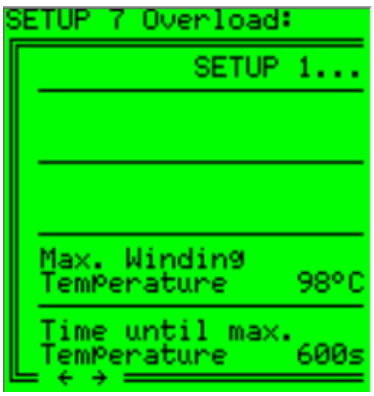
Overload Prediction (FW2.23)

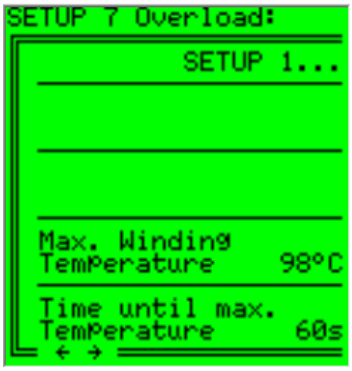
Two parameters are required to set this function up:

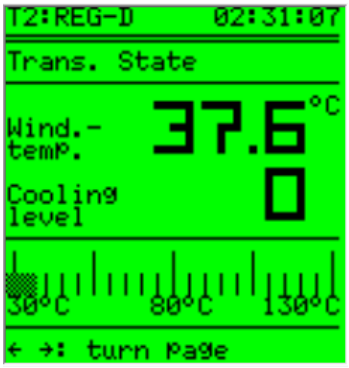


Max Winding Temp is like asking "at what temperature will my transformer be considered to be overloaded?" This is generally set to 98°C because this is the temp at which the transformer ages at normal time: 1hr = 1hr thermal ageing (Loss of Life)

Time until Max Temp is like asking "for an over-temperature to occur within this time, what load could the TF be run at?" The shorter the time set here, the greater the overload allowance, because the curve would need to be much steeper to reach 98°C in 60s than it would to reach 98°C in 600s

For example:





Given these starting parameters, what would the overload values be?

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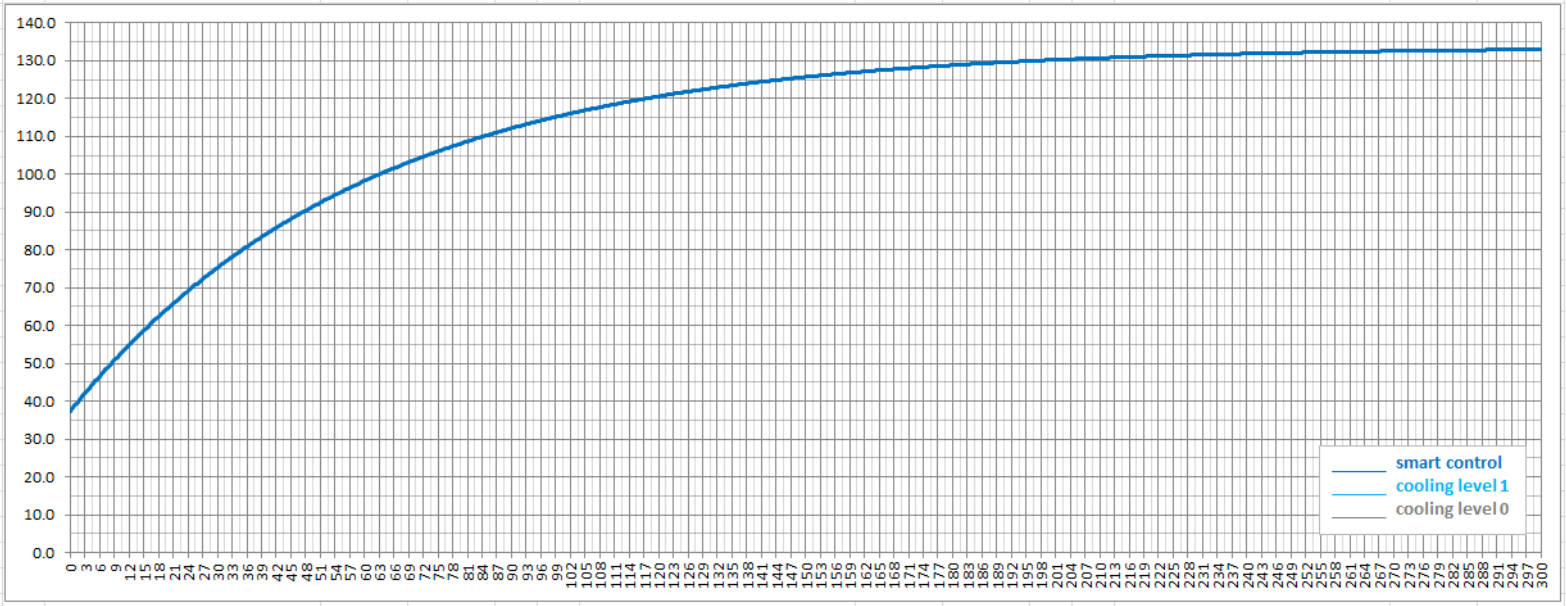
COOLING LEVEL 0			
Transformer	Transformer Power Rating	22	MVA
	Winding Voltage Rating	110	kV
	CT Ratio (Kni)	600	
	Nominal Current (Single Phase)	115	A
TMM	Nominal Current	115	A
	Time Constant of Winding	60	s
	Hot Spot Temperature Rise	19	
	Winding Exponent	1.6	
Test	Starting Oil Temp	37.5	deg C
	Load LV Current	318	A
	Injected Current	0.53	A
	Hot Spot Temperture	133.6	deg C

COOLING LEVEL 1			
Transformer	Transformer Power Rating	22	MVA
	Winding Voltage Rating	110	kV
	CT Ratio (Kni)	600	
	Nominal Current (Single Phase)	115	A
TMM	Nominal Current	115	A
	Time Constant of Winding	60	s
	Hot Spot Temperature Rise	19	
	Winding Exponent	1.6	
Test	Temperature Limit 1	37.5	deg C
	Load LV Current	318	A
	Injected Current	0.53	A
	Hot Spot Temperture	133.6	deg C

COOLING LEVEL 2			
Transformer	Transformer Power Rating	0	MVA
	Winding Voltage Rating	110	kV
	CT Ratio (Kni)	600	
	Nominal Current (Single Phase)	0	A
TMM	Nominal Current	0	A
	Time Constant of Winding	0	s
	Hot Spot Temperature Rise	0	
	Winding Exponent	0	
Test	Temperature Limit 2	0	deg C
	Load LV Current	318	A
	Injected Current	0.53	A



Final Time	Minutes	Final Temperature
300	05:00	133.6

Time (s)	Time (mm:ss)	Temp	Smart Temp
30	00:30	75.3	75.3
60	01:00	98.2	98.2
90	01:30	112.2	112.2
120	02:00	120.6	120.6
150	02:30	125.7	125.7
180	03:00	128.8	128.8
210	03:30	130.7	130.7
240	04:00	131.8	131.8
270	04:30	132.5	132.5
300	05:00	132.9	132.9
330	05:30	133.2	133.2
360	06:00	133.4	133.4
390	06:30	133.4	133.4
420	07:00	133.5	133.5
450	07:30	133.5	133.5
480	08:00	133.6	133.6
510	08:30	133.6	133.6
540	09:00	133.6	133.6
570	09:30	133.6	133.6
600	10:00	133.6	133.6

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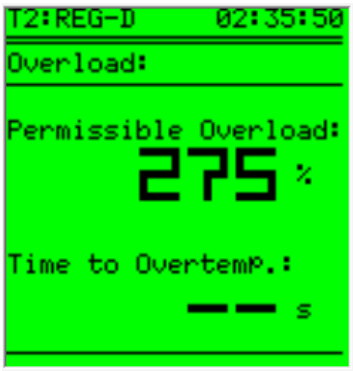
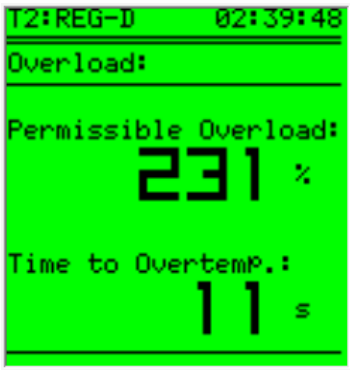
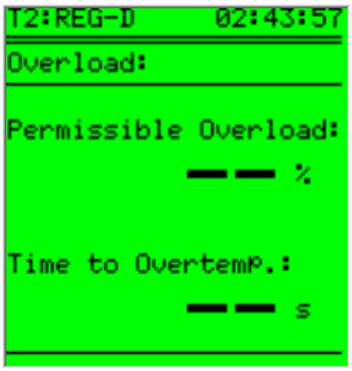
We see from the temperature curve that to reach 98°C in 60s, the load current would need to be 318A, or 275% of the nominal current:



If the combination of load current and top oil temperature will result in a final winding temp of more than 98°C, the **Time to Overtemp** begins counting down to this event.

For example, if the load current was step changed from 0 to 318A, the **Time to Overtemp** would count down from 60 to 0; after which both values would go to "--" (-1 on SCADA)





Please note:
Permissible Overload and **Time to Overtemp** are not directly available for mapping to SCADA (ie: do not have an RPS Offset), but can be mapped via the A-registers (A20 to A25) using simple H-Code.

The parameters required for this mapping are:

TmOvlTmMax:	parameter:	maximum time until overload
TmOvlTm:	displayed value:	calculated time until overload
TmOvlTmpMax:	parameter:	maximum temperature of winding (HotSpot)
TmOvlLdMax:	displayed value:	maximum permissible (over)load

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