Machine Model

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIMIG Workshop 425SWF</td>
<td>KUM425SWF</td>
</tr>
</tbody>
</table>

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*** CAUTION ***

Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapours from substance inside. These can cause an explosion even though the vessel has been “cleaned”. Vent hollow castings or containers before heating, cutting or welding. They may explode.

UNIMIG pursue a policy of continuous research and development, and therefore reserve the right to change the specifications, or design, without prior notice. 3 year warranty power source.
CE Declaration

The manufacturer, Weld-Impex Manufacturing and Trading Ltd, declares that the product conforms to:

- EN 60974-1 (Arc welding equipment)
- EN 50199 (Electromagn. compatibility)
- EN ISO 12100-2 (Safety of machinery)
- 73/23 EGK (Low-voltage directives)
- 89/336 EGK (Electromagn. compatibility)
- 98/37 EK (Machines)

European directives, norms and is suitable for the technical parameters in the instruction manual.

The machine has been designed according to the European norm EN 60974-1, it fulfils the (disturbance filtering) directions of EN 55011:1994 group "A", and it also complies with the directions of the European directive 2002/95/CE (RoHS).


........................................
István KISS
Managing Director

Legal Declaration

The quality certification will be handed over to the customer when purchasing. Technical parameters and proper usefulness of the equipment are warranted by the producer.

Warranty begins at installation; its period and services' list are in the warranty (supplement).

The manufacturer doesn't take responsibility for damages resulting any of the followings:

- using not according to intended designation
- not complying with labour etc. safety instructions
- not knowing instruction manual
- not proper qualification for the specified work (installation, welding, maintenance, etc.)
- lending the machine without instruction manual, and/or to not well trained person.

The manufacturer reserves the rights to change properties, technical parameters, appearance of the product.

Built-in parts lose their warranty if damaged!

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Weld-Impex Ltd. has the Quality Management System certified by ISO-9001. Its number: HU97/10906.

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Our other services:

- Galvanization, electrostatic powder-painting
- Screen process
- Body ironing works (also CNC)
- Manufacture of dry transformers
- Manufacture of unique electrical equipments
- Repairs over the guarantee
- Technical supervision
- Installing, transport, commission
- Leasing of equipment (MIG, TIG, Plas)
- National service network

For details, please visit our website or ask for information by telephone!
SAFETY

SAFETY PRECAUTIONS
for electric machines of welding/cutting industry

Present Manual should be studied thoroughly before starting any operation!

Next paragraphs provide some safety precautions and instructions on how to use electric machines of welding and cutting industry in order all persons to prevent accidents, injuries etc.

As all preventing rules cannot be written because of many variations of task environment, follow the rules concerning the actual job(s) and the employer's safety practices.

Read, understand and keep industrial safety and fire protection instructions concerning to safety of all parts and equipments used (cylinder, torch, extractor, etc.).

1. Dangerous features

1. Formed conditions of the machine and work are important: transport, storage, installation, operation, maintenance.

2. The machine is connected to the mains network.

3. The electrode, work-piece (or ground), and cables are under voltage (electricaly live). Voltage of more electrodes can be added up on the work-piece. At plasma cutting there is 200–350 V at the torch!

At welding/cutting, the followings are produced:

4. Visible light, ultraviolet and infra-red rays, significant heat.

5. Sparks, spatter and high-energy metal drops with great temperature (800–1600 °C). These are thrown from the arc and can fly to adjacent areas (through small gaps).

6. Toxic fumes, gases and smoke generated from
   • the worked (e.g. galvanized, lead or cadmium plated) metal,
   • the gas used for work,
   • those reacting with each other (e.g. phosgene).

7. Considerable electromagnetic field (because of high-current arc and mains cable) that radiates to the environment. Its effect highly decreases with the distance. Radiation of machines with HF-ignition unit (TIG, Plas) is more bigger.

8. Cylinders using for work and nearby contain high-pressure gas.

2. Damaging effects

These dangerous features have harmful influence to the workers and also to near living beings, machine, and other equipments:

♦ General injuries
1: A not suitable made environment, a not well prepared and made working area can be dangerous (machine tipping over, its overheating, person falling down, etc.).

♦ Electric shock
2: The machine's inside is under mains voltage.
3: Machine's cables have voltage while working.

♦ Eye damaging
4: Arc ray causes eye inflammation.
5: Flying sparks can cause physical eye damaging.
6: Smoke, gas, fume can irritate the eye.

♦ Cylinders' overpressure can came to the eye.

♦ Hand and skin injuries
4: Heat effect of the arc ray and the overheated work-piece can burn the skin.
5: Flying sparks can reach the skin.
6: Smoke, gas, fume can irritate the skin.

♦ Breathing damage
6: Smoke etc. can displace air and breathing in can cause injury or even death.

♦ Fire and explosion danger
2: Electric fault can happen in the machine in principle.
3: Cables can overheat or a short-circuit can happen.
4: Arc ray has a great heat effect to the work-piece.
5: Sparks are of high temperature and fly far away.
6: Fumes can be hot and can stimulate burning.
8: Cylinders can contain high-pressure and fire-feeding gas (e.g. oxygen).

♦ Electromagnetic disturbances
7: EM radiation has too much energy for sensitive electrical equipments.

♦ Environmental damage
1, 4, 5, 6: Welding/cutting and its waste materials can contaminate the surrounding soil, waters, and air. Damaging noise, light, and heat are produced.

3. The machine’s transport, storage

Must be in upright position, secured against tipping over.

Lifted (if bigger size) by means of lift device and with the help of more personnel.

Protected against vapour, moisture, damaging weather and mechanical effects (in dry, covered place, for good cause in its box or covered).

4. Creating working area

The working area should be ...

• clean and orderly
• well-lighted and -aired (e.g. extractor fan), and of good temperature; protected from falling water, rain, and storm
• of straight, smooth floor, free from obstructions (of non-combustible material)
• screened, fenced off with safety grids (if necessary).
SAFETY

» In the working area or near, there not be ...
  • inflammable materials (or cover them)
  • person living with pacemaker
  • electrically sensitive appliances in the area of health (e.g. pacemaker), control (e.g. computer), measurement, safety (e.g. guard), radio-waves (e.g. mobile phone), etc.

» The cylinder ...
  • must be in upright position, securely chained to a fixed support, and away from areas where they may be subjected to damaging physical or heat effect
  • valve protection cap should always be in its place if out of use.

» Pay attention to the followings:
  • Keep a fire-extinguisher, water hose, blanket, etc. readily available for immediate use.
  • Connect work clamp to the work piece close to the working area (not be complex current path). Connections must be tight.
  • Ground the work to a good electrical point.
  • Place the high-current cables side by side and at floor. Nobody stay close to them for a long time.
  • Cables not be wound around metal or living body.

5. Operation

» The equipment:
  • can be operated at a place which is suitable for safety work and well ventilated
  • changes decreasing its safety shall not be carried out
  • its electric shock prevention test must be carried out regularly as prescribed
  • must be connected to a line provided with protective grounding, circuit breaker or fuse, and possibly protection switch
  • its airing grids/slots be free
  • can be used only for the purpose that it was designed for
  • its all installation, repair and maintenance works (possibly on disconnected machine) can be performed only by qualified, trained, and competent (examined) persons, according to the labour safety provisions, electric shock protection, and local and manufacturer’s regulations.

» Protect ...
  • cables from any kind of damage, e.g. don’t step on them and don’t roll anything over them
  • low-current cables of the machine(s) by laying them in a safe location, or, if necessary, with screening
  • public utilities (gas hoses and fittings, electric wires and equipments, etc.)
  • air (by filter usage), soil, worked metal etc. from contamination.

6. Working

» Don’t weld/cut ...
  • with covers removed or with damaged cables
  • materials and parts under voltage (also don’t touch these)
  • near to inflammable or explosive materials, dust, vapours (e.g. chlorinated hydrocarbon vapours coming from cleaning or spraying operations)
  • when not knowing what gases and fumes can be generated e.g. from coated metals
  • in damp and dirty environment
  • tanks, drums, barrels, cylinders, containers, etc. as these are filled up with vapours (being inside in spite of “cleaning” and produced by working).

» Pay attention to the followings:
  • Safe and stable working position is needed.
  • Rolls of wire feeder and the fed wire are dangerous (at MIG welding).
  • Use enough ventilation and mask or respirator.
  • Keep your head and face:
    • out of the fume (avoid breathing in these)
    • away from the valve outlet when opening it.
  • Wear protective clothing (isolate yourself from the work-piece):
    • oil-free, fire-resistant clothing covering all body
    • dry, leather gloves with no holes
    • high shoes, hair cap, ear plugs
    • safety filter glass with side shield (helmet).
  • Switch off the machine when out of use (wait its cooling; also recommended pulling the mains plug out).
  • Waste materials must be handled carefully, regularly.
  • Keep all parts, fittings (e.g. gas hose) in well and safety condition, suitable for work, according to rules and specifications.

» Don’t do the followings:
  • Don’t turn any switch, don’t pull cables from the connector while working.
  • Never turn the torch toward anybody (and yourself).
  • Don’t touch the electrode:
    • to the work-piece when this is not necessary
    • to parts or cylinder under voltage
    • if touching also the work-piece at the same time
    • to liquid (e.g. for cooling).
1. Introduction

In case of MIG/MAG welding method the arc is generated between the automatically fed welding wire and the working piece, shielding in CO₂, gas or gas mixture.

The machine is able to weld unalloyed and low alloyed steel plates. When welding thin car chassis, the application of gas mixture is recommended, whilst in other cases, when deep penetration is required, pure CO₂ renders better solution.

Important advantages of this technology are high heat concentration and current density so warp of the material is very low.

Additional advantages:
- high welding speed, quick melting,
- deep penetration, high melting rate,
- ability to weld of thin plates, roots, etc.,
- wide range of welding parameters,
- easy automation,
- no slag on the welded seam.

The equipment consists of two, separated units: the Power Source and the Wire Feeder, and they are connected with cables and hoses of 10 m long. The power source is designed to constitute a compact unit with the gas bottle and the undercarriage fixed to it.

Main parts of these units:
- Metal housing with wheels and fan
- Main transformer (of flat static characteristic)
- Rectifier bridge
- Choke for smoothing the current
- Auxiliary transformer and contactor
- Metal housing with central torch adaptor
- Wire feeding unit with motor
- Solenoid (gas) valve
- Electronic control unit
- Connecting cables and hoses (10 m)

2. Specification

<table>
<thead>
<tr>
<th>Power Source</th>
<th>Wire Feeder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mains voltage</td>
<td>3×415 V, 50 Hz</td>
</tr>
<tr>
<td>Nominal input power</td>
<td>20 kVA</td>
</tr>
<tr>
<td>Maximum input current</td>
<td>3×28 A</td>
</tr>
<tr>
<td>Input fuse</td>
<td>3×T25 A</td>
</tr>
<tr>
<td>Open circuit voltage (DC)</td>
<td>19 - 50 V</td>
</tr>
<tr>
<td>Welding current range</td>
<td>40 A/16 V - 400 A/34 V</td>
</tr>
<tr>
<td>Duty cycle</td>
<td>60% - 400 A, 100% - 310 A</td>
</tr>
<tr>
<td>Number of welding steps</td>
<td>30 (3×10)</td>
</tr>
<tr>
<td>Cooling</td>
<td>AF</td>
</tr>
<tr>
<td>Insulation class</td>
<td>I</td>
</tr>
<tr>
<td>Weight (approx.)</td>
<td>177 kg</td>
</tr>
<tr>
<td>Dimensions (w×h×l)</td>
<td>470×660×1030 mm</td>
</tr>
<tr>
<td></td>
<td>470×490×1030 mm</td>
</tr>
<tr>
<td>with wheels</td>
<td></td>
</tr>
<tr>
<td></td>
<td>360×590×620 mm</td>
</tr>
<tr>
<td></td>
<td>230×495×620 mm</td>
</tr>
<tr>
<td>Without wheels</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Input voltage         | 42 V, 50 Hz         |
Maximum input power   | 75 VA               |
Maximum input current | 2 A                 |
Wire diameter range   | 0.6 - 1.6 mm        |
Max. welding current  | 400 A               |
Duty cycle            | 100%                |
Wire feed speed       | 0 - 18 m/min        |
Cooling               | AN                  |
Shock prevention class| III                 |
Weight (approx.)      | 25 kg               |
Dimensions (w×h×l)    |                     |
without wheels        |                     |

Class of heat resistance: F; Protection class: IP 21.

3. Transport and storage

The manufacturer delivers the equipment with standard accessories and undercarriage mounted. Before transport, the machine has to be secured against tipping over and protected against adverse effects of the weather. It must be stored at dry, covered places.

It shall be loaded and unloaded by lift trucks.

Protect it against moisture and mechanical shock carefully!
4. Installation

The equipment must be operated at places providing all the necessary conditions for its safe operation.

The machine should be connected to a line provided with protective grounding, fuse and differential protection switch. Always comply with the provisions of standards when repairing and installing the equipment.

- Equip the gas bottle with pressure regulator and flow meter according to the instruction manuals. Put the gas bottle onto the power source, secure it by the chain carefully and mount the flare nut of the gas hose to the regulator output by a wrench.
  Leakage should be checked at both ends e.g. by soap-water.

- Open the cover of the wire feeder. The reel holder is placed in a room separated from the electric parts.
  Push the wire reel onto the holder. Make free the end of the wire and cut it smoothly. The reel's braking can be adjusted by the bolt located on the middle of the holder, after removing the nut which fixes the reel.

- The wire feed mechanism which is mounted electrically isolated from the body serves for the reliable feed of the welding wire. The shaft of the feeder motor is equipped with a drive roll, which drives the feeding rolls, the groove of which aligns the welding wire.
  The wire is pressed against the feeding rolls by free running bearing rolls pressed down by the pressure arms. The pressure on the feeding rolls can be adjusted by a screw. The wire is guided by a guiding spiral.
  The feeding rolls, marked at theirs outer surface have two grooves. In case of changing the wire, remove shaft nut and turn the feeding rolls.
  Unlock the pressure arm and align the wire into the groove of the rolls putting a short part of the wire into the central adaptor. Finally, put the cover back, to protect the reel of wire and the feeder unit against contamination.

- Connect the...
  - wire feeder to the power source by welding and control cable and gas hose (accessories, in a 10 m long protective hose);
  - torch to the standard central adaptor;
  - earth cable to a socket on the power source's front plate (according to the less spatter);
  - earth clamp to the work piece or bench.
  The gas hose (to the cylinder), mains cable and fuses are located at the power source's rear plate.

5. Operation

- Q1: Main and coarse setting sw. (0-3)
- Q2: Fine setting switch (1-10)
- H1: "Power on" lamp
- C.A: Central adaptor (welding current, torch button, shielding gas).

Thermo-switches wound onto the main transformer prevent the power source from overheating, in this case the welding voltage and wire feeding are switched off. The yellow LED on the wire feeder signals this. After the built-in fan cools the equipment down (through the vent-holes by air flow), welding can be continued.
The machine is controlled by an electronic unit which provides the feeding motor's DC voltage, switches the contactor and gas valve on/off and controls the welding process.

- Green LED: signals the machine's on.
- Yellow LED: signals the overheating of the power source.
- K: Function selector switch.
- P4: Wire feed speed potentiometer.
- P7: Welding on time potentiometer.
- P8: Welding off time potentiometer.
- P1: Wire burn back (mini) potentiometer.
- P2: Gas post-flow time (mini) potentiometer.

Two operation modes which can be chosen by the switch K are:

- **Wire threading**: While pushing the torch button, the feeder is feeding the wire with speed approx. 10 m/min. into the torch cable (any other functions are prohibited). For smooth wire feed, keep torch cable as straight as possible during this operation. In case of slippage of the wire, increase drive roll pressure by the set screw.
- **Gas test**: While pushing the torch button, the gas valve is open (any other functions are prohibited). During this time the quantity and the pressure of gas can be checked and set. Set gas flow between approx. 16-20 l/min (depending on the welding current).

The welding can be started by pushing the button on the welding torch:

- First there is only gas pre-flow (its duration can be 0-0.5 sec., setting by P3 potentiometer on the PCB);
- Afterwards the wire feeding begins, with soft start (its duration is set to 0.2 sec. by P9 on PCB), and also the welding current starts.

The welding work is according to the operation modes set by the function selector switch (K):

- **4-stroke** mode: Releasing the button the welding continues and it stops only if the button is pushed again.
- **2-stroke** mode: After releasing the button, the welding stops.
- **Spot welding**: After the set time is finished (or releasing the button), the welding stops. The duration of the spot welding can be set by P7 potentiometer (0.5-2.5 sec).
- **Interval welding**: The welding stops if the button is released in the pause time. The duration of the feeding can be set by P7, while the pause time can be set by P8.

When the welding is finished:

- First the wire feeding stops (if it works);
- Elapsing the wire burn back time (P1), the welding current ceases;
- Elapsing the gas post-flow time (P2), the gas flow stops, too.

The P6 potentiometer on the PCB sets the minimal wire speed, while the P5 sets the maximal one.

### 6. Trouble shooting

All electrical repair’s must be carried out by a Licensed Technician.

The machine must be disconnected from the electrical supply before any repairs are made to the machine.

If the fault of the equipment remains or is caused by an unknown reason, contact the service division!

- The green LED is off: Faulty switch (Q1), mains cable or transformer(s); ⇒ replace it or contact the service. Bad electric connections to the power source; ⇒ check these cables.

- Blown fuse: ⇒ Find the cause of trouble (there may be short circuit in the machine!), replace fuse and check its rating.

- The yellow LED is on: The power source is overheated; ⇒ wait until the fan cools it down and the LED extinguishes.

- No welding arc: Faulty torch or its cable or button; ⇒ replace it. Loose connection at welding cables; ⇒ fasten it. Faulty control unit; ⇒ contact service.
• **Bad gas flow**: Empty gas bottle, faulty pressure regulator or flow meter, leakage at gas hose or gas valve; ⇒ repair or replace. The bottle or regulator is frozen, ⇒ *heat up* it by hot water or gas heater.

• **Irregular wire feed**: Worn or deformed input guide, roll or its groove, loose wire reel; ⇒ *locate fault* and repair it. Bad pressure on the roll; ⇒ *set correct* pressure. Faulty control unit; ⇒ contact service.

• **Bad quality of weld**: Bad gas flow, incorrect wire speed, contaminated surface, improper quality of wire or gas, bad welding parameters, worn parts of machine ⇒ use *good quality* products for welding, maintain the machine regularly.

It is very important that the welding *parameters* would be set *properly* for the welding task:

⇒ *Welding current*: can be regulated by the wire feed speed, via the melting output.

⇒ *Arc voltage*: weld with a *short* arc if it is possible; width, depth and surface of the seam depend also on this.

⇒ *Sticking out*: it is recommended to be *short*; it influences the melting output, gas shielding, spatter loss.

⇒ *Polarity*: the reverse polarity can be used *only* for piling welding.

⇒ *Nozzle-to-work distance*: be *short* because of gas shielding, but the gas nozzle must be protected from *heat*.

⇒ *Leading of the torch*: usually *pulling*; the *pushing* welding can be used for *root welding* because of the wide and flat seam.

**7. Maintenance**

All electrical repair’s must be carried out by a Licensed Technician,  
The machine must be disconnected from the electrical supply before any repairs are made to the machine.  
If the fault of the equipment remains or is caused by an unknown reason, contact the service division!

• **Torch**: During the welding work apply *anti-adhesive fluid* (silicon spray) to the *gas nozzle* to prevent melted droplets adhering to it. The *contact tip* is a consumable part to be changed regularly depending on its wear (burning, erosion). The *torch liner* should only be cleaned by compressed air.

• **Cables and hoses**: Check *gas hose* and *input/output cables* for flaws, replace if necessary.

• **Wire feeder**: This must be checked and maintained regularly at the *drive roll* and the *guiding spiral*.

• **High-current unit**: *Remove* dust from inside the equipment using compressed air. *Check* and - if necessary - *tightly* screw at connections.

**8. Parts list**

<table>
<thead>
<tr>
<th>№</th>
<th>Part</th>
<th>Code</th>
<th>№</th>
<th>Part</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2 feeding rolls ø40/32, for ø0.8-1.0</td>
<td>2342240634</td>
<td>2</td>
<td>Earth cable 50 mm², 10 m</td>
<td>2343630016</td>
</tr>
<tr>
<td>3</td>
<td>Output plug CX-22 <em>(on earth cable)</em></td>
<td>2142240692</td>
<td>4</td>
<td>Earth clamp</td>
<td>2142240184</td>
</tr>
<tr>
<td>5</td>
<td>Gas hose ø9/5, 10 m</td>
<td>2357320078</td>
<td>6</td>
<td>1/4&quot; flare nut <em>(on gas hose's end)</em></td>
<td>28274102</td>
</tr>
<tr>
<td>7</td>
<td>Protective hose 10 cm×10 m</td>
<td>2167320021</td>
<td>8</td>
<td>Welding cable 50 mm², 10 m</td>
<td>2343630053</td>
</tr>
<tr>
<td>9</td>
<td>Output plug CX-22 <em>(to the PS)</em></td>
<td>2142240692</td>
<td>10</td>
<td>Output plug CX-42 <em>(to the WF)</em></td>
<td>2142240617</td>
</tr>
<tr>
<td>11</td>
<td>Control cable 5×1.0 mm², 10 m</td>
<td>2343630071</td>
<td>12</td>
<td>6+1-pin plug T3104 <em>(to the PS)</em></td>
<td>2143730091</td>
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<tr>
<td>13</td>
<td>6+1-pin plug T3105 <em>(to the WF)</em></td>
<td>2143730089</td>
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### Power Source:

<table>
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<th>No.</th>
<th>Part</th>
<th>Qty</th>
<th>Code</th>
<th>No.</th>
<th>Part</th>
<th>Qty</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Plastic handle (half)</td>
<td>2</td>
<td>2142240230</td>
<td>2</td>
<td>Fan holder ø300</td>
<td>1</td>
<td>28422411</td>
</tr>
<tr>
<td>3</td>
<td>Safety grid for fan ø300</td>
<td>1</td>
<td>2142240235</td>
<td>4</td>
<td>Fan blade ø300</td>
<td>1</td>
<td>2142240178</td>
</tr>
<tr>
<td>5</td>
<td>Cable fixing clamp (mains cable)</td>
<td>1</td>
<td>2342240567</td>
<td>6</td>
<td>Gas hose ø9/5, 1.5 m (to bottle)</td>
<td>1</td>
<td>2357320008</td>
</tr>
<tr>
<td>7</td>
<td>3/8&quot; flare nut (on gas hose's end)</td>
<td>1</td>
<td>28274101</td>
<td>8</td>
<td>O-ring 7×2</td>
<td>1</td>
<td>2356560004</td>
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<tr>
<td>9</td>
<td>Mains cable 4×2.5 mm², 5 m</td>
<td>1</td>
<td>2343630024</td>
<td>10</td>
<td>Fuse holder G-30 (500V)</td>
<td>2</td>
<td>2343730050</td>
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<tr>
<td>11</td>
<td>Fuse B30/6.3, 1A</td>
<td>F1F2</td>
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<td>2343730052</td>
<td>12</td>
<td>Screw terminal K2.5B</td>
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<tr>
<td>13</td>
<td>Contactor LC1-D32.01, 42V K1</td>
<td>1</td>
<td>2142320096</td>
<td>14</td>
<td>Filter unit EMC-3</td>
<td>1</td>
<td>28040623</td>
</tr>
<tr>
<td>15</td>
<td>Fan motor VNT 34-45, 230V M1</td>
<td>1</td>
<td>2142241120</td>
<td>16</td>
<td>Switch GN 25-6720 (0-3) Q1</td>
<td>1</td>
<td>2142330065</td>
</tr>
<tr>
<td>17</td>
<td>Switch GN 25-8407 (1-10) Q2</td>
<td>1</td>
<td>2142330160</td>
<td>18</td>
<td>Auxiliary transformer T2</td>
<td>1</td>
<td>29081140</td>
</tr>
<tr>
<td>19</td>
<td>Main transformer T1</td>
<td>1</td>
<td>29080292</td>
<td>20</td>
<td>Rectifier bridge PTS.500 V1</td>
<td>1</td>
<td>2142240239</td>
</tr>
<tr>
<td>21</td>
<td>DC choke</td>
<td>L1</td>
<td>1</td>
<td>29090238</td>
<td>22</td>
<td>Output socket CX-31</td>
<td>4</td>
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<tr>
<td>23</td>
<td>Fuse holder PTF-35 (250V)</td>
<td>1</td>
<td>2343730015</td>
<td>24</td>
<td>Fuse B20/5.2, 3.15A (feeder) F3</td>
<td>2</td>
<td>2343730049</td>
</tr>
<tr>
<td>25</td>
<td>Lamp holder 18×18, LJ 243 H1</td>
<td>1</td>
<td>2342340064</td>
<td>26</td>
<td>Cap for lamp, green</td>
<td>1</td>
<td>2342340065</td>
</tr>
<tr>
<td>27</td>
<td>Bulb T4.5, 48V</td>
<td>1</td>
<td>2345210001</td>
<td>28</td>
<td>6+1-pin socket T3107 X2-1</td>
<td>1</td>
<td>2143730087</td>
</tr>
</tbody>
</table>

Option: Shunt 600A/60 mV (S1, 28475413) and V-A-meter (2147540008).

### Wire Feeder:

<table>
<thead>
<tr>
<th>No.</th>
<th>Part</th>
<th>Qty</th>
<th>Code</th>
<th>No.</th>
<th>Part</th>
<th>Qty</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Plastic handle (half)</td>
<td>2</td>
<td>2142240230</td>
<td>2</td>
<td>Wheel ø160</td>
<td>2</td>
<td>2132750052</td>
</tr>
<tr>
<td>3</td>
<td>Swivel wheel ø65</td>
<td>2</td>
<td>2132750047</td>
<td>4</td>
<td>Swivel plate</td>
<td>1</td>
<td>2142240110</td>
</tr>
<tr>
<td>5</td>
<td>Wire reel holder</td>
<td>1</td>
<td>2142240076</td>
<td>6</td>
<td>Feeding mechan. 2465L-504A</td>
<td>1</td>
<td>2142241562</td>
</tr>
<tr>
<td>7</td>
<td>Feeding roll ø40/32, ø0.9-1.2V</td>
<td>2</td>
<td>2342240742</td>
<td>8</td>
<td>Plastic plug for wheel's axle</td>
<td>2</td>
<td>2342240173</td>
</tr>
<tr>
<td>9</td>
<td>Standard central adaptor</td>
<td>1</td>
<td>2142240095</td>
<td>10</td>
<td>Output socket CX-12</td>
<td>1</td>
<td>2142240155</td>
</tr>
<tr>
<td>11</td>
<td>6+1-pin socket T3106 X2-2</td>
<td>1</td>
<td>2143730088</td>
<td>12</td>
<td>Auxiliary transformer T1</td>
<td>1</td>
<td>29081120</td>
</tr>
<tr>
<td>13</td>
<td>Solenoid valve 42V~</td>
<td>Y1</td>
<td>1</td>
<td>2142241101</td>
<td>14</td>
<td>Feed. motor D76, 24V 65W M1</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>Electronic unit MHT 3.0 A1</td>
<td>1</td>
<td>2142241056</td>
<td>16</td>
<td>11-pin PCB connector</td>
<td>1</td>
<td>2342240179</td>
</tr>
<tr>
<td>17</td>
<td>Turning knob FF-25 (P4)</td>
<td>1</td>
<td>2342240017</td>
<td>18</td>
<td>Turning knob FF-16 (K.P7.P8)</td>
<td>3</td>
<td>2342240015</td>
</tr>
</tbody>
</table>
Parts of the machine
Welding Tips

1. Using gas

Properties of argon and CO₂ are in the next table. Properties of mixed gas are between the two so it is good compromise between quality and cost.

<table>
<thead>
<tr>
<th>Property</th>
<th>Ar</th>
<th>CO₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width of seam</td>
<td>wide</td>
<td>narrow</td>
</tr>
<tr>
<td>Height of seam</td>
<td>flat</td>
<td>big</td>
</tr>
<tr>
<td>Depth of penetration</td>
<td>small</td>
<td>deep</td>
</tr>
<tr>
<td>Dimensions of bath</td>
<td>big</td>
<td>small</td>
</tr>
<tr>
<td>Current of welding torch</td>
<td>low</td>
<td>big</td>
</tr>
<tr>
<td>Danger of contact tip burning</td>
<td>frequent</td>
<td>rare</td>
</tr>
<tr>
<td>Spatter</td>
<td>low</td>
<td>strong</td>
</tr>
<tr>
<td>Danger of porosity</td>
<td>-</td>
<td>middle</td>
</tr>
<tr>
<td>Weldability of structural steels</td>
<td>less</td>
<td>good</td>
</tr>
<tr>
<td>Pulse arc welding</td>
<td>excellent</td>
<td>not poss.</td>
</tr>
<tr>
<td>Dipping arc welding</td>
<td>adequate</td>
<td>excellent</td>
</tr>
<tr>
<td>Weldability of Cr-Ni steels</td>
<td>good (+O₂)</td>
<td>conditionally</td>
</tr>
<tr>
<td>Weldability of Al and alloys</td>
<td>possible</td>
<td>not poss.</td>
</tr>
<tr>
<td>Costs</td>
<td>very high</td>
<td>low</td>
</tr>
</tbody>
</table>

It can be seen that only un- or low alloyed steels are practical to weld with CO₂.
It is worth considering offers of gas manufacturers!
Flux-cored wire doesn't need any gas!

Typical values of gas consumption (litre/min):

<table>
<thead>
<tr>
<th>wire Ø mm</th>
<th>gas cons.</th>
<th>wire Ø mm</th>
<th>gas cons.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.8</td>
<td>8 – 12</td>
<td>1.2</td>
<td>10 – 15</td>
</tr>
<tr>
<td>1.0</td>
<td>10 – 12</td>
<td>1.4</td>
<td>12 – 16</td>
</tr>
</tbody>
</table>

2. Welding properties

Welding unalloyed steel (in case of butt joint, 82% Ar+18% CO₂ gas):

<table>
<thead>
<tr>
<th>thickness</th>
<th>wire</th>
<th>current</th>
<th>voltage</th>
<th>w. speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>Ø mm</td>
<td>A</td>
<td>V</td>
<td>m/min</td>
</tr>
<tr>
<td>1.0</td>
<td>0.8</td>
<td>70</td>
<td>17</td>
<td>3.6</td>
</tr>
<tr>
<td>1.5</td>
<td>0.8</td>
<td>90</td>
<td>18</td>
<td>4.9</td>
</tr>
<tr>
<td>2.0</td>
<td>0.8</td>
<td>120</td>
<td>20</td>
<td>7.2</td>
</tr>
<tr>
<td>3.0</td>
<td>0.8</td>
<td>130</td>
<td>21</td>
<td>8.0</td>
</tr>
<tr>
<td>4.0</td>
<td>1.0</td>
<td>130</td>
<td>21</td>
<td>4.5</td>
</tr>
<tr>
<td>5.0</td>
<td>1.0</td>
<td>130 – 200</td>
<td>21 – 25</td>
<td>4.5 – 8.3</td>
</tr>
<tr>
<td>6 – 9</td>
<td>1.0</td>
<td>130 – 200</td>
<td>21 – 25</td>
<td>4.5 – 8.3</td>
</tr>
<tr>
<td>10 – 20</td>
<td>1.2</td>
<td>135 – 300</td>
<td>21 – 30</td>
<td>3.0 – 9.6</td>
</tr>
</tbody>
</table>

3. Welding parameters

It is very important welding parameters properly to set to the welding process.

♦ Welding current

Wire feed speed determines the welding current which assures uniform melting. Welding current is set by the wire feed speed.

♦ Arc voltage

Too high: wider and longer weld, lower penetration depth, higher spatter and burning alloying elements - in turn good appearance of seam surface.
Too low: narrow and deep weld, poor appearance of seam surface, bulgy fillet weld.

♦ Wire stickout

Too long: reduction of welding current (melting rate), bad gas shielding, strong spatter.
Too short: contact tip can be melted, and the wire can burn back.

Recommended values (according to welding current)

<table>
<thead>
<tr>
<th>A</th>
<th>50</th>
<th>100</th>
<th>150</th>
<th>200</th>
<th>250</th>
<th>300</th>
<th>350</th>
<th>400</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>17</td>
<td>20</td>
</tr>
</tbody>
</table>

♦ Polarity

Unusual polarity can be used only for piling welding, but arc burns irregularly and spatter is stronger.

♦ Gas nozzle-to-work distance

Too big: bad gas shielding.
Too small: difficult visible welding bath, easier melting gas nozzle, to which melted metal droplets can adhere.
Recommended value approx. 10-12 mm (15 mm upper 350 A).

♦ Tipping torch

In the direction of travel (pulling): higher penetration depth, narrow and high seam; good gas shielding, well visible welding bath.
In the opposite (pushing): fusion defects, lower penetration depth, wide and flat seam (but good for thin plates and roots).
Welding Tips

Welding time diagrams

- P3: Gas pre-flow time (0-0.5 s)
- P9: Soft start time (0-0.2 s)
- P1: Wire burn-back time (0-0.5 s)
- P2: Gas post-flow time (0-2.5 s)

- P7: Welding time (0.5-2.5 s)
- P8: Pause time (0.5-2.5 s)
MAINTENANCE

WARNING:
Exposure to extremely dusty, damp, or corrosive air is damaging to the welding machine. In order to prevent any possible failure or fault of this welding equipment, clean the dust at regular intervals with clean and dry compressed air of required pressure.

Please note that: lack of maintenance can result in the cancellation of the guarantee; the guarantee of this welding equipment will be void if the machine has been modified, attempt to take apart the machine or open the factory-made sealing of the machine without the consent of an authorized representative of the manufacturer.

TROUBLESHOOTING

Caution:
Only qualified technicians are authorized to undertake the repair of this welding equipment. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed in this manual.

WARRANTY

• 3 Years from date of purchase.
• Welding Guns of Australia Pty Ltd warranties all goods as specified by the manufacturer of those goods. This Warranty does not cover freight or goods that have been interfered with. All goods in question must be repaired by an authorised repair agent as appointed by this company. Warranty does not cover abuse, mis-use, accident, theft, general wear and tear. New product will not be supplied until Welding Guns of Australia Pty Ltd has inspected product returned for warranty and agrees to replace product. Product will only be replaced if repair is impossible.

If in doubt please ring.

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WELDING
WELDING GUNS OF AUSTRALIA Pty Ltd
WWW.UNIMIG.COM.AU

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112 Christina Rd, Villawood NSW 2163 - PO Box 3033 Lansvale NSW 2166

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