

CITOPULS II

MIG/MAG welding equipment



CITOPULS II

2010-510



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.

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 (Ø 1.4 mm now 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)
 - HPS™ (High Penetration Speed) (higher productivity with lower distortion of base material and less welding passes)
 - 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 500 A at 60%
- Full A1 automatic interface. This level of synchronization does not require an additional card, for simpler automatisisation
- 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

NEW

NEW





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



Speed Short Arc™ (SSA™)



MIG Brazing



Cold Double Pulse

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

Speed Short Arc™ (SSA™)

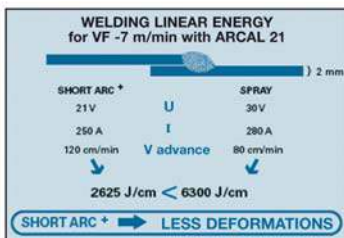
Speed Short Arc™ provides a transfer mode using short circuits in a wire speed domain usually governed by globular conditions.

The current values used in this mode are very different from those used in conventional “short arc” operation.

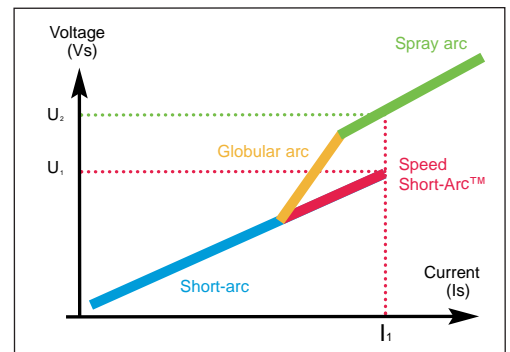
Faster wire speeds require a medium current together with a large peak current in order to form and detach the droplet more quickly.

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.



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

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.

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

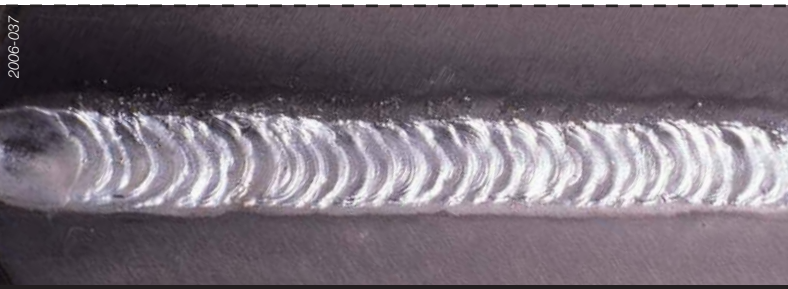
Cold Double Pulse produces very high quality welds on thin material while avoiding distortion.

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.

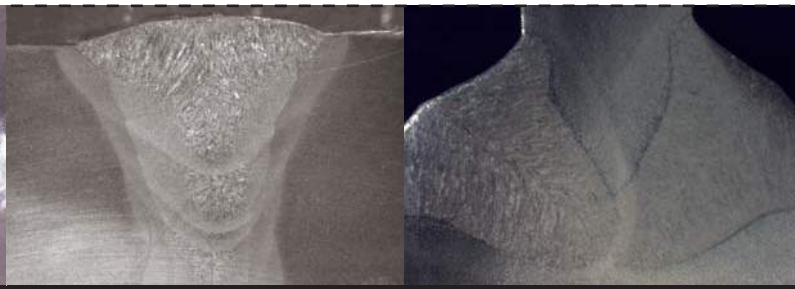
Cold Double Pulse advantages

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™ (SM™)



High Penetration Speed (HPS™)

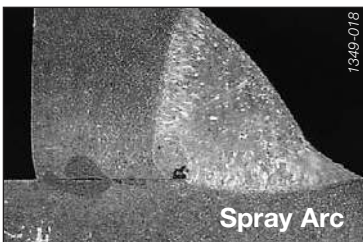
Spray-Modal™

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.

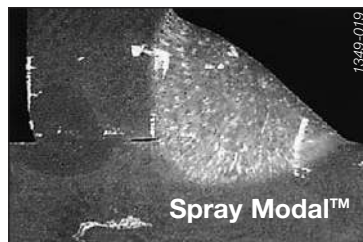
These modulations strengthen the rigidity of the welding arc making it possible to use this process in all positions.

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 Arc



Spray Modal™

Porosity level: comparison of Spray Arc, Spray-Modal™

High Penetration Speed (HPS™)

HPS (High Penetration Speed) is welding characteristic available with the high range of MIG/MAG inverter power sources manufactured by Air Liquide Welding. Using welding current usually given by Spray Arc behaviour, HPS arc transfer is combining two different main advantages :

- Provides lower voltage and so lower energy
- A very accurate and dynamic regulation of the welding parameters

This association is able to carry out very high productivity with the optimal welding performance.

HPS™ advantages

- Filling work need less passes with HPS as opposed to a classic Spray Arc thus giving labour cost savings.
- Due to lower energy, base material has less distortion and structural changes. The welding performances are stronger and the heat affected zone is reduced. No lost time through bad welding.
- Weld in restricted joints with tight angle is possible thanks to HPS process. Using stick out around 25 mm and above under some conditions.
- Less time spent in preparing the pieces, interpenetration of 10 - 12 mm thicknesses steel part are possible without any preparation (no machining).

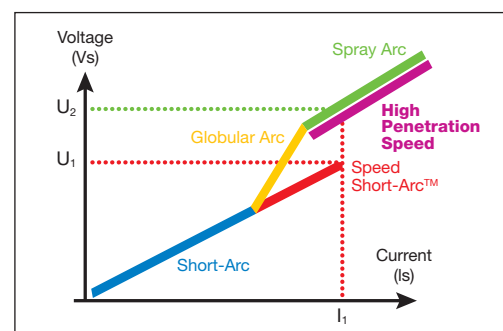
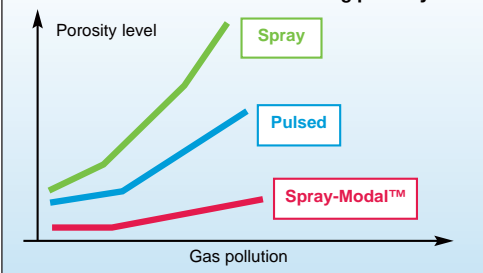
Spray-Modal™ advantages

- 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



Main applications:

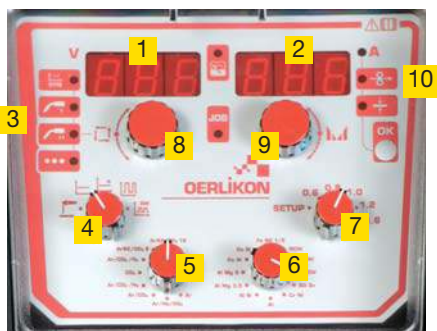
Bridge, hall construction, trailer, container, constructional system, chain hoist, construction machine, locomotive / wagon, pressure vessel.

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.

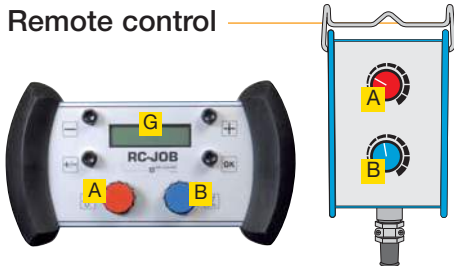
Power source



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- 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

Remote control



2008-778

- A Wire speed regulation
- B Arc length setting
- G Program selection and advance parameters display and buttons

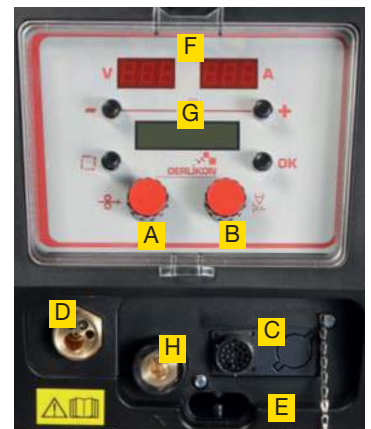
Wire feeders

DMU P400



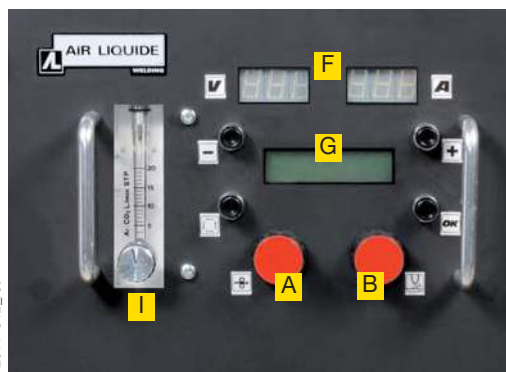
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DMU P500



2010-496

DV YARD PC D200



2011-342_ret

- 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
- I Flowmeter



| Power source | CITOPULS II 320 | CITOPULS II 420 | CITOPULS II 520 |
|---|---|--------------------|----------------------------|
| PRIMARY | | | |
| Power supply - 3 Phases - 50/60 Hz | 400 V (+ 15% / - 20%) | | |
| Maximum primary consumption (100%) | 20.1 A | 28.1 A | 36.3 A |
| Temporised fuses | 32 A | | 40 A |
| COS φ | 0.89 | 0.89 | 0.91 |
| Efficiency | 90% | 89% | 88% |
| SECONDARY | | | |
| Open circuit voltage | 86 V | | |
| Welding range | 15 A - 320 A | 15 A - 420 A | 15 A - 500 A |
| Duty cycle 60% | 320 A | 420 A | 500 A |
| Duty cycle 100% | 270 A | 350 A | 450 A |
| APPLICATION | | | |
| Processes | MIG-MAG / Speed Short Arc™ / MIG-MAG pulsed / High Penetration Speed (HPS) / Cold Double Pulse / Spray Modal™ / MIG Brazing / MMA | | |
| Programs | 100 (with expert wire feeder or RC JOB) | | |
| GENERAL | | | |
| Standard | EN 60974-1 - EN 60974-10 | | |
| Protection index | IP 23S | | |
| Dimensions (l x w x h) | 738 x 273 x 521 mm | | |
| Weight | 37 kg | | |
| Wire feeder | DMU P400 | DMU P500 expert | YARD PC D200 |
| Rollers | 4 drive rollers | | |
| Wire speed | 1 to 25 m/min | | |
| Wire Ø - Carbon steel - Stainless steel | 0.6 / 0.8 / 1.0 / 1.2 / 1.4 / 1.6 mm | | |
| Wire Ø Cored wires | 1.0 / 1.2 / 1.4 / 1.6 mm | | |
| Wire Ø Aluminium | 1.0 / 1.2 / 1.4 / 1.6 mm | | |
| Regulation | 2 potentiometers | 2 encoders | |
| Additional feature | Program management | | |
| Display | - | 3 LCD displays | 3 LCD displays + flowmeter |
| GENERAL | | | |
| Protection / Insulation | IP 23S - H | | |
| Standards | EN 60974-5 - EN 60974-10 | | |
| Dimensions (l x w x h) | 265 x 590 x 383 mm | 230 x 650 x 400 mm | |
| Weight | 17.5 kg | 11 kg | |
| Cooling unit | COOLER II | | |
| Cooling power | 1.3 kW | | |
| Maximum pressure | 4.5 bar | | |
| Dimensions (l x w x h) | 720 x 280 x 270 mm | | |
| Weight | 16 kg | | |

This equipment is 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)

To order

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.

1 Power sources



| | | |
|--------------|-----------------|------------|
| 320 A @ 60 % | CITOPULS II 320 | W000275262 |
| 420 A @ 60 % | CITOPULS II 420 | W000275264 |
| 500 A @ 60 % | CITOPULS II 520 | W000371971 |

2 Wire feeders



| | |
|---------------------|------------|
| DMU P400 (Standard) | W000275265 |
| DMU P500 (Expert) | W000275915 |

| | |
|--------------|------------|
| YARD PC D200 | W000372373 |
|--------------|------------|

- Expert**
- 100 programs
 - possibility to lock welding parameters
 - LCD display

3 Cooling unit



| | |
|-----------------------------|------------|
| COOLER II | W000273516 |
| Safety device for COOLER II | W000376539 |

4 Trolley for installation



| | |
|------------|------------|
| TROLLEY II | W000279927 |
|------------|------------|

4a Trolley extension



| | |
|-----------------|------------|
| ARMS TROLLEY II | W000279930 |
|-----------------|------------|

5 Trolley On site



| | |
|-----------------|------------|
| Trolley On site | W000372274 |
|-----------------|------------|

7 Support for wire feeder in vertical suspension



| |
|------------|
| W000377985 |
|------------|

6 Trolley for wire feeder



| | |
|---------------|------------|
| TROLLEY WF II | W000275908 |
|---------------|------------|

8 Swivel



| | |
|-------------------|------------|
| SWIVEL TROLLEY II | W000279932 |
|-------------------|------------|

9 Harnesses

| Length | Water | | |
|--------|------------|------------|------------|
| | Air | Standard | Aluminium |
| 2 m | W000275894 | W000275898 | W000371044 |
| 5 m | W000275895 | W000275899 | W000371045 |
| 10 m | W000275896 | W000275900 | W000371175 |
| 15 m | W000275897 | W000275901 | W000371174 |
| 25 m | W000276901 | W000276902 | W000371239 |
| 30 m | W000371246 | - | - |
| 40 m | W000371245 | - | - |
| 50 m | W000371244 | - | - |

10 Push-pull Puls II electronic circuit



| | |
|-------------------|------------|
| Push-pull puls II | W000275907 |
|-------------------|------------|

Allowing to connect a push-pull torch or gun.

11 Adaptator for exhaust fume arm



| |
|------------|
| W000371976 |
|------------|

12 Flowmeter to measure gas flowrate

| | |
|-----------|------------|
| Flowmeter | W000275905 |
|-----------|------------|



13 Remote control



| | |
|---------------|------------|
| RC JOB (10 m) | W000273134 |
|---------------|------------|



| | |
|------------------|------------|
| RC SIMPLE (10 m) | W000275904 |
|------------------|------------|

14 Anti-dust filter for power source protection

| |
|------------|
| W000373703 |
|------------|



15 Aluminium welding kit

| | |
|---------------------|------------|
| ALUKIT DVU 1.0 -1.2 | W000277622 |
| ALUKIT DVU 1.2-1.6 | W000277623 |
| ALUKIT DVU 1.6-2.4 | W000277624 |

A composition of wire guides and rollers for perfect aluminium welding

Examples of configuration

CITOPULS II air - DMU P400 2 m long harness

Is composed of:

- 1 Power source CITOPULS II 320 / 420
W000275262 / W000275264
- 2 Wire feeder
DMU P400
W000275265
- 8 Harness II air
2 m long
W000275894



CITOPULS II water - DMU P400 2 m long harness

Is composed of:

- 1 Power source CITOPULS II 320 / 420 / 520
W000275262 /
W000275264 /
W000371971
- 2 Wire feeder DMU P400
W000275265
- 3 Cooling unit
W000273516
- 8 Harness II water
2 m long
W000275898



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

Is composed of:

- 1 Power source CITOPULS II 320 / 420 / 520
W000275262 /
W000275264 /
W000371971
- 2 Wire feeder
DMU P500 expert
W000275915
- 4 Trolley for power
source
W000279927
- 4 Trolley extension
W000279930
- 7 Swivel
W000279932
- 8 Harness II air
10 m long
W000275896



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

Is composed of:

- 1 Power source CITOPULS II 320 / 420 / 520
W000275262 /
W000275264 /
W000371971
- 2 Wire feeder
DMU P500 expert
W000275915
- 4 Trolley for power
source
W000279927
- 4 Trolley extension
W000279930
- 3 Cooling unit
W000273516
- 7 Swivel
W000279932
- 8 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

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.



Torches with integrated potentiometer

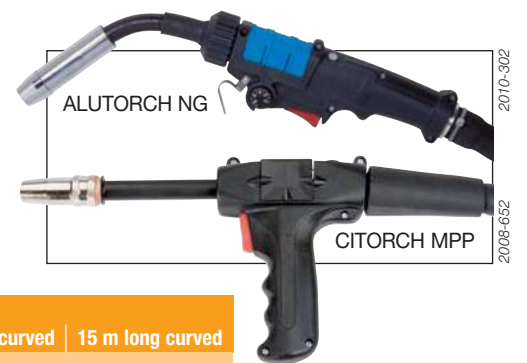
The **CITORCH MP** range meets the challenge of making the torch as small and easy to handle as a conventional torch with the inclusion of remote control facilities.



| Designation | Duty Cycle Ar+CO ₂ | Cooling | Ordering information | | |
|-----------------------------------|-------------------------------|---------|----------------------|------------|------------|
| | | | 3 m long | 4 m long | 5 m long |
| Conventional torches | | | | | |
| CITORCH M 341 NG | 320A @ 60% | Air | W000345091 | W000345092 | W000345093 |
| CITORCH M 441 NG | 380A @ 60% | Air | W000345097 | W000345098 | W000345099 |
| CITORCH M 341W NG | 320A @ 100% | Water | W000345094 | W000345095 | W000345096 |
| CITORCH M 441W NG | 380A @ 100% | Water | W000345100 | W000345101 | W000345102 |
| CITORCH M 450W NG | 450A @ 100% | Water | W000274868 | W000274869 | W000274870 |
| Torches with potentiometer | | | | | |
| CITORCH MP 341 | 320A @ 60% | Air | - | W000345118 | - |
| CITORCH MP 341W | 320A @ 100% | Water | - | W000345120 | - |
| CITORCH MP 441W | 380A @ 100% | Water | - | W000345122 | - |
| CITORCH MP 450W | 450A @ 100% | Water | - | W000278705 | - |

Push-pull torches and guns

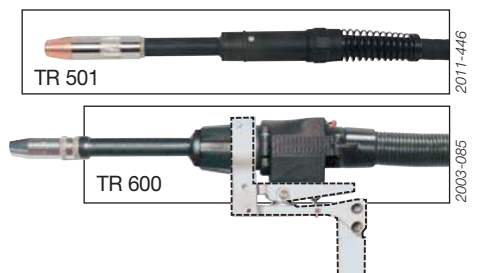
Several push-pull systems are available for use with **CITOPULS II**. The **ALUTORCH NG (torches)** and **CITORCH MPP (guns)** ranges have excellent operation due to the miniaturization of the wire drive system in line with the push-pull wire feeding axis. These torches and guns give an excellent wire 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.



| Designation | Duty Cycle Ar+CO ₂ | Cooling | Ordering information | | | |
|--------------------------|-------------------------------|---------|----------------------|-------------------|------------------|------------------|
| | | | 8 m long curved 45° | 8 m long straight | 10 m long curved | 15 m long curved |
| Push-Pull Torches | | | | | | |
| ALUTORCH NG 341 | 300 A @ 40% | Air | - | - | W000275991 | W000275992 |
| ALUTORCH NG 441W | 450 A @ 60% | Water | - | - | W000275993 | W000275994 |
| Push-Pull Guns | | | | | | |
| CITORCH MPP 352 | 270 A @ 60% | Air | W000267609 | - | - | - |
| CITORCH MPP 451W | 450 A @ 60% | Water | W000267608 | W000271007 | - | - |

Automatic torches

TM 501 and **TR 600** are the most popular torches in the OERLIKON range. **TM 501** is dedicated for automatic applications and **TR 600** for robotic use.



| Designation | Duty Cycle Ar+CO ₂ | Cooling | Ordering information* | | |
|-------------|-------------------------------|---------|----------------------------------|--------------------------------|--------------------------------|
| | | | 1 m long - 0° | 2 m long - 0° | 2.5 m long - 0° |
| TM 501 | 500 A @ 100% | Water | W000372691 | W000372693 | W000372694 |
| TR 600 | 400 A @ 100% | Water | torch with 0° neck W000370103 | harness 3 m long W000370111 | harness 4 m long W000370112 |

* available in other lengths and angles

Segment Activities

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.

Energy

Petrochemicals



Wind turbines



Thermal power stations



Hydroelectric



Transport

Rail



Shipbuilding



Road



Infrastructure



Offshore



General industry





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