DIGIPULS II

MIG/MAG equipment for superior welding results.
**DIGIPULS II**

**DIGIPULS II** is the only product on the MIG/MAG welding market offering superior quality welding and advanced welding processes with a simple interface at a competitive price. Moreover DIGIPULS II is designed in a modular system to fit with all users’ requirements.

### 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
  - Gouging (up to 6.3 mm diameter electrode)
- 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 DVU P500 or advanced remote control RC JOB)
- Parameter locking with a digit code (with expert wire feeder DVU 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 designed interface for a really easy to use front panel

- Power source and wire feeder

A modular concept to fit with all users’ requirements

Specify and build your own installation:

- Power source
- 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 4-wheel feeder unit
Focus on advanced processes for thin sheet welding

**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 seen in the diagram, by 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

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

Porosity level: comparison of Spray Arc, Spray-Modal™
DIGIPULS II power source and wire feeder have been designed to improve welding processes. They are built with a 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

**DVU 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

**DVU P500**

- 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

### Remote control

**RC-JOB**

- 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>DIGIPULS II 320</th>
<th>DIGIPULS II 420</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRIMARY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply – 3 Phases - 50/60 Hz</td>
<td>400 V (+ 15% / - 20%)</td>
<td></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>32 A</td>
<td></td>
</tr>
<tr>
<td>SECONDARY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open circuit voltage</td>
<td>86 V</td>
<td></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>APPLICATION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Processes</td>
<td>MIG-MAG / Speed Short Arc™ / MIG-MAG pulsed / Cold Double Pulse / Spray Modal™ / MIG Brazing / MMA / Gouging</td>
<td></td>
</tr>
<tr>
<td>Additional Feature</td>
<td>Synergic machine</td>
<td></td>
</tr>
<tr>
<td>Programs</td>
<td>100 (with expert wire feeder or RC JOB)</td>
<td></td>
</tr>
<tr>
<td>GENERAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection index</td>
<td>IP 23S</td>
<td></td>
</tr>
<tr>
<td>Standard</td>
<td>EN 60974-1 - EN 60974-10</td>
<td></td>
</tr>
<tr>
<td>Protection / Insulation</td>
<td>IP 23S - H</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>
<tr>
<td>Wire feeder</td>
<td></td>
<td></td>
</tr>
<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 - 1.8 mm</td>
<td></td>
</tr>
<tr>
<td>Regulation</td>
<td>2 potentiometers</td>
<td>2 encoders</td>
</tr>
<tr>
<td>Additional feature</td>
<td></td>
<td>Program management</td>
</tr>
<tr>
<td>Display</td>
<td>-</td>
<td>3 LCD displays</td>
</tr>
<tr>
<td>GENERAL</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>
<tr>
<td>Cooling unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling power</td>
<td>1.3 kW</td>
<td></td>
</tr>
<tr>
<td>Maximum pressure</td>
<td>4.5 bar</td>
<td></td>
</tr>
<tr>
<td>Dimensions (l x w x h)</td>
<td>720 x 280 x 270 mm</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>16 kg</td>
<td></td>
</tr>
</tbody>
</table>

These equipment are designed for industrial and professional use only and does not comply 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 DIGIPULS II allows you to build the perfect configuration for your requirement. From offshore & shipbuilding to boiler makers, train production and small workshops.
Examples of configuration

**DIGIPULS II 320 air - DVU P400**
2 m long harness

Is composed of:
1. Power source
   DIGIPULS II 320
   W000275263
2. Wire feeder
   DVU P400
   W000275266
3. Harness II air
   2 m long
   W000275894

**DIGIPULS II 320 Expert air - DVU P500**
10 m long harness + Trolley + Swivel

Is composed of:
1. Power source
   DIGIPULS II 320
   W000275263
2. Wire feeder
   DVU P500 expert
   W000275267
3. Trolley for power source
   W000279927
4. Trolley extension
   W000279930
5. Swivel
   W000279932
6. Harness II air
   10 m long
   W000275896

**DIGIPULS II 420 water - DVU P400**
2 m long harness

Is composed of:
1. Power source
   DIGIPULS II 420
   W000274838
2. Wire feeder DVU P400
   W000275266
3. Cooling unit
   W000273516
4. Harness II water
   2 m long
   W000275898

**DIGIPULS II 420 Expert water - DVU P500**
10 m long harness + Trolley + Swivel

Is composed of:
1. Power source
   DIGIPULS II 420
   W000274838
2. Wire feeder DVU P500 expert
   W000275267
3. Trolley for power source
   W000279927
4. Trolley extension
   W000279930
5. Cooling unit
   W000273516
6. Swivel
   W000279932
7. Harness II water
   10 m long
   W000275900
Torches

Although it is true that welding performance is linked to the technology of the current source and the correct regulation of the wire speed, the welding torch makes an equally important contribution. The parameters sent by the power source must be very accurately transferred by the torch to the arc.

Conventional torches

SAF-FRO propose a complete range of manual MIG-MAG torches PROMIG 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.

Torches with integrated potentiometer

The DIGITORCH P 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.

<table>
<thead>
<tr>
<th>Designation</th>
<th>Duty Cycle Ar+CO₂</th>
<th>Cooling</th>
<th>3 m long</th>
<th>4 m long</th>
<th>5 m long</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promig NG 341</td>
<td>320 A @ 60%</td>
<td>Air</td>
<td>W000345066</td>
<td>W000345072</td>
<td>W000345073</td>
</tr>
<tr>
<td>Promig NG 441</td>
<td>380 A @ 60%</td>
<td>Air</td>
<td>W000345069</td>
<td>W000345070</td>
<td>W000345071</td>
</tr>
<tr>
<td>Promig NG 441W</td>
<td>320 A @ 100%</td>
<td>Water</td>
<td>W000345075</td>
<td>W000345076</td>
<td>W000345077</td>
</tr>
<tr>
<td>Promig NG 450W</td>
<td>450 A @ 100%</td>
<td>Water</td>
<td>W000274865</td>
<td>W000274866</td>
<td>W000274867</td>
</tr>
</tbody>
</table>

Push-pull torches and guns

Several push-pull systems are available for use with DIGIPULS II. The ALUTORCH (torches) and DIGITORCH PP (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.

<table>
<thead>
<tr>
<th>Designation</th>
<th>Duty Cycle Ar+CO₂</th>
<th>Cooling</th>
<th>8 m long curved 45°</th>
<th>10 m long curved</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALUTORCH DG 342</td>
<td>300 A @ 40%</td>
<td>Air</td>
<td>-</td>
<td>W000264913</td>
</tr>
<tr>
<td>ALUTORCH DG 441W</td>
<td>450 A @ 60%</td>
<td>Water</td>
<td>-</td>
<td>W000265067</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Designation</th>
<th>Duty Cycle Ar+CO₂</th>
<th>Cooling</th>
<th>0° neck</th>
<th>3 m long harness</th>
<th>4 m long harness</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR600</td>
<td>400 A @ 100%</td>
<td>Water</td>
<td>W000370103</td>
<td>W000370111</td>
<td>W000370112</td>
</tr>
</tbody>
</table>
Segment Activities

The DIGIPULS 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 DIGIPULS II a superior welding quality with advanced processes with simple settings through an easy to use interface.
Air Liquide is the world leader in gases for industry, health and the environment, and is present in over 80 countries with 43,600 employees. Oxygen, nitrogen, hydrogen and rare gases have been at the core of Air Liquide’s activities since its creation in 1902. Using these molecules, Air Liquide continuously reinvents its business, anticipating the needs of current and future markets. The Group innovates to enable progress, to achieve dynamic growth and a consistent performance. Air Liquide combines many products and technologies to develop valuable applications and services not only for its customers but also for society.