SDE315B

Electrofusion Welding Machine

User Manual
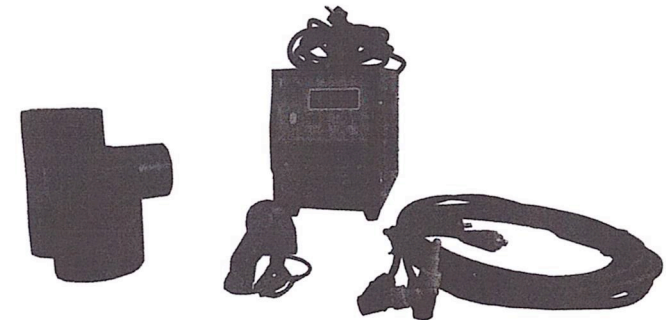
SUDA PLASTIC PIPE MACHINERY CO., LTD.

www.sudabuttfusion.com

SDE315B IGBT Electrofusion welding machine is the latest high performance DC electric welding machine of our company. It is used for special equipment for polyethylene (PE) pressure or non-pressure pipe electrofusion connection. The advanced PID control technology is adopted to make the output of the device more stable and reliable. The large-size LCD screen serves as a human-computer interface and supports multiple languages. The imported IGBT module and fast recovery diode are selected as the output power device, and the whole machine has the characteristics of small size, light weight and energy saving.

The main features are as follows:

♦ High-level MCU is used as control core, with abundant parameter setting, measuring and perfect protective function;

♦ High brightness liquid crystal display, support multi languages, touch button operation, man-machine interactive interface;

♦ Wide power supply and voltage input, suitable for on-the-spot electric network level;

♦ High precision control to electric energy and time, ensure welding quality;

♦ Swiftly output response time when power supply breaks, high stability;

♦ Support U disk reading welding record;

♦ Support U disk import formula parameter;

♦ Support USB portable printer, print welding record;

♦ With automatic identification matching pipe function;

♦ Good doubling protection function;

♦ With up to 10 phases programmable welding function, can adapt to different pipe welding requirements;

♦ Support a variety of welding parameters input: manual input, formula extraction, bar code scanning input;

♦ The control board adopts SMT welding technology to reduce the failure rate of the whole machine.
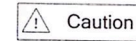
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1 Safety Note

Definitions of "Danger" and "Caution"
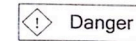
⬦ Danger

This symbol is intended to alert the user that severe personal injury or substantial property damage can result if the device is not operated as requested.
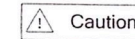
⚠ Caution

This symbol is intended to alert the user that minor personal injury or material damage can result, if the device is not operated as requested.

Failure to read this manual carefully before installation and operation may lead to improper operation.

1.1 Open-package inspection

⚠ Caution

- Check if there is any damage during transportation when opening the case.
- Check if the type, specification of machine's nameplate is in accordance with order, please contact supplier if there is any missing.

1.2 Wring
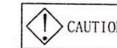
⬦ CAUTION

- Don't twist cable when using.
- Conform to national standard to choose section area of lead when lengthening cable.

1.3 Operation
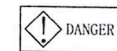
⬦ DANGER

- Professional welding must be done at the safe working condition by using IEFD electrofusion welding machine.
- Professional welding must be done by personnel who is trained and get the operation permission
- This welding machine possesses safety protective measure, damage to machine or injury to operator and personnel around may happen if operating without user manual.
- Don't contact PE material overflowing from fittings or surface of fittings, it may cause scald
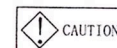
⬦ CAUTION

- Regular inspection to power supply must be done before using to make sure voltage of power supply is matching the machine's input voltage and power.

1.4 Maintenance

<div style="text-align:center">⚠ DANGER</div>
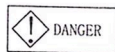
- Maintenance must be done only by professional and qualified personnel.
- Don't contact machine's charged part.
- Don't founder the machine, can't be used beside flammable and explosive object.

<div style="text-align:center">⚠ CAUTION</div>
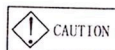
- Routine inspection must be done, discover and deal with loose and damage in time.

2 Product information

2.1 Type definition

SDE315 — 3K5

Output powr 3.5KW

Design No.
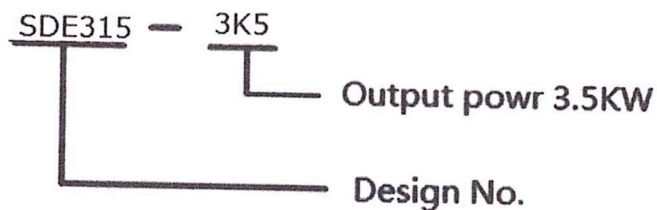
- Welder power: 3.5KW only meets single-phase 220V voltage input;

- Support functions: 1. Scanner reading 2. Printer function;

Note: Barcode scanning and printing functions require the purchase of additional accessories.

Note: Barcode scanning and printing functions require the purchase of additional accessories.

2.2 Data plate

The data plate is on the enclosure of the welding machine, and the content of data plate is shown as follow:

2.3 Technical parameters

|		
Input Power Supply	Rated input voltage	220V±20%
	Rated input frequency	45～65Hz
Output Power Supply	Rated output voltage	Refer to type definition
	Output power	Refer to type definition
Control Characteristics	Control mode	Constant voltage, constant current
	Electric quantity constant precision	≤±0.5%
	Time control precision	≤±0.1%
	Temperature measuring precision	≤1%
	Scan bar code	Scan 24 bit bar code conform to ISO 13950-2007
Ambient	Ambient temperature	-20～50℃
	Storage temperature	-30～70℃
	Humidity	20%～90%RH，no condensation
	Vibration	＜0.5G, no violent vibration and impact
	Altitude	＜1000m AMSL, when≥1000m de-rate in accordance with GB/T3859.2-2013

2.4 Product

Model	Input voltage	Output Power	Output Current	Output Voltage	Diameter(mm)	Welding Range
SDE315	AC220V±20%	3. 5KW	60	70	467*204*335	Dn20-315
SDE500	AC380V±20%	8KW	70	150	515*204*386	Dn20-500
SDE630	AC380V±20%	15KW	80	170	556*279*447	Dn20-630
SDE1000	AC380V±20%	15KW	80	210	556*279*447	Dn20-1000

3 Operation

3.1Interface description

```
Ready to weld

Setting parameters

Advanced settings
```
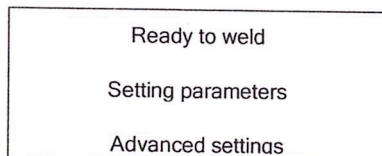
Prepare for welding: Select to prepare for welding. The welding parameters will default to the parameters of the last welder.

Setting parameters: Select setting parameters to select working mode and welding parameters.

Advanced settings: After selecting the advanced settings, the interface is as follows:

```
Setting parameters    Record export

Record printing       Import project
```
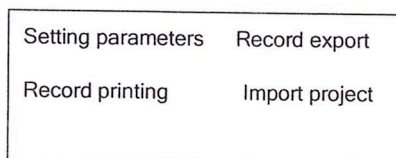
Parameter setting: You can enter the menu and make more parameter settings (such as wire resistance setting, bar code type, etc.)

Record export: connect the USB flash drive, select the record export, you can import the welding record into the USB flash drive, and you can view the previous welding records through the computer.

Record Print: Connect the printer and select Record Print to print out the weld data.

Import project: You can import the data previously stored in the USB flash drive into the device, and you can view it by 'Parameter Setting' in 'Advanced Settings'.

3.2Description of the key-press

| Key-press	Name	Function description
OK	Confirmation	Confirm
ESC	Exit	Cancel
⬆	Increase	Menu up / Data increases
⬇	Decrease	Menu down / Data decreases
➡	Right shift	Menu right shift/The modified position right shift
⬅	Left shift.	Menu left shift/The modified position left shift

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4 Functional Parameter

4.1 Parameter list

Menu No.	Name	Range	Default	Keyboard attribute
Parameter menu 1: welding parameters				
0.01	Control mode selection	Constant voltage / constant	Consta	
0.02	Welding phases	1～10	1	
0.03	Pipe resistance	0.00～19.99	0	
0.04	Welding para. of 1st phase	0～Rated	0	
0.05	Welding time of 1st phase	0～9999	0	
0.06	Welding para. of 2nd phase	0～Rated	0	
0.07	Welding time of 2nd phase	0～9999	0	
0.08	Welding para. of 3rd phase	0～Rated	0	
0.09	Welding time of 3rd phase	0～9999	0	
0.10	Welding para. of 4th phase	0～Rated	0	
0.11	Welding time of 4th phase	0～9999	0	
0.12	Welding para. of 5th phase	0～Rated	0	R/W
0.13	Welding time of 5th phase	0～9999	0	
0.14	Welding para. of 6th phase	0～Rated	0	
0.15	Welding time of 6th phase	0～9999	0	
0.16	Welding para. of 7th phase	0～Rated	0	
0.17	Welding time of 7th phase	0～9999	0	
0.18	Welding para. of 8th phase	0～Rated	0	
0.19	Welding time of 8th phase	0～9999	0	
0.20	Welding para. of 9th phase	0～Rated	0	
0.21	Welding time of 9th phase	0～9999	0	
0.22	Welding para. of 10th phase	0～9999	0	
0.23	Welding time of 10th phase	0～Rated	0	
Parameter menu 1: welding parameters				
1.01	Curre Temp	-50～50.0℃		
1.02	Standar Temp	-50～50.0℃	20.0℃	R/W
1.03	Temp compen	0.1%～0.9%	0.2%	

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1.04	Doubl R set	0～50%	0	
1.05	Barcode set	0、1	0	
1.06	Allow of R	0、1	1	
1.07	R of range	0～30%	6%	
1.08	language	0～4	0	
1.09	year	2000～2099	2019	
1.10	month	1～12	8	
1.11	day	1～31	8	
1.12	Time	0～23	8	
1.13	Minute	0～59	8	
1.14	Softw versi	0～32767	1002	
1.15	Factory set	0～32767	1000	
Parameter menu 2: welding parameters				
2.01	Eng	20 alphanumeric	--	
2.02	Term	20 alphanumeric	--	
2.03	Worker Num	6-digit combination	--	
2.04	Weld Num	6-digit combination	--	
2.05	PE types	10-digit alphanumeric	--	
2.06	PE fab	6-digit alphanumeric	--	R/W
2.07	PE diameter	0～32767	0	
2.08	PE SDR	33；26；21；17.6；17；13.6；11；9；no	no	
2.09	PE material	PE80/PE100/no	no	
2.10	Weld	25 alphanumeric	--	

4.2 Parameter Description

Keyboard Properties - Describes the properties of the keyboard for menu parameter operations.

R : Read only, parameters cannot be modified.

R/W : Read and write, parameters can be modified.

T : Read and write, parameters can be modified during shutdown.

Communication Properties - Describes the properties of the communication for menu parameter operations.

R : Read only, parameters cannot be modified; communication can only read this parameter.

R/W: Read and write, parameters can be modified; communication can read and modify this parameter.

T : Read and write, the parameters can be modified during shutdown; the communication can read this parameter, and the parameter can be modified in the stop state.

N : No communication.

Parameter menu 0: welding parameters

0.01	Control mode selection		Keyboard attribute	R/W	Comm. attribute	-
Range	CV/CC		Default		CV	

Select the type of control method for the welder.

0.02	Welding phases		Keyboard attribute	R/W	Comm. attribute	-
Range	1～10		Default		1	

Phase number of welding required.

0.03	Pipe resistance		Keyboard attribute	R/W	Comm. attribute	-
Range	0～20.00Ω		Default		0Ω	

The physical resistance of pipe, the pipe resistance will affect the test results.

0.04	Welding para. of 1st phase		Keyboard attribute	R/W	Comm. attribute	-
Range	0～Rated voltage / rated current		Default		0	

Setting value of 1st welding phase.

0.05	Welding time of 1st phase		Keyboard attribute	R/W	Comm. attribute	-
Range	0～9999		Default		0	

Time of 1st welding phase.

0.05	Welding para. of 2nd phase	Keyboard attribute	R/W	Comm. attribute	-
Range	0～Rated voltage / rated current	Default		0	

Refer to 0.04

0.07	Welding time of 2st phase	Keyboard attribute	R/W	Comm. attribute	-
Range	0～9999	Default		0	

Refer to 0.05

0.08	Welding para. of 3st phase	Keyboard attribute	R/W	Comm. attribute	-
Range	0～Rated voltage / rated current	Default		0	

Refer to 0.04

0.09	Welding time of 3st phase	Keyboard attribute	R/W	Comm. attribute	-
Range	0～9999	Default		0	

Refer to 0.05

0.10	Welding para. of 4st phase	Keyboard attribute	R/W	Comm. attribute	-
Range	0～Rated voltage / rated current	Default		0	

Refer to 0.04

0.11	Welding time of 4st phase	Keyboard attribute	R/W	Comm. attribute	-
Range	0～9999	Default		0	

Refer to 0.05

0.12	Welding para. of 5st phase	Keyboard attribute	R/W	Comm. attribute	-

Range	0～Rated voltage / rated current	Default		0	

Refer to 0.04

0.13	Welding time of 5st phase	Keyboard attribute	R/W	Comm. attribute	-
Range	0～9999	Default		0	

Refer to 0.05

0.14	Welding para. of 6st phase	Keyboard attribute	R/W	Comm. attribute	-
Range	0～Rated voltage / rated current	Default		0	

Refer to 0.04

0.15	Welding time of 6st phase	Keyboard attribute	R/W	Comm. attribute	-
Range	0～9999	Default		0	

Refer to 0.05

0.16	Welding para. of 7st phase	Keyboard attribute	R/W	Comm. attribute	-
Range	0～Rated voltage / rated current	Default		0	

Refer to 0.04

0.17	Welding time of 7st phase	Keyboard attribute	R/W	Comm. attribute	-
Range	0～9999	Default		0	

Refer to 0.05

0.18	Welding para. of 8st phase	Keyboard attribute	R/W	Comm. attribute	-
Range	0～Rated voltage / rated current	Default		0	

Refer to 0.04

0.19	Welding time of 8st phase		Keyboard attribute	R/W	Comm. attribute	-
Range	0～9999		Default		0	

Refer to 0.05

0.20	Welding para. of 9st phase		Keyboard attribute	R/W	Comm. attribute	-
Range	0～Rated voltage / rated current		Default		0	

Refer to 0.04

0.21	Welding time of 9st phase		Keyboard attribute	R/W	Comm. attribute	-
Range	0～9999		Default		0	

Refer to 0.05

0.22	Welding para. of 10st phase		Keyboard attribute	R/W	Comm. attribute	-
Range	0～Rated voltage / rated current		Default		0	

Refer to 0.04

0.23	Welding time of 10st phase		Keyboard attribute	R/W	Comm. attribute	-
Range	0～9999		Default		0	

Refer to 0.05

Parameter menu 1: welding parameters

1.01	Standar Temp		Keyboard attribute	R	Comm. attribute	-
Range	-		Default		-	

Display current ambient temperature。

1.02	Standar Temp		Keyboard attribute	R/W	Comm. attribute	-
Range	-50～50.0℃		Default		20.0℃	

The setting of the standard ambient temperature will affect the results of welding time compensation, the default value is 20℃

1.03	Temp compen		Keyboard attribute	R/W	Comm. attribute	-
Range	0.0～0.9%		Default		0.2%	

When there is a difference between the ambient temperature and the standard ambient temperature, the welding time is compensated according to the temperature compensation

1.04	Wire resistance setting		Keyboard attribute	R/W	Comm. attribute	-
Range	0～50.0%		Default		0%	

After the start of welding for 3 seconds, if the current pipe resistance value falls below the wire resistance setting ratio, it is considered that a wire failure occurs. See the following formula: current pipe resistance value < (tube set resistance - (tube set resistance * wire resistance set value / 100))

1.05	Barcode set		Keyboard attribute	R/W	Comm. attribute	-
Range	0～1		Default		0	

0：24-bit barcode 1: 36-digit barcode.

1.06	Allow of R		Keyboard attribute	R/W	Comm. attribute	-
Range	0～1		Default		1	

The resistance value of the welded pipe is judged before the welding starts, and the alarm is given if the resistance value of the pipe exceeds (1.07 resistance change Range).

1.07	R of range		Keyboard	R/W	Comm.	-

		attribute		attribute	
Range	0～±30%		Default		±6%

R of range：0；±6%；±8%；±10%；±12%；±15%；±19%；±24%；±30%

1.08	language	Keyboard attribute	R/W	Comm. attribute	-
Range	0～4		Default		0

0: Chinese 1: English 2: Spanish 3: Polish 4: Russian.

1.09	year	Keyboard attribute	R/W	Comm. attribute	-
Range	2000～2099		Default		2019

Current year setting.

1.10	month	Keyboard attribute	R/W	Comm. attribute	-
Range	1～12		Default		8

1.11	day	Keyboard attribute	R/W	Comm. attribute	-
Range	1～31		Default		8

1.12	time	Keyboard attribute	R/W	Comm. attribute	-
Range	0～23		Default		8

1.13	Minute	Keyboard attribute	R/W	Comm. attribute	-

Range	0～59		Default		8

1.14	Softw versi	Keyboard attribute	R	Comm. attribute	-
Range	0～32767		Default		1002

Displays the currently running software version number.

1.15	Factory set	Keyboard attribute	R/W	Comm. attribute	-
Range	0～32767		Default		1000

Factory settings window.

Parameter menu 2: welding parameters

2.01	Project Number	Keyboard attribute	R	Comm. attribute	-
Range	20 alphanumeric combination		Default		--

2.02	Item Number	Keyboard attribute	R	Comm. attribute	-
Range	20 alphanumeric combination		Default		--

2.03	Welder number	Keyboard attribute	R	Comm. attribute	-
Range	6-digit combination		Default		--

2.04	Weld number	Keyboard attribute	R	Comm. attribute	-

Range	6-digit combination		Default		--

2.05	Pipe type	Keyboard attribute	R	Comm. attribute	-
Range	10-digit alphanumeric combination	Default			--

2.06	Pipe fitting manufacturer	Keyboard attribute	R	Comm. attribute	-
Range	6-digit alphanumeric combination	Default			--

2.07	Pipe diameter	Keyboard attribute	R/W	Comm. attribute	-
Range	0～32767	Default			0

2.08	Pipe SDR	Keyboard attribute	R/W	Comm. attribute	-
Range	33；26；21；17.6；17；13.6；11；9；无	Default			no

2.09	Pipe material	Keyboard attribute	R/W	Comm. attribute	-
Range	PE80/PE100/no	Default			no

2.10	Welder number	Keyboard attribute	R	Comm. attribute	-
Range	15-digit alphanumeric combination	Default			--

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5 Function Description

5.1 Scanner welding

If the bar code shown below is attached to the pipe, it can be read by the scanner. The bar code welding parameters shown below are: constant pressure, 39.5V, soldering time of 200 seconds, and cooling time of 15 minutes.

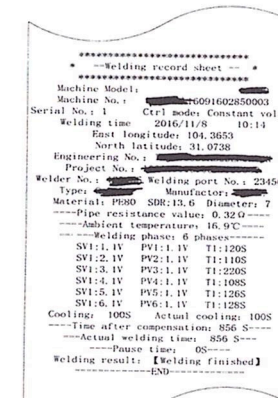S90 39.5V FUSE 200sec COOL 15min

950408320903992104200444

After the user connects the scanner correctly, he uses the scanner to scan the barcode. After the scan is successful, the scanner will make a "beep" sound to indicate that the barcode has been recognized, and the welder will also emit a "beep" sound to indicate that the barcode is correctly verified. The welding parameter value resolved by the barcode can be seen on the welding standby interface.

Note: The barcode must conform to the barcode type set in "1.05 Barcode Type";

Tip: When the laser and the barcode are not completely 90°, the scanning effect is best. The upper and lower effective tilt angle is ±65°, the left and right effective tilt angle is ±60°, and the effective tilt angle is ±42°. When scanning the barcode, please let the laser cover the entire barcode, otherwise the correct data may not be read.

5.2 Print function

If the printer is connected to the electrofusion welder via USB, the electrofusion welder automatically starts the printer to complete the printing of the current weld data when the weld is completed. It is also possible to print the current welding data through the "Advanced Settings" → "Record Print" menu after the welding is completed. The printed content is as shown below:

```
*************************
*  --Welding record sheet --  *
*************************
Machine Model：
Machine No.：        16091602850003
Serial No.：1    Ctrl mode：Constant volage
    Welding time    2016/11/8    10:14
    East longitude：104,3653
    North latitude：31,0738
Engineering No.：
    Project No.：
Welder No.：        Welding port No.：234567
    Type：          Manufactor：
Material：PE80  SDR：13.6  Diameter：7
----Pipe resistance value：0.32Ω----
----Ambient temperature：16.9℃----
----Welding phase：6 phases----
    SV1：1,1V    PV1：1,1V    T1：120S
    SV1：2,1V    PV2：1,1V    T1：110S
    SV1：3,1V    PV3：1,1V    T1：220S
    SV1：4,1V    PV4：1,1V    T1：108S
    SV1：5,1V    PV5：1,1V    T1：126S
    SV1：6,1V    PV6：1,1V    T1：128S
Cooling：100S    Actual cooling：100S
----Time after compensation：856 S----
----Actual welding time：856 S----
----Pause time：   0S----
Welding result：【Welding finished】
----------END----------
```

6 Fault reason and disposal

❖ Power supply low

Fault occurrence state	Analyse	Disposal
Display when starting	Input power supply low	Check input power source, ensure that the power source is in the virtual range
Display during welding process	Section area of input power source cable is small or connection is long	Replace with bigger cable

❖ Electrofusion welding machine overheat

Fault occurrence state	Analyse	Disposal
In operation	Operating temperature is too high	Re welding after temperature dropped
	Fan fault	Replace the fan
	Components damaged	Replace temperature acquisition switch

❖ Load open circuit

Fault occurrence state	Analyse	Disposal
In operation	Output cable is not properly connected	Stop and check whether the cable is broken and the connector is reliably connected.
	Pipe damaged	Check the pipe fittings

❖ Short circuit

Fault occurrence state	Analyse	Disposal
In operation	Output cable is not properly connected	Stop and check whether the cable is broken and the connector is reliably connected.
	Pipe damaged	Check the pipe

❖ Resistance value is too large

Fault occurrence state	Analyse	Disposal
Display during welding process	The resistance of the connecting pipe does not match the set resistance.	Set the appropriate pipe resistance identification range

7 Equipment Maintenance Instructions

As the ambient temperature, humidity, dust, corrosive gas, and vibration may cause effects on the device, to ensure long-term stable operation of the device, please do regular maintenance according to the environmental conditions.

- Maintenance of the equipment by professional;

- Check the equipment grounding whether in good or safe condition;

- Clean dust and sundries on the components;

- Detection of high-current connection point is in good contact condition, without exception; check other wiring points loose or not;

- Fan installed equipment, check whether the fan noise, jamming, rotating, protective circuit settings are appropriate; clean air duct and air filter;

- The equipment which equipped with large-capacity capacitor, check the temperature of the capacitor and check the leakage, bulge phenomenon of the external surface;

- When not using the equipment for a long time, you should cut off the power supply.