

Kjellberg
FINSTERWALDE

the
FINE FOCUS
company

**- Plasma FineFocus Technology -
the Fine Art of Plasma Cutting**



FineFocus 800

for dry plasma cutting up 80 mm and
underwater plasma cutting up 50 m

FineFocus 1600

for dry plasma cutting up 160 mm and
underwater plasma cutting up 100 mm

Since 1960 Kjellberg is setting standards for the cutting of metallic materials

Since more than 45 years Kjellberg Finsterwalde as the first and most competent producer in Europe has developed and manufactured successfully plasma technologies and equipment. So in the early sixties the first Plasma Cutting Unit PA100 (Kjellberg motor-generator PM 600 with 100 kW-plasma torch from Institut M. v. Ardenne). 1964 the Plasma FineFocus Technology was developed with the Institut Prof. Manfred von Ardenne, Dresden and the Plasma Cutting Unit PA 20 (picture) was officially introduced to the industry first time.

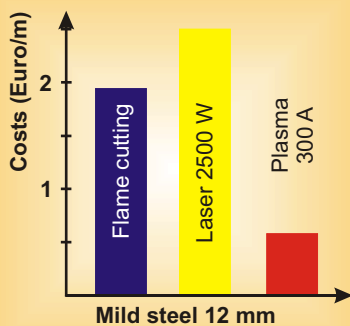
Then in the early seventies the plasma gas air entered the field and found application for the economical plasma cutting of mild steels. In the middle of the nineties Kjellberg was developing the oxygen cutting technology with the XL-Life-Time-system for increasing the consumable part longevity and for minimizing the labour costs because of reduction of the time consuming secondary finishing operations. Since 2001 Kjellberg Finsterwalde is concentrated on the development of new inverter power sources for the automated cutting.



FineFocus Technology - our experiences for your propositions in the future

Minimized costs

through optimized application of plasma gases and electric energy,



with optimum results to other technologies, as well as to competitors



High quality

because of the approved Plasma FineFocus Technology with clean cutting surfaces without dross

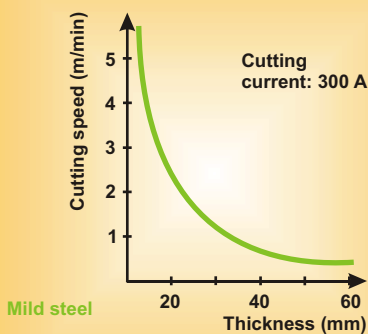
High flexibility

through modular structure of all plasma components to realize all standard and numerous special cutting applications



High productivity

because of superb functionality of the plasma torches, whereby at



high cutting speed rework-free surfaces are granted and down times become reduced.

High service standard

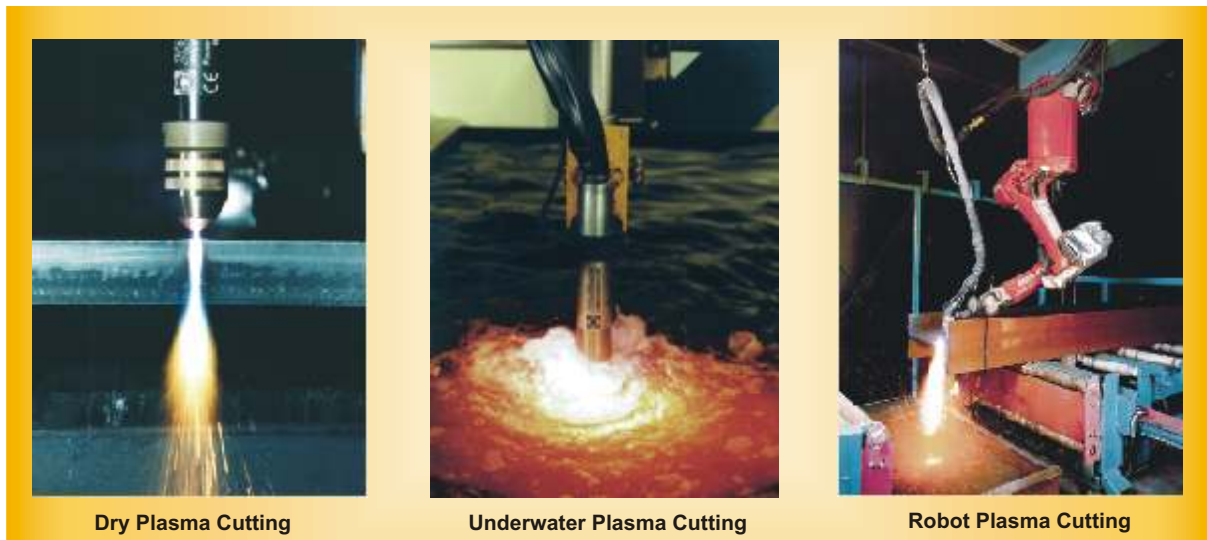
ensured by a highly qualified staff for attending customers, technological consultation and service duties at any time



Multifunctional application of the plasma cutting unit with swirl-gas technology

The universal technological concept of the plasma cutting devices *FineFocus 800* and *FineFocus 1600* enable the solution of all cutting problems on metallic materials up to 80 mm resp. 160 mm in an effective way. They are designed for the cutting with all kind of guiding systems and robots as well.

FineFocus systems are suitable for straight line, profile and bevel cutting with one and the same torch, without regard to dry or underwater cutting or the plasma gas, no modification of the equipment periphery is necessary.



Dry Plasma Cutting

Underwater Plasma Cutting

Robot Plasma Cutting

Plasma Cutting Units *FineFocus 800*

- with 300 A at 100 % duty cycle all metallic materials can be cut with technical gases or air
- with terminals for one or two plasma cutting torches cutting up to 80 mm is possible
- the plasma machine torch PB-S77 W with swirl-gas technology is only by changing the consumables suitable for cutting of mild steel with air or oxygen, or alloyed steels and aluminium with optimal mixed gases argon, hydrogen, nitrogen or air

FineFocus 1600

- parallel operation of two *FineFocus 800* with plasma machine torch PB-S150 W up to 600 A for dry-cutting up to 160 mm (with external water cooler, without swirl-gas) or
- with plasma machine torch PB-S100 WU for underwater cutting up to 100 mm
- disassembling of nuclear power plant modules under water up to 120 mm thickness with special equipment consisting of three parallel operating devices *FineFocus 800* and a high-performance plasma torch

Outstanding cutting results through free selectable gas mixtures

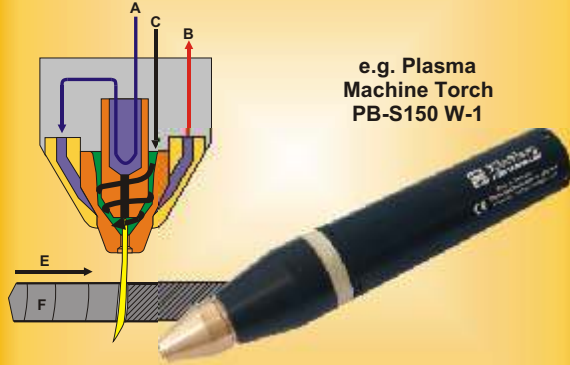
For achieving excellent results during cutting of metallic materials by the plasma arc the individual composition, the pressure and the flow rate of the plasma and the swirl gases influence them decisively.

For the supply with gases and gas mixtures Kjellberg Finsterwalde offers the manual Plasmagas Adjustment Units PGE 1-800 for oxygen, air and swirl gas as well as the PGE 2-800 for argon, nitrogen and hydrogen.

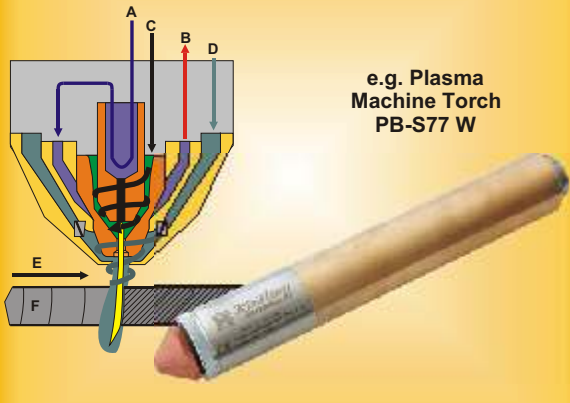


Procedure principles of the plasma cutting

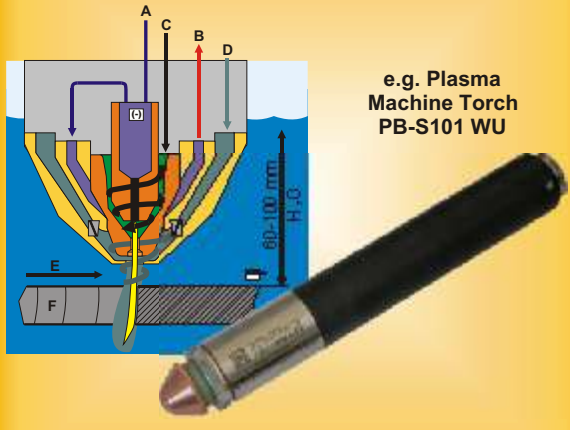
Dry plasma cutting without swirl gas



Dry plasma cutting with swirl gas



Underwater plasma cutting with swirl gas



Technology leader through most progressive torch technique

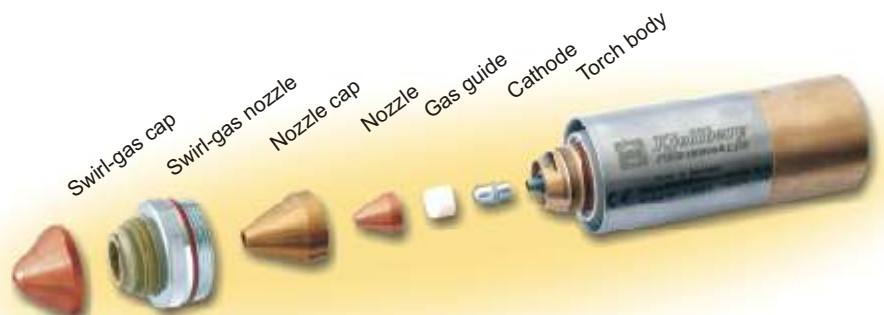
- High longevity of plasma torches and consumables because of direct water cooling of cathode and nozzle.
- Second gas ignition duplicates the hole piercing capacity.
- Outstanding cutting quality during a long period.
- Realization of optimum cutting results at different materials due to application of an individual adjustable gas combination.
- When using oxygen as plasma gas for cutting mild steel the cutting surface does not become nitrated. The time-wasting removing of such a layer can be avoided.
- The XL-Life-Time-technology multiplies the lifetime of the consumables.

... and comfortable swirl-gas technology

- Application of Kjellberg FineFocus torches acc. Patent nos. DE 3832630 / DE 301299 with swirl-gas technology guarantees high productivity and low costs.
- Same machine torch can be used for dry cutting and underwater cutting and is suitable for all cutting gases only by change of consumables.
- High longevity of consumables, no nozzle defects through upcoming material because of protection through potential-free swirl-gas nozzle.
- Trouble free stationary and running piercing for a determined thickness range.
- Reduction of squareness and inclination tolerances due to swirl-gas technology.
- Active influence on the cut quality by applied swirl gas.

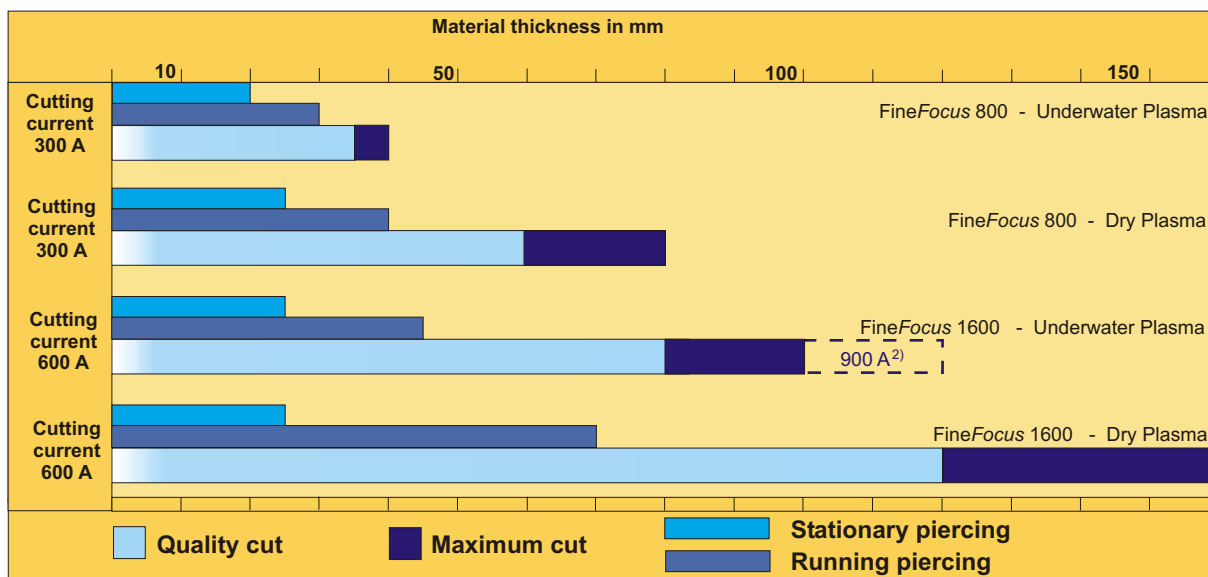
Legend:

- A) Water inlet
- B) Water outlet
- C) Plasma gas
- D) Swirl gas
- E) Cutting direction
- F) Cutting edge



Torch components of the plasma machine torch PB-S77 W

Cutting ranges of FineFocus 800 and 1600¹⁾



1) for straight line cutting, depend on material and guiding system

2) 3 plasma power sources FineFocus 800 in parallel

Cutting speed³⁾

| Material | FineFocus 800 PB-S77 W | | | | | FineFocus 1600 PB-S150 W (without swirl gases) PB-S100 WU | | | | | |
|---|---------------------------|---------------------------|------------------------------|---------------------------|------------------------------|--|---------------------------|------------------------------|------------------------|---------------------------|------------------------------|
| | Thick- ness (mm) | Cutting current (A) | Cutting speed (mm/min) | Cutting Current (A) | Cutting Speed (mm/min) | Thick- ness (mm) | Cutting Current (A) | Cutting Speed (mm/min) | Thick- ness (mm) | Cutting Current (A) | Cutting Speed (mm/min) |
| Mild steel Plasma gas: O ₂ Swirl gas: Air | 4 | 200 | 5500 | | | | | | | | |
| | 5 | 200 | 5000 | | | | | | | | |
| | 6 | 200 | 4500 | 300 | 5700 | | | | | | |
| | 8 | 200 | 3800 | 300 | 5000 | | | | | | |
| | 10 | 200 | 3500 | 300 | 4500 | | | | | | |
| | 15 | 200 | 2500 | 300 | 3500 | | | | | | |
| | 20 | 200 | 1500 | 300 | 2000 | | | | | | |
| | 25 | 200 | 1300 | 300 | 1500 | | | | | | |
| | 30 | | | 300 | 1200 | | | | | | |
| | 40 | | | 300 | 600 | | | | | | |
| 60 | | | 300 | 300 | | | | | | | |
| Alloyed steels Plasma gas: Ar/H ₂ /N ₂ Swirl gas: N ₂ | 5 | 120 | 2000 | | | | | | | | |
| | 10 | 200 | 1600 | | | | | | | | |
| | 15 | 250 | 1800 | | | | | | | | |
| | 20 | 250 | 1100 | | | 40 | 600 | 700 | 20 | 600 | 1000 |
| | 30 | 250 | 650 | | | 60 | 600 | 550 | 40 | 600 | 550 |
| | 40 | 300 | 400 | | | 80 | 600 | 380 | 60 | 600 | 350 |
| | 60 | 300 | 200 | | | 100 | 600 | 320 | 80 | 600 | 250 |
| | 80 | 300 | 150 | | | 120 | 600 | 250 | 100 | 600 | 200 |
| 160 | | | | | 160 | 600 | 150 | | | | |
| Aluminium Plasma gas: Ar/H ₂ /N ₂ Swirl gas: N ₂ | 5 | 120 | 5600 | | | | | | | | |
| | 10 | 150 | 4000 | | | | | | | | |
| | 15 | 200 | 2700 | | | 40 | 600 | 1500 | | | |
| | 20 | 250 | 3000 | | | 60 | 600 | 1100 | | | |
| | 30 | 250 | 1900 | | | 80 | 600 | 700 | | | |
| | 40 | 300 | 1300 | | | 100 | 600 | 480 | | | |
| | 60 | 300 | 800 | | | 120 | 600 | 300 | | | |
| | 80 | 300 | 400 | | | 160 | 600 | 200 | | | |

3) The cutting speed depends on material and technology and the required cut quality

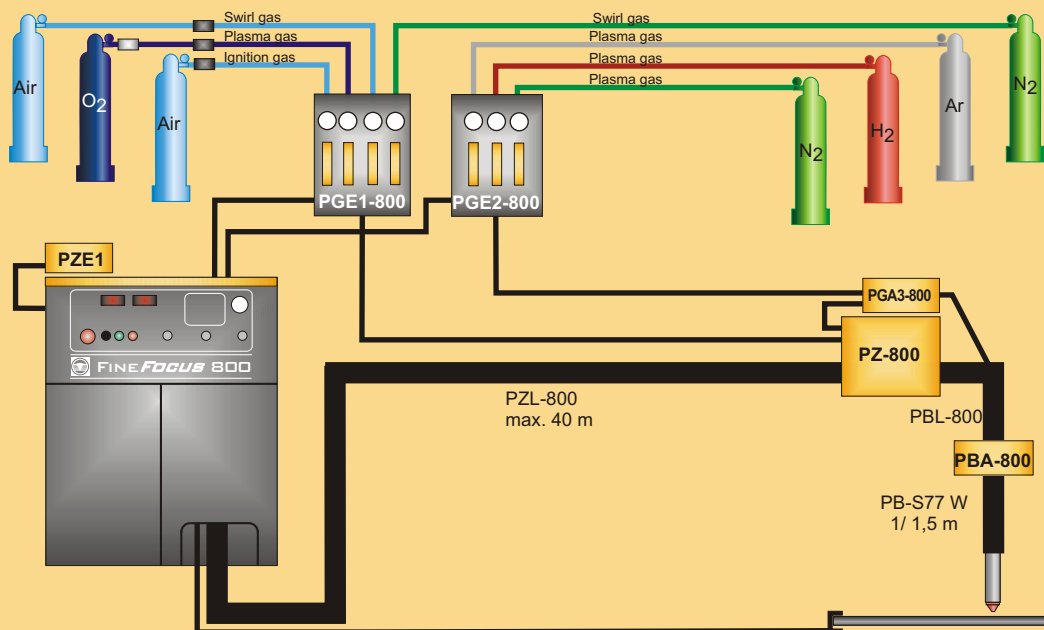
Technical data

| | FineFocus 800 | FineFocus 1600 |
|--------------------------------------|--|--|
| Mains voltage (V) | 3x 400, 50 Hz | 3x 400, 50 Hz |
| Connecting power (kVA) | 83 | 168 |
| Fuse, slow (A) | 125 | 2x 125 |
| Open circuit voltage (V) | 400 | 400 |
| Cutting current at 100 % d.c. (A) | 80-300 | 160 - 600 |
| Cutting thickness (mm) | max. 80 | max. 160 |
| - Quality cut | 60 | 120 |
| - Underwater plasma | 40 | 100 |
| Plasma gases | O ₂ , Air, Ar/H ₂ , Ar/H ₂ /N ₂ | Ar/H ₂ , Ar/H ₂ /N ₂ |
| Swirl gases | Air, N ₂ | N ₂ |
| Protection class | IP 22 | IP 22 |
| Insulation class | F | F |
| Weight (kg) | 556 | 2x 556 |
| Dimensions (mm) | 1370x875x1505 | 2x 1370x875x1505 |

| | PB-S77 W-1 PB-S77 W-2 | PB-S150 W-1 PB-S150 W-2 | PB-S100 WU |
|-------------------------------|---|----------------------------|------------|
| Plasma gases | | | |
| Pressure (MPa) | | | |
| Ar | 0,6 | 0,7 | 0,7 - 0,8 |
| Ar/H ₂ (65/35%) | - | - | 0,7 - 0,8 |
| H ₂ | 0,8 | 0,8 | 0,7 - 0,8 |
| N ₂ | 0,7 | - | 0,7 - 0,8 |
| O ₂ | 0,9 | - | - |
| Air | 0,9 | - | - |
| Consumption (l/min) | | | |
| Ar | 18 - 38 | 58 | 52 - 68 |
| Ar/H ₂ (65/35%) | - | - | 67 - 85 |
| H ₂ | 3 - 6 | 30 | 21 - 32 |
| N ₂ | 10 | - | 17 - 30 |
| O ₂ | 38 - 50 | - | - |
| Air | 18 | - | - |
| Swirl gases | | | |
| pressure (MPa) | | | |
| N ₂ | 0,5 - 0,6 | - | 0,5 - 0,6 |
| Air | 0,5 | - | - |
| Clamping diameter (mm) | 58 | 58 | 58 |
| Ignition | High voltage | | |
| Cutting current (A) | 300 | 600 | 600 |
| Start of the main arc | Fully automatic power increase at material contact of the pilot arc | | |

The plasma cutting systems are CE conform and comply with the latest instructions and regulations of the European Community. They are developed and manufactured on basis of following standards and directions: EN 60974-1 (VDE 0544, part 1) and BGV D1. All Kjellberg Plasma Systems are possessing the S-sign and therefore applicable in environments with increased hazard of electric shock. The fabrication follows the standard DIN EN ISO 9001. The factory-based quality control comprises piece-test under cutting conditions and is proved by test certificate.

Connection diagram FineFocus 800



Our products are produced according to the latest technical developments.
We reserve the rights for technical changes during production. Therefore, claims of whatever kind can't derived from prospectus.

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Kjellberg

FINSTERWALDE

Kjellberg Finsterwalde Elektroden und 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: www.kjellberg.de