Submerged-Arc Welding

Systems, Machines and Accessories

www.kjellberg.de
Automated Submerged-Arc Welding

Technology

Submerged-arc welding (also SAW) is an arc welding process where the arc burns between an endless wire electrode and the work-piece. A flux layer covers the arc and, thus, ensures an almost emission-free process. The usual sight protection measures are not necessary. This high-performance process achieves a high degree of thermal efficiency.

On request, we install the Kjellberg SA welding technique on gantries, column and booms, motor-driven axle systems or carriages. Its modular design and diverse support systems allow the welding of numerous different work-pieces and seam geometries, e.g. in shipbuilding, bridge and steel construction or in container production.

SA welding can be used efficiently for material thicknesses from 3 mm. It is suited for joint welding or for applying wear and corrosion protection layers. The process can be used as fully automated, mechanised or manual solution and achieves uninterrupted, long welds at high speeds and low costs.

Process Principle
Automated Submerged-Arc Welding

Advantages at a Glance

**Advantages**
- High quality due to stable arc
- Almost emission-free process
- No dazzling effect
- High welding speed
- High efficiency due to high deposition rate
- Low costs

**Fields of Application**
- Numerous units and components allow versatile applications
- Unalloyed, low-alloyed and high-alloyed steels
- Shipbuilding, bridge and steel construction, container production, wind power plants production
- Joint welding
- Applying of wear and corrosion protection layers
Automated Submerged-Arc Welding

System Solutions – Variable Use

Welding Task

T-beam  Double-T-beam  Box girder  Butt weld joint  Container, longitudinal weld  Container, circular weld (inside and outside)  Cladding

Possible Applications

The flexible modular concept of the KA series is the basis for different system solutions in the area of welding automation technology. In combination with the welding power sources made by Kjellberg there are numerous possibilities for customised solutions which guarantee an effective use in the industry, like welding gantries and equipment for column and booms.
Automated Submerged-Arc Welding

Advantages at a Glance

1. High welding quality due to stable speedometer-driven wire feeding
   - with four-wheel drive for wires up to ø 3 mm
   - for wires from ø 2.5–5 mm for single-wire SA welding (KA 1-UP), for parallel wire (KA7-UPP) ø 2 x 2.0 to 2 x 3.0 mm
   - as double drive for welding with two articulated arms (KA 4-UPDG) up to 2 x 2.5 mm wire diameter

2. Flexible, technological use due to
   - welding head pivoting for welding positions PA and PB (KA 1-UP)
     - long lifetime at welding currents of up to 1,400 A (KA 1-UP, KA 7-UPP)
     - convertible for narrow-gap welding (KA 1-UP)
     - convertible to KA 7-UPP (parallel wire)
   - welding head as drag arm (KA 4-UPDG)
     - reliable, mechanical seam tracking; cost-efficient compared to complex electronic sensors
     - SA ø 2 x 1.6 to 2 x 2.5 mm

3. Visual seam tracking with laser cross/laser spot

4. Quick positioning of the welding head by manual linear axles (effective adjustment track per 100 mm, others possible)

5. Further increase of stability possible with optional axle extensions

6. Minimum after-treatment due to pneumatic flux recovery unit (low-wear injection principle)

7. Transportation safety due to eye hooks

8. Easy to handle, comfortable control unit with
   - Pre-selection of parameters for welding current, arc voltage and welding speed
   - Pre-selectable procedure for automatic start mode and crater filling

9. Support of wire coil up to 30 kg (ISO K 435)

10. Flexible installation of strain relief for hose parcels (can be screw-connected to the side or front)

11. Safe guidance of carriage
   - along profiles, webs, flanges due to side stops
   - suitable for rails due to keyway wheels

12. Safe drive of the carriage due to
   - speedometer-controlled all-wheel drive from 0.1–1.6 m/min
   - rubber or keyway wheels with a diameter of 160 mm
   - manual clutch for releasing the drive
   - temperature-resistant rubber wheels (up to 200°C)
## Automated Submerged-Arc Welding

### Standard Automats of the KA Series

<table>
<thead>
<tr>
<th>Type/art. no.</th>
<th>Picture</th>
<th>Method</th>
<th>Max. welding current</th>
<th>Wire diameter (mm)</th>
<th>Recommended power source</th>
</tr>
</thead>
<tbody>
<tr>
<td>KA 1-UP</td>
<td></td>
<td>Single-wire SA welding tractor for different wire diameters</td>
<td>500/800 A</td>
<td>1,6–3,0 or 1,400 A</td>
<td>GTH 522, GTH 802</td>
</tr>
<tr>
<td>3mm: .11.300.103</td>
<td></td>
<td></td>
<td></td>
<td>2,5–5,0</td>
<td>GTH 1002, GTH 1402</td>
</tr>
<tr>
<td>5mm: .11.300.105</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KA 1-UP</td>
<td></td>
<td>Single-wire SA welding tractor for containers and inner tube welding</td>
<td>1,400 A</td>
<td>2,5–5,0</td>
<td>GTH 1002, GTH 1402</td>
</tr>
<tr>
<td>As steerable version .11.303.105</td>
<td></td>
<td>(e.g. windmill towers)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KA 2-UP/UPP</td>
<td></td>
<td>Single-wire welding head (also available as parallel-wire SA welding head with control unit for installation on column and booms, gantries etc. in this or other assembled forms, also without carriage) for different wire diameters</td>
<td>800 A</td>
<td>1,6–3,0 or 1,400 A</td>
<td>GTH 802, GTH 1002, GTH 1402</td>
</tr>
<tr>
<td>3mm: .11.300.203</td>
<td></td>
<td></td>
<td></td>
<td>2,5–5,0</td>
<td></td>
</tr>
<tr>
<td>5mm: .11.300.205</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2x3mm: .11.300.270</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KA 4-UPDG</td>
<td></td>
<td>SA welding tractor with two articulated arms (welding of two fillet welds or butt welds simultaneously)</td>
<td>600 A (per welding head)</td>
<td>1,6–2,5 or 1,400 A (per welding head)</td>
<td>2 x GTH 522, 2 x GTH 802</td>
</tr>
<tr>
<td>.11.300.400</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KA 7-UPP</td>
<td></td>
<td>Parallel-wire SA welding tractor (also available as steerable version)</td>
<td>1,400 A</td>
<td>2x 2,0–2x 3,0</td>
<td>GTH 1002, GTH 1402</td>
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<tr>
<td>.11.300.700</td>
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<td></td>
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<tr>
<td>UPK</td>
<td></td>
<td>SA fillet welding</td>
<td>800 A</td>
<td>1,6–4,0</td>
<td>GTH 802</td>
</tr>
<tr>
<td>.11.300.104</td>
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### Automated Submerged-Arc Welding

#### Power Sources – Technical Data

<table>
<thead>
<tr>
<th>Type: art. no.</th>
<th>GTH 522: .11.907.602A</th>
<th>GTH 802: .11.705.902A</th>
<th>GTH 1002: .11.903.102A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Characteristic</strong></td>
<td>Constant voltage (CV)</td>
<td>Constant voltage (CV)</td>
<td>Constant voltage (CV)</td>
</tr>
<tr>
<td><strong>Mains voltage</strong></td>
<td>3 x 400 V, +/-10%, 50 Hz</td>
<td>3 x 400 V, +/-10%, 50 Hz</td>
<td>3 x 400 V, +/-10%, 50 Hz</td>
</tr>
<tr>
<td><strong>Connected load</strong> (EN 60974-1)</td>
<td>23.6 kVA</td>
<td>31.7 kVA</td>
<td>78 kVA</td>
</tr>
<tr>
<td><strong>Mains connection</strong></td>
<td>CEE 63 A</td>
<td>CEE 63 A</td>
<td>Terminal connection fuse</td>
</tr>
<tr>
<td><strong>Welding current range</strong></td>
<td>70 A/18 V – 500 A/45 V 500 A/60 % 400 A/100 %</td>
<td>80 A/18 V – 800 A/44 V 800 A/80 % 720 A/100 %</td>
<td>100 A/19 V – 1,000 A/44 V 1,000 A/100 %</td>
</tr>
<tr>
<td><strong>Protection class</strong></td>
<td>IP 23</td>
<td>IP 22</td>
<td>IP 21</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>260 kg</td>
<td>319 kg</td>
<td>440 kg</td>
</tr>
<tr>
<td><strong>Dimensions (L x W x H)</strong></td>
<td>1,130 x 665 x 865 mm (with carriage)</td>
<td>980 x 720 x 1,000 mm (with carriage)</td>
<td>1,110 x 820 x 1,000 mm (stationary)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type: art. no.</th>
<th>GTH 1402: .11.903.802A</th>
<th>W 1005 VC: .11.691.002</th>
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</thead>
<tbody>
<tr>
<td><strong>Characteristic</strong></td>
<td>Constant voltage (CV)</td>
<td>Constant voltage (CV)</td>
</tr>
<tr>
<td><strong>Mains voltage</strong></td>
<td>3 x 400 V, +/-10%, 50 Hz</td>
<td>3 x 400 V/PE, +/-10%, 50 Hz</td>
</tr>
<tr>
<td><strong>Connected load</strong> (EN 60974-1)</td>
<td>83,8 kVA</td>
<td>77,2 kVA</td>
</tr>
<tr>
<td><strong>Mains connection</strong></td>
<td>Terminal connection fuse</td>
<td>Terminal connection fuse</td>
</tr>
<tr>
<td><strong>Welding current range</strong></td>
<td>100 A/19 V – 1,400 A/44 V 1,400 A/40 % 1,200 A/100 %</td>
<td>200 A/25 V – 1,000 A/44 V 1,000 A/100 %</td>
</tr>
<tr>
<td><strong>Protection class</strong></td>
<td>IP 21</td>
<td>IP 21</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>440 kg</td>
<td>510 kg</td>
</tr>
<tr>
<td><strong>Dimensions (L x W x H)</strong></td>
<td>1,110 x 820 x 1,000 mm (stationary)</td>
<td>1,130 x 750 x 990 mm (stationary)</td>
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<table>
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<th>Type: art. no.</th>
<th>GTF 401: .11.708.001/2</th>
<th>GTF 551: .11.709.002/1</th>
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<tbody>
<tr>
<td><strong>Characteristic</strong></td>
<td>Constant current (CC)</td>
<td>Constant current (CC)</td>
</tr>
<tr>
<td><strong>Mains voltage</strong></td>
<td>2 x 400 V/3 x 230/400/500 V, +/-10%, 50 Hz</td>
<td>3 x 400 V/3 x 230/400/500 V, +/-10%, 50 Hz</td>
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<tr>
<td><strong>Connected load</strong> (EN 60974-1)</td>
<td>11,2 kVA</td>
<td>16,5 kVA</td>
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<tr>
<td><strong>Mains connection</strong></td>
<td>CEE 32 A</td>
<td>CEE 32 A</td>
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<tr>
<td><strong>Welding current range</strong></td>
<td>10 A/20 V – 400 A/36 V 400 A/25 % 250 A/100 %</td>
<td>10 A/20 V – 550 A/42 V 550 A/25 % 400 A/40 % 300 A/100 %</td>
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<tr>
<td><strong>Protection class</strong></td>
<td>IP 23</td>
<td>IP 22</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>169 kg</td>
<td>194 kg</td>
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<tr>
<td><strong>Dimensions (L x W x H)</strong></td>
<td>925 x 685 x 1,000 mm (with carriage)</td>
<td>925 x 658 x 1,100 mm (with carriage)</td>
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</table>

<table>
<thead>
<tr>
<th>Type: art. no.</th>
<th>GTF 752: .11.705.602</th>
<th>GTF 1002: .11.903.202C</th>
<th>GTF 1402: .11.903.702C</th>
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<tbody>
<tr>
<td><strong>Characteristic</strong></td>
<td>Constant current (CC)</td>
<td>Constant current (CC)</td>
<td>Constant current (CC)</td>
</tr>
<tr>
<td><strong>Mains voltage</strong></td>
<td>3 x 400 V, +/-10%, 50 Hz</td>
<td>3 x 400 V, +/-10%, 50 Hz</td>
<td>3 x 400 V, +/-10%, 50 Hz</td>
</tr>
<tr>
<td><strong>Connected load</strong> (EN 60974-1)</td>
<td>51,5 kVA</td>
<td>78 kVA</td>
<td>83,8 kVA</td>
</tr>
<tr>
<td><strong>Mains connection</strong></td>
<td>CEE 125 A (63 A possible)</td>
<td>Terminal connection fuse 125 A</td>
<td>Terminal connection fuse 125 A</td>
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<tr>
<td><strong>Welding current range</strong></td>
<td>60 A/22,4 V – 750 A/44 V 750 A/80 % 630 A/100 %</td>
<td>200 A/28 V – 1,000 A/44 V 1,000 A/100 %</td>
<td>100 A/19 V – 1,000 A/44 V 1,400 A/80 % 1,200 A/100 %</td>
</tr>
<tr>
<td><strong>Protection class</strong></td>
<td>IP 22</td>
<td>IP 21</td>
<td>IP 21</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>304 kg</td>
<td>438 kg</td>
<td>438 kg</td>
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<tr>
<td><strong>Dimensions (L x W x H)</strong></td>
<td>980 x 720 x 1,000 mm (with carriage)</td>
<td>1,110 x 820 x 1,000 mm (with carriage)</td>
<td>1,110 x 820 x 1,000 mm (stationary)</td>
</tr>
</tbody>
</table>
Automated Submerged-Arc Welding

Application Examples

Profile and beam welding system

Specific application
- Automated SA welding gantry
- Joint welding of sheets to box profiles with a maximum initial tension of the components of 300 mm
- Fillet welds
- Material thickness from 10–20 mm
- Maximum dimensions: 60 x 1.5 x 2.5 m
- Materials: S235, S355

Features
- Production of complex box profiles with a construction height of up to 2.5 m
- On-board operating platform with all necessary control and display elements and camera system to record the two workspaces

Beam Welding System

Specific Application
- Fully mechanised parallel-wire SA welding gantry
- Longitudinal SA welding of box profiles, T-beams and trapezoidal profiles
- Fillet welds, option: butt welds
- Material thickness 8–30 mm
- Maximum dimensions: 35 x 6 m in position with initial tension or 35 m x 10 m without initial tension, box girder with 35 x 1.5 x 1 m
- Materials: S235, S355

Features
- Mechanisation of longitudinal welding
- Option to weld in all four directions due to rotatable centre column
Automated Submerged-Arc Welding

**Specific Application**

- Fully mechanised automat with two articulated arms
- Joint welding of sheets and rolled profiles to box-shaped profiles
- Fillet welds and butt welds
- Material thickness up to 30 mm
- Maximum dimensions: 30 x 1.5 x 0.8 m
- Materials: S355

**Features**

- Modified welding automat for welding of opposite fillet welds
- Seam tracking by guide rollers and drag arm
- Welding of components at 200 °C preheating

**Beam Welding System**

**Specific Application**

- Fully mechanised SA welding gantry
- Longitudinal SA welding of box profiles, T-beams and trapezoidal profiles
- Single bevel seams
- Material thickness 10–30 mm
- Maximum dimensions: 1.8 x 1.5 m
- Materials: Hardox 400

**Features**

- Mechanisation of longitudinal welding
- 360 °C rotatable by positioning unit
Automated Submerged-Arc Welding

Application Examples

Container Welding System

Specific Application
- Fully mechanised SA welding system
- Joint welding of rolled steel plates
- Circular and longitudinal welds (2 separate systems)
- Maximum container diameter 800 mm
- Material thickness 3 mm
- Maximum dimensions: 1.8 x 2.3 m
- Materials: mild steel, pressure vessel steels

Features
- Solid base frame with two support combinations and container rotating device for simultaneous circular welding
- With holding mandrel, roller guide-way and support combination for longitudinal welding

Container Welding System

Specific Application
- Automatic column and boom for SA welding
- Joint welding of rolled CrNi sheets
- Circular and longitudinal welds
- Material thickness 10–25 mm
- Maximum tube diameter: 3.5 m
- Materials: high-alloyed steels

Features
- Retrofit of a rotatable and steerable welding column and boom with longitudinal axis and height axis with Kjellberg SA technique
Automated Submerged-Arc Welding

Tube Welding System

Specific Application
- Fully mechanised steerable welding automat for parallel-wire welding
- Joint welding of rolled sheets to tube sections and segments
- Fillet and butt welds
- Minimum tube diameter 1.4 m
- Material thickness up to 40 mm
- Materials: S235, S355

Features
- Modified steerable SA welding automat for cylindrical and conical components with parallel-wire technology
- High stability due to standard axle extensions
- Modified power sources for sufficient process stability in case of long distances to the welding area

Container Surface Welding System

Specific Application
- Mobile welding column and boom
- Welding of containers and tubes
- Circular and longitudinal welds
- Work-piece diameter: 1–4 m
- Maximum dimensions: 5 x 6 m

Features
- Movable column and boom on rail system
- Roller blocks with a maximum total load of 30 tons
- Welding of inner and outer seams
The fluoride-basic flux is used for welding of general and high-tensile fine-grained steels as well as cold-tough and age-hardening steels. Tandem and multi welds and production of offshore components can be done with this kind of flux. It is also suitable for circular welds because the slag solidifies quickly.

Features
- Standard ISO 14174: SA FB 155 AC H5
- Approvals: TÜV, DB, GL, ABS
- Grain size: 0.2 – 1.8 mm
- Density: 1.2 kg/dm³
- Composition: SiO₂ + TiO₂; CaO + MgO; Al₂O₃; MnO; CaF₂
- Packaging: 25 kg in plastic bags

Mechanical Properties

<table>
<thead>
<tr>
<th></th>
<th>KF S2</th>
<th>KF S3</th>
<th>KF S2Mo</th>
</tr>
</thead>
<tbody>
<tr>
<td>ReL/Rp₀.₂</td>
<td>&gt;330</td>
<td>&gt;430</td>
<td>&gt;500</td>
</tr>
<tr>
<td>MPa (N/mm²)</td>
<td>450-550</td>
<td>530-630</td>
<td>580-680</td>
</tr>
<tr>
<td>A5 (%)</td>
<td>&gt;28</td>
<td>&gt;22</td>
<td>&gt;20</td>
</tr>
</tbody>
</table>

Current type/polarity: AC, DC+ up to 1,000 A
Re-drying temperature: 350 °C/2 h

For optimum welding results, we also recommend our welding wires KF S2, KF S3, KF S2Mo.

The aluminate-basic flux for welding of general mild steels is especially suited for single and multi-welds. The slag produced can be removed easily.

Features
- Standard ISO 14174: SA AB 167 AC H5
- Grain size: 0.2–1.8 mm
- Density: 1.3 kg/dm³
- Composition: SiO₂ + TiO₂; CaO + MgO; Al₂O₃; MnO; CaF₂
- Packaging: 25 kg in plastic bags

Mechanical Properties

<table>
<thead>
<tr>
<th></th>
<th>KF S2</th>
<th>KF S3</th>
<th>KF S2Mo</th>
</tr>
</thead>
<tbody>
<tr>
<td>ReL/Rp₀.₂</td>
<td>&gt;380</td>
<td>&gt;430</td>
<td>&gt;430</td>
</tr>
<tr>
<td>MPa (N/mm²)</td>
<td>510-610</td>
<td>530-630</td>
<td>550-650</td>
</tr>
<tr>
<td>A5 (%)</td>
<td>&gt;22</td>
<td>&gt;22</td>
<td>&gt;20</td>
</tr>
<tr>
<td>AV (J)</td>
<td>&gt;47</td>
<td>&gt;47</td>
<td>&gt;47</td>
</tr>
</tbody>
</table>

Current type/polarity: AC, DC+ up to 1,000 A
Re-drying temperature: 350 °C/2 h

Massively coppered welding wires give rust no chance.

Features
- Standard EN ISO 14171-A: S2, S3, S2Mo
- Approvals: TÜV, DB, GL, ABS
- Packaging: 25 kg on coils
- Ø: 2.0; 2.5; 3.0; 4.0 mm
Equipment

The wire feeding unit DV UP-H with integrated control unit and four-wheel drive can be operated with the manual submerged-arc welding torch UP-H 500. The equipment is suited for welding large seam geometries where mechanisation is not possible, e.g. on frames for windmill towers or large connecting pieces for containers and tubes. The DV UP-H is compatible with the mini-carriage KMF solid (see pages 10 and 11).

Advantages of the Equipment

- Suited for all power sources of the GTH type
- Torch is easy to operate (up to a maximum length of 10 m)
- Flux supply with external, mobile pressure tank, manual lock at hand torch
- Robust four-wheel wire feeder with constant contact pressure
- Suited for solid and filler wire
- Step-less pre-adjustment of set values for welding voltage and current as well as start parameters on the front panel
- Switchable from two-stroke to four-stroke operation
- Protected electronics
- Current-less wire threading and return
- Existing GTH power sources can be retrofitted

Technical Data

<table>
<thead>
<tr>
<th>Dimensions (L x W x H)</th>
<th>710 x 250 x 500 mm</th>
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<tbody>
<tr>
<td>Weight DV</td>
<td>25 kg</td>
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<tr>
<td>Diameter of wire coil:</td>
<td></td>
</tr>
<tr>
<td>Steel</td>
<td>0.6–2.0 mm</td>
</tr>
<tr>
<td>CrNi</td>
<td>0.8–2.0 mm</td>
</tr>
<tr>
<td>Filler wire</td>
<td>1.0–2.4 mm</td>
</tr>
<tr>
<td>Standard feed rollers</td>
<td>1.2 and 1.6 mm (steel)</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP 23</td>
</tr>
<tr>
<td>Maximum welding current range at 100 % duty cycle</td>
<td>depending on power source 400 A</td>
</tr>
<tr>
<td>Wire feeding speed</td>
<td>1–16 m/min</td>
</tr>
</tbody>
</table>
Manual Submerged Arc Welding

Mini-Carriage KMF solid

Its four wheels make the KMF solid especially stable, thus it can be flexibly used as two-torch version.

The torch system of the KMF solid ensures the quick, easy adjustment to different welding tasks and a reproducible torch position.

Features
• Digital speed adjustment/control
• Monitoring of battery capacity
• Self-positioning (in case of ferromagnetic materials no rails required)
• Drive wheels are in protected position, thus no wear resulting from UV and thermal radiation of the arc
• Retrofit with electronic pendulum system possible

• Can be used efficiently for piece and serial production, also for short welds
• Can be operated with hand torch and machine torch (integrated remote control of power source)
• Spatter-protected, adjustable guiding elements

Technical Data

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Dimensions (L x W x H)</td>
<td>340 x 220 x 210 mm</td>
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<tr>
<td>Weight</td>
<td>6.8 kg</td>
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<tr>
<td>Welding speed</td>
<td>10–200 cm/min</td>
</tr>
<tr>
<td>Track width</td>
<td>140 mm</td>
</tr>
<tr>
<td>Battery operation without Reloading (60 % duty cycle)</td>
<td>&gt; 12 h</td>
</tr>
<tr>
<td>Battery load time</td>
<td>&lt; 25 min</td>
</tr>
<tr>
<td>Magnetic system can be connected: adhesive force</td>
<td>&gt; 350 N</td>
</tr>
<tr>
<td>Weld types and positions</td>
<td>All except PD, PE</td>
</tr>
</tbody>
</table>
Mini-Carriage KMF

Being the KMF solid’s little brother, the KMF is especially easy to handle due to its light weight and small size. The flexible KMF can be used for submerged-arc welding and GMA welding as well as for everyday tasks in workshops.

Features

- Electronic speed control
- Monitoring of battery capacity
- Self-positioning (in case of ferromagnetic materials by means of permanent magnetic system)
- Economic use for piece and small batch production
- Can be used with hand and machine torch
- Spatter-protected, adjustable guiding elements
- Highest reproducibility and quality of the welds due to constant mechanical feed and exact torch guidance
- Flexible and loadable torch holding system
- Long battery life (minimum two shifts)

Technical Data

<table>
<thead>
<tr>
<th>Dimension (L x W x H)</th>
<th>290 x 190 x 170 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>4.8 kg</td>
</tr>
<tr>
<td>Welding speed</td>
<td>10–125 cm/min</td>
</tr>
<tr>
<td>Track width</td>
<td>85 mm</td>
</tr>
<tr>
<td>Battery operation without Reloading (60 % duty cycle)</td>
<td>&gt; 16 h</td>
</tr>
<tr>
<td>Battery load time</td>
<td>&lt; 25 min</td>
</tr>
<tr>
<td>Permanent magnetic system: adhesive force</td>
<td>&gt; 180 N</td>
</tr>
<tr>
<td>Weld types and positions</td>
<td>Alle except PD, PE</td>
</tr>
</tbody>
</table>
Product Portfolio

GMA welding technique
- Power sources
- Flexible use for mechanised, partly and fully automated welding processes with high seam quality

Plasma keyhole welding

PTA welding technique
- Power sources
- Pre-defined welding programmes facilitate the industrial use for producing high-quality protection layers

Special welding process InFocus

Welding periphery
- Column and booms, gantries and rotating devices produced and installed according to customer requirements

Complex plants
With different components from our product portfolio

Renting as Alternative to Purchasing

Maintenance downtimes and production peaks are no longer a problem if you choose our rental service. Of course we offer advice and delivery as well as detailed instruction and collection after the job is done. The fields of application and the possible combination of our offer are as diverse as your demands on Kjellberg. So please inquire after exact rental fees by telephone or online by using our contact form.

Rental Conditions
- Minimum term of rent is one calendar week
- Delivery, collection and instruction optional
- Advice and offers are free of charge and not binding

Contact: Manuel Kornek
Phone: +49 3531 500-319

Kjellberg Finsterwalde
Welding electrodes
Welding technique
Cutting technique
Mechanical Engineering