

Kjellberg[®]
FINSTERWALDE

the
FINE FOCUS[™]
company

Plasma Cutting System

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

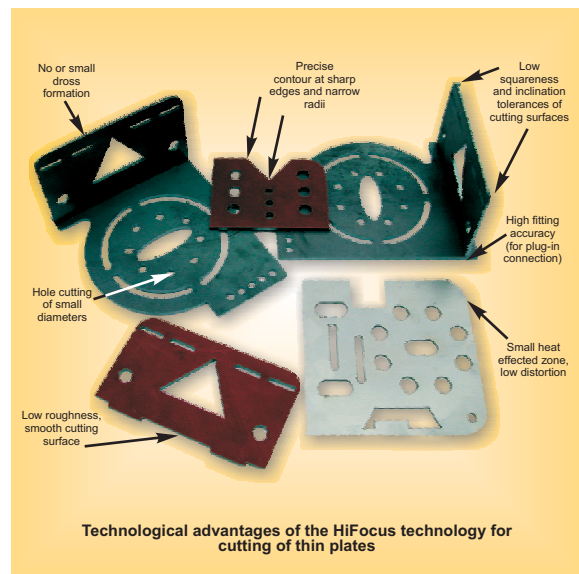
Since the first performance of the HiFocus technology in the year 2000 the world of plasma cutting was enriched by a new dimension of productivity, quality and variety of application, based on the well-known and approved FineFocus technology.

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 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 plasma cutting system 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 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

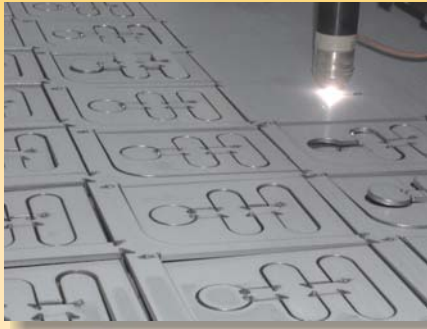
Technological flexibility, achievable cut quality and availability of the cutting system depend extensively on the coordination between power source and plasma cutting torch. Furthermore the **productivity** is influenced significantly by the configuration of the power source.

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 160A. Further advantages are:

- **Superior cut quality** due to flexible adaptation of the process sequence to the cutting job
- Optimised cutting process by **fast control** of the cutting current, high dynamic response at small contours and corners; reduced run-in path
- **Long consumable life** due to microprocessor controlled cutting process
- **Rapid operation** start because of extremely fast transition from pilot arc to main arc
- Small components, therefore low weight
- **Improved energy balance** due to minimised 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 a 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 cut quality is maintained over a long period.

The plasma torches PerCut 160 and 170 are furnished with a special 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 together with the unit FlowControl as an excellent marking tool. There is 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 (max. 12.000 mm/min) 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 units **PGE3-HM** (for mild steel) and **PGE-H** (for all materials), provided with manual adjusted flow meters, serve 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 sized plates it is acceptable.

For higher demands on gas mixtures Kjellberg Finsterwalde has developed the automatic gas console **FlowControl**. It 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 cut quality through tailored gas mixtures; compensation of pressure fluctuations
- Highest reproducibility due to microprocessor control and monitoring
- Use of a data bank with gas parameters for standard materials, established by the manufacturer; easy storage of optimised parameters for further materials
- The plasma torch is suitable for cutting and marking operations without changing of consumables

Versatile torch technology

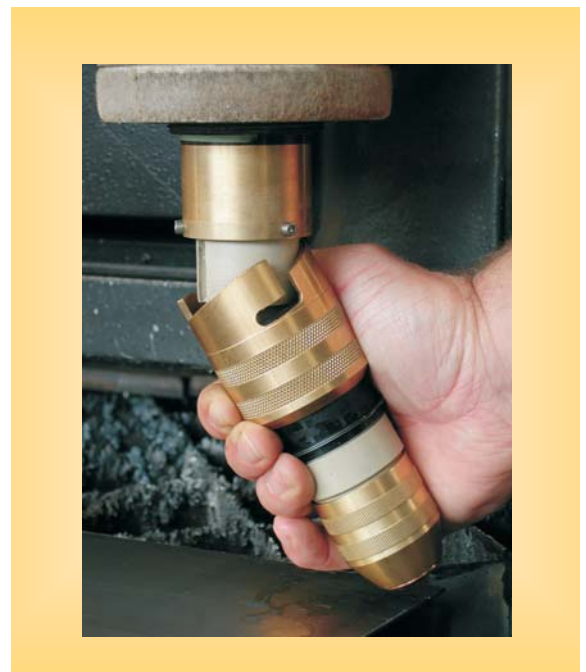
Especially for the *HiFocus* technology a new generation of plasma torches were developed, covering the enhanced demands of this new technology. They ensure an increased constriction of the plasma arc due to the use of smaller nozzle orifices, an improved gas rotation and the application of swirl gases. 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 work-pieces.

Furthermore 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

Material thickness	10 mm	20 mm	30 mm	40 mm	50 mm
Maximum values are material depending	Piercing with arc depending height control				
	Recommended range for application				
	Maximum cutting range				

Operating data (extract)¹⁾

Material thickness (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	5400				
1	20	3700	30	5000	35	3800
2	50	2600	55	4000	35	2600
3	50	2200	55	2600	35	2300
4	60	2600	60	2200	45	1500
5	60	2400	60	2000	50	1400
6	100	2700	130	2000	130	3200
8	100	2400	130	1600	130	2200
10	130	2600	160	1400	160	1800
12	160	2400	160	1100	160	1650
15	160	2000	160	950	160	1250
20	160	1400	160	700	160	1000
25	160	1200	160	550	160	800
30	160	550	160	400	160	600
35	160	450	160	250	160	400
40	160	400				
45	160	300				
50	160	200				

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.

Primarily by developing advanced torch components and by optimisation of the control sequences the spectrum of application of the HiFocus technology could be enlarged. With the technology HiFocus^{plus} extraordinary small differences in the cutting angle can be achieved. That means, smooth cutting surfaces, **without aftertreatment are possible in a wide cutting range.**

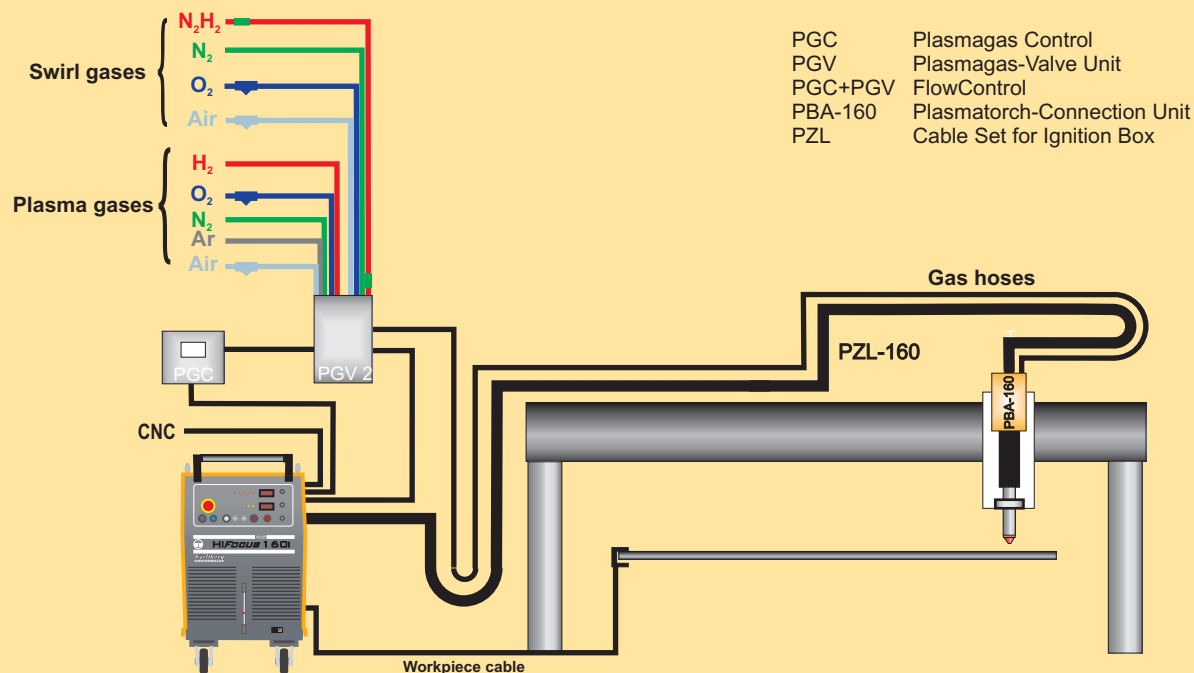
Technical data

Power source	HiFocus 160i
Mains voltage	3x 400 V, 50 Hz
Connected load, max.	33 kVA
Fuse, slow	50 A
Cross section mains cable, Cu	4 x 10 mm ²
Open circuit voltage	400 V
Cutting current	10 - 160 A (100 % d.c.)
Marking current	4 - 25 A (100% d.c.)
Cutting voltage	160 V
Cutting power	max. 25.6 kW
Protection class	IP 22
Dimensions (L x W x H)	960 x 540 x 1050 mm
Weight	196 kg

Plasma torch	PerCut 160 / 170
Plasma machine torch	PerCut 160
Quick change torch	PerCut 170
Max. cutting current	160 A
Duty cycle	100%
Max. cutting range	0.5 up to 50 mm
Clamping diameter	
PerCut 160	44 mm
PerCut 170	50 mm
Plasma gas	N ₂ , H ₂ , Ar, O ₂ , Air
Marking gas	Ar
Swirl gas	N ₂ , H ₂ , O ₂
Cooling	Coolant "Kjellfrost"

Kjellberg-plasma cutting systems 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 (VDE 0544). The plasma cutting systems 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 any kind can not be derived from this prospectus.

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