

Kjellberg®
FINSTERWALDE

the
FINE FOCUS™
company



Plasma Cutting Systems

HiFocus 280i / 360i / 440i

Plasma Cutting
cost-efficient and flexible as never before



Cutting of Metals
from 0.5 up to 120 mm

made in Germany

Plasma Cutting cost-efficient and flexible as never before

If cutting shops and users quite often have to change the cutting technology because of diverse material qualities, large thickness variations or different shapes of workpiece then the new Plasma Cutting Units HiFocus 280i, HiFocus 360i and HiFocus 440i will be the **perfect solution**.

HiFocus-Plasma is the synonym for the fulfilment of highest demands at the cutting of electrically conductive materials. The exceptional cutting quality of cutting surfaces is characterised by dross-free cutting edges, lowest straightness and inclination tolerances, lowest rawness and maximum precision. These parameters in connection with an outstanding repeatability and productivity are justifying the **world-wide reputation** of the HiFocus-Technology.

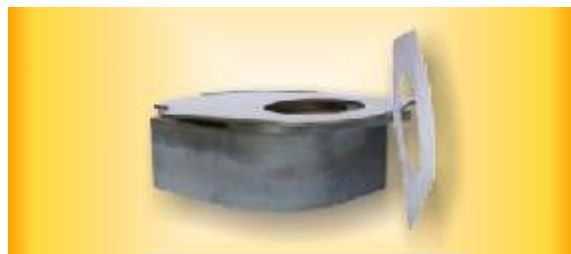
The cutting range of the new installations covers now the wide scope of material thicknesses from 0.5 up to 80 (120) mm.

Kjellbergs HiFocus-technology achieves **laserlike cuts according to quality range 2 to 4** as per DIN EN ISO 9013 and furthermore contrary to laser up to **thicknesses of 80 mm**.

Conventional plasma cutting just attains quality range 5 as per DIN.

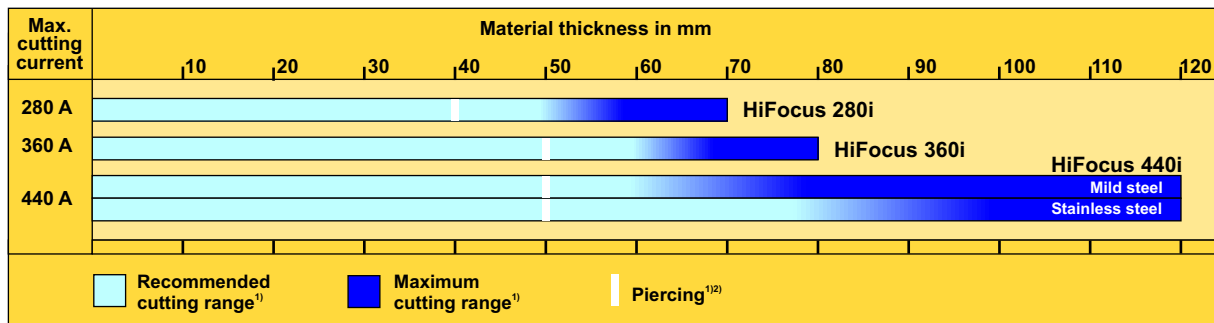
Groundwork for that are besides a suitable guiding system and a corresponding torch height control first of all a sophisticated torch technology, an accurate and fast process parameter control for the cutting current and a defined mixture of the process gases, their pressures and flow rates by means of a gas console.

The maximum cutting capacity of the HiFocus 280i, HiFocus 360i and HiFocus 440i is 70, 80 mm respectively 120 mm. Piercing is possible up to 40 respectively 50 mm.



No matter, whether thin or thick material - cutting with only one torch

Range of Application



1) These data are depending on the materials to be cut and their compositions.

2) Piercing capability is dependent on material, thickness as well as performance of THC and CNC. Please refer to operation manual.

HiFocus - Basis for optimal Quality and Efficiency

The integrated Soft-Switch-Inverter Technique with its flexible adaptability of the process sequence to the cutting job is the basis for optimising the quality and the productivity:



For a particular effective cooling an external cooling component was designed.

- **Optimisation of the cutting process** through fast and steples adjustment of the cutting current, reduced lead-in runs and corner signals
- **Long consumable life** due to micro-processor controlled cutting process
- **Best cutting results** with advanced HiFocus torch technology (high focused plasma beam)
- **Possibility of control** for all cutting parameters by analogue and serial interfaces
- Serial data transfer to computers for **diagnosis**

By integrating the ignition module into the Plasmatorch Connection Unit PBA-360 the scope of installation could be reduced.

High-Performance put into Practice by PerCut Torches

Quick-Change Torches reduce setup times

PerCut torches have been particularly developed for HiFocus machines to match high demands of this technology. It grants an increased constriction of plasma arc by using nozzles with smaller diameter, optimization of gas rotation as well as improved utilization of swirl gases.



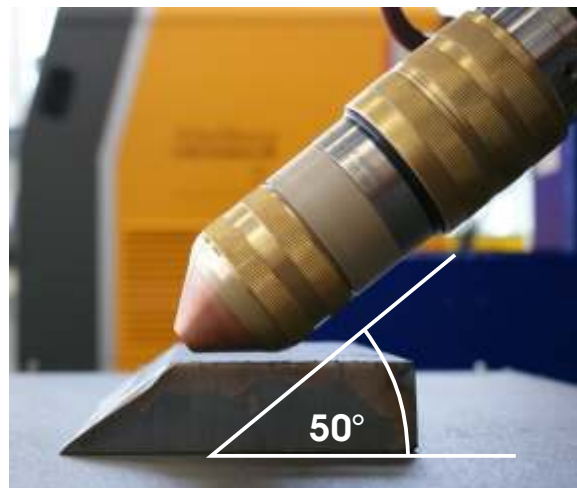
These PerCut torches are equipped with a quick change head to reduce setup times and enable an easy exchange of consumables.

PerCut 450M is suitable for manual head change on its threaded coupling. PerCut 450A has been particularly developed with bayonet coupling for automated head change by Kjellberg's ATChanger.

Plasma torch PerCut 440 is designated for bevel systems and does not have a quick change head.

All these torches cover entire range of application from 5 A up to 440 A with only one head and use same consumables, which have been optimized and furthermore simplified in terms of variety. Significantly improved fluid cooling in the torch tip and a modified sequence control provide a substantial extension of consumable life.

Bevel cutting, preparations of welding seams or 3D applications with an angle of up to 50 degrees can be accomplished with standard consumables.



Bevel cut PerCut 450M

Cutting and marking with only one torch



HiFocus torches PerCut 440 and PerCut 450 enable various applications as cutting, marking and punch marking without change of consumables.

Width and depth can be precisely adjusted due to low tunable marking currents, speed and torch distance. Punch marking can be performed with various depths.

Cutting sample marked with PerCut 450M

Optimal Equipment ensures high Quality and Reliability

Efficient Gas Control

The material-specific composition and the flow rate of the plasma gases have a substantial influence on the result of the cutting of metallic materials with the plasma beam.

The gas consoles **PGE 3-360¹⁾** for cutting of mild steel and **PGE 360** for cutting of all metals are gas mixing units with manual adjustable flow meters for the plasma and swirl gases.

For higher demands Kjellberg Finsterwalde has developed the gas console FlowControl, which delivers automatically an optimised gas mixture. It consists of the Plasmagas Valve Unit PGV 3 and the Plasmagas Control Unit PGC 3 and is characterised by following features:

- **Safe dosage**, even at different gas quantities and control of the flow rate for five separate gas control paths (3 for plasma gas, 2 for swirl gas)
- **Optimum cutting quality** through tailored gas mixtures, compensation of pressure fluctuations
- **Highest reproducibility** because of micro-processor control and monitoring
- Gas parameters for standard materials available from the installed **data base**, easy storage for further optimised gas parameters for other materials



In addition PGE 360²⁾ and FlowControl can also be used for marking - switched via CNC-control.

1) PGE3-360 is not available for HiFocus 440i.

2) For further information regarding functionality and handling, please refer to related cutting charts.

Long Life of Consumables

The optimised design of the consumables of the PerCut torches is the precondition for reaching highest cutting quality and for a long life time.

Topmost accuracy during fabrication and the use of properly selected materials or combinations of materials are required.

The user can profit only from those benefits if besides an ideal process sequence always **genuine Kjellberg consumables** are used.

Cathodes should be changed in time. By means of a cathode dial gauge, which is available from Kjellberg Finsterwalde, the wear on the hafnium pin can be measured.



Cathode dial gauge

Cost-efficient by Upgrading timeworn Cutting Installations

The plasma cutting units HiFocus 280i, HiFocus 360i and HiFocus 440i are furnished with an analogue and a serial interface for the adaptation to CNC- controls. Therefore they are flexible to combine with 2D and 3D guiding systems, like profile cutting machines, robots or tube manufacturing lines.

If the guiding system is not provided with a data base then in case of a retrofit the data base of the automatic gas control or that of the manual gas control can be used.

The further use of existing guiding systems enables a considerable cost-saving.

Enhanced Possibilities by PLUS technology

Operating Data (Extract) ¹⁾

Material		Mild steel				Stainless steel				Aluminium			
Plasma-cutting unit		HiFocus 280i	HiFocus 360i	HiFocus 440i	HiFocus 280i	HiFocus 360i	HiFocus 440i	HiFocus 280i	HiFocus 360i	HiFocus 280i	HiFocus 360i	HiFocus 440i	HiFocus 440i
max. cutting speed (mm/min)		Cutting current (A)	Cutting speed (mm/min)	Cutting current (A)	Cutting speed (mm/min)	Cutting current (A)	Cutting speed (mm/min)	Cutting current (A)	Cutting speed (mm/min)	Cutting current (A)	Cutting speed (mm/min)	Cutting current (A)	Cutting speed (mm/min)
Material thickness (mm)	0,5	20	8.000	20	8.000	20	8.000	60	8.000	35	6.000	35	6.000
	1	20	5.500	20	5.500	20	5.500	60	6.000	35	3.000	35	3.000
	3	35	4.500	60	4.000	60	6.000	60	6.000	35	3.000	35	3.000
	6	130	5.600	130	5.600	130	5.600	130	2.300	130	6.500	130	6.500
	8	130	4.500	130	4.500	130	4.500	130	1.800	130	5.500	130	5.500
	10	280	6.000	280	6.000	280	6.000	130	1.500	130	4.500	130	4.500
	15	280	4.100	280	4.100	280	4.100	280	1.900	280	4.300	280	4.300
	20	280	2.700	360	3.300	360	3.300	280	1.500	360	3.800	280	4.000
	30	280	1.600	360	1.900	360	1.900	280	1.200	440	3.000	360	2.800
	40	280	1.000	360	1.300	400	1.400	280	850	440	1.800	360	2.400
	50	280	560	360	850	400	950	280	600	440	1.500	440	1.700
	60	280	350	360	480	400	600	280	430	440	1.300	440	1.300
	70	280	120	360	270	400	360	280	280	440	1.000	440	1.000
	80			360	160	400	240		330	440	750	440	850
	100									440	180	440	300
	120									440			

1) Listed cutting speeds are depending on material characteristics, gas parameter, guiding system as well as proper consumables. According to quality requirements cutting speeds may differ.

Technical Data

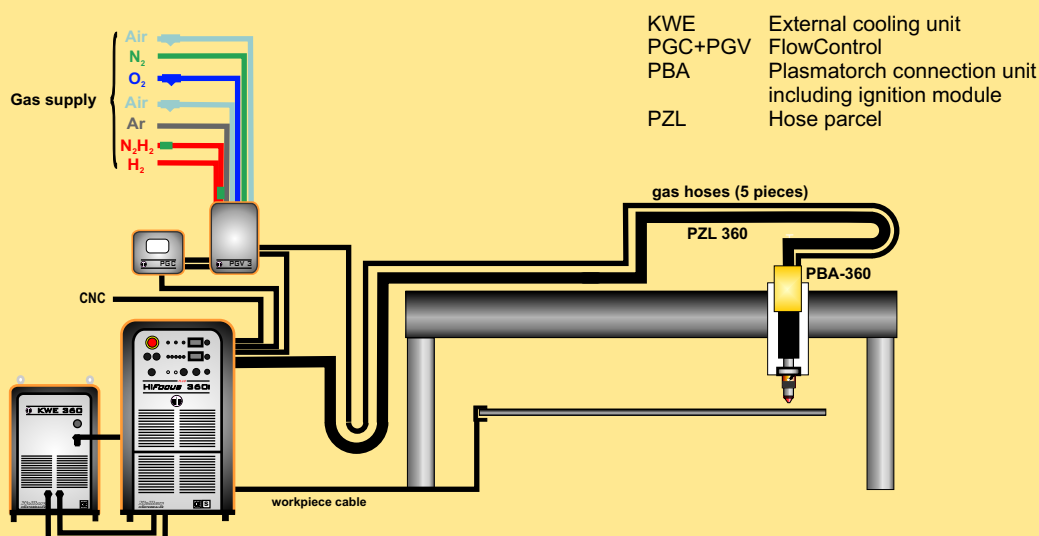
Power source	HiFocus 280i	HiFocus 360i	HiFocus 440i
Mains voltage ¹⁾	3x 400 V, 50 Hz	3x 400 V, 50 Hz	3x 400 V, 50 Hz
Connected load, max.	67 kVA	87 kVA	127 kVA
Fuse, slow	100 A	125 A	200 A
Cross section mains cable, Cu	4 x 35 mm ²	4 x 50 mm ²	4 x 50 mm ²
Open circuit voltage	330 V	330 V	330 V
Cutting current at 100% d.c.	280 A	360 A	440 A
Cutting voltage	200 V	200 V	200 V
Cutting power	max. 56 kW	max. 72 kW	max. 88 kW
Marking current	5 - 50 A	5 - 50 A	5 - 50 A
Protection class	IP 22	IP 22	IP 22
Dimensions (L x W x H)	1030 x 680 x 1450 mm	1030 x 680 x 1450 mm	1030 x 680 x 1450 mm
Weight	505 kg	517 kg	589 kg
Plasma torch	PerCut 450M, PerCut 450A, PerCut 440	PerCut 450M, PerCut 450A, PerCut 440	PerCut 450M, PerCut 450A, PerCut 440

1) other voltages and frequencies on request

Torch	PerCut 450M, PerCut 450A, PerCut 440
Max. cutting current	440 A
Duty cycle	100 %
Max. cutting range	0.5 up to 120 mm
Plasma gas	O ₂ , Ar/H ₂ , F5*
Marking gas	Ar
Swirl gas	O ₂ , N ₂ , Air
Torch cooling	Coolant "Kjellfrost"

*) Forming gas F5 (95% N₂/5% H₂)

Configuration of HiFocus 360i for Cutting with all Gases and FlowControl



Kjellberg-plasma cutting units are CE-conform and correspond with the valid guidelines and instructions of the European Union. They are developed and fabricated on basis of the standard EN 60974 (VDE 0544). The plasma cutting units are labelled with the S-sign and therefore applicable to environments with increased hazard of electric shock. The fabrication takes place according to DIN EN ISO 9001. The factory-owned quality assurance comprises piece and cutting performance tests, documented by test certificate.

Our products represent a high level of quality and reliability. We reserve the rights to change design and/or technical specification during the series fabrication. Claims of any kind can not be derived from this brochure.

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