other, for the middle piece of an elbow. If only one cut is to be made, enter 0 or just Return for cutback.



SE-4P PROGRAMMABLE SADDLE AND ELBOW CUTTER

NOTE: If the red stop button is pushed, the machine will be in the pause mode, and cannot be programmed. Push the reset button to get back to ready mode for programming.

OPERATION:

TO MAKE A CUT:

- 1: Set up the machine with pipe in position and power up.
2. Program the desired cut.
3. Push red stop button and use joystick to manually move to starting point.
4. Push reset button to fix starting point here.
5. For oxy-fuel, turn on and ignite pre-heat gases and wait till hot enough for starting cut.

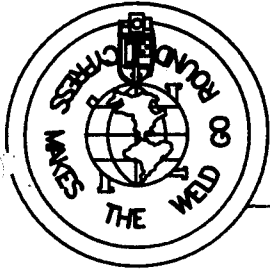
NOTE: TYPE 4, MITER.

If a cut-back dimension has been entered, the machine will make one cut, shut off the gas or arc, back up for the given distance, and rotate the pipe 180°. The machine will pause here until the start button is pressed again, and then repeat the same cut but rotated 180° from the first.

To make a dry run without cutting:

1. Push stop and hold down
2. Push start and hold down
3. Release stop (quickly, after 2. above)
4. Release start

The machine will move along the programmed cut without turning on the contacts for plasma, or the cutting solenoid.



SE-4P PROGRAMMABLE SADDLE AND ELBOW CUTTER

PANEL CONTROLS:

START BUTTON: (Black push-button)

Push to start cutting or resume cut after pause. If the torch has been manually positioned off the cut path, the machine will move it towards the cut and swing into the cut line when reached.

STOP: (Red push-button)

Computer control is interrupted when pushed until start button or reset button is pushed.

If pushed while running, the torch is shut off and machine stopped. Pushing start will resume cut.

When pushed, the machine can be manually positioned by the joystick switch; this does not change the home reference position unless the reset button is then pushed.

RESET (Small push-button.)

Resets the computer when pushed and makes whatever position the machine is in the home reference position.

If the torch or pipe is moved by the joystick, on releasing it the machine will return to home position.

SPEED KNOB:

Controls the tangential speed of the torch along the cut, from 0 to maximum. The speed will depend on the diameter of the pipe. When the torch arm is moving in or out the rotational speed will slow down to keep the resultant speed constant.

SE-4P PASS THROUGH

PROGRAMMABLE SADDLE AND ELBOW CUTTER

TECHICAL DATA:

CUTTING DIAMETER:

PASS THROUGH 4" TO 12 1/2" O.D. (100MM TO 317MM)

ROTATION SPEED:

MIN: .0.2 RPM

MAX: 2 RPM

DIMENSIONS: 52 1/2" L X 24 1/4" W X 33" H
(1333 X 616 X 838 MM)

TYPE OF CUTS:

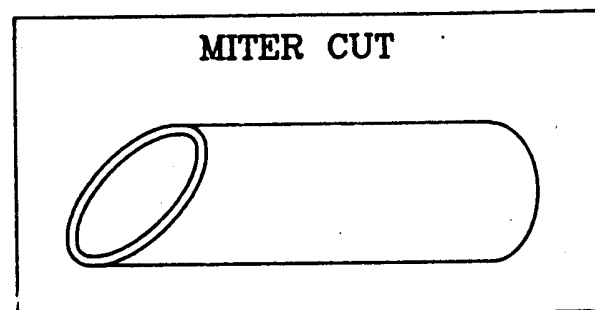
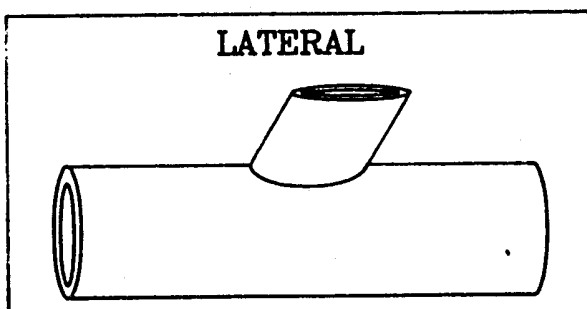
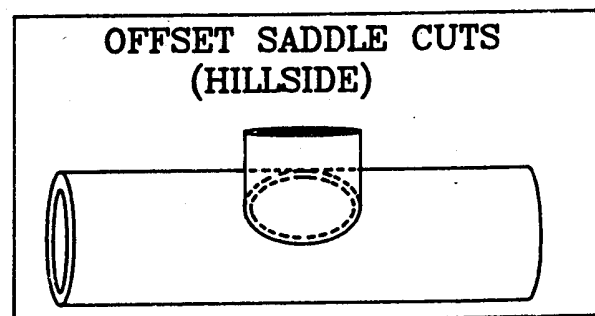
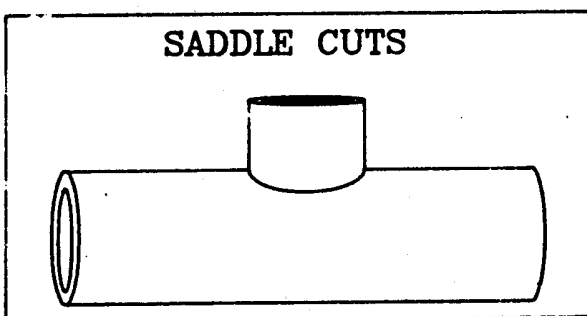
1. SADDLE CUTS
2. OFFSET (HILLSIDE)
3. LATERALS
4. MITER CUTS, SINGLE CUT OR 3 PIECE ELBOW

INPUT POWER 120/50-60/1 OR 240/50-60/1

NET WT. 705 LBS (320KG)

SHIPPING WT. 825 LBS (374 KG)

The Machine is designed to sit on a work table. Method of cutting can be oxy-fuel or plasma. If oxy-fuel is used, the machine will be equipped with solenoids and a three-hose cutting torch. When plasma is used, a rotary ground is installed on the machine. The machine can be delivered with plasma torch leads and power source, or the customer may provide his own plasma equipment.



DESCRIPTION:

THE MACHINE HAS 10 STORAGE AREAS IN MEMORY FOR DIFFERENT PROGRAMMED SHAPES, NUMBERED 0 TO 9. AT ANY TIME, ONE OF THESE SHAPE NUMBERS IS THE CURRENT ONE, AND WILL STAY CURRENT EVEN WHEN POWER IS SHUT OFF AND TURNED BACK ON, UNTIL THE SHAPE NUMBER IS CHANGED BY THE OPERATOR.

ALL PROGRAMMING IS DONE WITH THE HAND-HELD TERMINAL PROVIDED; THIS MAY BE PLUGGED INTO THE CONNECTOR ON THE REAR OF THE MACHINE OR UNPLUGGED AT ANY TIME. THE TERMINAL IS NOT NEEDED TO RUN THE MACHINE ONCE PROGRAMMED.

SHAPES ARE BUILT UP ONLY FROM THE SEGMENTS PROVIDED: CIRCULAR ARCS AND STRAIGHT LINES, SQUARE OR INCLINED, BY SELECTING TYPE AND QUADRANT FOR EACH SEGMENT. A SHAPE CAN HAVE UP TO 50 SEGMENTS. SOME OTHER OPERATIONS, LIKE SOLENOID ON/OFF, TIME DELAY, OR REPEAT ANOTHER SHAPE A NUMBER OF TIMES, ALSO COUNT AS ONE SEGMENT EACH IF USED.

IN NORMAL OPERATION, FIRST POSITION THE MACHINE AT THE STARTING POINT. NEXT TURN ON THE PREHEAT GASES, AND WAIT UNTIL THE REQUIRED PREHEAT IS REACHED. PUSH THE RUN BUTTON; THE MACHINE WILL TURN ON THE CUTTING OXYGEN AND START CUTTING THE CURRENT SHAPE. AT THE END OF THE SHAPE THE MACHINE WILL TURN OFF THE CUTTING OXYGEN AND STOP. MANUALLY TURN OFF THE PREHEAT GASES. (WHEN WELDING OR PLASMA CUTTING, AN EXTERNAL CONTACT RELAY IS USED INSTEAD OF THE CUTTING OXYGEN SOLENOID.)

OPERATION:

WHEN FIRST PLUGGED IN, THE POSITION THE MACHINE IS IN BECOMES THE REFERENCE START POSITION. NOW THERE ARE 3 OPTIONS (THE PENDANT TERMINAL IS NOT NEEDED FOR THE FIRST TWO):

1. MOVE

TO CHANGE THE START POSITION, PUSH THE HOLD BUTTON, MOVE THE MACHINE MANUALLY TO THE REQUIRED POSITION USING THE TOGGLE SWITCHES. AND PUSH THE RESET BUTTON.

2. RUN

PUSH THE RUN BUTTON TO CUT A SHAPE.

3. PROGRAM (ENTRY OR CHANGE)

THE PROGRAMMING OPERATION IS SELECTED BY PRESSING KEYS A,B,C,D,1

A: ALL SEGMENTS; DATA ENTRY FOR NEW SHAPE CONSISTS OF TOTAL NUMBER OF SEGMENTS

DATA FOR EACH: TYPE (ARC, X/Y LINE OF SLOPE)

QUADRANT 1-4

SIZE (RADIUS, OR X/Y DIMENSION)

SEE SHAPE PROGRAMMING FOR DETAILS.

CON'T TWO

FOR EXAMPLE, A 2 INCH DIAMETER CIRCLE COULD BE 4 SEGMENTS:

- | | | | | |
|----|---------|-----------------------|-------------|---------------|
| 1. | 2,1,100 | COUNTERCLOCKWISE ARC, | QUADRANT 1, | 1.00 INCH RAD |
| 2. | 2,2,100 | " " | QUADRANT 2, | " " |
| 3. | 2,3,100 | " " | QUADRANT 3, | " " |
| 4. | 2,4,100 | " " | QUADRANT 4, | " " |

THE DATA SHOULD BE TABULATED ON PAPER FROM A DIAGRAM BEFORE ENTERING.

B: PROGRAM SEGMENT.

PRESS B ON TERMINAL TO RE-PROGRAM A SINGLE SEGMENT. THIS IS USEFUL IF THERE IS AN ERROR IN DATA FOR JUST ONE SEGMENT, SO THE WHOLE SHAPE DOES NOT HAVE TO BE RE-TURNED.

C: CHANGE SHAPE NUMBER

PRESS C ON TERMINAL TO CHANGE THE CURRENT SHAPE NUMBER. THE PROGRAM SWITCHES TO THE NEW NUMBER IN MEMORY, AND TO WHATEVER SHAPE IS STORED THERE.

D: DISPLAY SHAPE DATA:

PRESS D TO DISPLAY THE DATA FOR THE CURRENT SHAPE. THE TERMINAL DISPLAY SHOWS TOTAL NO. OF SEGMENTS, AND DATA FOR EACH SEGMENT ON BY ONE EACH TIME YOU PRESS ENTER.

E: END OF SEGMENT SLOWDOWN:

PRESS E TO SET DECELERATION VALUE FOR THE SHAPE, WHEN THE MACHINE APPROACHES THE END OF EACH SEGMENT. THIS IS USEFUL, WHEN THE SHAPE HAS SHARP CORNERS, TO PREVENT OVERSHOOT. 99 IS MAXIMUM SLOWDOWN, 0 IS NO SLOWDOWN.

IMPORTANT:

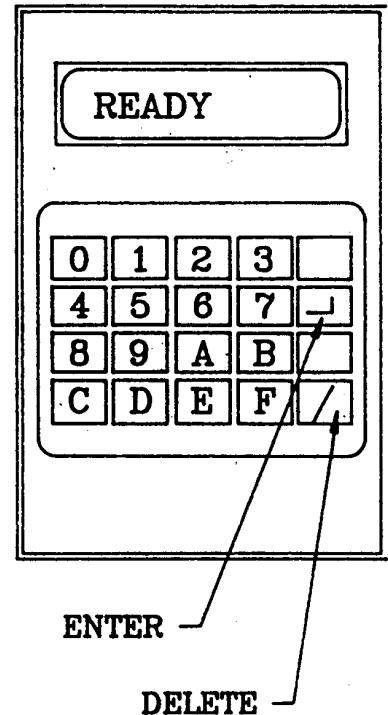
1. ONCE THE HOLD BUTTON IS PRESSED, COMPUTER CONTROL IS HALTED UNTIL THE RUN OR THE RESET BUTTON IS PRESSED. THEREFORE THE PROGRAMMING CANNOT BE DONE WITH THE HANDHELD TERMINAL IN THIS STATE; THE RESET BUTTON SHOULD BE PRESSED FIRST.

2. AFTER PUSHING "A" AND PROGRAMMING A NEW A NEW SHAPE, END OF SEGMENT SLOWDOWN WILL STILL HAVE THE OLD VALUE UNLESS REPROGRAMMED. TO SET NEW VALUE, PUSH "E".

SE-4P PROGRAMMABLE SADDLE, ELBOW, AND SHAPE CUTTERS.

HAND HELD TERMINAL

1. PRESS THE RESET BUTTON ON THE MACHINE.
THE HANDHELD TERMINAL WILL DISPLAY "READY"
2. PRESS "A" ON THE TERMINAL. THE TERMINAL WILL ASK YOU WHAT TYPE OF CUT YOU WANT.
3. PRESS THE NUMBER DESIRED AND THEN PRESS "ENTER".
4. THE TERMINAL WILL ASK FOR THE DIAMETER OF THE SMALL PIPE. PRESS THE APPROPRIATE DIMENSIONS AND PRESS "ENTER".
5. THE TERMINAL WILL ASK FOR THE DIAMETER OF THE LARGE PIPE. PRESS THE APPROPRIATE DIMENSIONS AND PRESS "ENTER".
6. ENTER THE OFFSET DIMENSION. (IF REQUIRED)
7. ENTER THE "ANGLE" IN DEGREES. (IF REQUIRED)
8. PRESS "START" ON THE MACHINE TO BEGIN THE CUT. IT COULDN'T BE EASIER!



PROGRAMMING ARBITRARY SHAPES

THIS MACHINE HAS AN ADDITIONAL PROGRAM THAT CAN BE SELECTED, FOR CUTTING PATTERNS OR SHAPES ON THE PIPE. PROGRAMMING IS SIMPLE BUT MAY TAKE A FEW MORE STEPS.

FIRST THE DEVELOPED PATTERN SHOULD BE LAID OUT AS IF THE PIPE IS UNROLLED FLAT. THE CUT IS THEN SPLIT INTO A SEQUENCE OF STRAIGHT LINES OR CIRCULAR ARC MOVES THAT MAKE UP THE DESIRED PATTERN.

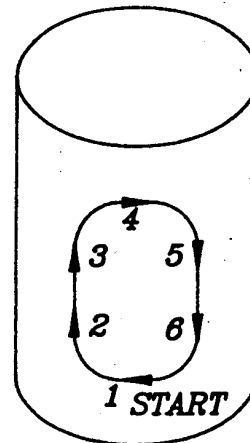
NEXT THESE SHOULD BE LISTED IN A TABLE

ON PAPER, WITH THE TYPE QUADRANT AND REQUIRED DIMENSIONS (REFERRING TO THE CHART IN THE INSTRUCTION MANUAL). FOR EXAMPLE TO CUT A SLOT LIKE THE ONE IN THE DIAGRAM THE SHAPE WOULD CONSIST OF THE SIX SEGMENTS SHOWN. THE FIRST SEGMENT IS A CLOCKWISE 90° ARC WHICH IS TYPE 1, IN QUADRANT 3, AND THE REQUIRED DIMENSION IS THE RADIUS.

TO PROGRAM THE SHAPE PRESS "A" THEN ENTER THE TOTAL SEGMENTS AT THE PROMPT.

NEXT THE DATA FOR EACH SEGMENT TYPE QUADRANT AND DIMENSIONS ARE ENTERED IN TURN AT THE PROMPT.

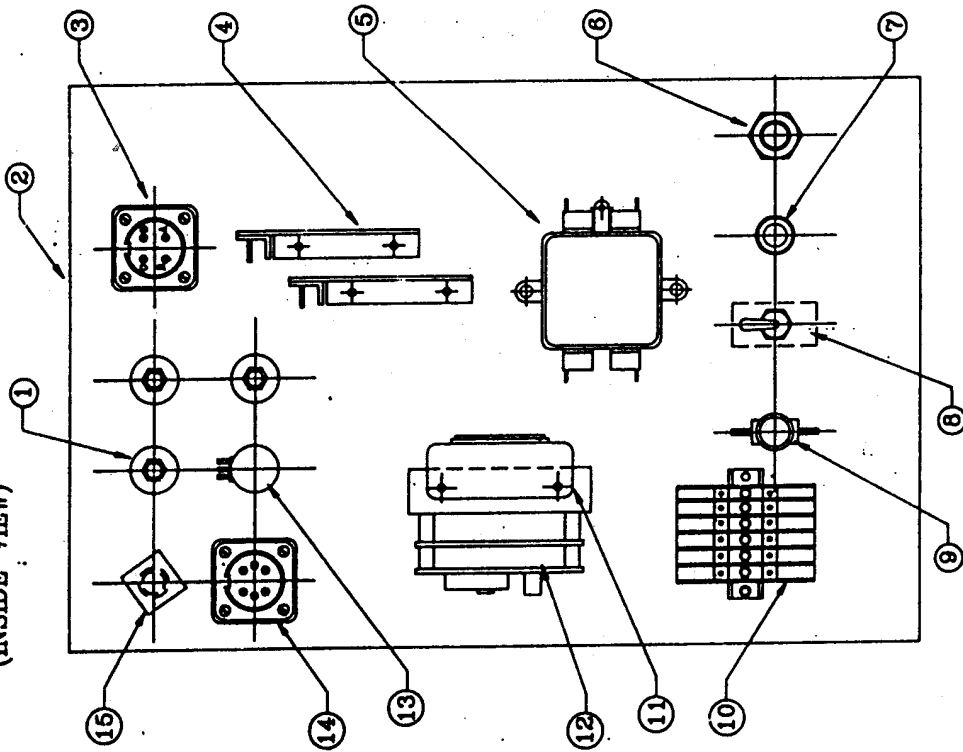
FINALLY AN END OF SEGMENT SLOWDOWN VALUE IS ENTERED AND THE MACHINE IS READY TO CUT.



SEO-4110 CONTROL PANEL 120V (INSIDE VIEW)

BILL OF MATERIAL

ITEM	NUMBER	DESCRIPTION
1	BUG-1536	PUSHBUTTON SWITCH
2	SEO-4111	PANEL
3	MUG-1156	SOCKET CONNECTOR
4	BUG-1770	MOTOR CONTROL BOARD
5	BUG-6031	FILTER
6	BUG-9445	POWER CORD
7	BUG-9446	CORD GRIP
8	BUG-1416	PILOT LIGHT
9	ARM-2279	TOGGLE SWITCH
10	BUG-2923	CIRCUIT BREAKER .7A
11	BUG-2924	RESET BUTTON SEAL
12	BUG-6028	TERMINAL BLOCK
13	BUG-5218	TRANSFORMER 117V 50/60 HZ
14	BUG-1393	VOLT TRAP (NOT SHOWN)
15	BUG-6030	CONTROL MODULE
16	BUG-9686	POTENTIOMETER CONTROL
17	BUG-9902	AMPHENOL
18	PRS-1065	JOYSTICK

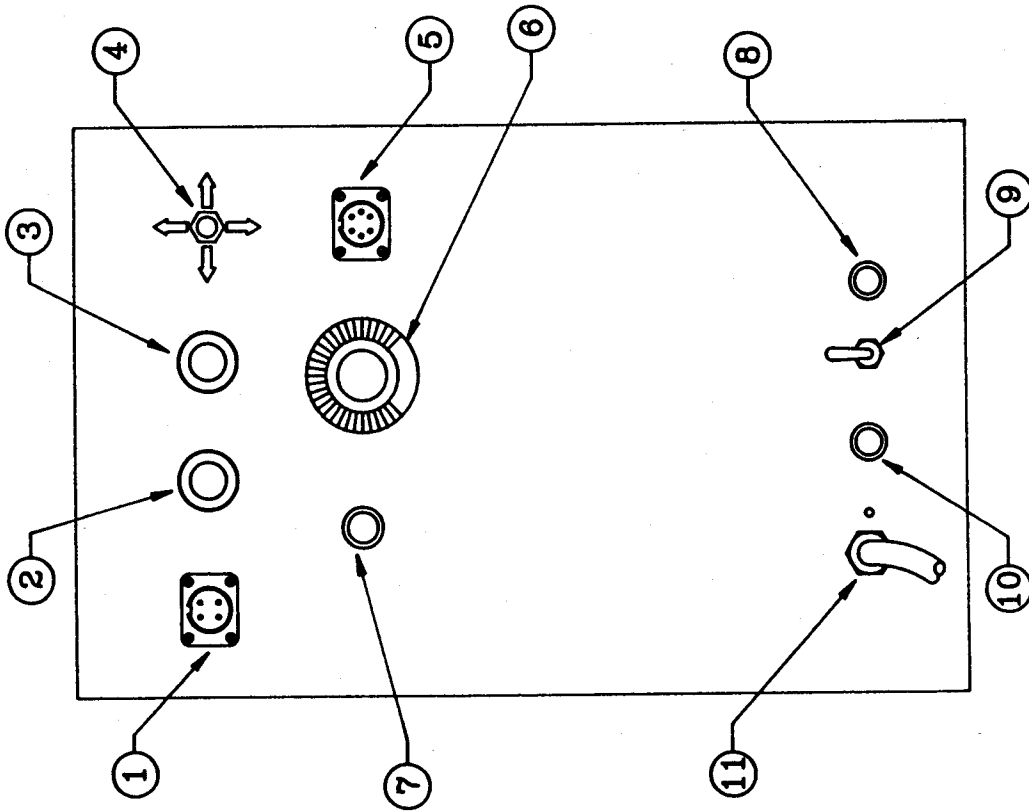


KEY	DESCRIPTION	DATE	BY

CYPRESS WELDING EQUIPMENT A DIVISION OF WELD TOOLING	
SCALE NONE	DRAWN BY J.BECK
NAME CONTROL PANEL 120V (INSIDE VIEW)	NUMBER SEO-4110

ALL DIMENSIONS IN INCHES
UNLESS OTHERWISE NOTED.

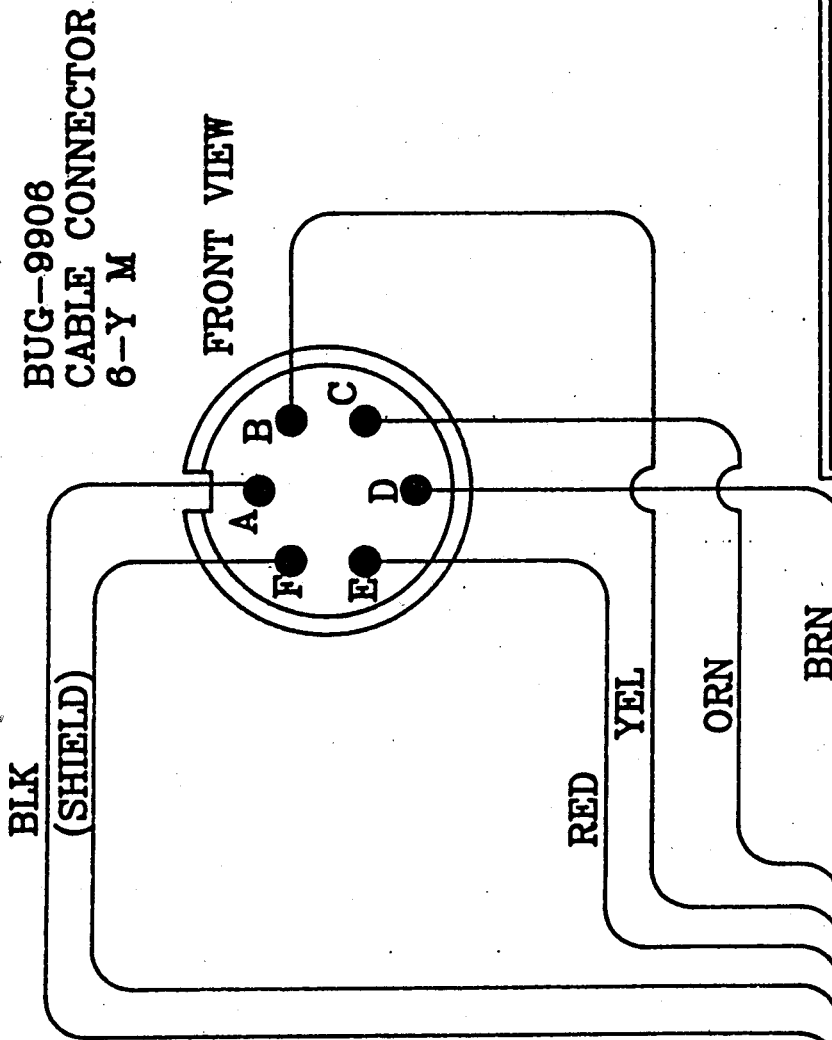
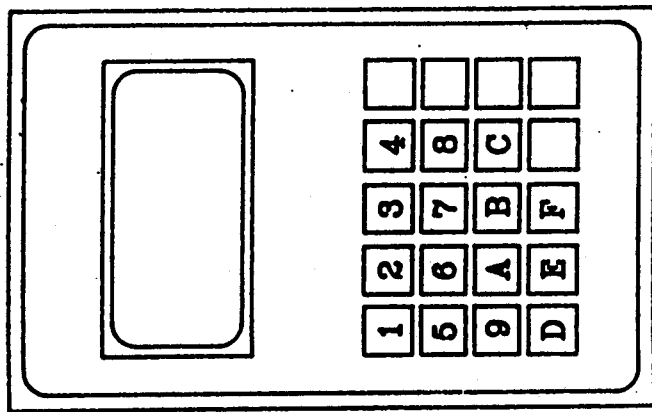
FRACTIONAL DIMENSIONS $\pm 1/64$
DECIMAL DIMENSIONS $\pm .005$



ITEM	DESCRIPTION	NUMBER
1	SOCKET CONNECTOR	MUG-1156
2	START	BUG-1536
3	STOP	BUG-1536
4	MANUAL JOG	PRS-1065
5	PENDANT	BUG-9902
6	SPEED CONTROL KNOB	BUG-9686
7	RESTART	BUG-1536
8	CIRCUIT BREAKER	BUG-2923
9	POWER ON/OFF	ARM-2279
10	POWER INDICATOR LIGHT	BUG-1415
11	POWER CORD	BUG-9445

CYPRESS WELDING EQUIPMENT		DATE	DRAWN BY	CHECKED
A DIVISION OF WELD TOOLING		6-14-83	J. BECK	
TOLERANCES UNLESS NOTED		NAME	SE-4P CONTROL PANEL	
SCALE: _____		No. CONTROL		
REV	DESCRIPTION	DATE	BY	

**BUG-6050
HAND HELD TERMINAL**



**BUG-9906
CABLE CONNECTOR
6-Y M**

FRONT VIEW

- A - BLACK CIRCUIT COM.
- B - YELLOW TX (TRANSMIT)
- C - ORANGE RX (RECEIVE) 9600 BAUD
- D - BROWN SIGNAL GROUND
- E - RED POWER (5 V)
- F - SHIELD DRAIN WIRE BARE, TOUCHING FOIL SHIELDING

NOTE: OTHER WIRES SHOULD BE TRIMMED AND UNABLE TO TOUCH TERMINAL PINS.

CYPRESS WELDING EQUIPMENT
A DIVISION OF WELD TOOLING

DATE 6-11-88 DRAWN BY CHECK

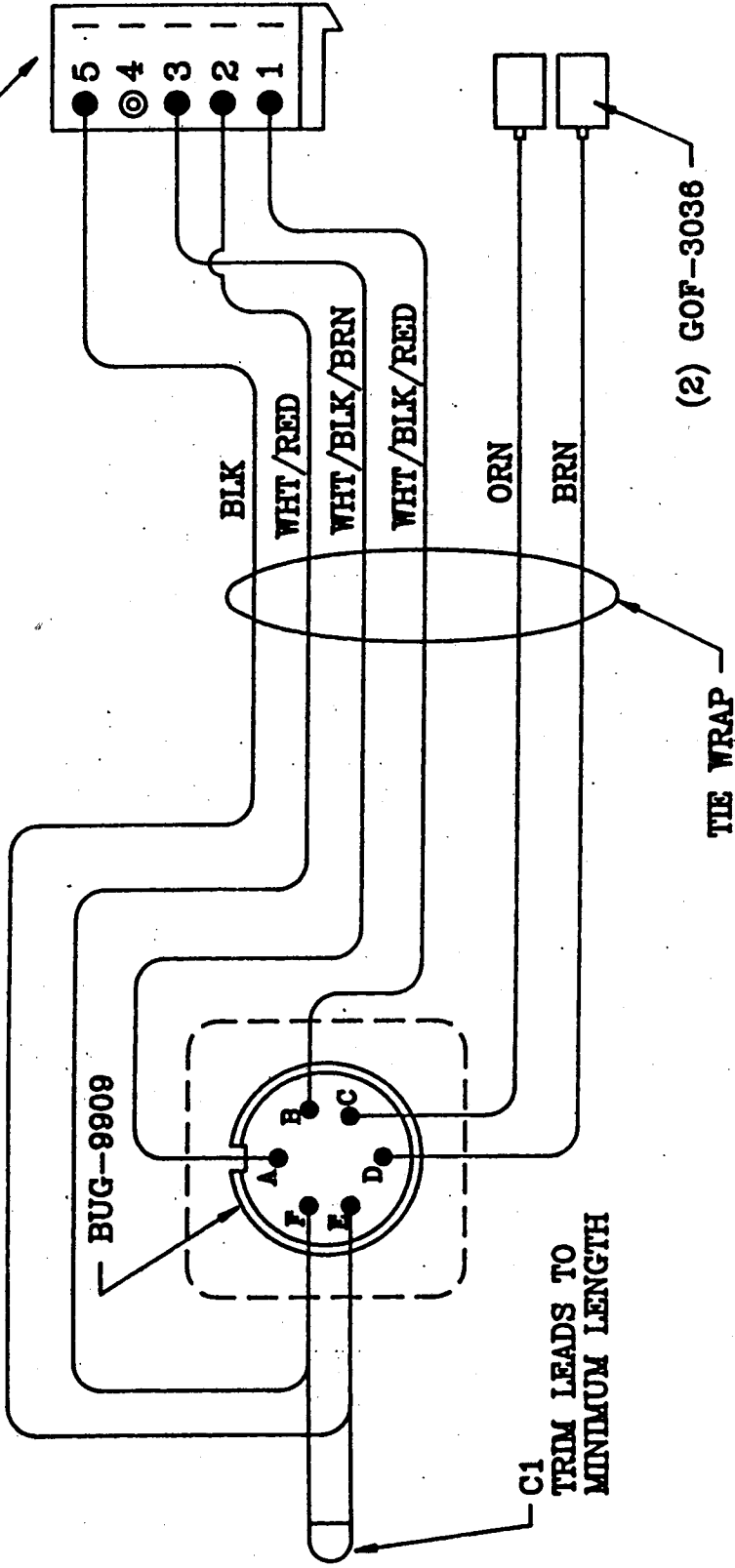
SCALE: +1/64
+0.05

NAME PENDANT CABLE WIRING DIAGRAM

No. BUG-6050-WD

REV	DESCRIPTION	DATE	BY

CNN-0125



PART NO.	DESCRIPTION
BUG-9909	AMPHENOL, MALE 6-PIN
C1	CAP 1.0 CERAMIC (CK08BK105K)
CNN-0125	CONNECTOR
GOF-3036	FEMALE CONNECTOR

REV	DESCRIPTION	DATE	BY

CYPRESS WELDING EQUIPMENT	DATE	DRAWN BY	CHECKED
A DIVISION OF WELD TOOLING	8-11-68	J. BECK	
SCALE: _____	TOLERANCES UNLESS NOTED	NAME	WIRING HARNESS
+1/64	+0.005		
			No. BUG-5607

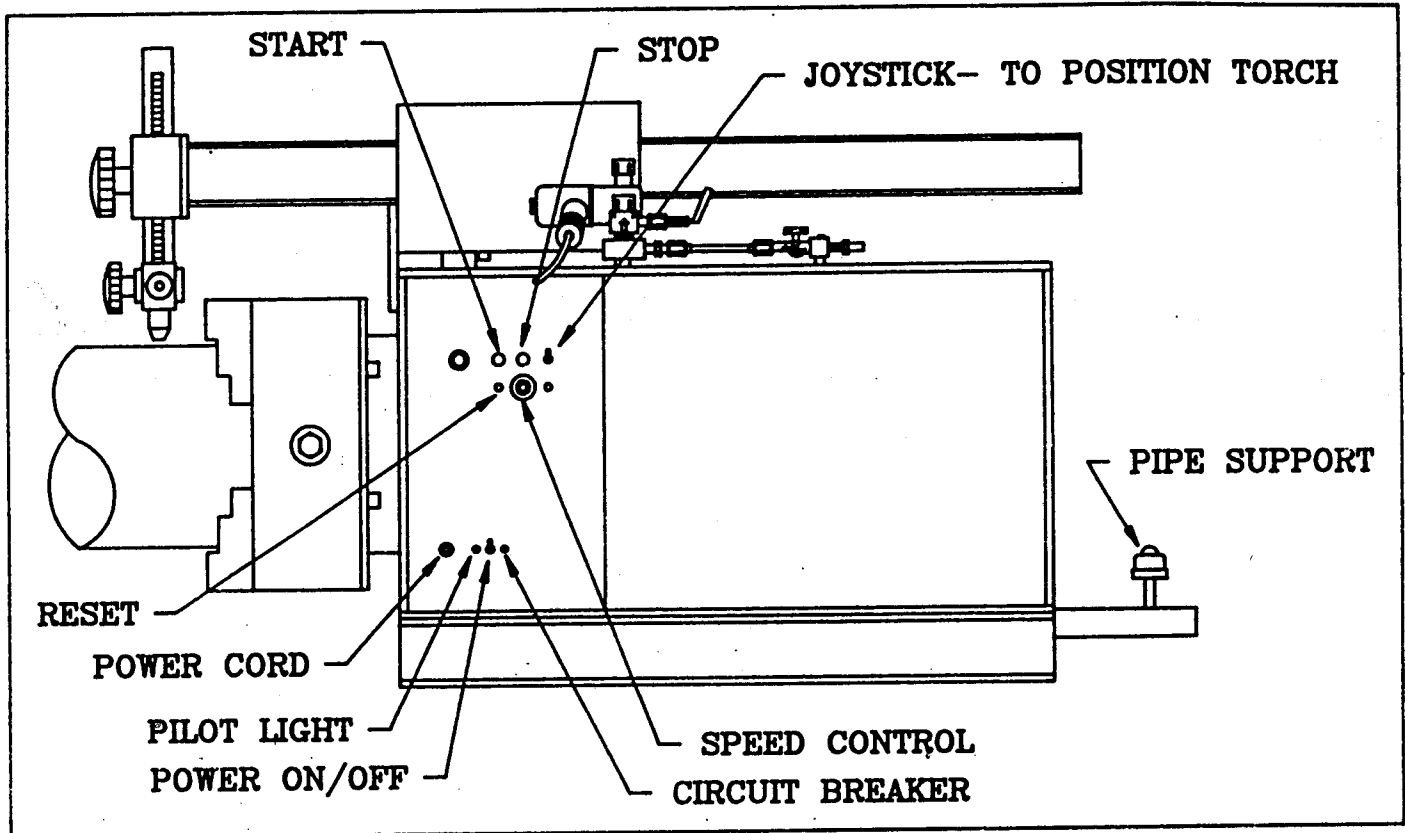


SE-4P PROGRAMMABLE SADDLE AND ELBOW CUTTER

INSTRUCTIONS AND PARTS LIST FOR SE-4PT

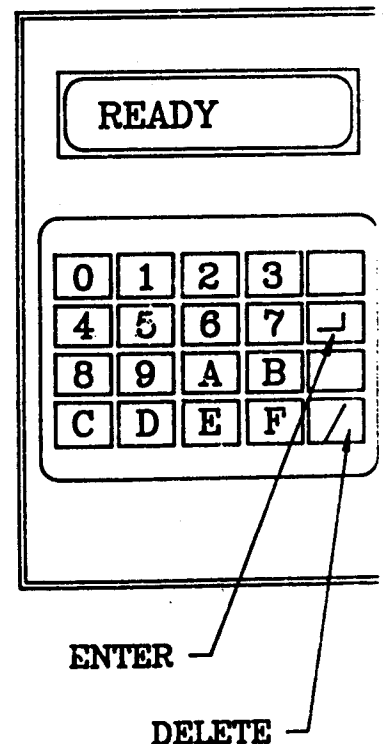
SE-4P PASS THROUGH

PROGRAMMABLE SADDLE AND ELBOW CUTTER



HAND HELD TERMINAL

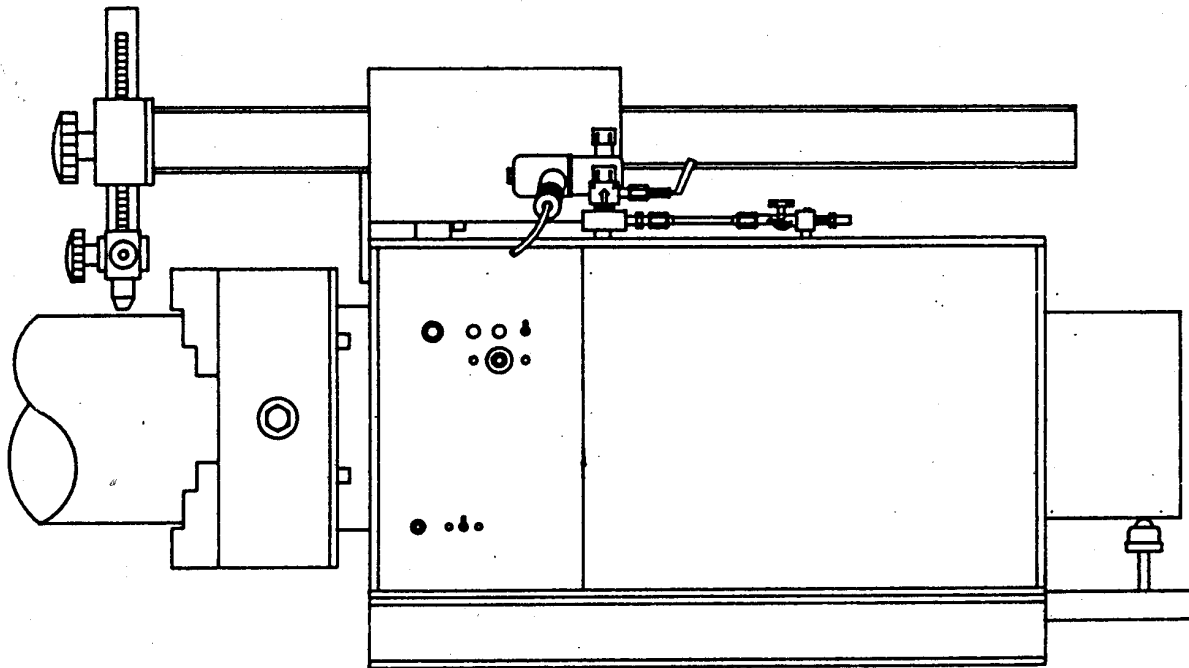
1. PRESS THE RESET BUTTON ON THE MACHINE.
THE HANDHELD TERMINAL WILL DISPLAY "READY"
2. PRESS "A" ON THE TERMINAL. THE TERMINAL WILL ASK YOU WHAT TYPE OF CUT YOU WANT.
3. PRESS THE NUMBER DESIRED AND THEN PRESS "ENTER".
4. THE TERMINAL WILL ASK FOR THE DIAMETER OF THE SMALL PIPE. PRESS THE APPROPRIATE DIMENSIONS AND PRESS "ENTER".
5. THE TERMINAL WILL ASK FOR THE DIAMETER OF THE LARGE PIPE. PRESS THE APPROPRIATE DIMENSIONS AND PRESS "ENTER".
6. ENTER THE OFFSET DIMENSION. (IF REQUIRED)
7. ENTER THE "ANGLE" IN DEGRESS.(IF REQUIRED)
8. PRESS "START" ON THE MACHINE TO BEGIN THE CUT. IT COULDN'T BE EASIER!



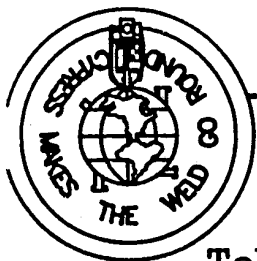
Now you can make saddle cuts, offset cuts, laterals, and miters quickly, easily and economically.

SE-4P PASS THROUGH

PROGRAMMABLE SADDLE AND ELBOW CUTTER



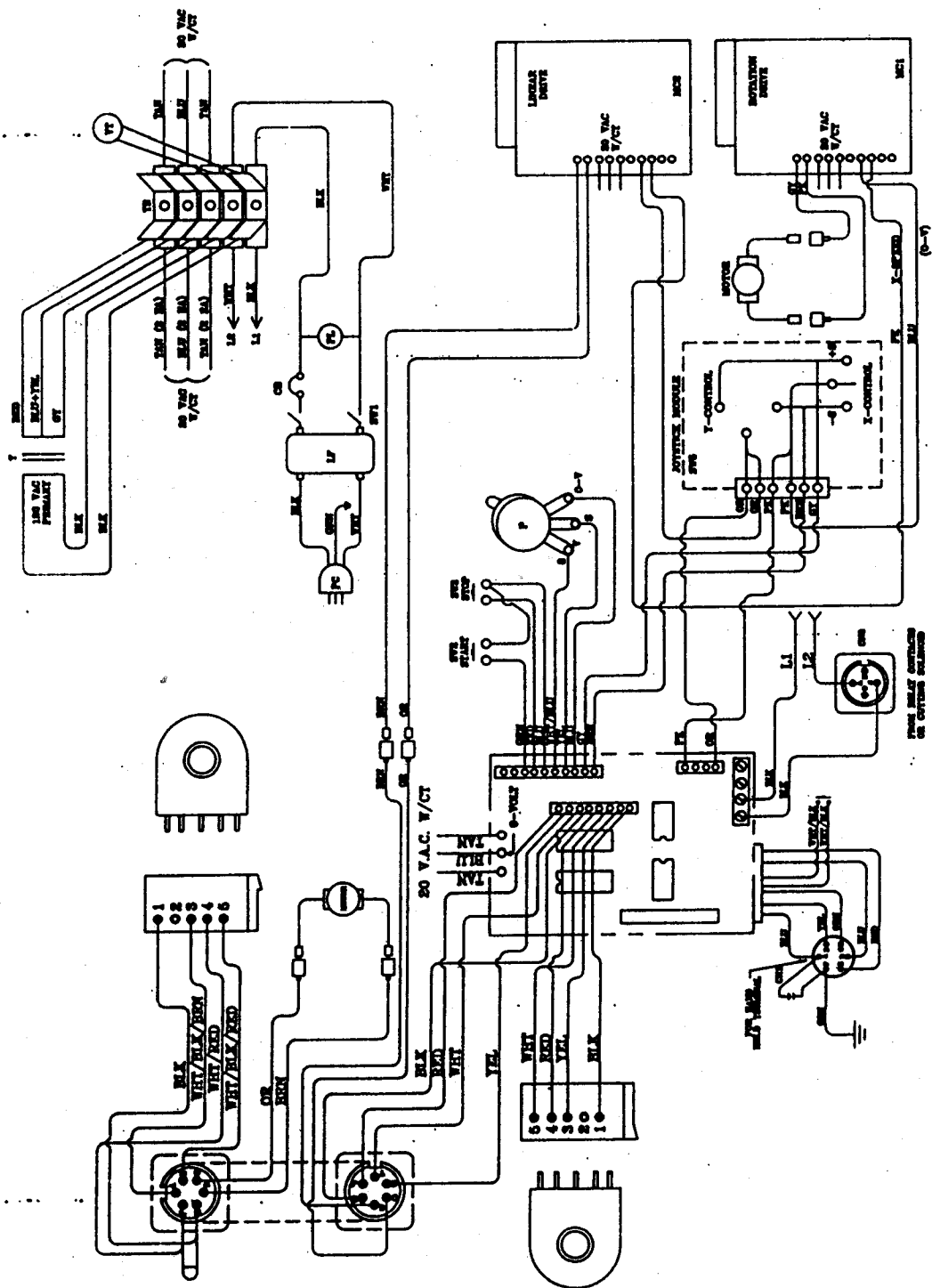
The new programmable saddle and elbow cutter is a computer controlled machine that automates the end preparation of pipes for fabrication. It allows the pipe to pass through the machine. Full lengths of pipe or tubing from 4" (100mm) to 12 1/2" (317mm). The machine rotates the pipe in a three jaw chuck while driving a cutting torch back and forth along the pipe's axis. The cutting torch traces the path of intersection of the pipe with another of the same or larger diameter.



CYPRESS WELDING EQUIPMENT INC.

A SUBSIDIARY OF WELD TOOLING CORPORATION

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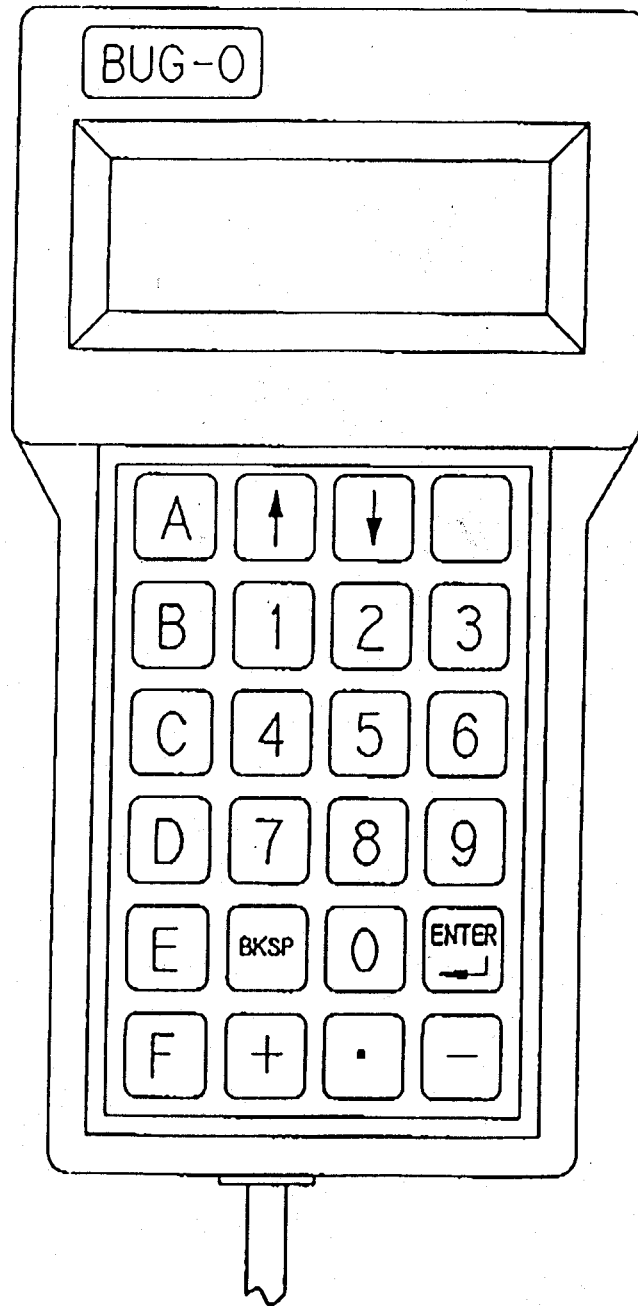


REV	DESCRIPTION	DATE	BY

CYPRUS WELDING EQUIPMENT A DIVISION OF WELD TOOLING	
SCALE NONE	DRAWN BY J. BECK
NAME SE-4P WIRING DIAGRAM	NUMBER SSE4P.WD

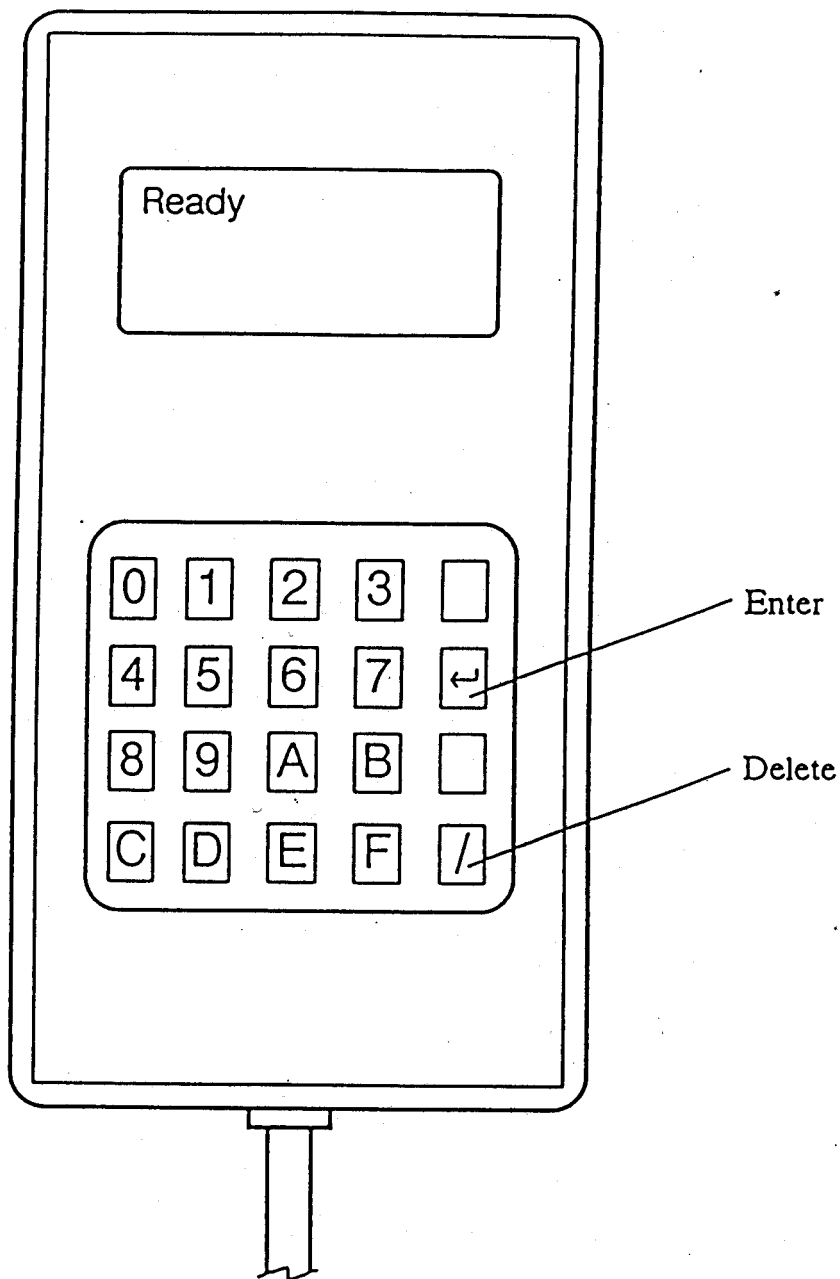
ALL DIMENSIONS IN INCHES
UNLESS OTHERWISE NOTED.
TOLERANCES UNLESS OTHERWISE NOTED
FRACTIONAL DIMENSIONS ± 1/64"
DECIMAL DIMENSIONS ± .005"

PROGRAMMING MODULE



This is a hand held terminal with keypad and display which plugs into the control panel. Press keys A, B, C, D, or E for the function desired, as described in the Programming Instructions on page 6. Use the digit keys to enter pipe diameters or other dimensions; push the Enter button to store the numeric value entered. The Backspace key removes the last digit before pushing the Enter button, in case a correction is required.

PROGRAMMING MODULE



This is a hand held terminal with keypad and display that plugs into the control panel. Press keys A, B C, or D for the function desired, described in Programming Instructions. Use the digit keys to enter pipe diameters or other dimensions; push the Enter button to store the numeric value entered. The Delete key deletes the last digit before pushing the Enter button, in case a correction is required.