



**Kjellberg**  
**FINSTERWALDE**

the  
**FINE FOCUS**  
company

## Plasma Cutting Unit

# HiFocus 160i

The All-Rounder for  
Marking and Cutting from 0.5 to 50 mm  
with Highest Productivity



Soft-Switch Inverter - Made in Germany

## Productivity - quality - flexibility: decisive in the competition

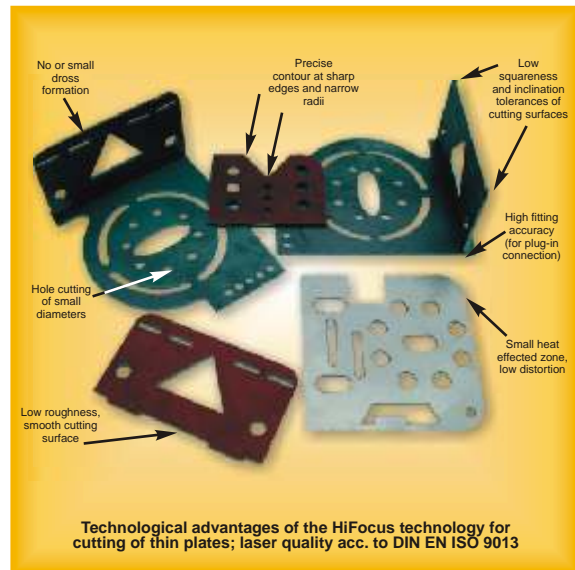
Since the first performance of the HiFocus technology in the year 2000 the world of plasma cutting was enriched **by a new dimension of productivity, quality and variety of application**, based on the well-known and approved FineFocus technology.

The exceptional quality on the cutting surfaces, characterised by dross-free cuts, the very small straightness and inclination tolerances as well as the low roughness are in connection with the high precision in the tolerance range of  $\pm 0.2$  mm and the high part reproducibility in relation with the excellent productivity the parameters, on which the world-wide reputation of the HiFocus technology is based.

The newly developed plasma cutting unit HiFocus 160i with its progressive **Soft-Switch Inverter** and the latest plasma torches PerCut 160 and PerCut 170 (quick-change torch with bayonet joint) is designed for **marking and cutting** operations on mild steels, stainless steels, aluminium and other electrically conductive materials in a range of 0.5 to 50 mm and offers various new possibilities for the application in the metal-working industries, vehicle fabrication, container production, etc.

Because of the outstanding quality standard with high productivity performance and enlarged application the new HiFocus 160i is the **all-rounder** in the field of plasma cutting technology.

In combination with the **unique innovation**, the flow-controlled plasmagas supply **FlowControl**, the HiFocus 160i represents the highest level of plasma technology in the world.



## High comfort due to Soft-Switch Inverter technology

Technological flexibility, achievable cutting quality and availability of the cutting system depend extensively on the coordination between power source and plasma cutting torch. Furthermore the **productivity** is influenced significantly by the configuration of the power source.

Primary-switched electronic power sources offer optimal possibilities for realising those demands. For this reason the inverter power source HiFocus 160i was developed, having the favourable working range of 4 to 160 A. Further advantages are:

- **Superior cutting quality** due to flexible adaptation of the process sequence to the cutting job
- Optimized cutting process by **fast control** of the cutting current, high dynamic response at small contours and reduced run-in path, corner signal, etc.
- **Longevity** of consumables by controlled current ramp-up and ramp-down during the start and stop sequence and at piercing as well
- **Rapid operation** start because of extremely fast transition from pilot arc to main arc
- Small components, therefore low weight
- **Improved energy balance** due to minimized switching losses
- Independent of mains fluctuations
- All cutting parameters controllable by serial interface; serial data transfer to PC for diagnostic purposes



## Process stability and reliability - requirements for the automatic operation



Foil-coated  
CrNi-plates  
(1.4301)



Final cut at a  
welded vehicle  
frame  
construction  
(IHU-profiles)



CrNi-tubes  
(1.4301) with  
metallic clean  
and dross-free  
cutting surface

With the HiFocus 160i the user gets an unit, which ensures a steady cutting process even under unfavourable conditions. Foil-coated or soiled material surfaces, conclusions in the metal, air gaps as well as mild steel with enhanced content of silicon or sulphur do not influence the cutting operation.

Besides the combined applications with standard guiding systems more and more robots are used for the cutting process, especially for three-dimensional workpieces; as practicable in vehicle fabrication for instance.

Here it is very important for the cutting quality to maintain a constant torch-to-workpiece distance. But unlike laser technology or competitive systems the tolerances are less critical.

Another trump for the process stability is the use of swirl gas. It avoids that up-coming spatter effect the cutting nozzle. The superior cutting quality is maintained over a long period.

The plasma torches PerCut 160 and 170 are furnished with a newly developed system of consumables. The cathode stands a higher current load, and cooling of the nozzle became more effective.

## Same torch for cutting and marking

The plasma arc itself can be used as an excellent marking tool. Depending on the kind of marking operation, there is often no change of consumable parts required.

Line thickness and marking depth can be easily dialled by the marking current (4 to 25 A), the speed and the torch distance. The punching depth is selectable, too.



## Superior cutting results because of optimal gas mixtures



The material specific composition and the flow rate of the cutting gases have a substantial influence on the cutting result.

The plasmagas-mixing unit **PGE-HM**, provided with manual adjusted flow meters, serves for mixing the plasma and swirl gases.

With this conventional unit however it is not possible to adapt the parameters during the cutting process, and no data storage can be carried out. But for many applications of cutting at standard materials and at thicker seized plates it is acceptable.

For higher demands on gas mixtures Kjellberg Finsterwalde has developed the automatic gas console **FlowControl**. This novelty - **nothing like it worldwide** - consists of the plasmagas-valve unit PGV and the plasmagas-control unit PGC, having the following advantages:

- Safe dosage even of smallest gas quantities and control of the flow rate through separate control paths
- Optimal cutting quality through tailored gas mixtures; compensation of pressure fluctuations
- Highest reproducibility due to microprocessor control and monitoring
- Independence from the operating state of the plasma torch (gas preflow, pilot arc, main arc)
- Use of a data bank with gas parameters for standard materials, established by the manufacturer; easy storage of optimised parameters for further materials

## Versatile torch technology

Especially for the HiFocus technology a new generation of plasma torches were developed, covering the enhanced demands of this new technology. They ensure an increased constriction of the plasma arc due to the use of smaller nozzle orifices, an improved gas rotation and the application of swirl gases. Thus the same torch is suitable for the cutting and for the marking procedure.

Various variants of application require a precise adaptation of the plasma torch **PerCut**. For using the full advantages of those torches modifications with 60°- oder 90° inclined torch heads and reinforced shafts are available; for instance for robot applications. That guarantees an optimal torch handling when cutting three-dimensional workpieces.

Furthermore as one of the latest developments a **quick-change torch** with bayonet joint is at disposal.

The easy use leads to the reduction of idle times by:

- Fast technology conversion for changing cutting jobs
- Quick adaptation to different material thicknesses
- Fast replacement of consumables with prepared torch head





## HiFocus 160i - the system with the unsurpassed range of application

### Range of application

	10 mm	20 mm	30 mm	40 mm	50 mm
Maximal values are material depending	piercing with arc depending height control				
	recommended range for application				
	cutting range for HiFocus technology				

### Cutting parameters for achieving the HiFocus quality <sup>1)</sup>

Thickness of material (mm)	Mild steel		Stainless steel		Aluminium	
	Cutting current (A)	Cutting speed (mm/min)	Cutting current (A)	Cutting speed (mm/min)	Cutting current (A)	Cutting speed (mm/min)
0,5	20	7.000				
1	25	6.500	30	4.500	30	1.800
2	50	2.600	45	3.200	30	1.400
3	50	2.200	45	2.400	35	1.200
4	70	2.800	50	2.000	45	1.500
5	70	2.200	130	2.400	45	1.400
6	70	2.000	130	2.200	130	3.200
8	160	3.600	160	1.800	160	2.500
10	160	3.200	160	1.500	160	1.800
12	160	2.800	160	1.200	160	1.650
15	160	2.200	160	1.000	160	1.250
20	160	1.600	160	850	160	1.000
25	160	1.150	160	600	160	800
30	160	750	160	450	160	600
35	160	550	160	400	160	450
40	160	450	160	300	160	250
45	160	350	160	250		
50	160	250				

1) The cutting speed depends on kind of material, gas pressure, cutting and swirl gas, and the used nozzle/cathode-system as well.  
If the requirements on the cutting quality are reduced, cutting with much higher speed can be performed.

### Marking with high speed

Material (mm)	Marking current (A)	Plasma gas	Swirl gas	Speed (mm/min)
mild steel	4	Ar	N <sub>2</sub>	1.000 - 4.000
	5	Ar/N <sub>2</sub>	N <sub>2</sub>	2.000 - 6.000
	6	Ar/N <sub>2</sub>	N <sub>2</sub>	2.000 - 7.000
	8	Ar/N <sub>2</sub>	N <sub>2</sub>	2.500 - 8.000
alloyed steel	4	Ar/N <sub>2</sub>	N <sub>2</sub>	1.000 - 4.000
	8	Ar/N <sub>2</sub>	N <sub>2</sub>	2.000 - 7.000
AlMg	6	Ar/N <sub>2</sub>	N <sub>2</sub>	2.000 - 6.000
	10	Air	N <sub>2</sub>	2.500 - 8.000

**For marking a gas pressure of 4 bar (0.4 MPa) is required.**

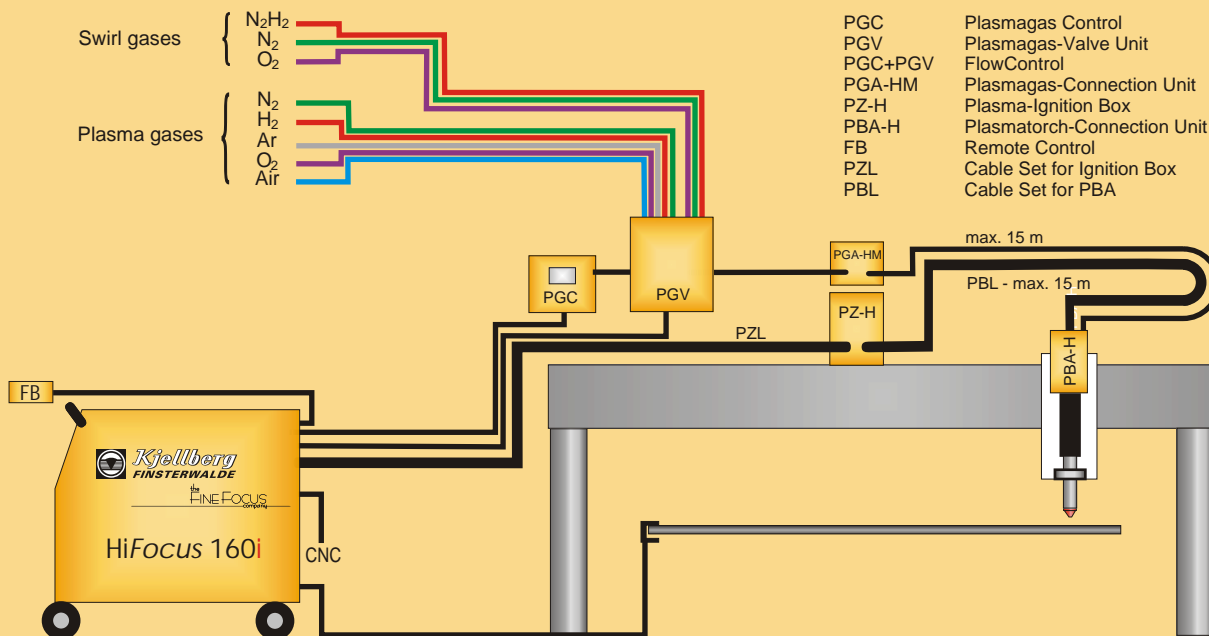
## Technical data

	HiFocus 160i
Power source	Soft-Switch Inverter
Cutting current	
Cutting	10 - 160 A (100 % d.c.)
Marking	4 - 25 A (100% d.c.)
Mains connection	3x 400 V, 50 Hz
Mains fuse	63 A "C"
Connecting load	38 kVA
Open circuit voltage	400 V
Ignition	High voltage
Protection class	IP 22
Insulation class	F
Dimensions (L x W x H)	960 x 540 x 1.050 mm
Weight	196 kg

	Plasma torch
Plasma-machine torch	PerCut 160
Quick-change torch	PerCut 170
Cutting current	max. 160 A
Standard lengths	
Torch-hose parcel	1.5 m
PZL	10, 20, 30, 40 m
PBL	4, 6, 10, 15 m
Clamping diameter	
PerCut 160	44 mm
PerCut 170	50 mm
Weight (with 1.5 m hose parcel)	3.8 kg
Cooling	circulating direct cooling
Plasma gases	Oxygen, Air, Argon, Nitrogen, Hydrogen and mixtures
Swirl gases	Oxygen, Air, Nitrogen and mixtures

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 following standards and instructions: EN 60974-1 (VDE 0544, part 1) and BGV D1. 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.

### HiFocus 160i - configuration with maximum components (with FlowControl)



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 whatever kind can't be derived from this prospectus.

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