SPT Plasmateknik AB

STATE OF THE ARC PLASMA CUTTING TECHNOLOGY

INSTRUCTIONS FOR USE

SPARCON 1200

A MULTI PLASMA SYSTEM
FOR MECHANIZED AND HEAVY
MANUAL PLASMA CUTTING
AND PLASMA ARC GOUGING

To the operator: Please read and understand this manual before using the SPARCON 1200. It is absolutely vital to know the information presented in this manual in order to use the SPARCON 1200 in the best way.
With this knowledge and a professional approach, you will be able to solve many complicated cutting applications with the SPARCON 1200.

Rev. 3.0, 2001-08-05
Rev. 3.1, 2018-07-09/AS

SPT Plasmateknik AB
Transportvägen 12
SE-241 38 Eslöv
Sweden

Telephone + 46 10-172 73 50
Email info@spt.se
Internet www.spt.se

CONTENTS

1. TECHNICAL DATA

Power supply:	3~50Hz 400V Other voltage and frequency on request
Main fuse:	50A
Process power:	LO - 130V,35A MED - 130V,70A HI- 130V/115A
Duty cycle:	100%
Maximum power:	32kVA
Power factor:	0,7 (130V,115A)
Open circuit voltage:	250V
Protection class:	IP 22
Cooling:	F
Temperature class:	F
Gas pre-flow:	1 sec
Gas post-flow:	5 sec
Dimensions:	880 x 360 x 800 mm
Weight:	240 kg

2. INSTALLATION

Power supply: 3~50Hz, 400V
Fuse: 50A slow blow

Gas supply:

Air plasma cutting: Connect the compressed air to the filter regulators and adjust the right one (no. 1.) to 3,5-4,5 bar and the left one (no. 2.) to 6-8 bar.
Gas plasma cutting: Connect the constant-flow regulator of the gas cylinder to the filter regulators and adjust no. 1 to 3,5-4,5 bar and no. 2 to 6-8 bar.

The gas flow can be checked by means of the GASTEST-switch in the front of the machine or with the SPAREM remote control unit. The air/gas flow should be approx. 14 l/min in OUTPUT LO/MED and 25 l/min in position HI.

The SPARCON 1200 can be connected to a profile cutting machine by means of a control cable. Pull the control cable through the inlet on the rear plate and connect to the ON/OFF relay situated on the mounting plate. This relay controls the carriage of the figure cutting machine. To obtain the correct function of this relay there is on the mounting plate situated a toggle switch “REMOTE”. If the remote control unit SPAREM is connected to the SPARCON 1200, place the switch in position “SPAREM”. If other types of remote control are used, place the switch in position “OTHER”.

PLEASE NOTE! The plasma cutting torch for SPARCON 1200 shall have the text ”SPARCON 1200” on the hose assembly. The quantity of plasma generating air/gas flowing is decided by a gas injector (throttle nozzle) situated in the connection between the gas hose and the torch body. This is unique for SPARCON 1200. The use of incorrect hose assembly may result in damage to the torch body as well as the power source.

3. OPERATING INSTRUCTIONS

The SPARCON 1200 can be used in manual as well as mechanised applications. This is controlled by the REMOTE switch in the front of the machine.

Manual cutting

Connect the manual plasma cutting torch SPARCUT to SPARCON 1200. Set the REMOTE switch in position OFF.

Mechanised cutting

Connect the figure cutting machine to SPARCON 1200 (see chapter 2. Installation). Connect the machine plasma cutting torch SPARCUT XL/M, BAZOOCUT or EXCALIBUR to SPARCON 1200.
Connect the SPAREM remote control unit to SPARCON 1200 via the multipole connection cable on the front panel.
Set the REMOTE switch in position ON. Switch on the power source and the lamp READY on the SPAREM will light to indicate that the SPARCON 1200 is now remote controlled.

SPAREM has the following functions:

GASTEST is used to check that air/gas is connected and flowing. This switch is also used for flushing the gas system when changing gas or before starting any cutting application if the equipment has not been used before.

The INCH-switch activates the carriage and places the torch in the right position before cutting starts.

The START-button activates the cutting process as well as the carriage.

The STOP-button stops the cutting process as well as the carriage.

The DELAY-knob is used to delay the carriage while the process is being established and during initial cutting through edges of the material. The delay can be set to 0-2,5 seconds.

Check that the machine has been properly connected to power supply and gas; see chapter 2, installation.

Connect the earth lead to the front of the machine. Attach the earth clamp directly to the workpiece. If necessary, remove paint, rust dirt etc. from the surface.

Cutting:

Place the power switch in position ”1”(ON).
The power lamp ”READY” will light. The pump and fan will start.

Check that the filter regulators are correctly adjusted by activating the GASTEST function.

Choose process power.
OUTPUT switch in position LO - low power. Suitable for cutting up to 3 mm thickness. Use Ø0,9mm nozzle.
OUTPUT switch in position MED - medium power. Suitable for cutting 3-15 mm thickness. Use Ø1,1 mm nozzle.
OUTPUT switch in position HI - high power. Suitable for cutting above 15 mm thickness. Use Ø1,4 mm nozzle.

Place the torch in position for contact cutting or distance cutting and press the START button on the torch handle or START on the remote control.

Contact cutting (manual cutting only):
Slide the nozzle against the workpiece. The pilot arc must be established without the nozzle having contact with the workpiece.

As an accessory there are special nozzles for contact cutting, part no. 199 108, made for profile cutting.

Contact cutting is suitable for cutting up to 4mm thickness.

Distance cutting:
Keep a distance of a few millimetres between the nozzle and the workpiece.

The accessories for distance cutting are the distance cutting guide, the distance roller and the circular cutting guide.

After activating cutting start the air/gas will flow for a short while before the plasma arc (pilot arc) strikes. If the cutting process does not start, the plasma arc will go out. Then make another try.

To stop the cutting process, just release the button on the torch handle or push STOP on the remote control. The plasma arc will go out instantaneously. Gas/air will flow for a few more seconds.

PLEASE NOTE! When the machine is not in use or is only used at long intervals, please set the power switch in position ”0” (OFF). The machine contains mechanical components, like fan and pump, which should not be exposed to unnecessary wear.

Air plasma cutting.
Use the electrode intended for air as plasma generating gas.
This electrode is nickel-plated.

Gas plasma cutting.
Use the electrode intended for gas; nitrogen (N2) or argon/hydrogen mix (Ar/H2) as plasma generating gas.
This electrode is coppered plated.

PLEASE NOTE! The plasma-cutting torch is a component designed for high power outputs. Please handle the torch body and the hose assembly with care.
With the proper handling, by an operator with the proper knowledge, the lifetime of the plasma-cutting torch will be very long, and the low wear on nozzles and electrodes will give good cutting economy. A damaged hose assembly, e.g. with air or water leakage, will infallibly damage the torch body.
Never use a damaged plasma cutting torch!

Plasma arc gouging.

Set the OUTPUT switch in position LO. Activate the GASTEST switch and adjust the no. 1 (left) regulator to 3,5 bar and regulator no. 2 (right) to 6 bar. Use the Ø2,2 mm gouging nozzle. When using the Ø3,0 mm gouging nozzle, repeat the above but adjust regulator no.1 to 4,5 bar and no. 2 to 10 bar. Use the special gouging electrode and the nozzle extension. (See p. 13-14)

4. GENERAL INFORMATION ON PLASMA CUTTING

With exception of the systems that have built-in compressors (SPARCIN 5C/9C), all SPT Plasmateknik AB manufactured plasma cutting systems with water cooled torch have full multi-gas capability.
When using technical gases, a pressure regulator as opposed to a flow regulator must be fitted to the gas cylinder. The use of flow regulators may lead to ignition problems and torch malfunction.
This chapter also describes in general how to optimise cutting quality and consumable lifetime.

When to use technical gas

Mild steel

Mild steel is cut with good quality using air as plasma generating gas. In some applications however, when better cut quality is desired, pure oxygen can be used as plasma generating gas. In order to reach an acceptable lifetime of the electrode there are specially designed electrodes for this purpose. For low power cutting (<40A), use the FineL electrode. For high power cutting (>40A), use the Hi-Power oxygen electrode.
When cutting with oxygen the consumable lifetime is shorter than with air.

Stainless steel

Most types of stainless steel are cut with good result with air as plasma generating gas. The weldability of the kerf however may be improved by using a technical gas.
Using pure nitrogen as plasma generating gas you can reduce the amount of chrome-oxide in the kerf. When cutting with nitrogen, the gas electrode as well as the air electrode may be used.
To further improve the kerf quality, a mixture of 10% hydrogen in nitrogen (NH10) may be used. Since this mixture contains hydrogen a tendency to develop dross may occur. This can be minimised if not eliminated by very precisely adjusting cutting parameters as speed, distance, gas flow, nozzle size, process power etc. When cutting with NH10 the gas electrode as well as the air electrode may be used.

Aluminium

There are a great number of different aluminium alloys available. Most of them are cut without dross and with high speed using air as plasma generating gas. The aluminium-oxide in the kerf may reduce the weldability of the cut.
To reduce the aluminium-oxide a gas mixture of 10% hydrogen in nitrogen (NH10) may be used. When cutting with NH10 the gas electrode as well as the air electrode may be used.
To further reduce the aluminium oxide a mixture of 35% hydrogen in argon (AH35) may be used. When cutting with AH35 the gas electrode must be used.
Note that when cutting with AH35 it may be necessary to use a nozzle with a bigger orifice to prevent double arcing.

Copper/brass

Copper and brass can depending on alloy be cut with air, nitrogen or a mixture of 10% hydrogen in nitrogen (NH10). When cutting with air, air electrode must be used. When cutting with nitrogen or NH10 air electrode as well as gas electrode may be used.

Titanium

Titanium is best cut with a mix of 70% helium in argon. When using this mixture, gas electrode must be used. Some titanium alloys are better cut with air or oxygen.

Piercing

Piercing is not recommended above 15 mm material thickness at >80A and 12 mm at <80A. When firing the pilot arc the nozzle must be protected from molten metal spattering back by keeping an adequate distance to the work piece. The piercing standoff distance must be at least double the cutting distance.
The piercing capacity is highly material dependant.

How to improve cutting quality

To reach the best possible results the first step is to assure that the plasma cutting system is properly installed an adjusted.
The cut quality is primarily determined from angle deviation, dross formation and the surface of the kerf.

Angle deviation

The angle deviation is either positive or negative. A positive angle deviation (V-shaped) occurs as a result of more material being removed in the upper part than the lower part of the cut. A negative angle deviation occurs as a result of the reversed conditions.
Problems with angle deviation consists either of the cut having too much angle deviation or inconsistent angle deviation, i.e. positive on one side, negative on the other.

Too much angle deviation

- Incorrect distance between nozzle and work piece. Adjust the distance.
  Too much distance > positive angle deviation
  To little distance > negative angle deviation

- Worn or damaged consumables. Check the parts and change if necessary.

- Wrong cutting direction. The left side of the cut seen from the cutting direction of the torch has less angle deviation than the opposite side. Check the direction and change if necessary.

- Too high cutting speed. By slowing the cutting speed the angle deviation can be minimised.

Inconsistent angle deviation

- Worn or damaged consumables. Check the consumables and change if necessary.

- The torch is not fitted straight in relation to the work piece. Check the torch position and adjust if necessary.

- Magnetic remanence in the work piece. Parts that are handled with electro-magnetic lift tools may become magnetic. Make sure that the material is handled without using magnetic lift tools.

Dross formation

Dross free cutting requires that all parameters for each job are optimised.

Dross formation as a result of too low cutting speed

- This type of dross formation occurs when the cutting speed is too low. The dross is extensive and porous. It is easy to remove. Reduce the dross formation by increasing cutting speed.

Dross formation as a result of too high cutting speed

- This type of dross formation occurs when the cutting speed is too high. The dross looks like drops of molten metal and is hard to remove.
  By lowering the cutting speed the dross formation can be reduced. If reducing the speed does not solve the problem it may help to lower the distance between nozzle and work piece.

Sporadic dross formation

- Worn or damaged consumables. Check and change if necessary.

- This type of dross formation may be material dependant. Some materials cause more dross than others.

- Work piece temperature. When cutting the first parts from a work piece the dross formation can be lass than when the material has become heated.

The surface of the kerf

The kerf may be convex or concave. An accurate adjustment of the cutting speed and distance can help in obtaining a straight cut.

Concave kerf

- Too little distance between nozzle and work piece. Increase the distance in order to straighten the kerf.

Convex kerf

- Too much distance between nozzle and work piece, or too high cutting current. By first lowering the torch and then if necessary lowering the current the kerf can be

straightened.
Some combinations of plasma generating gas and material can more than others cause convex kerfs.

Optimising consumable lifetime

The patented consumable parts of the water cooled torch guarantee the best possible consumable lifetime and optimum cutting economy. To optimise the consumable lifetime the following instructions must be followed.

Optimising electrode lifetime

- When piercing the torch must not be too close to the work piece
- Program the sequence so that the plasma arc goes out before the torch goes over the edge of the work piece. If the pilot arc re-ignites the electrode lifetime is reduced.
- The electrode lifetime can be increased by programming the sequence so that several parts are cut in one sequence, thereby reducing the number of starts.
- When changing plasma generating gas the gas system must be flushed.

Optimising nozzle lifetime

- When piercing, the torch must not be too close to the work piece. The piercing distance should be at least double the cutting distance.
- The distance between nozzle and work piece must be kept constant so that the nozzle does not touch the work piece.

5. ACCESSORIES FOR MANUAL PLASMA CUTTING

There are a number of accessories available for SPARCIN and SPARCON cutting systems equipped with hand torch.

Plasma gouging

All SPARCIN and SPARCON systems, except SPARCIN 5/5C, have gouging capability. By fitting the torch with nozzle extension, gouging nozzle (2,2 mm for <80 A, 3,0 mm for >80A), and protective cup for gouging (see torch parts lists) a powerful tool for gouging is obtained.

20 mm nozzle extension set

As an accessory there is a set of 20 mm nozzle extension, extended electrode and extended protective cup. This is useful for cutting in narrow places, corners, etc.

Contact cutting nozzle

By dragging the nozzle directly against the work piece a good cut quality can be obtained in material thickness up to 4 mm. To aid cutting against a template there are cylindrical contact cutting nozzles (art. No. 199108) available. Note that contact cutting is only allowed with cutting current up to 40 A.

Cutting wagon

For SPARCUT XL a two-wheel cutting wagon (art. No. 299027) is available. For both SPARCUT XL and DURACUT there is a four-wheel cutting wagon (art. No. 299078) adaptable for both torches available.

Circle cutting attachment

A circle attachment for DURACUT (art. No. 299079) and SPARCUT XL (art. No. 299082) for cutting radius between ca. 100 and 450 mm.

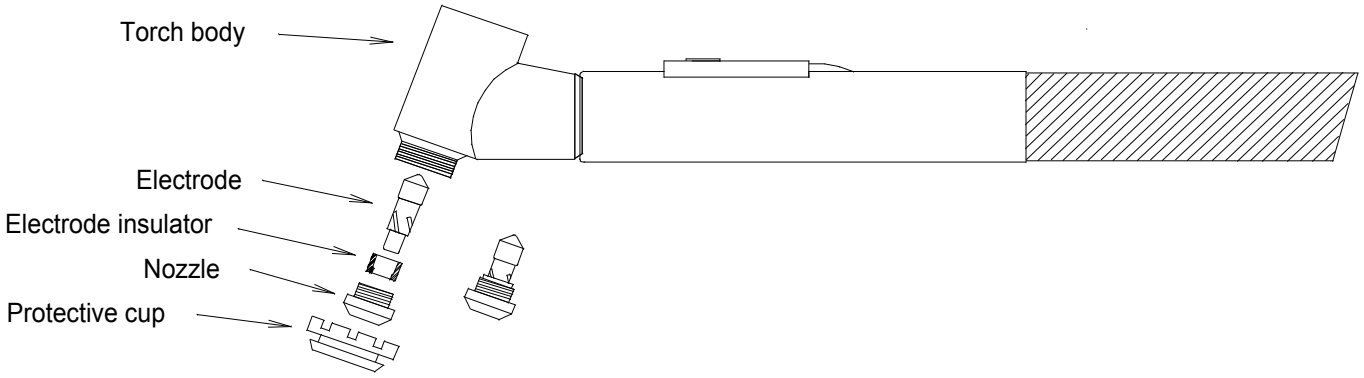
Distance cutting guide

For all hand torches there are two different types of distance cutting guides, art. No. 199107 and 199124. See the torch parts lists for more information.

CHANGING CONSUMABLES

WARNING! THE MACHINE MUST ALWAYS BE SWITCHED OFF WHEN CHANGING CONSUMABLES!

1. After removing the protective cup, loosen the nozzle with the nozzle tool. All the consumables can now be removed.
2. Please observe carefully the correct assembly of the consumables.
3. Tighten the nozzle with the nozzle tool.
4. Tighten the protective cup.



7. MAINTENANCE

Daily

Inspect and, if necessary, change nozzle, electrode and electrode insulator.

Empty and, if necessary, clean the moisture trap situated on the rear of the machine. This is easily done by pressing the bottom sealing of the glass cover while compressed air is connected, or by completely unscrewing the cover and cleaning it from dirt.

Carefully inspect the torch body and the hose assembly with regard to any damage and leakage of air, gas or water, mechanical damage or other.

NOTE! Never use a torch with damaged torch body or damaged hose assembly.

Every six months

Remove the plates from the machine. Inspect cable connections. Blow away dust and dirt with compressed air.

Check the quantity of coolant. If necessary, fill up with distilled or de-ionised water.

Coolant conductivity: < 5µS/cm.

Fill up with anti freezing agent when necessary.
Please note! The anti freezing agent shall be pure glycol.

8. TROUBLE SHOOTING

If pump, fan (and compressor) are working and the green READY lamp is not lit, check the following:

1. The thermal overload protection has been activated. Let the machine cool down while turned on until READY is lit again. The machine is now in working order.

2. Low coolant pressure. Check flow, level and for leakage.

3. Torch malfunction. Switch OFF the machine and then ON. If the READY lamp goes out again on attempt to establish pilot arc, change nozzle, electrode and electrode insulator and inspect the torch body and hose assembly for damage.

If the pilot arc does not strike:

- check and change the nozzle, electrode and electrode insulator

- check and adjust the gas pressure, 2,5-3/6 bar

- if possible, check the gas flow (14 l/min in LO/MED pos. 25 l/min in HI pos.). Too high gas flow will prevent the arc from striking.

If the pilot arc is unstable:

- too high gas/air flow, adjust the inlet pressure to 3/6 bar

- the machine is working two-phase, check mains fuses.

Inferior performance or cutting quality:

- check inlet gas/air pressure, 2,5-3/6 bar

- inspect the torch body and hose assembly for damage

- check nozzle, electrode and electrode insulator

- check the earth lead connection. If necessary, clean it from dirt, paint and oxide.

9. PERSONAL PROTECTION

Plasma cutting is, if correctly used, a safe, efficient and economically attractive method for cutting metals. However, like most industrial processes, it involves some risk factors. But they can be reduced - provided you are aware of them.

Plasma cutting produces noise, ultra violet radiation and fumes. For the safety of the workers some special measures should be taken.

To prevent burns:
The ultra violet (UV) radiation from the plasma arc may damage the eyes and the skin. The intensity of the radiation increases considerably near the arc. The operator and other persons near the work place should use some appropriate protection. The naked skin must be protected by wearing working clothes and protective gloves. An appropriate shield with glasses to protect from UV radiation must cover the eyes and face.

Noise:
Plasma cutting may produce some heavy noise. Always use good ear protection.

Fumes:
The operator and people near the work place should avoid as much as possible being exposed to the gases and smoke that might arise from the plasma cutting.
Provide for good ventilation combined with a suitable respiration protection and a correctly applied local exhaust system.
Remember that metals that are covered with or contain large quantities of lead, cadmium, zinc, chrome, nickel, mercury and beryllium may produce hazardous quantities of poisonous substances.

10. WARRANTY

SPT Plasmateknik AB grants a warranty for its products. The warranty covers damage caused by faulty raw material or production errors. A faulty part will be replaced by a new one, or, if possible, we will repair the faulty part without cost.

The warranty period is 2 years provided the machine is used under normal conditions (one shift working).

The warranty does not cover damage caused by improper or careless handling, overload, irresponsible maintenance or natural wear.

Any use of non-original parts or consumables renders the warranty void.

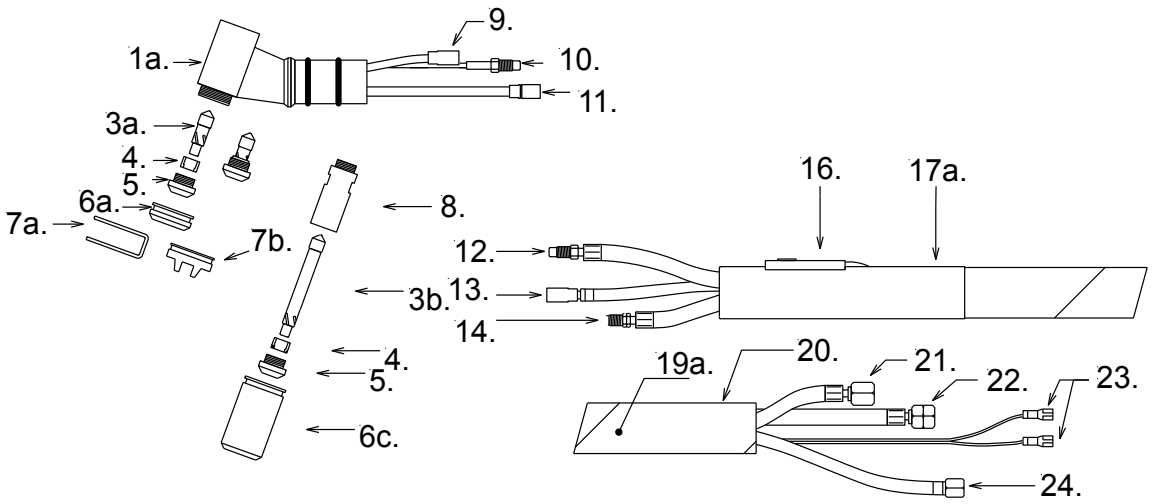
Travel costs in connection with warranty repairs or freight costs are not included in the warranty.

Warranty repairs may only be performed by SPT Plasmateknik AB or a representative assigned by SPT.

11. TORCHES/TORCH PARTS LISTS

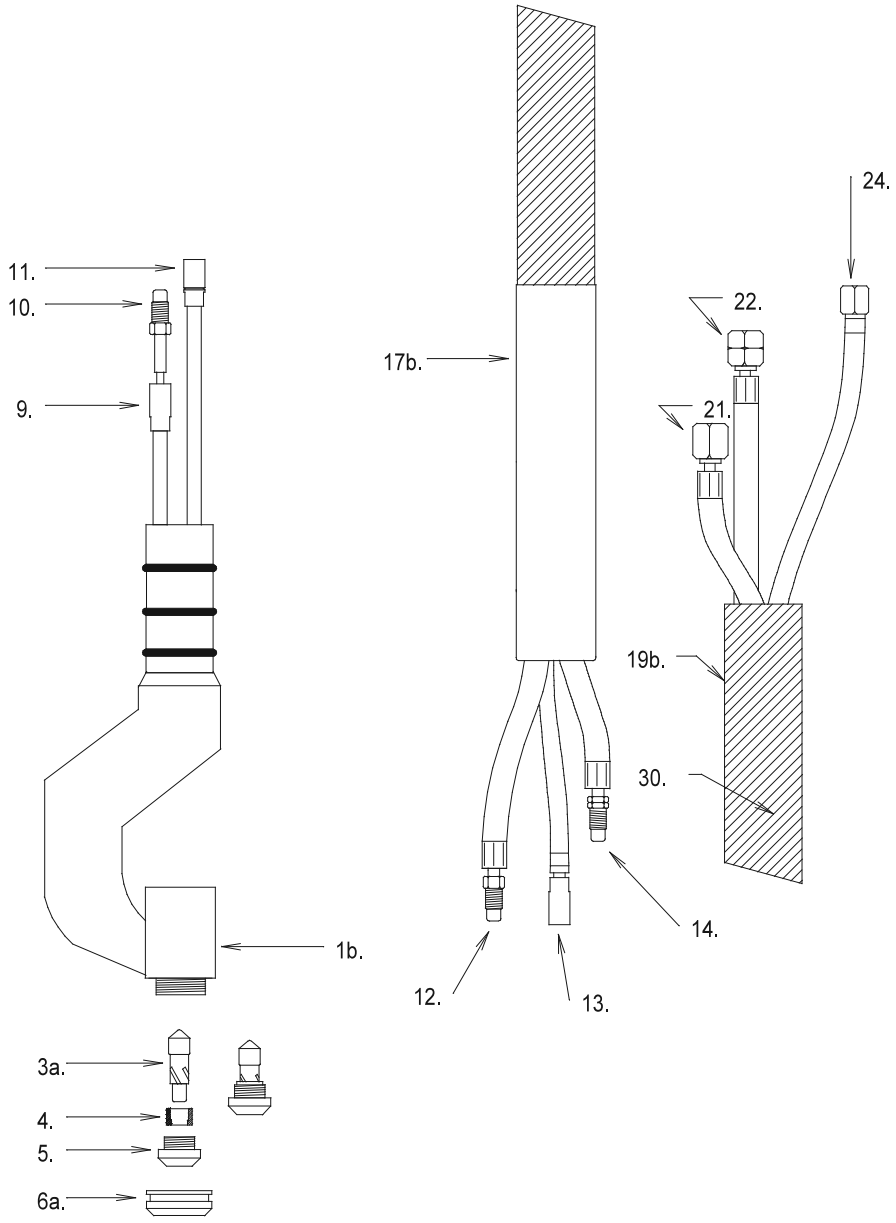
SPARCUT XL

LIQUID COOLED MANUAL TORCH



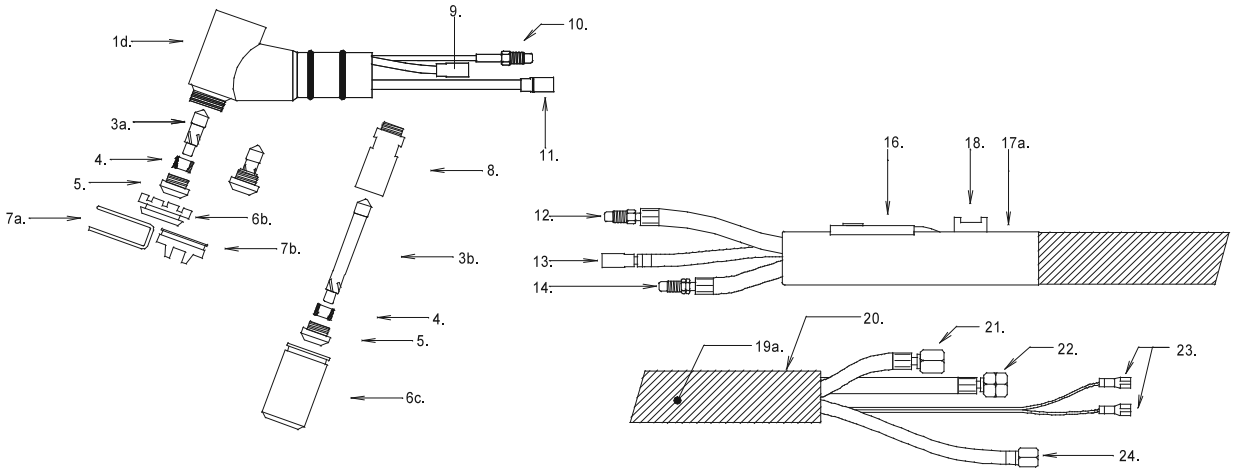
SPARCUT XL/M

LIQUID COOLED MACHINE TORCH



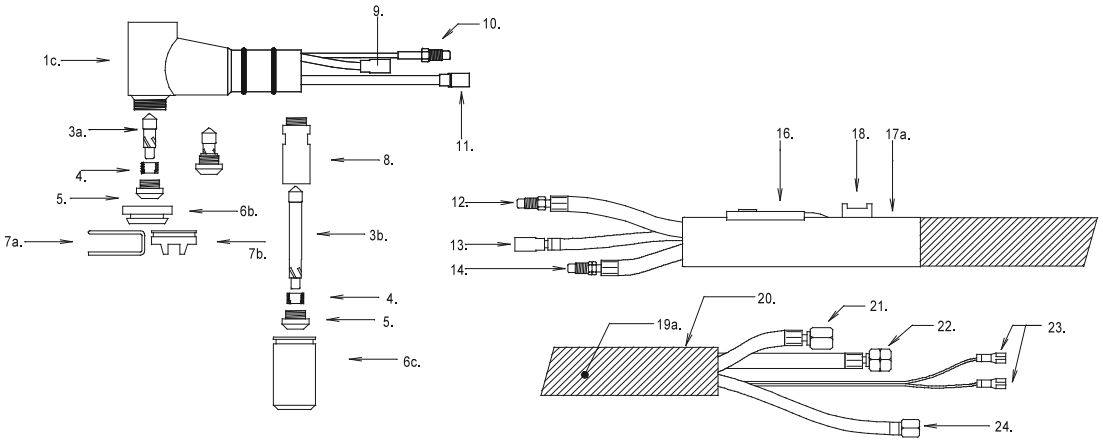
DURACUT

LIQUID COOLED MANUAL TORCH



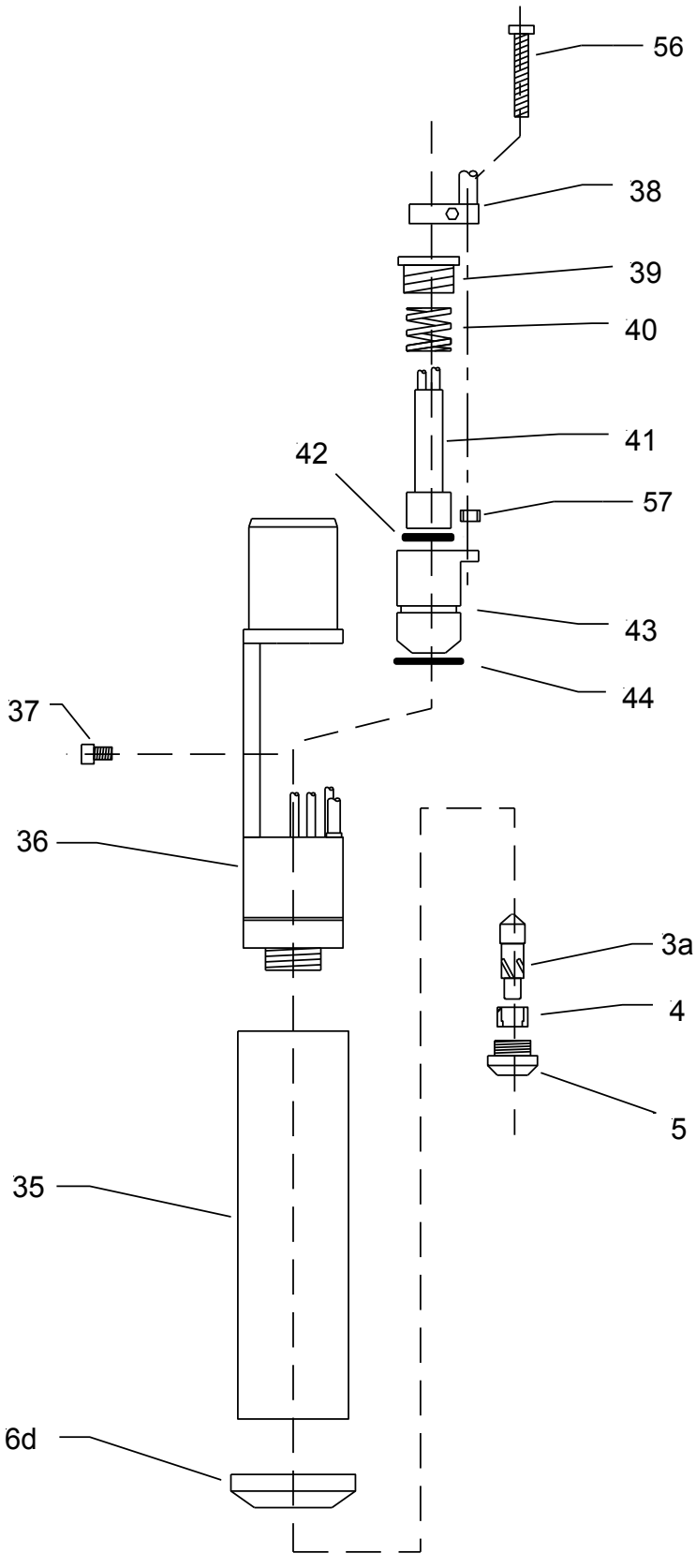
DURACUT 90

LIQUID COOLED MANUAL TORCH



BAZOOCUT™

SERVICEABLE HEAVY DUTY PLASMA CUTTING TORCH



PARTS LIST

Ref. No.	Det. No.	Denomination
1a.	299081	Torch body SPARCUT XL
1b.	299103	Torch body SPARCUT/M
1c.	299108	Torch body DURACUT 90
1d.	299072	Torch body DURACUT
2.	299010	Electrode cap
3a.	199002	Electrode, air
	199003	Electrode, gas
	199127	Electrode, O_2 FineL
	199128	Electrode, O_2 HI-Power
	199162	Electrode, Long Life
3b.	199114	Electrode for gouging
3c.	199202	Electrode, air long
3d.	199192	Electrode, air, EXCALIBUR
	199193	Electrode, gas, EXCALIBUR
4.	199006	Electrode insulator
5.	199060	Nozzle 0,9
	199001	Nozzle 1,1
	199101	Nozzle 1,4
	199113	Nozzle 2,2 for gouging
	199123	Nozzle 3,0 for gouging
	199143	Nozzle 0,7 FineL
	199144	Nozzle 0,8 FineL
	199146	Nozzle 1,1 S High Precision
	199147	Nozzle 1,4 S High Precision
6a.	199064	Protective cup, PTFE
6b.	199125	Protective cup, PTFE for DURACUT/DURACUT 90
6c.	199364	Protective cup for gouging
6d.	199158	Protective cup, PTFE for BAZOOCUT
--	199126	Spatter shield for DURACUT/DURACUT 90
§		(Not shown in picture)
7a.	199107	Distance cutting guide
7b.	199124	Distance cutting guide, brass
8.	199112	Nozzle extension 40mm for gouging
	199203	Nozzle extension 20mm for use with electrode 199202
9.		Connection to current/water
10.		Connection to gas/air
11.		Connection to pilot/water
12./22.		Current water hose
	299004	6m
	299039	12m
	299042	20m
13.	299020	Throttle pin for Type I hose assembly
	299051	Throttle pin for Type II hose assembly
	199018	Throttle pin for Type III hose assembly
14./21.		Pilot water hose
	299005	6m

	299038	12m
	299041	20m
15.		Connection to current lead
16.	199015	Torch switch START
17a.	199016	Torch handle for manual torches
17b.	199067	Torch handle for SPARCUT XL/M™ torch
18.	299074	Safety switch
19a.		Hose assembly for manual torch, liquid cooled, Type I
	299003	6m
	299032	12m
	299033	20m
		Hose assembly for manual torch, liquid cooled, Type II/III
	299045	6m
	299046	12m
	299047	20m
19b.		Hose assembly for machine torch, Type I
	299034	6m
	299035	12m
	299036	20m
		Hose assembly for machine torch, Type II/III
	299048	6m
	299049	12m
	299050	20m
20.	199110	Protective hose, Type I
	199111	Protective hose, Type II/III
23.	183202	Control cable
24.		Gas hose (without throttle pin)
	299006	6m
	299040	12m
	299043	20m
35.	199157	Cover
36.	299101	Front piece with holder
37.	199161	Nylon screw
38.	199155	Electrical connector
39.	199154	Tightening screw
40.	199153	Spring
41.	199156	Contact piece
42.	199159	Inner O-ring
43.	199152	Insulator
44.	199160	Outer O-ring
45.		Pilot lead
	299089	6m
	299090	12m
	299091	20m
46.		Gas hose
	299006	6m
	299040	12m
	299043	20m
47.		Coolant return hose
	299098	6m

	299099	12m
	299100	20m
48.		Coolant hose
	299095	6m
	299096	12m
	299097	20m
49.		Current lead
	299092	6m
	299093	12m
	299094	20m
50.	199164	Reduction nipple 8-4
51.	199036	Hose clamp
52.	299102	Gas hose l=55 mm
53.	199165	Reduction nipple 4-4
54.	299080	BAZOOCUT torch head complete
	299107	EXCALIBUR torch head complete
55.		Hose assembly BAZOOCUT/EXCALIBUR Type I
	299083	6m
	299084	12m
	299085	20m
		Hose assembly BAZOOCUT/EXCALIBUR Type II
	299086	6m
	299087	12m
	299088	20m
56.	199186	Nylon nut
57.	199187	Nylon screw
58.	199189	Electrical connector, EXCALIBUR
59.	199188	Contact piece, EXCALIBUR
60.	199190	O-ring, inner, contact piece, EXCALIBUR
61.	199191	O-ring, inner, electrical connector, EXCALIBUR

ACCESSORIES

299078	Distance roller, all torches
299082	Circle cutting bar, SPARCUT XL
299208	Circle cutting bar, SPARCSPLIT
299079	Circle cutting bar, DURACUT

COMPLETE TORCHES

IMPORTANT!
For SPARCON 9 and SPARCON 900 use only Type I torches. For SPARCIN 5/5C, SPARCIN 9, SPARCON 1200 and SPARCIN 1800 use only Type II torches. For SPARCIN 9C use only Type III torches. On Type III torches, the throttle nozzle has been removed. The use of incorrect torches may result in damage to torch and power source.

399001	SPARCUT XL 6m Type I
399005	SPARCUT XL 12m Type I
399006	SPARCUT XL 20m Type I
399009	SPARCUT XL 6m Type II
399010	SPARCUT XL 12m Type II
399011	SPARCUT XL 20m Type II
399047	SPARCUT XL 6m Type III
399004	SPARCUT XL/M 6m Type I
399007	SPARCUT XL/M 12m Type I
399008	SPARCUT XL/M 20m Type I
399012	SPARCUT XL/M 6m Type II
399013	SPARCUT XL/M 12m Type II
399014	SPARCUT XL/M 20m Type II
399046	SPARCUT XL/M 6m Type III
399020	SPARCSPLIT 6m Type I
399021	SPARCSPLIT 12m Type I
399022	SPARCSPLIT 20m Type I
399030	SPARCSPLIT 6m Type II
399031	SPARCSPLIT 12m Type II
399032	SPARCSPLIT 20m Type II
399048	SPARCSPLIT 6m Type III
399033	DURACUT 6m Type I
399034	DURACUT 12m Type I
399035	DURACUT 20m Type I
399036	DURACUT 6m Type II
399037	DURACUT 12m Type II
399038	DURACUT 20m Type II
399045	DURACUT 6m Type III
399042	DURASPLIT 6m
399049	BAZOOCUT 6m Type I
399050	BAZOOCUT 12m Type I
399051	BAZOOCUT 20m Type I
399052	BAZOOCUT 6m Type II
399053	BAZOOCUT 12m Type II
399054	BAZOOCUT 20m Type II
399055	EXCALIBUR 6m Type I
399056	EXCALIBUR 12m Type I
399057	EXCALIBUR 20m Type I
399058	EXCALIBUR 6m Type II

399059	EXCALIBUR 12m Type II
399060	EXCALIBUR 20m Type II

11. SPARE PARTS LIST

Machine parts for SPARCON 1200

Det. no.	Denomination	Remarks
234 005	Main transformer 400V	T1,T2,T3
235 001	Control transformer 230/400/500V	T4
236 001	Pulse transformer	T5
221 002	PCB ignition	E1
221 008	PCB under voltage guard	E2
124 002	Resistor 3R9, 200W	R1
124 004	Resistor 100R, 50W	R2
110 001	Capacitor 0,1µF, 1000V	C1,C2
111 001	Capacitor 330µF, 250V	C3
100 001	Rectifier bridge	D1,D2,D3
140 001	Transient protector	Z1
144 001	Contactor	K1,K2,K3
146 002	Auxiliary contact	K2
152 003	Solenoid valve	MV1,MV2
154 005	Fan	F
262 019	Pump	P
141 001	Mains switch, 16A, 500V	B1
141 002	Switch GASTEST, HI/LO	B2,B3
141 006	Switch REMOTE	B4
150 001	READY lamp	LA1
151 002	Fuse holder	
151 001	Fuse 3AT, 20x5mm	S1,S2
191 018	Wheel, solid	
191 019	Wheel, link	
262 006	Filter regulator complete	
191 021	Manometer	
253 003	Earth lead complete, 25mm², 5m	
191 020	Earth clamp LEM150	
143 001	Relay	RL3
163 001	Connection device	AD2
381 001	SPAREM remote control unit	

12. WIRING DIAGRAM