



Dynamic Rating, Monitoring, Control and
Communications

DRMCC-T2

ALARM & TRIP

LOGIC

Revision: 020404



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DRMCC-T2 ALARM & TRIP LOGIC

REVISION HISTORY

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DRMCC-T2 ALARM & TRIP LOGIC

GENERAL ALARM

0.1 General Alarm is activated by any of the 6 high level alarms (Temperature, Voltage, Cooling Fail, Tap Change Fail, Ancillary, DRMCC)

TEMPERATURE ALARMS

LED	UIM MESSAGE	UIM MESSAGE	UIM MESSAGE	DELAY	RESULT OF ALARM	CAUSE	PROPOSED ACTION:
TEMPERATURE ALARM	1.1 TRANSFORMER TEMPERATURE	1.1.1 TOP OIL TEMPERATURE	1.1.2 WINDING TEMPERATURE			Top Oil Max > Top Oil Alm Set point	Check that Oil Pumps & Fans are operating, check Oil Level, Check Transfer Load; check that oil valves are open; Consider dropping load; plan maintenance.
	1.2 TRANSFORMER TEMP. TRIP	1.2.1 TOP OIL TEMP. TRIP		Delayed Trip Time Mins (180 Default)	Transformer Trip Relay will activate (If installed)	Top Oil Temp. Delayed Trip	
				1.2.1.1 TOP OIL DELAYED TEMP. TRIP	Transformer Trip Relay will activate (If installed)		
		1.2.2 HOT SPOT TEMP. TRIP	1.2.2.1 HOT SPOT DELAYED TEMP. TRIP	1.2.2.2 HOT SPOT INSTANT TEMP. TRIP	Delayed Trip Time Mins (180 Default)	Transformer Trip Relay will activate (If installed)	
				Delayed Trip Time Mins (180 Default)	Transformer Trip Relay will activate (If installed)	WTI Instant Trip	

VOLTAGE ALARMS

LED	UIM MESSAGE	UIM MESSAGE	UIM MESSAGE	DELAY	RESULT OF ALARM	CAUSE	PROPOSED ACTION:
VOLTAGE ALARM	2.1 VOLTAGE ALARM	2.1.1 UNDER VOLTAGE		OnDelay1 (8 sec Default)	Inhibits OTLC	Vpu Secondary < Under Voltage Set point	Check system Voltages (primary & secondary load); Check Tap Changer
		2.1.2 OVER VOLTAGE		OnDelay1 (8 sec Default)	Inhibits OTLC raise volts	Vpu Secondary > Over Voltage Set point	Check Supply Load; Check Tap Changer position and operation
		2.1.3 VOLTAGE OUT OF TOLERANCE		OnDelayVLimit		Vpu Secondary Out of Tolerance	Check Tap changer is in operation & not a Top or Bottom Tap
		2.1.4 OLTC NOT IN REMOTE		OnDelay1 (8 sec Default)	Inhibits OTLC	OLTC NOT "Remote"	Check that OLTC SELECTOR SWITCH is in REMOTE POSITION (if not under maintenance or test)
		2.1.5 CONTROL VOLTAGE BAD		OnDelay1 (8 sec Default)	Inhibits OTLC	A value used to calculate the control voltage is bad.	
		2.1.6 NO MASTER PRESENT		OnDelay1 (8 sec Default)	Inhibits OTLC	Cannot find a Master for operations	Follower Ensure that a Master is selected and online.
		2.1.7 MULTIPLE MASTERS PRESENT		OnDelay1 (8 sec Default)	Inhibits OTLC	More than one Master present for operations	Follower Ensure that only one Master is selected.



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COOLING FAIL ALARMS

LED	UIM MESSAGE	UIM MESSAGE	UIM MESSAGE	DELAY	RESULT OF ALARM	CAUSE	PROPOSED ACTION:		
COOLER FAIL ALARM	3.1 COOLING FAIL	3.1.1 PUMP 1 FAIL	3.1.1.1 PUMP 1 CONTACTOR	6 sec	Inhibits Pump 1	Pump 1 Should be ON Pump 1 Contactor is NOT Closed Pump 1 CB NOT Tripped Aux Power has NOT Failed Pump 1 Selected "In Service" Pump 1 Contactor Failure is Unacknowledged	Check electrical system - eg circuit wiring for loose connection, contactor coil failure.		
			3.1.1.2 PUMP 1 CB TRIP	OnDelay2 (5 sec Default)	Inhibits Pump 1	Pump 1 CB Tripped Pump 1 Selected "In Service"	Check cause of Trip e.g. mechanical (pump shaft 'frozen') or electrical (short circuit or overload)		
			3.1.1.3 PUMP 1 NOT IN SERVICE	OnDelay2 (5 sec Default)	Inhibits Pump 1	Pump 1 NOT "In Service" Either: Transformer Load > 0.2 pu or Mode Selected AUTO	Check that PUMP SELECTOR SWITCH is in SERVICE POSITION (if not under maintenance or test)		
			3.1.1.4 PUMP 1 OIL FLOW LOW	OnDelay3 (25 sec Default)	Inhibits Pump 1	Oil Flow Low Pump 1 Contactor Closed Pump 1 CB NOT Tripped Pump 1 Oil Flow Low is Unacknowledged	Check appropriate valves in oil circuit; Check Pump & Motor; consider maintenance history, plan shutdown to service oil coolers		
			3.1.2 PUMP 2 FAIL	Similar upstream logic to that for Pump 1					
			3.1.3 FAN 1 FAIL	3.1.3.1 FAN 1 CONTACTOR	6 sec		Fan 1 Should be ON Fan 1 Contactor is NOT Closed Fan 1 CB NOT Tripped Aux Power has NOT Failed Fan 1 Selected "In Service"	Check electrical system - e.g. circuit wiring for loose connection, contactor coil failure.	
				3.1.3.2 FAN 1 CB TRIP	OnDelay2 (5 sec Default)	Inhibits Fan 1	Fan 1 CB Tripped Fan 1 Selected "In Service"	Check cause of Trip e.g. mechanical (pump shaft 'frozen') or electrical (short circuit or overload)	
				3.1.3.3 FAN 1 NOT IN SERVICE	OnDelay2 (5 sec Default)	Inhibits Fan 1	Fan 1 NOT "In Service" Either: Transformer Load > 0.2 pu or Mode Selected AUTO	Check that FAN SELECTOR SWITCH is in SERVICE POSITION (if not under maintenance or test)	
				3.1.3.4 FAN 1 VS DRIVE 1 FAIL	OnDelay3 (25 sec Default)	Inhibits Fan 1	Fan 1 Contactor Closed Fan 1 Selected "In Service" Fan 1 Var Speed Drive 1 Failure	Check variable speed drive system	
				3.1.3.5 FAN 1 VS DRIVE 2 FAIL	OnDelay3 (25 sec Default)	Inhibits Fan 1	Fan 1 Contactor Closed Fan 1 Selected "In Service" Fan 1 Var Speed Drive 2 Failure	Check variable speed drive system	
	7.1 AUXILIARY POWER FAIL	Similar upstream logic to that for Fan 1							
		OnDelay1 (8 sec Default)	Inhibits OLTC and Cooling	Auxiliary Power/Phase (i.e. 3 Ph power or loss of phase for Transformer Auxiliaries) Switches, Fuses, Circuit Breakers Failure	Auxiliary Power/Phase (i.e. 3 Ph power or loss of phase for Transformer Auxiliaries) Switches, Fuses, Circuit Breakers Failure	Check Power Supply, i.e. Isolators, Switches, Fuses, Circuit Breakers			



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TAP CHANGE FAIL ALARMS

LED	UIM MESSAGE	UIM MESSAGE	UIM MESSAGE	DELAY	RESULT OF ALARM	CAUSE	PROPOSED ACTION:
TC FAIL ALARM	4.1 TAP CHANGER	4.1.1 TC TOO LONG	Inhibits OTLC	OnDelay3 (25 sec Default)	Tap change fails to occur in the specified time period	TC Motor Circuit Breaker Tripped, and TC Tap changer before resetting Circuit Breaker; could be short circuit of motor overload.	
		4.1.2 MOTOR CB TRIP					
		4.1.3 TC OUT OF STEP	Master Inhibits OTLC while not in step		Tap changer out of step alarm - follower mode only		
		4.1.4 CIRCULATING CURRENT			Circulating current has exceeded specified limit.		
		4.1.5 OLTC DIRECTION ERROR	Inhibits OTLC		Tap position reported is in the wrong direction	Check that the wiring is correct and that the DRMCC is configured correctly	
		4.1.6 OLTC STEP ERROR	Inhibits OTLC		Tap position reported is more than one step from previous position.		
		7.1 AUXILIARY POWER FAIL	Inhibits OLTC and Cooling	OnDelay1 (8 sec Default)	Auxiliary Power/Phase (ie 3 Ph power or loss of phase for Transformer Auxiliaries) Failure		



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ANCILLARY ALARMS

LED	UIM MESSAGE	UIM MESSAGE	UIM MESSAGE	DELAY	RESULT OF ALARM	CAUSE	PROPOSED ACTION:
ANCILLARY ALARM	5.1 ANCILLARIES ALARM						
		5.1.1 TC PRESSURE SUREGE			OnDelay1 (8 sec Default)		Check visual Level Gauge & for leaks; plan oil top-up next shutdown
		5.1.2 TAP CHANGER OIL LOW			OnDelay1 (8 sec Default)		Take Gas Sample, Test, Plan Maintenance
		5.1.3 HYDRAN GAS HIGH			OnDelay1 (8 sec Default)		
		5.1.4 HYDRAN GAS HIGH HIGH			OnDelay1 (8 sec Default)		Consiar gas history, advance maintenance plan for shutdown/service
		5.1.5 BUCHHOLZ GAS ALARM			OnDelay1 (8 sec Default)		Review Operating Conditions & Gas Sample
		5.1.6 BUCHHOLZ SURGE TRIP			OnDelay1 (8 sec Default)		
		5.1.7 GAS PRESSURE HIGH			OnDelay1 (8 sec Default)		
		5.1.8 GAS PRESSURE LOW			OnDelay1 (8 sec Default)		
		5.1.9 TX PRESSURE RELIEF DEVICE			OnDelay1 (8 sec Default)		
		5.1.10 TRANSFORMER OIL LOW			OnDelay1 (8 sec Default)		Check visual Level Gauge & for leaks; plan oil top-up next shutdown
		5.1.11 VOLTAGE H OUT OF BALANCE			OnDelay1 (8 sec Default)		Check Load Currents and downstream or upstream system
		5.1.12 VOLTAGE M OUT OF BALANCE			OnDelay1 (8 sec Default)		
		5.1.13 VOLTAGE L OUT OF BALANCE			OnDelay1 (8 sec Default)		
		5.1.14 VOLTAGE B OUT OF BALANCE			OnDelay1 (8 sec Default)		
		5.1.15 CURRENT H OUT OF BALANCE			OnDelay1 (8 sec Default)		Check transformer Load; Action accordingly
		5.1.16 CURRENT M OUT OF BALANCE			OnDelay1 (8 sec Default)		
		5.1.17 CURRENT L OUT OF BALANCE			OnDelay1 (8 sec Default)		
		5.1.18 CURRENT C OUT OF BALANCE			OnDelay1 (8 sec Default)		
	5.1.19 CURRENT B OUT OF BALANCE			OnDelay1 (8 sec Default)			



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LED	UIM MESSAGE	UIM MESSAGE	UIM MESSAGE	DELAY	RESULT OF ALARM	CAUSE	PROPOSED ACTION:
		5.1.20 MISCELLANEOUS ALARM 0		OnDelay1 (8 sec Default)			User Defined Alarm
		5.1.21 MISCELLANEOUS ALARM 1		OnDelay1 (8 sec Default)			
		5.1.22 MISCELLANEOUS ALARM 2		OnDelay1 (8 sec Default)			
		5.1.23 MISCELLANEOUS ALARM 3		OnDelay1 (8 sec Default)			
		5.1.24 MISCELLANEOUS ALARM 4		OnDelay1 (8 sec Default)			
		5.1.25 MISCELLANEOUS ALARM 5		OnDelay1 (8 sec Default)			
		5.1.26 MISCELLANEOUS ALARM 6		OnDelay1 (8 sec Default)			



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DRMCC ALARMS

LED	UIM MESSAGE	UIM MESSAGE	UIM MESSAGE	DELAY	RESULT OF ALARM	CAUSE	PROPOSED ACTION:
DRMCC ALARM	6.1 DRMCC SYSTEM PROBLEM	6.1.1 TRANSDUCER TEMP. AMBIENT	OnDelay1 (8 sec Default)	Range	Ambient Temp Transducer Input	Out of Range	Check displayed quantities in EXTRAScreen, the sensor, and associated circuit/wiring
		6.1.2 TRANSDUCER TEMP. TANK OIL	OnDelay1 (8 sec Default)	Range	Top Oil Temp Transducer Input	Out of Range	
		6.1.3 TRANSDUCER TEMP. FO 1	OnDelay1 (8 sec Default)	Range	FO Winding Temp Transducer Input	Out of Range	
		6.1.4 TRANSDUCER TEMP. FO 2					
		6.1.5 TRANSDUCER TEMP. FO 3					
		6.1.6 TRANSDUCER TEMP. FO 4					
		6.1.7 TRANSDUCER TEMP. UIM	OnDelay1 (8 sec Default)		UIM Temp Transducer Input	Out of Range	
		6.1.8 TRANSDUCER TEMP. SICM2	OnDelay1 (8 sec Default)	Range	SICM2 Temp Transducer Input	Out of Range	
		6.1.9 TRANSDUCER TEMP. SICM3	OnDelay1 (8 sec Default)	Range	SICM3 Temp Transducer Input	Out of Range	
		6.1.10 TRANSDUCER TPI	OnDelay1 (8 sec Default)		TPI Transducer Input	Out of Range	
		6.1.11 TRANSDUCER CURRENT	OnDelay1 (8 sec Default)		Current Transducer Input(s)	Out of Range	
		6.1.11.1 TRANSDUCER CT HV Pha			Inhibits LDC		
		6.1.11.2 TRANSDUCER CT HV Phb					
		6.1.11.3 TRANSDUCER CT HV Phc					
		6.1.11.4 TRANSDUCER CT MV Pha					
		6.1.11.5 TRANSDUCER CT MV Phb					
		6.1.11.6 TRANSDUCER CT MV Phc					
		6.1.11.7 TRANSDUCER CT LV Pha					
		6.1.11.8 TRANSDUCER CT LV Phb					
		6.1.11.9 TRANSDUCER CT LV Phc					
		6.1.11.10 TRANSDUCER CT C Pha					
		6.1.11.11 TRANSDUCER CT C Phb					
		6.1.11.12 TRANSDUCER CT C Phc					
		6.1.11.13 TRANSDUCER CT BV Pha					
		6.1.11.14 TRANSDUCER CT BV Phb					
		6.1.11.15 TRANSDUCER CT BV Phc					
		6.1.12.1 TRANSDUCER VT HV Pha	OnDelay1 (8 sec Default)		Voltage Transducer Input(s)	Out of Range	
		6.1.12.2 TRANSDUCER VT HV Phb					
		6.1.12.3 TRANSDUCER VT HV Phc			Inhibits AVR		
		6.1.12.4 TRANSDUCER VT MV Pha					
		6.1.12.5 TRANSDUCER VT MV Phb					
		6.1.12.6 TRANSDUCER VT MV Phc					
		6.1.12.7 TRANSDUCER VT LV Pha					
		6.1.12.8 TRANSDUCER VT LV Phb					
		6.1.12.9 TRANSDUCER VT LV Phc					
		6.1.12.10 TRANSDUCER VT BV Pha					
		6.1.12.11 TRANSDUCER VT BV Phb					
		6.1.12.12 TRANSDUCER VT BV Phc					



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LED	UIM MESSAGE	UIM MESSAGE	UIM MESSAGE	DELAY	RESULT OF ALARM	CAUSE	PROPOSED ACTION:
		6.1.13 TRANSDUCER Watts HV		OnDelay1 (8 sec Default)	Inhibits LDC	WATTS Transducer Input Out of Range	
		6.1.14 TRANSDUCER Watts MV					
		6.1.15 TRANSDUCER Watts LV					
		6.1.16 TRANSDUCER Watts BV					
		6.1.17 TRANSDUCER VArS HV				VARS Transducer Input Out of Range	
		6.1.18 TRANSDUCER VArS MV					
		6.1.19 TRANSDUCER VArS LV					
		6.1.20 TRANSDUCER VArS BV					
		6.1.21 TRANSDUCER FREQUENCY		OnDelay1 (8 sec Default)		Frequency Transducer Input Out of Range	
		6.1.22 TRANSDUCER HYDROGEN		OnDelay1 (8 sec Default)		Hydrogen Transducer Input Out of Range	
		6.1.23 TRANSDUCER ACETYLENE		OnDelay1 (8 sec Default)		Acetylene Transducer Input Out of Range	
		6.1.24 TRANSDUCER MOISTURE		OnDelay1 (8 sec Default)		Moisture Transducer Input Out of Range	
		6.1.25 TRANSDUCER TEMP. COOLER TOP OIL		OnDelay1 (8 sec Default)		Cooler Top Oil Transducer Input Out of Range	
		6.1.26 TRANSDUCER TEMP. COOLER BOT OIL		OnDelay1 (8 sec Default)		Cooler Bottom Oil Transducer Input Out of Range	
		6.1.27 HYDRAN FAIL		OnDelay1 (8 sec Default)		Hydran Unit Failure	Check / plan replace unit
		6.1.28 UIM TEMP. HIGH				UIM Temperature > 75.0 deg C	
		6.1.29 SICM2B TEMP. HIGH				SICM2 Temperature > 75.0 deg C	
		6.1.30 SICM3B TEMP. HIGH				SICM3 Temperature > 75.0 deg C	
		6.1.31 DNP COMMS FAULT		OnDelay1 (8 sec Default)		No Communications to DNP	
		6.1.32 MODBUS COMMS FAULT		11 sec		Modbus error count is rapidly increasing	Check communications link between UIM and Modbus slaves.
		6.1.33 UIM SELF TEST FAIL				Unavailable	
		6.1.34 UIM RTC BATTERY LOW		OnDelay1 (8 sec Default)		UIM	Advance maintenance plan for shutdown/service and replace battery
		6.1.35 PARALLEL COMS LINK FAIL		11 sec		The communications link between UIMs is reporting erroneous values	Check communications link between UIM master and followers.
		6.1.36 FAIL SAFE MODE ACTIVE		0		DRMCC unable to control the cooling, can be caused by mechanical or software failure	
		7.1 AUXILIARY POWER FAIL		OnDelay1 (8 sec Default)		Auxiliary Power/Phase (ie 3 Ph power or loss of phase for Transformer Auxiliaries) Failure	