

EDH

Packaged Type Dehumidifier Unit



Index

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EDH Packaged Type Dehumidifier Unit

Custom design solutions are required for comfortable use in indoor pools because of high humidity levels.

Eneko dehumidifier series are energy efficient high technology solutions in order to provide the dehumidifier need in indoor pools where dehumidification is required.

The developments in design are protected by the patent of PCT / TR2017 / 050125.

MCC-DCC panels, automation systems and electrical control systems are located on the device where the requirements are supplying the electrical power and setting the unit to work at design conditions. Microprocessor based control system is used for providing proper temperature, air flow and indoor air quality. Electronical control concept is enhanced by different design requirements. The devices are designed to work in plug-and-play fashion resulting in advantageous setup and installation time at worksites.



Plug Fans
EC Technology



Heat Recovery
(Aluminium Plate)



Control Panel



Low Noise



Plug
& Play



The technical specifications and the performance data declared with this logo have been developed by the tests performed in Eneko Energy Laboratory which is established with the development Project support of Tübitak by regarding relevant standards.

Evaporator & Condenser

Copper tube - aluminum fin type and high efficiency evaporator and condenser are used. At the entrance of the evaporator, refrigerant distributor is used for a uniform distribution. The pressure drops on the air side are reduced, since a lower value for the air speed is selected for evaporator and condenser. There is a stainless steel drain pan under the evaporator and condenser.

Aluminum Cross-flow Exchanger

Packaged type dehumidifier units have aluminum counterflow, epoxy-coated, high efficient plate heat recovery exchangers. Plate heat recovery exchangers have plates that are produced improved surface areas to provide high efficient and leakage free design. With the optimization of exchanger heat transfer is increased and pressure drop is decreased. Heat recovery exchanger has Eurovent certification There is a stainless steel drain pan under the cross-flow exchanger.

Casing & Insulation

The unit's casing is made up of double skinned high corrosion resistive 200 gr/m² galvanize coated steel. 50 mm thickness and 70kg/m³ density of Rockwool insulation between the walls is used for thermal and sound insulation. The case of unit is painted by electrostatic powdered paint. There is epoxy coating in the case. The unit is constructed in sections to ease transportation, mounting and commissioning. Every section has its own basis and transport slots.

Filters

The first stage filter is G class, the second stage filter can be chosen as M5, M6, F7, F8, F9 optionally for supply air streams, G class filter is used for exhaust air streams. The first stage filter is washable and secured in rigid frames made of galvanized steel. The second stage filter is innovative compact filters with increased filtration surface area to reduce initial pressure drop over the filter and also reduce units' size. All the filters comply with EN 779 to meet the requirements of odor absorption and dust arrestment. Filter blockage is indicated in the control panel by standard installed differential pressure switches however pressure gauge is also available optionally to observe fouling. Filter sections are designed to ease filter service and changing.

Compressor and Heat Pump Cycle

High efficiency, fully hermetic compressors are used in the dehumidifier with heat pump. Externally balanced thermostatic expansion valve is used in the unit. The system safety is ensured with low and high pressure pressurestats. The system can work in cooling mode or heating as optional depending on the season selection on the control panel. The unit has an automatic free-cooling system which enables further savings in order to reduce operating costs.

Control System 

Packaged type dehumidifier units are equipped with a microprocessor based control system to meet various design needs. Both electrically and electronically control hardware comes with the unit that's why the unit is "Plug and Play". Exchanger monitoring and speed control, filter monitoring, fan monitoring are standard. With the use of optional IAQ, CO₂ sensor or constant flow kit, fans regulate automatically according to user demand. The panel is BMS compatible and can handle various communication protocols like Modbus, Bacnet and Lonworks. Room control panel is supplied where no BMS protocol is demanded. Control System is also capable of controlling heating/cooling capacity when Packaged type dehumidifier units are used with heating/cooling coils.

Exhaust and Supply Air Fans

The fans in packaged type dehumidifier units are equipped with innovative Electronically Commutated EC Plug Fan technology. EC motors have higher efficiency and simple speed control than AC motors and can be connected directly to the AC mains. Fan blades have high aerodynamic efficient backward curved design. EC motors reduce the energy consumption and increase the energy efficiency of the unit. With EC Fans it is also possible to reduce maintenance costs as the fans are direct drive; free of belt and pulley.

Unit Modes

Eneko packaged type dehumidifier units are designed for increasing interior air quality of indoor pools. The packaged type dehumidifier units are able to operate in 5 different modes.

■ Dehumidifier Mode

The fan module operates in 3 different speed control levels (low, medium, high). Optionally, it can be set to control a constant air flow. DX module operates to control the humidity level. Heating coil with water controls the temperature in an proportionally.

■ Ventilation Mode

The fan module operates in 100% capacity providing 100% fresh air and 100% heat exchanger.

■ Heating Mode

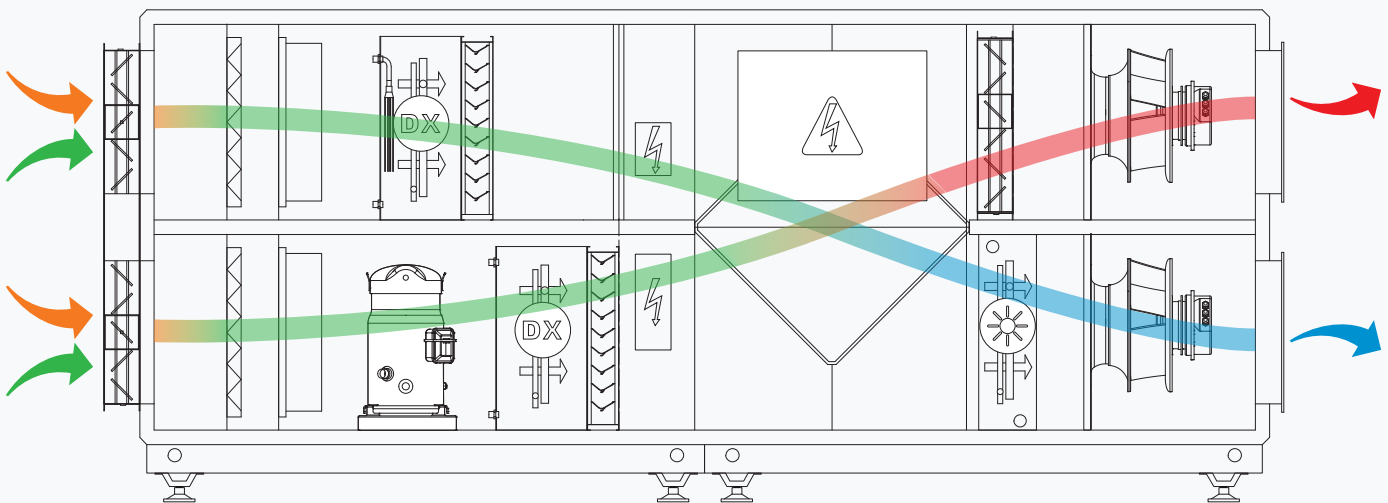
The fan module operates in 3 different speed control levels (low, medium, high). Optionally, it can be set to control a constant air flow. Heat exchanger bypass damper is in 100% open condition. DX module operating as heat-pump. Coil with water controls the temperature in an proportional. Defrost mode is available under proper conditions. Defrost mode provides 100% heat exchanger.

■ Cooling Mode

The fan module operates in 3 different speed control levels (low, medium, high). Optionally, it can be set to control a constant air flow. Heat exchanger bypass damper is in 100% open condition. DX module is operating as cooler.

■ Auto-Mode

The system requirements are determined automatically by the device and one the proper modes explained above is chosen for operation.



 Outdoor Air
  Supply Air
  Return Air
  Exhaust

Technical Specifications

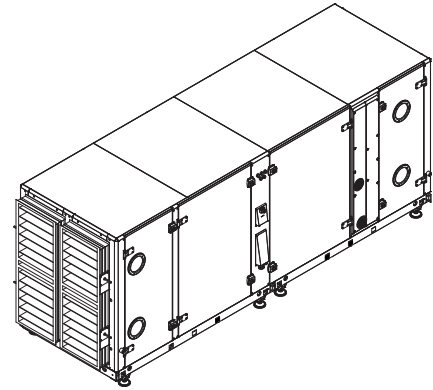
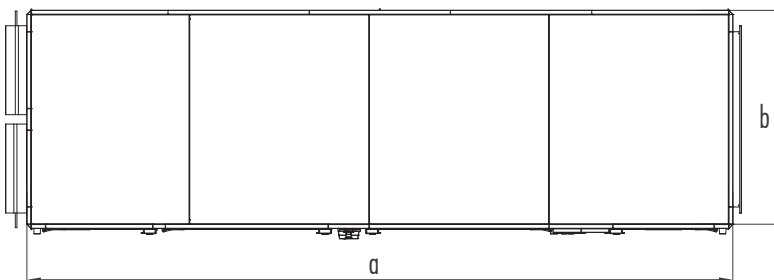
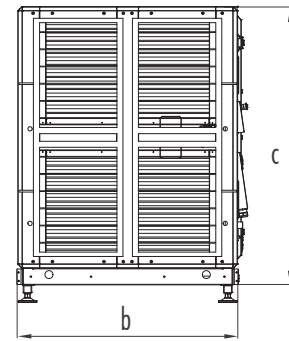
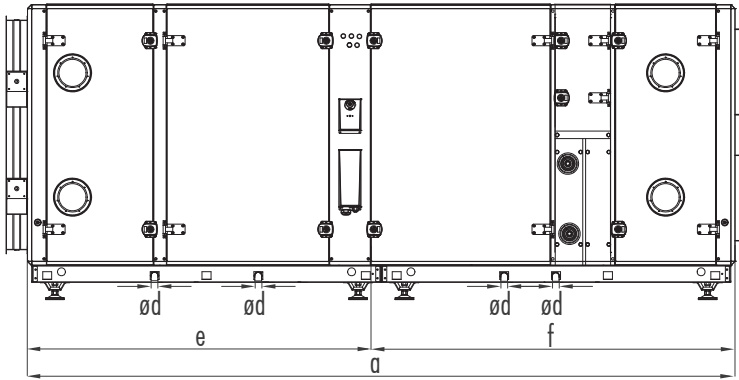
		EDH 3000	EDH 4000	EDH 5000	EDH 6000	EDH 8000	EDH 10000	EDH 12000	EDH 15000	EDH 18000	EDH 20000
Air flow	m ³ /h	3000	4000	5000	6000	8000	10000	12000	15000	18000	20000
Return External Static Pressure	Pa	300	350	350	400	400	400	450	500	600	600
Supply External Static Pressure	Pa	300	350	350	400	400	400	450	500	600	600
Pool Surface Area	m ²	82	105	143	160	197	255	307	385	501	588
Dehumidifier Capacity	kg/h	25	31	43	48	59	77	92	116	151	177
Cooling Capacity	kW	21	26	38	41	47	63	76	95	128	157
Heating Coil Capacity	kW	26	34	40	48	63	71	96	114	146	175
Heat Recovery Capacity	kW	17	22.4	29.3	34.8	37.0	57.6	67.8	87.3	107	118.8
Total Power Consumption	kW	9.9	11.9	16.9	18.1	22.0	28.9	34.9	44.5	63.2	72.7
Nominal Voltage	V/Hz/ph	400/ 50 /3~									
Filter Type (EN 779)		Supply air side; first stage G4, second stage with optional (M5, M6, F7, F8, F9) Exhaust side; G4									

- According to VDI 2089 standard, the pool condition multiplier "e" is set as 20, 30% fresh air ratio, 28°C pool water temperature, 30°C %55 RH indoor air temperature operating conditions are presented in the table.

- The calculations are based on 5°C outdoor temperature and 85% RH condition. The heating coil capacity is set for 80/60°C water condition.



Unit Dimensions



	EDH 3000	EDH 4000	EDH 5000	EDH 6000	EDH 8000	EDH 10000	EDH 12000	EDH 15000	EDH 18000	EDH 20000
a	4000	4000	4250	4300	4525	4850	4850	5300	6475	6625
b	1275	1375	1375	1525	1625	1800	1800	2150	2550	2950
c	1620	1620	2150	2150	2430	2770	2770	2770	2850	2850
ød	1"									
e	1800	1800	1800	1800	1800	2125	2125	2125	2850	2850
f	2200	2200	2450	2500	2725	2725	2725	3175	3625	3775
Unit Weight	1165	1250	1300	1425	1550	1700	1700	2225	2300	2450

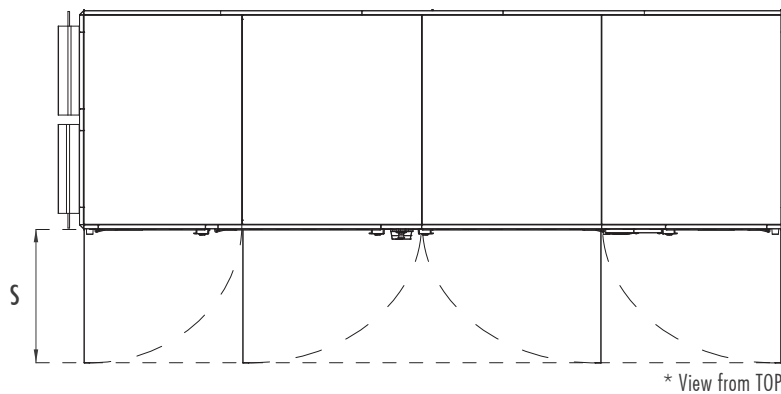
- "a", "b", "c" values are mm.

- "ød" value indicates drain pan outlet pipe diameter.

- Unit weight is kg.

-DH18000 and DH20000 models are manufactured as 4 moduls.

Service Space





	EDH 3000	EDH 4000	EDH 5000	EDH 6000	EDH 8000	EDH 10000	EDH 12000	EDH 15000	EDH 18000	EDH 20000
S	1275	1375	1375	1375	1625	1750	1750	2100	2400	2950

"S" values indicate the size of the service area.*

All measurement values are mm.

Automation Options		Control Cards
Standard	Optional	Standard
OA Temperature Sensor and Humidity Info		☑
RA Temperature Sensor and Humidity Info		☑
SA Temperature Sensor and Humidity Info		☑
SA Fan Control		☑
RA Fan Control		☑
Filter Contamination Info (DPS)		☑
Proportional Damper Control		☑
Compressor Control		☑
Proportional Heating Coil		☑
Modbus RTU		☑
Web Browser (TCP/IP)		☑
Weekly Timer		☑
	4 Way Control	☑
	Airflow Control	☑
	CO2 Control	☑
	On/Off Heating Coil	☑
	On/Off Cooling Coil	☑
	Proportional Cooling Coil	☑
	Electrical Pre-Heater	☑
	Electrical After-Heater	☑
	BacNET MSTP/IP	☑

Control Panel		Control Cards
Panel Type	Panel Descriptions	Standard
	Standard-1 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	☑
		☑
	Standard-2 Magnet type, IP 31 protection class, Max:700 m communication ability	☑

The device works at high efficiency thanks to proper design and the use of proper components as well as realization of properly installed control and automation systems.

Eneko designs are all-in-one solutions consisting MCC+DCC panels, control panel and relevant control systems based on customer requirements, project requirements and maximum efficiency resulting in reduced installation and operating costs.

Our devices provide user monitoring and allows user inputs with user friendly control panel so that they can work as standalone devices even they are not connected to building automation.

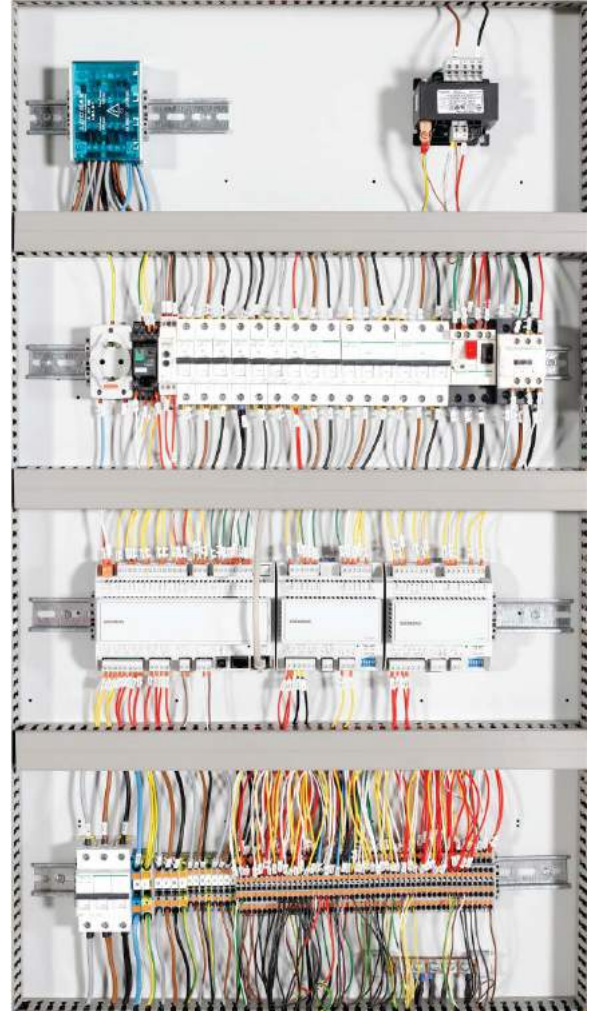
Automation modules are used with KNX and Modbus communication protocols as standard. BACnet and Lonworks are used as optional.

■ Automation system

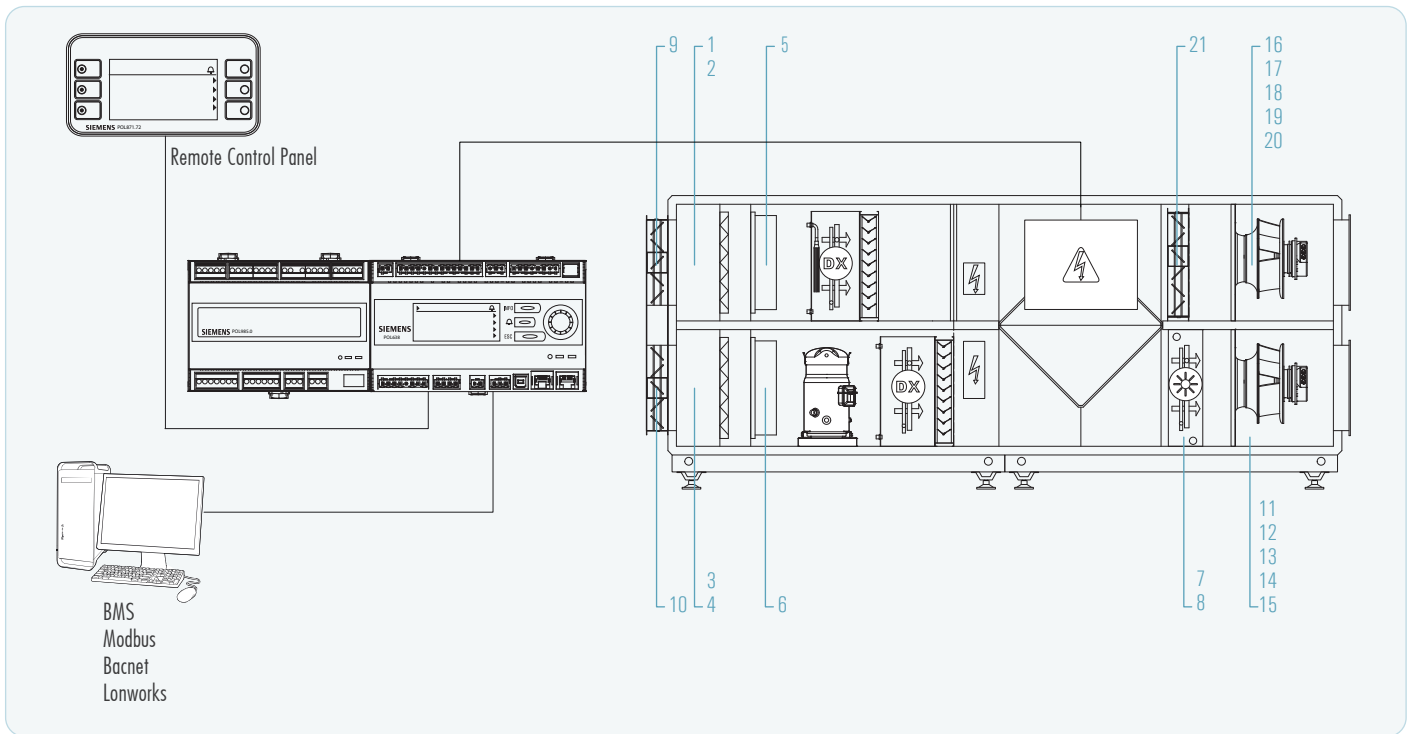
Our devices can provide following controls with necessary hardware and software capabilities:

- Air flow control in EC fans
- Gradual fan speed control
- Indoor air quality / airflow control based on CO₂ level or fresh air ratio control
- Damper control (on-off or proportional)
- Hot water heater valve control (on-off or proportional)
- Cold water cooler valve control (on-off or proportional)
- Freezing control
- Humidity control
- Integrated DX module control (compressor running, compressor circuit control, gas pressure monitoring, dynamic defrost etc.)
- Electrical heating gradual control
- Fire scenario compatible running
- Automatic season selection
- Free cooling running
- Time programming

In addition to these; filter dirtiness and fault informations can be monitored both over control panel and building automation system as well as monitoring running parameters.



■ Packaged Type Dehumidifier Unit



Components

- | | | |
|----------------------------------|---|-------------------------|
| 1- Outdoor Air Temperature | 9- Supply Air Motorized Damper Control | 17- Return Fan 1 Status |
| 2- Outdoor Air Humidity | 10- Return Air Motorized Damper Control | 18- Return Fan 1 Fault |
| 3- Return Air Temperature | 11- EC Supply Fan Control | 19- Return Fan 2 Status |
| 4- Return Air Humidity | 12- Supply Fan 1 Status | 20- Return Fan 2 Fault |
| 5- Supply Air Filter Status | 13- Supply Fan 1 Fault | 21- By-pass Control |
| 6- Exhaust Air Filter Status | 14- Supply Fan 2 Status | |
| 7- Heating Coil Capacity Control | 15- Supply Fan 2 Fault | |
| 8- Cooling Coil Capacity Control | 16- EC Return Fan Control | |



GENERAL

The sale of all Products of ENEKO shall exclusively be made on the basis of these General Terms and Conditions of Sales. Any other conditions and General Conditions of Purchase of the Buyer are not accepted.



OFFERS

Our offers are non-binding and without obligation. Contracts for delivery and all other agreements (including subsidiary agreements) as well as declarations of our representatives shall only become legally binding for us after written confirmation. We do not render planning service.

Proposals made and information provided by our representatives shall be non-binding. Illustrations, drawings, dimensions and weights or other performance data shall only be binding if this is expressly agreed in writing.



TERMS OF ORDER

Purchase orders shall be sent to ENEKO in written form and shall be non-binding unless they are accepted by written confirmation (order confirmation) from ENEKO. Each order shall include properly identified Products ordered and relevant shipping dates.



PRICE OF THE GOODS

Prices are net Ex Works according to current Incoterms unless stated otherwise and do not include any kind of taxes. Prices are valid at the date of delivery will be applied. We reserve the right to adjust prices for confirmed orders as well to reflect any increase in our costs for any reason beyond our control like force majeure, shortage of primary material or labor strikes, official orders, transportation or similar problems. In this case, a new price agreement shall be required for higher rates. If such an agreement is not made, we shall be entitled to withdraw from the contract by written notice within 15 days.



TERMS OF PAYMENT

Payments shall be carried out according to the contractual terms as defined and set forth in the order confirmation. If the payment conditions have not been agreed upon conclusion of the contract, the payment terms and payment dates specified in our invoices shall be binding. Deadlines for discounts and periods allowed for payment shall begin to run upon receipt of the invoice. Payments by draft, bills of Exchange or anyway extended payments shall mean neither credit novation, nor prejudice to the Retention of Title agreement, nor to territorial competence. If buyer fails to make payment by due date, we are entitled to charge the buyer with a relevant interest on the unpaid amount.



TERMS OF DELIVERY

Delivery time information is only approximate. We shall only be in default if the performance is due and a written demand for payment was issued.

Delivery day is the day of dispatch Ex Works. We shall also not be liable with regard to bindingly agreed periods and dates in the event of delays in delivery and of performance due to force majeure and events which considerably complicate or make delivery impossible not only temporarily-strike lockout, breakdown, delay in supply with important raw and auxiliary materials even if the delay occurs at our supplier, in particular. These delays entitle us to postpone delivery for the period of the impediment plus a reasonable start-up period or to withdraw from the contract as a whole or in part. If delivery time is extended or we are released from our delivery commitment, the buyer may not derive a claim for damages from it. However, we may only rely on the circumstances mentioned if we notify the buyer immediately. We shall be entitled to make part deliveries. Any part delivery shall be considered as independent transaction. In case of default, our liability is limited to contract-typical foreseeable damage.



SHIPMENT

Shipment is made for the buyer's account. Mode of shipment and shipping route, transport and packaging and other securities respectively shall be at our choice. We shall be entitled, however, not obliged to insure deliveries in the name and for account of the buyer. Risk passes to the buyer when shipment is handed over to the person performing the transport or left our Works for shipment. If shipment is delayed upon buyer's request, risk passes to the buyer with the ready for shipment note. If ordered goods are rejected after the ready for shipment note, we shall be entitled to request payment and store the goods at buyer's expense. Discharge of the goods is made at buyer's expense.



RETENTION OF TITLE

In any event ENEKO shall retain full ownership of all materials supplied whilst the payment conditions of the entire amount have not been complied with, said materials may be removed from the customer at our request. Should the customer be declared bankrupt or insolvent and has not made paid the entire amount of payments. ENEKO shall be entitled to recover the goods. ENEKO may interrupt the supply without incurring any liability whatsoever if he had notice of or became aware of a decrease in the creditworthiness of the purchaser or if any of the existing negotiable instruments or debts were not properly complied with, shall result as being unpaid and protested.



WARRANTY

ENEKO Products are under warranty (defect in material or workmanship) for 2 years from the date of sale reflected on the invoice. Under this warranty, ENEKO is under the obligation to replace the part requested under warranty.

The followings are excluded from ENEKO warranty:

- Normal wear and tear
- Defective assembly or handling
- Third party compensation

Parts the subject of a claim shall be sent to our warehouse as carriage paid with relevant report completely filled in, wherein the parts shall be subjected to analysis.



LIABILITY

ENEKO, for any losses/damages, shall only be responsible within the limits of the law. Owing to basic obligations undertaken by simple negligence, if the contract is violated, ENEKO's liability shall be limited to compensate for losses which are emerged specific and predictable. ENEKO shall not carry any responsibility in case of a single negligence in breach of non-essential contractual obligations.



PROPERTY RIGHTS

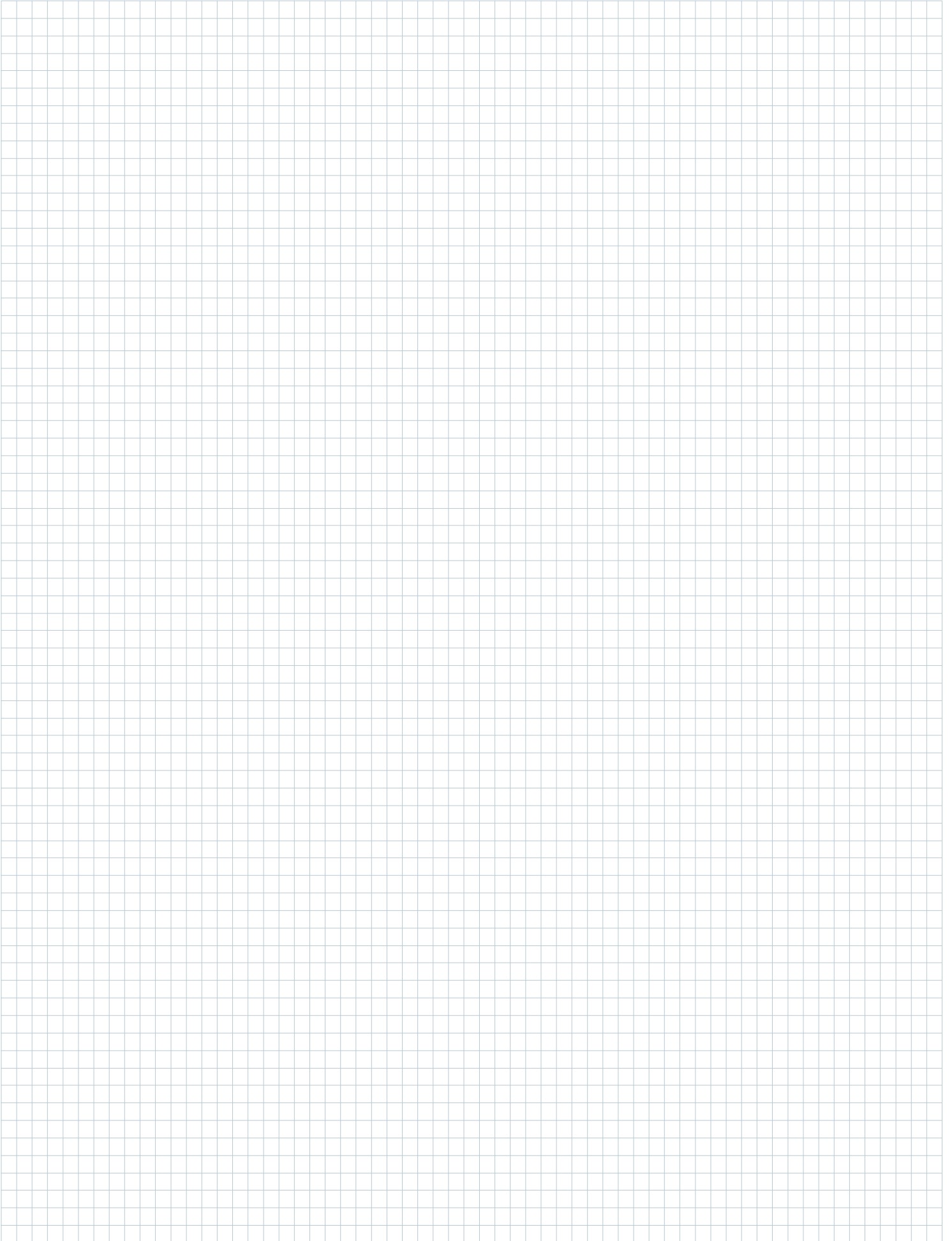
The purchaser in no event and under no circumstances whatsoever shall publish or use the trademark, trade name or logo of ENEKO without a prior written permission.



GOVERNING LAW AND JURISDICTION

This agreement shall be governed with all aspects of the Turkish Law. The courts of Izmir/Turkey shall have an exclusive jurisdiction to adjudicate any dispute arising under or in connection with this agreement.









Technology, Making You Breathe

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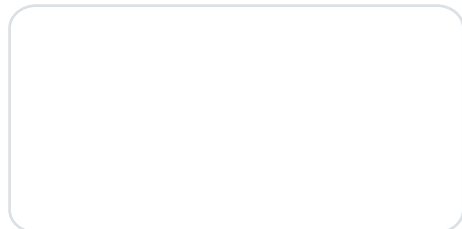
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