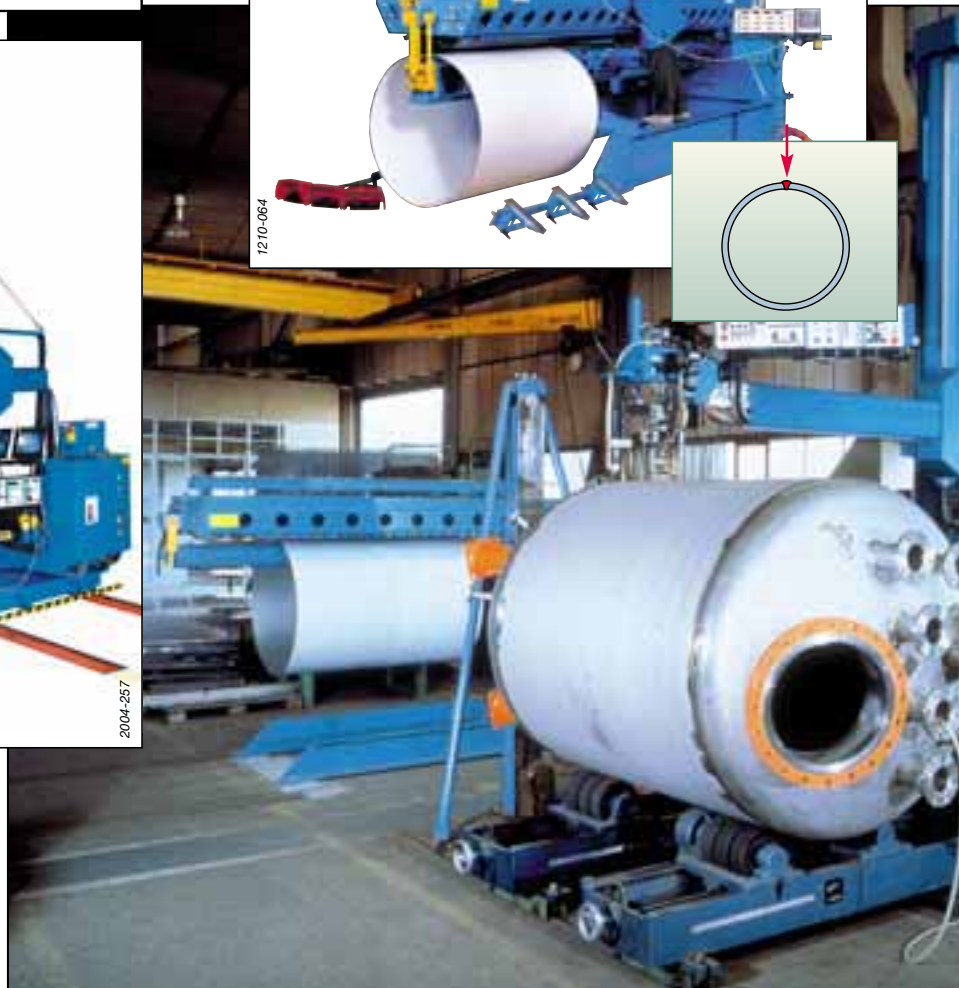
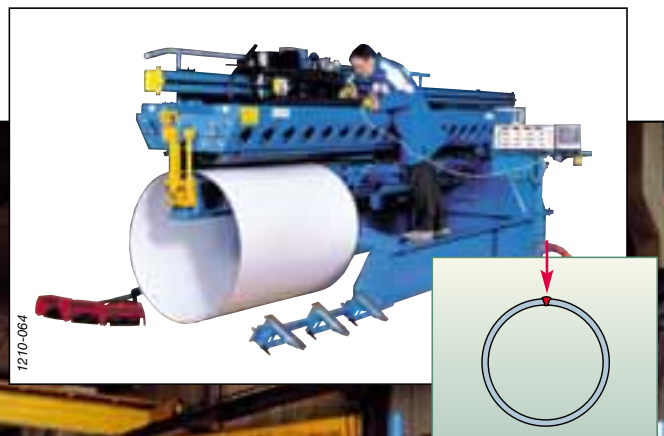
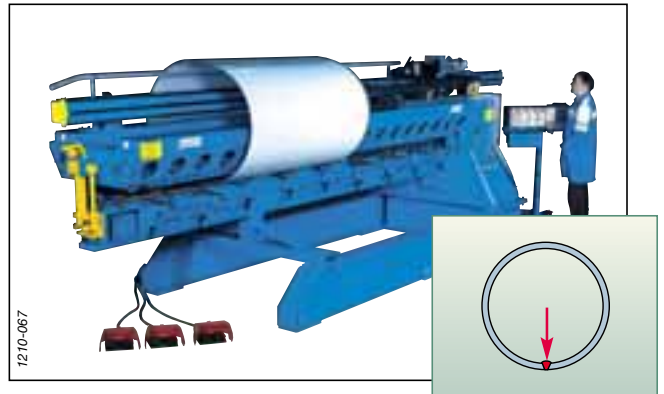
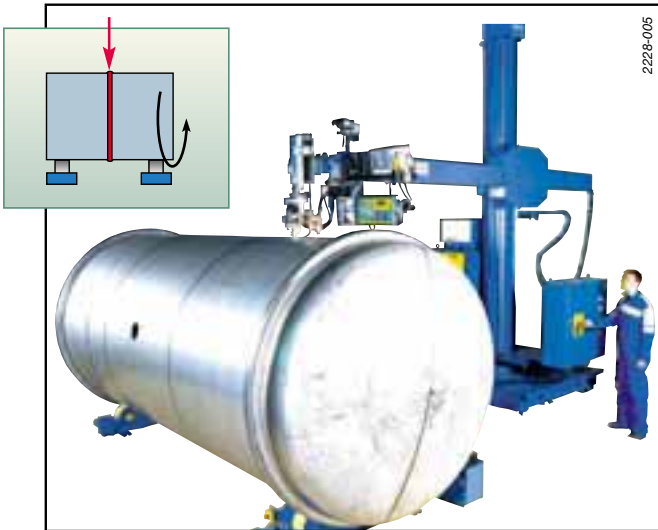


Typical TIG-plasma solutions



Boilers maker solutions





2000-343

2000-160

2003-204

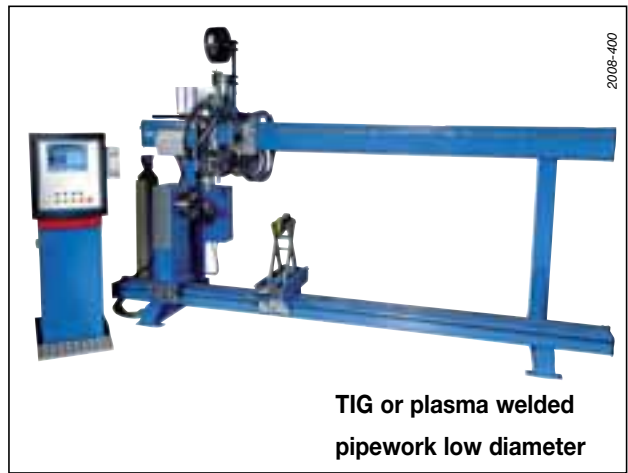
1467-003

Pipework solutions



TIG or plasma welded
pipework high diameter

3635-008



TIG or plasma welded
pipework low diameter

2005-400

Vertical solutions



1415-014



2000-169

Light alloy vertical cylinder with AC TIG process



Stainless steel vertical cylinder with
Key hole plasma process

2007-318

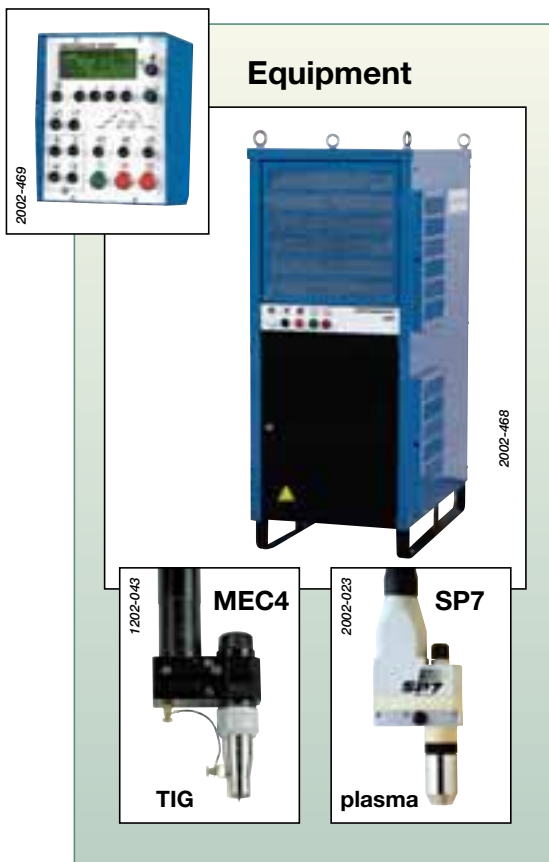
TIG and PLASMA installations



Multi-purpose welding installation to enable the following processes to be used in automatic applications:

- DC TIG with smooth or pulsed current
 - AC TIG with variable polarity,
 - DC plasma with smooth or pulsed current,
- This equipment is offered in several versions.**

Nertamatic 450 plasma or TIG



Process control

- 50 welding programs
(voltage, current, wire speed, movement)
- Clear text LCD screen display
- Parameter modification while welding
- Cycle start/stop, manual control of gas/wire, AVC

TIG/plasma direct current basis

- PC 104 central unit and interface
- Pulser 450 A/100 %
- Control arc circuit 25 A/100 %
- Primary three-phase power supply
50/60 Hz - 230/400/415/440 V

Optional alternating module

- Variable polarity TIG operation on aluminium
- Variable polarity current 450 A/100 %
- Variable polarity frequency from 50 to 200 Hz

Basic installation:

- NERTAMATIC 450 power source
- HF module + torch connection
- Remote control unit box, welding control
with 50 memorised programs
(display/control of current, voltage, wire speed)
- Diskette drive for uploading or downloading programs
- Parameter print-out
- Power controller module
- Harness length 10, 17 or 22 meters compatible
with cable hanger chain

NERTAMATIC 450 add-ons

- Wire, AVC, gas control box

Machine add-ons

- Movements, mecacycles, PLCs etc...



This installation meets the highest quality standards for welding and productivity for industries as diverse as boiler-making using stainless steels, aeronautics using noble metals, chemical engineering, energy production, transformation and transport as well as prefabrication of gas and petrol pipelines etc.

Nertamatic 450 HPW plasma or TIG

The system is based on the same components of the NERTAMATIC 450.

Only the control unit is changed by an industrial PC allowing the complete management of the machine starting from only one control panel, giving :

- Numerical management of the welding process, its associated movements and drive units
- Traceability, a program integrates all the parameters allowing the repetitivity of the welding
- Quality follow-up in option, record and storage of the essential parameters of welding (current, voltage, wire feeding, movement)
- User friendly and intuitive interface allowing the programming, controls and follow up
- Intuitive built up of cycle machine thanks to a graphic programming
- Touch screen facilitating the HPW use
- Off line programming on PC, data exchange via USB key
- Optimisation of the machine integration
- Control via industrial PC

User friendly and intuitive interface allowing the programming, controls and follow up

Intuitive, interactive and user friendly, this HPW interface software allows an easy navigation, facilitating the dialogue between the machine and the operator, also the flexibility of the welding to your production constraints.

HPW interface is divided according to the type of work to carry out in four indexes :

- Configuration
- Programming
- Welding
- Quality (as an option)



Configuration



Programming



Welding



Quality (as a option)

For an easy navigation, management and control of the machine, the dialogue with HPW is done starting from a touch screen, industrial LCD of 15 inches.

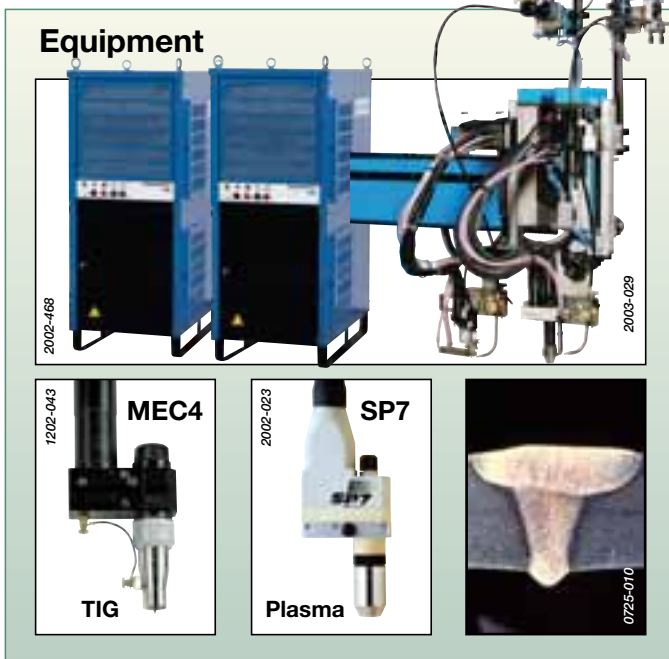
TIG and PLASMA installations



2007-438

This installation was developed and built for large-capacity stainless steel boiler makers (basic activity transport and storage of chemical products and foodstuffs with series 300 stainless steels, thickness from 1 to 8-10 mm).

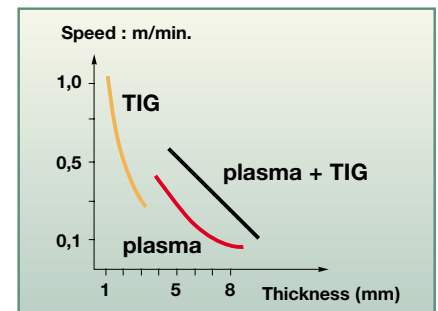
Nertamatic 450 bicathode plasma + TIG



This tool is ideal for assembling panels for the prefabrication of vessels longer than 4 meters and carrying out circular welds for diameters greater than 2 meters.

It uses Air Liquide Welding's original plasma + TIG process whereby the first "plasma" torch penetrates the butt-jointed panels. The second "TIG" torch equipped with metal filler, electromagnetic arc oscillation and a gas protection carriage produces a perfect surface finish which can often be left without further treatment.

This process of using 2 torches in tandem gives a productivity gain of 30-50 % over a single-torch plasma installation.



Welding equipment

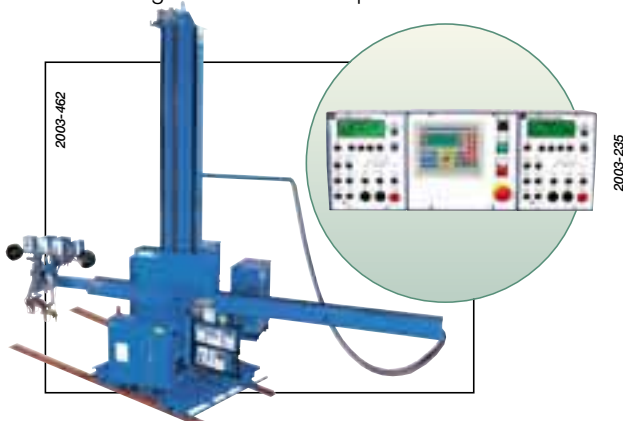
The plasma + TIG installation is made up of two NERTAMATIC 450 installations:

- a plasma installation with SP7 torch and arc voltage regulation,
- a TIG installation with MEC4 torch, arc voltage regulation, wire feed, arc oscillation and gas protection carriage.

Two welding controls are available, the standard or the HPW

Standard

Plasma and TIG get its own control unit which stores all the welding parameters. Then, a PLC unit drives the complete P+T sequence in order to synchronise welding torch starts and stops and to control the speed and length of weld. This digital control memorises and manages the movement parameters.



HPW

Control device for the complete management of the machine starting from only one control panel, allowing:

- Numerical management of the welding process, its associated movements and drive units
- Traceability, a program integrates all the parameters allowing the repetitiveness of the welding
- Quality follow-up in option, record and storage of the essential parameters of welding (current, voltage, wire feeding, movement)
- User friendly and intuitive interface allowing the programming, controls and follow up
- Intuitive built up of cycle machine thanks to a graphic programming
- Touch screen facilitating the HPW use
- Off line programming on PC, data exchange via USB key
- Optimisation of the machine integration
- Control via industrial PC



Additionally to those TIG/plasma installations, optional functions can be added as video system, arc oscillation, hot wire, automatic seam tracking system...

Video system: VISIOARC

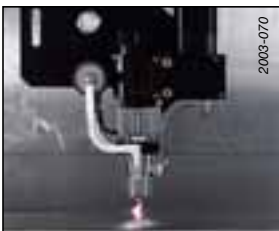
The TIG/plasma video system can be easily integrated



into Air Liquide Welding installations. It uses a greatly enlarged image which enables the precise position of the welding torch to be viewed thus making the operator's work easier and improving the quality of the welding operation.

OSCILLARC 3

Deviation or electromagnetic oscillation of the TIG arc



Arc deviation
This technique is used to electrically deflect the TIG arc which considerably increases the heat affected zone along the weld axis and increases speed

by the order of 30 to 50% for thicknesses of less than 2 mm. This facility is particularly suited to the continuous welding of thin tubes formed from strip, cable conduit, electrical resistance shielding etc. i.e. all mass-produced parts welded without filler metal.

Arc oscillation

An extension of the arc deviation technique described above, arc oscillation is used to deposit metal over areas up to 20 mm wide to fill bevels or reconstitute surface coating.

Hot wire TIG and plasma

Productivity improvement by increasing the deposition rate

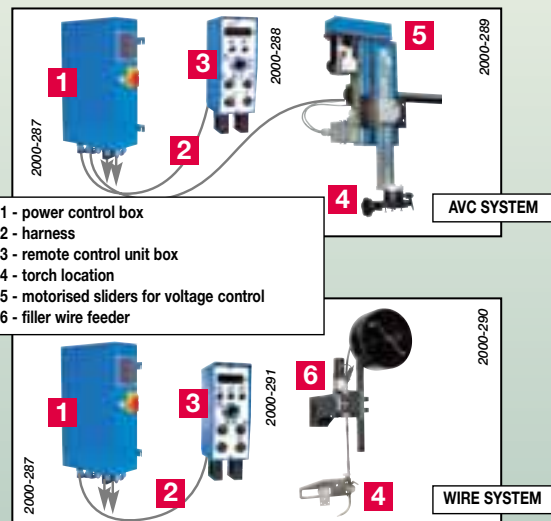
For filling bevels 40 mm deep, the use of hot filler wire provides a good solution and is particularly suited to applications where a high specification of the welded joint is required. This special technique uses an auxiliary current to bring the end of the wire to nearly melting point. Viable for plates of thickness 10 mm and above, the use of hot filler wire enables 2.5 to 3 kg of metal to be deposited per hour for filling bevels using multiple passes



or for quality hard-surfacing.

AVC (Arc Voltage Control) and wire system autonomous units

These devices can be used to update older automatic TIG and plasma welding installations, but also to create simplified installations for manual welding stations.



In line pipe welding



2662-031

2002-468



N450



400i

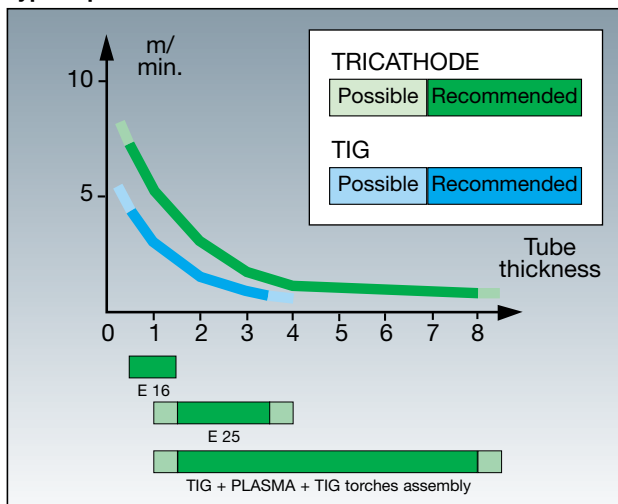
2008-467

In line pipe

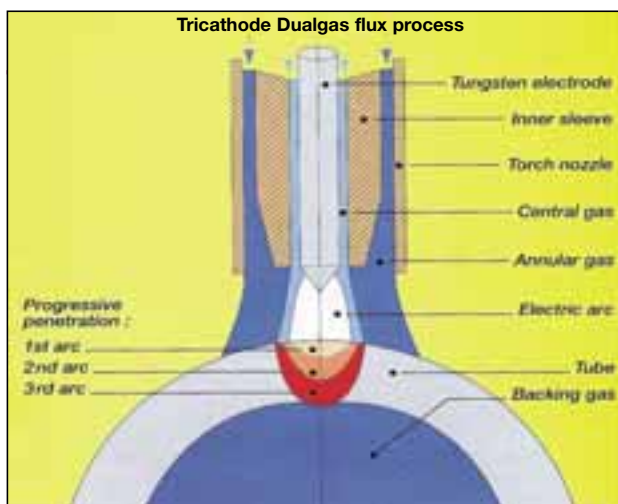
Air Liquide Welding proposes solutions for in line pipe welding, process to be integrated into pipe mills

- monacathode equipment in TIG or plasma
- tricathode torch with 3 x TIG or TIG + plasma + TIG

Typical performances



Welding speeds are indicative and depend on the material, quality required and pipe mill quality.



Monacathode welding

Two installations based on N450 or 400i:

- Nertamatic 450 (450 A/100%)
- Power cycle 400i (400 A/100%)

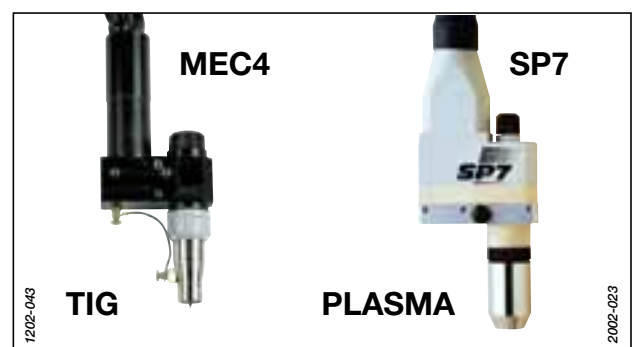
Basic system composition:

- 1 power source (N450 or 400i)
- HF starting unit
- control panel for N450 or remote control for 400i
- MEC4 TIG torch or SP7 plasma torch
- Cable set and pipe work for connecting the welding sets (10 m)

Optional extras

- REFRIJET GR5 or FRIJET 3B cooling unit,
- System primary power supply cabinet.

Welding heads



1202-043

2002-023

MEC4: 450 A at 100%, typical application welding thickness from 0.5 to 3 mm

SP7: 450 A at 100%, typical application welding thickness from 2.5 to 8 mm

2188-002



Tricathode 400i E16 or E25

Combinaison of 3x TIG double flux arcs (E16 or E25)

Smooth current welding up to 3 x 400 A/100% (inverter).

- E25 torch (thicknesses from 1 to 3.5 mm).
- E16 torch (thicknesses from 0.5 to 1.5 mm).

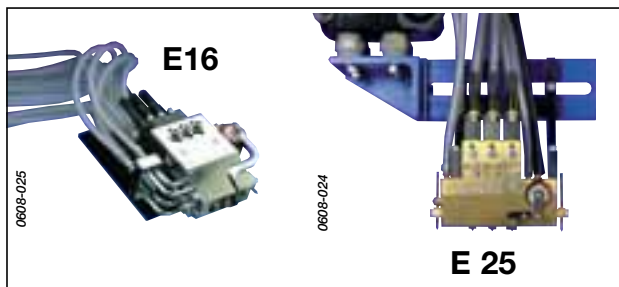
Basic system composition:

- 3 x power cycle 400 i welding sets 400 A each 100% (inverter),
- HF starting unit,
- Control panel with:
 - current regulation, digital voltage & current displays for each arc,
 - adjustment and displays of gas flow settings,
 - adjustment of electromagnetic arc (first electrode).
- Welding head mounting assembly,
- E25 or E16 welding torch,
- Cable set and pipework for connecting the welding sets, head and control panel (15 m).

Optional extras

- REFRIJET GR5 or FRIOJET 3B cooling unit,
- System primary power supply cabinet.

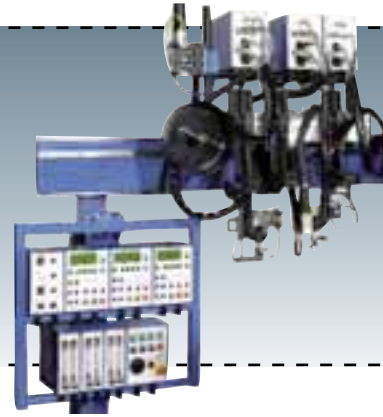
Welding heads, tricathode dual flow TIG



E 16: Implements the dual flow tricathode process. 200 Amps per electrode (total 600 Amps). Independent adjustment of each electrode to the shoe (one piece design). Fit tungsten \varnothing 2.4 mm. Typical application (wall thickness) 0.5 to 1.5 mm.

E 25: Implements the dual flow tricathode process. 400 Amps per electrode (total 1200 Amps). Independent adjustment of each electrode to the shoe (modular design). Fit tungsten \varnothing 3.2 and \varnothing 4.0 mm. Typical application (wall thickness) 1 to 3.5 mm.

2008-468



Tricathode TPT N450

Combinaison of TIG + plasma + TIG process

Smooth or pulsed current welding up to 3 x 450 A at 100% (chopper technology)

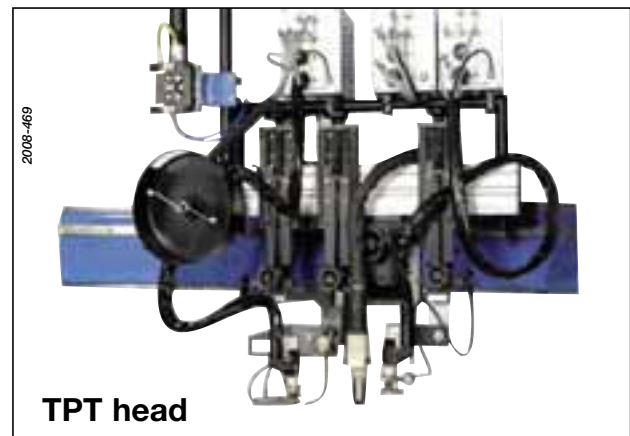
Basic system composition:

- 3 x NERTAMATIC 450 welding sets, 450 A at 100 % each,
- Control panel with:
 - current regulation, digital voltage & current displays for each arc,
 - adjustment and displays of gas flow settings.
 - adjustment of electromagnetic arc movement.
- Torch interface including HF source,
- Mechanical torch adjustment,
- Cable set and pipework for connecting the welding sets, head and control panel (10 m).

Optional extras

- REFRIJET GR5 (x3) or FRIOJET 3B cooling unit,
- System primary power supply cabinet.

Welding heads



TPT head

TPT head: Two MEC4 TIG torches and one SP7 plasma torch. ideal for thickness betneses between 2.5 and 8 mm.

TIG and plasma welding processes



Welding sets for automatic TIG or plasma welding processes

A Power cycle 400 i

An inverter technology unit for plasma or TIG DC welding systems.

- Power supply: 400 V, 3-phase, 50-60 Hz
- Welding current: 400 A at 100%

B NERTAMATIC 450

A transistorised chopper technology unit for DC TIG or plasma welding systems (optional AC module for TIG AC).

- Power supply: 230/400/415/440 V, 3-phase, 50/60 Hz.
- Welding current: 450 A at 100%.
- Pulse frequency: 1 to 100 Hz in DC / (1 to 200 Hz in AC).

Water cooled welding torches

Torches	C TIG MEC 4		D SP 150		E PLASMA SP 7	
	straight	curved	straight	curved	straight	curved
Classic	W 000 315 606	W 000 315 607	W 000 315 609	W 000 315 614	W 000 315 615	-
Quick connectors**	W 000 315 611	W 000 315 612	-	-	W 000 315 613	W 000 315 626
Thoriated tungsten electrodes 3% (2%*)	Ø 1.6 mm	S03710258*		S03710258*		-
	Ø 2.4 mm	W 000 315 768	-		-	
	Ø 3.2 mm	W 000 315 769	W 000 315 769		W 000 315 769	
	Ø 4 mm	W 000 315 770	-		W 000 315 770	
	Ø 4.8 mm	W 000 315 771	-		W 000 315 771	
Nozzles	Ø 1.5 mm	-	-		W 000 315 791	
	Ø 2 mm CD	-	W 000 315 780		-	
	Ø 2.5 mm	-	-		W 000 315 792	
	Ø 3 mm	-	-		W 000 315 793	
	Ø 3 mm CD	-	-		W 000 315 794	
Constricting nozzles	Ø 4 mm	-	-		W 000 315 795	
	Ø 5 mm	-	W 000 315 790		-	
Nozzles	Ø 6 mm	-	-		W 000 315 796	
	Ø 11 mm = S92579701	water = S92579891		water = S93570025		-
	Ø 13 mm = S92579698	air = S92579830		-		-
Trailing shield water	Ø 18 mm = S92579696	-		-		-
	W 000 315 603	-		W 000 315 616		-
	For TIG welding, twin HF ignition for better arc striking. • Current 500 A at 100%, • Standard electrode length 150 mm, simple to replace, Optional extra: • Gas trailer to protect welds in sensitive metals (eg, titanium) or improve the quality of stainless steel welds, • Magnetic arc oscillation equipment may be used to fill in large weld grooves.		For dual-flow TIG welding, key hole plasma welding (up to 4 mm edge to edge) or soft (unconstricted) plasma welding. • Current: - up to 150 A at 100% for plasma, - up to 200 A at 100% for dual-flow TIG, • Standard electrode length 150 mm, simple to replace, with automatic alignment.		For single or dual-flow TIG welding and key hole plasma welding. • Current 450 A at 100% • Standard electrode length 150 mm, simple to replace. Self-aligning. Optional extra: • Gas trailer to protect welds in sensitive metals (eg, titanium) or improve the quality of stainless steel welds.	

** Quick interface torch, for quick connectors torch type: W 000 315 574.