CURRENT MONITORING RELAY SERIES CMR

TECHNICAL SPECIFICATIONS:

Product:	Three Phase		Single Phase	
	P1, P2, P3, P4, P5, P6,P7, P8	P9, P10, P11, P12	P13, P14, P15, P16	P17, P18, P19, P20
Supply Characteristics:				
Auxiliary Supply	220 to 415 VAC, -20 % to +15 %, 50 / 60 Hz		110 to 240 VAC, -20 % to +10 %, 50 / 60 Hz	
Power Consumption (Max.)	12 VA (approx.)		5 VA (approx.)	
LED Indication:				
Power ON (ON) / Lock Out (Blink)	Green LED ON / Green LED Blink			
Over Load (OL)	OL LED ON			
Under Load (UL)	UL LED ON			
*Phase REV.	LED ON:Phase Reverse/Blink: Imbalance (Red LED 3)		N.A.	
Phase UNB/Loss	BLINK: UNB LED		N.A.	
Relay Output Characteristics:				
Contact Arrangement & Rating	1 C/O (Fail Safe Operation) 5A @ 240 VAC			
Utilization Category AC-15 Ue Rated Voltage V Ie Rated Current I	120 / 240 V 3.0 / 1.5 A			
Mechanical Life Expectancy	1 X 10^7 Operations			
Electrical Life Expectancy	1 X 10^5 Operations @ Rated Load			
Contact Material	Ag alloy			
Feature Characteristics:				
Number Of CTs	2		1	
Trip Characteristics:	**Inverse Time**	**Definite Time**	**Inverse Time**	**Definite Time**
Thermal Memory	Yes	N.A.	Yes	N.A.
Trip Class (IEC 60255-08)	10 A, 10, 20, & 30	N.A.	5, 10, 20, & 30	N.A.
Start Time	N.A.	0.2 to 30 s	N.A.	0.2 to 30 s
Trip Delay	As per trip class	0.2 to 10 s	As per trip class	0.2 to 10 s
Under Load Protection	40% to 90% (Trip Time:5 s +/-1 s)	50% (Trip Time:5 s +/-1 s)	40% to 90% (Trip Time:5 s +/-1 s)	50% (Trip Time:5 s +/-1 s)
Locked Rotor Protection	400% of the Set Value Trip Time:< 4 s after starting	N.A.	400% of the Set Value Trip Time: < 4 s after starting	N.A.
Current Imbalance Protection	> 50% Imbalance and 70% load condition (Trip Time < 5 s)		N.A.	
Phase Loss Protection	> 70% Imbalance and 70% load condition (Trip Time < 3 s)		N.A.	
*Phase Reverse Protection Delay	100 ms approx.		N.A.	
Reset Mode – Auto	Class 10A=3 min; Class 10=6 min; Class 20=12 min; Class 30=15 min.	6 min	Class 5=3 min; Class 10=6 min; Class 20=12 min; Class 30=15 min.	6 min
Reset Mode – Manual	2 s +/- 1 s			
Lock Out (Restarts allowed/Hour)	For Class 10A, 10=6; Class20,30=4	6 restarts	For Class 5A, 10=6; Class20,30=4	6 restarts applicable per hour
Reset Time	120 ms to 400 ms		60 ms to 700 ms	
Terminals Details	L1,L3,15,16,18		L, N, 15, 16, 18	

Common Characteristics:	
Test Function	Applicable
Setting Accuracy	+/-5 %
Repeat Accuracy	+/-2 %
On Delay	800 ms +/- 50 ms
Pollution degree	Type II
Dimensions in mm (W X H X D)	110.8 X 36.5 X 76.8
Mounting	Base Mounting
Weight Approx. (Packed)	200 gm
Degree of Protection**	IP-20
Operating Position	Any
Maximum Operating Altitude	2000 m
Operating Temperature	-10° C to + 60° C
Storage Temperature	-25° C to + 70° C
Relative Humidity	5 to 95% Rh (without condensation)
Size Of Wire passing Through CT	16 mm^2 Max.
Screw Size for Mounting	M4 x 20 mm Cheese Head Screw (Blue Zinc Passivation), 2 No's
Conformity to standards:	
Product Certification	CE
EMC:	
Harmonic Current Emission	IEC 61000-3-2 Ed. 3.2 (2009-04) Class A
ESD	IEC 61000-4-2 Ed. 2.0 (2008-12) Level II
Radiated Susceptibility	IEC 61000-4-3 Ed. 3.2 (2010-04) Level III
Electrical Fast Transients	IEC 61000-4-4 Ed. 3.0 (2012-04) Level IV
Surge	IEC 61000-4-5 Ed. 2.0 (2005-11) Level IV
Conducted Susceptibility	IEC 61000-4-6 Ed. 3.0 (2008-10) Level III
Voltage Dips and interruptions	IEC 61000-4-11 Ed. 2.0 (2004-03) For Class A
Power Frequency Magnetic Field	IEC 61000-4-8 Ed. 2.0 (2009-09) Level IV
Voltage Flickers & Fluctuations	IEC 61000-3-3 Ed. 3.0 (2013-05) Class A
Conducted Emission	CISPR 14-1 Ed. 5.2 (2011-11) Class A
Radiated Emission	CISPR 14-1 Ed. 5.2 (2011-11) Class A

*Phase Reverse not applicable to 17A122OB0,222OB0,322OB0 & 422OB0 products. **Note: For products 15-45A range, IP protection is not applicable.

Product:	IEC 60255-08	
Environmental Testing Std:		
Vibration	IEC 60068-2-6	Ed. 7.0 (2007-12) 5 g
Cold Heat	IEC 60068-2-1	Ed. 6.0 (2007-03)
Dry Heat	IEC 60068-2-2	Ed. 5.0 (2007-07)
Repetitive Shock	IEC 60068-2-27	Ed. 4.0 (2008-02), 40 g, 6 ms
Non Repetitive Shock	IEC 60068-2-27	Ed. 4.0 (2008-02), 30 g, 15ms
Safety Std:		
Test Voltage between I/P and O/P	IEC 60947-5-1	Ed. 3.0 (2003-11) 2 kV
Impulse Voltage between I/P & O/P	IEC 60947-5-1	Ed. 3.0 (2003-11) 2 kV
Test Voltage between all Terminal & Enclosure	IEC 60947-5-1	Ed. 3.0 (2003-11) 4 kV
Single Fault	IEC 61010-1	Ed. 3.0 (2010-06)
Insulation Resistance	UL 508	Ed. 17 (1999-01) >50k Ω
Leakage Current	UL 508	Ed. 17 (1999-01) <3.5 mA

CAUTION:

1. Always follow instructions stated in this product leaflet.
2. Before installation, check to ensure that specifications agree with the intended application.
3. Installation to be done by skilled electrician.
4. Suitable dampers should be provided in the event of excessive vibrations during installation.
5. Automation and control devices must be installed so that They are protected against any risk of involuntary Actuation.
6. While using the device with Star Delta Starter, configure the Full Load Motor Current as per the current in Delta mode.

Three Phase Products

Inverse Cat. No.		Definite Cat. No.		Current
P1	17A122CB0	**P9**	17B122AA0	3 A to 9 A
P2	17A222CB0	**P10**	17B222AA0	8 A to 24 A
P3	17A322CB0	**P11**	17B322AA0	15 A to 45 A
P4	17A422CB0	**P12**	17B422AA0	2 A to 5 A
P5	17A122OB0			3 A to 9 A
P6	17A222OB0			8 A to 24 A
P7	17A322OB0			15 A to 45 A
P8	17A422OB0			2 A to 5 A

Single Phase Products

Inverse Cat. No.		Definite Cat. No.		Current
P13	17C112EB0	**P17**	17D112DA0	3 A to 9 A
P14	17C212EB0	**P18**	17D212DA0	8 A to 24 A
P15	17C312EB0	**P19**	17D312DA0	15 A to 45 A
P16	17C412EB0	**P20**	17D412DA0	2 A to 5 A

2 A to 5 A Product can be used with External CT.

Main Features:

- Overload Protection
- Auto/Manual Reset Selection
- LED Indications for all failure conditions
- Fail-Safe Protection
- Phase Imbalance Protection
- Phase Loss Protection
- Phase Reverse Protection
- Wide Range of Current Adjustment (1 A to 45 A)
- Base Mounting
- Easy to Install
- Compact Size
- Test Feature

Inverse Time:	**Definite Time:**
Selectable Under Load Protection Selectable Locked Rotor Protection Selectable Trip Class	Under Load Protection Selectable Start Time and Trip Time

Functional Description:

Under Load Protection:
Under Load protection is provided by undercurrent trip. It is suitable for small pumps to avoid dry running, cavitations, etc.

Phase Imbalance Protection

Phase Loss Protection:
Negative sequence current due to phase imbalance or phase loss may damage rotor winding. Relay gives excellent protection for Phase imbalance or phase loss.

Phase Reverse Protection:
Relay detects the phase reversal during starting only. For this feature motor start duration should be more than 0.1 seconds.

RESET :

Auto:
In case of Auto reset mode, relay resets within 3 min to 15 min (as per selected class), after trip in case of 3-phase or Single phase Inverse trip products and within 6 min or 20 sec (as per product specs),after trip in case of Definite trip products.

Manual:
For all trips relay can be reset immediately. For manual reset press reset switch For 2 seconds.

Terminal Details :

ø 3.5 mm	0.45 N.m (4 Lb.in) Terminal screw - M2.6
	1 X 0.2 ....4 mm^2 Rigid Wire (Without wire protection) 1 X 0.2 ....2.5 mm^2 (With wire protection)
AWG	1 X 22 to 12

NOTE: Product innovation being a continuous process, we reserve right to alter specifications without prior notice.

17LL001_11

Current Monitoring Relay Series CMR

Functional Description:

Inverse Time:

•Overload protection:

Relay implements the thermal image of the motor during heating and cooling periods. If the motor current exceeds 1.11 times the set value of the current, relay trips the motor as soon as the value of thermal capacity exceeds threshold value.

Locked Rotor Protection:

Protects motor from locked rotor conditions if load current exceeds by greater than 400% of set nominal current within 4 sec due to mechanical fault or due to high inertia load.

Test Function:

This function can be used to check the trip of the relay. For test sequence press and hold the TEST switch for 5 sec during this time all LEDs glows ON. After relay trip 'UNB' LED starts Blinking for Three Phase products & 'OL' LED ON for 1PH products.Press Reset switch for 2 sec. to come out of Test function.

Definite Time:

• Overload Protection:

1) Relay trips if the motor current exceeds 1.11 times set value of the current for duration of set trip time for runtime 'OL' fault.
2) If 'OL' fault occurs at motor start up, relay trips after the current exceeds 1.11 times of set nominal current, by taking start time plus trip time.

• Test Function:

This function can be used to check the trip time of the relay. For test sequence press and hold the TEST switch for 5 sec. Relay trips after completion of set values of start time and trip time. During test, 'UL' & 'OL' LED's become ON. After relay trip, 'OL' LED remains ON. Press Reset switch for 2 sec. to come out of Test function.

NOTE:

For '1A' current, use 3A to 9A range product with 3-wire turns through the Ct's and select 3A range of nominal current. OR

For '1A' current, use 2A to 5A range product with 2-wire turns through the Ct's and select 2A range of nominal current.

Lock Out:

In Auto Reset mode of operation Lockout feature enables to restrict number of restarts of motor per hour in case of continuous fault persistence. once the number of restarts in an hour exceeds the given limit device enter into Lockout mode in which relay will not turn on unless device is powered off and on.

EXTERNAL CT INTERFACE:

In case of nominal current setting range requirement is higher than 45A, then model with 2 to 5 A current range setting should be used with external CT interface as shown in connection diagram.

Note:-Always use external CT having secondary rating 5A.

e.g.:-In case of external CT with ratio 100:5 is to be used then nominal current setting knob can be aligned at 40%, 50%, 60%, 70%, 80% 90% & 100% of rated primary current.

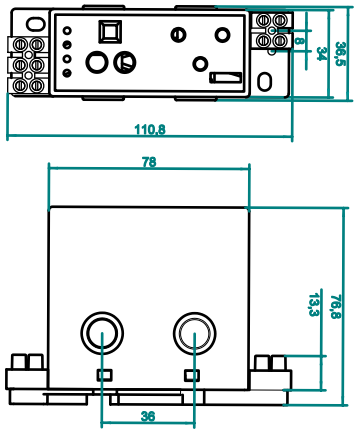
External CT with following ratios can also be used:- 50:5, 200:5.

Crest Factor:

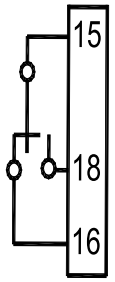
For pure sine wave, the crest factor is 1.414, hence for 8 times current, the peak value will be 1.414 X 8 X full scale RMS current.

As the sampling rate is 2kHz, phase reverse detection is not possible for 90 degree angle.

Overall Dimensions for Product with Terminal:



Relay Connection Diagram:



Connection for Terminal based products: Input connection between L1 & L3
Relay out put : 15, 16, 18

MODE Selection:

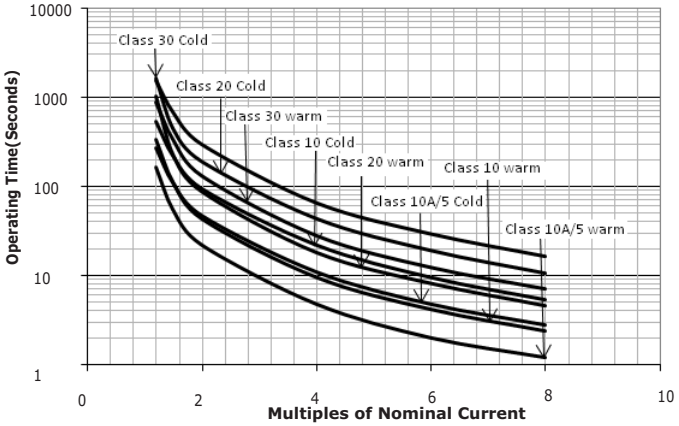
Two position DIP slide switch has been provided on the front facial of the product. By using these switches following protection / modes can be made On and OFF.

1) Auto Reset mode.
2) Locked Rotor Protection (for Inverse Time products)
3) Underload Protection mode (for Definite Time products)

AUTO Reset mode = OFF (Manual ON)
LOCKED Rotor Protection = OFF
Under Load Protection = OFF

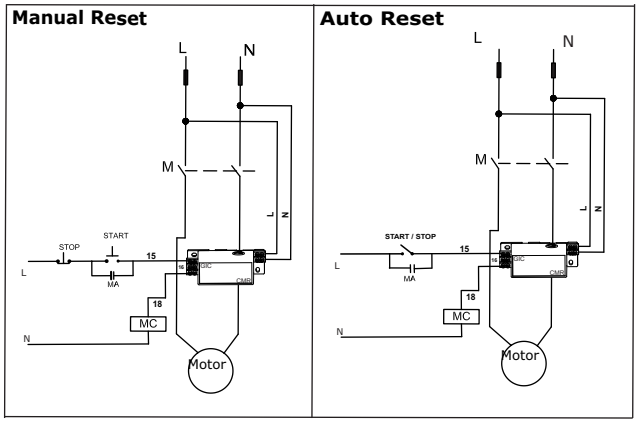
AUTO Reset mode = ON
LOCKED Rotor Protection = ON
Under Load Protection = ON

INVERSE TRIP CHARACTERISTIC CURVES:

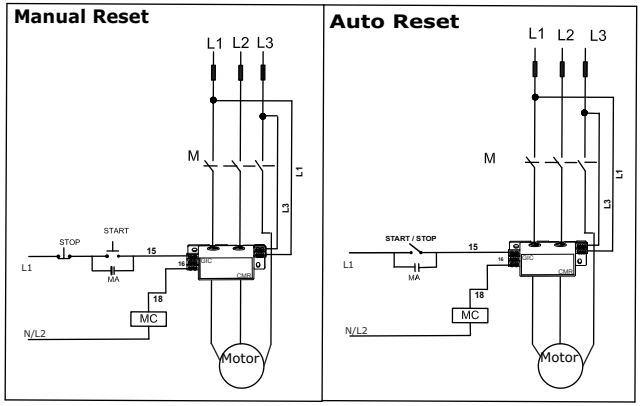


Warm Curve: Pre loading at 90% of load according to IEC 60255 - 08

Connection Diagram for Single Phase

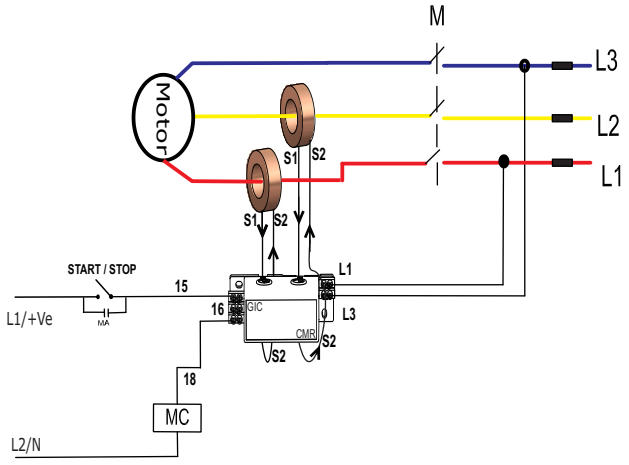


Connection Diagram for Three Phase:



MA = AUXILLIARY SUPPLY MC = AUXILLIARY CONTACT

Connection Diagram for External CT interface:



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