

# TECHNICAL MANUAL FOR PROMIG EVOLUTION 501, 501L, 511 & 530

(version 1.0)



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# General maintenance

**Maintenance of the wire feeder will normally consist of:**

- Visible checking for possible damages
- General cleaning of the wire feeder
- Checking and cleaning of wire feeding mechanism and especially consumable parts like wire guide tubes, feed rolls, gear wheels, etc.
- Checking and testing of controlling components like switches and potentiometers.
- Function testing
- Test welding

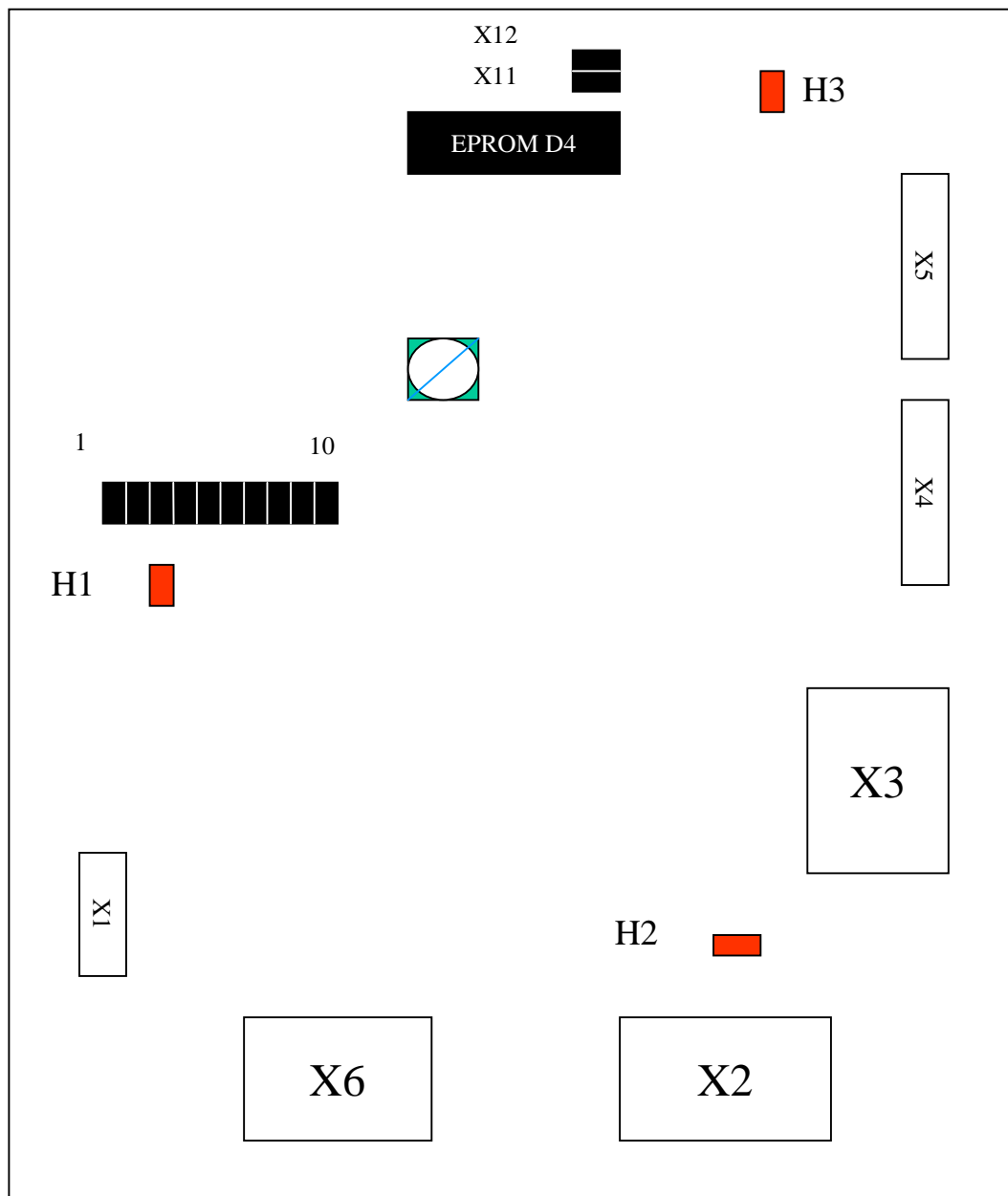
## **NOTE !**

Only person who have electrical engineering competence (fulfil the requirements of local laws and rules) and trained by Kemppi Oy is allowed to make maintenance and possible reparations for Kemppi -products.



# Control card A001

## Layout



# Control card A001

## LED indicators

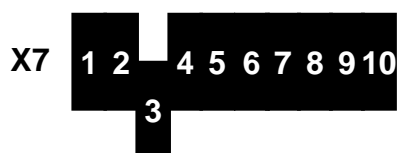
- **H1: *CONTROL CARD POWER SOURCE OPERATION***. Indicates the functioning of control card's power source section.
- **H2: *REMOTE CONTROLLER VOLTAGE***. Indicates the presence of +5 Volts in the remote control circuit. If the LED is off there is a short circuit in the remote control circuit.
- **H3: *SERIAL COMMUNICATION***. Indicates serial communication functioning in continuous state. Blinking at the moment of supply voltage connection indicates, that the processor can't detect the panel type. Panel detection is run through connector X4 pins 5, 7 and 8.

## Trimmer R113

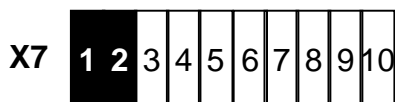
- **R113: *BURNBACK TIME***. Possibility to adjust burnback time.

# Control card A001

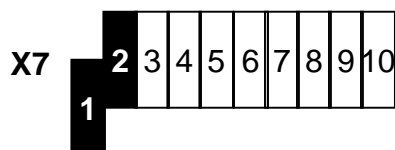
## Jumper functions (jumper block X7)



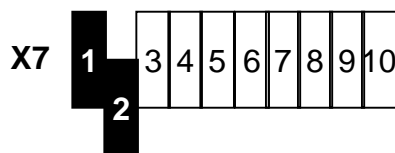
Factory setting



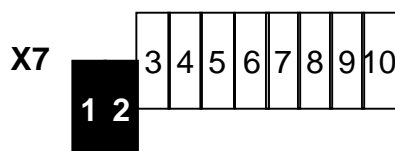
Wire feeder 1 (address 102)



Wire feeder 2 (address 105)



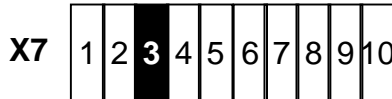
Wire feeder 3 (address 150)



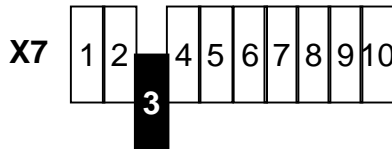
Wire feeder 4 (address 153)

# Control card A001

## Jumper functions (jumper block X7)



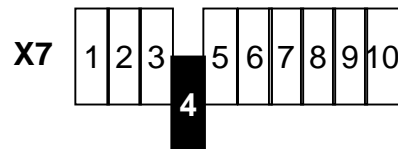
Gas/Water cooled gun selection switch by-passing (always in water position).



Gas/Water cooled gun selection switch by-passing (selection controlled by Gas/Water selection switch).



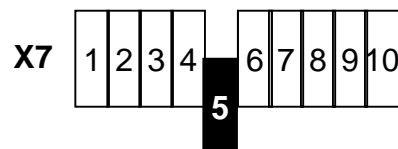
Output is linear according to potentiometer turning angle.



Output is linear according to control voltage:  
Wire feeding: 0- 5V  $\Rightarrow$  0 - 18, 25m/min.  
Voltage: 0- 5V  $\Rightarrow$  0 - 50V.



PMT and RMT 10 additional properties in operation.



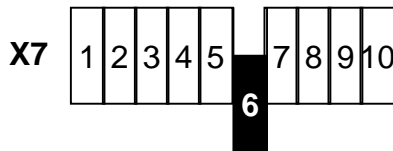
PMT and RMT 10 additional properties NOT in operation (Err 11).

# Control card A001

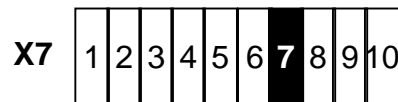
## Jumper functions (jumper block X7)



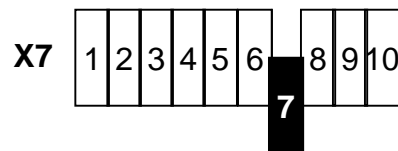
Local control function is switched on automatically, when remote controller is disconnected.



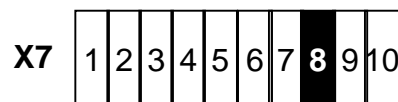
Remote control function stays on, when remote controller is disconnected.



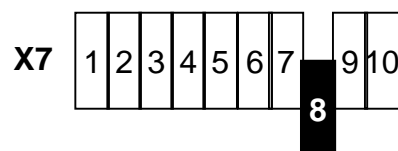
4T HOT START **not** in use (*MC / ML -panel*).



4T HOT START in use (*MC / ML -panel*).



- No crater filling (*MC / ML -panel*).
- 2T procedure (*without panel*).

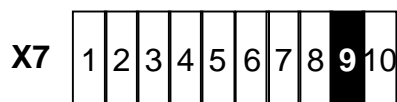


- Crater filling in 4T procedure with synergic MIG/PULSMIG (*ML -panel*).
- Crater filling in 4T (*MC -panel*).
- 4T procedure (*without panel*).

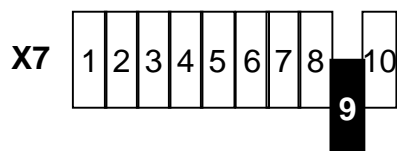


# Control card A001

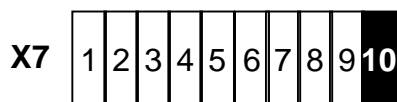
## Jumper functions (jumper block X7)



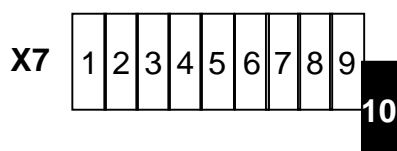
Fe synergic MIG / PULSMIG (*ML –panel*).



AlSi synergic MIG / PULSMIG (*ML –panel, extra sticker*).



Wire feeding max. speed 18 m. / min.



Wire feeding max. speed 25 m. / min.

# Control card A001

Jumper functions (jumper block X10 “software selection”)

X10		Promig Evolution software
X11		

X10		Promig software
X11		

X10		Promig INOX software
X11		

X10		Promig Opel special software
X11		

# Control card A001

## Error codes

### Error 1:

- MMA/2T/4T -selection switch is turned into MMA position when source is already welding with another method (MMA local control from power source or from TIG).
- MMA/2T/4T -selection switch is turned into MMA position and there is malfunction in connection between power source and wire feeder (intermediate cable or connectors).

### Error 2:

### Error 3:

- Torch switch is pressed down when the power source is already welding.

### COOLER Error 4:

### COOLER Error 5:

- This error message appears if the the water/gas selection switch has been turned into “water” position. Possible reason for this error message can be:
  - Disconnection of the supply voltage to the cooling unit
  - Cooling unit is not switched on (Procool 10)
  - Probus is not connected (Procool 10)
  - Pressure switch and/or cooling liquid PTC is not connected (Procool 30)
  - Cooling liquid is too hot
  - Cooling liquid pressure is too low
  - Pressure switch is dirty

# Control card A001

## Error codes

### Error 8:

- PMT torch has overheated. This function can be disabled by removing jumper 5 when using standard MIG guns (without RMT-10 and overheat protection facilities).

### Error 9:

- Overload of wire feed motor.

### Error 10:

- Power source does not start, when start message is sent. This error can be caused by following reasons (for example):
  - Power source overheated
  - Power source faulty
  - Two wire feeders with same address (jumpers 1 & 2) has been connected to the Probus.

### Error 11:

- Jumper 5 (which prevents PMT-torches RMT-10 and overheat protection facilities) has been removed from control card and and PMT torch has been connected to wire feed unit.

### Error 12:

- The link between X3,4 and X3,6 is open.

# Control card A001

## Error codes

### Error 14:

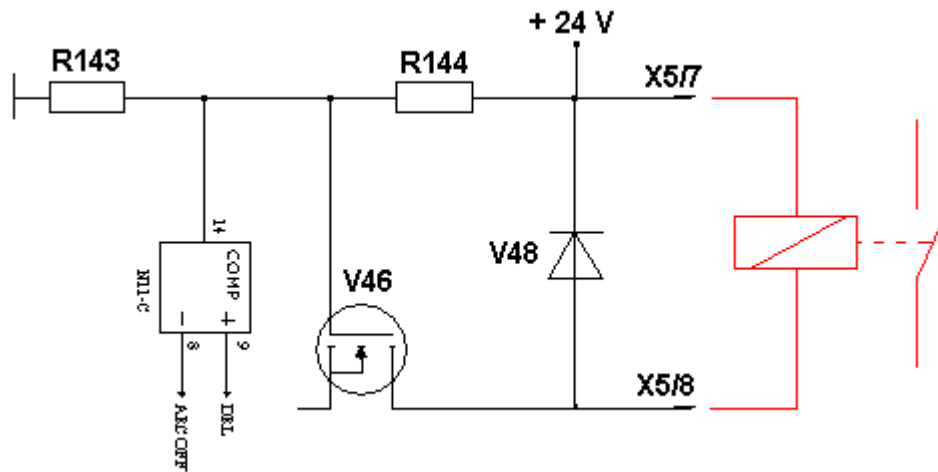
- Wire feeder supply voltage >70 VDC

## Error codes removal

- Error code **Error 1** is removed, when Promig Evolution feeder is set to MIG mode.
- Error code **Error 2...4** is automatically removed in 5s, if the trigger is not pulled. The cause of this error code should be eliminated before next start.
- Error codes **Error 5...14** are removed during next start, if the causes of these error codes are eliminated.

# Control card A001

## Arc ON/OFF -signal



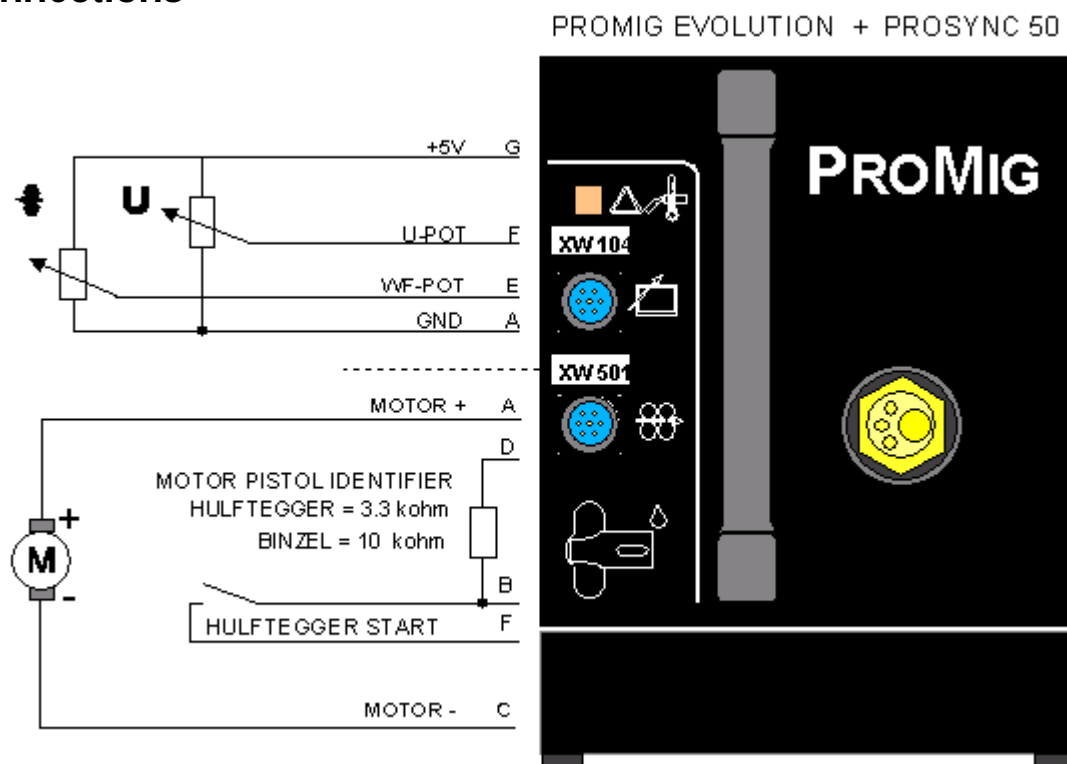
Arc on/off-signal can be used to control for example mechanization devices ON/OFF.

# Prosync 50 (6263121)

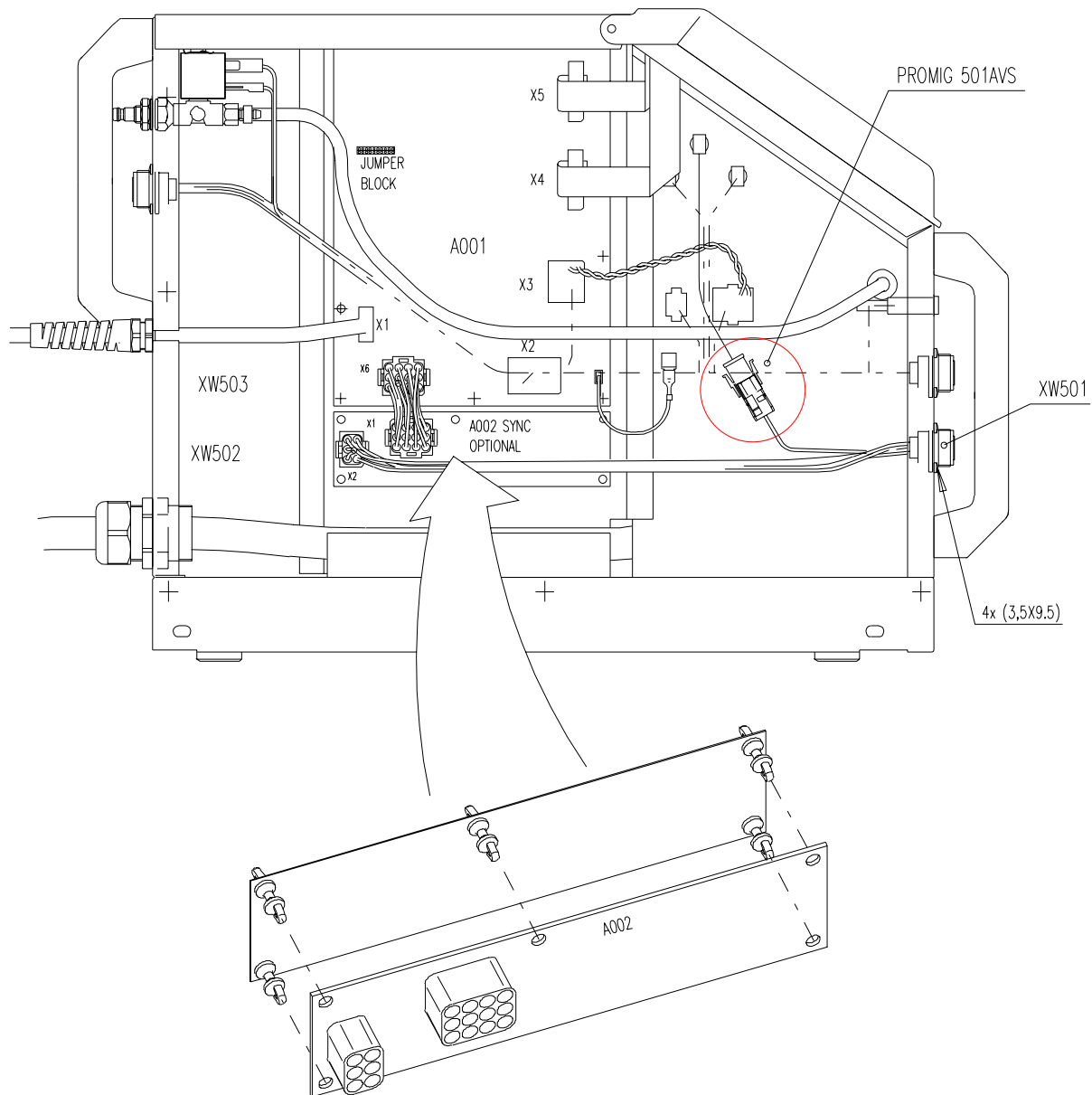
## Mounting instruction

- Install synchronisation card A002 (Prosync 50) to the Promig. See next page.
- Install connector XW501 (“military-type”) to the machines front panel. Use 3,5 x 9,5 mm. screws (included to the delivery).
- Connect connector XW502 (6-pole) from the XW501 to the connector X2 on the synchronisation card A002.
- Connect connector XW503 (12-pole) to the connector X1 on the synchronisation card A002. Connect connector XW504 (12-pole) to the connector X6 on the control card A001.
- NOTE !! 2-pole connector is used only with Promig AVS models.

## Connections



# Prosync 50 (6263121)





# Troubleshooting

PROBLEM	POSSIBLE CAUSE	REMEDY
The Promig Evolution doesn't work at all. Wire feeding motor or solenoid valve is not operating. Panel displays are not working.	Fuse F2 6,3A in the power source is blown.	Change the fuse and check that there are not any short circuits in control cable.
	The control cable is not properly connected or connector X1 in the control card A001 is loose or broken.	Check Promig operation voltage +50 VDC from the connector X1/1 and X1/3. Check that all LED indicators are illuminating.
	Control card A001 is faulty	Replace the control card A001, if needed.
The panel P001 (MC, ML, MXE) in Promig Evolution is not operating properly or control of the Promig Evolution is not working.	Connection cables between panel and control card A001 are loose or they are cross connected.	Check that the connection cables are connected according to main circuit diagram.
	Faulty EPROM D4 (M27C4001).	Replace the faulty EPROM.
	Faulty panel P001.	Replace the faulty panel.
The wire feeding motor M001 does not start, when torch switch is closed.	Faulty switch, poor connection in start lines or problem with start line wire insulators.	Check the switch and start line wires of the MIG gun. Replace if needed.

# Troubleshooting

PROBLEM	POSSIBLE CAUSE	REMEDY
The wire feeding motor M001 does not start, when MIG gun switch is pressed.	Start line wires are cross connected.	Locate the cross connection to the MIG gun or to the Promig Evolution and correct it.
Wire feeding can not be stopped, when PMT gun with RMT-10 remote controller is connected to the feeder.	Start line wires are cross connected.	Locate the cross connection to the MIG gun or to the Promig Evolution and correct it.
Remote controller (R10, R20) does not work.	Defective remote controller or short circuit in the remote controller cable.	Change or repair the remote controller.
	LOCAL/GUN/REMOTE -switch is in wrong position or broken.	Check and correct position of the LOCAL/GUN/ REMOTE –switch. Replace switch if needed.
Solenoid valve Y001 is not working: gas is flowing all the time or the gas is not flowing at all.	Faulty solenoid valve or malfunction in the control card A001.	Check the control voltage (24 VDC) of the solenoid valve from connectors X2/10 and X2/13. If voltage exist, the solenoid valve is faulty.

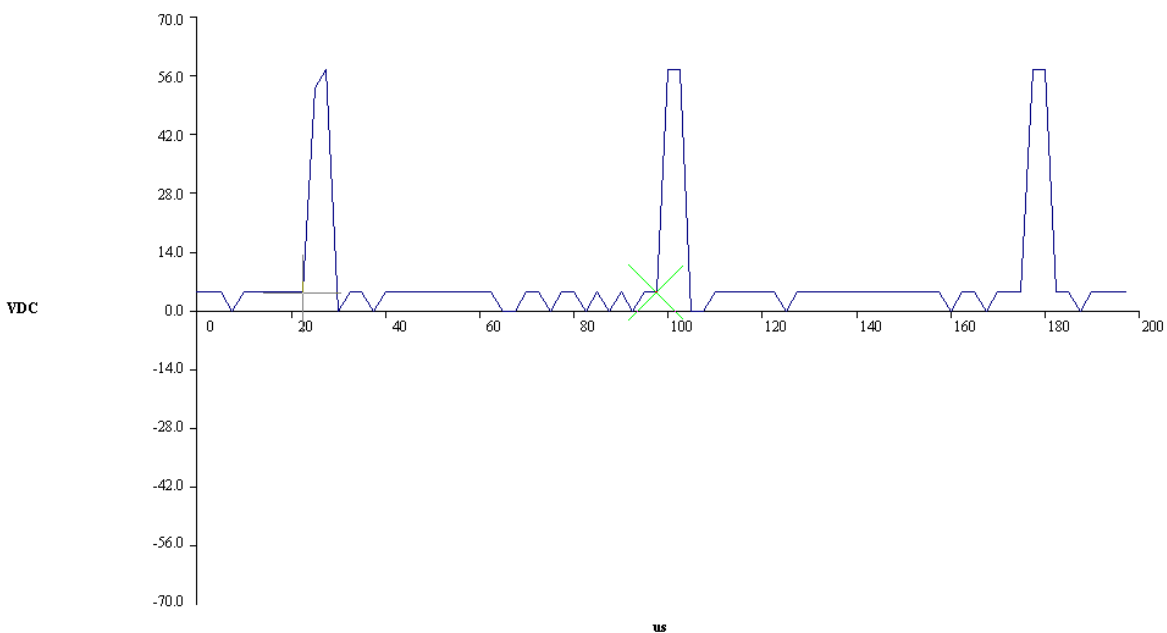
# Troubleshooting

PROBLEM	POSSIBLE CAUSE	REMEDY
Welding is breaking when the welding wire is touching the piece.	Short circuit between cables inside of the torch.	Check is there galvanic connection between welding current cable and start lines. Repair or replace cables if galvanic connection exist.
Disturbance in start or welding is interrupted without any error message.	The start line wire may be in contact with the brass body of quick coupling (EURO - connector). Also moisture could cause this problem.	Measure resistance between start lines and body of the quick coupling (EURO -connector). Resistance should be higher than 2.5 Mohm. If resistance is lower, repair the MIG gun or change the body of the quick coupling (EURO – connector).

# Measurements

## Wire feed motor M001 control (1)

Wire feed speed: 1 m/min



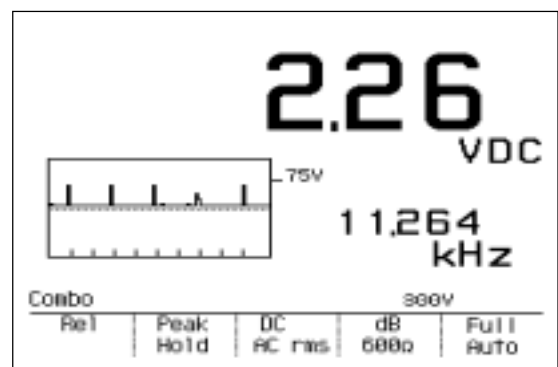
## Wire feed motor control

Wire feed speed: 1 m/min

$U_{\text{peak}}$ : 57 V

$U_{\text{average}}$ : 2,26 V

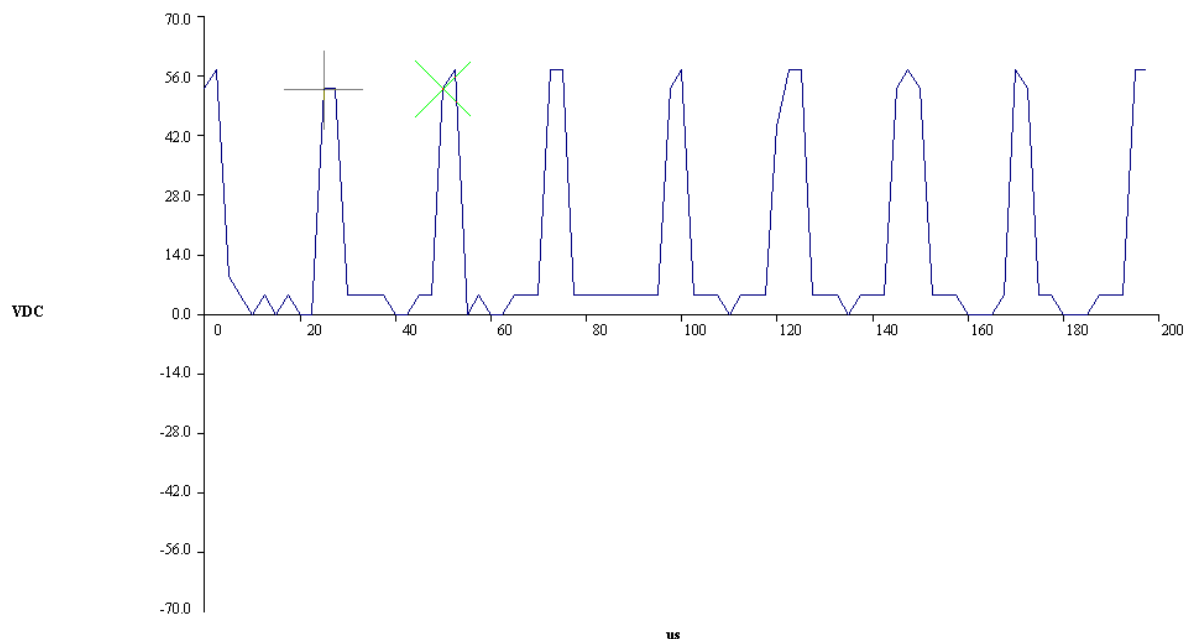
Frequency: approx. 11 000 Hz



# Measurements

## Wire feed motor M001 control (1)

Wire feed speed: 8 m/min



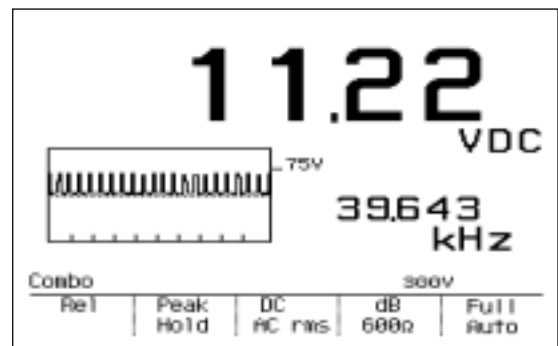
## Wire feed motor control

Wire feed speed: 8 m/min

$U_{\text{peak}}$ : 57 V

$U_{\text{average}}$ : 11,22 V

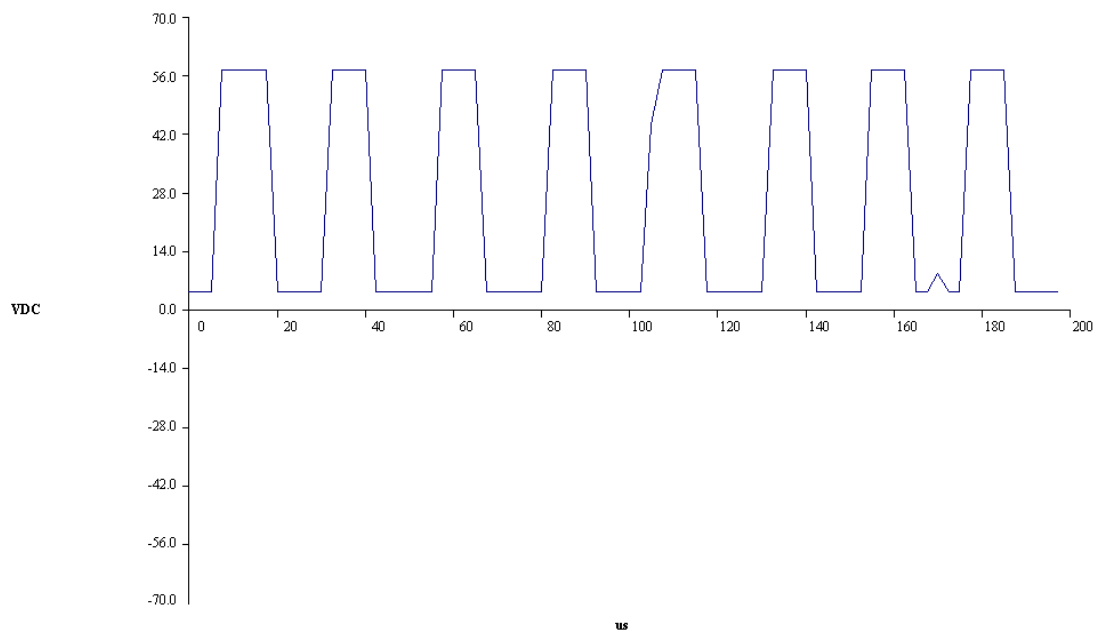
Frequency: approx. 40 000 Hz



# Measurements

## Wire feed motor M001 control (1)

Wire feed speed: 18 m/min



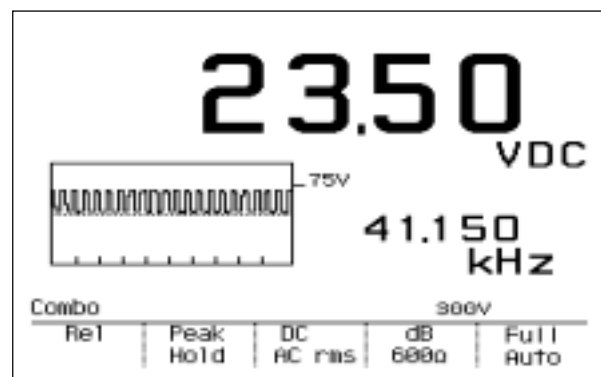
## Wire feed motor control

Wire feed speed: 18 m/min

$U_{\text{peak}}$ : 57 V

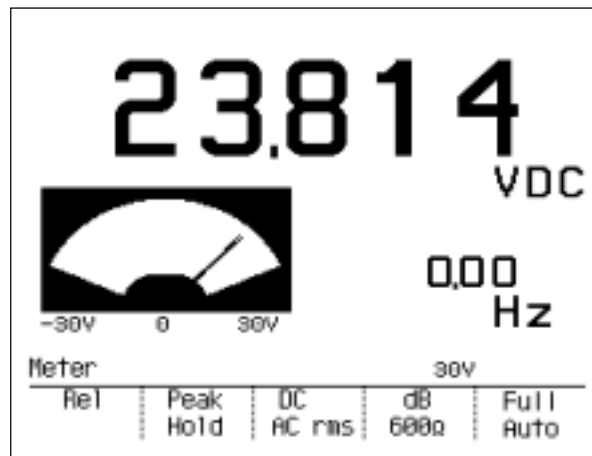
$U_{\text{average}}$ : 23,50 V

Frequency: approx. 40 000 Hz



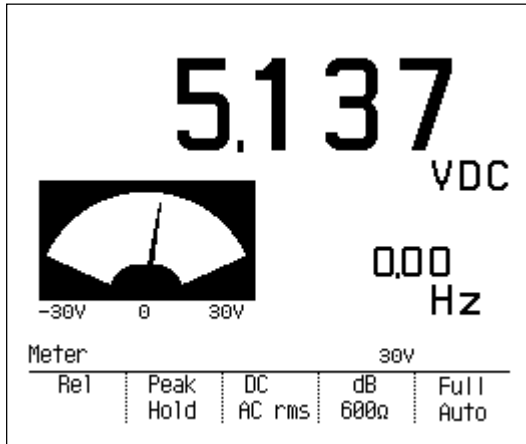
# Measurements

Solenoid valve Y001 control (2)

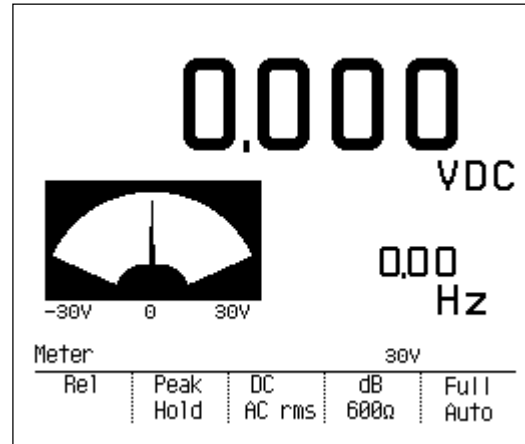


# Measurements

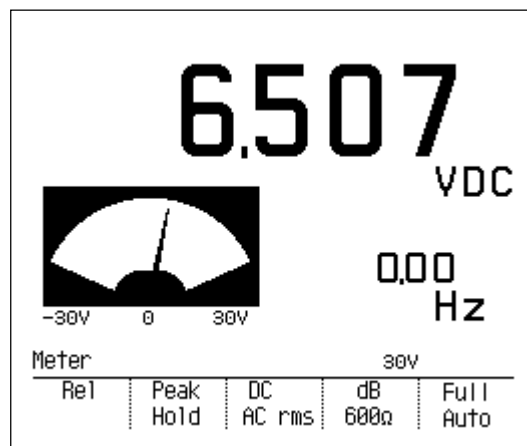
Remote controller connector (3)



Remote controller, max



Remote controller, min



No remote controller



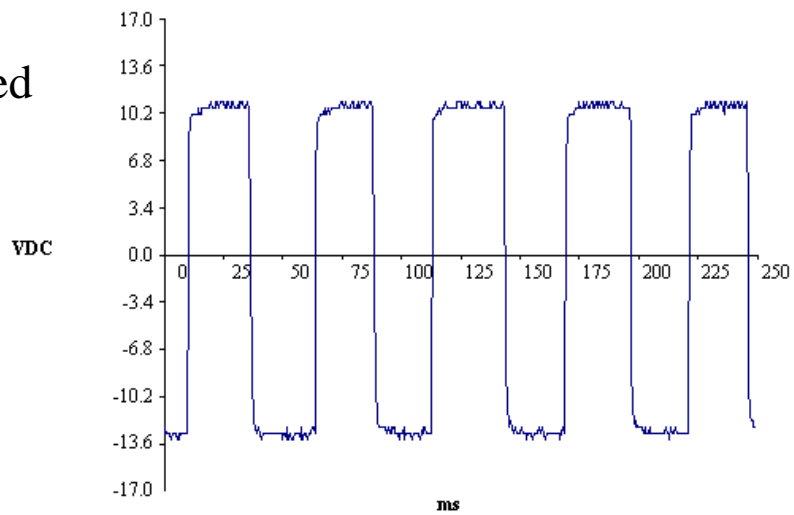
# Measurements

## MIG gun connection (4)

PMT-gun connected

$U_{\max}$ : 11,9 V

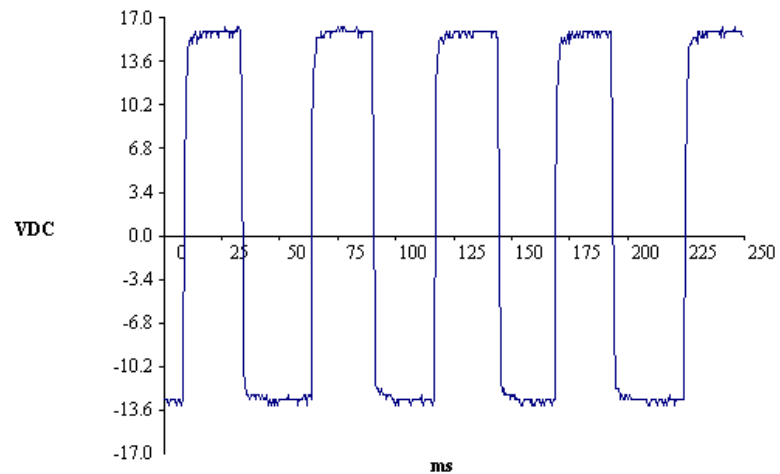
$U_{\min}$ : -13,3 V



MT-gun connected

$U_{\max}$ : 16,4 V

$U_{\min}$ : -13,3 V



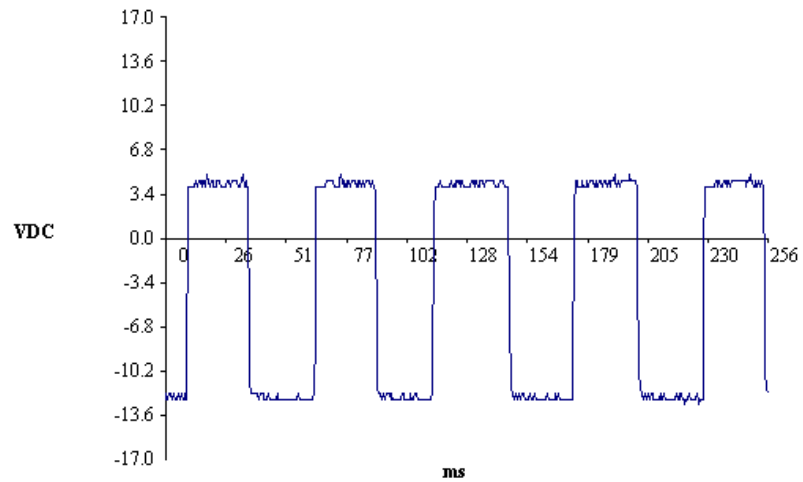
# Measurements

## MIG gun connection (4)

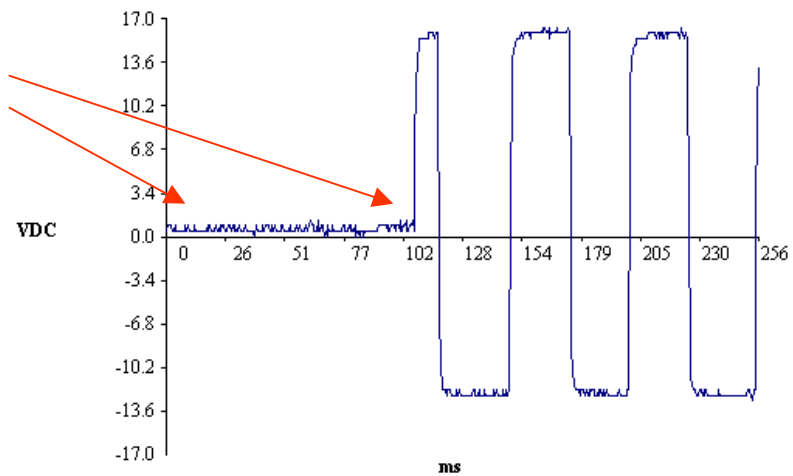
PMT-gun / start

$U_{\max}: 4,9 \text{ V}$

$U_{\min}: -12,8 \text{ V}$



MT-gun / start



# Measurements

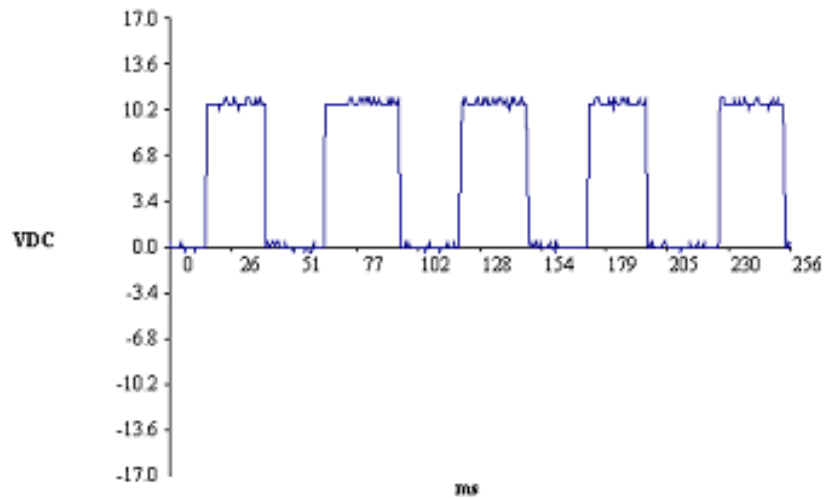
## MIG gun connection (4)

PMT-gun

RMT-10 pos. 1

$U_{\max}$ : 11,1 V

$U_{\min}$ : -0,4 V

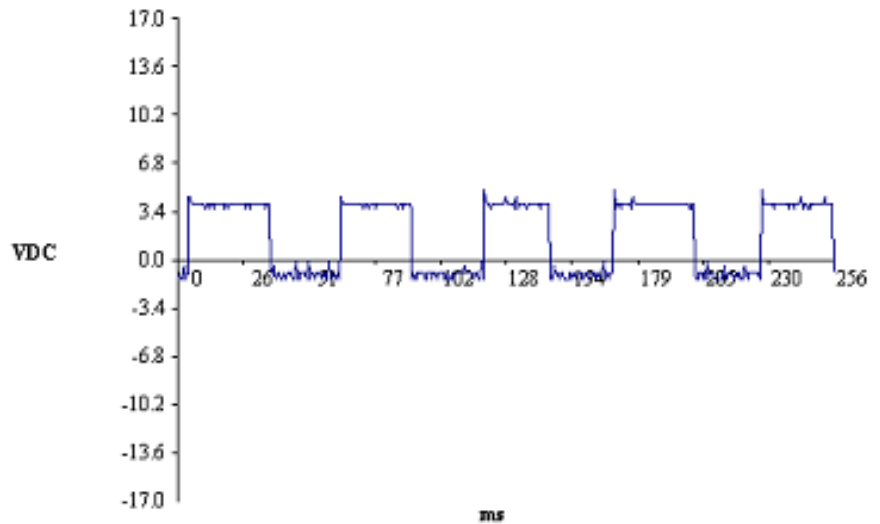


PMT-gun

RMT-10 pos. 1 + start

$U_{\max}$ : 4,9 V

$U_{\min}$ : -1,3 V



# Measurements

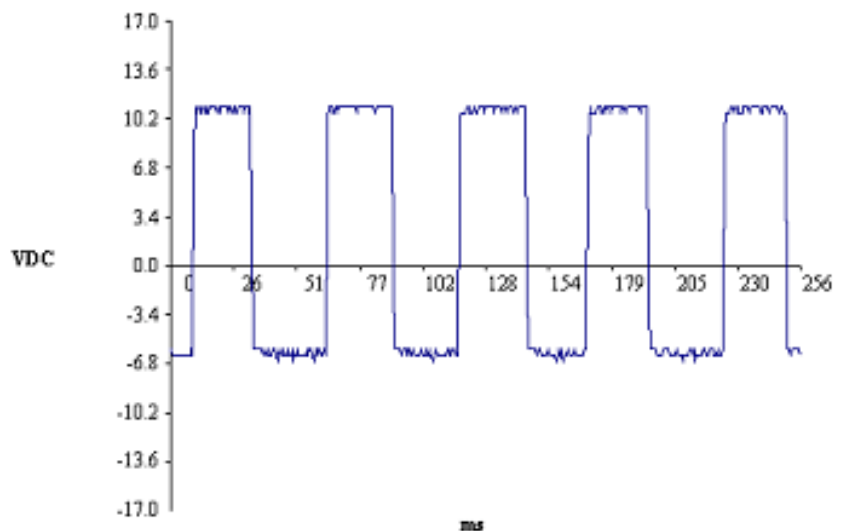
## MIG gun connection (4)

PMT-gun

RMT-10 pos. 3

$U_{\max}$ : 11,1 V

$U_{\min}$ : -6,6 V

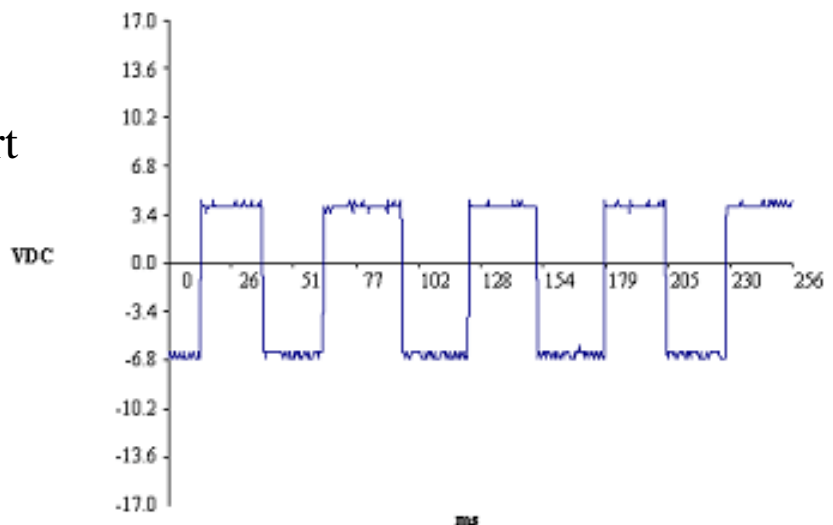


PMT-gun

RMT-10 pos. 3 + start

$U_{\max}$ : 4,4 V

$U_{\min}$ : -6,6 V



# Measurements

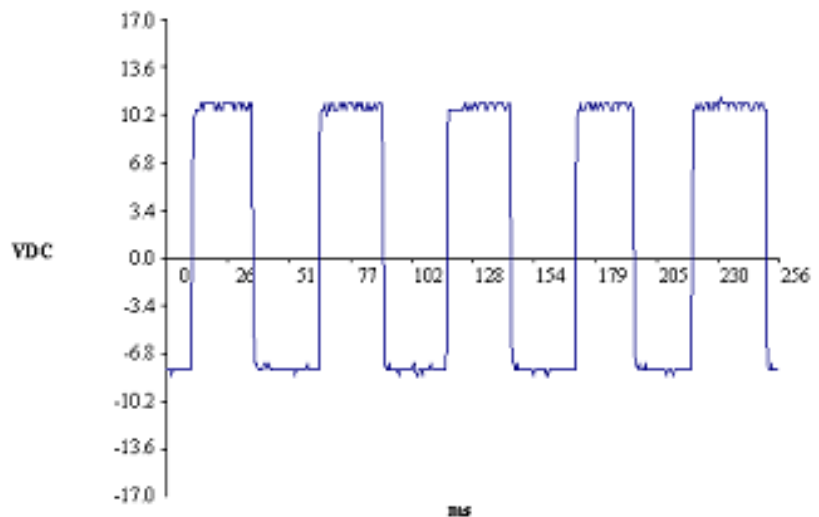
## MIG gun connection (4)

PMT-gun

RMT-10 pos. 5

$U_{\max}$ : 11,5 V

$U_{\min}$ : -8,4 V

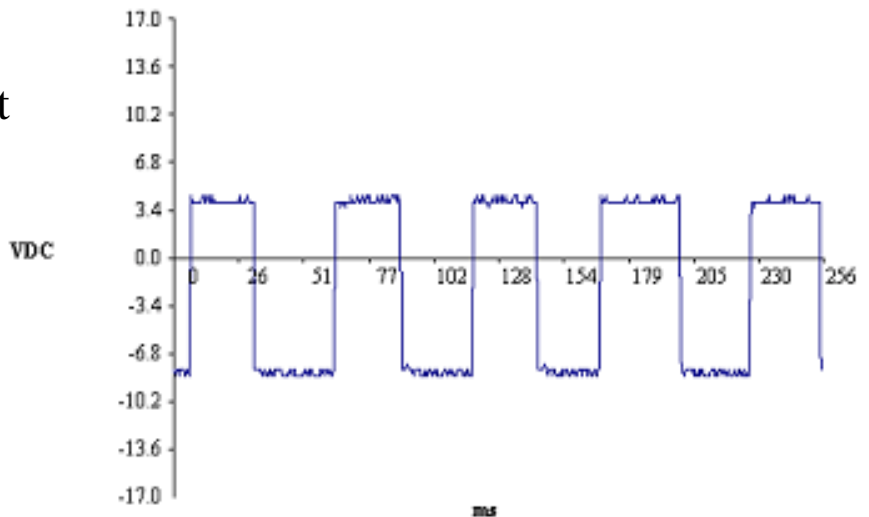


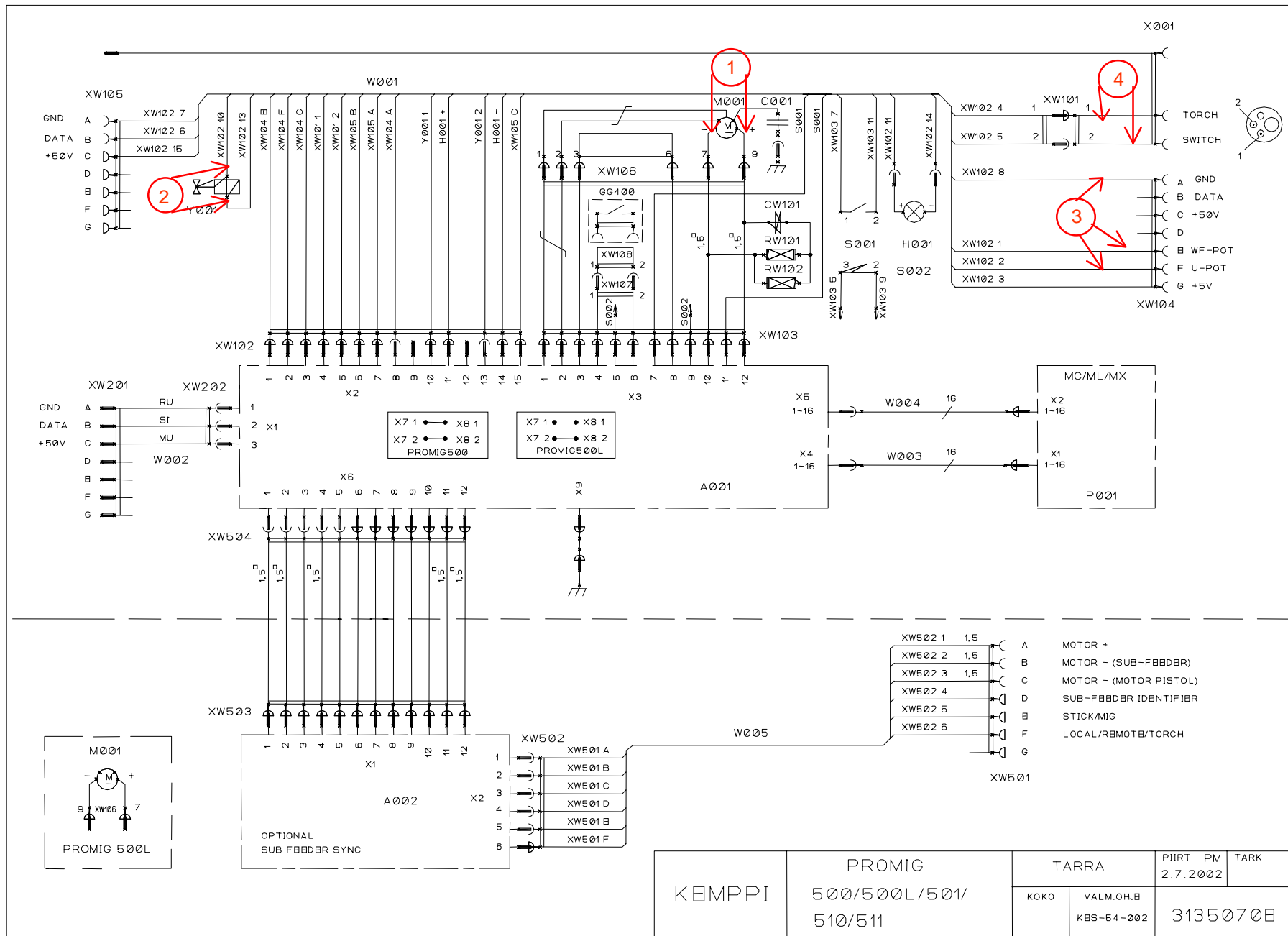
PMT-gun

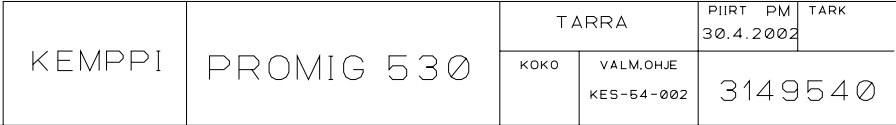
RMT-10 pos. 5 + start

$U_{\max}$ : 4,4 V

$U_{\min}$ : -8,4 V







# Notes