INSTALLATION INSTRUCTION FOR D2 MPR2

INTRODUCTION

It's the company's pleasure to enlist you as one of our esteemed customers. Thank you for selecting & purchasing Minilec make phase failure & Reversal + Dry run + Over load + Under & Over voltage cutout relay D2 MPR2.

The following installation instructions would guide you in installing D2 MPR2 and making the best use of it.

D2 MPR2 is operating on negative sequence current component sensing principle for phase failure protection & sensing motor current for overload protection & dry run protection,& operating on IEEE / NEEMA standard method for voltage unbalance detection.

It offers protection against :

- Overloading condition.
- Unbalanced Voltage & current condition.
- Phase failure condition. / Phase reversal condition.
- Dry running condition .
- Under & Over voltage condition

Being current operated it is to be used with Minilec make current sensors CTS only. Refer selection chart for CTS. Your D2 MPR2 is an auxiliary relay & is to be used along with the motor starter only. The effective working of D2 MPR2 will depend on efficient working of the electromagnetic motor starter. Before installing your D2 MPR2 check whether the motor starter is operating perfectly by starting the motor with the "START" push button and switching it off by "STOP" push button . If the motor does not "START" or "STOP" on respective operations the starter needs to be serviced. **Do not install D2 MPR2 with faulty motor starter.**

TRIP SETTING, TRIP DELAY & RESETTING

The D2 MPR2 is factory set to trip the starter for unbalanced currents between any two phases exceeding 50 % of full load currents (F.L.C). The trip time delay is between 4.0 ± 1.0 secs. In D2 MPR2, fixed inverse time characteristic (IDMTL) of 2 sec is provided. For other characteristics user has to specify while ordering. Depending upon the percentage of excess load on the motor above 100% rated load, the D2 MPR2 decides the trip time delay as per inverse time current characteristics. (Ref. Fig 8 for typical inverse time current characteristic chart). In D2 MPR2, fixed Dry run setting facility of 50 % of full load currents (F.L.C) is given.The Dry Run Trip Time Delay is between 4.0 ± 1.0 sec. D2 MPR2 model offers a delayed Auto reset facility. The time delay is factory set for 15 min ± 10 sec. This time delayed resetting function can be bypassed depressing the externally connected Remote reset push button between terminals 11 & 12.

MOUNTING

D2 MPR2 unit & CTS are RAIL mounted or PANEL mounted . They are suitable for 35 mm RAIL (For Panel mounting & Drilling details see Fig. 3 &4).

CAUTION

1. Ensure that your D2 MPR2 is

- Not installed near any heat sources like Burner, Sunlight, Electric Arc etc.
- Not subjected to Abnormal Vibrations.
- Not subjected to direct Rains, Stormy wind & Dust
- Installed as near to the starter as possible.

2. D2 MPR2 with AUTO RESET mode should not be used with Fully automatic reset starter.

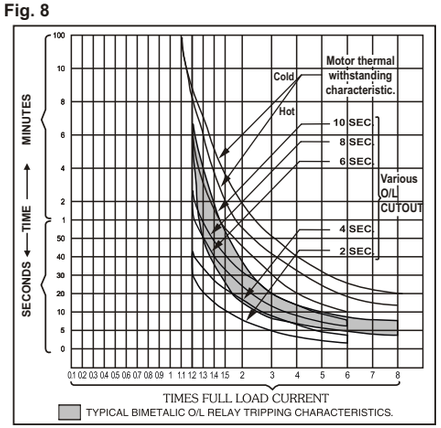
ELECTRICAL CONNECTIONS OF D2 MPR2

See Fig.6 for electrical connection details of D2 MPR2. Connect Auxiliary Supply Voltage at terminals 7 & 8 as marked on front cover plate of the unit. Connect the output of CTS at A, B, C to terminals 1, 2, 3 of D2 MPR2 respectively, Connect L1, L2 & L3 phases at terminal 4, 5 & 6 respectively. The output relay contacts 13 & 14 are to be connected in series with the no volt coil of the contactor.

NOTE: For motors above 75 H. P. D2 MPR2 can be used with CTS 5, CTS 1.25 along with external 5 amp. or 1 amp. Secondary CT (Ref. Fig. 5). CTS 20 / CTS 40 / CTS 80 / CTS 120 pair has feed through type construction. Power cables for two phases R & B are to be passed through it for CTS 20 / CTS 40 / CTS 80 (Ref. Fig. 2). But for CTS 1.25 / CTS 2.5 / CTS 5 / CTS 10 the incoming / outgoing power cables (Secondary of 5 A or 1A CTS) for R & B phases are to be terminated on the CTS (Ref. Fig. 1). For CTS 120, R & B phase CTS are enclosed in two different enclosures. Power cables for two phases R & B are to be passed through respective CTS separately (Ref. Fig. 7).

INVERSE TIME CHARACTERISTICS (IDMTL) GRAPH

Fig. 8



TECHNICAL SPECIFICATIONS OF D2 MPR2

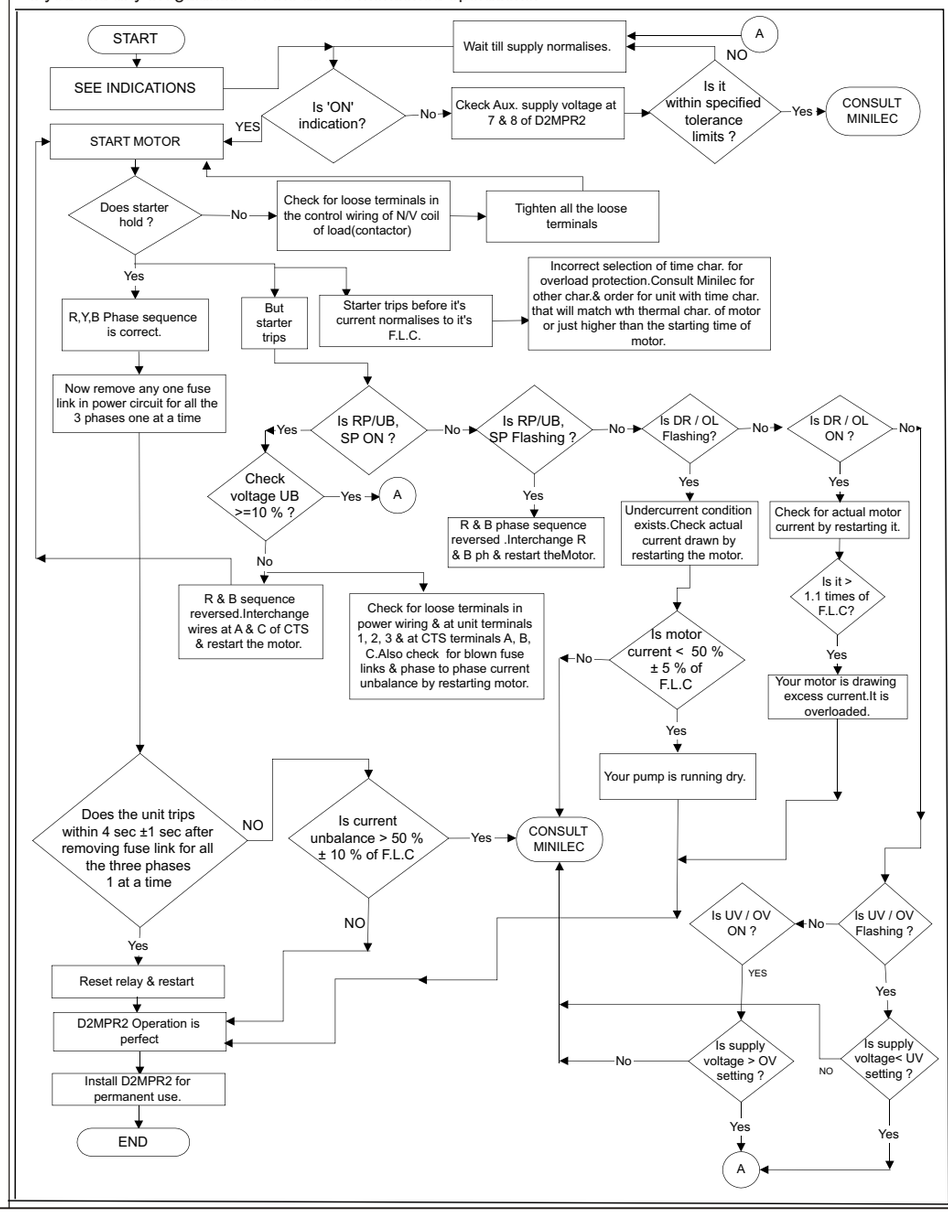
1. **System Supply :** 380 - 440 VAC ± 20 %.
   Aux. Supply : 380-440 / 220 -240 /100-120 VAC± 20 %.
2. **Frequency :** 48 Hz - 63 Hz..
3. **Power Consumption :** 5 VA max.
4. **Output Relay Contacts :** 2 Changeover
5. **Output Contact Rating** [Resistive] **:** 5A, 240 VAC.
6. **Life Expectancy :** 0.5 x10^6 operations at 100% rating.
7. **Current UB trip setting :** 50 % of Motor current [Fixed]
8. **Under current setting :** 50 % set current [Fixed]
9. **Current setting [FLC] : 0.4 to 1.0 of CTS Imax[40 % to 100 % of CTS Imax]**
10. **Overload Trip time setting :**As per IDMTL char [2SEC]
11. **Voltage UB trip setting :** 10 % ± 1% as per IEEE Method [Fixed]
12. **Under Voltage Trip setting :** - 20 % of System supply
13. **Over Voltage Trip setting :** + 20 % of System supply
14. **Set Accuracy :**
    For UV & OV : ± 2 % of set value
    For others : ± 5 % of set value
15. **Trip Time Delay :**
    - **Phase Failure :** 4 Sec ± 1 Sec
    - **Current & voltage UB :** 4 Sec ± 1 Sec
    - **Dry Running :** 4 Sec ± 1 Sec
    - **Overloading :** As per IDMTL CHAR.
    - **Under & Over voltage :** 4 Sec ± 1 Sec
    - **Phase Reversal : Less than 2 sec**
16. **Resetting :** Delayed Auto Reset [15 Min] or Manual [Remotely wired] With NO Push Button.
17. **Indications :**
    1. ON : Power On
    2. RP / SP,UB : Flashing - Phase Reversal/ Steady ON - Unbalance Phase Failure
    3. DR / OL : Flashing - Dry Run(No Load)/ Steady ON - Over load
    4. UV/ OV : Flashing - Under Voltage/ Steady ON - Over Voltage
18. **Operating Condition :**
    Temperature : -5°C to 60 °C
    Humidity : Up to 95% R. H.
19. **Enclosure :** ABS
20. **Unit Weight :** 460 gms (approx)
21. **Sensor Weight :** (gms)
    225 (For CTS 1.25 / CTS 2.5)
    320(For CTS 5 / CTS 10 / CTS 20 / CTS 40)
    330 (For CTS 80) & 380 (For CTS 120 pair)

SELECTION CHART FOR CTS TO USE WITH D2 MPR2 (for 415 VAC, 50 / 60 Hz 3 phase)

CURRENT RANGE			MODEL
HP From - To	KW From - To	FULL LOAD AMPS RANGES	CURRENT SENSORS
0.30 - 0.75	0.22 - 0.56	0.5 to 1.25 AMPS	CTS 1.25
0.75 - 1.75	0.56 - 1.31	1to 2.5 AMPS	CTS 2.5
1.75 - 3.00	1.30 - 2.25	2 to 5 AMPS	CTS 05
3.00 - 6.00	2.20 - 4.50	4 to 10 AMPS	CTS 10
6.00 -12.50	4.50 -9.40	8 to 20 AMPS	CTS 20
12.50 - 30.0	9.40 - 22.50	16 to 40 AMPS	CTS 40
30.0 - 60.0	22.5 - 45.0	32 to 80 AMPS	CTS 80
40.0 - 75.0	30.0 - 56.25	48 to 120 AMPS	CTS 120

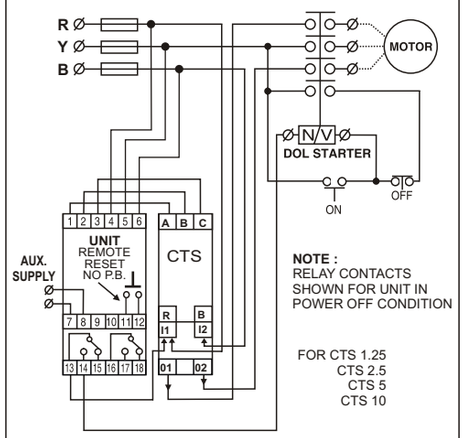
TESTING PROCEDURE

TESTING : If you need to test the functioning of D2 MPR2 without connecting it in the control circuit of the motor starter, check it as per the following procedure. Connect required auxiliary supply at terminals 7 & 8 of the unit. Check the output relay contacts at 13 & 14. Indication 'ON' should be ON. After making the electrical connections as per connection diagram, functioning of the unit can be checked as per flow chart given below. Consult MINILEC if you find any irregularities in the above mentioned operations.



ELECTRICAL CONNECTION IN POWER AND CONTROL WIRING

Fig. 1



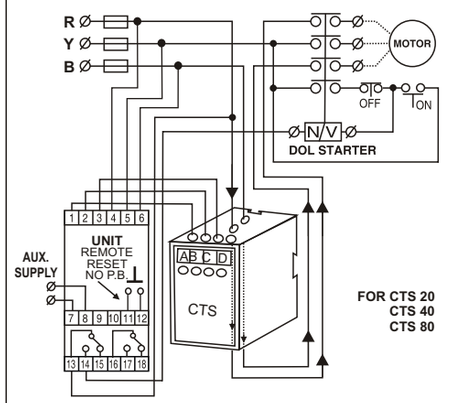
NOTE :
RELAY CONTACTS SHOWN FOR UNIT IN POWER OFF CONDITION

FOR CTS 1.25
CTS 2.5
CTS 5
CTS 10

Refer Fig. 6 (CONNECTION DIAGRAM) for TERMINAL DETAILS of respective unit. Other details are also given in the same.

ELECTRICAL CONNECTION IN POWER AND CONTROL WIRING

Fig. 2



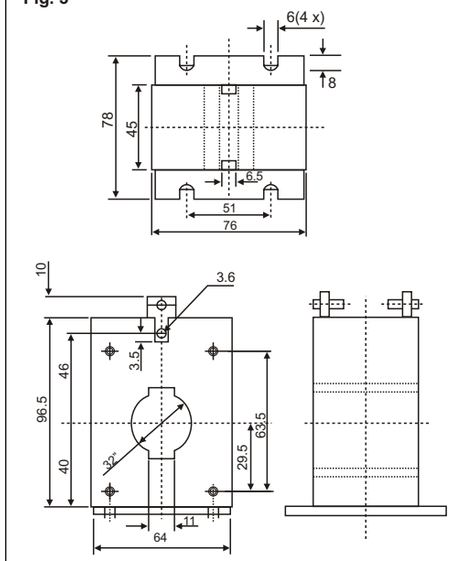
FOR CTS 20
CTS 40
CTS 80

NOTE :
RELAY CONTACTS SHOWN FOR UNIT IN POWER OFF CONDITION

Refer Fig. 6 (CONNECTION DIAGRAM) for TERMINAL DETAILS of respective unit. Other details are also given in the same.

MOUNTING DIMENSIONS

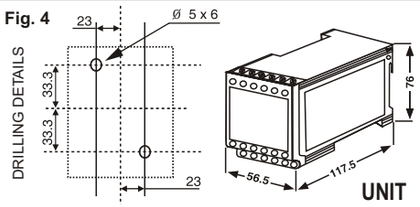
Fig. 3

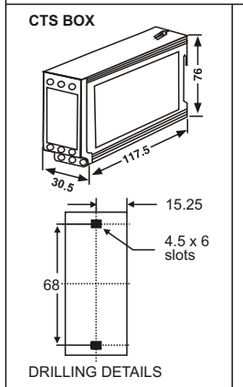


(FOR CTS 120)

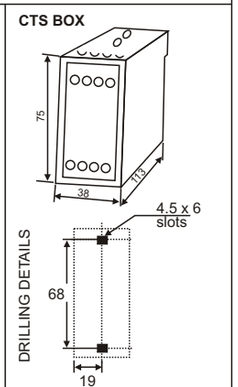
MOUNTING DIMENSIONS

Fig. 4





(FOR CTS 1.25 / 2.5 / 5 / 10)



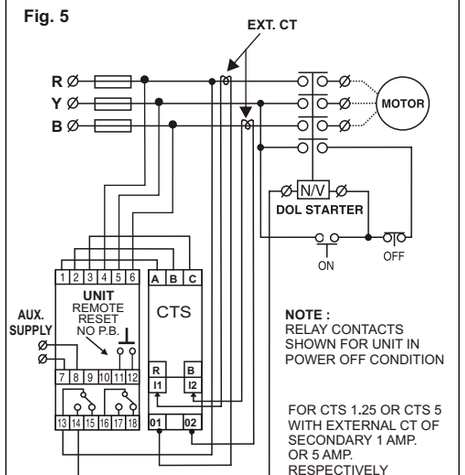
(FOR CTS 20 / 40 / 80)

INSTALLATION INSTRUCTION MANUAL FOR PHASE FAILURE & REVERSAL + DRY RUN + OVER LOAD+ UNDER & OVER VOLTAGE CUTOUT

D2 MPR2

ELECTRICAL CONNECTION IN POWER AND CONTROL WIRING

Fig. 5



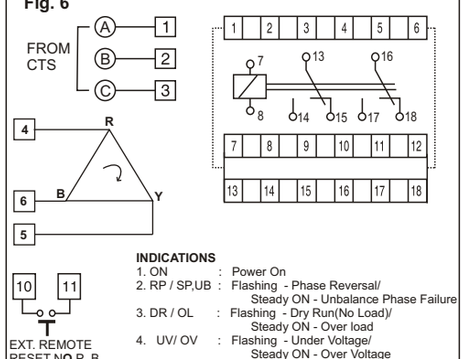
NOTE :
RELAY CONTACTS SHOWN FOR UNIT IN POWER OFF CONDITION

FOR CTS 1.25 OR CTS 5 WITH EXTERNAL CT OF SECONDARY 1 AMP. OR 5 AMP. RESPECTIVELY

Refer Fig. 6 (CONNECTION DIAGRAM) for TERMINAL DETAILS of respective unit. Other details are also given in the same.

CONNECTION DIAGRAM

Fig. 6



INDICATIONS

1. ON : Power On
2. RP / SP,UB : Flashing - Phase Reversal/ Steady ON - Unbalance Phase Failure
3. DR / OL : Flashing - Dry Run(No Load)/ Steady ON - Over load
4. UV/ OV : Flashing - Under Voltage/ Steady ON - Over Voltage

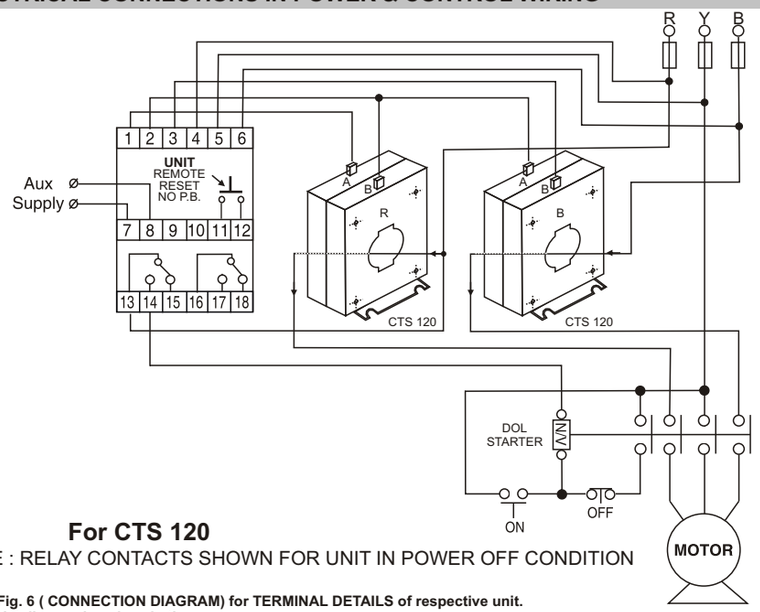
Terminal Details

TERMINAL NO.	D2 MPR1
1 - 2 - 3	CURRENT INPUT FROM CTS (A - B - C)
4, 5, 6	R, Y, B PHASE VOLTAGE SENSING POINTS
7 - 8	AUX. SUPPLY AS MARKED ON THE UNIT
11 - 12	EXT. REMOTE RESET PUSH BUTTON (NO TYPE)
13 - 14 -15	C1 - NO1 - NC1
16 - 17 -18	C2 - NO2 - NC2
9 - 10	DUMMY

NOTE : RELAY CONTACTS SHOWN FOR UNIT IN POWER OFF CONDITION

ELECTRICAL CONNECTIONS IN POWER & CONTROL WIRING

Fig. 7



For CTS 120

NOTE : RELAY CONTACTS SHOWN FOR UNIT IN POWER OFF CONDITION

Refer Fig. 6 (CONNECTION DIAGRAM) for TERMINAL DETAILS of respective unit. Other details are also given in the same.

WARRANTY

AGAINST
ALL MANUFACTURING DEFECTS
FOR 18 MONTHS
FROM DATE OF SUPPLY
OR 12 MONTHS FROM
INSTALLATION
WHICHEVER IS EARLIER

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S.NO. 1073/1-2-3,
AT POST : PIRANGOOT,
TAL : MULSHI, DIST. : PUNE (INDIA)
PIN : 412 111

VERSION - 01
(18/01/08)