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**Programming Manual
Control and Power Unit
TMP**

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1. Menu Access and Selection











When switching the TMP weld unit on the screen display will be activated. The TMP will identify itself by presenting unit and peripherals types as well as the corresponding software versions.

Software version 1		Software version 2	
T U C K E R #####		T U C K E R #####	
System software	V ##.##	System software	V ##.##
Keypad/Display	V ##.##	Keypad/Display	V ##.##
Central CPU	V ##.##	Central CPU	V ##.##
SMPS	V ##.##	SMPS	V ##.##
Interface #####	V ##.##	Interface #####	V ##.##
Output 1 #### / ####	V ##.##	Output 1 #### / ####	V##.## LM V ##.##
Output 2 #### / ####	V ##.##	Output 2 #### / ####	V##.## LM V ##.##
Output 3 #### / ####	V ##.##	Output 3 #### / ####	V##.## LM V ##.##
Output 4 #### / ####	V ##.##	Output 4 #### / ####	V##.## LM V ##.##
Output 5 #### / ####	V ##.##	Output 5 #### / ####	V##.## LM V ##.##
<F1..F5> <ESC>		<F1..F5> <ESC>	


Now please press the  key to open the main menu.

OPERATION	
Weld parameter monitor	
Programming	
Statistics	
Fault reset	
Status weld sequence	
Status customer interface	
Status Feeder/Stud-Divider	
Status TMP	
Functions	
Warnings	
<↓↑>	<F1..F5>

As soon as the main menu appears on the screen the sub-menus listed can be selected.

1. Position the cursor with the direction keys  and  on the corresponding submenu and confirm your selection with .
2. Sub-menus with alterable contents may also be selected by pressing one of the function keys listed below directly.
 - Function key  : open main menu "**Function Keys**"
 - Function key  : open main menu "**OPERATION**"
 - Function key  : open main menu "**Programming**"
 - Function key  : open main menu "**Monitor Parameters**"
 - Function key  : open main menu "**Reset Fault**"
 - Function key  and  open changing over languages.

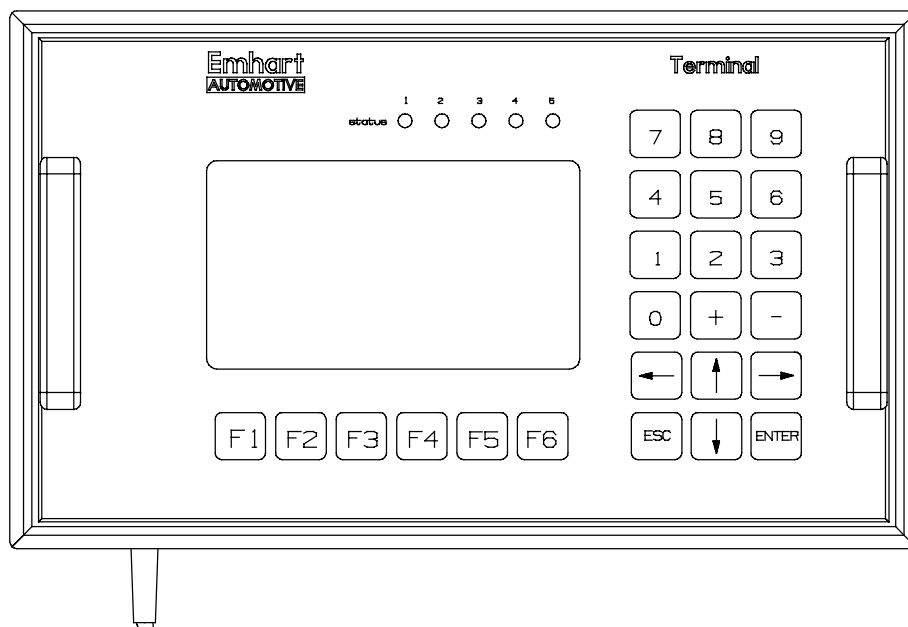
1.1 Sub-Menu “Keyboard Functions“

The sub-menu “Keyboard Functions“ is selected via the  key. This menu informs the user about the configuration of the operation control keys.


Key Functions	
F1	- Display key functions
F2	- Main menu
F3	- Programming
F4	- weld parameter monitoring
F5	- fault reset
F6	- Release Manual Functions
ESC	- ESCAPE, abort
ENT	- ENTER, confirmation
0..9	- input SKK/PK, program no.
+ -	- change, set/reset values
<↓↑>	- select menu, value

Exit the menu by pressing any key.

Display- and Control Panel



1.2 Sub-Menu “Weld Parameter Monitor“

Having selected the sub-menu "Weld Parameter Monitor" using  or through the direction keys the cursor will move to the first menu line requesting selection of the TMP output (1-5) to be monitored as well as the program no. (1-27) of the weld program to be monitored.


Remark: Output "0" described below has a special function.

Weld parameter monitor					

SKK/PK outlet : #	Program.No.: . . . ###				
Weld part ident : #####					
Autoplunge : ####	Optimization. . . .####				
	Ref	+tol	-tol	Act	

Vp	##	##	##	##	V #
Vw	##	##	##	##	V #
Iw	####	####	####	####	A #
tw	###	##	##	###,#	ms #
td	##,#			##,#	ms #
#Lift	#,##	,##	,##	#,##	mm #
Fault : #####					

< 0..5> <ENTER>			<F1..F5> <ESC>		

Select output and program number and confirm with  The individual menu lines of the display signify the following:

SKK/PK Output 0	The parameters of the weld tool that welded last will be displayed in the table.
SKK/PK Output 1-5	The parameters of the last weld of the selected weld tool will be listed.
Progr.-Nr. 0	The parameters of the last weld program will be displayed in the table.
Progr. Nr. 01 - 127	The parameters of the selected weld program will be displayed in the table.

Weld part ident	Display of the program ident for the weld part.
-----------------	---

Autoplunge: Yes (tw = weld time)	The deenergization time of the solenoid will be automatically adjusted to the reference stud drop time.
Autoplunge No	Automatic autoplunge is not activated.
Optimization: Yes (Up to max. 800A/60ms)	Automatic adjustment of the weld current Iw / weld time tw when welding through impurities on work surfaces.
Optimization: No	No optimization of weld current (Iw) and weld time (tw).

Ref	Preset value set according to weld program.
+ tol	Positive tolerance. "0" selections will not be monitored.
- tol	Negative tolerance. "0" selections will not be monitored.
Act	Actually measured weld parameters of last weld.

Vp [V]	Arc voltage in pilot current phase. *
Vw [V]	Arc voltage in weld current phase.
Iw [A]	Weld current.
tw [ms]	Weld time.
td [ms]	Stud drop time.
Lift [mm]	Lift distance. An exclamation mark before the text Lift signifies that the stud length measurement function for SD2 has been deactivated in terms of position.

* Some voltage values are of particular importance (see Annex E).

Fault	The fault will be displayed that has occurred during welding.
-------	---

Possible fault indications are:

None	Weld cycle without fault.
SMPS	Defect within SMPS, welding was stopped.
Lift Cycle On	Fault when enabling the solenoid.
No arc Voltage	Defective lift; short circuit in weld circuit.
Short circuit weld	The last weld performed was a short circuit operation.
Lift Cycle Off	Fault when disabling the solenoid.
Drop Time Timeout	Monitoring time in weld sequence was exceeded.
No Weld Current	The last weld performed was an open circuit operation.

Faults will be recorded under a fault number in the fault memory.

Selecting the function keys **F3**.. **F5** will open the corresponding sub-menu. By pressing **ESC** or **F2** you will access the main menu.



1.3 Sub-Menu "Programming"



Note

Please note that opening of the sub-menu "Programming" is exclusively reserved for authorized and qualified personnel.

The sub-menu "Programming" is to be selected for programming of the weld parameters as well as the weld outputs and the specific feed times.

Direct access will be accomplished via the function key  or by positioning the cursor on the second line of the main menu and pressing .

Programming	

Weld parameters	
Output/feeder	

<↓↑> <ENTER>	<F1..F5> <ESC>

1.3.1 Function Menu "Programming Weld Parameters"

The function menu "Programming Weld Parameters" is selected via the  and  keys and confirmed via .

Programming weld parameters	

Output No	#
Weld programm no	###
Weld programm activ.	####
Weld diameter.	#####
Workpiece gauge	#####
Workpiece coating	#####
Energy adjustment	### %

<1..9> <↓↑> <+,-> <ENTER>	<F1..F5> <ESC>



The significance of the individual menu lines is described on the following pages.

Output No.:	The output number defines the weld tool which will be addressed based on the TMP connector configuration.
-------------	---

When indicating the output the following operation modes are to be differentiated:

Standard operation	In standard operation (feeder - SKK/PK) the output no. must be entered corresponding to the TMP connector configuration. For example: "TMP-pin 1 - feeder 1 - SKK/PK no. 1".
SD2 operation	When using a 2-way stud divider "SD2" only output no. 1 is to be addressed.
SD5 operation	When using a 5-way stud divider the output no. is to be entered corresponding to the "SD5" configuration. For example: "SD5 connector configuration 3 - SKK no. 3".
SD5 operation	When using a 5-way stud divider the output no. is to be entered corresponding to the "SD5" configuration. For example: "SD5 connector configuration 3 - SKK no. 3".

Weld Program No.	For each weld task a specific weld program should be available which is to be addressed via the corresponding program no. (1 - 127).
------------------	--

Enter a number between 1 and 5 for the weld output as well as between 1 and 127 for a weld program via the numerical keypad and confirm with  press  to exit the input mode.

Yes	External program selection enabled.
No	External program selection disabled. Remark: if no external program selection is requested only weld program 1 may be activated for the corresponding output.

Weld diameter	Selection of weld flange diameter.
Flange diameter	Selection of flange diameter in a range from 2 mm - 8 mm (step size: 1 mm).
SWB10	When welding T-studs with a length of 3,8 mm and a flange diameter of 3 mm the TUCKER-name SWB10 is to be entered.

Workpiece Gauge	Selection of sheet thickness of work surface: 0,8 mm, 1,2 mm, 2 mm or >2 mm.
-----------------	--




Coating	Selection of work surface coating.
none	Untreated work surface.
galvanized	Galvanized work surface.

Energy adjustment	Weld energy adjustment in a range from -50% - +50% (step size: 5%).
-------------------	---

Programming is to be executed by the and keys. The selections of the individual parameters can be either confirmed with or rejected with .

By pressing the or the key the cursor will move to the field "output no." and enables further programming. By pressing you will return to the sub-menu "programming".

1.3.2 Function Menu "Programming Output / Feeder"

The function menu "Programming Output / Feeder" will be selected via the  and  keys in the sub-menu "Programming" and confirmed with .

Programming output/feed time	





Weld output No . :	#
Output active.....	####
Feed time.....	#### ms

<1..9> <↓↑> <+,-> <ENTER> <F1..F5> <ESC>	


Weld output no.	The weld output no. will define the weld tool which will be addressed based on the TMP connector configuration.
-----------------	---

Yes	The output of the TMP weld unit is activated.
No	The output of the TMP weld unit is not activated.

Feed time	The time between feeding signal and arrival of the stud in the stud receiver is to be selected in a range from 50ms - 1600ms.
-----------	---

Remark: Programming is to be performed via the numerical keys, the  and  keys as well as the  and  keys.

1.4 Sub-Menu "Statistics"


The sub-menu "Statistics" will be selected by positioning of the cursor on the third line of the main menu and by pressing the  key. The sub-menu "Statistics" contains sub menus in which information on faults, welds and maintenance are recorded.

Statistics	

Fault memory	
WOPs memory	
Weld output statistics	
Weld program statistics	
Maintenance	

<↓↑>	<ENTER> <F1..F5> <ESC>

1.4.1 Sub-Menu "Fault Memory"

By positioning the cursor on the first line of the sub-menu "Statistics" and then pressing the  key you can access the "Fault Memory" screen.

Fault memory			Fault no. ###		
O	Prg	Fault type	No.	Date	Time
#	###	#####	###	##.##.##	##:##:##
#	###	#####	###	##.##.##	##:##:##
#	###	#####	###	##.##.##	##:##:##
#	###	#####	###	##.##.##	##:##:##
#	###	#####	###	##.##.##	##:##:##
#	###	#####	###	##.##.##	##:##:##

Fault description:					



<↓↑>			<F1..F5> <ESC>		



The individual menu lines will be described on the following page:

Fault Memory	All faults of the equipment will be recorded.
Fault No.	Number of fault on which the cursor is positioned.

A	Display of output 1 - 5.
Prg	If faults occur during the weld sequence the weld program will be displayed.
Fault Type	Information at which component the fault occurred (unit / SKK/PK / feeder / stud divider).
No.	No. of fault message.
Date	Date of fault.
Time	Time of fault.

Fault Description	Short fault description (according to current cursor position).
-------------------	---

With the keys  and  you can alternately display the fault memory.


By pressing  you will return to the sub-menu "Statistics". By pressing  you will return to the main menu.

Trouble Shooting Information:

- Faults can be reset based on the information "Fault Messages".
- Faults which can not be reset on location through the listed remedial measures require the replacement of the weld unit.
- Faults occurred at a peripheral unit are to be remedied based on the information given in the corresponding operating manual.
- Faults will be reset in the menu "Clear Fault Condition".


1.4.2 "WOP- Memory"

The "WOP-Memory" contains messages and information about welds out of tolerance (**W**eld **O**utside **P**arameter = WOP)

The "WOP-Memory" screen can be accessed by positioning of the cursor on the second line of the sub-menu "Statistics" and by pressing  .

WOP-mem Outlet:# Prog:### Page:###						
Weld part ident : #####						
Date.....	##.##.##	Time	##.##.##			
Autoplunge. .	#####	Optimization....	#####			
	Ref	+tol	-tol	Act		
Vp	##	##	##	##	V	#
Vw	##	##	##	##	V	#
lw	####	###	###	####	A	#
tw	###	##	##	###,#	ms	#
td	##,#			##,#	ms	#
#Lift	#,##	,##	,##	#,##	mm	#
Fault : #####						
<0..5> <↓↑> <ENTER> <F1..F5> <ESC>						

Select output number and confirm with  . The individual menu lines of the display signify the following:

WOP-Memory	Record for all welds out of tolerance.
Weld part ident	Display of the program ident for the weld part
0	Those outputs for which WOP's are to be displayed can be entered with the numerical keys 1 - 5. With the key 0 all WOP's will be displayed in sequence of their occurrence. The selection must be confirmed with  .
Prog.	Display of current weld program.
Page	Display of current page.

Date	Date when WOP occurred.
Time	Time when WOP occurred.

Autoplunge: Yes (tw = weld time)	The de-energization time of the solenoid will be automatically adjusted to the reference stud drop time.
Autoplunge: No	Automatic autoplunge was not activated.
Optimization: Yes (up to max. 800A/60ms)	An automatic adjustment of the weld current Is / weld time ts when welding through impurities on work surface was performed.
Optimization: No	No optimization of weld current lw and weld time tw performed.

Ref	Preset value set according to weld program.
+ tol	Positive tolerance. "0" selections will not be measured.
- tol	Negative tolerance. "0" selections will not be measured.
Act	Actually measured weld parameters of the last weld performed.



Vp [V]	Arc voltage in pilot current phase.
Vw [V]	Arc voltage in weld current phase.
Iw [A]	Weld current.
tw [ms]	Weld time.
td [ms]	Stud drop time.
Lift [mm]	Lift distance.

Fault	The fault will be displayed that has occurred during welding.
-------	---


- Possible fault messages are:

None	Weld sequence without fault.
SMPS	Defect within SMPS, welding was stopped.
Lift Cycle On	Fault when enabling the solenoid.
No arc voltage	Defective lift; short circuit in weld circuit.
Short circuit weld	The last weld performed was an short circuit operation.
Lift Cycle Off	Fault when disabling the solenoid.
Drop Time Timeout	Monitoring time in weld sequence was exceeded.
No weld currentt	The last weld performed was an open circuit operation.

The WOPs can be alternately displayed with the keys  and .

By pressing  you will return to the sub-menu "Statistics". By pressing  you will return to the main menu.

1.4.3 "Weld Output Statistics"



By positioning the cursor on the third line of the sub-menu "Statistics" and then pressing the  key you can access the memory menu "Weld Output Statistics" screen.


Weld outlet statistics						
O	Number of WIP&WOP	Number of WOP	WOP repeat lim	act	Number of faults	auto rep.- feed
1	#####	#####	#	#	#####	#####
2	#####	#####	#	#	#####	#####
3	#####	#####	#	#	#####	#####
4	#####	#####	#	#	#####	#####
5	#####	#####	#	#	#####	#####


<F1..F5> <ESC>

The individual menu lines signify the following:


Output	Display of the output the statistics are related to.
Number of WIP & WOP	Total number of welds.
Number of WOPs	Total number of welds out of tolerance.
WOP repeat limit	Display of programmed acceptable sequential welds that may be out of tolerance.
Actual WOP repeat	Actual number of sequential welds out of tolerance.
Number of faults	Total number of faults occurred.
Auto refeed	No. of studs automatically supplied due to missing SOW-signal during internal slide rail control.

The information for the individual weld programs can be alternately displayed with the keys  . 

By pressing  you will return to the sub-menu "Statistics".

By pressing  you will return to the main menu.

1.4.4 "Weld Program Statistics"

By positioning the cursor on the fourth line of the sub-menu "Statistics" and then pressing the  key you can access the memory menu "Weld Program Statistics" screen.

Weld program statistics				Outlet:#	
Prog	number of WIP&WOP	number of WOP	WOP repeat lim	act	auto. rep. feed
	#####	#####	#	#	#####
	#####	#####	#	#	#####
	#####	#####	#	#	#####
	#####	#####	#	#	#####
	#####	#####	#	#	#####
	#####	#####	#	#	#####
	#####	#####	#	#	#####
	#####	#####	#	#	#####



<↓↑>



<F1..F5> <ESC>


Select output number and confirm with . The individual menu lines of the display signify the following:

Weld Program Statistics	Statistics of welds within and out of tolerance for the individual outputs.
Output	Selection of the output for which statistical information is to be displayed.

Prog	Display of the program the statistics are related to.
Number of WIP & WOP	Total number of welds.
Number of WOPs	Total number of welds out of tolerance.
WOP repeat limit	Display of programmed acceptable sequential welds that may be out of tolerance.
Actual WOP repeat	Actual number of sequential welds out of tolerance.
Auto refeed	No. of studs automatically supplied due to missing SOW-signal during internal slide rail control.


The information for the individual weld programs WOP's can be alternately displayed with the keys  and .

By pressing  you can select another output, by pressing  again you will return to the sub-menu "Statistics".

By pressing  you will return to the main menu.

1.4.5 "Maintenance"

The "Maintenance" screen contains information about the condition of the connected weld tools due to wear.

By positioning the cursor on the fifth line of the sub-menu "Statistics" and then pressing the  key you can access the "Maintenance" screen.

Maintenance					
Collet maint. – No. welds					
	1	2	3	4	5
Act.	#####	#####	#####	#####	#####
Warn.	#####	#####	#####	#####	#####
Fault	#####	#####	#####	#####	#####
Monitor - drop time (ms)					
Act.	###,#	###,#	###,#	###,#	###,#
Warn.	+# -#	+# -#	+# -#	+# -#	+# -#
Fault	+# -#	+# -#	+# -#	+# -#	+# -#
<F1..F5> <ESC>					

The individual menu lines signify the following:

Maintenance	The wear of the collet as well as the drop time of the connected weld tools will be displayed.
Collet Maint.- No. of Welds	Weld statistics will begin with assembly of new collet. Remark: After replacing the collet the maintenance meter must be reset.
Act.	Actual number of welds performed with a collet.
Warn.	Programmed number of welds with which, when exceeded, the corresponding maintenance warning will become active.
Fault	Programmed number of welds with which, when exceeded, the weld output will be set into fault condition.
Monitor Drop Time (ms)	Monitoring of the mechanical parameter "stud drop time". Remark: The difference refers to the established drop time of the past 8 welds in relation to the programmed (!) drop time.
Act.	Deviation of actual measured stud drop time from the programmed one will be displayed.
Warn.	Programmed deviation with which, when exceeded, the corresponding maintenance warning will become active.
Fault	Programmed deviation with which, when exceeded, the corresponding weld output will be set to fault condition.

Maintenance Information:

- The maintenance warning will be transmitted to the customer interface and will appear as " ! " in the corresponding field of the sub-menu " Status TMP ".
- Irrespective of the TMP unit maintenance warnings the prescribed maintenance intervals of the unit components must be maintained.
- Information on the specific maintenance works can be read from the corresponding operating manuals.
- Having repaired the unit components the maintenance statistics in the menu " Clear Functions" must be reset to " 0 ".

1.5 Sub-Menu "Clear Fault Condition"

The sub-menu "Clear Fault Condition" can be selected directly with the function key **F5** or by positioning the cursor on the fourth line of the main menu "OPERATION" and then pressing **ENTER**.

In case of no fault condition the following will be displayed on the monitor when the sub-menu "Clear Fault Condition" is selected:

OPERATION	
Weld parameter monitoring Programming Statistics Fault reset	
No fault exist	
Status TMP Functions Warnings	
<↓↑> <ENTER>	<F1..F5>

In case of a TMP system fault all fault sources will be displayed

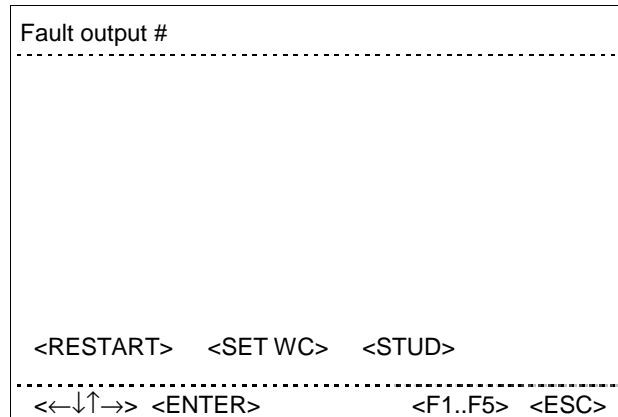
Fault condition	
To continue operation clear the fault condition.	
<F1..F5>	<ESC>



Note

If system faults requires the opening of the weld unit it is exclusively reserved for authorized and qualified personnel. All fault messages will be cleared when the TMP unit is switched on again, following the remedy of the fault condition.

In case there are simultaneous faults at other TMP outputs apart from the unit faults (flashing of one, of several or of all "operation/error"-LED's) these can be represented as follows after the system fault has been remedied.



Select output and program number and confirm with The individual menu lines of the display signify the following:

Fault Output #	The fault is only related to the TMP output displayed. All faults of this output will be listed.
----------------	--

The fault occurred will cause a defective weld cycle.

In case there are simultaneous faults at other TMP outputs these can be represented alternately with the direction keys and .

The sub-menu "Clear Fault Condition" offers the user several possibilities how to deal with fault messages

The below mentioned operations can be selected with the two cursor keys , and activated by pressing the key.


RESTART	By selecting RESTART the fault will be reset and the weld will be performed if there is a start weld signal, if possible.
SET WC	With the command SET WC the fault will be reset, if possible and the signal "Welding complete" will be issued.
STUD	With the command STUD a stud feeding cycle will be initiated, if possible. The screen display remains the same; the fault message will not be reset.

Remark: In case the fault message will not reset after having performed the corresponding operation the following message will be displayed:

"Function cannot be performed"

Please note the remedial measures in the corresponding operating manuals for the resetting of faults at unit peripherals.

Having reset the fault the menu selected before the fault occurred will be re-displayed automatically.

Irrespective of the removal of faults you can exit the sub-menu "Fault Reset" by pressing  and return to the main menu.


Remark: If the fault can not be cleared by either RESET, RESTART or SET WC resetting of faults is limited to the remedial measures listed in section "Fault Messages".



Warning

Operational defects of the weld equipment which can not be cleared through the listed remedial measures are to be fixed by qualified service personnel.

1.6 Sub-Menu "Status Weld Sequence"

The sub-menu "Status Weld Sequence" is to be selected for obtaining an overview on the weld circuit-related signals. Position the cursor on the corresponding menu line of the main menu and press the  key.

Status weld sequence					
	1	2	3	4	5
Weld cycle	#	#	#	#	#
Feed cycle	#	#	#	#	#
SOW	#	#	#	#	#
Angularity switch PK	#	#	#	#	#
Start weld	#	#	#	#	#
Start feed	#	#	#	#	#
SKK R-position	#	#	#	#	#
I. Tolerance	#	#	#	#	#
Program number	###	###	###	###	###

<F1..F5> <ESC>

The individual menu lines of the display signify the following:

The status information is related to output 1 ... 5 of the TMP-weld unit.

Weld cycle	*:	Weld cycle operation.
	-:	No weld cycle operation.

Feed cycle	*:	Stud feeding operation.
	-:	No stud feeding operation.

SOW	*:	SOW (stud on workpiece) signal is active.
	-:	No SOW signal.

Angularity switch PK	*:	Angularity signal is active.
	-:	No angularity signal.



Start weld	*:	Start weld signal is active.
	-:	No start weld signal.

Start feed	*:	Start feed signal is active.
	-:	No start feed signal.


SKK R-position	*:	SKK retracted signal is active.
	-:	No SKK retracted signal

I/O Tolerance	*:	Parameters are within the operating tolerance range.
	-:	Parameters are out of operating tolerance range

Program number	1-127 : Display of program no under which the last weld was performed.
----------------	--

By pressing  or  you will return to the main menu.

1.7 Sub-menu "Status Customer Interface"

The sub-menu "Status Customer Interface" is to be selected for obtaining an overview on interface signals given. Position the cursor on the sixth menu line of the main menu and press the  key.

Status customer interface					
	#	#	#	#	#
Operation mode	####	####	####	####	####
Start weld	#	#	#	#	#
Start feed	#	#	#	#	#
Without weld	#	#	#	#	#
Reset fault	#	#	#	#	#
Restart	#	#	#	#	#
Set WC	#	#	#	#	#
Start SKK F-pos.	#	#	#	#	#
Start SKK R-pos.	#	#	#	#	#
Program number	###	###	###	###	###
<F1..F5> <ESC>					

The individual menu lines of the display signify the following:

Status information is related to output 1 ... 5 of the TMP - weld unit.

AUT	Selected operation mode: "automatic".
MAN	Selected operation mode: "manual".
STOP	Selected operation mode: "operation stop".

The following menu lines represent through " * " whether a signal has been given or through " - " that a signal has not been given.

Start Weld	*:	The signal "start weld " is set via the interface.
	-:	The "start weld" signal has not been set

Start Feed	*:	The signal "start feed" is given via the interface.
	-:	The signal "start feed" has not been set

Without weld	*:	The signal "without weld" has been set.
	-:	The signal "without weld" has not been set

Reset fault	*:	The signal "reset fault" is set.
	-:	The signal "reset fault" has not been set.

Restart	*: The signal "restart" has been set. -: The signal "restart" has not been set
---------	---



Set WC	*: The signal "Weld complete" is set. -: The signal "Weld complete" has not been set.
--------	--

Start SKK F-pos.	*: The signal for advancing the weld head slide rail is set. -: The signal "start SKK extend" has not been set
------------------	---


Start SKK R-pos.	*: The signal for retracting the weld head slide rail is set. -: The signal "start SKK retract" has not been set.
------------------	--

Program number	1...127: Number of the weld program selected via the customer interface.
----------------	--

Remark: If a signal is set the corresponding command is given via the customer interface.

By pressing  or  you will return to the main menu.

1.8 Sub-menu "Status Feeder / Stud Divider"

The sub-menu "Status Feeder / Stud divider" is to be selected for obtaining an overview on the feeder and stud divider signals. Position the cursor on the seventh menu line of the main menu and press the  key.

Status feeder / stud divider					
	#	#	#	#	#
Operation mode	###	###	###	###	###
Feed cycle	#	#	#	#	#
Piston retracted	#	#	#	#	#
Pos. Stud divider	#	#	#	#	#
SKK R-position	#	#	#	#	#
Angularity switch PK	#	#	#	#	#
Start weld	#	#	#	#	#
Start feed	#	#	#	#	#
Stud level low	#	#	#	#	#
<F1..F5> <ESC>					

The individual menu lines of the display signify the following:

Status information is related to output 1 ... 5 of the TMP - weld unit.

Operation Mode	Feeder is in operation mode " Automatic ", " Manual " or " Test ".
----------------	---

Feed cycle	*: Display that a feeding cycle is performed. -: No feeding cycle performed.
------------	---

Piston retracted	*: SKK/PK piston is retracted. -: Piston is not retracted.
------------------	---

Position Stud Div.	*: Display of current stud divider position. -: No stud divider position recognized.
--------------------	---



SKK retracted	*: SKK is retracted. -: No input signal "SKK retracted".
---------------	---

Angularity switch PK	*: Angultary signal is active. -: No angultary signal.
----------------------	---

Start weld	*: Start weld signal is active. -: No start weld signal.
------------	---

Start feed	*: Start feed signal is active. -: No start feed signal.
------------	---

Stud level low	*: Stud level low signal is active. -: No stud level low signal.
----------------	---



By pressing  or  you will return to the main menu.

1.9 Sub-menu "Status TMP "

This sub-menu contains specific messages and information on the peripheral units. Position the cursor on the eighth menu line of the main menu and press the

 key.

Status TMP					
Date.	##.##.##	Time	##.##.##		
Software.	V##.##	Address.	###		
Interface.	#####	SMPS ready. . . .	####		
Operation stop. . . .	####	Emergency	####		
	# #	# #	# #	# #	# #
Connection	#####	#####	#####	#####	#####
SF-Typ	####	####	####	####	####
SKK/PK	###	###	###	###	###
SF..A/D	#	#	#	#	#
Lift sensor	####	####	####	####	####
Maintenance	#	#	#	#	#
<F1..F5> <ESC>					

By pressing  or  you will return to the main menu.

The individual menu lines of the display signify the following:

Date	Shows the date in the sequence of "day.month.year".
Time	Shows the time in the sequence of "hour:minutes:seconds".
Software	The version no. (V ##.##) informs about the present software version of the TMP weld unit.
Address	When connecting several TMP weld units to a central personal computer each TMP must be attributed a customer-specific address
Interface	The following customer interface are possible: parallel, Interbus-S, Profibus DP or no interface.
SMPS ready	The weld energy source SMPS is ready / not ready
Stop Operation	Display of existing / not existing stop operation
Emergency	Display of existing / not existing emergency stop
Connection	norm: standard feeder configured SD2-M master feeder SD2 configured SD2-S: slave feeder SD2 configured SD5-Z: SD5 feeder configured SD5-W: SD5 divider configured PKE: manual gun extension configured

SF-Typ	Represents the connected feeder type, i.e. SF 12, SF 50, SF 52, SF 53, SF 54, SF 56. If no feeder is connected, " - " is displayed.
--------	---

SKK/PK	If a weld head is connected, SKK is displayed, otherwise PK or " - " is displayed.
--------	--


SF..A/D	If the feeder is equipped for slide rail control, " D " is displayed, otherwise " A " or " - " is displayed.
---------	--

Lift sensor	If the weld head is equipped for lift measuring, " yes " is displayed, otherwise " no " or " - " is displayed.
-------------	--

Maintenance	If the weld tool exceeded the programmed limit value, " ! " is displayed, otherwise " - " is displayed.
-------------	---



1.10 Sub-menu "Functions"

This sub-menu contains a command mode for the manual control of the TMP as well as the possibility to display the software levels.


The sub-menu "Functions" will be opened by positioning the cursor on the last menu line of the main menu and by pressing the  key.

The individual functions are to be selected via the keys ,  and .

.Functions	
display system configuration	
test mode cycle functions	
test mode outputs interface	
test mode weld process	
test mode power supply	
<↓↑> <ENTER>	<F1..F5> <ESC>


By pressing  or  you will return to the main menu.

1.10.1 Function Menu "Display System Configuration"

This sub-menu will be selected by positioning the cursor on the first menu line of the sub- menu "Functions" and by pressing the  key.


E M H A R T	T M P	####
System software		V ##.##
Keypad/Display		V ##.##
Central CPU		V ##.##
SMPS		V ##.##
Interface #####		V ##.##
Outlet 1	#### / ####	V ##.##
Outlet 2	#### / ####	V ##.##
Outlet 3	#### / ####	V ##.##
Outlet 4	#### / ####	V ##.##
Outlet 5	#### / ####	V ##.##
		<F1..F5> <ESC>

The TMP will identify itself by displaying unit and peripherals as well as the corresponding software versions.


By pressing  you will return to the sub-menu "Functions".

1.10.2 Function Menu "Test Mode Cycle Functions"


In test mode important control commands can be given directly at the control panel. These control commands supersede external customer control and will be executed immediately.

This sub-menu will be selected by positioning the cursor on the second menu line of the sub- menu "Functions" and by pressing the key 

Test mode cycle functions					
	1	2	3	4	5
Cyclus	#####	#####	#####	#####	#####
SKK F-pos.	#####	#####	#####	#####	#####
SKK R-pos.	#####	#####	#####	#####	#####
Start feed	#####	#####	#####	#####	#####
Lift	#####	#####	#####	#####	#####
Set WC	#####	#####	#####	#####	#####
Color mark	#####	#####	#####	#####	#####
Reference outlet :	#				
SKK ext. . . ##### ms			Drop time. . . ##, # ms		
SKK ret. . . ##### ms			Lift. #, ## ms		
<<-↓↑-> <ENTER>=Start <F1..F5> <ESC>					

To execute a certain function the corresponding menu line as well as the TMP output number is to be selected with the cursor keys. The start command will be given by operating the  key.

Remark: Test mode will be automatically cancelled if no key is operated within 60s.

- As a precaution additionally the " " - key must be pressed.

Attention: With certain software levels (f.i. System V1.30, OPEL carline) these test functions may still be performed despite the system being in stop operation mode.

The individual menu lines of the display signify the following:

Cycle	The command for executing a weld sequence test without performing an actual weld can be given.
SKK ext.	The command for advancing the weld head can be given.
SKK ret.	The command for retracting the weld head can be given.
Start feed	The command for "stud feeding" can be given.
Lift	The command for executing a lift can be given.

Set WC	A WC-signal is generated for the selected output
--------	--


Color mark	A color mark is generated for the selected output
------------	---

The readings of the selected TMP output will be displayed in menu lines 10 and 11. If the connected SKK is equipped with a lift measuring system (option) the measured lift will be displayed in menu line 11.

By pressing you will exit the "test mode cycle functions". By pressing you will return to the main menu.



1.10.3 Function Menu "Test Mode Outputs Interface"

In the function menu "Test Mode Outputs Interface" the customer interface signals may be set and tested.

This sub-menu will be selected by positioning the cursor on the third menu line of the sub- menu "Functions" and by pressing the  key.

Test mode outputs interface					
	1	2	3	4	5
Operation mode	####	####	####	####	####
Ready	#	#	#	#	#
SOW	#	#	#	#	#
SKK R-position	#	#	#	#	#
I.Tolerance	#	#	#	#	#
Fault	#	#	#	#	#
WC	#	#	#	#	#
Maintenance	#	#	#	#	#
Emergency stop	#	#	#	#	#
Fault code	###	###	###	###	###

<<-> <↑> <↓> <→> <ENTER>=Start <F1..F5> <ESC>

The cursor can be moved within the table with the direction keys. Signals will be set or cancelled by pressing  or  .

The individual menu lines of the display signify the following:

Operation mode	The following operation modes can be simulated: AUTO, TEST, PROG, ERR, STOP, NO
----------------	---



Outputs	The following outputs can be connected: ready, SOW, SKK back, i. tolerance, fault, WC, maintenance, emergency stop.
---------	---

Fault code	An fault code no. from 1 - 255 can be set.
------------	--




Note

The test mode can only be performed if the signal for stop operation has been set by customer control.

By pressing  you will exit the "Test Mode Outputs Interface" mode. By pressing  you will return immediately to the main menu.


1.10.4 Function Menu "Test Mode Weld Process"

During test mode all signals at the customer interface will be processed as in standard operation. Control commands will be executed without the weld current being enabled.



This function will be selected by positioning the cursor on the fourth menu line of the sub- menu "Functions" and by pressing the  key.

Test mode weld process					
	1	2	3	4	5
Weld cycle	#	#	#	#	#
Feed cycle	#	#	#	#	#
SOW	#	#	#	#	#
Angularity switch PK	#	#	#	#	#
Start weld	#	#	#	#	#
Start feed	#	#	#	#	#
SKK R-position	#	#	#	#	#
I.Tolerance	#	#	#	#	#
Program number	###	###	###	###	###
Warning ! The TMP-unit will work in test mode However the unit will not weld !					
<F1..F5> <ESC>					

Regarding the function, this menu is identical with the menu "Status Weld Process". It displays various process data.






Note The test mode can only be performed if the signal for "Without welding" has been set by customer control.



By pressing  or  you will return to the main menu.

1.10.5 Functions Menu “Test Mode Power Supply“

In the Function Menu "Test Mode Power Supply" the function of the SMPS can be tested in a short circuit

- Select the requested function menu with the direction keys  and  .
- Confirm your entry with  .

Test mode power supply	
Output No. :	#
Quantity of testcycles. :	###
Start :	#####
Actual weld current :	#### A
Actual cycle count. . . . :	###
The short circuit test can be stopped with the <ESC> key	
<<-> <↑> <↓> <→> <+, -> <ENTER> <F1..F5> <ESC>	



- Select the output that is to be tested.
- Position the cursor on the menu line "Start".
- Confirm your entry with  .
- Press  to start the test cycle.

Remark: Test mode will be automatically cancelled if no key is operated within 60 s.

- Press  and  simultaneously to start the function.

Remark: With some software versions it is possible to execute these test functions even with an active Operation stop.

The individual menu lines of the display signify the following:


Output nr.	Select the output for which the test mode is to be executed
Number of cycles (ref)	Number of test cycles that are to be simulated.
Start	Press the keys  and  simultaneously to start the function

Weld current act	The measured weld current
------------------	---------------------------

Number of cycles (act.)	Number of test cycles executed
----------------------------	--------------------------------

- By pressing ESC you will return to the function menu.
- By pressing F2 you will return to the main menu.

1.11 Function Menu "Warnings"

The sub-menu "Warnings" can be accessed by positioning the cursor on the tenth line of the main menu "OPERATION" and by pressing the key 

If there is no warning message available when selecting the sub-menu "Warnings" the following screen message will be displayed:

OPERATION	
Weld parameter monitor Programming Statistics Fault reset	
No warning message available	
Status TMP Functions Warnings	
<↓↑> <ENTER>	<F1..F5>

Warnings will be marked by "slow" flashing of the corresponding output LED. If there are warnings available they will be displayed in the sub-menu "Warnings".

Warnings
<F1..F5> <ESC>

The following warnings can be displayed:

Maintenance clamping tongs	The number of welds exceeds the set limit value
Maintenance weld head	The gun drop time established via 10 welds exceeds the programmed limit values (the differences to the programmed drop time are evaluated).
Level to low	The proximity switch for monitoring the filling level in the stud feeder is not covered.
C-CPU: empty battery RAM-module	The battery in the RAM-module on the central CPU is run down. Before replacing the RAM-module a backup via PC should be performed.
C-CPU: empty battery clock	The battery for securing the real-time clock is run down and must be replaced.

1.12 Sub-Menu "Extended Functions"



Note

Access to the sub-menu "Extended Functions" is secured by a code and is exclusively reserved for the service personnel.

Extended functions	
System parameters	
Mechanical parameters	
Weld parameters	
Copy programs	
Clear functions	
ZCPU system test	
De / activate programs	
Stud length detection	
Set date and time	

<↑↓> <ENTER> <F1..F5> <ESC>


This menu gives access to all data which are related to the weld process.

The menu "Extended Functions" can be accessed via the sub-menu "Programming" by pressing first the < + > key and then the < 0 > key.

There is also the possibility to access the individual sub-menus directly through the following codes.

- <+> <1> : System parameters
- <+> <2> : Mechanical parameters
- <+> <3> : Weld parameters
- <-> <99> : Clear functions

1.12.1 Function Menu "System Parameters"

This function menu will be selected by positioning the cursor on the first menu line of the "Extended Functions" menu and by pressing the  key.

TMP version1

TMP version 2

System parameters	
Address	Interface### Network###
Language #####
Parameter printout: ##### ##### ##### #####

<↓↑> <+, -> <ENTER> <F1..F5> <ESC>	

System parameters	
Address	Interface### Network###
Language #####

<↓↑> <+, -> <ENTER> <F1..F5> <ESC>	


Address Interface	The unit address Interface serves to identify the TMP when connecting it to the Pro-Bus customer interface.
Address Network	The unit address Network serves to identify the TMP when connecting several weld units to a central PC.

Select a number between 1 and 255 to identify the unit.

Language	There are two country-specific languages available to the user for the communication between the TMP weld unit and the operating personnel.
----------	---

Parameter printout	The printer output can be activated and adapted here <ul style="list-style-type: none"> - Printing of WOP or WIP and WOP - Individual or all weld outputs - Baurate
--------------------	--

1.12.2 Function Menu "Mechanical Parameters"

This function menu will be selected by positioning the cursor on the second menu line of the "Extended Functions" menu and by pressing the  key.

Mechanical parameters outlet : #	

Outlet active . . .	####
Slide rail	#####
Start feed	#####
Feedtime	####
Loadtime	####
Repeat feed . . .	####
Permitted WOP .	#
Protect. gas . . .	####
Pre-gas (ms) . . .	####
Post-gas (ms) . .	####
Maint. at	#####
Fault at	#####
Feed adj	####
Color mark	####
Air blow	####
Angularity	####
Stud monitor. . .	####
tp-Maint	+ # - #
tp-Fault	+ # - #

<1..5> <←↓↑→> <+,-> <ENT> <F1..F5> <ESC>	

When the menu "mechanical parameters" has been opened the cursor will move into the heading requesting the input of the selected SKK/PK outlet no. (1 - 5).

SKK/PK: No. in standard operation	In standard operation (feeder - SKK/PK) the SKK/PK no. is to be entered according to the TMP configuration. For example: "TMP output 1 - feeder 1 - SKK/PK No. 1".
SKK/PK: No in operation with SD2	For programming the weld head parameters as well as for programming the parameters of the "master" feeder select only the SKK/PK output no. 1. Information: In order to program the feeding time of the second stud feeder select SKK/PK output no. 2 while the menu line "SKK/PK active" displays "yes".

SKK/PK: No. in operation with SD5	When operating with a 5-way stud divider the SKK no. must be entered as it is at the "SD5-stud divider". For example: "SD5-output 3 - SKK No. 3".
-----------------------------------	--

Enter the respective SKK/PK output no. with the numerical keys and confirm with .

The cursor is now positioned in the first menu line requesting input. With the direction keys you can access the various menu lines directly.

The individual menu lines of the display signify the following:

SKK/PK active	Yes : The output of the TMP-weld unit is activated. No : The output of the TMP-weld unit is not activated.
Slide rail	Internal: The SKK slide rail will be controlled by the TMP-weld unit. External: The SKK slide rail will be under customer-specified control.


Start feed	<p>Extern after SOW: The customer may execute a start signal for "stud feeding" after the collet has disengaged from the welded stud.</p> <p>Intern after SOW: The TMP weld unit will execute the "stud feeding" cycle after the collet has disengaged from the welded stud.</p> <p>Extern after WC: The customer may execute a start signal for "stud feeding" after the end of each welding process.</p> <p>Internal after WC: The TMP weld unit will execute the "stud feeding" cycle after the end of each welding process.</p>
Feedtime	<p>The time between executing the stud feeding signal and arrival of the stud in the receiver can be adjusted in a range from of 50 ms - 1600 ms.</p>
Loadtime	<p>T-Studs SWB 10 with SF 54: The time between piston retract signal and the end of feedtime can be adjusted in a range from 50 ms - 1600 ms.</p> <p>Other Studs with SF ...: The time between piston retract signal and enabling of the blow air can be adjusted in a range from 50 ms - 1600 ms.</p>
Repeat feed	<p>Yes: If the SOW signal is not recognized when the weld tool moves forward the feeding process will be repeated.</p> <p>No: No auto-refeed requested.</p>
Feed adjustment	<p>Yes: The feeding cycle is terminated upon arrival of the stud in the weld tool disregarding the feeding time. (Condition: SKK/PK is equipped with a sensor for weld stud detection).</p> <p>No: No automatic feed adjustment.</p>
Permitted WOP	<p>Sequential welds out of tolerance can be limited by the customer by selecting a number between 1 - 9. When this number has been reached the welding operation will be interrupted.</p>
Color mark	<p>Yes: When connecting color marking units SMB 128 (option) welds out of tolerance will be marked by color.</p> <p>No: Welds out of tolerance will not be marked by color.</p>
Protec. gas	<p>Yes: Shielded arc welding operation with gas (option) is activated</p> <p>No: Shielded arc welding operation with gas is not activated.</p>



Air blow	Yes: If the weld tool is optionally equipped with an air nozzle for clearing the work surface, it will be activated No: Air nozzle for clearing the work surface will not be activated.
Pre-gas	The time of protect. gas flow before weld begin can be adjusted in a range from 0 ms - 1000 ms.
Post-gas	The time of protect. gas flow after the weld has been performed can be adjusted in a range from 0 ms - 1000 ms.
Angularity switch	Yes : n.c. No : n.c.
Stud monitor	Yes: Stud length detection will be activated. Special case SD2: Additionally testing of the feeder allocated by the programm is activated. No: Stud length detection will not be activated.
Maint. at	0...950.000 : Number of welds with a collet after which the maintenance warning will be activated (step size: 5000). " 0 " selections will not be monitored.
tp-Maint.	0 - ±8 : Tolerance value for testing the drop time. If it is exceeded the maintenance warning will be activated. " 0 " selections will not be monitored.
Fault at	0...950.000 : Number of welds with a collet after which the output will be set into fault condition (step size: 5000). " 0 " selections will not be monitored.
tp-Fault	0 - ± 8 : Tolerance value for testing the drop time. If it is exceeded the output will be set into fault condition. " 0 ".selections will not be monitored.

Remark: Programming is to be effected via the and keys

Programmed parameters will be confirmed with or rejected with . You may exit the input mode by pressing the key.

1.12.3 Function Menu "Weld Program"

This function menu will be selected by positioning the cursor on the third menu line of the "Extended Functions" menu and by pressing the  key.

This menu consists of two monitor pages. You can alternately display them by pressing the keys  and  in the corresponding menu line.

Outlet: #	Weld program: ###			



Program active	####			
Pilot current	##	A		
Pilot current time.	##	ms		
Weld current	####	+ ###	- ###	A
Weld current time	###	+ ##	- ##	ms
Varc pilot current.	##	+ ##	- ##	V
Varc weld current	##	+ ##	- ##	V
Optimization.	####			
Weld type	#####			

Program continues	<##>			

<1..5>	<←↓↑→>	<+,->	<ENT>	<F1..F5> <ESC>

When the menu "Weld Program" has been opened the cursor will move into the heading requesting the input of the selected outlet no. (1 - 5).

Enter the outlet no. as well as the number of the weld program with the numerical keys and confirm each with .

Now the cursor is positioned in the first menu line. You can access the various menu lines with the direction keys  and  directly.

Program active	Yes : External program selection enabled No : External Program selection disabled. Remark: if no external program selection is requested only weld program 1 may be activated for the corresponding output.
----------------	--

Pilot current	Selection of pilot current in a range from 20A - 30A.
---------------	---

Pilot current time	Selection of pilot current time 30 ms - 60 ms.
--------------------	--

Weld current	Selection of weld current in a range from 100A - 1000A.*
+ tolerance	Positive tolerance from 0 - 100A (Selection of "0" will cancel monitoring)
- tolerance	Negative tolerance from 0 - 100A (Selection of "0" will cancel monitoring)

* depending on the unit type!

Weld current time	Selection of weld time in a range from 6 ms - 1000 ms.
+ tolerance	Positive tolerance from 0 - 8 ms (Selection of "0" will cancel monitoring)
- tolerance	Negative tolerance from 0 - 8 ms (Selection of "0" will cancel monitoring)


Varc pilot current	Input of arc voltage value (pilot current phase) for parameter monitoring (range: 16V - 36V).
+ tolerance	Positive tolerance from 0V-10V (Selection of "0" will cancel monitoring)
- tolerance	Negative tolerance from 0V-10V (Selection of "0" will cancel monitoring)


Varc weld current	Input of arc voltage value (in main current phase) in a range from 16V - 36V.
+ tolerance	Positive tolerance from 0V-10V (Selection of "0" will cancel monitoring)
- tolerance	Negative tolerance from 0V-10V (Selection of "0" will cancel monitoring)

Optimization	No : Optimization of weld parameters not requested. Current : Automatic adjustment of the weld current when welding through impurities on work surfaces. Time : Automatic adjustment of the weld time ts when welding through impurities on work surfaces.
--------------	--


Weld type	DC : Welding with constant current Pulse : Welding with pulse wave form current
-----------	--

Remark: Programming is to be performed with the keys  and .

Program continues	The second menu page can be displayed by pressing the direction key  .
-------------------	---

Having pressed the  key the cursor will have moved to the second menu page.

Outlet : #	Weld program: ###
Program continues . . . < ↑ >	
Start delay	### ms
Lift distance	#,## +,## -,## mm
Drop time	## ms
Autoplunge	####
Air blow	####
Detect stud	####
Corresponding stud . .	#####
Weld part ident.	#####
<1..5> <←↓↑→> <+,-> <ENT> F1..F5 <ESC>	

Program continues	The first menu page can be displayed by pressing the direction key  .
-------------------	--

Start Delay	If the weld location is not sufficiently stable the time between SOW and lift can be adjusted in a range between 0 ms - 500 ms.
-------------	---

Lift distance	Input of lift value in a range from 0,6mm-3,0mm for parameter monitoring (step size: 0,1 mm). Note: Input only necessary when the connected weld tool is equipped with an integrated lift measurement system to detect distance.
+ tolerance	Positive tolerance from 0-0,6mm (Selection of "0" will cancel monitoring)
- tolerance	Negative tolerance from 0-0,6mm (Selection of "0" will cancel monitoring)

Drop time	Input of the time between de-energizing of the solenoid and the plunging of the stud into the melted work surface. Note: Input serves to adapt weld time to stud plunge time and also serves as reference value for maintenance monitoring
-----------	--

Autoplunge	Yes : Autoplunge is activated to keep weld time constant. No : No autoplunge requested.
------------	--

Air blow	Yes: If the weld tool is optionally equipped with an air nozzle for clearing the work surface, it will be activated No: Air nozzle for clearing the work surface will not be activated.
----------	--

Detect stud	Yes : Stud detection via the length measurement function of the lift measuring system is activated. No : No autoplunge requested Attention: Stud detection function is only performed if the stud detection function in the mechanical parameters has been activated as well.
-------------	--




Remark: If "Detect Stud" is activated it will be verified before each weld whether the stud length of the supplied stud is according to the programmed reference value. In case of an deviation the corresponding fault message will be initiated.

Corresponding stud	Feeder 1 - 5 : The weld program will be attributed a feeder. Note: It will be verified before the weld whether the last stud feed was performed by the correct feeder. None : Corresponding stud verification feature not requested
--------------------	--

Remark: Verification of corresponding stud is only possible during operation with a 2-way stud divider SD 2.


Weld part identification	Input of an alphanumeric text for identification of the weld part
--------------------------	---

Remark: Programming is to be effected via the  ,  ,  and  keys.

Programmed parameters will be confirmed with  or rejected with . You may exit the input mode by pressing the  key.

1.12.4 Function Menu "Copy Programs"




The function menu "Copy Programs" serves to transfer weld programs.


This function menu will be selected by positioning the cursor on the fourth menu line of the "Extended Functions" menu and by pressing the  key.



Copy programs				
Single program				
Program area				
Programs per output				
Copy	Outlet	#	#####	###
To	Outlet	#	#####	###
####			#####	###
<1..9>		<↓↑>		<ENTER>
			<F1..F5>	<ESC>

The user has the following possibilities to copy weld programs:

Single Program	In selecting "Single Program" one copy of the weld program will be made
Program Area	In selecting "Program Area" several copies of the weld program will be made
Programs per Output	In selecting "Programs per Output" all weld programs of an output will be copied

Select the requested copy function with the direction keys  and  and confirm with .

Select a number between 1 and 5 for the weld output as well as a number between 1 and 127 for the weld program and confirm your input with .

By pressing  the cursor will move to the function selection and by pressing  again you will exit the menu.

Information on copying programs:

Weld programs will need to be copied when in a robot unit studs are to be welded at different weld locations with identical programs. The stud detection is not copied.




Note

If a weld program is copied to an address under which a program is already stored the existing program will be overwritten by the new program.

1.12.5 Function Menu "Clear Functions"




The function menu "Clear Functions" serves to Clear and thus to reset counters and memories of the statistics menu.




This function menu will be selected by positioning the cursor on the fifth menu line of the "Extended Functions" menu and by pressing the  key.

Clear functions					
	1	2	3	4	5
Maintenance	####	####	####	####	####
Statistic	####	####	####	####	####
Fault memory	#####				
WOP memory	#####				
<<-> <↑> <↓> <→> <ENTER>=Clear <F1..F5> <ESC>					


The individual menu lines signify the following:

Maintenance	By clearing "Maintenance" the statistics in "Maintenance" menu information will be reset to "0" . Any existing maintenance warning will be automatically reset
Statistic	By clearing the "Statistics" the information in the two statistics menus "Weld Output" and "Weld Program Statistics" will be reset to "0"
Fault Memory	By clearing the "Fault Memory" all information will be deleted in the "Fault Memory"
WOP Memory	By clearing the "WOP Memory" all information will be deleted in the "WOP Memory"

For selecting statistics or a memory position the cursor with the direction keys  And  and confirm with the  key. The message "Activate Clear Function" will appear on the display.

By pressing the  key the selected memory will be cleared, by pressing  the selection will be cancelled. By pressing  again you will exit the menu "Clear Functions".

1.12.6 Function Menu "ZCPU System Test"

This function menu will be selected by positioning the cursor on the sixth menu line of the "Extended Functions" menu and by pressing the  key.

ZCPU System test	
RAM-Module:	
- existent	#
RAM-Module Battery:	
- within operating tolerance.	#
- voltage level (Volts)	#, #
ZCPU Battery:	
- within operating tolerance.	#
- voltage level (Volts)	#, #
<F1..F5> <ESC>	

The individual menu lines will be described on the following pages:

RAM-Module : The system test checks whether the RAM-module is responsive.

Existent	* :	A RAM-Module is existent.
	- :	No RAM-Module.

RAM-Module battery : The system checks the battery in the RAM-Module

Tolerance	* :	The battery voltage is within the operating tolerance.
	- :	The battery voltage is out of the operating tolerance
Voltage level		The system test will indicate the measured battery voltage


ZCPU-Module battery : The system checks the battery on the ZCPU (real-time clock)

Tolerance	* :	The battery voltage is within the operating tolerance.
	- :	The battery voltage is out of the operating tolerance
Voltage level		The system test will indicate the measured battery voltage

By pressing the  key you will exit the function menu "ZCPU System Test".

1.12.7 Function Menu "De/Activate Program"







The function menu "De/Activate Program" displays a clearly arranged overview on the active/inactive weld programs in terms of output. Individual programs may be de/activated.

The function menu is selected by positioning the cursor on the seventh line of the "Extended Functions" menu and then pressing the  key.

Overview active programs										O: #
1	2	3	4	5	6	7	8	9	10	
11	12	13	14	15	16	17	18	19	20	
21	22	23	24	25	26	27	28	29	30	
31	32	33	34	35	36	37	38	39	40	
41	42	43	44	45	46	47	48	49	50	
51	52	53	54	55	56	57	58	59	60	
61	62	63	64	65	66	67	68	69	70	
71	72	73	74	75	76	77	78	79	80	
81	82	83	84	85	86	87	88	89	90	
91	92	93	94	95	96	97	98	99	100	
101	102	103	104	105	106	107	108	109	110	
111	112	113	114	115	116	117	118	119	120	
121	122	123	124	125	126	127				

<1..5> <<↓↑>> < + >=active < - >=inactive <ESC>

An overview on all programs nos. is displayed. Program numbers displayed in italic are activated.


In order to alter a de/activation the cursor must be positioned on the requested program number via the arrow keys , ,  or  and then the keys  or  must be pressed.

The status of the program will be altered correspondingly and the cursor moves automatically to the next position.

Exit the menu with .


1.12.8 Function Menu "Stud Length Detection"

From the function menu "Stud Length Detection" a reference value for the stud length can be stored in memory if a lift measuring system is available. This value is then considered for checking the supplied stud, if the stud detection function (see "Mechanical Parameters" as well as "Weld Parameters") has been activated.





This function menu will be selected by positioning the cursor on the fifth menu line of the sub-menu "Functions" and by pressing the .

Stud length detection	
Feeder number :	#
Stud load :	#####
Process :	#####
Value (ref) :	### mm
Checkup :	#####
Difference :	####
The length of the stud selected will be stored in mem.	

<1..5> <↓↑> <ENTER> <F1..F5> <ESC>	



Select a number between 1 and 5 for the feeder and confirm your input with .

The individual menu lines signify the following:

Feeder number	Input of feeder no. 1 to 5 Note: In a SD2-application both feeders/studs must be measured for the master output.
Stud load?.... : Press  and  simultaneously, to load a stud on the selected feeder. started: The stud feed cycle has begun. Note: If you are not sure whether the right stud has been supplied, you should always perform this function before a reference measurement.
Process?.... : Press  and  simultaneously to start the reference measurement process (stud length).. During internal slide rail control the head will be advanced automatically to the front position. started: The reference measurement process has begun. Note: If you are not sure whether the right stud has been supplied, you should always perform this function before a reference measurement


Value (ref.)	The stud length is displayed.
--------------	-------------------------------


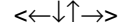



Test	The stud length will be tested.
Difference	The difference of the displayed stud length to the measured value will be displayed.





- Press  to get to the menu line "Feeder number".
- Press  again, to return to the Sub-Menu "Extended Functions".


1.12.9 Function Menu "Set Date and Time"

The date and time can be changed in the function menu "Set Date and Time".

This function menu will be selected by positioning the cursor on the ninth line of the "Extended Functions" menu and by pressing the  key.

Set date and time	
Date : <i>##.##.##</i>	
Time : <i>##:##:##</i>	
    	

In order to change the date or the time, move to the number to be changed with the arrow keys , ,  or . The selected number is represented in italic.

Then enter a new number via the numerical keys. Confirm this number with the key  thereby exiting the menu. Only meaningful numbers will be accepted.

By pressing  changes will be rejected and the menu is also exited.

The individual menu lines signify the following:

Date	The current date will be displayed.
------	-------------------------------------

Time	The current time will be displayed.
------	-------------------------------------

Note: If the date changes after the TMP has been switched off or nonsense numbers are displayed, probably the battery jumper for the real-time clock has not been set.

Appendix A:TMP Software Main-Menu OPERATION

```

OPERATION
-----
Weld parameter monitor
Programming
Statistics
Fault reset
Status weld sequence
Status customer interface
Status Feeder/Stud-Divider
Status TMP
Functions
Warnings
-----
<↓↑> <ENTER>                                <F1..F5>
    
```

```

Weld parameter monitor
-----
SKK/PK outlet: #   Program.No ...:###
Weld part ident : #####
Autoplunge...### Optimization...###
| Ref  +tol -tol | Act |
-----+-----+-----+-----+
Vp |   ##   ##   ## |   ## | V | #
Vw |   ##   ##   ## |   ## | V | #
Iw |  ###   ##   ## |  ### | A | #
tw |  ###   ##   ## |  ###, # | ms | #
td |  ##, #   ##   ## |  ##, # | ms | #
#Lift | #, ## , ## , ## | #, ## | mm | #
Fault :#####
-----
<0..5> <ENTER>                                <F1..F5> <ESC>
    
```

```

Programming
-----
Weld parameters
Outlet/feeder
-----
<↓↑> <ENTER>                                <F1..F5> <ESC>
    
```

```

Programming weld parameters
-----
Outlet No. ....: #
Weld position No.....:###

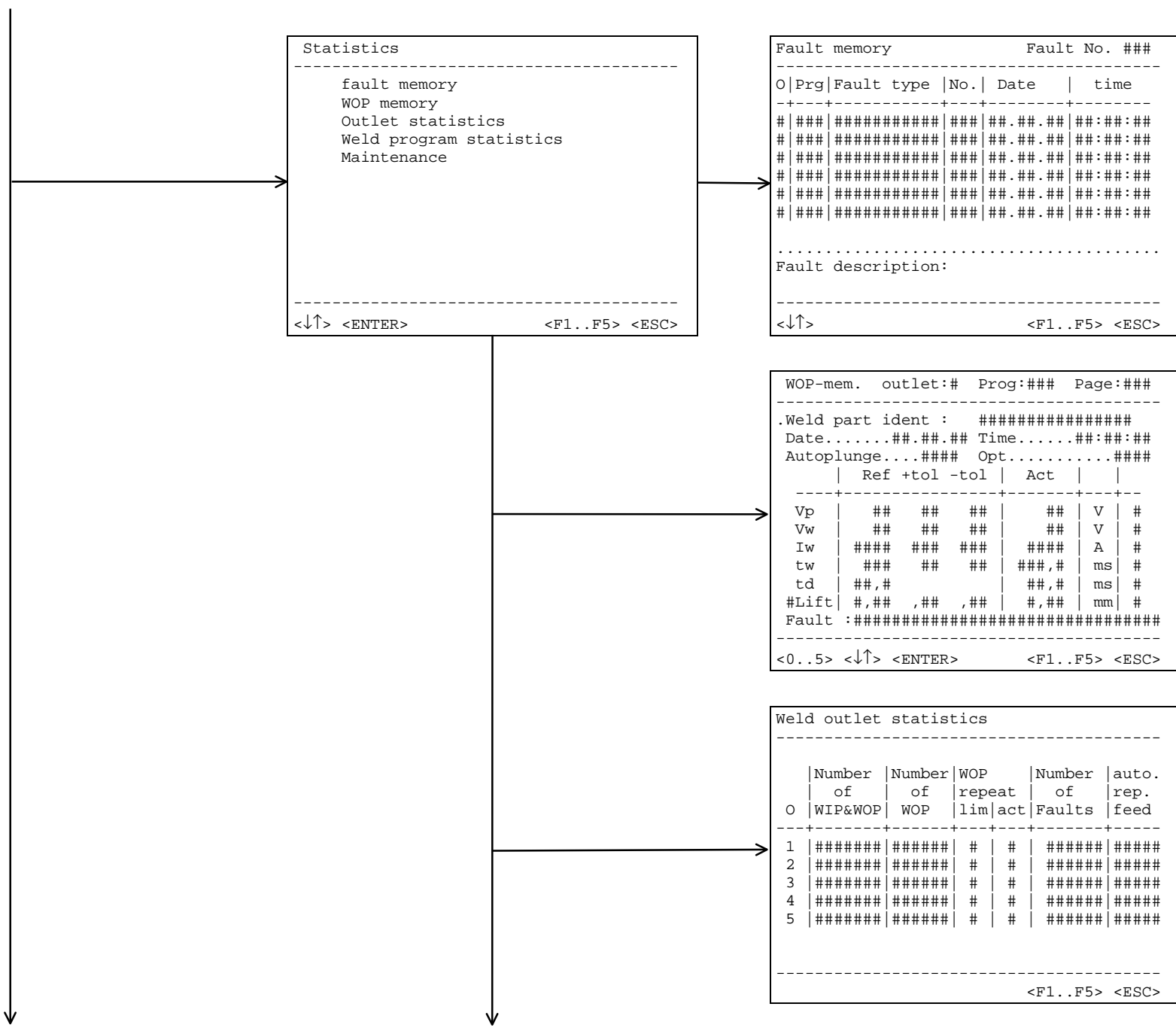
Weld position aktive...   ###
Weld diameter.....       #####
Workpiece gauge.....     #####
Workpiece coating.....   #####
Energy adjustment.....   ### %
-----
<1..9> <↓↑> <+,-> <ENTER> <F1..F5> <ESC>
    
```

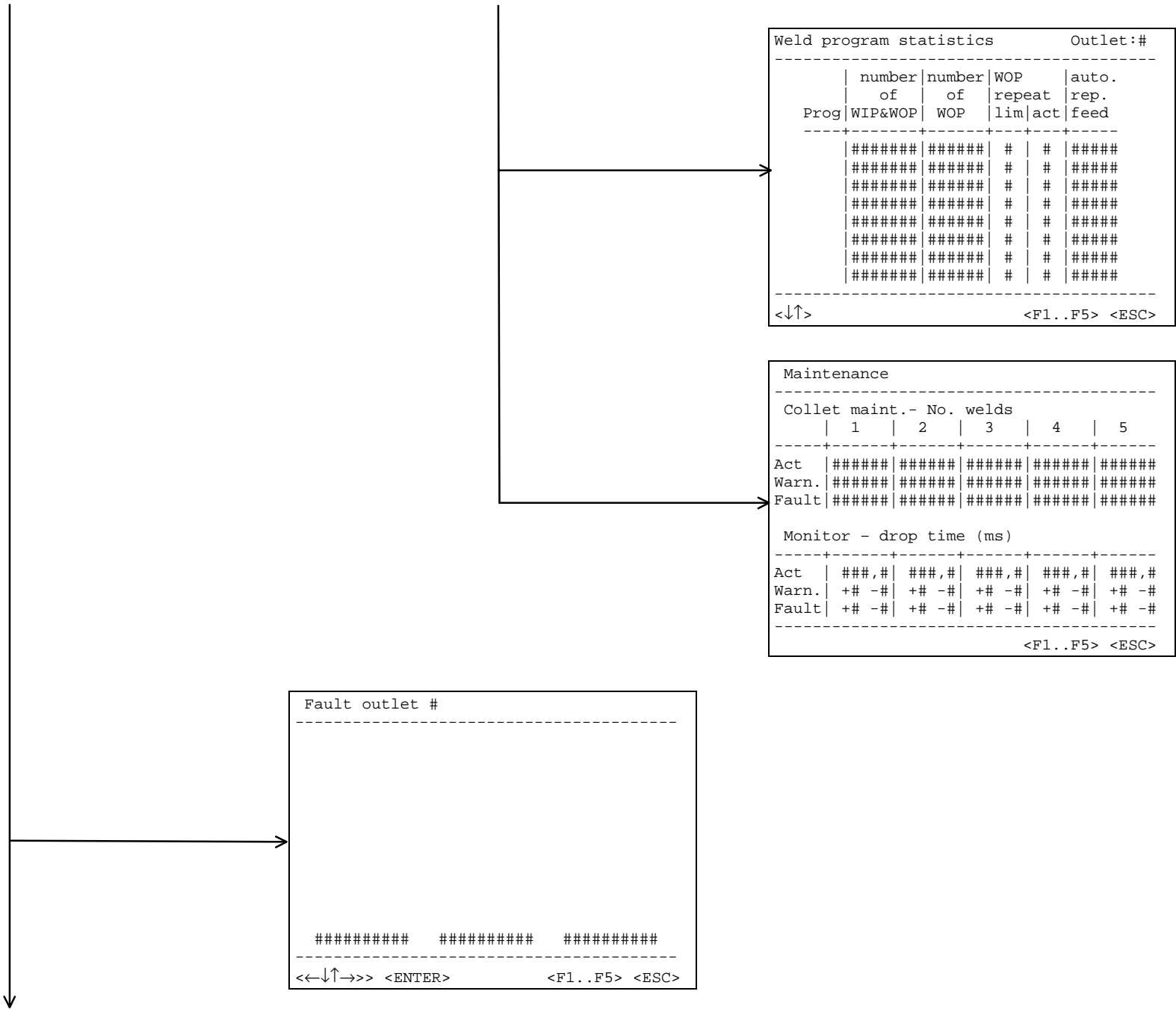
```

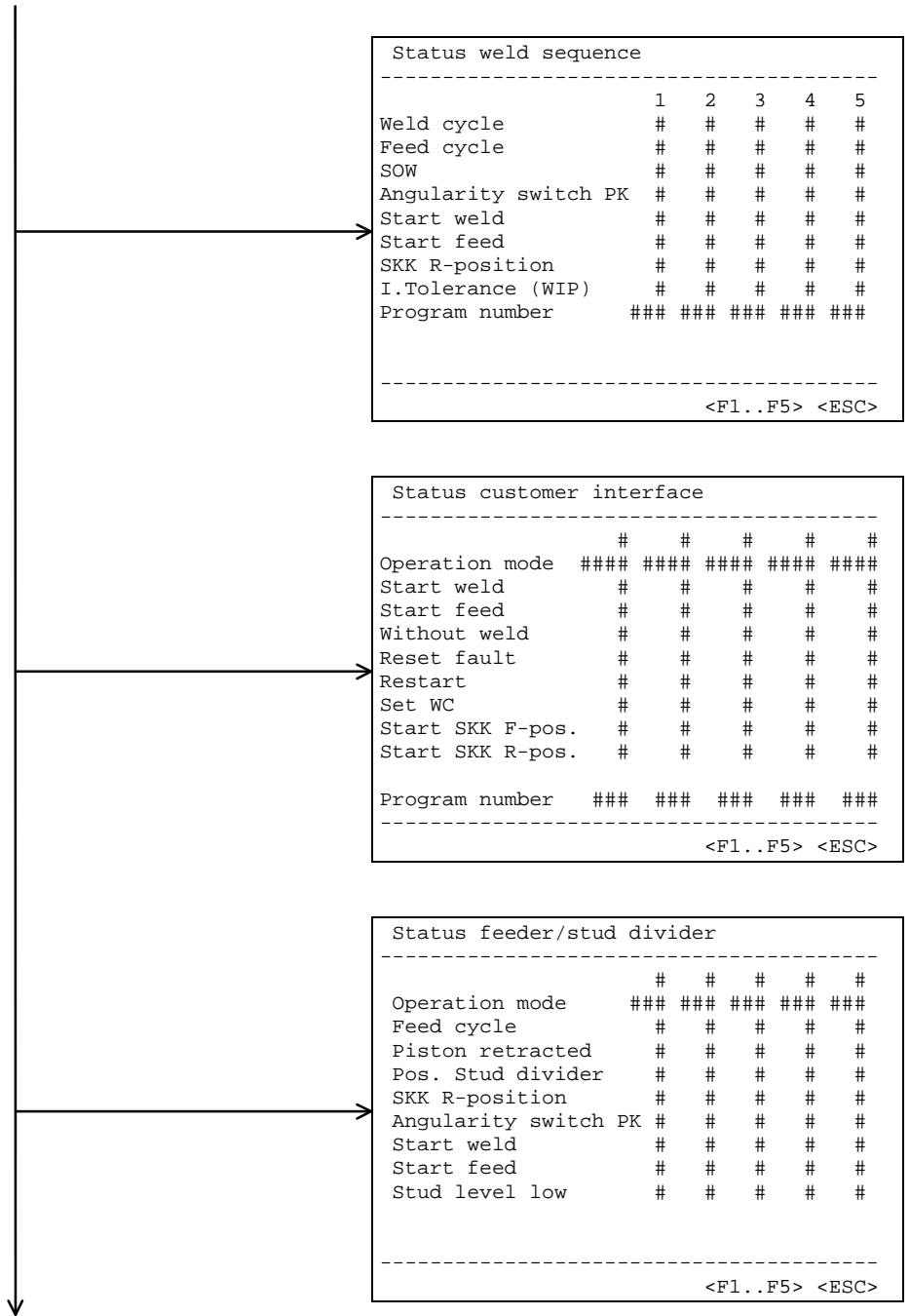
Programming outlet/feed time
-----
Weld outlet no....: #

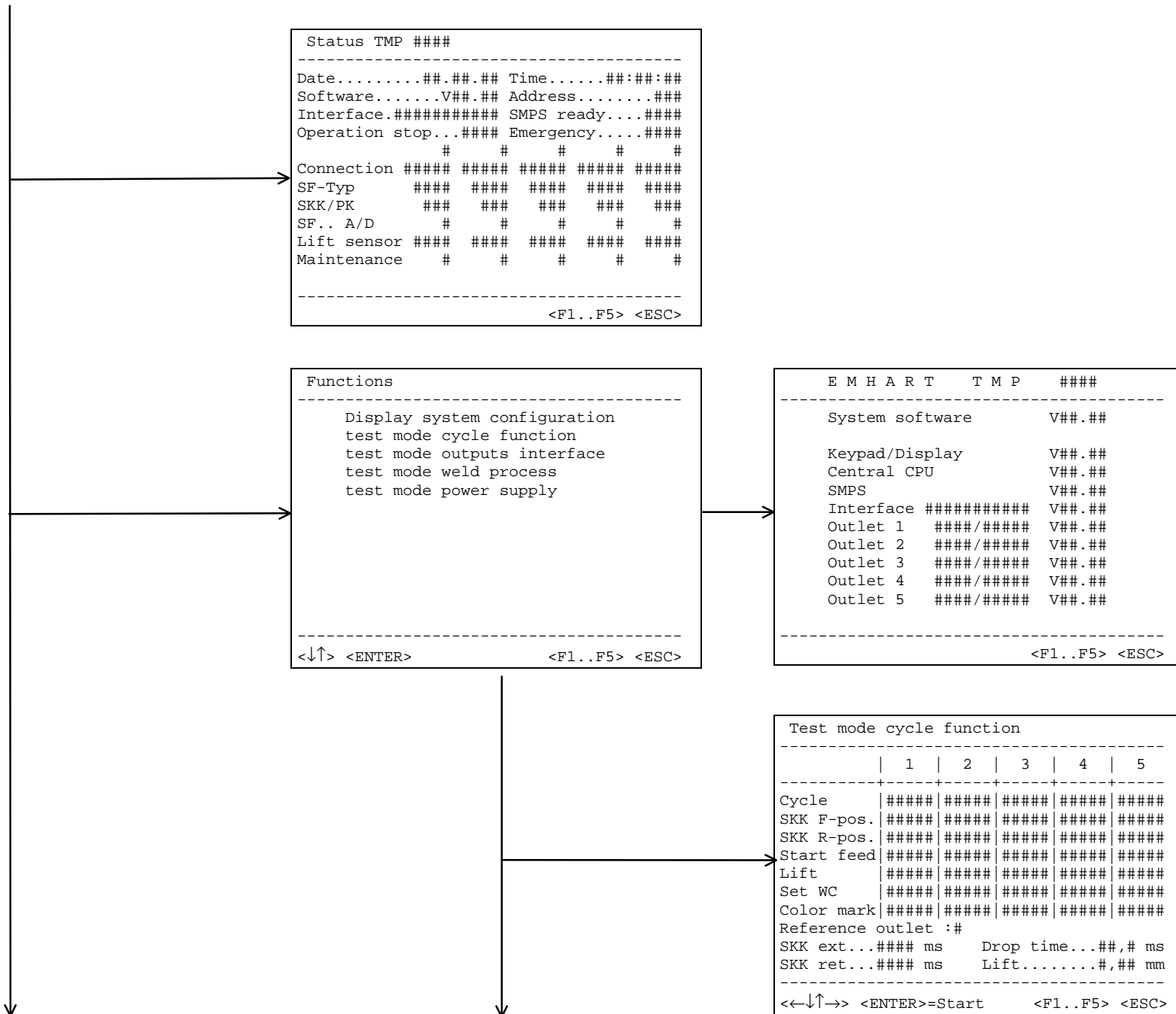
Outlet active.....###
Feede time.....### ms
-----
<1..9> <↓↑> <+,-> <ENTER> <F1..F5> <ESC>
    
```











```

Warnings:
-----
<F1..F5> <ESC>

```

```

Test mode outputs interface
-----
Operation mode      1    2    3    4    5
Ready              #    #    #    #    #
SOW                 #    #    #    #    #
SKK R-position     #    #    #    #    #
I.Tolerance (WIP) #    #    #    #    #
Fault              #    #    #    #    #
WC                 #    #    #    #    #
Maintenance        #    #    #    #    #
Emergency stop     #    #    #    #    #
Fault code         ###  ###  ###  ###  ###
-----
<←↓↑→> <+,->          <F1..F5> <ESC>

```

```

Test mode weld process
-----
Weld cycle us      1    2    3    4    5
Feed cycle         #    #    #    #    #
SOW                #    #    #    #    #
Angular switch PK #    #    #    #    #
Start weld         #    #    #    #    #
Start feed         #    #    #    #    #
SKK R-position     #    #    #    #    #
I.Tolerance        #    #    #    #    #
Program number     ###  ###  ###  ###  ###
Warning! The TMP-unit will work in test-
mode. However the unit will not weld!
-----
<F1..F5> <ESC>

```

```

Test mode power supply
-----

Outlet No. . . . . . :    #
Quantity of testcycles .:  ###

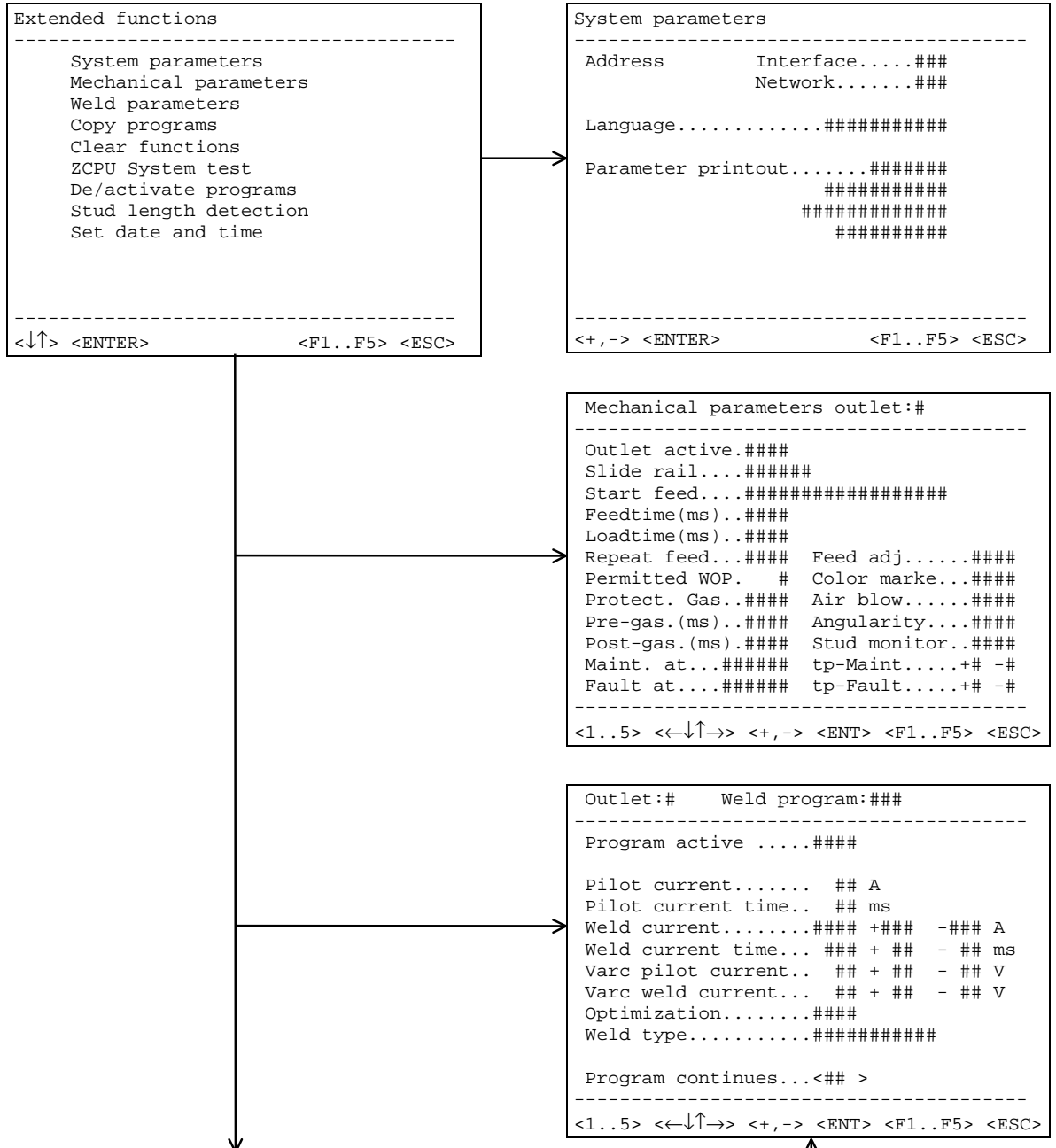
Start . . . . . : #####

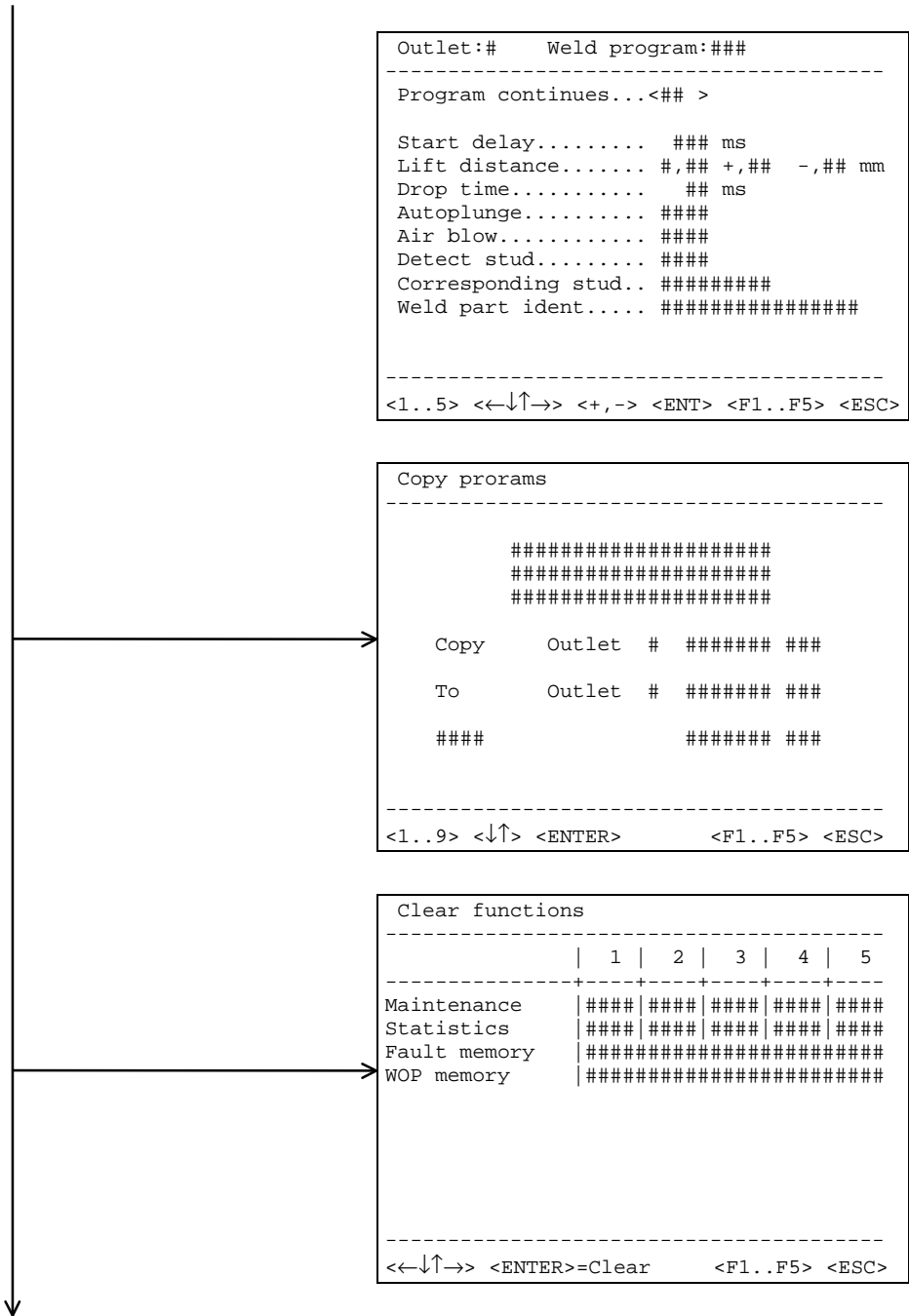
Actual weld curent. . . : #####
Actual cycle count. . . :  ###

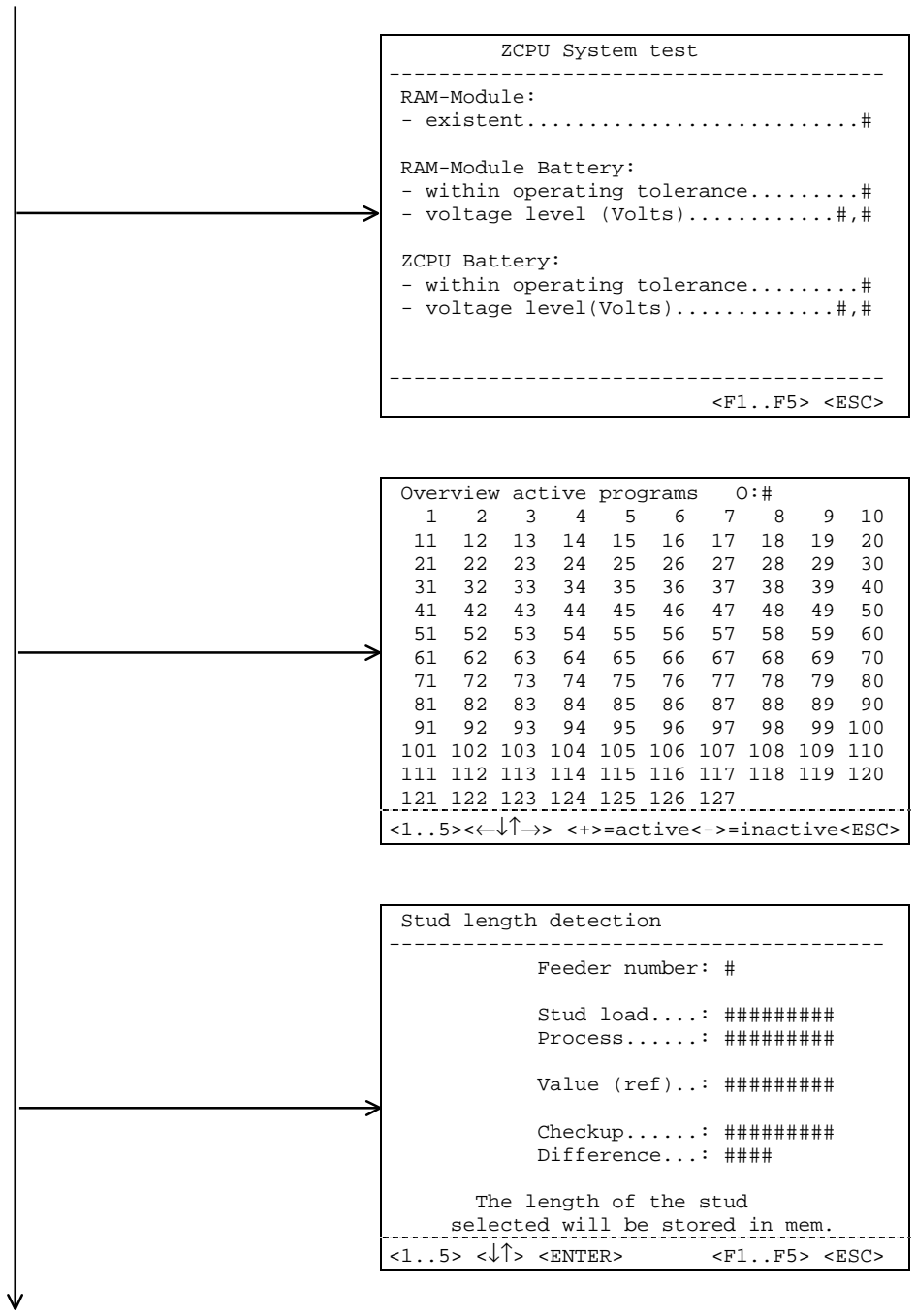
The short circuit test can be stopped
With the <ESC> key
-----
<1..5> <+,-> <↓↑> <ENTER> <F1..F5> <ESC>

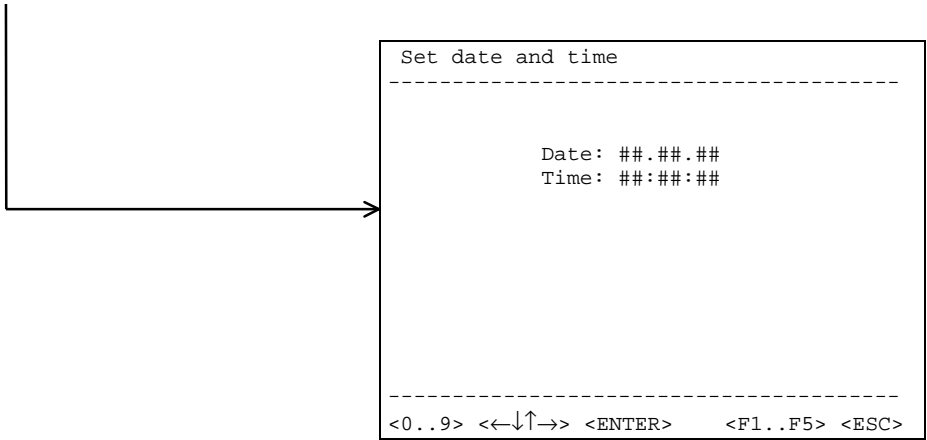
```

Sub-menu to EXTENDED FUNCTIONS (hidden)









Special menus (Function keys, confirmations)

```

Key functions
-----
F1 - display key functions
F2 - main menu
F3 - programming
F4 - weld parameter monitor
F5 - fault reset
F6 - approval for test mode

ESC - ESCAPE, abort
ENT - ENTER, confirmation

0..9 - input SKK/PK, program No.
+-    - change, set/reset values
<↓↑> - select menu, value
  
```

```

Clear functions
-----
| 1 | 2 | 3 | 4 | 5 |
-----
Maintenance |####|####|####|####|####|
Statistics   |####|####|####|####|####|
Fault memory |#####|#####|#####|#####|#####|
WOP memory   |#####|#####|#####|#####|#####|

-----
|           Activate clear function?           |
| <ENTER>=YES                               <ESC>=NO |
-----
<ENTER>                               <F1..F5> <ESC>
  
```

```

Functions
-----
display system configuration
test mode cycle functions
test mode outputs interface
test mode weld process
test moce power supply

-----
|Warning! Test mode will be activated |
| Confirm <ENTER>                     Exit <ESC> |
-----
<ENTER>                               <F1..F5> <ESC>
  
```

```

Fault outlet  #
-----

#####  #####  #####

-----
<↓↑> <ENTER>                               <F1..F5> <ESC>
  
```

```

Fault condition
-----

-----
To continue operation clear
the fault condition

-----
<F1..F5> <ESC>
  
```

Appendix B: DIP-Switch Information.



Warning

The DIP-switches are located in the unit interior. Please note that only electrotechnically trained personnel may open the unit

ZCPU DIP-Switches

- DIP-Switch 2: System reset, delete RAM-module.
- DIP-Switch 7: Lock single programming.
- DIP-Switch 8: Lock extended programming.

Customer Interface DIP-Switches

Due to the differing interface cards along with their software levels the DIP-switch configuration differs and therefore must be looked up based on these factors.

- Some examples:
- TSG-emulation (FK-generation in case of error)
 - TSG-emulation (FK-generation during slide rail control)
 - Output "I/O-TOL" or "Feedback BU"
 - No. of heads (IBS for BMW)
 - Display of I/O's on the LED (IBS for BMW)

Feeder DIP-switches:

The DIP-switches in the feeder are configured differently depending on the software. Therefore the feeder service manual must be consulted for details.

- Some examples:
- Key-operated switch removable in position Auto/All
 - Proximity switch escapement blade active/deactivated
 - Internal/external slide rail control
 - With / without protection gas
 - With / without lift (LM-Box)
 - Proximity switch escapement chamber active/deactivated

SKK DIP-Switches:

The DIP-switches in the weld head may differ depending on the pcb type and therefore the corresponding service manual must be consulted for details.

- Some examples:
- Pcb B 289 (SKK 240 / 310)I
 - Pcb B 89 (SKK 160)
 - LM-Head

Appendix C: Fault Messages



Note

When repairing the TMP 1000 on location operator safety must be assured. Trouble-shooting is only to be performed by qualified personnel

In the sub-menu "Clear Fault Condition" the user will find help in the form of fault messages indicating clearly the trouble source.

- Trouble-shooting by operating personnel is limited to the "remedial" measures of the respective fault message.
- During repair the general rules and regulations for the prevention of accidents and industrial safety must be observed.

Fault:	Display-Message:
1	slide rail remains in R-position
2	no SOW
3	slide rail not in R-position
4	SOW was not reset
5	weld procedure sequence fault
6	program not selected
7	program not activated
8-12	Out of tolerance
13	no lift
14	short-circuit weld
15	drop time timeout
16	no arc, open circuit
17	measurement line broken
19	collet PM required
21	weld head PM required
23	handgun sequence not followed
25	wrong stud loaded
26	fault feed or stud divider function
32	SMPS regulation out of range
34	safety circuit fault

Fault:	Display-Message:
35	system configuration fault
38	fiber optic connection feeder fault
39	fiber optic connection customer interface fault
40	fiber optic connection SMPS fault
43	feeder configuration fault
45	start weld not reset
46	missing stud feed
47	test conditions aren't met
49	feeder not in automatic operation mode
62	ZCPU: RAM module fault or defective
100	feeder: no power to aux. supply
102	feeder: rail way not filled in time
103	feeder: air pressure too low
104	feeder: knife not in front position
106	feeder: feed tube monitor switch
109	feeder: feed cycle timeout
120	wrong corresponding stud
132	SD5: voltage fault
133	SD5: still in front position
134	SD5: front position not reached
135	SD5: R1-position not reached
140	SD5: front position and all R-pos.
141	SD5: at minimum 2 positions not OK
142	stud divider position not reached
143	SD5: not in home position
144	feeder: LM system fault
146	feeder: LM not ready
159	feeder: LM stud length faulty
160	feeder: colour mark not possible
202	SMPS: temperature exceeded
204	SMPS hardware fault



Note

Operational faults of the TMP 1000 that can not be reset on location by the listed remedial measures require unit replacement

Fault 1: "Slide rail remains in R-position"

Description:

- After a successful weld start the weld head slide rail remains in R-position (internal slide rail control).

Cause:

- compressed-air supply interrupted
- feeder fault (i.e. defective magnetic solenoid valve)
- weld head fault (i.e weld head got jammed)

Remedial Measure:

- reset fault
- check compressed air supply
- check feeder fuses
- replace feeder or weld head
- inform TUCKER service !

Fault 2: "No SOW"

Description:

- After a successful weld start SOW was not detected. Therefore welding is not permitted.

Cause:

- no stud in collet
- no studs left in feeder
- feed tube incorrectly set or contaminated
- weld circuit interrupted
- weld head fault (i.e. weld head got jammed)
- defective collet

Remedial Measure:

- remove feeding problem
- check feed tube setting and feeder
- check weld circuit
- feed studs
- repeat weld
- replace collet
- inform TUCKER service !

Fault 3: "Slide rail not in R-position"

Description:

- Proximity switch for R-position not configured, defective or power supply missing.

Cause:

- drop in compressed-air supply
- defective cable package
- monitoring time after welding was exceeded
- defective weld head
- defective feeder
- collet welded to work surface

- Remedial Measure:
- check compressed-air
 - check tube package
 - check weld head - slide rail motion
 - check or replace weld head
 - check feeder
 - check feeder fuses F1 - F3
 - reset fault
 - replace collet
 - inform TUCKER service !

Fault 4: " SOW was not reset"

- Description:
- After a weld performed on internal slide rail control SOW signal remains.

- Cause:
- collet and stud welded together
 - connection between weld cable and work surface ground

- Remedial Measure:
- replace collet
 - search for short-circuit and remove
 - inform TUCKER service !

Fault 5: "weld procedure sequence fault"

- Description:
- Due to a malfunction the weld sequence is not terminated correctly.

- Cause:
- Feeder or SMPS malfunction

- Remedial Measure:
- reset fault
 - check weld (if necessary, reweld)
 - inform TUCKER service !

Fault 6: "program not selected"

- Description:
- The weld unit does not detect any program number.

- Cause:
- program no. is 0
 - transfer signal has not been set
 - defective data line

- Remedial Measure:
- customer interface (or interface program) must be verified
 - inform TUCKER service !

Fault 7:**"program not activated"**

Description:

- The selected weld program is not active and therefore cannot be executed.

Cause:

- weld unit incorrectly programmed
- customer control fault
- defective data line

Remedial Measure:

- check weld program and activate or select an active weld program
- inform TUCKER service !

Fault 8 - 12:**"out of tolerance"**

Description:

- The maximum number of defective welds in sequence was reached.

Cause:

- tolerances programmed too tightly
- weld circuit resistance too high
- defective SMPS or weld tool

Remedial Measure:

- reset fault
- verify tolerances
- check weld circuit and weld conditions
- check SMPS and weld tool
- inform TUCKER service !

Fault 13:**"Fault no lift"**

Description:

- Weld unit is unable to identify lift via measurement lines.

Cause:

- weld conditions prohibit lift
- defective cable package
- defective weld head
- defective feeder
- internal process cycle fault

Remedial Measure:

- check weld conditions
- check weld head
- check feeder
- feed studs
- check feeder connection
- repeat weld
- set WC
- inform TUCKER service !



Note

If the weld unit can not identify lift this fault will be displayed in the reference data line via a coded pilot current arc voltage ($V = 99V$).

Fault 14: "short-circuit weld"

Description:

- During main current phase (except no lift) shortcircuit was detected.

Cause:

- weld gap too small
- weld parameters too strict

Remedial Measure:

- set WC
- repeat weld
- feed studs
- check weld program
- check weld head lift
- inform TUCKER service !

Fault 15: "Drop time timeout"

Description:

- Max. drop time was exceeded and welding was stopped.

Cause:

- air gap incorrectly adjusted
- weld circuit resistance too high
- measurement line-ground missing
- defective SKK / PK

Remedial Measure:

- reset fault
- check measurement line (if necessary, reduce weld circuit resistance)
- check SKK / PK settings
- inform TUCKER service !

Fault 16: "no arc, open circuit"

Description:

- Extinguishing of the arc during weld, resp. the weld current is below $I = 80A$.

Cause:

- air gap too large
- gun was removed at the beginning of the weld
- extremely impure work surface
- SMPS fault

Remedial Measure:

- repeat weld
- feed studs
- check gun settings
- check weld conditions
- check workpiece conditions
- inform TUCKER service !

Fault 17: "measurement line broken"

- Description:
 - Measurement line signal not any longer detected.
- Cause:
 - measurement line broken or incorrectly connected
 - reversed measurement line-ground and measurement line
 - SOW power failure
 - weld line interrupted
- Remedial Measure:
 - check fuses on front panel.
 - reset fault.
 - check weld line.
 - check instrument lead.
 - check instrument lead ground.
 - check feeder fuses.
 - inform TUCKER service !



Note

With reversed polarity and an uninterrupted measurement line-ground the measurement line signal can not be detected

Fault 19: "collet PM required"

- Description:
 - The collet is worn out and should be replaced.
- Cause:
 - the limit value of preventive maintenance statistics was exceeded.
- Remedial Measure:
 - replace collet.
 - reset fault.
 - clear maintenance statistics.

Fault 21: "weld head PM required"

- Description:
 - The weld head is contaminated and thus does not keep the required drop time.
- Cause:
 - the limit value of the drop time tolerance for preventive maintenance was exceeded.
- Remedial Measure:
 - replace weld head and perform maintenance.
 - reset fault.
 - clear maintenance statistics.

Fault 23: "handgun sequence not followed"

Description:

- Correct sequence when welding with a gun (PK) was not observed.

Cause:

- angularity by-passed or incorrectly adjusted
- trigger start by-passed
- correct sequence "SOW-ANG-START" not observed

Remedial Measure:

- observe sequence "SOW-WS-START"
- check PK for correct setting of angularity
- release trigger and restart
- inform TUCKER service !

Fault 25: "wrong stud loaded"

Description:

- The supplied stud is not the specified stud required by unit control.

Cause:

- the weld unit identified an incorrect stud in the weld head via the lift measuring system or the stud verification test

Remedial Measure:

- reset fault
- repeat feed process
- verify correct stud length in the feeder
- verify programming

Fault 26: "Fault feed or stud divider function"

Description:

- During stud feed a fault occurred.

Cause:

- when using a 2-way stud divider a fault occurred at a peripheral unit

Remedial Measure:

- reset fault
- check stud divider
- check feeder
- check feeding tube
- inform TUCKER service !



Note

This fault message will be displayed during divider operation at the feeders which did not cause the fault. The remedial measures are to be taken at the concerned unit

Fault 32: "SMPS regulation out of range"

- Description:
- The programmed weld current is not reached.
- Cause:
- external circuit resistance too high
 - defective SMPS
- Remedial Measure:
- check external circuit
 - increase energy cross-section in the external circuit
 - check SMPS
 - inform TUCKER service !

Fault 34: "safety circuit fault"

- Description:
- During welding the voltage in the external circuit is too high.
- Cause:
- other source of current
 - defective SMPS
- Remedial Measure:
- check equipment for other source of current
 - check SMPS
 - inform TUCKER service !



Warning

The safety symbol on the TMP door indicates dangerous electrical voltage. Opening of the control cabinet is reserved for qualified electricians

Fault 35: "system configuration fault"

- Description:
- The weld unit identified an unacceptable system configuration.
- Cause:
- incorrect connection of stud divider (SD2 or SD5)
 - defective peripheral unit
- Remedial Measure:
- check peripherals
 - verify system configuration
 - check connections
 - inform TUCKER service !

Fault 38: "fiber optic connection feeder fault"

Description:

- Connection between the ZCPU and the feeder failed.

Cause:

- line interruption
- defective hardware

Remedial Measures:

- check fibre optic line to the feeder
- inform TUCKER service !

Fault 39: "fiber optic connection to customer inter. fault"

Description:

- Connection between the ZCPU and the customer interface failed.

Cause:

- external power supply failed
- line interruption
- defective hardware

Remedial Measures:

- verify power supply to customer interface
- inform TUCKER service !

Fault 40: "fibre optic connection to SMPS fault "

Description:

- The central CPU cannot connect with the SMPS.

Cause:

- line interruption
- hardware fault

Remedial Measure:

- inform TUCKER service !

Fault 43: "feeder configuration fault"

Description:

- The weld unit identified an unacceptable system configuration.

Cause:

- when using a stud divider (SD2 / SD5) the feeder will indicate an external slide rail control or connection of a manual weld gun

Remedial Measure:

- verify system configuration
- check feeder
- inform TUCKER service !

Fault 45: "start weld not reset"

- Description:
- The pending weld start is invalid.
- Cause:
- when switching the weld unit on a start signal is pending
 - after an emergency stop a start signal is pending
- Remedial Measure:
- cancel start signal
 - reset fault

Fault 46: "missing stud feed "

- Description:
- A weld start signal was given without a stud having been supplied.
- Cause:
- no refeed performed after last weld
- Remedial Measure:
- perform refeed
 - reset fault

Fault 47: "test conditions aren't met"

- Description:
- "Test mode weld sequence" was activated at the weld unit, the signals at the customer interface, however, do not meet the conditions for a test mode.
- Cause:
- test mode access is unauthorized
 - reset fault



For performing the "test mode weld sequence" the signal "without weld" must be set at the customer interface

Fault 49: "Feeder not in Automatic Operation Mode"

- Description:
- The key-operated switch at the feeder is not locked in position "Automatic".
- Remedial Measure:
- Switch the key-operated switch to "Automatic" in case it should be locked in any other position unintentionally.

Fault 62: "ZCPU: RAM module fault or defective"

Description:

- The central CPU does not identify or identifies a defective RAM module.

Cause:

- the RAM module is not correctly connected or defective

Remedial Measure:

- connect RAM module correctly (if necessary replace)
- check central CPU
- inform TUCKER service !

Fault 100: "feeder: no power to aux. supply"

Description:

- The feeder identifies no voltage supply.

Cause:

- defective feeder fuse
- defective feeder

Remedial Measure:

- replace feeder fuse
- check feeder
- inform TUCKER service !



Note

Detailed information on how to remove defects at the stud feeder can be read from the corresponding operating manual

Fault 102: "feeder: rail way not filled in time"

Description:

- The stud feeder identifies a stud escapement fault.

Cause:

- stud got jammed in escapement rails
- mechanical defect of the escapement rails
- defective proximity switch "Min" or "Max"
- escapement bowl empty
- defective feeder

Remedial Measure:

- check feeder (if, necessary refill)
- remove blockage
- inform TUCKER service !

Fault 103: "feeder: air pressure too low"

Description:

- The stud feeder indicates insufficient input air pressure.

Cause:

- no or too little air pressure at feeder
- defective PE-transformer in the feeder

Remedial Measure:

- check compressed air supply
- check PE-transformer
- inform TUCKER service !

Fault 104: "feeder: shuttle not in front position"

Description:

- The stud feeder indicates a defective shuttle function.

Cause:

- stud got jammed between blade and rail
- defective proximity switch for blade initial position

Remedial Measure:

- remove blockage
- check proximity switch
- inform TUCKER service !

Fault 106: "feeder: feed tube monitor switch open"

Description:

- The signal for feed tube locking at the stud feeder is not configured.

Cause:

- feed tube not connected (gun)
- no bridge for feed tube locking (head)

Remedial Measure:

- connect feed tube
- verify locking switch
- check cable package
- check feeder
- inform TUCKER service !



Note

Detailed information on how to remove defects at the stud feeder can be read from the corresponding operating manual

- Fault 109:** "feeder: feed cycle timeout"
- Description: • the weld tool indicates an incorrectly performed feed cycle.
- Cause: • the feeder does not terminate a feed cycle in the maximum monitoring time
- Remedial Measure: • check feeder
• inform TUCKER service !
- Fault 120:** "wrong corresponding stud"
- Description: • The programmed corresponding stud is unacceptable
- Cause: • stud divider without function
• defective cable package
- Remedial Measure: • check weld program
• check cable package
• set WC
- Fault 132:** "SD5: voltage fault"
- Description: • The stud divider SD5 identifies no supply voltage.
- Cause: • defective SD5 fuse
• defective stud divider
- Remedial Measure: • replace defective fuse
• check stud divider
• inform TUCKER service !
- Fault 133:** "SD5: still in front position"
- Description: • The stud divider indicates a defective detaching slide function.
- Cause: • the detaching slide has already been moved to front position
- Remedial Measure: • reset fault
• bring stud divider back into initial position
• repeat feed cycle
• inform TUCKER service !

Fault 134: "SD5: front position not reached"

Description:

- The stud divider indicates a defective detaching slide function.

Cause:

- insufficient compressed air supply
- stud divider got jammed

Remedial Measure:

- check compressed air supply
- remove blockage
- inform TUCKER service !

Fault 135: "SD5: R1-position not reached"

Description:

- The stud divider indicates a defective detaching slide function.

Cause:

- insufficient compressed air supply
- stud divider got jammed

Remedial Measure:

- check compressed air supply
- remove blockage
- inform TUCKER service !

Fault 140: "SD5: front position AND all R-positions"

Description:

- The stud divider indicates that all rear positions as well as the front position are covered.

Cause:

- SD5 connection line divider - control interrupted
- defective stud divider

Remedial Measure:

- check connection line
- check stud divider
- inform TUCKER service 1

Fault 141: "SD5: at minimum 2 positions not OK"

Description:

- The stud divider indicates that there are at least 2 uncovered positions.

Cause:

- insufficient compressed air supply
- stud divider got jammed

Remedial Measure:

- check compressed air supply
- remove blockage
- inform TUCKER service !

Fault 142: "stud divider position not reached"

Description:

- The stud divider did not reach the required position within the monitoring time.

Cause:

- insufficient compressed air supply
- stud divider got jammed

Remedial Measure:

- check compressed air supply
- remove blockage
- inform TUCKER service

Fault 143: "SD5: not in home position"

Description:

- The stud divider did not reach the home position within the monitoring time.

Cause:

- insufficient compressed air supply
- stud divider got jammed

Remedial Measure:

- check compressed air supply
- remove blockage
- inform TUCKER service !

Fault 144: "feeder: LM system error"

Description:

- The linear motor is not ready for welding

Cause:

- defective Servo-Controller-Card
- defective Servo-Amplifier-Card
- defective fuse F8 (Backplane)

Remedial Measure:

- if necessary replace all components successively
- inform TUCKER service !

Fault 145: "feeder: LM not ready"

Description:

- The SF LM-Feeder is not ready for the next weld

Cause:

- the Linear-Motor is heated up and needs a cooling phase before the next weld

Remedial Measure:

- if possible reduce weld cycles

Fault 159: "feeder: - LM stud length faulty "

Description:

- The stud length, measured at the sustainer is too small

Cause:

- wrong stud fed (into the weld head)

Remedial Measure:

- feed stud with the correct length or with the exact measured length

Fault 160: "feeder: colour mark not possible "

Description:

- No colour mark box connected

Cause:

- a color marking was actuated without a color marking box being connected

Remedial Measure:

- connect a colour marking box



Note

Detailed information on how to remove defects at the stud feeder can be read from the corresponding operating manual

Fault 202: "SMPS : Temperature Exceeded"

Description:

- The SMPS in the TMP is overheated

Cause:

- the environmental temperature is too high for the requested weld energy

Remedial Measure:

- improve cooling system
- reduce weld energy

Fault 204: "SMPS hardware fault"

Description:

- One defective SMPS component.

Cause:

- SMPS defect

Remedial Measure:

- check SMPS
- inform TUCKER service

Appendix D: Error Memory Messages

The messages listed in the table below are registered in the error memory for documentation reasons. They will, however, not cause an error.

Code:	Display Message:
69	RAM-Module deleted
70	Maintenance deleted
71	Statistics deleted
72	Error memory deleted
73	WOP memory deleted

Appendix E: Messages regarding pilot arc voltage

Various pilot arc voltages are used to display particular conditions:

Code:	Message:
96V	Weld discontinued due to overshooting the safety circuit threshold voltage.
97V	Reserved.
98V	Short circuit test flagged. (is not needed in normal welding mode)
99V	No gun lift detected. An attempt is made to successfully bring the process to a close.

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