Kjellberg®
FINSTERWALDE

the FINE FOCUS™ company

NEW !

Plasma Cutting Systems

Hi*Focus* 280i / 360i / 440i

Plasma Cutting
cost-efficient and flexible as never before

Cutting of Metals
from 0.5 up to 100 mm

made in Germany

Plasma Cutting cost-effcient and flexible as never before

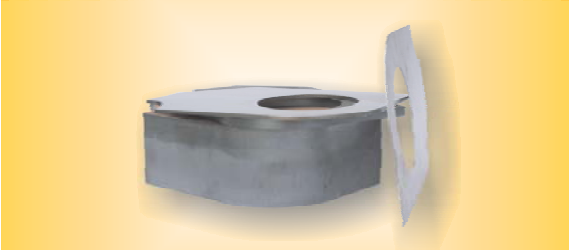
If cutting shops and users quite often have to change the cutting technology because of diverse material qualities, large thickness variations or different shapes of workpiece then the new Plasma Cutting Units Hi*Focus* 280i, Hi*Focus* 360i and Hi*Focus* 440i will be the **perfect solution**.

Hi*Focus*-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 Hi*Focus*-Technology.

The cutting range of the new installations covers now the wide scope of material thicknesses from 0.5 up to 80 (100) mm.

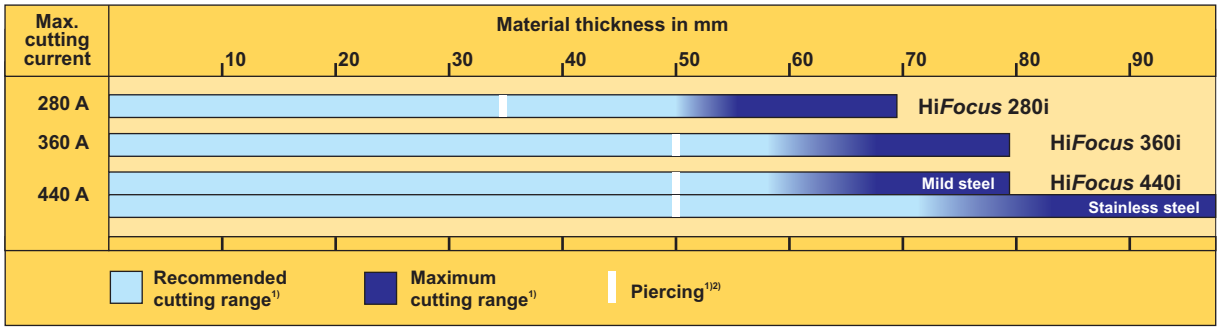
Kjellbergs Hi*Focus* technology achieves **laser-like cuts according to quality range 2 to 4** as per DIN EN ISO 9013 and furthermore contrary to laser up to **thicknesses of 80 mm**. Conventional plasma cutting just attains quality range 5 as per DIN.

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.



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.

Hi*Focus* - 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:

- **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 Hi*Focus* torch technology (high focused plasma beam)
- **Possibility of control** for all cutting para-meters by analogue and serial interfaces
- Serial data transfer to computers for **diagnosis**

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

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 Preparation Time

Especially for the Hi*Focus* technology the series of PerCut torches was developed and is covering the high demands of this procedure.

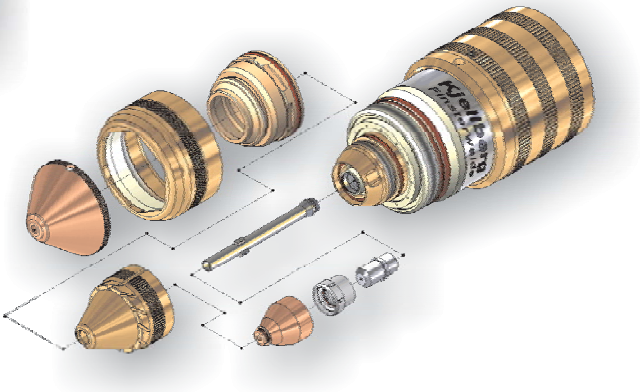
PerCut 370.1M and PerCut 370.2M

The characteristic features of this method are the increased constriction of the plasma arc through smaller orifices, the optimised gas rotation and the use of swirl gases.

For a fast change of consumables or a time-saving conversion to an other performance range both torch heads PerCut 370.1M (cutting current up to 160 A) and PerCut 370.2M (up to 440 A) generally are equipped with quick-change system.

Due to an ident gas the control identifies the actual used torch head and depending on the material the corresponding optimum data will be adjusted.

For preparing welding seams or at 3D applications special nozzles enable **bevel cutting** up to an angle of 45 degrees. Fluid cooling, swirl-gas technology and second-gas ignition contribute to a **long life of the consumables**.



A complex geometry ensures highest efficiency of the torches, here the exploded view of the PerCut 370.2M

Only one Plasma Torch for Cutting and Marking

The torch heads PerCut 370.1M and PerCut 370.2M are suitable for cutting, marking and punch marking operations without changing the consumables.

The markings can be varied in width and depth by selecting the current, speed and torch distance to meet the requirements. Also for punch marking different depths are adjustable.

Cutting sample marked with PerCut 370.1M

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 3-360**[1)] for cutting of mild steel and **PGE 360** for cutting of all metalls 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 Flow*Control*, 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 360[2)] and Flow*Control* can also be used for marking - switched via CNC-control.

1) PGE3-360 is not available for Hi*Focus* 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 Hi*Focus* 280i, Hi*Focus* 360i and Hi*Focus* 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.

Operating Data (Extract) [1)]

Material		Mild steels				Stainless steel						Aluminium					
Plasma cutting unit		HiFocus 280i		HiFocus 360i / 440i		HiFocus 280i		HiFocus 360i		HiFocus 440i		HiFocus 280i		HiFocus 360i		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)	Cutting current (A)	Cutting speed (mm/min)	Cutting current (A)	Cutting speed (mm/min)
Material thickness (mm)	0,5	20	6.000	20	6.000												
	1	20	5.500	20	5.500	35	7.000	35	7.000	35	7.000	35	3.900	35	3.900	35	3.900
	3	50	2.200	50	2.200	60	2.800	60	2.800	60	2.800	35	2.400	35	2.400	35	2.400
	6	130	4.500	130	4.500	130	2.000	130	2.000	130	2.000	130	3.200	130	3.200	130	3.200
	8	130	3.700	130	3.700	130	1.600	130	1.600	130	1.600	130	2.500	130	2.500	130	2.500
	10	200	4.500	200	4.500	130	1.500	130	1.500	130	1.500	130	2.000	130	2.000	130	2.000
	15	280	3.900	280	3.900	250	1.800	250	1.800	250	1.800	250	4.500	250	4.500	250	4.500
	20	280	2.400	300	2.800	280	1.500	360	1.600	360	1.600	280	3.800	360	4.000	440	4.500
	30	280	1.200	300	1.500	280	1.000	360	1.200	440	1.300	280	2.200	360	2.800	440	2.800
	40	280	750	360	1.200	280	650	360	850	440	1.000	280	1.550	360	1.800	440	2.400
	50	280	500	360	750	280	480	360	650	440	800			360	1.300	440	1.700
	60	280	250	360	430	280	350	360	500	440	650	280	800	360	1.100	440	1.300
	70	280	150	360	250	280	200	360	400	440	450			360	800	440	1.000
	80			360	180			360	320	440	380	280	150	360	700	440	850
	100									440	190						

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.

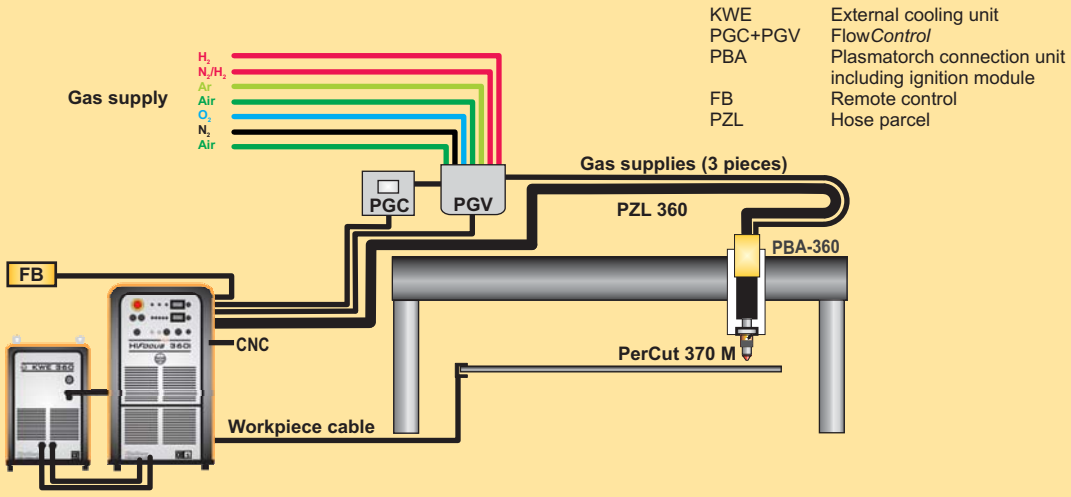
Technical Data

Power source	Hi*Focus* 280i	Hi*Focus* 360i	Hi*Focus* 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 - 25 A (PerCut 370.1M) 10 - 50 A (PerCut 370.2M)	5 - 25 A (PerCut 370.1M) 10 - 50 A (PerCut 370.2M)	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 M with head 370.1M and 370.2 M	PerCut M with head 370.1M and 370.2 M	PerCut M with head 370.1M and 370.2 M

1) other voltages and frequencies on request

Torch	PerCut 370.1M	PerCut 370.2M
Max. cutting current	160 A	440 A
Duty cycle	100 %	100 %
Max. cutting range	0.5 up to 50 mm	Mild steel: 0.5 up to 80 mm Stainless st.: 1.0 to 100 mm
Plasma gas	Air, O_2, Ar, N_2, H_2 Purging gas	Air, O_2, Ar, N_2, H_2 Purging gas
Marking gas	Ar	Ar
Swirl gas	Air, N_2, O_2	Air, N_2, O_2
Torch cooling	Coolant “Kjellfrost”	Coolant “Kjellfrost”

Configuration of Hi*Focus* 360i for Cutting with all Gases and Flow*Control*



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.

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