



**EVHR** 820, 1020, 1520, 2020, 2520, 3020, 3520, 5020, 420 EC ,820 EC  
1020 EC, 1520 EC, 2020 EC, 2520 EC, 3020 EC, 3520 EC, 5020 EC, 6020 EC

Ceiling Type Heat Recovery Unit (Aluminium Plate)



Assembly & Maintenance Guide



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Introduction .....	Page 1
Warnings & Safety Informations.....	Page 2
Check List .....	Page 3
Technical Specifications .....	Page 4
Unit Dimensions .....	Page 5
Installation Alternatives .....	Page 6
Installation .....	Page 7
Selection of Electrical Cable Cross-Section .....	Page 9
Maintenance .....	Page 11

## INTRODUCTION

Installation&Operation Manual has been prepared and given to customer as a guide for easy installation&operation units manufactured by ENEKO A.Ş. The manual contains description of the unit, components and basic informations and recommendations for proper and fail free operation. Please read the instructions and warnings given in this manual before starting installation, operation and maintenance works and keep this manual near the unit, within easy reach of service personnel.



Any damage, failure or hazard occurred because of use except this purpose is beyond the responsibility of manufacturer.



For technical service and questions, please contact with following information.



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# WARNINGS & SAFETY INFORMATION



## PROHIBITED

- ◆ This unit has to be used under proper conditions according to its technical specification and design purpose. (Otherwise responsibility belongs to practitioner)
- ◆ Unauthorized personnel must not interfere in unit and/or must not use unoriginal spare parts. (Otherwise responsibility of failure that may occur belongs to practitioner)
- ◆ Do not install this product in a refrigerated warehouse, heated swimming pool or other location where temperature and humidity are significantly different. (Failure to heed this warning may result in electrical shock or malfunctioning.)
- ◆ Do not install this product where it will be directly exposed to rain. (Failure to heed this warning may result in electrical shock or malfunctioning.)
- ◆ Do not install this product in a location where acid, alkali or organic solvent vapors, paints or other toxic gases, gases containing corrosive components or high concentrations of oily smoke are present (Failure to heed this warning may result not only in malfunctioning but also fire, power leakage and electrical shock.)
- ◆ Do not use this product outside the range of its rated voltage and control capacity.



## ATTENTION

- ◆ Install this product in an environment where the temperature ranges from 0 °C to +40 °C and the relative humidity is less than 60%. If condensation is expected to form, heat up the fresh outside air by a duct heater etc.
- ◆ Select an adequately sturdy position for installing the product and install it properly and securely.
- ◆ Use the designated electrical wires for the terminal board connections and connect the wires securely so that they will not be disconnected. (Failure to ensure proper connections may result in fire.)
- ◆ When passing metal ducts through wooden buildings clad with metal laths, wire laths or metal, these ducts must be installed in such a way that they will not make electrical contact with metal laths, wire laths or metal sheets. (Power leakage can cause ignition.)
- ◆ The outside ducts must be tilted at a gradient (1/30 or more) downwards toward the outdoor area from the main unit, and properly insulated. (The entry of rain water may cause power leaks, fire or damage to household property.)
- ◆ Gloves should be worn while installation. (Failure to heed this warning may result in injury.)
- ◆ A dedicated circuit breaker must be installed at the origin of mains power supply. This circuit breaker must be provided with a means for locking (lock and key).
- ◆ The body of the unit, room control panel and cables keep away the unit 3 m. distance.



- ◆ This product must not be disassembled under any circumstances. Only authorized repair technicians are qualified to conduct disassembly and repairs. (Failure to heed this warning may result in fire, electrical shock or injury.)



- ◆ Connect the product properly to the ground. (Malfunctioning or power leaks can cause electrical shock.)



- ◆ An isolator switch having minimum contact gap of 3 mm in all poles must be provided as a means of disconnecting the power supply.

**NOTE:** The installations, which is not available for installation and operation manual, is out of guarantee.

# CHECK LIST

In the event of unit failure and pre-commissioning checks to be made are determined as follows; after checking this information, please contact our company in case failure continues.

## Controls

√

Make sure that the unit receives power and electrical grounding is made!

Make sure that the electricity cables are drawn from in the correct cross section!  
(Please check whether there is heating on cables or not.)

Please check whether the cables in unit control panel are shielded (shielded magnetic field) or not; make sure shielding is grounded. If not, please change them!

Make sure that fresh air and exhaust air filters are clean and they do not block the flow of air!

Make sure there is the connection of drainage on the unit, check any possible clogging in drainage line and clean if necessary!

Please check whether the diameter of the air duct connection of the unit and the diameter of the spigot are the same. If the duct connection is smaller, change it with the correct one.

Make sure the electrical connections of the unit are made as suggested on the unit and in this guide, check if there is incorrect connection.

Make sure during the installation of the unit there is enough space for the service and if there is not enough space, re-install again.

In extremely cold climate applications, frost may occur on the exchanger, apply electric heater in fresh air intake section of the unit to get the temperature to -3°C and above.

After installing the unit, make sure that it does not create an abnormal sound or vibration, if there is, make sure that rubber pads are used.

# TECHNICAL SPECIFICATIONS

		EVHR 820	EVHR 1020	EVHR 1520	EVHR 2020	EVHR 2520	EVHR 3020	EVHR 3520	EVHR 5020		
EVHR TECHNICAL SPECIFICATIONS	Air Flow*	m³/h	780	930	1440	1800	2440	2780	3500	4650	
	Supply Voltage	V/Hz/f	230/ 50 /1 ~								
	Max. Power Consumption	w	244	350	688	688	1060	1060	1020	1460	
	Max. Operation Current	A	1.08	1.54	3.02	3.02	4.68	4.68	4.92	6.58	
	Max. Sound Pressure**	dB	42	43	46	42	52	52	44	50	
	Unit Weight	kg	46	46	60	82	104	127	132	164	
	Filter Class		G Class Synthetic Filter According to ISO 16890								
	E.Heater Supply Voltage	V/Hz/f	Please check below "Electrical Heater Capacities" table.								
Heater Coil (90/70 °C)	kW	2.9	4.3	6.4	8.3	11.4	14.2	17	22.8		

\*External static pressure is 0 Pa.

\*\*Measured at 1,5m distance to the unit.

\*\*\*Electrical heater and heater coil are optional. Electrical heaters shall be used before the fresh air inlet of the unit to preheat air where outdoor air is below -3 °C and condensation can occur. Also in humid climates extract air ducts must also be insulated against condensation.

		EVHR 420 EC	EVHR 820 EC	EVHR 1020 EC	EVHR 1520 EC	EVHR 2020 EC	EVHR 2520 EC	EVHR 3020 EC	EVHR 3520 EC	EVHR 5020 EC	EVHR 6020 EC		
EVHR EC TECHNICAL SPECIFICATIONS	Air Flow*	m³/h	420	960	1075	1600	2350	3075	3300	3550	4700	6250	
	Supply Voltage	V/Hz/f	230/ 50 /1 ~							400/50/3			
	Max. Power Consumption	w	144	280	380	810	1020	1040	1040	2400	2240	6140	
	Max. Operation Current	A	0.98	2.18	2.98	5.18	6.38	4.58	4.58	3.78	3.58	9.58	
	Max. Sound Pressure**	dB	42	43	46	42	52	52	44	50	50	50	
	Unit Weight	kg	25	43	44	63	74	94	119	119	142	154	
	Filter Class		G Class Synthetic Filter According to ISO 16890										
	E.Heater Supply Voltage	V/Hz/f	Please check below "Electrical Heater Capacities" table.										
Heater Coil (90/70 °C)	kW	1.5	2.9	4.3	6.4	8.3	11.4	14.2	17	22.8	25.1		

\*External static pressure is 0 Pa.

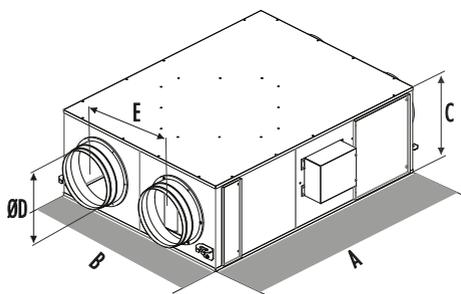
\*\*Measured at 1,5m distance to the unit.

\*\*\*Electrical heater and heater coil are optional. Electrical heaters shall be used before the fresh air inlet of the unit to preheat air where outdoor air is below -3 °C and condensation can occur. Also in humid climates extract air ducts must also be insulated against condensation.

Model	Electrical Heater Capacities (Kw)									
EVHR 420	1	1,5	2							
EVHR 820	2	3	4							
EVHR 1020	1,5	3	5	6						
EVHR 1520	1,5	3	5	6						
EVHR 2020	2	4	5	6	8					10
EVHR 2520	4	6	8	10	12					16
EVHR 3020	4	6	8	10	12					16
EVHR 3520	4	6	8	10	12					16
EVHR 5020	5	10	13	15	18					20
EVHR 6020	5	10	13	15	18					20

\* Gray values supply voltage are 230/50/1 (V/Hz/f). Other values supply voltage are 400/50/3 (V/Hz/f).

# UNIT DIMENSIONS



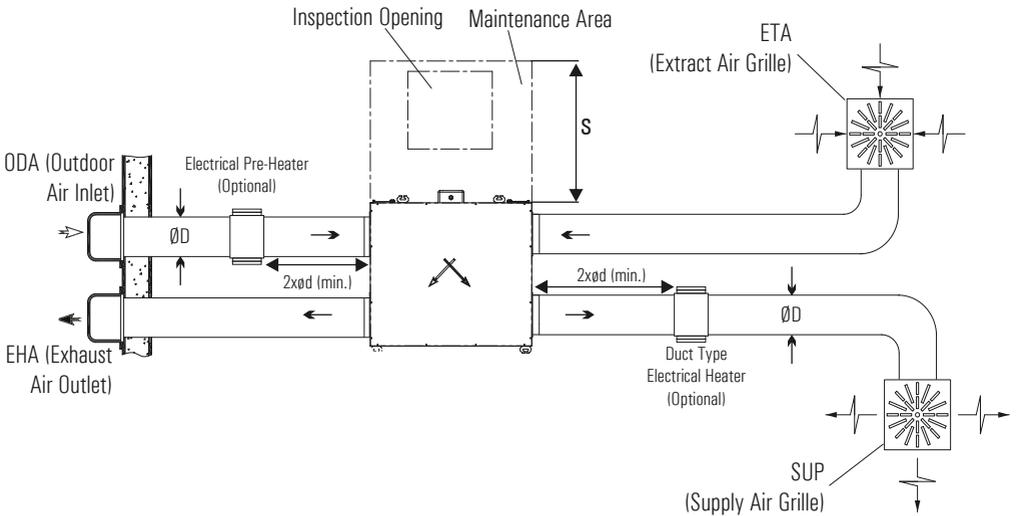
	A	B	C	E	ØD	S
<b>EVHR 420 EC</b>	820	550	275	260	160	500
<b>EVHR 820 EVHR 820 EC</b>	930	680	342	340	200	500
<b>EVHR1020 EVHR1020 EC</b>	930	680	342	340	250	500
<b>EVHR1520 EVHR1520 EC</b>	1072	826	379	420	250	500
<b>EVHR2020 EVHR2020 EC</b>	1193	980	433	490	300	600
<b>EVHR2520 EVHR2520 EC</b>	1335	1120	433	560	355	700
<b>EVHR3020 EVHR3020 EC</b>	1570	1160	535	580	355	700
<b>EVHR3520 EVHR3520 EC</b>	1570	1160	535	580	355	700
<b>EVHR5020 EVHR5020 EC</b>	1800	1170	650	580	450	750
<b>EVHR6020 EC</b>	1800	1170	650	580	450	750

\* All measurement values are mm.

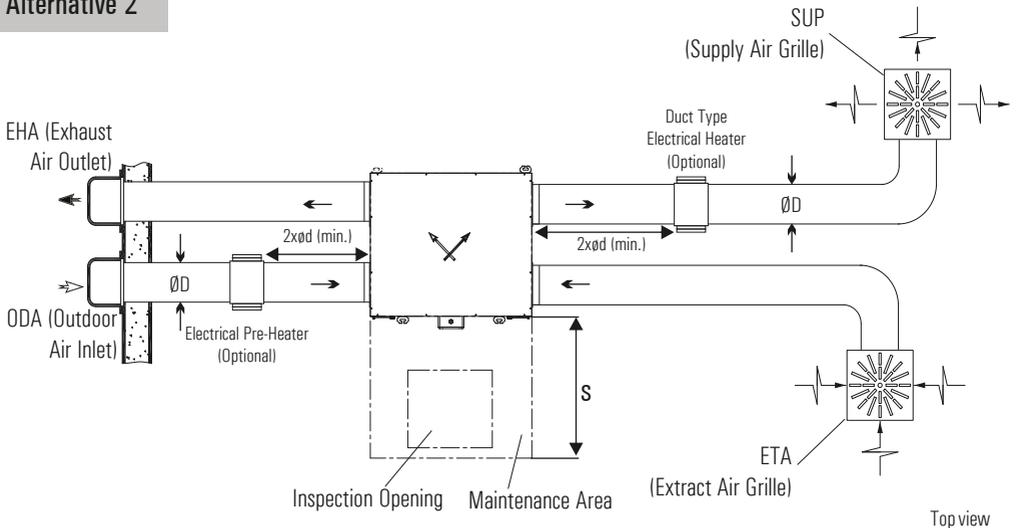
\* The gaps of the maintenance area values are specified as "S" on the table. (Please see Installation pages.)

# INSTALLATION ALTERNATIVES

## Alternative 1



## Alternative 2

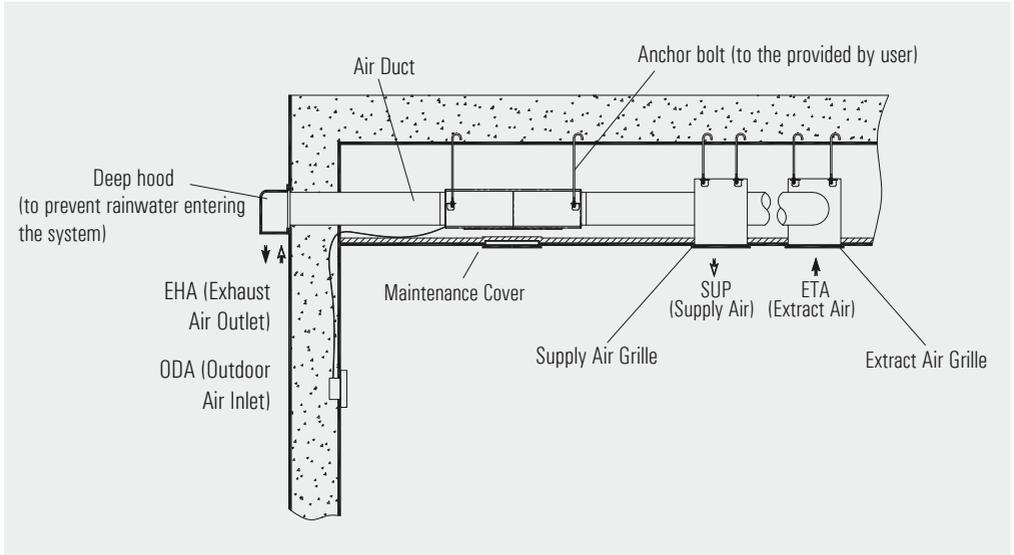


Top view



The gaps of the maintenance area are specified as "S" on the technical picture.  
(Please see Unit Dimension pages.)

\* Drain pipe must be installed.



  
Check these warnings before installation.

Extremely Sharp Bends



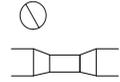
Multiple Bends



Bends right next to the outlet



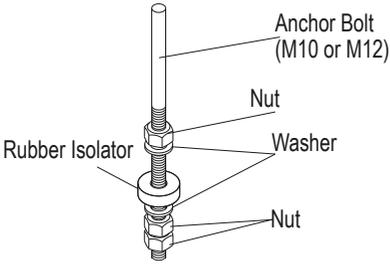
Extreme Reduction in the diameter of the connected ducts



  
1- Install the electric heater at a distance of two times away from duct connection diameter.  
2- Connect the drainage line with downward slope.  
3- Water condensed in the exchanger should be discharged by connecting 10mm. diameter drain hose to the drain outlet under the unit.

4- The applications which can prevent the flow of water in the drainage line should be avoided.  
5- The drainage line shall never be moved to an upper level than the drain pan.

## Preparing The Sling Bolts

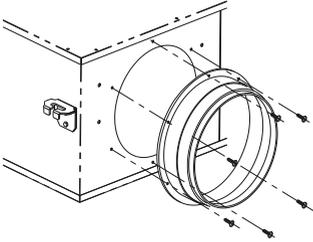


Hang the suspension bracket on the anchor bolts and adjust in such a way that the unit is installed horizontally. Tighten up securely using double nuts in order to prevent looseness.

### **! WARNING**

Check the stability of sling bolts during the installation.

## Attaching The Duct Connection Flanges

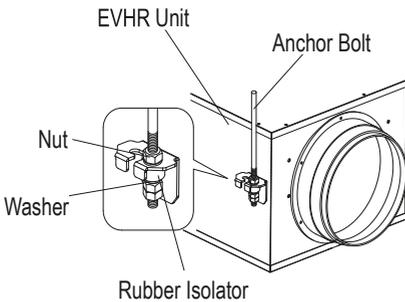


If the duct connection flanges are not connected to the unit, use the screws that can be found in the installation package to connect the flanges to the unit as the figure on the left.

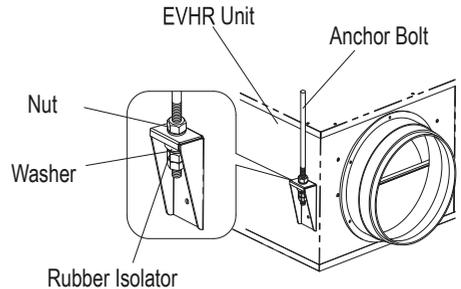
### **! WARNING**

Before attaching the duct connection flanges, check that no foreign matter has found.

## Installation Of The Unit



Hang the unit on the anchor bolts and adjust in such a way that the unit is installed horizontally. Tighten up securely using double nuts in order to prevent looseness.



### **! WARNING**

Do not handle the unit in such way that force will be applied to the control box when suspending the main unit from the ceiling.

# SELECTION OF ELECTRICAL CABLE CROSS-SECTION

Unit Model	Unit Voltage (V)	Unit Power Input (kW)	Current (A)	Fuse (A)	Cable Cross-Section(mm <sup>2</sup> ) for 50M and PF=0.8
EVHR					
820	230	0.24	1.08	2	1.5
1020	230	0.35	1.54	2	1.5
1520	230	0.69	3.02	3.15	2.5
2020	230	0.69	3.02	3.15	2.5
2520	230	1.06	4.68	5	2.5
3020	230	1.06	4.68	5	2.5
3520	230	1.02	4.92	6.3	2.5
5020	230	1.46	6.58	10	4

The data in the table shows the maximum power/current values. Please check unit label for updated values.

Unit Model	Unit Voltage (V)	Unit Power Input (kW)	Current (A)	Fuse (A)	Cable Cross-Section(mm <sup>2</sup> ) for 50M and PF=0.8
EVHR EC					
420	230	0.14	0.98	2	1.5
820	230	0.28	2.18	2.5	1.5
1020	230	0.38	2.98	3.15	1.5
1520	230	0.81	5.18	6.3	2.5
2020	230	1.02	6.38	10	2.5
2520	230	1.04	4.58	5	2.5
3020	230	1.04	4.58	5	2.5
3520	400	2.40	3.78	3x4	2.5
5020	400	2.24	3.58	3x4	2.5
6020	400	6.14	9.58	3x16	2.5

The data in the table shows the maximum power/current values. Please check unit label for updated values.

## Cable Cross-Section Formulas

1  

$$I_{\text{current}} = \frac{P}{U \cdot \cos\phi}$$

$I_{\text{cable}} > I_{\text{current}}$

2  

$$\%e = \frac{100 \cdot P \cdot L}{k \cdot S \cdot U^2}, \quad S = \frac{100 \cdot P \cdot L}{k \cdot \%e \cdot U^2}$$

$\%e = \%3$

3  
 $I_{\text{cable}} > I_{\text{fuse}} \geq I_{\text{current}}$   
 Cable Cross-Section  $S = \text{Max}(S1, S2, S3, 1.5\text{mm}^2)$

**P** : Power

**I** : Current

**U** : Voltage

**S** : Conductor cross section

**k** : Conductor coefficient

**L** : Conductor length

**%e** : The voltage drop

## Example of Cable Cross-Section Calculation

**P** : 2,6 kW

**L** : 50m

**U** : 230V

**%e** : %3

**PF** : **cosφ**: 0,8

**k** : 56m / Ω

1  

$$I_{\text{current}} = \frac{2600 \text{ W}}{230 \cdot 0,8} = 14.2 \text{ A}$$

The cable will be used, is selected from the cable cross-section table so that the equivalent ampere value in the table should be higher than calculated "I<sub>current</sub>" value.

$S1 = 1.5 \text{ mm}^2$

2  
 $\%e = \%3$

$$S = \frac{100 \cdot 2600 \cdot 50}{56.3 \cdot 230^2} = 1.46 \text{ mm}^2$$

$S2 \geq 1.46 \text{ mm}^2 \geq 1.5 \text{ mm}^2$

$S2 = 1.5 \text{ mm}^2$

3  
 $I_{\text{cable}} > I_{\text{fuse}} \geq I_{\text{current}}$

$I_{\text{cable}} > 16\text{A} \geq 14.2\text{A}$

"I<sub>fuse</sub>" which will be higher than "I<sub>current</sub>", is selected.

The cable will be used, is selected from the cable cross-section table so that the equivalent ampere value in the table should be higher than selected "I<sub>fuse</sub>" value.

$I_{\text{cable}} = 24\text{A}$

$S3 = 1.5 \text{ mm}^2$

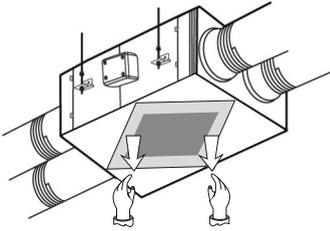
Cable cross-section  $S = \text{Max}(S1, S2, S3, 1.5 \text{ mm}^2)$

$S = \text{Max}(1.5, 1.5, 1.5, 1.5)$

$S = 1.5 \text{ mm}^2$

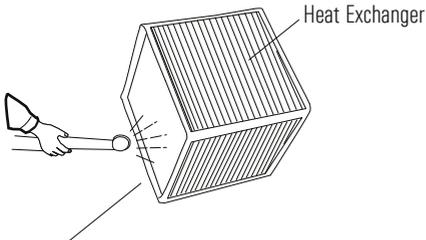
- ◆ TURN OFF all the power switches before the maintenance is performed.
- ◆ Do not operate the system without the air filter to protect the components of the unit against being clogged.
- ◆ Clean up the air filter more than once in a year.
- ◆ Clean up the heat exchanger more than once per year.

## Heat Exchanger Cleaning



**Step 1:** Remove the exchanger's service cover, then remove the heat exchanger out from the main unit.

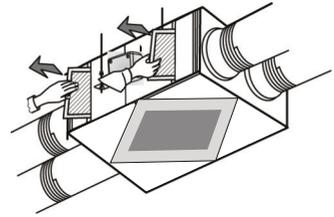
**Note:** The maximum weight of heat exchanger is 30 kg.



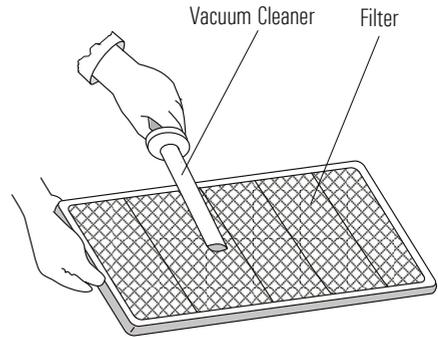
Clean using hot water or steam.

**Step 2:** Heat exchanger can be cleaned by hot water or steam. Leave to dry after cleaning heat exchanger. Connect the unit after making sure that the heat exchanger has dried.

## Air Filter Cleaning



**Step 1:** Open the maintenance cover. Draw out the air filters from the unit.



**Step 2:** Use a vacuum cleaner to clean the dust from the coarse air filter. Dirty fine filters should be changed.







## Warranty Certificate

- \* If the unit is used according to the instructions given in user manual and interfered in only authorized technical service that we authorize about any maintenance and repair reasons, all spare parts will be under warranty for 2 years against material, labor and production faults except motor components.
- \* Identifying of parts replaced and determining troubleshooting technical procedure applied, will belong to our company.
- \* After ex-works of goods, all faults during loading, unloading and shipment will be out of guarantee. If a falsify has been made on documents or any falsify and changing have been made on serial number, goods will be out of guarantee.

## Terms of Guarantee

1. Guarantee period is 2 years as from the time of delivery.
2. All spare parts except motor components are under warranty.
3. If the goods break down during guarantee period, the time spent for maintenance will be added to guarantee period. Maintenance period is 30 days at most. 30 days begin with the notice to a service station. If there is no service station, 30 days begin with the notice to the seller, dealer, agency, agent, importer or manufacturer of the goods.
4. If production fault occurs during guarantee period; the cost of new spare part and labor will not be claimed from the customer.
5. If a fault occurs because of not using or assembling according to the instructions given in user manual, goods will be out of guarantee.

**UNIT TYPE**

**SERIAL NO**

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