

# MASTER TIG-400CT/500CT



## Quick Specs



### Application:

Metal fabrication workshops  
Shipyards and offshore industry  
Chemical and process industry  
Installation and set-up  
Mechanized welding

### Process:

DC TIG (GTAW)  
AC TIG (GTAW)  
MIX TIG (GTAW)  
Stick (SMAW)

**Input Power:** 400V, 3-Phase

### Amperage Range:

400CT: 20-400A/ 500CT:20-500A

### Rated Output at 40 ° C (104°F):

400CT: 400A at 26V @60% Duty Cycle

500CT: 500A at 30V @60% Duty Cycle

**Weight:** 80KG

## For TIG and Stick Welding

### The powerful AC/DC tig welding equipment

**MASTERTIG-400CT/500CT** built with a maximum power output of 400 amp at 60% duty cycle ensures you have enough power and the integral water cooling unit keeps torches cool during high duty production welding.

**MASTERTIG-400CT/500CT** is a precise aluminum welding specialist that suits all welded materials. The control panels provide all of the necessary functions needed for TIG welding. Modular design allows you to build the package that best suits your needs.

It's a total solution for your TIG welding jobs.

## Specialist Features

### Precision Arc Performance:

- **Built in pulsing functions** help minimize heat input on thin materials, and provide for a faster freezing weld puddle for uphill welding on curved surfaces such as process piping. The TIG pulse also helps moderate filler metal deposition for consistent bead appearance.
- **DC+/DC-**: Improved TIG starting. Now starts DC(-) to maintain a sharp tungsten.
- **Lift-Arc start** provides AC or DC arc starting without the use of high frequency.
- **Adjustable AC output frequency** allows the operator to focus the arc minimizing the heat affected zone.
- **Extended AC Balance Control** helps maintain a pointed tungsten to direct the arc in the weld joint.
- **Independent amplitude/amperage control** allows EP and EN amperages to be set independently to precisely control heat input to the work and electrode.
- **Multiple Waveshapes:**
  - Standard Squarewave** for fast travel speeds and excellent puddle control,
  - Soft squarewave** for a soft buttery arc with maximum puddle control and good wetting action,
  - Sine wave** for a traditional softer sounding arc,
  - Triangular wave** to reduce the heat input into the weld at low amperage.
- **HF or Non-HF Arc ignition:** reliable plasma arc initiation without high frequency.
- **Continuous Output Control:** focus the arc for different material thickness.
- **10 channels memory capacity**

### Outstanding Quality:

- Newly designed using the latest power electronic technology for improved reliability.
- CE Certified.



## Technical specifications

| Item No                       | Master TIG-400CT  | Master TIG-500CT                                 |
|-------------------------------|---|--|
| Rated Input Voltage           | 3PH ~ 400V ±15%   | 3PH ~ 400V ±15%                                  |
| Max. Load Power Capacity      | TIG: 14.39 KVA<br>MMA: 14.21 KVA  | TIG: 20.76KVA<br>MMA:19.93KVA                    |
| Rated Duty Cycle(40°C) 60%    | TIG: 400A/26V<br>MMA: 315A/32.6V  | TIG: 500A/30V<br>MMA: 400A/36V                   |
| 100%                          | TIG: 315A/22.6V<br>MMA: 250A/30V  | TIG: 400A/26V<br>MMA: 315A/32.6V                 |
| Welding Current/Voltage Range | TIG:5A/10.2V~400A/26V<br>MMA: 20A/20.8V~315A/32.6V                              | TIG:5A/10.2V~500A/30V<br>MMA: 20A/20.8V~400A/36V |
| Open Circuit Voltage          | 70V~80V   | 70V~80V  |
| Power Factor                  | 0.85  | 0.85   |
| Efficiency                    | 85%   | 85%  |
| TIG Pulse                     | Peak Current<br>Pulse Frequency<br>Pulse Width (Ratio)                          | 5A~400A<br>0.2Hz~200Hz<br>1~100%                 |
| AC TIG                        | AC Frequency Range<br>AC Clean Width (AC Balance)<br>AC Clean Ratio (AC Bias) % | 5A~500A<br>0.2Hz~200Hz<br>1~100%                 |
| MIX TIG                       | MIX Frequency:<br>DC Balance: (%)   | 20Hz~250Hz<br>+40~40<br>+30~50                   |
|                               | 1Hz~5Hz<br>20-80  | 1Hz~5Hz<br>20-80                                 |
| Arc-starting Current          | 5A~400A   | 5A~500A  |
| Crater Filling Current        | 5A~400A   | 5A~500A  |
| Current Up-slope Time         | 0.1S~15S  | 0.1S~15S   |
| Current Down-slop Time        | 0.1S-15S  | 0.1S-15S   |
| Pre-Gas Time                  | 0.1S-15S  | 0.1S-15S   |
| Flow-Gas Time                 | 0.1S-15S  | 0.1S-15S   |
| Spot Arc Time                 | 0.1S-10S  | 0.1S-10S   |
| MMA Arc Force                 | 10A~315A  | 10A~400A   |
| Hot Start Time                | 0.1-3S  | 0.1-3S   |
| Hot Start Current             | 10A~315A  | 10A~400A   |
| Dimension (LxWxH)             | 960x420x1100mm  | 960x420x1100mm                                   |
| Weight (KG)                   | 80KG  | 80KG   |

### Water-cooling Unit: WC-100 (optional)

|                            |                       |
|----------------------------|-----------------------|
| Operating Voltage          | 230V 50/60Hz          |
| Rated Power                | 260W                  |
| Cooling Power              | 1.5KW(1L/MIN)         |
| Maximum Pressure           | 0.3MPA/60HZ           |
| Recommended Cooling Liquid | 20%~40% ethanol/water |
| Tank Volume                | 6.5L                  |

## 4 kinds of wave shapes

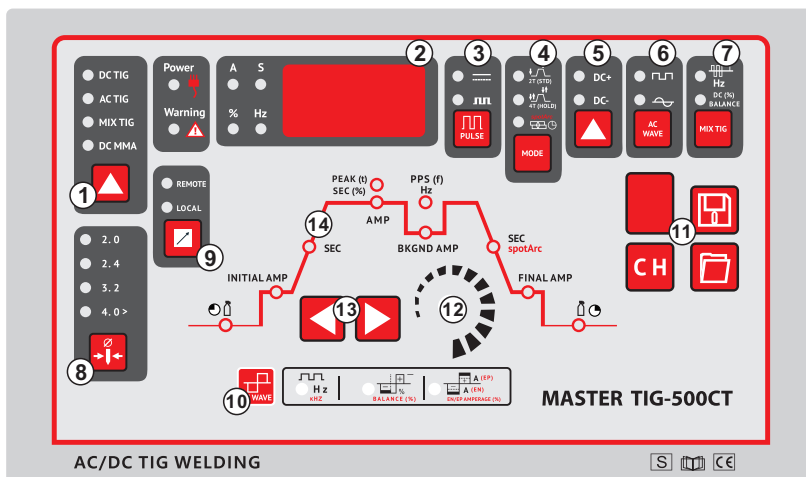


Standard  
Square wave



Soft wave

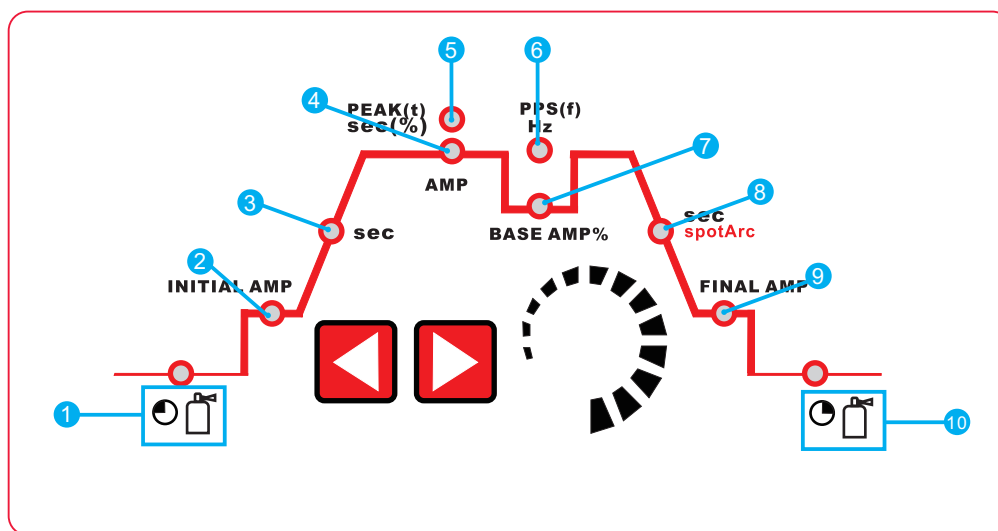
# General View of Control Panel




## Control Panel Parameter Values

|  |   |   |
|--|---|---|
| <p><b>1. Welding Process</b></p> <ul style="list-style-type: none"> <li>DC TIG</li> <li>AC TIG</li> <li>MIX TIG</li> <li>DC MMA</li> </ul> <p><b>2. Ammeter/Voltmeter Display</b></p> <p><b>3. Pulser Control</b></p> <p>Pulse ON/OFF selection.</p> <p><b>4. Mode</b></p> <ul style="list-style-type: none"> <li>2T(STD)</li> <li>4T(HOLD)</li> <li>Spot Arc</li> </ul> | <p><b>5. Arc Ignition Polarity</b></p> <p>DC+/DC-</p> <p><b>6. AC Waveshape types</b></p> <ul style="list-style-type: none"> <li>Advanced Squarewave</li> <li>Triangular Wave</li> </ul> <p><b>7. MIX TIG</b></p> <p>MIX Frequency: 0.1Hz~5Hz<br/>DC Balance: (%) 10~90</p> <p><b>8. Tungsten Electrode Dia.</b></p> <p>From 2.0mm to &gt;4.0mm</p> <p><b>9. Remote:</b> used for foot pedal or Remote torch.</p> | <p><b>Local:</b> adjusted Currents by face panel</p> <p><b>10. AC Waveshape</b></p> <ul style="list-style-type: none"> <li>AC Frequency Range 20Hz~200Hz</li> <li>AC Clean Width (AC Balance) +40~-40</li> <li>AC Clean Ratio (AC Bias) % +30~-50</li> </ul> <p><b>11. Memory</b></p> <p><b>12. Encoder Control</b></p> <p><b>13. Select welding parameters button</b></p> <p><b>14. Function Sequence (see next chapter)</b></p> |
|--|---|---|

## Definitions & Glossary



| Item | Symbol      | Description  |
|------|-------------|--|
| 1    |             | Gas pre-flow time (TIG)<br>Absolute setting range 0.1 s to 5.0 s (0.1 s increments).   |
| 2    | INITIAL AMP | Ignition current (TIG)<br>Percentage of the main current. Setting range 1 % to 100 % (1 % increments).<br>Hotstart current (MMA)<br>Percentage of the main current. Setting range 1 % to 150 % (1 % increments). |

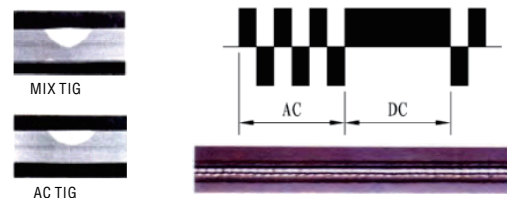
| Item | Symbol  | Description   |  |
|------|---|---|--|
| 3    | <b>sec</b>  | Up-slope time (TIG)<br>Setting ranges: 0.00 s to 20.0 s<br>(0.1 s increments).<br>The up-slope time can be set separately<br>for non-latched and latched. | Hotstart time (MMA)<br>Setting ranges: 0.00 s to 5.0 s<br>(0.1 s increments).      |
| 4    | <b>AMP</b>  | Main current (TIG) / pulse current<br>I min to I max (1 A increments)   | Main current (MMA)<br>I min to I max (1 A increments)                              |
| 5    | <b>PEAK(t)<br/>sec(%)</b>   | Pulse time<br>Pulse time setting range: 0.01 s to 9.99 s (0.01 s increments)  |  |
|      |   | TIG pulses<br>The pulse time applies to the main current<br>phase (AMP) for pulses.   | TIG AC Special<br>The pulse time applies to the AC phase for<br>AC special.        |
| 6    | <b>PPS(f)<br/>Hz</b>  | Pulse break time<br>Pulse break setting range: 0.01 s to 9.99 s (0.01 s increments)   |  |
|      |   | TIG pulses<br>The pulse break time applies to the<br>secondary current phase (AMP%)   | TIG AC Special<br>The pulse break time applies to the<br>DC phase with AC special. |
| 7    | <b>BASE AMP%</b>  | Secondary current (TIG) / pulse pause current<br>Setting range 1 % to 100 % (1 % increments). Percentage of the main current.                             |  |
| 8    | <b>sec<br/>spotArc</b>  | Down-slope time (TIG)<br>0.00 s to 20.0 s (0.1 s increments).<br>The down-slope time can be set separately for non-latched and latched.                   |  |
| 9    | <b>FINAL AMP</b>  | End-crater current (TIG)<br>Setting range 1 % to 100 % (1 % increments). Percentage of the main current.  |  |
| 10   |  | Gas post-flow time (TIG)<br>Setting ranges: 0.1 s to 20.0 s (0.1 s increments).   |  |

## MIX TIG Control

### Features of MIX TIG:

The AC current can get a very good clearance, and DC current can get a deeper penetration. Use the MIX TIG we can get an excellent Arc Concentration, can be carried out the excellent welding performance from thin to thick plate.

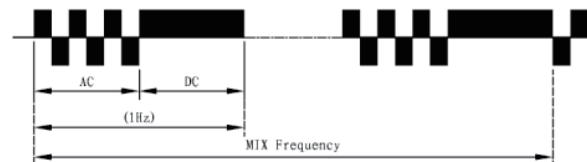
- 1) Nice weld appearance, deep penetration.
- 2) Excellent Arc Concentration.
- 3) Substantially reduce the electrode consumption.



### MIX TIG Frequency (Hz):

the cycle time of MIX

TIG in 1 second. Adjustable range: 0.1-10Hz.



### MIX TIG Balance (DC) %:

DC Balance (%) = (tad/Tmix) x 100



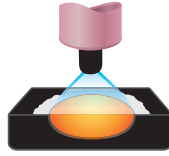
# AC Waveshape Controls



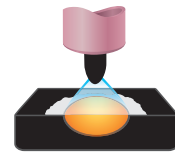
## AC Frequency control

Controls the width of the arc cone. Increasing the AC Frequency provides a more focused arc with increased directional control.

Note: Decreasing the AC Frequency softens the arc and broadens the weld puddle for a wider weld bead.



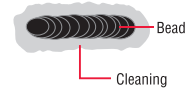
Wider bead, good penetration ideal for buildup work



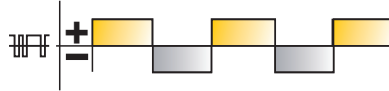
Narrower bead for fillet welds and automated applications



Wider bead and cleaning acting



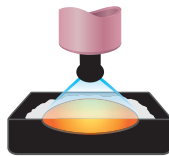
Wider bead and cleaning acting



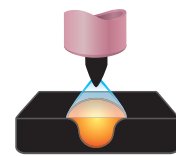
## AC Balance Control

Controls arc cleaning action. Adjusting the % EN of the AC wave controls the width of the etching zone surrounding the weld.

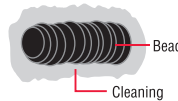
Note: Set the AC Balance control for adequate arc cleaning action at the sides and in front of the weld puddle. AC Balance should be fine tuned according to how heavy or thick the oxides are.



Wider bead, good penetration ideal for buildup work



Wider bead, good penetration ideal for buildup work



Wider bead and cleaning action

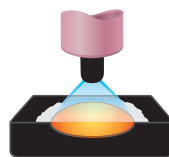


Narrow bead, with no visible cleaning

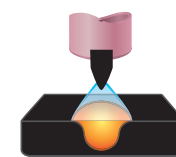


## Independent AC Amperage Control

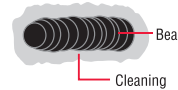
Allows the EN and EP amperage values to be set independently. Adjusts the ratio of EN to EP amperage to precisely control heat input to the work and the electrode. EN amperage controls the level of penetration, while EP amperage dramatically effects the arc cleaning action along with the AC Balance control.



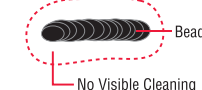
More current in EP than EN: Shallower penetration



More current in EN than EP: Deeper penetration and faster travel speeds



Wider bead and cleaning action



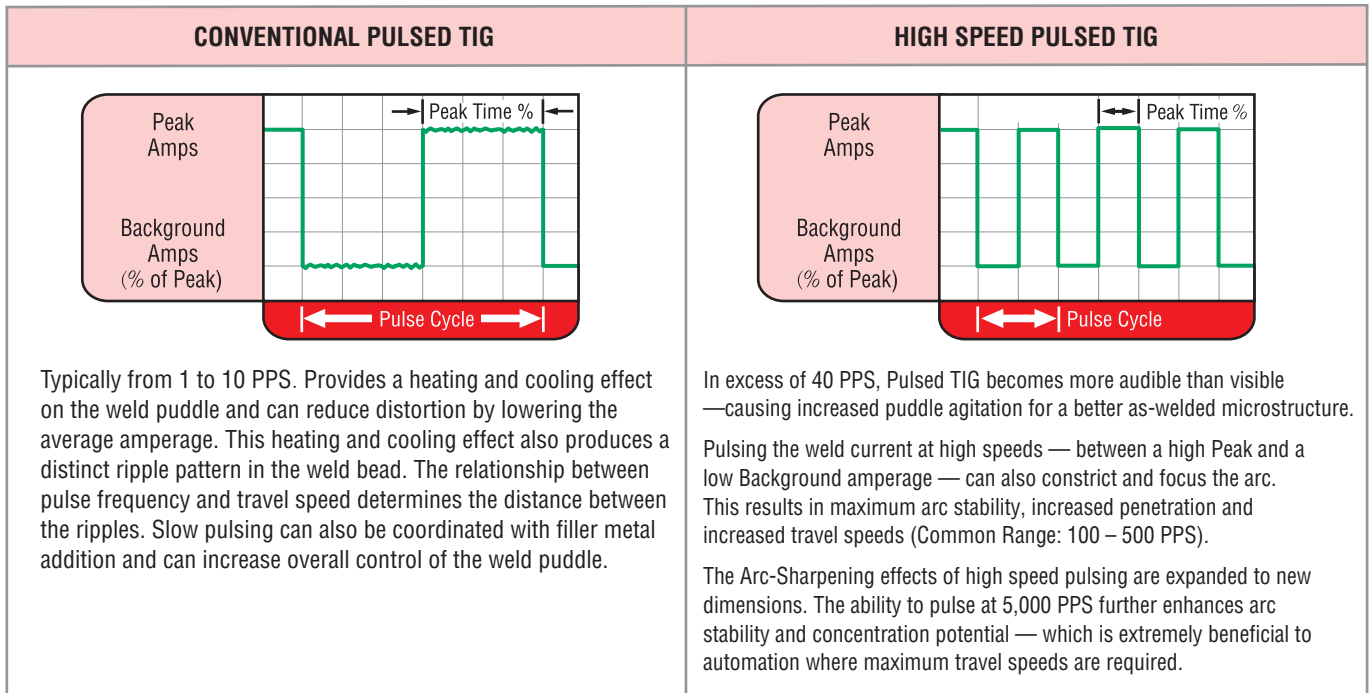
Narrow bead, with no visible cleaning



# DC TIG-Pulse

## High Speed DC TIG-Pulse Controls

- **PPS Pulses per second (Hz):** DC = 0.1 – 5,000 PPS / AC = 0.1 – 500 PPS
- **% ON – % Peak Time:** 5 - 95% (Controls the amount of time during each pulse cycle at the PEAK amperage.)
- **Background Amps:** 5 – 99% (Sets the low-pulse amperage value as a % of the Peak Amps.)



# Accessories

## For Standard accessories



**TIG torch: TIG-18**  
 Cooling: Water Cooled  
 Duty100%DC: 320AMP  
 Duty100%AC: 240AMP  
 Electrode Size: 0.5-4mm



**Electrode holder with cable 2M**  
**Earth clamp with cable 2M**



**Water-cooling unit: WC-150**  
 Operating Voltage: 230V 50/60Hz  
 Rated Power: 260W  
 Cooling Power: 1.5KW(1L/MIN)  
 Tank Volume: 6.5L

## For Optional accessories



**Argon gas regulator**



**TIG torch: TIG-26**  
 Gas connector: M16  
 Cable length 4M  
 5-pin control coupler



**Foot Pedal**  
 Model No.: FX-390B  
 Serial No.: 12D36  
 Input Voltage: + 15V  
 Output Voltage: 0-13V



**Hand-hold Remote Controller for TIG torch**  
 Dimensions: 110x27x30mm  
 Material: ABS  
 Weight: 30g  
 Resistance: 10K / 0.5W



**Trolley: WT-150**