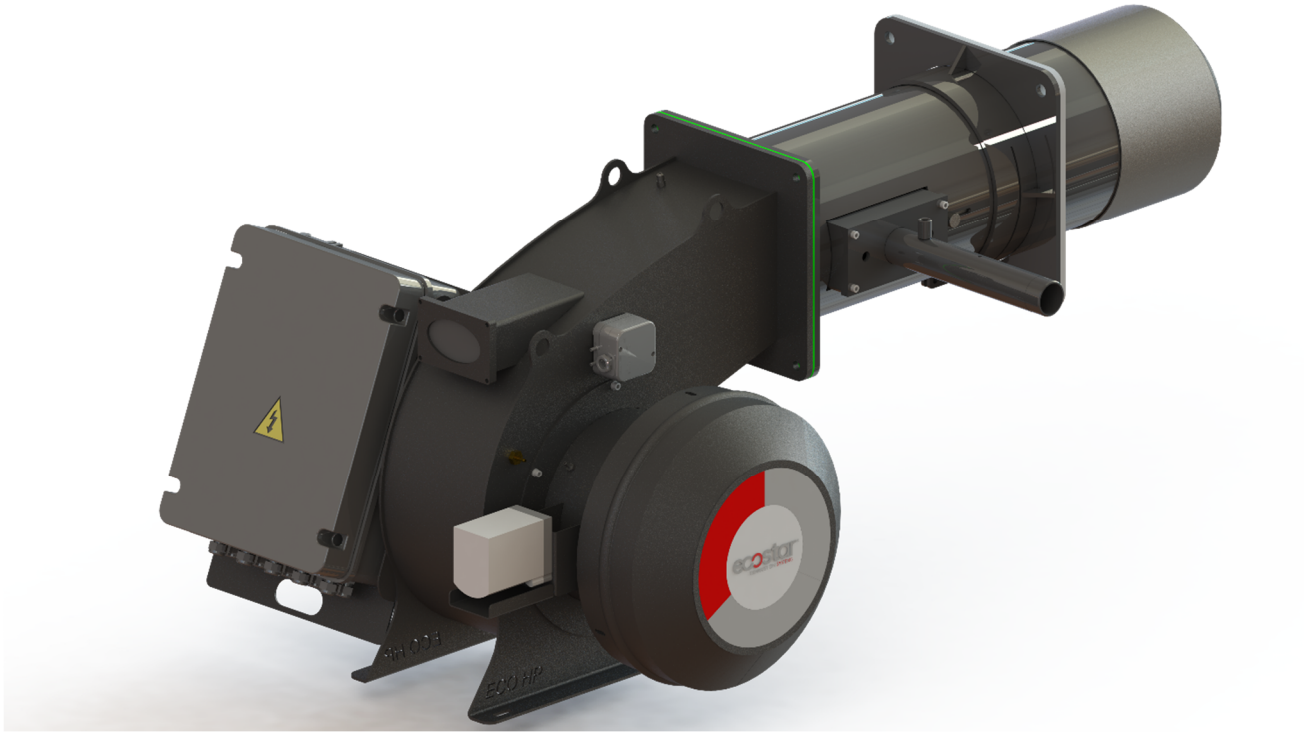
MONOBLOCK HP GAS BURNERS INSTALLATION, OPERATING AND MAINTENANCE MANUAL

ONE-STAGE, TWO STAGE AND MODULATING OPERATION



ECO 50 HP
ECO 100 HP
ECO 200 HP
ECO 350 HP
ECO 450 HP
ECO 700 HP
ECO 1100 HP
ECO 1500 HP
ECO 2000 HP
ECO 3000 HP
ECO 4500 HP

28.11.2023 Rev. 01

DEAR USER,

ECOSTAR **ECO 50 HP, ECO 100 HP, ECO 200 HP, ECO 350 HP, ECO 450 HP, ECO 700 HP, ECO 1100 HP, ECO 1500 HP, ECO 2000 HP, ECO 3000 HP, ECO 4500 HP, Gas** 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.

Ecostar Gas Burners are manufactured in accordance with TS EN 676 +A2 standards.

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.

TERMO ISI SİSTEMLERİ SAN.VE TİC.A.Ş.
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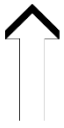
CONTENTS

1. WARNINGS

1.1.Warning Symbols and Descriptions

Symbols	Symbol Descriptions
	Important information and useful hints.
	Warning of danger to life or property.
	Warning of electrical voltage.
	Product handling information.
P_F	Impulse connection detecting combustion chamber pressure
P_L	Impulse connection detecting combustion air pressure
P_{BR}	Impulse connection detecting burner gas head
	"Clean the gas line" warning on gas line.
	Electric motor direction of rotation
	Carry in an upright position. Fragile Item. Protect against water.

1.2.General Safety Rules

- All personnel engaged in installation, disassembly, commissioning, operation, control, maintenance and repair should have received the necessary training, qualified 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, ventilation and air discharge holes must not be closed.

If you sense gas leakage;

- 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 boiler 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.

Use lifting device or belt for lifting fan motor, if necessary

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 comissioned 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 ensu re 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 min. 20 mbar and max. 300 mbar., at 15%...+10% of nominal voltage, between the ambient temperature range of -15ºC….+60˚C and declared capacity and boiler pressure ranges with Natural Gas and Liquid Petrol Gas.

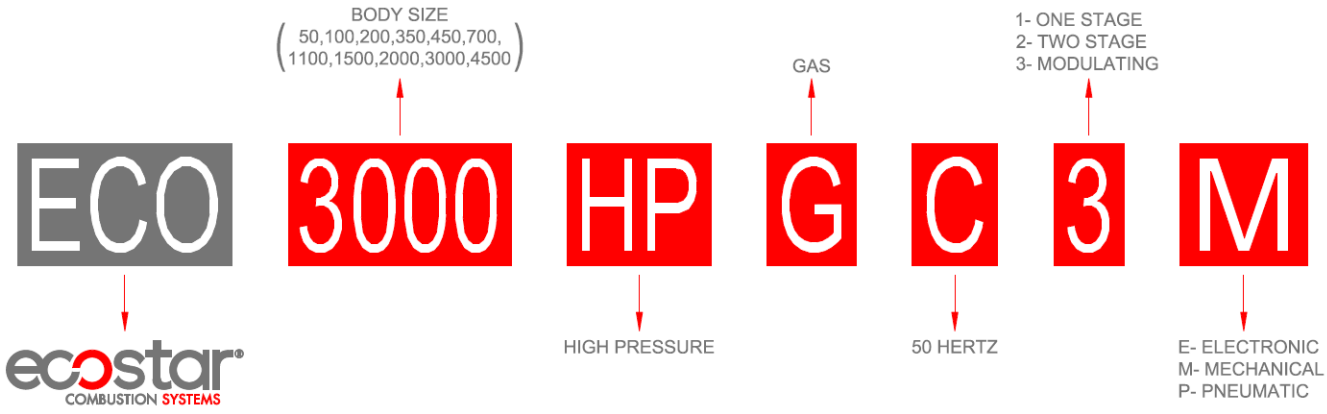
3.1.Purpose of Use and Work Limits of Burners

- This product works at any load value equivalent to its max. capacity or covered by its capacity range;

  - In hot water and steam boilers,
  - In direct and indirect hot air generators,
  - Industrial appliances operating at temperature below 600 ^{0}C,
  - -15 ^{0}C…+60 ^{0}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.

⚠ This device must never be operated with open flame!

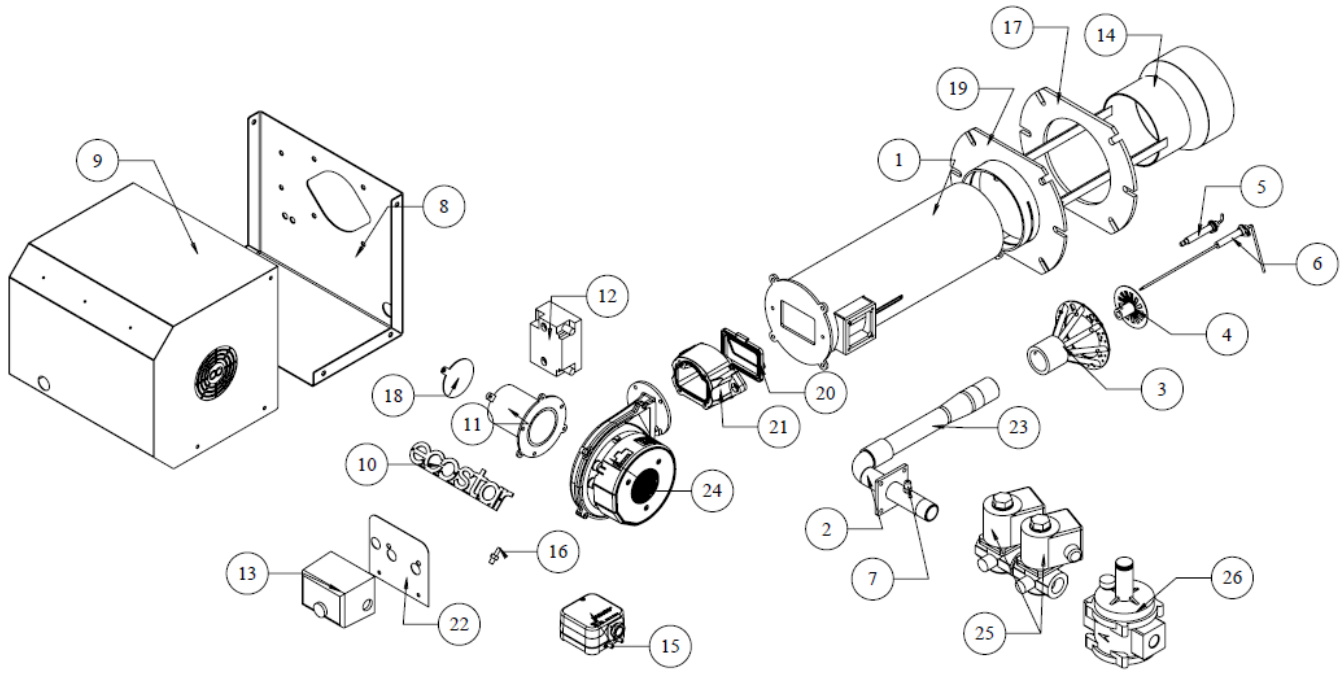
3.2.Code Key



3.3.Burner Components

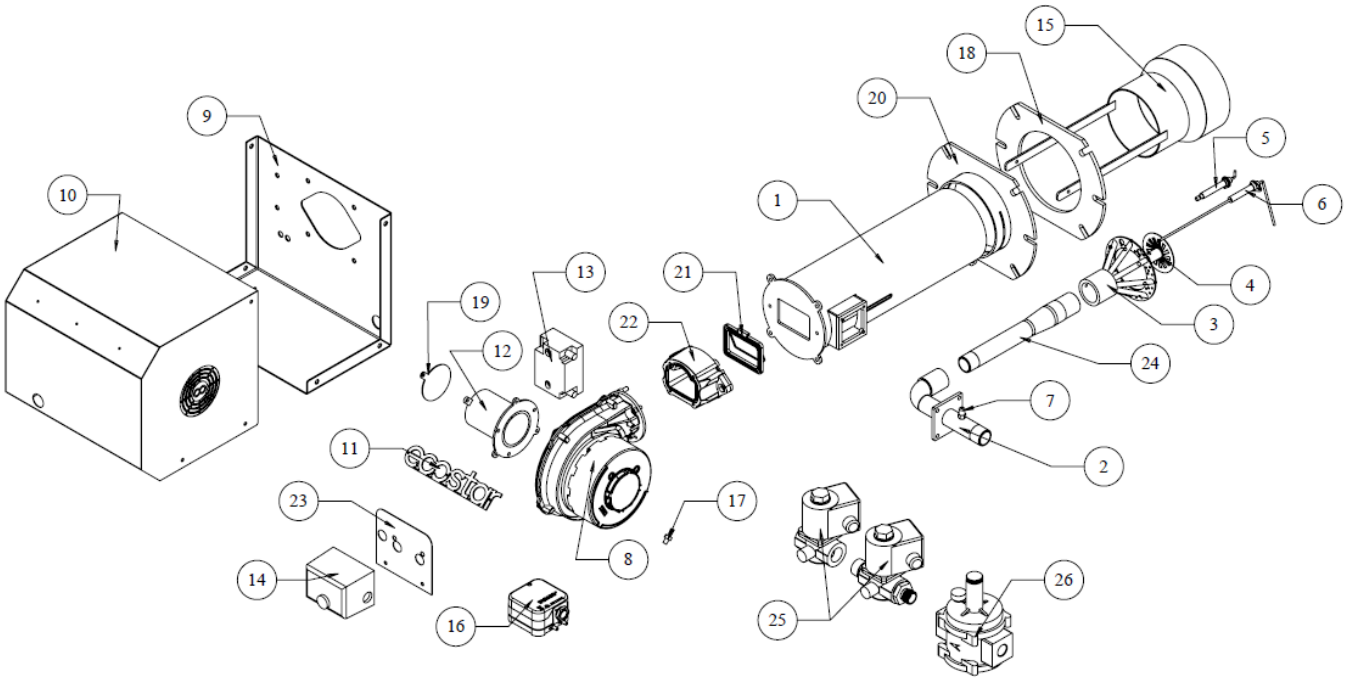
One Stage HP Burners

ECO 50 HP G C1 SV



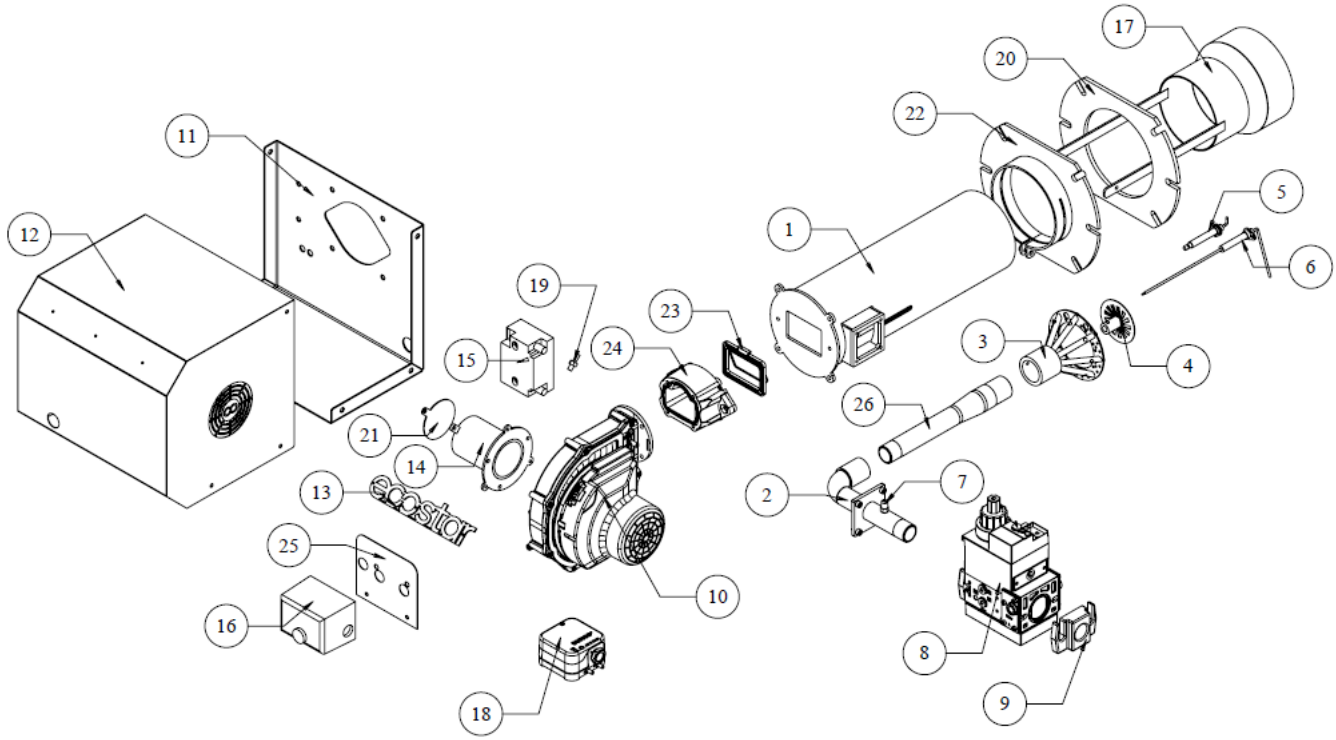
ASEEMBLY NO.	DESCRIPTION
1	FLAME PIPE
2	GAS ENTRY PIPE
3	GAS HEAD
4	TURBULATOR
5	ELECTRODE IGNITION
6	ELECTRODE IONIZATION
7	PURGER
8	FRONT COVER SHEET
9	BACK COVER
10	LOGO
11	CLAMP PIPE
12	TRANSFORMER
13	RELAY
14	FLAME PIPE EXTENSION
15	AIR SWITCH
16	AIR SWITCH PURGER
17	GASKET
18	CLAMP SHEET
19	BOILER CONNECTION FLANGE
20	RECYCLE CLAMP
21	CLAMP SPACER
22	RELAY CONNECTION SHEET
23	GAS ENTRY PIPE
24	FAN
25	GAS VALVE
26	GAS REGULATOR

ECO 100 HP G C1 SV



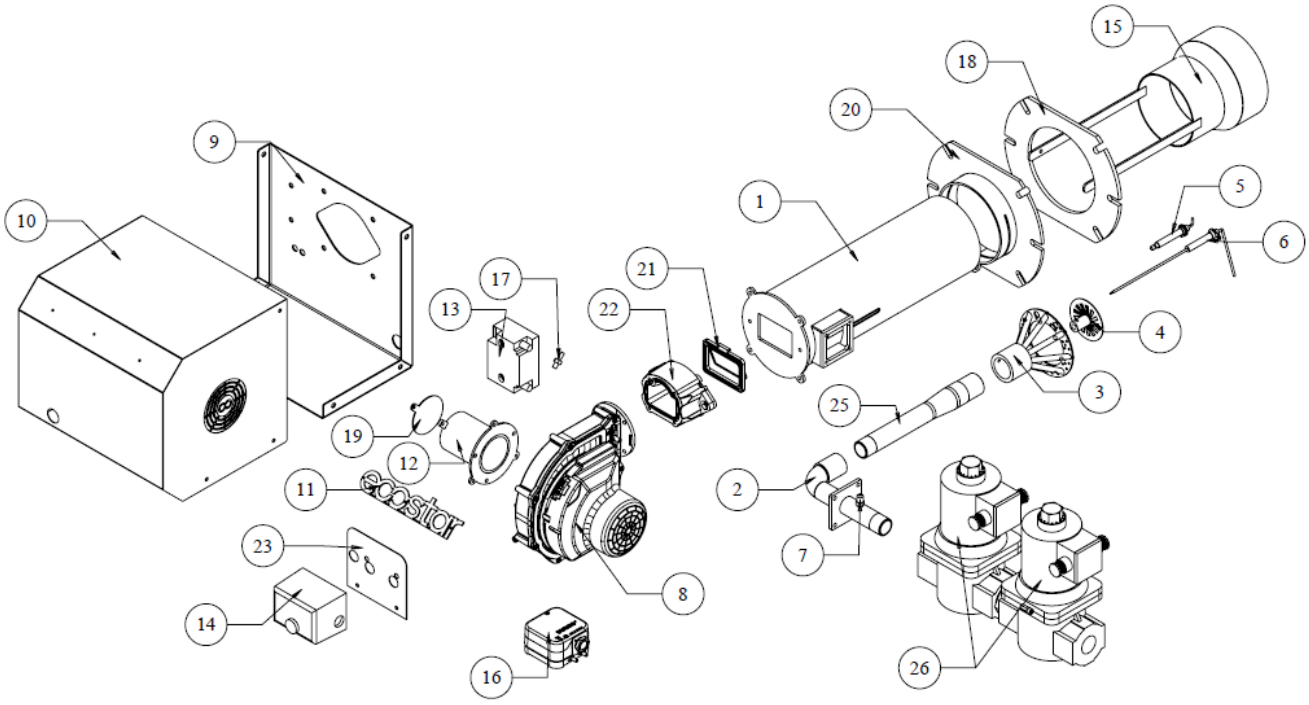
ASEEMBLY NO.	DESCRIPTION
1	FLAME PIPE
2	GAS ENTRY PIPE
3	GAS HEAD
4	TURBULATOR
5	ELECTRODE IGNITION
6	ELECTRODE IONIZATION
7	PURGER
8	FAN
9	FRONT COVER SHEET
10	BACK COVER
11	LOGO
12	CLAMP PIPE
13	TRANSFORMER
14	RELAY
15	FLAME PIPE EXTENSION
16	AIR SWITCH
17	AIR SWITCH PURGER
18	GASKET
19	CLAMP SHEET
20	BOILER CONNECTION FLANGE
21	RECYCLE CLAMP
22	CLAMP SPACER
23	RELAY CONNECTION SHEET
24	GAS ENTRY PIPE
25	GAS VALVE
26	GAS REGULATOR

ECO 200 HP G C1 3/4" D



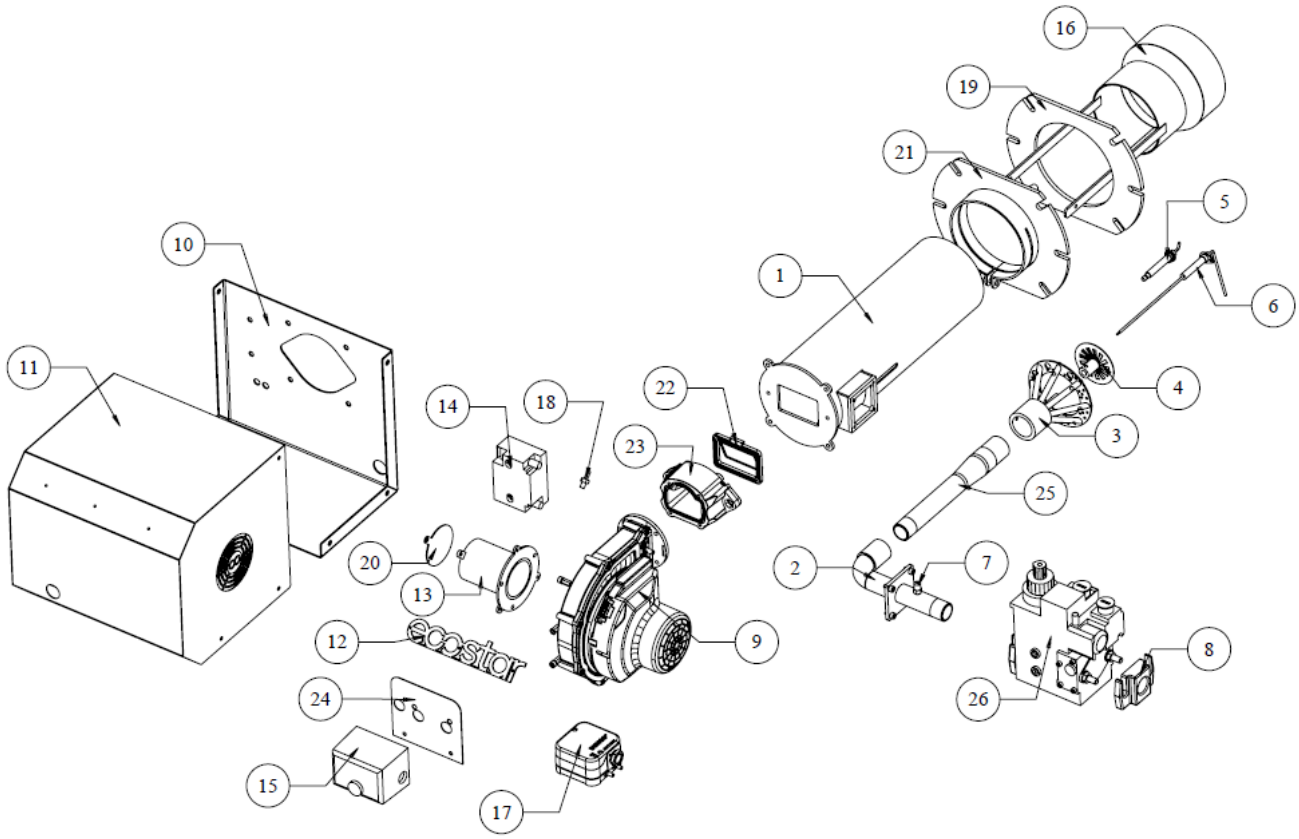
ASEEMBLY NO.	DESCRIPTION
1	FLAME PIPE
2	GAS ENTRY PIPE
3	GAS HEAD
4	TURBULATOR
5	ELECTRODE IGNITION
6	ELECTRODE IONIZATION
7	PURGER
8	VALVE
9	ENTRY FLANGE
10	FAN
11	FRONT COVER SHEET
12	BACK COVER
13	LOGO
14	CLAMP PIPE
15	TRANSFORMER
16	RELAY
17	FLAME PIPE EXTENSION
18	AIR SWITCH
19	AIR SWITCH PURGER
20	GASKET
21	CLAMP SHEET
22	BOILER CONNECTION FLANGE
23	RECYCLE CLAMP
24	CLAMP SPACER
25	RELAY CONNECTION SHEET
26	GAS ENTRY PIPE

ECO 200 HP G C1 SV



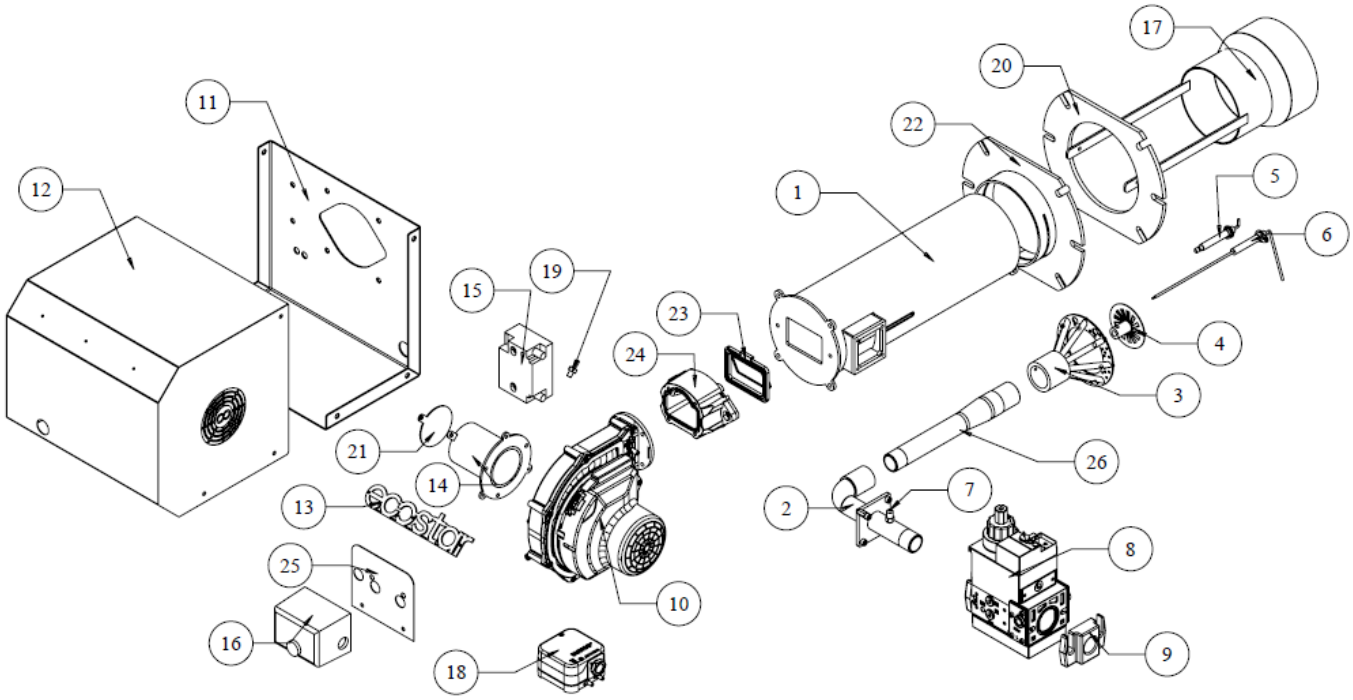
ASEEMBLY NO.	DESCRIPTION
1	FLAME PIPE
2	GAS ENTRY PIPE
3	GAS HEAD
4	TURBULATOR
5	ELECTRODE IGNITION
6	ELECTRODE IONIZATION
7	PURGER
8	FAN
9	FRONT COVER SHEET
10	BACK COVER
11	LOGO
12	CLAMP PIPE
13	TRANSFORMER
14	RELAY
15	FLAME PIPE EXTENSION
16	AIR SWITCH
17	AIR SWITCH PURGER
18	GASKET
19	CLAMP SHEET
20	BOILER CONNECTION FLANGE
21	RECYCLE CLAMP
22	CLAMP SPACER
23	RELAY CONNECTION SHEET
24	GAS ENTRY PIPE
25	VALVE

ECO 200 HP G C1 1/2" D



ASEEMBLY NO.	DESCRIPTION
1	FLAME PIPE
2	GAS ENTRY PIPE
3	GAS HEAD
4	TURBULATOR
5	ELECTRODE IGNITION
6	ELECTRODE IONIZATION
7	PURGER
8	ENTRY FLANGE
9	FAN
10	FRONT COVER SHEET
11	BACK COVER
12	LOGO
13	CLAMP PIPE
14	TRANSFORMER
15	RELAY
16	FLAME PIPE EXTENSION
17	AIR SWITCH
18	AIR SWITCH PURGER
19	GASKET
20	CLAMP SHEET
21	BOILER CONNECTION SHEET
22	RECYCLE CLAMP
23	CLAMP SPACER
24	RELAY CONNECTION SHEET
25	GAS ENTRY PIPE
26	VALVE

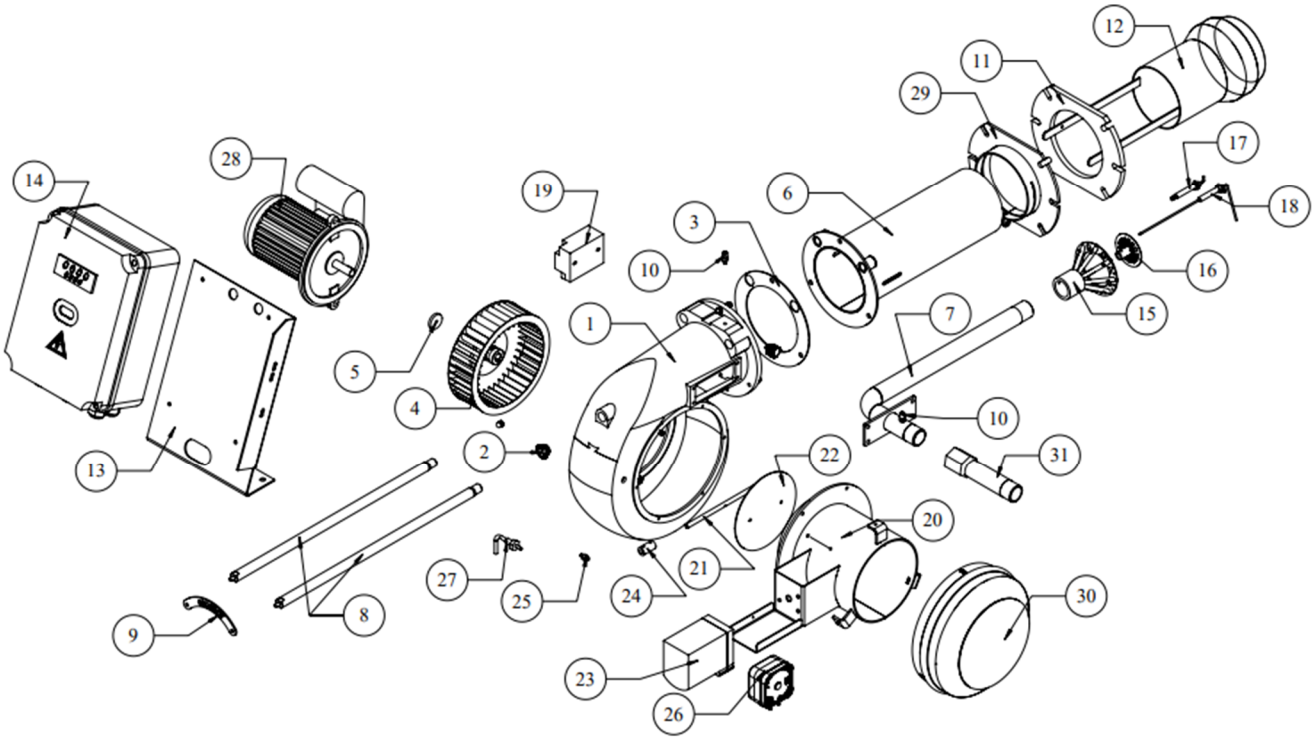
ECO 350 HP G C1 3/4" D



ASEEMBLY NO.	DESCRIPTION
1	FLAME PIPE
2	GAS ENTRY PIPE
3	GAS HEAD
4	TURBULATOR
5	ELECTRODE IGNITION
6	ELECTRODE IONIZATION
7	PURGER
8	VALVE
9	ENTRY FLANGE
10	FAN
11	FRONT COVER SHEET
12	BACK COVER
13	LOGO
14	CLAMP PIPE
15	TRANSFORMER
16	RELAY
17	FLAME PIPE EXTENSION
18	AIR SWITCH
19	AIR SWITCH PURGER
20	GASKET
21	CLAMP SHEET
22	BOILER CONNECTION FLANGE
23	RECYCLE CLAMP
24	CLAMP SPACER
25	RELAY CONNECTION SHEET
26	GAS ENTRY PIPE

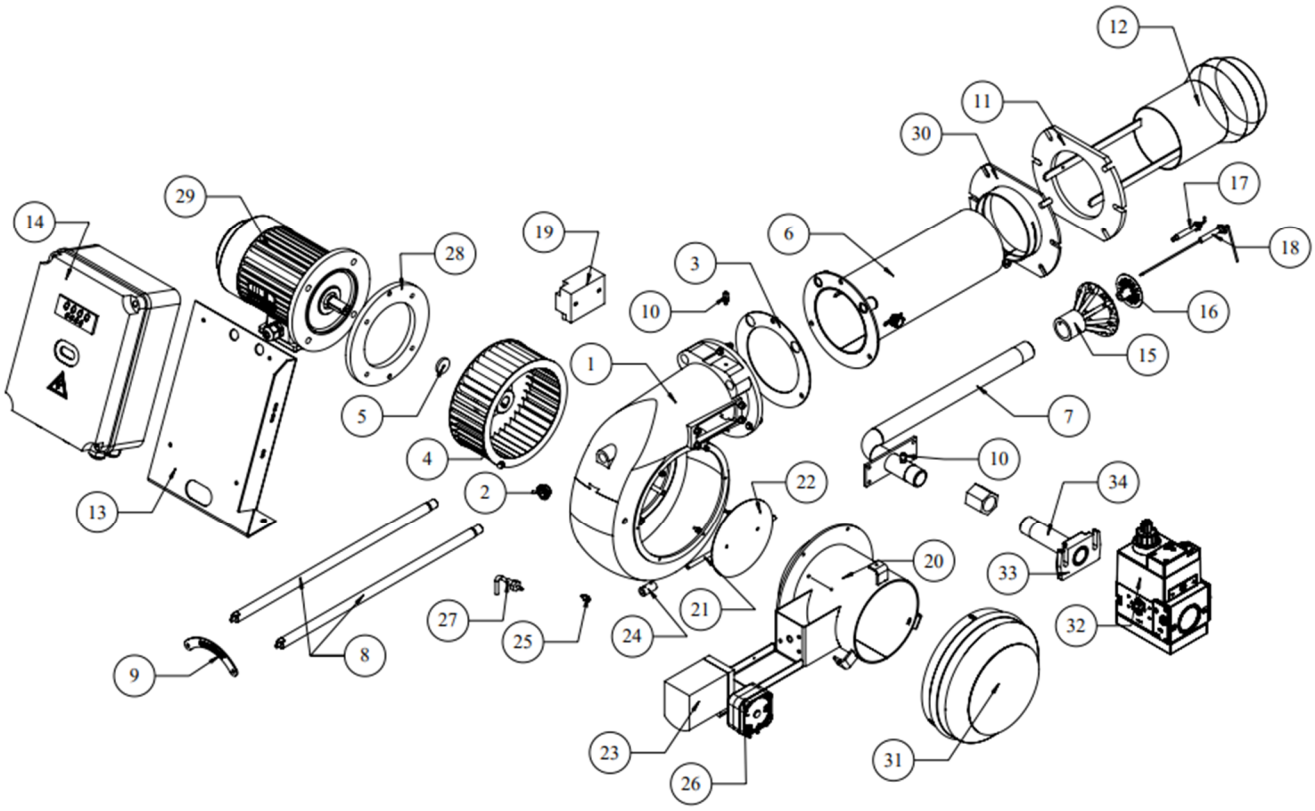
Two Stage HP Burners

ECO 450 HP G C2



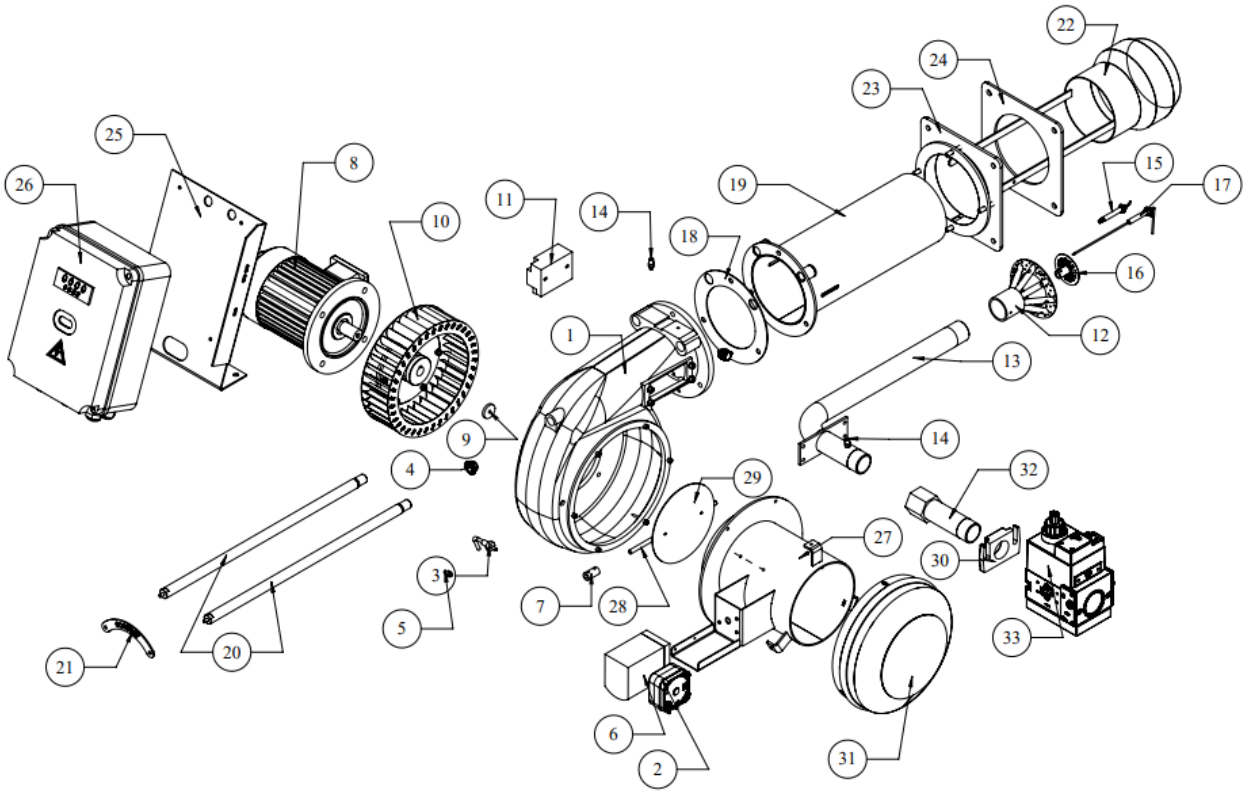
ASEEMBLY NO.	DESCRIPTION
1	BODY
2	OBSERVATION GLASS
3	KLINGRITE GASKET
4	FAN
5	MOTOR SECURITY ROVE
6	FLAME PIPE
7	GAS ENTRY PIPE
8	HANDLING SHAFT
9	SHAFT FIXING PLATE
10	PURGER
11	BOILER CONNECTION GASKET
12	FLAME PIPE EXTENSION
13	PANEL CONNECTION SHEET
14	PANEL
15	GAS HEAD
16	TURBULATOR
17	ELECTRODE IGNITION
18	ELECTRODE IONIZATION
19	TRANSFORMER
20	AIR CAGE
21	CLAMP SHAFT
22	CLAMP SHEET
23	SERVOMOTOR
24	SERVOMOTOR COUPLING
25	AIR SWITCH PURGER
26	AIR SWITCH
27	AIR SWITCH ADAPTER
28	MOTOR
29	BOILER CONNECTION FLANGE
30	SILENCER
31	VALVE PIPE

ECO 700 HP G C2



ASEEMBLY NO.	DESCRIPTION
1	BODY
2	OBSERVATION GLASS
3	KLINGRITE GASKET
4	FAN
5	MOTOR SECURITY ROVE
6	FLAME PIPE
7	GAS ENTRY PIPE
8	HANDLING SHAFT
9	SHAFT FIXING PLATE
10	PURGER
11	BOILER CONNECTION GASKET
12	FLAME PIPE EXTENSION
13	PANEL CONNECTION SHEET
14	PANEL
15	GAS HEAD
16	TURBULATOR
17	ELECTRODE IGNITION
18	ELECTRODE IONIZATION
19	TRANSFORMER
20	AIR CAGE
21	CLAMP SHAFT
22	CLAMP SHEET
23	SERVOMOTOR
24	SERVOMOTOR COUPLING
25	AIR SWITCH PURGER
26	AIR SWITCH
27	AIR SWITCH ADAPTER
28	MOTOR CONNECTION FLANGE
29	MOTOR
30	BOILER CONNECTION FLANGE
31	SILENCER
32	VALVE
33	FLANGE
34	VALVE EXTENSION PIPE

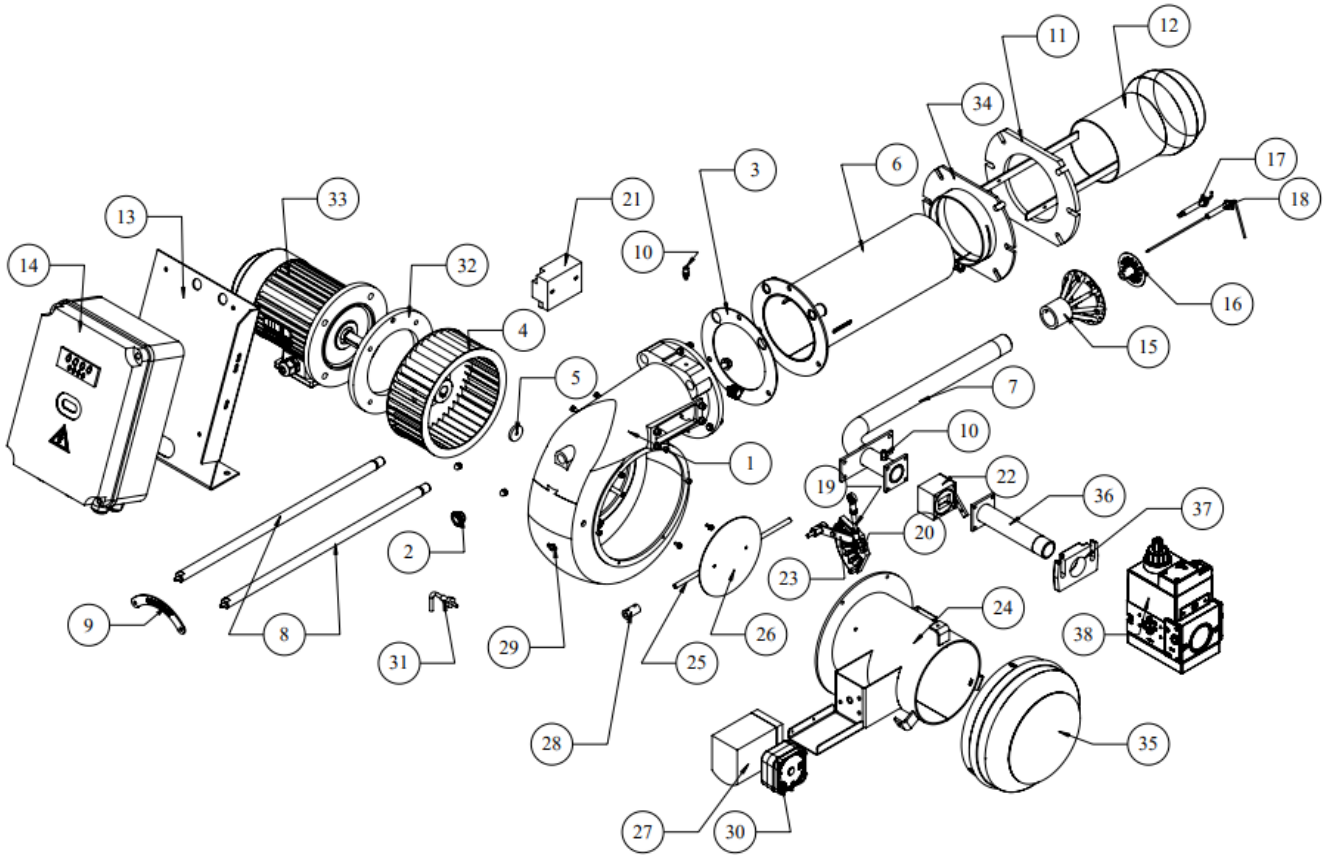
ECO 1100 HP G C2



ASEEMBLY NO.	DESCRIPTION
1	BODY
2	AIR SWITCH
3	AIR SWITCH ADAPTER
4	OBSERVATION GLASS
5	AIR SWTICH PURGER
6	SERVOMOTOR
7	SERVOMOTOR COUPLING
8	MOTOR
9	MOTOR SECURITY ROVE
10	FAN
11	TRANSFORMER
12	GAS HEAD
13	GAS ENTRY PIPE
14	PURGER
15	ELECTRODE IGNITION
16	TURBULATOR
17	ELECTRODE IONIZATION
18	KLINGRITE GASKET
19	FLAME PIPE
20	HANDLING SHAFT
21	SHAFT FIXING PLATE
22	FLAME PIPE EXTENSION
23	BOILER CONNECTION FLANGE
24	GASKET
25	PANEL CONNECTION SHEET
26	PANEL
27	AIR CAGE
28	CLAMP SHAFT
29	CLAMP SHEET
30	FLANGE
31	SILENCER
32	VALVE EXTENSION PIPE
33	VALVE

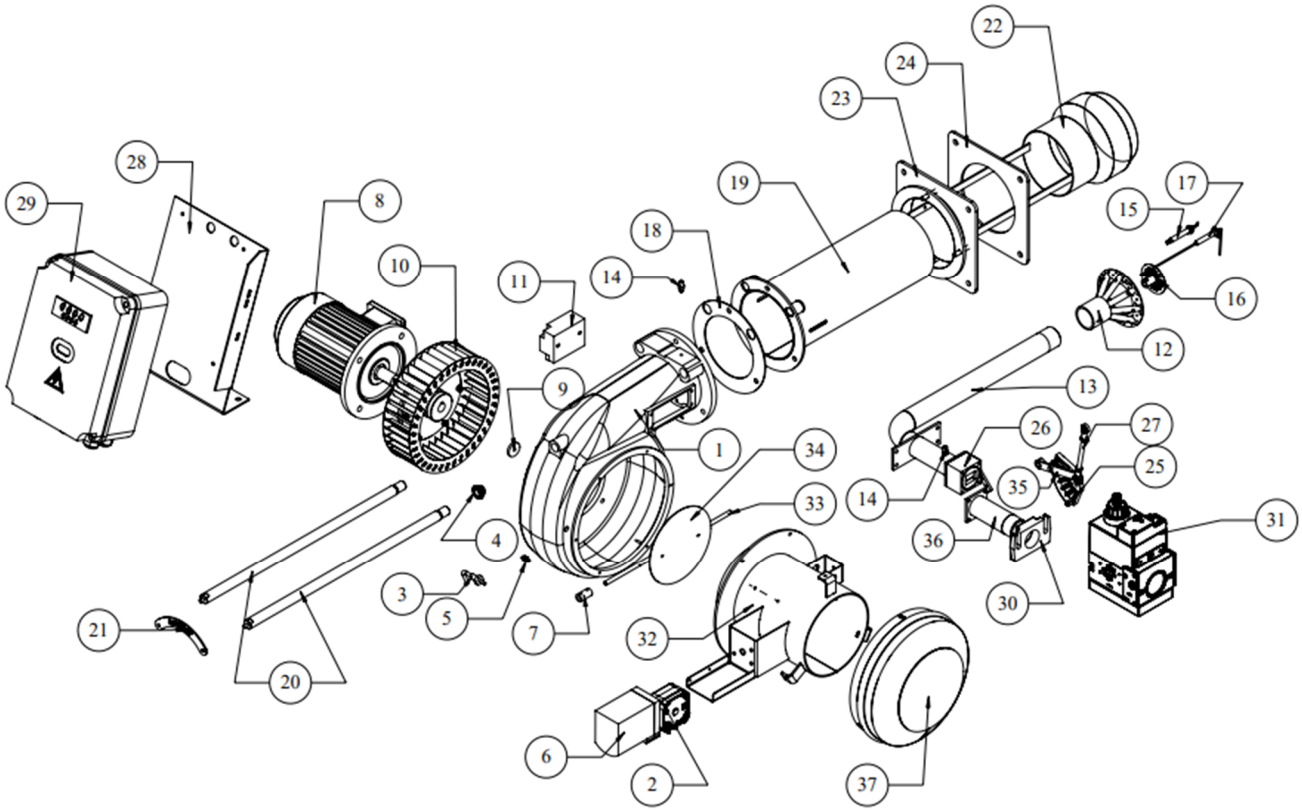
Modulating HP Burners

ECO 700 HP G C3



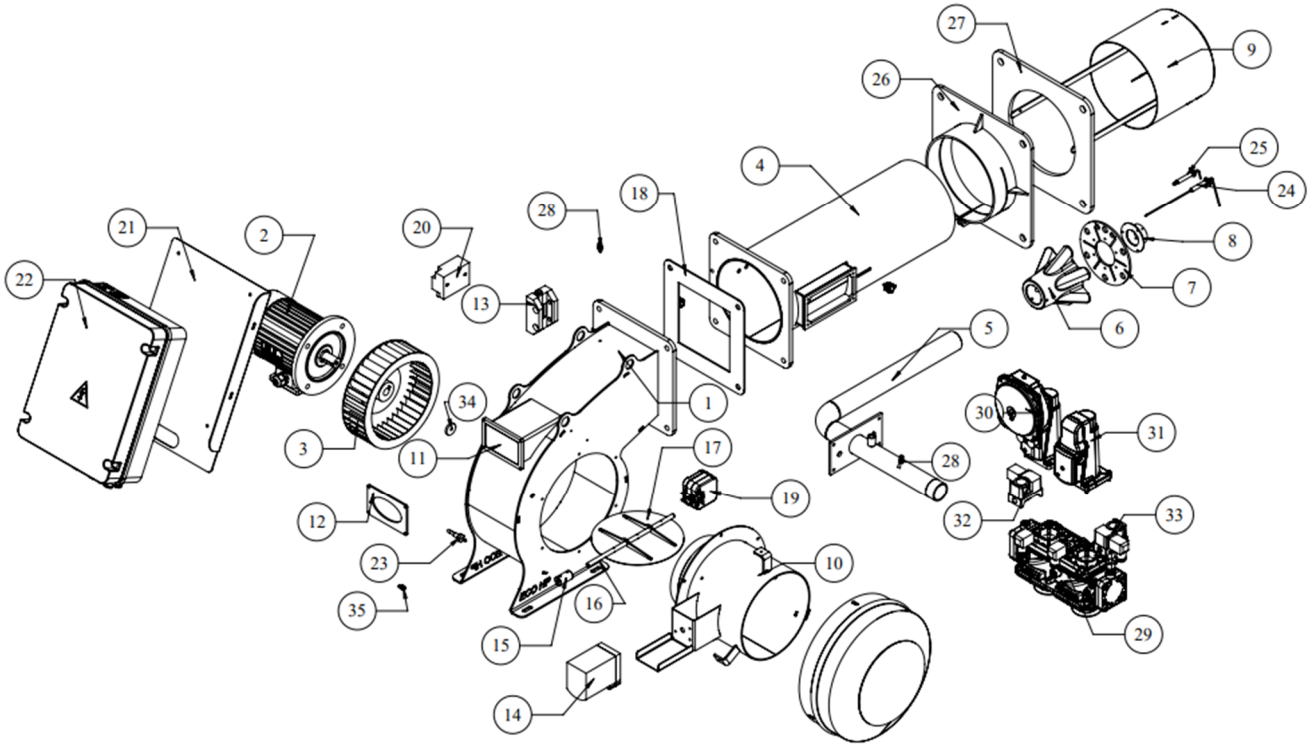
ASEEMBLY NO.	DESCRIPTION
1	BODY
2	OBSERVATION GLASS
3	KLINGRITE GASKET
4	FAN
5	MOTOR SECURITY ROVE
6	FLAME PIPE
7	GAS ENTRY PIPE
8	HANDLING SHAFT
9	SHAFT FIXING PLATE
10	PURGER
11	BOILER CONNECTION GASKET
12	FLAME PIPE EXTENSION
13	PANEL CONNECTION SHEET
14	PANEL
15	GAS HEAD
16	TURBULATOR
17	ELECTRODE IGNITION
18	ELECTRODE IONIZATION
19	PROPORTIONAL DISC MOVEMENT LEVER
20	DISC GROUP PROPORTIONAL
21	TRANSFORMER
22	VALVE GAS ADJUSTMENT
23	LEVER PROPORTIONAL
24	AIR CAGE
25	CLAMP SHAFT
26	CLAMP SHEET
27	SERVOMOTOR
28	SERVOMOTOR COUPLING
29	AIR SWITCH PURGER
30	AIR SWITCH
31	AIR SWITCH ADAPTER
32	MOTOR CONNECTION FLANGE
33	MOTOR
34	BOILER CONNECTION FLANGE
35	SILENCER
36	VALVE EXTENSION PIPE
37	FLANGE
38	VALVE

ECO 1100 HP G C3



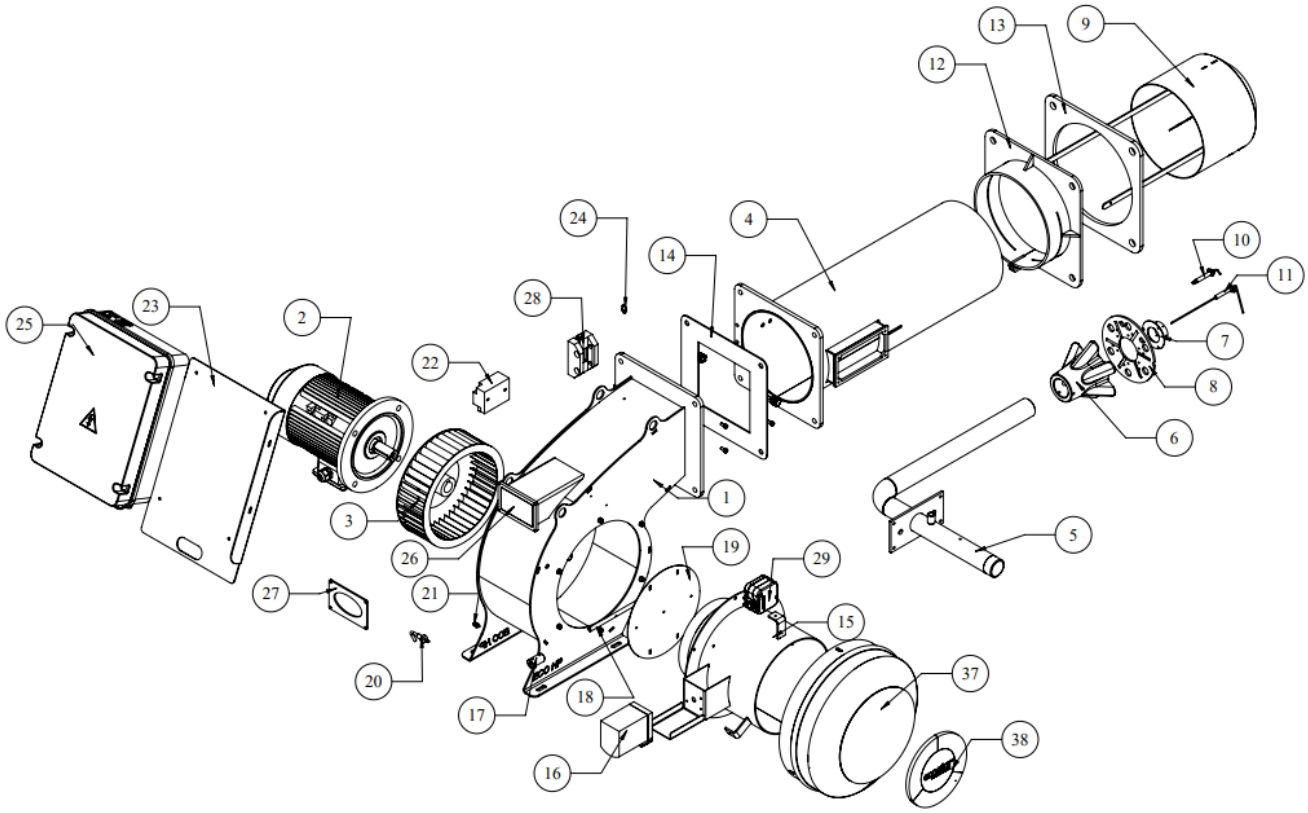
ASEEMBLY NO.	DESCRIPTION
1	BODY
2	AIR SWITCH
3	AIR SWITCH ADAPTER
4	OBSERVATION GLASS
5	AIR SWITCH PURGER
6	SERVOMOTOR
7	SERVOMOTOR COUPLING
8	MOTOR
9	MOTOR SECURITY ROVE
10	FAN
11	TRANSFORMER
12	GAS HEAD
13	GAS ENTRY PIPE
14	PURGER
15	ELECTRODE IGNITION
16	TURBULATOR
17	ELECTRODE IONIZATION
18	KLINGRITE GASKET
19	FLAME PIPE
20	HANDLING SHAFT
21	SHAFT FIXING PLATE
22	FLAME PIPE EXTENSION
23	BOILER CONNECTION FLANGE
24	GASKET
25	DISC GROUP PROPORTIONAL
26	VALVE GAS ADJUSTMEN
27	PROPORTIONAL DISC MOVEMENT LEVER
28	PANEL CONNECTION SHEET
29	PANEL
30	ENTRY FLANGE
31	VALVE
32	AIR CAGE
33	CLAMP SHAFT
34	CLAMP SHEET
35	LEVER PROPORTIONAL
36	VALVE EXTENSION PIPE
37	SILENCER

ECO 1500 HP G C3



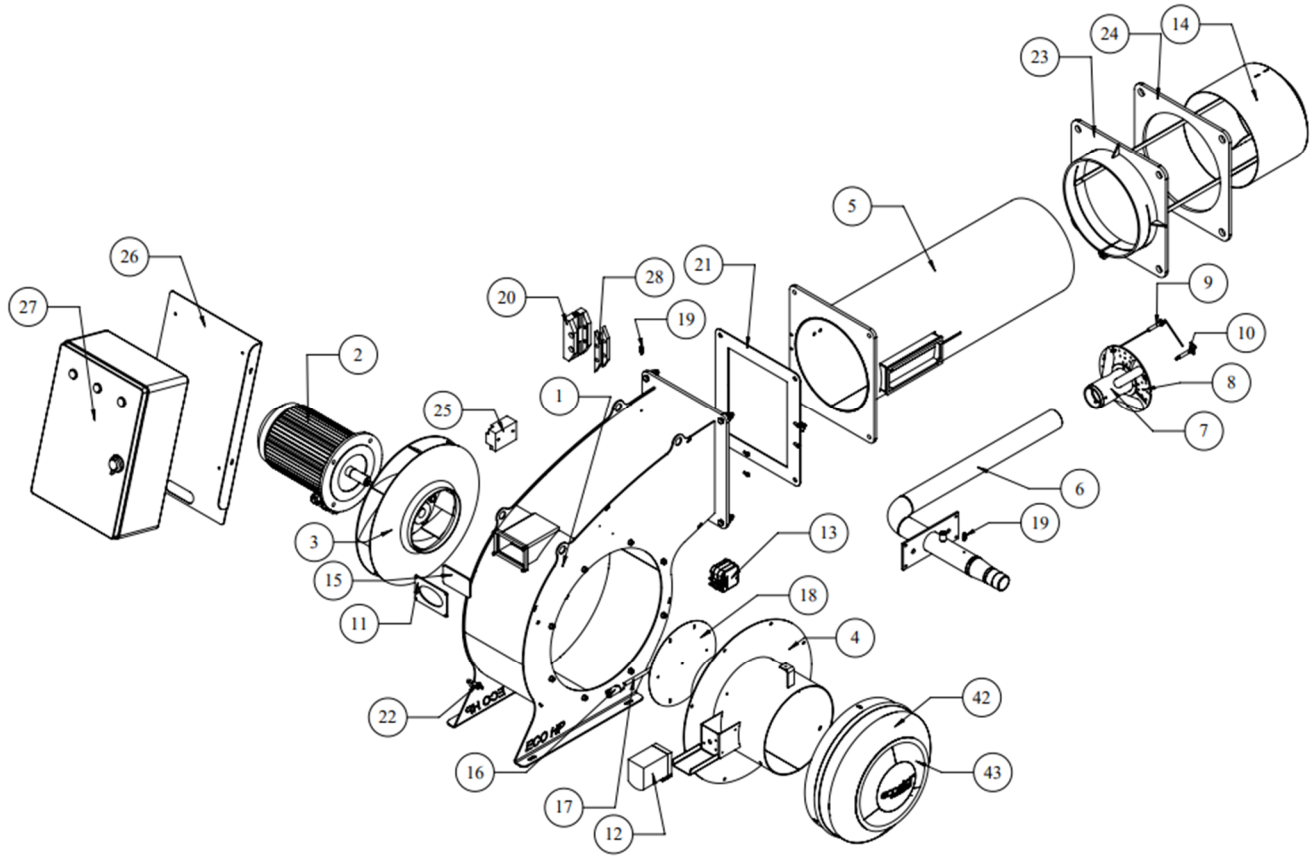
ASEEMBLY NO.	DESCRIPTION
1	BODY
2	MOTOR
3	FAN
4	FLAME PIPE
5	GAS ENTRY PIPE
6	GAS HEAD
7	TURBULATOR
8	FRONT COVER
9	FLAME PIPE CONICAL
10	AIR CAGE
11	OBSERVATION GLASS
12	OBSERVATION FRAME
13	HINGE GROUP
14	SERVOMOTOR
15	SERVOMOTOR COUPLING
16	CLAMP SHAFT
17	CLAMP SHEET
18	KLINGRITE GASKET
19	AIR SWITCH
20	TRANSFORMER
21	PANEL SHEET
22	ELECTRICAL PANEL
23	AIR SWITCH ADAPTER
24	IONIZATION ELECTRODE
25	ELECTRODE IGNITION
26	BOILER CONNECTION FLANGE
27	BOILER CONNECTION GASKET
28	PURGER
29	VALVE
30	ACTUATOR
31	ACTUATOR
32	AIR SWITCH
33	AIR SWITCH
34	MOTOR SECURITY ROVE
35	AIR SWITCH PURGER
36	WASHER
37	NUT
38	SILENCER

ECO 2000 HP G C3



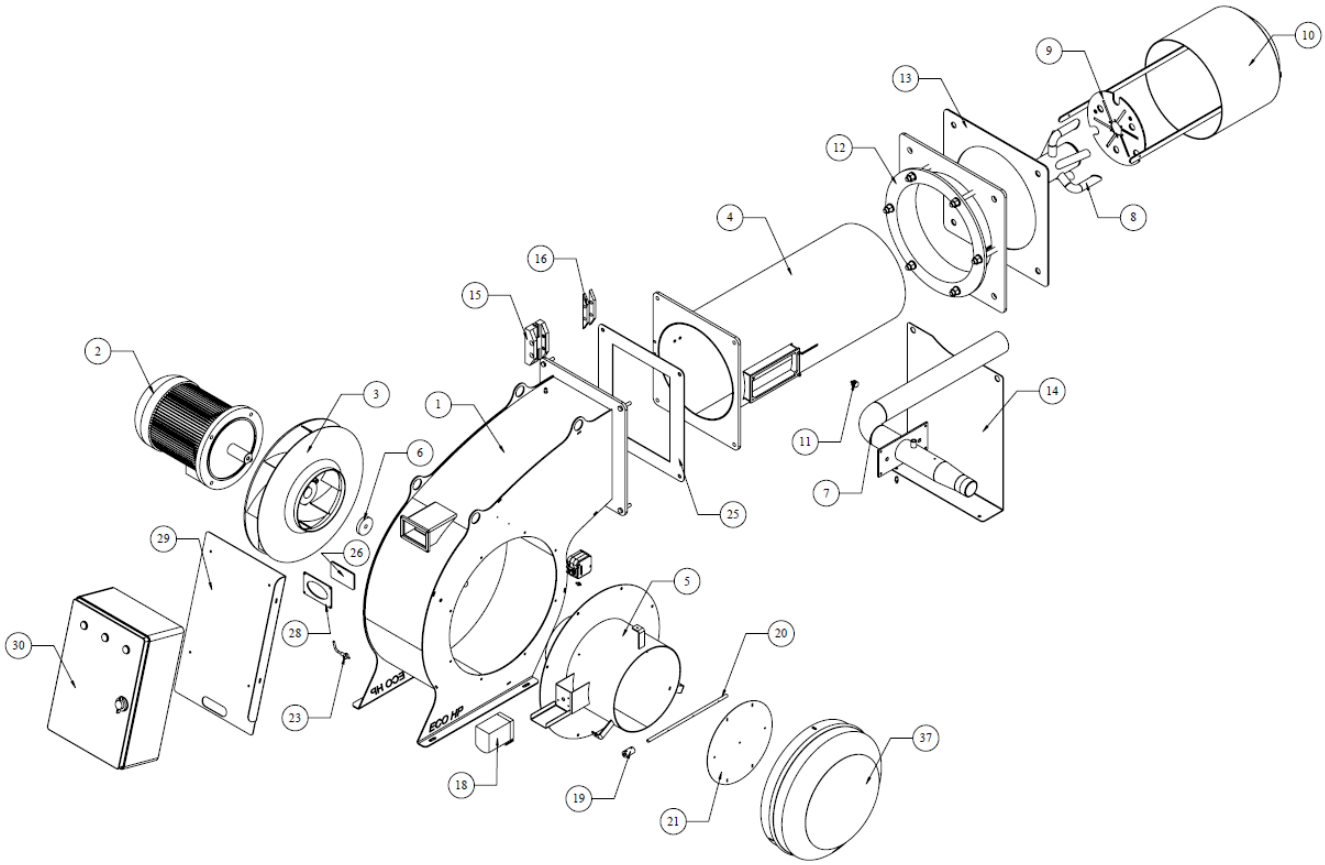
ASEEMBLY NO.	DESCRIPTION
1	BODY
2	MOTOR
3	FAN
4	FLAME PIPE
5	GAS ENTRY PIPE
6	GAS HEAD
7	FRONT COVER
8	TURBULATOR
9	FLAME PIPE CONICAL
10	ELECTRODE IGNITION
11	IONIZATION ELECTRODE
12	BOILER CONNECTION FLANGE
13	BOILER CONNECTION GASKET
14	KLINGRITE GASKET
15	AIR CAGE
16	SERVOMOTOR
17	SERVOMOTOR COUPLING
18	CLAMP SHAFT
19	CLAMP SHEET
20	AIR SWITCH ADAPTER
21	AIR SWITCH PURGER
22	TRANSFORMER
23	PANEL SHEET
24	PURGER
25	ELECTRICAL PANEL
26	OBSERVATION GLASS
27	OBSERVATION FRAME
28	HINGE GROUP
29	AIR SWITCH
33	BOLT
34	WASHER
35	WASHER
36	NUT
37	SILENCER
38	LABEL

ECO 3000 HP G C3



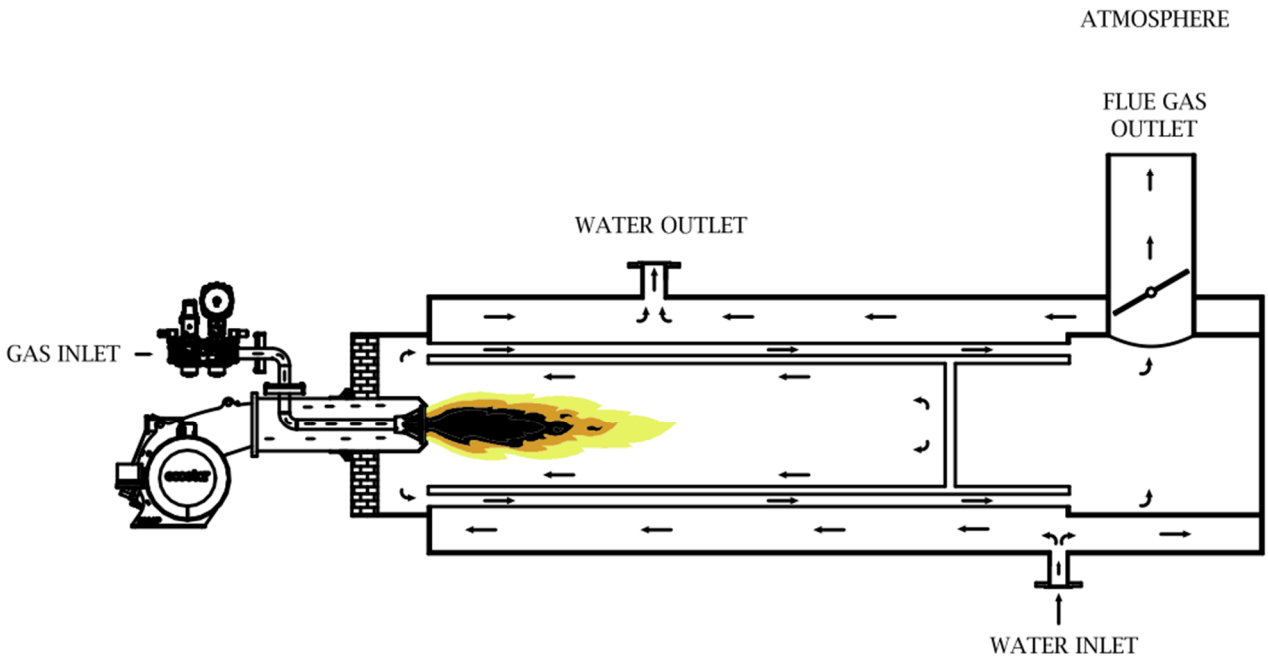
ASEEMBLY NO.	DESCRIPTION
1	BODY
2	MOTOR
3	FAN
4	AIR CAGE
5	FLAME PIPE
6	GAS ENTRY PIPE
7	COMBUSTION HEAD
8	TURBULATOR
9	IONIZATION ELECTRODE
10	ELECTRODE IGNITION
11	OBSERVATION GLASS FRAME
12	SERVOMOTOR
13	AIR SWITCH
14	FLAME PIPE CONICAL
15	OBSERVATION GLASS
16	SERVOMOTOR COUPLIN
17	CLAMP SHAFT
18	CLAMP SHEET
19	PURGER
20	HINGE GROUP
21	KLINGRITE GASKET
22	AIR SWITCH ADAPTER
23	BOILER CONNECTION FLANGE
24	BOILER CONNECTION GASKET
25	TRANSFORMER
26	PANEL SHEET
27	PANEL
28	HINGE ADDITIONAL
40	WASHER
41	NUT
42	SILENCER
43	PAN LABEL

ECO 4500 HP G C3



ASEEMBLY NO.	DESCRIPTION
1	BODY
2	MOTOR
3	FAN
4	FLAME PIPE
5	AIR CAGE
6	FAN FIXING WASHER
7	GAS INLET PIPE
8	COMBUSTION HEAD
9	TURBULATOR
10	FLAME PIPE EXTENSION
11	BOLT
12	BOILER CONNECETION FLANGE
13	GASKET
14	BOILER CONNECTION FLANGE SUPPORT FEET
15	HINGE GROUP
16	HINGE
17	TRANSFORMER
18	SERVOMOTOR
19	COUPLIN
20	CLAMP SHAFT
21	CLAMP SHEET
22	PURGER
23	PRESSURESTAT ADAPTER
24	PRESSURESTAT PURGER
25	KLINGRITE GASKET
26	OBSERVATION GLASS
27	PRESSURESTAT
28	OBSERVATION GLASS FRAME
29	PANEL SHEET
30	PANEL
31	BOLT
32	BOLT
33	WASHER
34	NUT
35	WASHER
36	NUT
37	SILENCER
38	PAN LABEL

4. GAS, FLUE GAS AND HEATING WATER SCHEMA



5. TECHNICAL DATA

5.1.Capacity Table

One Stage HP Burners

HIGH FAN PRESSURE ONE STAGE GAS BURNERS CAPACITY TABLE										
BURNER TYPE	CAPACITY		CAPACITY		NATURAL GAS CONSUMPTION		FAN MOTOR POWER	MAIN SUPPLY	GAS INLET DIAMETER	
	Min. kcal/h	Max. kcal/h	Min. kW	Max. kW	Min. Nm³/h	Max. Nm³/h	kW	VAC	Gas Valve	Gas Inlet Diameter
ECO 50 HP G C1 SV	8.600	43.000	10	50	1	5	0,1	1N 230	ZEVR DN15	1/2"
ECO 100 HP G C1 SV	17.200	86.000	20	100	2	10	0,2	1N 230	ZEVR DN20	3/4"
ECO 200 HP G C1 SV	68.800	172.000	80	200	8	21	0,3	1N 230	ZEVR DN32	1 1/4"
ECO 200 HP G C1 1/2" D	68.800	172.000	80	200	8	21	0,3	1N 230	MB-DLE 405	1/2"
ECO 200 HP G C1 3/4" D									MB-DLE 407	3/4"
ECO 350 HP G C1 3/4" D	77.400	301.000	90	350	9	36	0,3	1N 230	MB-DLE 407	3/4"
ECO 350 HP G C1 1" D									MB-DLE 410	1"
ECO 350 HP G C1 1 1/4" D									MB-DLE 412	1 1/4"

H_u Natural Gas =8250 kcal/Nm^3

H_u LPG=22500 kcal/Nm^3

Two Stage HP Burners

HIGH FAN PRESSURE TWO STAGE GAS BURNERS CAPACITY TABLE										
BURNER TYPE	CAPACITY		CAPACITY		NATURAL GAS CONSUMPTION		FAN MOTOR POWER	MAIN SUPPLY	GAS INLET DIAMETER	
	Min. kcal/h	Max. kcal/h	Min. kW	Max. kW	Min. Nm³/h	Max. Nm³/h	kW	VAC	Gas Valve	Gas Inlet Diameter
ECO 200 HP GC 2 1/2" D	68.800	172.000	80	200	8	21	0,2	1N 230	MB-ZRDLE 405	1/2"
ECO 200 HP GC 2 3/4" D									MB-ZRDLE 407	3/4"
ECO 350 HP GC 2 3/4" D	77.400	301.000	90	350	9	36	0,3	1N 230	MB-ZRDLE 407	3/4"
ECO 350 HP GC 2 1" D									MB-ZRDLE 410	1"
ECO 450 HP G C2 3/4" D	129.000	387.000	150	450	16	47	0	1N 230	MB-DLE 407	3/4"
ECO 450 HP G C2 1" D									MB-DLE 410	1"
ECO 450 HP G C2 1 1/4" D									MB-DLE 412	1 1/4"
ECO 700 HP GC 2 1 1/4" D	215.000	602.000	250	700	26	73	0,75	3N 400	MB-ZRDLE 412	1 1/4"
ECO 700 HP GC 2 1 1/2" D									MB-ZRDLE 415	1 1/2"
ECO 1100 HP GC 2 1 1/4" D	215.000	946.000	250	1100	26	115	1,5	3N 400	MB-ZRDLE 412	1 1/4"
ECO 1100 HP GC 2 1 1/2" D									MB-ZRDLE 415	1 1/2"
ECO 1100 HP GC 2 2" D									MB-ZRDLE 420	2"
ECO 1100 HP GC 2 1 1/2" -S									VGD 20.4011	1 1/2"
ECO 1100 HP GC 2 2" -S									VGD 20.5011	2"
ECO 1500 HP GC 2 1 1/2" -S	258.000	1.290.000	300	1.500	31	156	1,5	3N 400	VGD 20.4011	1 1/2"
ECO 1500 HP GC 2 2" -S									VGD 20.5011	2"
ECO 2000 HP GC 2 1 1/2" -S	473.000	1.720.000	550	2.000	57	208	3	3N 400	VGD 20.4011	1 1/2"
ECO 2000 HP GC 2 2" -S									VGD 20.5011	2"
ECO 2000 HP GC 2 DN65									VGD 40.065	DN65
ECO 3000 HP GC 2 1 1/2" -S	516.000	2.580.000	600	3.000	63	313	4	3N 400	VGD 20.4011	1 1/2"
ECO 3000 HP GC 2 2" -S									VGD 20.5011	2"
ECO 3000 HP GC 2 DN65									VGD 40.065	DN65
ECO 3000 HP GC 2 DN80									VGD 40.080	DN80
ECO 4500 HP GC 2 1 1/2" -S	645.000	3.870.000	750	4.500	78	469	7,5	3N 400	VGD 20.4011	1 1/2"
ECO 4500 HP GC 2 2" -S									VGD 20.5011	2"
ECO 4500 HP GC 2 DN65									VGD 40.065	DN65
ECO 4500 HP GC 2 DN80									VGD 40.080	DN80
ECO 4500 HP GC 2 DN100									VGD 40.0100	DN100
ECO 4500 HP GC 2 DN125									VGD 40.125	DN125

H_u Natural Gas =8250 kcal/Nm^3

H_u LPG=22500 kcal/Nm^3

Modulating HP Burners

HIGH FAN PRESSURE MODULATING GAS BURNERS CAPACITY TABLE										
BURNER TYPE	CAPACITY		CAPACITY		NATURAL GAS CONSUMPTION		FAN MOTOR POWER	MAIN SUPPLY	GAS INLET DIAMETER	
	Min. kcal/h	Max. kcal/h	Min. kW	Max. kW	Min. Nm³/h	Max. Nm³/h	kW	VAC	Gas Valve	Gas Inlet Diameter
ECO 200 HP G C3M 1/2" D	68.800	172.000	80	200	8	21	0,2	1N 230	MB-DLE 405	1/2"
ECO 200 HP G C3M 3/4" D									MB-DLE 407	3/4"
ECO 350 HP G C3M 3/4" D	77.400	301.000	90	350	9	36	0,3	1N 230	MB-DLE 407	3/4"
ECO 350 HP G C3M 1" D									MB-DLE 410	1"
ECO 350 HP G C3M 1 1/4" D									MB-DLE 412	1 1/4"
ECO 450 HP G C3M 3/4" D	129.000	387.000	150	450	16	47	0	1N 230	MB-DLE 407	3/4"
ECO 450 HP G C3M 1" D									MB-DLE 410	1"
ECO 450 HP G C3M 1 1/4" D									MB-DLE 412	1 1/4"
ECO 700 HP G C3M 1 1/4" D	215.000	602.000	250	700	26	73	0,75	3N 400	MB-DLE 412	1 1/4"
ECO 700 HP G C3M 1 1/2" D									MB-DLE 415	1 1/2"
ECO 1100 HP G C3M 1 1/2" -S	215.000	946.000	250	1.100	26	115	1,5	3N 400	VGD 20.4011	1 1/2"
ECO 1100 HP G C3M 2" -S									VGD 20.5011	2"
ECO 1500 HP G C3P 1 1/2" -S	301.000	1.290.000	350	1.500	36	156	1,5	3N 400	VGD 20.4011	1 1/2"
ECO 1500 HP G C3P 2" -S									VGD 20.5011	2"
ECO 2000 HP G C3P 1 1/2" -S	473.000	1.720.000	550	2.000	57	208	3	3N 400	VGD 20.4011	1 1/2"
ECO 2000 HP G C3P 2" -S									VGD 20.5011	2"
ECO 2000 HP G C3P DN65									VGD 40.065	DN65
ECO 3000 HP G C3P 1 1/2" -S	516.000	2.580.000	600	3.000	63	313	4	3N 400	VGD 20.4011	1 1/2"
ECO 3000 HP G C3P 2" -S									VGD 20.5011	2"
ECO 3000 HP G C3P DN65									VGD 40.065	DN65
ECO 3000 HP G C3P DN80									VGD 40.080	DN80
ECO 4500 HP G C3P 1 1/2" -S	645.000	3.870.000	750	4.500	78	469	7,5	3N 400	VGD 20.4011	1 1/2"
ECO 4500 HP G C3P 2" -S									VGD 20.5011	2"
ECO 4500 HP G C3P DN65									VGD 40.065	DN65
ECO 4500 HP G C3P DN80									VGD 40.080	DN80
ECO 4500 HP G C3P DN100									VGD 40.100	DN100
ECO 4500 HP G C3P DN125									VGD 40.125	DN125

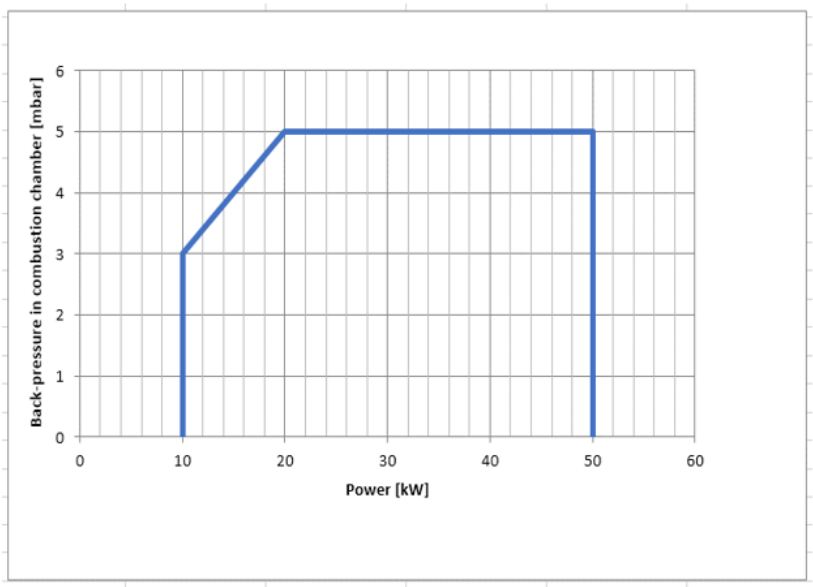
H_u Natural Gas =8250 kcal/Nm^3

H_u LPG=22500 kcal/Nm^3

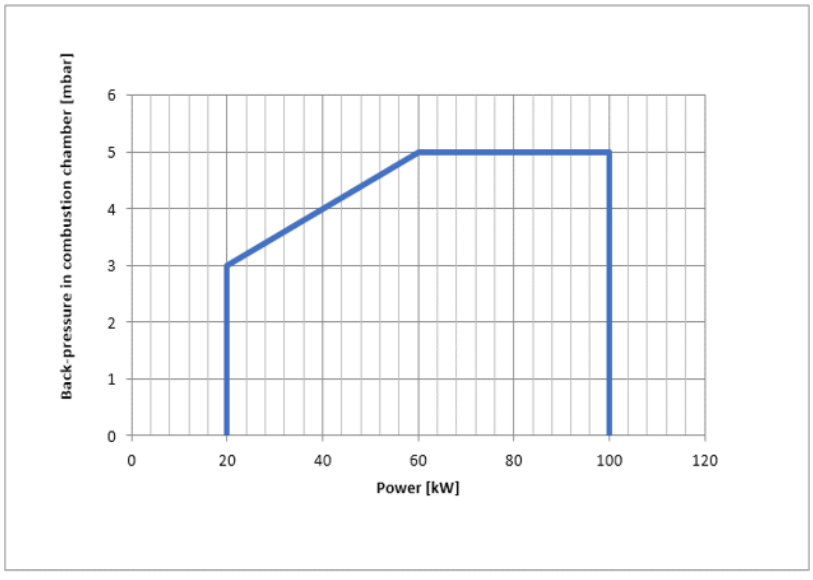
5.2.Back Pressure and Gas Line Selection Table

One Stage HP Burners

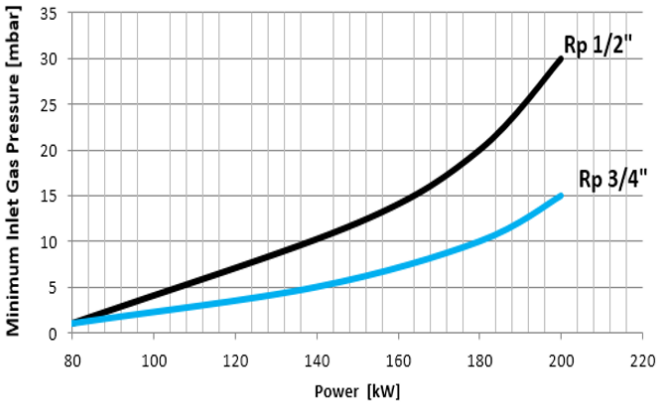
ECO 50 HP G C1

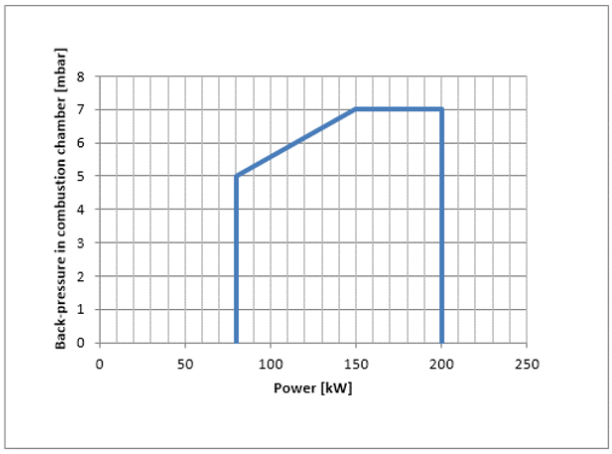


ECO 100 HP G C1

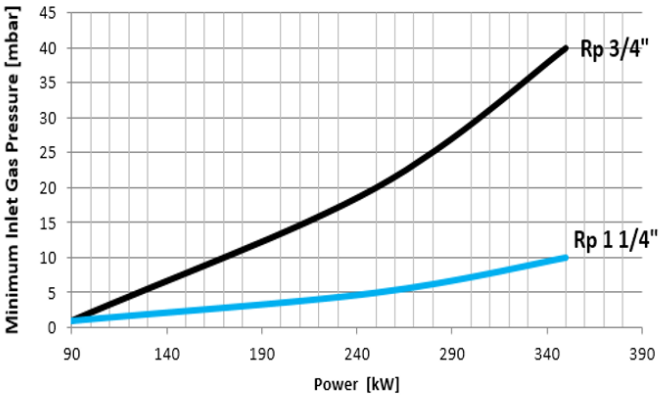


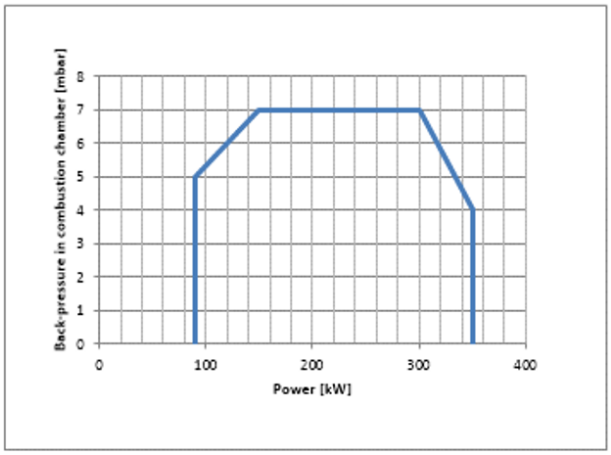
ECO 200 HP G C1





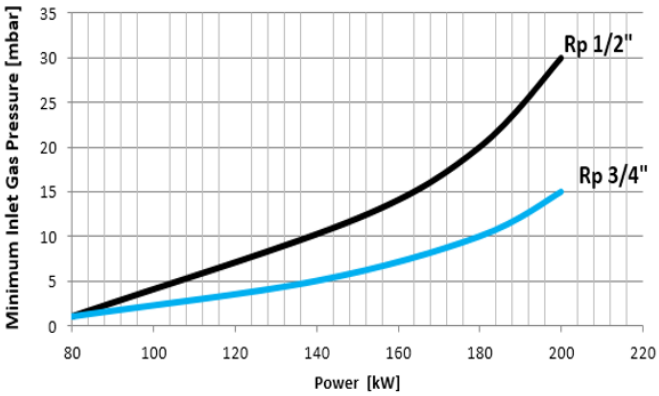
ECO 350 HP G C1

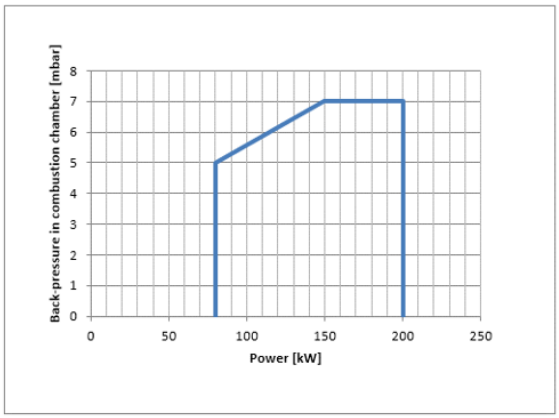




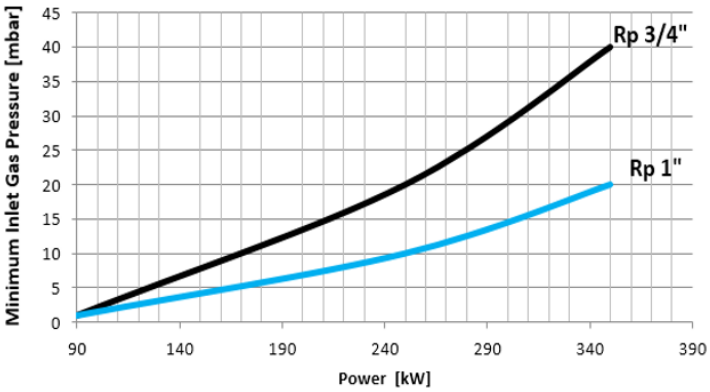
Two Stage HP Burners

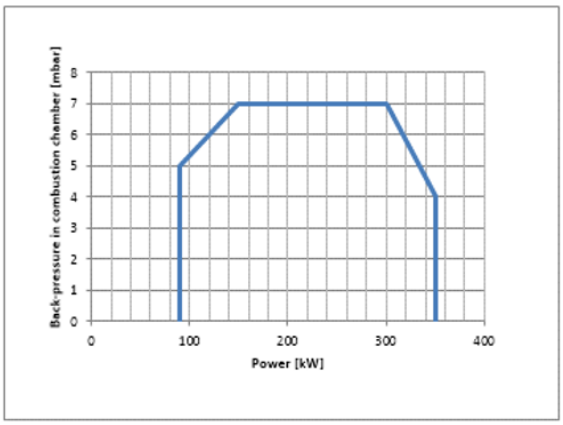
ECO 200 HP G C2



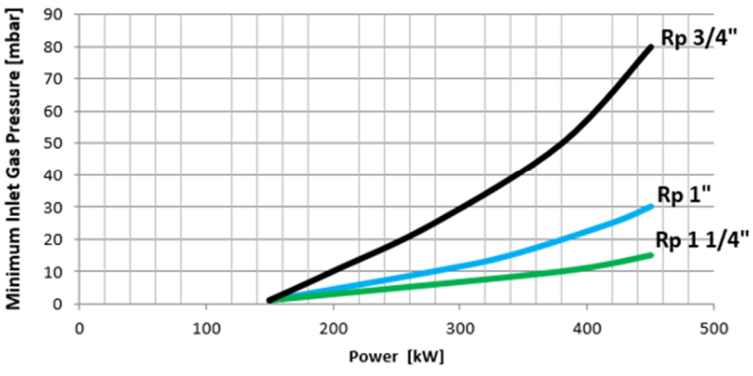


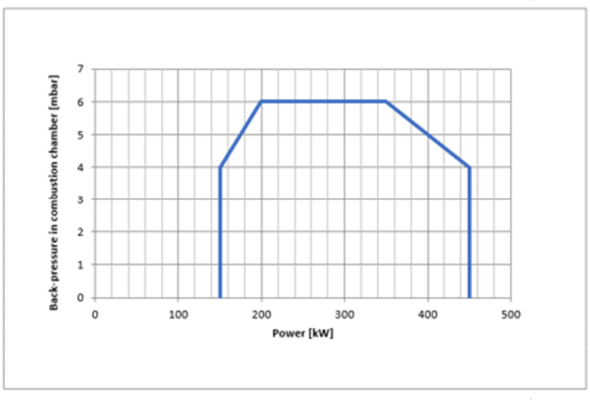
ECO 350 HP G C2



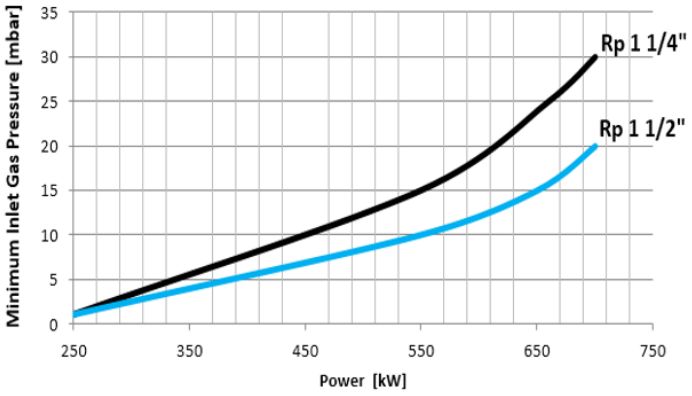


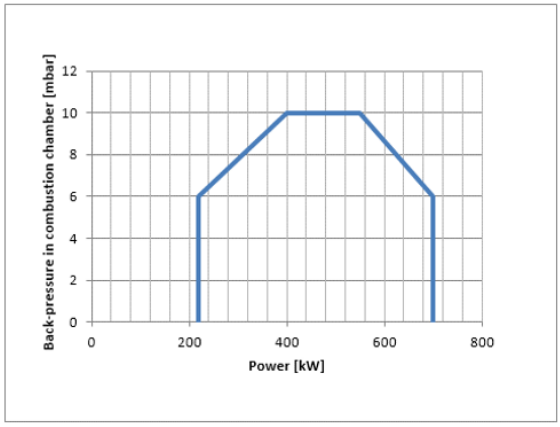
ECO 450 HP G C2



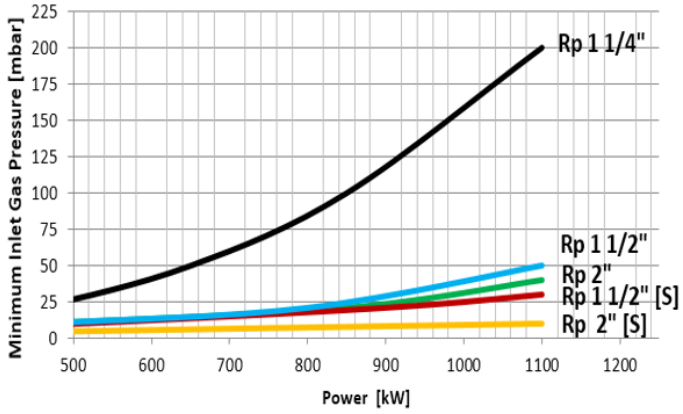


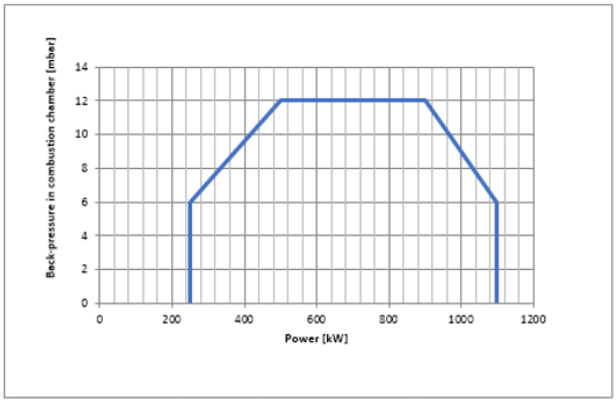
ECO 700 HP G C2





ECO 1100 HP G C2





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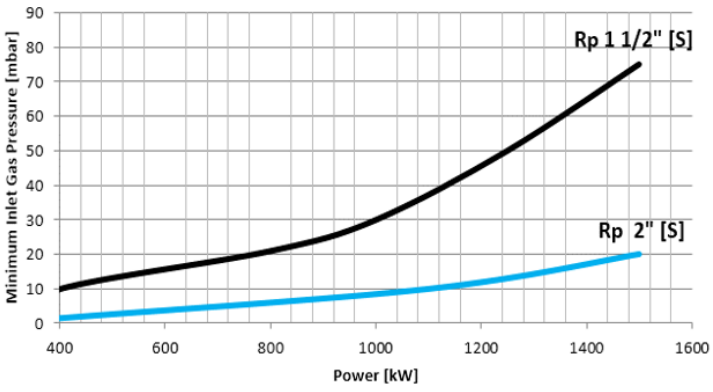
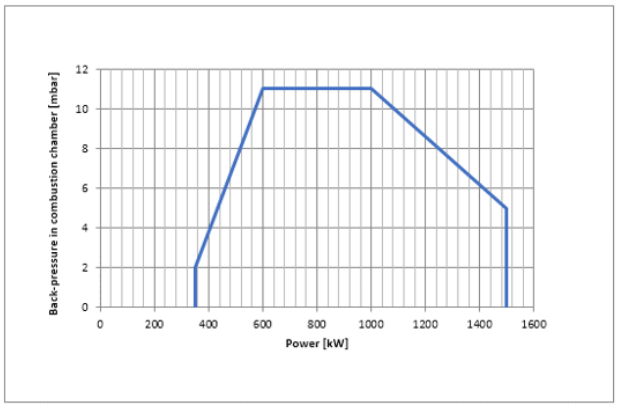
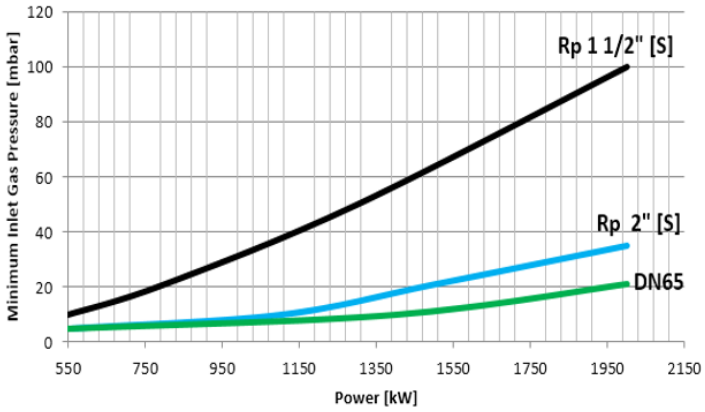
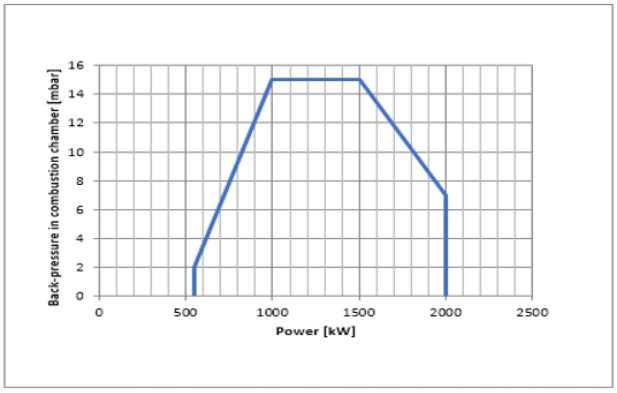


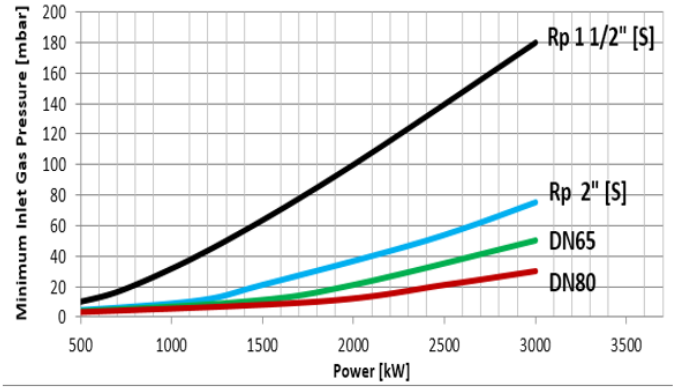


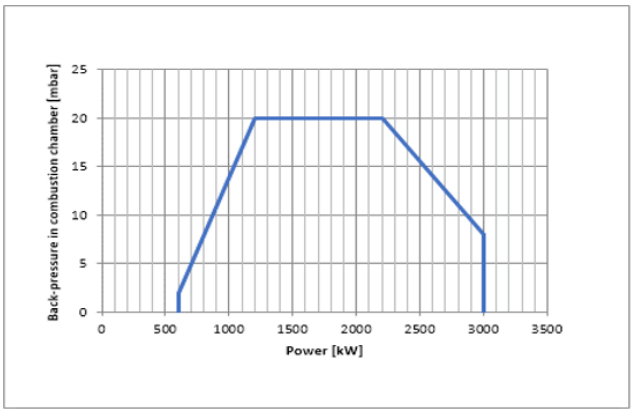
ECO 2000 HP G C2



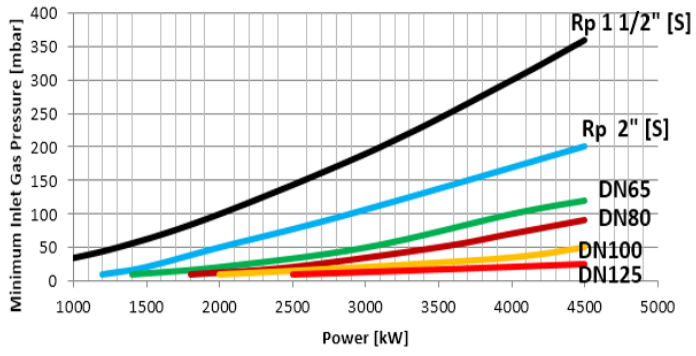


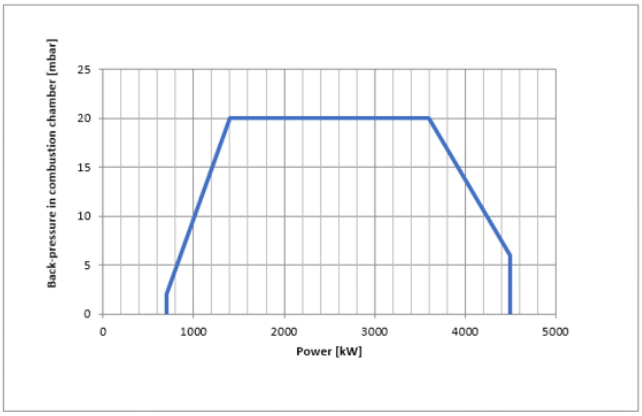
ECO 3000 HP G C2





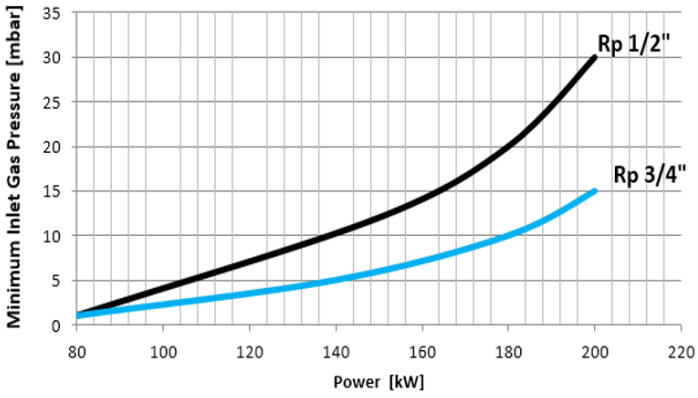
ECO 4500 HP G C2

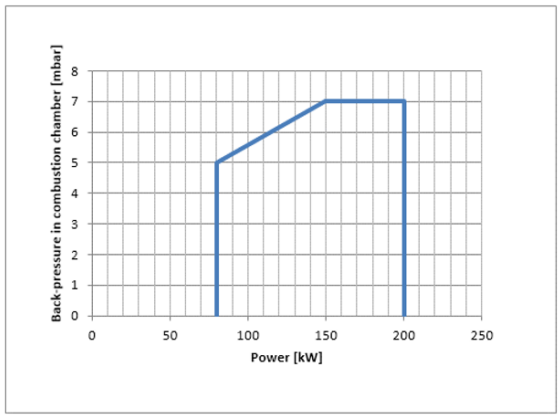




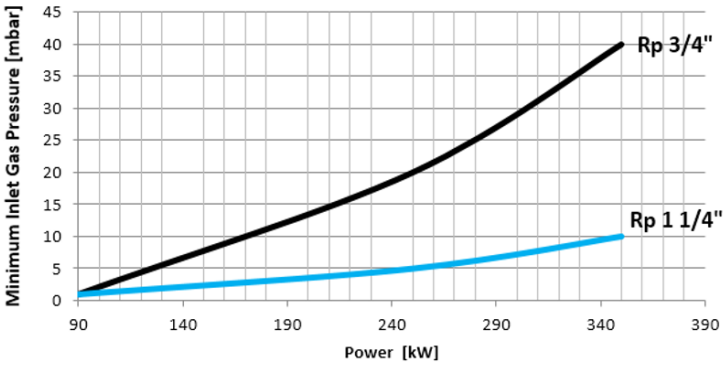
Modulating HP Burners

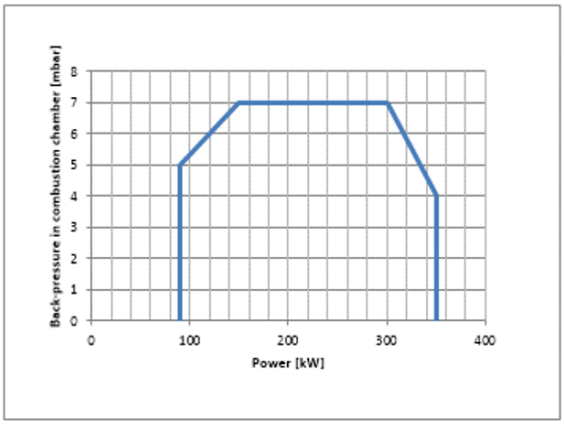
ECO 200 HP G C3



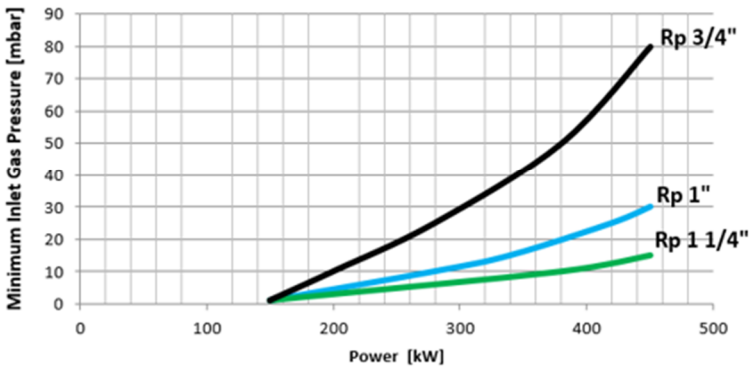


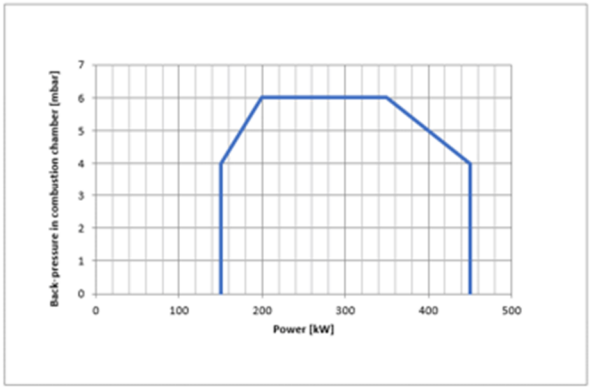
ECO 350 HP G C3



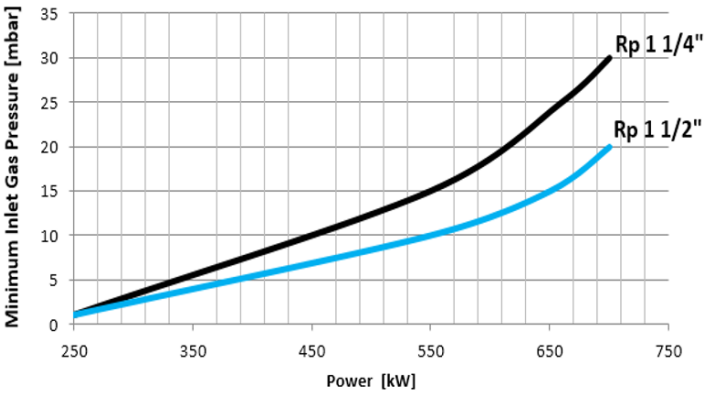


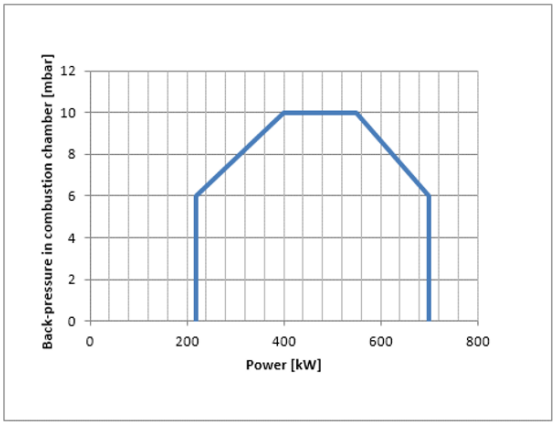
ECO 450 HP G C3



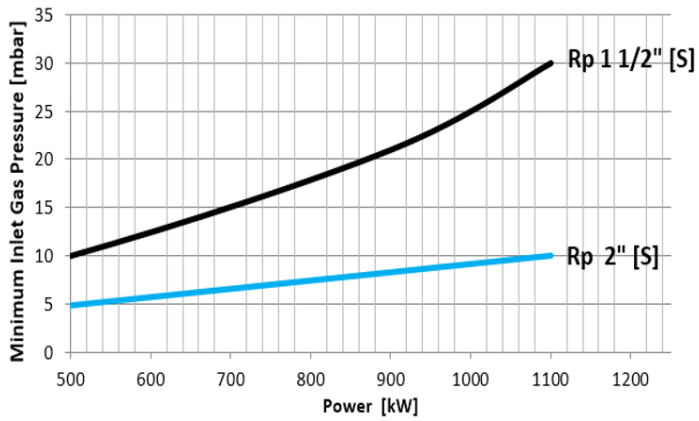


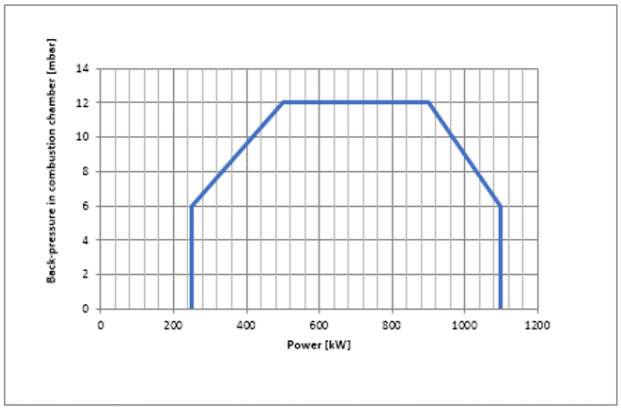
ECO 700 HP G C3



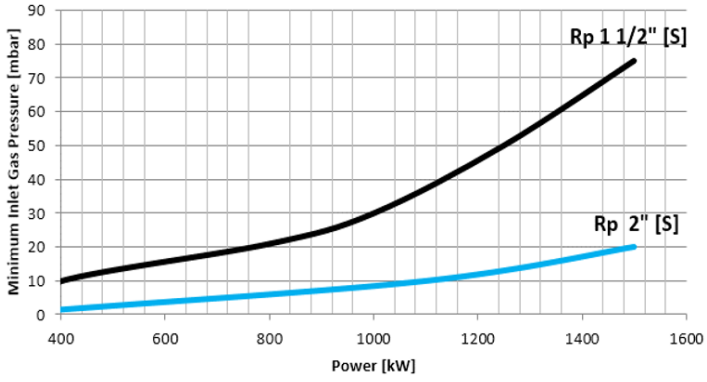


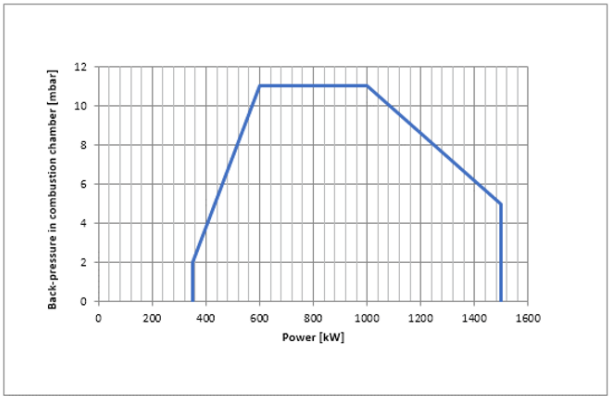
ECO 1100 HP G C3



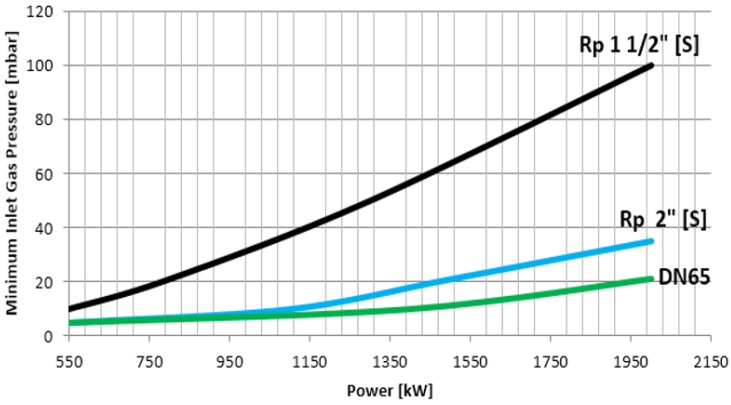


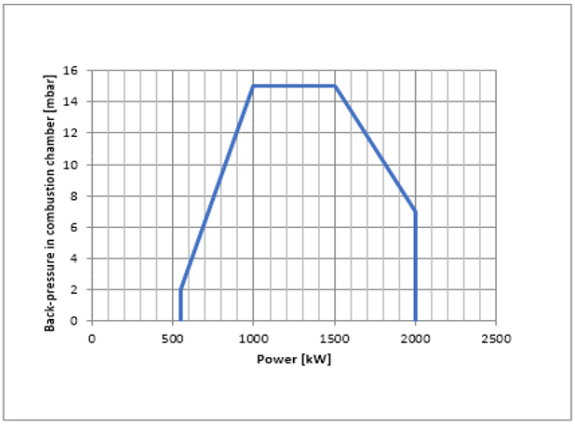
ECO 1500 HP G C3



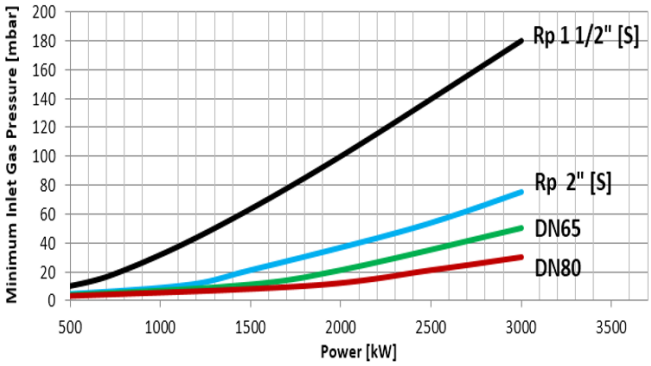


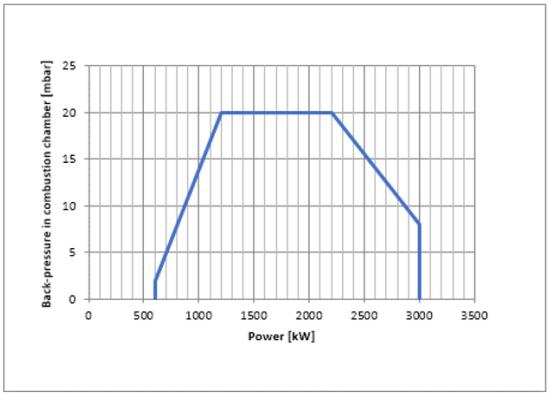
ECO 2000 HP G C3



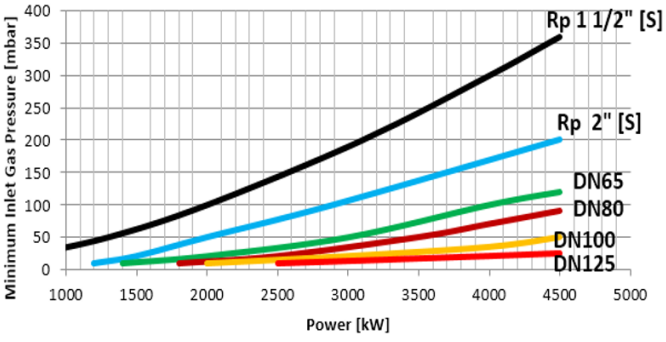


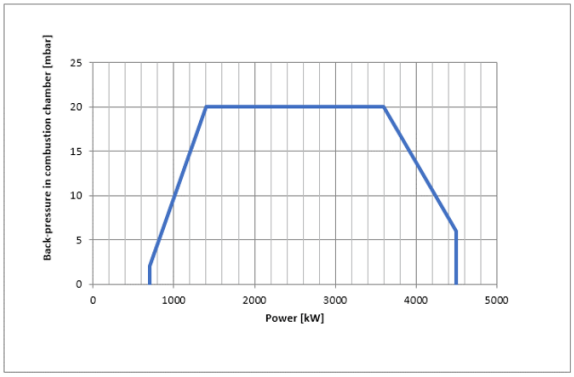
ECO 3000 HP G C3





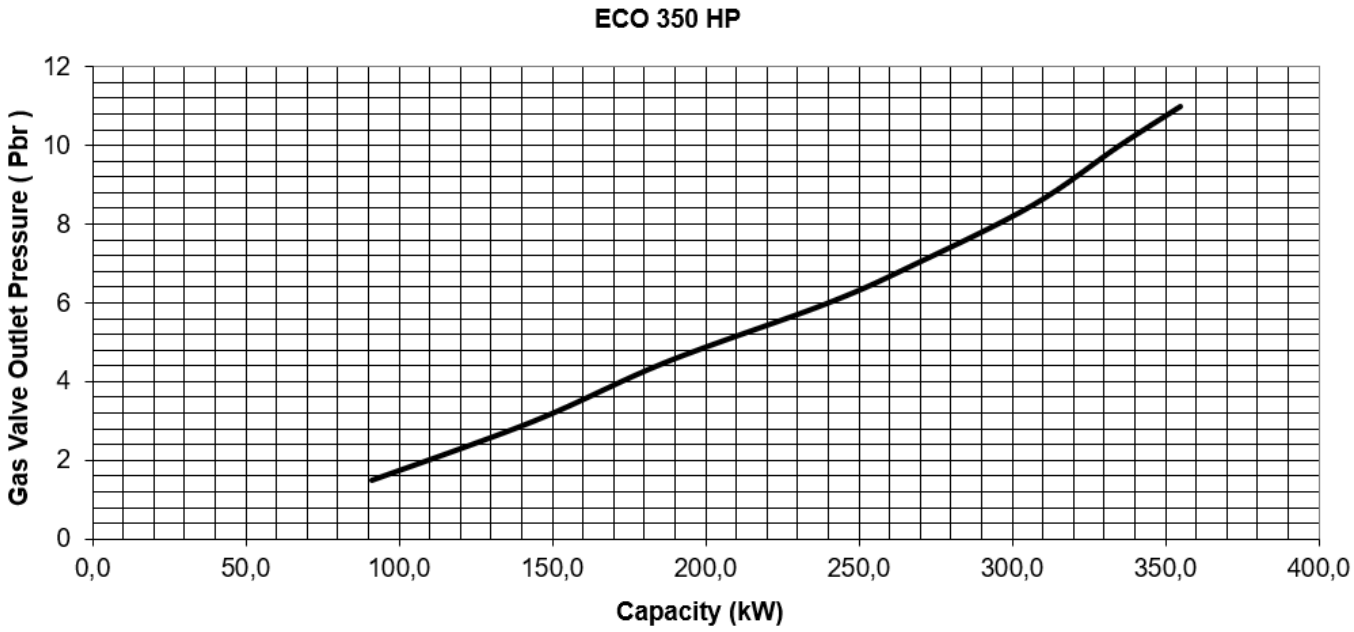
ECO 4500 HP G C3



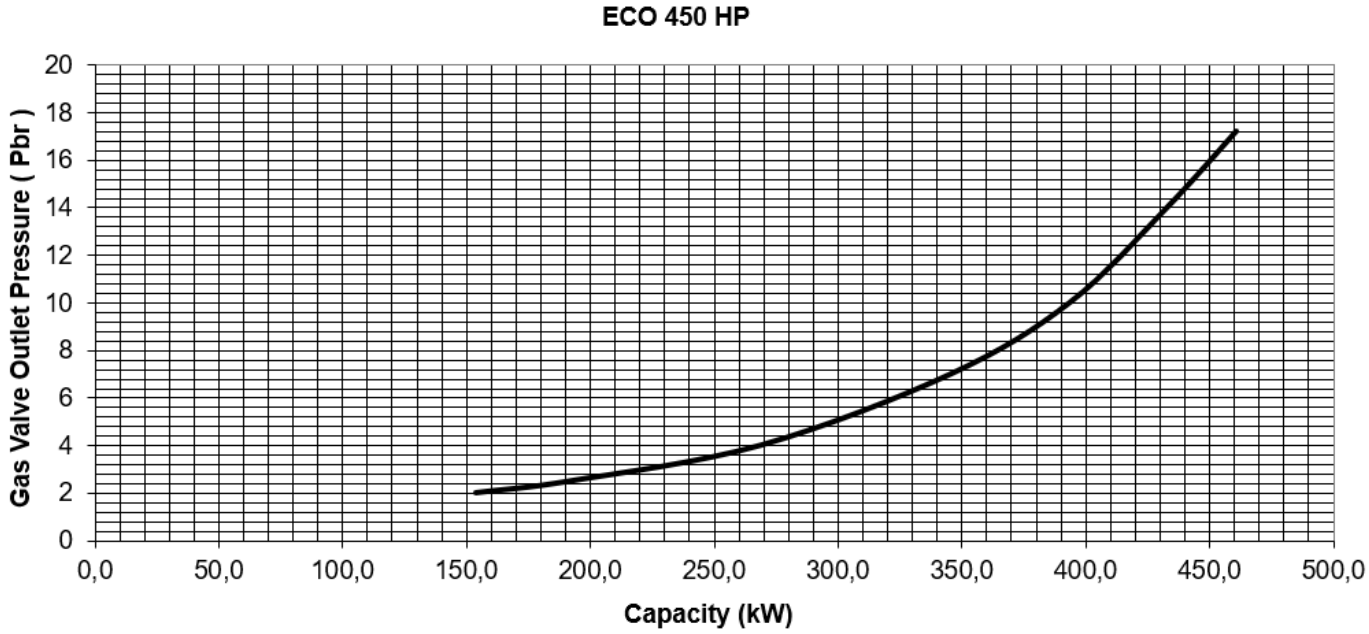


5.3.Gas Valve Outlet Pressure

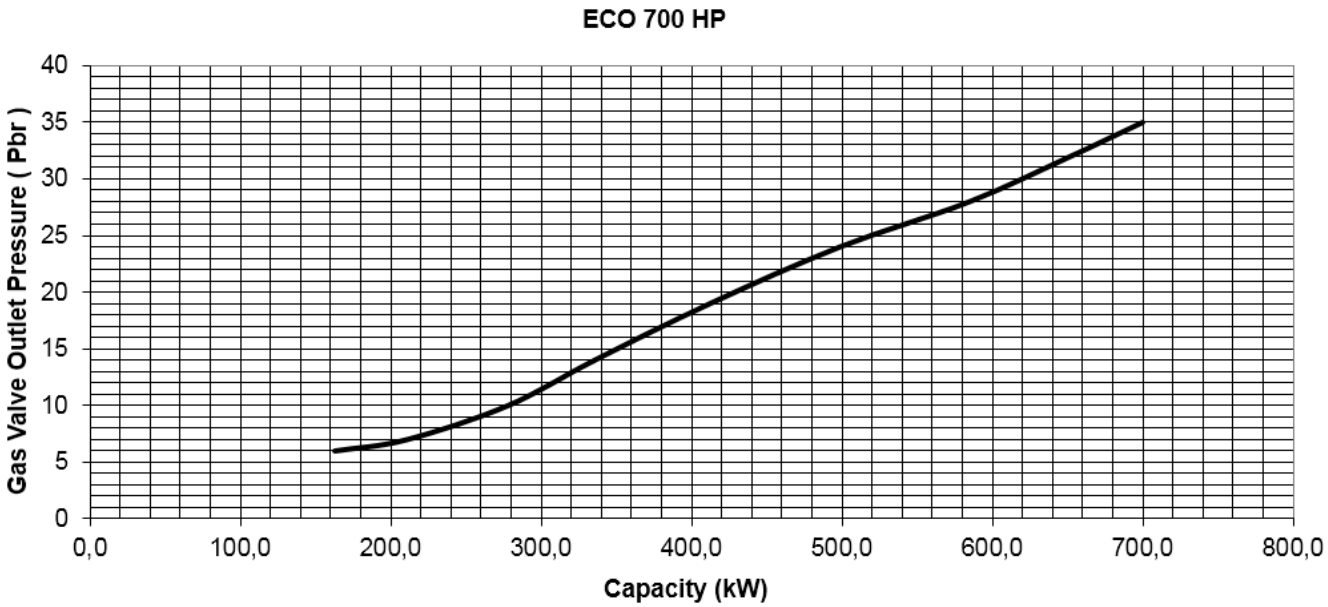
- **MB-DLE/ZRDLE 407**



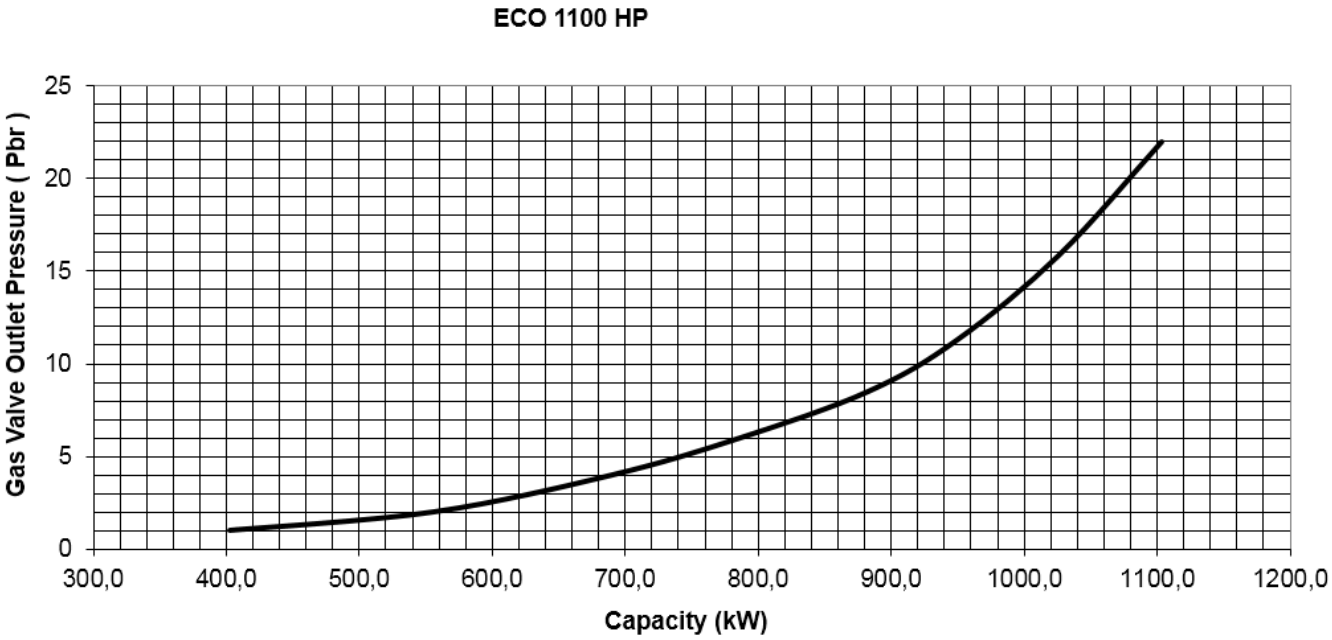
- **MB-DLE/ZRDLE 407**



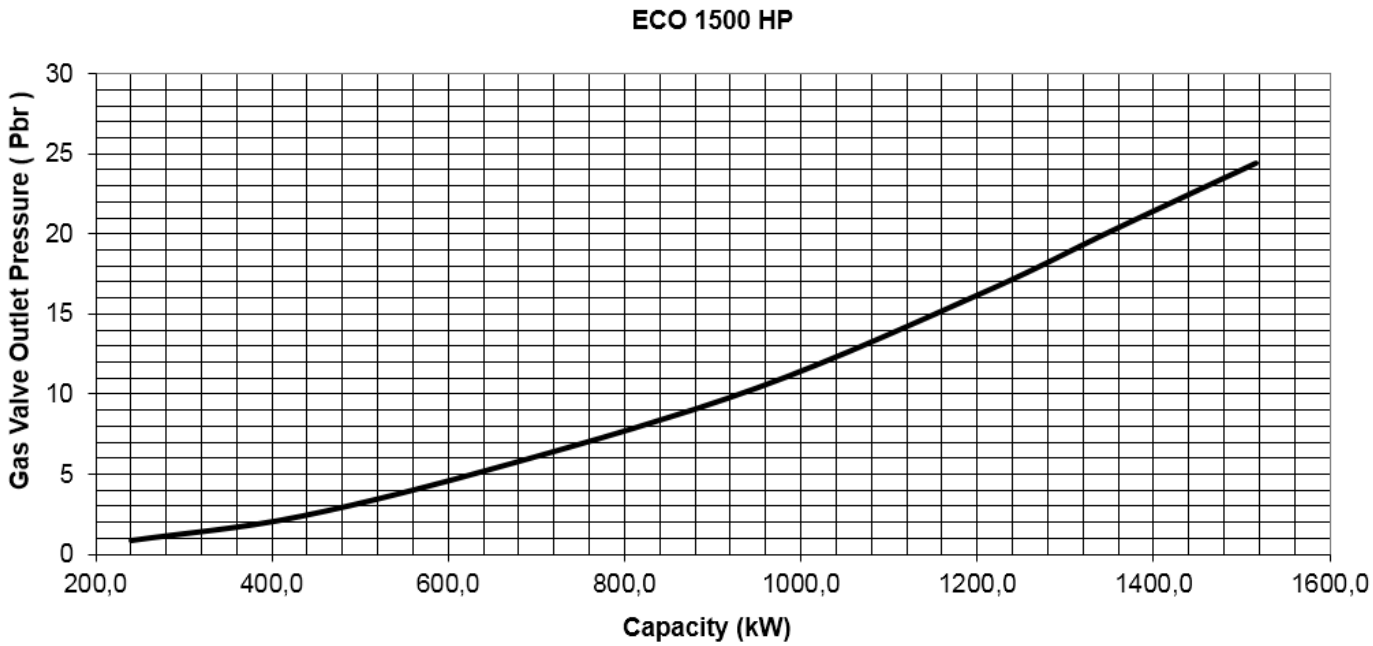
- **MB-DLE/ZRDLE 412**



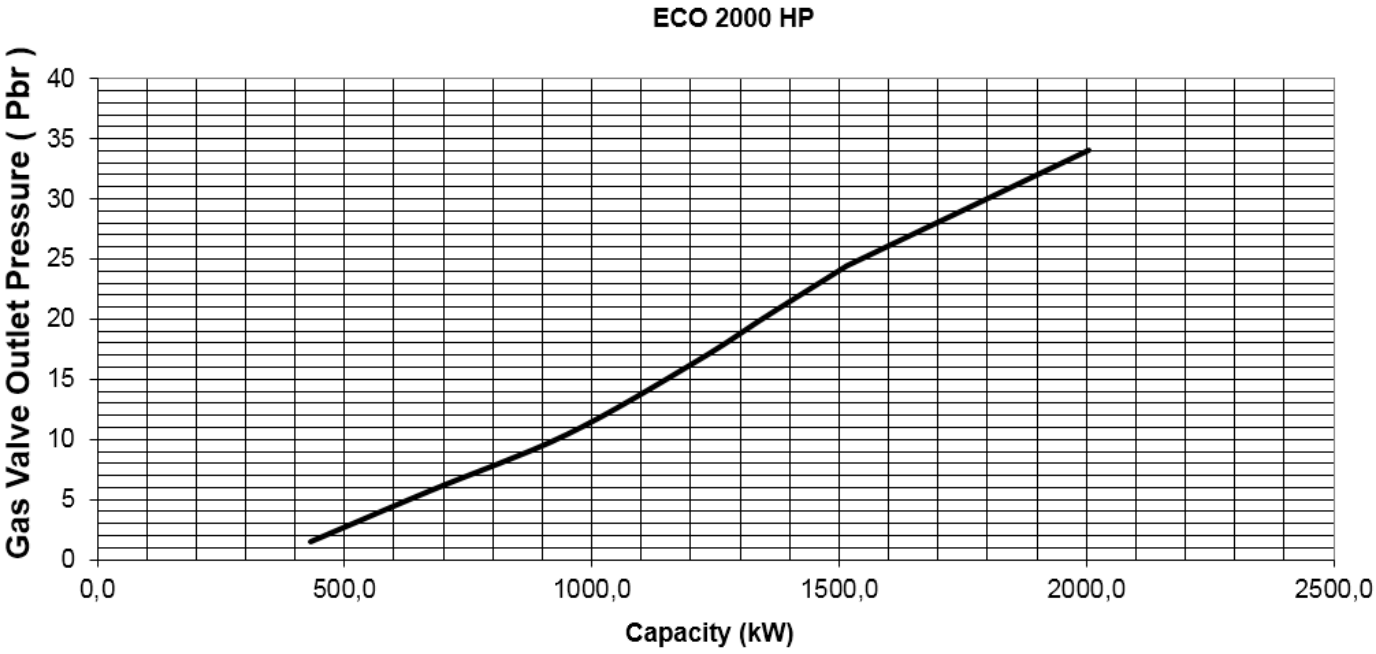
- **MB-DLE/ZRDLE 420**



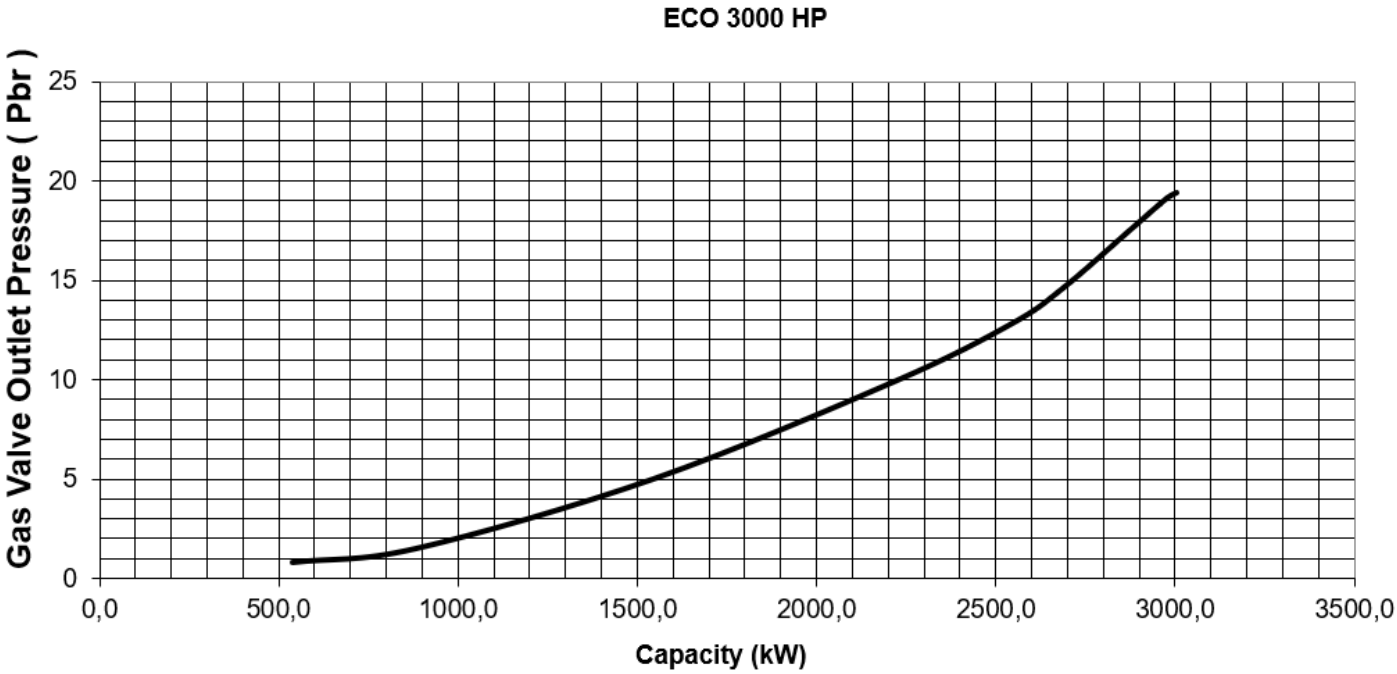
- **VGD 20.4011**



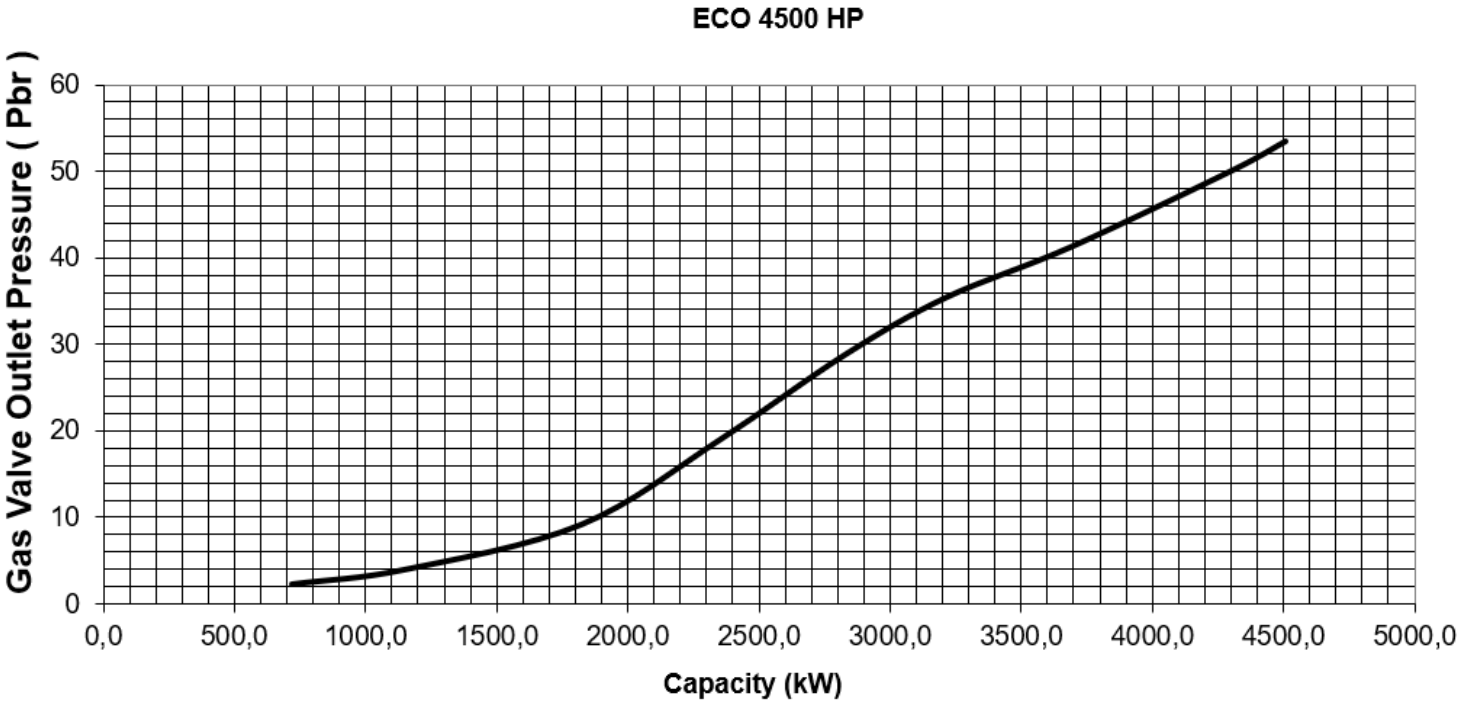
- **VGD 20.4011**



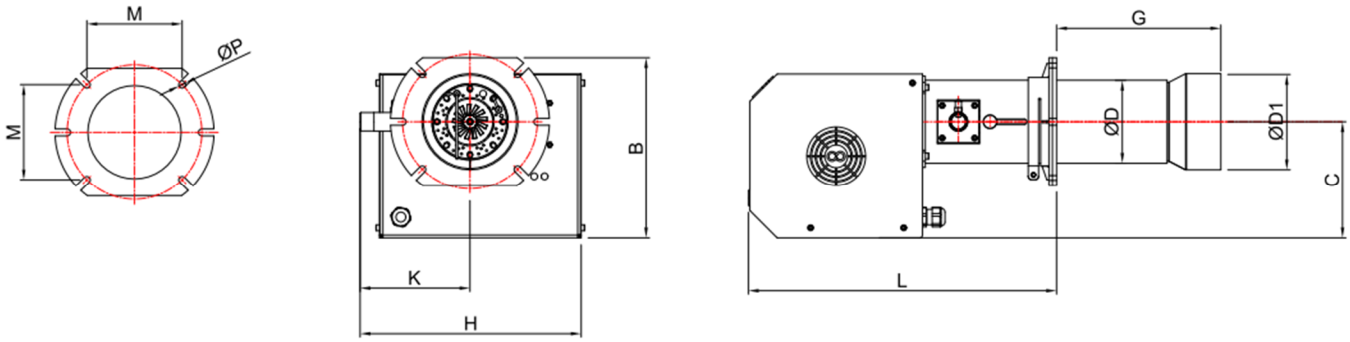
- **VGD 40.065**



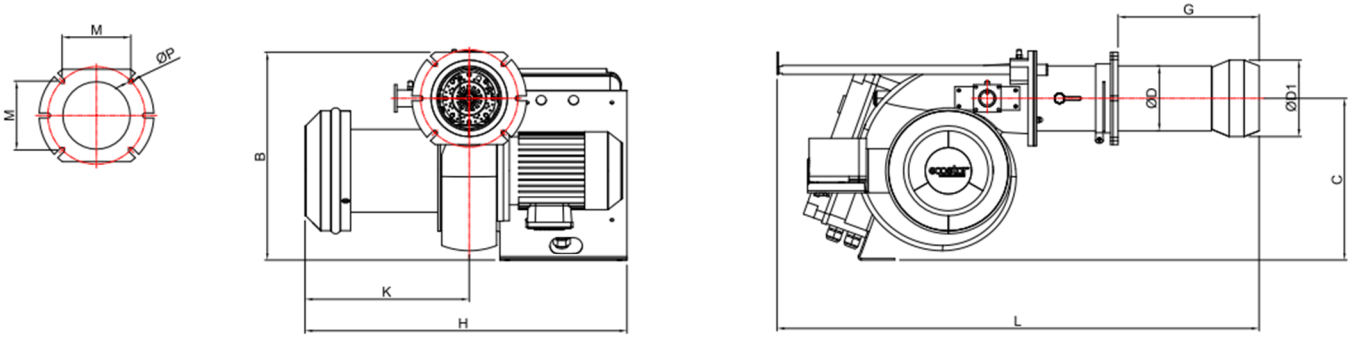
- **VGD 20.4011**



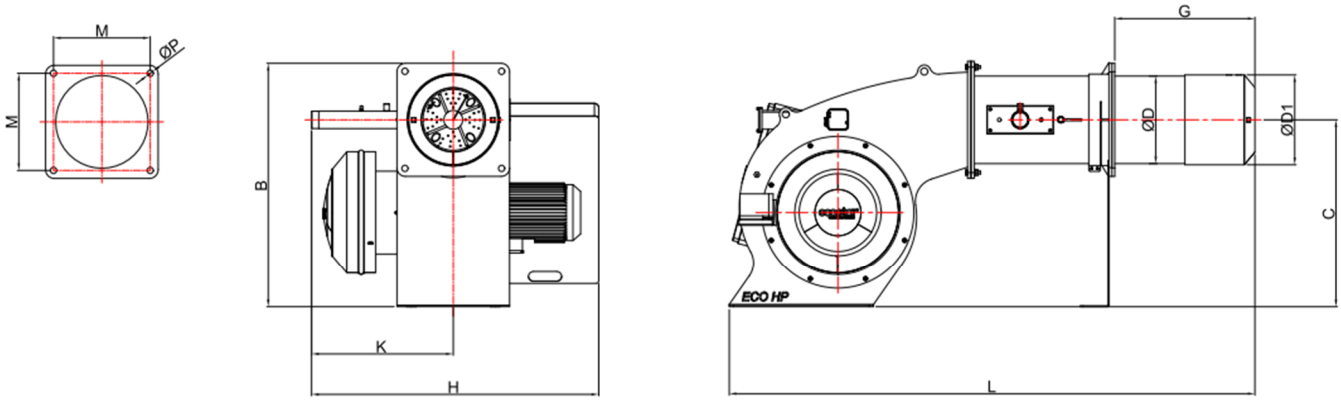
5.4.Burner Dimensions



	L	Gmin	Gmax	H	K	B	C	ØP	M	ØD	ØD1
ECO 50 HP	446	238	288	320	160	262	170	10	142	120	139
ECO 100 HP	446	238	288	320	160	262	170	10	142	120	139
ECO 200 HP G C1	446	238	288	320	160	262	170	10	142	120	139
ECO 200 HP G C2	446	238	288	320	160	295	170	10	142	120	139
ECO 350 HP G C1	446	238	288	320	160	262	170	10	142	120	139
ECO 350 HP G C2	446	238	288	320	160	295	170	10	142	120	139

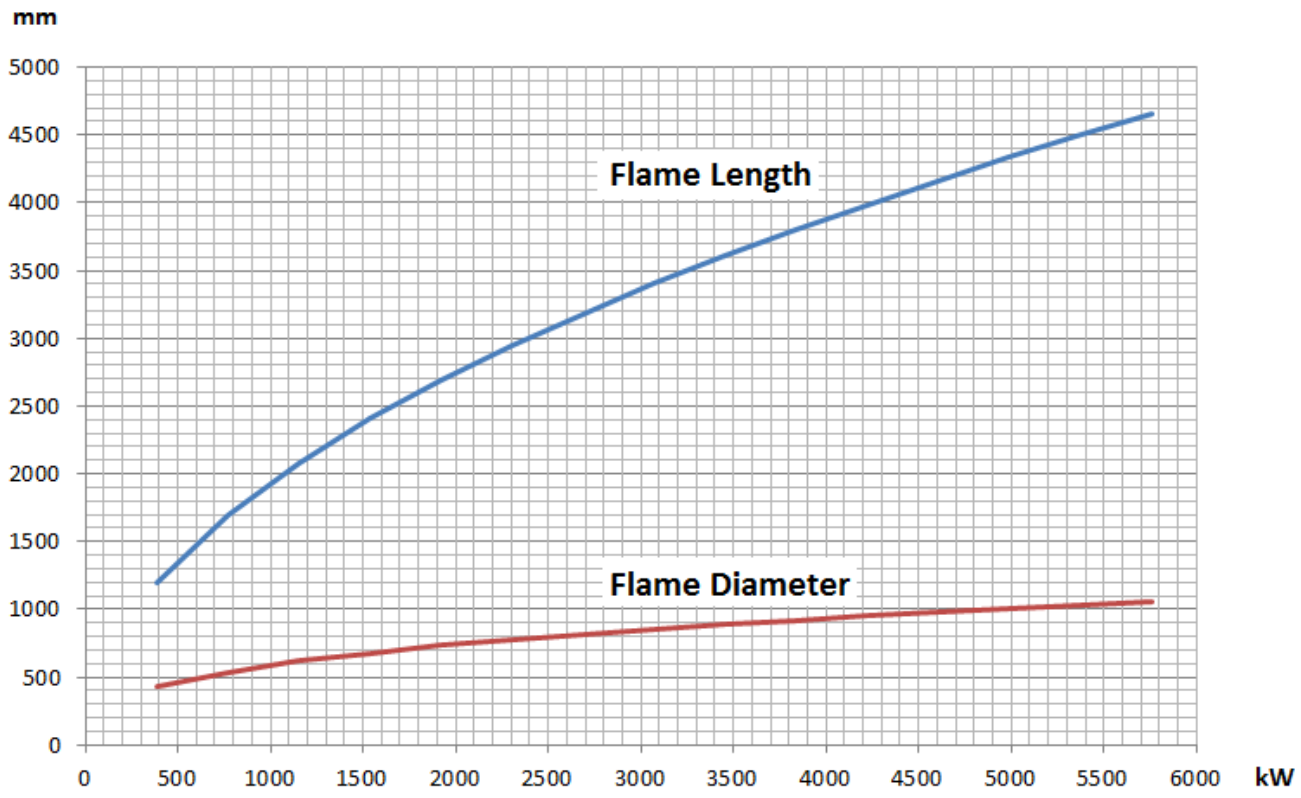


	L	Gmin	Gmax	H	K	B	C	ØP	M	ØD	ØD1
ECO 450 HP G C2	968	283	323	590	276	419	326	10	142	130	153
ECO 450 HP G C3	968	283	323	646	330	419	326	10	142	130	153
ECO 700 HP G C2	968	283	323	590	276	419	326	10	142	130	153
ECO 700 HP G C3	968	283	323	646	330	419	326	10	142	130	153
ECO 1100 HP G C2	1030	260	300	634	315	450	340	12	180	148	172
ECO 1100 HP G C3	1030	260	300	634	315	450	340	12	180	148	172



	L	Gmin	Gmax	H	K	B	C	ØP	M	ØD	ØD1
ECO 1500 HP G	1220	350	390	830	417	590	423	18	275	218	226
ECO 2000 HP G	1370	350	390	865	443	640	476	18	275	248	254
ECO 3000 HP G	1820	485	555	995	492	843	648	22	335	302	310
ECO 4500 HP G	1970	500	570	1054	535	980	730	22	400	358	367

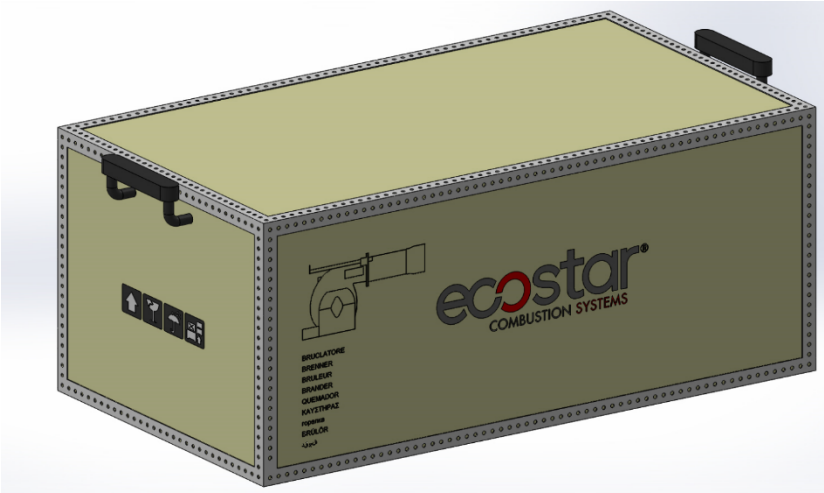
5.5.Flame Length and Diameter



5.6.Noise Level

Product operates within the range of 75 decibels max. and 85 decibels.

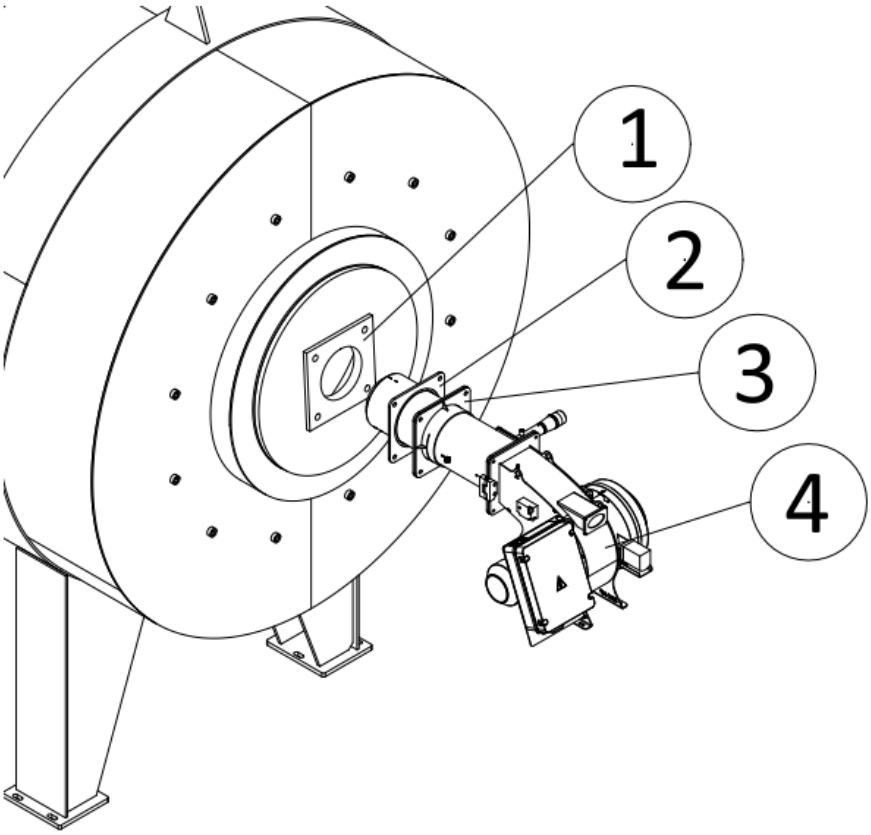
6. BURNER HANDLING INFORMATION



- 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.

7. INSTALLATION

7.1.Burner Installation Picture



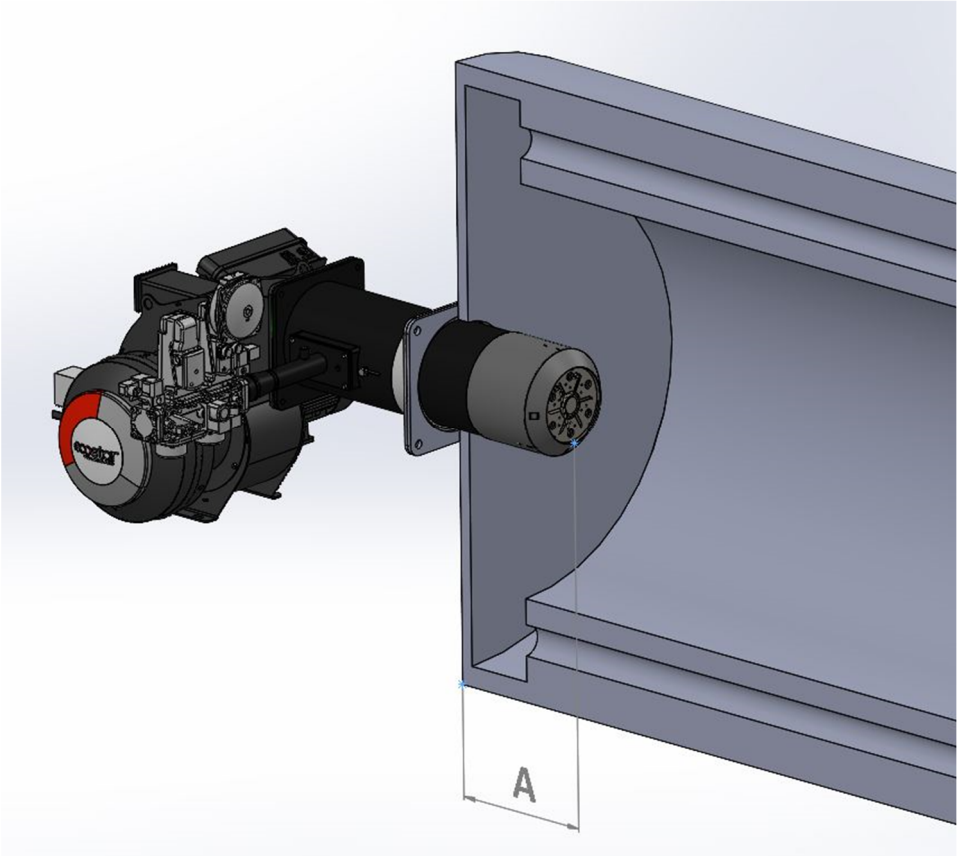
1- Boiler Flange
2- Gasket
3- Boiler Connection Flange
4- Burner

You must definitely ensure sealing between boiler and burner!

Device must be shipped in original packaging!

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.

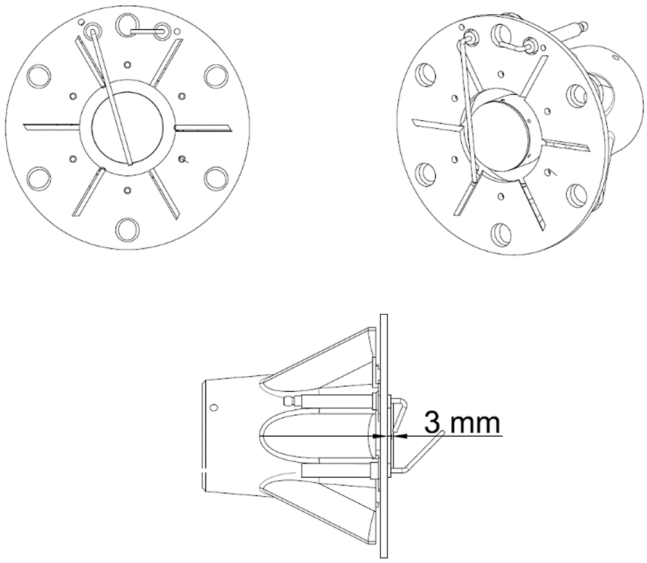


While installing the burner in reverse flame front mirror boilers, flame tube tip must be adjusted such that it gets inside by 50 mm-100 mm from flue pipes (50mm≤A≤100mm). Otherwise flue gas temperature will rise and fuel consumption will increase.

8. COMMISSIONING

8.1.Before Commissioning

8.1.1. Ignition and Ionizasyon System



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.

8.2.General Controls

Make sure to perform the following controls before commissioning the burner.

- Are the electrical connections correct?
- Is there electricity current?
- Is there gas?
- Has the heating system been filled with water?
- Is the thermostat set at the required temperature?
- Has the boiler explosion lid been controlled?
- Is there sufficient air in boiler room (ventilation section cm^2 = boiler capacity kW x 7)
- Has the boiler been installed correctly? Has the boiler cover been closed properly?
- Has the air of the gas line been removed? Has a sealing test been made?

Operation of two-stage burner

- Open the main gas valve, check the gas pressure from the manometer at the valve. (max.300 mbar)
- Check the boiler thermostat or pressure switch settings.
- Bring the operating switch on the burner panel to position 2.
- Burner fan motor will be activated.
- Ignition will take place at the end of pre-purge process.
- 3 sec. later, the gas valve will be opened and combustion will occur.
- Flame control system (ionization) will start flame control.
- Burner will switch to the second stage (max. capacity) according to the heat requirement.
- After the boiler water heated up or the boiler pressure has risen, the burner will turn off.

Operation of a modulating burner

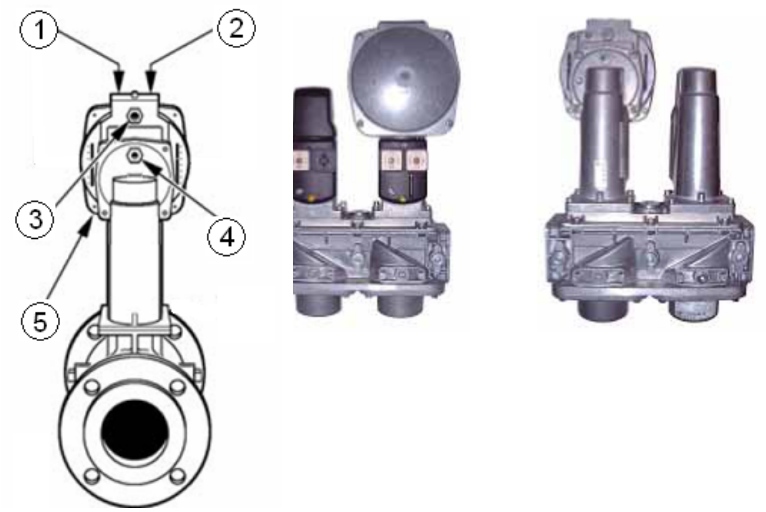
- Open the main gas valve; check max 300 mbar gas pressure from the manometer.
- Open operating switch on the burner panel.
- Switch on the modulating control switch.
- Switch automatic-hand switch to automatic.
- Check the temperature and pressure set values from the modulating control unit.
- Ignition will take place at the end of pre-purge process.
- 3 sec. later, the gas valve will be opened and combustion will occur.
- Flame control system (ionization) will start flame control.
- In modulating burner, the burner goes into max. capacity according to the signal from the modulating control unit.
- When the boiler water temperature or steam pressure increase, the modulating control unit will cause burner to run with min. capacity.
- If the boiler water temperature or steam pressure increases despite the operation of burner with min. capacity, the modulating control unit will stop the burner.

8.3.Combustion Adjustment

8.3.1. Gas Adjustment

Follow the instructions of the valve manufacturer during installation, dismantling and adjustment of the gas valve

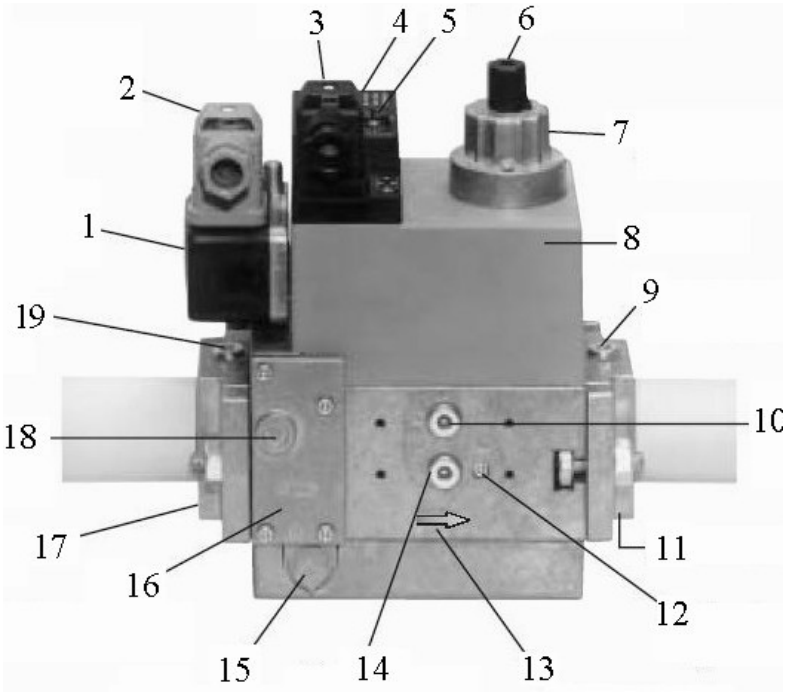
8.3.1.1.VGD 20 4011 - 5011 Series Gas Valve



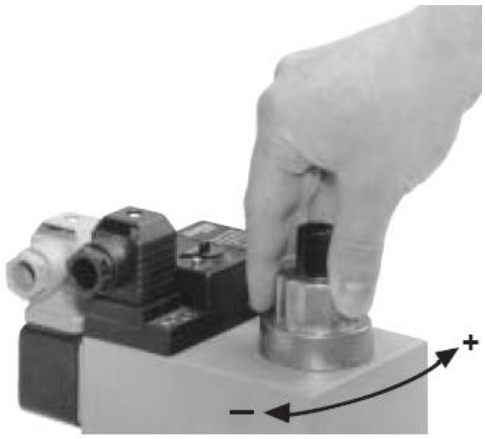
SKP 75 Connection Diagram

1 – Air-gas adjustment ratio
2 – Zero "0" point (start) adjustment
3 – Boiler counter pressure impulse connection
4 – Gas pressure impulse connection
5 – Air pressure impulse connection

8.3.1.2.MB DLE Series Monoblock Gas Valve



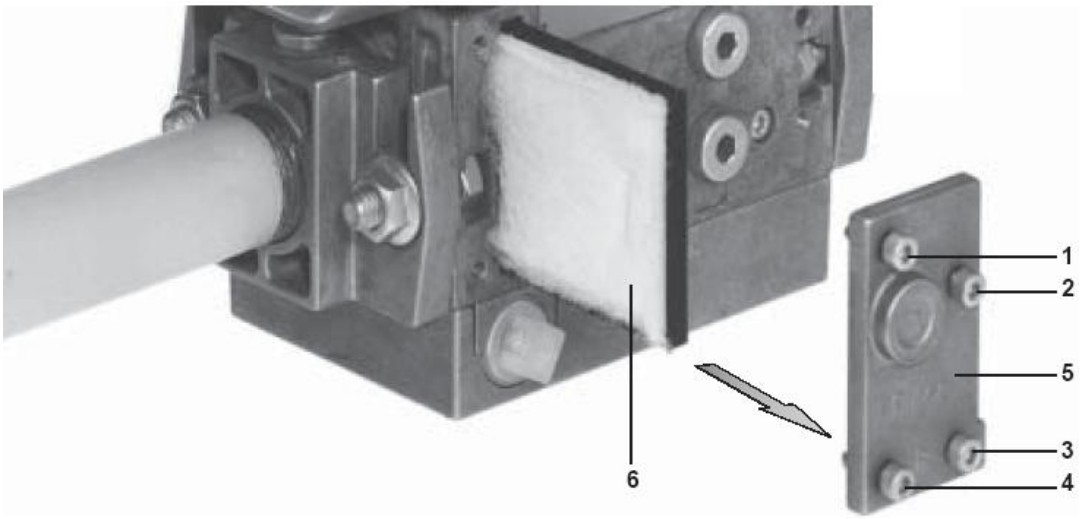
1- Pressure switch
2- Pressure switch electrical connection
3- Electrical connection of the valve
4- Operation gauge
5- The sealing ring
6- Set cover
7- Hydraulic disk brakes or settings
8- Coil
9- Measuring element connection (1/8)
10- Measuring element connection (1/8)
11- Output flange
12- Measuring element connection (1/8)
13- Gas flow way
14- Measuring element connection (1/8)
15- The vent plug
16- Filter chamber cover
17- Inlet flange
18- Measuring element connection (1/8)
19- Measuring element connection (1/8)



- Consider the below torque values for bolts tightened on the valve.
- Tighten flange bolts according to cross ordering and use proper tools.
- Sealing and function check must be performed if the valve is dismantled and re-installed over the line due to any reason.
- Before dismantling the valve from the line, you can perform filter replacement according to the below order.
    - Cut off the gas flow (turn off the ball valve)
    - Remove the 4 bolts (1,2,3,4) on the cover seen in the picture and take out the cover (5).
    - Take the filter cartridge (6) out of its socket and replace with a new one
    - Close the cover and tighten the bolts. In frequently performed filter replacement operations, use M4x14 bolt instead of self-tapping bolts used for fixing the cover.
    - Perform sealing and function control

Max. torque values;

M 4	M 5	M 6	M 8	G 1/8	G 1/4	G 1/2	G 3/4
2,5 Nm	5 Nm	7 Nm	15 Nm	5 Nm	7 Nm	10 Nm	15 Nm



8.3.1.3.MB ZRD(LE) 415 – 420 Series Gas Valve

GasMultiBloc
Combined regulator and safety shut-off valves
Two-stage function

DUNGS®

MB-ZRD(LE) 415 - 420 B01

7.26

Technical description

The DUNGS GasMultiBloc integrates filter, regulator, valves and pressure switches in one compact fitting. Various designs are possible by the modular system:

- Dirt trap: microfilter
- One regulator and two main valves: B01
- One one-stage valve and one two-stage valve
- One valve is fast opening, one valve is slow or fast opening
- Solenoid valves up to 360 mbar as per DIN EN 161 Class A Group 2
- Sensitive setting of output pressure by proportional regulator as per DIN EN 88 Class A Group 2
- High flow rates with low pressure drop
- DC solenoid drive interference degree N
- Main volume restrictor and partial volume restrictor at valve V2
- Hydraulic opening delay
- Flange connections with pipe threads as per ISO 7/1
- Simple mounting, compact, light-weight

The modular system permits individual solutions by using external ignition gas tap in connection with separately controlled valves, by adding a valve proving system, mini/maxi pressure switches, pressure limiters, limit switch at valve V2.

Application

The modular system permits individual solutions in gas safety and regulator engineering. Suitable for gases of families 1, 2, 3 and other neutral gaseous media.

Approvals

EC type test approval as per EC Gas Appliance Directive:

MB-ZR...415-420 B01 CE-0085 AP 3156

EC type test approval as per EC Pressure Equipment Directive:

MB-ZR...415-420 B01 CE0036

Approvals in other important gas consum-

8.4.Air Pressure Switch Adjustment

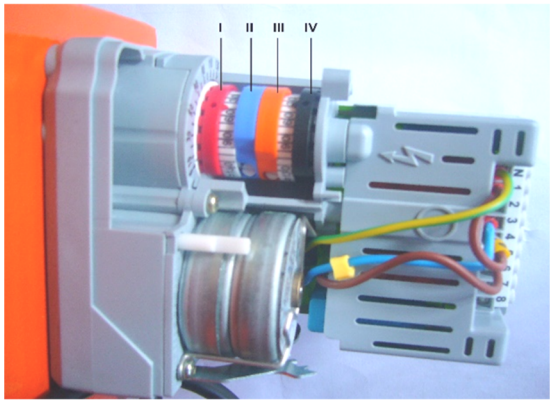
While the burner is working without any problem, the air pressure switch is adjusted to desired minimum pressure as follows.

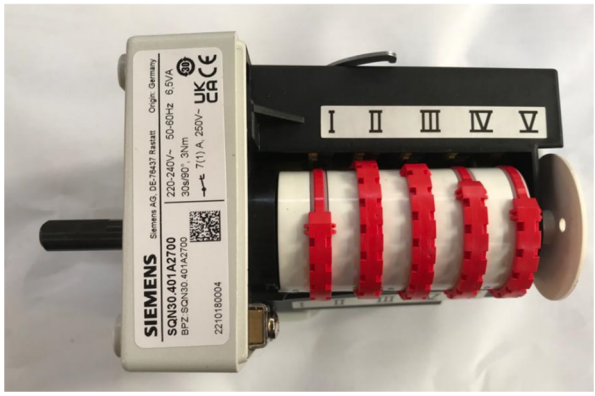
- Unscrew the screw of the transparent cover and remove the cover.
- Turn the adjustment wheel in the direction to increase the pressure, note the pressure value at which the burner is failed.
- Set the pressure switch to a value 1 mbar lower than the pressure value at which the burner failed and close the pressure switch lid.
- 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.

- **SQN70-SQN30**





At Two-Stage Burners;

I. Red Cam: Adjusts 2nd level max. air.
II. Blue Cam: Resets the clamp.
III. Orange Cam: Adjusts 1st level min. air.
IV. Black Cam: Adjusts 2nd level valve opening degree.

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.Emission Measurement

In emission measurements, the following values are accepted as reference according to TS EN 676 +A2 standard.

- CO < 100 mg/ kWh
- %3 ≤ O_2 ≤ %5
- NO_x < 170 mg/ kWh
- Excess air ratio 1,2≤ λ ≤ 1,3

It is important for the boiler to be sealed in order to avoid incorrect measurements during emission measurements.

Boiler temperature must be between 40 C° and 80 C° while making emission measurement in hot water boilers.

8.7.Capacity Adjustment

Exemplary Application:

Suppose the required burner capacity is (C) 2000 kW.
H_u = 8250 kcal/m^3 (lower heating value)
P = 860 kcal/kW (Value of 1 kW in kcal)
Q = C x P
Q = 2000x860 = 1720000 kcal/h
V = Q / H_u
V = 1720000/8250 = 208.48 m^3/h

Set the required gas flow rate over the valve and check this value on the gas counter. Should there be no gas flowmeter in the system, set the burner by using the gas tip lost pressure diagram given at page 20-21-22.

In order to ensure the emission values set the air klappe in each gas flow increase.

8.8.Burner Control System

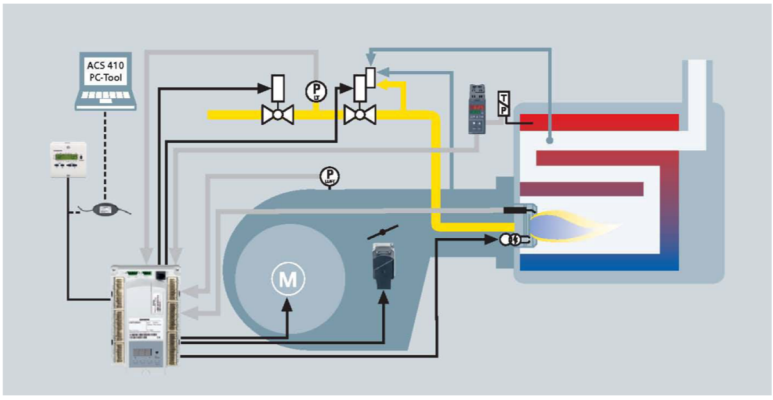
The burner control system SIEMENS LME7... is a microprocessor-based burner control with matching system components for the control and supervision of forced draft burners of medium to high capacity.

LME7… are used for the startup and supervision of 1- or 2-stage forced draft gas burners in intermittent operation. The flame is supervised with an ionization probe, optionally with UV flame detector QRA2..., QRA4.U or QRA10....

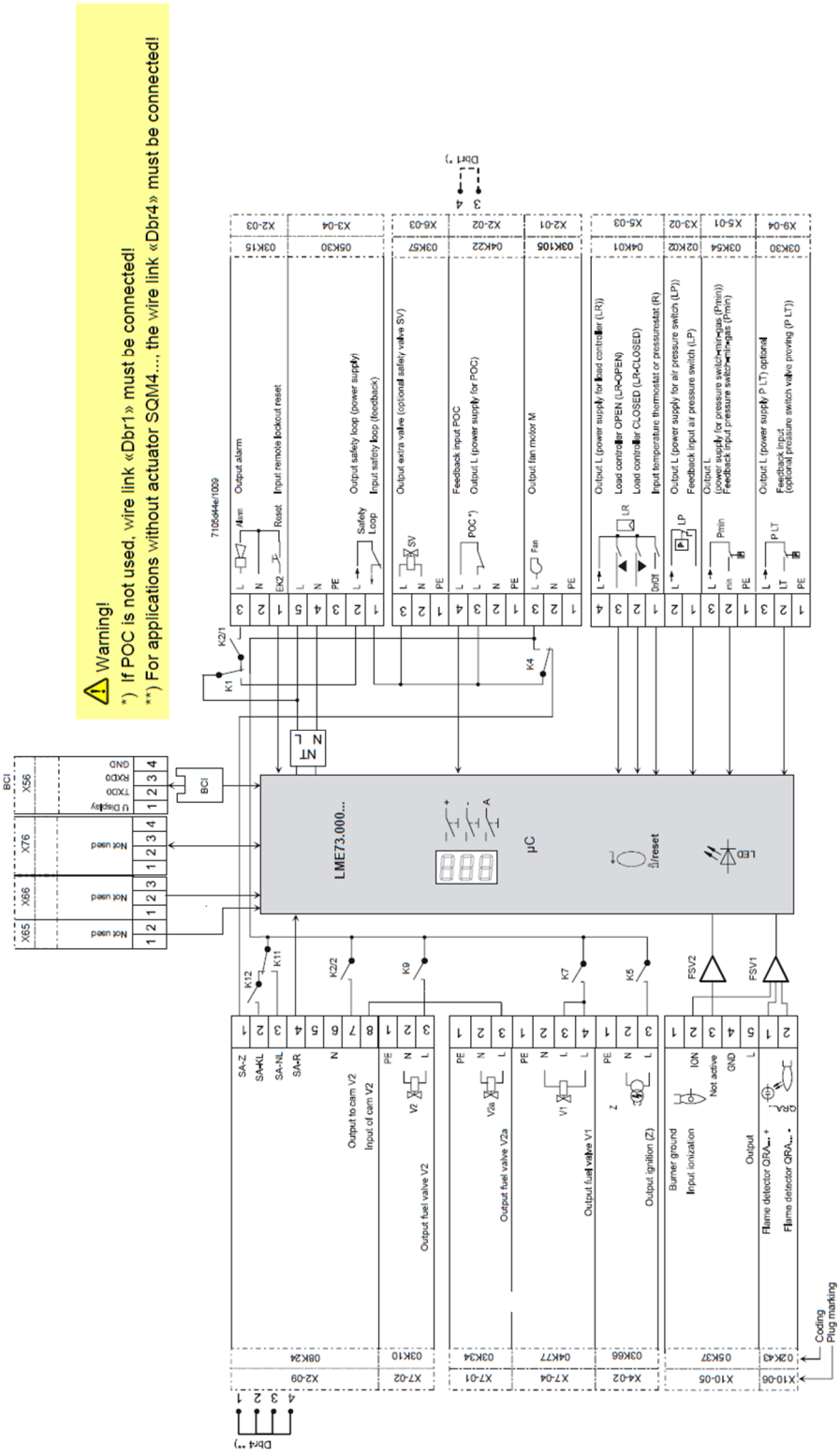
- Burner control to EN 298: 2003
- For forced draft gas burners to EN 267 and EN 676

Integrated in the LME7... basic unit are:

- Burner control
- BCI
- Only LME72... / LME73...: Control for one actuator
- Lockout reset button (info button)
- 3 multicolor signal lamp LED for operations and fault notifications
- Optional: Analog inputs for load controller DC 0...10 V, DC 0 / 4...20 mA, 0...135 Ω
- 3 x 7-segment display for service, fault and operating state information
- Interface for program module



8.8.1. Inputs and Outputs / Internal Connection Diagram

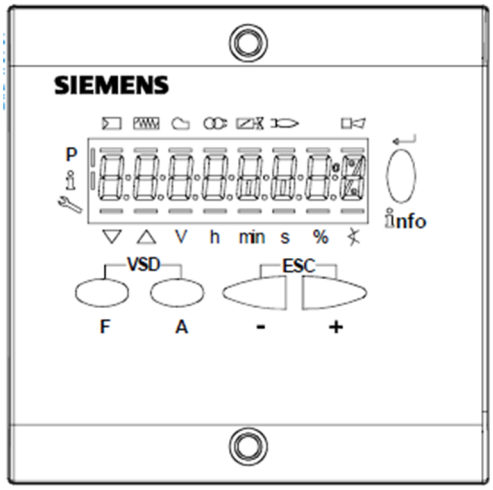


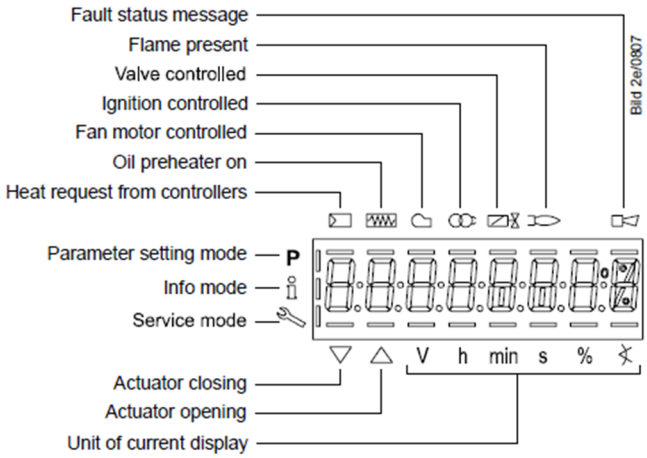
8.8.2. Error code list with operation via internal led

Error code	Clear text	Possible cause
bAC Er3	Fault of compatibility program module to basic unit during backup process	Program sequence of program module does not match the basic unit
Err PrC	Fault of program module	- Error in data content of program module - No program module fitted
Loc: 2	No establishment of flame at the end of safety time (TSA)	- Faulty or soiled fuel valves - Faulty or soiled flame detector - Poor adjustment of burner, no fuel - Faulty ignition equipment
Loc: 3	Air pressure faulty (air pressure switch (LP) welded in no-load position, decrease to specified time (t10) (air pressure switch (LP) response time)	Air pressure switch (LP) faulty - Loss of air pressure signal after specified time (t10) - Air pressure switch (LP) has welded in no-load position
Loc: 4	Extraneous light	Extraneous light during burner startup
Loc: 5	Air pressure faulty, air pressure switch welded in working position	Timeout air pressure switch (LP) - Air pressure switch (LP) has welded in working position
Loc: 6	Fault of actuator	- Actuator faulty or blocked - Faulty connection - Wrong adjustment
Loc: 7	Loss of flame	Too many losses of flame during operation (limitation of repetitions) - Faulty or soiled fuel valves - Faulty or soiled flame detector - Poor adjustment of burner
Loc: 8	---	Free
Loc: 9	---	Free
Loc: 10	Error not relatable (application), internal error	Wiring error or internal error, output contacts, other faults
Loc: 12	Valve proving	Fuel valve 1 (V1) leaking
Loc: 13	Valve proving	Fuel valve 2 (V2) leaking
Loc: 14	POC error	Error valve closure control POC
Loc: 20	Pressure switch-min-gas open	Gas shortage
Loc: 22	Safety loop open	- Pressure switch-max-gas open - Safety limit thermostat cut out
Loc: 60	Analog power source 4...20 mA, I <4 mA	Wire breakage
Loc: 83	PWM fan faulty	- PWM fan does not reach the target speed within the preset period of time, or - After reaching the target speed, the PWM fan leaves the tolerance band again (P650) for a time exceeding the tolerance time speed deviation (P660)
Loc: 138	Restore process successful	Restore process successful
Loc: 139	No program module detected	No program module plugged in
Loc: 167	Manual locking	Manual locking
Loc: 206	AZL2... incompatible	Use the latest version
Loc: 225	PWM fan faulty	- Fan speed dropped below the minimum prepurge PWM (P675.00) after reaching the prepurge speed, or - After reaching the ignition load speed, the maximum ignition load PWM (P675.01) was exceeded

Error code	Clear text	Possible cause
Loc: 226	PWM fan faulty	Parameterization error: - Speed low-fire > speed high-fire, or - Low-fire = 0 rpm, or - Maximum speed = 0 rpm
Loc: 227	PWM fan faulty	One or several parameters violate the minimum / maximum limit
rSt Er1	Error in compatibility program module to basic unit during restore process	- Program sequence of program module does not match the basic unit
rSt Er2	Error in compatibility program module to basic unit during restore process	- Hardware of basic unit does not match the program module
rSt Er3	Error during restore process	- Program module faulty - Program module removed during restore process

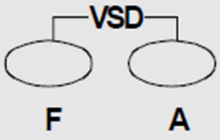
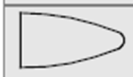
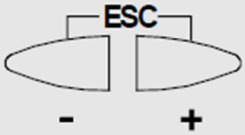
8.8.3. Operating Control and Displays (Optional Usage)



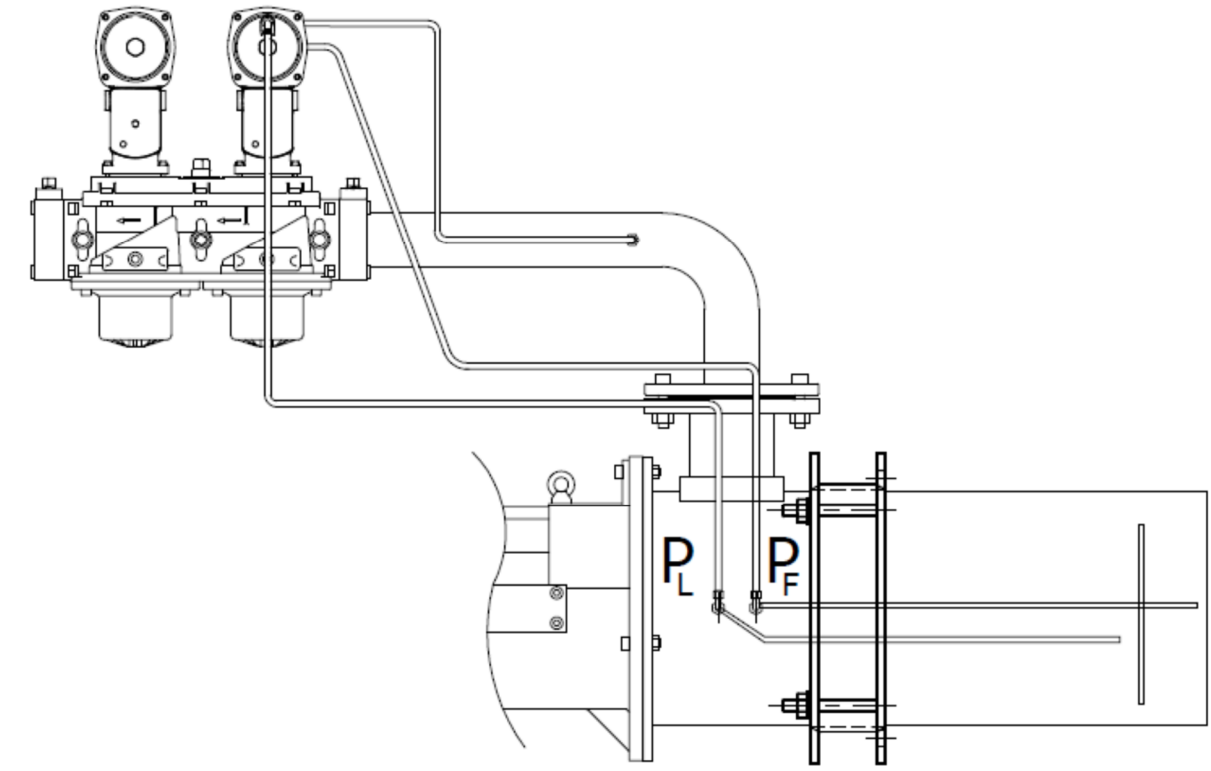


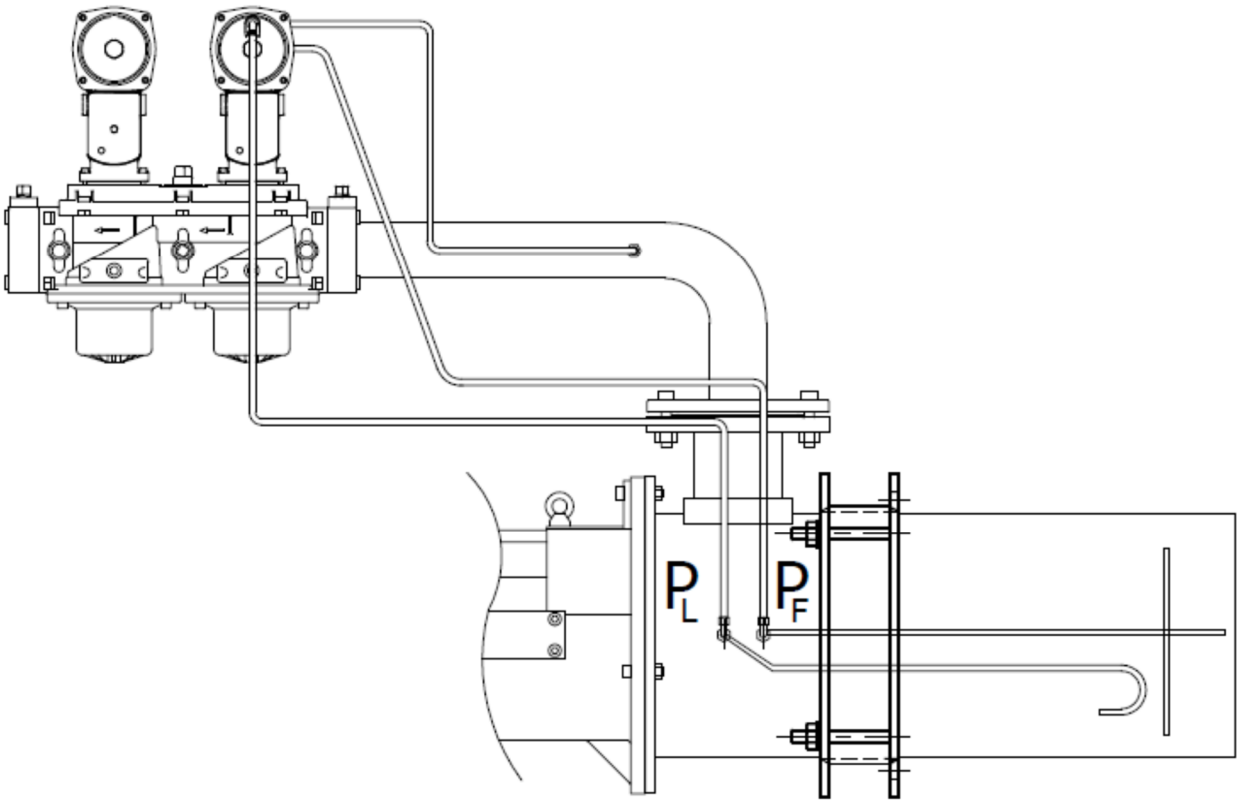
Display of operating states, program phases and fault codes

- Setting of parameters and ratio curves
- 8-digit LCD with bars
- LCD with backlit (support dependent on respective burner control)
- 5 multifunction buttons with reset facility
- Housing designed for wall mounting
- Degree of protection IP40 when mounted
- BCI interface
- Prepared for extra fault indication via LED (on request)
- Backup / restore function with specific types of burner controls (on request)

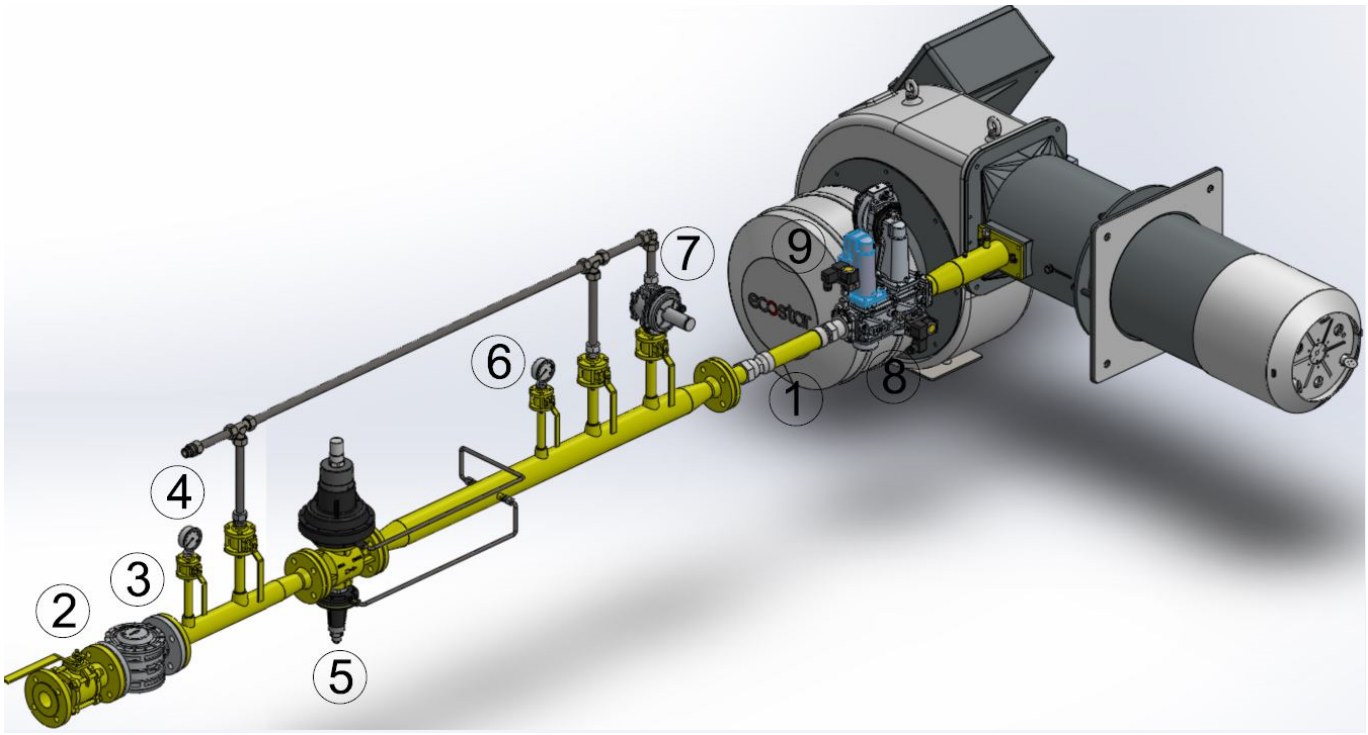
Button	Function
	**F button** - For driving the fuel actuator to another position (keep F depressed and adjust the value by pressing - or +)
	**A button** - For driving the air actuator to another position (keep A depressed and adjust the value pressing - or +)
	**F and A buttons** - For changing to parameter setting mode **P** (press simultaneously F and A plus - or +) - For readjusting the speed of the VSD operation (press F and A with - or + simultaneously)
	**Info and Enter button** - For navigating in info and service mode * Incrementing the selection (flashing symbol) (press button for <1 s) * Going one menu level down (press button for 1…3 s) * Going one menu level up (press button for 3…8 s) * Changing to operating mode (press button for >8 s) - **Enter** in parameter setting mode - **Reset** in the event of fault - One menu level down
	**- button** - For decreasing the value - For navigating during curve adjustments in info and service mode
	**+ button** - For increasing the value - For navigating during curve adjustments in info and service mode
	**- and + buttons: Escape function** (press - and + simultaneously) - No adoption of value - One menu level up

If the value measure from PL point is below 0.5 bar, set the impulse pipe as follows.





8.9.Gas Pass Equipment Required in Gas Line



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

Threaded and flanged connections may vary depending on the gas pressure and consumption.

9. MAINTENANCE

9.1.Monthly Maintenance

Monthly maintenance is a comprehensive process where general checks of burner and peripheral components are performed to prevent possible faults. After completion of maintenance and adjustment processes, make sure to perform an emission analysis.

- Clean the filters on the main line and multiblock.
- Check the burner gas tip.
- Perform insulation measurements of ignition and ionization electrodes, replace electrodes should there be leakage to the body.
- Check ignition cables and sockets.
- Check all wiring points. Tighten loose connections.
- Clean the dust and layers accumulated on the fan and air klappes.
- Check gas line pressure, it must be the same with the first adjusted pressure, otherwise burner load and emission values will also have changed.
- Check all bolts of the burner. Tighten loose bolts.
- After starting the burner and adjusting air klappe, perform flue gas emission measurement and check if there is an ideal combustion.

9.2.Seasonal Maintenance

Comprehensive maintenance work when the burner is re-started after long periods of shut-down or interruptions. After completion of maintenance and adjustment processes, make sure to perform a combustion analysis.

- Check insulation resistance of electric motor.
- Replace ignition and ionization electrodes with new ones.
- Clean air fan and clamps.
- Check the operating function.
- Check boiler thermostats.
- Check cleanliness of boiler inside and clean if necessary.

Follow installation directions during maintenance.

10. TROUBLESHOOTING

Problem	Cause	Explanation-Suggestion
Burner cannot be commissioned	Gas is cut or does not come	Gas valve might be closed. Open the valve.
	Fuse failure	Check burner power supply. The fuse on the main panel or the fuse on the burner might be tripped.
	Relay failure	Reset the thermal relay. Check adjustment of the thermal relay according to the current in motor label. If the failure is not removed, replace the thermal relay.
	Boiler thermostat, pressure switch failure	If there is a problem with the burner thermostats, pressure switches and steam tank this may be due to an unadjusted or faulty water level device; adjust it and if broken, replace it.
Flame appears and goes into failure mode.	Gas pressure error	Supply gas pressure might be low.
	Ionization electrode failure	Ionization electrode may be faulty or contaminated. Remove and clean.
	Program relay failure	Replace it with a new one.
Burner starts up, but fails after 10 seconds.	Air pressure switch adjustment	Air pressure switch might be adjusted to a high value. There may be dirt in the air pressure switch. Air pressure switch might be broken.
	Program relay failure	Replace it with a new one.
	Fan motor failure	Check fan motor coils, motor contactor and outlet from program relay.
Burner starts up, but fails after 30 seconds.	Gas valve, gas pressure drop	Gas valve might be closed. Supply gas pressure might be low. Check gas inlet manometer.
	Ignition electrode failure	Ignition electrodes might be misadjusted or ignition cables might have come out of their terminals. Adjust ignition electrodes with a distance of 3-5 mm. between them.
	Gas valve adjustment	Check the starting setting of the gas valve. Burner must be adjusted to sufficient start gas flow for its activation.
Boiler cover is overheating.	Sealing problem	Ensure sealing between the boiler cover and burner. If required, use insulating material between the boiler connecting flange and boiler cover.

11. PERIODICAL FLUE GAS MEASUREMENT REPORT								
Fuel Consumption (m^3/h)	**CO (ppm)**	**O_2 (%)**	**CO_2 (ppm)**	**NO_X (ppm)**	**Yield (%)**	**Flue Temp. (°C)**	**Date**	**Signature**

12. 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.

For your suggestions, complaints and service requests
Esentepe Mah.Milangaz Cad. No:75 K:3
Kartal Monumento Plaza
KARTAL/İSTANBUL/TÜRKİYE
Tel: 444 8 326
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.

13. NOTES

Please record and forward your measurements and observations to us
www.ecostar.com.tr