DALMIA CEMENT (B) LIMITED – CEMENT PLANT ARIYALUR ELECTRICAL MANUAL			
Issue No:02	**Rev. No: 00**	**Effective Date: 01.11.2019**	**SOP/Elect /054**
Issued By:		**Approved By: HOD - ELECTRICAL**	
SOP for Setting of vector surge relay MRN - 3			

Scope : SOP for MRN 3-1-1 DM Relay

Responsibility : Electrical section Technician / Section Engineer

Accountability : Electrical Section Head

PPE:

1. Safety Helmet.
2. Safety Shoe.
3. Goggle.

TOOLS:

1. MRN 3-1-1 DM Relay Manual.

Hazard Analysis:

Risk associated:	**Mitigation Measures**
Flash Over of Panel	Use of Safety Harness
Effect of Shock	Suitable Electrical Insulated glove
Effect of Eye Irritation	Use of goggles

Parameter Available in the MRN 3-1-1 DM Relay

Parameters:

Green LED - L1,L2,L3,f,Δθ,min,max,RS,FR,
Green LED - U<,U<<,U>,U>>,Fn,f1,f2,f3,1/3,
RED LED - tU<,tU<<,tU>,tU>>,T,tf1,tf2,tf3,Δθ

Function:

set/reset,
-,+,
enter, trip

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Display &Setting

Function	Display shows	Pressed pushbutton	Corresponding LED	Type of relay
Normal operation	CSE			all types
Measured operating values	Actual measured value Min. and max. values of voltage, frequency and vector surge	<SELECT/RESET> one time for each value	L1, L2, L3, f, min, max ΔΘ df	MRN3-1 MRN3-2
Transformer ratio of the CT's	(SEK) 1.01-6500=prim	<SELECT/RESET><+><->	L1, L2, L3	
Setting values: star/delta connection	Y/DELT	<SELECT/RESET><+><->	Δ/Y	
Parameter switch/ext. Trigger for FR	SET1, SET2, B_S2, R_S2, B_FR, R_FR, S2_FR	<SELECT/RESET><+><->	P2	
Switch-over LED flash No LED flash	FLSH NOFL	<SELECT/RESET><+><->		
undervoltage (low set) tripping delay of low set element undervoltage (high set) tripping delay of high set element overvoltage (low set) tripping delay of low set element overvoltage (high set) tripping delay of high set element rated frequency frequencymeasuringrepitition frequency element f1 tripping delay of frequency element f1 frequency element f2 tripping delay of frequency element f2 frequency element f3 tripping delay of frequency element f3 1-of-3/3-of-3 measurement threshold for vector surge setting value df/dt measuring repitition df/dt	setting value in volt setting value in seconds	<SELECT/RESET><+><-> one time for each value	U< $t_{U<}$	
	setting value in volt setting value in seconds	<SELECT/RESET><+><-> one time for each value	U<< $t_{U<<}$	
	setting value in volt setting value in seconds	<SELECT/RESET><+><-> one time for each value	U> $t_{U>}$	
	setting value in volt setting value in seconds	<SELECT/RESET><+><-> one time for each value	U>> $t_{U>>}$	
	setting value in Hz	<SELECT/RESET><+><->	f_N	
	setting value	<SELECT/RESET><+><->	T	
	setting value in Hz setting value in seconds	<SELECT/RESET><+><-> one time for each value	f_1 t_{f1}	
	setting value in Hz setting value in seconds	<SELECT/RESET><+><-> one time for each value	f_2 t_{f2}	
	setting value in Hz setting value in seconds	<SELECT/RESET><+><-> one time for each value	f_3 t_{f3}	
	1Ph/3Ph	<SELECT/RESET><+><->	1/3	MRN3-1
	setting value in degree	<SELECT/RESET><+><->	ΔΘ	MRN3-1
	setting value in Hz/s setting value in periods	<SELECT/RESET><+><-> one time for each value	df dt	MRN3-2

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Blocking	EXIT	<+> until max. setting value	LED of blocked parameter	
Under voltage blocking of frequency and vector surge meas- uring (df/dt for *MRN3-2*)	setting value in Volt	<SELECT/RESET><+><->	f, ΔΘ, df	
Slave address of serial interface	1 - 32	<SELECT/RESET><+><->	RS	
Baud-Rate1)	1200-9600	<SELECT/RESET><+><->	RS	
Parity-Check 1)	even odd no	<SELECT/RESET><+><->	RS	
Recorded fault data: star—connection: U1, U2, U3 delta-connection: U12, U23, U31 frequency rate of change of frequency vector surge	tripping values in Volt	<SELECT/RESET><+><-> one time for each phase	L1, L2, L3, U<, U<<, U>, U>>	
	tripping values in Volt	<SELECT/RESET><+><-> one time for each phase	L1, L2, L3 U<, U<<, U>, U>>	
	tripping values in Hz	<SELECT/RESET><+><-> one time for each phase	f, f1, f2, f3	
	tripping value in Hz/s	<SELECT/RESET><+><->	df	MRN3-2
	tripping value in degree	<SELECT/RESET><+><-> one time for each phase	ΔΘ+L1,L2 or L3	MRN3-1
Delete failure memory	wait	<-><SELECT/RESET>		
Enquiry failure memory	FLT1; FLT2....	<+><->	L1, L2, L3, U< U<<, U>, U>> f, Δδφ/δτ, ΔΘ	
Save parameter?	SAV?	<ENTER>		
Save parameter!	SAV!	<ENTER> for about 3 s		

Function	Display shows	Pressed pushbutton	Corresponding LED	Type of relay
Trigger signal for the fault recorder	TEST, P_UP, A_PI, TRIP	<SELECT/RESET><+><->	FR	
Number of fault occurrences	S=2, S=4, S=8	<SELECT/RESET><+><->	FR	
Display of date and time	Y=99, M=10, D=1, h=12, m=2, s=12	<SELECT/RESET><+><->		
Software version	First part (e.g. D02-) Sec. part (e.g. 6.01)	<TRIP> one time for each part		
Manual trip	TRI?	<TRIP> three times		
Inquire password	PSW?	<SELECT/RESET>/ <+>/<->/<ENTER>		
Relay tripped	TRIP	<TRIP> or fault tripping		

Secret password input	XXXX	<SELECT/RESET>/ <+>/<->/<ENTER>		
System reset	CSE	<SELECT/RESET> for about 3 s		

Emergency Shut- off:

If any injury is there, give First aid and inform to the Safety department or Call Emergency number 3108/9865152222/9750963761

Records/Annexure:

JOB SAFETY ANALYSIS :(JSA)

Job Safety Analysis	Job: Parameter selection of tri vector meter	Date: 20 - 5 – 2013	Analysis by: SE	Reviewed by: SH
Title of employee doing job: Engineer	Supervisor: Sec.Engr	Department: Electrical	Section: MISS	Approved by: HOD
Reqd./recommended PPE: Safety Shoe, Safety Helmet, Goggle.				
Sequence of Basic Job Steps	**Potential Hazards**	**Recommended Safe Job Procedure**	**What Could Go Wrong**	**Corrective Action**
Identification of Tri Vector Meter	Trip of Power due to wrong selection of Meter.	Cross check with Display which is Displayed	Fail to Cross check the Meter Display not Available	Ensure the SOP to Followed Once in the Year Cross check the Displays.