Kjellberg
FINSTERWALDE

the FINE FOCUS company

Plasma Cutting Machine Fine*Focus* 450

and Plasma Fine Focus Torches
PB-S47 W-1
PB-S47 W-1/O_2

Have Confidence in Your Investment

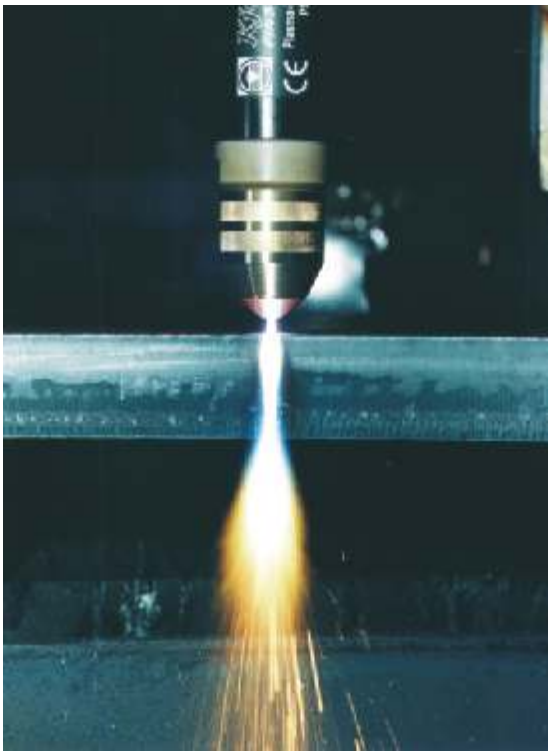
Take Advantage of over 40 Years of Experience and Know-How in the Production of Plasma Techniques !

Since 1960 Kjellberg plasma technology has applied standards for the cutting of metallic materials.

With the new plasma cutting machine Fine*Focus* 450 we offer our most modern technology. Quick and clean almost kerf free cutting gives higher productivity and reduced costs.

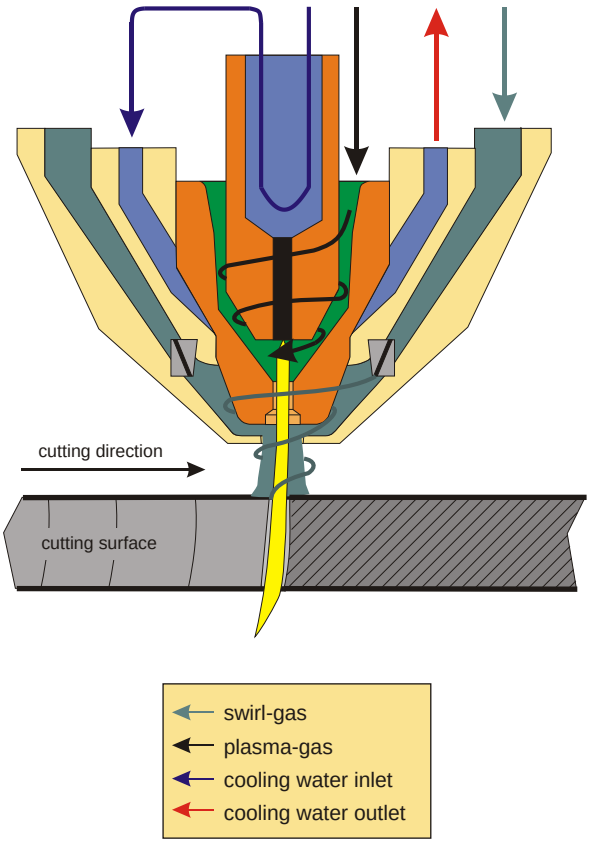
The usually necessary cleaning costs can be reduced to a minimum.

Plasma Fine Focus Torches from Kjellberg Finsterwalde with Double-Straight-Effect give technologically usable cutting surfaces with excellent quality on both sides.



We are the specialists in Plasma Technology !

- The Plasma Fine Focus Torches PB-S47 W and PB-S47 W-1/O_2 (according to patent no. DE 3832630 / DE 301299) are equipped with swirl-gas cap and gas flow control.
- “Stationary” piercing up to 12 mm material thickness with high reliability over a long period.
- The potential-free swirl-gas cap protects the cutting nozzle from spraying material and a high cutting quality over a maximum period is guaranteed.
- “Flying” piercing with height control is perfectly mastered up to 25 mm material thickness.
- Small run-on cuts make the production of small circles and holes possible.
- With swirl-gas cuts of high alloyed steels without slag-adherence and of excellent quality will be achieved.
- Nitrogen as swirl gas considerably prolongs the life of the tungsten cathode as the portion of nitrogen at the plasma gas itself is reduced.



Swirl-gas technology
with Plasma Fine Focus Torches PB-S47 W / PB-S47 W-1/O_2

Reasons, why you will always have a good cut with our Plasma Technique !

Mild steels

- Metallurgicly perfect cutting surfaces for welding seam preparation when cutting with oxygen.
- Our world-wide unique XL-Life-Time System with dual-gas ignition and the swirl-gas cap give extra life for the spare parts.
- Amazingly smooth cutting surfaces.
- Cuts with almost no slag-adherence.
- High precision hole cutting even for small diameters.

High alloyed steels

- Metallicly clean cutting surfaces for highest demands.
- Almost rectangular cutting edges.
- Bevel cuts up to 45°.
- Excellent cutting rsult, scarcly aftertreatment
- Small kerfes, therfore minimum material loss and low pollution.

Aluminium / Aluminium alloys

- Excellent cutting quality when using Ar/H_2 as plasma gas.
- Cuts with no or almost no slag-adherence.
- Outstanding accuracy at all cutting tasks

The Fine*Focus* 450 is unbeaten in its range of capacity

- Steplessly controllable cutting current from 40 to 130 A (100 A / 100 % d.c.) for quality cuts up to 35 mm and maximum cuts up to 45 mm material thickness (material depending, standard).
- Excellently suitable for industrial use for CNC controlled cutting jobs.
- Outstanding cutting quality by very smooth cutting current by means of a 12-pulse rectificaton.
- Contactless high-voltage ignition for starting the pilot arc.
- Meets highest safety standards according to VBG 15 (UVV 26.0)
- Preset control to preset the desired cutting current and digital display for cutting current and voltage.
- Select control for adjusting the cutting current by the potentiometer of the system by means of the remote control or by a CNC system (profile cutting machine, robot, active control).
- Direct pre-selection of the plasma gases or the plasma gas mixtures (air, O_2, Ar/H_2, $Ar/H_2/N_2$).
- User-friendly and comprehensive diagnostic and service system to control the most important ope-rational conditions by LEDs:
  - Stand-by,
  - Pilot arc function and main arc function,
  - Nozzle protection circuit,
  - Pilot arc time,
  - Thermal protection, coolant, plasma gases,
  - Accumulative error information and so on.

Plasma Fine Focus Torches for mechanised cutting

For this purpose three torch models are at your disposal::

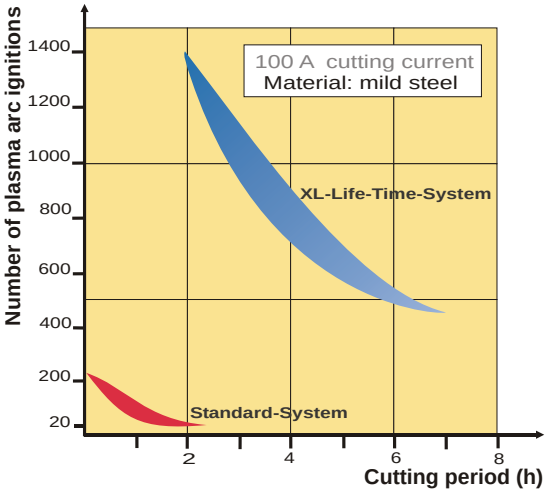
- The Plasma Fine Focus Torch PB-S47 W-1/O_2 with two solenoid valves:
  - 1 solenoid valve for the plasma gas (O_2) and
  - 1 solenoid valve for the dual-gas igniton.

  This torch can be also adapted to the plasma gases Ar/H_2/N_2 andair.
- The Plasma Fine Focus Torches PB-S47 W/L and PB-S47 W/A are equipped with a solenoid valve for the gas flow control of the plasma gases air / Ar/H_2/N_2. They can be adapted to the corresponding plasma gas by exchanging nozzle and cathode.
- The hoses of the plasma torches are available up to 15 m (standard 6 m and 10 m) and can be additionally equipped with an HF-screening for the application to CNC controlled guidance systems.
- PB-S47 W-1/O_2, PB-S47 W/L or PB-S47 W/A can be also used without swirl-gas cap, a protection cap (with insulation) ensures the torch protection instead.
- The protection cap is electro-pneumatically controlled.

1. **Plasma Fine Focus Torch PB-S47 W-1/O_2 with dual-gas ignition for cutting with oxygen**
2. **Plasma Fine Focus Torch PB-S47 W-1/O_2 with spare parts**
3. **Plasma Fine Focus Torch PB-S45 W, special model 90°**
4. **Plasma Fine Focus Torch PB-S45 W, special model 60°**

Oxygen Cutting Technology with XL-Life-Time and Dual-Gas Ignition

- When cutting unalloyed steels with air as plasma gas the cutting surface confines the nitrogen portion of the air. This can result in porosity at the welding seam if the surface is not cleaned.
- Oxygen as plasma gas avoids this metallurgical problem, achieves a very good cutting quality and therefore saves cleaning costs considerably.
- The XL-Life-Time technology with dual-gas ignition prolongs the life of the spare parts.
- With 1,400 plasma arc ignitions/nozzle up to 100 A Kjellberg is the technology leader in cutting with oxygen.



Longer life of the spare parts directs to reduced operating costs

Longer life of nozzle and cathode by:

- Extremely effective water cooling directly at the area of stress of nozzle and cathode.
- Soft start circuit for the cutting current.
- Process optimised gas flow control for piercing and at the end of the cutting process.

Peripheral Accessories for precise and reproducable adjustment of the process data

Plasma gas adjustment unit PGE 1 with plasma gas connection unit PGA 1 for the plasma gases air and O_2 as well as for the swirl-gases.

Plasma gas adjustment unit PGE 2 with plasma gas connection unit PGA 2 for the plasma gases Ar, H_2, N_2.

The plasma ignition unit PZ-S47 W in connection with the hose extension PZL-S47 W-1 (standard 10, 20, 30 and 40 m) enlarges the radius of operation of the plasma torch up to 55 m.

The plasma gas mixing unit PM-S47 W ensures a homogeneous gas mixture for constantly excellent cutting quality when using the gases Ar, H_2, N_2.

Important hint!

If the plasma torch is directly connected to the power source the PGE 1 and PGE 2 are generally placed on top of the power source. For a better handling of the gas hoses of the plasma torch the PGE 1 and PGE 2 are each additionally equipped with a plasma gas connection unit PGA 1 and PGA 2. If using hose extensions with plasma gas ignition boxes the PGA 1 and PGA 2 are not necessary. For switching from the swirl-gas air over to the swirl-gas nitrogen a switching unit WGU 1 is at your disposal.

Technical Data

Plasma Cutting Machine Fine*Focus* 450

Mains voltage [1]		230 /400 V, 3 Ph, 50Hz
Fuse, slow		80 / 50 A
Connecting power		34 kVA
Protection class		IP 22
Insulation class		F
Cutting current		40 - 130 A, stepless 130 A / 75% duty cycle 100 A / 100% duty cycle
Cutting range (material depending)	● **quality cut** ● **max. cut**	35 mm 45 mm
Piercing	● **stationary** ● **flying**	12 mm 25 mm
Plasma gases		Air, O_2, Ar/H_2, Ar/H_2/N_2, Ar/N_2, N_2
Ignition		high voltage
Open-circuit-voltage		400 V
Weight		251 kg
Dimensions (l x w x h)		1025 x 711 x 970 mm

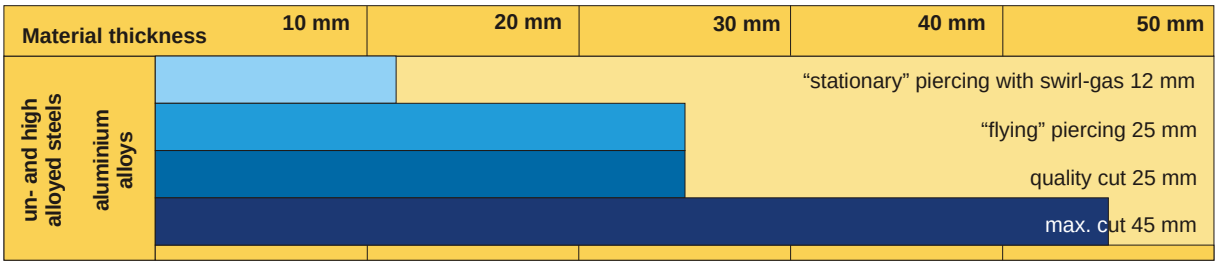
1) Other voltages and frequences on request

Plasma Machine Torch [3]

Type		**PB-S47 W-1/O_2**	**PB-S47 W/L** **PB-S47 W/A**
Hose lengths [1]		6 m, 10 m, 15 m	
Forced-circulation cooling flow rate		3.8 l/min	
Water pressure		0.45 MPa	
Pilot arc current		19 A	
Cutting current		max. 130 A	
Torch diameter		42 mm	42 mm
Ignition of the main arc		fully automatic power increase at workpiece contact	
Plasma gas pressure [2]	**Air**	0.4 - 0.6 MPa (Ignition gas)	0.5 - 0.6 MPa
	O_2	0.4 - 0.6 MPa	-
	Ar	0.5 - 0.6 MPa	0.5 - 0.6 MPa
	H_2	0.5 - 0.6 MPa	0.5 - 0.6 MPa
	N_2	0.5 - 0.6 MPa	0.5 - 0.6 MPa
Plasma gas-flow rate [2]	**Air**	20 - 26 l/min (Ignition gas)	20 - 26 l/min
	O_2	20 - 26 l/min	-
	Ar	20 - 26 l/min	20 - 26 l/min
	H_2	20 - 26 l/min	20 - 26 l/min
	N_2	20 - 26 l/min	20 - 26 l/min
Swirl-gas pressure [2]		0.5 - 0.6 MPa	0.5 - 0.6 MPa
Swirl-gas flow rate [2]		26 - 49 l/min	26 - 49 l/min

1) Other lengths on request
2) The exact values arc given in the tables at the service manuals
3) Also with HF screening for CNC operation available

Cutting Parameter



Cutting Speed Fine*Focus* 450 (m/min) [1)]

Material thickness (mm)	Mild steel		High alloyed steel			Aluminium	
	Air	Oxygen	Air	ArH_2N_2	ArH_2	ArH_2	Air
5	>5.0 [2)]	5.0	>5.0	2.5	-	>5.0	>5.0
	3.6 [3)]	3.4	3.7	2.1	-	4.2	4.5
10	2.4	2.5	3.4	1.7	-	3.6	3.5
	2.0	1.8	2.6	1.35	-	3.0	3.0
15	1.5	1.6	2.2	1.1	1.25	2.35	2.5
	1.25	1.25	1.7	0.9	1.2	1.85	1.1
20	1.0	1.0	1.4	0.75	0.9	1.45	1.7
	0.75	0.8	1.2	0.6	0.7	1.1	1.3
25	0.7	0.7	0.9	0.55	0.7	1.15	1.35
	0.5	0.6	0.75	0.4	0.6	0.95	0.8
30	0.5	0.5	0.6	-	0.5	0.9	1.0
	0.35	0.4	0.5	-	0.35	0.6	0.5
35	0.38	0.35	0.35	-	0.4	0.75	0.7
	0.25	0.25	0.3	-	0.3	0.45	0.35
40	0.25	0.2	0.25	-	0.3	0.7	0.4
	0.2	0.2	0.2	-	0.25	0.35	0.2
45	0.2	0.15	0.2	-	0.25	0.5	0.3
	0.15	-	0.1	-	0.2	0.25	0.15

1) standards (material depending, straight cuts)
2) max. cut
3) quality cut

Quality features

CE
EN
S
ISO 9001

The plasma cutting system Fine*Focus* 450 possesses the CE conformity and also conforms to the valid regulations of the European Union.

Development and production take place according to the following standards:

EN 60974-1 (VDE 0544, part 1); EN 50078 (VDE 0544, part 203); EN 50192; EN 50199 (VDE 0544, part 206); VBG 15 (UVV 26.0)

The plasma cutting system Fine*Focus* 450 is in possession of the S mark and therefore applicable to work places with increased electrical endangerment.

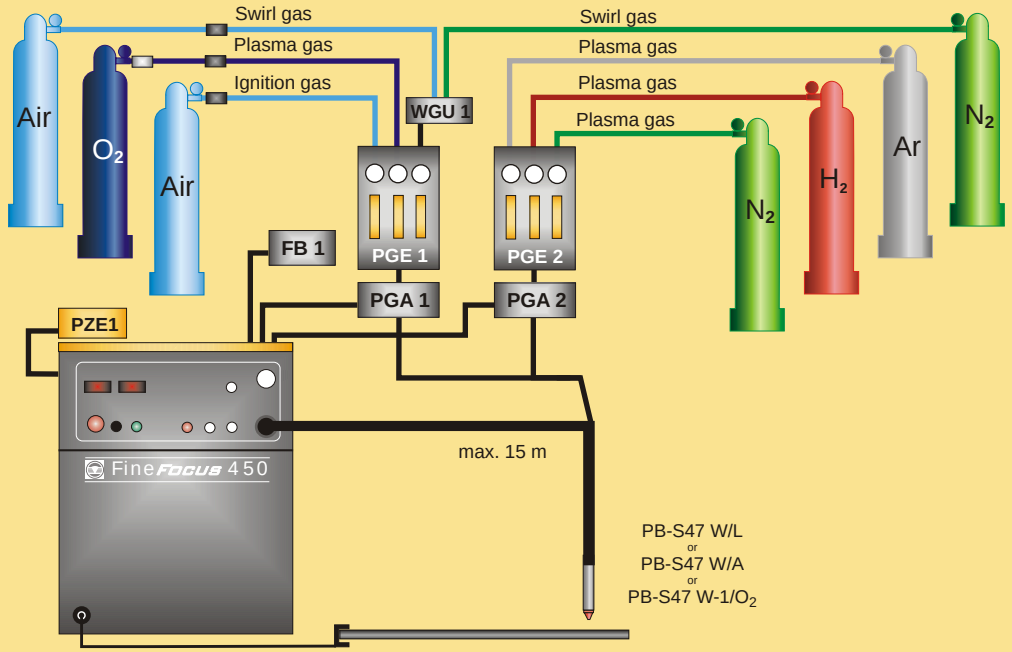
All products are manufactured under strict quality assurance control and proved by certificates and product-related test records.

The production takes place according to DIN EN ISO 9001.

Versions

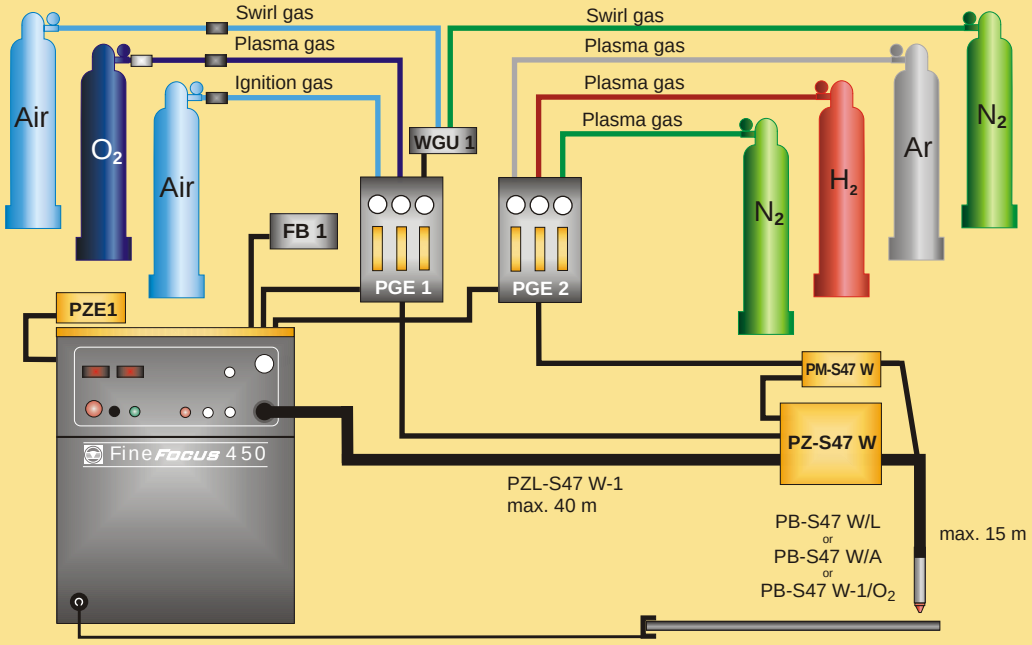
Fine*Focus* 450 - Compact

Direct swirl-gas torch connection



Fine*Focus* 450 - Distance

Swirl-gas torch connection by plasma ignition box and hose extension



01-08-02

Kjellberg FINSTERWALDE

Kjellberg Finsterwalde Elektroden & Maschinen GmbH
Germany D - 03238 Finsterwalde Leipziger Str. 82
Tel.: +49 3531 500-0 Fax: +49 3531 500-227
e-mail: kjellberg@kjellberg.de
Internet: http://www.kjellberg.de