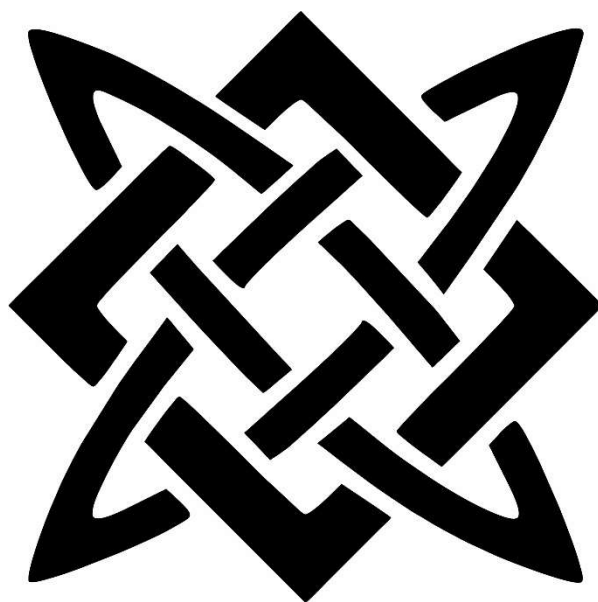


Plasma SVS-125 machine torch - cutting data for

**SVAROG 105 PLASMA CNC
SVAROG 125 PLASMA CNC**





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1. INTRODUCTION

This document is only about the SVS-125 machine torch. For information about the conditions of use and maintenance of the SVAROG 105 and SVAROG 125 plasma torches, please refer to the respective operating manuals.

Operating Instructions SVAROG 105	Instruction manual SVAROG 125
	

2. SV-FIT SYSTEM

The SV-FIT system allows for great variability in the use of different welding torch terminations or allows the torch length to be extended from the standard 9 m by 6 or 12 m using the Coax Extension Cable # 7088.

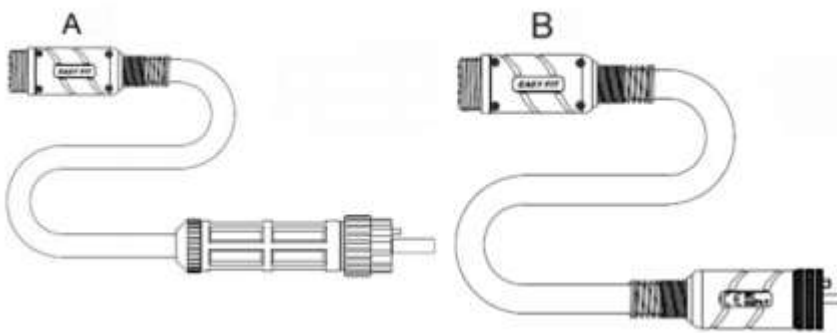


Fig. 1 SV-FIT system

3. TECHNICAL DATA OF THE SVS-125 TORCH

Max. input air pressure	bar	8,5
Load cell DZ-60%	A	125
Working pressure (cutting, SVH/SVS 125/6,7-9m torch)	bar	5,0 - 5,5
Working pressure (grooving, SVH-125 6.7m torch)	bar	4,0 - 4,5
Air consumption at 105 A (SVHSVS 125/6,7-9m Torch)	l/min	285
Air consumption at 125 A (SVHSVS 125/6,7-9m Torch)	l/min	295
Arc ignition		pneu-mechanic

Pressure air source requirements

See the relevant instructions.

4. SPARE AND CONSUMABLE PARTS

Lifetime of consumable parts

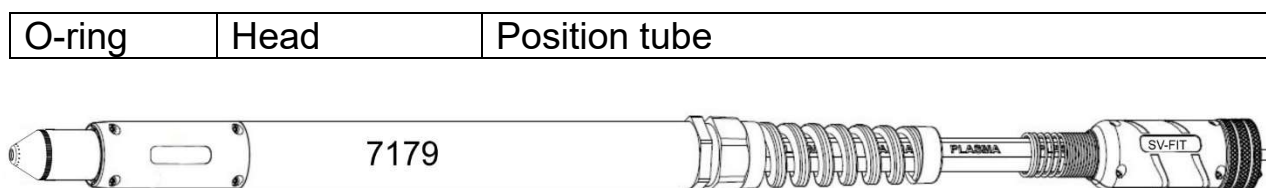
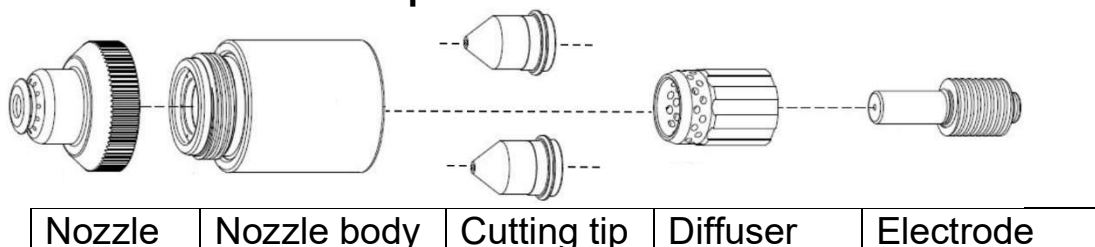
The need to change consumable parts on your torch depends on the thickness of the material to be cut, the length of the cut, the air quality (presence of moisture, oil and dirt), the way the cut starts (from the side or through the piercing), the appropriate piercing height, the cutting mode (solid material or perforated).

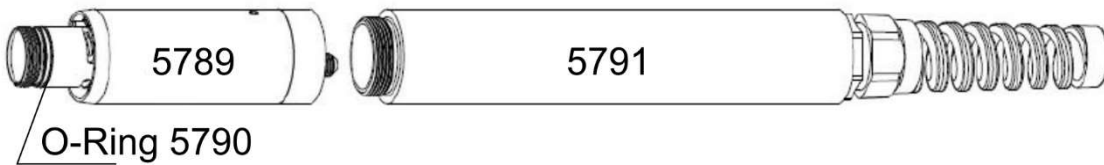
In general, the current set of consumable parts lasts on average 1 to 3 hours of cutting (arc firing). For machine cutting, the principle is that the electrode needs to be replaced at the same time as the nozzle. When replacing the 5790 o-ring, lubricate the o-ring area with 7101 lubricant.

How to choose the right consumable parts

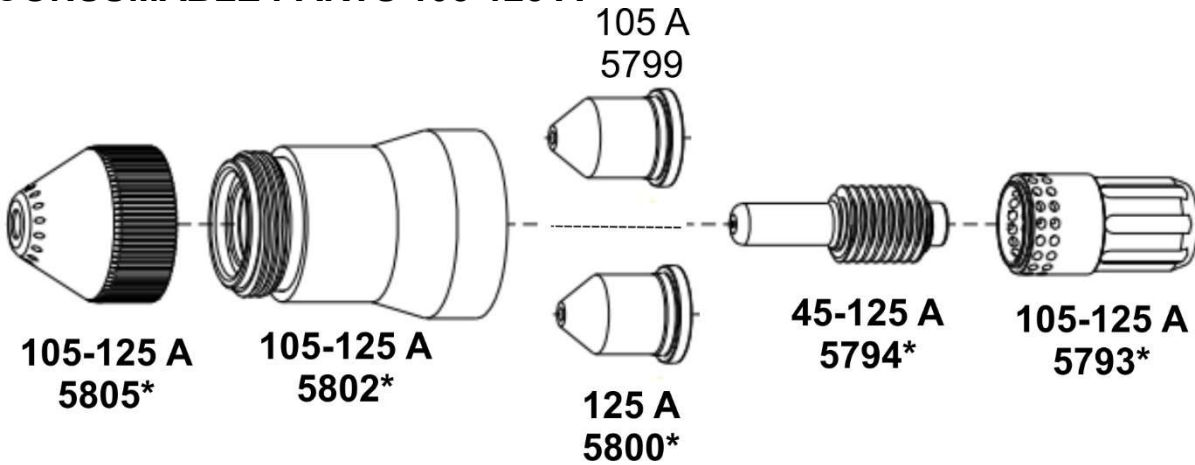
For the best quality of cut, it is essential to use the appropriate consumable parts assemblies. The assemblies are shown below by performance and type of operation.

Names of SVS Torch parts

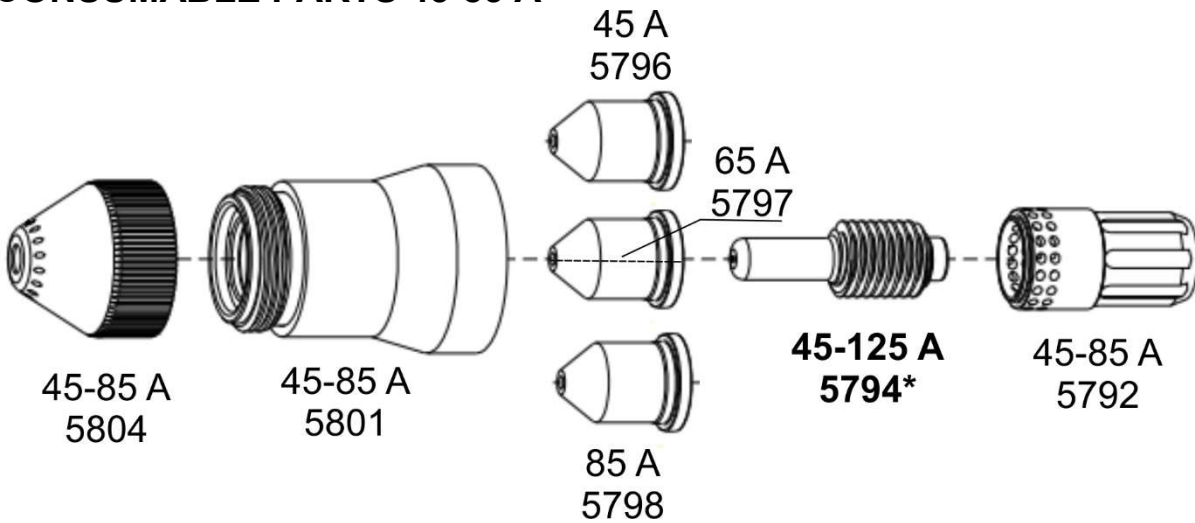




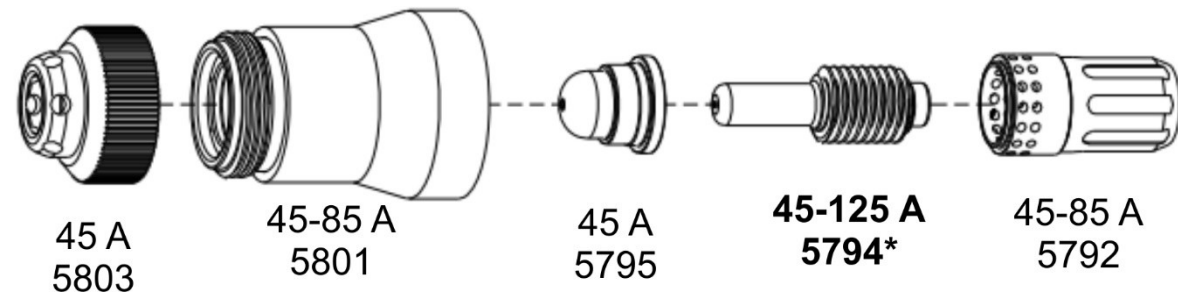
CONSUMABLE PARTS 105-125 A



CONSUMABLE PARTS 45-85 A



CONSUMABLE PARTS PRECISION CUT 30-45 A



Parts with * are fitted to the torch on delivery.

Start set

The starter kit includes the nozzle, nozzle body, plenum distributor and deflector, which are not fitted to the torch, nozzles and electrodes.

Code	Name	Number of
6071	START set for torch 125	
5803	Deflector 45A	1
5799	Cutting tip 105A (pack of 10)	2
5800	Cutting tip 125A (pack of 10)	5
5796	Cutting tip 45A (pack of 10)	2
5795	Cutting tip 45A precision cut (pack of 10)	2
5797	Cutting tip 65A (pack of 10)	2
5798	Cutting tip 85A (pack of 10)	2
5794	Electrode 45-125A (pack of 10)	20
5804	Machine nozzle 45-85A	1
5801	Nozzle-body 45-85A Long Life	1
5792	Gas distributor 45-85A Long Life (pack 2)	1

5. INDICATIVE PARAMETERS OF THE CUTTING JOINT

The parameters in the table are for reference only. They were measured at the highest cutting quality setting.

Current	Thickness (mm)														
	0,5	1	2	3	6	8	10	12	16	20	25	30	32	35	40
	Fine grain steel														
125 A					2,2	2,3	2,4	2,4	2,6	2,8	3,1	3,6	3,8	3,9	4,1
105 A					2	2,1	2,2	2,3	2,4	2,5	2,7	3	3,2		
85 A					1,9	2	2,1	2,2	2,5	2,6	2,9				
65 A			1,6	1,6	1,8	1,9	2	2,2	2,7	3,2	3,7				
45 A	1,6	1,4	1,3	1,5	1,6										
Precision cut	1,3	1,2	1,2	1,2											
	Stainless steel														
125 A					1,9	2,2	2,2	2,6	2,6	2,7	3,1	3	3	3,2	3,6
105 A					1,6	1,9	2,2	2,3	2,4	2,5	2,9	2,9	2,9		
85 A					1,7	1,8	2	2	2,2	2,4					
65 A			1,4	1,5	1,8	1,8	1,9	1,9	2,1	2,3					
45 A	1,4	1,2	1,2	1,5	1,7										
Precision cut	1,2	1,2	1	1											
	Aluminium														
125 A					2,3	2,5	2,6	2,6	2,8	2,9	2,8	2,9	3	3,3	3,7
105 A					1,9	2	2,2	2,2	2,3	2,3	2,5	2,5	2,5		
85 A					1,9	1,9	2,1	2,1	2,2	2,2					

65 A			1,9	1,9	1,9	1,9	2	2	2,1	2,2					
45 A		1,5	1,4	1,6	1,8										

6. INDICATIVE CUTTING PARAMETERS

Fine grain steel 125 A

Sheet thickness (mm)	Cutting height of the torch (mm)	Initial piercing height (mm)	Punching time (s)	Max. productive cut (m/min)	High cutting quality, speed (m/min)
6	4,6	9,2	0,2	5,96	4,98
8	4,6	9,2	0,3	4,57	3,8
10	4,6	9,2	0,4	3,33	2,75
12	4,6	9,2	0,5	2,51	2,05
16	4,6	11,5	0,6	1,66	1,31
20	4,6	11,5	2	1,14	0,98
25	4,6	11,5	3,5	0,76	0,68
30	4,6	Side start	1	0,55	0,45
32	4,6	Side start	1	0,5	0,4
35	4,6	Side start	1	0,43	0,34
40	4,6	Side start	1	0,31	0,24

Stainless steel 125 A

Sheet thickness (mm)	Cutting height of the torch (mm)	Initial piercing height (mm)	Punching time (s)	Max. productive cut (m/min)	High cutting quality (m/min)
6	4,6	9,2	0,5	7,69	5,91
8	4,6	9,2	0,5	5,55	4,06
10	4,6	9,2	0,5	3,7	2,54
12	4,6	9,2	0,5	2,3	1,82
16	4,6	11,5	0,7	1,37	1,14
20	4,6	11,5	1,2	1,03	0,82
25	4,6	Side start	1	0,76	0,54
30	4,6	Side start	1	0,64	0,43
32	4,6	Side start	1,1	0,6	0,4
35	4,6	Side start	1,2	0,45	0,32

40	4,6	Side start	1,2	0,21	0,18
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Aluminium 125 A

Sheet thickness (mm)	Cutting height of the torch (mm)	Initial piercing height (mm)	Punching time (s)	Max. productive cut (m/min)	High cutting quality (m/min)
6	4,6	9,2	0,2	8,56	7,66
8	4,6	9,2	0,3	6,1	5,1
10	4,6	9,2	0,4	4,02	2,98
12	4,6	9,2	0,5	3,07	2,14
16	4,6	11,5	0,6	2,09	1,54
20	4,6	11,5	2	1,5	1,26
25	4,6	11,5	3,5	1,05	0,85
30	4,6	Side start	1	0,83	0,54
32	4,6	Side start	1,1	0,75	0,43
35	4,6	Side start	1,2	0,58	0,37
40	4,6	Side start	1,2	0,3	0,27

Fine grain steel 105 A

Sheet thickness (mm)	Cutting height of the torch (mm)	Initial piercing height (mm)	Punching time (s)	Max. productive cut (m/min)	High cutting quality (m/min)
6	4,6	9,2	0,5	4,92	4,11
8	4,6	9,2	0,6	3,77	3,22
10	4,6	9,2	0,8	2,73	2,41
12	4,6	9,2	0,7	1,98	1,81
16	4,6	11,5	1	1,23	1,05
20	4,6	11,5	1,3	0,85	0,78
25	4,6	Side start	Side start	0,58	0,54
30	4,6	Side start	Side start	0,4	0,37
32	4,6	Side start	Side start	0,38	0,35

Stainless steel 105 A

Sheet thickness (mm)	Cutting height of the torch (mm)	Initial piercing height (mm)	Punching time (s)	Max. productive cut (m/min)	High cutting quality (m/min)
6	4,6	9,2	0,5	5,78	5,32
8	4,6	9,2	0,5	3,94	3,65
10	4,6	9,2	0,5	2,42	2,23
12	4,6	9,2	0,6	1,85	1,49
16	4,6	11,5	1	1,05	0,95
20	4,6	11,5	2,5	0,79	0,66
25	4,6	Side start	Side start	0,52	0,44
30	4,6	Side start	Side start	0,35	0,33
32	4,6	Side start	Side start	0,32	0,28

Aluminium 105 A

Sheet thickness (mm)	Cutting height of the torch (mm)	Initial piercing height (mm)	Punching time (s)	Max. productive cut (m/min)	High cutting quality (m/min)
6	4,6	9,2	0,5	6,7	5,95
8	4,6	9,2	0,6	4,7	4,1
10	4,6	9,2	0,8	3,2	2,55
12	4,6	9,2	0,7	2,41	1,85
16	4,6	11,5	1	1,6	1,25
20	4,6	11,5	1,3	1,15	0,98
25	4,6	Side start	Side start	0,78	0,64
30	4,6	Side start	Side start	0,56	0,42
32	4,6	Side start	Side start	0,48	0,33

Fine grain steel 85 A

Sheet thickness (mm)	Cutting height of the torch (mm)	Initial piercing height (mm)	Punching time (s)	Max. productive cut (m/min)	High cutting quality (m/min)
3	3,2	5,5	0,1	9,02	5,44
4	3,2	5,5	0,2	7,16	4,52
6	3,2	5,5	0,5	4,32	2,88

8	3,2	5,5	0,5	3,04	2
10	3,2	5,5	0,5	2,03	1,35
12	3,2	6,5	0,7	1,57	1,03
16	3,2	6,5	1,1	0,92	0,7
20	3,2	8,6	1,3	0,67	0,46
25	3,2	Side start	Side start	0,45	0,28
30	3,2	Side start	Side start	0,3	0,16

Stainless steel 85 A

Sheet thickness (mm)	Cutting height of the torch (mm)	Initial piercing height (mm)	Punching time (s)	Max. productive cut (m/min)	High cutting quality (m/min)
3	3,2	5,5	0,1	9,02	6
4	3,2	5,5	0,2	7,35	4,88
6	3,2	5,5	0,5	4,51	2,96
8	3,2	5,5	0,5	2,99	1,96
10	3,2	5,5	0,5	1,87	1,24
12	3,2	6,5	0,7	1,38	0,88
16	3,2	6,5	1,2	0,75	0,56
20	3,2	Side start	Side start	0,56	0,39
25	3,2	Side start	Side start	0,37	0,24

Fine grain steel 65 A

Sheet thickness (mm)	Cutting height of the torch (mm)	Initial piercing height (mm)	Punching time (s)	Max. productive cut (m/min)	High cutting quality (m/min)
2	1,5	3,8	0,1	7	5,93
3	1,5	3,8	0,2	6,08	5,15
4	1,5	3,8	0,5	5,1	4,2
6	1,5	3,8	0,5	3,23	2,52
8	1,5	3,8	0,5	2,22	1,68
10	1,5	4,5	0,7	1,49	1,085
12	1,5	4,5	1,2	1,14	0,84
16	1,5	6	2	0,64	0,55
20	1,5	Side start	Side start	0,45	0,34

25	1,5	Side start	Side start	0,27	0,21
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Stainless steel 65 A

Sheet thickness (mm)	Cutting height of the torch (mm)	Initial piercing height (mm)	Punching time (s)	Max. productive cut (m/min)	High cutting quality (m/min)
2	1,5	3,8	0,1	9,97	7,8
3	1,5	3,8	0,2	8,24	6,51
4	1,5	3,8	0,5	6,11	5,1
6	1,5	3,8	0,5	2,84	2,4
8	1,5	3,8	0,7	1,86	1,47
10	1,5	4,5	0,7	1,245	0,95
12	1,5	4,5	1,2	0,91	0,74
16	1,5	Side start	Side start	0,49	0,49
20	1,5	Side start	Side start	0,36	0,295

Aluminium 65 A

Sheet thickness (mm)	Cutting height of the torch (mm)	Initial piercing height (mm)	Punching time (s)	Max. productive cut (m/min)	High cutting quality (m/min)
2	1,5	3,8	0,1	10,27	7,805
3	1,5	3,8	0,2	8,79	6,565
4	1,5	3,8	0,5	7,32	5,32
6	1,5	3,8	0,5	4,375	2,485
8	1,5	3,8	0,7	2,75	2,015
10	1,5	4,5	0,7	1,65	1,535
12	1,5	4,5	1,2	1,33	1,055
16	1,5	Side start	Side start	0,8	0,64
20	1,5	Side start	Side start	0,55	0,335

Fine grain steel 45 A

Sheet thickness (mm)	Cutting height of the torch (mm)	Initial piercing height (mm)	Punching time (s)	Max. productive cut (m/min)	High cutting quality (m/min)
0,5	0,5	0,2	0	12,49	8,89

1	0,5	0,2	0	10,76	8,89
1,5	0,5	0,2	0,1	10,16	8,04
2	1,5	3,8	0,3	7,77	6,565
3	1,5	3,8	0,4	4,89	3,725
4	1,5	3,8	0,4	3,55	2,2
6	1,5	3,8	0,5	2,05	1,265

Stainless steel 45 A

Sheet thickness (mm)	Cutting height of the torch (mm)	Initial piercing height (mm)	Punching time (s)	Max. productive cut (m/min)	High cutting quality (m/min)
0,5	0,5	2	0	12,51	8,89
1	0,5	2	0	10,76	8,89
1,5	0,5	2	0,1	10,16	7,825
2	1,5	3,8	0,3	8,645	6,09
3	1,5	3,8	0,4	4,405	3,585
4	1,5	3,8	0,4	2,6	2,185
6	1,5	3,8	0,5	0,99	0,97

Aluminium 45 A

Sheet thickness (mm)	Cutting height of the torch (mm)	Initial piercing height (mm)	Punching time (s)	Max. productive cut (m/min)	High cutting quality (m/min)
1	1,5	3,8	0	11,1	9,145
2	1,5	3,8	0,1	9,21	7,47
3	1,5	3,8	0,2	6,19	4,675
4	1,5	3,8	0,4	4,845	3,7
6	1,5	3,8	0,5	2,795	1,74

Fine grain steel precision cut

Sheet thickness (mm)	Cutting height of the torch (mm)	Initial piercing height (mm)	Punching time (s)	Max. productive cut (m/min)	High cutting quality (m/min)	Current (A)
0,5	1,5	2,25	0	-	4,33	30
0,6	1,5	2,25	0	-	4,08	30
0,8	1,5	2,25	0,1	-	4,064	30

1	1,5	2,25	0,2	-	4,826	40
1,5	1,5	2,25	0,4	-	4,826	40
2	1,5	2,25	0,4	-	4,75	45
3	1,5	2,25	0,5	-	3,45	45
4	1,5	2,25	0,5	-	1,28	45

Stainless steel precision cut

Sheet thickness (mm)	Cutting height of the torch (mm)	Initial piercing height (mm)	Punching time (s)	Max. productive cut (m/min)	High cutting quality (m/min)	Current (A)
0,5	0,5	2,02	0	-	4,825	30
0,6	0,5	2,02	0	-	4,825	30
0,8	0,5	2,02	0,1	-	4,825	30
1	0,5	2,02	0,2	-	4,825	40
1,5	0,5	2,02	0,4	-	4,825	40
2	0,5	2,02	0,4	-	4,55	45
3	0,5	2,02	0,5	-	2,34	45
4	0,5	2,02	0,5	-	0,998	45

7. THE MOST COMMON MISTAKES IN MACHINE CUTTING

Insufficient cutting penetration, excessive sparks on the top of the sheet during cutting. Possible causes:

1. The sheet metal has an unclean surface from rust or paint.
2. Consumable parts are worn out. For optimum machine cutting, replace electrodes and cutting tips at the same time.
3. High cutting speed.
4. The current is set too low.
5. Large material thickness and inappropriate choice of cutting current and cutting tip diameter.
6. Poor electrical contact between the grounding clamp and the material.

Pilot arc passes, but no ignition

1. There is poor electrical contact between the cut sheet and the grounding clamp.
2. Torch cutting height too high.

The cutting arc is unstable, goes out and "shoots"

1. Worn cutting tip or electrode, replace both.
2. High air pressure.
3. Polluted air.
4. Untrapped water condensate.

👉 Notice 👈

An unstable arc causes very intense interference that can cause the machine control system to collapse or endanger surrounding equipment!

Conical cut

1. If a crooked cut occurs, turn off the machine, release the nozzle body, and rotate the cutting tip about 1/4 and try cutting again.
2. Damaged cutting tip and electrode, replace both.
3. The position of the torch is not perpendicular to the material.
4. Large distance of the torch from the material.

👉 Notice 👈

If the electrode is burnt deeper than 1.5mm, it must be replaced together with the cutting tip.

Scales on the underside of the cut

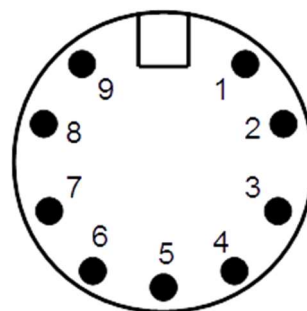
1. High air pressure.
2. Damaged cutting tip or electrode, replace both.
3. The cutting speed is not correct.
4. The distance between the torch and the cut sheet is not correct.

Consumable lifetime is short

1. High or low air pressure.
2. Set current, cutting speed and other parameters are not set according to chapter recommendations
3. The puncture is made from an inappropriate height.
4. The air quality is not good.

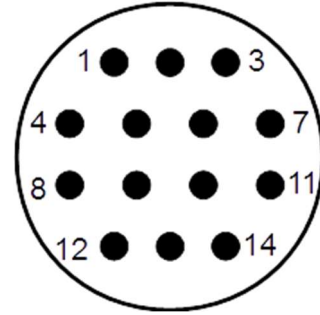
8. TORCH WIRING DIAGRAM

PIN NO.	TORCH
1	Torch switch
2	Torch switch
3	Machine / manual torch
4	/
5	Pilot arc
6	Pilot arc
7	/
8	Safety
9	Safety



9. CNC REMOTE CONTROL SCHEMATIC + DIVIDER

PIN #	DIRECTION
1	Current setting Input I+
8	Start
9	Start
6	Divider output arc voltage (+)
7	Divider output arc voltage (-) Current setting Input I-
13	Signal OK move cutting arc is ON
14	Signal OK move cutting arc is ON



Signal	Type	Instruction	The connector socket
Trigger Start (start plasma)	Input	Normally open. 18 VDC open circuit voltage at START terminals. Requires dry contact closure to activate.	8,9
OK MOVE	Output	Normally open. Dry contact closure when the arctransfers. 120 VAC/1 A maximum at the machine interface relayor switching device (supplied by the customer).	13,14
Voltage divider	Output	CUT: Divided arc signal of 20:1,30:1, 40:1, 50:1 (provides a maximum of 18 V).	6 (+), 7 (-)

Machines with CNC interface are equipped with the possibility of remote current adjustment. The setting is done by using current from an external source. The output current of the machine can be controlled in the range of 20A up to the value set by the encoder, i.e. if we set e.g. 60A on the potentiometer, we will be able to control the current with an external signal in the range of 20-60A. Remote control signal for current setting 3-25 mA (1 - 5 V)

DIP switches - Voltage divider

Scale selection	20:1	30:1	40:1	50:1
Dial number				
1	ON	1	1	1
2	2	ON	2	2
3	3	3	ON	3
4	4	4	4	ON

The voltage divider is factory preset to 20:1. To change the voltage divider to a different setting:

1. Switch off the plasma and disconnect the power cord from the mains.
2. Remove the plasma cover.
3. The voltage divider DIP switches are on the left side of the plasma.

