

HighTIG^(DC) & Insquare^(AC/DC)

The TIG Industry Series







PERFECT WELDING TECHNOLOGY FOR THE REAL PROFESSIONALS

The TIG units take care of daily maximum performance.

The TIG Inverter welding units of the series Insquare (AC/DC) and HighTIG (DC) offer professional performance all along the line. Six models, 320 A to 600 A, for DC and AC current fulfill even highest demands for industrial applications. Professionals are enthusiastic about the perfect technique and the easy operation of the Merkle HighTIG and Insquare welding units.

- Inverter power sources.
- Perfectly smoothed DC gives outstanding welding characteristics in TIG and electrode welding.
- DC high frequency pulse for concentrated arc (see page 5).
- Perfect arc ignition over the whole range due to separate ignition circuit.
- Stable arc in AC over the full range due to square wave or noise reduced wave.
- Continuous setting of the welding frequency in AC.
- Efficient cleaning in AC.
- Choice of light arcs: narrow for fillet welds
 wide for butt welds
- A minimum of radiation caused by the HF-ignition unit.
- Special filters mounted to avoid radiation.

Series Insquare (AC/DC)

THE WATER COOLED INDUSTRIAL LINE



Insquare 321 AC/DC

Insquare 421 AC/DC

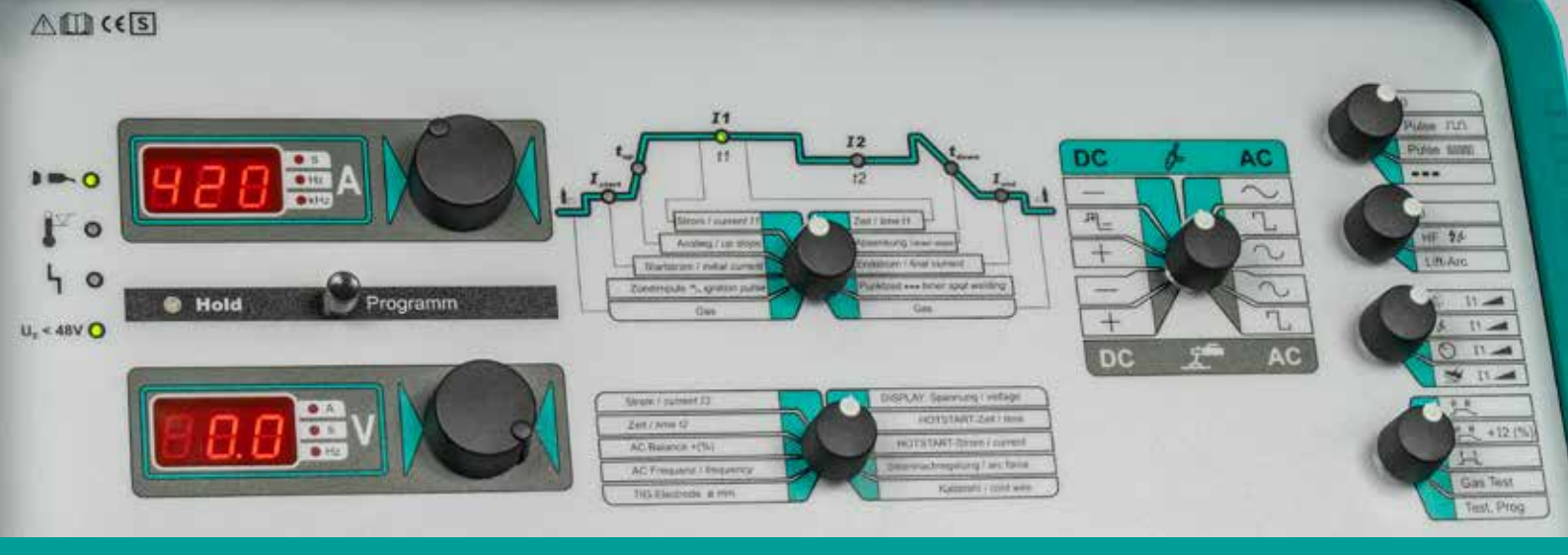
GENEROUS HANDLING WITH HIGHEST COMFORT!

The operation panel of the Merkle Insquare series has been designed to the demands of the real professionals.

Well-arranged operation panel, digital display and the easy adjustment of all welding parameters provide highest functionality and safety in the daily work.

And the lockable operation panel cover of the models Insquare W 321 and W 421 offers even more protection of unintentional changing of the welding parameters.





Multitude of control functions

■ TIG welding process:

TIG DC minus, TIG DC plus, TIG DC minus with start positive impulse, TIG AC "noise reduced", TIG AC "square wave", TIG AC "sinusoidal".

■ MMA/Stick electrode welding process:

Electrode minus, Electrode plus, Electrode "sinus", Electrode "square wave".

- 20 programmable jobs.
- 2 welding currents separately adjustable; in 4-stroke recallable by a short touch on the torch trigger or by using a welding torch with two triggers.
- Adjustable parameters: gas pre-flow and gas post-flow time, start and final current, timer for current up and down slope.

- Parameter pre-selection by 2 switches.
- 2 large LED displays with pre-indication and Hold function for current, voltage, time and frequency.
- Pulse device and spot welding.
- Concentrated arc due to high frequency pulsation up to 5 kHz.
- Current remote control with potentiometer at the torch (option).
- High frequency (HF) or LiftTIG ignition.
- 2-stroke, 4-stroke, 4-stroke with 2 currents.
- AC-frequency setting: 50–200 Hz.
- AC-balance: continuous setting of the plus/minus from 9 to 91 %.
- Hand-, torch or foot remote control (optional).

HIGH FREQUENCY DC PULSE

The machines of the series HighTIG and Insquare come as a standard with the high frequency DC pulse. The arc can be pulsed with a frequency up to 12 kHz. The arc characteristics provide outstanding opportunities in TIG DC welding that are not available in the normal TIG arc:



Standard TIG weld



High freq. DC pulse weld

CHARACTERISTICS

- Extreme arc constriction.
- Arc similar to plasma welding.
- Less heat input.
- Higher welding speed.
- Extremely stable arc.
- Perfect for corner welds.



TIG DC welding

Series HighTIG

The compact and robust welding units of the HighTIG series are available for applications in TIG DC welding. With welding currents of 350, 450 and 550 A, all areas of application are covered. The units are designed for industrial production and can be used perfectly for manual, automatic and robot welding solutions.



HighTIG W 350 DC

HighTIG 452/552 DC RS*

*water cooling unit and trolley (optional)



ROBOT AND AUTOMATED WELDING APPLICATIONS

For the automated solutions in TIG welding MERKLE offers perfectly compatible components and systems. This guarantees the highest productivity and reproducibility. The systems are especially suited for use in heavy industry

and designed for use in automation and robotics. The control of the machines can be achieved via a CNC or robotic interface. The parameters welding current, AC frequency and AC balance can all be controlled.



Automated welding



Robot welding

Series HighTIG (DC)



Series Insquare (AC/DC)



Technical Data	HighTIG W 350 DC	HighTIG 452 DC	HighTIG 552 DC	Insquare W 321 AC/DC	Insquare W 421 AC/DC	Insquare W 600 AC/DC
Primary:						
Power supply	3 x 400 V	3 x 400 V	3 x 400 V	3 x 400 V	3 x 400 V	3 x 400 V
Frequency	50 (60) Hz	50 (60) Hz	50 (60) Hz	50 (60) Hz	50 (60) Hz	50 (60) Hz
Continuous power	13.1 kVA	13.2 kVA	18 kVA	13.2 kVA	14.5 kVA	24.2 kVA
Continuous current	19 A	19 A	26 A	19 A	21 A	35 A
cos phi	0.98	0.98	0.98	0.95	0.95	0.95
Secondary:						
Operation mode	DC	DC	DC	AC and DC	AC and DC	AC and DC
No load voltage	57 V	72 V	72 V	80 V	80 V	80 V
Welding voltage	10 - 24 V	10 - 28 V	10 - 32 V	10 - 22.8 V	10 - 26.8 V	10 - 34 V
Welding current DC	5 - 350 A	5 - 450 A	5 - 550 A	5 - 320 A	5 - 420 A	20 - 600 A
Welding current AC	-	-	-	5 - 320 A	5 - 400 A	20 - 600 A
Duty cycle 50 % (10 min.)	350 A (40 °C)	450 A (40 °C)	550 A (40 °C)	-	420 A (20 °C)	-
Duty cycle 60 % (10 min.)	-	-	-	320 A (40 °C)	360 A (40 °C)	-
Duty cycle 80 % (10 min.)	-	-	-	300 A (40 °C)	-	600 A (40 °C)
Duty cycle 100 %	280 A (40 °C)	350 A (40 °C)	420 A (40 °C)	260 A (40 °C)	310 A (40 °C)	500 A (40 °C)
MMA/stick electrode welding:						
No load voltage	57 V	72 V	72 V	80 V	80 V	80 V
Welding voltage	20 - 34 V	20 - 38 V	20 - 42 V	20 - 32.8 V	20 - 36.8 V	20 - 44 V
Welding current	20 - 350 V	20 - 450 A	20 - 550 A	5 - 320 A	5 - 420 A	5 - 600 A
Protection mode	IP 23			IP 23		
Characteristics:						
Cooling	AF			AF		
Settings	2 rotary switches and 2 selectors for: current 1, time 1, current 2, time 2 (for pulsation), pre and post flow time, up and down slope time, start current, final current, timer spot welding, Arc force, Hotstart time and current			2 rotary switches and 2 selectors for: current 1, time 1, current 2, time 2 (for pulsation), pre and post flow time, up and down slope time, start current, final current, timer spot welding, Arc force, Hotstart time and current, AC-balance, AC-frequency,		
Timer functions	slow pulsation, quick pulsation (max. 12 kHz), spot welding			slow pulsation, quick pulsation (max. 5 kHz), spot welding		
Energy adjusting	at the unit, manual remote control, foot pedal, torch potentiometer			at the unit, manual remote control, foot pedal, torch potentiometer		
Operation modes	2-stroke, 4-stroke, 4-stroke with 2 currents			2-stroke, 4-stroke, 4-stroke with 2 currents		
Indications	2 LED displays with pre-indication and Hold-function for current, voltage, time and frequency			2 LED displays with pre-indication and Hold-function for current, voltage, time and frequency		
Ignition	high frequency (HF) or LiftTIG			high frequency (HF) or LiftTIG		
Power source	Inverter			Inverter		
Norm	EN 60974-1 "S" / CE			EN 60974-1 "S" / CE		
Torch connection	Euro connector with 5-pole plug			Euro connector with 5-pole plug		
Torch cooling	integrated water cooling system	seperate water cooling system (optional)		integrated water cooling system		
Weight	115 kg	63 kg	65 kg	140 kg	150 kg	255 kg
Dimensions (LxWxH)	1100 x 490 x 895	740 x 350 x 690		1020 x 476 x 970		1055x630x1290
Gas bottle holder	incl. gas bottle holder for 10, 20 or 50 l cylinders	Trolley with gas bottle holder for 10, 20 l cylinders (optional)		incl. gas bottle holder for 10, 20 or 50 l cylinders		

Technical changes reserved.



CREATE YOUR FUTURE SUCCESSFULLY.

With **MERKLE**. Your specialist for welding units, welding machines, torches and intelligent automation systems.

With own subsidiaries and **MERKLE** dealers in Germany, Europe and many other countries throughout the world.

Welcome to **MERKLE**.

06/2025

PRODUCT RANGE

- MIG/MAG Welding Units
- Synergic Pulse Welding Units
- TIG Welding Units
- MMA / Stick Electrode Welding Units
- Welding Torches
- Turntables and Roller Drive Units
- Automation Components and Solutions
- Complete Solutions and Robotics
- Specialized Machinery Construction
- MERKLE WeldFACTORY - Industry 4.0



MERKLE Schweissanlagen-Technik GmbH

Industriestr. 3 | D-89359 Koetz | Germany

Phone: +49 8221 915-0

E-Mail: info@merkle.de

www.merkle.de