



WELCOME



**Alexander Binzel Schweisstechnik
GmbH & Co. KG**

Postfach 10 01 53 · D-35331 Gießen

Tel.: ++49 (0) 64 08 / 59-0 Fax: ++49 (0) 64 08 / 59-141 www.binzel-abicor.com

New Arc Welding Robot Generation

Dr.-Ing. habil. E. Schubert, schubert@binzel-abicor.com

Dipl. Ing. Ingo Frischkorn, frischkorn@binzel-abicor.com

Dipl.-Ing. Ralf Weber, weber@binzel-abicor.com

Alexander Binzel Schweisstechnik GmbH & Co. KG, Buseck

Speaker: Ralf Weber

40 years, married, two children

With ABICOR Binzel since 2004 as

Key Account Manager Robotics, based in Germany

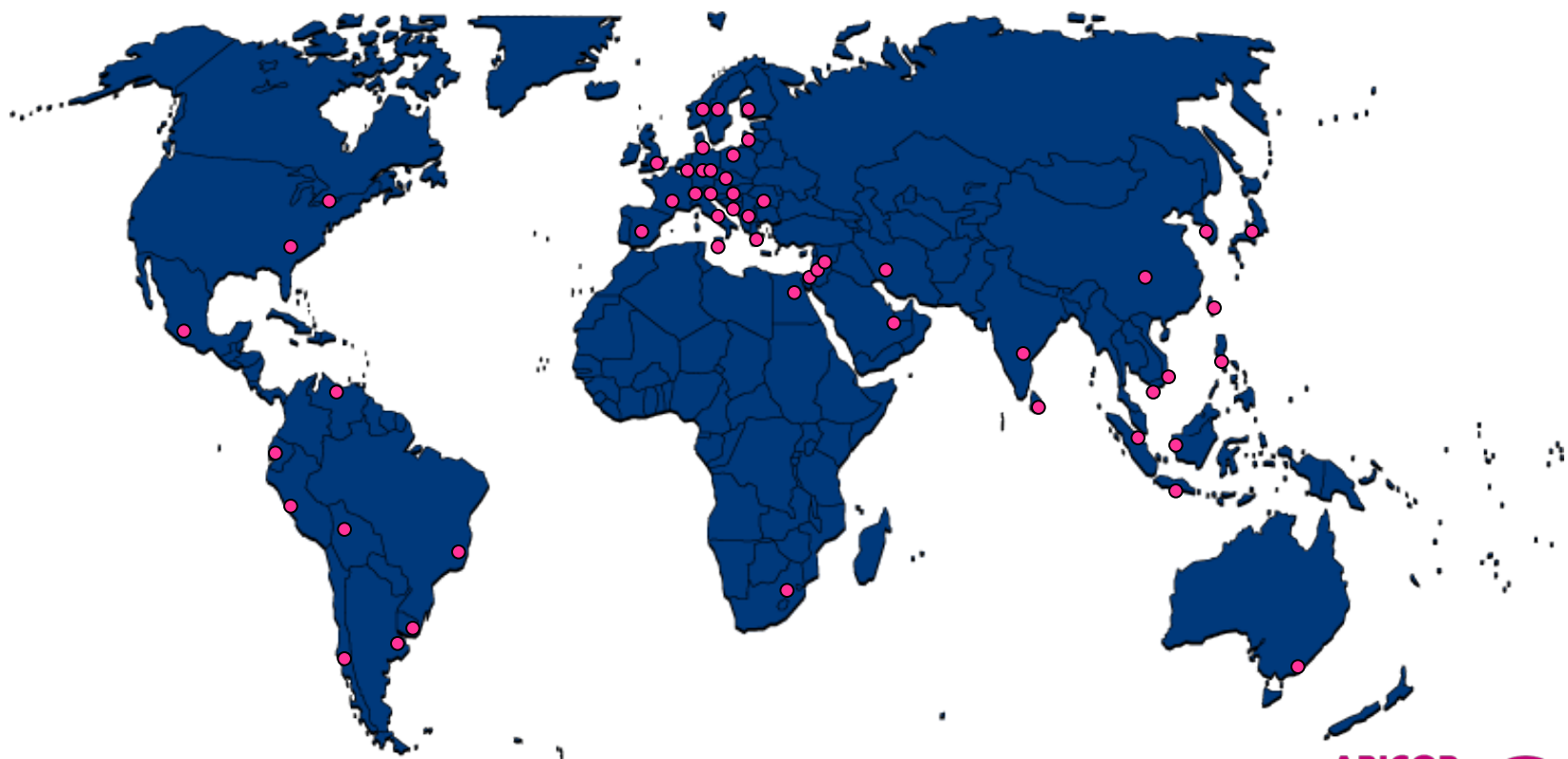
Since September 2007 Global Account Manager Robotics



ABICOR BINZEL

... the welders world ...

„World wide. With more than 32 Produktion- and Sales units and more than 20 exclusive partners...“



Hollow wrist robots

Abstract

Hollow wrist robots are in the meantime the main popular robots for welding applications. Compared with the old generation of robots with external cable assembly's, the new generation of this robots have many advantages. Hollow wrist robots has been developed by ABB, FANUC, IGM, KUKA, MOTOMAN, OTC, PANASONIC, REIS etc.

ABICOR Binzel group researched corresponding torches and technology and have with more than 3500 working systems for this new robot styles very successful applications in the world.

The new generation arc welding robot systems with good accessibility and high performance are applied widely in automotive industry and T1/T2 industry.



Hollow wrist robots

Robot concepts – Standard/Hollow Wrist

Standard Robot:

- External cables
- Different processes can be changed by using a WWS



- Not so fast as the specialised HW welding robots



Source: FANUC Arc Symposium 2011, Neuhausen

Hollow wrist robots

Robot concepts – Standard/Hollow Wrist

Standard Robot:

- Special Welding applications like Tandem



Source: BOMAG

Hollow wrist robots

Robot concepts – Standard/Hollow Wrist



Hollow Wrist Robot:

- The welding specialist
 - Cables integrated in the process arm
 - Short cables, no push pull necessary
 - Complex movements of the torch possible
 - Easy to program and simulate
-
- No change of the processes is possible

Source: HMS, Austria, Aurach am Hongar



Hollow wrist robots

Robot concepts – Arm design



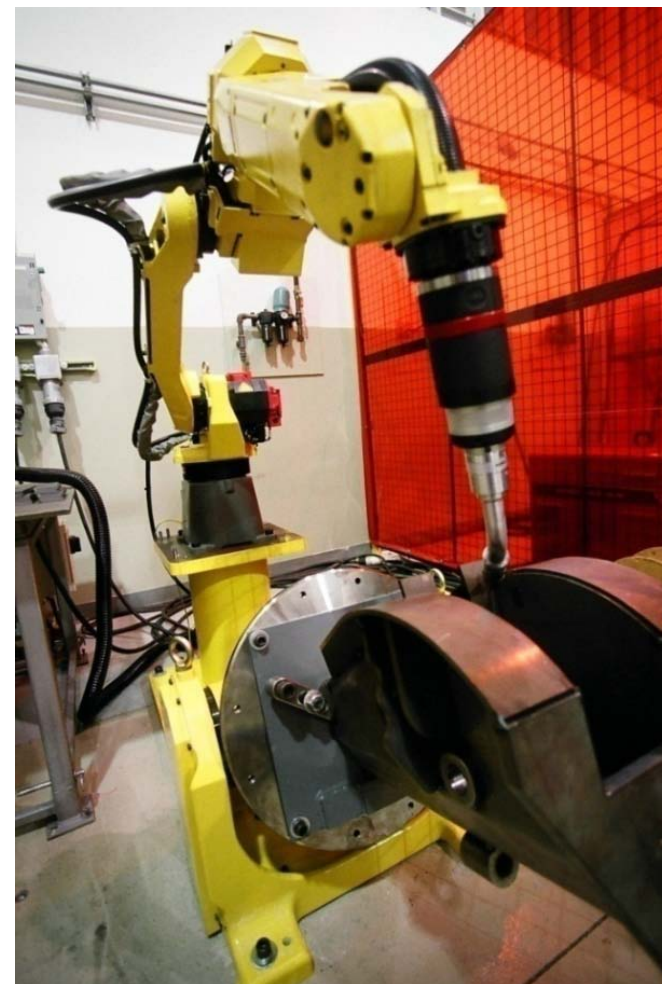
Source: KUKA



Source: ABICOR Binzel

Arm design:

- One side open arm
- Parallel arm



Source: FANUC

Hollow wrist robots

Robot concepts – Quick stop strategy

There are two possibilities having a quick or emergency stop:

- using a shock sensor with a switch signal to the robot
- using a collision detection software (Servo motor of the robots are controlled)

For both strategies ABICOR BINZEL have solutions.

Shock Sensor:

For standard robots:	CAT2, CAT2 HL
For HW robots:	iCAT

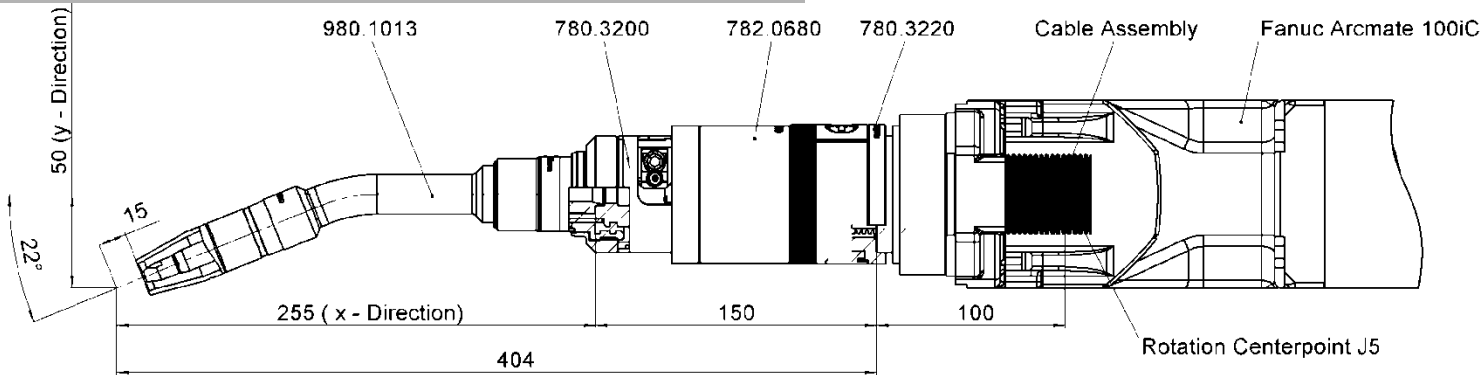
Collision detection software:

For standard robots:	RTM holder, NO-CAT
For HW robots:	iSTM

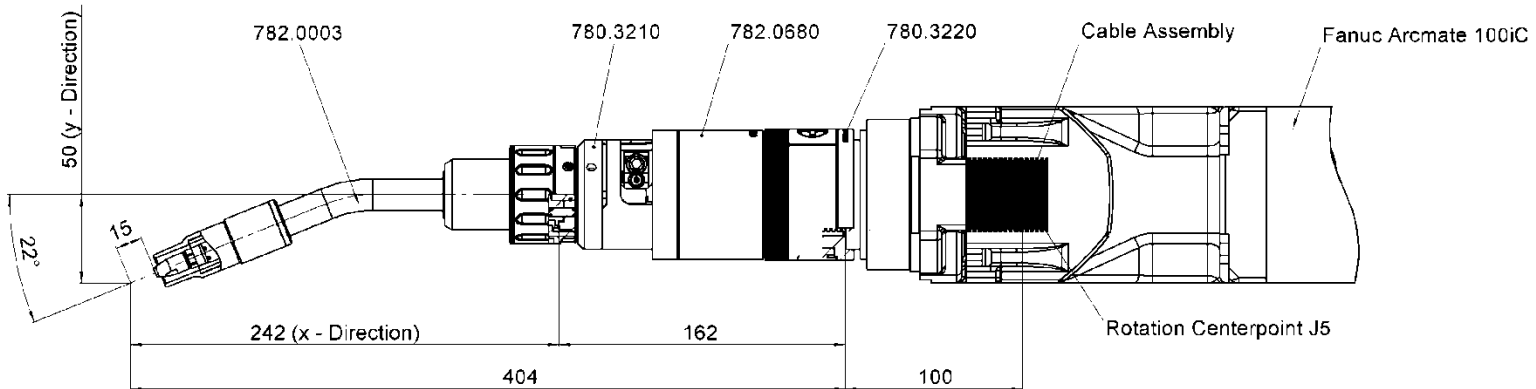
Hollow wrist robots

Equipment – iSTM air- and water-cooled

AIR-COOLED Package iSTM-ABIROB A

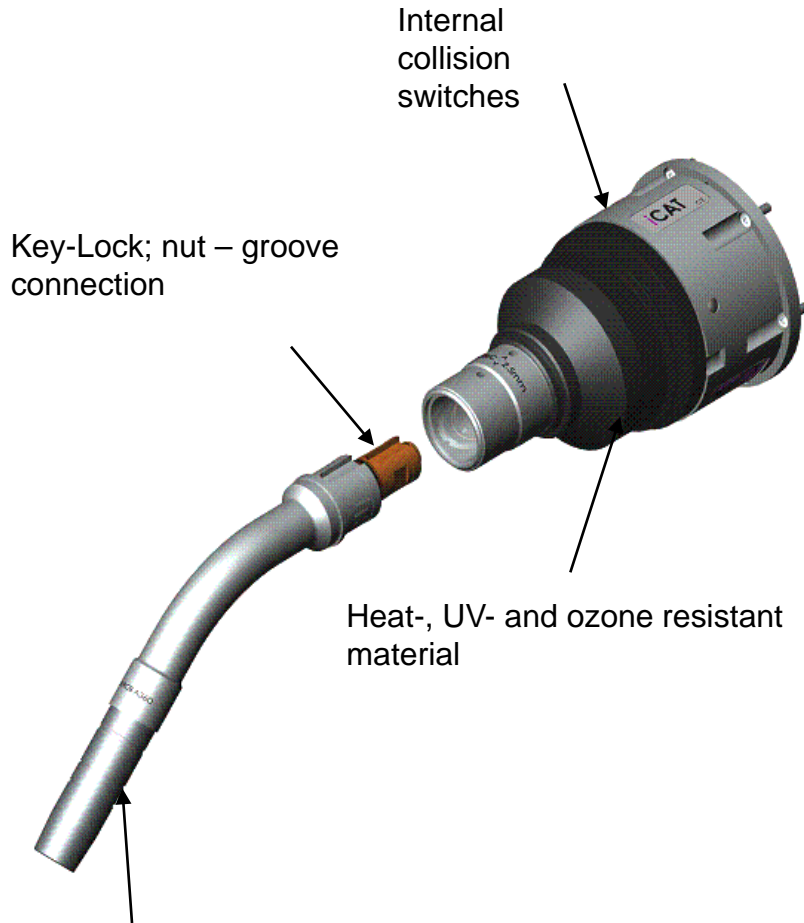


WATER-COOLED Package iSTM-ABIROB W



Hollow wrist robots

Equipment – iCAT air- and water-cooled

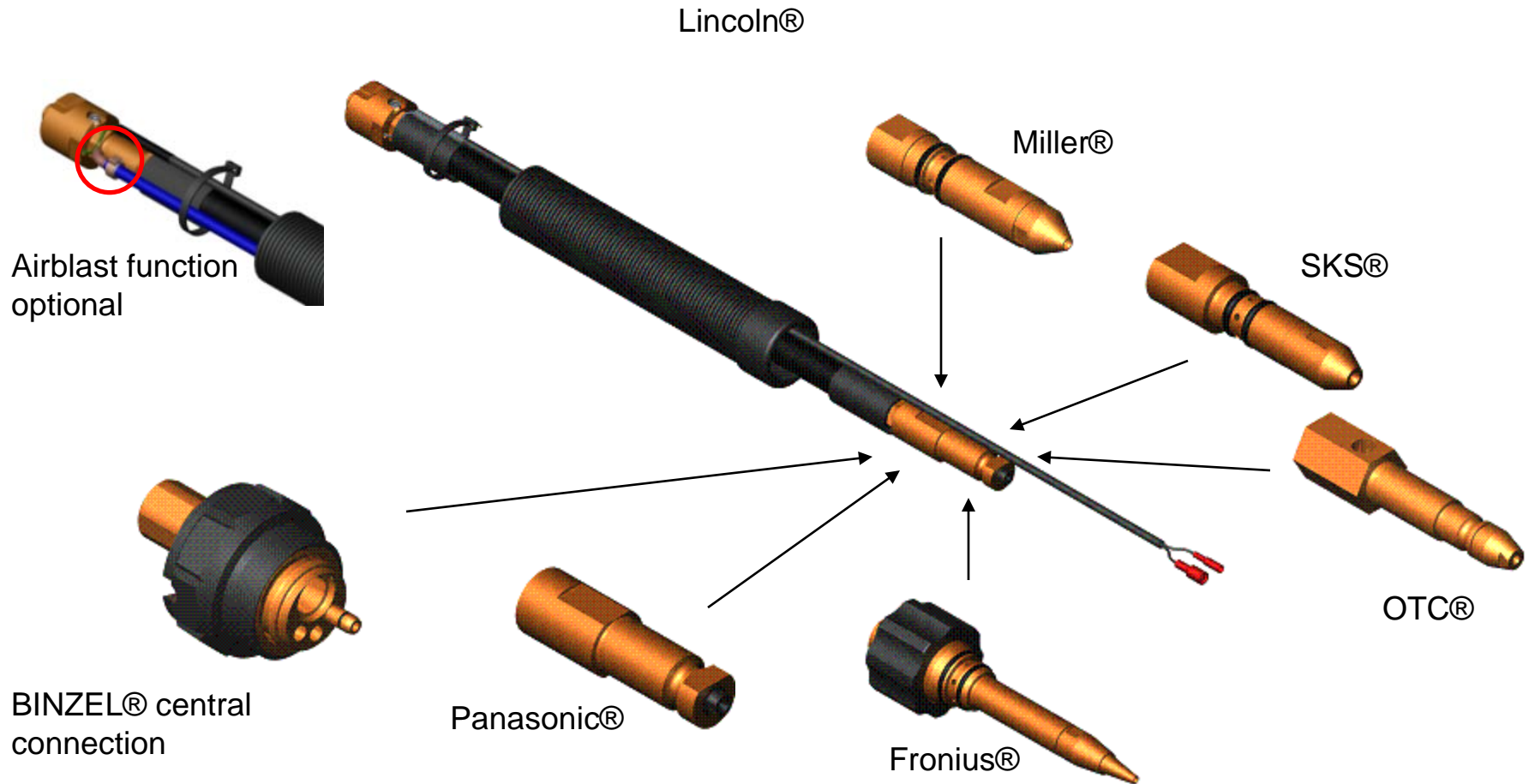


ABIROB A 360 / 500



Hollow wrist robots

iCAT and iSTM – Wire feeder connectors and cables



Hollow wrist robots

Cable management - movements



Source: FANUC Arc
Symposium 2011, Neuhausen



Hollow wrist robots

Speed improvement – higher productivity

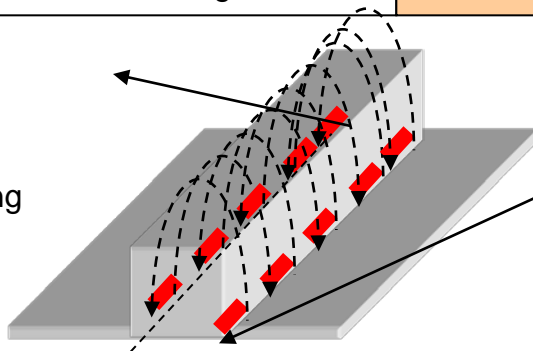
- Increase Max. axis speed on average of all axes over the current model

		ARC Mate 100iC	ARC Mate 100iB
Max. speed	J1	210 ° /sec	150 ° /sec
	J2	190 ° /sec	160 ° /sec
	J3	210 ° /sec	170 ° /sec
	J4	400 ° /sec	400 ° /sec
	J5	400 ° /sec	400 ° /sec
	J6	600 ° /sec	520 ° /sec
	Total	2010 ° /sec	1800 ° /sec

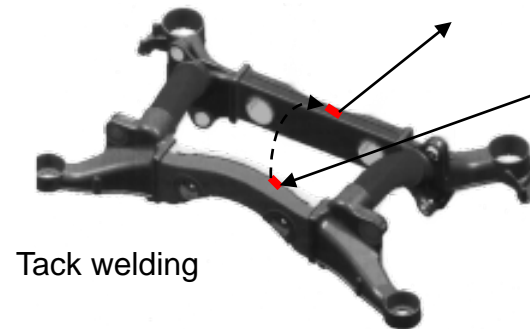
- Increase productivity more than 15% through increased acceleration performance

	ARC Mate 100iC	ARC Mate 100iB
Staggered intermittent welding	11.65sec	13.71sec
Tack welding	6.94sec	8.07sec

Staggered intermittent welding



Source: FANUC



Tack welding



Hollow wrist robots

Less use of space – higher robot/arc density



Source: FANUC

Hollow wrist robots

Better accessibility

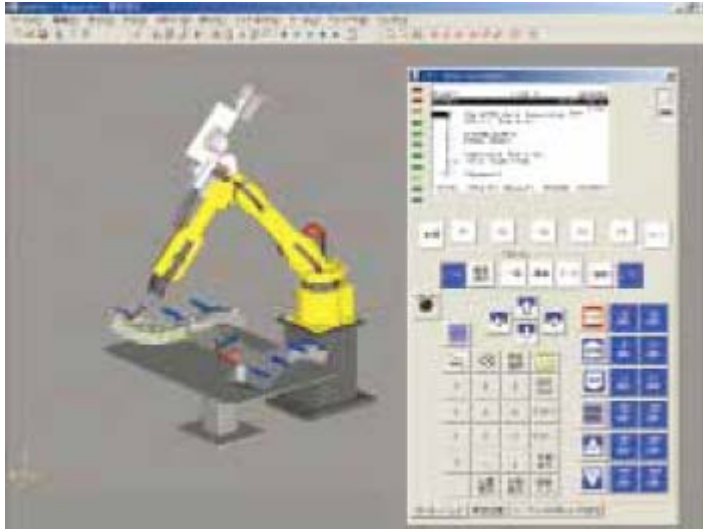


Source: FANUC Neuhausen

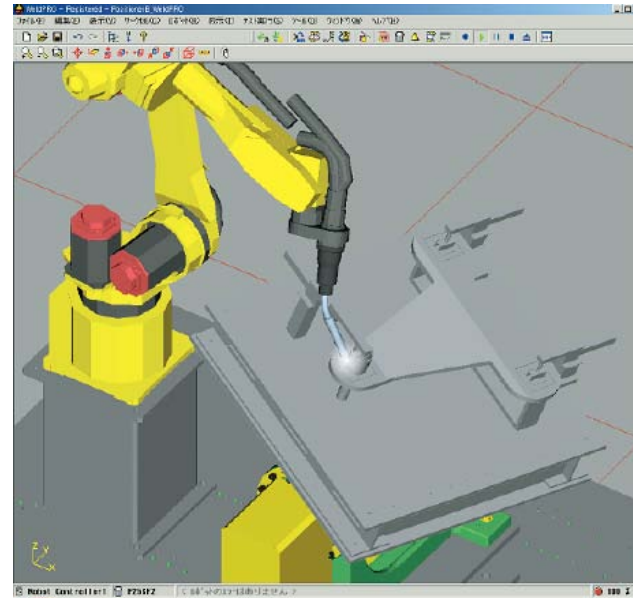


Hollow wrist robots

Better simulation and programming



Source: FANUC



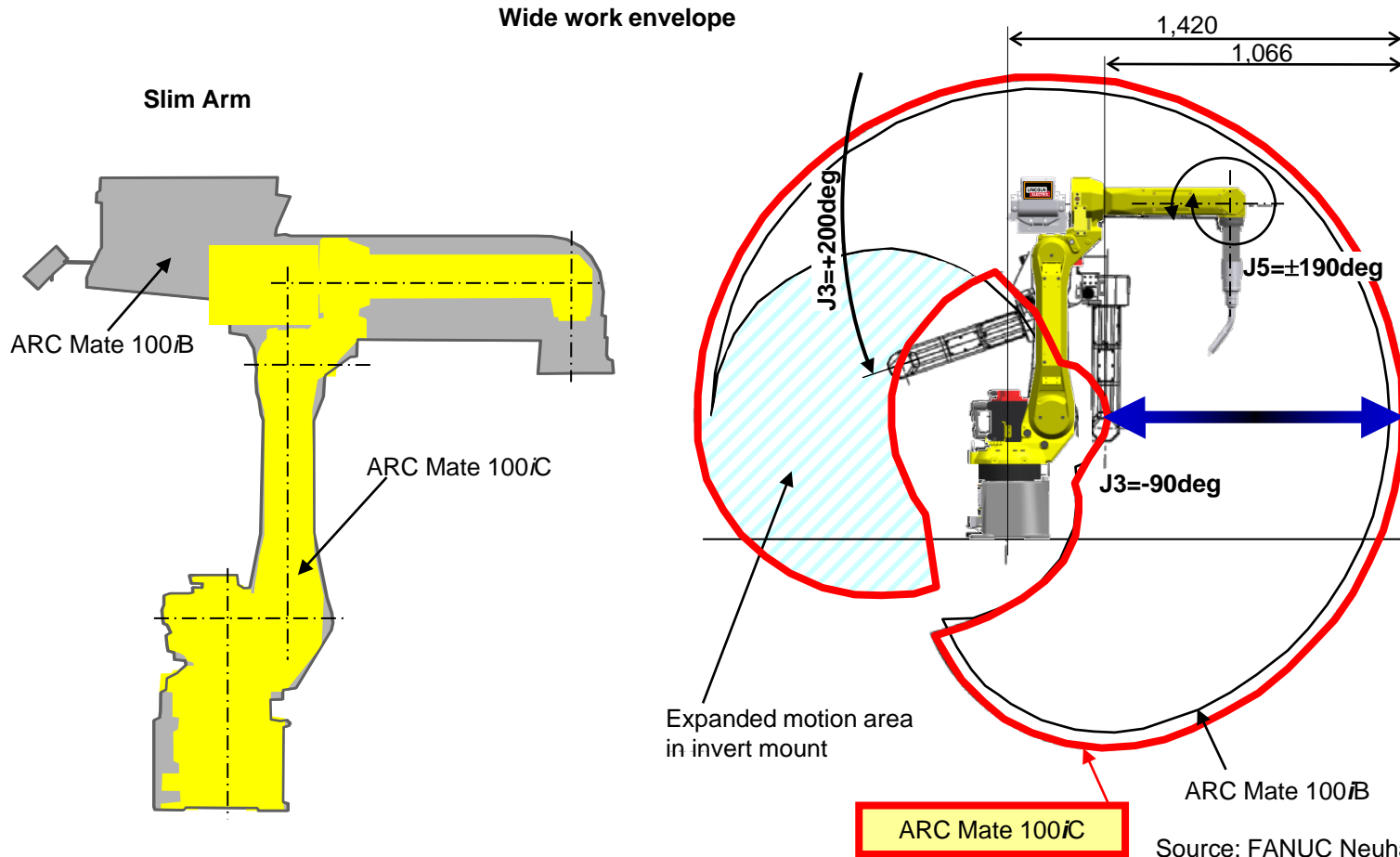
Oktober 2008

<p>DVS – DEUTSCHER VERBAND FÜR SCHWEISSEN UND VERWANDTE VERFAHREN E.V.</p>	<p>Industrierobotersysteme zum Schweißen, Schneiden, Kleben und Beschichten Anlagenkonzepte, Programmierung und Betrieb kooperierender Roboter und externer Achsen</p>	<p>DVS Merkblatt DVS 0922-7</p>	<p>108</p>
<p>DVS – DEUTSCHER VERBAND FÜR SCHWEISSEN UND VERWANDTE VERFAHREN E.V.</p>	<p>Industrierobotersysteme zum Schweißen, Schneiden, Kleben und Beschichten Offline Programmierung und Simulation</p>	<p>DVS Merkblatt DVS 0922-6</p>	



Hollow wrist robots

FANUC® ArcMate 100iC/100iC-6L/120iC/120iC-10L



Source: FANUC Neuhausen



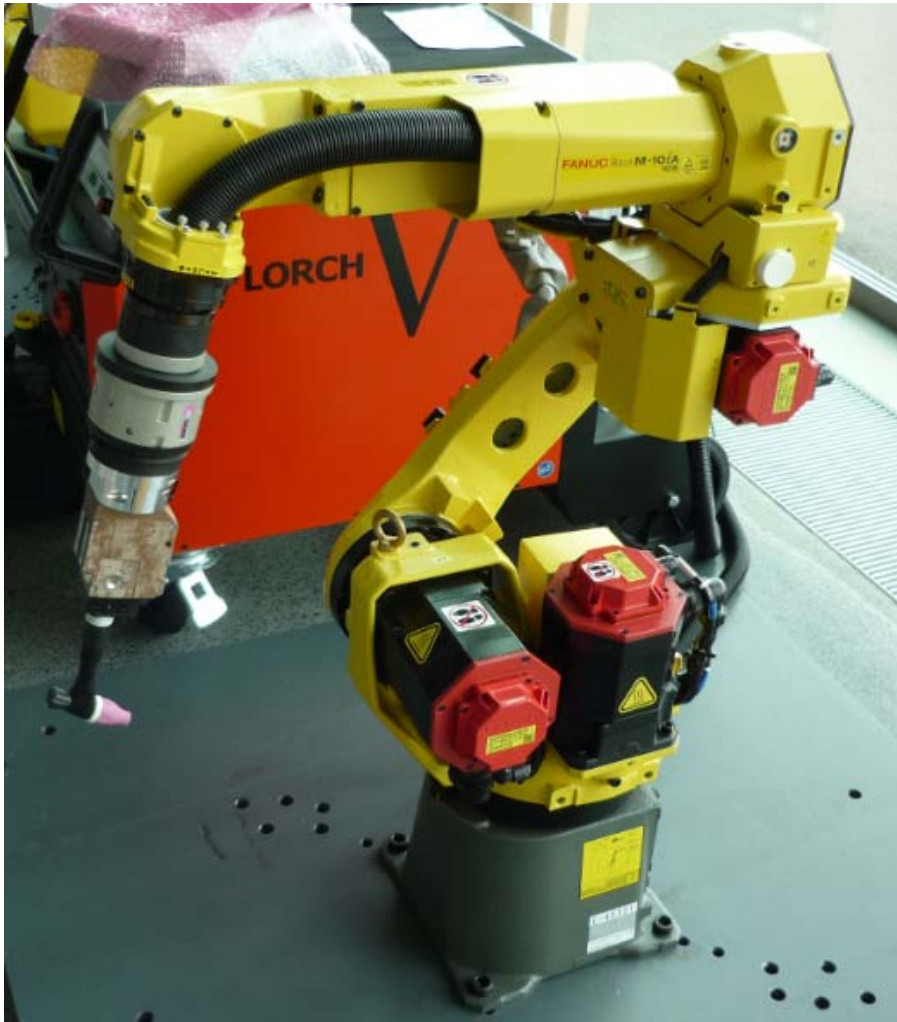
Hollow wrist robots

FANUC® ArcMate 100iC/100iC-6L/120iC/120iC-10L



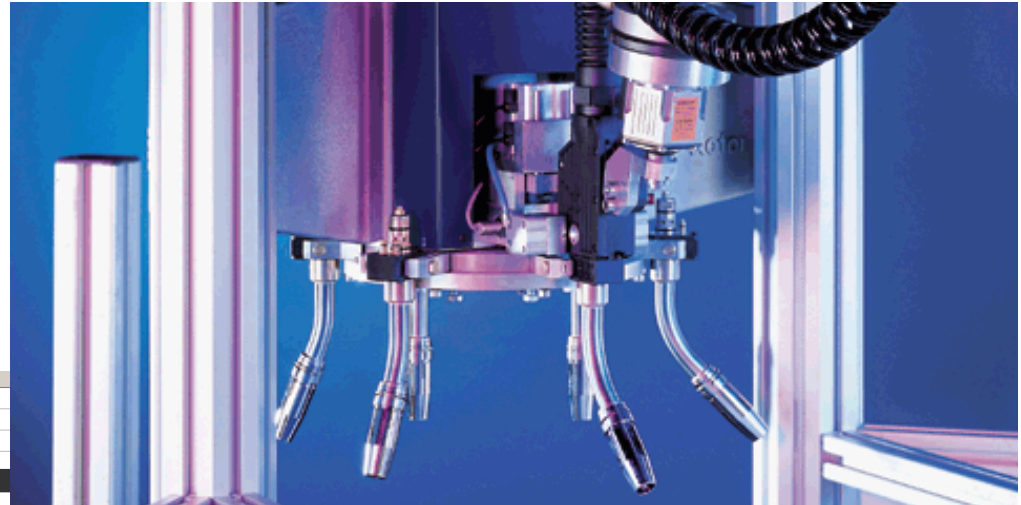
Hollow wrist robots

HW - TIG



Hollow wrist robots

Automatic torch exchange



	A	B	D	E	G	H	I		
11	Optimierung der Anlagenverfügbarkeit setzt keine hohen Investitionen voraus.								
12	Entscheiden Sie selbst, wie schnell sich der ATS Rotor von ABICOR BINZEL rechnet.								
13	Hier am Beispiel einer Roboterzelle ohne verkettete Produktion.								
14									
15	Ohne ATS-Rotor								
16									
17	Kompaktschweisszelle mit Standard-Brenner-System								
18	dto.								
19	durchschnittlicher Fertigungsstundensatz bei Zwei- Schichtbetrieb - 240 Arbeitstage / Jahr								
20		€ / h	€ / Tag	€ / Jahr	€ / 7 Jahren				
21		40,95	614,25	147.420	1.031.940				
22									
23									
24									
25									
26	Prozessbedingte Störungen (Jahres-0) z.B. Rückbrenner der Drahtelektrode, Kollisionen, Wechsel der Verschleissteile, Reinigung von Hand, Instandsetzungsarbeiten beim Schweißbrenner, etc.								
27		Durchschnittliche Kosten bei 20 min manueller Wartung /Schicht				Durchschnittliche Kosten bei 1 min automatisierter Brennerhalswechsel / Schicht - belegt durch Anwenderangaben in der Automobilindustrie			
28		€ / h	€ / Tag	€ / Jahr	€ / 7 Jahren	€ / h	€ / Tag	€ / Jahr	€ / 7 Jahren
29		1,82	27,30	6.552,00	45.864,00	0,092	1,38	331,20	2.318,40
30									
31									
32									
33									
34									
35	Ersparnis durch ATS Rotor								
36		€ / h	€ / Tag	€ / Jahr	€ / 7 Jahren				
37		1,728	25,92	6.220,80	43.545,60				
38									
39									
40									



Hollow wrist robots

Summary

The biggest advantages for the end users are following topics:

- Faster movement – improved productivity
- Longer live time due to the excellent cable management – increasing reliability
- Soft and smooth movements during the welding
- Easier to use with offline programming
- Automatic torch exchange is available with WH torches
- Bigger work envelope
- Higher robot density – more arms per part are possible

Some basic information about welding robots with cost estimations can be found in DVS 0922/1-7

<p>Deutscher Verband für Schweißtechnik e.V.</p>	<p>Industrieroboter zum Schweißen und für verwandte Verfahren Aufwand und Nutzen einer Roboteranwendung</p>	<p>Merkblatt-Entwurf DVS 0922-7 (März 2010)</p>
--	---	---

Vielen Dank für Ihre Aufmerksamkeit



ROBOTER* 2011

DVS Congress | **DVS Expo**

ROBOTER* 2011
WIRTSCHAFTLICHE FERTIGUNG DURCH
FÜGETECHNISCHE AUTOMATISIERUNG

26.-28. SEPTEMBER 2011
CONGRESS CENTER HAMBURG