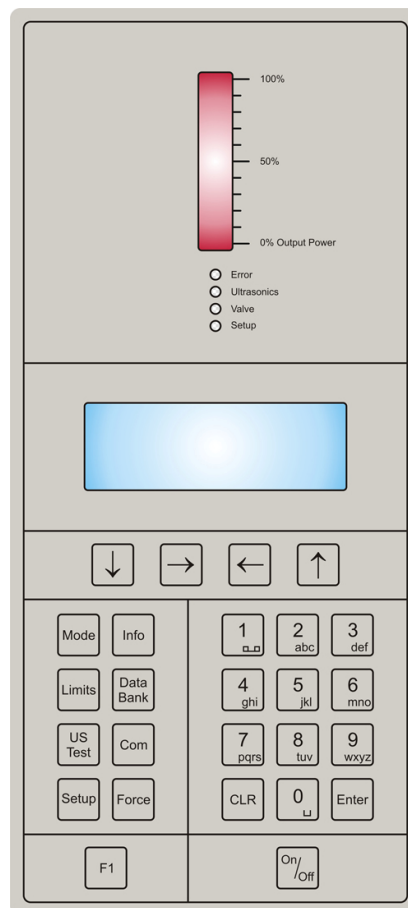


Operating Manual

Ultrasonic Generator

Viper XL



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1 Safety Instructions

The design of the generator conforms to the current state of engineering and is safe to use.

The parts and the complete unit are subject to continual inspection by our quality assurance department.

The generator is intended exclusively for the ultrasonic welding of thermoplastic materials. Any other use is regarded as inconsistent with the intended purpose, and is undertaken at the user's own risk. The manufacturer is not liable for any resultant damage.

Before you are using this generator the first time you must read this instruction manual carefully. In case of lack of knowledge of the user, malfunction on the unit can result in damage. Always keep this instruction manual next to the unit.

Do not make any modifications which might endanger safety without permission of the manufacturer.

Work on the unit may only be performed by reliable staff.

ATTENTION !!!

Before you open the cover of the generator you must remove all connections.

Do not touch any part inside of the generator before all LED on the main board are dark. The capacitors are still loaded for some time after power off.

See chapter POSITION FUSES AND LED for the position of the LED.

ATTENTION !!!

Be sure to fit the power connection with a grounded connector.

2 Technical Data

Pos	Function	Specs
1	Input Voltage	190 - 265 V AC / 50-60 Hz
2	Size	H 280 x W 125 x L 420
3	Line Filter	Integrated
4	Weight of 35 KHz 600 & 900W	7.5 kg
5	Weight of 20 kHz 1000 & 1500W	7.5 kg
6	Weight of 20 kHz 2000 & 3000 W	8.5 kg
7	Colour	RAL 3020 red
8	Display	4 x 20 Characters with backlight
9	LED Bar	20 LED with Peak Memory for Output power
10	LED	4 LED for Status
11	Keyboard	24 Keys plus on/off
12	Microcontroller Generator	16 bit / 20 MHz
13	Microcontroller Controller	16 bit / 16 MHz
14	AD / DA Converter	12 bit
15	Power Measuring	Real Time
16	Frequency Range	19700 - 20150 Hz, 34700 - 35150 Hz
17	Auto tuning	Real time
18	Power Loss Measuring	Before , after, off
19	Nominal Output power	600, 900 W at 35 kHz
20	Nominal Output power	1000, 1500, 2000, 3000 W at 20 kHz
21	Maximum Output power	10 % above nominal Power
22	Constant Amplitude	205 -265 V AC
23	Internal Amplitude	60 to 100% at 5 % steps
24	External Amplitude	60 to 100% at 5 % steps
25	Time Mode	0.005 - 9.999s
26	Energy Mode	0 - 99999.99Ws
27	US Stop Mode	Integrated
28	Travel Mode	0 – 500.00mm / Tolerant +/- 0.01mm
29	Power Mode	0 - 100 %
30	Force Trigger	0 – 6.5 bar / Sensor 4 - 20 mA
31	Time Trigger	0 - 9.999s
32	Power Output Analog	0 – 5 V
33	Controller for Welding Press	Dual Palm Button & Pneumatic Press
34	Parts and Reject Counter	999999999
35	Speed reduction over Travel	0 – 500.00mm
36	Inputs	Opto coupler 20 - 28 V DC / max. 7 mA
37	Integrated Power Supply	24V DC / 400 mA stabilized & short circuit protected
38	Outputs	Opto coupler 22 - 26 V DC / 250 mA short circuit protected
39	Emergency Stop	Message in Display
40	Error Message	Display / Hardware Output
41	Interface for PLC	Various digital Input and Output
42	Data Bank	99 Memories
43	Software Update	BDE Interface
44	Buzzer	Confirmation Of Keyboard & Error Message
45	Connectors	All Standard D SUB
46	Pin Code	4 digit to protect access to parameters
47	Main Power Switch	On the back Panel
48	Languages	E,D,SP,F,I,P,S,DK,N,SF;NL,CZ,PL,RO,SLO,H,TR
49	Service Program	Hardware Test for all Input & Output
50	Temperature	-5°C ~ 45°C / Stock -20°C ~ 60°C
51	Design & Production	Switzerland

3 Power on Message

All LED will be alight during Power on. After some time the following display will be shown.

Generator Init

Made in Switzerland www.apsonic.com Viper XL 20 – 1500 Version V 1.1a
--

123456789	TM / 99
1.000s	1000W
9999.9Ws	2000W
199.99mm	20.00kHz

Welded Parts
Weld Time
Energy
Travel

Mode / Data Bank Number
Power
Power Maximum
Frequency

The power on routine will take about 7 s until it is executed. As soon as you can see the Welding Results in the Display, then the unit is ready for the next Welding Cycle.

Output 5 on X3 Pin 12 **READY** will be activated at the same time.

If there is no Travel Sensor in the Welding Press, then the display will be as below

123456789	TM / 99
1.000s	1000W
9999.9Ws	2000W
-----	20.00kHz

Welded Parts
Welding Time
Energy

Mode / Data Bank Number
Power
Power Maximum
Frequency

4 Key Functions

Mode	Select Welding Mode
Limits	Select Limits Menu
US – Test	US – Test
Setup	Select Setup Mode Menu
Data Bank	Select Data Bank Menu
Info	Select Information Menu
COM	Select Communication Menu
Force	Select Proportional Valve Menu
F1	Select Special Function Menu
CLR	Clear Error Message, Counter, Character Press key for 1 s to clear the whole line, Scrolling through the saved data in the Data Bank Menu
Enter	Confirm any numeric Input
←	Scrolling to the left within a line / select a fix value within the line
→	Scrolling to the right within a line / select a fix value within the line
↑	Scrolling up within a menu
↓	Scrolling down with a menu
0	Input parameter / 0 ; space
1	Input parameter / 1 ; . ; - ; : ; /
2	Input parameter / 2 ; a ; b ; c ; A ; B ; C
3	Input parameter / 3 ; d ; e ; f ; D ; E ; F
4	Input parameter / 4 ; g ; h ; i ; G ; H ; I
5	Input parameter / 5 ; j ; k ; l ; J ; K ; L
6	Input parameter / 6 ; m ; n ; o ; M ; N ; O
7	Input parameter / 7 ; p ; q ; r ; s ; P ; Q ; R ; S
8	Input parameter / 8 ; t ; u ; v ; T ; U ; V
9	Input parameter / 9 ; w ; x ; y ; z ; W ; X ; Y ; Z
on / off	Power Switch (for details see chapter power switch)

5 Welding Cycle of a Press in CE Mode

Press to the dual palm button within 300 ms. The horn will move downward. Keep the buttons pressed until the **SAFETY SWITCH** is reached.

After the **SAFETY SWITCH** is activated the **TRIGGER (Time or Pressure)** starts. After the **TRIGGER** is elapsed the welding will start. After the **WELD TIME *** is elapsed the horn will stay on the part until the **HOLD TIME** is elapsed.

Then the horn will go back to the home position.

Press **CLR** to or activate **Input 7 RESET** to abort the cycle at any time.

Press **CLR** to or activate **Input 7 RESET** to reset an ERROR. The next start will reset the ERROR automatically.

* The Welding Time is depending on the selected Mode.

5.1 Option 1 : SYSTEM INIT US PULSE TIME = ON

After the **HOLD TIME** you can set a delay time (**DELAY US PULSE**). If the delay time is elapsed the Ultrasonics will be activated one more time. The time can be set in the menu **US PULSE TIME**.

This pulse is used to remove a part that is sticking on the horn.

5.2 Option 2 : SYSTEM INIT PRESS POSITION = DOWN

The horn will stay on the part after the welding, in case of an error during welding. Press **CLR** to return the press to its home position. An error will be displayed.

Press **CLR** to reset an ERROR.

5.3 Option 3 : BLOW

As on the back stroke the **SAFETY SWITCH** will open, the **BLOW WAITING TIME** will start. After the **BLOW WAITING TIME** is elapsed, **OUPTUP 8** on X3 Pin 15 will be activated for the set **BLOW TIME**.

The same signal is on **OUTPUT 9** on X6 Pin 3.

The option 1-3 can be activated in the **SYSTEM INIT MENU**.

6 Indicators

LED Bar red	Output Power	Output Power in 5 % steps. After welding, the maximum power is indicated by a LED.
LED red	Error	Alight in case of an error.
LED green	Ultrasonics	Alight if Ultrasonic is on.
LED green	Valve	Alight if valve output is active.
LED yellow	Setup	Alight if SETUP mode is active. Blinking if SYSTEM INIT mode is active.

7 Pin Code

7.1 Pin Code 1

To prevent access to the unit for unauthorized user there is a pin code. The system will automatically lock itself again after 10 minutes or after a power on/off.

Enter the Pin Code 1

0000

Enter the pin code / Standard = 9928 **Enter**

If the pin code in the **SYSTEM INIT MENU = 0000**, then there is no request for the pin code.

The pin code 1 is active in all menus except in the **SYSTEM INIT MENU**.

Press the **Setup** key to return to the welding menu. The **LED SETUP** is off.

123456789	TM / 99
1.000s	1000W
9999.9Ws	2000W
199.99mm	20.00kHz

Press the **CLR** key or power on/ff to lock the generator.

7.2 Pin Code 2

To prevent access to the unit for unauthorized user there is a pin code. The system will automatically lock itself again after 10 minutes or after a power on/off.

Enter the Pin Code 2

0000

Enter the pin code / Standard = 8828 **Enter**

If the pin code in the **SYSTEM INIT MENU = 0000**, then there is no request for the pin code.

The pin code 2 is only active in the **SYSTEM INIT MENU**.

Press the **Setup** key to return to the welding menu. The **LED SETUP** is off.

123456789	TM / 99
1.000s	1000W
9999.9Ws	2000W
199.99mm	20.00kHz

The generator is automatically locked.

8 Setup

This function can be used to adjust horn and fixture. The press will come done without activating the Ultrasonics.

Press the **SETUP** Key to activate the **SETUP MODE**.

Enter the Pin Code 1
0000

Enter the pin code / Standard = 9928 **Enter**

The yellow LED is alight if the **SETUP MODE** is active.

Press to the dual palm button within 300 ms. The horn will move downward. Keep the buttons pressed until the safety switch is reached. After the safety switch is reached then the display will be updated with the measured values. If you press the buttons again, then the horn will go back to the home position.

This is valid for **START MODE** Manual and Impulse.

In the **START MODE** automatic the valve is activates as long as Input 1 START 1 is activated. After the safety switch is reached then the display will be updated with the measured values.

Setup
Down Stroke
9.9bar

1-9. cursor right, cursor left, Enter

The Down stroke pressure can be 0.1 – 9.9 bar.

Setup
9.9bar
199.99mm 1111ms

Enter
Pressure
Travel
Down Speed Time

When the press is in the lower position then you can press **ENTER** to save the Reference Travel. This is only active in the Mode **Travel Reference**.

Press the **SETUP** Key again to return to the **WELDING MODE**.

The Down Speed Time is reflecting the down speed. So you can adjust the down speed on a speed throttle without scale. Please mind that you need to have the same stroke if you compare the down speed time. The time is getting long if the stroke is bigger or the down speed is higher.

9 US-Test

If you are pressing **US – TEST** an ultrasonic pulse will be activated. The minimum pulse time is 300 ms. After 5s the generator is automatically switching off.

ATTENTION !!!

Do not touch the horn during the US-Test.

9.1 Frequency range while tuning

20 kHz 20.000 – 20.050 Hz
 35 kHz 35.000 – 35.050 Hz

A new horn should be tuned within this range at 20 degree Celsius.

9.2 Frequency range during production

20 kHz 19.700 – 20.150 Hz *
 35 kHz 34.700 – 35.150 Hz *

* Booster 1:1.5 al and horn diameter 30mm and a gain of 1:1

US – TEST			
123456789	TM / 99	Welded Parts	Mode / Data Bank Number
1.000s	1000W	Weld Time	Power
9999.9Ws	2000W	Energy	Power Maximum
199.99mm	20.00kHz	Travel	Frequency

10 Amplitude Table

Depending on the output power each generator has different output amplitude. The output amplitude has a tolerance of +/- 2 %. The output amplitude of the horn is also depending on the output amplitude of the converter. The output amplitude of the converter has a tolerance of +/- 10 % .

Type	Basic Output Amplitude with Booster V1:1 & Horn V1:1
35 – 600	3.75 um
35 – 900	5.00 um
20 – 1000	6.50 um
20 – 1500	8.50 um
20 – 2000	9.00 um
20 – 3000	10.00 um

11 Welding Mode Menu

Welding Modes
Time Mode

Cursor left, right

Time Mode / Energy Mode / US Stop Mode

Travel Mode Absolute / Travel Mode Diff. / Travel Mode Ref.

11.1 Time Mode

Welding with constant Time

Limits : Energy Maximum & Energy Minimum

11.2 Energy Mode

Welding with Constant Energy

Limits : Time Maximum & Time Minimum

11.3 US – Stop Mode

Welding over Time by external Sensor

Control : Control Time

Limits : Energy Maximum & Energy Minimum

11.4 Travel Mode Absolute *

Welding over Absolute Distance from Home Position

Limits: Time Maximum, Time Minimum, Energy Maximum, Energy Minimum, Travel Tolerance + & Travel Tolerance -

11.5 Travel Mode Diff. *

Welding over Differential Distance from the Trigger

Limits : Time Maximum, Time Minimum, Energy Maximum, Energy Minimum, Travel Tolerance + & Travel Tolerance -

11.6 Travel Mode Reference *

Welding over Reference Distance

You need to place a reference part into the fixture. Lower the horn in the **SETUP** Mode on to the Reference part. Press the key **ENTER** to save the **DISTANCE REF. UP**.

Limits : Time Maximum, Time Minimum, Energy Maximum, Energy Minimum, Travel Tolerance + & Travel Tolerance -

* A travel sensor must be installed and the Jumper **EN** on Trigger Board TIP002 must be active. If the Jumper **EN** is not active then the Travel Mode can not be selected.

Suggested Travel Sensor : Baumer Electric MLFK 10G2124/N100

11.7 Power Mode

Continuous welding

Limits : Power Maximum & Power Minimum

The Power Mode is possible if in the SYSTEM INIT start mode = Hand active is.

12 Welding Parameter Time Mode

Time Mode Weld Time 1.000s	0-9 , Confirm with ENTER 0.005 – 9.999s
Time Mode Amplitude 100%	Cursor left, right 60 – 100 %
Time Mode Trigger 1.0bar / 1.000s	0-9 , Confirm with ENTER 0.1 - 9.9 bar / 0.000 – 9.999 s
Time Mode Hold Time 1.000s	0-9 , Confirm with ENTER 0.000 – 9.999s
Time Mode After Pulse Delay 0.300s	0-9 , Confirm with ENTER 0.000-9.999s / Off
Time Mode After Pulse 0.005s	0-9 , Confirm with ENTER 0.005 – 1.000 s / Off
Time Mode Welded Parts 123456789	Reset with CLR
Time Mode Rejected Parts 123456789	Reset with CLR

13 Limits Time Mode

Limits Time Mode Energy Maximum 9999.99Ws	0-9 , Confirm with ENTER 00000.00 – 99999.99Ws
Limits Time Mode Energy Minimum 0000.00Ws	0-9 , Confirm with ENTER 00000.00 – 99999.99Ws
Limits Time Mode Parts required 999999999	0-9 , Confirm with ENTER 1 – 999999999

14 Welding Parameter Energy Mode

Energy Mode Energy Target 0100.00Ws	0-9 , Confirm with ENTER 00005.00 – 99999.99Ws
Energy Mode Amplitude 100%	Cursor left, right 60 – 100 %
Energy Mode Trigger 1.0bar / 1.000s	0-9 , Confirm with ENTER 0.1 - 9.9 bar / 0.000 – 9.999 s
Energy Mode Hold Time 1.000s	0-9 , Confirm with ENTER 0.000 – 9.999s
Energy Mode After Pulse Delay 0.300s	0-9 , Confirm with ENTER 0.000-9.999s / Off
Energy Mode After Pulse 0.005s	0-9 , Confirm with ENTER 0.005 – 1.000 s / Off
Energy Mode Welded Parts 123456789	Reset with CLR
Energy Mode Rejected Parts 123456789	Reset with CLR

15 Limits Energy Mode

Limits Energy Mode Time Maximum 9.999s	0-9 , Confirm with ENTER 0.000- 9.999s
Limits Energy Mode Time Minimum 0.000s	0-9 , Confirm with ENTER 0.000- 9.999s
Limits Energy Mode Parts required 999999999	0-9 , Confirm with ENTER 1 – 999999999

16 Welding Parameter US-Stop Mode

US – Stop Mode Control Time 1.000s	0-9 , Confirm with ENTER 0.005 – 9.999s
US – Stop Mode After Weld Time 0.000s	0-9 , Confirm with ENTER 0.000 – 9.999s
US – Stop Mode Amplitude 100%	Cursor left, right 60 – 100 %
US – Stop Mode Trigger 1.0bar / 1.000s	0-9 , Confirm with ENTER 0.1 - 9.9 bar / 0.000 – 9.999 s
US – Stop Mode Hold Time 1.000s	0-9 , Confirm with ENTER 0.000 – 9.999s
US – Stop Mode After Pulse Delay 0.300s	0-9 , Confirm with ENTER 0.000-9.999s / Off
US – Stop Mode After Pulse 0.005s	0-9 , Confirm with ENTER 0.005 – 1.000 s / Off
US – Stop Mode Welded Parts 123456789	Reset with CLR
US – Stop Mode Rejected Parts 123456789	Reset with CLR

17 Limits US-Stop Mode

Limits US – Stop Mode Energy Maximum 9999.99Ws	0-9 , Confirm with ENTER 00000.00 – 99999.99Ws
Limits US – Stop Mode Energy Minimum 0000.00Ws	0-9 , Confirm with ENTER 00000.00 – 99999.99Ws
Limits US – Stop Mode Parts required 999999999	0-9 , Confirm with ENTER 1 – 999999999

18 Welding Parameter Travel Mode Absolute

Travel Mode Absolute Distance Absolute 050.00mm	0-9 , Confirm with ENTER 0.00 – 500.00mm
Travel Mode Absolute Control Time 3.000s	0-9 , Confirm with ENTER 0.000 – 9.999s
Travel Mode Absolute Amplitude 100%	Cursor left, right 60 – 100 %
Travel Mode Absolute Trigger 1.0bar / 1.000s	0-9 , Confirm with ENTER 0.1 - 9.9 bar / 0.000 – 9.999 s
Travel Mode Absolute Hold Time 1.000s	0-9 , Confirm with ENTER 0.000 – 9.999s
Travel Mode Absolute After Pulse Delay 0.300s	0-9 , Confirm with ENTER 0.000-9.999s / Off
Travel Mode Absolute After Pulse 0.005s	0-9 , Confirm with ENTER 0.005 – 1.000 s / Off
Travel Mode Absolute Welded Parts 123456789	Reset with CLR
Travel Mode Absolute Rejected Parts 123456789	Reset with CLR

19 Limits Travel Mode Absolute

Limits Travel Mode Absolute Time Maximum 9.999s	0-9 , Confirm with ENTER 0.000- 9.999s
Limits Travel Mode Absolute Time Minimum 0.000s	0-9 , Confirm with ENTER 0.000- 9.999s
Limits Travel Mode Absolute Energy Maximum 9999.99Ws	0-9 , Confirm with ENTER 00000.00 – 99999.99Ws
Limits Travel Mode Absolute Energy Minimum 0000.00Ws	0-9 , Confirm with ENTER 00000.00 – 99999.99Ws
Limits Travel Mode Absolute Distance Tolerance + 0.50mm	0-9 , Confirm with ENTER 0.00-1.00mm
Limits Travel Mode Absolute Distance Tolerance - 0.50mm	0-9 , Confirm with ENTER 0.00-1.00mm
Limits Travel Mode Absolute Parts required 999999999	0-9 , Confirm with ENTER 1 – 999999999

20 Welding Parameter Travel Mode Differential

Travel Mode Diff. Distance Difference 001.00mm	0-9 , Confirm with ENTER 0.00 – 500.00mm
Travel Mode Diff. Control Time 3.000s	0-9 , Confirm with ENTER 0.005 – 9.999s
Travel Mode Diff. Amplitude 100%	Cursor left, right 60 – 100 %
Travel Mode Diff. Trigger 1.0bar / 1.000s	0-9 , Confirm with ENTER 0.1 - 9.9 bar / 0.000 – 9.999 s
Travel Mode Diff. Hold Time 1.000s	0-9 , Confirm with ENTER 0.000 – 9.999s
Travel Mode Diff. After Pulse Delay 0.300s	0-9 , Confirm with ENTER 0.000-9.999s / Off
Travel Mode Diff. After Pulse 0.005s	0-9 , Confirm with ENTER 0.005 – 1.000 s / Off
Travel Mode Diff. Welded Parts 123456789	Reset with CLR
Travel Mode Diff. Rejected Parts 123456789	Reset with CLR

21 Limits Travel Mode Differential

Limits Travel Mode Diff. Time Maximum 9.999s	0-9 , Confirm with ENTER 0.000- 9.999s
Limits Travel Mode Diff. Time Minimum 0.000s	0-9 , Confirm with ENTER 0.000- 9.999s
Limits Travel Mode Diff. Energy Maximum 9999.99Ws	0-9 , Confirm with ENTER 00000.00 – 99999.99Ws
Limits Travel Mode Diff. Energy Minimum 0000.00Ws	0-9 , Confirm with ENTER 00000.00 – 99999.99Ws
Limits Travel Mode Diff. Travel Tolerance + 0.50mm	0-9 , Confirm with ENTER 0.00-1.00mm
Limits Travel Mode Diff. Travel Tolerance - 0.50mm	0-9 , Confirm with ENTER 0.00-1.00mm
Limits Travel Mode Diff. Parts required 999999999	0-9 , Confirm with ENTER 1 – 999999999

22 Welding Parameter Travel Mode Reference

Travel Mode Ref. Distance Ref. up 000.00mm	Must be measured in the SETUP Mode. Not possible to edit.
Travel Mode Ref. Distance Correction + 0.00mm	0-9 , Confirm with ENTER , CLR + / - 0.00 – 1.00mm
Travel Mode Ref. Part Height 020.00mm	0-9 , Confirm with ENTER 0.00 – 500.00mm
Travel Mode Ref. Control Time 1.000s	0-9 , Confirm with ENTER 0.005 – 9.999s
Travel Mode Ref. Amplitude 100%	Cursor left, right 60 – 100 %
Travel Mode Ref. Trigger 1.0bar / 1.000s	0-9 , Confirm with ENTER 0.1 - 9.9 bar / 0.000 – 9.999 s
Travel Mode Ref. Hold Time 1.000s	0-9 , Confirm with ENTER 0.000 – 9.999s
Travel Mode Ref. After Pulse Delay 0.300s	0-9 , Confirm with ENTER 0.000-9.999s / Off
Travel Mode Ref. After Pulse 0.005s	0-9 , Confirm with ENTER 0.005 – 1.000 s / Off
Travel Mode Ref. Welded Parts 123456789	Reset with CLR
Travel Mode Ref. Rejected Parts 123456789	Reset with CLR

23 Limits Travel Mode Reference

Limits Travel Mode Ref. Time Maximum 9.999s	0-9 , Confirm with ENTER 0.000- 9.999s
Limits Travel Mode Ref. Time Minimum 0.000s	0-9 , Confirm with ENTER 0.000- 9.999s
Limits Travel Mode Ref. Energy Maximum 9999.99Ws	0-9 , Confirm with ENTER 00000.00 – 99999.99Ws
Limits Travel Mode Ref. Energy Minimum 0000.00Ws	0-9 , Confirm with ENTER 00000.00 – 99999.99Ws
Limits Travel Mode Ref. Travel Tolerance + 0.50mm	0-9 , Confirm with ENTER 0.00-1.00mm
Limits Travel Mode Ref. Travel Tolerance - 0.50mm	0-9 , Confirm with ENTER 0.00-1.00mm
Limits Travel Mode Ref. Parts required 999999999	0-9 , Confirm with ENTER 1 – 999999999

24 Welding Parameter Power Mode

Power Mode Measuring Delay 0.500s	0-9 , Confirm with ENTER 0.005 – 9.999s
Power Mode Hold Time 1.000s	0-9 , Confirm with ENTER 0.000 – 9.999s
Power Mode Amplitude 100%	Cursor left, right 60 – 100 %
Power Mode Welded Parts 123456789	Reset with CLR
Power Mode Rejected Parts 123456789	Reset with CLR

25 Limits Power Mode

Limits Power Mode Power Maximum 1000W	0-9 , Confirm with ENTER 0-3500W
Limits Power Mode Power Minimum 0000W	0-9 , Confirm with ENTER 0-3500W
Limits Power Mode Parts required 999999999	0-9 , Confirm with ENTER 1 – 999999999

26 Information Menu

Information
Project
Audi A8 Glove Box

0-9, Confirm with **ENTER**

Information
Lot Number
123456789

0-9, Confirm with **ENTER**

Information
Horn Number
123456789

0-9, Confirm with **ENTER**

Information
Horn Gain
2.0

0-9, Confirm with **ENTER**

Information
Booster Gain
2.0

0-9, Confirm with **ENTER**

Information
Amplitude calculated
33 um

This value is calculated. Can not be edited.

If data of gain booster and horn is incorrect then the calculated value is wrong.

Information
Converter Number
123456789

0-9, Confirm with **ENTER**

Information
Jig Number
123456789

0-9, Confirm with **ENTER**

Information
Pressure Press
2.2bar

0-9, Confirm with **ENTER**

Information
Setting Throttle
2.5

0-9, Confirm with **ENTER**

Information
Down speed Time Press
9.999s

0-9, Confirm with **ENTER**

Information
Stroke Press
100mm

0-9, Confirm with **ENTER**

Information
Height adjustment
300m m

0-9, Confirm with **ENTER**

27 Data Bank Menu

Data Bank
Save Data
Audi A8 Glove Box
33

0-9, Confirm with **ENTER**
 Cursor left, right, up, down
 Data Bank
 01-99

Data Bank
Load Data
Audi A8 Glove Box
33

0-9, Confirm with **ENTER**
 Cursor left, right, up, down, CLR
 Data Bank
 01-99

Data Bank
Delete Data
Audi A8 Glove Box
33

0-9, Confirm with **ENTER**
 Cursor left, right, up, down, CLR
 Data Bank
 00-99

The Data Bank has 99 memories. The first Data bank number is 01. The number 00 is not valid.

The active Databank will be displayed in the LCD Display.

123456789	TM / 99
1.000s	1000W
9999.9Ws	2000W
199.99mm	20.00kHz

Welded Parts
 Weld Time
 Energy
 Travel

Mode / Data Bank Number
 Power
 Power Maximum
 Frequency

27.1 Save Data

The next empty Data Bank will be displayed. The number can be over written anytime. Press **ENTER** to save the data. The message **DATA SAVED** will be displayed. If the Data Bank is not empty the Message **OVERWRITING DATA ?** will be displayed. Press **ENTER** to over write or enter a new number.

Press the key **Data Bank** to go back to the Welding Menu.

27.2 Load Data

The next empty Data Bank will be displayed. The number can be over written anytime. Press **ENTER** to save the data. The message **DATA SAVED** will be displayed. If the Data Bank is not empty the Message **OVERWRITING DATA ?** will be displayed. Press **ENTER** to over write or enter a new number.

With the key **CLR** you can scroll through the saved data.

Press the key **Data Bank** to go back to the Welding Menu.

27.3 Delete Data

The last used Data Bank will be displayed. If you want to delete an other memory please enter the number and confirm by **ENTER**.

With the key **CLR** you can scroll through the saved data.

Press the key **Data Bank** to go back to the Welding Menu.

If you enter the number 00, then all data banks will be deleted.

28 Special Function Menu

Press **F1** to activate the Special Function Menu. The LED Setup will alight. Press **F1** to return to the Welding Menu.

Special Function	0-9, Confirm with ENTER
Delay Blow Time 0.000s	0.000 – 9.999s
Special Function	0-9, Confirm with ENTER
Blow Time 0.0000s	0.000 – 9.999s
Special Function	0-9, Confirm with ENTER
Speed Throttle 599.99mm	0.00 – 500.00mm

28.1 Blow

When the **SAFETY SWITCH** will open in the back stroke, then the **DELAY BLOW TIME** will start. After the time is elapsed the **OUTPUT 8** at X3 Pin 15 will be activated for the set **BLOW TIME**. The function **BLOW** must be activated in the SYSTEM INIT Menu.

At **OUTPUT 9 BLOW** at X6 Pin 3 the function is always active.

28.2 Speed reduction

After reaching the set travel starting for the home position the output 2 **SPEED REDUCTION** will be activated.

29 System Init Menu

In the SYSTEM INIT Menu you can change the settings of the machine parameter.

Attention !!!

Wrong settings can influence the welding result

All LED will alight during Power on. After some time the following display will be shown.

Generator Init

Made in Switzerland
www.apsonic.com
Viper XL 20 – 1500
Version V 1.1a

Press **SETUP** key for System Init Menu

123456789 TM / 99
1.000s 1000W
9999.9Ws 2000W
199.99mm 20.00kHz

Parts
Welding Time
Energy
Travel

Mode / Data Bank Number
Power
Power Maximum
Frequency

Press **SETUP** key for System Init Menu during Power on to get into the SYSTEM INIT Menu. The LED SETUP is blinking.

Enter Pin Code 2

0000

Enter the pin code / Standard = 8828 **Enter**

Press **SETUP** key to return to the Welding menu. The LED Setup is off

123456789 TM / 99
1.000s 1000W
9999.9Ws 2000W
199.99mm 20.00kHz

The generator is automatically locked,

System Init Start Mode Manual	Cursor left, right Manual / Impulse / Automatic Hand Unit / Hand Unit Time
System Init Trigger Pressure	Cursor left, right Pressure / Time
System Init After Pulse Off	Cursor left, right on / off
System Init Amplitude Internal	Cursor left, right Internal / External
System Init Press Position Up	Cursor left, right Up / Down
System Init Home Position off	Cursor left, right on / off
System Init Part in Position Off	Cursor left, right on / off
System Init Output 8 Ultrasonics active	Cursor left, right Ultrasonics active / Blow active
System Init Power Loss test Before	Cursor left, right Before / After / Off
System Init Gap Power Loss Test 100	0-9 , Confirm with ENTER 1 – 999
System Init Language English	Cursor left, right German / English
System Init Scale Unit Travel Mm	Cursor left, right mm / inch

System Init Encoder Pulse/mm 0200	0-9 , Confirm with ENTER 0001 - 0999
System Init Soft start 20	0-9 , Confirm with ENTER 02-30
System Init Feedback Control 030	0-9 , Confirm with ENTER 020-500
System Init Pin Code 1 9928	Cursor left, right 0000 = Off
System Init Pin Code 2 8828	Cursor left, right 0000 = Off
System Init Buzzer Off	Cursor left, right Off / on / Error message

29.1 Start Mode


The start mode for a CE press is always MANUAL. It can not be changed.

For automation please check chapter AUTOMATION.

29.2 Trigger Mode

Settings : Pressure / Time

If set to Pressure then 4 mA = 0 bar, 20mA = 10 Bar. Impedance of 500 Ohm.

Press  to select

Standard Setting : Pressure

This setting can influence the welding result.

29.3 After Pulse

Settings : on / off

After the welding you can activate an **AFTER PULSE** (see page 7 for details)

Press  to select

Standard Setting : off

29.4 Amplitude

Settings : Internal / External

The amplitude can be selected internal over the keyboard or from external via an analogue signal.

External 1V = 60 %, 2V = 65 %, 9V = 100 %

Press  to select

Standard Setting : Internal

This setting can influence the welding result.

29.5 Press position

Settings : up / down

After an Error the press will return to its home position or it will stay on the welded part. For details see chapter Welding Cycle of a CE press.

Press  to select

Standard Setting : up

29.6 Home Position

Settings : on / off



If there is no home position sensor in the press you need to select off. For a CE Press there is a must of a home position sensor.

Standard Setting : on

29.7 Part in Position

Settings : on / off

If you have a part detection sensor in the jig you need to select on. If you start the welding cycle and there is not part in the jig the press will not come down. The error NO PART will be displayed. If set to off, then this input is not checked.



Press   to select

Standard Setting : Off

29.8 Output 8

Settings : Ultrasonics active/ Blow active

The OUTPUT 8 is either active if US ON or BLOW VALVE.



Press   to select

Standard Setting : Ultrasonics active

29.9 Power Loss Test

Settings : before / after / off

According to the setting the power loss of the vibration system will be tested. The measurement is used to calculate the real Energy.

Press   to select

Standard Setting : before

29.10 Gap Power Loss Test

Settings : 0 - 999

If you select a gap bigger then 1, the power loss test will not be done every welding.



Press **1 - 9** for the settings and confirm with **ENTER**

Standard Setting : 100

29.11 Language

Settings : E,D,SP,F,I,P,S,DK,N,SF;NL,CZ,PL,RO,SLO,H,TR

Select language of user interface.



Press   to select

Standard Setting : English

29.12 Scale Unit Travel

Settings : mm / inch

1 inch is equal to 25.4 mm



Press   to select

Setting : mm

29.13 Encoder Pulse/mm

Settings : 0001 - 0999

To adapt different encoder to this controller you can set the pulse / mm ratio of your encoder. The controller uses this value of the encoder to calculate the real travel. The Encoder must have an A/B channel PNP output with 24VDC.

Press  for the settings and confirm with 

Standard Setting : 0200

Suggested Encoder : Baumer Electric MLFK 10G2124/N100



This setting can influence the welding result.

29.14 Soft start

Settings : 2 - 30

This parameter is changing the time until the maximum amplitude is reached when starting the horn.

2 = slow / 30 = fast

Press  for the settings and confirm with 



Standard Setting : 20

This setting can influence the welding result.

29.15 Feedback Control

Settings : 010 - 500

With this parameter you can set the speed that the generator is controlling the amplitude. In application above 80 % it can be useful to set it a bit higher. This will help to reduce the risk to run in to an Overload.

Press  for the settings and confirm with 

Standard Setting : 20

This setting can influence the welding result.

29.16 Pin Code 1

Settings : 9928

The settings can only be changed after entering the access code.

Press **1 - 9** for the settings and confirm with **ENTER**

Standard Setting : 9928 0000 = Code not active

29.17 Pin Code 2

Settings : 8828

The settings can only be changed after entering the access code.

Press **1 - 9** for the settings and confirm with **ENTER**

Standard Setting : 8828 0000 = Code not active

29.18 Buzzer

Settings : on / off / Error message

With this setting you can activate a buzzer. The buzzer will confirm a pressed key or an error.

Press **→←** to select


Standard Setting : off

30 Standard Init

With a **STANDARD INIT** the generator will put back to factory settings. This can be done after a software hang up, a software update or if you want to have the factory settings again.

Attention !!!

All parameter and settings will be lost. The data bank will be not deleted.

Press the key  during power on to execute a **STANDARD INIT**.

Standard Init All Data will be lost ! Press ENTER to Execute or CLR to Cancel
--

Enter / CLR

Generator Init

123456789	TM / 99
1.000s	1000W
9999.9Ws	2000W
199.99mm	20.00kHz

31 Error Message

Press **CLR** or activate Input 7 **RESET** to clear an ERROR. The next welding cycle will clear an ERROR too.

If set **PRESS POSITION = DOWN** in the SYSTEM INIT Menu then the horn will stay on the part. Press **CLR** to reset.

Error Message

EMERGENCY STOP

- Emergency Stop(Pin 1 und Pin 2 an X1) not closed
- Short on the 24V for input & output
- 24 V supply defect

Error Message

Home Position
Number : 1

Home Position sensor defect or not connected

Error Message

Safety Switch
Number : 2

Safety Switch sensor defect or not connected

Error Message

Generator not ready
Number : 3

- Power supply from oscillator defect or not connected
- Oscillator Board defect

Hardware Error

Valve Control
Number : 4

- Safety Switch sensor activated or defect
- Valve Output defect *

Error Message

No Part
Number : 5

No part in the fixture or part sensor not connected or defect

Error Message

Number : 6

No Function

Error Message

Number : 7

No Function

Error Message

Hardware Error 8
Number : 8

- Memory Error / Please execute STANDARD INIT
- RS 485 defect
- DIP Switch 1 on the oscillator on

Hardware Error

Supply +15V
Number : 9

*

<p>Hardware Error Supply -15 V Number : 10</p>	<p>*</p>
<p>Hardware Error Phase Voltage Number : 11</p>	<p>*</p>
<p>Hardware Error DC Converter V Number : 12</p>	<p>*</p>
<p>Hardware Error DC Converter C Number : 13</p>	<p>*</p>
<p>Hardware Error Line Voltage Number : 14</p>	<p>*</p>
<p>Hardware Error DC Offset Number : 15</p>	<p>*</p>
<p>Error Message Frequency Maximum Number : 16</p>	<p>- Horn defect or not proper tuned - RF cable not connected or defect</p>
<p>Error Message Frequency Minimum Number : 17</p>	<p>- Horn defect or not proper tuned - RF cable not connected or defect</p>
<p>Error Message Converter Voltage Number : 18</p>	<p>- Welding Pressure too high - Horn, Booster, Converter or RF Cable defect</p>
<p>Error Message Energy too low Number : 19</p>	<p>Energy to low in Time or Distance Mode</p>
<p>Error Message Energy too high Number : 20</p>	<p>Energy to high in Time or Distance Mode</p>
<p>Error Message Time Underflow Number : 21</p>	<p>Time to small in Energy or Distance Mode</p>

<p>Error Message</p> <p>Time Underflow Number : 22</p>	<ul style="list-style-type: none"> - US – Stop Signal to late or not activated - Energy not reached in Energy Mode - Distance not reached in Distance Mode
<p>Error Message</p> <p>Time Overflow Number : 23</p>	<p>Time to long in Energy or Distance Mode</p>
<p>Error Message</p> <p>Power too low Number : 24</p>	<p>Power too low in Power Mode</p>
<p>Error Message</p> <p>Power to high Number : 25</p>	<p>Power too high in Power Mode</p>
<p>Error Message</p> <p>Generator Overload Number : 26</p>	<ul style="list-style-type: none"> - Generator output Power to small - Welding Pressure too high - Amplitude too high
<p>Error Message</p> <p>Power Measuring Number : 27</p>	<p>Power Measuring out of Range</p>
<p>Error Message</p> <p>US interrupted Number 28</p>	
<p>Error Message</p> <p>Cycle interrupted Number 29</p>	<p>Interrupt of the welding Cycle by pressing the key CLR or a signal at X3 Pin or X2 Pin 3 (Reset)</p>
<p>Error Message</p> <p>Quantity reached Number : 30</p>	<p>The quantity required is reached</p>
<p>Error Message</p> <p>Time Overflow Number : 31</p>	
<p>Error Message</p> <p>Time Underflow Number : 32</p>	
<p>Error Message</p> <p>Distance to large Number : 33</p>	<p>Distance too large in Distance Mode</p>

Error Message Distance too small Number : 34	Distance to small in Distance Mode
Error Message Energy too high Number : 35	Energy too high in Travel Mode
Error Message Energy too low Number : 36	Energy too low in Travel Mode
Error Message Output 1 - 8 Number : 37	Outputs 1 – 8 overloaded or defect
Error Message Output 9 - 16 Number : 38	Outputs 9 - 16 overloaded or defect
Error Message Start 2 Number : 99	- Dual Palm button not correct connected - Input 2 Start 2 not active

* In case of a HARDWARE ERROR you must contact with the supplier.

32 Input and Output

32.1 Inputs

Connection :	Opt coupler
Voltage :	20 – 28 V DC
Current :	Maximum 7 mA

32.2 Outputs

Connection :	Opt Coupler
Voltage :	23 – 25 V DC short circuit protected
Current :	Maximum 250 mA each output

The maximum load to the internal 24V power supply is 400 mA. The output voltage is stabilized and short circuit protected.

Each output is short circuit protected.

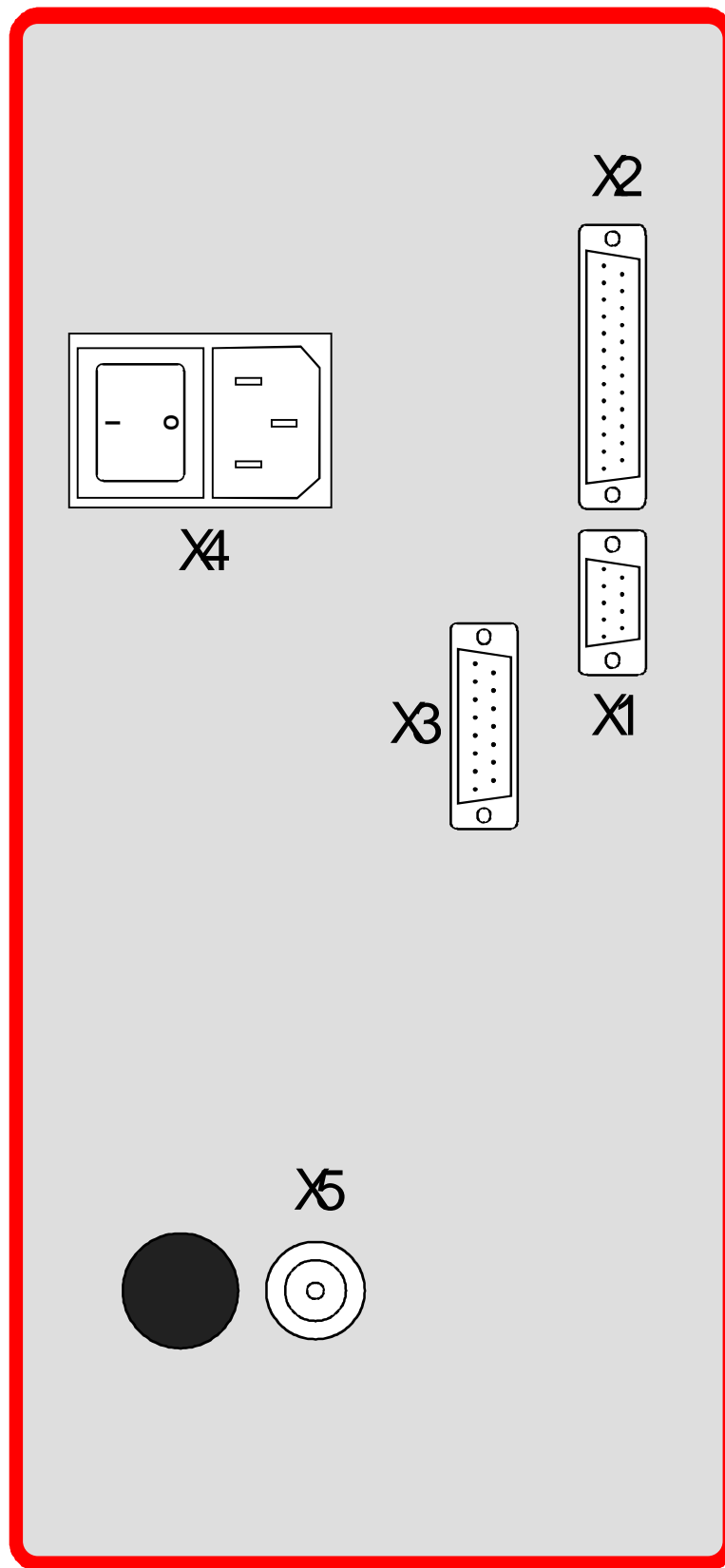
In case of a short the message **Output 1-8** or **Output 9-16** will be displayed.

If the short is removed you can clear the error by pressing any key.

ATTENTION !!!

Do you use only shielded cables and connectors !

33 Connection



34 Connection X1 Start

34.1 Connection Start X1 9-pin SUB-D female

Pin	Signal
1	Emergency
2	Emergency
3	24 V DC if 1 & 2 are closed
4	Input 1 Start 1
5	Input 2 Start 2
6	Input 3 Dual palm button
7	Input 6 Part detection
8	GND 24
9	GND 24

Pin 1 & 2

Connection for Emergency Stop. Must be closed.
If not closed the message EMERGENCY will be displayed.

Pin 3

24V DC will be supplied if Pin 1 & 2 are closed.

Pin 4 & 5

Input for Dual Palm Button. 4 = normally open, 5 = normally closed. The buttons must have two independent contacts. 1x NO & 1 x NC

Both inputs must switch over with in 300 ms, otherwise the cycle will not start of safety reason.

For the modes **AUTOMATIC, HAND UNIT and HAND UNIT TIME** you need only input start 1. An impulse of 100ms will start the cycle. In case of HAND UNIT the ultrasonic is active as long as input START 1 is activated.

In case of using an external 24V supply you need to connect the GND24 PIN 8 & 9 with the ground of the external supply.

Pin 6

The input DUAL PLAM BUUTON must be open to run the generator in the CE conform Mode.

ATTENTION !!!

In the following Modes there is no support for safe operation of a welding press. The user is responsible to take action for safety of the system.

If you want to use the unit in the following modes **IMPULSE, AUTOMATIC, HAND UNIT & HAND UNIT TIME** Pin 6 & Pin 3 must be connected. The unit is not safe without external safety setups.
Not CE.

Pin 7

The Input PART DETECTION is active if 24V is supplied. In the SYSTEM INIT Menu PART DETECTION = ON must be set. If there is no part in the Jig the Error NO PART will be displayed.

Pin 8 & 9

GND 24 V

35 Connection X2 Press

35.1 Connection Press X2 25-pin SUB-D female

Pin	Signal
1	Output 1 Valve
2	Output Analogue 1
3	Input 7 Reset
4	Output 2 Speed Reduction Valve
5	Input 4 Safety Switch
6	Output 3 Error Overload
7	Input 8
8	Output 4 Error Message general
9	Input 15 US – Stop digital
10	Output 5 Ready
11	Input 9 DTM active
12	Input analogue 1 / Trigger 4mA=0bar / 20mA=100%
13	Input 5 Home Position
14	Output Analogue 2 Power 5V = 100% / 6V = 120%
15	Input Encoder A
16	Input Encoder B
17	Input Analogue 3
18	NC
19	24 V
20	24 V
21	GND 24
22	GND 24
23	NC
24	NC
25	NC

Pin 1

The Output 1 **VALVE** is supplying 24V if active. The Output 1 **VALVE** is controlling the valve of a pneumatic press.

Pin 2

The Output Analogue 1. No function.

Pin 3

The Input 7 **RESET** must have 24V to activate. The welding cycle will be interrupted and an ERROR will be activated.

Pin 4

The Output 2 **SPEED REDUCTION VALVE** is supplying 24V if active. This output is only valid in the three **TRAVEL MODE**. The output is active after the set value in the **SPECIAL MENU** and key **F1** is reached.

Pin 5

The Input 4 **SAFETY SWITCH** must have 24V to activate. If the Input 4 **SAFETY SWITCH** is activated you can release the dual palm buttons. The TRIGGER will be started.

Pin 6

The Output 3 **OVERLOAD** is supplying 24V if active. The Output 3 **OVERLOAD** is active in case on an generator overload. Press the key CLR or activate Input 7 **RESET** to reset the error.

Pin 7

The Input 8. No function.

Pin 8

The Output 4 **ERROR** is supplying 24V if active. The Output 4 **ERROR** is active in case on an any error. Press the key **CLR** or activate Input 7 **RESET** to reset the error.

Pin 9

The 15 Input **US-STOP** must have 24 V to activate. The Input 15 **US-STOP** is in a OR Connection with **US-STOP** on X3.

The **US-STOP** is only active if mode is **US- STOP**. Use switch or PNP Sensor.
For switch off horn – knife contact you need to use **US –STOP** on X3

Pin 10

The Output 5 **READY** is supplying 24V if activated. The Output 5 **READY** is active if the unit is ready for the next welding cycle.

Pin 11

The Input 9 **DTM ACTIVE** must have 24 V to activate. This input must be activated to access the Travel Modes. In the display the last line on the right side with show the distance.

A digital linear Encoder with A7B Channel must be in your system.

If you are using the Trigger Board TIP002 in your system then you can set Jumper **EN** on the board to activate.

The scaling must be done in the **SYSTEM INIT** Menu.

Suggested Encoder : Baumer Electric MLFK 10G2124/N100

Pin 12

The Input **TRIGGER ANALOGUE 1** is only active if set to **TRIGGER ANALOGUE = PRESSURE** in the SYSTEM INIT Menu. Otherwise the Trigger is by Timer

Input **TRIGGER ANALOGUE 1** 4mA = 0bar, 20mA=10bar, Impedance = 500ohm

Pin 13

The Input **HOME POSITION** must have 24V to activate. Your system must have a Home Position Sensor. If there is no Home Position Sensor you need to set **HOME POSITION=OFF** in the SYSTEM INIT Menu.

Pin 14

The Output Analogue 2 **POWER** is supplying 0-10V. 5V is equal to 100% 6V is equal to 120%.

Pin 15

The Input Encoder **A** must have 24v to be activated. A & B must have 90 degree phase shift.

Pin 16

The Input Encoder **B** must have 24v to be activated.

Pin 17

The Input **TRIGGER ANALOGUE 2** has no function.

Pin 18, 23 & 24

Not connected.

Pin 19 & 20

24 V DC

Pin 21 & 22

GND

36 Connection X3 Interface 1

36.1 Connection Interface 1 X3 15 pin SUB-D female

Pin	Signal
1	24 V
2	GND 24
3	Input US - Stop +
4	Input Analogue 2 external Amplitude $1V=60\%$ / $9V = 100\%$
5	Input 7 Reset
6	Input 15 US Stop digital
7	Input 6 Part detection
8	Output 6 Home Position
9	24 V
10	GND 24
11	Input US - Stop -
12	Output 5 Ready
13	Output 4 Error General
14	Output 7 Safety Switch
15	Output 8 US on / Blow

Pin 1 & 9

24V DC

Pin 2 & 10

GND 24 V

Pin 3

The Input **US-STOP +** must have 24V to activate the **US-STOP** . The Input **US-STOP –** must be connect to GND at the same time.

The Input **US-STOP** is only active in the **US-STOP** Mode. The welding cycle will be interrupted and an ERROR will be activated.

Pin 4

The Input **ANALOGUE 2 AMPLITUDE** is only active if **AMPLITUDE = EXTERN** in the SYSTEM INIT Menu.
1V = 60 %, 2V = 65 %, 9V = 100 %

Pin 5

The Input 7 **RESET** must have 24 to be activated. The welding cycle will be interrupted and an ERROR will be activated.

Pin 6

The 15 Input **US - STOP** must have 24 V to activate. The Input 15 US-STOP is in a OR Connection with US-STOP on X3.

The US – STOP is only active if mode is US- STOP. Use switch or PNP Sensor. For switch off horn – knife contact you need to use US –STOP on X3

Pin 7

The Input 6 **PART DETECTION** must have 24 V to be activated. In the SYSTEM INIT Menu PART DETECTION = ON must be set. If there is no part in the Jig the Error NO PART will be displayed.

Pin 8

The Output 6 **HOME POSITION** is supplying 24V if activated. The output is indicating that the press is in home position.

Pin 11

The Input **US-STOP–** must be connecting to GND to be activated. The input **US-STOP+** must be connected to 24V at the same time.

The Input **US-STOP** is only active in the **US-STOP** Mode. The welding cycle will be interrupted and an ERROR will be activated.

This function can be used to cut fabric & films. Connect a insulated knife to this pin.

Pin 12

The Output 5 **READY** is supplying 24 if activated. The Output is indicating that the unit is ready for the welding cycle.

Pin 13

The Output 4 **ERROR GENERAL** is supplying 24V is activated. The output is indicating an ERROR in the system or during the welding. Press CLR, activate Input 7 RESET ort he next welding cycle will reset the ERROR.

Pin 14

The Output 7 **SAFETY SWITCH** is supplying 24V if activated. The output is indication the status of the SAFETY SWITCH. The system must have a SYFETY SWITCH.

Pin 15

The Output 8 **US ON or BLOW** is supplying 24 V if activated. The function must be selected in the SYSTEM INIT Menu.

OUTPUT 8 = US ON then the Output is activated as long as the ultrasonic is active. **OUTPUT 8 = BLOW**. For Details see Special Function Menu.

37 Connection X4 Line

37.1 Connection Line X4 C13 / C15

Pin	Signal
1	Phase
2	Neutral
3	Ground

Pin 1 & 2

230 V AC Tolerances see chapter **TECHNICAL DATA**
Connection Value see **chapter FUSES**

Pin 3

The generator must be connected to GROUND.

38 Connection X5 RF Output

38.1 Connection RF Output X5 Lemo 1/2

Pin	Signal
1	RF Output
2	Ground

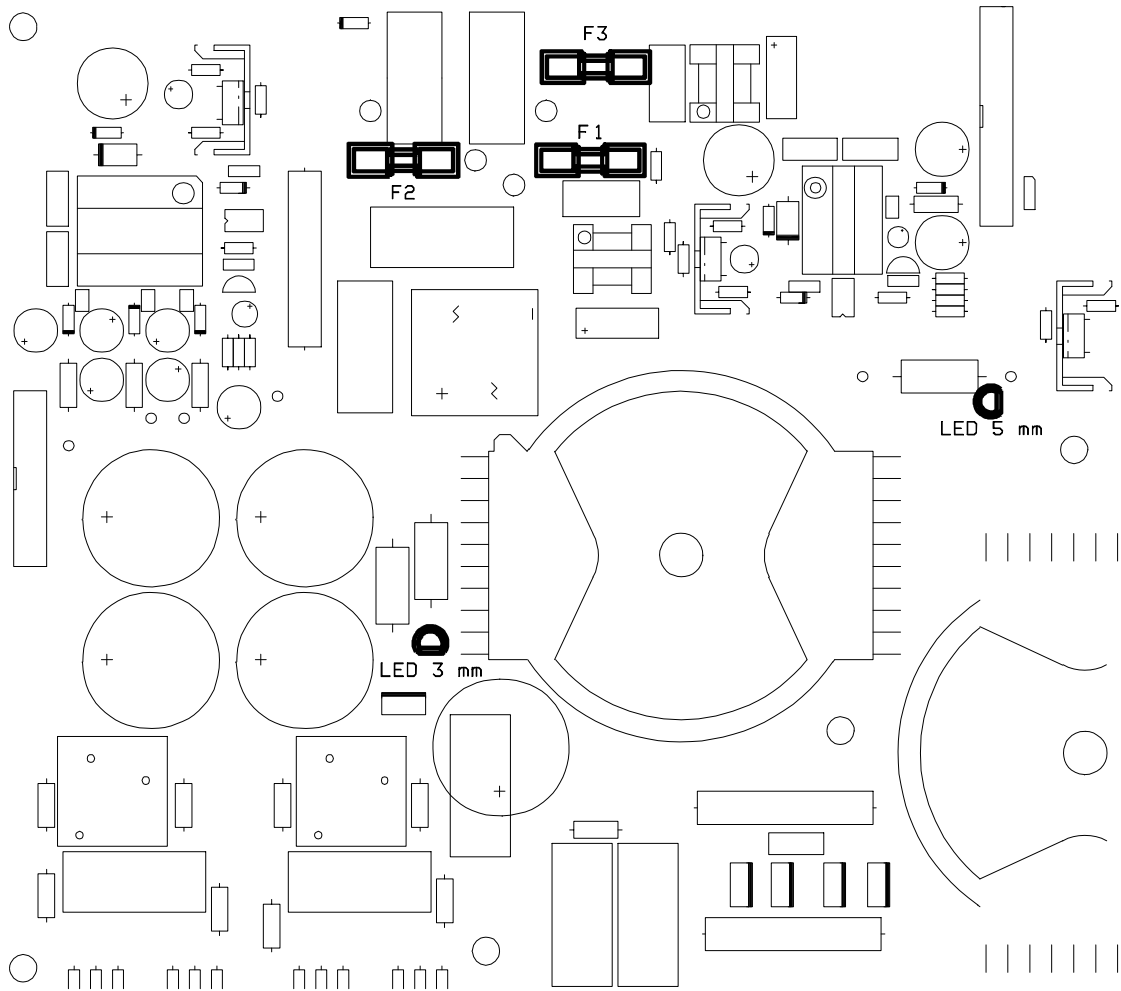
Pin 1

Attention high voltage on this Pin. Do not remove the connector when in use.

Pin 2

Ground

39 Position Fuses and LED



40 Fuses

Fuse	Type	Value
F1	all	3.15 AT

Fuse	Type	Value
F2	35-600	4 AT
F2	35-900	6.3 AT
F2	20-1000	6.3 AT
F2	20-1500	8 AT
F2	20-2000	10 AT
F2	20-3000	16 AT

Fuse	Type	Value
F3	all	3.15 AT

Please make sure the main switch on the back is on and the power cord is connected.

Check F1 if the LED diameter 5 mm on the power board is not alight.

Please make sure the on/off on the front panel is activated

Check F2 is the LED diameter 3 mm red on the power board is not alight.

Check F3 is no LED on the oscillator board is alight.

F1 – F3 are located below the oscillator board. See chapter POSITION FUSES AND LED.

Remove 2 piece of M4 to remove frame with oscillator board.

ATTENTION !!!

Before opening the generator housing you must disconnect all connections.

Do not touch inside the generator housing before all LED's on the power board are dark. Some Capacitors can be loaded for some minutes after disconnecting the power.

41 Automation

41.1 Safety Issue

ATTENTION !!!

The safety of the system in the Automation Modes must be controlled by an external controller.

If the generator is controlled by an external controller then start mode can be changed to Impulse, Automatic, Hand or Hand Time.

The system in these modes is not save to use. The safety features in these modes must by taken care from a external controller.

To change the generator to these modes you need to follow the following instructions.

1. Connect Pin 3 & Pin 6 on X1 1
2. Change the Start Mode in the SYSTEM INIT Menu

All LED will alight during Power on. After some time the following display will be shown.

Generator Init

Made in Switzerland
www.apsonic.com
Viper XL 20 – 1500
Version V 1.1a

Press **SETUP** during Power on

123456789	TM / 99
1.000s	1000W
9999.9Ws	2000W
199.99mm	20.00kHz

Welded Parts
Weld Time
Energy
Travel

Mode / Data Bank Number
Power
Power Maximum
Frequency

Press **SETUP** key for System Init Menu during Power on to get into the SYSTEM INIT Menu. The LED SETUP is blinking.

Enter the Pin Code 2
0000

Enter the pin code / Standard = 8828 **Enter**

System Init
Start
Manual

Cursor left, right

Manual / Impulse / Automatic
Hand Unit / Hand Unit Time

Press **SETUP** key to return to the Welding menu. The LED SETUP gets dark.

41.2 Impulse Mode

Both dual palm buttons must be pressed with in 300ms. The welding cycle will now start automatically. This function is in connection with a welding press or an actuator.

41.3 Automatic Mode

An Impulse of 100 ms on **START 1** Pin 4 on X1 will start the welding cycle. This function is in connection with a welding press or an actuator.

41.4 Hand Mode

Ultrasonics is active as long **START 1** Pin 4 on X1 is activated. This function is in connection with a hand welder or a converter. The valve output is active.

41.5 Hand Mode Time

An Impulse of 100 ms on **START 1** Pin 4 on X1 will start the welding cycle. The weld time can be set in the menu according to the set welding mode. This function is in connection with a hand welder or a converter only. The valve output is active.

42 Power on Switch

The unit has a main power switch on the back panel. If the main switch is off, then the unit completely disconnected from the power line.

On the front panel is a power on key. The key on the front panel is only active if the main power switch is on.

The key on the front panel can be bypassed by a jumper on the front board. In this case the unit can be switch on by the main power switch only

43 BDE Interface

On the front board there is a 6 pin BED interface. This interface can be used to update the software of the generator.

44 Service Menu

In the Service Menu you can check all input & out put of the generator.

ATTENTION !!!

The Service Menu should only be used by trained personal. Malfunction can cause damage to the generator.

44.1 Activation of the Service Menu

Press **SETUP** to enter the Service Program. The LED Setup is alight.

Enter the Pin Code 1
0000

Enter the pin code / Standard = 8080 **CLR**

44.2 Deactivation of the Service Menu

Press **SETUP** to go back to the welding Menu. The LED Setup is off.

123456789	TM / 99
1.000s	1000W
9999.9Ws	2000W
199.99mm	20.00kHz

The generator is locked

44.3 Service Menu Inputs & Outputs

Service Menu Input 1 Start 1 0	Cursor down
Service Menu Input 2 Start 2 0	Cursor up , down
Service Menu Input 3 Dual Palm Button 0	Cursor up , down
Service Menu Input 4 Safety Switch 0	Cursor up , down
Service Menu Input 5 Home Position 0	Cursor up , down
Service Menu Input 6 Part Detection 0	Cursor down
Service Menu Input 7 Reset 0	Cursor down
Service Menu Input 8 Proportional Valve 0	Cursor up , down
Service Menu Input 9 DTM active 0	Cursor up , down
Service Menu Input 10 Data Bank 1 0	Cursor up
Service Menu Input 11 Data Bank 2 0	Cursor up , down
Service Menu Input 12 Data Bank 3 0	Cursor up , down

Service Menu Input 13 Data Bank 4 0	Cursor up , down
Service Menu Input 14 Generator ready 0	Cursor up , down
Service Menu Input 15 US Stop digital 0	Cursor up , down
Service Menu Input 16 Input 24V 0	Cursor up , down
Service Menu Input 17 US-Stop 0	Cursor up , down
Service Menu Analogue Input 1 Trigger 0.0 bar	Cursor up , down
Service Menu Analogue Input 2 Amplitude 100%	Cursor up , down
Service Menu Analog Input 3 10.00V	Cursor up , down
Service Menu Analogue Input 4 10.00V	Cursor up , down
Service Menu Analogue Input 5 24V external 24.00V	Cursor up , down
Service Menu Analogue Input 6 +15V Front panel +15.00V	Cursor up , down
Service Menu Analogue Input 7 - 15V Fontanel -15.00V	Cursor up , down
Service Menu Analogue Input 8 5 V Front panel 5.00	Cursor up , down

Service Menu Output 1 Valve Off	Cursor up , down Cursor left, right
Service Menu Output 2 Speed Reduction Off	Cursor up , down Cursor left, right
Service Menu Output 3 Error Overload Off	Cursor up , down Cursor left, right
Service Menu Output 4 Error General Off	Cursor up , down Cursor links, right
Service Menu Output 5 Ready Off	Cursor up , down Cursor left, right
Service Menu Output 6 Home Position Off	Cursor up , down Cursor left, right
Service Menu Output 7 Safety Switch Off	Cursor up , down Cursor left, right
Service Menu Output 8 US on / Blow Valve Off	Cursor up , down Cursor left, right
Service Menu Output 9 Blow Valve Off	Cursor up , down Cursor left, right
Service Menu Output 10 Off	Cursor up , down Cursor left, right
Service Menu Output 11 Data Bank 2 Off	Cursor up , down Cursor left, right
Service Menu Output 12 Off	Cursor up , down Cursor left, right

Service Menu Output 13 Off	Cursor up , down Cursor left, right
Service Menu Output 14 Off	Cursor up , down Cursor left, right
Service Menu Output 15 Off	Cursor up , down Cursor left, right
Service Menu Output 16 Off	Cursor up , down Cursor left, right
Service Menu Analogue Output 1 Proportional Valve 5.00V	Cursor up , down Cursor left, right 0-9, Confirm with ENTER
Service Menu Analogue Output 2 5.00V	Cursor up , down Cursor left, right 0-9, Confirm with ENTER
Service Menu Analogue Output 3 5.00V	Cursor up , down Cursor left, right 0-9, Confirm with ENTER
Service Menu DTM 999.99mm	Cursor up , down
Service Menu Total Cycles 99999999	Cursor up

45 Encyclopedia

45.1 After Pulse Time

The after pulse time is used to shake of a part that is sticking on the horn after welding.

45.2 After Pulse Delay

The after pulse time is starting after the hold time. The after pulse time is to make sure that the horn is no longer on the part before the after pulse is activated.

45.3 Amplitude

The amplitude is the movement on the horn surface. The amplitude is depending on the output power of the power supply, Generator setting (60 – 100%) Gain Booster und Gain of the horn. The amplitude is chosen depending on the material to weld. The best amplitude to weld you can get from the supplier of the raw material. The amplitude is measured in micro meter. The value is peak. Typical amplitude values are 10 – 60 micro meter.

The generator is calculating the output amplitude. You must make sure that the settings of booster gain and horn gain are correct.

45.4 Amplitude Values Guideline

Material	Typ3	Guideline in [um]
ABS	amorphous	15 - 30
CA	Semi crystalline	20 - 35
PA	Semi crystalline	35 - 55
PBTP	Semi crystalline	40 -50
PC	amorphous	25 - 40
PE	Semi crystalline	25 - 60
PETP	Semi crystalline	45 - 55
PMMA	amorphous	20 - 35
POM	Semi crystalline	40 - 50
PP	Semi crystalline	30 - 60
PPO	amorphous	25 - 40
PS	amorphous	15 - 30
PVC hard	amorphous	20 - 40
PVC soft	amorphous	25 - 40
SAN	amorphous	15 - 30
SB	amorphous	20 - 35

45.5 Automation

In case that the generator is used in automation you need to disconnect the dual palm buttons. All safety regulation must be controlled by an external controller

45.6 Blow

At output 8 BLOW you can connect a solenoid valve. After the welding an impulse will be activated to bow out the part of the jig. The impulse is activated after blow delay waiting time.

45.7 Booster

The booster is amplifying the amplitude produced by the converter. The gain on the booster is fix.

Standard Booster : 1:1, 1:1.5; 1:2, 1:2.5, 1:3.

The booster is tuned to the resonant frequency. Do not modify anything on the booster. Boosters are made of titanium or aircraft grade aluminum.

Make sure that the horn stud can not touch the bottom of the thread in the booster. Thread Converter = M16. Thread Horn = M12.

45.8 Control Time

The control time is used in US- STOP and TRAVEL. If the sensor in US-Stop Mode or the set travel in the travel mode is not reached in the set time you will get an error. The welding will stop automatically after the control time is reached.

45.9 Converter

The converter is transferring an electrical voltage to a mechanical vibration. The converter is tuned to resonant frequency. Do not modify anything on the converter. The stud M16 is part of the converter and can not be taken off. If the temperature on the converter body is reaching 50 degree Celsius you must use a cooling.

Too high temperature can destroy the converter.

45.10 Converter Number

Serial Number of the converter.

45.11 Cutting of Synthetic Textiles

Cutting with Ultrasonic has the big advantage that you get a sealed edge after cutting. Compared to a cut with a hot knife the cutting edge will stay soft.

In most cases a flat horn is used against a cutting knife. In some cases the horn shape is built as a knife.

To reduce the wear of horn and knife the cutting is done in the US – STOP Mode. The knife is mounted insulated from the press. A cable from the knife is connected with X3. The Ultrasonics will stop as the horn will touch the knife.

45.12 Cutting of food

The cutting of food with ultrasonic has the advantage that you can get a clear cut. The build up of food on the knife is reduced to a minimum.

The horn is designed to a knife.

Typical application : Cheese, Cake, Pizza, Pasta, Chocolate

45.13 Data Bank

In the data bank you can store up to 99 parameter sets.

45.14 Design of the welding line

It is very important that you have a good design of the welding area. Mostly there is an energy director design or butt joint design. It is very important that you have sharp edges on the energy director and on butt joint. The sharp edges will help to bring the energy into the part.

If you weld films or non woven then you do not need a joint design. In this case the horn has some lines or a knurled surface. This surface will help to bring the energy into the part.

45.15 Down Speed Time Press

The down speed Time press is measured in the SETUP Mode. The Time is depending on the length of the stroke, Pressure and setting of the Speed Throttle. The Down Speed Time Press is measured between start and reaching the safety switch.

45.16 Dual Palm Button

The press is equipped with dual palm button. If you release the palm button before reaching the safety switch the press. The button must be pressed within 300 ms.

After each welding the palm buttons are tested. If a button got a problem the cycle will not start. You need to replace the button first.

45.17 Emergency Stop

If you press the emergency stop button then the welding will stop and the power off the press will be shut down. The 24V supply in the generator will be switched off as well. In the display you will get the message EMERGENCY STOP.

45.18 Energy

The supplied energy to the part is measured by the generator. The Energy is calculated by time versus power in Ws.

45.19 Gain Booster

You need to enter the gain of the booster. If the setting is wrong, then the calculated output amplitude is not correct.

45.20 Gain Horn

You need to enter the gain of the horn. If the setting is wrong, then the calculated output amplitude is not correct.

45.21 Height Adjustment

Set height of the Welding press

45.22 Hold Time

The horn will stay under pressure on the part during the hold time. The hold time is used to cool off the welded part. If the hold time is too short you might get a bad welding result.

45.23 Home Position

The press has got a home position sensor to make sure the press is back to home position after welding. If the press is not in the home position at start impulse you will get an error.

45.24 Horn (Sonotrode)

The horn or Sonotrode is the welding tool. The horn is tuned to the resonant frequency. Modification should only be done by trained staff. Wrong modification can end in destroying the horn or the generator. Horns are made of titanium, aircraft grade aluminum or hardened steel. The stud on the horn is M12. The stud is part of the horn and can not be removed. The shape of the horn is influencing the welding result.

45.25 Horn Number

Part Number of the horn

45.26 Jig (Fixture)

The jig will hold the part in position for the welding. It is important the jig is fitting exactly to the part. The welding line must be supported on the whole part.

45.27 Jig number

Part Number Jig.

45.28 Measuring Delay

The measuring delay is only active in the Power Mode. The Power Limits are only active after the measuring delay. This is necessary because at the start the power minimum is always reached.

45.29 Overload

In case of an overload then the generator does not have enough output power.

To reduce the power consumption you can reduce the pressure or the amplitude. If this does not help you need to use a generator with more output power.

45.30 Parts Counter

The parts counter is counting the good welds. In case of an error the Reject counter will count it.

45.31 Pin Code

To change the welding and machine parameter you need to enter a pin code. The service program is also locked by a pin code.

45.32 Pressure Press

Set Pressure on the Welding Press. The pressure is influencing the welding result. More pressure is giving a stronger weld. Too much pressure can reflect in markings on the part.

45.33 Problems with the welding

Bad welding can have many reasons.

- Wrong design of the welding area
- Wrong raw material
- Recycled material
- Too much water in the part
- Too much glass in the part
- Too much other additive in the part
- Wrong amplitude
- Bad amplitude on the horn surface, not even
- Jig does not support the part well
- Wrong welding parameter
- Pressure too high

45.34 Project

Here you can set the project name.

45.35 Power

The output power is displayed on the LED bar on the front panel. After the welding the maximum power is shown with one LED. In the LCD display you see maximum power and the power at the end of the welding.

45.36 Power Maximum

In the force profile menu you can set a maximum power value. If this value is reached the welding pressure will be reduced to the set pressure automatically. This will help to reduce the risk to get an overload of the generator. Mostly you with semi crystalline material that need a high trigger force.

45.37 Quality Control

In each mode you can set limits. If the limits are exceeded you will get an error.

45.38 Reject

The reject counter is counting all bad welds.

45.39 Reset

The Input 7 RESET is use to quit an Error or the active Cycle. The key CLR has the same function.

45.40 Safety Switch

The press is equipped with a safety switch. The safety switch is mounted so, that the safety switch is will activated at 6mm before the end of the maximum stroke. This is for safety reason. If you release the palm button before reaching the safety switch the press will return to the home position.

The function of the safety switch is tested after each welding. In case the switch got a problem you can no longer start a cycle. You need to replace the safety switch first.

If Trigger =Timer then the Trigger time will start after reaching the safety switch. If Trigger = Pressure then the welding will start reaching the set pressure and the safety switch.

45.41 Service Program

In the service program you test all inputs and outputs of the generator. This must be done by trained stuff only.

45.42 Speed Reduction Valve

In a press with a linear encoder you can activate the speed reduction valve over a set travel. The value can be set in the SPECIAL FUNCTION MENU. The valve must be connected at Output 2 PIN 8 of ST 5 on the trigger board TIP 002..

In a press without linear encoder you have to add an extra switch to the press. The switch must be connected to ST8 on the trigger board TIP002. The valve must be connected to the ST9 on the trigger board TIP002. The trigger board TIP002 is inside of the press.

45.43 Speed Throttle

The setting of the Speed throttle is influencing the horn down speed. The down speed has influence to the welding result.

45.44 Stroke Press

Set stroke of the actuator. The stroke should set that you can easily load the part to the jig. If the stroke is to long you will have a longer cycle time.

45.45 Welding

The welding will be influenced by the following parameters.

- Amplitude
- Pressure
- Down Speed
- Trigger
- Weld Time

The weld time is depending on the set welding mode.

45.46 Welding Modes

The generator is supporting different welding modes. The welding parameters are depending on the set mode.

- Time Mode set Weld Time
- US Stop Mode by external sensor
- Energy Mode set Energy
- Travel Mode Absolute set travel
- Travel Mode Difference set travel
- Travel Mode Reference set travel
- Hand continuous

45.47 Welding continuous

Welding of Films, Textiles, Non Woven and coated Carton. In the continuous welding you can have a fix horn or a rotating horn. The anvil is either fix or rotating too.

With continuous welding you can be waterproof and airtight seals.

Typical application : Filter, outdoor cloths, awnings

45.48 Welding of rigid Parts

Welding of two rigid part. The parts must be designed for Ultrasonic Welding. The parts will have an energy director or a shear joint. Both parts should be made with the same material. In some case similar materials can be welded.

Typical applications : Welding of Display window on Mobile Phone, Welding of cigarette

45.49 Welding Staking

In staking the lower part must have a pin coming out of the part. The upper part has a hole. The pin is overlooking the hole of the upper part. The pin will be welded down by the horn to a rivet. The upper part can be any material.

Typical applications : Door panel of car, Bumper of car, IP of car

45.50 Trigger

The Trigger will start the ultrasonic. The trigger can be a timer or a pressure sensor. This can be set in the SYSTEM INIT Menu. In case of the timer, the delay time will start after reaching the safety switch. In case of a pressure sensor the welding will start after the safety switch and the set pressure is reached. The trigger is influencing the welding result.