

Fig 3 - ELECTRICAL CONNECTION DIAGRAM

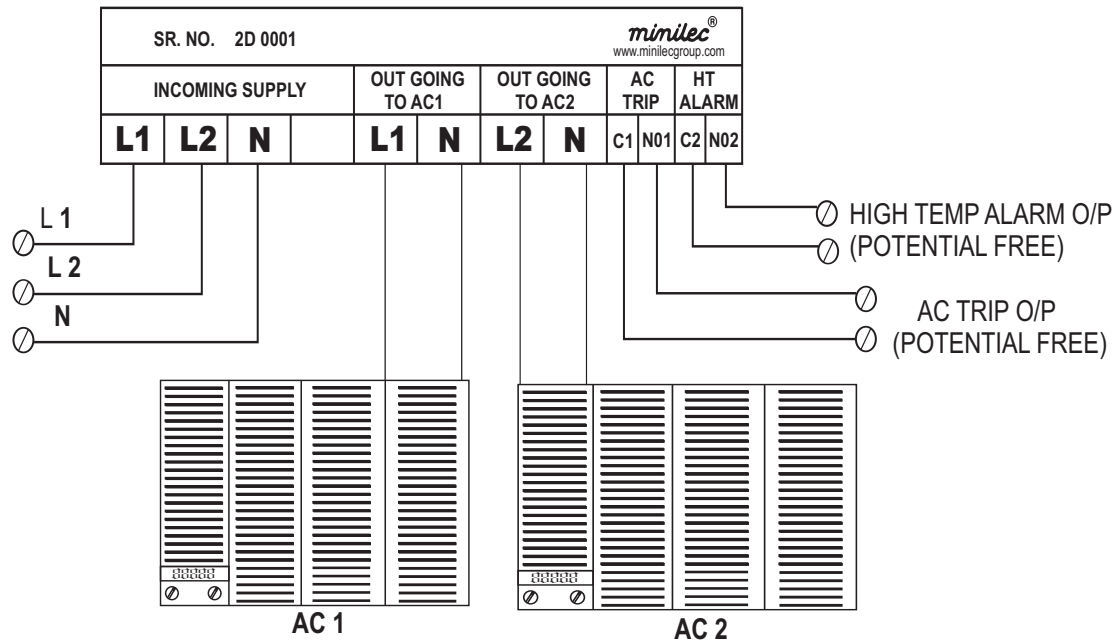
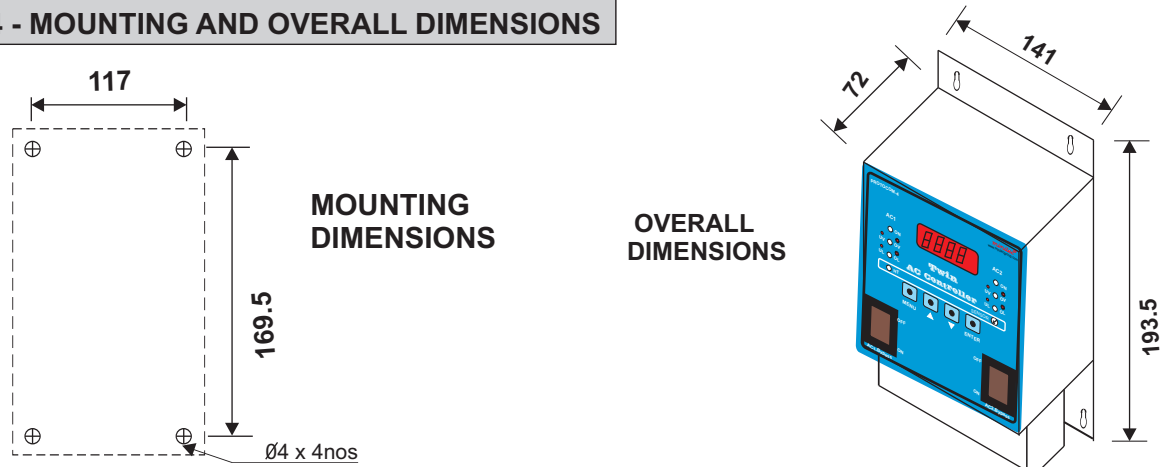


Fig 4 - MOUNTING AND OVERALL DIMENSIONS



WARRANTY



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

MANUFACTURED BY
MINILEC (INDIA) PVT.LTD.1073/1-2-3, AT POST : PIRANGOOT, TAL-MULSHI,
DIST-PUNE,(INDIA),PIN-412 111.
www.minilecgroup.com
VERSION - 01 (17/08/2012)

INSTALLATION INSTRUCTION OF TWIN AC CONTROLLER

MODEL- PROTOCOM 4

INTRODUCTION

Thank you for selecting and purchasing Minilec make twin AC controller model PROTOCOM 4. The following installation instruction would guide you in installing PROTOCOM 4 and making the best use for it. PROTOCOM 4 is best suitable for small offices, business suites, Bank ATMs, telecom exchanges, control rooms where two air conditioners of 1/1.5/2 tons are installed for normal and standby operation. PROTOCOM 4 saves energy by alternately using only one air conditioner (or both in case of temp rise) and that too only when depending upon requirement.

MOUNTING

PROTOCOM 4 is wall mounting type unit and provides suitable terminals to connect both AC units. See fig 4 for mounting and overall dimensions.

CAUTION

- Ensure that PROTOCOM 4 is
- 1) Not installed near any heat source like burner, sunlight, electric arc etc.
 - 2) Not subjected to any abnormal vibration.
 - 3) Not subjected to direct rains, stormy wind and dust.
 - 4) Install with external MCBs / isolators for adequate protection from short circuit. Install for two AC's having equal capacity.

ELECTRICAL CONNECTIONS

See fig 3 for electrical connections.

SILENT FEATURES :

- 1) Suitable for window & split ACs control & protection.
- 2) ACs can operate on two separate phases & controller can operate on any one healthy phase.
- 3) Four digit bright LED display visible from 10 meters displaying voltage, current, temperature, balance cycle time etc.
- 4) Password protection to avoid disturbance of setting.
- 5) Provide protection against under/over voltages, under/over load, over temperature.
- 6) Site selectable setting for voltage, current, temperature & cycle time.
- 7) Alarm relay contact for AC trip & room temp high.
- 8) LED indications for each fault.
- 9) Two logical operations, balance AC operation as well as combine AC operation.
- 10) Automatic changeover of AC, if running AC fails.
- 11) Provision of bypass switch in case of controller failure.

LOGIC OF OPERATION

- 1) Only one AC at a time will run for set time cycle in alternate mode. Changeover will take place only if
 - a) Cycle time is completed.
 - b) Running AC trip due to fault condition (UV/OV, UL/OL).
- 2) One AC will be running as normal running AC for set time cycle. If temp rises above set point of both AC ON, second AC is switched ON as stand - by running AC. This AC will be running until temp drops below both hysteresis level. When temp drops second AC will be switched OFF (LIFO). In case both ACs are running and cycle time of first AC completed & temp drops below both hysteresis set point, first started AC will be made OFF (FIFO) and running AC will be consider as normal running AC.

NORMAL CYCLE OPERATION

After power ON display will start showing input AC1, AC2 voltages, AC1 & AC2 current and room temp with scanning time of 3 sec. AC1 will become ON for next set time cycle. After completion of timing cycle, it will be OFF and second AC will ON (Depending upon temp setting). Second AC will remain ON for next set time cycle. This operation will be repeated in cyclic mode. When AC is ON, respective LED glow steady. Every time any AC will be made ON after set ON delay (See table 1).

UNDER VOLTAGE/ OVER VOLTAGE

The PROTOCOM 4 monitors voltage of both phases connected & offers built-in protection against under voltage (def 170 VAC with auto reset gap of 6VAC) & over voltage (def 270 VAC with auto reset gap of 6VAC). Upon arising one of above condition running AC will switched OFF after trip delay (def-5 sec) & AC trip relay turn ON. (Manually AC trip relay can be made OFF by pressing UP & DOWN key simultaneously.) UV/OV trip conditions are separated by LED steady & flashing effect. Alternative AC will be switched ON & will operate for next time cycle.(See fig1)

UNDER LOAD/ OVER LOAD

The PROTOCOM 4 monitors current of both ACs independently & protects the AC against over /under load condition depending on set value. After occurrence of fault running AC will switch OFF after UL/OL trip time delay. AC trip relay also activated after trip delay & remain ON till starting of another AC. Alternative AC will be switched ON for next time cycle resetting previous fault indication. UL/OL LED remain steady for UL & remain flashing for OL. (Manually AC trip relay can be made OFF by pressing UP & DOWN key simultaneously).If both ACs trips by UL/OL then these faults automatically reset after 3 min.(see fig 1)

ROOM TEMP. HIGH

The PROTOCOM 4 operates the AC by sensing the room temperature with help of temp sensor. Please keep sensor position properly so as to sense room temp correctly. After power ON or during running of any AC, the ambient temperature is monitored and if it is above set HT level then HT ALARM LED turns on, also HT alarm relay gets energized after trip delay(def- 60 sec). ALARM relay remain in energized condition till the ambient temp reduces below the hysteresis level of HT. HT ALARM relay can be made off manually by pressing UP & DOWN key simultaneously. See fig 2 for Ac1, AC2 ON/OFF depending upon set temperature.

Fig 1 - FAULT DEPENDENT TIMING DIAGRAM

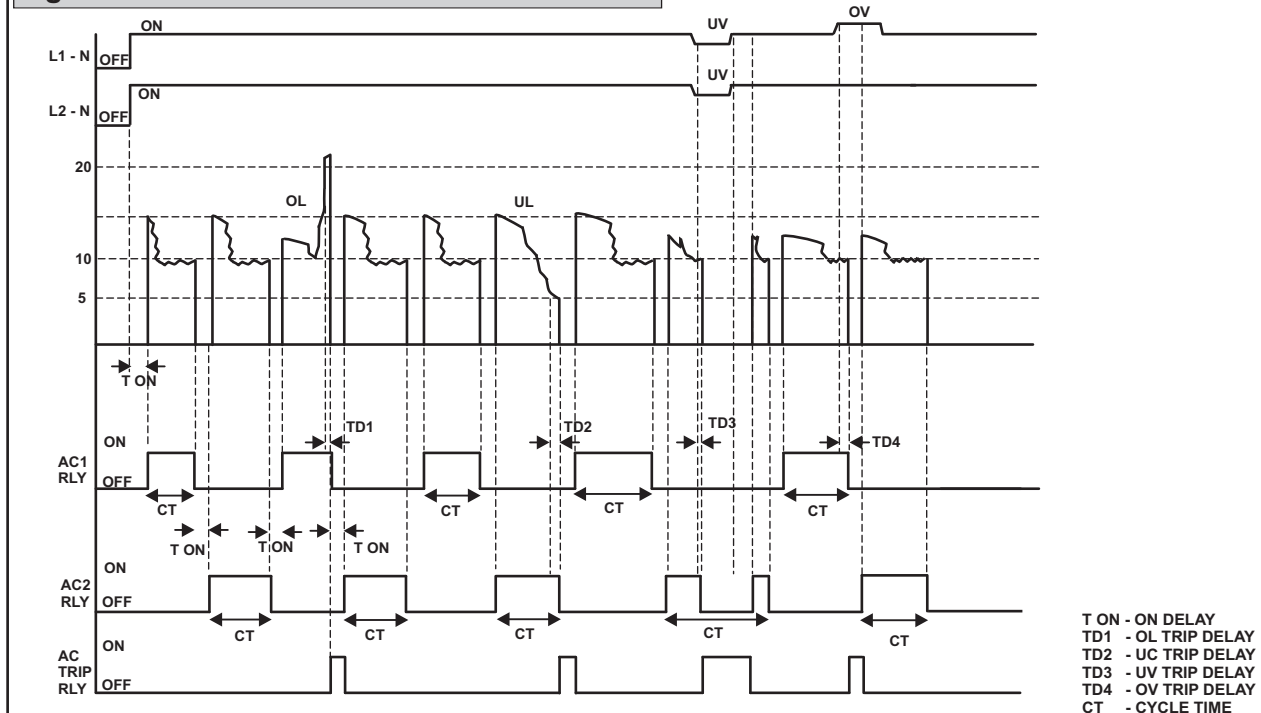
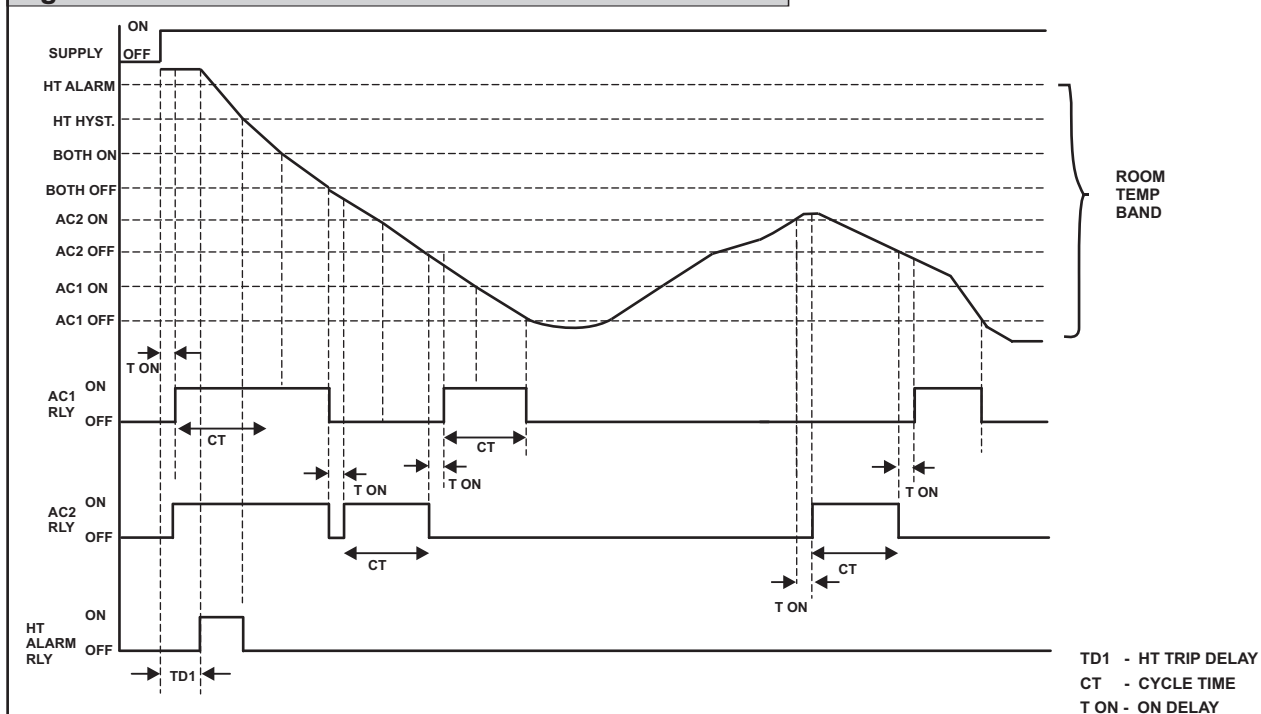
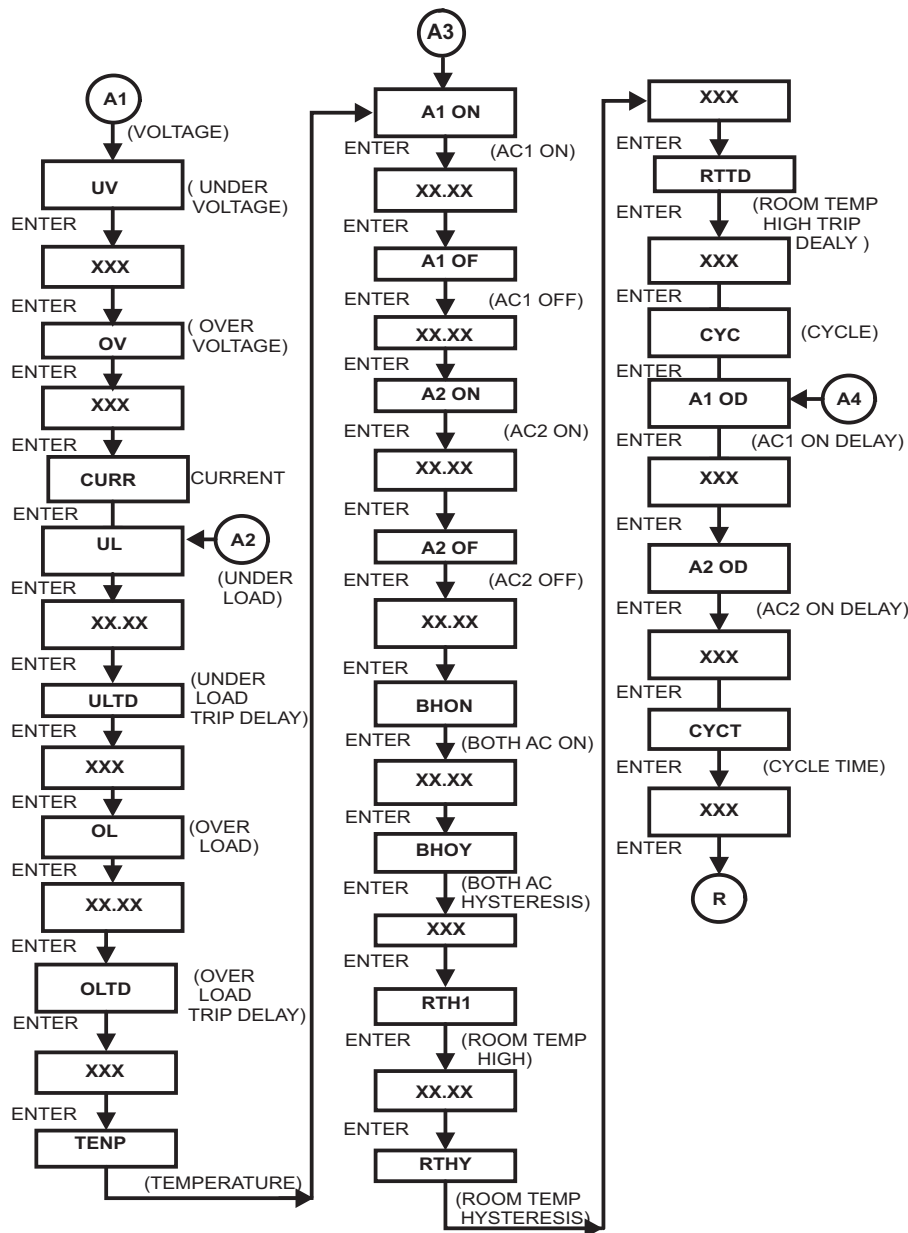


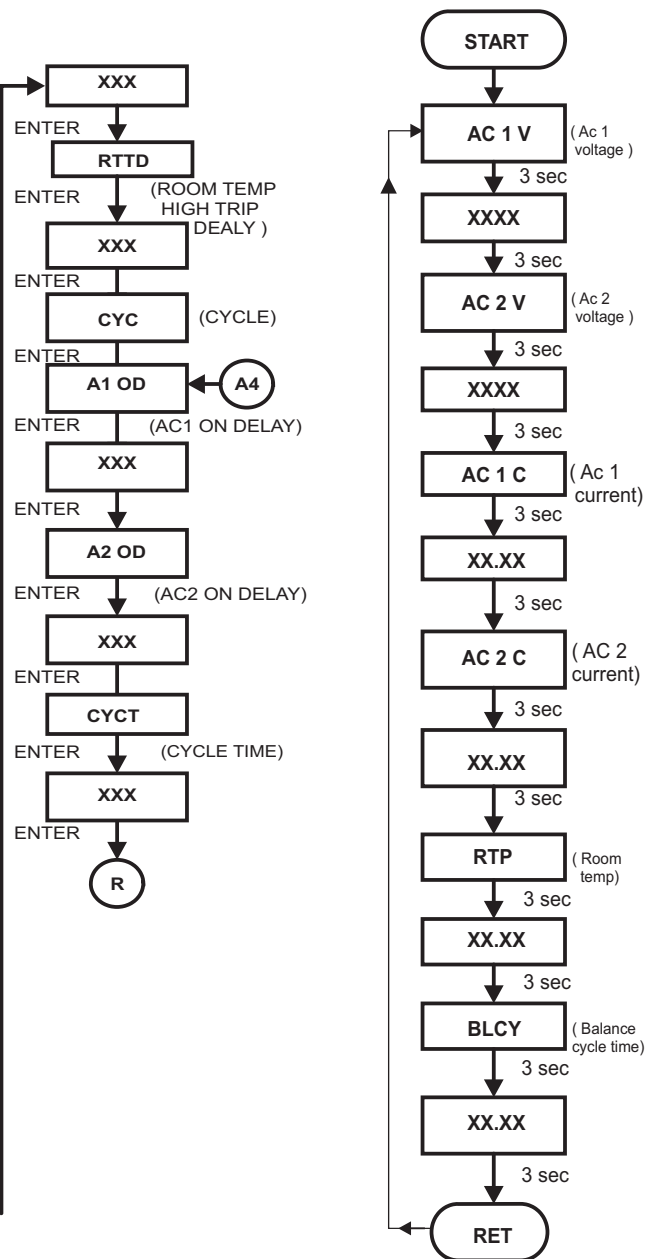
Fig 2 - TEMPERATURE DEPENDENT TIMING DIAGRAM



SETTING MODE FLOW CHART NO. 2



PARAMETERS SCANNING FLOWCHART - RUN MODE



DETAIL SPECIFICATIONS:

1. SUPPLY VOLTAGE : 240 VAC (+/- 20%) [L1, L2 & N]
2. FREQUENCY : 50Hz / (60Hz) ± 3 %
3. OUTPUT RELAY CONTACTS : RLY 1 -- 1 NO FOR AC1 ON
RLY 2 -- 1 NO FOR AC2 ON
RLY 3 -- 1 NO FOR AC TRIP (POTENTIAL FREE)
RLY4 - 1 NO FOR HIGH TEMP (POTENTIAL FREE)
4. OUTPUT CONTACT RATING- : RLY 1 -- 30 AMP @ 240 VAC [RESISTIVE]
RLY 2 -- 30 AMP @ 240 VAC [RESISTIVE]
RLY 3 -- 5AMP @ 240 VAC [RESISTIVE]
RLY 4 -- 5AMP @ 240 VAC [RESISTIVE]
5. CURRENT SETTINGS- : 1 TO 20 AMP [SETTABLE BY KEYS & DISPLAY]
6. SETTING ACCURACY- : ± 10 % OF SET VALUE
7. DISPLAY ACCURACY - : ± (1 % OF FSI + 5 DIGITS) - FOR VOLTAGE
± 5 % OF FULL SCALE - FOR CURRENT
± 2.5 °C - FOR TEMPERATURE
8. DISPLAY- : 4 DIGIT (SEVEN SEGMENT)
9. AC ON/CHANGE OVER DELAY- : 2- 600 SEC (SETTABLE)
10. LOGIC OPERATIONS- : SINGLE AC OPERATION ALTERNATE MODE.
: SINGLE OR BOTH AC OPERATIONS BASED ON TEMP. RISE IN ALTERNATE MODE.
11. SETTING KEYS- : 4 NOS OF FRONT KEYS.
MENU, ▲(UP), ▼(DOWN), ENTER
12. ENCLOSURE : SHEET METAL FABRICATED BOX WITH POWER COATING .
13. MOUNTING : WALL MOUNTING
14. DIMENSIONS OVER ALL - : 141 X 193.5 X 72 (LXWXD) mm
WALL MOUNTING - : 117 X 169.5 (LXW) mm
15. OPERATING CONDITIONS TEMPERATURE - : 0 ° C TO 60 °C
HUMIDITY- : UP TO 95% RH.
16. WEIGHT (gms) : 1100 MAX.

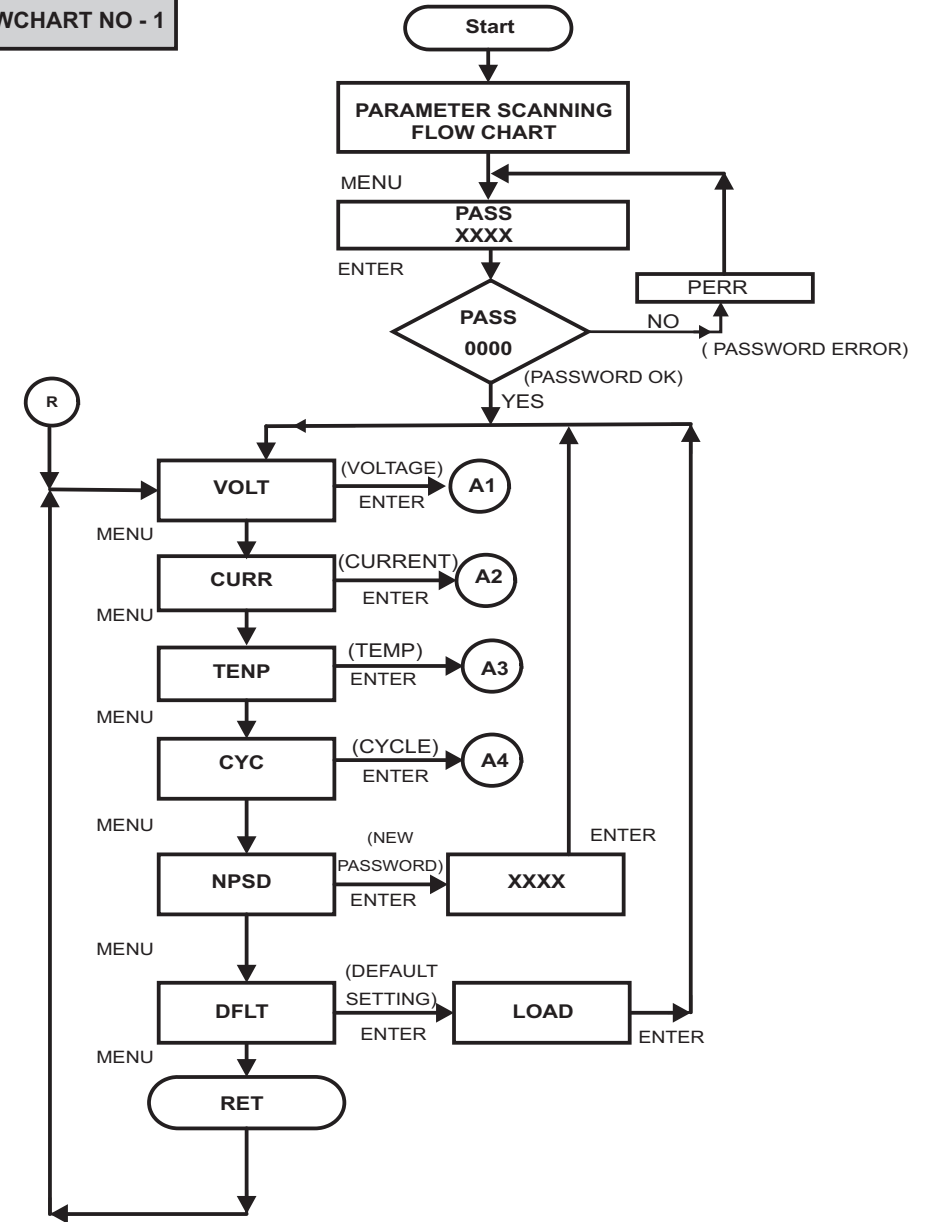
17.LED INDICATIONS

FOR AC 1	FOR AC 2
AC1 (Green) : AC1 ON	AC 2 (Green) : AC2 ON
UV/OV (Red) UNDER VOLTAGE(STEADY) OVER VOLTAGE (FLASHING)	UV/OV (Red) UNDER VOLTAGE(STEADY) OVER VOLTAGE (FLASHING)
UL/OL(Red) UNDER LOAD (STEADY) OVER LOAD (FLASHING)	UL/OL (Red) UNDER LOAD (STEADY) OVER LOAD (FLASHING)
HT ALARM (RED): HIGH TEMP	

18.TRIP SETTINGS, TIME DELAY AND RESETINGS: (Table 1)

PARAMETERES	MIN.	MAX	DE-FAULT	RESET GAP	TRIP DELAY			OTHER DELAY			STEP
					MIN.	MAX	DEF	MIN.	MAX	DEF	
UNDER VOLTAGE	120 VAC	210 VAC	170 VAC	6 VAC ± 3VAC	NA	NA	5 SEC FIX	-	-	-	1V
OVER VOLTAGE	240 VAC	300 VAC	270 VAC	6 VAC ± 3VAC	NA	NA	5 SEC FIX	-	-	-	1V
UNDER LOAD	1A	7A	7A	NA	2SEC	600 SEC	15 SEC	-	-	-	0.5 A & 1/30SEC
OVER LOAD	5A	20A	20A	NA	2 SEC	5 SEC	5 SEC	-	-	-	0.5 A & 1 SEC
AC 1 ON TEMP.	10 °C	35 °C	23 °C	NA	-	-	-	-	-	-	0.5 °C
AC 1 OFF TEMP.	10 °C	35 °C	21 °C	NA	-	-	-	-	-	-	0.5 °C
AC 2 ON TEMP.	10 °C	35 °C	24 °C	NA	-	-	-	-	-	-	0.5 °C
AC 2 OFF TEMP.	10 °C	35 °C	22 °C	NA	-	-	-	-	-	-	0.5 °C
BOTH AC ON TEMP.	20 °C	50 °C	30 °C	1 - 10 °C (DEF 5 °C)	-	-	-	-	-	-	0.5 °C
ROOM TEMP. HIGH	22 °C	45 °C	35 °C	1 - 10 °C (DEF 5 °C)	2SEC	900 SEC	60 SEC	-	-	-	0.5 °C & 1/30 SEC
ON DELAY FOR AC 1 & AC 2	-	-	-	-	-	-	-	2 SEC	600 SEC	20 SEC	1/30 SEC
CYCLE TIME	-	-	-	-	-	-	-	3 MIN	1440 MIN	3 MIN	1/30 MIN

SETTING MODE FLOWCHART NO - 1



Note :

1. After entering in program mode if any key is not pressed for 30 sec then controller automatically goes in scanning (Run) mode.
2. In default menu if pressed enter then all previous setting erased & factory setting are activated.
3. Inside the sub parameter if pressed menu key then setting shifted to main parameter.
4. Use up/down keys for increment / decrement values.