CITOPULS II

MIG/MAG welding equipment

SIMPLY INNOVATIVE
**CITOPULS II**

**CITOPULS II** is the only product on the MIG/MAG welding market offering superior quality welding and advanced welding processes with a simple interface at the price of standard welding equipment. Moreover CITOPULS II is designed in a modular system for a better fit with the users’ requirements.

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**Superior quality welding**

**Advanced processes and features**

- Fully digitally controlled inverter: for process repeatability and consequently higher welding quality and simpler regulation
- In Synergic mode, more than 100 synergies are available
- Soft switching inverter (increased efficiency of the power source)
- Full range of processes
  - Standard MIG/MAG
  - Pulsed MIG/MAG
  - Speed Short Arc™ (for high quality thin sheet welding & root pass)
  - Spray Modal™ (special for high quality welding of aluminium)
  - Cold Double Pulse (producing very high quality welds on thin material)
  - MIG brazing
  - MMA coated electrodes
- Powerful installation up to 420 A at 60%
- Full A1 automatic interface. This level of synchronization does not require an additional card, for simpler automatisation
- Storage of 100 welding programs (with expert wire feeder DMU P500 or advanced remote control RC JOB)
- Parameter locking with a digit code (with expert wire feeder DMU P500 or advanced remote control RC JOB). When this function is activated, the welder can still fine-tune the parameters in a +/- 20% range
A user interface designed for a really easy to use front panel

- Power source and wire feeder

A modular concept for a better fit with the users’ requirements

Specify and build your installation:

- Power sources
- Wire feeders
- Cooling unit
- Harnesses (up to 50 m for shipbuilding applications)
- Trolleys for the installation and the wire-feeder
- Remote control
- Torches (standard, with potentiometer, push-pull, automatic...)

More benefits for the user

- Small machine for easier access
- Light installation (37 kg for the power source)
- Compatible with motor generator
- A powerful wire feeder unit with 4 drive rollers as standard
Focus on advanced processes for thin sheet welding

CITOPULS II integrated advanced welding processes in an easy to use interface.

**Speed Short Arc™ (SSA™)**

Speed Short Arc™ provides a transfer mode using short circuits in a wire speed domain usually governed by globular conditions. The current values used in this mode are very different from those used in conventional “short arc” operation. Faster wire speeds require a medium current together with a large peak current in order to form and detach the droplet more quickly.

This is done by programming a digitally-regulated inverter where the current is controlled and where, for wire speeds governed by globular conditions, a specific current profile is required (particularly the rise and fall gradients of the current as well as the maximum peak current).

This means the appearance of short-circuits is “forced” in a mode where, under natural conditions, they appear only erratically.

As can be seen in the diagram below, in applying Speed Short Arc™ to the welding of medium-thickness sheet (2mm), the large increase in travel speed induces a much lower linear energy than that of the conventional mode.

**MIG Brazing**

MIG brazing appeared in the late 1990’s as a better replacement for flame brazing.

Since this time, it has gone from strength to strength and has become an essential process in automobile construction.

The use of digital technology further increases the performance of this process both from the point of view of the quality of the joint produced, the productivity obtained and also the preservation of coatings applied to steel sheets for corrosion protection.

**Cold Double Pulse**

Cold Double Pulse produces very high quality welds on thin material while avoiding distortion.

The operating technique is made easier due to good control of the weld pool even on badly-prepared sheets. This sequencer mode automatically chains hot arc and cold arc regimes together.

**SSA™ advantages**

- Large increase in travel speed
- Reduction in distortion
- Reduction of adhering spatter
- Reduction of fume

**Main applications:**
Parts and products in alloy steels; Containers, steel trailers, infrastructure, agricultural trailers, public works plant.

**MIG Brazing advantages**

- Effective on thin coated sheets
- Reduces distortion
- Large joint tolerance
- Good mechanical characteristics

**Main applications:**
Parts and products in aluminium; automobile construction and repair, metal furniture, ventilation ducting.

**Cold Double Pulse advantages**

CDP™ gives a TIG appearance to the weld and is very effective on very thin aluminium or stainless steel sheet (< 2mm).
Focus on advanced processes for high quality welding of aluminium

**Spray-Modal™**

This is a special transfer mode which uses a modulated current at frequencies of 30 to 50 Hz that produce vibrations in the liquid weld pool that have the effect of removing most of the hydrogen bubbles before the metal solidifies.

These modulations strengthen the rigidity of the welding arc making it possible to use this process in all positions.

The use of low frequency modulation also gives a TIG-like appearance to the weld bead.

This process is particularly suitable for aluminium applications using sheet thicknesses of > 2 mm.

**Spray-Modal™ advantages**

- Large reduction in porosity
- Increases penetration
- Increase in travel speeds
- All-position welding

**Main applications:**

Parts and products in aluminium; automobile construction and repair, metal furniture, ventilation ducting.

**Comparison between different arc transfer methods on the effectiveness of reducing porosity**

- **Spray**
- **Pulsed**
- **Spray-Modal™**

**Example of result obtained with the Spray-Modal™ process in fast aluminium ferry construction.**

- **Welding length in meters**
  - Length inspected: 189,000 m
  - Length defective: 1,079 m (0.57 %)

**Horizontal Welding**
Front panels are easy to understand and use

CITOPULS II power source and wire feeder have been designed to facilitate the welder’s activities. They are built with an user interface designed for a really easy to understand and to use front panel.

### Power source

1. Welding voltage and set up parameter display
2. Welding current or wire speed or thickness display
3. Mode and welding cycle selection LEDs
4. Process choice selector
5. Gas selector
6. Wire grade selector
7. Wire diameter selector
8. Scrolling of set up parameters
9. Parameter setting
10. Selector for wire speed or thickness display

### Wire feeders

**DMU P400**

- A: Wire speed regulation
- B: Arc length setting
- C: Remote control and push-pull connector
- D: Torch connector
- E: Coolant connections
- F: Display of welding parameters
- G: Program selection and advance parameters display and buttons
- H: MMA electrode holder connection

**DMU P500**

### Remote control

- A: Wire speed regulation
- B: Arc length setting
- C: Program selection and advance parameters display and buttons
<table>
<thead>
<tr>
<th>Power source</th>
<th>CITOPULS II 320</th>
<th>CITOPULS II 420</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRIMARY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply - 3 Phases - 50/60 Hz</td>
<td></td>
<td>400 V (+ 15% / - 20%)</td>
</tr>
<tr>
<td>Maximum primary consumption (100%)</td>
<td>21.2 A</td>
<td>29 A</td>
</tr>
<tr>
<td>Temporised fuses</td>
<td></td>
<td>32 A</td>
</tr>
<tr>
<td><strong>SECONDARY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open circuit voltage</td>
<td></td>
<td>86 V</td>
</tr>
<tr>
<td>Welding range</td>
<td>15 A - 320 A</td>
<td>15 A - 420 A</td>
</tr>
<tr>
<td>Duty cycle 60%</td>
<td>320 A</td>
<td>420 A</td>
</tr>
<tr>
<td>Duty cycle 100%</td>
<td>270 A</td>
<td>350 A</td>
</tr>
<tr>
<td><strong>APPLICATION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Processes</td>
<td>MIG-MAG / Speed Short Arc™ / MIG-MAG pulsed / Cold Double Pulse / Spray Modul™ / MIG Brazing / MMA</td>
<td></td>
</tr>
<tr>
<td>Additional Feature</td>
<td>Synergetic machine</td>
<td></td>
</tr>
<tr>
<td>Programs</td>
<td>100 (with expert wire feeder or RC JOB)</td>
<td></td>
</tr>
<tr>
<td><strong>GENERAL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard</td>
<td>EN 60974-1 - EN 60974-10</td>
<td></td>
</tr>
<tr>
<td>Protection index</td>
<td>IP 23S</td>
<td></td>
</tr>
<tr>
<td>Dimensions (l x w x h)</td>
<td>738 x 273 x 521 mm</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>37 kg</td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Wire feeder</th>
<th>DMU P400</th>
<th>DMU P500 expert</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rollers</td>
<td>4 drive rollers</td>
<td></td>
</tr>
<tr>
<td>Wire speed</td>
<td>1 to 25 m/min</td>
<td></td>
</tr>
<tr>
<td>Wire Ø - Stainless steel</td>
<td>0.6 - 1.6 mm</td>
<td></td>
</tr>
<tr>
<td>Wire Ø Cored wires</td>
<td>1.0 - 1.6 mm</td>
<td></td>
</tr>
<tr>
<td>Wire Ø Aluminium</td>
<td>1.0 - 1.6 mm</td>
<td></td>
</tr>
<tr>
<td>Regulation</td>
<td>2 potentiometers</td>
<td>2 encoders</td>
</tr>
<tr>
<td>Additional feature</td>
<td>Programs management</td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>-</td>
<td>2 Displays + LCD</td>
</tr>
<tr>
<td><strong>GENERAL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection / Insulation</td>
<td>IP 23S - H</td>
<td></td>
</tr>
<tr>
<td>Standards</td>
<td>EN 60974-5 - EN 60974-10</td>
<td></td>
</tr>
<tr>
<td>Dimensions (l x w x h)</td>
<td>265 x 590 x 383 mm</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>17.5 kg</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cooling unit</th>
<th>COOLER II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling power</td>
<td>1.3 kW</td>
</tr>
<tr>
<td>Maximum pressure</td>
<td>4.5 bar</td>
</tr>
<tr>
<td>Dimensions (l x w x h)</td>
<td>720 x 280 x 270 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>16 kg</td>
</tr>
</tbody>
</table>

This equipment is designed for industrial and professional use only and it does not comply with with EN 61000-3-2/12. If it is connected to a public low voltage system, it is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment may be connected. (See also the instruction manual)
The modular concept of CITOPULS II allow to build the perfect configuration for any kind of needs. From offshore & shipbuilding to boiler makers, train production and small workshops.
Examples of configuration

CITOPULS II 320 air - DMU P400
2 m long harness

Is composed of:
1. Power source
   CITOPULS II 320
   W000275262
2. Wire feeder
   DMU P400
   W000275265
7. Harness II air
   2 m long
   W000275894

CITOPULS II 320 Expert air - DMU P500
10 m long harness + Trolley + Swivel

Is composed of:
1. Power source
   CITOPULS II 320
   W000275262
2. Wire feeder
   DMU P500 expert
   W000275915
4. Trolley for power source
   W000279927
4. Trolley extension
   W000279930
6. Swivel
   W000279932
7. Harness II air
   10 m long
   W000275896

CITOPULS II 420 water - DMU P400
2 m long harness

Is composed of:
1. Power source
   CITOPULS II 420
   W000275264
2. Wire feeder DMU P400
   W000275265
3. Cooling unit
   W000273516
7. Harness II water
   2 m long
   W000275898

CITOPULS II 420 Expert air - DMU P500
10 m long harness + Trolley + Swivel

Is composed of:
1. Power source
   CITOPULS II 420
   W000275264
2. Wire feeder DMU P500 expert
   W000275915
4. Trolley for power source
   W000279927
4. Trolley extension
   W000279930
6. Swivel
   W000279932
7. Harness II water
   10 m long
   W000275900
Conventional torches

OERLIKON propose a complete range of manual MIG-MAG torches CITORCH M NG which are innovative, powerful and suited to quality applications in the various market sectors. Torches comply with the EN 60974-7 standard and use the European standard connector.

Torch with integrated potentiometer

The CITORCH MP range meets the challenge of making the torch as small and easy to handle as a conventional torch with the inclusion of remote control facilities.

Push-pull torches and guns

Several push-pull systems are available for use with CITOPULS II. The CITORCH PPA (torches) and CITORCH MPP (guns) ranges have excellent operation due to the miniaturization of the wire drive system in line with the push-pull wire feeding axis. These torches and guns give an excellent wire feeding quality, and therefore an excellent weld quality and are particularly recommended for aluminium applications or use with small diameter wires. They can be easily adapted with a push-pull kit.

Automatic torch

The TR600 is the most popular torch in the OERLIKON range for applications application. The torch is available with a 0° neck and in standard lengths of 3 or 4 m.
The CITOPULS II high tech MIG/MAG equipment fits perfectly with the needs of the most demanding welding applications in various segments of activity. Whatever your requirements, you will find with the CITOPULS II a superior welding quality with advanced processes with simple settings through an easy to use interface.