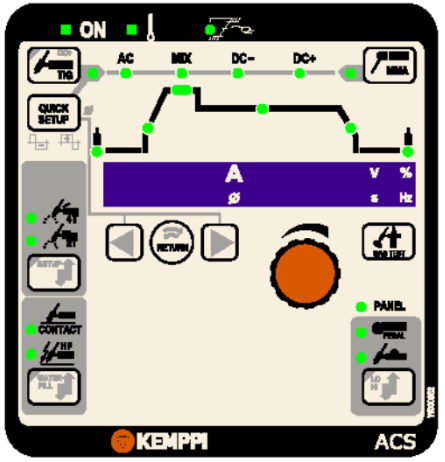
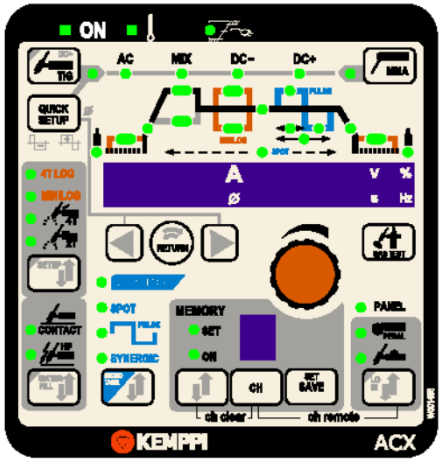
MasterTIG MLS™ 2300 ACDC
Product training material





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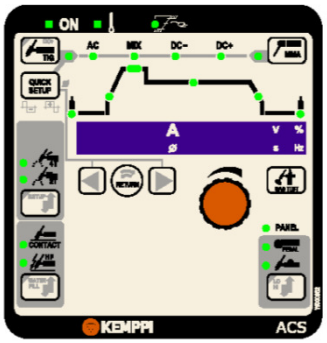
Applications

- **Customer segments**
  - Thin sheet / pipe fabrication
  - Installation, Maintenance & Repair welding
  - Food industry, Wineries, Breweries
  - Architecture, Metal furniture
  - Machine building
  - Marine applications, Boat builders
  - Shipyards & Offshore
  - Motor sports, Automotive components
  - Sub contractors & Site workers
  - Rental & Hire
  - Home & Hobby
- **Pipe & plate welding**

Arguments

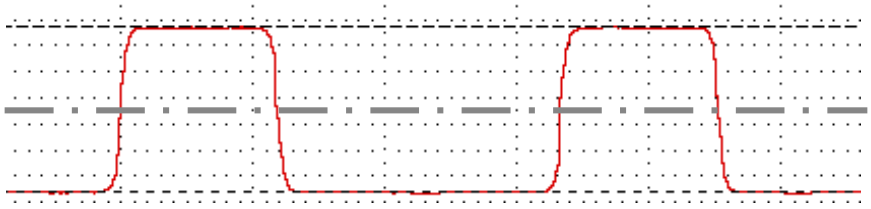


- **High Power output from single phase supply with PFC**
- **Flexibility**
  - MMA/TIG processes on AC/DC and AC/DC MIX
  - Process Manager regulation (1-knob)
  - **ACS** basic model for most of TIG applications
  - **ACX** model for the most demanding TIG applications
- **Excellent arc characteristics**
- **Mix TIG, Pulse-TIG, Synergic DC Pulse-TIG**
  - Welds all material types
  - All Current types and wave forms
  - **MICROTACK**, new tacking possibility
- **Generator safe**
  - Mechanically and electrically protected

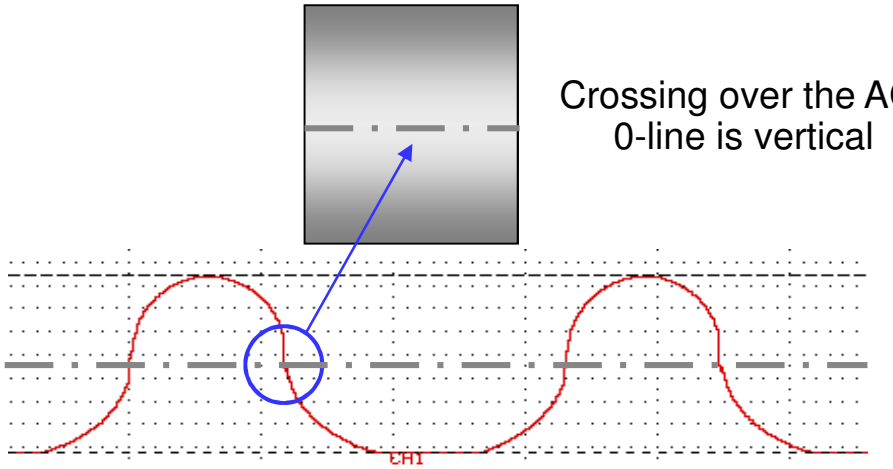
Exchangable MLS operation panels

Power source benefits

- **Improved AC wave form control**



Square wave



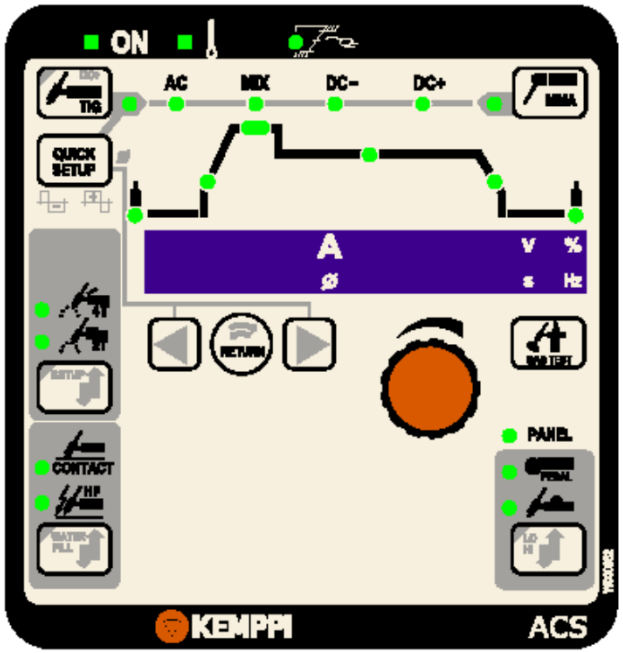
Crossing over the AC 0-line is vertical

Sinus wave

- More arc stability
- Less arc noise

Flexibility

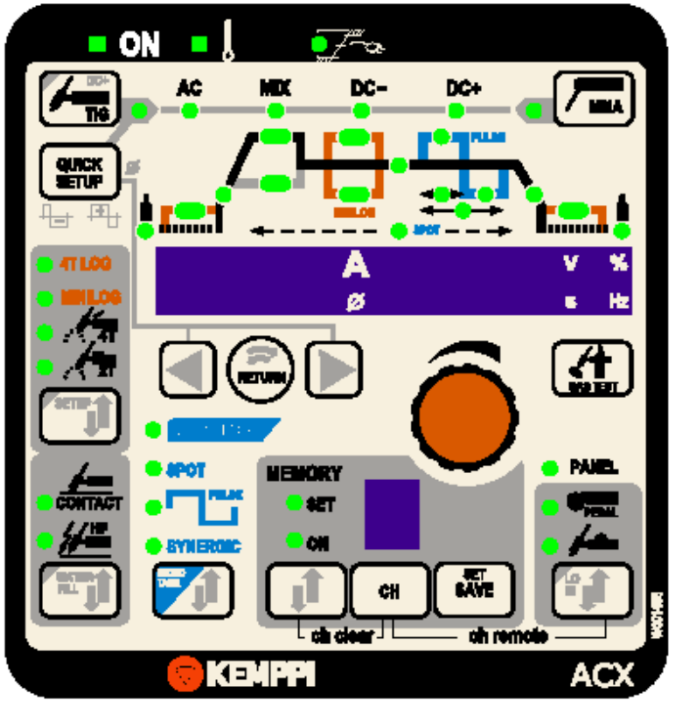
- **ACS panel functions**



- Currents (MMA and TIG): AC, MIX, DC-, DC+
- Pre gas time 0 – 10 s
- Current Up Slope time 0 – 10 s
- Hot Start Current 100 – 150 %
- Current Down Slope time 0 – 15 s
- Post gas timer 1 – 30 s
- Current / Voltage displays, other welding parameters display
- Quick SETUP for MMA / TIG regulations e.g. AC-Balance
- 2T and 4T function
- HF and Contact ignition (TIG)
- Remote control selection and adjustment range set: LO / HI
- Filling function for water-cooled torch (WATER FILL)
- Test function for gas (GAS TEST)
- SETUP and Quick SETUP

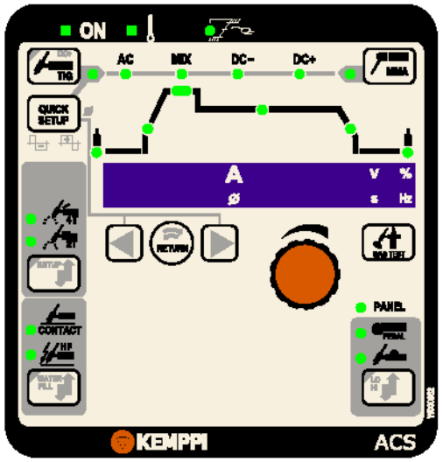
Flexibility

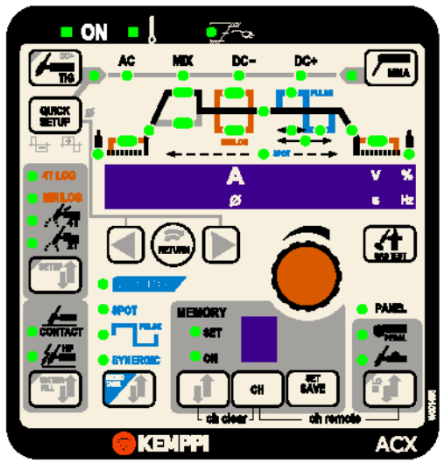
- **ACX panel functions**



- **ACX** include all standard **ACS** functions plus:
  - 4T-LOG and MINILOG functions
  - Soft / Hot Start Current 80 – 150 % of welding Current
  - MINILOG Current 10 – 150 % of welding Current
  - End Current 5 – 90 % of welding Current
  - MICROTACK
  - Spot TIG welding
  - Spot timer 0,0 – 10,0 s
  - Pulse TIG (AC and DC)
  - Synergic Quick Pulse-TIG (DC)
  - Pulse Current 10 A … Power source max Current
  - Background Current 10 – 70 % of Pulse Current
  - Pulse ratio 10 – 70% of Pulse time
  - Pulse Frequency DC 0,2 – 250Hz / AC 0,2 – 20Hz
  - 10 Channel MEMORY function

Flexibility

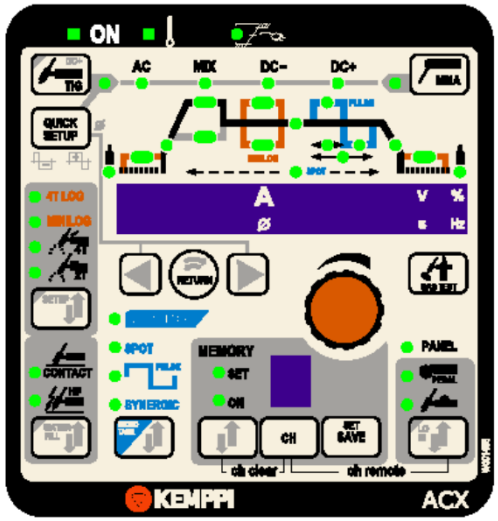




- **Simple 1-knob Process Manager regulation**
  - Fast and easy to find correct welding parameters
  - Ideal 1-knob regulation principle
- **Select parameter for the regulation with arrow keys**
- **Set value with Process Manager potentiometer**
  - Display indicate all set values
  - LED´s & text on display indicate units
  - RETURN function recalls welding Current

Welds all material types

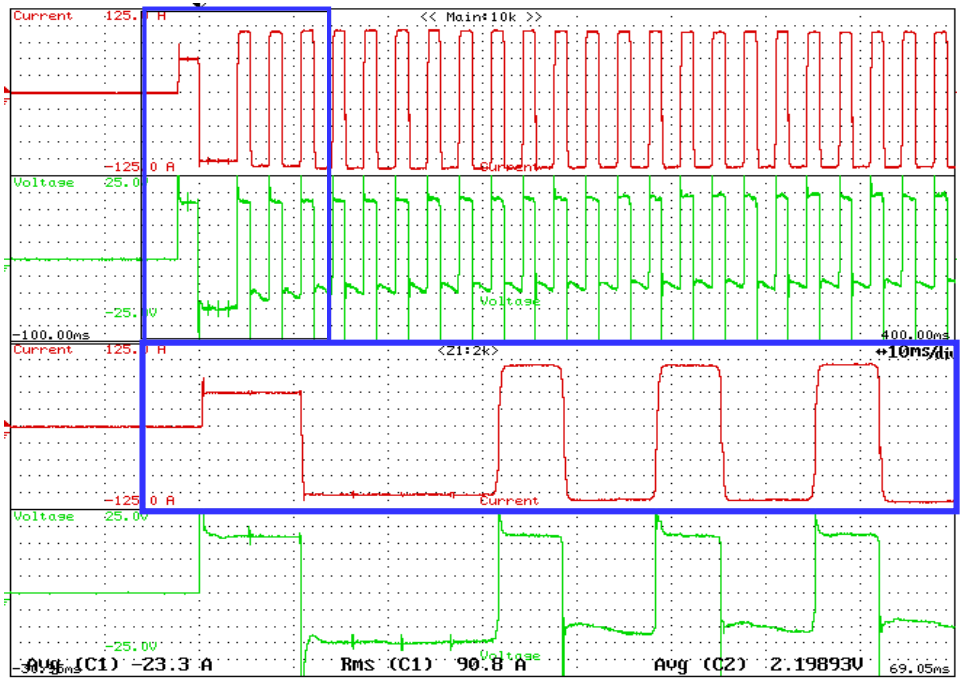
- **No cable changes**
  - Change from (MMA ← … → TIG)
  - Change between current types (DC- ← … → AC)
  - Change between polarities (DC- ← … → DC+)
  - Earth cable always in minus pole (-)

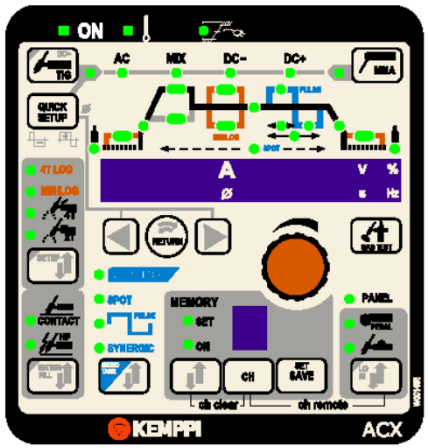


- **TIG**
  - All Current types and wave forms
- **MMA**
  - Increases machine usability in outdoor use
  - Also with thicker base materials
  - For most of MMA electrode types
  - MMA Arc Force & Hot Start regulation in Quick SETUP

Welding characteristics

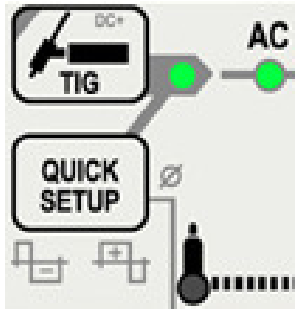
- **HF ignition with AC-TIG**
- Arc ignition happens with **DC +** cycle
- **DC-** cycle preheats Al-base material
- Ignition cycle is software based
- DC + period depends on Current set value
- **Contact ignition**
- Can be used also with AC welding
- Can be used with sharp electrode head
- Applications in EMC sensitive environments
  - Interference free arc
  - Safety

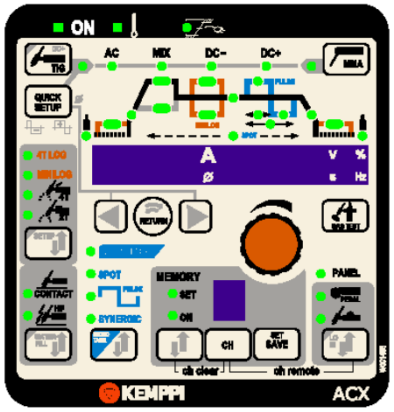




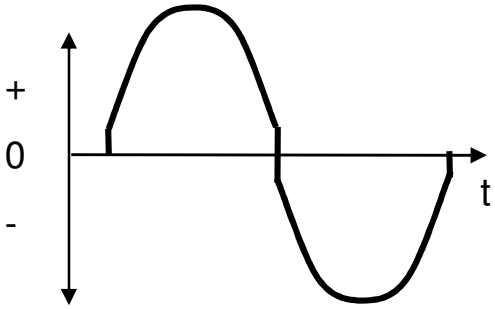
Welding characteristics

- **AC-TIG current wave forms**



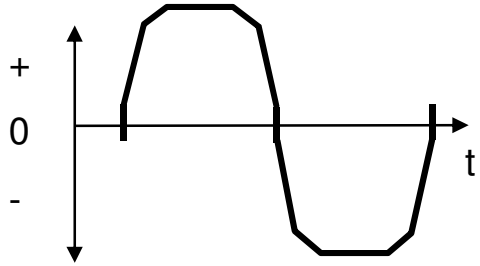


AC wave form selection

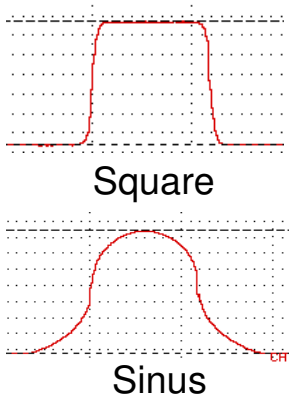


Sinus AC wave form

- **Sinus wave form**
- Lowest AC arc noise
- For clean Al-base materials
- Compromised Aluminum oxide cleaning
- **Modified Square wave form**
- Combination of Sinus and Square wave forms
  - Good Aluminum oxide cleaning
    - Well pointed and focused arc
    - Optimum AC welding characteristics
- Recommendable for Al repair welds, castings etc
  - Selection Sinus / Square AC wave type in Quick SETUP

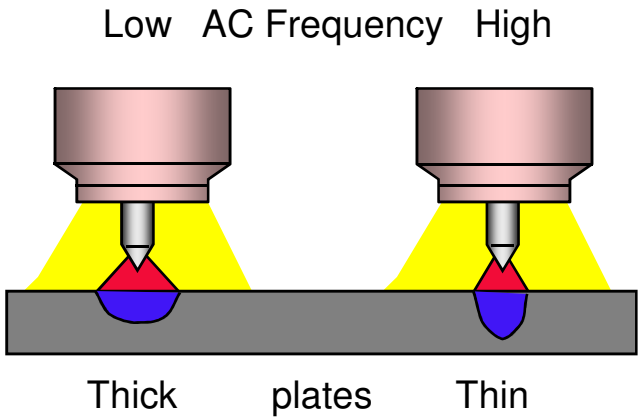


Square AC wave form



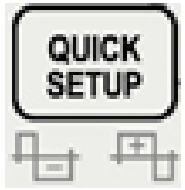
Welding characteristics

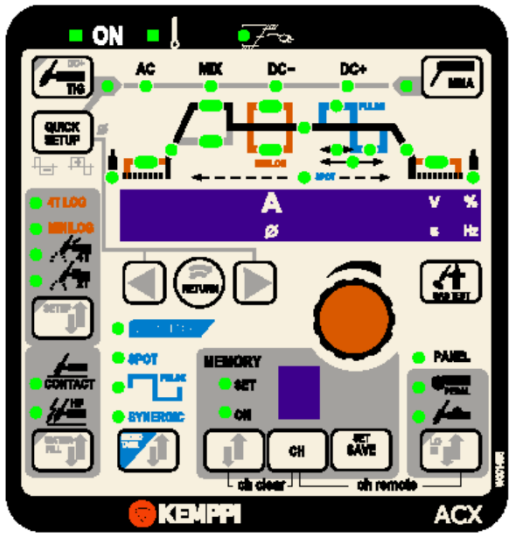
- **AC Frequency**
  - Influence to AC TIG arc form and penetration profile
  - Regulation scale 50 – 250 Hz
  - Factory set is 60 Hz, suitable for most of the welding cases
  - Higher AC arc Frequencies can be used with thinner plates and lower Currents
  - Lower AC arc Frequencies can be used with thicker plates and higher Currents
- **Benefits and Features**
  - More stable arc with higher AC Frequency
  - More narrow and focused AC TIG arc
    - Narrows weld seam
    - Increases penetration depth
- **NOTICE!**
  - Higher AC Frequency increase arc noise level

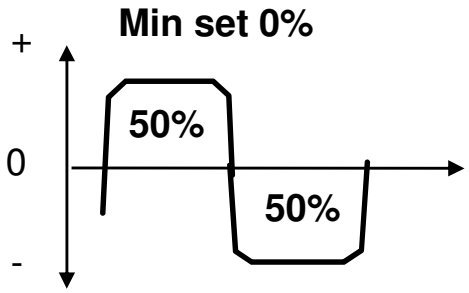


Welding characteristics

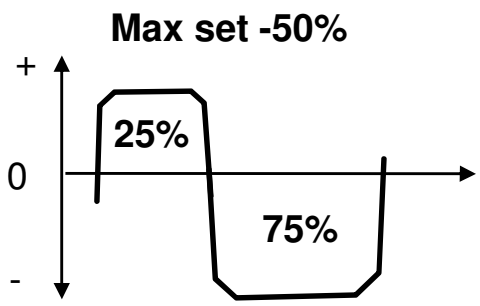
- **AC-TIG Balance**
- Balance value is freely selectable according welding application
  - Machine display recommends min used electrode diameter
  - AC Balance modification in Quick SETUP
  - Factory set of AC Balance is -25 %
  - Regulation scale -50%...0 %
  - Welding with sharp electrode head is on -25%...-50%







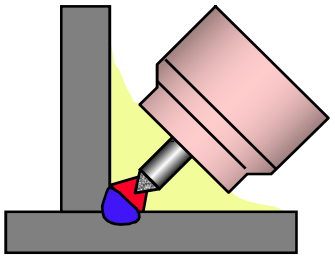
Good cleaning effect

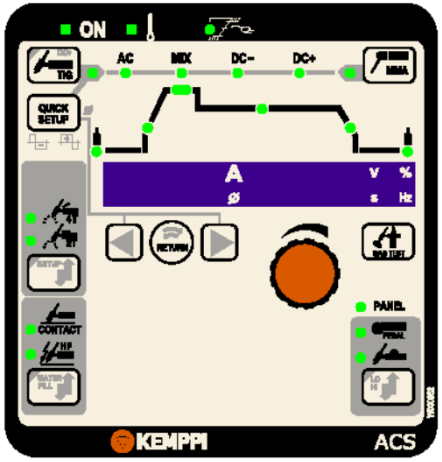


Good penetration

Welding characteristics

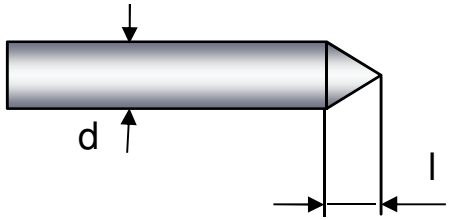
- **Sharp electrode function**
  - DC type of TIG arc on AC
  - Best applications in fillet welds





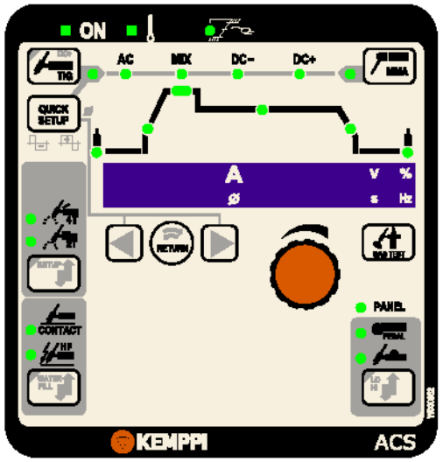
  - Arc is narrow and pointed exactly to the corner of the joint
  - Quick SETUP AC Balance set -25%...-50%
- **Benefits & Features**
  - Better penetration ➔ Increases the strength of the weld seam
  - Better focused arc ➔ Less risk for welding defects
  - Better welding speed ➔ Productivity
  - Less stress to base material ➔Less deformation
  - Decrease need for electrode Ø and consumable changes
  - Same electrode type on AC and on DC (Grey / Red / Gold)
  - Increase electrode operation to the wider AC Current range

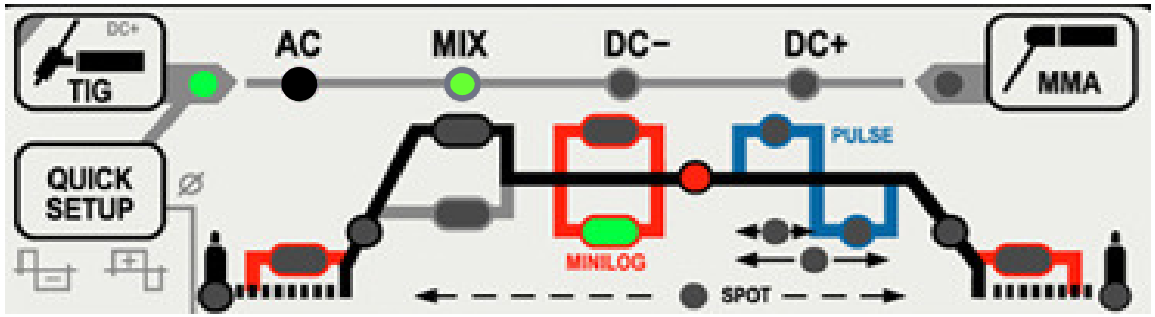
l = 1…1,5 x d

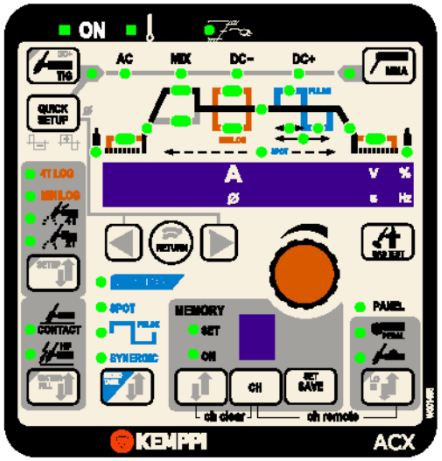


Electrode head form
for AC and AC/DC MIX

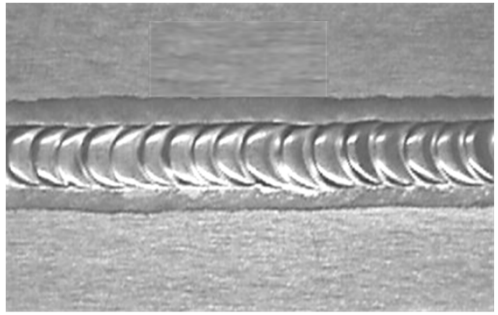
Welding characteristics







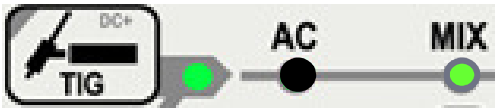
- **AC / DC MIX TIG**
  - Mix AC and DC Current to make a new wave form type
  - AC wave form selection (Sinus, Square)
- **Applications**
  - Aluminium & Al-alloys welding
  - For joining thick + thin Al-base materials
  - Deep penetration
  - More equal fish scale appearance of weld joint
  - Reduce TIG arc noise compared to AC TIG welding arc

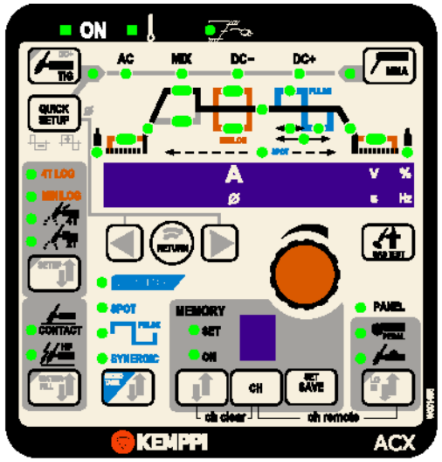


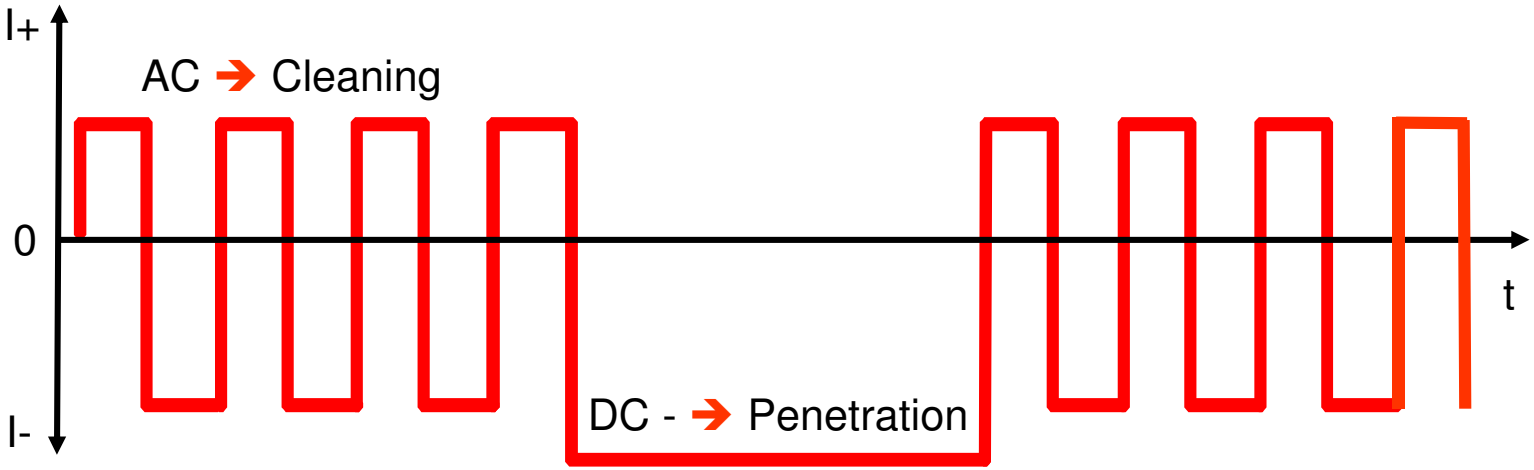
Welding characteristics

- **AC / DC MIX TIG Principle**

- Current cycle wave form consists of adjustable AC and DC- periods
- New possibility to affect weld profile and penetration
  - Thin + thick weld joints
  - Possibility to affect penetration / cleaning effect
  - Best weld results on clean / new Al-base material
- AC and DC Current cycles can be set in different lengths & heights
- On AlMg5 (AWS 5356) use more AC (thick oxide layer)



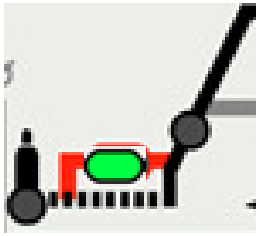


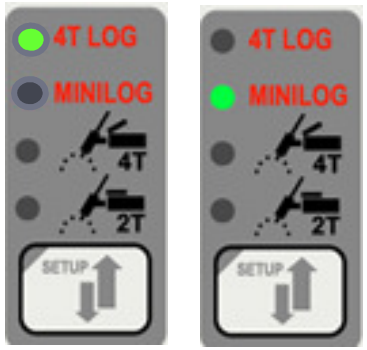


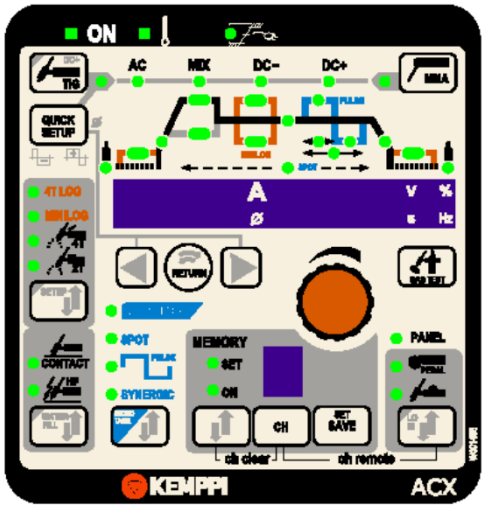
KEMPPI
The Joy of Welding

Welding characteristics

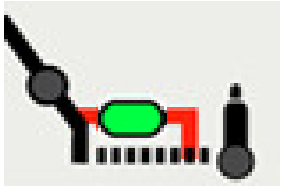
- **Search Arc**
- Start with lower Current level:
  - Plate edges in the start
  - Groove opening variations
  - Thinner base materials
  - Out of position welding



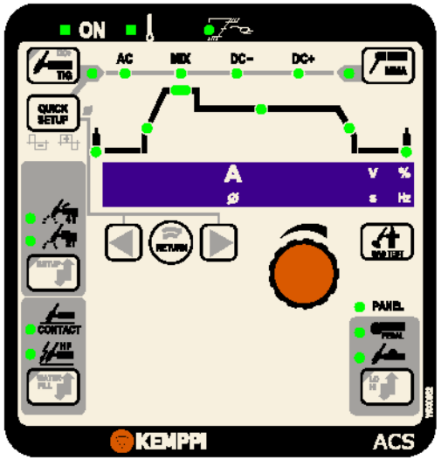


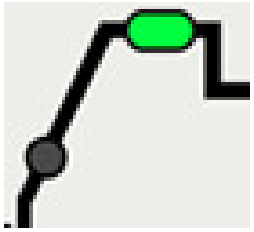


- **Tail Arc**
- End welding in more controlled way with lower Current level:
  - Minimize risk for end crater and base material over heating
  - Plate edges at the end of welding
  - Groove opening variations
  - Thinner base materials
  - Out of position welding
    - Both functions are activated in **4T LOG** and **MINILOG**

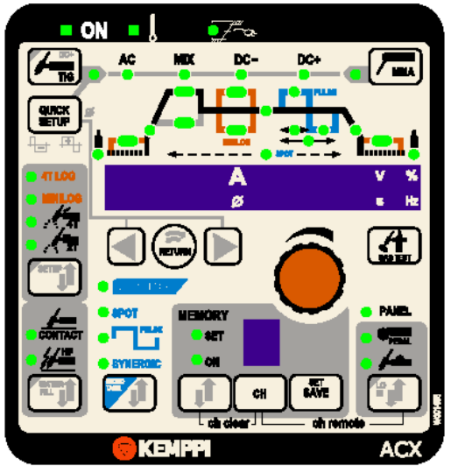


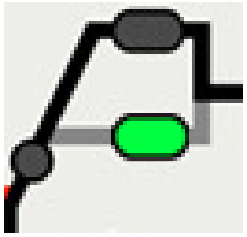
Welding characteristics





- **Hot Start Current**
  - Function allows base material pre-heat
  - Regulation range is based on % of welding Current
  - Operates on both AC and DC Current
  - On ACS Hot Start Current is 100 – 150 %
  - On ACX Soft / Hot Start Current is 80 – 150 %
  - On 2T regulation scale is 0,1 – 5,0s
  - Factory set of H2t is 1,0s

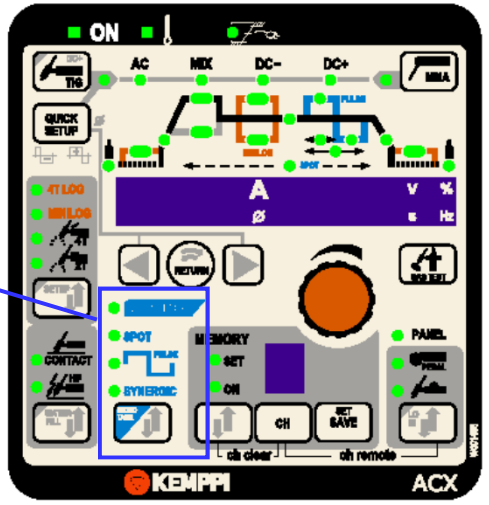




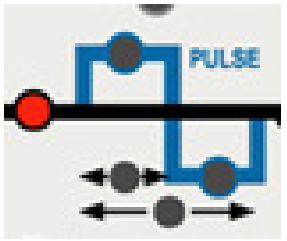
- **Soft Start Current**
  - Allows lower starting Current than welding Current
  - For starts in bigger openings, positions etc
  - Ensures a faultless start of welding
  - Special application requirements

Welding characteristics

- **Pulse-TIG**
  - Free selection for all Pulse-TIG parameters
  - Easy to use, **Average Current** regulation
- **Synergic Quick Pulse-TIG**
  - Ready Pulse-TIG parameters
  - All Pulse-TIG parameters are tied to Current

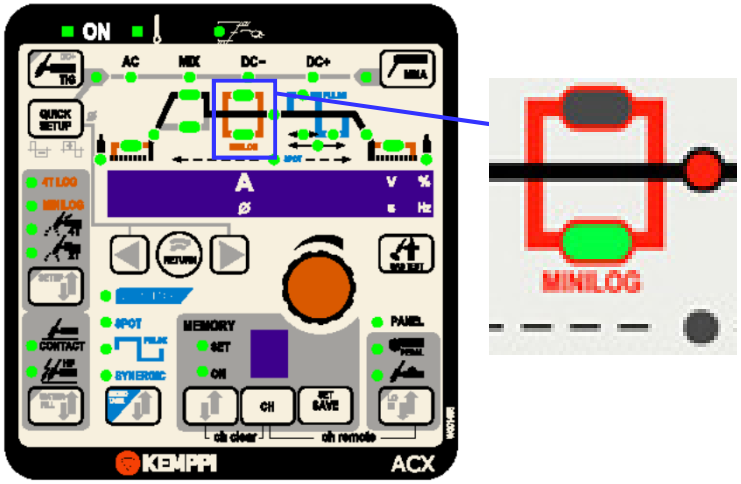


- **Benefits & Features**
- Automatic adjustment ➔ Easy to use
- Also for not so experienced welders ➔ Easy to use
- Good welding characteristics for thin sheets / tubes ➔ Easy to use
- Very concentrated arc, deep penetration ➔ Good Quality
- Better control for heat input ➔ Less deformation ➔ Good Quality
- Higher welding speed ➔ Narrow weld seam ➔ Higher Productivity
- Faster adjustment for settings ➔ Higher Productivity
- **Pulse-TIG improves weld Quality**



In both Pulse-TIG modes
Average Current display
Change both Pulse and
Background Current value

Welding characteristics

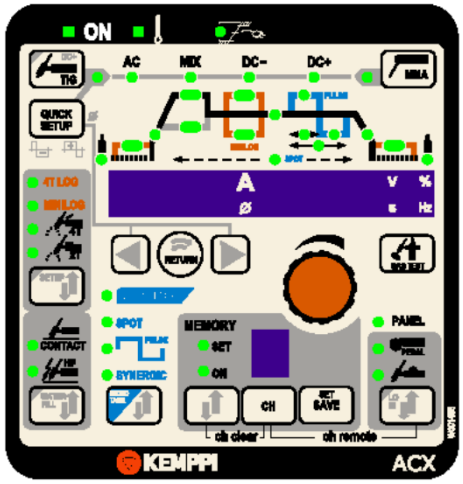


- **TIG MINILOG**
- Function allows fast Current change between two pre-set Current levels from TIG torch trigger.
- Long TIG torch trigger press starts and stops welding, short torch trigger press changes Current level.
- Display shows both Current set values

- **Benefits & Features**
  - To avoid welding faults at starts and at the end of welding
  - Better weld pool control in positional welding
  - Better weld pool control if air gap is varying
  - Welders position change or take more filler wire without arc break
  - For Soft or Hot-start
  - Two value Current “Memory”
  - Decreases need to use remote control

Welding characteristics

- **MINILOG applications**
- Pre heat of thick base material ➔ Productivity
- Starting from thin material or from air cap ➔ No need to break arc
- Flat position ➔ Change to out of position welding
- Pipe welding ➔ Continuous need to change current
- Welding of two different material thickness
- Air cap variations ➔ No need to break arc
- Filler wire position change ➔ No need to break arc
- Welders position change ➔ No need to break arc

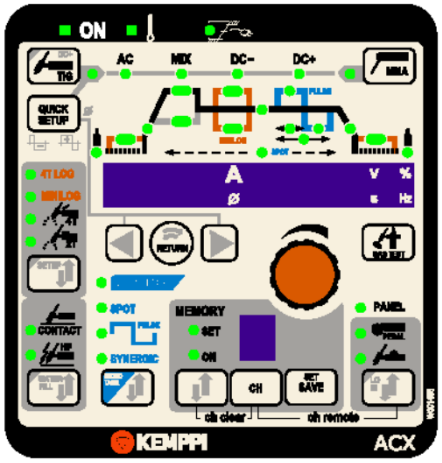


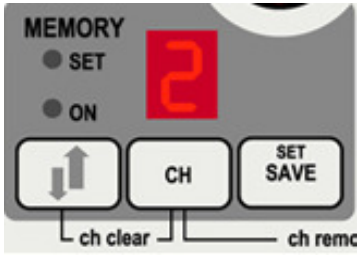
- Torch trigger can be released in long seam welding ➔ Decrease stress from welders hand
- Better control of penetration and heat input ➔ Better welding quality
- When two different Current levels is needed ➔ Welding work according WPS`s

- **MINILOG improves weld Quality**

Welding characteristics

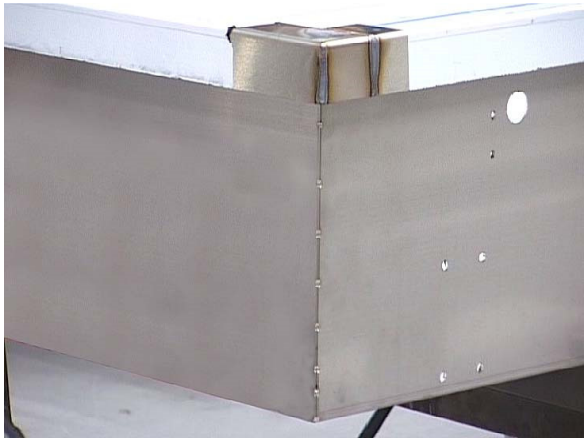
- **MEMORY**
  - Possibility to save and recall all panel parameter settings in 10 channels
  - TIG torch / Hand remote can control 5 channels (RTC 10)
- **Benefits & Features**
  - Decrease need for machine regulation
  - Helps welders work, less parameters to remember
  - Guarantees same welding parameters for all welders
  - Decrease welding defects
  - Helps welding engineers / Quality personnel work
  - Demanding welding work (Piping, Power plants, Food industry)
  - Works according WPS or Welding instructions
  - Sensitive base materials
  - Decrease risk for welding failures
    - **MEMORY improves weld Quality and Productivity**

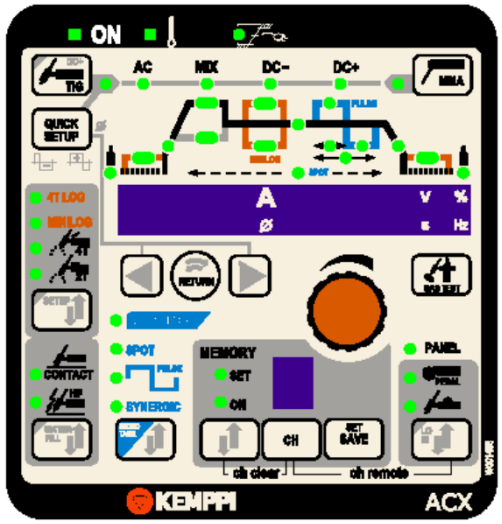




Welding characteristics

- **MICROTACK**
- For thin sheet tack welding





- **Benefits & Features**
  - Easy and fast
  - No filler metal
  - **Small tack weld size**

- **Operation**
- Function is activated in MICROTACK position
- Contact ignition or HF ignition on DC or AC
- Spot time (Spt in ms), Up / Down slope 0s
- In AC MICROTACK (Pco), number of Current pulses (1…5)

➔ Minimum heat and deformation to the weld piece

➔ Spot welds are easy to weld over

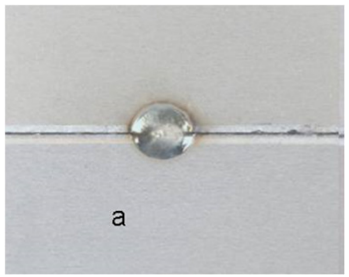
➔ Less risk for base material burn through / oxidisation

Welding characteristics

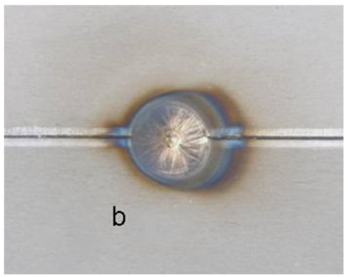
- **Torch angle & distance in MICROTACK and electrode grinding angles**
- In manual tacking gas nozzle can be used for support on sheet surface
- Nozzles edge is used as an hinge to remove electrode to right distance (Contact ignition)
- Nozzles edge offers also a good support and speeds up tacking (HF ignition)
- MICROTACK tack is appr 4 times smaller in size compared to normal TIG
- Electrode Ø 3,2mm in tacking of 2,0mm thick Stainless steel sheets

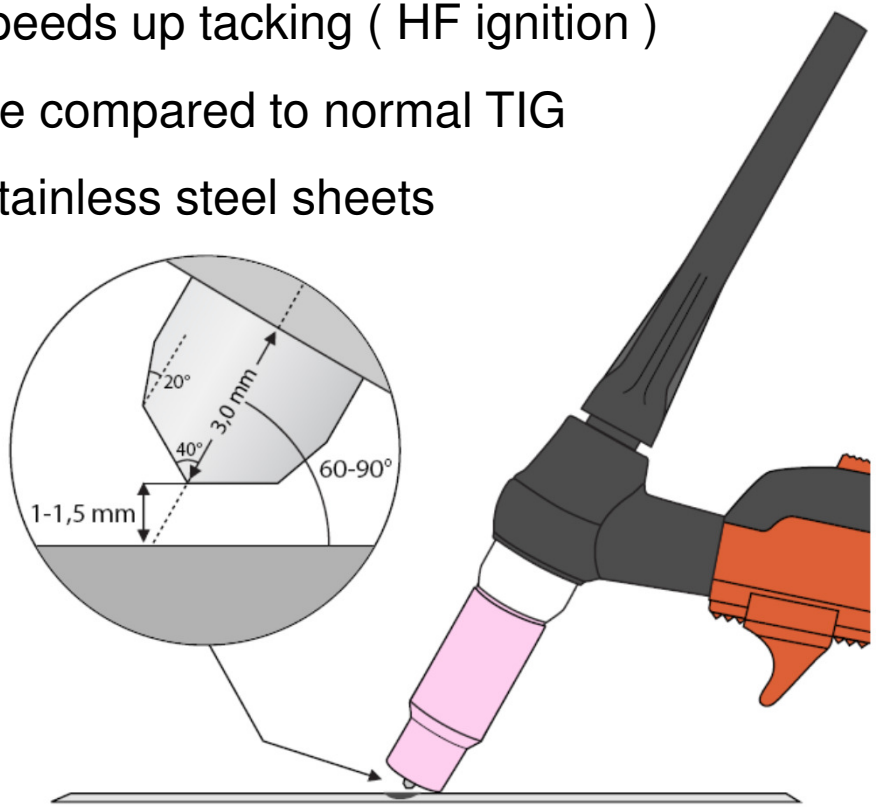
- **Sample on Ss sheets**

MICROTACK



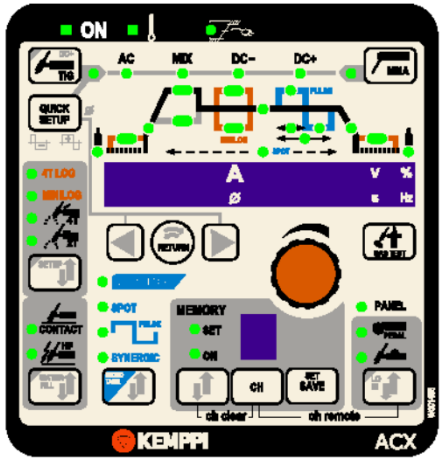
Normal TIG





Welding characteristics

- **PANEL** ➔ Current set from panel potentiometer
- **PEDAL** ➔ Set used min and max Amperes in LO / HI range
  - Operates on 2T torch trigger selection
- **TORCH** ➔ Current set from optional TIG torch potentiometer
  - RTC 10 operates also as MEMORY channel selector



Foot pedal R 11F
(6185407)

R 10
(6185409)

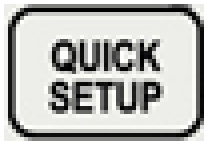
RTC 10
(6185477)

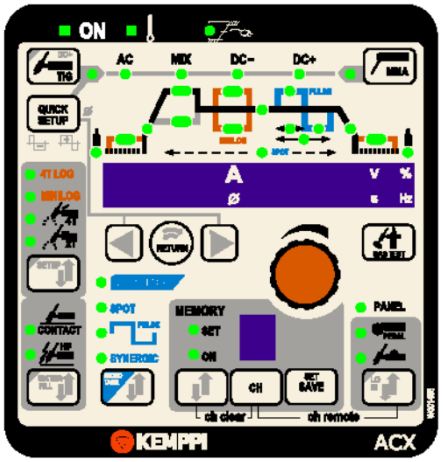
- **Full remote control increase Productivity**

KEMPPI
The Joy of Welding

Quick SETUP functions

- Function allows easy and fast access to modify parameters
  - Needed to change often / daily or depending of welding application





- **Adjustable parameters:**
- MIX TIG AC time (AC 10…90%), Factory set 50%
- MIX TIG AC + DC Cycle time (CYc 0,1…1,0s), Factory set 0,6s
- MIX TIG DC current (DC 50…150%), Factory set 100%
- AC Balance (bAL -50…0 %), Factory set -25%
- AC Frequency (FrE 50…250Hz), Factory set 60Hz
- AC wave form selection (SinuS / SquArE), Factory set Square
- 2T Hot Start time (H2t 0,1…5,0s), Factory set 1,0s
- MICROTACK Spot welding time (Spt 1…200ms), Factory set 10ms
- MICROTACK (Pco), AC Current pulses (1…5)

Technical data

- **MasterTIG MLS™ 2300 ACDC**

Mains Voltage		1 ~ 230V +/- 15%	
Mains cable 3,3 m / 16A Delayed fuse		3 x 2,5 mm²	
Max Output (AC & DC)			
	TIG	230A	40%
	MMA	180A	40%
100% Current	TIG	170A	
	MMA	120A	
Minimum Current	MMA	10A	
	TIG	3A (AC 5A)	
Open circuit Voltage		60V (<35V in AU version)	
AC Frequency		50…250 Hz	
Power Factor		0,99	
Efficiency		0,82 % (180A / 27,2V)	
		0,78 % (230A / 19,2V)	
Open circuit Power		6,0 W	
Electrode sizes		1,5 - 4,0 mm	
Size (l x w x h)		430 x 180 x 390 mm	
Weight		15 kg	

Gas cooled TTC TIG torches

- **GAS COOLED TIG TORCHES**

TTC 130
130 A / 40 %

TTC 130 F
130 A / 40 %

TTC 160
130 A / 40 %

TTC 160 S
130 A / 40 %

TTC 220
220 A / 40 %

Water cooled TTC TIG torches

- **WATER COOLED TIG TORCHES**

TTC 200 W
200 A / 100 %

Water cooled model torch TTC 250 WS, with S-neck allow also welding to the negative neck angles (pipes)

TTC 250 WS
200 A / 100 %

TTC 250 W
250 A / 100 %

Options

- **Transport units**

T 110

(6185251)

- T 110 without cooler and with small gas bottle

T 130

(6185222)

- T 130 with cooler and big gas bottle

Ordering numbers

Power source	
Mastertig MLS™ 2300 ACDC	6162300
Panels	
ACS	6162805
ACX	6162804
Cabels	
Welding cable, 16 mm² 5 m	6184103
Welding cable, 25 mm² 5 m	6184201
Welding cable, 25 mm² 10 m	6184202
Welding cable, 35 mm² 5 m	6184301
Earth cable, 16 mm² 5 m	6184113
Earth cable, 25 mm² 5 m	6184211
Earth cable, 25 mm² 10 m	6184212
Earth cable, 35 mm² 5 m	6184311
Torches	
TTC 160, 4 m	627016004
TTC 160, 8 m	627016008
TTC 160, 16 m	627016016
TTC 220, 4 m	627022004
TTC 220, 8 m	627022008
TTC 220, 16 m	627022016
Gas flow meter Argon/clock	6265136

Cooling unit	
Mastercool 20	6162900
Water-cooled torches	
TTC 200W, 4 m	627020504
TTC 200W, 8 m	627020508
TTC 200W, 16 m	627020516
TTC 250W, 4 m	627025504
TTC 250W, 8 m	627025508
TTC 250W, 16 m	627025516
Optional device	
TIG torch controls	
RTC 10	6185477
RTC 20	6185478
Remote control	
R 10	6185409
R11F	6185407
Transport unit	
T130	6185222
T110	6185251