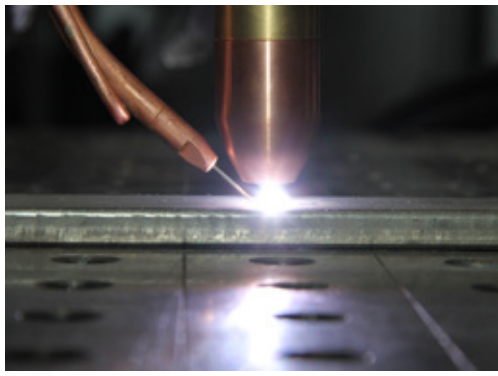
forceTig®

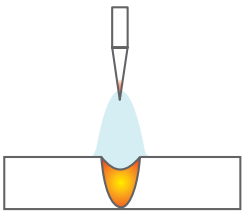
The patented high-performance TIG joining process

With an especially focussed arc for greater penetration and faster welding speeds

PATENTED



Reduce production costs – increase efficiency and quality.



- Higher welding speed
- Deep penetration
- Less energy per unit length due to the highly focussed TIG arc with high energy density.
- Single-pass welding of thin and thick metal sheets is possible
- For fully mechanised and automated manufacturing processes
- Increased efficiency, less non-productive time – maintenance-free set-up and replacement of the electrodes, no setting gauges necessary

forceTig® – A REVOLUTIONARY AND HIGHLY EFFICIENT WELDING PROCESS

EWM's new, patented forceTig® welding process takes TIG welding to places that could not previously have been imagined. This joining process enables a much higher energy density in the weld pool by way of an extremely concentrated welding arc and makes possible the fastest welding speeds.

Versatility in your automation – virtually all metals can be welded effortlessly even with different material thicknesses or gap widths, always matched to your applications and individually configured.

Power sources capable of delivering up to 1000 A are also available for welding greater panel thicknesses and for keyhole processes.

MODULAR SYSTEM

Touchscreen PC

Wire feed unit

forceTig welding torch RTT800W

Interfaces

forceTig®

Cold/hot-wire feed

forceTig 552 RC AW
Cold and hot wire

forceTig552 RC HW GR
Hot wire with integrated gas control

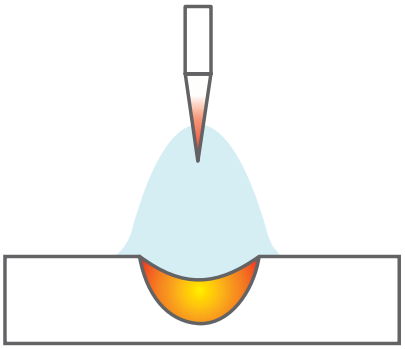
forceTig 1002 RC AW
Cold and hot wire

PATENTED

forceTig®

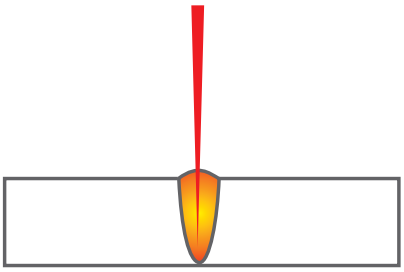
TIG welding process with an especially focussed arc for greater penetration and faster welding speeds

ADVANTAGES OF TIG



- Low procurement costs
- Low operating costs
- Easy handling

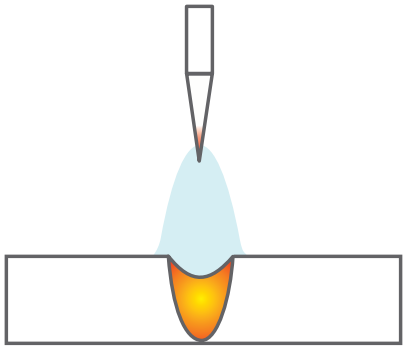
ADVANTAGES OF LASER



- High process stability
- High-speed joining
- High energy density
- Deep penetration

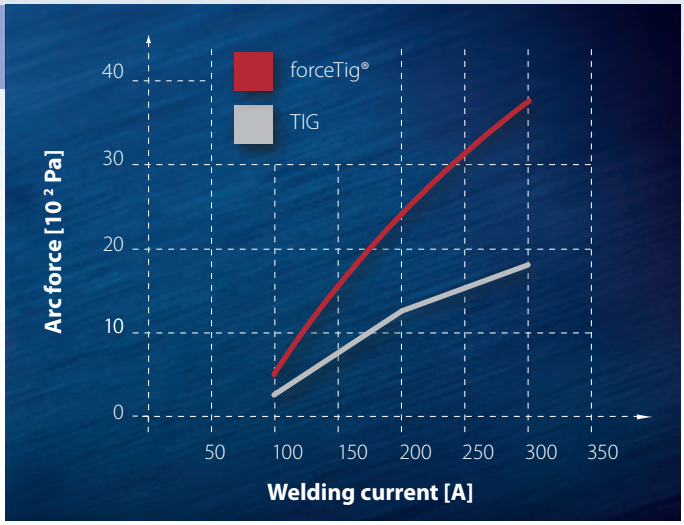
forceTig® - ADVANTAGES OF THE HIGHLY FOCUSSED ARC

- Optimum for mechanised and automated applications, with or without welding consumables.
- 100% reproducible TCP, perfect for automated applications
- High torch power: 800 A at 100% DC
- Electrode easy to change without gauges thanks to de-fined, calibrated geometry
- Very high current-carrying capacity, high current density
- Stable welding torch design for increased crash safety
- Closed, highly effective cooling circuit
- Low procurement costs and energy requirement
- Cold/hot wire applications
- Higher deposition rates with TIG hot wire applications



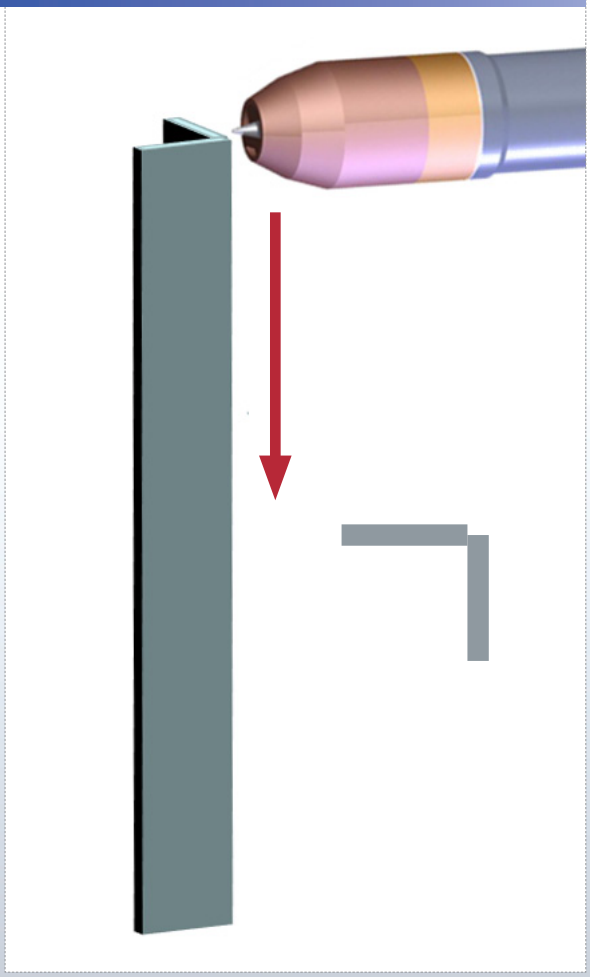
Universal use – from thin to thick

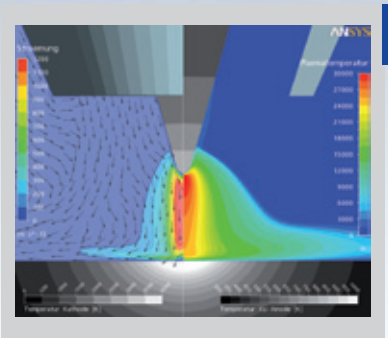
COMPARISON BETWEEN ARC FORCE TIG/forceTig®



EDGE WELD IN POSITION PG forceTig® CORNER JOINT

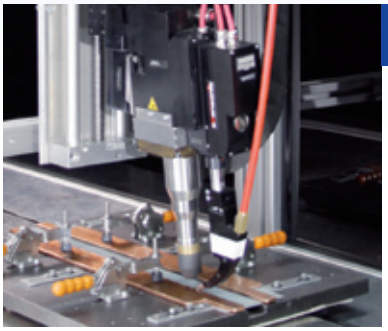
- Material: 1.4301
- Panel thickness: 2 mm
- Welding current: 250 A
- Welding speed > 2 m/min





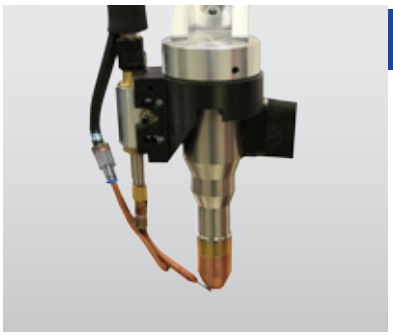
THE PROCESS – forceTig®

- High-speed welding
- High energy density
- Concentrated, constricted arc for narrow welds and deep penetration
- Exceptional directional stability of arc
- Welding currents up to 1000 A – perfect for thick metal sheets



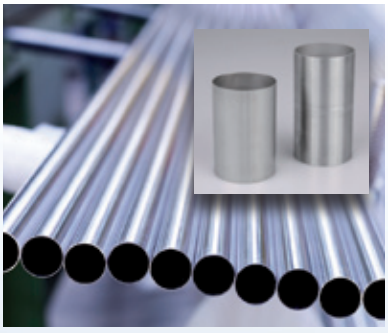
SYSTEM ADVANTAGES OF forceTig®

- A modular system with perfectly matched components – digital power source forceTig®, torch system, cold and hot-wire feed and cooling system – Compatible with all common seam tracking systems on the market, e.g. Scansonic
- Simple set up and maintenance compared to conventional TIG automation systems



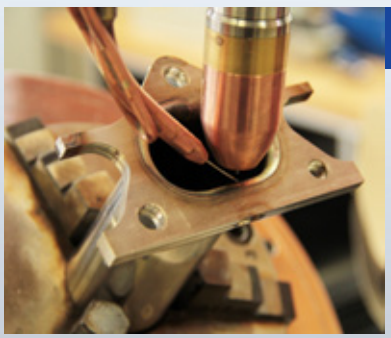
LOW INVESTMENT AND OPERATING COSTS COMPARED TO LASER

- Huge cost benefits of the forceTig® system compared with laser and plasma: low investment costs, low operating costs thanks to increased efficiency, low-cost replacement and wearing parts
- Low operating costs – torch has only two wearing parts: electrode and gas nozzle
- Easy-to-change electrode means low idle time thanks to optimally calibrated and aligned screw-in electrodes – all this without the inconvenience of a setting gauge



EXCELLENT WELD SEAM QUALITY FOR PIPE MANUFACTURE

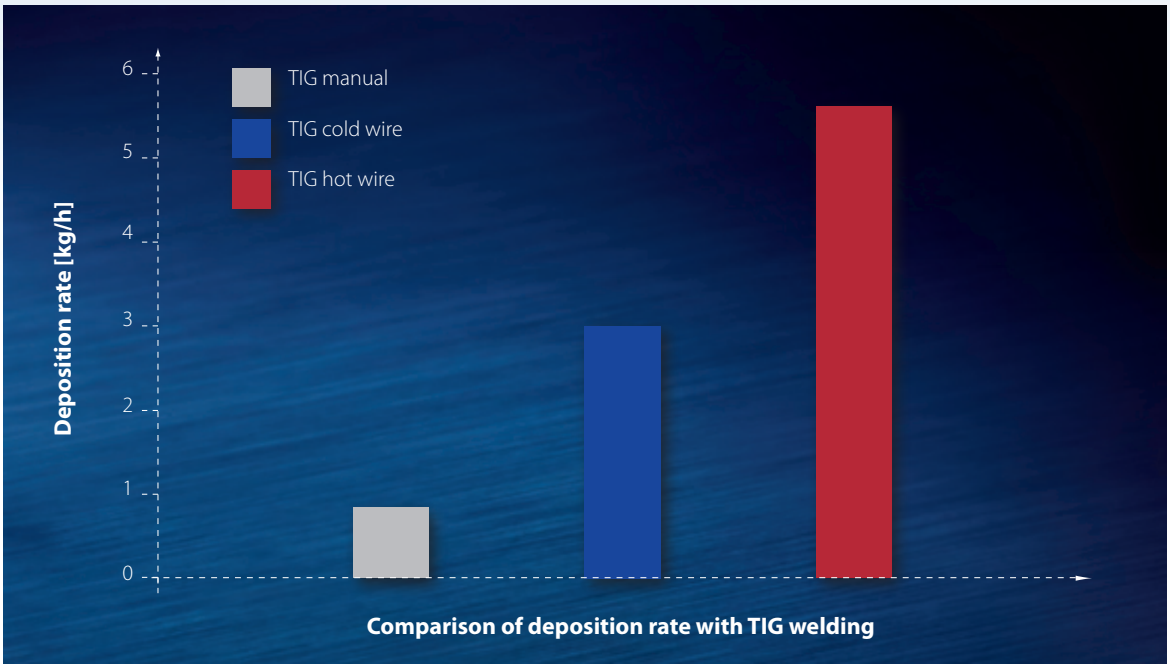
- Concentrated, constricted arc with high energy density
- High-speed welding with reduced heat input means lower energy per unit length and less distortion
- Weld with both cold and hot wire feeds, as well as without welding consumables
- Perfect for longitudinal pipe welds from high-alloy steel



IDEAL FOR PIPE FLANGE CONNECTIONS

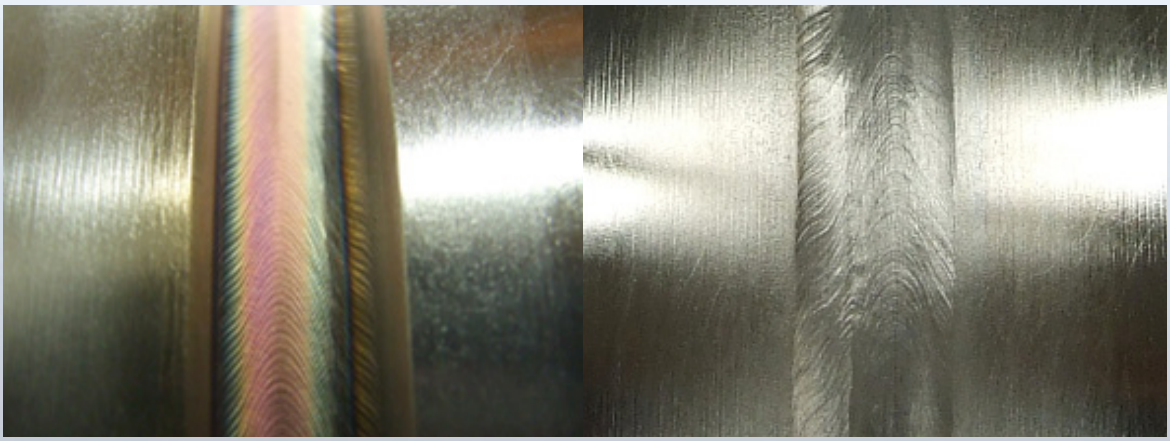
- Safe welding of pipe flange connections, e.g. high-alloy steel, pipes with 2 mm wall thickness to flanges with 8 mm panel thickness

TIG hot wire
100% faster welding speed



ADVANTAGES OF TIG HOT WIRE WELDING

- Up to 100% faster welding speed
- Up to 60% improvement in deposition rate
- Dilution reduced by up to 60%
- Higher deposition rate (30–50%) with same welding performance
- Simplified positional welding

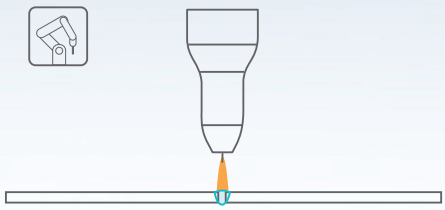


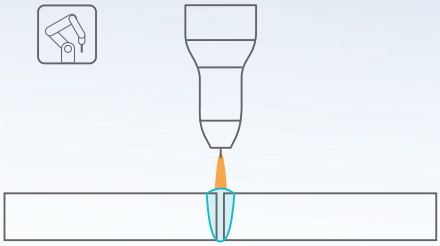
forceTig®

PATENTED

TIG welding process with highly focussed arc
for greater penetration and higher welding speeds.

forceTig





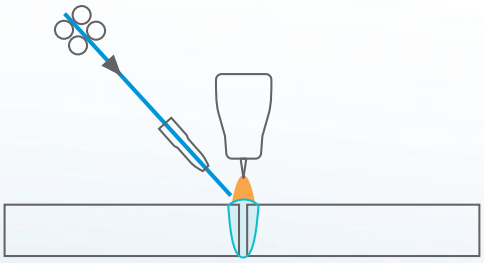
forceTig®

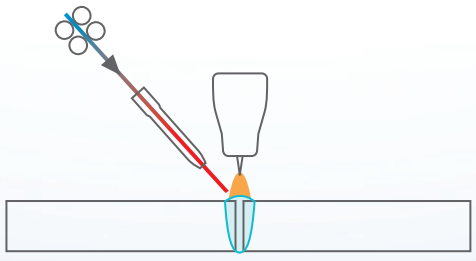
- Stable arc at very high joining speeds of more than 3 m/min, e.g. when brazing vehicle body panels
- Strongly focused TIG arc with high energy density
- Narrow welds comparable to plasma or laser welding
- Single-pass welding of thin and thick metal sheets is possible
- For fully mechanised and automated manufacturing processes
- Brazing and welding of thin metal sheets at high speed

Cold wire
Hot wire

Effective and productive TIG processes
thanks to the mechanised addition of the welding consumable.

forceTig





Cold wire

- Effective handling of the TIG process
- Particularly advantageous when welding long seams and large cross-sections
- Greater welding speed and deposition rate in comparison to conventional TIG welding
- Also suitable for non-ferrous metals, e.g. aluminium and aluminium alloys

Hot wire

- High deposition rates comparable to MIG/MAG welding
- High welding speed
- Low risk of fusion faults
- Highly suitable for narrow-gap welding and surfacing
- High-quality, fine-flaked seam
- Especially effective in mechanised and automated applications

forceTig® – Much less non-productive time
Change electrodes without a setting gauge

CHANGE ELECTRODES IN ONLY FOUR STEPS

- Quick, safe and maintenance-free
- Electrode setting that can be reproduced at any time
- Drastically reduced conversion times
- No setting gauges necessary
- Easy as pie for users with no experience

Step 1: Screw off the gas nozzle

Step 2: Release the worn electrode

Step 3: Insert a new electrode

Step 4: Screw on the gas nozzle. Finished!

Technical data

forceTig power sources

High duty cycle for use in multiple-shift operation
Modular system, process:
TIG, forceTig® and activArc®

Cold and hot wire

Integrated gas control

Cold and hot wire

	forceTig 552 RC AW	forceTig 552 RC HW GR	forceTig 1002 RC AW
Setting range for welding current	5 A–550 A	5 A–550 A	10 A–1000 A
Duty cycle at ambient temperature	40 °C	40 °C	40 °C
60%	550 A	550 A	1000 A
100%	420 A	420 A	750 A
Mains fuse (slow-blow)	3 x 35 A	3 x 35 A	3 x 63 A
Mains voltage (tolerances)	3 x 400 V (–25% to +20%)	3 x 400 V (–25% to +20%)	3 x 400 V (–25% to +20%)
Max. connected load	22.2 kVA	22.2 kVA	42.9 kVA
Machine dimensions L x W x H in mm	780 x 990 x 625	780 x 990 x 1110	780 x 990 x 1110
Weight, machine	183.5 kg	282.0 kg	282.0 kg

Wire feed unit

Small, light, easy handling – rollers can be replaced without using tools

	T drive 4 Rob 3
Drive rollers	4
Wire feed speed	0.1 m/min–5 m/min
Dimensions, wire feed unit L x W x H	345 mm x 230 mm x 250 mm
Weight, wire feed unit	6.5 kg

Integrated cooling units

RK 2 and RK3
Cooling unit
High-performance cooling unit with fully thermal motor compressor
Temperature control and LED display
Connections at rear
Coolant drain valve and coolant level indicator

	RK2	RK3
Cooling output	2000 W	3200 W
Tank capacity	15 l	15 l

forceTig welding torch

Stable torch structure
Closed cooling circuit
Screw-in electrode, defined calibrated geometry when changing electrodes, i.e. no need to adjust using gauges at replacement.
Optionally with or without filler wire feed

800 A (100% DC)

Optional industrial PC

Interference-proof industrial PC with touchscreen including PC300.Net software for parameterising and operating the forceTig power sources

Type	Short description	
forceTig 552	forceTig welding machine, including RK 2 cooling unit, XX2 double pallet	
forceTig 1002	forceTig welding machine, including RK 3 cooling unit, XX2 double pallet	
PC & PC300.Net set	Set comprising touchscreen PC, holder and PC300.Net software	
PC300.Net	Software only including cable and SECINT X10 USB interface	
T drive 4 Rob 3 RE HW	Wire feed unit, opening on right	
T drive 4 Rob 3 LI HW	Wire feed unit, opening on left	
		Version
forceTig RTT800W	forceTig welding torch with hose package	5 m
forceTig RTT800W	forceTig welding torch with hose package	8 m
GD NW=12MM L=37MM	Gas nozzle	
KM 10x9.75 D6.4 30DEG P0.8R	Cathode, knurled	
BH forceTig CAT2	Torch holder for forceTig welding torch on CAT2 collision sensor	
AW forceTig CW 1.5M	Torch holder with swivelling 1.5 m wire feed tube	
	With EWM Quick Connect for standard M6 contact tips	

General accessories

Mounting console

ROB 3 UNIVERSAL MOUNTING CONSOLE
Mounting console for drive 4 Rob 3 for mounting on all common robots.

Safety components

CAT2
Collision sensor
Welding torch collision protection to fit all common robots

ON SENSOR UNIT WIRE END
Wire end sensor
Monitoring of the wire end

Interfaces

BUSINT X11
Industrial bus interface

- For installation in external switching cabinet
- Integration in manufacturing processes/robot applications e.g. with DEVICE-NET, CAN-OPEN, ETHERCAT, ETHERNET IP INTERBUS, PROFIBUS, PROFINET CU and PROFINET LWL systems
- Start/stop, gas test 1, 2, inch 1, 2, direction of rotation, welding type (standard MIG/pulse arc MIG welding), JOB operation
- Digital inputs for JOB selection
- 256 JOBs and 16 programs available
- Welding data monitoring: Current, voltage, wire feed speed, armature current
- Reference voltage for wire feed speed (welding performance), arc voltage correction, dynamics/choke effect
- Diagnostic interface for set up, problem analysis and operation of the Analyzer software
- Optionally available with signal conditioning for AVC using fast actual process values (V, I)
- Optional switching between several cold wire drive units

Type	Short description
BUSINT X11 CAN-OPEN	CAN-OPEN industrial bus interface
BUSINT X11 DEVICE-NET	DEVICE-NET industrial bus interface
BUSINT X11 INTERBUS	INTERBUS industrial bus interface
BUSINT X11 PROFIBUS	PROFIBUS industrial bus interface
BUSINT X11 PROFINET	PROFINET industrial bus interface
BUSINT X11 ETHERCAT	ETHERCAT industrial bus interface
BUSINT X11 ETHERCAT IP	ETHERCAT IP industrial bus interface

Software

Analyzer
Software for control and status signal analysis

PC 300.Net
Welding parameter software

Interfaces

RINT X12
Robot interface

- For installation in external switching cabinet
- Interface for control (conversion by means of jumpers)
- Control signals, analog: MIG/MAG reference voltage for wire-feed speed (welding performance), arc voltage correction, dynamics – TIG/plasma control voltage: Welding current, secondary current, pulse time, pulse pause time
- Control signals, digital: Operating modes, e.g. non-latched, special non-latched, start/stop, gas test 1, 2, inch 1, 2, direction of rotation, inch speed (constant/ramp), welding type (standard MIG/pulsed arc MIG welding)
- Status signals, analog: Current, voltage, wire feed speed, armature current
- Status signals, digital: Current flowing I > 0; ready for welding, fusing, error
- JOB selection, 256 JOBs available, switching of internal/external JOB selection
- Program selection, 16 programs available
- JOB operation with welding and operating mode per program
- Expanded control signal to parameterise the pulse modes
- Simplified activation
- Workpiece search function
- Software-based emergency shut-down signal
- Diagnostic interface for set up, problem analysis and operation of the Analyzer software
- Fast and easy integration into robot systems

Type	Short description
RINT X12 STANDARD	Standard robot interface
RINT X12 STANDARD WF SWITCH	Robot interface including WF switching option
RINT X12 TANDEM	Robot interface including tandem option

ATCASE
All BUSINT X11 and RINT X12 variants also available in a separate housing for attachment to the welding machine

Headquarters

EWM HIGHTEC WELDING GmbH
Dr. Günter-Henle-Straße 8
56271 Mündersbach · Germany
Tel: +49 2680 181-0 · Fax: -244
www.ewm-group.com · info@ewm-group.com

Technology centre

EWM HIGHTEC WELDING GmbH
Forststr. 7-13
56271 Mündersbach · Germany
Tel: +49 2680 181-0 · Fax: -144
www.ewm-group.com · info@ewm-group.com

Production, Sales and Service

EWM HIGHTEC WELDING GmbH
Dr. Günter-Henle-Straße 8
56271 Mündersbach · Germany
Tel: +49 2680 181-0 · Fax: -244
www.ewm-group.com · info@ewm-group.com

EWM HIGHTEC WELDING (Kunshan) Ltd.
10 Yuanshan Road, Kunshan · New & High-tech Industry Development Zone
Kunshan · Jiangsu · 215300 · People´s Republic of China
Tel: +86 512 57867-188 · Fax: -182
www.ewm-kunshan.cn · info@ewm-kunshan.cn

EWM HIGHTEC WELDING AUTOMATION GmbH
Boxbachweg 4
08606 Oelsnitz/V. · Germany
Tel: +49 37421 20-300 · Fax: -318
www.ewm-automation.de · info@ewm-automation.de

EWM HIGHTEC WELDING s.r.o.
Tr. 9. kvetna 718 / 31
407 53 Jiříkov · Czech Republic
Tel: +420 412 358-551 · Fax: -504
www.ewm-jirikov.cz · info@ewm-jirikov.cz

Sales and Service Germany

EWM HIGHTEC WELDING GmbH
Vertriebs- und Technologiezentrum
Grünauer Fenn 4
14712 Rathenow · Tel: +49 3385 49402-0 · Fax: -20
www.ewm-rathenow.de · info@ewm-rathenow.de

EWM HIGHTEC WELDING GmbH
Lindenstraße 1a
38723 Seesen-Rhüden · Tel: +49 5384 90798-0 · Fax: -20
www.ewm-seesen.de · info@ewm-seesen.de

EWM HIGHTEC WELDING GmbH
Sachsstraße 28
50259 Pulheim · Tel: +49 2234 697-047 · Fax: -048
www.ewm-pulheim.de · info@ewm-pulheim.de

EWM HIGHTEC WELDING GmbH
In der Florinskaul 14-16
56218 Mülheim-Kärlich · Tel: +49 261 988898-0 · Fax: -20
www.ewm-muelheim-kaerlich.de · info@ewm-muelheim-kaerlich.de

EWM HIGHTEC WELDING GmbH
Vertriebs- und Logistikzentrum
Sälzerstr. 20
56235 Ransbach-Baumbach · Tel: +49 261 2623 9276-0 · Fax: -244
www.ewm-ransbach-baumbach.de · info@ewm-ransbach-baumbach.de

EWM HIGHTEC WELDING GmbH
Eiserfelder Straße 300
57080 Siegen · Tel: +49 271 3878103-0 · Fax: -9
www.ewm-siegen.de · info@ewm-siegen.de

EWM HIGHTEC WELDING GmbH
Vertriebs- und Technologiezentrum
Draisstraße 2a
69469 Weinheim · Tel: +49 6201 84557-0 · Fax: -20
www.ewm-weinheim.de · info@ewm-weinheim.de

EWM Schweißtechnik Handels GmbH
Rittergasse 1
89143 Blaubeuren · Tel: +49 7344 9191-75 · Fax: -77
www.ewm-blaubeuren.de · info@ewm-blaubeuren.de

EWM Schweißtechnik Handels GmbH
Heinkelstraße 8
89231 Neu-Ulm · Tel: +49 731 7047939-0 · Fax: -15
www.ewm-neu-ulm.de · info@ewm-neu-ulm.de

EWM HIGHTEC WELDING AUTOMATION GmbH
Steinfeldstrasse 15
90425 Nürnberg · Tel: +49 911 3841-727 · Fax: -728
www.ewm-automation.de · info@ewm-automation.de

Sales and Service International

EWM HIGHTEC WELDING GmbH
Fichtenweg 1
4810 Gmunden · Austria · Tel: +43 7612 778 02-0 · Fax: -20
www.ewm-gmunden.at · info@ewm-gmunden.at

EWM HIGHTEC WELDING UK Ltd.
Unit 2B Coopies Way · Coopies Lane Industrial Estate
Morpeth · Northumberland · NE61 6JN · Great Britain
Tel: +44 1670 505875 · Fax: -514305
www.ewm-morpeth.co.uk · info@ewm-morpeth.co.uk

EWM HIGHTEC WELDING (Kunshan) Ltd.
10 Yuanshan Road, Kunshan · New & High-tech Industry Development Zone
Kunshan · Jiangsu · 215300 · People´s Republic of China
Tel: +86 512 57867-188 · Fax: -182
www.ewm-kunshan.cn · info@ewm-kunshan.cn

EWM HIGHTEC WELDING Sales s.r.o. / Prodejní a poradenské centrum
Tyršova 2106
256 01 Benešov u Prahy · Czech Republic
Tel: +420 317 729-517 · Fax: -712
www.ewm-benesov.cz · info@ewm-benesov.cz

EWM HIGHTEC WELDING FZCO / Regional Office Middle East
LOB 21 G 16 · P.O. Box 262851
Jebel Ali Free Zone · Dubai, UAE · United Arab Emirates
Tel: +971 48870-322 · Fax: -323
www.ewm-dubai.ae · info@ewm-dubai.ae

Plants Branches More than 300 EWM sales partners worldwide

Headquarters

EWM HIGHTEC WELDING GmbH
Dr. Günter-Henle-Straße 8
56271 Mündersbach · Germany
Tel: +49 2680 181-0 · Fax: -244
www.ewm-group.com · info@ewm-group.com

Technology centre

EWM HIGHTEC WELDING GmbH
Forststr. 7-13
56271 Mündersbach · Germany
Tel: +49 2680 181-0 · Fax: -144
www.ewm-group.com · info@ewm-group.com

www.ewm-group.com

SALES / CONSULTANCY / SERVICE

Arc Technology Co., Ltd
163/28/8 Thong Nhat st, Ward 11
GoVap District, Ho Chi Minh City
Vietnam.
Tel : + 84-839966211
Fax : + 84-839210273
email : info@arctechnology.vn
www.arctechnology.vn