eneko®

Ecology Units
(ECO Series)

Installation & Operation Manual

CE

EN

INDEX

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.

+90 232 328 20 80 / 103-152
+90 530 875 65 88
www.eneko.com.tr
servis@eneko.com.tr

- 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.)
- Unit should not be subjected to excessive vibration and shock while transporting.
- If the unit is damaged due to any transporting etc. reasons, it should not be mounted.
- There should be avoided to put any material on to the unit that may cause any damage.
- 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.

- If outdoor air is too cold and can cause condensation, pre-heater should be used to prevent.
- Select an adequately sturdy position for installing the product and install it properly and securely.(The unit can cause injuries in case of fall.)
- The surface of the unit must be able to carry the weight of the unit.
- Use electric cables specified in the manual to connect the room control board and check the connection strength (Otherwise fire may occur).
- Where ducts pass through the building and in the area which is connection with building construction, pay attention that ducts never touch any metal parts and any electrical contact.
- 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.
- 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, the control room panels and cables must be at least 3 meters away from high electro-magnetic field forming equipment or cables.

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

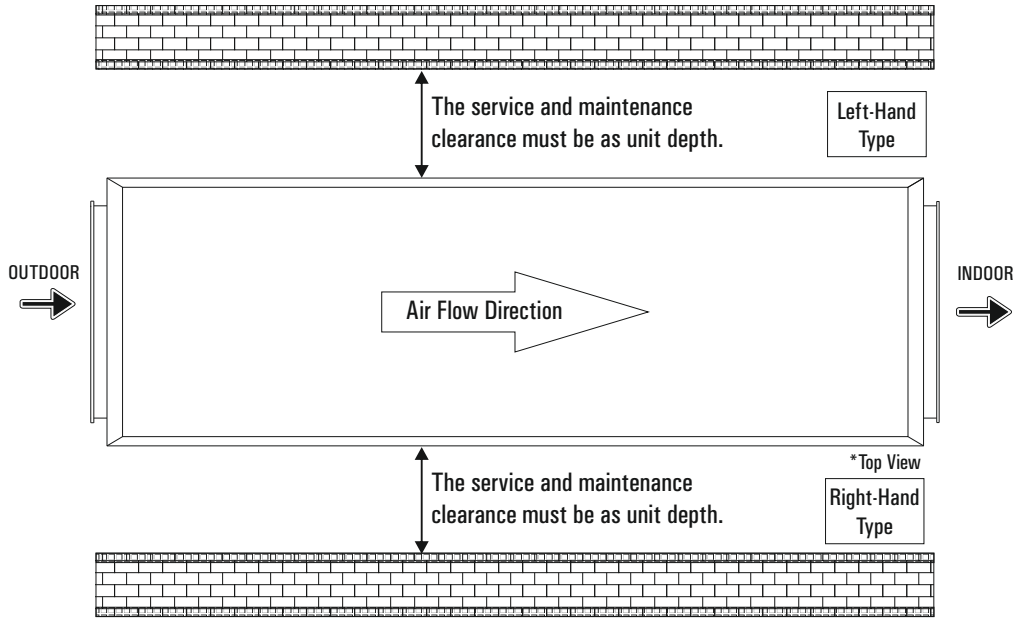
- Connect the product properly to the ground.(Malfunctioning or power leaks can cause electrical shock.)
- Electrical connection should be made by authorized and trained technical personnel.
- Water connections should be done before the electrical connection is made. Before starting electrical connection, make sure water connection is made tightly.
- Electrical wiring connections must be made according to the specified electrical wiring diagram.
- There should not be any changes to the electrical connections that is made at the factory.
- Cables used in network connection must conform to specified standards and earth connection must be made.
- A circuit breaker should be placed between the network and unit. The circuit breaker should be selected according to the total power and current value specified on the label.
- Overcurrent fuse is recommended for the unit.

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.	
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.	



Sufficient clearance must be provided on all sides of unit to remove access panels, fixed panels and in unit equipment. For countries where local regulations take force, appropriate service clearance according local regulations shall be maintained.

Lifting Considerations

- Do not lift the unit when it is windy and while a personnel is working under the unit.
- Use lifting chain as shown below. Lifting chains must be capable of supporting the entire weight of the device.
- Lifting chains may not be the same length. Set lifting chains to balance the device.
- If possible, create a parallel loop straps to the air flow direction.
- For your safety, when unit is lifted up, you may use appropriate equipment method such as belts, straps.
- Determine center of gravity of unit and test it by lifting up about 500 mm. If lifting point is not appropriate, re-determine it to prevent falls. Not lifting the unit properly may cause serious injury even death.

⚠ Failure to follow the instructions above may cause damage of equipment, serious injury, or even death.
Subassemblies and parts of unit are equipped as shipped from the factory.

For units that are dispatched as one piece, please place minimum 4 pipes into carrying holes which are located on the unit and affix them to the carrying handle then carry the units as it is shown in **figure a**.

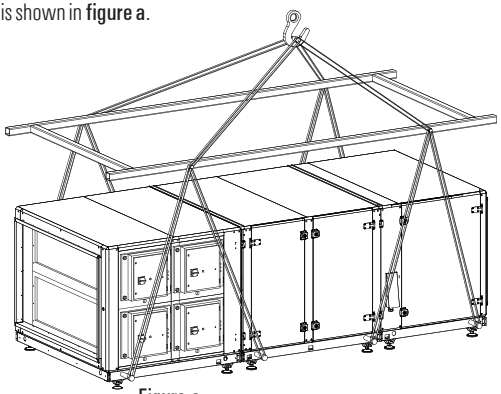


Figure-a

For units that are dispatched as modular, please affix pipes into holes which are located on the units and carry with ropes as it is shown in **figure b**.

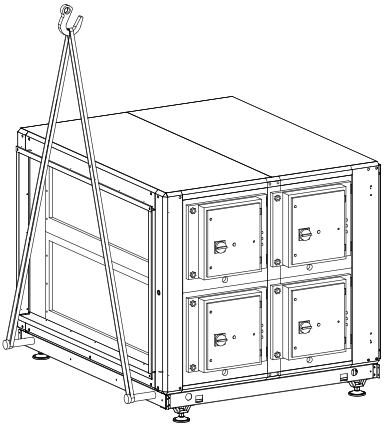
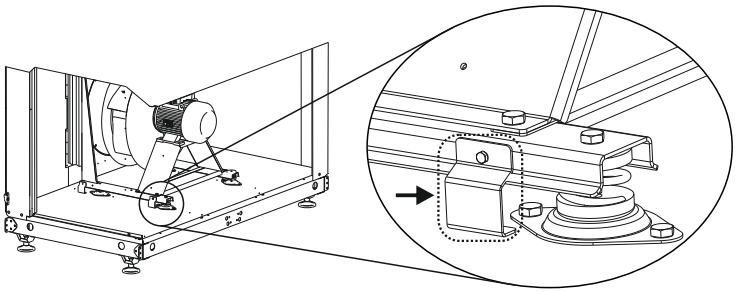


Figure-b

Fan Fixing



⚠

Fan fixing parts should be removed before the duct and electrical installation applications.

Assembly of Modular Units

⚠ The following information is available for modular units.

- The modules are moved closer to each other as shown in **Figure 1**.

- The level difference is set (considering surface flat enough). The modules must be equal to each other with the distance from the floor to the floor.Adjustment made by adjustable feet.

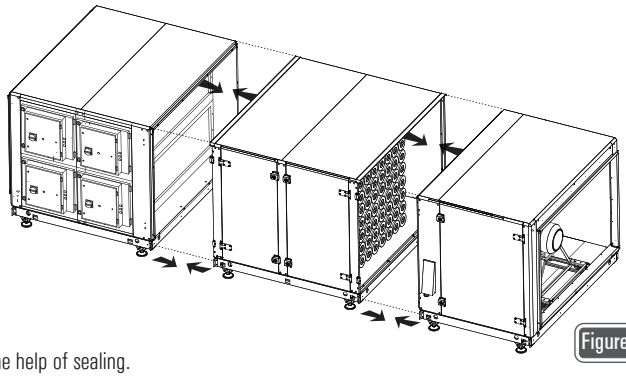


Figure-1

- Prepare the installation parts.

- Remove shipping bolts on the mounting surface.

- Assemble the contact surfaces of the unit with the help of sealing.

- Check the seals in between the modules. Change if it damaged.

- Assemble the modules.

- Screw the bolts of connecting parts of the module base frame.**(Figure-2-a)**

- Screw the bolts of connecting parts of the module.**(Figure-2-b)**

- The electrical connection sockets are installed.

- All bolts and nuts placed in an electric panel are assembled.

- If the bolt is in the position where it can be installed, the module assembly is assumed to be uniform then the fixing bolt is installed.

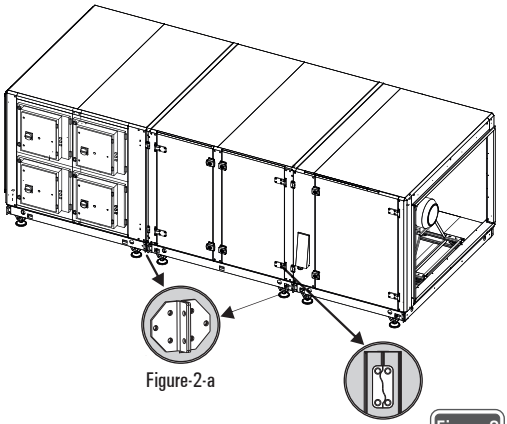
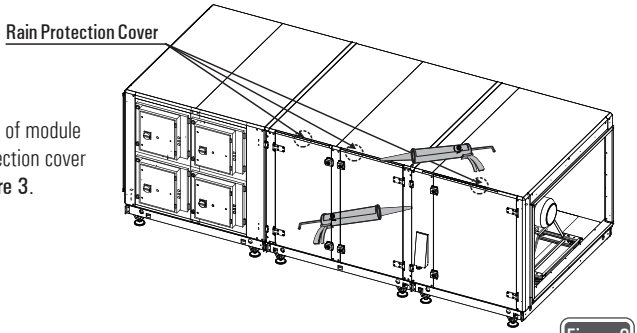


Figure-2-a

Figure-2-b

Figure-2



- If unit is an outdoor unit, apply silicon to the edges of module connections, underneath and edge of the rain protection cover and the edge of duct connections as shown if **Figure 3**.

Figure-3

Assembly of Duct Connections

- Ductwork connections should be connected to the unit by flexible duct connectors. Air tightness should be maintained to achieve required air flow conditions. Incorrect ductwork connections can change airflow conditions.
- Make sure that duct connections are connected in correct way using suitable duct sizes. Incorrect assembly directly affects the airflow and sound level.
- Insulate the ductworks or use insulated ductworks.
- Do not allow use elbow joints greater than 90° along with ducting.
- Do not allow use different duct size other than stated in the project.
- Make sure that all ductwork connections are air tight.
- If the ductwork connections are passing through a metal surface wall or metal construction area, make sure that there is ground connection between duct and these surfaces.
- Be sure to ground the ductwork against static electricity. The electric current that may occur on the channel may cause the oil on the surface of the channel to burn.
- Place an in-duct access cover on the device port.

Unit Service Door

- Service doors of the unit are designed to prevent air leakage and to interfere with the unit components.Be careful that the unit doors are locked correctly to make sure there is no air leakage.
- Make sure that the unit doors are locked by inserting the lock key in the middle of the door lock and turning it in the direction of in figure b.

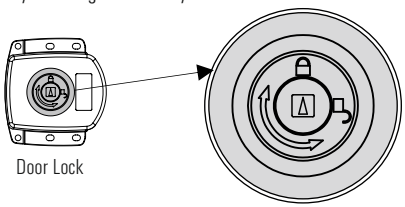


figure-b

Inner Casing

- The inner surface of the unit consists of corrosion-resistant galvanized / stainless steel. Also, cleaning and disinfection is easy because the inner surface of the unit is smooth.
- The galvanized / stainless steel design prevents oxidation of the inner surface of the unit caused by humidity or condensation in the air.
- The inner surface of the unit is resistant to disinfectant and similar applications.
- By appliying mastic sealant to the gaps at the panel profile joints of the unit, sealing is increased, and dust and dirt accumulation is prevented.

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.

Please, read the instructions carefully on this manual before operating the system.

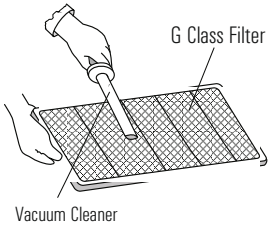
Filter

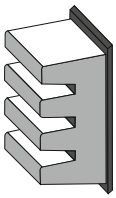
To clean up G class filters according to EN 779;

- Turn off the unit.
- Remove dirty filters.
- Use a vacuum cleaner to clean the G3-G4 class filters. Use warm water to clean the G2 class filter. Leave to dry after cleaning the G2 class filter.
- Place the filters in the filter slots.
- Close the service cover and be sure it is closed tightly.

To clean up F and M class filters according to EN 779;

- Turn off the unit.
- Remove dirty filters.
- Place new bag filters in the filter slots.
- Close the service cover and be sure it is closed tightly.





Place the F class filters in vertical position.

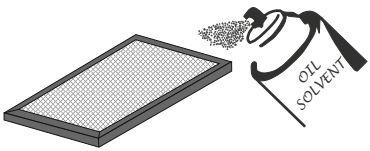
To clean up activated carbon air filter;

- Turn off the unit.
- Remove dirty filters.
- Place new filters.
- Close the service cover and be sure it is closed tightly.

Activated carbon air filter should have never cleaned with the water. Activated carbon filter should have replaced every 3-6 months with a new one in order to obtain the odor insulation level.

To clean up grease filters;

- Turn off the unit.
- Remove dirty filters.
- Clean with oil solvent every fifteen days. Then clean with the hot water. Leave to dry after cleaning the grease filter.
- Close the service cover and be sure it is closed tightly.

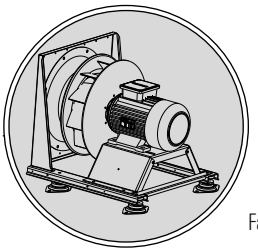


To clean up electrostatic filter;

- Turn off the unit.
- Remove dirty filters.
- Clean the ionizer and collector to the water you prepare at about 60 ° C together with the oil solvent chemical you add at the rate of 2%. You can clean both parts with a high pressure water gun. Check if the ionizer has a broken ionization wire. Such broken ionization wires can be easily replaced. During washing, check whether there are bent limbs in the collector. If so, carefully fix it with a screwdriver. If an inclined blade comes into contact with another, it may cause a short circuit.
- Leave to dry after cleaning the parts, replace them in the same position before removing them.
- Close the service cover and be sure it is closed tightly.

Fan

- Turn off the power of the unit.
- If the fan connector connection is available, disconnect it first.
- Remove the fan out of the unit carefully.
- Clean the fan with vacuum cleaner.
- Clean the dirty areas of the fan with warm water with natural detergent or soap powder.
- Dry wet surfaces to prevent corrosion on metal surfaces.
- Place cleaned fan in the slots.



Fan Modules

Service Doors

- All unit service doors have leakproof gaskets.
- Make sure that there are leakproof gaskets on unit service doors.
- Always replace when the leakproof gaskets are worn or damaged.

UV Lamps

- UV lamps are used embedded in the panel to prevent dust-dirt accumulation on the inner surface. Replace the bulb during each annual service and maintenance.

Electrostatic Filter Unit (ESP)

Basic maintenance can only be done by expert teams. You can see the recommended optimum plan for these operations in the table below.
Note: Before starting the maintenance operations, a general maintenance plan must be prepared and submitted to the management.

Maintenance and Cleaning Plan

Basic Maintenance operations	Maintenance Period
Clean the outside of the unit with diluted detergent.	6 months
Check the door gasket.	12 months
Clean the inside of the unit and remove the dust/oil from the compartment where the filters are installed.	From once a week to every 3 months, depending on the level of contamination.
Clean the Pre-filter, ESP Collector Cell and After Filter, check for damage.	From once a week to every 3 months, depending on the level of contamination.

Cleaning and Maintenance Operations

Clean or replace the Main Frame, Wire Mesh Filters and Collector Chamber at the intervals recommended in the maintenance and Cleaning Schedule, or:
- When Wire Mesh Filters and/or Collector Cells are damaged.
- When the Collector Cell starts to make a crackling sound (arc).
- When the unit's filtering and traction performance begins to decline.

Only experience can determine when the Unit should be cleaned, as the degree and type of pollution depend heavily on factors such as the location, humidity, and intensity of use. However, the filters and main body should be cleaned regularly, once a week to every 3 months, according to the procedures described below.

Removing Wire Mesh Filters and Collector Cells

Begin the cleaning process by removing the Wire Mesh Filters and Collector Cells from the Main Body:
1. Turn off the Pako Switch on the unit and cut off the energy supply.
2. Wait at least 60 seconds for any static electricity charge to dissipate.
3. Check again that the main power supply is cut off.
4. Unscrew the upper and lower Star Butterfly bolts on the main cover counterclockwise and open the cover.
5. Remove the Wire Mesh Prefilter, Collector Cell and Wire Mesh Postfilter in order.
6. Remove the filter carrier.

Cleaning the Main Body

After removing the Wire Mesh Filters (pre and post) and Collector Cell:
1. Depending on its density, discharge the accumulated oil in the crankcase either from the drainage outlet or by scraping with the help of a spatula.
2. Spray the surface of the crankcase with a high quality degreaser and wipe it off using a suitable cloth or paper towel.
3. Use a high-quality degreaser to ensure that there is no residue/oil on the surface of the electric transfer lugs on the inner surface of the cover and clean using a suitable cloth or paper towel.
4. Make sure the cap rubber wick is undamaged and free of residue/oil by cleaning with warm soapy water if necessary.
5. Clean the Filter Carrier and the Rear Surface using a high quality degreaser and cloth and replace them in the Unit.

Cleaning of Wire Mesh Filters (pre and post)

Clean the Wire Mesh Filters as described below:

1. Clean the Wire Mesh Filters (pre and post) in water with added detergent at a temperature of approximately 60°C. This application can be repeated many times.

A pressure washer can also be used to clean the filters.

2. Allow the Wire Mesh Filters to dry completely before placing them in the Unit after cleaning.

Cleaning the Collector Cell

Clean the Collector Cell as described below:

1. Clean the Collector Cell in water at a temperature of approximately 60°C with added detergent.
2. Check whether there is a broken Ionization Wire during washing.

Note: If necessary, remove the broken wire. Hook the spring end of the new ionization wire to its place on the carrier bar and pull the other end into its place on the opposite side by pulling in the opposite direction of the spring force.

3. While cleaning the Collector Cell, check if any of the plates are bent.

Note: If a bent plate is found, it can be easily straightened by either carefully pressing a screwdriver or using pliers. If the Collector Cell is beyond repair, please call the service and order a new one.

4. Allow the Collector Cell to dry completely before placing it in the Unit after cleaning.

A pressure washer can be used to clean the Collector Cell, but in this case, extreme care must be taken to avoid damaging or deforming the plates.

Replacing the Collector Section and Pre/After Wire Mesh Filters

Replace the Collector Chamber and pre/post Wire Mesh Filters as described below:

1. Insert the Collector Cell.

Note: If there is more than one Collector Cell in the Unit, make sure that the electrical connection shoes are in good contact with each other.

2. Place the Wire Mesh Filters (pre and post) in their previous positions in the Collector Cell and Filter Carrier.
3. Close the Main Cover and insert the upper and lower Star Butterfly bolts.
4. Turn the Star Butterfly bolts clockwise enough for a good seal between the Main Cover and the Main Body of the unit.

Note: It may be necessary to push the Main Cover into the Main Body of the Unit to tighten the Star Butterfly bolts sufficiently for a good seal.

5. Turn on the unit normally. The green Operating Lamp should be lit.

If the crackling or arcing sound continues and the green Power Lamp goes out, there is an error in the Unit. In this case, turn off the Unit and consult a qualified service technician.

Make sure that the Collector Cell is placed in the correct direction as indicated by the arrow sign printed on the surface of the Collector Cell in accordance with the air flow pattern. When the cover is closed, pay special attention to whether the contact discs on the cover and the contact pins in the Collector Cell and the contact spring are in the correct position.

You may hear a slight crackling or arcing sound after turning on the Unit as the Collector Cell will begin to charge. This is completely normal.

System Connection

1- Cut the gaskets in cable connection hole from the center.
2- Pass the on/off switch cables through the cable connection hole.
3- Connect the main power cable and ground wires to the terminals in the junction box.
4- Use cable tie to hold the cables tightly.
5- After making cable connections, insulate the cable connection hole against entering water and impurity.

⚠ Make sure that the Ecology unit is properly grounded ⏚ according to the local regulations.

Considerations During Electricity Network Connection

1- Electrical connection must be done by an authorized personnel.
2- Drain pipe connection should be done before making the electrical connection and please start electrical installation after being sure that insulation is ensured.
3- All kinds of safety measures should be taken by the technician during installation.
4- Electrical wiring must be done according to the specified electrical diagram. Any electrical connection which is made by the factory should not be changed.
5- Cables to be used during network connection must conform with the specified standards and should be connected to a grounded power supply.
6- A circuit breaker should be placed between the unit and network. Circuit breaker must be selected according to the total power and current value specified on the unit's nameplate.
7- Over current protection is recommended for the units.

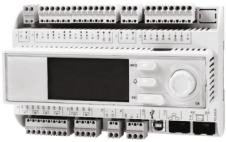
⚠ There are two switch box on the unit. You need to make cabling for each switch box separately.

Automation Cable Color Standard

NO	ELECTRICAL PROPERTIES	FUNCTION
1	R ~	GRAY CABLE
2	S ~	BROWN CABLE
3	T ~	BLACK CABLE
4	NEUTRAL	BLUE CABLE
5	⏚	YELLOW / GREEN CABLE
6	CONTROL SIGNAL 1	BLACK CABLE (230 VAC)
7	CONTROL SIGNAL 2	RED CABLE (24 VAC)
8	24 VAC	RED CABLE
9	24 VAC G0	WHITE CABLE
10	24 VDC +	RED / WHITE CABLE
11	24 VDC -	BLUE / WHITE CABLE
12	4-20 mA / 0-10 V	YELLOW CABLE
13	NTC 10k / Pt1000...	ORANGE CABLE
14	NC / NO DRY CONTACT	GREEN CABLE

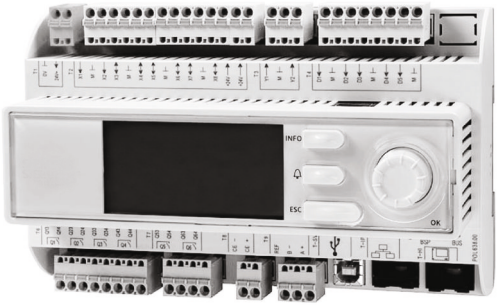
Control Panels

Using on the Ecology units control panel types and descriptions are indicated below. The control panels are used optional on the Ecology units.

Control Panel Type	Control Panel Descriptions
 Type-1 (Internal Display)	- Internal display on the PLC - IP 20 protection class (EN 60529) - There is no need for any external communication display due to the provided internal display on the PLC.
 Type-2 (External Display)	**Hand Panel 1**: Wall-mounted type, IP 65 protection class for only front side of panel, Max. 50 m communication ability **Hand Panel 2**: Magnet type, IP 65 protection class for whole panel, Max. 50 m communication ability
 Type-3 (External Display)	- Magnet type, - IP 31 protection class, - Max. 700 m communication ability

Control Panel - Keypad Explanations

- Type-1 Control Panel (Internal Display)



Type-1 (Internal Display) Control Panel

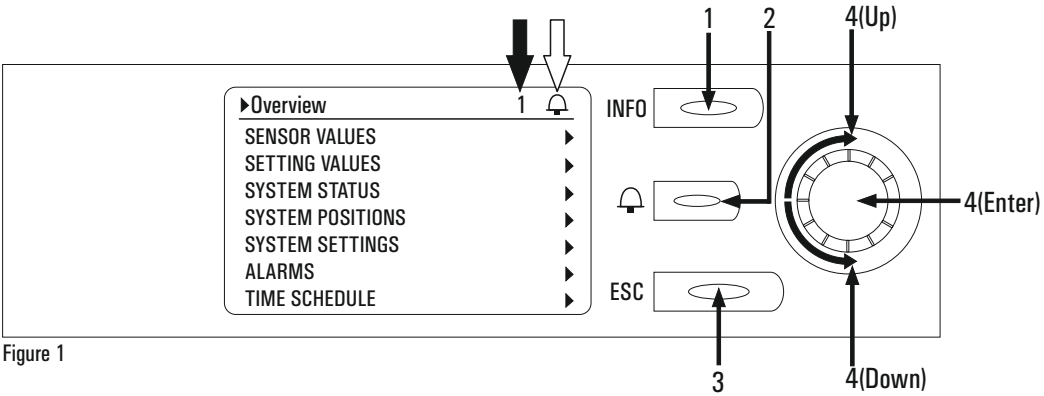


Figure 1

1. **Info:** It allows you to enter the account menu. When the user password is entered as "1000", the system is entered with the user account. After login, the service page will be active on the bottom line in the main menu. The user can access the service menu from this page.
2. **Alarm** 🔔: This is the alarm key that displays you malfunctions in the system.
3. **ESC:** This is the exit key that allows you return to the previous menu.
4. **Up/Down:** It is used to turning between the lines and change set values.
5. **Enter:** It's the confirmation key. It allows the changes to be saved.

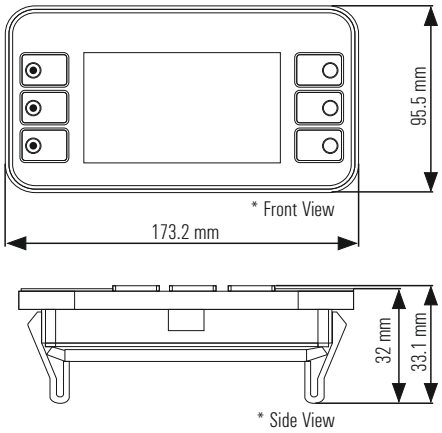
⚠ "1" Indicates the number of rows on the page where the selected row is located.
🔔 This symbol indicates malfunctions in the system. If there is a fault in the system, the bell starts to swing. If there is no fault, it doesn't swing.

Control Panel - Keypad Explanations

▪ Type-2 Control Panel (External Display)

Type-2 (External Display) Control Panel

▪ Control Panel Dimensions



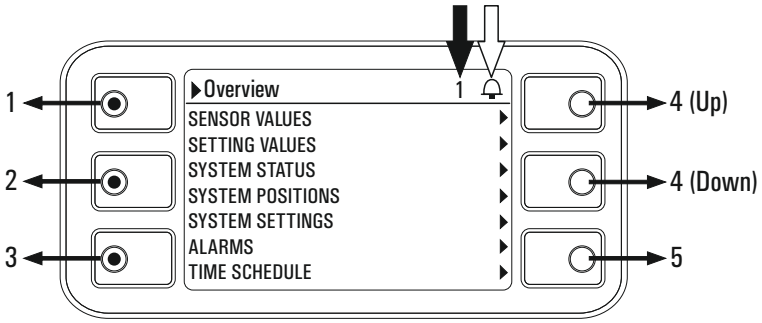


Figure 2

1. **Info:** It allows you to enter the account menu. When the user password is entered as "1000", the system is entered with the user account. After login, the service page will be active on the bottom line in the main menu. The user can access the service menu from this page.
2. **Alarm** 🔔: This is the alarm key that displays you malfunctions in the system.
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Control Panel Displays and Descriptions

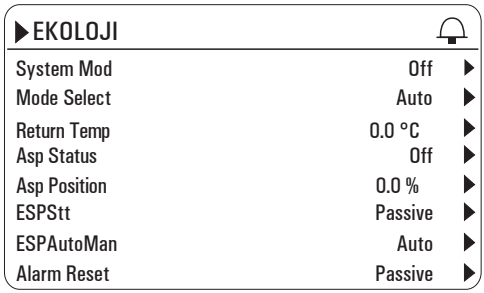

Figure 1

Set and tracking values are divided into pages for easy access. As shown in Figure 1, when the "Enter" key is pressed on the line indicated by the "▶" mark, it goes to the related page.

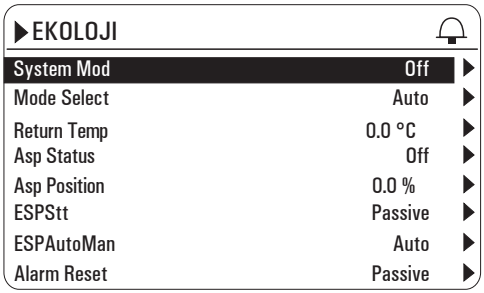

Figure 2

If the background of the line is black as shown in Figure 2, it means that the line is selected. With the "Up/Down" functions, you can switch between the lines. If the entire line is black, then that line has a changeable value.

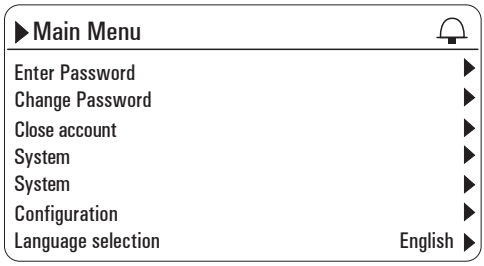

Figure 3

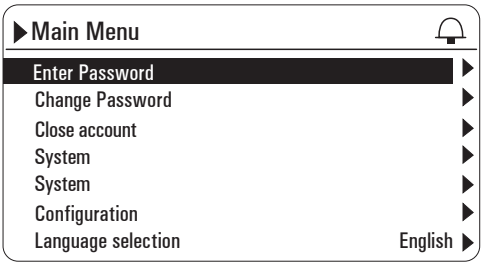

Figure 4

In order to access all menus, you must open the Main Menu screen by pressing the Info button and enter the password given to you.

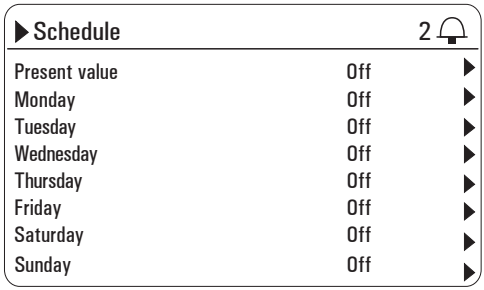

Figure 5

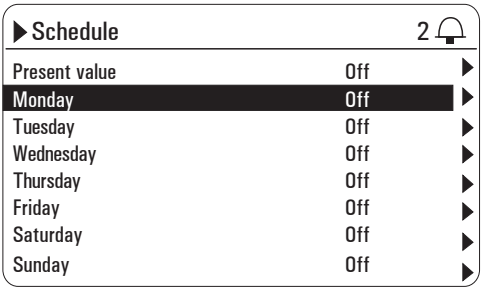

Figure 6

When the "Enter" key is pressed on the "TIME SCHEDULE" line, it goes to the page that can be adjusted weekly time schedule. The start time and end time can be adjusted during the day by pressing the "Enter" key onto the days in the "Weekly Time Schedule" page as shown in Figure 5.

NOTES

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

SIGNATURE:

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Sistem Teknolojileri Makina San. ve Tic. A.S.
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