Explanation of error code structure and FU (function unit) abbreviations

error:

all = **4-digit** error numbers in the 1st line are the general errors appearing (and logged in the generator memory) at all generators Optimus RAD-R/F-C and Velara even if the reason for the error might not be related to the function unit sending the event

VTB = ***4-digit*** *error numbers in the 2nd line are errors displayed at user interfaces with Velara (VTB) generators in C/V Allura environment (TheBox interface), but only if read via the ACCO interface (system controller), explanations identical to the 4/5-digit VTC errors*

VTC = ***4-digit*** *or* ***5-digit*** *error numbers in the 3rd line are errors displayed at user interfaces with Velara (VTC) generators in a CFD, Ibis, URF, Eleva environment*

C = **7-digit** error numbers 61xxxxx in the 4th line are the reference error numbers displayed at the Cockpit desk of Duo Diagnost systems if Optimus C is at release 1.2 and Duo system firmware at release 3.x .

error code structure **xxYY**:
xx = function unit involved or sending the event (non-existing function units appearing at some screens Optimus and *Velara* are not listed), **YY** = error symptom
Some units are indicated in error detail screens with their **HEX** address, these are listed in **bold xxH** characters. Function units 00.. - 09.. numbers are HEX and decimal.
At generators Optimus RAD release 2 generators error messages might appear with the HEX address instead of the decimal address.

class:
E = Error (displayed at the control desk or user interface and logged) or **W** = Warning (logged only); **E/W** case dependent,
IR = invalid request; **F** = fatal error (LED of function unit steadily on)

explanation, test procedures, fixing suggestions:
if written only in normal characters valid for all generator types whilst *italic comments especially or exclusively for Velara, indicated with V:*
special comment prefixes:
2R: Optimus RAD release 2 only (previous releases not supported)
3RF: Optimus RAD + R/F release 3.x
C: Optimus C in a Duo Diagnost system
V: *Velara TC and TheBox*

00..		**CU**	central unit EZ139; *EZ = central unit CuBe (central unit + base extension)*
01..		**FU_DRC**	dose rate control, physically located on **CU** EZ139, parts of basic interface EZ150 also involved (Amplimat), FU_DRC also handles fluoroscopy; *part of EZ = central unit CUBE (Central Unit + Base Extension), FU_DRC also handles fluoroscopy*
02..		**FU_kV**	kV control EZ130; *part of EH = FU kV-mA*
03..		**FU_mA**	mA control EZ119, handles 2 filaments for up to 3 tubes; *part of EH = FU kV-mA, handles 2 filaments for max to 2 tubes*
07..		**FU_CIE**	central interface extension EZ150, basic interface, drives low speed rotor control
08..		**FU_HI**	human interface C300, control desk
10..	**0AH**	**FU_RC**	rotor control (high speed / dual speed) EY100,
13..	**0DH**	**FU_ADAP_a**	adapter decade cables for 4 aux. units RAD = WA102 or 1WA102
14..	**0EH**	**FU_ADAP_b**	adapter decade cables for 4 aux. units RAD = 2WA102
15..	**0FH**	**FU_ADAP_c**	adapter decade cables for 4 aux. units R/F = WB102

Some error explanations can have the information ... #1#2H or .... #1H, #2H, #3H, #4H, #5H, #6H. It just says that up to 2 or 6 function units might be listed in this chain with their HEX address, empty fields indicate 00H.

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	0099 *1673* *05757*	W	*can only occur with special software versions where the trial period has elapsed*		*update CU firmware*
all VTB VTC C	00A0 *0000* *06548*	IR	*received a simulation mode request from the system controller during adaptation*		*request simulation mode (without X-ray) in standby*
all VTB VTC C	00A1 *0001* *06549*	IR	*received a simulation mode ON request from the system controller whilst the generator tried to turn it ON anyway*		*request simulation mode (without X-ray) in standby*
all VTB VTC C	00A2 *0002* *06550*	IR	*received a simulation mode OFF request from the system controller whilst the generator tried to turn it OFF anyway*		*contact Helpdesk Hamburg, send error log and detailed error information*
all VTB VTC C	00A3 *0003* *06551*	F	*FU-mA cannot turn ON simulation mode without X-ray*		*1. Check and/or change values sent by system controller for the control method, select another EPX 2. Change PC-104 3. Change CUBE 4. Contact Helpdesk Hamburg*
all VTB VTC C	00A4 *0004* *06552*	F	*FU-mA cannot turn OFF simulation mode without X-ray*		
all VTB VTC C	00B0 *0064* *06648* 6106648	E/W	error in application data service interface		*contact Helpdesk Hamburg, send error log and detailed error information*
all VTB VTC C	00B1	E/W	internal interrupt message was not expected by generator order list		
all VTB VTC C	00B2	E/W	human interface order is not expected - NO member in display table		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00B3	E/W	data language selector is invalid, = appears with a non-programmed **CU** after the very first turn-on, = when appearing after CU Complete restore the data file might be defective		if permanent erase NV-RAM (see ..\..\data_collection\info_files\Memory_quick_erase_Optimus_RAD_RF_C.pdf and start programming from scratch dump CU Complete file which won't work, download CU Complete again using AgenT 3.1.2, get it from the Intranet ..\..\data_collection\AGenT\AGenT-download-pages-and-PC-settings.pdf
all VTB VTC C	00B4	E/W	message invalid in Adopmes		
all VTB VTC C	00B5	E/W	input parameter out of range in syntax = leads to a hang-up in combination with **CU** release 3.x if **FU_HI** firmware < 4512 113 20524 = causes a warning entry with **CU** release 2, does not disturb application		fixed with **FU_HI** firmware 4512 113 20524 for release 2 + 3 generators = if **CU** release still at 3.2 and **FU_HI** firmware still 20523 a PREP wakes up the generator check if FCO 00 135 006 has been carried out solved with desk firmware version 4512 113 20525
all VTB VTC C	00B6	E/W	FU adap WA/WB data for DI are invalid = appears with a non-programmed **CU** after the very first turn-on, = when appearing after CU Complete restore the data file might be defective		if permanent erase NV-RAM (see ..\..\data_collection\info_files\Memory_quick_erase_Optimus_RAD_RF_C.pdf and start programming from scratch dump CU Complete file which won't work, download CU Complete again using AgenT 3.1.2, get it from the Intranet ..\..\data_collection\AGenT\AGenT-download-pages-and-PC-settings.pdf
all VTB VTC C	00B7	E/W	message can not be send		
all VTB VTC C	00B8	E/W	tomo mode switch can not be enabled		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00B9 *0073* *06657* 6106657	E	AD: message from unknown function unit		*contact Helpdesk Hamburg, send error log and detailed error information*
all VTB VTC C	00BA	E/W	data of RGDV are invalid = appears with a non-programmed **CU** after the very first turn-on, = when appearing after **CU** Complete restore the data file might be defective		if permanent erase NV-RAM (see ..\..\data_collection\info_files\Memory_quick_erase_Optimus_RAD_RF_C.pdf and start programming from scratch dump CU Complete file which won't work, download CU Complete again using AgenT 3.1.2, get it from the Intranet ..\..\data_collection\AGenT\AGenT-download-pages-and-PC-settings.pdf
all VTB VTC C	00BB	E/W	base data of RGDV are invalid = appears with a non-programmed **CU** after the very first turn-on, = when appearing after CU Complete restore the data file might be defective		if permanent erase NV-RAM (see ..\..\data_collection\info_files\Memory_quick_erase_Optimus_RAD_RF_C.pdf and start programming from scratch dump CU Complete file which won't work, download CU Complete again using AgenT 3.1.2, get it from the Intranet ..\..\data_collection\AGenT\AGenT-download-pages-and-PC-settings.pdf
all VTB VTC C	00BC	E/W	state data of RGDV are invalid = appears with a non-programmed **CU** after the very first turn-on, = when appearing after CU Complete restore the data file might be defective		if permanent erase NV-RAM (see ..\..\data_collection\info_files\Memory_quick_erase_Optimus_RAD_RF_C.pdf and start programming from scratch dump CU Complete file which won't work, download CU Complete again using AgenT 3.1.2, get it from the Intranet ..\..\data_collection\AGenT\AGenT-download-pages-and-PC-settings.pdf

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00BD	E/W	data of APR are invalid = appears with a non-programmed **CU** after the very first turn-on, = when appearing after CU Complete restore the data file might be defective		if permanent erase NV-RAM (see ..\..\data_collection\info_files\Memory_quick_erase_Optimus_RAD_RF_C.pdf and start programming from scratch dump CU Complete file which won't work, download CU Complete again using AgenT 3.1.2, get it from the Intranet ..\..\data_collection\AGenT\AGenT-download-pages-and-PC-settings.pdf
all VTB VTC C	00BE	E/W	data of active RGDV are invalid = appears with a non-programmed **CU** after the very first turn-on, = when appearing after CU Complete restore the data file might be defective		if permanent erase NV-RAM (see ..\..\data_collection\info_files\Memory_quick_erase_Optimus_RAD_RF_C.pdf and start programming from scratch dump CU Complete file which won't work, download CU Complete again using AgenT 3.1.2, get it from the Intranet ..\..\data_collection\AGenT\AGenT-download-pages-and-PC-settings.pdf
all VTB VTC C	00BF	E/W	data of RGKeys are invalid = appears with a non-programmed **CU** after the very first turn-on, = when appearing after CU Complete restore the data file might be defective		if permanent erase NV-RAM (see ..\..\data_collection\info_files\Memory_quick_erase_Optimus_RAD_RF_C.pdf and start programming from scratch dump CU Complete file which won't work, download CU Complete again using AgenT 3.1.2, get it from the Intranet ..\..\data_collection\AGenT\AGenT-download-pages-and-PC-settings.pdf
all VTB VTC C	00BG	E/W	no more lowest level menus available		
all VTB VTC C	00BH	E/W	display position collision		
all VTB VTC C	00BI	E/W	menu/APR mismatch in same level		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00BJ	E/W	menu name not found		
all VTB VTC C	00BK	E/W	APR is assigned to a different RGDV		
all VTB VTC C	00BL	E/W	menu name already exists		
all VTB VTC C	00BM	E/W	max display position reached		
all VTB VTC C	00BN	E/W	APR not found in this menu		
all VTB VTC C	00BO	E/W	data of menu tree are invalid = appears with a non-programmed **CU** after the very first turn-on, = when appearing after CU Complete restore the data file might be defective		if permanent erase NV-RAM (see ..\..\data_collection\info_files\Memory_quick_erase_Optimus_RAD_RF_C.pdf and start programming from scratch dump CU Complete file which won't work, download CU Complete again using AgenT 3.1.2, get it from the Intranet ..\..\data_collection\AGenT\AGenT-download-pages-and-PC-settings.pdf
all VTB VTC C	00BP *0096* *06680* 6106680	E	AD: unknown message from system controller		*contact Helpdesk Hamburg, send error log and detailed error information*
all VTB VTC C	00BQ *0097* *06681*	E/W W	APR can not be modified, *calculation of startup x-ray data set failed*		*load a new startup EPX from the system controller*
all VTB VTC C	00BR *0098* *06682*	E/W W	APR is not assigned to an RGDV *a startup x-ray dataset has been processed on startup and the dataset needed to be limited*		*load a new startup EPX from the system controller*

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00BS *0099* *06683*	E/W IR	the RGDV of the APR is not ready for operation, *an adaptation request has been received whilst the CU was performing adaptation anyhow*		*contact Helpdesk Hamburg, send error log and detailed error information*
all VTB VTC C	00BT *0100* *06684* 6106684	E/W W	data of APR characteristics are invalid = appears with a non-programmed **CU** after the very first turn-on, = when appearing after CU Complete restore the data file might be defective, *an adaptation dataset calculation could not be successfully performed, due to incorrect parameters or generator state*		if permanent erase NV-RAM (see ..\..\data_collection\info_files\Memory_quick_erase_Optimus_RAD_RF_C.pdf and start programming from scratch dump CU Complete file which won't work, download CU Complete again using AgenT 3.1.2, get it from the Intranet ..\..\data_collection\AGenT\AGenT-download-pages-and-PC-settings.pdf *1. change PC-104* *2. change CUBE* *3. contact Helpdesk Hamburg, send error log and detailed error information*
all VTB VTC C	00BU	E/W	adaptation paused due to missing load		if the tube temperature supervision sees any of the temperatures beyond a limit to allow 100% load adaptation waits until a 100% load is possible and keeps on automatically 00BU will not be displayed at the control desk or on the service PC, the only indication is the red traffic light at the control desk and a flickering "Waiting" window on the PC screen
all VTB VTC C	00BV	E/W	tube temperature supervision status message during adaptation		
all VTB VTC C	00BW	E/W	APR not accepted by general calculation		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00BX	E/W	Variofocus allowed invalid = appears with a non-programmed **CU** after the very first turn-on = when appearing after CU Complete restore the data file might be defective		if permanent erase NV-RAM (see ..\..\data_collection\info_files\Memory_quick_erase_Optimus_RAD_RF_C.pdf and start programming from scratch dump CU Complete file which won't work, download CU Complete again using AgenT 3.1.2, get it from the Intranet ..\..\data_collection\AGenT\AGenT-download-pages-and-PC-settings.pdf
all VTB VTC C	00BY	E/W	RGDV order without active RGDV		
all VTB VTC C	00BZ *0106 06690*	IR	*system controller sent select mode for an unused buffer*		*contact Helpdesk Hamburg, send error log and detailed error information*
all VTB VTC C	00CB *0146 06766*	W	received internal interface message #1#2H unknown *FU #1 sent IIM which CU didn't know, possibly inconsistency between FU resp. CU version (release/level),* *FU parameter #1: 02=kV-(mA-)control; 03=(kV-)mA-control; 0A=RoCo*	*did you install a wrong version?*	*1. change function unit* *2. change PC-104* *3. change CUBE* *4. contact Helpdesk Hamburg, send error log and detailed error information*
all VTB VTC C	00CC *0147 06767*	W	frame repeat counter overflow (internal interface message #1#2H) *communication with FU #1 disturbed, possibly the FU is overloaded or stopped* *FU parameter #1: 02=kV-(mA-)control; 03=(kV-)mA-control; 0A=RoCo*		
all VTB VTC C	00CD *0148 06768*	W	function unit #1H not addressable *transmit to FU #1 can't be started* *FU parameter #1: 02=kV-(mA-)control; 03=(kV-)mA-control; 0A=RoCo*	RGDV switch-over times very long	might be caused by a defective WA unit
all VTB VTC C	00CE *0149 06769*	W	rx signal conflict function unit #1H *reception from FU #1 disturbed* *FU parameter #1: 02=kV-(mA-)control; 03=(kV-)mA-control; 0A=RoCo*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00CF *0150* *06770*	W	no retry from function unit #1H *while sending to FU #1 it is not communicating anymore (i.e. the expected Remote Transmit Request is missed), possibly because of overload or stop,* *FU parameter #1: 02=kV-(mA-)control; 03=(kV-)mA-control; 0A=RoCo*		
all VTB VTC C	00CG *0151* *06771*	W	domain tx response, mailbox type wrong *error messages CD, CF or CL not reported because wrong error mailbox token*		
all VTB VTC C	00CH *0152* *06772*	W	invalid tbdor parameter function unit type *invalid parameter of CA_PUT_CU_IIM_TOKEN*		
all VTB VTC C	00CJ *0154* *06774*	W	CAN auto configuration successful function unit #1H = will always be logged if command "CAN Auto Configuration" has been carried out = appears with a non-programmed **CU** after the very first turn-on *info that CAN auto configuration has updated the CAN NV table,* *if #1=53H all is ok because CAN auto config. initiated by service command* *if #1=45H CAN auto config. started because NV-data corrupted*	= when appearing after CU Complete restore the data file might be defective *CAN auto configuration can be used to initiate a soft reboot*	if permanent erase NV-RAM (see ..\..\data_collection\info_files\Memory_quick_erase_Optimus_RAD_RF_C.pdf and start programming from scratch dump CU Complete file which won't work, download CU Complete again using AgenT 3.1.2, get it from the Intranet ..\..\data_collection\AGenT\AGenT-download-pages-and-PC-settings.pdf *if there are more NV-problems exchange CUBE*
all VTB VTC C	00CK *0155* *06775*	W	CAN auto configuration without success function unit #1H *CAN auto configuration ran without updating the CAN NV table,* *if #1=53H CAN auto config. by service command* *if #1=45H CAN auto config. started because NV-data corrupted*	*CAN auto configuration can be used to initiate a soft reboot*	
all VTB VTC C	00CL *0156* *06776*	W	function unit #1H not addressable *transmit to FU #1 can't be started* *FU parameter #1: 02=kV-(mA-)control; 03=(kV-)mA-control; 0A=RoCo*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00CM *0157* *06777*	W	function unit #1H sent event and did not answer RTR *reception from FU #1 disturbed (i.g. no answer to remote transmit request; possible reasons CUBE overload;* *FU parameter #1: 02=kV-(mA-)control; 03=(kV-)mA-control; 0A=RoCo*		
all VTB VTC C	00CP *0160* *06780*	W	max function unit count exceeded while auto configuration more FU's found than can be handled		
all VTB VTC C	00CQ *0161* *06781*	W	radiography system is not responding (CAN connected systems) only Optimus RAD/RF/C		
all VTB VTC C	00CR *0162* *06782*	W	guarded connection failed = if communication to SUN is off at Digital Diagnost or Thoravision systems only Optimus RAD/RF		
all VTB VTC C	00CX *0168* *06788*	W	last only repeat counter overflow internal interface message #1#2H *reception from FU #1 disturbed* *FU parameter #1: 02=kV-(mA-)control; 03=(kV-)mA-control; 0A=RoCo*		
all VTB VTC C	00CY *0169* *06789*	W	abort of rx of internal interface message #1#2H, unexpected frame *reception from FU #1 disturbed* *FU parameter #1: 02=kV-(mA-)control; 03=(kV-)mA-control; 0A=RoCo*	+15VDC missing at turn-on, typically in combination with 00-' (invalid code) + 00M0 and fatal error LED condition EZ119	try to find the reason for the missing +15VDC, remove PCBs and all external devices using +15V like e.g. measuring chambers, suppressor diode on backpanel EZ might be short
all VTB VTC C	00CZ *0170* *06790*	W	unexpected frame received after internal interface message #1#2H *reception from FU #1 disturbed; message is delivered nevertheless,* *FU parameter #1: 02=kV-(mA-)control; 03=(kV-)mA-control; 0A=RoCo*		
all VTB VTC C	00DA *0209* *06865* 6106865	E/W	no CPU access to CAN chip *problem with CAN chip on CUBE*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00DB *0210* *06866*	W	CAN chip reset not acknowledged *problem with CAN chip on CUBE*		
all VTB VTC C	00DC *0211* *06867*	W	CAN chip reset release not acknowledged *problem with CAN chip on CUBE*		
all VTB VTC C	00DD *0212* *06868*	W	CAN chip DPRAM check failed *problem with CAN chip on CUBE*		
all VTB VTC C	00DE *0213* *06869* 6106869	E/W	unexpected CAN chip interrupt pointer *problem with CAN chip on CUBE*		
all VTB VTC C	00DF *0214* *06870*	W	CAN chip state undefined *problem with CAN chip on CUBE*		
all VTB VTC C	00DG *0215* *06871*	W	CAN chip error active after passive #1H *00DH ended*		
all VTB VTC C	00DH *0216* *06872*	W	CAN chip state error passive #1H *CUBE-CAN-chip error because of detected transmission problem; it's just an info; the transmission is still working; possibly no running FU is connected to the CAN bus or EMC problems*		
all VTB VTC C	00DI *0217* *06873* 6106873	E	CAN chip state bus off #1H *CUBE-CAN-chip serious error because of detected transmission (probably EMC) problems; no transmission possible till next startup*		
all VTB VTC C	00DJ *0218* *06874*	W	CAN chip state DPRAM error *problem with CAN-chip on CUBE*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00DK *0219* *06875*	W	CAN chip state DPRAM error and passive *problem with CAN-chip on CUBE*		
all VTB VTC C	00DL *0220* *06876* 6106876	W	unexpected CAN chip interrupt *problem with CAN-chip on CUBE*		
all VTB VTC C	00DM *0221* *06877*	W	CAN frame error (code #1H) *problem with CAN-chip on CUBE*		
all VTB VTC C	00E0 *0256* *06948* 6106948	E/W	iRMX exception #2#1H occurred, **2R+3RF:** appears if a desk key has been pushed after erasing APR data without a reset afterwards, **3RF:** might appear if data sets can not be downloaded due to unknown data mismatch *first two byte parameters taken as a 16 bit word give RMX exception code*		**2R+3RF:** if 00E0 appears during APR loading erase **CU** memory by setting the battery jumper to the off position for at least 5 minutes, put it back to ON, then start programming from scratch, better not use existing CU Complete download file, it might carry the problem **C:** load release 1.2 flash load program, >> load Agent 3.1.2, get it from the Intranet ..\..\data_collection\AGenT\AGenT-download-pages-and-PC-settings.pdf
all VTB VTC C	00FA *0337* *07065*	W	CPU: CAL(CS)-Error code: #2#1H *system CAN problem*		*it might be necessary to remove the PC cable connection (even if the Agent program is not active anymore) and to switch the system off and on again to inhibit the master state of the PC*
all VTB VTC C	00FB *0338* *07066*	W	CPU: CS: Fast Domain Error *communications failure on system CAN*		
all VTB VTC C	00G0 *0384* *07148*	E/W	variable in case statement has undefined value *internal SW failure, invalid state transition action specified*		
all VTB VTC C	00G1 *0385* *07149* 6107149	E/W	condition_code <> OK after CALL to send *this error is not used*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00G2 *0386* *07150*	E/W	condition_code <> OK after CALL to init *CU could not initialize the internal CAN properly*		
all VTB VTC C	00G3 *0387* *07151*	W	entering CU ONLY simulation mode *the CU just entered CU ONLY simulation mode and any FU's present will be ignored*		
all VTB VTC C	00G4 *0388* *07152*	E	firmware update archive file corrupted *a firmware update was unsuccessful because the archive file used was corrupted*		
all VTB VTC C	00I1 *0513* *07349*	E/W	CPU Index to I/O-table is wrong *not used in Optimus TC*		
all VTB VTC C	00I2 *0514* *07350*	E/W	No interrupt reason on sig-bus *not used in Optimus TC*		
all VTB VTC C	00I3 *0515* *07351*	E/W	No interrupt reason on XS-bus *not used in Optimus TC*		
all VTB VTC C	00I4 *0516* *07352* 6107352	E/W	one FU has a watchdog-error, a message with an unexpected message number (IIM) has been received, the first parameter byte gives the IIM that was received. *not used in Optimus TC*		TV is not programmed correctly = check XRGSCOPE > Optimus > Program > Dose Rate Control > CONT > scantime_TV = 20ms
all VTB VTC C	00J1 *0577* *07449* 6107449	E/*W*	DI: unknown IIM #1H *a message with an unexpected message number (IIM) has been received, the first parameter byte gives the IIM that was received*		
all VTB VTC C	00J2 *0578* *07450* 6107450	E/*IR*	DI: rx LWDR parameter out of range FS= #1H PID= #2H *DI: rx LWDR p. range FS=#1H PID=#2H SID=#3#4* *false parameter received from system controller; error parameter bytes: 1=function selector FS, 2=parameter id (PID) of the faulty parameter in this message*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00J3 *0579* *07451* 6107451	E/*IR*	DI: rx LWDR message corrupted FS= #1H PID= #2H *DI: rx LWDR p. range FS=#1H PID=#2H SID=#3#4 st=#5H* *corrupted/invalid message received from system controller; error parameter bytes: 1=function selector FS, 2=parameter id (PID) of the faulty parameter in this message*		
all VTB VTC C	00J4 *0580* *07452* 6107452	E/*W*	DI: internal table lookup failed FS= #1H PID= #2H *DI: table error FS=#1H PID=#2H SID=#3#4H TYP=#5H* *CU could not find parameter info in its internal table;* *error parameter bytes: 1=function selector FS of faulty message; 2=parameter id PID of the faulty parameter in this message*		
all VTB VTC C	00J5 *0581* *07453*	E/*W*	DI: tx LWDR parameter out of range *DI: tx LWDR p. range FS=#1H PID=#2H SID=#2H4#4H val=#5H#6H* *CU is attempting to send false parameter to system controller; error parameter bytes: 1=function selector FS of faulty message; 2=parameter id PID of the faulty parameter of this message*		**C:** Optimus C release 1.1 if mains resistance value > 300mohms programmed, load release 1.2 flash load program, >> load AgenT 3.1.2, get it from the Intranet ..\..\data_collection\AGenT\AGenT-download-pages-and-PC-settings.pdf
all VTB VTC C	00J6 *0582* *07454* 6107454	E	DI: tx LWDR parameter error FS= #1H PID= #2H ER= #3H *DI: tx LWDR p. error FS=#1H PID=#2H SID#3#4H st=#5H* *CU is trying to send a corrupted/invalid message to system controller; error parameter bytes: 1=function selector FS of faulty message; 2=parameter id PID of the faulty parameter in this message; 3=internal error code*		
all VTB VTC C	00J7 *0583* *07455* 6107455	E *W/IR*	DI: LWDR message creation failed *DI: LWDR message creation failed FS=#1H ERR=#2H* *the CU software failed to process a fixed parameter of an LWDR message; procedure ID can be used by XRG development team to determine the source of the problem; error class W = message from CU, IR = message from SC*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00J8 *0584* *07456*	W	DI: unknown X-ray mode No. run data provided *the CU is trying to send a run data message with an invalid X-Ray mode*		
all VTB VTC C	00J9 *0585* *07457*	W *IR*	DI: message from suspended device ignored *message from SC whilst the generator is being controlled over the service interface*		
all VTB VTC C	00JA *0593* *07465*	W *IR*	DI: no interface version received FS= #1H *DI: no interface version received, message ignored; failure during initialization by the system controller*		
all VTB VTC C	00JB *0594* *07466* 6107466	E *IR*	DI: unknown LWDR message received FS= #1H *unknown LWDR message received from SC; possible compatibility problem SC–OptiTC; parameter 1= function selector FS*		
all VTB VTC C	00JC *0595* *07467* 6107467	E *W*	DI: tx LWDR message size invalid FS= #1H *internal SW error; possible compatibility problem SC-OptiTC; parameter 1= function selector FS*		
all VTB VTC C	00JD *0596* *07468*	 *IR*	*DI: rx LWDR message invalid FS= #1H* *unknown/invalid/corrupted LWDR message received from SC; possibly compatibility problem SC-Opti TC; parameter 1 = function selector (FS)*		
all VTB VTC C	00JE *0597* *07469*	 *IR*	*DI: can't translate FS=#1H PID=#2H SID=#3#4H val=#5#6H* *the CU has received an LWDR message with a parameter value that it cannot translate to its internal format; possibly compatibility problem SC-opti TC; function selector = param 1, parameter id = param 2, sub-param id = params 3+4, value = param 5+6*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00L1 *0705* *07649* 6107649	E/W	GC: checksum error = appears with a non-programmed **CU** after the very first turn-on = when appearing after CU Complete restore the data file might be defective *reasons might be: checksum errors for selected table part; table first time calculated*		if permanent erase NV-RAM (see ..\..\data_collection\info_files\Memory_quick_erase_Optimus_RAD_RF_C.pdf and start programming from scratch dump CU Complete file which won't work, download CU Complete again using AgenT 3.1.2, get it from the Intranet ..\..\data_collection\AGenT\AGenT-download-pages-and-PC-settings.pdf
all VTB VTC C	00L2 *0706* *07650* 6107650	E/W *IR*	tube calculation data might have changed during start-up or service work online with the PC parts of the tube data might be missing after tube data loading process to the generator *reasons might be: selected (programmable) table parts not existing or not accessible, selected table parts not valid, number of coordinates of selected table is zero*	a defective filament (data corruption) will be taken from the APR data at Duo Diagnost systems with Optimus C, the remaining filament is automatically set for all APR in ADAM, after tube load and adaptation the assignment filament<>APR is back to normal check whether the medium focus has been programmed in the default APR data set, it does not exist and MUST NOT be programmed	= CAN connected systems: EZX42+EZX43 must be removed during the loading process = Thoravision and Digital Diagnost: signal bus EZX23 must also be removed to avoid reset commands of the SUN, = signal bus EZX23 must be removed anyhow for adaptation = such measures are not required for Optimus C and non-system-CAN systems
all VTB VTC C	00L3 *0707* *07651* 6107651	E/W *W*	GC: limit data error *reasons might be: (programmable) tables contain not enough coordinates for specified application, expected table values not found*		
all VTB VTC C	00L4 *0708* *07652* 6107652	E/W *IR*	during service work online with the PC such error might come up after whatever XRGSCOPE screen has been sent with <F2> to the generator *reasons might be: the lower and upper limits of the limitation tables are inconsistent (example: I_min > I_max), combinations of application data produce inconsistent lower and upper limits (example: power factor = 0)*		check RGDV Data Set B "Tube power factor [%]: ": = if [***] or [0]appears then set [100] instead, check all other Data Set B settings as they might have changed, too

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00L5 *0709* *07653* 6107653	E/W *IR*	GC: calculation error *reasons might be: division by zero, input parameter not usable for calculation (example: pulse speed value = 0), input parameter specification not kept (example: decreasing U coordinate into curve), error in sequence of U coordinates of curve*		
all VTB VTC C	00L6 *0710* *07654* 6107654	E/W *IR*	GC: function not implemented *reasons might be: selected nomogram is unavailable, selected Vario focus function or X-ray technique is not implemented*		
all VTB VTC C	00M0 *0768* *07748* 6107748	E/W *E*	Unable to initialize FU(s) #1H, #2H, #3H, #4H, #5H, #6H the unit(s) will be indicated in the string at #1H, #2H ... , all other fields will indicate 00H	+15VDC missing at turn-on, typically in combination with 00CY + 00-‘ (invalid code) and fatal error LED condition EZ119	try to find the reason for the missing –15VDC, remove PCBs and all external devices using –15V like e.g. measuring chambers, suppressor diode on backpanel EZ might be short
all VTB VTC C	00M1 *0769* *07749* 6107749	E/W *E*	Configuration key is missing or defective *for future use: the existing CU has no configuration key and so this error message should never appear*	check that all chip pins properly stick in the socket EZ139 D38	if chip defective order 4512 100 45292 together with the generator serial number
all VTB VTC C	00M2	E/W	Unable to initialize the FU mA		
all VTB VTC C	00M3 *0771* *07751* 6107751	E/W *E*	No response at all from FU(s) #1H, #2H, #3H, #4H, #5H, #6H the missing unit(s) will be indicated in the string at #1H, #2H ... , all other fields will indicate 00H unit indications at the top of this document		check if FCO 00 135 004 (high speed rotor control modification) has been carried out
all VTB VTC C	00M4 *0772* *07752* 6107752	E	Function value from SE out of range *this error points to a failure which can only be caused by the software; a function call is performed from the function group MC and the module mcidle.c to a procedure in the function group SE, this procedure returns a parameter which is out of range*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00M5 *0773* *07753* 6107753	E	Procedure index from SE out of range *this error points to a failure which can only be caused by the software; a function call is performed from the function group MC and the module mcidle.c to a procedure in the function group SE, this procedure returns a parameter which is out of range*		
all VTB VTC C	00MA *0785* *07765*	W	Limit for allocated memory exceeded, job id: #1 *this error points to a failure which can only be caused by the software; a background program called OSRAM has detected, that the limit for the allocated memory for the job (referenced by the job id) is reached*		
all VTB VTC C	00MB *0786* *07766*	W	Limit for available memory exceeded, job id: #1 *this error points to a failure which can only be caused by the software; a background program called OSRAM has detected, that the limit for the allocated memory for the job (referenced by the job id) is reached*		
all VTB VTC C	00MC *0787* *07767*	W	Limit for borrowed memory exceeded, job id: #1 *this error points to a failure which can only be caused by the software; a background program called OSRAM has detected, that the limit for the borrowed memory for the job (referenced by the job id) is reached*		
all VTB VTC C	00MD *0788* *07768*	W	Allocated memory is increasing, job id: #1 *this error points to a failure which can only be caused by the software; a background program called OSRAM has detected, that the limit for the allocated memory for the job (referenced by the job id) is increasing*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00ME *0789* *07769*	W	Available memory is decreasing, job id: #1 *this error points to a failure which can only be caused by the software; a background program called OSRAM has detected, that the limit for the available memory for the job (referenced by the job id) is decreasing*		
all VTB VTC C	00MF *0790* *07770*	W	Borrowed memory is increasing, job id: #1 *this error points to a failure which can only be caused by the software; a background program called OSRAM has detected, that the limit for the borrowed memory for the job (referenced by the job id) is increasing*		
all VTB VTC C	00MG *0791* *07771*	W	NVRAM: Main control, NV checksum error *the checksum of the table which stores the parameters for OSRAM is corrupted, this happens also when the table does not (yet) exist after installing a new CUBE board or parts of it*		
all VTB VTC C	00MH *0792* *07772* 6107772	E	Job incorrectly identified *this error points to a failure which can only be caused by the software; a background program called OSRAM has not found all jobs under their expected names*		
all VTB VTC C	00MI *0793* *07773*	W	Limit for number of objects exceeded, job id: #1 *this error points to a failure which can only be caused by the software; a background program called OSRAM has detected, that the limit for a number of objects for the job (referenced by the job id) is reached*		
all VTB VTC C	00MJ *0794* *07774*	W	Number of objects are increasing, job id: #1 *this error points to a failure which can only be caused by the software; a background program called OSRAM has detected, that the limit for a number of objects for the job (referenced by the job id) is increasing*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00MK *0795* *07775*	W	**FU_mA** filament checksum failed,FUtype:#1,filament:#2 *the data for the filament received from the FU is different to the data stored in the CU, parameter #2 is the filament number, #1 is the FU number, where FumA_A=3, FumA_B04 etc, #3 is the tube number (1…3) and #4 is the focus (1=SF 3=LF)*		
all VTB VTC C	00ML *0796* *07776*	*W*	*FU(s) failed, rebooting in CU only mode* *the CU could not contact one or more FU's necessary for running and so is rebooting in CU the only mode*		
all VTB VTC C	00MM *0797* *07777*	*W*	*job gone, job id: #1* *this error points to a failure which can only be caused by the software; a background program called OSRAM analyses all jobs under their expected names, but the job identified by "job id" is now gone*		
all VTB VTC C	00MN *0798* *07778*	*W*	*FU msg too short; expect:#1 got:#3#2 fu:#4 iim:#5 mid:#6* *a message has been received from an FU during startup of the CU which is shorter than the expected message; possibly incompatibility between CU and FU or problem with FU; expected size = param 1, receive size = params 2+3, FU = param 4, iim = p. 5*		
all VTB VTC C	00MO *0799* *07779*	*W*	*unexpected message; Fu type:#1, iim:#2* *unexpected message received from an FU during CU startup; FU = param 1, iim received param 2; possibly incompatibility between CU and FU or problem with FU*		
all VTB VTC C	00MP *0800* *07780*	*W*	*generator performing automatic reboot* *the generator is about to reboot itself automatically*		
all VTB VTC C	00N0 *0832* *07848*	*W*	*BX: LWDR message creation failed FS= #1H ERR= #2H* *the LWDR pack was unable to create the requested message; function selector requested was #1H and the LWDR pack error code was #2H*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00N1 *0833* *07849*	*W*	*BX: table error FS= #1H PID= #2H SID #3#4H TYP= #5H CU could not find parameter info in its internal table; error parameter bytes: 1=function selector FS of faulty message, 2=parameter id PID of the faulty parameter of this message*		
all VTB VTC C	00N2 *0834* *07850*	*IR*	*BX: rx LWDR param. missing FS=#1H PID=#2H SID=#3#4H st=#5H LWDR pack tried to decode a message which had one or more missing fixed parameters, function selector is #1H, sub-param. id #3#4H LWDR status is #5H*		
all VTB VTC C	00N3 *0835* *07851*	*IR*	*BX: rx LWDR param. range FS=1H PID=#2H SID=#3#4H false parameter received from system controller, error param. bytes: 1=function selector FS of faulty message, 2=param. id PID of faulty param. in this message*		
all VTB VTC C	00N4 *0836* *07852*	*IR*	*BX: rx LWDR corrupted FS=#1H PID=#2H SID=#3#4H st=#5H corrupted/invalid message received from system controller, error param. bytes: 1=function selector FS of faulty message, 2=param. id PID of the faulty parameter in this message*		
all VTB VTC C	00N5 *0837* *07853*	*IR*	*BX: rx unknown LWDR message FS=#1H unknown LWDR message received from SC, possibly incompatibility problem SC-Velara, param. 1= function selector FS*		
all VTB VTC C	00N6 *0838* *07854*	*IR*	*BX: tx LWDR param. range FS=#1H SID=#2H SID=#3#4H val=#5#6H TheBox is attempting to send a false parameter to CU, error parameter bytes: 1=function selector FS of faulty message, 2=parameter id PID of the faulty parameter in this message*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00N7 *0839* *07855*	*IR*	*BX: tx LWDR param. error FS=#1H PID=#2H SID=#3#4H st=#5H* *TheBox is trying to send a corrupted/invalid message to system controller, error parameter bytes: 1=function selector FS of faulty message, 2=parameter id PID of the faulty parameter in this message, 3=internal error code*		
all VTB VTC C	00N8 *0840* *07856*	*IR*	*BX: tx unknown LWDR message FS=#1H* *TheBox is trying to send an unknown LWDR message, possibly compatibility problem TheBox-Velara, parameter 1=function selector FS*		
all VTB VTC C	00N9 *0841* *07859*	*W*	*BX: not enough memory* *TheBox ran out of memory trying to create an LWDR message*		
all VTB VTC C	00NA *0849* *07865*	*E*	*BX SDL: max transmit retries reached, Fit message lost* *a transmission towards the Integris Acco failed*		
all VTB VTC C	00NB *0850* *07866*	*E*	*BX SDL: rx sequence mismatch, at least one Fit message lost* *synchronization problem at SDL level*		
all VTB VTC C	00NC *0851* *07867*	*E*	*BX SDL: tx sequence mismatch, at least one Fit message lost* *synchronization problem at SDL level*		
all VTB VTC C	00ND *0852* *07868*	*W*	*BX: unexpected message received fu_type=#1H, iim=#2H* *received an unexpected message, FU type is #1H iim is #2H*		
all VTB VTC C	00NE *0853* *07869*		*BX: multiple request signals on signal bus* *currently not used*		
all VTB VTC C	00NF *0854* *07870*	*IR*	*BX: Fit command not recognized* *unexpected or unrecognized Fit command received*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00NG *0855* *07871*	*IR*	*BX: Fit message number not recognized* *TheBox tried to encode or decode a Fit message with an unexpected or unrecognized message type*		
all VTB VTC C	00NH *0856* *07872*	*IR*	*BX: error in Fit message parameters* *a Fit parameter was either missing or incorrect*		
all VTB VTC C	00NI *0857* *07873*	*W*	*BX: unexpected Fit command #2#1H message #4#3H received* *an unexpected Fit command / message was received, the command is reported using #2#1H and the message type using #4#3H*		
all VTB VTC C	00NJ *0858* *07874*	*IR*	*BX: unexpected buffer #1H received* *TheBox attempted to process an unexpected buffer (given by #1H)*		
all VTB VTC C	00NK *0859* *07875*	*W*	*BX: unexpected LWDR function selector #1H received* *an unexpected LWDR message was received by TheBox, function selector =#1H*		
all VTB VTC C	00NL *0860* *07876*	*IR*	*BX: parameter out of range* *an internal parameter to a function call was out of range*		
all VTB VTC C	00NM *0861* *07877*	*IR*	*BX: illegal SID value read from hardware* *an illegal SID value has been read from the hardware*		
all VTB VTC C	00NN *0862* *07878*	*W*	*BX: SPD value out of range* *TheBox received an SID value which could not be converted into a valid LWDR EDL distance*		
all VTB VTC C	00NO *0863* *07879*	*IR*	*BX: curve parameter out of range* *a curve could not be calculated because the given curve parameters were out of range*		
all VTB VTC C	00NP *0864* *07880*	*IR*	*BX: unexpected state #1H* *an unexpected / invalid CU or TheBox state was received*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00NQ *0865* *07881*	*W*	*BX: CU info request #1H failed* *a request (number #1H) from TheBox to the CU software for information failed*		
all VTB VTC C	00NR *0866* *07882*	*W*	*BX: #1H kV not found in curve* *TheBox failed to find the required mA value in the curve returned by the Velara software*		
all VTB VTC C	00NS *0867* *07883*	*W*	*BX: attempt to divide by zero* *an attempt was made to divide a value by zero*		
all VTB VTC C	00NT *0868* *07884*	*W*	*BX: unexpected Fit command #1H* *TheBox has received an unexpected Fit command type, i.e. not one of SET – EVA – CP$SET – RE$SET – LOCK - UNLOCK*		
all VTB VTC C	00NU *0869* *07885*	*IR*	*BX: flag already set to #1H* *TheBox has attempted to set an internal flag when it already had the same value #1H*		
all VTB VTC C	00NV *0870* *07886*	*W*	*BX: SW timers exhausted* *TheBox has run out of internal software timers*		
all VTB VTC C	00NW *0871* *07887*	*W*	*BX: invalid NVRAM checksum for file no. #2#1H* *TheBox has tried to open the file number #1#1H and failed, if the file was corrupt then it has been replaced by a new file with default values in it; if it was missing then a new file has been created using the default values*		
all VTB VTC C	00NX *0872* *07888*	*IR*	*BX: given Fit parameter too long for message* *TheBox has tried to create a Fit message with an invalid (too long) parameter*		
all VTB VTC C	00PA *0977* *08065*	W	CPU: IIM/MSC number unknown *allowed are only IIMs/MSCs as all MSCN_DR and the MSCN_SE_MAIN; DRC will be called by a wrong IIM/MSC*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00PB *0978* *08066*	W	CPU: technique mode unknown *DR_modes means all specified CMs, the DRC calculation calls the wrong mode*		
all VTB VTC C	00PC *0979* *08067*	W *IR*	CPU: value limit overflow *CPU: DRC input parameter #1H out of range this occurs if the entry check of all parameters from XR fails or the boundary check of kV_mA_curve fails, one of these values is out of the specified range*		
all VTB VTC C	00PD *0980* *08068* 6108068	E	PC communication: unknown TDL proc id *the service call to DRC is wrong, the called service procedure is not available in DRC*		
all VTB VTC C	00PE *0981* *08069*	W	NVRAM: DRC NV checksum error = appears with a non-programmed **CU** after the very first turn-on = when appearing after CU Complete restore the data file might be defective *checksum of NV RAM is invalid/wrong, maybe a NV problem*		if permanent erase NV-RAM (see ..\..\data_collection\info_files\Memory_quick_erase_Optimus_RAD_RF_C.pdf and start programming from scratch dump CU Complete file which won't work, download CU Complete again using AgenT 3.1.2, get it from the Intranet ..\..\data_collection\AGenT\AGenT-download-pages-and-PC-settings.pdf
all VTB VTC C	00PF *0982* *08070*	W	CPU: equal kV-sets from **CU** comes twice *the kV_mA_curves or kV_mA_ms_curves, gotten from CU SW, contain more than two equal following kV curve points*		
all VTB VTC C	00PG *0983* *08071*	W	CPU: kV sequence does not increase *this warning occurs when the following kV value of a curve point doesn't decrease, DRC got this curve from CU*		
all VTB VTC C	00PH *0984* *08072*	W	CPU: EDL is not possible, min_mA limit *this warning will never occur with Velara, EDL is deactivated in DRC for Velara release 1*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00PI *0985* *08073*	W	CPU: DCALC Dr_curve has only one element *this warning occurs when a dose rate curve doesn't exist*		
all VTB VTC C	00PJ *0986* *08074*	W	CPU: DCALC Dr_curve has strange values *DRC expanded the curve coming from CU; this warning occurs if DRC makes an expand error*		
all VTB VTC C	00PK *0987* *08075*	W	CPU: equal kV sets from **CU** with equal mA *the kV_mA_curves for continuous fluoro, gotten from CU, contain more than one equal following kV_mA curve points*		
all VTB VTC C	00PL *0988* *08076*	W	dose digits disturbance = noise level at chamber signal input increases a limit value before kV is started *this warning occurs if the measurement of the dose signal increases 20mV before the exposure is started*	check signal waveform in standby, prep and ready 2 condition before exposure starts the chamber signal at EZ150 X4 should not be > 20mV release 3.3 and > 80mV release 3.5, otherwise the problem source has to be investigated	= solved with release 3.5 (higher limit value) = does not exist at release 2.x generators
all VTB VTC C	00PM *0989* *08077*	W *IR*	CPU::PULS: value limit overflow *CPU: :PULS: input parameter #1H out of range this occurs if the entry check of all parameters from CU fails, especially for pulsed technique; one of these values is out of the specified range*		
all VTB VTC C	00PN *0990* *08078*	W	CPU::PULS: equal kV-sets from **CU** comes twice *the kV_mA_ms curves for a pulsed technique, gotten from CU, contain more than one equal following kV_mA_ms curve points*		
all VTB VTC C	00PO *0991* *08079*	W	CPU: calculation during pulse *this warning occurs if the control method changes during a pulse technique which is actually running in an x-ray pulse*		
all VTB VTC C	00PP *0992* *08080*	*W*	*CPU: :DR-ICE: dose too high, limited more than 500% of the dose has been measured relatively to the expected (100%) dose*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00PQ *0993* *08081*	*W*	*CPU: :DRC: dose much smaller after exposure than during exposure* *the 'published' dose will be taken from the latest time during pulse*		
all VTB VTC C	00PR *0994* *08082*	*IR*	*CPU: :DRC: parameter concerning the sensor doesn't fit* *FDXD installed, but data set sent with SensorScanTime of 0; this is not compatible with FDXD*		
all VTB VTC C	00PS *0995* *08083*	*W*	*CPU: :DRC: Pulse-Statemachine inconsistence; cause: #1H* *this warning is issued at state machine failure result with a parameter (values 1-5); values from 1-4 are internal for development, value 5 typically means that the requested frame speed and the realized frame speed are not the same*		
all VTB VTC C	00S* *1146* *08342*	PC log-in entry	every PC service log-in XRGSCOPE or APRMAN causes this entry to indicate service work	too many entries can be prevented by keeping XRGSCOPE active even when the connection might be disconnected or the generator is turned off + on	
all VTB VTC C	00S? *1167* *08363* 6108363	E	PC communication: unexpected error *an internal software / runtime problem was detected; under normal conditions it shall never happen*		
all VTB VTC C	00S0 *1152* *08348* 6108348	E	PC communication; tube programming error *during the tube data programming a data distribution error occurred*		
all VTB VTC C	00S1 *1153* *08349*	*W*	*PC communication: reconfiguration needed* *the configuration stored at the NVRAM does not match with the configuration stored at the FlashDisk; this could mean that the battery is empty or the FlashDisk is corrupted or something was changed, e.g. a function unit or the FlashDisk or the CUBE board*		
all VTB VTC C	00S2 *1154* *08350*	*E*	*PC communication: timeout reached* *can occur in the CU simulation mode or more generally if a task does not respond to a service request within 5 minutes*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00S3 *1155* *08351*	*W*	*PCcomm: service interface speed fall back performed* *the persistent baudrate of 115kbps was witched back to the default 9600bps because a lower baudrate was used by the service tool*		
all VTB VTC C	00S4 *1156* *08352*	*W*	*PCcomm: CU battery lifetime low* *the CU battery lifetime is low, its lifetime may have exceeded its 2 year guaranteed lifetime*		
all VTB VTC C	00S5 *1157* *08353*	*E*	*PCcomm: restore process failed* *the restore of a backup file was not successful*		
all VTB VTC C	00S6 *1158* *08354*	*W*	*PCcomm: restore data from different firmware version* *the backup was made by a different version of the firmware than that which is currently running on the system; it is possible that some restored data were ignored or overridden with different data*		
all VTB VTC C	00SA *1169* *08365* 6108365	E	PC communication: Not enough space at destination segment *this is a software bug, nothing to fix, maybe retry will help*		
all VTB VTC C	00SB *1170* *08366*	E	PC communication: Base out of range *this is a software bug, nothing to fix, maybe retry will help*		
all VTB VTC C	00SC *1171* *08367* 6108367	E	PC communication: Value too large *this is a software bug, nothing to fix, maybe retry will help*		
all VTB VTC C	00SD *1172* *08368* 6108368	E	PC communication: Terminator not found *this is a software bug, nothing to fix, maybe retry will help*		if XRGSCOPE is used to program film-screen-combinations Optimus RAD-R/F release ≥3.6, use AGenT 4.1.1. ..\..\data_collection\AGenT\AGenT-4-1-1--download-pages-and-PC-settings.pdf
all VTB VTC C	00SE *1173* *08369* 6108369	E	PC communication: Error in description *this is a software bug, nothing to fix, maybe retry will help*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00SF *1174* *08370* 6108370	E	PC communication: Item type unknown *this is a software bug, nothing to fix, maybe retry will help*		
all VTB VTC C	00SG *1175* *08371* 6108371	E	PC communication: Internal type unknown *this is a software bug, nothing to fix, maybe retry will help*		
all VTB VTC C	00SH *1176* *08372* 6108372	W	PC communication: Value negative *this is a software bug, nothing to fix, maybe retry will help*		
all VTB VTC C	00SI *1177* *08373*	E	PC communication: Not enough space at destination buffer *this is a software bug, nothing to fix, maybe retry will help*		
all VTB VTC C	00SJ *1178* *08374* 6108374	E	PC communication: Syntax wrong *this is a software bug, nothing to fix, maybe retry will help*		
all VTB VTC C	00SK *1179* *08375* 6108375	E	PC communication: String too long *this is a software bug, nothing to fix, maybe retry will help*		
all VTB VTC C	00SL *1180* *08376*	W	PC communication: String truncated *this is a software bug, nothing to fix, maybe retry will help*		
all VTB VTC C	00SM *1181* *08377*	E	PC communication: TDL segment overflow *this is a software bug, nothing to fix, maybe retry will help*		
all VTB VTC C	00SN *1182* *08378* 6108378	E	PC communication: FU reference table full *this is a software bug, nothing to fix, maybe retry will help*		
all VTB VTC C	00SO *1183* *08379* 6108379	E	PC communication: Node ID unknown *this is a software bug, nothing to fix, maybe retry will help*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00SP *1184* *08380* 6108380	E	PC communication: FU Code unknown *this is a software bug, nothing to fix, maybe retry will help*		
all VTB VTC C	00SQ *1185* *08381* 6108381	E	PC communication: Syntax error in node ID = can happen if the PC boots up with the generator on and the communication cable to **CU** already connected *this is a software bug, nothing to fix, maybe retry will help*		
all VTB VTC C	00SR *1186* *08382*	W	PC communication: No node ID found *this is a software bug, nothing to fix, maybe retry will help*		
all VTB VTC C	00SS *1187* *08383* 6108383	E	PC communication: Request not performed *the request sent to the generator could not be performed, because the request was not allowed, incorrect or a previous error leads to this response*		
all VTB VTC C	00ST *1188* *08384* 6108384	E	PC communication: RMX error *this is a software bug, nothing to fix, maybe retry will help*		
all VTB VTC C	00SU *1189* *08385*	W	PC communication: Enumeration element not found *this is a software bug, nothing to fix, maybe retry will help*		
all VTB VTC C	00SV *1190* *08386* 6108386	E	PC communication: Mail corrupted *this is a software bug, nothing to fix, maybe retry will help*		
all VTB VTC C	00SW *1191* *08387* 6108387	E	PC communication: Procedure ID unknown *this is a software bug, nothing to fix, maybe retry will help*		
all VTB VTC C	00SX *1192* *08388* 6108388	E	PC communication: FU mA incompatible *the version of FU_mA could not be handled by the CU firmware*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00SY *1193* *08389* 6108389	E	PC communication: FU Off request failed *the FU was requested to stop operation, but it didn't work*		
all VTB VTC C	00SZ *1194* *08390* 6108390	E	PC communication: Wrong response *this is a software bug, nothing to fix, maybe retry will help*		
all VTB VTC C	00T? *1231* *08463* 6108463	E	TTS: Unexpected Error *an internal resource problem was detected*		
all VTB VTC C	00TA *1233* *08465* 6108465	E	TTS: Received Message unknown *the received message is unknown and will not be processed*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00TB *1234* *08466* 6108466	E	tube temperature supervision error from **FU_kV** *tube housing contact or cable defect, detected by FU_kV*	= short to ground or signal noise from any source at tube housing thermal switch signal EZX3 / EWGX8 / EWGX9 - pins **3-4** back panel version 4512 108 05983 - pins **6-7** back panel versions 4512 108 05984 + 4512 108 09361 remove cable connection and insert a decade plug with a short link pins **3-4 or 6-7** instead to simulate the tube housing contact, if problem disappears, if not measure signal TH_OL_SW/ at EZ130 X1:A11, details see ..\..\data_collection\faultfinding\mnemonic_routing.pdf = short to ground at signal TH_OL EZ130 X1:A12, signal routing of TH_OL see ..\..\data_collection\faultfinding\mnemonic_routing.pdf this signal is not used in any system as a thermal tube sensor is not available yet with PC and XRGSCOPE: go path >Select Unit > FU-kV > FU-kV > Faultfind > Monitoring > Measure Temperatures > tube temp switch: should be **closed** = ok will have **short circuit** =00TB can be = **open** if connection removed	screened stator cable 3 x 1.31mm*2 0722 215 02054 2-wire screened cable for thermal switch 4512 100 66151
all VTB VTC C	00TC *1235* *08467* 6108467	E	internal tube temperature supervision error *for more info see TTS internal error logging*		tube data table corrupted? = can happen after CU Complete restore if tubes are of a different speed type = reboot generator to get it into a stable standby condition, then repeat loading of CU Complete. = if error persistent even after reboot erase NV-RAM (see ..\..\data_collection\info_files\Memory_quick_erase_Optimus_RAD_RF_C.pdf and start programming from scratch

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00TD *1236* *08468* 6108468	E	TTS: Tube Number unknown *this is a software bug, nothing to fix, maybe retry will help*		
all VTB VTC C	00TE *1237* *08469* 6108469	E	TTS: NVRAM Checksum Error *the checksum found is not correct, that could mean that the battery is empty or the NVRAM is corrupt*		
all VTB VTC C	00TF *1238* *08470* 6108470	E	TTS: NVRAM unavailable *the requested NVRAM space is unavailable*		
all VTB VTC C	00TG *1239* *08471* 6108471	E	TTS: Tube overheated *the temperature of the focal track exceeds the T0 limit*	1) mA measuring circuit might be defective, check circuit in standby against oscilloscope screenshot ma_pulse.pcx most likely in non-AEC technique 2) wrong calculation of switched loads	1) exchange high tension transformer 2) exchange FU_mA PROM by version 4512 113 20212 check if application data (APR, system dependent) can be improved
all VTB VTC C	00TH *1240* *08472*	W	TTS: Load Data Supply inconsistent *one or more of the values (mAs, t, mA, kV) are 0*		
all VTB VTC C	00TI *1241* *08473*	*W*	*TTS: tube housing contact state inconsistent the tube housing contact is open, but the calculated temperature of the tube doesn't match with it; check the tube type programming or cooling unit*		
all VTB VTC C	00TJ *1242* *08474*	*W*	*TTS: cooling unit defect* *cooling unit is defective*		
all VTB VTC C	00X0 *1472* *08848* 6108848	E/W *E*	FU_RC high speed did not respond to a stator request within the time required Duo: CPU wrong timer id *the FU_RoCo did not respond during tube switch to a stator request within the time required*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00X1 *1473* *08849* 6108849	E/W *E*	**FU_RC** high speed did not obtain the requested speed within the time required Duo: CPU wrong timer mode		
all VTB VTC C	00X2 *1475* *08850* 6108850	E/W *E*	wrong message type *internal CAN_send failed* *the transmission of a message on the CAN bus to the FU_RoCo / _kV / _mA failed*		
all VTB VTC C	00X3 *1475* *08851*	E/W *E*	DWORD does not fit into BYTE3 *FU_kV tube select timeout* *FU_kV did not respond to a tube selection request within the time required*		
all VTB VTC C	00X4 *1476* *08852* 6108852	E/W *E*	timeout of X-ray backup timer *FU_kV data set timeout* *FU_kV did not respond to the data setting message within the time required*	1) check backup time with kV-mA-ms technique at screen Faultfind > X-Ray log > Dose Rate Control Logging > Non Automatic Technique Calculation: t_nominal is the safety backup time of CU 2) switch exposure, then read screen > Read Actual Status; if time measured > t_nominal exchange mA control PCB	
all VTB VTC C	00X5 *1477* *08853*	E/W *E*	timeout of X-ray rotation timer *FU_mA data setting failed* *FU_mA rejected the x-ray parameter setting*		try replacement of desk hand-switch 4512 104 36801
all VTB VTC C	00X6 *1478* *08854*	E/W *E*	timeout setting function units, response missing *FU_mA grid test failed*		if in combination with 00XK + 07LJ load tube file again
all VTB VTC C	00X7 *1479* *08855*	E/W *E*	curve token is NO_TOKEN *FU_mA data set timeout* *FU_mA did not respond to the data setting messages within the time required*		
all VTB VTC C	00X8 *1480* *08856*	*E*	*FU_mA not installed* *the data set from AD specifies a tube / focus combination which is not available*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00X9 *1481* *08857*	*E*	*DRC calculation timeout* *DRC did not respond to a calculation request within the time required*		
all VTB VTC C	00XA *1489* *08865*	E/W *E*	switch table invalid *no DRC mode* *the x-ray mode / nomogram selector combination in the data set does not yield a valid DRC mode*		
all VTB VTC C	00XB *1490* *08866*	E/W *E*	tube data rotation invalid = appears with a non-programmed **CU** after the very first turn-on = when appearing after CU Complete restore the data file might be defective *FU_mA off request timeout* *FU_mA control state machine has not responded to a request to go to the OFF state within the time required*		if permanent erase NV-RAM (see ..\..\data_collection\info_files\Memory_quick_erase_Optimus_RAD_RF_C.pdf and start programming from scratch dump CU Complete file which won't work, download CU Complete again using AgenT 3.1.2, get it from the Intranet ..\..\data_collection\AGenT\AGenT-download-pages-and-PC-settings.pdf
all VTB VTC C	00XC *1491* *08867*	E/W *E*	watch dog invalid *FU_kV off request timeout* *fU_kV control state machine has not responded to a request to go to the OFF state within the time required*		
all VTB VTC C	00XD *1492* *08868*	E/W *E*	configuration table invalid *FU_RoCo init request timeout* *FU_RoCo state machine has not responded to a request to go to the INIT state within the time required*		
all VTB VTC C	00XE *1493* *08869*	E/W *E*	test data invalid *FU_mA off to standby request timeout* *FU_mA control state machine has not responded to a request to go to the STANDBY state from the OFF state within the time required*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00XF *1494* *08870*	E/W *E*	rotor control high speed data invalid *FU_kV of to standby request timeout* *FU_kV control state machine has not responded to a request to go to the STANDBY state from the OFF state within the time required*		
all VTB VTC C	00XG *1495* *08871*	E/W *E*	received internal interrupt message is unknown *FU_RoCo init to stopped request timeout* *FU_RoCo state machine has not responded to a request to go to the STOPPED state from the INIT state within the time required*		
all VTB VTC C	00XH *1496* *08872*	E/W *E*	received function unit type unknown *FU_mA prep to standby request timeout* *FU_mA control state machine has not responded to a request to go to the STANDBY state from a PREP state within the time required*		
all VTB VTC C	00XI *1497* *08873* 6108873	E/W *E*	initialization with **FU_RC** high speed not ok *FU_kV prep to standby request timeout* *FU_kV control state machine has not responded to a request to go to the STANDBY state from a PREP state within the time required*		check if FCO 00 135 004 at **FU_RC** has been carried out
all VTB VTC C	00XJ *1498* *08874* 6108874	E/W *E*	exposure time too short *FU_RoCo prep to stopped request timeout* *FU_RoCo state machine has not responded to a request to go to the STOPPED state from a PREP state within the time required*	might occur in combination with 02WG tube arcing (or other 02xx kV errors) if the exposure has been terminated prior to a controlled termination of AEC or mA_control; look for adjacent errors in the error log index which occurred at the same time	
all VTB VTC C	00XK *1499* *08875*	E/W *E*	**FU_mA** refuses data set *FU_mA standby to prep request timeout* *FU_mA control state machine has not responded to a request to go to the requested PREP state from the STANDBY state within the time required*		if in combination with 07LJ + 00X6 load tube file again

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00XL *1500* *08876*	E/W *E*	tube yield table invalid = appears with a non-programmed **CU** after the very first turn-on = when appearing after CU Complete restore the data file might be defective *FU_kV standby to prep request timeout* *FU_kV control state machine has not responded to a request to go to the requested PREP state from the STANDBY state within the time required*		if permanent erase NV-RAM (see ..\..\data_collection\info_files\Memory_quick_erase_Optimus_RAD_RF_C.pdf and start programming from scratch dump CU Complete file which won't work, download CU Complete again using AgenT 3.1.2, get it from the Intranet ..\..\data_collection\AGenT\AGenT-download-pages-and-PC-settings.pdf
all VTB VTC C	00XM *1501* *08877*	E/W *E*	additional collimator filter correction table invalid *FU_RoCo stopped to prep request timeout* *FU_RoCo state machine has not responded to a request to go to the requested START state from the STOPPED state within the time required*		
all VTB VTC C	00XN *1502* *08878*	E/W *E*	collimator wedge filter correction table invalid *FU_mA prep to prepx request timeout* *FU_mA control state machine has not responded to a request to go to the PREPARED XRAY state from the PREP state within the time required*		
all VTB VTC C	00XO *1503* *08879* 6108879	E/W *E*	exposure time too long *FU handler looping* *the main loop in the procedure to run all FU state machines has run more than the specified maximum loops without reaching a stable state*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00XP *1504* *08880*	E/W *W*	exposure time too long *SW timers exhausted* *more timers have been requested than the module Xrswtim can maintain*	most likely in free techniques without AEC, **FU_mA** terminates non-EAC exposures once the set mAs are achieved, if X_ACT_S/ has not been received as mAs counter trigger or if STOP_X_C/ has not been sent by **FU_mA CU** terminates the exposure; !! can be logged even though the exposure has been interrupted prior to a regular termination in combination with 02xx kV errors !! look for adjacent errors in the error log index which occurred at the same time	
all VTB VTC C	00XQ *1505* *08881*	E/W *W*	tube statistic data invalid - when upgrading a generator form release 3.3 or 3.4 to 3.5 as the tube counter tables are of different format *unknown input message* *unexpected message received*		
all VTB VTC C	00XR *1506* *08882*	E/W *W*	gsta data invalid *run data collect timeout* *run data could not be collected within the time required*		
all VTB VTC C	00XS *1507* *08883*	E/W *W*	tube number in **CU** and **FU_kV** different might appear in combination with 02WA *run x-ray off timeout* *notification of X-ray off has not been received from the radiation state machine within the time required*	check status of tube selection signals TB_2/ EZ130 X1:A13 TB_3/ EZ130 X1:C13 there should not be multiple selections, TB_2/ and/or TB_3/ must not be low active if tube 1 is selected; does WGK1 (2WGK1) switch the 230VAC between X61 / X62 ? if so, is a suppressor diode parallel to the TB_?_RT/ short? check at the backpanel drawings	if multiple selections are active exchange kV control PCB; exchange WG PCB; remove suppressor diode or exchange backpanel PCB EZ;

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00XT *1508* *08884*	E/W *W*	Rotation in **CU** and **FU_RC** high speed or **FU_CIE** for low speed different. If more than 4 PREP's have been switched within one minute the 5th will cause this entry not allowing the next acceleration to prevent overheating of the stator. *set x-ray off timeout* *notification of X-ray off has not been received from the radiation state machine within the time required*	bouncing hand switch? check behavior at EN_X/ EZX82	If in combination with 10LA (**FU_RC** high speed only) program "enable" at "rotation prolongation after prep".
all VTB VTC C	00XU *1509* *08885* 6108885	W	input message field out of range *input message field out of range* *procedures 8003, 8004, 8005, 8009, 8010, 8018, 8030, 8031, 8032, 8033, 8035: a field in the message has an unexpected value*		can happen during transition fluoro to exposure, Scopomat exposures only, solved with release 3.5
all VTB VTC C	00XV *1510* *08886*	W	NVRAM HW test flags invalid *kV value not in specified yield table* *the kV value from DRC is not within the range of the specified yield table provided for the current tube*		
all VTB VTC C	00XW *1511* *08887* 6108887	E	EN_X active in startup *frid not allowed by FU_mA* *grid mode has been selected for a tube / focus combination that does not support grid mode*		
all VTB VTC C	00XX *1512* *08888* 6108888	E *W*	RD_PR_X stays active after prep *FU_mA Ie-adaptation aborted* *FU_mA aborts the emission current adaptation*		
all VTB VTC C	00XY *1513* *08889*	*W*	*FU_mA boost-adaptation aborted* *FU_mA aborts boost adaptation*		
all VTB VTC C	00XZ *1514* *08890*	*W*	*adap-request in adaptation procedure (8030 Ie and/or 8031 boost)* *adaptation request received while adaptation in progress*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00Y0 *1536* *08948*	*E*	*specific yield out of range, adjusted* *a zero value has been detected in the yield table*		
all VTB VTC C	00Y1 *1537* *08949*	*E*	*FU_kV tube select failed* *FU_kV did not respond to tube selection message*		
all VTB VTC C	00Y2 *1538* *08950*	*E*	*FU_RoCo braking timeout* *FU_RoCo did not confirm that the rotor was stopped*		
all VTB VTC C	00Y3 *1539* *08951*	*E*	*SE rotation speeds not compatible with FU_RoCo* *the rotation speeds XR got during start up from SE and FU_RoCo don't fit*		
all VTB VTC C	00Y4 *1540* *08952*	*IR*	*curve invalid* *curve received from AD is not valid*		
all VTB VTC C	00Y5 *1541* *08953*	*IR*	*requested index not received* *the selected index to play was not recorded before*		
all VTB VTC C	00Y6 *1542* *08954*	*IR*	*play mode invalid* *only the record / play mode is allowed to change if you switch from record to play*		
all VTB VTC C	00Y7 *1543* *08955*	-	*error is disabled*		
all VTB VTC C	00Y8 *1544* *08956*	*W*	*adaptation parameters changed by AD* *the requested adaptation parameter from the FU_mA got changed by AD*		
all VTB VTC C	00Y9 *1545* *08957*	*W*	*wait time for CTRL_X in adaptation exceeded* *user started adaptation but waited too long before applying CTRL_X signal to allow adaptation exposures*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00YA *1553* *08965*	*W*	*adaptation : filament not available* *ADAP SM requests adaptation of filament* *which is not in configuration*		
all VTB VTC C	00YB *1554* *08966*	*E*	*XR manager looping* *the main loop in the procedure to run all XR* *state machines has run more than the specified* *maximum loops without reaching a stable state*		
all VTB VTC C	00YC *1555* *08967*	*E*	*FU_mA simulation mode request timeout* *FU_mA has not responded to a simulation* *request within the time required*		
all VTB VTC C	00YD *1556* *08968*	*W*	*FU_mA calibration timeout* *no response to FU_mA calibration request*		
all VTB VTC C	00YE *1557* *08969*	*E*	*X_ACT_S signal missing* *the X_ACT_S* *signal is not connected to the CU*		
all VTB VTC C	00YF *1558* *08970*	*IR*	*tube switch during preparation* *a tube switch was requested when generator* *not in standby*		
all VTB VTC C	00YG *1599* *08971*	*E*	*filament status message not received* *XR not initialized properly*		
all VTB VTC C	00YH *1560* *08972*	*E*	*CAN configuration message not received* *XR not initialized properly*		
all VTB VTC C	00YI *1561* *08973*	*E*	*options message not received* *XR not initialized properly*		
all VTB VTC C	00YJ *1562* *08974*	*E*	*software backup timeout* *software backup timer terminated X-ray*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00YK *1563* *08975*	*W*	*EN_X signal missing* *the EN_X signal is not connected to the CU*		
all VTB VTC C	00YL *1564* *08976*	*E*	*CON_EN_X_C failure* *the EN_X_C signal could not be set via CON_EN_X_C*		
all VTB VTC C	00YM *1565* *08977*	*E*	*dose limit cannot be kept, Ie below Imin* *to keep the dose rate limit EDL has to go below the Imin emission current value*		
all VTB VTC C	00YN *1566* *08978*	*W*	*EN_X signal detected at start-up* *the PREP signal EN_X detected at start-up*		
all VTB VTC C	00YO *1567* *08979*	*W*	*RQ_SN_X signal detected at start-up* *RQ_SN_X signal detected at start-up*		
all VTB VTC C	00YP *1568* *08980*	*W*	*CTRL_X signal detected at start-up* *the X-ray signal CTRL_X detected at start-up*		
all VTB VTC C	00YQ *1569* *08981*	*W*	*CTRL_X_C signal detected at start-up* *the X-ray signal CTRL_X_C detected at start-up*		
all VTB VTC C	00YR *1570* *08982*	*W*	*X_ACT_S signal detected at start-up* *the X-ray signal X_ACT_S detected at start-up*		
all VTB VTC C	00YS *1571* *08983*	*W*	*NR_PR_X signal failure at start-up* *PREP ready signal NR_PR_X failure at start-up*		
all VTB VTC C	00YT *1572* *08984*	*W*	*CTRL_X_C signal detected in STANDBY* *X-ray signal CTRL_X_C detected in STANDBY*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00YU *1573* *08985*	*E*	*X_ACT_S signal detected in STANDBY* *X-ray signal X_ACT_S detected in STANDBY*		
all VTB VTC C	00YV *1574* *08986*	*E*	*dose rate limit cannot be kept, t below t-min* *to keep the dose rate limit, EDL has to go below the t-min value*		
all VTB VTC C	00YW *1575* *08987*	*E*	*dose rate limit cannot be kept, Q below Q-min* *to keep the dose rate limit, EDL has to go below the Q-min value*		
all VTB VTC C	00YX *1576* *08988*	*IR*	*X-ray mode invalid* *requested X-ray mode not allowed in simulation without X-ray*		
all VTB VTC C	00YY *1577* *08989*	*IR*	*simulation mode request invalid* *simulation mode request under wrong conditions*		
all VTB VTC C	00YZ *1578* *08990*	*E*	*invalid segment length in message from FU* *unexpected message format received from a function unit*		
all VTB VTC C	00Z0 *1600* *09048*	*E*	*emergency reduction data set required* *an emergency reduced data set is required but not sent yet to XR*		
all VTB VTC C	00Z1 *1601* *09049*	*W*	*no FU_RoCo reply to re-trigger message* *FU_RoCo did not send a reply to a re-trigger message (rotation request)*		
all VTB VTC C	00Z2 *1602* *09050*	*IR*	*second update filament checksum request* *before the 1st request is finished XR got a 2nd update filament checksum request*		
all VTB VTC C	00Z3 *1603* *09051*	*IR*	*request for not installed filament* *XR got a request for a not installed filament*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00Z4 *1604* *09052*	*W*	*FU_mA filament limit data request* *timeout on a filament limit data request to FU_mA*		
all VTB VTC C	00Z5 *1605* *09053*	*W*	*cooling unit coolant flow defect* *the cooling unit of the tube's coolant can no longer be guaranteed*		
all VTB VTC C	00Z6 *1606* *09054*	*IR*	*data setting during idle with PREP* *in idle and PREP condition a data setting is not allowed*		
all VTB VTC C	00Z7 *1607* *09055*	*W*	*no rotation limits from FU_RoCo at start-up* *no information from FU_RoCo at start-up*		
all VTB VTC C	00Z8 *1608* *09056*	*E*	*emergency power limit exceeded* *whilst running an emergency data set the 330W limit has been exceeded*		
all VTB VTC C	00Z9 *1609* *09057*	*W*	*filament #1H state #2Hfrom FU_mA, assumed not installed* *XR received an undefined filament state from FU_mA*		
all VTB VTC C	00ZA *1617* *09065*	*W*	*NVRAM checksum bad of tube yield table* *tube yield tables NVRAM data corrupt or missing, default values will be used*		
all VTB VTC C	00ZB *1618* *09066*	*W*	*NVRAM checksum bad of tube statistics* *tube statistics NVRAM data corrupted or missing, new data will be created*		
all VTB VTC C	00ZC *1619* *09067*	*W*	*NVRAM checksum bad of tube load units* *tube load units NVRAM data corrupted or missing, new data will be created; can be caused by a software update*		
all VTB VTC C	00ZD *1620* *09068*	*W*	*FU_kV standby to PREP slow* *FU_kV took longer than expected getting to PREP*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	00ZE *1621* *09069*	*W*	*FU_mA standby to PREP slow* *FU_mA took longer than expected getting to PREP*		
all VTB VTC C	00ZF *1622* *09070*	*W*	*FU_mA grid test slow* *FU_mA grid test took longer than expected*		
all VTB VTC C	00ZG *1623* *09071*	*E*	*record mode invalid* *an APR for record mode has been received with an invalid control method in it*		
all VTB VTC C	00ZH *1624* *09072*	*E*	*rotation speeds inconsistent* *the CU has requested FU_RoCo to accelerate to a given (non-zero) speed, but RoCo has reported a different speed (i.e. rotation speeds inconsistent); cause is too many requests to RoCo within a minute, before and after a tube switch-over*		
all VTB VTC C	02AB *4114* *26566*	W	procedure called with wrong parameter *software development error*		
all VTB VTC C	02AC *4115* *26567* 6126567	E	wrong index for table access *software development error*		
all VTB VTC C	02AD *4116* *26568* 6126568	E	wrong do case entry *software development error*		
all VTB VTC C	02AE *4117* *26569*	W	unknown IIM received *software development error*		
all VTB VTC C	02AF *4118* *26570*	W	IIM parameter out of range *software development error*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02CA *4241* *26765*	W	error in CASE selector *internal software failure, possibly caused by defective hardware*		
all VTB VTC C	02CB *4242* *26766*	W	a CAN message with wrong IIM-no (no recipient defined) received *CU sent IIM, which the FU didn't know; possibly inconsistency between FU or CU version (release/level); wrong version installed?*		
all VTB VTC C	02CC *4243* *26767*	W	multiple reception of the same CAN frame (transmitter ill) *communication with CU disturbed, possibly CU overloaded*		
all VTB VTC C	02CE *4245* *26769*	W	unexpected signal value in CAN rx task *reception from CU disturbed*		
all VTB VTC C	02CF *4246* *26770*	W	CAN bus timeout while domain transmission *transmission to CU disturbed*		
all VTB VTC C	02CG *4247* *26771*	W	token of CAN response mailbox is not a mailbox token *error message 00CF not reported because wrong error mailbox token*		
all VTB VTC C	02CX *4264* *26788*	W	multiple rx of the same CAN last/only frame (transmitter ill) *reception from CU disturbed*		
all VTB VTC C	02CY *4265* *26789*	W	aborted CAN domain receive (because of timeout or wrong signal) *reception from CU disturbed*		
all VTB VTC C	02CZ *4266* *26790*	W	unexpected CAN domain frame received (outside IIM-reception) *reception from CU disturbed, message is delivered nevertheless*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02DA *4305* *26865*	W	no CPU access to the CAN controller *problem with CAN chip on the function unit*		
all VTB VTC C	02DB *4306* *26866*	W	reset or release of the CAN controller was not acknowledged *problem with CAN chip on the function unit*		
all VTB VTC C	02DD *4308* *26868*	W	check of the DPRAM of the CAN controller failed *problem with CAN chip on the function unit*		
all VTB VTC C	02DE *4309* *26869*	W	unexpected interrupt pointer in the CAN controller *problem with CAN chip on the function unit*		
all VTB VTC C	02DF *4310* *26870*	W	CAN controller state undefined *problem with CAN chip on the function unit*		
all VTB VTC C	02DG *4311* *26871*	W	CAN controller state ERROR ACTIVE after ERROR PASSIVE *info: 02DH ended*		
all VTB VTC C	02DH *4312* *26872*	W	CAN controller state ERROR PASSIVE *function unit CAN chip error because of detected transmission problem; it's just an info, the transmissions still working; possibly no running function unit connected to the CAN bus or EMC problems*		
all VTB VTC C	02DI *4313* *26873*	W	CAN controller state BUS OFF *function unit CAN chip serious error because of detected transmission problems (probably EMC); no transmission possible until next start-up*		
all VTB VTC C	02DJ *4314* *26874*	W	CAN controller state DPRAM ERROR *problem with CAN chip on the function unit*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02DK *4315* *26875*	W	CAN controller state DPRAM ERROR and ERROR PASSIVE *problem with CAN chip on the function unit*		
all VTB VTC C	02EA *4369* *26965* 6126965	E	interrupt 0: divide by zero *SW or HW development error*		
all VTB VTC C	02EB *4370* *26966* 6126966	E	interrupt 1: single step *SW or HW development error*		
all VTB VTC C	02EC *4271* *26967* 6126967	E	interrupt 2: NMI *SW or HW development error*		
all VTB VTC C	02ED *4372* *26968* 6126968	E	interrupt 3: breakpoint *SW or HW development error*		
all VTB VTC C	02EE *4373* *26969* 6126969	E	interrupt 4: overflow exception *SW or HW development error*		
all VTB VTC C	02EF *4374* *26970* 6126970	E	interrupt 5: array bounds exception *SW or HW development error*		
all VTB VTC C	02EG *4375* *26971* 6126971	E	interrupt 6: unused opcode *SW or HW development error*		
all VTB VTC C	02EH *4376* *26972* 6126972	E	interrupt 7: ESC opcode *SW or HW development error*		
all VTB VTC C	02EI *4377* *26973* 6126973	E	CAN connection to **CU** lost		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02GA *4497* *27165*	W	interpolation not possible		
all VTB VTC C	02HA *4561* *27265*	W	kV nominal value out of range +/- (4%+1kV) 3 measurements within 30ms *kV nominal value out of range*	with PC and XRGSCOPE: select error # from error log index list, select error details and read screen **Error: HW Set Values** to get **kV nominal**, then read **Error: Specific Information** to get the faulty value	check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 = if all supplies ok replace PCB
all VTB VTC C	02HB *0462* *27266* 6127266	E	kV nominal value out of range 0kV > U > 170kV *kV nominal value out of range*	with PC and XRGSCOPE: select error # from error log index list, select error details and read screen **Error: HW Set Values** to get **kV nominal**, then read **Error: Specific Information** to get the faulty value	check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 = if all supplies ok replace PCB
all VTB VTC C	02HC *0463* *27267*	W	Z nominal value out of range +/- 1% +/- 0.2 3 measurements within 30ms duty cycle range Z = 3...30% *Z nominal value out of range*	with PC and XRGSCOPE: select error # from error log index list, select error details and read screen **Error: HW Set Values** to get **Z nominal**, then read **Error: Specific Information** to get the faulty value	check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 = if all supplies ok replace PCB
all VTB VTC C	02HD *4564* *27268* 6127268	E	Z nominal value out of range 0% > Z > 50% duty cycle range Z = 3...30% *Z nominal value out of range*	with PC and XRGSCOPE: select error # from error log index list, select error details and read screen **Error: HW Set Values** to get **Z nominal**, then read **Error: Specific Information** to get the faulty value	check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 = if all supplies ok replace PCB

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02HE *4565* *27269*	W	kV actual value too large during transition standby to exposure ➢ 3kV at > 400ms after PREP *kV value during standby too large*	with PC and XRGSCOPE: select error # from error log index list, select error details and read screen **Error: Specific Information** to get the faulty value monitor with oscilloscope at EZ130 X3 AVHT 20kV/V trigger: EN_X/ EZX82	check signal connections EZ130 to HT measuring circuit EG100 connection details see ..\..\data_collection\faultfinding\mnemonic_routing.pdf check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB
all VTB VTC C	02HF *4566* *27270* 6127270	E	kV actual value too large during transition standby to exposure > 4kV at > 400ms after PREP *kV value during standby too large*	with PC and XRGSCOPE: select error # from error log index list, select error details and read screen **Error: Specific Information** to get the faulty value monitor with oscilloscope at EZ130 X3 AVHT 20kV/V trigger: EN_X/ EZX82	check signal connections EZ130 to HT measuring circuit EG100 connection details see ..\..\data_collection\faultfinding\mnemonic_routing.pdf check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02HG *4567* *27271* 6127271	W	kV actual value out of range +/- (4% +1kV) 2 measurements within 20ms *kV actual value out of range*	with PC and XRGSCOPE: select error # from error log index list, select error details and read screen **Error: HW Set Values** to get **kV nominal**, then read **Error: Read HW Values** to get the faulty value monitor with oscilloscope at EZ130 X3 AVHT 20kV/V or X4 anode and X5 cathode trigger: CTRL_X_C/ EZX74 check mains conditions	**release 2** generators: = check kV behavior against document ..\..\data_collection\kV_control\kV1_2_mod.pdfand carry out modification if necessary = carry out **kV driver test** chapter 8.2 FAULT FINDING **release 3** generators: = check and carry out adjustment "factor for duty" cycle according to document ..\..\data_collection\kV_control\OPTIMUS_RF_6_b010.pdf = carry out **kV driver test** chapter 5.3 register Converter R/F = check if FCO 00 135 014 has been carried out check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02HH *4568* *27272* 6127272	E	kV actual value out of range 20kV > U > 170kV 3 measurements within 30ms *kV actual value out of range*	with PC and XRGSCOPE: select error # from error log index list, select error details and read screen **Error: HW Set Values** to get **kV nominal**, then read **Error: Read HW Values** to get the faulty value monitor with oscilloscope at EZ130 X3 AVHT 20kV/V or X4 anode and X5 cathode trigger: CTRL_X_C/ EZX74 check mains conditions	**release 2** generators: = check kV behavior against document ..\..\data_collection\kV_control\kV1_2_mod.pdfand carry out modification if necessary = carry out **kV driver test** chapter 8.2 FAULT FINDING **release 3** generators: = check and carry out adjustment "factor for duty" cycle according to document ..\..\data_collection\kV_control\OPTIMUS_RF_6_b010.pdf = carry out **kV driver test** chapter 5.3 register Converter R/F = check if FCO 00 135 014 has been carried out check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02HI *4569* *27273* 6127273	W	E value (converter DC) during standby out of range 470V > E > 780V 3 measurements within 30ms *E value during standby out of range*	with PC and XRGSCOPE: select error # from error log index list, select screen **Error: Read HW Values** to get the faulty value measure with multi meter at ENK2:41 :42 when generator is on and ENK1 energized **!! Attention High Voltage !!** might appear after a converter damage, breakers and fuses might have been on after the event, generator was turned on with short in converter which lets the damping resistors ENR1...3 open the springs (can be soldered on again)	check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB if ceramic body is cracked exchange damping spring resistor version dependent: release 2 generators with 100 Ohms resistors (horizontal mounting) 4512 100 44941 release 2+3 generators with 47 Ohms resistors (vertical mounting) 4512 100 45441

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02HJ *4570* *27274* 6127274	E	E value (converter DC) during standby out of range 450V > E > 800V 3 measurements within 30ms *E value during standby out of range*	with PC and XRGSCOPE: select error # from error log index list, select screen **Error: Read HW Values** to get the faulty value measure with multi meter at ENK2:41 :42 when generator is on and ENK1 energized **!! Attention High Voltage !!** might appear after a converter damage, breakers and fuses might have been on after the event, generator was turned on with short in converter which lets the damping resistors ENR1...3 open the springs (can be soldered on again) -15VDC missing at turn-on, typically in combination with 03PB + 03HM	check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB if ceramic body is cracked exchange damping spring resistor version dependent: release 2 generators with 100 Ohms resistors (horizontal mounting) 4512 100 44941 release 2+3 generators with 47 Ohms resistors (vertical mounting) 4512 100 45441 try to find the reason for the missing –15VDC, remove PCBs and all external devices using –15V like e.g. measuring chambers, suppressor diode on backpanel EZ might be short

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02HK *4571* *27275* 6127275	W	E value (converter DC) during high tension out of range 400V > E > 780V 3 measurements within 30ms *E value during high tension out of range*	with PC and XRGSCOPE: select error # from error log index list, select screen **Error: Read HW Values** to get the faulty value monitor with oscilloscope at - EZ130 X1:A5 X1:C5 24V = 750V (E value) frontal converter EQ (measuring point for all **release 2** generators and all 50kW generators with one converter only) - EZ130 X1:A26 X1:C26 24V = 750V (E value) rear converter E2Q (all **release 3** generators with 2 converters)	check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB
all VTB VTC C	02HL *4572* *27276* 6127276	E	E value (converter DC) during high tension out of range 350V > E > 800V 3 measurements within 30ms *E value during high tension out of range*	with PC and XRGSCOPE: select error # from error log index list, select screen **Error: Read HW Values** to get the faulty value monitor with oscilloscope at - EZ130 X1:A5 X1:C5 24V = 750V (E value) frontal converter EQ (measuring point for all **release 2** generators and all 50kW generators with one converter only) - EZ130 X1:A26 X1:C26 24V = 750V (E value) rear converter E2Q (all **release 3** generators with 2 converters)	check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02HM *4573* *27277* 6127277	W	converter 1 temperature out of range 0 deg C > T > 85 deg C 3 measurements within 30ms	4.4V...1.5V = 20...100 deg C EZ130 X1:C6 measured with NTC resistor 15kOhms (+/-10%, 20 deg C)	check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB
all VTB VTC C	02HN *4574* *27278* 6127278	E	converter 1 temperature out of range 0 deg C > T > 90 deg C 3 measurements within 30ms	4.4V...1.5V = 20...100 deg C EZ130 X1:C6 measured with NTC resistor 15kOhms (+/-10%, 20 deg C)	check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB ready re-appears only after re-boot of generator if problem solved
all VTB VTC C	02HO *4575* *27279* 6127279	W	converter 2 temperature out of range 0 deg C > T > 85 deg C 3 measurements within 30ms	4.4V...1.5V = 20...100 deg C EZ130 X1:C27 measured with NTC resistor 15kOhms (+/-10%, 20 deg C)	check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02HP *4576* *27280* 6127280	E	converter 2 temperature out of range 0 deg C > T > 90 deg C 3 measurements within 30ms	4.4V...1.5V = 20...100 deg C EZ130 X1:C27 measured with NTC resistor 15kOhms (+/-10%, 20 deg C)	check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB ready re-appears only after re-boot of generator if problem solved
all VTB VTC C	02HQ *4577* *27281* 6127281	W	high tension tank temperature out of range 0 deg C > T > 80 deg C 3 measurements within 30ms	4.4V...1.5V = 20...100 deg C EZ130 X1:C19 measured with NTC resistor 15kOhms (+/-10%, 20 deg C)	check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB
all VTB VTC C	02HR *4578* *27282* 6127282	E	high tension tank temperature out of range 0 deg C > T > 85 deg C 3 measurements within 30ms	4.4V...1.5V = 20...100 deg C EZ130 X1:C19 measured with NTC resistor 15kOhms (+/-10%, 20 deg C)	check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB ready re-appears only after re-boot of generator if problem solved

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02HS *4579* *27283* 6127283	W	divider test cathode out of range 45.5kV > U > 50.5kV 3 measurements within 30ms	compare waveform during preparation or fluoroscopy start from anode standstill against preptest.pcx oscilloscope screenshot	check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB
all VTB VTC C	02HT *4580* *27284* 6127284	E	divider test cathode out of range 43kV >= U > 53kV	compare waveform during preparation or fluoroscopy start from anode standstill against preptest.pcx oscilloscope screenshot	check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB
all VTB VTC C	02HU *4581* *27285* 6127285	W	divider test anode out of range 45.5kV > U > 50.5kV 3 measurements within 30ms	compare waveform during preparation or fluoroscopy start from anode standstill against preptest.pcx oscilloscope screenshot	check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB
all VTB VTC C	02HV *4582* *27286* 6127286	E	divider test anode out of range 43kV >= U > 53kV 3 measurements within 30ms	compare waveform during preparation or fluoroscopy start from anode standstill against preptest.pcx oscilloscope screenshot	check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02HW 4583 27287 6127287	W	kV anode out of range or asymmetrical +/-15% 2 measurements within 20ms *kV asymmetrical*	monitor kV actual value at EZ130 X4 (anode 20kV/V) EZ130 X5 (cathode 20kV/V, value also positive) or EZ130 X1:C17 (anode 10kV/V) EZ130 X1:C16 (cathode 10kV/V) trigger EZX74 CTRL_X_C/	check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB
all VTB VTC C	02HX *4584* *27288* 6127288	E	kV anode out or range or asymmetrical +/-15% 3 measurements within 30ms *kV asymmetrical*	monitor kV actual value at EZ130 X4 (anode 20kV/V) EZ130 X5 (cathode 20kV/V, value also positive) or EZ130 X1:C17 (anode 10kV/V) EZ130 X1:C16 (cathode 10kV/V) trigger EZX74 CTRL_X_C/	**release 2** generators: = check kV behavior against document ..\..\data_collection\kV_control\kV1_2_mod.pdfand carry out modification if necessary = carry out **kV driver test** chapter 8.2 FAULT FINDING **release 3** generators: = check and carry out adjustment "factor for duty" cycle according to document ..\..\data_collection\kV_control\OPTIMUS_RF_6_b010.pdf = carry out **kV driver test** chapter 5.3 register Converter R/F = check if FCO 00 135 014 has been carried out check supply voltages EZ130 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB
all VTB VTC C	02MA *4881* *27765* 6127765	E	state request not accepted because of grid mode *software development error*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02MB *4882* *27766* 6127766	E	state request not accepted because of error state		
all VTB VTC C	02MC *4883* *27767* 612767	W	state requested by **CU** unknown		
all VTB VTC C	02OA *5009* *27965* 6127965	E	RMX error: timeout *software development error*		
all VTB VTC C	02OB *5010* *27966* 6127966	E	RMX error: memory *software development error*		
all VTB VTC C	02OC *5011* *27967* 6127967	E	RMX error: busy *software development error*		
all VTB VTC C	02OE *5013* *27969* 6127969	E	RMX error: limit *software development error*		
all VTB VTC C	02OF *5014* *27970* 6127970	E	RMX error: context *software development error*		
all VTB VTC C	02OG *5015* *27971* 6127971	E	RMX error: exist *software development error*		
all VTB VTC C	02OH *5016* *27972* 6127972	E	RMX error: state *software development error*		
all VTB VTC C	02OI *5017* *27973* 6127973	E	RMX error: not configured *software development error*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02OJ *5018* *27974* 6127974	E	RMX error: interrupt saturation *software development error*		
all VTB VTC C	02OK *5019* *27975* 6127975	E	RMX error: interrupt overflow *software development error*		
all VTB VTC C	02OL *5020* *27976* 6127976	E	RMX error: transmission *software development error*		
all VTB VTC C	02OM *5021* *27977* 6127977	E	RMX error: divide by zero *software development error*		
all VTB VTC C	02ON *5022* *27978* 6127978	E	RMX error: overflow *software development error*		
all VTB VTC C	02OO *5023* *27979* 6127979	E	RMX error: type *software development error*		
all VTB VTC C	02OP *5024* *27980* 6127980	E	RMX error: parameter *software development error*		
all VTB VTC C	02OQ *5025* *27981* 6127981	E	RMX error: bad call *software development error*		
all VTB VTC C	02OR *5026* *27982* 6127982	E	RMX error: array bound *software development error*		
all VTB VTC C	02OS *5027* *27983* 6127983	E	RMX error: NDP error *software development error*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02OT *5028* *27984* 6127984	E	RMX error: illegal opcode *software development error*		
all VTB VTC C	02OU *5029* *27985* 6127985	E	RMX error: emulator trap *software development error*		
all VTB VTC C	02OV *5030* *27986* 6127986	E	RMX error: interrupt table limit *software development error*		
all VTB VTC C	02OW *5031* *27987* 6127987	E	RMX error: CPU xfer data limit *software development error*		
all VTB VTC C	02OX *5032* *27988* 6127988	E	RMX error: wrap around *software development error*		
all VTB VTC C	02OY *5033* *27989* 6127989	E	RMX error: check exception *software development error*		
all VTB VTC C	02OZ *5034* *27990* 6127990	E	RMX error: unknown *software development error*		
all VTB VTC C	02RA *5201* *28265*	W	grid mode changeover requested during prep		
all VTB VTC C	02RB *5202* *28266*	W	tube switch requested during preparation		
all VTB VTC C	02RC *5203* *28267*	W	requested P out of range		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02SA *5265* *28365*	W	Not enough space at the destination		
all VTB VTC C	02SB *5266* *28366*	W	Base out of range		
all VTB VTC C	02SC *5267* *28367*	W	PC comm.: Value too large		
all VTB VTC C	02SD *5268* *28368*	W	Terminator not found		
all VTB VTC C	02SE *5269* *28369*	W	PC comm.: Error in description		
all VTB VTC C	02SF *5270* *28370*	W	PC comm.: Item type unknown		
all VTB VTC C	02SG *5271* *28371*	W	PC comm.: Internal type unknown		
all VTB VTC C	02SH *5272* *28372*	W	PC comm.: Value negative		
all VTB VTC C	02SI *5273* *28373*	W	PC comm.: No space at dest. buffer		
all VTB VTC C	02SJ *5274* *28374*	W	PC comm.: Syntax wrong		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02SK *5275* *28375*	W	PC comm.: String too long		
all VTB VTC C	02SL *5276* *28373*	W	PC comm.: String truncated		
all VTB VTC C	02SO *5275* *28379*	W	PC comm.: Unknown Table ID Received		
all VTB VTC C	02SP *5280* *28380*	W	PC comm.: Access Level to Low		
all VTB VTC C	02SQ *5281* *28381*	W	PC comm.: Unknown Action Requested		
all VTB VTC C	02SR *5282* *28382*	W	PC comm.: Routing or Message Corrupt		
all VTB VTC C	02SS *5283* *28383*	W	Source Buffer to Small for Incoming Message		
all VTB VTC C	02ST *5284* *28384*	W	CAN Buffer to Small for Outgoing Message		
all VTB VTC C	02SU *5285* *28385*	W	PC comm.: Access. level is N_A		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02UA *5393* *28565* 6128565	F/E *E*	HW configuration identifier wrong FU kV starts blinking during turn-on, once CU starts blinking FU kV turns LED on = FATAL error *HW configuration identifier wrong*	check resistances 46Ohms each Q100 X1:21 against X1:19 and X1:23 for each converter, check continuity of cable(s) Q100X1 – EZX24 / 34 2) check that signal SI_PH/ is not zero, normal level about 2.6V, signal path EN100X1:5-EZX47:5-EZ130X1:C14	
all VTB VTC C	02UB *5394* *28566*	W	Set Up request received during preparation		
all VTB VTC C	02UC *5395* *28567*	W	adaptation aborted because no suitable correction value could be found		
all VTB VTC C	02VA *5457* *28665*	*W*	*DSP: divider test cathode out of range*		
all VTB VTC C	02WA *5521* *28765*	W	wrong tube selected might appear in combination with 00XS *wrong tube selected*	check status of tube selection signals TB_2/ EZ130 X1:A13 TB_3/ EZ130 X1:C13 there should not be multiple selections, TB_2/ and/or TB_3/ must not be low active if tube 1 is selected; does WGK1 (2WGK1) switch the 230VAC between X61 / X62 ? if so, is a suppressor diode parallel to the TB_?_RT/ short? check at the backpanel drawings	if multiple selections are active exchange kV control PCB; exchange WG PCB; remove suppressor diode or exchange backpanel PCB EZ;
all VTB VTC C	02WB *5522* *28766* 3128766	E	wrong tube selected		
all VTB VTC C	02WC *5523* *28767*	W	EN X C signal faulty		
all VTB VTC C	02WD *5524* *28768* 6128768	E	EN X C signal faulty		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02WE *5525* *27769* 6127769	W	wrong grid mode selected		
all VTB VTC C	02WF *5526* *28770* 6128770	E	wrong grid mode selected		
all VTB VTC C	02WG *5527* *28771* 6128771	W	tube arcing detected	with PC and XRGSCOPE: select error # from error log index list, select error details and read screen **Error: HW Set Values** to get **kV nominal** switch an exposure with this value and check kV actual value signal waveform against arcing.pcx or arcing2.pcx	carry out tube conditioning procedure tube_conditioning.doc to improve tube behavior
all VTB VTC C	02WH *5528* *28772* 6128772	E	tube arcing detected	with PC and XRGSCOPE: select error # from error log index list, select error details and read screen **Error: HW Set Values** to get **kV nominal** switch an exposure with this value and check kV actual value signal waveform against arcing.pcx or arcing2.pcx	carry out tube conditioning procedure tube_conditioning.doc to improve tube behavior
all VTB VTC C	02WI *5529* *28773* 6128773	W	kV over voltage detected *converter 1 kV over voltage detected*	with PC and XRGSCOPE: select error # from error log index list, select error details and read screen **Error: HW Set Values** to get **kV nominal**, then read **Error: Read HW Values** to get the faulty value monitor with oscilloscope at EZ130 X3 AVHT 20kV/V or X4 anode and X5 cathode trigger: CTRL_X_C/ EZX74	

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02WJ *5530* *28774* 6128774	E	kV over voltage detected *converter 1 kV over voltage detected*	with PC and XRGSCOPE: select error # from error log index list, select error details and read screen **Error: HW Set Values** to get **kV nominal**, then read **Error: Read HW Values** to get the faulty value monitor with oscilloscope at EZ130 X3 AVHT 20kV/V or X4 anode and X5 cathode trigger: CTRL_X_C/ EZX74	
all VTB VTC C	02WK *5531* *28775* 6128775	W	measuring not stable	if problem can not be solved with FCO 00 135 015 check if there are other error entries like 00CD, 00M3 (look for details: which unit is sending or missing) = if a function unit is on such a detail screen check its function: does the LED blink or is it on? problem might not at all be linked to kV functions	check if solution can be found with FCO 00 135 015, see file
all VTB VTC C	02WL *5532* *28776* 6128776	E	Tube Supervision Error		
all VTB VTC C	02WM *5533* *28777* 6128777	E	Tube Supervision Error		
all VTB VTC C	02WN *5534* *28778*	W	converter 1 overload detected *converter 1 over current detected*		
all VTB VTC C	02WO *5535* *28779*	E	converter 1 overload detected *converter 1 over current detected*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02WP *5536* *28780*	*W*	*converter 2 over voltage detected*		
all VTB VTC C	02WQ *5537* *28781*	*E*	*converter 2 over voltage detected*		
all VTB VTC C	02WR *5538* *28782*	*W*	*converter 2 over current detected*		
all VTB VTC C	02WS *5539* *28783*	*E*	*converter 2 over current detected*		
all VTB VTC C	02WT *5540* *28784*	*W*	*converter 1 short circuit detected*		
all VTB VTC C	02WU *5541* *28785*	*E*	*converter 1 short circuit detected*		
all VTB VTC C	02WV *5542* *28786*	*W*	*converter 2 short circuit detected*		
all VTB VTC C	02WW *5543* *28787*	*E*	*converter 2 short circuit detected*		
all VTB VTC C	02WX *5544* *28788*	*W*	*DSP: watchdog*		
all VTB VTC C	02WY *5545* *28789*	*W*	*DSP: error unknown*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	02WZ *5546* *28790*	*W*	*DSP: divider test anode out of range*		
all VTB VTC C	03AA *6161* *36565*	W	Internal parameter error *software development error on FU_mA or CU*		
all VTB VTC C	03AB *6162* *36566*	W	Wrong parameter from CU *software development error on CU*		
all VTB VTC C	03AC *6163* *36567*	W	emission current regulation active on two filaments *software development error on CU*	under normal conditions only one focus is active during exposure and fluoroscopy, the second focus is in standby = exception: Variofocus; the small focus filament current is always constant, the additional part of the emission current Variofocus will be controlled by the large focus	
all VTB VTC C	03AI *6169* *36573*	W	Wrong IIM received *software development error on CU*		
all VTB VTC C	03BA *6225* *36665*	W	Coordinates not monotonic boost adaptation error *problems with the measurement of the emission current boost curve*	with PC and XRGSCOPE: Select Unit > FU-mA > FU-mA > Faultfind > Adaptation Results > Select Adaptation Table for Reading type in at focus: 1 = large focus tube 1 2 = small focus tube 1 and a kV value between min and max or if known the kV value at which the generator errors > Read Previously Selected Adaptation Table detailed explanations see sheet ..\..\data_collection\mA_control\If-Ie-data-table.pdf	use firmware of **FU_mA** version 4512 113 20212 if previous version installed
all VTB VTC C	03BB *6226* *36666*	W	No measurement values for adaptation found *emission current measurement failed*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	03CA *6289* *36765*	W	Error in CASE selector *internal software failure, perhaps caused by defective hardware*		
all VTB VTC C	03CB *6290* *36766*	W	A CAN message with wrong IIM-no (no recipient defined) received *CU sent IIM which the function unit didn't know; possibly inconsistency between FU or CU version (release/level); has a wrong version just been installed?*		
all VTB VTC C	03CC *6291* *36767*	W	multiple reception of the same CAN frame (transmitter ill) *communication with CU disturbed, possibly CU overloaded*		
all VTB VTC C	03CE *6293* *36769*	W	unexpected signal value in CAN rx task *reception from CU disturbed*		
all VTB VTC C	03CF *6294* *36770*	W	CAN bus timeout while domain transmission *transmission to CU disturbed*		
all VTB VTC C	03CG *6295* *36771*	W	token of CAN response mailbox is not a mailbox token *error message 03CF not reported because wrong error mailbox token*		
all VTB VTC C	03CX *6312* *36788*	W	multiple rx of the same CAN last/only frame (transmitter ill) *reception from CU disturbed*		
all VTB VTC C	03CY *6313* *36789*	W	aborted CAN domain receive (because of timeout or wrong signal) *reception from CU disturbed*		
all VTB VTC C	03CZ *6314* *36790*	W	unexpected CAN domain frame received (outside IIM-reception) *reception from CU disturbed, message is delivered nevertheless*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	03DA *6353* *36865*	W	no CPU access to the CAN controller *problem with CAN chip on the function unit*		
all VTB VTC C	03DB *6354* *36866*	W	reset or release of the CAN controller was not acknowledged *problem with CAN chip on the function unit*		
all VTB VTC C	03DD *6356* *36868*	W	check of the DPRAM of the CAN controller failed *problem with CAN chip on the function unit*		
all VTB VTC C	03DE *6357* *36869*	W	unexpected interrupt pointer in the CAN controller *problem with CAN chip on the function unit*		
all VTB VTC C	03DF *6358* *36870*	W	CAN controller state undefined *problem with CAN chip on the function unit*		
all VTB VTC C	03DG *6359* *36871*	W	CAN controller state ERROR ACTIVE after ERROR PASSIVE *info: 03DH ended*		
all VTB VTC C	03DH *6360* *36872*	W	CAN controller state ERROR PASSIVE *function unit CAN chip error because of detected transmission problem; it is just an info, the transmission is still working; possibly no running FU connected to the CAN bus or EMC problems*		
all VTB VTC C	03DI *6361* *36873*	W	CAN controller state BUS OFF *function unit CAN chip serious error because of detected transmission (probably EMC) problems; no transmission possible until next start-up*		
all VTB VTC C	03DJ *6362* *36874*	W	CAN controller state DPRAM ERROR *problem with CAN chip on function unit*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	03DK *6363* *36875*	W	CAN controller state DPRAM ERROR and ERROR PASSIVE *problem with CAN chip on function unit*		
all VTB VTC C	03EA *6417* *36965* 6136965	E	CPU interrupt 0 *software or hardware development error*		
all VTB VTC C	03EB *6418* *36966* 6136966	E	CPU interrupt 1 *software or hardware development error*		
all VTB VTC C	03EC *6419* *36967*	E	CPU interrupt 2 *software or hardware development error*		
all VTB VTC C	03ED *6420* *36968* 6136968	E	CPU interrupt 3 *software or hardware development error*		
all VTB VTC C	03EE *6421* *36969* 6136969	E	CPU interrupt 4 *software or hardware development error*		
all VTB VTC C	03EF *6422* *36970* 6136970	E	CPU interrupt 5 *software or hardware development error*		
all VTB VTC C	03EG *6423* *36971* 6136971	E	CPU interrupt 6 *software or hardware development error*		
all VTB VTC C	03EH *6424* *36972* 6136972	E	CPU interrupt 7 *software or hardware development error*		
all VTB VTC C	03EI *6425* *36973* 6136973	E	CAN is unable to send an error to CU		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	03FA *6481* *37065*	W	NVRAM: Invalid checksum occurs at turn-on/warm-start if checksum changed *NVRAM: invalid checksum* *data lost*	"Test" might be displayed for one or both filaments	re-adapt the non-adapted filament
all VTB VTC C	03FB *6482* *37066*	W	NVRAM: Standby filament not found *software development error*		
all VTB VTC C	03FC *6483* *37067* 6137067	E	No NVRAM plugged in *memory not found*		
all VTB VTC C	03FD *6484* *37068*	W	NVRAM empty	battery jumper in ON position?	battery empty ?
all VTB VTC C	03GA *6545* *37165* 6137165	E	Linint error *software development error*		
all VTB VTC C	03GB *6546* *37166*	W	Real math. error: real underflow *software development error*		
all VTB VTC C	03GC *6547* *37167*	W	Real math. error: real overflow *software development error*		
all VTB VTC C	03GD *6548* *37168*	W	Real math. error: dword overflow *software development error*		
all VTB VTC C	03GE *6549* *37169*	W	Real math. error: integer overflow *software development error*		
all VTB VTC C	03GF *6550* *37170*	W	Real math. error: word overflow *software development error*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	03GG *6551* *37171*	W	Singular matrix *software development error*		
all VTB VTC C	03GH *6552* *37172*	W	Real math. error: negative square root *software development error*		
all VTB VTC C	03HA *6609* *37265* 6137265	E	Unknown hardware		exchange PCB and firmware
all VTB VTC C	03HB *6610* *37266* 6137266	E/W	Intermediate circuit voltage < 200 V	= mains phase 2 present ? = check the fuses F3 and F1+2 where present = with PC and XRGSCOPE: select error # from error log index list, select screen **Error: Read HW Values** to get the faulty value = switch the generator off and wait about 1 minute before removing PCB EZ119 **!! Attention High Voltage !!** put PCB on extender and turn on measure with multi meter at EZ119 capacitors C18/19/20, should be 325VDC +/-10%	has the modification on EZ119 (versions with 3 fuses) with a 33nF capacitor parallel to triac V36 been carried out which comes with the firmware upgrade kits for release 2 and 3 ? (optical check: big flat capacitor at the soldering side of the PCB) check supply voltages EZ119 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB
all VTB VTC C	03HF *6614* *37270*	W	Undefined analog input channel *software development error*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	03HG *6615* *37271* 6137271	W	If-actual out of tolerance	= check high tension cable cathode plug pins at generator and tube side = with PC and XRGSCOPE: select error # from error log index list, select error details and read screen **Error: Read HW Values** to get the set point and the faulty value fil. circuit 1 = small focus fil. circuit 2 = large focus = monitor with oscilloscope at EZ119 X5 = small focus EZ119 X7 = large focus 1V = 2.5A filament current = mains phase 2 present? = try HT cable exchange if the actual ones very old / suspicious = installation: 230VAC lines for HT solenoids connected?	check supply voltages EZ119 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB
all VTB VTC C	03HH *6616* *37272* 6137272	E	If set point too large	= with PC and XRGSCOPE: select error # from error log index list, select error details and read screen **Error: Read HW Values** to get the set point value displayed = if error persistent go path > Select Unit > FU-mA > FU-mA > Faultfind > Monitoring > read If nominal fil. circuit 1 = small focus fil. circuit 2 = large focus	check supply voltages EZ119 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	03HI *6617* *37273* 6137273	E	If-actual out of tolerance *500mA out of tolerance*	= check contacts of high tension cable cathode plug pins at generator and tube side, common connection poor if error during prep = with PC and XRGSCOPE: select error # from error log index list, select error details and read screen **Error: Read HW Values** to get the set point and the faulty value fil. circuit 1 = small focus fil. circuit 2 = large focus = monitor with oscilloscope at EZ119 X5 = small focus EZ119 X7 = large focus 1V = 2.5A filament current = mains phase 2 present?	check supply voltages EZ119 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB
all VTB VTC C	03HJ *6618* *37274* 6137274	E	If-actual out of tolerance *1A out of tolerance*	= check contacts of high tension cable cathode plug pins at generator and tube side = with PC and XRGSCOPE: select error # from error log index list, select error details and read screen **Error: Read HW Values** to get the set point and the faulty value fil. circuit 1 = small focus fil. circuit 2 = large focus = monitor with oscilloscope at EZ119 X5 = small focus EZ119 X7 = large focus 1V = 2.5A filament current = mains phase 2 present? = installation: 230VAC lines for HT solenoids connected?	check supply voltages EZ119 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if values indicated at the detail screens do not match the externally measured ones exchange PCB

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	03HK *6619* *37275* 6137275	W	If-nominal out of tolerance	with PC and XRGSCOPE: select error # from error log index list, select error details and read screen **Error: HW Set Values** and **Error: Read HW Values** the set point values must be identical at both screens = if error persistent go path > Select Unit > FU-mA > FU-mA > Faultfind > Monitoring > read If nominal fil. circuit 1 = small focus fil. circuit 2 = large focus	check supply voltages EZ119 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if supply voltages ok but error persistent replace PCB
all VTB VTC C	03HL *6620* *37276* 6137276	E	If-nominal out of tolerance	with PC and XRGSCOPE: select error # from error log index list, select error details and read screen **Error: HW Set Values** and **Error: Read HW Values** the set point values must be identical at both screens = if error persistent go path > Select Unit > FU-mA > FU-mA > Faultfind > Monitoring > read If nominal fil. circuit 1 = small focus fil. circuit 2 = large focus	check supply voltages EZ119 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if supply voltages ok but error persistent replace PCB

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	03HM *6621* *37277* 6137277	E	If-nominal out of tolerance	with PC and XRGSCOPE: select error # from error log index list, select error details and read screen **Error: HW Set Values** and **Error: Read HW Values** the set point values must be identical at both screens = if error persistent go path > Select Unit > FU-mA > FU-mA > Faultfind > Monitoring > read If nominal fil. circuit 1 = small focus fil. circuit 2 = large focus -15VDC missing at turn-on, typically in combination with 03PB + 02HJ	check supply voltages EZ119 + 5V X2:AC1 X2:AC2 +15V X2:AC11 - 15V X2:AC12 +26V X2:AC14 against ground X2:AC15 if supply voltages ok but error persistent replace PCB try to find the reason for the missing –15VDC, remove PCBs and all external devices using –15V like e.g. measuring chambers, suppressor diode on backpanel EZ might be short
all VTB VTC C	03HN *6622* *37278* 6137278	E	No re-trigger received from CU		
all VTB VTC C	03IA *6673* *37365*	W	Adaptation can not be completed		
all VTB VTC C	03IC *6675* *37367*	W	No Emission current -adaptation measurement values		
all VTB VTC C	03ID *6676* *37368*	W	Emission current -adaptation values could not be evaluated		
all VTB VTC C	03KA *6801* *37565*	W	conditioning-X-Ray mode without mAs parameter		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	03MA *6929* *37765*	W	Undefined status *software development error*		
all VTB VTC C	03MB *6930* *37766*	W	Status change not allowed		
all VTB VTC C	03MC *6931* *37767*	W	FU init data not expected		
all VTB VTC C	03OA *7057* *37965* 6137965	E	RMX exception: E$TIME *software development error*		
all VTB VTC C	03OB *7058* *37966* 6137966	E	RMX exception: E$MEM *software development error*		
all VTB VTC C	03OC *7059* *37967* 6137967	E	RMX exception: E$BUSY *software development error*		
all VTB VTC C	03OD *7060* *37968* 6137968	E	RMX exception: E$LIMIT *software development error*		
all VTB VTC C	03OE *7061* *37969* 6137969	E	RMX exception: E$CONTEXT *software development error*		
all VTB VTC C	03OF *7062* *37970* 6137970	E	RMX exception: E$EXIST *software development error*		
all VTB VTC C	03OG *7063* *37971* 6137971	E	RMX exception: E$STATE *software development error*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	03OH *7064* *37972* 6137972	E	RMX exception: ENOTCONFIGURED *software development error*		
all VTB VTC C	03OI *7065* *37973* 6137973	E	RMX exception: E$INTERRUPT$SATURATION *software development error*		
all VTB VTC C	03OJ *7066* *37974* 6137974	E	RMX exception: E$INTERRUPT$OVERFLOW *software development error*		
all VTB VTC C	03OK *7067* *37975* 6137975	E	RMX exception: E$TRANSMISSION *software development error*		
all VTB VTC C	03OL *7068* *37976* 6137976	E	RMX exception: E$ZERO$DIVIDE *software development error*		
all VTB VTC C	03OM *7069* *37977* 6137977	E	RMX exception: E$OVERFLOW *software development error*		
all VTB VTC C	03ON *7070* *37978* 6137978	E	RMX exception: E$TYPE *software development error*		
all VTB VTC C	03OO *7071* *37979* 6137979	E	RMX exception: E$PARAM *software development error*		
all VTB VTC C	03OP *7072* *37980* 6137980	E	RMX exception: EBADCALL *software development error*		
all VTB VTC C	03OQ *7073* *37981* 6137981	E	RMX exception: E$ARRAY$BOUND *software development error*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	03OR *7074* *37982* 6137982	E	RMX exception: ENDPERROR *software development error*		
all VTB VTC C	03OS *7075* *37983* 6137983	E	RMX exception: E$ILLEGAL$OPCODE *software development error*		
all VTB VTC C	03OT *7076* *37984* 6137984	E	RMX exception: E$EMULATOR$TRAP *software development error*		
all VTB VTC C	03OU *7077* *37985* 6137985	E	RMX exception: E$INTERRUPT$TABLE$LIMIT *software development error*		
all VTB VTC C	03OV *7078* *37986* 6137986	E	RMX exception: E$CPUXFER$DATA$LIMIT *software development error*		
all VTB VTC C	03OW *7079* *37987* 6137987	E	RMX exception: ESEGWRAP$AROUND *software development error*		
all VTB VTC C	03OX *7080* *37988* 6137988	E	RMX exception: E$CHECK$EXCEPTION *software development error*		
all VTB VTC C	03OY *7081* *37989* 6137989	E	unknown RMX exception *software development error*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	03PA *7121* *38065* 6138065	E	Ie = emission current zero measured *emission current measurement failed*	check the mA measuring circuit in standby against oscilloscope screenshot ma_pulse.pcx	Might be logged at the end of an initial kV problem in combination with 02HG + 02HH + 02HX or other 02xx entries. If kV already disappeared during mA measurement one should ignore 03PA and look at the kV problem first. Otherwise the filament or the cathode cable might have a short circuit. Then expect 03PF in combination. If in installation check if HT cables anode and cathode side are interchanged on tank or tube side.
all VTB VTC C	03PB *7122* *38066* 6138066	W	Ie = emission current out of tolerance (+/- 10% if Ie > 5mA and exp. time < 45ms // +/-3% if Ie > 5mA and exp. time > 44 ms) *emission current out of tolerance*	Connect an oscilloscope at EZ119 X7 large focus or X5 small focus and monitor the filament current behavior. Set kV-mA-ms technique with 50% of the max mA value at any kV value with an exposure time of 50ms. Any deviation between mA_set and mA_measured will cause a reaction in the filament current. If mA_measured is lower compared to mA_set the filament current will rise (up to filament max), if mA_measured is higher compared to mA_set the filament current will drop down to min 0.5A check the mA measuring circuit in standby against oscilloscope screenshot ma_pulse.pcx -15VDC missing at turn-on, typically in combination with 03HM + 02HJ	If warnings appear during normal work and if the tube has not been adapted for long time carry out re-adaptation. try to find the reason for the missing –15VDC, remove PCBs and all external devices using –15V like e.g. measuring chambers, suppressor diode on backpanel EZ might be short

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	03PC *7123* *38067* 6138067	E	Ie = emission current out of tolerance (+/- 30% if Ie > 5mA and exp. time > 44 ms) *emission current out of tolerance*	Connect an oscilloscope at EZ119 X7 large focus or X5 small focus and monitor the filament current behavior. Set kV-mA-ms technique with 50% of the max mA value at any kV value with an exposure time of 50ms. Any deviation between mA_set and mA_measured will cause a reaction in the filament current. If mA_measured is lower compared to mA_set the filament current will rise (up to filament max), if mA_measured is higher compared to mA_set the filament current will drop down to min 0.5A. check the mA measuring circuit in standby against oscilloscope screenshot ma_pulse.pcx	If errors appear during normal work and if the tube has not been adapted for long time carry out re-adaptation.
all VTB VTC C	03PD *7124* *38068*	W	Set point for emission current regulation incorrect.		
all VTB VTC C	03PE *7125* *38069* 6138069	E	Emergency off! Grid not closed!		
all VTB VTC C	03PF *7126* *38070* 6138070	E	No kV discharge due to missing emission current.	Conditioning procedures must never be carried out with small filaments, not enough emission current achieved within a certain time	Installation: HT cables anode and cathode side interchanged at one side? Short circuit in HT cable for selected focus. Filament short circuit, possibly in combination with 03PA.
all VTB VTC C	03PG *7127* *38071*	W	Grid defect!		
all VTB VTC C	03SC *7315* *38367*	W	PC comm.: Value too large		
all VTB VTC C	03SE *7317* *38369*	W	PC comm.: Error in description		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	03SF *7318* *38370*	W	PC comm.: Item type unknown		
all VTB VTC C	03SG *7319* *38371*	W	PC comm.: Internal type unknown		
all VTB VTC C	03SH *7320* *38372*	W	PC comm.: Value negative		
all VTB VTC C	03SI *7321* *38373*	W	PC comm.: No space at dest. buffer		
all VTB VTC C	03SJ *7322* *38374*	W	PC comm.: Syntax wrong		
all VTB VTC C	03SK *7323* *38375*	W	PC comm.: String too long		
all VTB VTC C	03SL *7324* *38376*	W	PC comm.: String truncated		
all VTB VTC C	03SO *7327* *38379*	W	PC comm.: Unknown Table ID Received		
all VTB VTC C	03SP *3728* *38380*	W	PC comm.: Access Level to Low		
all VTB VTC C	03SQ *03SQ* *38381*	W	PC comm.: Unknown Action Requested		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	03SR *7330 38382*	W	PC comm.: Routing or Message Corrupt		
all VTB VTC C	03SU *7333 38385*	W	PC comm.: Access. level is N_A		
all VTB VTC C	07CA 6176765	E	CAN: case-selector error		
all VTB VTC C	07CB	W	CAN: invalid CAN ID %u		
all VTB VTC C	07CC 6176767	E	CAN: frame repeat overflow IIM%u		
all VTB VTC C	07CD 6176768	E	CAN: no retry from **CU**	+26VDC missing at WA unit?	
all VTB VTC C	07CE 6176769	E	CAN: rx signal conflict IIM%u		
all VTB VTC C	07CF 6176770	E	CAN: tx timeout		
all VTB VTC C	07CI	W	CAN: IMPOSSIBLE ERROR		
all VTB VTC C	07CP	W	CAN: CPU: Pxerr %d %s(%d)		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	07CR	W	CAN: CPU: message request fail		
all VTB VTC C	07CS	W	CAN: CPU: message send error		
all VTB VTC C	07CY 6176789	E	CAN: rx abort IIM%u		
all VTB VTC C	07CZ	W	CAN: unexpected frame (IIM%u)		
all VTB VTC C	07DA 6176865	E	CA: chip access error		
all VTB VTC C	07DB 6176866	E	CAN: chip reset error		
all VTB VTC C	07DC 6176867	E	CAN: chip reset release error		
all VTB VTC C	07DE	W	CAN: illegal interrupt pointer		
all VTB VTC C	07DF 6176870	E	CAN: chip state undefined		
all VTB VTC C	07DG	W	CAN: chip err act. after pass.		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	07DH	W	CAN: chip state error passive		
all VTB VTC C	07DI	W	CAN: chip state bus-off		
all VTB VTC C	07DJ 6176874	E	CAN: chip DPRAM error		
all VTB VTC C	07DK	W	CAN: chip DPRAM error&passive		
all VTB VTC C	07DL	W	CAN: unexpected interrupt		
all VTB VTC C	07LA	W	CV received IIM unknown		
all VTB VTC C	07LB	W	rotor control stator number not available		
all VTB VTC C	07LC	W	rotor control stator not available		
all VTB VTC C	07LD 6177668	E	rotor control stator 1 read back failed		
all VTB VTC C	07LE 6177669	E	rotor control stator 2 read back failed		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	07LF 6177670	E	rotor control stator 3 read back failed		
all VTB VTC C	07LG	W	rotor control speed value out of range		
all VTB VTC C	07LH 6177672	E	rotor control speed set timeout		
all VTB VTC C	07LI	W	rotor control max stator load exceeded		If more than 4 PREP have been switched within one minute the 5th will cause this entry not allowing the next acceleration to prevent overheating of the stator.
all VTB VTC C	07LJ 6177674	E	maximal rotation time low speed rotor control exceeded = **FU_CIE** time out if preparation still active after 60 seconds, exposure ready disappears after max free run time 30 seconds		= during adaptation if in installation with BuckyTH system BuCo release 5.x which does not allow an exposure repetition, change settings free cassette RGDV syncmaster present = no Mounted radiographical controller = none remove signal bus EZX23; if in combination with 00XK + 00X6 load tube file again
all VTB VTC C	07LK	W	Amplimat chamber number out of range		
all VTB VTC C	07LL	W	Amplimat field number out of range		
all VTB VTC C	07LM	W	Amplimat delay value out of range		
all VTB VTC C	07LN	E		check if there is a short circuit to ground at EZX1:10-EWGX2:10-EWGX3:10	short circuit at door contact signal detected during start-up, release 2 generators only
	08CA	E	CAN: case-selector error		

Gen.	error	class	explanation	test procedures	fixing suggestions
	08CB	W	CAN: invalid CAN ID %u		
	08CC	E	CAN: frame repeat overflow IIM%u		
	08CD	E	CAN: no retry from **CU**		
	08CE	E	CAN: rx signal conflict IIM%u		
	08CF	E	CAN: tx timeout		
	08CI	W	CAN: IMPOSSIBLE ERROR		
	08CP	W	CAN: CPU: Pxerr %d %s(%d)		
	08CR	W	CAN: CPU: message request fail		
	08CS	W	CAN: CPU: message send error		
	08CY	E	CAN: rx abort IIM%u		
	08CZ	W	CAN: unexpected frame (IIM%u)		
	08DA	E	CA: chip access error		
	08DB	E	CAN: chip reset error		
	08DC	E	CAN: chip reset release error		
	08DE	W	CAN: illegal interrupt pointer		
	08DF	E	CAN: chip state undefined		
	08DG	W	CAN: chip err act. after pass.		
	08DH	W	CAN: chip state error passive		
	08DI	W	CAN: chip state bus-off		
	08DJ	E	CAN: chip DPRAM error		
	08DK	W	CAN: chip DPRAM error&passive		
	08DL	W	CAN: unexpected interrupt		
	08HA	E	no message receive displaytask		
	08HB	E	no message release displaytask		
	08HC	E	APR not found		
	08HD	E	offset in menu structure out of range		
	08HF	E	no message request for test task		
	08HG	E	no message send for test task		
	08HH	E	APR buffer full		
	08HI	E	no message send for ODD task		
	08HJ	E	no send message to **CU** from ODD no message send for service task		
	08HK	E	data error in CAN message		
	08IE	E	wrong setup IIM		
	08SA	E	no request domtxtask when scanning		
	08SB	E	no request domtxtsak when testing		
	08SC	E	no send message to task2_sc		
all VTB VTC C	10CA *2193* *56765* 6156765	E	CAN: case-selector error *internal software failure* *perhaps caused by defective hardware*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	10CB *2194* *56766*	W	CAN: invalid CAN ID %u *CU sent IIM which the FU didn't know; possibly inconsistency between FU or CU version (release/level); has a wrong version just been installed?*		
all VTB VTC C	10CC *2195* *56767* 6156767	E	CAN: frame rep. overflow IIM%u *communication with CU disturbed, possibly CU overloaded*		
all VTB VTC C	10CD *2196* *56768* 6156768	E	CAN: no RTR from CU *transmission to CU disturbed*		
all VTB VTC C	10CE *2197* *56769* 6156769	E	CAN: rx signal conflict IIM%u *reception from CU disturbed*		
all VTB VTC C	10CF *2198* *56770* 6156770	E	CAN: tx timeout *transmission to CU disturbed*		
all VTB VTC C	10CI *2201* *56773*	W	CAN: IMPOSSIBLE ERROR *internal software failure, perhaps caused by defective hardware*		
all VTB VTC C	10CP *2208* *56780*	W	CAN: CPU: PXerr %d %s(%d) *error message of the operating system, perhaps caused by defective hardware*		
all VTB VTC C	10CR *2210* *56782*	W	CAN: CPU: message request fail *problem during reception from CU*		
all VTB VTC C	10CS *2211* *56783*	W	CAN: CPU: message send error *transmission to CU disturbed*		
all VTB VTC C	10CY *2217* *56789* 6156789	E	CAN: rx abort IIM%u *reception from CU disturbed*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	10CZ *2218* *56790*	W	CAN: unexpected frame (IIM%u) *reception from CU disturbed, message is delivered nevertheless*		
all VTB VTC C	10DA *2257* *56865* 6156865	E	CAN: chip access error *problem with CAN chip on the function unit*		
all VTB VTC C	10DB *2258* *56866* 6156866	E	CAN: chip reset error *problem with CAN chip on the function unit*		
all VTB VTC C	10DC *2259* *56867* 6156867	E	CAN: chip reset release error *problem with CAN chip on the function unit*		
all VTB VTC C	10DE *2261* *56869*	W	CAN: illegal interrupt pointer *problem with CAN chip on the function unit*		
all VTB VTC C	10DF *2262* *56870* 6156870	E	CAN: chip state undefined *problem with CAN chip on the function unit*		
all VTB VTC C	10DG *2263* *56871*	W	CAN: chip err act. after pass. *info: 10DH ended*		
all VTB VTC C	10DH *2264* *56872*	W	CAN: chip state error passive *FU CAN chip error because of detected transmission problems; it's just an info, the transmission is still working;* *possibly to running FU connected to the CAN bus or EMC problems*		
all VTB VTC C	10DI *2265* *56873*	W	CAN: chip state bus-off *FU CAN chip serious error because of detected transmission (probably EMC) problems;* *no transmission possible until next start-up*		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	10DJ *2266* *56874* 6156874	E	CAN: chip DPRAM Error *problem with CAN chip on the function unit*		
all VTB VTC C	10DK *2267* *56875*	W	CAN: chip DPRAM Error&passive *problem with CAN chip on the function unit*		
all VTB VTC C	10DL *2268* *56876*	W	CAN: unexpected interrupt *problem with CAN chip on the function unit*		
all VTB VTC C	10FB *2386* *57066* 6157066		short circuit detected motor phase short circuit for more than 300ms		
all VTB VTC C	10FT *2404* *57084* 6157084		over current detected motor phase short circuit for less than 300ms		
all VTB VTC C	10IF *2582* *57370*	W	initialization failed software start-up not ok		
all VTB VTC C	10LA *2769* *57665* 6157665	W	acceleration count limit exceeded	bouncing hand switch? check behavior at EN_X/ EZX82	If more than 4 PREP's have been switched within one minute the 5th will cause this entry not allowing the next acceleration to prevent overheating of the stator. If in combination with 00XT (RoCo high speed only) program "enable" at "rotation prolongation after prep".
all VTB VTC C	10LC	W	current limit exceeded		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	10LH *2776* *57672* 6157672	E/W	intermediate current too high FU_RC 4512 104 71401...6 firmware 4512 113 22311/12 stator phase current too high FU_RC 4512 104 7142x or 4512 104 7146x firmware 4512 113 22322/3 *stator phase current too high*	check system with ..\..\data_collection\rotor_control\repl_high_speed_roco.pdf FU_RC 4512 104 7142x/6x: compare stator currents for SRO tubes 9000rpm with ..\..\data_collection\oscilloscope\RoCo_high-speed\rdrchs_1.pcx ..\..\data_collection\oscilloscope\RoCo_high-speed\rdrchs_2.pcx ..\..\data_collection\oscilloscope\RoCo_high-speed\rdrchs_3.pcx ..\..\data_collection\oscilloscope\RoCo_high-speed\rdrchs_4.pcx ..\..\data_collection\oscilloscope\RoCo_high-speed\rdrchs_5.pcx ..\..\data_collection\oscilloscope\RoCo_high-speed\rdrchs_6.pcx or for RO tubes 3000rpm ..\..\data_collection\oscilloscope\RoCo_high-speed\ro_acc1.pcx ..\..\data_collection\oscilloscope\RoCo_high-speed\ro_acc2.pcx ..\..\data_collection\oscilloscope\RoCo_high-speed\ro_bra1.pcx ..\..\data_collection\oscilloscope\RoCo_high-speed\ro_bra2.pcx ..\..\data_collection\oscilloscope\RoCo_high-speed\ro_star1.pcx ..\..\data_collection\oscilloscope\RoCo_high-speed\ro_start.pcx	

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	10LL *2780* *57676* 6157676	E/W	intermediate current too low FU_RC 4512 104 71401...6 firmware 4512 113 22311/12 stator phase current too low FU_RC 4512 104 7142x or 4512 104 7146x firmware 4512 113 22322/3 **firmware 4512 113 22322/3 must not be used in units 4512 104 71401…406 with control PCBs** **4512 108 08702/3** **firmware details see** ..\..\data_collection\firmware\FU_FIRM.pdf *stator phase current too low*	check system with ..\..\data_collection\rotor_control\repl_high_speed_roco.pdf FU_RC 4512 104 7142x/7146x/7410x/736xx compare stator currents for SRO tubes 9000rpm with ..\..\data_collection\oscilloscope\RoCo_high-speed\rdrchs_1.pcx ..\..\data_collection\oscilloscope\RoCo_high-speed\rdrchs_2.pcx ..\..\data_collection\oscilloscope\RoCo_high-speed\rdrchs_3.pcx ..\..\data_collection\oscilloscope\RoCo_high-speed\rdrchs_4.pcx ..\..\data_collection\oscilloscope\RoCo_high-speed\rdrchs_5.pcx ..\..\data_collection\oscilloscope\RoCo_high-speed\rdrchs_6.pcx or for RO tubes 3000rpm ..\..\data_collection\oscilloscope\RoCo_high-speed\ro_acc1.pcx ..\..\data_collection\oscilloscope\RoCo_high-speed\ro_acc2.pcx ..\..\data_collection\oscilloscope\RoCo_high-speed\ro_bra1.pcx ..\..\data_collection\oscilloscope\RoCo_high-speed\ro_bra2.pcx ..\..\data_collection\oscilloscope\RoCo_high-speed\ro_star1.pcx ..\..\data_collection\oscilloscope\RoCo_high-speed\ro_start.pcx if WG unit for 2nd or 3rd tube present: stator relay energized ? stator phase cables U-V-W interchanged ? +/- 15V supply present?	

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	10LO *2783* *57679* 6157679	E *W/E*	intermediate voltage %u V (>%u) *should this error occur before anode acceleration then it is reported as an error, otherwise it is reported as a warning in order that the CU does not terminate the exposure*		
all VTB VTC C	10LT *2788* *57684* 6157684	E	temperature limit exceeded, heat sink temperature too high	check lines to NTC if short; NTC should have 15kohms at 20°C measure 5VDC across Y100X4:1-3 when open, about 4.425V when connected and ok	
all VTB VTC C	10LU *2789* *57685* 6157685	E *W/E*	intermediate voltage %u V (<%u) *should this error occur before anode acceleration then it is reported as an error, otherwise it is reported as a warning in order that the CU does not terminate the exposure*	measure DC supply voltage at EY100 X43 / X44 RoCo units 4512 104 7142x and 4512 104 7146x ENF3 switched on ? measure resistors between the big blue capacitors: R4/R7 = 210kohms R5/R6 = 90kohms	if resistors defective cut just the resistor body and solder the new resistor at the remaining wires
all VTB VTC C	10LZ *2794* *57690* 6157690	E	heat sink temperature sensor failure temperature too low	check line crimped to NTC if open; NTC should have 15kohms at 20°C measure 5VDC across Y100X4:1-3 when open, about 4.425V when connected and ok	
all VTB VTC C	10OE *2965* *57969*	W	CPU: PXROS error %d		
all VTB VTC C	10OF *2966* *57970*	W	CPU: PXROS error %d %s(%d)		
all VTB VTC C	10RC *3155* *58267* 6158267	E	rotation check failed		
all VTB VTC C	10RI *3161* *58273* 6158273	E	invalid rotation request : %u		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	10RM	E	rotation detector not present		
all VTB VTC C	10RT *3172* *58284* 6158284	W	rotation request timeout		= during adaptation if in installation with BuckyTH system BuCo release 5.x which does not allow an exposure repetition, change settings free cassette RGDV syncmaster present = no Mounted radiographical controller = none remove signal bus EZX23
all VTB VTC C	10SA *3217* *58365*	W	over-current in stator line detected	check system with ..\..\data_collection\rotor_control\repl_high_speed_roco.pdf	
all VTB VTC C	10SC *3219* *58367*	E	short circuit in stator line detected	check system with ..\..\data_collection\rotor_control\repl_high_speed_roco.pdf	
all VTB VTC C	10SF *3222* *58370*	W	heat sink temperature out of range temperature too low	check line crimped to NTC if open; NTC should have 15kohms at 20°C measure 5VDC across Y100X4:1-3 when open, about 4.425V when connected and ok	
all VTB VTC C	10TD *3284* *58468* 6158468	E	invalid data for tube %u =1= appears most likely after exchange of high speed rotor control unit to version 4512 104 7142x/46x which requires the new data for the RC firmware only at release 3.x generators, tube file TUBE_R3 (use version file date 18.4.2001) = appears with a non-programmed **CU** after the very first turn-on, =2= when appearing after CU Complete restore the data file might be defective *invalid data for tube %u*		=1= only at release 3.x generators: after exchange of **FU_RC** load tube data with file TUBE_R3.TDL (use version file date 18.4.2001) and re-adapt, download CU Complete afterwards =2= dump CU Complete file which won't work, download CU Complete again, see ..\..\data_collection\info_files\PC-up-download-settings.pdf erase NV-RAM (see ..\..\data_collection\info_files\Memory_quick_erase_Optimus_RAD_RF_C.pdf and start programming from scratch
all VTB VTC C	10TE *3285* *58469* 6158469	W	stator %u hardware error		

Gen.	error	class	explanation	test procedures	fixing suggestions
all VTB VTC C	10TF *3286* *58470* 6158470	E	stator %u switching failed		
all VTB VTC C	10TI *3289* *58473* 6158473	E	invalid stator request : %u feedback signal problem	check signals depending on the tube # selection at TB_2_RT/ EZ130 X1:A10 TB_3_RT/ EZ130 X1:C10 generated at tube extension unit WG / 1WG / 2WG	
all VTB VTC C	10TR *3298* *58482* 6158482	E	stator change with rotating anode		
all VTB VTC C	10UI *3353* *58573*	W	unknown message from **CU**: IIM %u		
all VTB VTC C	10UM *3357* *58577*	W	unexpected message from **CU**: IIM %u		
all VTB VTC C	10WT *3492* *58784*	W	CPU: watchdog timeout		
all VTB VTC C	10XX *3560* *58888*	W	IMPOSSIBLE ERROR		
	13CA	E	CAN: case-selector error		
	13CB	W	CAN: invalid CAN ID %u		
	13CC	E	CAN: frame repeat overflow IIM%u		
	13CD	E	CAN: no retry from **CU**		
	13CE	E	CAN: rx signal conflict IIM%u		
	13CF	E	CAN: tx timeout		
	13CI	W	CAN: IMPOSSIBLE ERROR		
	13CP	W	CAN: CPU: Pxerr %d %s(%d)		
	13CR	W	CAN: CPU: message request fail		
	13CS	W	CAN: CPU: message send error		
	13CY	E	CAN: rx abort IIM%u		

Gen.	error	class	explanation	test procedures	fixing suggestions
	13CZ	W	CAN: unexpected frame (IIM%u)		
	13DA	E	CA: chip access error		
	13DB	E	CAN: chip reset error		
	13DC	E	CAN: chip reset release error		
	13DE	W	CAN: illegal interrupt pointer		
	13DF	E	CAN: chip state undefined		
	13DG	W	CAN: chip err act. after pass.		
	13DH	W	CAN: chip state error passive		
	13DI	W	CAN: chip state bus-off		
	13DJ	E	CAN: chip DPRAM error		
	13DK	W	CAN: chip DPRAM error&passive		
	13DL	W	CAN: unexpected interrupt		
	13LA	W	CV received IIM unknown		
	13LB	W	IO wrong bi-directional lines output value		
	13LC	W	TR TOMO value out of range		
	13LD	W	TR RGDV value out of range		
	13LE	E	TR RGDV read back failed	relay contact stuck on-board of WA102, in combination with 00X6 possible	
	13LF	W	TR wrong sync contact value		
	13LG	W	TR wrong hand switch enable value		
	13LH	E	PR S1/S2 switch active during startup		
	14CA	E	CAN: case-selector error		
	14CB	W	CAN: invalid CAN ID %u		
	14CC	E	CAN: frame repeat overflow IIM%u		
	14CD	E	CAN: no retry from **CU**		
	14CE	E	CAN: rx signal conflict IIM%u		
	14CF	E	CAN: tx timeout		
	14CI	W	CAN: IMPOSSIBLE ERROR		
	14CP	W	CAN: CPU: Pxerr %d %s(%d)		
	14CR	W	CAN: CPU: message request fail		
	14CS	W	CAN: CPU: message send error		
	14CY	E	CAN: rx abort IIM%u		
	14CZ	W	CAN: unexpected frame (IIM%u)		
	14DA	E	CA: chip access error		
	14DB	E	CAN: chip reset error		
	14DC	E	CAN: chip reset release error		
	14DE	W	CAN: illegal interrupt pointer		
	14DF	E	CAN: chip state undefined		
	14DG	W	CAN: chip err act. after pass.		
	14DH	W	CAN: chip state error passive		

Gen.	error	class	explanation	test procedures	fixing suggestions
	14DI	W	CAN: chip state bus-off		
	14DJ	E	CAN: chip DPRAM error		
	14DK	W	CAN: chip DPRAM error&passive		
	14DL	W	CAN: unexpected interrupt		
	14LA	W	CV received IIM unknown		
	14LB	W	IO wrong bi-directional lines output value		
	14LC	W	TR TOMO value out of range		
	14LD	W	TR RGDV value out of range		
	14LE	E	TR RGDV read back failed		
	14LF	W	TR wrong sync contact value		
	14LG	W	TR wrong hand switch enable value		
	14LH	E	PR S1/S2 switch active during startup		
	15CA	E	CAN: case-selector error		
	15CB	W	CAN: invalid CAN ID %u		
	15CC	E	CAN: frame repeat overflow IIM%u		
	15CD	E	CAN: no retry from **CU**		
	15CE	E	CAN: rx signal conflict IIM%u		
	15CF	E	CAN: tx timeout		
	15CI	W	CAN: IMPOSSIBLE ERROR		
	15CP	W	CAN: CPU: Pxerr %d %s(%d)		
	15CR	W	CAN: CPU: message request fail		
	15CS	W	CAN: CPU: message send error		
	15CY	E	CAN: rx abort IIM%u		
	15CZ	W	CAN: unexpected frame (IIM%u)		
	15DA	E	CA: chip access error		
	15DB	E	CAN: chip reset error		
	15DC	E	CAN: chip reset release error		
	15DE	W	CAN: illegal interrupt pointer		
	15DF	E	CAN: chip state undefined		
	15DG	W	CAN: chip err act. after pass.		
	15DH	W	CAN: chip state error passive		
	15DI	W	CAN: chip state bus-off		
	15DJ	E	CAN: chip DPRAM error		
	15DK	W	CAN: chip DPRAM error&passive		
	15DL	W	CAN: unexpected interrupt		
	15LA	W	CV received IIM unknown		
	15LB	W	IO wrong bi-directional lines output value		
	15LC	W	TR TOMO value out of range		
	15LD	W	TR RGDV value out of range		
	15LE	E	TR RGDV read back failed		

Gen.	error	class	explanation	test procedures	fixing suggestions
	15LF	W	TR wrong sync contact value		
	15LG	W	TR wrong hand switch enable value		
	15LH	E	PR S1/S2 switch active during startup		