

# FAST SPOTTER WT-FS-5.0



## Installation, Operating and Maintenance Manual

**WELDING TECHNOLOGIES**    [www.weldingnet.com](http://www.weldingnet.com)  
1365 Horseshoe Dr., Blue Bell, PA 19422  
Phone: 610-278-9325    Fax: 610-278-9325  
Toll Free Number: 1-888-383-WELD (9353)

## INDEX

	<b>Page #</b>
General Safety Warnings .....	3
Prevention Measures .....	4
Technical Data and Installation .....	5
PX1500P Plus Weld Controller .....	6
Description of Functions .....	8
Programming .....	9
Control Connections .....	10
DIP Switch setting .....	11
Wiring Diagram .....	12
Troubleshooting .....	13
Main Components .....	14

# GENERAL SAFETY WARNINGS








THE FAILURE TO OBSERVE THESE WARNINGS AND/OR ANY MODIFICATION OF OR TAMPERING WITH THE WELDING MACHINE WILL RELEASE **WELDING TECHNOLOGIES** FROM ANY LIABILITIES IN THE CASE OF ACCIDENTS TO PEOPLE OR DAMAGE TO THINGS AND/OR TO THE WELDING MACHINE ITSELF.

**Before turning the welding machine on, it is essential that the user knows how to carry out all the operations described in this manual.**

**The manual is an integral of the machine and must be kept until it is disposed of.**

## RESIDUAL RISKS

By residual risks we mean any hazard that could not be totally eliminated with the design or protection means and any potential hazard that is not evident.

	<p>There must not be excessive quantities of dust, acids, corrosive substances or gases etc., on the premises except those generated by the welding machine.</p> <p><b>We recommend keeping an extinguisher near the workstation.</b></p>
	<p>It must not be excessively humid on the premises. We recommend using an insulating platform, All maintenance jobs must be done on the machine only after having disconnected it from the electrical power.</p>
	<p>Mind your hands when working; always keep them well away from the electrodes and moving parts when welding.</p>
	<p>The strong magnetic field that the welding machine generates during welding can be dangerous for people wearing pacemakers. Watches and electronic devices in general, if placed near the welding machine, can be damaged.</p>
	<p>Only use the spot welder on a horizontal plane. If it slants more than 15° with respect to the floor it could tip over.</p>
	<p>An incorrect adjustment of welding pressure, an erroneous setting of parameters or malfunctioning of the pneumatic system can all cause squirts of melted material during -" welding.</p>
	<p>The electrodes may become very hot during welding. Do not touch them with your bare hands immediately after welding.</p>

## **PREVENTION MEASURES TO BE TAKEN BY THE USER**

- a) We recommend wearing safety glasses.
- b) The user must observe the safety instructions given on the welding machine.
- c) Personal protection gear must comply with and be certified by current standards.
- d) Signs must be placed in the vicinity of the machine relative to the risks that call for personal protection gear.

It is necessary that the user observe the accident prevention laws in force in his/her state.

The operator who has been specifically trained to use welding machines and welding equipment can use it.

Install a fume extractor unit if the material to be welded produces fumes.

The operator must wear glasses to protect his/her eyes against squirts of melted material, a protective apron and leather gloves.

The operator must avoid wearing metal objects (bracelets, watches etc.)

Routine and extraordinary maintenance jobs must only be done on the machine after having disconnected the power sources (electricity, air).

Make sure the machine is grounded effectively and earth ground is implemented.

Water flow through the weld control and transformer must be not less than 1 gal/min.

## TECHNICAL DATA

Rated Output at 50%, KVA .....	5.0KVA
Primary Voltage, V .....	440-480VAC
Frequency, HZ .....	50/60HZ
Sec. Short circuit current, KA .....	4.0kA
Weld Current, KA .....	3.2KA
Secondary Voltage .....	6.3V
Delayed Fuse, A .....	16-20.0A
Dimensions, Inches	
L .....	13.5in
W .....	12.5in
H .....	11in
Weight, lbs .....	66lbs
WELD GUN:	
Gun Cable Length .....	6ft
Ground Cable Length .....	6ft
Diameter of the Wheel, In .....	2.5in

### NOTE:

Qualified personnel who can also certify their work must install the machine. THE INSTALLER IS RESPONSIBLE FOR A CORRECT INSTALLATION AND, IN PARTICULAR, FOR THE CHOICE OF DEVICES TO PROTECT AGAINST SHORT CIRCUITING, OVERLOADS, LEAKAGE CURRENTS IN THE CASE OF A FAILURE AND OF THE WIRES USED TO CONNECT TO THE MAINS WHICH MUST COMPLY WITH CURRENT LAWS AND STANDARDS. THE INSTALLER MUST ALSO CHECK THAT THE EARTHING SYSTEM, TO WHICH THE WELDING MACHINE IS CONNECTED, IS EFFECTIVE.

**THE MACHINE MUST BE CONNECTED WITH A PLUG TO THE POWER SOURCE IN ORDER TO BE UNDER THE OPERATOR SURVEILLANCE.**

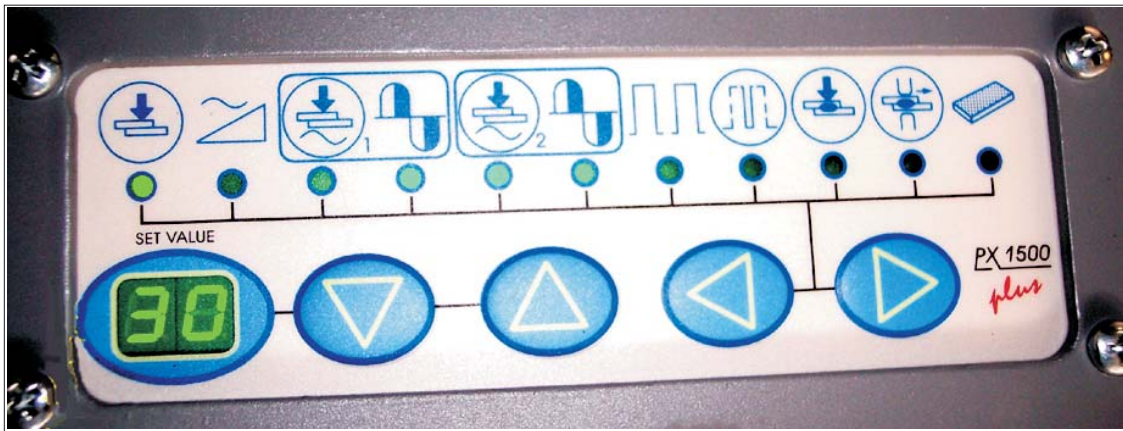
### **Electrical connection**

Sizing of line fuses and the cross section of the supply cables. With a mains voltage of  $V_1=440-480VAC$ .

#### **Model WT-FS-5.0 Normal current delayed fuses (A):**

440VAC .....	20A, wire size #10AWG for a distance 50ft.
480VAC .....	16A, wire size #10AWG for a distance 50ft.

# PX1500-PX1500P PLUS



## Operating Manual

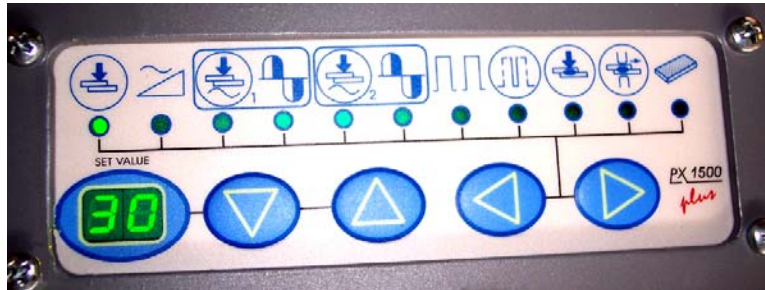
**WELDING TECHNOLOGIES**    [www.weldingnet.com](http://www.weldingnet.com)  
1365 Horseshoe Dr., Blue Bell, PA 19422  
Phone: 610-278-9325    Fax: 610-278-9325  
Toll Free Number: 1-888-383-WELD (9353)

## DESCRIPTION OF THE SYNOPTIC PANEL

The synoptic panel is divided in two parts.


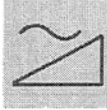








The top shows the graphical symbols of the functions available as well as the LEDs signaling the function selected.

The bottom part has the four arrow keys for programming and two-digit display that shows the value of the function selected.



**DESCRIPTION OF THE FUNCTIONS**

C2 plus PX1500 plus PX1500P plus plus are timers that control the welding cycle . A mains period is the timer's unit of time, corresponding to 1/50<sup>th</sup> of a second (50Hz). If, for instance, a squeeze time of 50 periods is set, time will be equal to 1 second.

	<p><b>Squeeze time (0-99 periods):</b> it is the time needed by the welding machine's electrodes to come into contact with the piece to be welded and to exert the welding pressure Melted material will squirt if this time is too short.</p>
	<p><b>Current risetime (0-20 periods):*</b> Weld time with growing current increase. If this value is not zero, welding current will gradually reach the value required during risetime. This technique is used when welding extra thick sheets that are not well matched together, or for welding steels</p>
	<p><b>Adjustment 1-2:*</b> Welding time and current, together with the force on the electrodes, are the most important parameters to make a spot weld. If the thickness of the pieces to be welded differ then (at least) the welding current has to be modified, leaving all the other parameters as they are. This is why PX1500plus and px1500p plus have two times and two different currents. Adjustment 1 or Adjustment 2 are selected automatically by the welding control if an additional foot pedal is fitted. If not, only Adjustment 1 is selected.</p>
	<p><b>Weld time (0-99 periods):</b> time during which the pieces to be welded have welding current passing through them.</p>
	<p><b>Power adjustment (0-99%):</b> The value of the welding current is determined as a percentage of power.</p>
	<p><b>Number of pulses (1-20):*</b> weld time is repeated without opening the electrodes, according to the value set. <b>Attention: this function cannot be used if weld time is longer than 20 periods</b></p>
	<p><b>Cold time (0-99 periods):*</b> pause time between welding pulses.</p>
	<p><b>Holding time (0-99 periods):*</b> time during which the electrodes stay closed after weld time.</p>
	<p><b>Pause time (0-99 periods):*</b> if this time is 0, the welding machine will carry out a single welding cycle even if the START signal persists. If this time is not 0 the welding cycle will be repeated automatically. In such a case, pause time determines the interval between one cycle and another.</p>
	<p><b>Energy function (0-1):</b> By setting value 1 the "energy compensation" function is enabled to facilitate the welding of dirty or oxidised sheets. This function is disabled if 0 is set.</p>

\* PX1500plus – PX1500P plus only.



## PROGRAMMING

When the control is not carrying out a welding cycle it can be used to programme or modify welding parameters.



Simply press the key to select the parameters of the welding cycle wanted.

The illuminated green LED under the graphical symbol highlights the function selected.



The SET VALUE display shows the value of the function selected. With keys the value contained in the SET VALUE is either increased or decreased.

## OPERATING INSTRUCTIONS

When the welding machine is turned on, control carries out a test on all the indicator lights. The SET VALUE display shows the software version installed.

Subsequent to self-testing, the welding control returns as it was prior to turning off; simply press START for the welding machine to start the work cycle.

During welding all the phases of the cycle are displayed by turning the function LEDs on in sequence.

## SELECTING THE WELDING PROGRAMME (only for the PX1500P *plus* version)

PX1500P *plus* can carry out nine different welding programmes.



To select the one you want, press the key several times until the display starts flashing.

The PX1500P will now display the active programme.



If you wish to recall a different programme use the keys selecting a value between 1 and 9.

**DESCRIPTIONS OF CONTROL CONNECTIONS**

No.	name		description
4	PRG1	(in)	Start cycle with time-current 1 (active when low)
8	PRG2 *	(in)	Start cycle with time-current 2 (active when low)
7	SPOT	(in)	Start cycle with time-current 2 without solenoid valve EV1(active when low)
2	WELD	(in)	Welding time enable (active when low)
17	WNW *	(in)	Excludes the current from the welding cycle (active when low)
12	SAFE	(in)	Safety input: if high, cycle is not possible and display "00" flashing
5	SQZ	(in)	When active, change status of output EV1
25	PSQZ *	(in)	When active, change status of output EV2 ( if SW1.1 = ON). If SW1.1 = OFF EV2 is « on » if the input PSQZ is active
16	WEND *	(out)	End of welding time: become low after the welding time; it will be active till the start signal (PRG1 or PRG2) are active (open connectors 500mA max)
15	CEND *	(out)	End cycle: become low after the holding time; it will be active till the start signal (PRG1 or PRG2) are active (open connectors 500mA max)
1-3-6-11-18	GND		∅ volt, common line for all the inputs
22-23	+24V		Supply voltage (24V dc 500mA max)
24	C+EV1		Supply for EV1 (+24V)
13-14	-EV2+EV2 *	(out)	EV2 supply (extra stroke cylinder) 24V / 7W
9-10	-EV1+EV1	(out)	EV1 supply (welding stroke) 24V / 7W
19-20	TAEN-TAEN	(in)	Input signal for welding current sensor
26-27	Vac IN		Connections to supply control(24V ac) from external source: <b>JP8-JP9 must be removed!</b>
21	TRG		Firing signal for external SCR firing module: <b>JP7 must be removed if this signal is used</b>
L1			Supply phase L1- 400V 50/60 Hz
L2			Supply phase L2- 400V 50/60 Hz
PE			Protection earth connection

\* (only for PX1500 plus and PX1500P plus)

**DESCRIPTION OF DIP-SWITCHES FUNCTION ON PX1500 plus PX1500P plus**

**SOFTWARE VERSION 2.0**

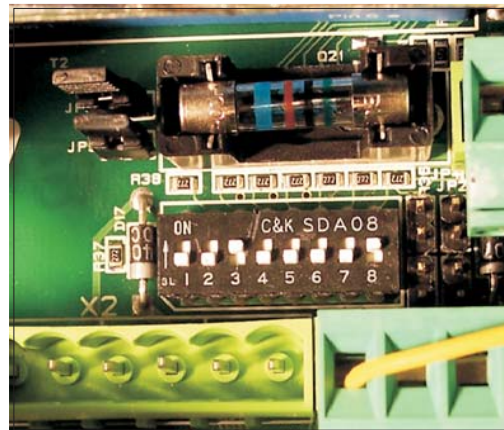
		OFF	ON
SW1.1	OUT EV2	MONOSTALBLE	BISTABLE
SW1.2	ENERGY COMPENSATION	DISABLED	ENABLED
SW1.3	COS FI ADJUSTEMENT	MINIMUM	MAXIMUM
SW1.4	TIME UNIT	1 CYCLE	½ CYCLE
SW1.5	PAUSE TIME	ENABLED	DISABLED
SW1.6	OUT EV1	FREE	EV1=ON IF EV2=ON
SW1.7	FIRST HALF CYCLE FIRING DELAY	3.5 mSec.	4 mSec.
SW1.8	SEAM WELDING OPERATION	NOT	YES

**DESCRIPTION OF JUMPERS ON PCB**

	CLOSED	OPEN
JP7	INTERNAL FIRING CIRCUIT ENABLED	INTERNAL FIRING CIRCUIT DISABLED
JP8-JP9	INTERNAL SUPPLY TRANSFORMER ENABLED (PARALLEL JUMPERS)	INTERNAL SUPPLY TRANSFORMER DISABLED (PARALLEL JUMPERS)

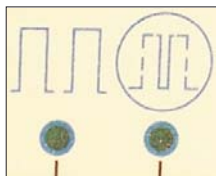
# SET UP

Weld Controller has an option to weld in “SEAM WELDING” mode, where the cycle repeats itself as long as the trigger is depressed. In order to activate “SEAM WELDING” mode, place dip switch (pos.8) on the weld controller circuit board to “ON” position. Dip switch is shown on the picture below:



Once the weld controller is set to “SEAM WELDING” mode, it can execute continuous seam welds. In order to stop welding, just release a trigger on the seam welding head gun.

Weld Controller can be programmed to execute single weld mode, as long as the number of programmed pulses is “1”.



Number of pulses can be programmed 0-20.

Cool time can be programmed 0-99 cycles

Note: 1 cycle = 1/60sec at 60HZ

and

1 cycle = 1/50sec at 50HZ

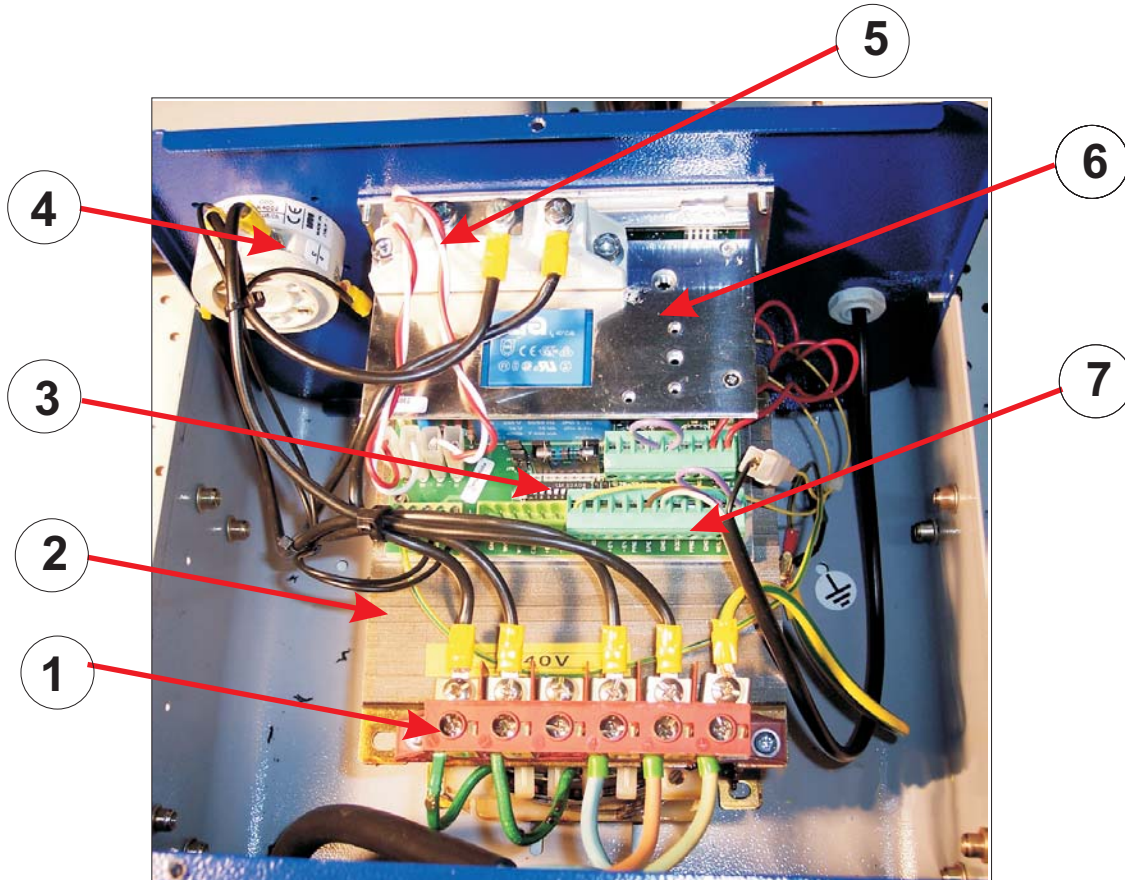
In order to have a smooth start it is recommended to use “Slope” mode, where the weld controller starts from “0” heat up to the programmed value.



TROUBLESHOOTING AND A GUIDE TO ELIMINATING PROBLEMS IN WELD CYCLE
---

PROBLEM	CAUSE	REMEDY
The control unit does not turn when the main switch has been turned on.	<ul style="list-style-type: none"> <li>No electricity</li> <li>Line fuses have blown</li> <li>Fuses on the control unit have blown</li> </ul>	<ul style="list-style-type: none"> <li>Check mains voltage and soundness of the fuses</li> </ul>
The control unit turns on but when the push button is pressed the welding cycle fails to start.	<ul style="list-style-type: none"> <li>Mains voltage is too low</li> </ul>	<ul style="list-style-type: none"> <li>Check mains voltage and compare it with the machine's rating plate data.</li> </ul>
The PX1500 control unit turns on and the SET VALUE display flashes "00"	<ul style="list-style-type: none"> <li>The thermostats have tripped</li> <li>Push button microswitch is faulty</li> <li>Gun microswitch is faulty</li> </ul>	<ul style="list-style-type: none"> <li>Welding programming time is too long</li> <li>Change the microswitch</li> </ul>
Squirts of material when the electrodes come into contact	<ul style="list-style-type: none"> <li>Squeeze time is too short</li> <li>Electrodes' pressure is too low</li> <li>SCR has short circuited</li> </ul>	<ul style="list-style-type: none"> <li>Increase squeeze time</li> <li>Increase force on the electrodes</li> <li>Change the SCR</li> </ul>
While you are welding there is a loud noise coming from the welding transformer and the line fuses blow	<ul style="list-style-type: none"> <li>SCR has failed</li> </ul>	<ul style="list-style-type: none"> <li>Change the SCR</li> <li>Change the control card</li> </ul>

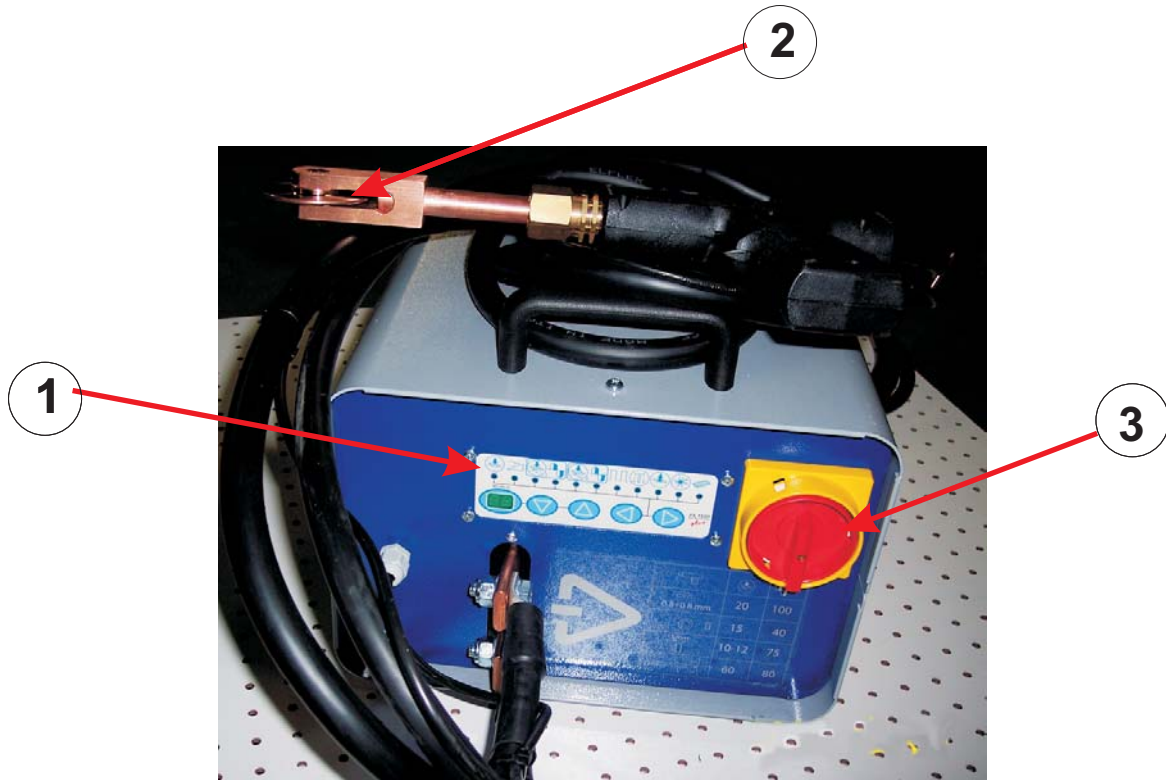
## MAIN COMPONENTS



- Item 1 - Power Terminal Strip
- Item 2 - Welding Transformer
- Item 3 - Dip Switch
- Item 4 - Main Switch
- Item 5 - SCR
- Item 6 - Weld Controller PX1500P Plus
- Item 7- I/O terminals

**WELDING TECHNOLOGIES [www.weldingnet.com](http://www.weldingnet.com)**

## MAIN COMPONENTS II



- Item 1 - PX-1500 Weld Controller
- Item 2 - Seam Welding Head WT-HTSW-2
- Item 3 - Main Switch

## MAIN COMPONENTS III



- Item 1 - Chuck Gun 30901
- Item 2 - Thermostat 70 deg. L01.070.05.300
- Item 3 - Gun Micro-switch
- Item 4 - Ground Cable