HighPULSE

The impressive PulseARC series!

www.merkle.de

Merkle HighPULSE series:

ALWAYS AT THE PULSE OF TIME!

Taking the leading welding technology to a higher perfection was the goal of the Merkle R&D department.

The new HighPULSE series features a completely re-designed control panel. Together with the all new TEDAC® DIGITAL welding torch there is no doubt who is the old and new champion.

HighPULSE 284/354 K

HighPULSE 284/354 K

HighPULSE 454/554 KW

HighPULSE 354/454/554 DW

TECHNOLOGY
MIG / MAG

TECHNOLOGY
PULSE ARC

USER BENEFITS WITH MERKLE PulseARC TECHNOLOGY:

- **Extremely spatter free welding due to the non short-circuit characteristics, one drop transfer:**
  - tremendous time saving due to reduction of working hours for cleaning
  - high deposition rate
  - longer life of torch consumables
  - less down time due to cleaner consumables
- **Safe, spatter reduced ignition due to a new ignition process controlled by 13 parameters:**
  - 2 independent ignition pulses
  - precise soft start of the wire
  - slag droplet is removed from the wire end at the end of each weld to ensure a safe re-ignition.
- **Optimal processing of aluminium and aluminium alloys and stainless steel.**
- **Optimized welding programs for:**
  - different materials
  - different wire diameters
  - different protective gases
- **Multiple variations of pulse parameters:**
  - Manipulation of the arc characteristics and the penetration.
- **Alloy elements are maintained due to adaption of the pulse parameters when using high alloyed wire.**

The HighPULSE operation panel:

SIMPLY EVERYTHING PERFECTLY AT HAND

- New multifunctional control panel for maximum comfort and convincing safety
- Easy to use, even with gloves. Great visibility in dark surroundings through bright LEDs
- Innovative welding torch TEDAC® DIGITAL with unique digital display at the torch
- All welding processes like DeepARC, ColdMIG, HighUP & ProSWITCH included as a standard

2

Easy-to-use control elements.
New and clear operation panel; either integrated in the power source or at the wire feeder.


1

Asymmetrical rotatable device. (Option)
For a wide operation radius of the wire feeder and welding torch.


2

Cover for operation panel. (Option)
With lock, transparent, for more safety on the construction site and in the workshop.


3

Robust transport handles.
Easier handling and better transport safety.

NEW!


3

Optional torch holder.
The assembly is possible on both the left or the right handle.


4

Air filter.
Convenient filter attachment on the front for simple filter exchange.

HighPULSE series:

TWO VERSIONS ONE DISPLAY

VERSION 1:
All control buttons of the welding unit are integrated in the power source and can be operated directly at the front.

VERSION 2:
The complete operation panel is integrated in the separate wire feeder. This allows an easy operation of the Merkle HighPULSE with a maximum flexibility, regardless of the position of the welding machine.

Remote control
MFR 20

Remote control
MRC 50

EXTERNAL REMOTE CONTROL MFR 20

The remote control MFR 20 is mounted in a robust housing and comes with a magnet holder on the back. Energy and arc length can be adjusted via two potentiometers.

EXTERNAL REMOTE CONTROL MRC 50

The external remote controller comes with 2 handles and a magnet holder on the back. At the large display all important parameters are shown: amperage, voltage, wire feed speed, as well as throat, material thickness, welding wire, and wire diameter. Welding jobs can be selected and displayed at the remote controller.

The Merkle HighPULSE comes with a new design of the operation panel, it offers a number of first-class advantages.

- New multifunctional control panel for maximum comfort and convincing safety
- Easy to use, even with gloves
- Large and bright LEDs with great visibility even in dark surroundings
- Large LED display for all important functions
- Clear arrangement of all functions
- New rotary switches for comfortable operation

1. **Large LED displays with preview for**
   - welding current
   - welding voltage
   - wire feed speed
   - material thickness
2. **Automatic hold function (saves the last displayed welding parameters)**
3. **Setting of the arc length**
4. **Setting of the energy**
5. **Selection of operating modes:**
   - 2-stroke operation
   - 4-stroke operation with down slope
   - 4-stroke operation with start current
6. **Selection of energy setting:**
   - Continuously at the front panel
   - Continuously at the wire feeder
   - Continuously at the TEDAC® torch
   - Job mode available on TEDAC® torch or rotary switch
7. **Selection of welding processes:**
   - MIG/MAG
   - PulseARC
   - Interpulse welding
   - MMA/stick electrode welding
   - Option: TIG DC
8. **Rotary switch for program selection and programming of the multi-functional display**
9. **Wire inching**
10. **Gas test (with automatic switch-off)**

The HighPULSE wire feeder:

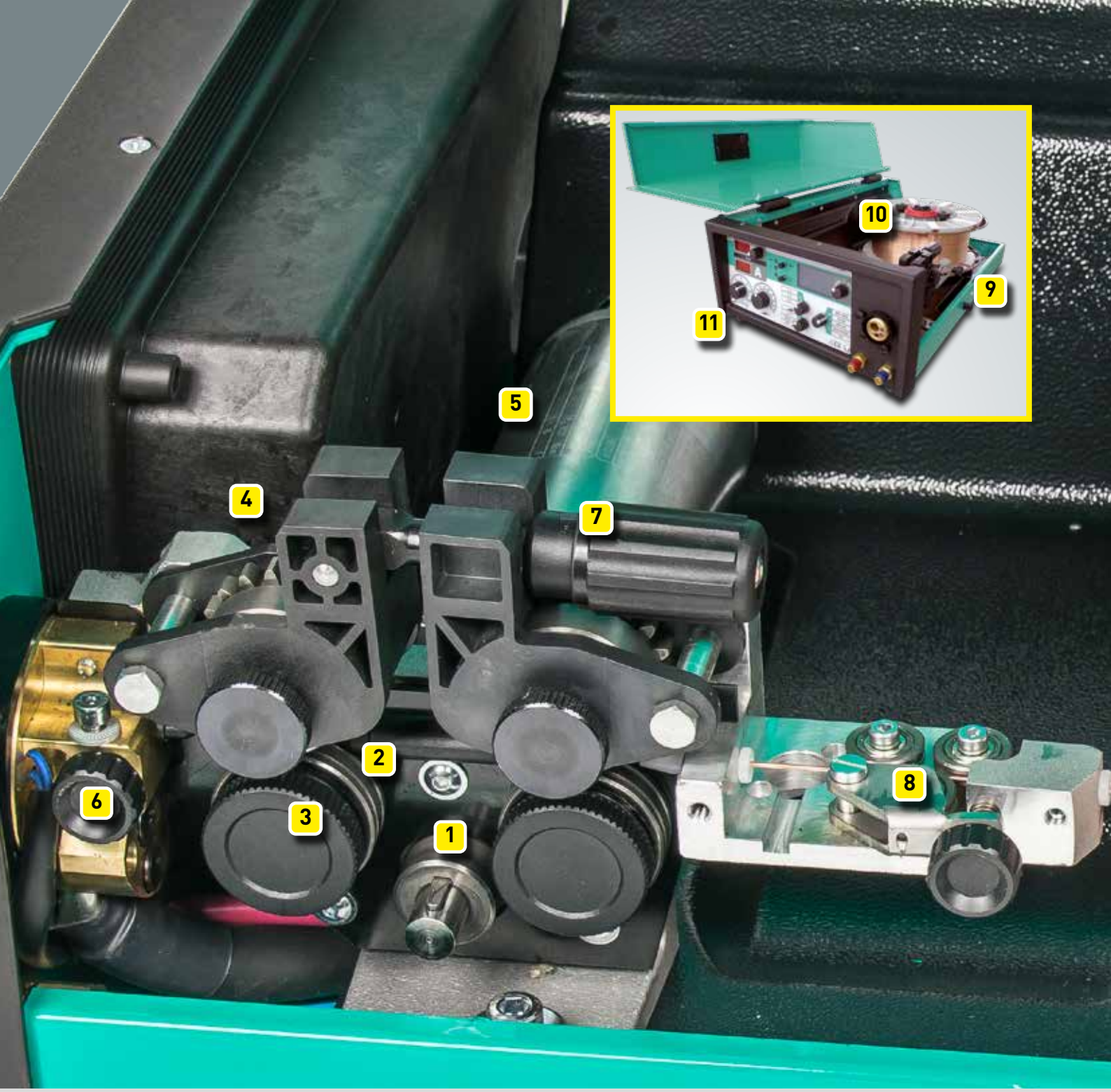
PERFECT WIRE FEEDING FAST WIRE EXCHANGE!

1. Precise 4-roller gear with 4 motorized wire feed rollers. Wire feed speed 0.5 – 25 m/min (model DV-26) or high performance drive 0.5-30 m/min (model DV-31).
2. Big wire feed rings allow a constant wire feed speed at a low pressure. 2 grooves for 2 different wire diameters.
3. Change of the wire feed rings without any tools.
4. Easy wire insertion due to superb accessibility and snap lock mechanism.
5. Dust-tight drive motor guarantees a constant wire feed speed.
6. Euro torch connector as a standard, directly mounted without need for alignment.
7. Pressure adjustment of both rollers.
8. Wire straightening device for perfect and constant wire feeding (DV-31).
9. Cut away side panels facilitate easy insertion of the wire spool.
10. Insulated interior, gas and water hoses and all cables are well protected from environmental damage due to a unique closed case design.
11. 2 x 4 rubber feet ensure operation in both, vertical and horizontal position.

DOUBLE WIRE FEEDER DV-32 TWIN

Two different wires shall be welded with the same machine? The annoying changing of the wire and the torch is no longer required with the double wire feeder DV-32 TWIN.

Two different programs can be selected, the machine switches automatically to the selected torch by just pressing the torch trigger. The operation panel of the HighPULSE is integrated in the wire feeder. A wheeled version is also available.



Asymmetrical swiveling axis at the rear allows a wide working area.

Standard horizontal mounting.

Vertical mounting of the wire feeder can be achieved within seconds.

HighPULSE 284/354 K:

COMPACT & POWERFUL

The small and compact machines are equipped with an integrated wire feeder and are portable.

The trolley TW 112 comes with extra large wheels (200 mm), a gas bottle holder and an optional drawer for the accessories.

As an option the water cooling unit WK 300 can be mounted easily. For welding with gasless flux cored wires the polarity can be exchanged.

Folded steel housing for increased stability.

HighPULSE for Automation and Robotics

With the power sources HighPULSE 352, 452 and 552 RS Merkle offers a perfect product range for all welding processes in automation needs.

The HighPULSE series consists of synergic PulseARC welding power sources, especially developed for the connection with Robots and CNC-controls. They are based on a state-of-the-art 100 kHz inverter power module and a high speed 32-bit processor.

HighPULSE power sources:

Model	Welding current
HighPULSE 352 RS	20 - 350 A, 60 %
HighPULSE 452 RS	20 - 450 A, 50 %
HighPULSE 552 RS	20 - 550 A, 40 %

HighPULSE 353 K

The housing of the HighPULSE 353 K measures only 170 mm in width. This special version is designed for the suspension from a ceiling rail.

This solution is extremely space saving and ideal for limited working areas. Mains power and gas are supplied from above. There are no interfering cables on the floor.

All controls are easy to reach.

4-job or 8-job control panels for quick retrieval of repeating jobs.

Merkle TEDAC® DIGITAL:

THE DIGITAL INNOVATION AT THE TORCH

The standard Merkle TEDAC® system is working for many years in a huge number of welding machines. For the first time the energy could be controlled and displayed directly at the welding torch via a multi-colored LED - without the need for an additional control cable.

Merkle is now entering a new level of innovation with the new system TEDAC® DIGITAL in terms of efficiency and ease-of-use.

The energy control is carried out directly at the welding torch, the display is brand new with alphanumeric data shown in a well readable digital display on top of the torch.

These are the benefits for the user:

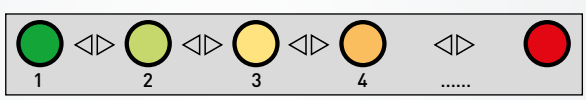
- **HIGHER PRECISION**
  due to numeric display of the welding current
- **CLEARLY MORE EFFICIENCY**
  due to energy control directly at the welding torch
- **EXTREMELY MORE COMFORT**
  thanks to an easily readable alphanumeric display
- **MEASURABLE TIME SAVING**
  due to ideal handling and control

The Classic: Welding torch TEDAC®

The multi-coloured LED shows the selected energy or program (job).

Continuous setting of the energy

Recall of programmed jobs



Ergonomically formed handle, torch trigger with a micro switch for guaranteed more than 10 mio. operations. Standard Euro connector, no extra control cables are necessary.

NEW!

TEDAC®

DIGITAL

The new TEDAC® DIGITAL is designed for the Merkle series HighPULSE.

Continuous, precise energy control with digital display

Precise energy control directly at the torch at any time: before, during and after welding. Display of the current via a digital display directly at the welding torch.

Correction of the arc length

The arc length can be adjusted individually according to the selected energy.

Recall of free programmable jobs

Pre-programmed jobs can be selected with the control button. All job parameters can be programmed according to the need of the user. Perfect reproducible welding results are guaranteed in all settings.

That‘s the way to weld today:

FOUR PERFECT WELDING PROCESSES

DeepARC

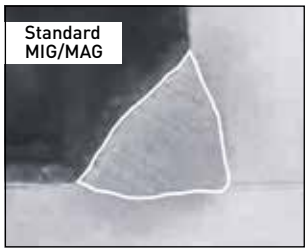
Witness yourself the new high speed formula of MIG/MAG welding! An extremely narrow welding arc (similar to a plasma arc) is achieved through a highly dynamic voltage control system in the HighPULSE series welding units.

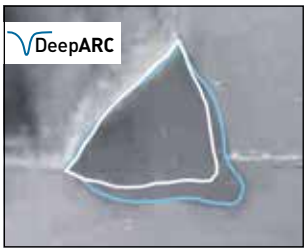
This new welding arc defines itself through several characteristics. The DeepARC process is perfect for use with mild and stainless steels as well as for aluminum and aluminum alloys. The DeepARC process is available as a standard in all units of the series HighPULSE.

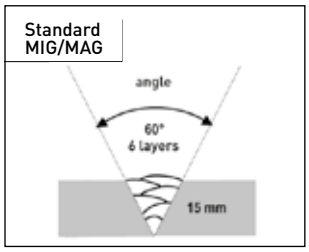
There is a multitude of application advantages with the DeepARC process: 30 % deeper penetration, excellent root penetration, no problem of undercut and up to 100 % faster welding speed. Due to the concentrated arc the opening angle of thick work pieces can be reduced and the welding can be done with significantly fewer layers. The small, low-energy spatters do not stick to the workpiece.

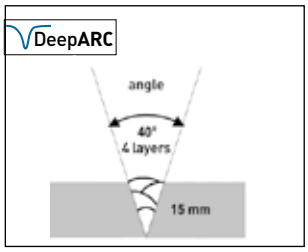
Merkle DeepARC.
Faster welding with deep penetration!

- **30% deeper penetration**
- **100% faster welding**
- **100 % no spatter adherence**









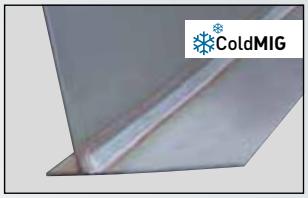
ColdMIG

The Merkle ColdMIG process sets new standards in welding with up to 30 % less heat input. Thin metal sheet welding (0.6 – 3.0 mm) is achieved to perfection in manual and automated operation.

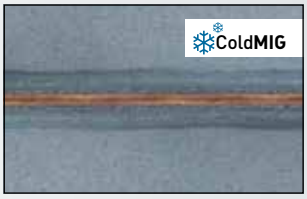
Its high gap bridging capacity, the low heat input and the optimum welding facility of mixed materials and coated sheet metals are other world class features. The ColdMIG process is available for all HighPULSE machines as a standard.

Merkle ColdMIG.
Welding with minimum heat input!

- **30% less heat input**
- **100 % gap bridging**
- **100 % perfect for brazing**



Welding of thin metal sheets



MIG brazing of galvanised sheet metals

High gap bridging capability

All Inclusive

FOR HIGHEST EFFICIENCY

HighUP

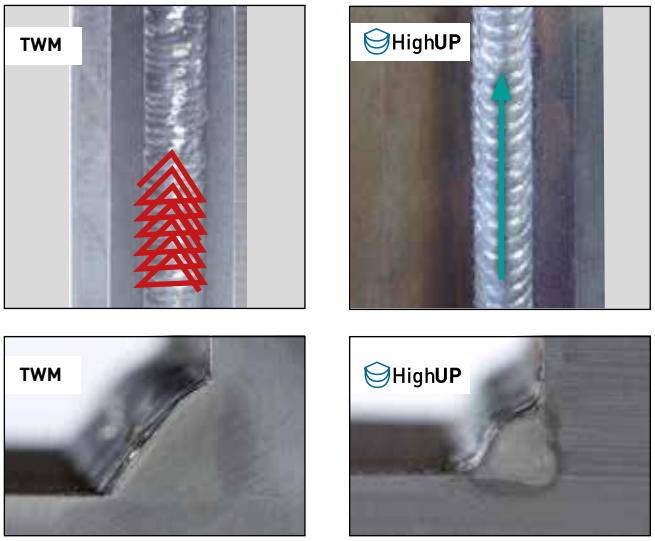
HighUP is the new Merkle process enabling a total elimination of the difficult to use, triangular weave method (TWM) of vertical up welding. Because the HighUP process allows vertical up welding up to 100 % faster with a safe penetration and an amazingly easy handling.

The Merkle HighUP process combines a hot high current phase (such as PulseARC, approx. 25 %) and a lower current phase (such as MAG, approx. 75 %) and enables a very easy to use, and to control, welding process.

HighUP can be used on most available materials such as low and high alloyed steels or aluminium and its related alloys. Problems with undercut or flank penetration defects are now a thing of the past thanks to Merkle`s HighUP process. Be the first to the top.

Merkle HighUP.
Vertical-up welding made easy!

- **Up to 100 % faster welding**
- **100 % safer penetration**
- **100 % easier to control**



ProSWITCH

The new ProSWITCH mode allows the combination of different MIG welding processes. Like this a wide range of new applications is available.

All processes can be combined: short or spray arc, PulseARC, DeepARC or ColdMIG. The sequence, the quantity of processes, and the interval times can be determined freely be the operator.

For example, the root welding of a v-joint can be realized without a backing. The combination of the hot PulseARC (good flank penetration) with the energy reduced ColdMIG process (cooling down of the melting pool) opens up new applications

Merkle ProSWITCH.
Easy combination of different welding arcs!

- **Combination of different MIG processes**
- **Perfect welding results**
- **Easy operation**

Merkle Weld Factory

PRODUCTIVITY EASILY IMPROVED

Merkle Weld Factory is an Industry 4.0 conform software solution for increasing production through cloud based process control and quality assurance of welding processes.

Merkle Weld Factory is suitable for manual welding processes, automated welding and robotic solutions of one or any number of units.

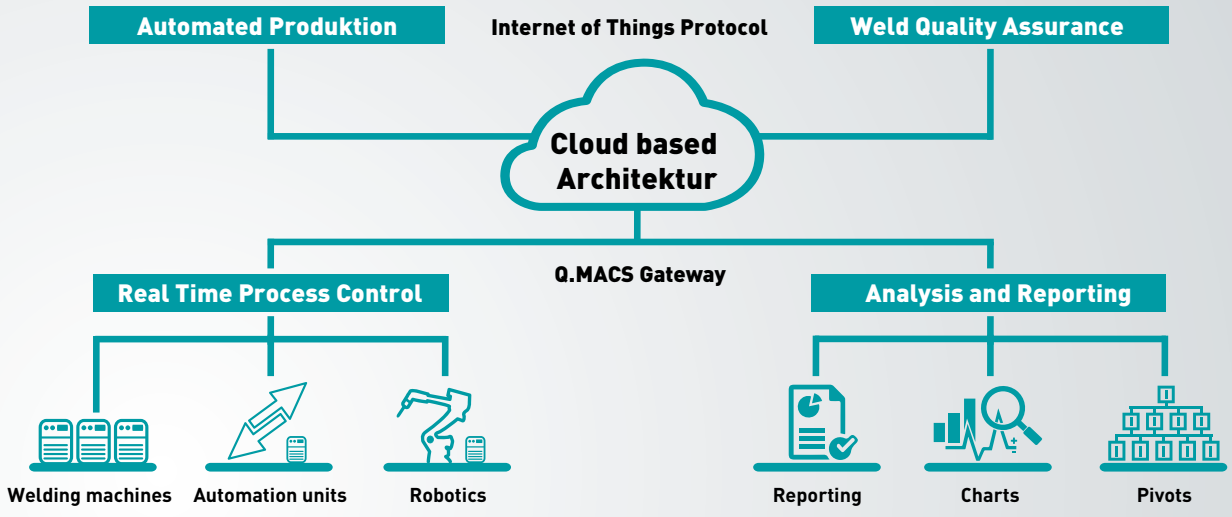
With Merkle Weld Factory at your side!

Advantages:

- Suitable for manual, automated and robotic controlled welding processes
- Communication with various devices via Internet of Things Protocol (IoT)
- Any number of welding systems and devices to be controlled from any number of workstations
- Cloud based software architecture
- Connection of additional peripherals possible in the network (z.B. barcode reader, component counter, input terminals)
- Creation, execution and control of automated production workflows
- Intuitive control with a graphical touchscreen user interface

Merkle Weld Factory

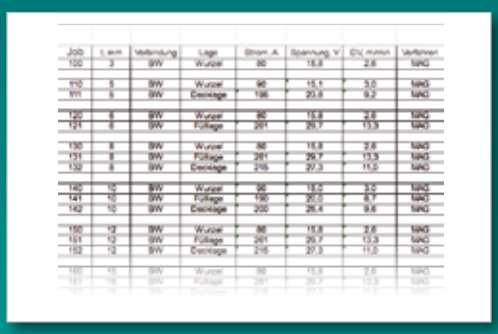
The Software Solution for Industry 4.0



Job package for HighPULSE and SpeedMIG!

Pre set jobs with certified settings can be stored at the continous controlled welding units of the HighPULSE and SpeedMIG series. Therefore the settings from the WPS/WPQR hand book needn't to be set separtly and are available immedately to the user by purchasing the WPS/WPQR package.

Example: For welding a butt weld of a material with 15 mm thickness three jobs (160, 161 and 162) need to be retreived for root run, filler bead and the final run. The clear reading of the settings is shown at the multi functional display.



Material ≤ S355 G3 Si1 1,0 mm 82 % Ar / 18 % CO_2

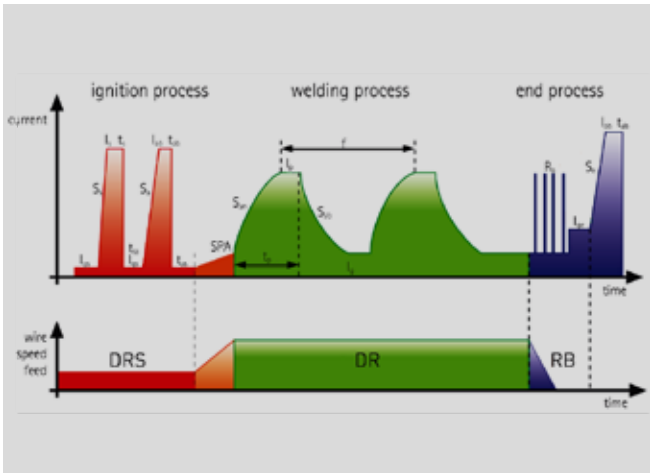
Job No.	t, mm	Connection	Position	Welding current A	Welding voltage V	Wire feeder m/min	Welding process
160	15	BW	root run	80	15.8	2.6	MAG
161	15	BW	filler bead	261	29.7	13.3	MAG
162	15	BW	final run	215	27.3	11.0	MAG

The Merkle PulseARC technology:

ECONOMICAL, SAFE VERSATILE!

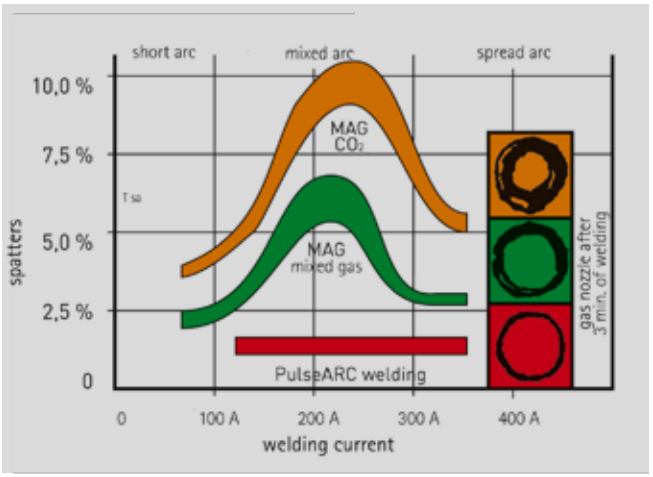
PulseARC welding programs:

Structure of the pulse welding programs: Welding process control with 35 free programmable parameters. Perfect ignition due to 13 variable parameters within the ignition process. 144 different pulse forms programmable. Generation of different forms of welding characteristic curves and parameters are possible.



Comparison between MAG and PulseARC:

The diagram shows the spatter emission in relation to the welding current in percent. The comparison demonstrates the outstanding advantages of the PulseARC welding compared to the traditional MIG/MAG welding using CO_2 or mixed gas as shield gas.



Interpulse process:

With this process we enter a new dimension in welding aluminium and stainless steel. A second pulse process is added to the base pulse.

The advantages of the Interpulse process:

- Scaled weld and welding quality similar to TIG welding process.
- Welding speed as high as in MIG welding.
- Exact manipulation of the scaled weld.
- Reduced heating up of the material.
- Reduced distortion of the work piece.
- Easy adjustment by only one potentiometer (different pulse parameters are adapted automatically).

Technical Data	HighPULSE 284 K	HighPULSE 354 K	HighPULSE 454 KW	HighPULSE 554 KW	HighPULSE 354 DW	HighPULSE 454 DW	HighPULSE 554 DW
Primary:							
Power supply	3 x 400 V						
Frequency	50/60 Hz						
Continuous power	11.1 kVA	12.5 kVA	15.9 kVA	19.4 kVA	14.5 kVA	15.9 kVA	19.4 kVA
Continuous current	16 A	18 A	23 A	28 A	21 A	23 A	28 A
Max. current	19 A	25 A	34 A	45 A	25 A	34 A	45 A
cos phi	0.98						
Secondary:							
Open circuit voltage	57 V	57 V	72 V	72 V	57 V	72 V	72 V
Welding voltage	15-28 V	15-31.5 V	15–36.5 V	15–41.5 V	15 - 31.5 V	15 - 36.5 V	15 - 41.5 V
Welding current	25-280 A	25-350 A	20–450 A	20–550 A	25 - 350 A	20 - 450 A	20 - 550 A
Duty cycle 35 % (10 min.)	280 A (40 °C)	-	-	-	-	-	-
Duty cycle 40 % (10 min.)	-	350 A (40 °C)	-	550 A (40 °C)	-	-	550 A (40 °C)
Duty cycle 50 % (10 min.)	-	-	450 A (40 °C)	500 A (40 °C)	350 A (40 °C)	450 A (40 °C)	500 A (40 °C)
Duty cycle 60 % (10 min.)	280 A (20 °C) 240 A (40 °C)	330 A (20 °C) 280 A (40 °C)	450 A (25 °C) 400 A (40 °C)	550 A (20 °C) 470 A (40 °C)	350 A (20 °C) 330 A (40 °C)	450 A (25 °C) 400 A (40 °C)	550 A (20 °C) 470 A (40 °C)
Duty cycle 100%	230 A (20 °C) 200 A (40 °C)	280 A (20 °C) 250 A (40 °C)	400 A (25 °C) 330 A (40 °C)	500 A (20 °C) 420 A (40 °C)	300 A (20 °C) 280 A (40 °C)	400 A (25 °C) 330 A (40 °C)	500 A (20 °C) 420 A (40 °C)
Protection class	IP 23						
Cooling	AF						
Arc length	automatic energy control						
Programs	MIG/MAG, PulseARC, MMA/stick electrode, MIG brazing, Interpulse, ColdMIG, DeepARC, HighUP, ProSWITCH						
TIG (DC) welding	with LiftTIG ignition		option: LiftTIG ignition				
Program selection	material, wire diameter and gas at the display						
Wire feed	synergic wire feed control						
Operation modes	2-stroke, 4-stroke, interval, stitch						
energy control	control at the machine, TEDAC®torch, job mode				control at the machine, wire feed unit, TEDAC®torch, job mode		
Adjustable parameters	choke inductance, pulse shape						
Power source	inverter						
Digital display	current, voltage, wire feed speed and material thickness with pre-display and hold function						
Wire feeder unit	4-roller-drive DV-26 integrated				4-roller-drive DV-26 optional: DV-31, separate		
Torch cooling	option: separate water cooler WK 300		integrated water cooler				
Norm	EN 60974-1"S"/CE						
Gas bottle holder	optional with trolley TW 112 10 - 20 l cylinders		10 - 20 - 50 l cylinders				
Weight	33 kg	36.5 kg	115 kg	120 kg	130 kg	140 kg	145 kg
Dimensions L x W x H:	600 x 300 x 565		1100 x 490 x 895		1100 x 490 x 1200		

Technical changes reserved.

04/2019 EN

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.

PRODUCT RANGE

- MIG/MAG Welding Units
- Synergic Pulse Welding Units
- TIG Welding Units
- MMA / Stick Electrode Welding Units
- Plasma Welding and Cutting Units
- Turntables and Roller Drive Units
- Welding and Cutting Torches
- Automation Components and Solutions
- Merkle Robotics

MADE IN GERMANY

55 JAHRE YEARS

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