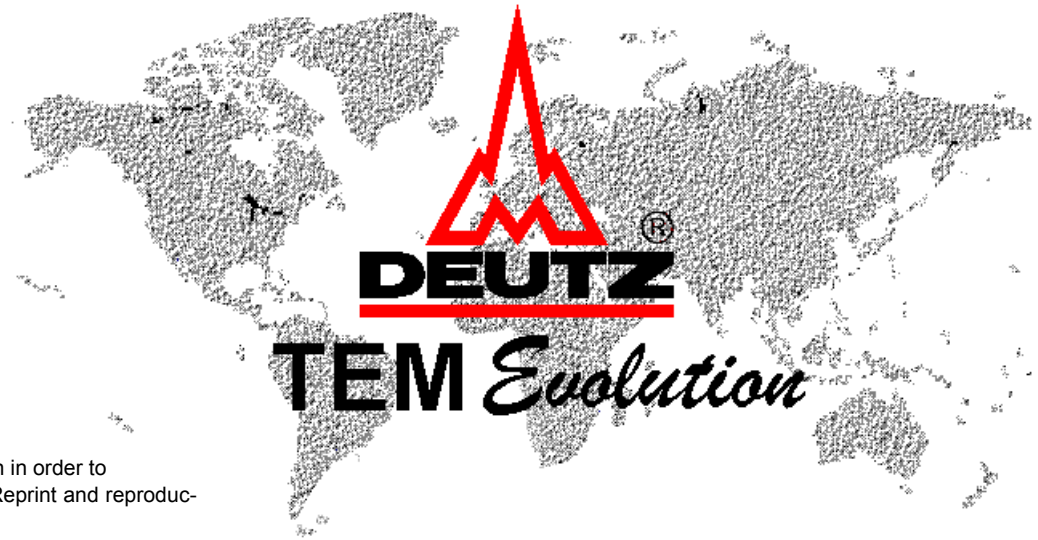
DEUTZ
TEM-*Evolution*-System

System manual

TBG 632

Limit values list



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0 Remarks

0.1 Application

This limit values list is only applicable for DEUTZ gas engines equipped with the TEM-Evo-system. It is only valid for the engine type indicated on the front page.

The limit values list applies only for the software version indicated in the foot note (i.e. v2.29.16)

Observe the following documents>:
- Operating instructions DEUTZ TEM System Evolution
- System manuals for the TEM-Evo-Systems, particu-larlz the system manual »operation log«

0.2 Limit values list

Column	Explanation
Identification	Name of the limit value
Sensor monitoring	
	Monitoring of the sensors with delay
RA	RA: remote acknowledge 10 h: remote acknowledge is possible every 10 hours

Column	Explanation
Monitoring	
	Monitoring of the measured value For limit values are indicated standard values. In case of parametrizable monitoring the limit values differ from the standard values. The limit value is stated in the comment.
vvv	Not reaching a limit value with a fault e.g. lubricating oil pressure insufficient
vv	Not reaching a limit value with an alarm e.g. lubricating oil pressure insufficient
v	Not reaching a limit value with a message e.g. pre-heating failure
^^^	Exceeding a limit value with a fault e.g. overtemperature inlet of jacket water
^^	Exceeding a limit value with an alarm e.g. overtemperature inlet of jacket water
^	Exceeding a limit value with a message e.g. power reduction due to overtemperature air inlet

Column	Explanation
Limit value	Limit value of the monitoring with unit The standard value is indicated with parametrizable limit values.
Delay	Delay with unit
RA	RA: remote acknowledge 10 h: remote acknowledge is possible every 10 hours
Comment	Comment

0.3 Abbreviations of options

Abbreviations	Explanation
AES	Demand of external starting preparations
AKR	Anti-knock governor
AVW	Air inlet pre-heating
BY	Exhaust bypass
CH4	Additional CH4 compensation
CH4K	Extension of option CH4.
DK	Leakage check

Abbreviations	Explanation
GK	Intercooler circuit
GKS	Intercooler-dry cooler
GL	Monitoring of the generator bearing temperatures
HK	Heat utilization with heating circuit
KTB	Cooling water tank
MK	Jacket water regulation
NA	Handling of mains fault
NATL	Monitoring of the exhaust gas temperature after exhaust turbocharger
NK	Emergency cooler circuit
NKS	Emergency cooler-dry cooler
NKAT	Monitoring of the exhaust gas temperature after KAT
NMOT	Monitoring of the exhaust gas temperature after engine
OWF	Remote oil change
QEÜ	Confirmation of external monitorings

Abbreviations	Explanation
RL1	Cabin ventilation with admixture or frequency-controlled coolers
RL2	Cabin ventilation without admixture with two-stage coolers
SATL	Measurement and restriction of the exhaust turbo-charger speeds.
VAWT	Measurement warm water temperature before exhaust-gas heat exchanger
VSWT	Measurements cooling water/heating water before lube oil heat exchanger
xMW	Parametrizable measured values
xPR	Parametrizable control circuit
ZG	Dual gas operation with change of the gas type only at standstill
ZM	Dual gas operation with composite mode and change of the gas type under load
ZU	Dual gas operation with change of the gas type under load

identification	Sensor monitoring	RA	Monitoring		Limit value	Delay	RA	Comment
1 engine								
P145 crank case	**fault**	**0 ms**						
			fault	⩓	10 mbar	0 ms		after start phase
			alarm	⩔	-10 mbar	5 min		with engine running
P196 lube oil before filter	**fault**	**500 ms**						
T201 receiver (A)	**fault**	**500 ms**						**[GK]**
			fault	⩓	57 °C	2 s		limit value: Par. 13800 + 5,0K
			message	∧	55 °C	2 s		limit value: Par. 13800 + 3,0K
			message	∧	52 °C	5 min		power red.; lim. value: Par. 13800; Island: delay 30s
T378 receiver B	**fault**	**500 ms**						**[GK]**
			fault	⩓	57 °C	2 s		limit value: Par. 13800 + 5,0K
			message	∧	55 °C	2 s		limit value: Par. 13800 + 3,0K
			message	∧	52 °C	5 min		power red.; lim. value: Par. 13800; Island: delay 30s
T202 cooling water GK inlet	**fault**	**500 ms**						**[GK]**
T203 air inlet (A)	**alarm**	**500 ms**						
			fault	⩓	40 °C	2 min		[RL without T404]; lim.value Par. 13900
			alarm	⩑	35 °C	2 min		[RL without T404]; lim.value Par. 13900 - 5,0K
			message	∧	30 °C	0 ms		with [AVW] lim.value.: Par. 23230/23231 + 3,0K
T377 air inlet B	**alarm**	**500 ms**						
			message	∧	30 °C	0 ms		with [AVW] lim. value: Par. 23230/23231 + 3,0K

identification	Sensor monitoring		RA	Monitoring		Limit value	Delay	RA	Comment
T206 jacket water engine outlet	**fault**	**500 ms**							
				fault	⩓	98 °C	2 s	RA	
				alarm	^	96 °C	2 s		
				message	v	20 °C	240 min		
T207 jacket water engine inlet	**fault**	**500 ms**							
				fault	⩓	98 °C	2 s		
				message	^	75 °C	5 min		power red.; lim. value: Par. 13400; Island: delay 30s
T208 lube oil	**fault**	**500 ms**							
				fault	⩓	90 °C	0 ms		lim.value: Par. 23019
				alarm	^	85 °C	0 ms		lim.value: Par. 23019 - 5,0K
L234 lube oil level	**fault**	**500 ms**							
L2341 lube oil level									**filtered value**
				fault	⩔	30 %	20 s		with engine stopped delay 1s
				fault	⩓	120 %	20 s		with engine stopped delay 1s
				message	^	95 %	0 ms		enable only during oil change
				message	v	50 %	0 ms		enable only during oil change
P302 lube oil after filter	**fault**	**500 ms**							**[NFI]**
				fault	⩔	5,3 bar	0 ms		oper.oil pressure; 900rpm: limit value 4,8bar
				alarm	⩒	5,5 bar	0 ms		oper.oil pressure; 900rpm: limit value 5,0bar
				fault	⩔	2 bar	2 s		start phase: lim.value + delay variable

identification	Sensor monitoring	RA	Monitoring		Limit value	Delay	RA	Comment
P3021 differential pressure lube oil								**[NFI]**
			fault	⩓	1,5 bar	2 min		
			alarm	⩑	1 bar	2 min		
			alarm	⩒	-1 bar	2 min		
P356 crank case fan								
			fault			10 s		
P371 starter air press.	**fault**	**500 ms**						**[632, 620V20] enable with Par. 13030**
			fault	⩔	4 bar	10 s		enabling: Par. 13030; lim.value if stopped Par. 23050
			alarm	⩒	18 bar	15 s		enabling: Par. 13030; lim. value: Par. 23050
S492 speed ATL A	**alarm**	**500 ms**						**[SATL]**
			fault	⩓	683 1/s	60 min		limit value: Par. 15210 + 5%
S493 speed ATL B	**alarm**	**500 ms**						**[SATL+(620V20, 632)]**
			fault	⩓	683 1/s	60 min		limit value: Par. 15210 + 5%
T494 exhaust after ATL A	**alarm**	**500 ms**						**[NATL]**
			alarm	⩑	550 °C	2 s		limit value: Par. 15111 / 15113
			alarm	⩑	550 °C	10 min		enable from 80% load
T495 exhaust after ATL B	**alarm**	**500 ms**						**[NATL+(620V20, 632)]**
			alarm	⩑	550 °C	2 s		limit value: Par. 15111 / 15113
			alarm	⩑	550 °C	10 min		enable from 80% load
TxxxxVergleichstelleA	**fault**	**500 ms**						
TxxxxVergleichstelleB	**fault**	**500 ms**						

identification	Sensor monitoring	RA	Monitoring		Limit value	Delay	RA	Comment
turning device								
			fault			0 ms		
T461 comb. chamber A1	**fault**	**500 ms**						**indiv. for each cylinder**
			fault	⩓	450 °C	2 s		
			fault	⩔	240 °C	2 min		lim.value 50K-120K below av. value; island op: 10 min
			alarm	⩔	240 °C	20 s		lim.value 50K-120K below av. value
T471 comb. chamber B1	**fault**	**500 ms**						**indiv. for each cylinder**
			fault	⩓	450 °C	2 s		
			fault	⩔	240 °C	2 min		lim.value 50K-120K below av. value; island op: 10 min
			alarm	⩔	240 °C	20 s		lim.value 50K-120K below av. value
T46x7 comb. chamber average (A)								**average value bank A**
			fault	⩓	450 °C	0 ms		
T47x7 comb. chamber average B								**average value bank B**
			fault	⩓	450 °C	0 ms		
T4xx2 Ist comb. chamber (A)								**filtered value**
			fault	⩔	150 °C	0 ms		
T47x2 Ist comb. chamber B								**filtered value**
			fault	⩔	150 °C	0 ms		
deviation comb. chamber control (A)								
			fault	⩓	10 °C	5 min		delay variable
deviation comb. chamber control B								
			fault	⩓	10 °C	0 ms		delay variable

identification	Sensor monitoring	RA	Monitoring		Limit value	Delay	RA	Comment
gas mixer A limit stop lean								
			message	v		4 s		stop position not reached
gas mixer A start position OK								
			alarm	vv		0 ms		start position not reached
			message	v		0 ms		start position not reached
gas mixer B limit stop lean								
			message	v		4 s		stop position not reached
gas mixer B start position OK								
			alarm	vv		0 ms		start position not reached
			message	v		0 ms		start position not reached
S200 engine speed	**fault**	**200 ms**						
			fault	^^	1150 rpm	200 ms		limit value: Par. 11108 + 15%
			alarm	^	1150 rpm	0 ms		limit value: Par. 11108 + 15%, auto-acknowledging
			fault	vv	600 rpm	500 ms		lim value dep. on condition
			alarm	^	60 rpm	0 ms		speed before start
DZR TDC sensor fault								**OT-signal missing**
			fault			2 s		enabled if engine turns
			alarm			0 ms		enabled if engine turns, auto-acknowledging
DZR tooth number fault								
			fault			2 s		enabled if engine turns
			alarm			0 ms		enabled if engine turns, auto-acknowledging
DZR TDC mixed up with gear ring								
			fault			2 s		

identification	Sensor monitoring		RA	Monitoring		Limit value	Delay	RA	Comment
G1971 throttle position (A) (V)	**fault**	**0 ms**							**feedback voltage**
G197 throttle position (A) (%)	**fault**	**0 ms**							
G1972 DZR (A) Ukal 0%	**fault**	**0 ms**							**calibration voltage 0%**
G1973 DZR (A) Ukal 100%	**fault**	**0 ms**							**calibration voltage 100%**
DZR (A) calibration				fault			15 s		calibration failed
G1974 DZR (A) engine current	**fault**	**0 ms**							
X197xDzr_A_Stromabsenkung				alarm			5 s		enable in load run
DZR (A) short circuit power stage				fault			0 ms		
AKR_knock sensor fault bank A				alarm	^^	0 (code)	10 s		**[AKR]** enable from 50% load
AKR_knock sensor fault bank B				alarm	^^	0 (code)	10 s		**[AKR]** enable from 50% load
Critical fault! Check the motor!				fault	vv	-9 °	6 s		**[AKR] ZZP-adjustment max.** limit value: Par. 11502-1,0°

identification	Sensor monitoring	RA	Monitoring		Limit value	Delay	RA	Comment
AKR speed signal								**[AKR] speed signal error**
			alarm			0 ms		enable in load run
anti-knock governor available								**[AKR]**
			alarm	⌄⌄		0 ms		Anti-knock governor missing
ZA ignites								**feedback of ZA**
			fault	⌄⌄⌄		3 s		ignition does not ignite
ZA fault code								**error message of ZA**
			fault	^^^	0 (code)	3 s		5min after alarm appearence: delay = 0
			alarm	^^	0 (code)	0 ms		
ZA capacitor discharge bank A								**capacitor discharge error**
			alarm	^^	0 (code)	1 min		
			message	^	0 (code)	0 ms		
ZA capacitor discharge bank B								**capacitor discharge error**
			alarm	^^	0 (code)	1 min		
			message	^	0 (code)	0 ms		
ZA condition serial connection S								**Timeout ZA-communication**
			fault			10 s		
ZA condition serial connection W								**ZA-communication error**
			message			0 ms		
Xxxx number of start attempts								
			fault	^^^	3	0 ms	10 h	

identification	Sensor monitoring	RA	Monitoring		Limit value	Delay	RA	Comment
2 power / generator								
T209 generator winding U	**fault**	**500 ms**						**[GW]**
			fault	^^	140 °C	10 s		limit value: Par. 13500
			alarm	^	135 °C	10 s		limit value: Par. 13500 - 5,0K
T210 generator winding V	**fault**	**500 ms**						**[GW]**
			fault	^^	140 °C	10 s		limit value: Par. 13500
			alarm	^	135 °C	10 s		limit value: Par. 13500 - 5,0K
T211 generator winding W	**fault**	**500 ms**						**[GW]**
			fault	^^	140 °C	10 s		limit value: Par. 13500
			alarm	^	135 °C	10 s		limit value: Par. 13500 - 5,0K
T317 generator position A		**500 ms**						**[GL]**
			fault	^^	60 °C	2 s		limit value: Par. 13501
			alarm	^	55 °C	2 s		limit value: Par. 13501 - 5,0K
T318 generator position B		**500 ms**						**[GL]**
			fault	^^	60 °C	2 s		limit value: Par. 13501
			alarm	^	55 °C	2 s		limit value: Par. 13501 - 5,0K
T487 generator air inlet	**fault**	**500 ms**						**[GLU]**
			fault	^^	80 °C	2 s		limit value: Par. 13030
			alarm	^	75 °C	2 s		limit value: Par. 13030 - 5,0K
T488 generator air outlet	**fault**	**500 ms**						**[GLU]**
			fault	^^	80 °C	2 s		limit value: Par. 13030
			alarm	^	75 °C	2 s		limit value: Par. 13030 - 5,0K
E121 generator protection								**input safety chain**
			fault			0 ms	RA	

identification	Sensor monitoring		RA	Monitoring		Limit value	Delay	RA	Comment
E198 actual power generator	**fault**	**500 ms**	**RA**						
E1982 act. power									**filtered value**
				fault	^^	120 %	5 s		overload
				fault	^^	105 %	2 min		overload; limit value: Par. 13100 + 5%
				fault	v	-5 %	12 s	RA	return power; delay: Par. 13510
E1988 actual power in kW									
				fault	vv	1060 kW	15 min	10 h	minimum load; V12: 800kW, V16: 1060kW
				alarm	v	1060 kW	10 min		minimum load; V12: 800kW, V16: 1060kW
power reduction due to receiver temp.									**[GK]**
				message	v	0 %	0 ms		enabled with message T201/T378
power reduction due to jacket water temp.									
				message	v	0 %	0 ms		enabled with message T207
power reduction due to throttle									
				fault	vv	-20 %	0 ms		
				message	v	0 %	2 min		
power reduction due to CH4-value									**[CH4]**
				message	v	0 %	0 ms		enabled with message Q311
power reduction due to AKR									**[AKR]**
				message	v	0 %	2 min		
power reduction due to ATL speed									**[SATL]**
				message	v	0 %	0 ms		enabled with message S492/S493

identification	Sensor monitoring	RA	Monitoring	Limit value	Delay	RA	Comment
E199 demand analog	**fault**	**500 ms**					**only for demand 4..20mA**
E1987 demand active			message	^ 30 %	0 ms		
deviation power control			fault	^^ 5 %	5 min		startup/shutdown: lim. value 20%
synchronization			fault		10 min	10 h	synchronization time exceeded
E104 mains fault			fault		30 s		**[NA]**
			alarm		0 ms		
			message		0 ms		
mains fault sequencial fault			fault		0 ms		**[NA]**

identification	Sensor monitoring	RA	Monitoring		Limit value	Delay	RA	Comment
3 gas control system								
gas pressure gas pipe A								
			fault			0 ms	RA	auto acknowl. (Par. 12900)
			message			0 ms		[ZU] for gas type change
P125 leakage check gas A								**[DK]**
			fault			1 min		leakage control time exceeded
T147 temp. monitoring gas regul. section A								
			fault			0 ms		
Q311 CH4-value	**fault**	**2 s**						**[CH4]**
			fault	⩔	38 %	5 min		limit value: Par. 12806
			message	∨	38 %	0 ms		limit value: Par. 12806
			message	∨	30 %	0 ms		gas ytpe change; lim. value: Par. 12806 - 8,0%
			message	∨	0 %	30 s		deselection; enable/lim. value Par. 12810/12811
			message	∨	50 %	5 min		power red.; lim. value: Par. 12803; Island: delay 30s
stop due to CH4 calibration								**[CH4K]**
			fault			75 min		calibration time exceeded
			alarm			75 min		calibration time exceeded

identification	Sensor monitoring	RA	Monitoring		Limit value	Delay	RA	Comment
4 heating water								
T289 heating water return	**alarm**	**500 ms**						**[HK] enable with Par. 14009**
T290 heating water before KWT	**alarm**	**500 ms**						**[VKWT]**
T291 heating water flow	**fault**	**500 ms**						**[HK] enable with Par. 14008**
T384 ht. water at emergency cooler	**alarm**	**500 ms**						**[NK+VNK]**
T385 heating water before AWT	**alarm**	**500 ms**						**[VAWT]**
T386 heating water before SWT	**alarm**	**500 ms**						**[VSWT]**
T286 exh. after engine	**alarm**	**500 ms**	alarm	^	550 °C	2 s		**[NMOT]** limit value: Par. 15111 / 15113
T287 exhaust after KAT	**fault**	**500 ms**	fault	^^	550 °C	2 s		**[NKAT]** limit value: Par. 15111 / 15113
T288 exhaust after AWT	**alarm**	**500 ms**	alarm	^	180 °C	2 s		**[NAWT]** limit value: Par. 15112
P157 exhaust back press. too high			alarm	^	50 mbar	2 min		**limit value switch**
exhaust bypass AWT limit stop closed			message			500 ms		**[HK+BY]**

identification	Sensor monitoring	RA	Monitoring	Limit value	Delay	RA	Comment
T276 HK overtemperature limiter 1			fault		0 ms	RA	**[HK] input safety chain**
T277 HK overtemperature monitoring			fault		0 ms	RA	**[HK] input safety chain**
P278 HK pressure minimum limiter a			fault		0 ms	RA	**[HK] input safety chain**
P2781 HK pressure minimum limiter b			fault		0 ms	RA	**[HK] input safety chain**
P279 HK overpressure limiter 1			fault		0 ms	RA	**[HK] input safety chain**
L280 low water heating circuit			fault		0 ms	RA	**[HK] input safety chain**
P281 heating circuit pump			fault		0 ms	RA	**[HK] input safety chain**
T435 HK overtemperature limiter 2			fault		0 ms	RA	**[HK] input safety chain**
P437 HK overpressure limiter 2			fault		0 ms	RA	**[HK] input safety chain**
S397 heat. circuit control valve	**alarm**	**500 ms**					**[HKV]**
HK ctrl. valve limit stop cold			message		500 ms		**[MK, HK]**

identification	Sensor monitoring	RA	Monitoring	Limit value	Delay	RA	Comment
HK ctrl. valve limit stop warm			message		500 ms		**[MK, HK]**

identification	Sensor monitoring	RA	Monitoring	Limit value	Delay	RA	Comment
5 cooler circuits/ pre-heating							
P126 jacket water pump			fault		3 s		
L123 low water engine cooling circuit			fault		0 ms	RA	**input safety chain**
T156 pre-heating genset			alarm		2 s		
filling valve jacket water tank			alarm	^^	30 min		**[KTB]** time exceeded; delay from Par. 23031
L442 leakage check KTB			alarm		0 ms		**[KTB]**
Sxxx GK ctrl. valve	**alarm**	**500 ms**					**[GKV] position feedback**
GK ctrl. valve limit stop warm			message		500 ms		**[GK]**
GK ctrl. valve limit stop cold			message		500 ms		**[GK]**
P309 intercooler pump			fault		3 s	RA	**[GK]**
L308 low water intercooler circuit			fault		0 ms	RA	**[GK] input safety chain**
T405 GK dry cooler outlet	**alarm**	**500 ms**					**[GKS] enable with Par. 13085**

identification	Sensor monitoring	RA	Monitoring	Limit value	Delay	RA	Comment
Sxxx NK ctrl. valve	**alarm**	**500 ms**					**[NKV] position feedback**
HK emerg. cool. ctrl. valve limit stop warm			message		500 ms		**[NK]**
HK emerg. cool. ctrl. valve limit stop cold			message		500 ms		**[NK]**
T419 NK dry cooler outlet	**alarm**	**500 ms**					**[NKS] enable with Par. 14055**
air inlet VW limit stop warm			message		500 ms		**[AVW]**
air inlet VW limit stop cold			message		500 ms		**[AVW]**

identification	Sensor monitoring	RA	Monitoring		Limit value	Delay	RA	Comment
6 cabin ventilation								
T404 cabine air BHKW	**alarm**	**500 ms**						**[RL1x] enable with Par. 13092**
			fault	^^	40 °C	2 s		limit value: Par. 13900
			alarm	^^	35 °C	2 s		limit value: Par. 13900 - 5,0K
			message	^	32 °C	2 s		limit value: Par. 13900 - 8,0K
cabine ventil.								**[RL]**
			fault			3 s		delay: during start 60s
cabine ventil. flap limit stop warm								**[RL1x]**
			message			500 ms		
cabine ventil. flap limit stop cold								**[RL1x]**
			message			500 ms		

identification	Sensor monitoring	RA	Monitoring		Limit value	Delay	RA	Comment
7 dual gas								
gas pressure gas pipe B								**[ZG]**
			fault			0 ms	RA	auto acknowl. (Par. 12900)
			message			0 ms		for gas type change
P128 leakage check gas B								**[ZG+DK]**
			fault			1 min		leakage control time exceeded
T131 temp. monitoring gas regul. section B								**[ZG]**
			fault			0 ms		
gas type change not possible								**[ZU, ZM]**
			alarm			15 min		
gas pressure control B start position OK								**[ZU, ZM]**
			fault	^^		10 s		start position + limit stop simultan.
			alarm	^		2 s		start position + limit stop simultan.
			alarm	v		0 ms		start position not reached
gas pressure control B limit stop closed								**[ZU, ZM]**
			fault	^^		10 s		start pos. + lim.stop or both limit stops simultan.
			alarm	^		1 s		start pos. + lim.stop or both limit stops simultan.
			fault	vv		5 min		limit stop not reached (stepper motor blocked)
			alarm	v		10 s		limit stop not reached (stepper motor blocked)
gas pressure control B limit stop open								**[ZU, ZM]**
			fault	^^		10 s		start pos. + lim.stop or both limit stops simultan.
			alarm	^		1 s		start pos. + lim.stop or both limit stops simultan.
			fault	vv		5 min		limit stop not reached (stepper motor blocked)
			alarm	v		10 s		limit stop not reached (stepper motor blocked)

identification	Sensor monitoring	RA	Monitoring		Limit value	Delay	RA	Comment
8 other								
E149 supply voltage TEM	**fault**	**500 ms**						
			alarm	⩛	20 V	0 ms		
			alarm	⩓	30 V	0 ms		
Exxx isol. monit. cabinet TEM	**fault**	**0 ms**						
			alarm	⩛	10 kOhm	5 s		
G143 circuit breaker TEM								
			fault			0 ms		
H141 internal quick stop								
			fault			0 ms		
H117 ext. quick stop without heat removal								**input safety chain**
			fault			0 ms		
H116 ext. quick stop with heat removal								**input safety chain**
			fault			0 ms	RA	
security chain								**safety chain opened**
			fault			0 ms	RA	
parametrizable message 01/37								**[xM] par. message; free text**
			message			0 ms	RA	lim. value, delay, enabling parametrizable
parametrizable data 01	**alarm**	**500 ms**						**[xMW] par. measurement; free text**
			message	⩛	0	0 ms	RA	lim. value, delay, enabling parametrizable
			message	⩛	0	0 ms	RA	lim. value, delay, enabling parametrizable
Xxxx5XdParaRegXX								**[xPR] control deviation par. ctrl; XX=1..3**
			message	⩓	10	0 ms	RA	lim. value, delay, enabling parametrizable