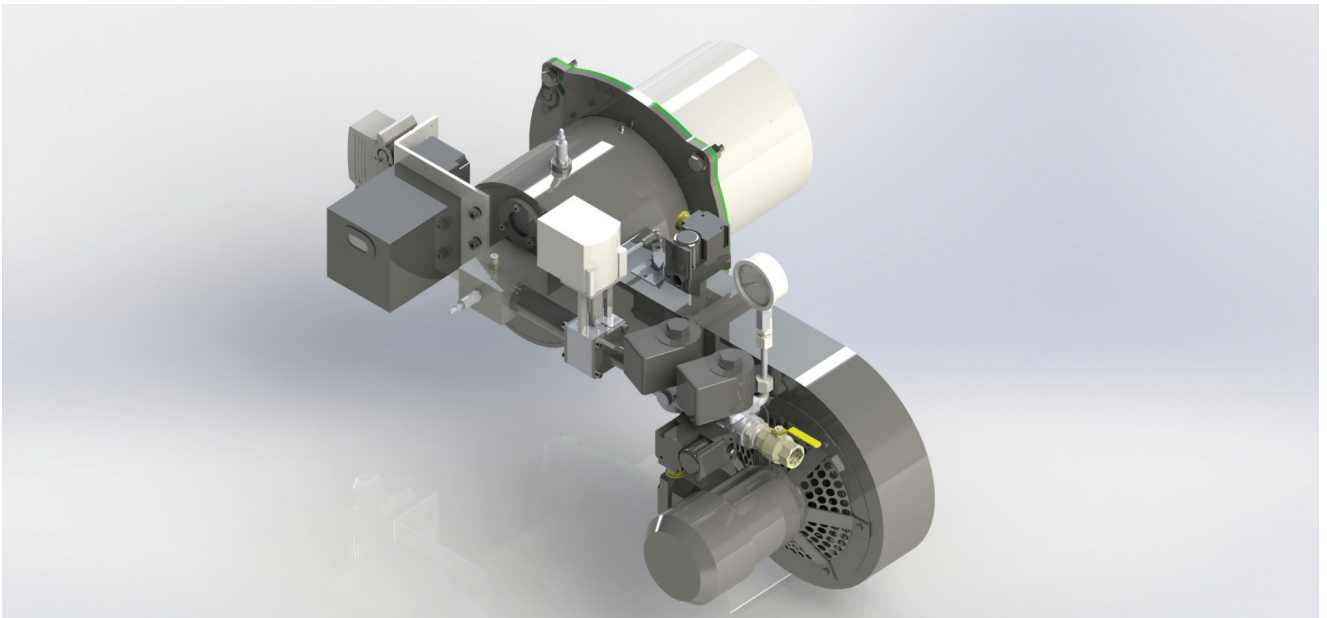


GRM SERIES NOZZLE MIX BURNERS INSTALLATION, OPERATING AND MAINTENANCE MANUAL

MODULATING OPERATION



GRM 15
GRM 30
GRM 40
GRM 60
GRM 70
GRM 80
GRM 100

DEAR USER,

ECOSTAR GRM 15, GRM 30, GRM 40, GRM 60, GRM 70, GRM 80 GRM 100, GRM Series burners are prepared and manufactured according to the latest technical developments and safety rules. It is easy to use for our customers.

We recommend that you read this manual and safety warnings thoroughly before the use of the device in order to ensure safe, cost effective and environmental-friendly use.

If you encounter any issue that is not explained clearly in this manual or you could not understand, please contact with our service department.

We thank you for choosing ECOSTAR brand.






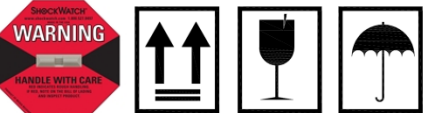
This Operating Manual is an integral part of the burner and must be maintained in a plastic dossier and hung at a clearly visible place in the burner room.

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1. WARNINGS

1.1. Warning Symbols and Descriptions

Symbols	Symbol Descriptions
	<p>Important information and useful hints.</p>
	<p>Warning of danger to life or property.</p>
	<p>Warning of electrical voltage.</p>
	<p>Product handling information.</p>
	<p>Electric motor direction of rotation</p>
	<p>Carry in an upright position. Fragile Item. Protect against water.</p>

1.2. General Safety Rules

- All personnel engaged in installation, disassembly, commissioning, operation, control, maintenance and repair should have received the necessary training and fully read and understood this manual.
- No changes that might damage the safety of the burner unit must be made by persons and/or organizations on the burner unit.
- All operation, commissioning and installation works (except for burning adjustment) should be carried out when the burner is not operating and after disconnecting the power supply. Noncompliance with these rules may lead to serious bodily injuries and even death by electrical shocks or uncontrolled flame formation.
- Repairs concerned with safety elements should be carried out only by the manufacturing company.
- The device should never be used by children, mentally handicapped and inexperienced persons.
- Children must not be allowed to play with the device.
- Keep the device away from explosive and flammable materials.
- Device must intake air, and ventilation and air discharge holes must not be closed.



If you sense scent of gas;

- Shut down valves of all gas devices.
- Open all doors and windows.
- Do not turn on electric devices or do not turn them off if they are working.
- Do not use burner derived tools such as match and lighter.
- Inform the gas company.



Do not store any inflammable materials in boiler room.



Wear hearing protectors if there is noise in boiler room.



In case of fire or other emergency;

- Switch off the main switch
- Close the main fuel shut-off valve outside the plant.
- Take appropriate actions



The burner installation must be carried out in accordance with the instructions. Vibration can damage the burner and its components.



Keep combustion room doors closed while starting burner and during burner operation.



Check combustion values to be correct by using flue gas analyzer at the whole adjustment range between minimum, full load, and ignition load.



During the first commissioning of the burner or in case of any revision carried out in the electrical system or motor cables by any reason, direction of the fan rotation must certainly be checked by the authorized technical service.



For products that have not been commissioned or started more than 6 months, before activating the servomotor;

In gas and air dampers, servomotor and air damper connections must be checked to ensure that they are free running in spite of immobility and oil freezing.



BURNER ROOM

Install the burner in a suitable room/floor with minimum external air openings and sufficient to ensure perfect combustion, in compliance with current regulations.

Never obstruct air openings of the burner room, burner fan intake vents or air ducts in order to prevent:

- a. The build up of toxic / explosive gas mixtures in the burner room,
- b. Combustion with insufficient air, resulting in hazardous, anti-economical and polluting operation.

The burner must be always protected from rain, snow and frost to prevent corrosion and paint deformations.

Keep the burner room clean and free of solid volatile substances, which could be sucked into the fan and clog the internal burner or combustion head air ducts.

2. TERMS OF WARRANTY

Main and auxiliary equipment and all components used in Ecostar gas burners are guaranteed for 1 year by TERMO ISI SİST. A.Ş starting from the date of commissioning under the maintenance, adjustment, operating conditions and relevant mechanic, chemical and thermal effects explained herein.



Please note that this warranty is only valid if the device(s) is commissioned and maintained by our authorized services.



Our company reserves the right to make any modifications on the product and all instructions thereof for improvement purposes.

2.1. Out of Warranty Conditions

- Any damage arising out of or in relation to customers' non-compliance to their responsibilities with regards to installation, commissioning, operation and maintenance,
- Any damage arising out of or in relation to commissioning, repairs and maintenance carried out by unauthorized services,
- Any damage that may occur during transportation or storage of the product,
- Not preserving the product in its original packaging until the installation stage,
- Incorrect and poor electrical connections, failures due to incorrect voltage applications, frequent repetition of voltage fluctuations,
- Any damage that may occur as a result of incorrect fuel usage or, foreign substances in the fuel used or using of the product without any fuel,
- Any damage that may occur due to foreign particles entered into the product during installation and operation,
- Failures due to incorrect device selection,
- Any damage to unit due to natural disasters,
- Devices without any warranty certificates,
- Warranty Certificates without the stamp and signature of the authorized dealer or service,
- Devices with any falsification on the warranty certificate or without an original serial number.
- The risks during transportation of device under the responsibility of customer belong to the customer.
- Presence of misuse faults are indicated in the reports issued by authorized service stations or our authorized agent, dealer, representative or our factory in case of unavailability of authorized service stations.
- Customers may apply consumer protection arbitrator committee with regards to this report and request for an expert report.

3. BURNER'S GENERAL FEATURES

ECOSTAR gas burners are manufactured such that they operate in gas pressure of max. 50 mbar, at -15%...+10% of nominal voltage, between the ambient temperature range of -15°C....+60°C and declared capacity and boiler pressure ranges with Natural Gas and Liquid Petrol Gas.

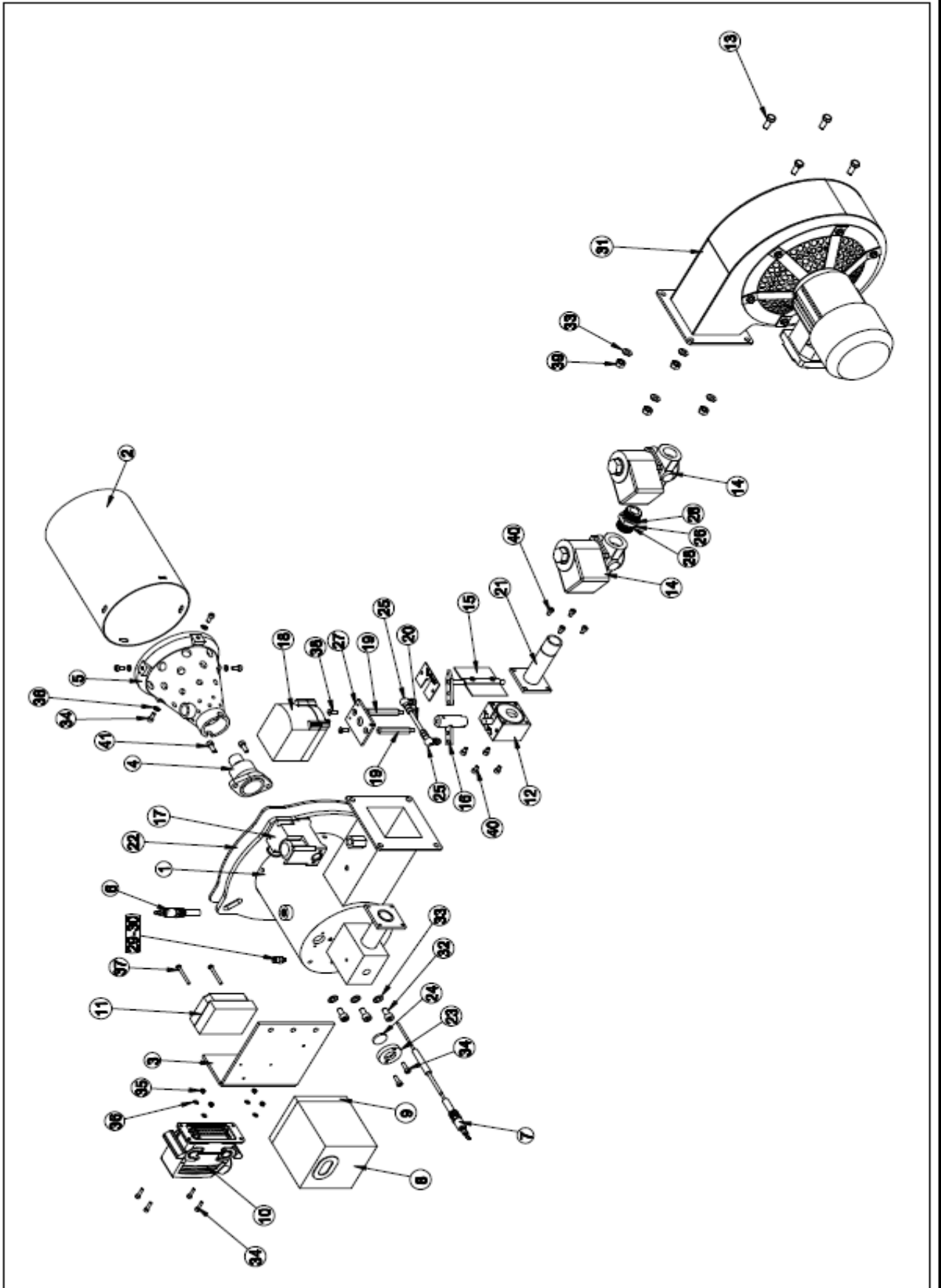
3.1. Purpose of Use and Work Limits of Burners

- This product works at any load value equivalent to its max. capacity or covered by its capacity range;
 - Not used in furnaces performing direct drying with natural gas and drying cabinets,
 - In vacuum or "0" (zero) pressure combustion chambers,
 - Industrial appliances operating at temperature below 600 °C,
 - -15 °C...+60 °C ambient temperature range,
 - 1N 230 VAC/3N 380VAC /50 Hz feed voltage (-%15...+%10) values,
 - Max. 95% relative humidity,
 - In well-ventilated open and closed spaces compatible with protection class IP 40.
 - Operation with natural gas and LPG.
 - Not used in combustion chambers with positive pressure.



This device must never be operated with open flame!

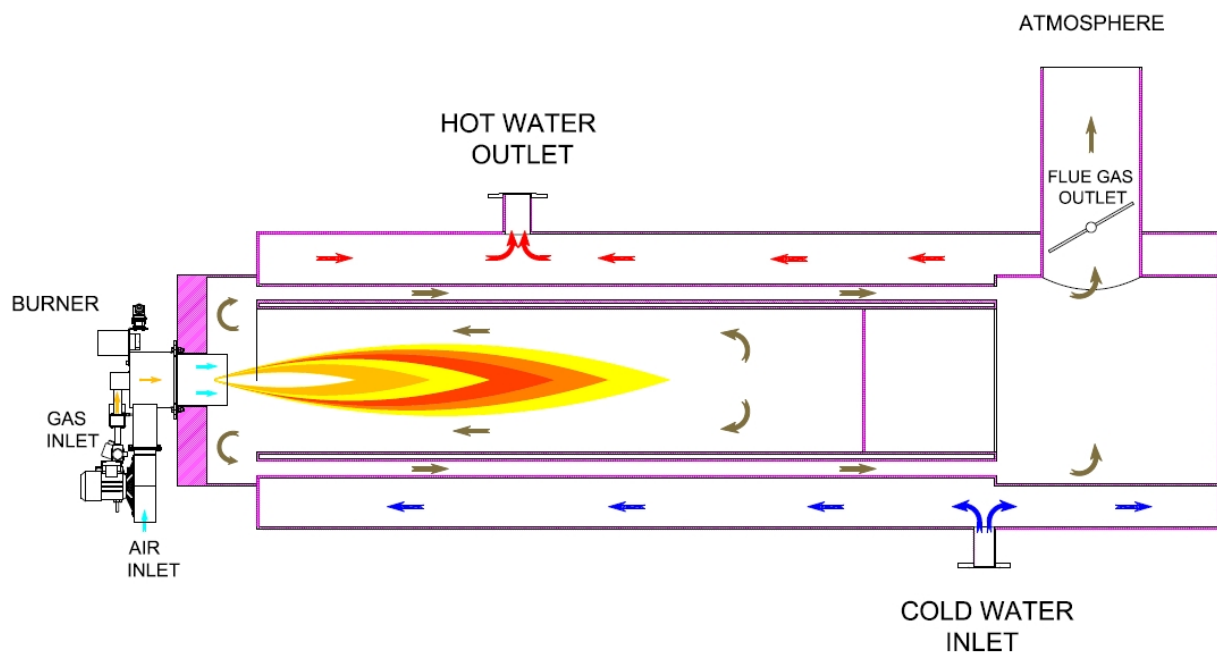
3.2. Burner Components



No	Part Name	No	Part Name
1	Body	22	Gasket
2	Flame Tube	23	Observation Glass Frame
3	Relay Mounting Plate	24	Observation Glass
4	Gas Diffuser	25	Linkage
5	Swirler Disc	26	Steel Nipple
6	Ionization Electrode	27	Servomotor Connection Flange
7	Ignition Electrode	28	Copper Washer
8	Relay	29	Purger
9	Relay Socket	30	Purger Needle
10	Wall Type 24 Pin Socket	31	Fan Group
11	Transformer	32	Socket Screw
12	Gas Valve	33	Washer
13	Hex Bolt	34	Socket Screw
14	Solenoid Valve	35	Bolt
15	Air Damper	36	Washer
16	Air Damper Motion Rod	37	Carriage Bolt
17	Pressure Switch	38	Socket Screw
18	Servomotor	39	Bolt
19	Servomotor Shaft	40	Socket Screw
20	Stud Bolt	41	Socket Screw
21	Gas Pipe		

4. GAS, FLUE GAS AND HEATING WATER SCHEMA

GAZORAM BURNER



5. TECHNICAL DATA

5.1. Capacity Table

GRM SERIES BURNER CAPACITY TABLE							
BURNER TYPE	CAPACITY		CAPACITY		NATURAL GAS CONSUMPTION		MAIN SUPPLY
	Min. kcal/h	Max. kcal/h	Min. kW	Max. kW	Min. Nm ³ /h	Max. Nm ³ /h	VAC
GRM 15	4.500	150.000	5,18	174,42	0,54	18,18	1N 230/3N 400
GRM 30	8.500	300.000	9,88	348,84	1,03	36,36	1N 230/3N 400
GRM 40	11.500	400.000	13,33	465,12	1,39	48,48	1N 230/3N 400
GRM 60	15.000	550.000	17,44	639,53	1,82	66,67	1N 230/3N 400
GRM 70	20.000	700.000	23,21	814,11	2,42	84,85	1N 230/3N 400
GRM 80	21.500	750.000	25,03	872,09	2,61	90,91	1N 230/3N 400
GRM 100	28.500	1.000.000	33,19	1162,79	3,46	121,21	1N 230/3N 400

H_u Natural Gas =8250 kcal/Nm³

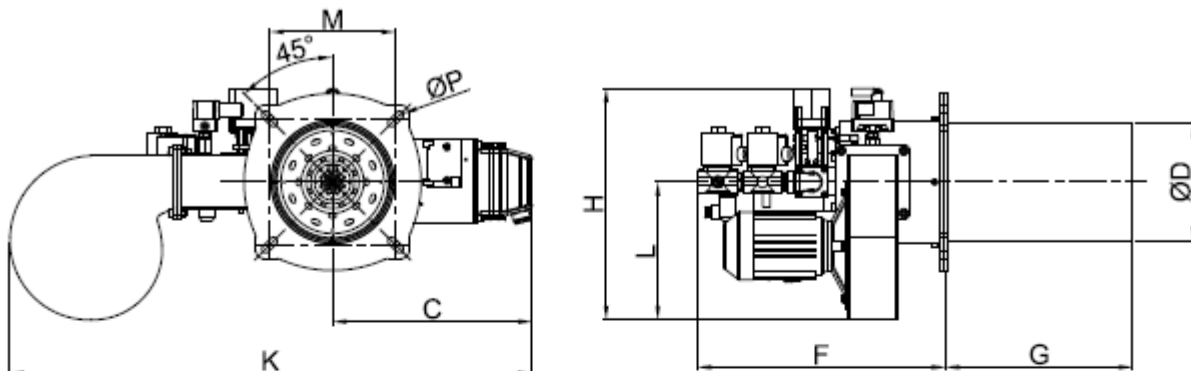
H_u LPG=22500 kcal/Nm³

Modulation Rates

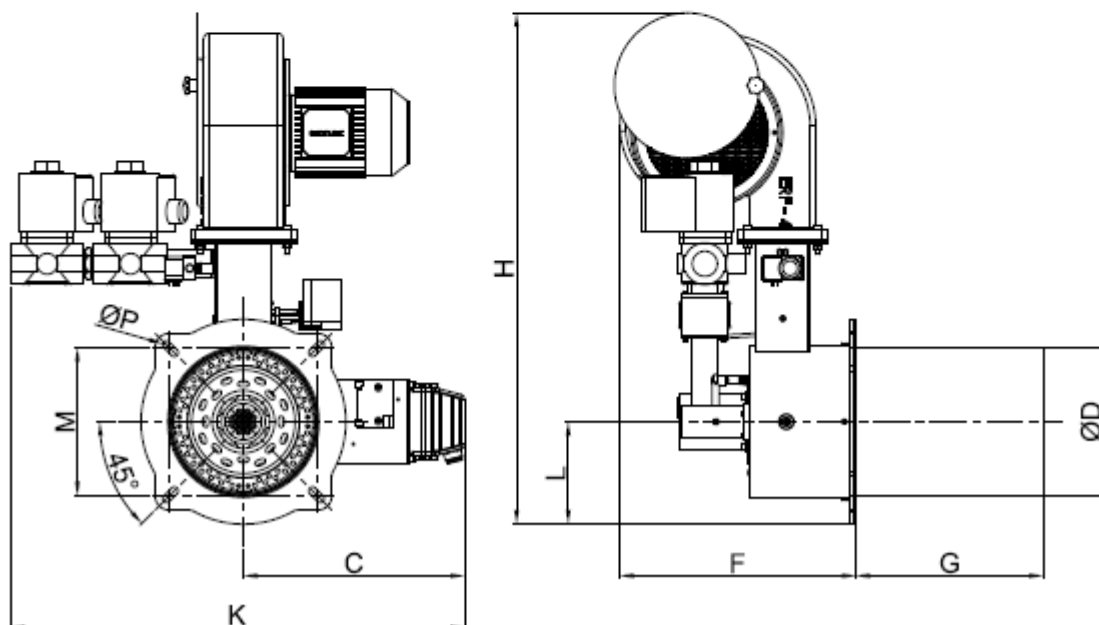
- GRM 15: 33:1
- GRM 30: 35:1
- GRM 40: 35:1
- GRM 60: 36:1
- GRM 70: 35:1
- GRM 80: 35:1
- GRM 100: 35:1

5.2. Burner Dimensions

GRM 15 -GRM 30



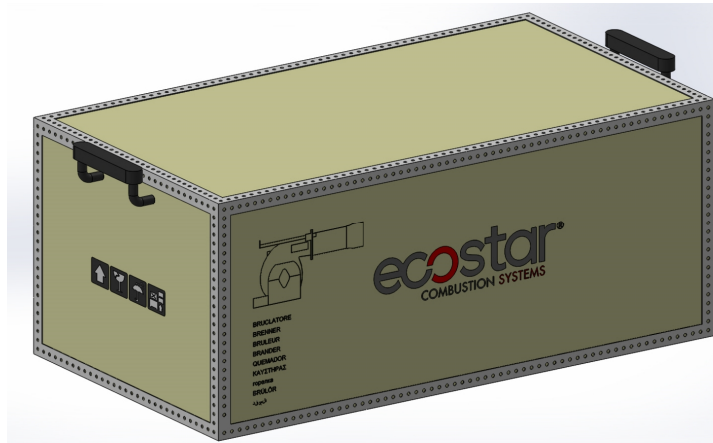
GRM 40 -GRM 60 - GRM 70 - GRM 80 - GRM 100



	ØD	G	H	L	F	C	K	M	ØP
GRM 15	158	200	420	260	450	350	900	185	R7x34
GRM 30	210	200	420	250	450	360	950	225	R7x34
GRM 40	210	200	420	250	450	360	950	225	R7x34
GRM 60	263	200	950	185	450	400	820	265	R7x34
GRM 70	263	200	950	185	450	400	820	265	R7x34
GRM 80	263	200	950	185	450	400	820	265	R7x34
GRM 100	308	200	1150	200	500	450	900	305	R7x34

***PLEASE CONTACT THE SALES DEPARTMENT FOR DESIRED G SIZES.**

6. BURNER HANDLING INFORMATION



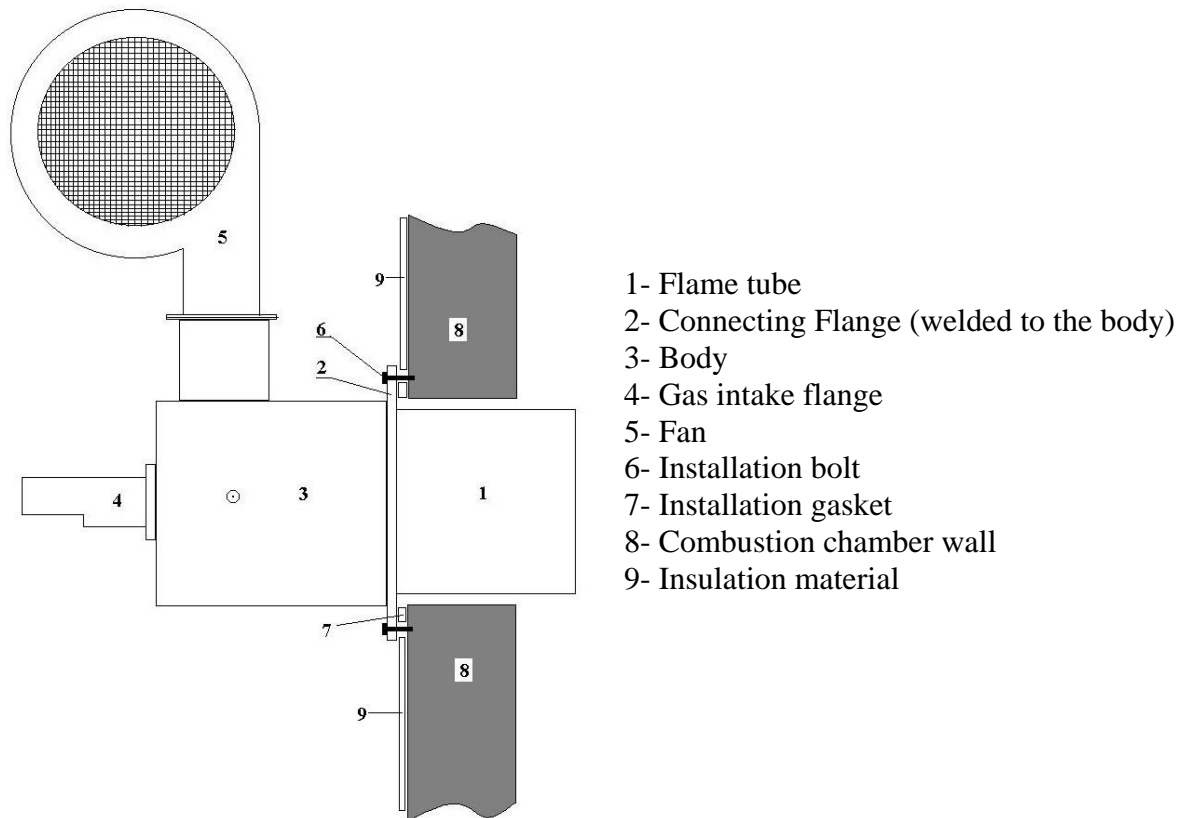
- Lift the product by holding the handles as seen in the picture.
- Prevent strong impacts on top of the product and vibration while handling the product.
- Do not leave the product in wet environment.



Device must be shipped in original packaging!

7. INSTALLATION

7.1. Burner Installation Picture



It is possible to perform installation in GRM Series Burners such that combustion air ventilator and gas path are in different axes. Suggested method of installation is the installation, in which gas line is parallel to the axis so that it is easier to interfere gas line equipment. The hole to be opened on combustion chamber wall must be 20 mm larger than the diameter of the flame tube.



Installation surface must be coated with insulation material (9) in order for burner equipment not to be affected by combustion chamber.



Use suitable compensator or flex hose while connecting the gas line reaching out the burner to the burner gas line.



Do not lift the device holding from servomotor, gas valve, impulse pipes or pressure switch during installation!



Clean the inside of fuel line thoroughly before installing the burner to the fuel line. Any damage that may occur due to solid objects and metal particles from the fuel line shall not be covered by our company.

Electrical Connection



Perform electrical connections according to the diagram provided with the burner. Follow general security rules during installation of electric wiring and making connections. Connect the earthing terminal in electric panel to the earthing installation.

8. COMMISSIONING

8.1. General Controls

- Are the electrical connections correct?
- Has the sealing of gas lines been controlled?
- Is the pressure provided to the burner suitable? (max. 50 mbar)
- Is the suction ventilator connected to the combustion chamber working?
- Is the wall element checking combustion chamber temperature working correctly?

8.2. Operating Gazoram Burner

- Verify that the combustion chamber suction ventilator is working.
- Insert plug sockets, which ensure electric connection, in their holes.
- Since the gas valve is turned off, gas pressure switch will not let the burner to work.
- Turn on the gas shut-off valve.
- Having detected gas pressure, gas pressure switch will send operating voltage to the program relay and relay's operational steps will commence.
- When fan motor starts and pre-purge commences, air pressure switch will verify the existence of combustion air and commence relay ignition operation.
- Ignition step is composed of two stages: pre-ignition and final (safety) ignition. Gas solenoid valve turns on at the end of pre-ignition period (3 seconds) and flame is formed; ignition is active for 3 seconds more despite formation of flame.
- After the flame detector detects flame existence, burner continues its normal operation. Working load is automatically changed by the proportional control device according to the signal arriving from combustion chamber heat sensitive element.
- In that case, commissioning process is successful.

8.3. Function Controls

- a. First commissioning with closed gas valve
Following fault, relay must switch to fault position once the safety period ends.
- b. In first commissioning, turn off the gas valve while burner is working.
After the flame goes out, relay should transit to fault position.
- c. Cut off air pressure switch during pre-purge or working in first commissioning
Burner control unit should immediately bring the device to fault position.
- d. Bridge the air pressure switch before starting.



Fan motor starts working for 2-3 seconds and switches to fault at the end of this period. In second try, device starts the fan motor again and makes another try after 10 seconds. If the contacts of the air pressure switch are still bridged, it switches to fault position. As soon as the unit starts working, it checks if the air pressure switch is brought to ON position from OFF position.

8.4. Air Pressure Switch Adjustment

While the burner is working without any problem, the air pressure switch is adjusted to desired minimum pressure as follows.

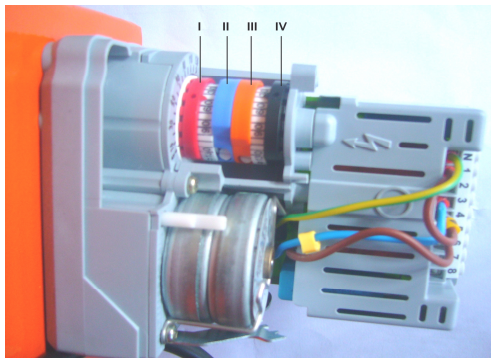
- Ø Unscrew the screw of the transparent cover and remove the cover.
- Ø Turn the adjustment wheel in the direction to increase the pressure, note the pressure value at which the burner is failed.
- Ø Set the pressure switch to a value 1 mbar lower than the pressure value at which the burner failed and close the pressure switch lid.
- Ø It is recommended that this adjustment is carried out when the burner is at minimum load.



8.5. Servomotor Adjustment

The amount of air is adjusted by means of the servomotor. The servomotor adjustment at two-stage and modulating burners is made by the cams on the servomotor.

Ø SQN70/SQN71



At Modulating Burners;

- I. Red Cam: Performance max. air adjustment.
- II. Blue Cam: Resets the clamp.
- III. Orange Cam: Performs min. air adjustment.
- IV. Black Cam: Not used.



Do not open servomotor. Do not interfere with. It may damage servomotor or change burner settings.

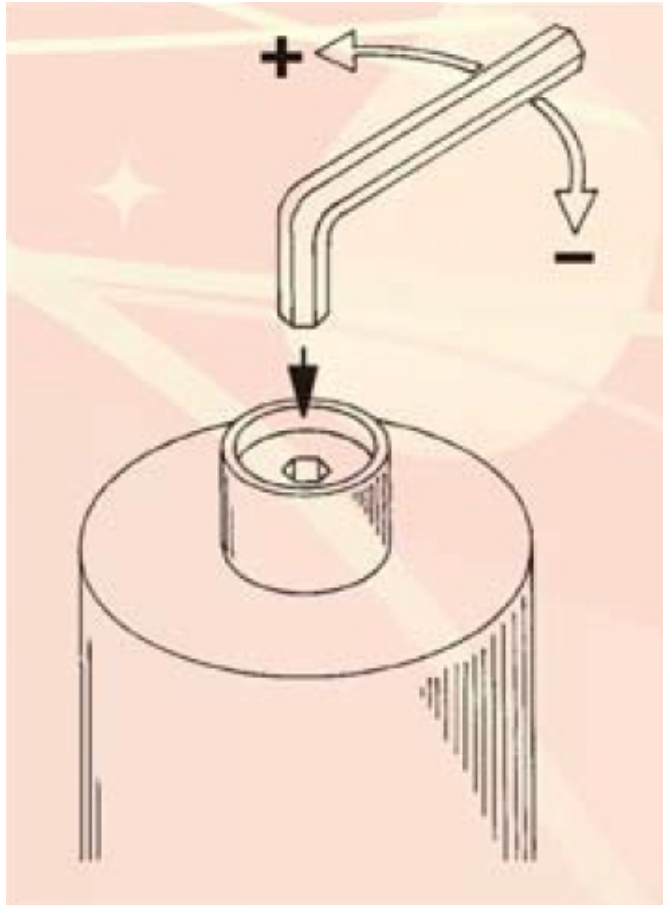
8.6. Program Relay

LFL 1.335



9. GAS VALVE ADJUSTMENT

9.1. BANICO ZEVR

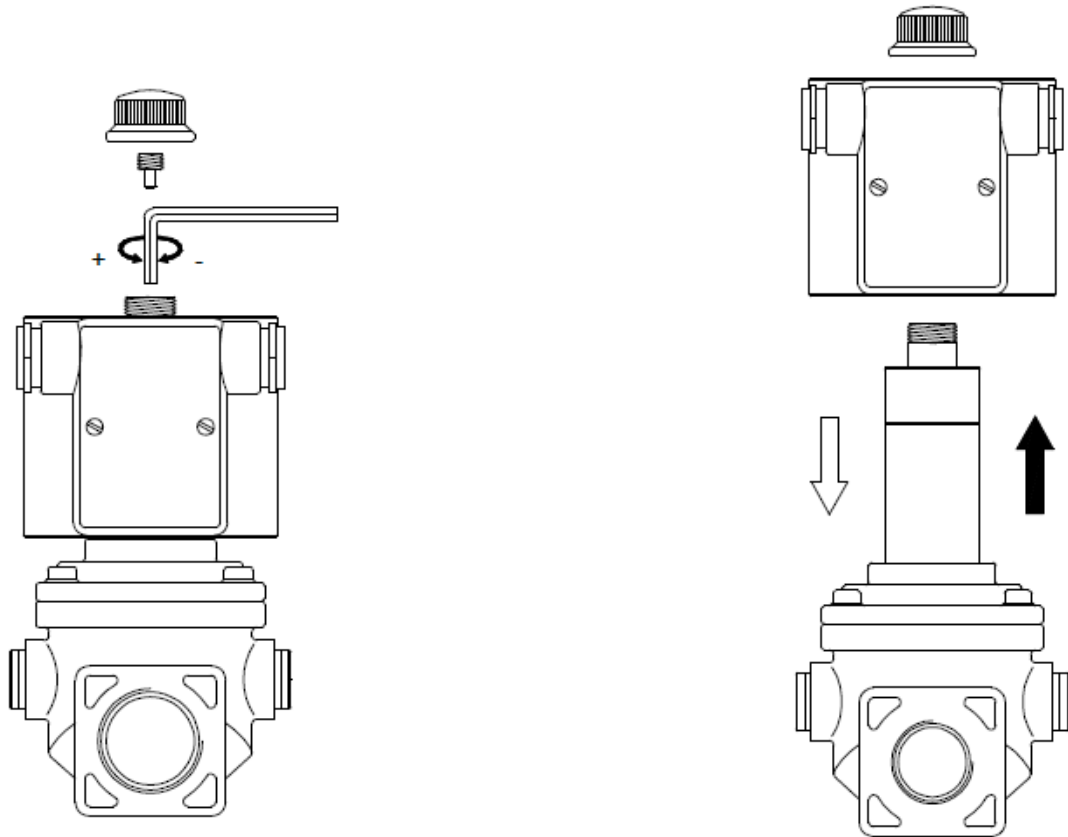


Adjusting Gas Flow

Follow the steps below for adjusting maximum capacity:

1. Release the cover of gas solenoid valve.
2. Remove the stopper with a 4 mm allen.
3. Turn the adjustment screw clockwise in order to reduce the flow rate and counter clockwise to increase flow rate.
4. After adjusting the flow rate fasten the stopper and cover.

9.2. ELEKTROGAS VMR



Adjusting Gas Flow

Follow the steps below for adjusting maximum capacity:

1. Release the cover of gas solenoid valve.
2. Remove the stopper with a 4 mm allen.
3. Turn the adjustment screw clockwise in order to reduce the flow rate and counter clockwise to increase flow rate.
4. After adjusting the flow rate fasten the stopper and cover.

9.3. BRAHMA EG

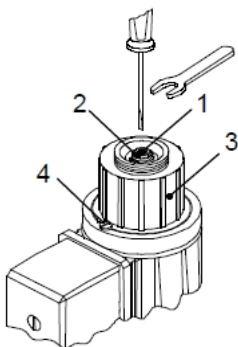


Fig. 1

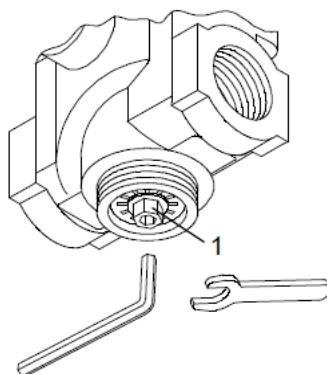


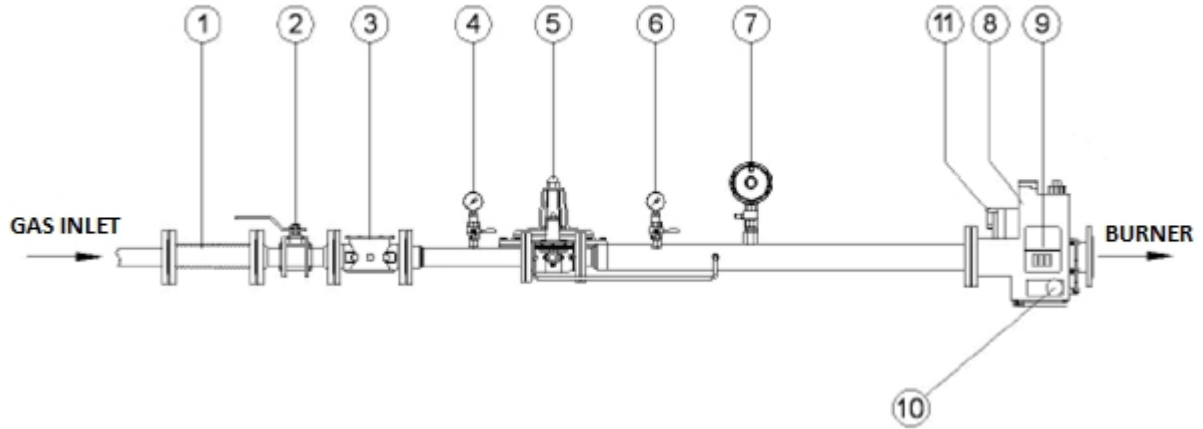
Fig. 2

Adjusting Gas Flow

Follow the steps below for adjusting combustion:

- 1- Remove the bottom cover in order to adjust gas flow rate.
- 2- Turn the adjustment screw, shown as number 1 in Figure 2, clockwise to reduce the flow rate and counterclockwise to increase the flow rate.
- 3- Fasten the bottom cover after adjusting the flow rate.

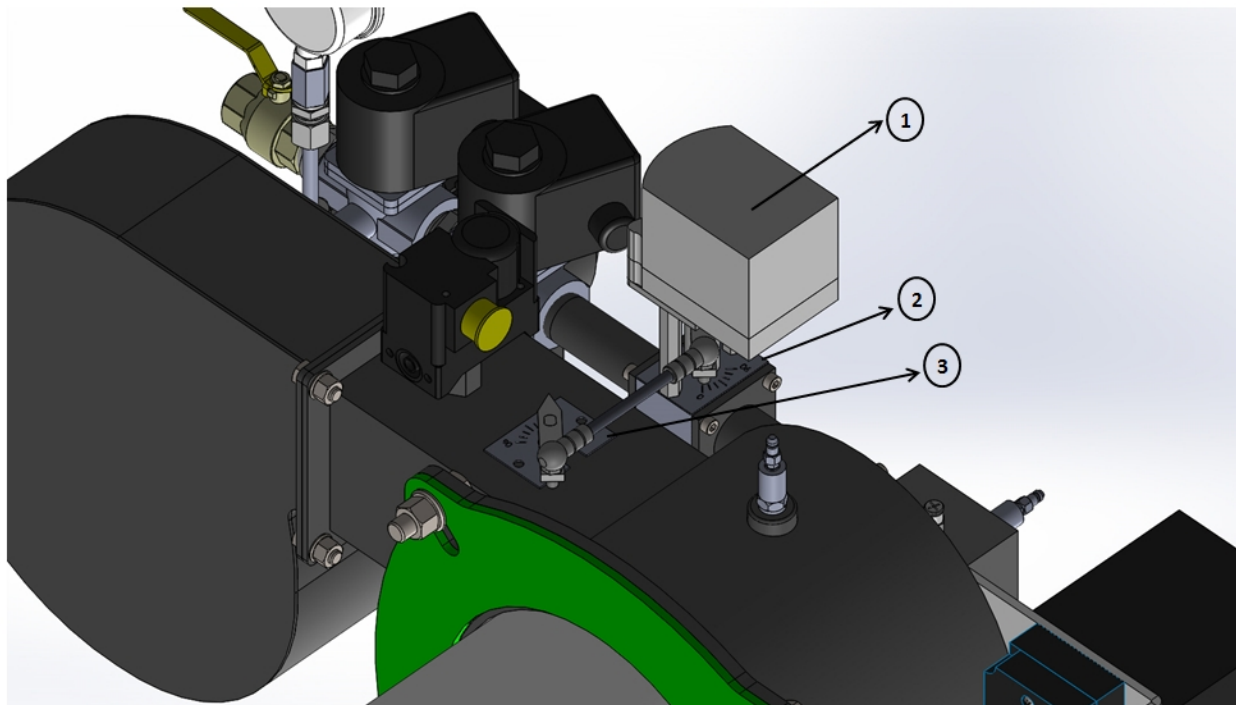
9.4. Gas Pass Equipment Required in Gas Line



Pe < 300 mbar Q<1200kW	Pe > 300 mbar Q<1200kW
1-Compensator	1-Compensator
2- Ball valve	2- Ball valve
3- Gas filter	3- Gas filter
4- Inlet manometer + valve	4- Inlet manometer + valve
8- Multi-block (safety and operation solenoids)	5- Regulator
9- Min. Pressure switch	6- Outlet manometer + valve
	7- Safety discharge valve
	8- Multi-block (safety and operation solenoids)
	9- Min. Pressure switch

10. AIR/FUEL ADJUSTMENT

Air-fuel load control is done with a mechanical controlled servomotor. Servomotor (1) is mounted on the gas valve (2) and gas valve is connected to the air damper by a shaft (3).



Check page 15 for the servomotor adjustment and cam definitions.



Air-fuel ratio can be adjusted by changing the gas-air shaft mounting position on the plate (2 mounting hole option available) and the shaft length.

11. MAINTENANCE

11.1. Daily Maintenance

- Ø Check if the gas line pressure is proper.
- Ø Clean by using compressor air the dust and particles that have accumulated on GRM.
- Ø Perform function control

11.2. Monthly Maintenance

- Ø Check if the gas line pressure is proper.
- Ø Clean dust and particles that have accumulated between fan vanes.
- Ø Perform function control

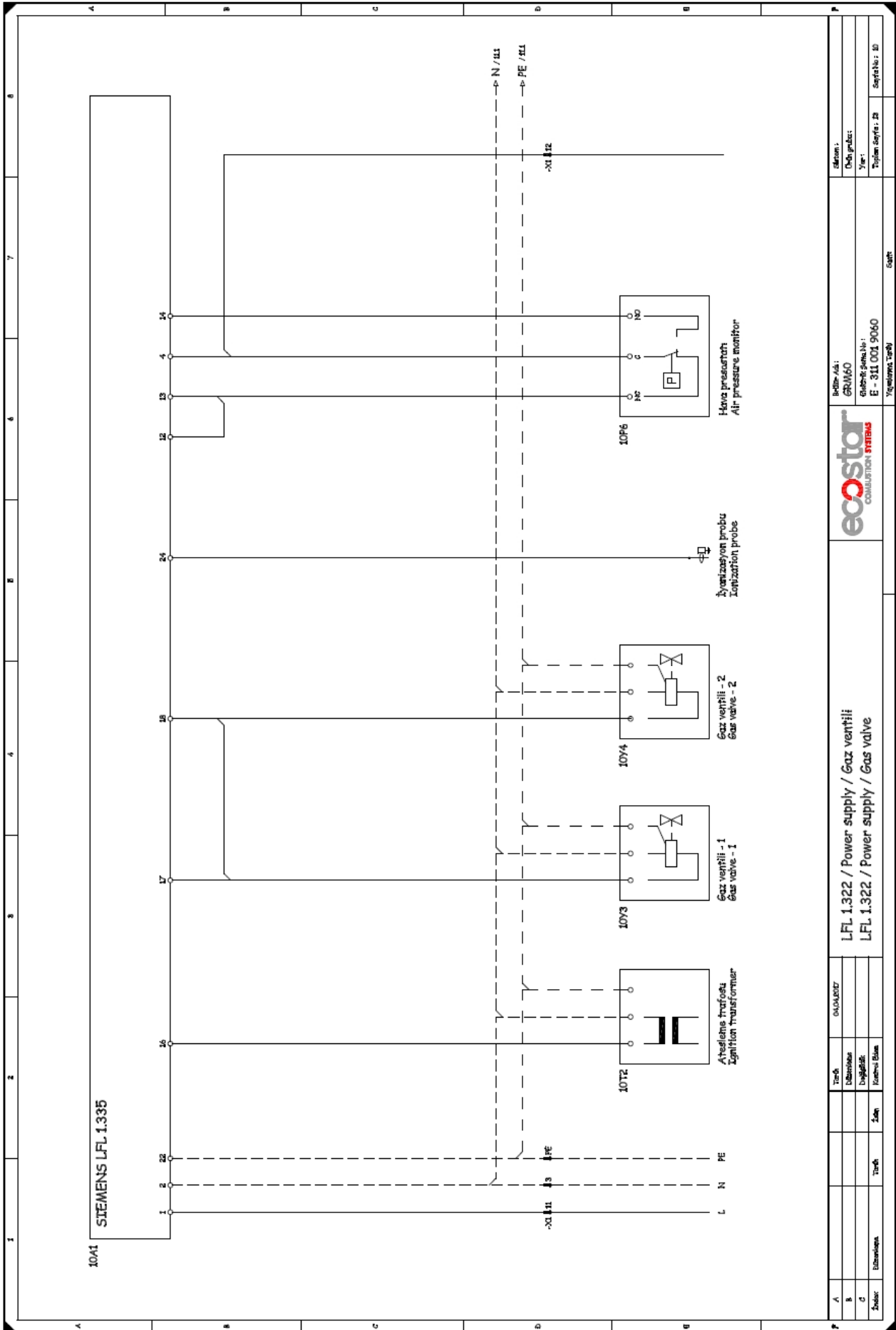
11.3. Seasonal (6 Months) Maintenance

- Ø Check if the gas line pressure is proper.
- Ø Clean dust and particles that have accumulated between fan vanes.
- Ø Check ignition electrode and ignition function. Replace electrode in case of deformation.
- Ø Check ionization electrode and ionization function. Replace electrode in case of deformation.
- Ø Perform cleaning control of gas adjusting valve, clean and lubricate gas adjusting valve should there by excessive contamination due to particles from gas line.
- Ø Re-adjust.

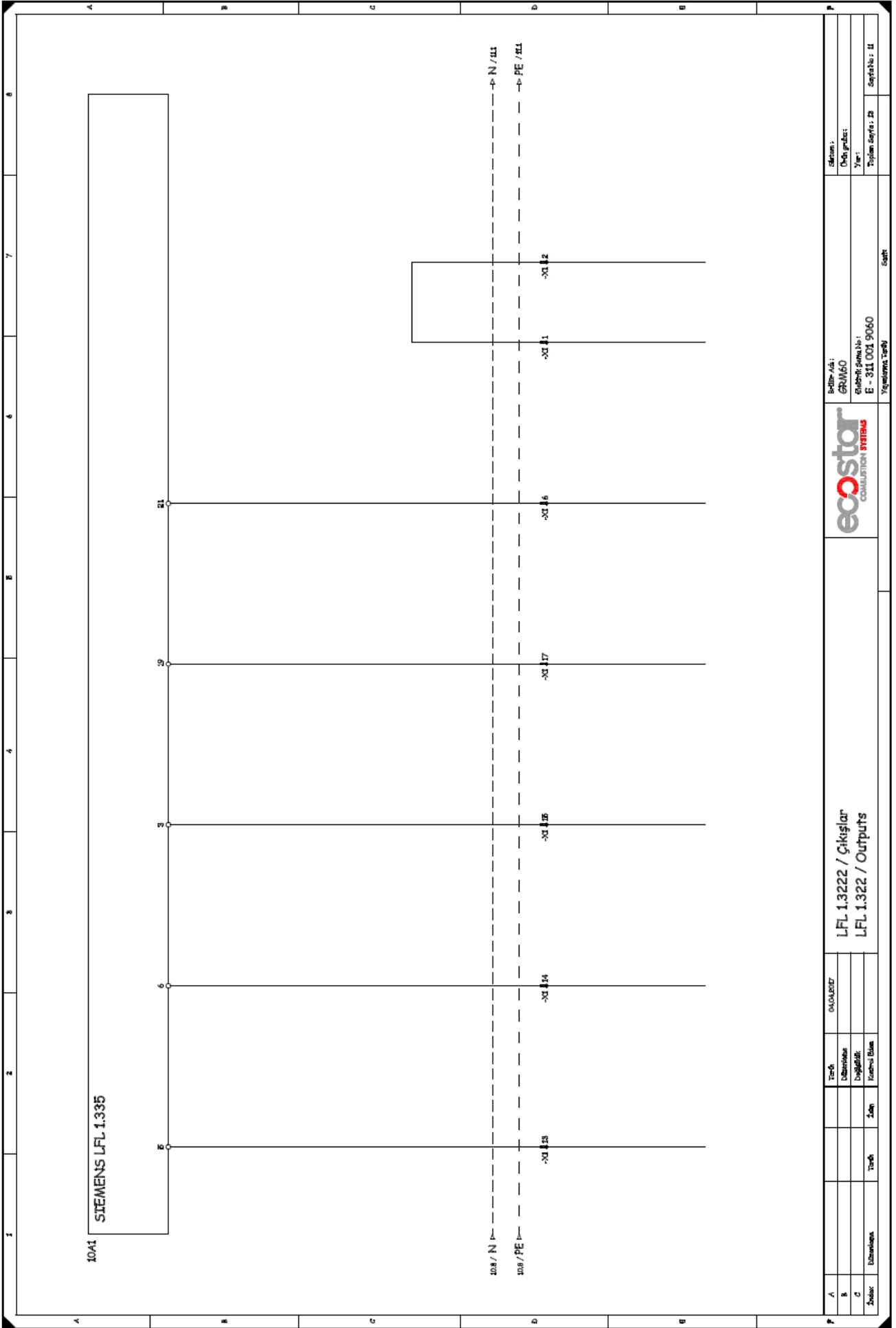


Follow installation directions during maintenance.

12. ELECTRIC DIAGRAM



		Model: GRM60 Date: 01.01.2021 Version: 1.001.0060 Project: 01.01.2021	Date: 01.01.2021 Author: 01.01.2021 Version: 1.001.0060 Project: 01.01.2021
LFL 1.322 / Power supply / Gaz ventili LFL 1.322 / Power supply / Gas valve		Project: 01.01.2021	
Terminal: 10A Description: 10A Location: 10A	Terminal: 10B Description: 10B Location: 10B	Terminal: 10C Description: 10C Location: 10C	Terminal: 10D Description: 10D Location: 10D

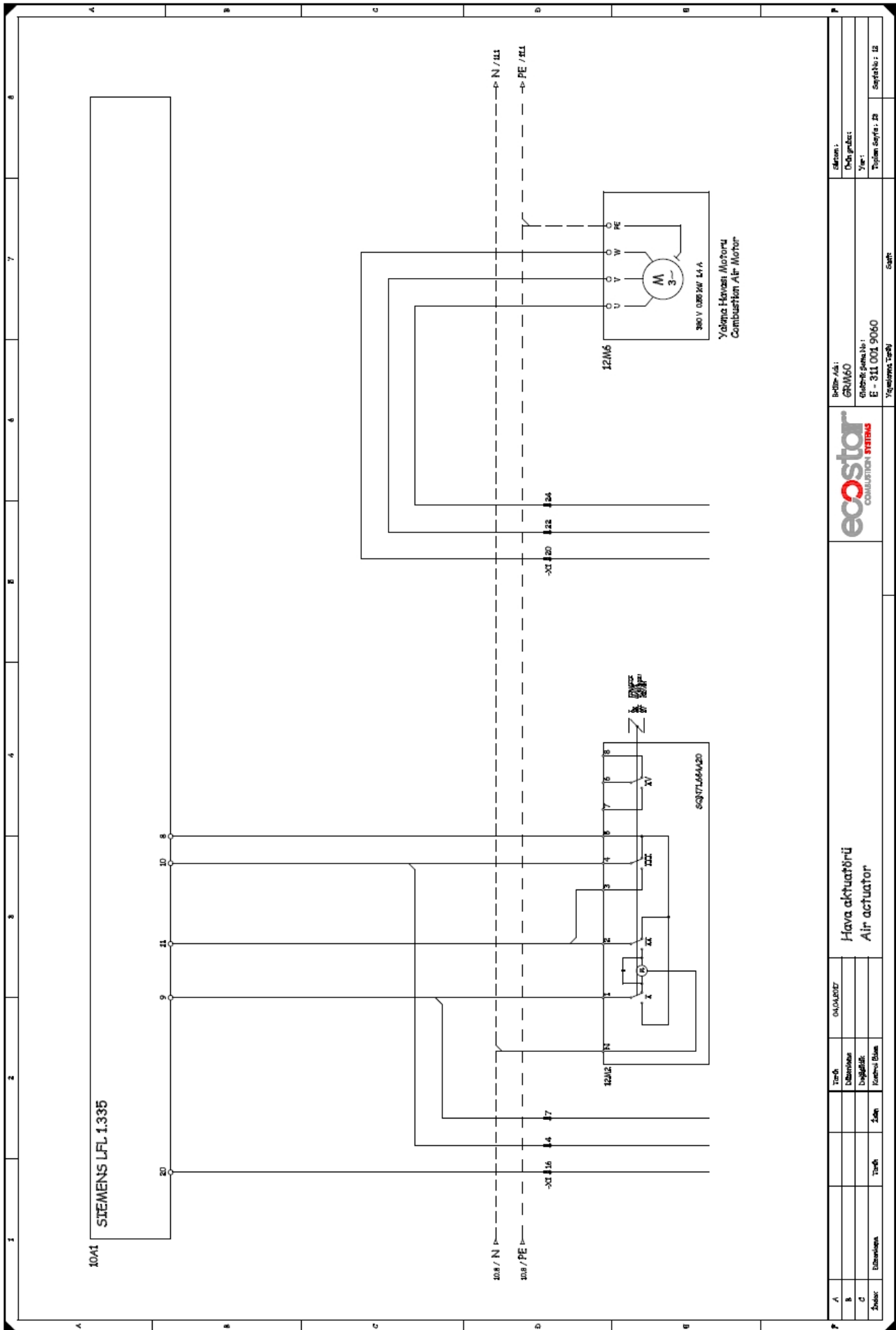


İmalatçı:	GRIMCO
Ürün Grubu:	
Yıl:	
Teknik Çizim No:	311 001 9060
Şirket No:	11

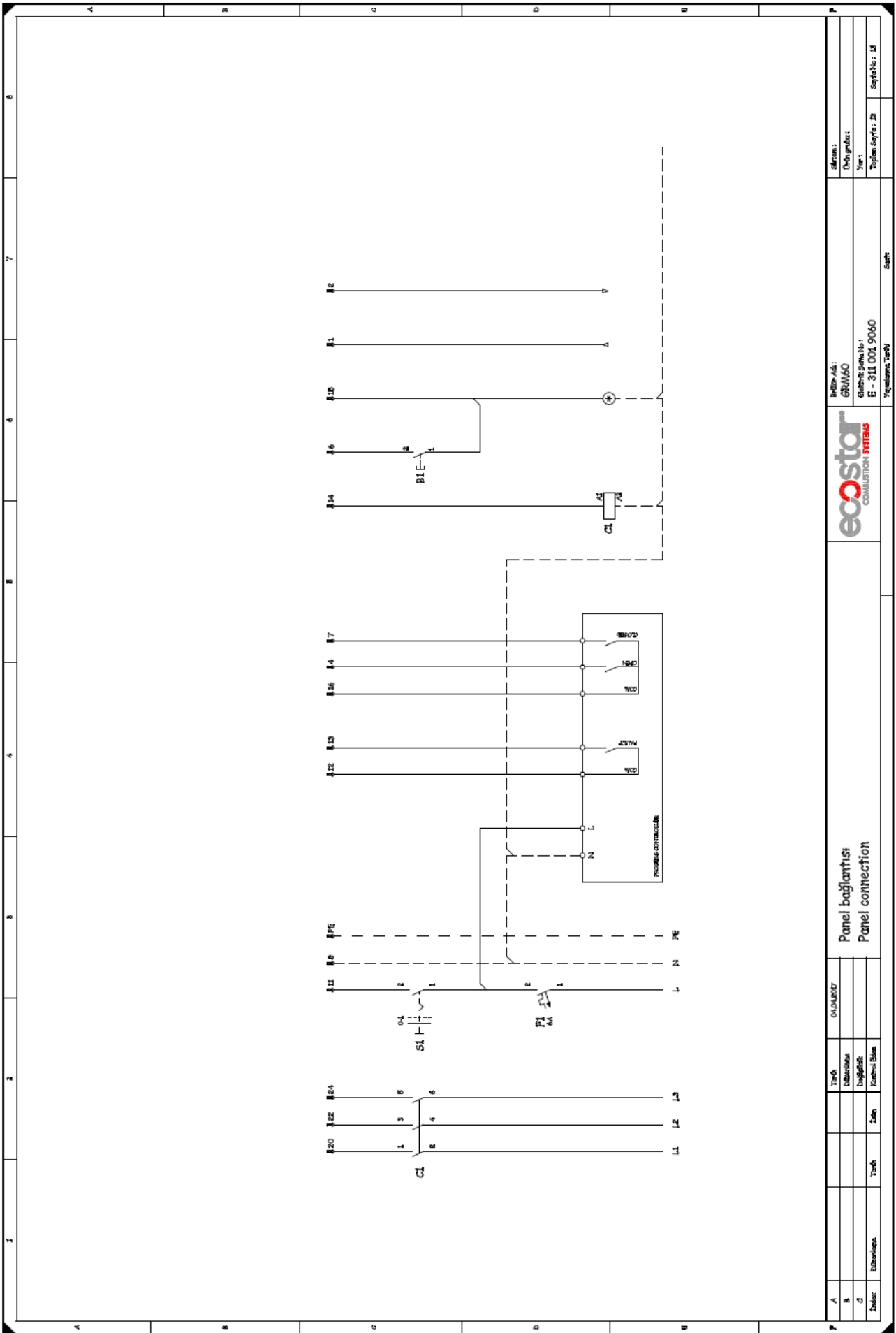


LFL 1.322 / Çıktılar
LFL 1.322 / Outputs

Terim:	ÖLÇÜLER
Ürün No:	
Değişiklik:	
Kontrol Blömi:	
Zaman:	
Terim:	



A	Terb	0A/0.025	Hava aktuatörü Air actuator		Şirket	Şahe
B	Edenme					
C	Uygulama					
Şehir	Edenme	Terb	Şah			
Şirket Adı : GEMCO		Şirket Adı : GEMCO		Şirket Adı : GEMCO		
Yapı No : E - 311 001 9050		Yapı No : E - 311 001 9050		Yapı No : E - 311 001 9050		
Yapı No : E - 311 001 9050		Yapı No : E - 311 001 9050		Yapı No : E - 311 001 9050		
Yapı No : E - 311 001 9050		Yapı No : E - 311 001 9050		Yapı No : E - 311 001 9050		



A	Terah	ÖLÜKLEŞTİR	Panel bağlantısı Panel connection		İşletim No:
B	Altınbaş		ecostar COMBUSTION SYSTEMS		Ürün grubu:
C	Diyadinli				Yer:
Çukurova	İzmirli Binası				Proje Sayısı: 28
	Terah	Çukurova			Sayı: 13
					Şehir:

13. TROUBLESHOOTING

PROBLEM	CAUSES and SUGGESTIONS FOR SOLUTION
Burner is not working	<ul style="list-style-type: none"> - Thermostat circuit is open - Faulty electric connection - Electric voltage below 187
Fan motor fails a short time after it starts.	<ul style="list-style-type: none"> - Burner control unit is not reset. - Air pressure switch is not open.
Burner control unit fails during pre-purge	<ul style="list-style-type: none"> - Air pressure switch did not switch to closed position within 60 seconds.
Burner control unit fails at the end of pre-purge	<ul style="list-style-type: none"> - Air pressure switch was opened. - Flame signal formed.
Burner started, flame did not form and failed.	<ul style="list-style-type: none"> - Pseudo flame formed. - No ignition or no fuel.
Burner started, flame formed. However, it failed after safety period.	<ul style="list-style-type: none"> - Too low flame signal or no flame signal (Flame did not form, ionization rod had bad insulation, earthing connection is not properly established)

14. PERIODICAL FLUE GAS MEASUREMENT REPORT

Fuel Consumption (Nm³/h)	CO (ppm)	O₂ (%)	CO₂ (ppm)	NO_x (ppm)	Yield (%)	Flue Temp. (°C)	Date	Signature

15. AFTER-SALES SERVICES

Dear Customer,

We believe that providing a good service is as important as providing a good product. Therefore, we continue offering wide range of comprehensive services to our conscious customers.

Our contact details for your requests and complaints

Esentepe Mah.Milangaz Cad. No:75 K:3

Kartal Monumento Plaza

KARTAL/İSTANBUL/TÜRKİYE

Tel: +90 216 442 93 00

Fax: +90 216 370 45 03

Factory Contact Details

Türkgücü OSB

Bülent Ecevit Bulvarı No:11

ÇORLU/TEKİRDAĞ/TÜRKİYE

Tel: +90 282 685 44 80-81

Fax: +90 282 685 42 09

Also you can contact with us:

Web site : www.ecostar.com.tr

E - mail : servis@ecostar.com.tr



Please observe the following recommendations.

- Use the product in accordance with the principles of this manual.
- For any service demands regarding the product, please contact our Service Center from the abovementioned phone numbers.
- Upon your purchase, register your warranty certificate during installation.

