

# **CARE TAKE DEVICES** (Manufacturing Unit) **Since 2002**

(Manufacturer & Traders of **Electronic controllers**, being used in **REF. & AIR-CONDITIONERS**)  
C-29 / 184, Behind Post Office, ZAKIR NAGAR, New Delhi-110025

Approved Vendor:- **VOLTAS** **WHIRLPOOL**

# **CREATIVE MINDS** (Lab & Service Unit) **Since 1982**

( EARLIER KNOWN AS “ ENTERTAINMENT ELECTRONICS REGD.” )

(Trouble shooter & Designer of **Electronic controllers**, being used in **REF. & AIR-CONDITIONERS**)  
Shop No.382 / 4, Street No.17, Near Post Office, ZAKIR NAGAR, New Delhi-110025

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To, \_\_\_\_\_

Kind Attn. Ms/Mr. \_\_\_\_\_

Sub: **Company Profile, Product range, Services & Price list w.e.f. March, Ist. 2K9**

Dear Madam/Sir,

We take-over your problems and provides excellent solutions to you. Following products and services are active elements of our echo-friendly network. Please consider and feel the **comforts & earn more** in your business.

## **A- PRODUCT'S RANGE & PRICES** **Table-1**

Sl.No.	Item	Unit Price (for dealers)	Free Repair Commitment (at our service center)
1.	<b>Intelligent Timer (1Ph.)</b>		
	Model: A.T.M. Xpert-2C	Rs.1500/-	12 Months
	Model: Shellter Care-2B	Rs.2000/-	12 Months
	Model: Shellter Care-2C	Rs.2500/-	12 Months
	Model: Shellter Care-2D 1 Ph.	Rs.3000/-	12 Months
	Shelter Care-2D 3 Ph.	Rs.5500/-	
	Model: Server 3/4	Rs.3000/-	12 Months
2	<b>Adjustable T.D.R (20 Amps.)</b>	Rs. 450/-	06 Months
3	<b>D.C. Contactor (20 Amps.) 1 Ph.</b>	Rs. 450/-	06 Months
4.	<b>3 Phase Monitor</b>	Rs. 900/-	06 Months
5.	<b>Controllers for refrigerators</b>	Rs. 1000/-	06 Months
6.	<b>Electronic Starter</b>	Rs. 400/-	06 Months
7.	<b>Heating circuit ( for comp. &amp; heater )</b>	Rs. 400/-	06 Months
8.	<b>Power Supply for D.C. Motor, using in “AMTREX SENPAI &amp; HITACHI ATOM” Split A.C.</b>	Rs. 600/-	06 Months

9.	<b>Automatic 3 Phase Sequence corrector</b>	See table-2	See table-2
10.	<b>3 Phase liquid level controller</b>	Rs.1500/-	06 Months.
11.	<b>Temp. based alarm &amp; controller</b>	Rs.1500/-	06 Months.
12.	<b>1 Phase supply protector 5 Amps.</b>	Rs.900 /-	06 Months
13.	<b>UNIVERSAL CORDLESS CONTROLLER FOR, WAC, SAC, CASSETE, A.H.U., DUCT ABLE.</b>	Rs.1500/-	12 Months

**Table-2**

<b>S.No.</b>	<b>Current Rating Per Phase</b>	<b>Recommended Load Capacity (approximately)</b>	<b>Unit Price (For Dealers)</b>
1.	16 Amps.	Up to 5.0 Tr.	Rs3,200/-
2.	25Amps.	5.5 to 7.5 Tr.	Rs.5,000/-
3.	32 Amps.	8.3 to 10.0 Tr.	Rs.6,400/-
4.	40 Amps	11.0 to 15.0 Tr.	Rs.8,000/-
5.	50 Amps	16.0 to 20.0 Tr.	Rs.10,000/-
6.	65 Amps	21.0 to 25.0 Tr.	Rs.13,000/-
7.	73 Amps	26.0 to 30.0 Tr.	Rs14,600/-

**B- REMOTE CONTROLLER'S REPAIR CHARGES.**

- |    |                          |           |                        |                         |
|----|--------------------------|-----------|------------------------|-------------------------|
| 1. | <b>Corded Remote</b>     | (Local)   | Rs. 200/-              | Per Piece               |
| 2. | <b>Cordless Remote</b>   | (Local)   | Rs. 250/-              | Per Piece               |
| 3. | <b>Corded Remote</b>     | (Branded) | Rs. 300/-              | Per Piece               |
| 4. | <b>Cordless Remote</b>   | (Branded) | Rs. 350/-              | Per Piece               |
| 5. | <b>Micro controllers</b> | (1 Phase) | Rs. 600/-              | Per Piece               |
| 6. | <b>Micro controllers</b> | (3 Phase) | Rs. 750/-              | Per Piece               |
| 7. | <b>Phase Monitors</b>    |           | Rs. 200/-              | Per Piece               |
| 8. | <b>Hand sets</b>         |           | Rs. 50/-               | Per Piece (without LCD) |
|    |                          |           | Rs. 100/-              | Per Piece (with LCD)    |
| 9. | <b>Rest all</b>          |           | On actual repair cost. |                         |

**SITE VISITING CHARGES.**

- Double of Repair charges + convence in Delhi & NCR.
- Double of Repair charges + Rs.1000/- Per day + Boarding + convence, for rest of North India.

**Note :-** I Site visit facility is available for **special cases** only.

II If controller is found O.K. on the site, you will have to pay above repair charges, as applicable.

**FREE REPAIR COMMITMENT.**

- Six months from the date of repair.
- Free repair commitment will be void, if our "seal" found broken / open / tempered.
- Damaged/burnt/broken/software fail, controllers will not cover free repair commitment period.

**TERMS & CONDITIONS (FOR BOTH ORGANISATIONS).**

- Except micro-controller I.C., SOLID STATE RELAYS , LCD & proprietary parts etc., all **electrical parts** are included in above charges (in repair cases).
- "A" class **missing parts** (I.C., Relay, Transformer, sensors) will be charged extra at actual cost.

**TAXES AND DUTIES (will be charged extra)**

- Delhi VAT @ 12.5 %.
- CST @ 12.5 %
- Service Tax @ 10.30%

**FRIEGHT**

Extra, as applicable.

**DELIVERY**

- I With in 24 working hours (for repair cases) and as per stock status (for products).
- II May be repaired hand to hand in few specific / emergent cases only.
- III In rare cases of non-availability of the parts and major electrical breakdowns, you will have to bear with us.

**PAYMENT**

- I 100% (In cash) on delivery, or
- II As per terms & conditions of agreement with you.

We assure you of our best services and we look forward to build-up a long lasting relationship.

Thanking you  
Yours Sincerely

**(M. Rashid Ansari)**  
Prop.

Timing : 9 AM to 9 PM ( March to Oct.) and 10 AM to 8 PM ( Nov. to Feb.)

Weekly off : Sunday

Date: \_\_\_\_\_ 2K \_\_\_\_\_

## 1) INTELLIGENT TIMER:

- A) A.T.M. Xpert – 2c
- B) Shelter Care – 2b ( See page-4 )
- C) Shelter Care – 2c (See Page-5 & 6)
- D) Shelter Care – 2d (See page-7 & 8)
- E) Server 3 & 4 (See page- 9 & 10)

1. These “**Timers**” are used for automatic change over between the combinations of **Two** Air conditioners.
2. A.T.M. Xpert-2c operates on a single supply source (220 VAC $\pm$  15% 50 Hz) through single stabilizer and SHELTER CARE-2b, 2c & 2d can operate either on a single supply source (220 VAC $\pm$  15% 50 Hz) connected across, or any two separate phases are connected with **L<sub>1</sub> & L<sub>2</sub>** terminals, through separate stabilizers (2 Nos.).
3. Above models deliver **two** separate outputs of **220 VAC 20 Amperes** to operate up to 2.0Tr. machines in cyclic manner for the programmed time / period.

### A.T.M.Xpert-2C

- 1-Provides **2 out puts**, to drive 2 ACs.
- 2-Both out puts are available in **CYCLIC** way, after a preset time.( one out put at a time )
- 3-Pre set time is selectable by **Dip switch-4**. ( **5Hrs. or 10Hrs.** ) Microprocessor calculates the **Run Time**.  
If Power fails, controller saves the current status.
- 4-As power up the controller **Relay-1** is switched ON after the “**ON DELAY**” of **3 minutes**, **LED-1** (yellow) **blinks** during on delay time. LED-1 becomes off when Relay-1 gets start.
- 5-**Key-1** ( quick start ) is used to by-pass ON DELAY.
- 6-After completing the 5Hrs. or 10Hrs. run time ( as selected by Dip switch-4) Relay-1 becomes switched off, and **Relay-2** becomes **ON** with **15 seconds delay**, for next cycle. During this delay **LED-1** ( yellow ) **blinks for 15 seconds**. Key-1 is un-operational during this time delay.
- 7-**Key-2** ( system ON/OFF ) is used to switch ON and OFF the system (**keep press for >3 sec.for both logics** ) No out put is available in OFF mode.
- 8-**LED-2** ( red ) glows, when system is OFF.
- 9-**Dip switch-3** is used to select AUTO or MANUAL function. In AUTO mode , controller works in cyclic way with equal time duration in both channels. But in manual mode , it provides only one out put permanently( as selected by Dip switch-3). This single out put also behaves in cyclic way with un-equal time duration, 5 Hrs. ON & 1Hr. OFF, or 10Hrs.ON & 2Hrs.OFF in NORMAL position. And 5 minutes ON & 1minute OFF, or 10 minutes ON & 2 minutes OFF in DEMO. position. During OFF cycle, O/P is not available, but both LED-1 & 2 blinks alternately, in order to represent OFF cycle.
- 10-**Dip switch-2** is used to select OUT PUT-1 or OUT PUT-2. ( **This switch is operational, when Dip switch-3 will be in manual mode.** )
- 11-**Dip switch-1** is used to select NORMAL or DEMO. Function. In **normal** mode, change over time is 5Hrs. and 10Hrs. (as selected by Dip switch-4), but , in **Demo** mode, 5Hrs.becomes 5 minutes and 10Hrs. becomes 10 minutes.

**NOTE-1 :-** To re-set the run time counter, keep press the **Key-1**(quick start) for **>5 sec. or until both LED-1&2 glows for a moment** when system is ON ( **not in time delay mode** ). Time counter of both sections becomes zero, and system starts from O/P-1.

**NOTE-2 :-** In **manual** mode only, ( when any out put is selected ) and power becomes fail during **OFF time**, If OFF time was spent > 50 % , controller keeps OFF the selected O/P for balance period after power re-gain. If OFF time was spent < 50 % , controller starts the selected O/P from zero time after power re-gain.

**NOTE-3 :-** In **manual** mode only, ( when any out put is selected ) and power becomes fail during **ON time**, If ON time was spent > 75 % , controller starts the selected O/P from zero time after power re-gain. If ON time was spent < 75 % , controller provides the O/P for balance period.

## Shelter Care-2B

S.No.	Features & Specifications
1	Change-over time is selectable (4Hrs./8Hrs. $\pm$ 3%).
2	Demonstration facility (Approximately 9 to 10 minutes per cycle).
3	Built in re-chargeable battery back up for timer I.C. with charging facility, so that, change-over time shall not disturb due to power break downs or change over between power and generator supply.
4	Timer ON/OFF switch (T.B.R) with Battery On/Off & time "Reset" features.
5	Line (Power, with on delay), M-I (AC-I) & M-II (AC-II) "On" L.E.D. indicators.
6	Built in short duration timer circuit (3 minutes "On" delay) with "Quick Start" key.
7	Auto & Manual (I / II) facility.
8	<b>High Room Temp.Guard</b> , so that, stand-by machine could help to running machine, if it is not achieving the Temp., because of any problem.(cut in at 27 <sup>0</sup> C & cut off at 25 <sup>0</sup> C) <b>HRT alarm at 32<sup>0</sup>C</b>
9	Potential free (NO) contacts available, for Alarm Purpose, against HRT & power fail.
10	Using, 28 Amperes fire proof Teflon wires, for internal wiring of 220 V. input & outputs.
11	Power consumption of timer: 25 Watts (max.).
12	Field wiring terminals: 30 amperes bakelite strip.
13.	Thermostat ( NTC 10k $\Omega$ )
14.	Power fail alarm

### Notes/Operations (Shelter care-2B)

- Keep T.B.R. Switch in "On" position for "Auto" (Timer) mode, and wait (Up to 3 Mins.) for output. To avoid "On delay" press "Quick Start" Key.
- "Line" L.E.D. glows Red when "On delay" works.
- "Line" L.E.D. glows Green when Timer provides output, for machines.
- Keep T.B.R. switch in "Off" position, when Timer is not in use (to avoid battery discharged) **OR** when using machines manually.
- Keep "Auto/M-I/M-II" Selector Switch in M-I or M-II position (as required), for Manual operation. In manual mode "on delay" will activate again, therefore, wait (Up to 3 Mins.) for output. To avoid "On delay" press "Quick Start" Key.
- Keep "Demo./4Hrs./8Hrs." switch in Demo. Position, when testing the system. And select 4 Hrs. or 8 Hrs. (as required) after successful installation / testing.
- To "Re-set" the time, switch Off T.B.R. switch once and switch On again after few seconds. The On delay will activate again therefore, wait (Up to 3 Mins.) for output. To avoid "On delay" press "Quick Start" Key.
- Connect Alarm wires to the potential free contacts for HRT and power fail (PF).

### Alarm Details

- Temporary Problem : - Alarm will beep for the time being & stops.
- Anyone Aircon fail : - Alarm will beep in ON-OFF / ON-OFF manner, till the set period of fail machine (up to 4 Hrs. or 8 Hrs.)
- Both Aircons fail : - Alarm will beep continuously.

AC-I	00-00 AM	to	04-00 AM
AC-II	04-00 AM	to	08-00 AM
AC-I	08-00 AM	to	12-00 Noon
AC-II	12-00 Noon	to	04-00 PM
AC-I	04-00 PM	to	08-00 PM
AC-II	08-00 PM	to	12-00 Mid Night

# INTELLIGENT TIMER

## Shelter Care – 2C

S.No.	Features & Specifications
	<b>Change over between the combination of two (1.5 Tr.) machines.</b>
1	Change-over time is selectable (4Hrs./8Hrs. $\pm$ 3%) by sliding switch.
2	Demonstration mode available (Approximately 9 to 10 minutes per cycle).
3	Built in re-chargeable battery back up for timer I.C. with charging facility, so that, change-over time shall not disturb due to power break downs or change over between mains and generator supplies. (Approximately 30 mins. Back-up)
4	Timer ON/OFF switch (T.B.R) with Battery On/Off & time “Reset” features.
5	Line (Power with on delay), M-I (AC-I) “On”, M-II (AC-II) “On”, Hi. Temp., M-I fail, M-II fail & Temp. achieved L.E.D. Indicators.
6	Built in short duration timer circuit (>2 minutes “On” delay) with “Quick Start” key.
7	Auto & Manual (I / II) modes available.
8	High Room Temp. guard, so that, stand-by machine could help to running machine, if it is not achieving the required Room Temp., because of any problem. 2 <sup>nd</sup> machine will cut in at 27 <sup>o</sup> C & cut off at 25 <sup>o</sup> C.
9	Potential free N/C (or N/O optional) contacts in healthy conditions are available, for the connections of <b>ext. Alarms</b> , against power fail, HRT, M-I fail & M-II fail.
10	At the time of instillation, if room temp. is high, both machines will operate together. 2 <sup>nd</sup> machine will start after 1 min. time delay with respect to machine 1.
11.	Using, 28 Amperes fire proof Teflon wires, for internal wiring of 220 V. inputs & outputs.
12.	Power consumption of timer: 50 Watts (max.).
13.	Field wiring terminals: 30 amperes bakelite strip.
14.	Cabinet: Metallic CRC 23gauge.
15.	P.C.B. : Glass epoxy.
16.	Under current setting at & below 6 amps. and over current setting at & above 12 amps.
17.	Waiting time for Aircon Fail Alarm: - 18 Mins. (Approx.) for under current cases & 10 seconds (Approx) for over current cases.
18.	High Temp. Alarm at 32 <sup>o</sup> C & above.
19.	Thermostat: - 10 K $\Omega$ (N.T.C. type)
20.	In case of failure of any A.C., other (O.K.) A.C. takes its position, till get it repair.

### Temp. Controller & Display (2 Digits)

1. Set Temp. range: - 16<sup>o</sup> C to 32<sup>o</sup> C
2. Room Temp. display range: - 00<sup>o</sup> C to +99<sup>o</sup> C
3. Cut off at set point & cut in by +2<sup>o</sup> C.
4. Keys available: - Temp. set / Up / Down .
5. L.E.D. indicator glows, when room Temp. is achieved & machines are tripped off by thermostat.

**Note:** - Field wiring diagram is printed on the “Timer” cabinet.

**Notes/Operations (Shelter Care -2C)****TEST THE CONTROLLER IN LOADED CONDITIONS ONLY.**

1. Keep T.B.R. Switch in “On” position for “Auto” (Timer) mode, and wait (Up to 3 Mins.) for output. To avoid “On delay” press “Quick Start” Key.
2. “Line” L.E.D. glows Red when “On delay” works.
3. “Line” L.E.D. glows Green when Timer provides output, for machines.
4. Keep T.B.R. switch in “Off” position, when Timer is not in use (to avoid battery discharged) **OR** when using machines manually.
5. Keep “Auto/M-I/M-II” Selector Switch in M-I or M-II position (as required), for Manual operation. In manual mode “on delay” will activate again, therefore, wait (Up to 3 Mins.) for output. To avoid “On delay” press “Quick Start” Key.
6. Keep “Demo./4Hrs./8Hrs.” switch in Demo. Position, when testing the system. And select 4 Hrs. or 8 Hrs. (as required) after successful installation / testing.
7. To “Re-set” the time, switch Off T.B.R. switch once and switch on again after few seconds. The On delay will activate again therefore, wait (Up to 3 Mins.) for output. To avoid “On delay” press “Quick Start” Key.
8. LED (M-I) will glow during all **odd** cycles of timer and power of 220 VAC (as per Input) will be available on the output (M-I) terminal.
9. LED (M-II) will glow during all **even** cycles of timer and power of 220VAC (as per input) will be available as the output (M-II) terminal.
10. At the time of installation or in routine, if room temp. is  $\geq 27^{\circ}\text{C}$  & both machines are O.K., M-I & M-II work together with time delay of 1 min. (approx). As temp. goes down upto  $\leq 25^{\circ}\text{C}$ , the one machine becomes stand-by (according to cycle).
11. In spite of team working of machines, if room temp. goes high and reaches the temp. level of  $32^{\circ}\text{C}$ , Red LED (for Hi.Temp.) glows and Alarm contacts for “Hi. room Temp” become operational.
12. If input supply to the controller through **L-1** disconnects due to any reason, Alarm contacts for “Power fail” become operational.
13. When M-I or M-II becomes fail due to any reason, the controller waits upto 18 Mins. (Approx.) in order to avoid false alarms / information’s, then activate failure reporting circuit. Respective Red LED glows and respective alarm contacts for “M-I fail / M-II fail” become operational. As failure reporting circuit activities, the stand-by machine becomes “ON” till the rectification of failed machine.

**Notes/Operations Temp. Controller & Display**

14. Press the **SET** key once and fill up the temp. value to be maintained in the room by the help of **UP** & **DN** keys. Again press the **SET** key once, in order to store the entered data.
- Note:** - keep set temp. level below  $25^{\circ}\text{C}$ , because stand-by machine operates at  $27^{\circ}\text{C}$  & cutoff at  $25^{\circ}\text{C}$ .
15. As set Temp. is achieved, green LED (for “Temp. Achieve”) glows & out put for machine becomes “OFF.”
  16. On the increment of  $2^{\circ}\text{C}$  in room temp. machine starts again.

# INTELLIGENT $\mu$ CONTROLER (1Ø & 3 Ø)

## (SHELTER CARE – 2D)

### A Change over between the combination of two Air-conditioners.

As power up the “Controller”, **3 digits 7 segment display** shows present **“room temperature”** in step of 1<sup>0</sup>C. AC-1 starts after the time delay of **three minutes**.

B. **Quick Start Key :-** This key is used to by-pass, initial **“ON” delay** of 3 minutes.

C. **MODE Key :-** (Scrolls between 2 steps.)

1. **Demo. mode, “LED (Demo)”** becomes ON. (in this mode, change-over time for toggling of both AC-1&2 is fixed for **5 Mins.** each.)

**Note:-** In this mode, **all** below said functions / features are **un-operational**.

2. **Normal mode**, display shows continuously Room Temp. & Demo LED becomes OFF. (in this mode, change over time for toggling of both ACs depends on setting of **cycle** time.)

**Note:-** When switch over from **Demo Mode** to **Normal Mode**, AC-1 starts from **“Zero”** hour, and AC-2 becomes stand-by till the end of 1<sup>st</sup>. cycle.

D. **FUNCTION Key :-** (scrolls between 4 steps with respective LED indications.)

**Step-1,** LED (Room Temp.) becomes **“ON”** and display shows settings of **“room temp.”** (18<sup>0</sup>C to 27<sup>0</sup>C) in step of 1 dig. Default setting is **23<sup>0</sup>C**. Running AC cut off at **set point** & cut in as per setting of **differential temp.**

**Step-2,** LED (Differential Temp.) becomes **“ON”** and display shows setting of **“differential temp.”** (+2, +3, +4 & +5<sup>0</sup>C). Default setting is **+3<sup>0</sup>C**.

**Step-3,** LED (H.R.T. Alarm) becomes **“ON”** and display shows setting of **“Alarm temp.”** (33 to 40<sup>0</sup>C). Default setting is **33<sup>0</sup>C**. **Alarm Relay** becomes ON at set temp. & above. This is never ON at below set temp. It is independent from all functions.

**Step-4,** LED (Cycle) becomes **“ON”** and display shows setting of **“change-over time”** in order of **One hour per step** (01Hr. to 12Hrs.) Default setting is **6 Hrs.** After programmed **“time”** controller toggles AC-1 to AC-2 or AC-2 to AC-1.

**NOTE :-** The stand-by AC **cut in at setting of room temp.+ differential temp. +3<sup>0</sup>C** in parallel of running AC (if it is not cooling) & Cut off by **minus 3<sup>0</sup>C**. In this case Stand-by AC switch ON after the time delay of **One min.** after sensing the **setting of room temp.+ differential temp. +3<sup>0</sup>C**. If, running AC is in under current condition, this feature is disabled.

E. **Up Key :-** By pressing this key, required value **increases**.

F. **Down Key :-** By pressing this key, required value **decreases**.

G. **Enter Key :-** By pressing this key, programmed value **stores** & corresponding LEDs, ( **Room Temp., Differential Temp., H.R.T. alarm** or **Cycle** ) will turn **“Off”** to ensure the registration of entered data .

- H. Default key** After pressing this key, Controller works on **default settings**, as below,
- 1- Room temp.= 23°C
  - 2- Differential temp.= +3°C
  - 3- H.R.T. alarm = 33°C
  - 4- Cycle = 6Hrs.
- I.** If power fails, **all settings remain same** (last memory stores).
- J - AUTO / MANUAL KEY :-** ( scrolls in 3 steps ) By pressing this key, display shows “**nor, AC1, AC2**” step wise.
- 1- In **nor** mode, AC-1 & AC-2 toggles as usual.
  - 2- In **AC1** mode, only AC-1 is available permanently with temp. control feature.
  - 3- In **AC2** mode, only AC-2 is available permanently with temp. control feature.
- K-**
- 1- When AC-1 is in ON cycle, and during this cycle, under current signal is found, AC-1 will turn OFF after a time delay of **18 mins.**, Now, **AC-2 & AC-1 fail alarm relay** will turn ON Permanently. The toggling action will stop. It will re-set by power cut off.
  - 2- When AC-1 is in ON cycle, and during this cycle, over current signal is found, AC-1 will turn OFF after a time delay of **10 sec.**, Now, **AC-2 & AC-1 fail alarm relay** will turn ON Permanently. The toggling action will stop. It will re-set by power cut off.
- L-**
- 1- When AC-2 is in ON cycle, and during this cycle, under current signal is found, AC-2 will turn OFF after a time delay of **18 mins.**, Now, **AC-1 & AC-2 fail alarm relay** will turn ON Permanently. The toggling action will stop. It will re-set by power cut off.
  - 2- When AC-2 is in ON cycle, and during this cycle, over current signal is found, AC-2 will turn OFF after a time delay of **10 sec.**, Now, **AC-1 & AC-2 fail alarm relay** will turn ON Permanently. The toggling action will stop. It will re-set by power cut off.
- NOTE:-** If, conditions in points “**K**” & “**L**” becomes normal, before ending the time delay of either 18 mins. or 10 sec. the said process disables. If both ACs fails, both alarms will be available.
- M- Under voltage protection at **175VAC**, and Over voltage protection at **260 VAC**.**
- N- Field settable potential free alarm contacts are available. Default, N/O in **healthy** conditions, and N/C in **failures**.**
- O- To lock and un-lock the key board (except Quick start key), press Up & Dn. Keys together for 5 sec. When locked, display will show “**LOC**” for few sec. When un-locked, display will show “**ULO**” for few sec.**
- P-** If sensor fails, ( open or short ) display shows “**SF**” permanently, and all the functions related with sensor becomes disable till get it correct. Controller works as a timer only.
- Q-** If memory fails, whenever any key is pressed, display shows “**EPF**” for few sec. and controller does not update new entries till get it correct.
- R-** Provision of both AC and DC operating supplies.
- .....
- S- Protects against reverse phasing and missing phase.** ( Indicators for Reverse ph., Missing ph. & Healthy supply are available).

# INTELLIGENT TIMER

## Server-3 / Server-4

1. These timers are used for Automatic change over between the combination of **three & four** Machines (Air-conditioners) respectively.
2. Can be operate either on a single phase supply source (220V AC  $\pm$  15% 50 Hz) when all inputs are connected across the mains supply or all inputs can connect to the separate phase of a 3 phase supply source with common neutral.
3. All outputs have upto 20 Amperes load carrying capability to operate upto 2.0 TR machines.
4. Change over after every one hour (See example in table 1) or 4 hrs (selectable at site).
5. Demonstration mode available.
6. "ON" delay with "Quick start" key.
7. Staggered start of A.Cs.  
 1<sup>st</sup> A.C. starts after on delay (> 2 mins.) &  
 2<sup>nd</sup> A.C. starts after 15 sec. of 1<sup>st</sup> A.C.  
 3<sup>rd</sup> A.C. starts after 15 sec. of 2<sup>nd</sup> A.C.  
 4<sup>th</sup> A.C. starts after 15 sec. of 3<sup>rd</sup> A.C. (During H.R.T. conditions)
8. Timer ON/OFF Switch (TBR) with time re-set provision.
9. Built in re-chargeable battery back-up with Auto charger, for timer memory.
10. Fire proof Teflon coated internal wiring for 220V input & output.
11. Field wiring terminals: 30 Amps bakelite.
12. One machine stand-by and rest all operational in every cycle.
13. After every change-over, the first of running machines, become stand-by for next cycle.
14. LED indicator are there, for machines "ON", line & on delay and temp. achieved indications.
15. High Room Temp. guard, so that, stand-by machine could help to running machines, if they are not achieving the required Room Temp., because of any problem. Stand-by machine will cut in at &  $>27^{\circ}\text{C}$  and cut off at  $25^{\circ}\text{C}$  & below.
16. Potential free N/O ( N/C optional) contacts in healthy conditions are available, for the connections of **ext. Alarms**, against **power fail** and **HRT**.
17. At the time of instillation, if room temp. is above  $27^{\circ}\text{C}$ , all machines operate together with the preset starting delay.
18. Independent power input facility for controller. So that, in case of MCB trip down by any A.C., Alarms can be generate. (3 cores power cord is provided).
19. High Temp. Alarm at  $32^{\circ}\text{C}$  & above.
20. Thermostat: -  $10\text{K}\Omega$  (N.T.C. type)

### **Temp. Controller & Display (2 Digits)**

1. Set Temp. range: - 16<sup>0</sup> C to 32<sup>0</sup> C
2. Room Temp. display range: - 00 to +99<sup>0</sup> C
3. Cut off at set point & cut in by +2<sup>0</sup> C.
4. Keys available: - Temp. set / Up / Down .
5. L.E.D. indicator glows, when room Temp. is achieved & machines are tripped off by thermostat.

**Note:** - Field wiring diagram is printed on the “Timer” cabinet.

**Table - 1**

<b>Time</b>	<b>Operational Machines</b>	<b>Stand-by Machine</b>
At 12.00 Noon	M- 1, 2, 3	M – 4
At 01:00 PM	M- 2, 3, 4	M – 1
At 02:00 PM	M- 3, 4, 1	M – 2
At 03:00 PM	M- 4, 1, 2	M – 3

**Note:-** Above table and literature belongs to server- 4 model.

Slide switch for selection of server-3 / server-4 model is available.

## 2) ADJUSTABLE - T.D.R.

Creates starting time delay between AirConditioners to prevent **Heavy Starting Load** on the main supply line. ( **2 Mins.fixed delay + 2 Mins. Adjustable delay** ).

- Inbuilt **Quick Start** Switch for immediate start.
- Time Delay and Power Output bi-colour **LED Indicator**.
- Very useful on sites where output for all ACs. is from **Servo Stabilizer**, &
- Where frequent power cutoff **AND** change over between **Mains & DG** .
- **Fire Proof** Taflon coated wires are used.

## 3) D.C. CONTACTOR ( 1 Ph. )

Electro – Mechanical Contactors in Split AC's at **low voltage**.

- Creates chattering noise.
- Contact Points are burnt, (since contact points are unrepairable, therefore we have to replace contactor).
- Cost of contactor is high.

To prevent above problems **D.C. Contactor** is used.

- Inbuilt **Under Voltage Protection & TDR**
- Since relay is used, hence negligible contact noise.
- **Fire Proof** Taflon coated wires are used.
- **Low cost** product with inbuilt features.

## 4) THREE PHASE MONITOR:

- Protects the three phase **compressors & motors** against **missing phase & reverse phase**.
- LED indicators are available for **healthy supply, missing phase & reverse phase**.

## 5) CONTROLLERS FOR REFRIGERATORS. WHIRLPOOL GNF ( INTELCOOL ) MODEL.

6) ELECTRONIC STARTER : Some remote operated airconditioners which does not start itself after regaining of the power.

**This circuit helps to start airconditioners automatically.**

7) HEATING CIRCUIT : Remotes of Airconditioners are modified to work in heat pump mode in addition to cooling operation.

**Modification is done on Same Handset and Thermostat .**

## 8) POWER SUPPLY FOR “AMTREX SENPAI” & “HITACHI ATOM” D.C. MOTOR :

- Whenever there is remote failure in **senpai & Atom** model having DC indoor motor, machine cannot operate on main supply voltage. Therefore, by using this device machine can be operational for the time being till remote is not available/under repair.
- You can use it, as a “Test Equipment” to check this motor, before to purchase new one. This is available for 1.0 Tr., 1.5 Tr. and 2.0 Tr. in the same device.

## 9. Intelligent (Automatic) **3 Phase Sequence Corrector (PSC...)**

- Protects the **“Three phase Motors & Compressors”** against **missing phase** conditions. During such conditions Machine becomes stand-by.
- Provides **“correct phase sequence”** to the connected 3 Phase loads. Whenever input phase sequence is incorrect. Machine works in its proper order.
- In built **“on delay”** 10 sec. & >2 mins. (selectable at site by slide switch.)
- Separate **LED** indicators, for
  - (1) On delay (yellow)
  - (2) Healthy supply (green)
  - (3) Missing phase (red)
  - (4) Reverse phase (red)
- **Teflon coated Internal wiring** for three phase input and output.
- CRC 23,21 gauge metallic, powder coated, wall mounting type cabinet
- Glass epoxy P.C.B.
- Super branded contractor, relays and other components are used.
- By-pass switch is also available.
- Available in following **RATINGS**

<b>S.No.</b>	<b>Current Rating Per Phase</b>	<b>Recommended Load Capacity (approximately)</b>
1.	16 Amps.	Up to 5.0 Tr.
2.	25Amps.	5.5 to 7.5 Tr.
3.	32 Amps.	8.3 to 10.0 Tr.
4.	40 Amps	11.0 to 15.0 Tr.
5.	50 Amps	16.0 to 20.0 Tr.
6.	65 Amps	21.0 to 25.0 Tr.
7.	73 Amps	26.0 to 30.0 Tr.

**NOTE:** Check the **current** of **single phase devices** (using in machine) & add it into **compressors** current, then select the **P.S.C. MODEL**. Keep 20% margin in current for better efficiency and results.

- Free Repair Commitment:- **CONTACTOR ( 00 Months ) REST ALL (06Months )**.

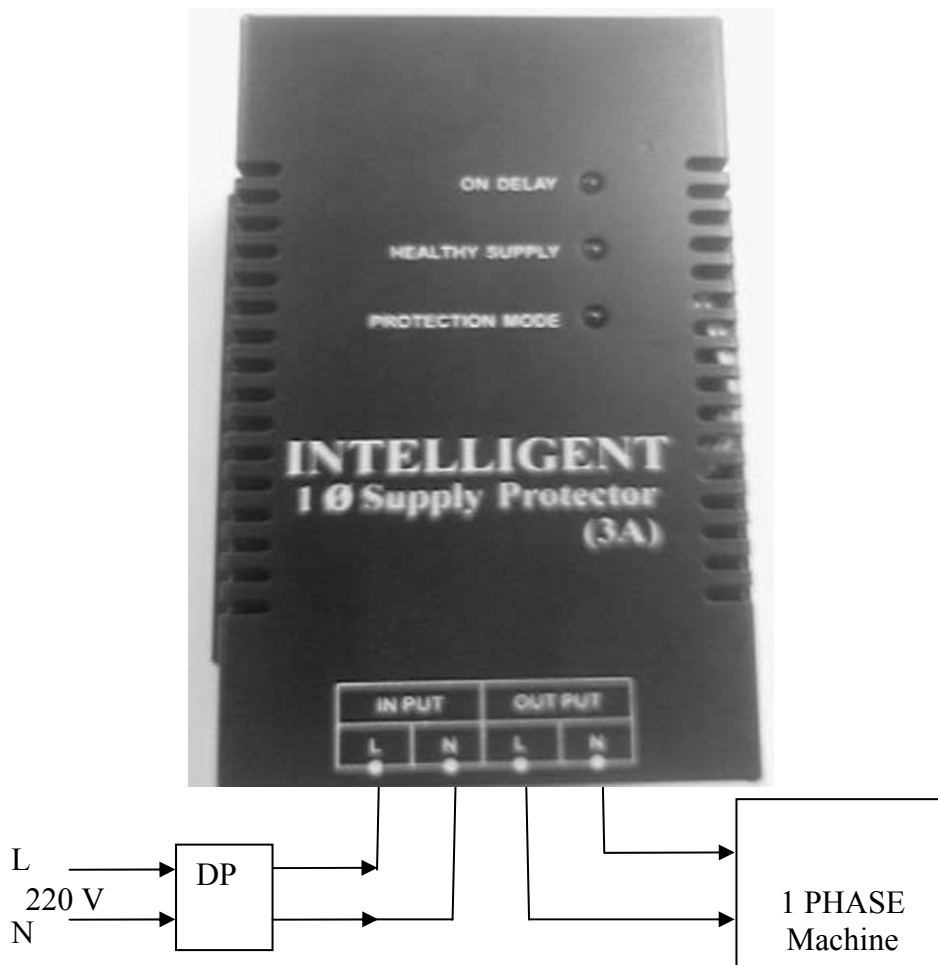


10. [3 Phase Liquid Level Controller](#)

11. [Temp. Based Alarm & controller \( with 2 digits 7 segment display\)](#)

12- [One Phase Supply Protector \( 5 Amps.\)](#)

- In built **“on delay”** (adjustable at factory) 15 Sec. to 3 Mins. with “QUICK START” key.
- Protects Single Phase devices, i.e. **Contactors, Electronic Circuit, Solenoid Valve, Single Phase Motors, Drain Pumps & Transformers** etc. Against **abnormal voltage** conditions. (under volt cut off at  $\leq 175$  v~, over volt cut off at  $\geq 255$  v~)
- Protection against **Neutral** breakage.
- Protection against **Double phasing**.
- In built **Spikes Suppressor**.
- Separate **LED** indicators, for
  - (1) On delay (yellow)
  - (2) Healthy supply (green)
  - (3) Protection Mode (red)
- CRC 23 gauge metallic, powder coated, wall mounting type cabinet
- Glass epoxy P.C.B.
- Super branded components are used.
- Available in **5 Amps. & 20 Amps.** Ratings. (20A with **Teflon Coated Wiring**).



### 13- UNIVERSAL CODRLESS CONTROLLER ( ISR-09 )

For use in,

Window AC

Wall mounting split AC

Cassette type AC

Tower type AC

Single compressor duct able AC

A.H.U.

Roof top type AC.

#### Features.

- 1- As power up the controller, all glowing components are light up for few seconds, in order to ensure that all LEDs and segments are O.K.
- 2- When machine is in ON state,
  - a. **The 7 segment display** normally shows the set temperature in **Cool / Dry** modes. ( No temp. display in fan mode..)
  - b. **One** of the three + Auto Fan speed (in order of High / Medium / Low) is available, as selected. (Respective LED, H/M/L glows.)
  - c. Out put for **Swing Motor** is available ( If swing key is already pressed for Swing ON ). Provision of 220VAC motor .
  - d- Out put for **Compressor**, is available after the time delay of **3 minutes**.

### KEYS OF NON-LCD HAND SET,

- 3- **POWER ON-OFF KEY.....**By pressing this key, machine completely switch OFF or ON at previous settings. ( This key is also available on display panel.)
- 4- **MODE KEY.....**By pressing this key , **COOL / DRY / FAN** mode scrolls in the said order , and respective LED glows. When **FAN mode** is selected , display becomes off. In any **Cooling mode** compressor trip-off at set temp. and cut-in, when room temp. increases by **+2 °C** in respect of set value. If room Temp. increases **+2 °C** in respect of set temp. before 3 minutes, Processor waits up to total 3 minutes, then **µP** provides out put for compressor. If temp. increases after 3 minutes, compressor gets start immediately.
- 5- **FAN KEY ....**By pressing this key , one of three + Auto Fan speed selects in order of **H , M , L ,Auto** and respective LED glows. In Auto Fan speed, fan runs on High speed with compressor and shift to Low speed automatically, when compressor gets trip-off through thermostat. **Low or High** speed LED glows accordingly.  
**NOTE:-** Provision to use with a **single, double & triple speed Fan Motor** ( through hardware setting ).
- 6- **SWING KEY.....**By pressing this key , **Swing motor** gets ON or OFF. It is an independent function.
- 7- **TEMPERATURE UP KEY .....**By pressing this key , required temp. values increases, **16 to 30 °C** and it is available in **COOL & DRY** modes.
- 8- **TEMPERATURE DOWN KEY .....**By pressing this key , required temp. values decreases, **30 to 16 °C** and it is available in **COOL & DRY** modes.
- 9- **TIMER KEY .....**By pressing this key , **OFF TIMER** sets **00 to 24 Hrs.** in step of one hour. Respective LED glows. After completing the programmed time, machine gets OFF. When time is set for ZERO ZERO, or user switched off the machine, Timer function becomes disable and timer LED turns off. It is available in **all modes**.
- 10- **SLEEP MODE KEY.....** **This feature is available in Cool mode only.** By pressing this key, **set temp.** changes automatically **+1°C every Hr.** (2 steps only) Buzzer beeps on every change. Respective LED glows. After 2<sup>nd</sup>. Step, temp. setting does not. If key is pressed again, sleep mode becomes cancel. After 12 hrs. it becomes cancel automatically. After cancellation , it goes back to the previous setting. Fan selection, Timer mode and temp. setting is allowed. If power ON/OFF key is pressed, sleep mode becomes cancel.
- 11- **DRY mode.....** In this mode, **Fan speed** is default low. And **comp.** works in **cyclic** mode. If room temp. is **more then 3 °C** in respect of set value, comp. runs for 6 mins. and stop for 6 mins. If room temp. is **less then 3 °C** in respect of set value, comp. runs for 12 mins. and stop for 12 mins. **The Comp. cut off through thermostat at set temp.** And re-start, when room temp. increases by **+2°C** in respect of set temp.
- 12- Out put for **Drain pump** is available. It is independent from **comp.** section , it works on the basis of **float switch** reporting only. Provision of both **NC & NO** type float switches ( field set able ).
- 13- **MISC. FEATURES** are as under,
  - a. Error codes, "**SF**" for room sensor fail (open or short circuit ) , **EP** for memory fail.
  - b. When sensor fails, compressor runs for 30 mins. And cut off for 15 mins. In cyclic mode. Display shows " SF " continuously. Except Power ON/OFF & Timer keys, all keys becomes un-operational.
  - c. When memory fails, display shows " EP" for few seconds, machine starts on **default** settings ( Cool mode and high fan ). User can change the settings, but, new entries does not store.
  - d. **Pre-set memory**..... If power regains after break-down, machine stars at previous settings.
  - e. On each user setting, Buzzer beeps & after few seconds, Display blinks ( during display related functions). to ensure acceptance of command given. **After blink, display normally shows set temp.**
  - f. By externally slightly change in **Field terminal** wiring, it can operate with a **24V** system. Like **Roof top** type machines and **A.H.Us**.