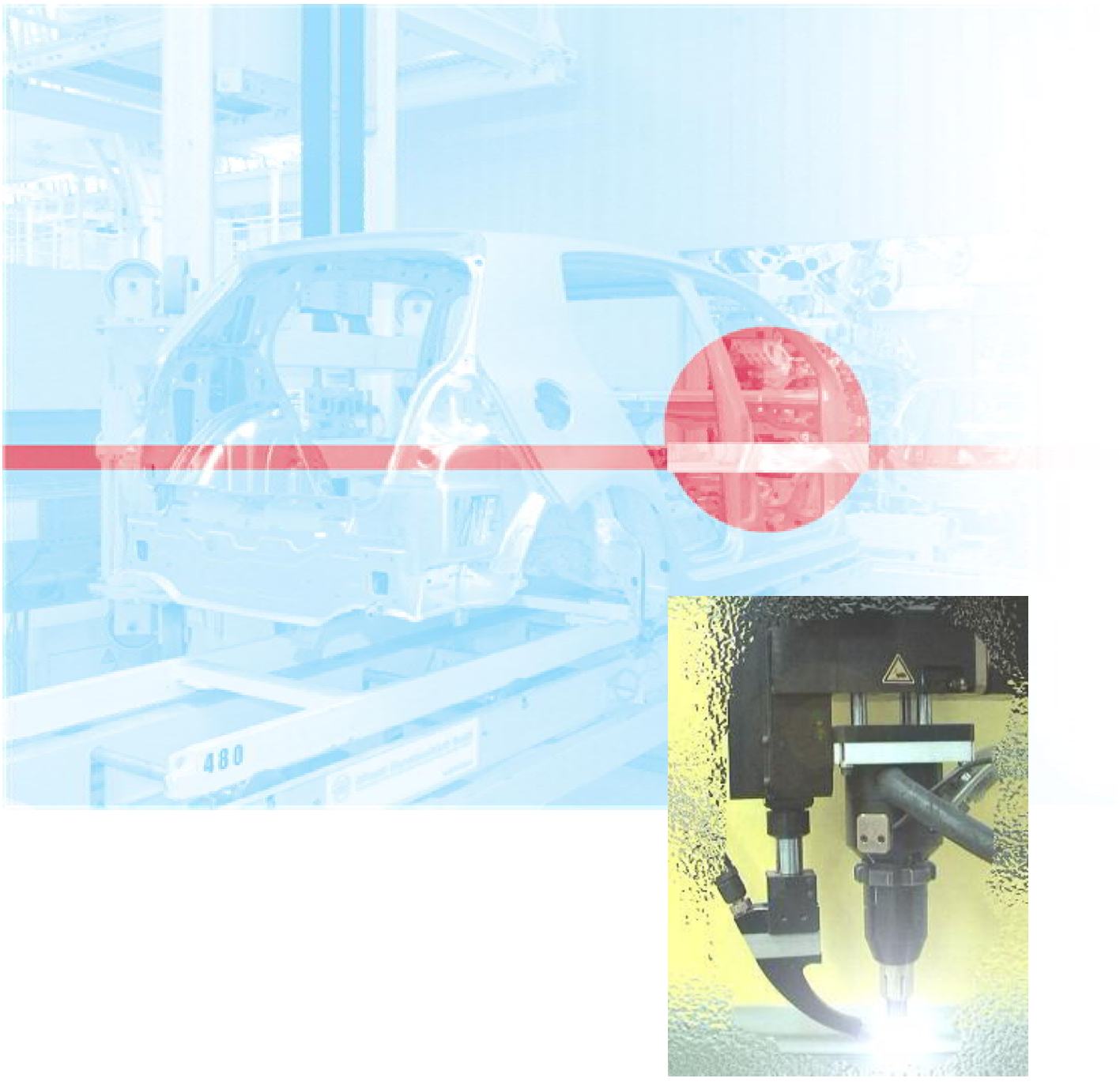


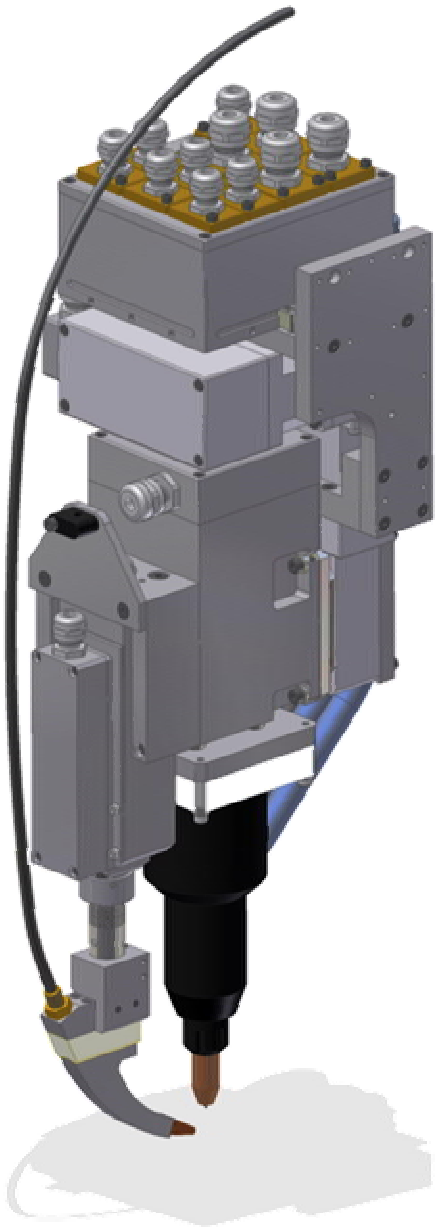
APN seam tracking system from Scansonic and Plasmatron®-joining by Inocon Technologie

v.2.1/17.01.2006

Scansonic – APN

Adaptive Plasmatron®-processing head
Force-controlled joint tracking utilizing filler wire

Plasmatron®-joining utilizing Scansonic's proven joint-tracking principle together with Plasmatron® technology supplied by Inocon



Applications:

Welding and Brazing:

- of stainless steel,
- of aluminium alloy
- of ordinary steel
- of sintered metal

Characteristics

- The APN combines a plasma arc torch and joint tracking in one device.
- The filler wire acts as a mechanical sensor for the joint tracking.
- Force control ensures that the wire is reliably held in the joint and that the gap in height between the electrode and the wire remains constant.
- Utilizing force control, the tip of the filler wire is pressed into the weld joint and is mechanically guided along the path of the joint. The APN compensates for any deviations from the programmed path of the joint: laterally by swivelling, and for deviations in height by correcting the position of the plasma head.
- The electrode is coupled to the movements of the wire so that it mirrors both its lateral and height movements.

Technical data

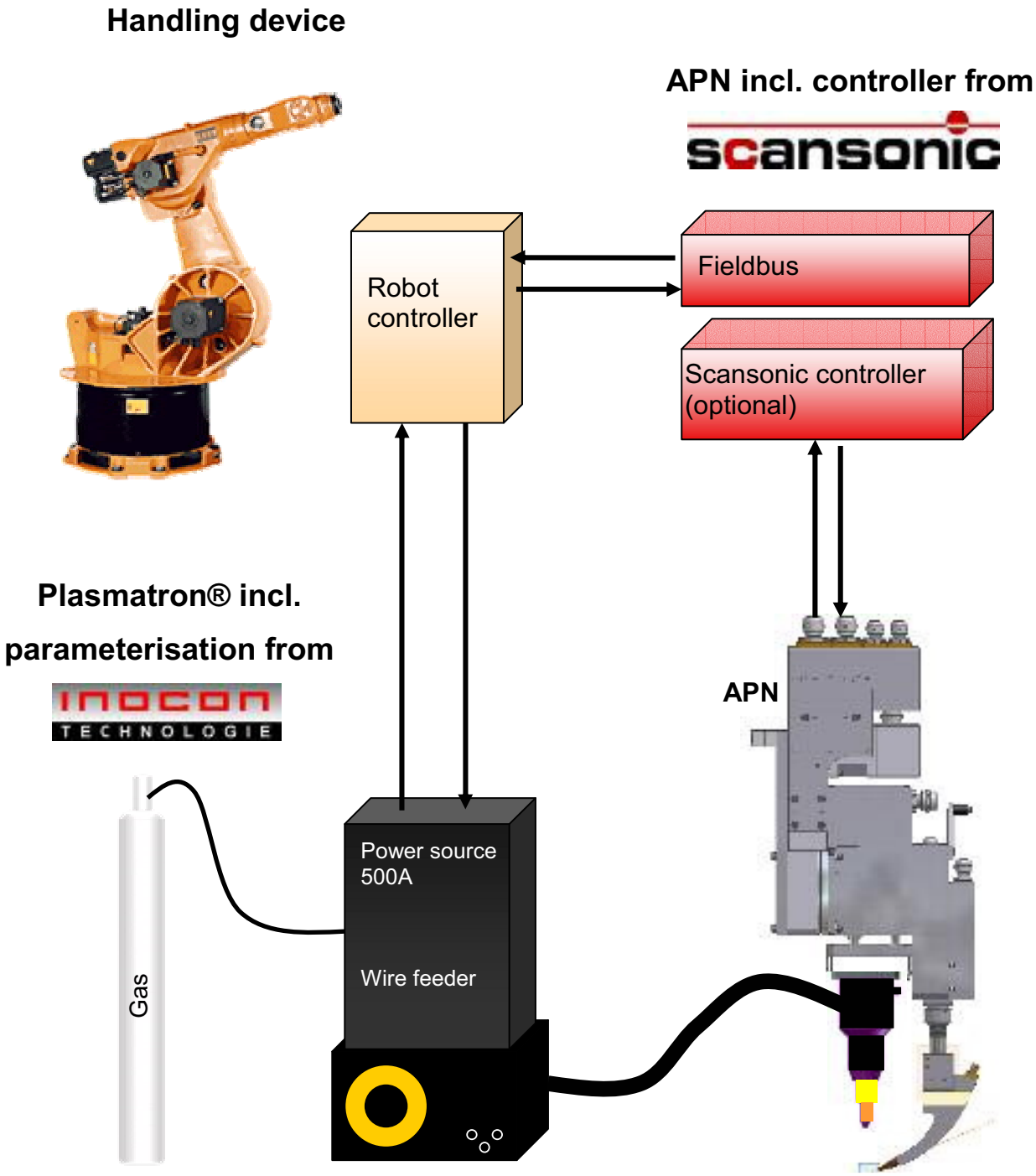
1. Plasma head APN – Technical data

Vmax	Process dependent
Operating range: lateral	+/-10 mm
Operating range clearance	+/- 5 mm
Search position	+/- 90°
Operating temperature	16 - 70 °C
Dimensions (L x W x H)	Approx. 217 x 164 x 570 mm
Weight	Approx. 15 kg

2. Technical data for the controls (required for Variant 2 only)

Operating voltage	24 V (19.2 V to 30.0 V, DIN EN 61131)	
Maximum operating temperature	50 °C	
Communication		
Variant 1		
Control and Parameter assignment	Bus:	Interbus
Variant 2		
Control via interface box	Separate industrial bus coupler (Modbus TCP with digital inputs and outputs)	
	Digital inputs	24V/ 10 mA
	Digital outputs	24V/ 200 mA
	Dimensions (L x W x H)	210 mm x 300 mm x 400 mm
	Weight	Approx. 10 kg
Parameter assignment via	Ethernet + PC - software	

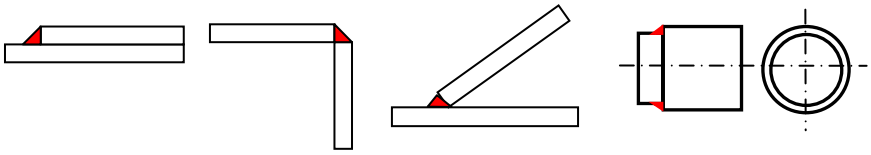
Schematic sketch of an APN application



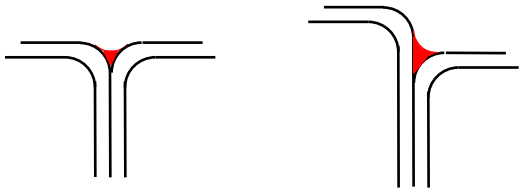
Typical applications for Scansonic's joint tracking principle

Basic joint **Examples**

Fillet joint



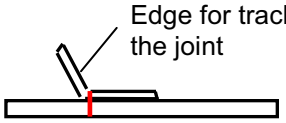
Flange butt weld



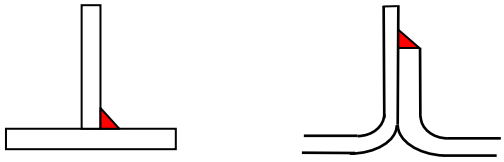
Butt joint

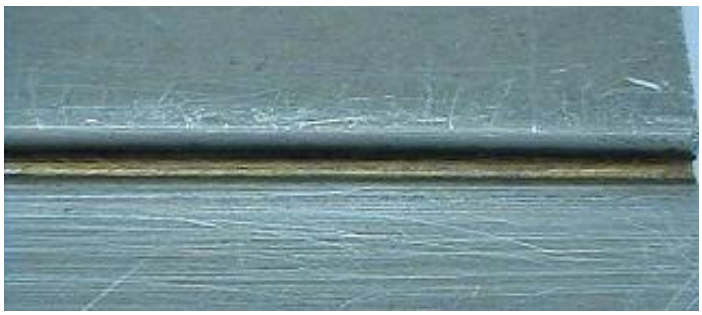
(projecting edge necessary
min. 0.2 mm)
for example 'Tailored Blanks'

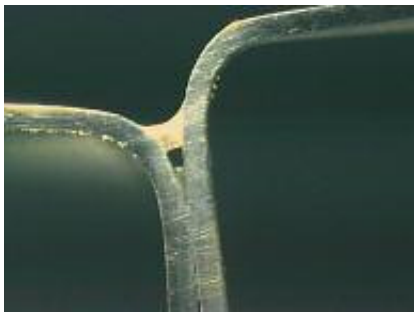
Square groove weld



T-joint





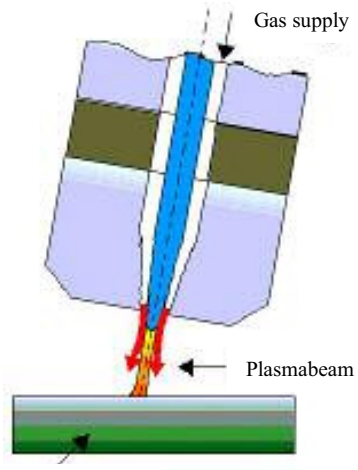


APN brazing: flange butt joint (view from above and micrograph)

Welding current 190 A
Welding speed 3 m/min
Wire feed rate: 3.2 m/min
Brazing alloy CuSi3 Ø 1,2 mm
Gas: Argon 4.6; 10 l/min
Sheet thickness: about 1,4mm

The Plasmatron® – welding by Inocon Technologie

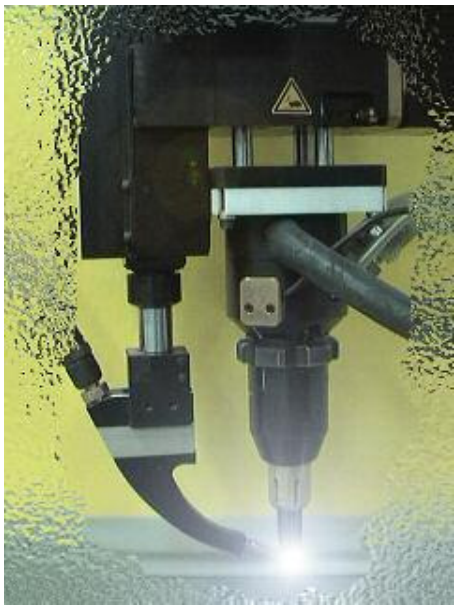
The Plasmatron®-Generator produces the plasma before the nozzle and not behind the nozzle till now. At the same time the Plasmatron® focuses the plasma beam to a focus point with a constructive selectable diameter and a definitive “bottleneck”, therefore a zone with similar diameter of the focus point with up to 4mm length.



Functional principle of **Plasmatron®** by high welding speeds

The cathode stands intentionally about 1,5mm before the nozzle edge. Thereby welding with torch directed towards th finished part of the weld is possible and a skipping of the arc to the nozzle edge can be suppressed. So a very high welding speed is possible.

The determined effect degree amounts approx. 73%-80% compared to approx. 10%-30% in conventional procedures. It depends on the used gas, but you can reach plasma temperatures about 18.000°C with argon, 25.000-30.000°C with helium and up to 50.000°C with hydrogen. If you use mixtures of gas you can reach temperatures between them.

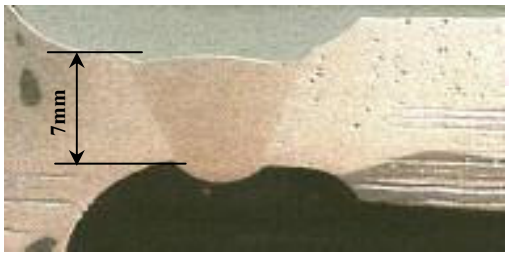


At innovative Plasmatron®-welding torch the constriction takes place by gas flow, which forms und a defined angle an operating focus far from the nozzle. This concept reveals a number of advantages.

Various possible variations arise from the selection of the gas mixture and the selection of the electrical parameters and the different nozzle forms.

The Plasmatron®-concept reveals a number of outstanding advantages:

+ welding with high speed depending on component parts and material
+ tough, fine, grained welding structure (**high load alternation stability)**
+ **up to 80% effect degree** (extremely high energy efficiency)
+ at aluminium-welding the joint preparation can multiple fall
+ **short service standing time of approx. 10-30 sec.**
+ high standing time of the retirement nozzle through the omission of the direct contact with the arc
+ optical cleanly surface of the joint – **visibility joint**
+ the welding process is absolute **without spilling**
+ large achievement stability in heights tolerances
+ in the thinly- and thick sheet metal area useable
+ good accessibility because of narrow nozzles
+ **with or without additional wire** useable
+ working area up to 1000 ampere because of different sizes of the welding torch
+ low insertion of heat and **low distortion**
+ different welding joints possible
+ best suited for full automation
+ best suited for stainless steel
+ slight acquisition costs
+ **slight overhead**
+ high joint stability



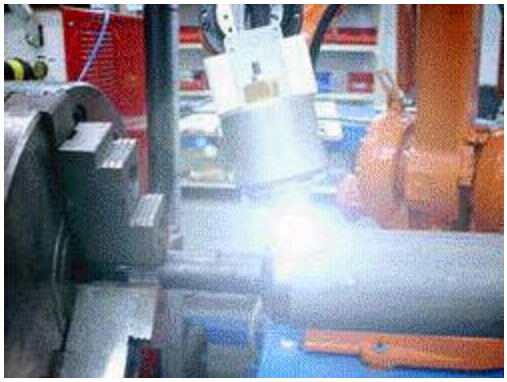
Aluminium welding with a wall-thickness of 7mm without additive

Examples of use

Safety part for a vehicle, hollow body out-of fine grain building steel, 2x1,2mm–flange joint, average v=2,4m/min. (higher speed possible)

part of a vehicle/girder of ALMg3, 2x2,5mm-flange joint without additional material, v=2,5m/min

Brazing joint with CuSi3 solder on galvanised sheet, flange seem with overlaying border, v=3m/min without holes



power plant-unit, different material pairing in steel-performed as stump joint

Fully automatic dual head welding-equipment for driveshaft, fillet weld

door handle made of stainless steel, no incursion of joint and no reinforcement of joint

For future information, detailed product data sheets or an individual consultation, please contact us!

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