

TERMÖDİNAMİK®

HVAC SYSTEMS

***ECS SERIES STEEL BODY
CENTRAL HEATING HOT WATER BOILER
USER AND MAINTANCE MANUAL
(81 kW - 2326 kW)***

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FOREWORD

Dear Customer;

First of all, thank you for choosing our product. We hope you will get complete satisfaction ECS boiler.

We would like you to use your device with maximum efficiency, therefore please read this instruction book carefully before you start using the product and save it to refer to in the future.

This manual will help you to operate your device safely and efficiently. For this reason you should pay attention to these:

- *Please read this instruction book carefully before you install and operate the product.*
- *Follow the instructions and the rules on safe usage.*
- *The instruction book may apply to other models as well; the differences between the models are clearly described inside.*

GENERAL SAFETY WARNINGS!

1. Before attempting to install or operate this device/equipment, make sure you read and understand the entire installation, operation and service manual. Special attention must be given to all the safety warnings provided throughout this manual. Failure to follow these warnings could result in a fire or explosion causing property damage, personel injury or death.
2. Spare part that is bought from uncertified personnel or store might damage the equipment.
3. **DANGER:** Risk of electric shock! Do not try to repair or explore elektronik control-unit. That would be dangerous and cause to cancel the warranty.
4. Surface of the boiler would be hot during operation. To prevent burns, do not touch the surface bare hand. Use gloves.
5. Contact only Termodinamik A.Ş personnel for any electrical or mechanical services.
6. The burner and boiler contain part which produce sparkle. Therefore DO NOT keep any flammable matterial around the boiler.
7. **WARNING:** Must use ground-wire to supply power
8. Do not start the boiler which has damaged-wire
9. Instructions in this manual, for installation and annual-services, must be followed otherwise the producing company will not be responsible for any personel injury or death and the damages in/on equipment.
10. If the boiler starts smoking: Turn the power off righth away and contact qualified service personnel.
11. Shut the front lid completely before starting.
12. Do not allow a person, who is not knowledgeable about the boiler, interferes with it.
13. The user manual must be passed new owner in case of resale.
14. Do not use any hot liquid other than water.

15. The equipment is designed to produce 90 °C hot water for heating systems. Not use for other purposes.
16. The tank room must apply all regulations and conditions to exhaust the fume.
17. Installation, service and repair must be done by qualified service personnel.
18. EN 676 (gas fuel) or EN 267 (liquid fuel) certified burner must be used for ECS boilers.
19. The ventilation in boiler room must be continuous to provide maximum safety and efficiency.
20. The boiler must be installed on a 20 cm off-floor platform which must made out of a fire-resistance material that can carry the weight of boiler .
21. If any part of the boiler contact with water, do not start the boiler and call a qualified service personel to find out what happened and change the part which contacted with water.
22. Recommended to install an emergency switch, away from the boiler room, to shut off the boiler and gas flow.
23. If the system is fed by a type of fuel that is heavier than air (such as diesel) extra cautions must be taken. The boiler room must be designed to take the fuel tank out of the room or automatic shut off system for fuel-flow in case of fuel-leakage.

To get more information about your boiler; make sure to have serial number and capacity values of the boiler with you before contacting service personnel.

Fiberglass and fiber ceramic are used for insulation of the boiler. So that it is advised to have extra caution not to harm anyone or the equipment.

The Boiler

1. Do not use oil-based cleaning material.
2. Tap water would damage the boiler. The minerals in tap water will settle in fractions therefore heat transfer will reduce and the fractions will be damaged. Also O₂ and other gas ratio in tap water will cause corrosion. The boiler and pipes periodically must be checked for any leakages or damages.
3. Do not add cold water into the hot boiler which will cause cracks.

Do not add any material contains anti-freeze for automotive. Those material damage the system.

To determine location of the boiler

- 1. Check:** Plumbing
Ventilation
Fuel pipes
Electric Wiring
- 2. Clear:** Do not keep any flammable material around the boiler.
- 3. Dryness:** Around the whole system and the system including the boiler must be kept dry all the time.
- 4. Replace Old Boiler With New:** Check the whole system for corrosion, leakage, residue of CA++ (cause of tap water) and capacity of expansion tank.

WHEN YOU SMELL GAS

OPEN

- Windows and doors to ventilate for fresh air.

TURN OFF

- Main valves
- All natural gas appliances and their valves,

DO NOT

- Lit lighter or matches,
 - Smoke,
 - Touch electric switches,
 - Turn on/off appliances,
 - Unplug appliances,
 - Ring door bell,
 - Use land line phone,
 - Evacuate the area ,
 - Go to basement if the smell coming from basement,
 - Repair the problem your own.
- Dial the number is used in emergencies from one of your neighbour.

GENERAL INFORMATION

- Fuel Type: Natural gas - diesel
- Type of Combustion Chamber: Cylindrical
- Heating-either direct or return flame: There is no return flame.
- Boiler Type: Closed expansion, multi-stage burner.

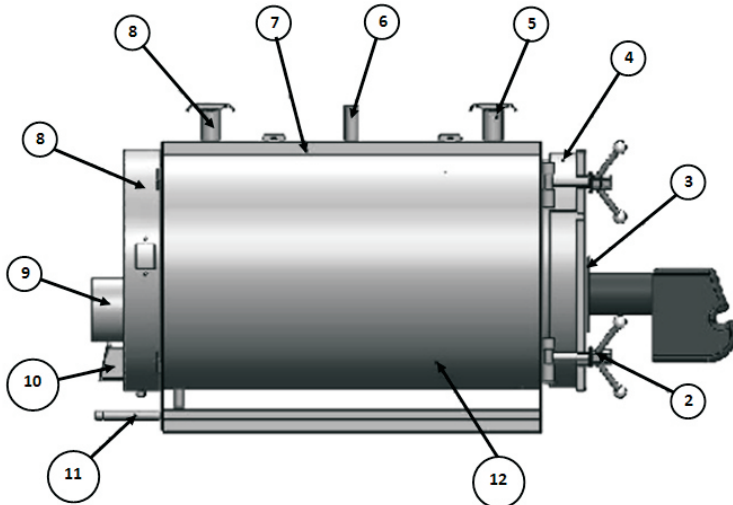
WHEN YOU SMELL GAS IN WELL

- To ventilate the air; please open all the doors and windows contact to the well.
- Shut off the main valve belongs to the main building.
- Do not use bells and electric switches.
- Do not operate any electrical equipment such as elevator in building and inform the manager of the building.

PRESANTATION OF THE PRODUCT

The product is 3-way-pass steel central heating boiler which, could operate with liquid or gas fuel and also heats water up to 90 °C to use in heating systems. By 3-way-pass-system, the thermal energy which is produced by burning the fuel, transmit to liquid very quickly and efficiently. Hence working life of the boiler will be longer. Thanks to 3-way-pass system the smoke reaches the exhaust pipe, NOx level drops pallel to smoke's temperature. Therefore 3-way-pass system not only increase the efficiency but also decrease pollution.

ECS BOILER MAIN PARTS

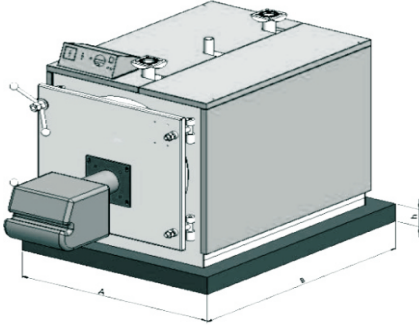


1. Boiler Frame
2. Hinge

3. Boiler Flange
4. Front Lid
5. Central System
Turning Water Connection
6. Safety Line

7. Bearer Supports
8. Central System Going
Water Connection
9. Shaft Pipe
10. Back Lid
11. Bursting Lid
12. Filling - Discharging

INSTALLATION



Montage platform where the boiler will be placed on must withstand the temperatures over 50°C. Concrete platform is recommended.

MODEL	Minimum ground sizes
	A(mm)xB(mm)xh(mm)
ECS 70	880x760x200
ECS 85	880x760x200
ECS 100	880x910x200
ECS 150	880x1202x200
ECS 200	1010x1130x200
ECS 250	1010x1230x200
ECS 300	1010x1330x200
ECS 350	1010x1510x200
ECS 400	1254x1380x200
ECS 500	1254x1720x200
ECS 600	1311x1740x200
ECS 700	1311x2010x200
ECS 800	1411x1960x200
ECS 900	1411x2200x200
ECS 1000	1411x2450x200
ECS 1250	1950x1766x200
ECS 1500	1950x1916x200
ECS 1750	1950x2116x200
ECS 2000	1950x2366x200

1. Keep the boiler on its own pallet and its own packing until location is decided.
2. Place the boiler on the location had been decided before.
3. Unpack it while on the pallet.
4. De-attach the boiler from the pallet in order of
 - a. Lift right side of the boiler and attach the right legs of the boiler.
 - b. Lift left side of the boiler and attach the left legs of the boiler.
 - c. Push the boiler back and secure it.

INSTALLATION WARNINGS

Installation and operation of the system must be in accordance with regulations, rules and the instructions in this manual.

Proper ventilation must be install to avoid condensing.

Electrical wiring must be in accordance with regulations and standart.

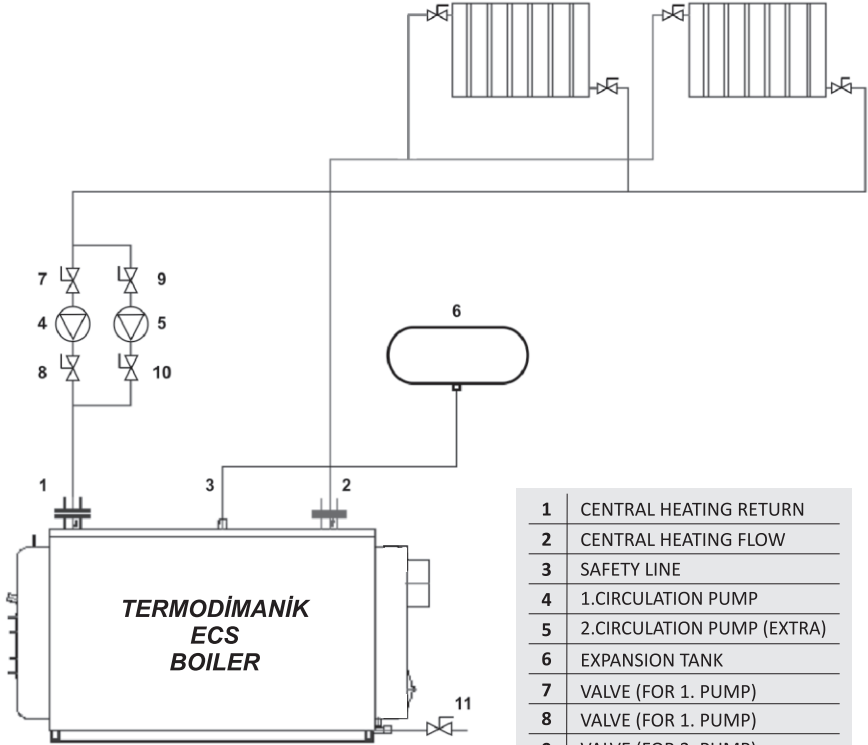
Flue connections must be in accordance with regulations and standart. The distance between chimney and boiler, and the number of elbow pipes must be mininum. The chimney must be isolated properly to avoid condensing.

After installation whole system must be controlled for leakage of water, fuel, electricity and chimney.

Do not put weight of burner on the front door of boiler. To carry the weight; proper platform must be built under the burner.

SAMPLE DIAGRAM

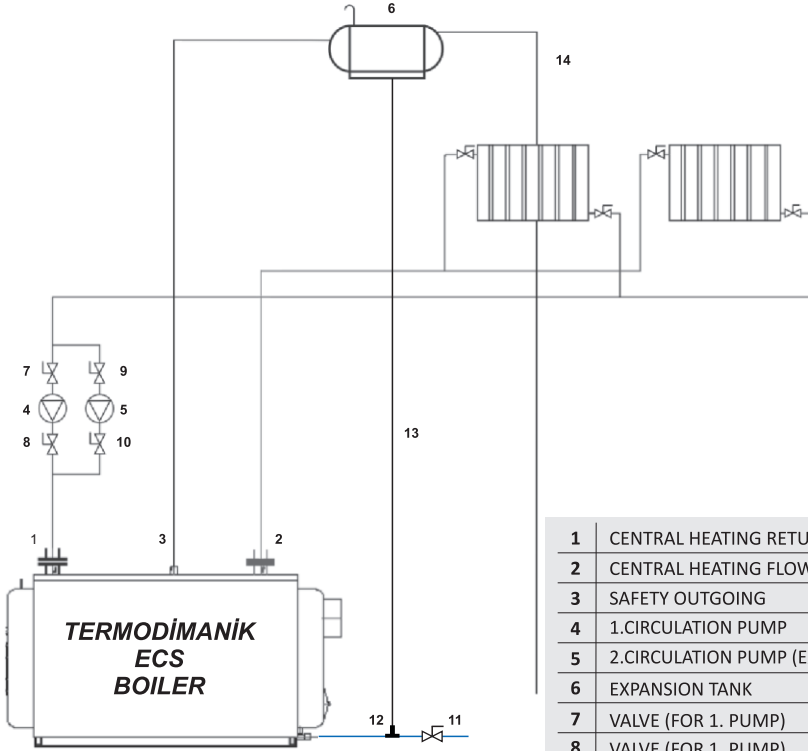
Closed Expansion Tank and Piping Detail



1	CENTRAL HEATING RETURN
2	CENTRAL HEATING FLOW
3	SAFETY LINE
4	1.CIRCULATION PUMP
5	2.CIRCULATION PUMP (EXTRA)
6	EXPANSION TANK
7	VALVE (FOR 1. PUMP)
8	VALVE (FOR 1. PUMP)
9	VALVE (FOR 2. PUMP)
10	VALVE (FOR 2. PUMP)
11	FILL VALVE

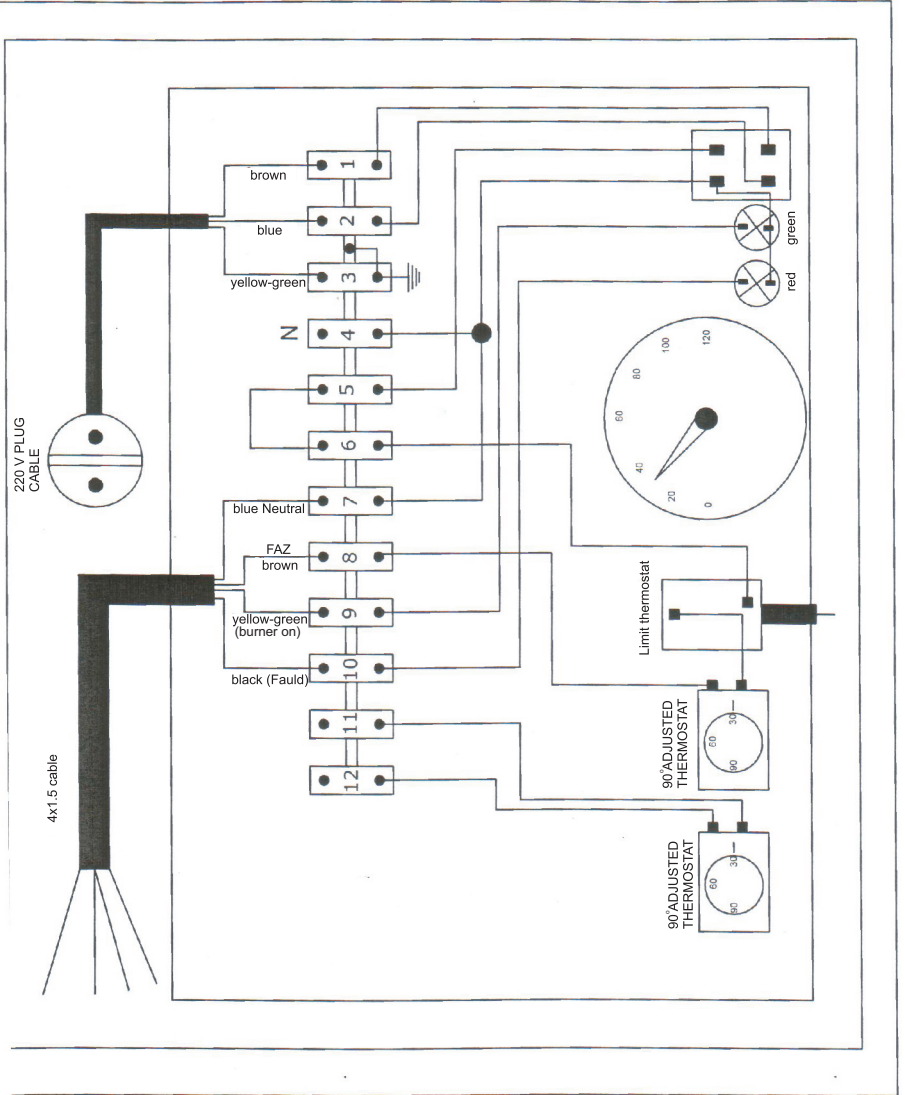
SAMPLE DIAGRAM

Open Expansion Tank and Piping Detail



1	CENTRAL HEATING RETURN
2	CENTRAL HEATING FLOW
3	SAFETY OUTGOING
4	1.CIRCULATION PUMP
5	2.CIRCULATION PUMP (EXTRA)
6	EXPANSION TANK
7	VALVE (FOR 1. PUMP)
8	VALVE (FOR 1. PUMP)
9	VALVE (FOR 2. PUMP)
10	VALVE (FOR 2. PUMP)
11	FILL VALVE
12	FITTINGS
13	SAFETY RETURN
14	MESSENGER PIPE

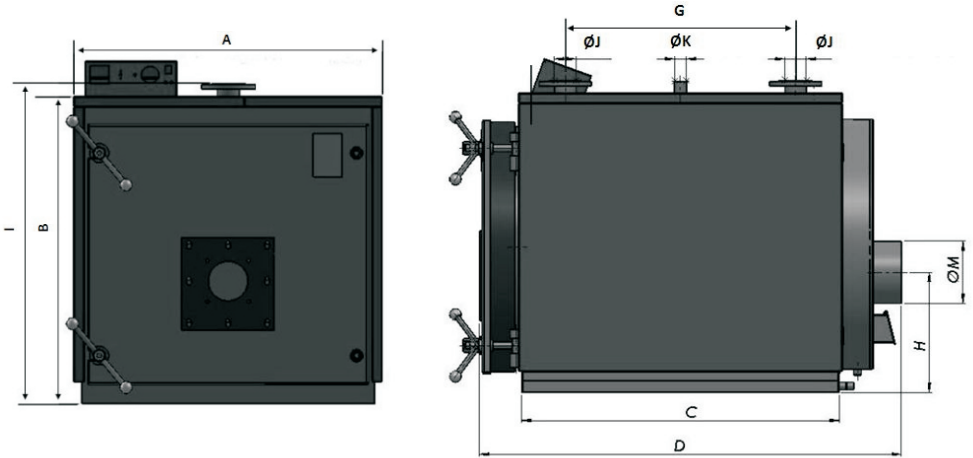
CONNECTION DIAGRAM



Check for any fuel leakages before starting the boiler. If so, first solve the problem, then operate the boiler.

There is a scent added in propane tank to notice any leakage; However you must still consider;

- Smell the air close to floor since propane accumulate close the floor. If so do not lit the boiler.
- Certified service personnel must start the propane-boiler.
- Check the smell of the propane periodically.
- Check for leakage the boiler and its pipes at least once a year.
- Consult with your propane-supplier about any detector.



BOILER DIMENSIONS

DIMENSIONS												
ECS 3G	Capacity	A	B	C	D	G	H	I	M	J	K	L
ECS 70	81	935	955	760	1130	450	390	1040	200	R2"	R1 1/4"	R 3/4"
ECS 85	99	935	955	760	1130	450	390	1040	200	R2"	R1 1/4"	R 3/4"
ECS 100	116	935	955	910	1280	600	390	1040	200	R2"	R1 1/4"	R 3/4"
ECS 150	174	935	955	1202	1572	892	390	1040	200	R2"	R1 1/4"	R 3/4"
ECS 200	232	1065	1060	1130	1500	820	426	1103	220	R2 1/2"	R1/2"	R 3/4"
ECS 250	291	1065	1060	1230	1600	920	426	1103	220	R2 1/2"	R1/2"	R 3/4"
ECS 300	349	1065	1060	1330	1700	1020	426	1103	220	R2 1/2"	R1/2"	R 3/4"
ECS 350	407	1065	1060	1510	1880	1200	426	1103	220	R2 1/2"	R1/2"	R 3/4"
ECS 400	465	1311	1285	1380	1752	1068	506	1367	250	R3"	2"	R 3/4"
ECS 500	581	1311	1285	1720	2165	1408	506	1367	250	R3"	2"	R 3/4"
ECS 600	698	1365	1315	1710	2194	1428	470	1394	300	R3"	2"	R 3/4"
ECS 700	814	1365	1315	2010	2445	1698	470	1394	300	R3"	2"	R 3/4"
ECS 800	930	1467	1467	1960	2407	1644	608	1545	350	R4"	R2 1/2"	R 3/4"
ECS 900	1046	1467	1467	2200	2647	1890	608	1545	350	R4"	R2 1/2"	R 3/4"
ECS 1000	1162	1467	1467	2450	2897	2134	608	1545	350	R4"	R2 1/2"	R 3/4"
ECS 1250	1454	2008	1916	1766	2266	1450	1275	2010	350	R5"	R2 1/2"	R 3/4"
ECS 1500	1744	2008	1916	1916	2416	1600	1275	2010	350	R5"	R2 1/2"	R 3/4"
ECS 1750	2035	2008	1916	2116	2616	1800	1275	2010	350	R5"	R3"	R 3/4"
ECS 2000	2326	2008	1916	2366	2816	2050	1275	2010	350	R5"	R3"	R 3/4"

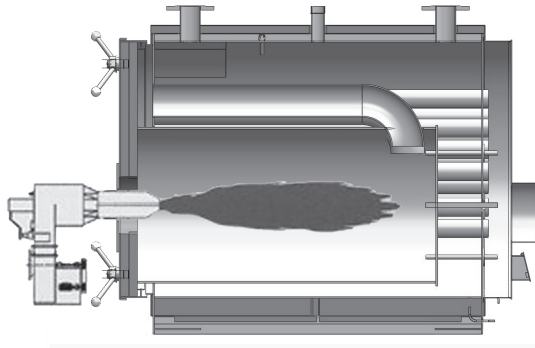
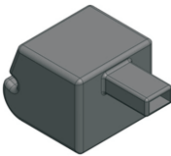
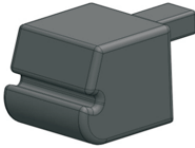
SELECTION OF BOILER BURNERS

Burner Flange Dimensions for ECS 2G and 3G	Model (ECS 2G and 3G)	ECS 70 - 150	ECS 200 - 350	ECS 400-2000
	Dimensions	240 x 250	320 x 320	370 x 370
Hole Diameter Centre of the Flange	Model (ECS 2G and 3G)	ECS 70 - 150	ECS 200 - 2000	
	Ø (mm)	130	137	

In order to ensure the best efficiency of your boiler, perform your burner selection according to the following criteria:

- Boiler Capacity
- Value of Back Pressure Boiler
- Measures of distances and components between front cover and combustion chamber. (This criterion will determine the length of the barrel of your burner.)

In order to operate ECS boilers in compliance with gas burning appliances and efficiency directives, burners complying with EN 676 (gas fueled) and EN 267 (liquid fuel) norms must be used.



TECHNICAL SPECIFICATIONS

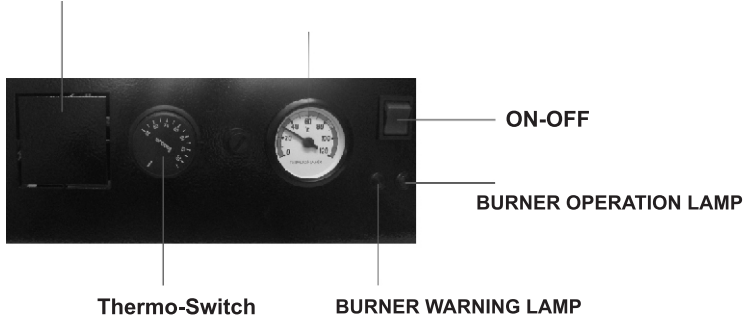
Model	Heat Outlet kW	Heat Inlet kW	Max. Heat Inlet kW	Rated Power and Heat Power Range	Back Pressure Pa	Boiler Losses kW	Water Part Resistance bar	Max Ope. Temperature °C	Temperature Range °C	Combusitor Pressure mbar	Max Ope. Pressure bar	Test Pressure bar
ECS 70	81,4	88,9	94	81	234,06	1,47	0,18	95	40-90	0,5	5 6 7 8	7,5 9 10,5 12
ECS 85	98,8	107,6	113	99	240,64	1,78	0,18	95	40-90	0,5	5 6 7 8	7,5 9 10,5 12
ECS 100	116,3	127,7	132	116	247,21	1,74	0,24	95	40-90	0,6	5 6 7 8	7,5 9 10,5 12
ECS 150	174,4	191,5	203	174	269,16	2,4	0,27	95	40-90	1,2	5 6 7 8	7,5 9 10,5 12
ECS 200	232,5	255,5	261	232	291,11	2,91	0,3	95	40-90	1,6	5 6 7 8	7,5 9 10,5 12
ECS 250	290,7	319,3	334	291	313,1	3,27	0,32	95	40-90	2,4	5 6 7 8	7,5 9 10,5 12
ECS 300	348,8	383,2	402,3	349	335,05	3,49	0,36	95	40-90	3,3	5 6 7 8	7,5 9 10,5 12
ECS 350	406,97	447	460,4	407	357	3,56	0,4	95	40-90	4,2	5 6 7 8	7,5 9 10,5 12
ECS 400	465,11	510,9	526,2	465	378,95	3,49	0,6	95	40-90	4,5	5 6 7 8	7,5 9 10,5 12
ECS 500	581,4	638,6	657,7	581	422,85	4,07	0,62	95	40-90	4,8	5 6 7 8	7,5 9 10,5 12
ECS 600	697,7	766,3	789,3	698	466,75	4,54	0,65	95	40-90	5,3	5 6 7 8	7,5 9 10,5 12
ECS 700	813,95	894	920,8	814	510,69	4,88	0,68	95	40-90	5,9	5 6 7 8	7,5 9 10,5 12
ECS 800	930,23	1021,7	1052,3	930	554,59	5,12	0,7	95	40-90	6,4	5 6 7 8	7,5 9 10,5 12
ECS 900	1046,5	1149,4	1183,8	1047	598,49	5,56	0,78	95	40-90	7	5 6 7 8	7,5 9 10,5 12
ECS 1000	1162,8	1277,3	1315,6	1163	642,39	5,82	0,85	95	40-90	7,5	5 6 7 8	7,5 9 10,5 12
ECS 1250	1453,5	1596	1570	1453	751,12	7,27	0,93	95	40-90	7,51	5 6 7 8	7,5 9 10,5 12
ECS 1500	1744,2	1916	1832	1744	860,68	8,72	1,02	95	40-90	8,6	5 6 7 8	7,5 9 10,5 12
ECS 1750	2034,9	2223	2136	2035	970,24	10,17	1,11	95	40-90	9,2	5 6 7 8	7,5 9 10,5 12
ECS 2000	2325,58	2540	2442	2326	1079,81	11,63	1,2	95	40-90	9,6	5 6 7 8	7,5 9 10,5 12

TECHNICAL SPECIFICATIONS

Model	Water Capacity L (2G)	Water Capacity L (6G)	Flue Pipe Diameter mm	Combustor Dimensions mm	Inlet-Outlet Water Con. inch	Inlet-Outlet Water Con. inch	Flue Outlet Temperature Range °C	Temp. of the combustion Products at the Discharge for the Heat Capacity Regulating Extent °C	Mass Flow Rate of the Combustions Products at the Discharge kg/s	Required Draught mbar	Gas Volume of the Boiler (m ³)
ECS 70	174	178,5	200	430 668	0,097	2"	170-195	70	279.13	0.5	0.217
ECS 85	174	178,5	200	430 668	0,097	2"	170-195	70	279.13	0.6	0.217
ECS 100	208	213	200	430 820	0,119	2"	175-195	70	280.35	0.6	0.218
ECS 150	272	278	200	430 1110	0,161	2"	170-195	75	283.2	1.0	0.220
ECS 200	346	337,5	220	535 1000	0,225	2 1/2"	170-195	75	281.43	1.2	0.405
ECS 250	374	364,9	220	535 1100	0,247	2 1/2"	175-196	75	284.24	1.4	0.439
ECS 300	405	395,3	220	535 1189	0,267	2 1/2"	170-195	80	285.53	1.5	0.450
ECS 350	454	442,2	220	535 1379	0,31	2 1/2"	170-195	80	284.94	1.6	0.470
ECS 400	583	614,7	250	650 1248	0,414	3"	175-197	80	284.56	1.8	0.763
ECS 500	739	768,1	250	650 1563	0,519	3"	170-195	80	284.01	3.2	0.919
ECS 600	760	792,2	300	738 1583	0,677	3"	170-195	85	283.27	3.3	1.084
ECS 700	869	890,6	300	738 1853	0,793	3"	175-196	85	281.14	3.4	1.239
ECS 800	1037	1033,1	350	820 1776	0,938	4"	170-195	90	282.51	3.7	1.501
ECS 900	1154	1149,12	350	820 2015	1,64	4"	170-195	90	280.74	3.8	1.546
ECS 1000	1276	1269,4	350	820 2265	1,196	4"	175-197	95	283.56	3.8	1.841
ECS 1250	1305	2102	400	1150 1500	2,04	5"	170-195	105	285.68	4.2	2.59
ECS 1500	1452	2165	400	1150 1650	2,09	5"	170-195	105	286.28	4.5	2.65
ECS 1750	1701	2378	400	1130 1800	2,28	5"	180-195	105	289.36	4.8	2.84
ECS 2000	1894	2555	400	1130 2100	2,58	5"	180-195	105	291.48	5.1	3.14

ELECTRONIC CONTROL PANEL

CLOCK HOLE (OPTIONAL)



BOILER OPERATION

- Be sure that the gas valve is open.
- Check that the safety valve is open.
- Set the operating temperature on the control panel.
- Activate the burner by pressing on-off button on the control panel.
- Check the burner operation lamp and be sure if the burner is on or off.
- If the malfunction indicator lamp light up on the control panel, there is a fault in the burner. Call authorised service.

CLEANING AND MAINTENANCE

Advised that annual service must be done by a qualified service personnel to confirm the boiler and its component work safely and efficiently. The technician who install the system must emphasize how important is the annual-service and warn the user for otherwise.

Before To Start Cleaning:

1. Turn off main power
2. Turn off circulation-pump-power
3. Turn off gas-valve to stop gas-flow
4. Make sure that surface of the boiler is cool down
5. Open the front door and take out turbulator and clean
6. Brush inside of the pipes and main tank
7. Control leakage from back and front door
8. After cleaning put back all the turbulator
9. Turn fuel-line back on
10. Turn power back on

Before Contacting To A Qualified Personnel When The Boiler Is Out Of Order:

Please check: If the system power is on or not

If there is efficient pressure exist or not

If fuel-valve is on or not

If efficient water level and its pressure exist or not.

WARNING!!!

Before winter-season, it is important to have a qualified personnel to check your system, by reference the list below, for efficiency of your equipment and your safety.

- Boiler user must remove the turbulators, clean combustor chamber and inner surface of the pipes with pipe brush.

BOILER SERVICE PLAN

Step by Step

Piping

Exterior Piping	Check the boiler and all the pipes in whole system for leakage.if needed add supports under exterior pipes.
Ventilation	Check all the ventilation system
Gas	Check for leakage, wear and tear, and supports under pipes

System

Visual	Check whole system for any unusual look
Functional	Test all functional systems (heating,safety, hot water input (if install))

Electric

Connection	Check connection of all the wiring make sure there is no loose wire.
Braker	Make sure proper braker system is installed and works properly.
On/ Off Switch and Plugs	Check on/off switch and plugs are sufficient for the system and work properly
Smoke and CO-Dedector	Make sure there is one is installed and works properly. Its batteries are working

Boiler Room and Burner Chamber

Boiler Room and Brulor	Clean burner chamber if needed.
Burner Chamber	Check barrel of boiler and service boiler chamber according to user manual.

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