



# Gas and Liquid Fuel Steel Boiler



**2 Pass CGS2 Series  
116-930 kW Low Temperature Boiler**



LEADER IN STEEL BODY BOILERS

# Gas and Liquid Fuel **2 PASS CGS2 SERIES** Steel Boiler



## STATE OF THE ART TECHNOLOGY

All manufacturing processes, methods and materials comply with the relevant European and national norms. Boilers are manufactured using cutting edge automation technologies such as CNC punch, CNC plasma, NC welding robots and NC bending.

## HIGH EFFICIENCY

High volume combustion chamber and maximized heat transfer surfaces ensure efficiency and maximized energy transfer to water.

Efficiency is maximized while gas and water side boiler resistance and boiler stand-by losses are minimized. CGS2 series boilers have optimized combustion chambers which enable them to achieve nitrous oxide levels in accordance with the European directives. No environmentally hazardous materials (such as asbestos) were used in production of the boiler.

## LONG SERVICE LIFE

Long service life thanks to design and calculations in accordance with European directives (EN12953), certified materials, balanced design in the thermal expansion areas and approved automated source methods. 5 years warranty.

## AESTHETICALLY APPEALING DESIGN

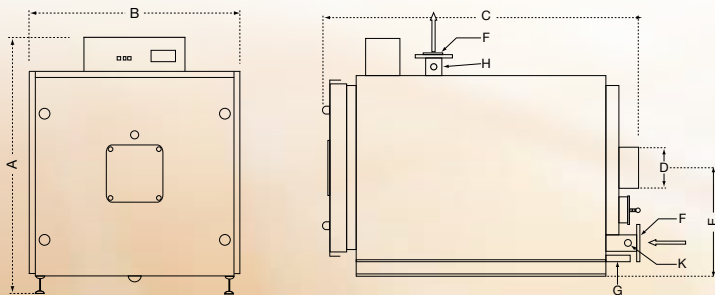
The outer protection plates are double shielded against corrosion and ambient conditions:

1. Both surfaces are coated with a special organic protective primer coating.
2. The front side is coated with an appealing, protective topcoat.

## COMPATIBLE WITH THE BURNER OPERATION

No need for special long nozzle, high pressure burners. A highly efficient, stable, smooth and silent combustion is achieved through the use of burners in accordance with EN 676 and EN 267 standards.





## Easy installation, simple maintenance and safe operation

Easy installation, maintenance and reliability thanks to specially designed hinge system which can open in two directions. Independently adjustable sealing on the 4 edges. To protect from possible sealing damage, the cover is automatically pulled forward while loosening the hinge side.



		CGS2-100	CGS2-125	CGS2-150	CGS2-200	CGS2-250	CGS2-300
Rated thermal power	kcal/h x 1000	100	125	150	200	250	300
	kW	116	145	174	233	291	349
Rated thermal load	kcal/h x 1000	108	135	162	216	270	324
	kW	125	157	188	251	314	376
Efficiency	%	92.7					
Maximum operating pressure*	bar	3					
Maximum operating temperature	°C	90					
Flue gas side resistance	Pa	5	6	6	11	10	7
	mbar	0.5	0.6	0.6	1.1	1.0	0.7
Recommended flow rate	m³/h	5	7	8	10	12	15
Water side resistance (at the recommended flow rate)	mbar	6	10	10	12	14	14
	mSS	0.06	0.10	0.10	0.12	0.14	0.14
Water output to the network	inch	NW50	NW50	NW65	NW65	NW65	NW65
Water input from the network	inch	NW50	NW50	NW65	NW65	NW65	NW65
Safety output connection	inch	1"	1"	1 ¼"	1 ½"	1 ½"	1 ½"
Safety input connection	inch	1"	1"	1 ¼"	1 ½"	1 ½"	1 ½"
Boiler weight (w/o water)	inch	352	407	447	552	712	790
Boiler water volume	Lt	141	151	139	234	293	347

### FLUE GAS VALUES \*\*

Flue gas temperature	Full load	°C	190					
	Partial load	°C	120					
Flue gas flow rate	Full load	gr/sec	47	60	71	95	117	141
	Full load	m³/hr	188	237	284	378	471	566
	Partial load	gr/sec	28	35	42	57	71	85
	Partial load	m³/hr	113	142	170	227	283	340
Flue gas required delivery	Pa, mbar		0					

### DIMENSIONS

A	mm	1030	1030	1030	1155	1155	1260
B	mm	820	820	820	945	945	1050
C	mm	1350	1370	1370	1590	1590	1810
D	mm	200	200	200	200	200	250
E	mm	460	460	460	525	525	575
F	mm	NW50	NW50	NW65	NW65	NW65	NW65
G	inch	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"
H	inch	1"	1"	1 ¼"	1 ½"	1 ½"	1 ½"
K	inch	1"	1"	1 ¼"	1 ½"	1 ½"	1 ½"
Combustion chamber diameter	mm	400	450	450	473	500	530
Combustion chamber length	mm	880	900	900	1050	1100	1280

\* Boilers with higher operating pressure can be manufactured if required.

\*\* This values apply for 10% CO<sub>2</sub> with natural gas. Calculated at boiler water temperature of 75°C and burning air temperature of 20°C. Partial load is equal to 30% of rated power. Any changes in the partial load are calculated separately.



## Perfect natural circulation and maximum heat transfer

Perfect natural circulation and maximum heat transfer thanks to the balanced distribution of large water galleries within the boiler.



## Minimum feed losses

Boiler radiation and stand-by losses are kept at minimum thanks to aluminium foil, glass wool insulation.



## Perfect isolation and sealing

Unparalleled insulation and gas tightness; High temperature resistance (1371°C), High strength (62 kg/cm<sup>2</sup>) Low density (1.28 kg/dm<sup>3</sup>), Low thermal conductivity (0.33 kCal/hr (C/M))

			CGS2-350	CGS2-400	CGS2-450	CGS2-500	CGS2-600	CGS2-700	CGS2-800
Rated thermal power	kcal/h x 1000		350	400	450	500	600	700	800
	kW		407	465	523	582	698	814	930
Rated thermal load			378	431	485	539	647	755	863
	kW		439	502	565	627	753	878	1004
Efficiency	%	92.7							
Maximum operating pressure*	bar	3							
Maximum operating temperature	°C	90							
Flue gas side resistance	Pa		5	6	6	13	16	22	29
	mbar		0.5	0.6	0.6	1.3	1.6	2.2	2.9
Recommended flow rate	m³/h		18	20	23	25	30	35	40
Water side resistance (at the recommended flow rate)	mbar		15	15	15	16	16	18	20
	mSS		0.15	0.15	0.15	0.16	0.16	0.18	0.20
Water output to the network	inch		NW80	NW80	NW80	NW100	NW100	NW100	NW100
Water input from the network	inch		NW80	NW80	NW80	NW100	NW100	NW100	NW100
Safety output connection	inch		1 ½"	1 ½"	1 ½"	2"	2"	2"	2"
Safety input connection	inch		1 ½"	1 ½"	1 ½"	2"	2"	2"	2"
Boiler weight (w/o water)	Kg		990	1125	1250	1350	1485	1755	2025
Boiler water volume	Lt		394	608	630	652	691	794	1012
FLUE GAS VALUES **									
Flue gas temperature	Full load	°C	190						
	Partial load	°C	120						
Flue gas flow rate	Full load	gr/sec	165	188	212	235	282	330	376
	Full load	m³/hr	660	753	847	942	1130	1317	1505
	Partial load	gr/sec	99	113	127	141	170	198	226
	Partial load	m³/hr	396	452	508	565	678	790	903
Flue gas required delivery	Pa, mbar		0						
DIMENSIONS									
A	mm		1260	1375	1375	1465	1465	1600	1600
B	mm		1050	1140	1140	1235	1235	1370	1370
C	mm		1840	2080	2080	2080	2080	2290	2290
D	mm		250	250	250	300	350	350	350
E	mm		575	645	645	690	690	755	755
F	mm		NW80	NW80	NW80	NW100	NW100	NW100	NW100
G	inch		3/4"	3/4"	3/4"	3/4"	1"	1"	1"
H	inch		1 ½"	1 ½"	1 ½"	2"	2"	2"	2"
K	inch		1 ½"	1 ½"	1 ½"	2"	2"	2"	2"
Combustion chamber diameter	mm		600	600	600	630	670	750	750
Combustion chamber length	mm		1300	1500	1500	1500	1500	1700	1700

\* Boilers with higher operating pressure can be manufactured if required.

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# Boiler Control Panels



## STANDARD PANEL

1



1. Control Panel Fuse
2. Safety Limit Thermostat
3. Boiler Temperature Indicator
4. Main Control Switch
5. Control Panel Energy Lamp, Pump Operation Lamp
6. Limit Thermostat Failure Lamp
7. First and Second Level Thermostat

## EKOPANEL (7/21 and 12/31)

2



**Up to 20% savings, up to 35% savings with three way motor valve.**

### Complete Comfort with Ekopanel Complete Safety

Ekopanel is a cutting-edge technology microprocessor to operate the heating system in the most efficient and economical manner, optimize operation time, increase service life and provide comfort & economy in one device. It continuously monitors the outside temperature all day long. It provides uninterrupted comfort by operating the boiler to provide the required comfort temperature...

#### Condensation Safety

In order to prevent the water vapour inside the flue gas from condensing and therefore undermining the service life of the boiler, the ekopanel will stop the circulation pumps temporarily when the burner starts/stops. The boiler temperature dramatically increases. The critical area is free from condensation.

#### High and Low Temperature Safety

Ekopanel turns the boiler on and prevent the piping and boiler water from freezing when the temperature of the boiler water drops below the freezing point. It stops the boiler when the temperature is too high.

#### Lime & Deposits Safety

Ekopanel runs the circulation pump and valve motor intermittently to prevent limestone deposits from blocking the pump, valves and the boiler.

#### Remote and Manual Control

The system can be operated without accessing the boiler room using a digital or analogue room unit. You can switch to manual operation mode just by pressing a button to control the boiler from its own panel.

#### Fuel Savings

Ekopanel continuously monitors the outside temperature. It calculates the "reduced outside temperature" taking into consideration many factors such as the heat stored in the building walls and the ambient radiation. The boiler operation depends on this temperature. It saves fuel.

#### Economy under all Circumstances

It saves fuel at night time thanks to "Economy Temperature". When outdoor temperature exceeds a certain limit, automatic summer-winter operation switches the boiler to summer mode to prevent unnecessary heating.

#### Scheduled Heating

The operating hours of the boiler can be scheduled daily or weekly.

#### Optimum Switch On/Off

It calculates the start count and running time of the boiler taking into consideration the weekly operation schedule and the set room temperature. It controls the operation of the boiler using these values. Prevents unnecessary operation.







### 1. Reversible Flame Combustion Chamber

Large volume combustion chamber. In order to ensure a complete burning process, flame and combustion gases formed in the burner are fed back from the back mirror of boiler combustion chamber to meet with the burner flame once more so that any remaining flammable materials and gasses are completely burned. This process produces max. usable thermal energy while decreasing the amount of hazardous waste gases.

### 2. Flues and Turbulators

Turbulators located inside the flues enable the flue gases to swivel ensuring maximum heat transfer to the boiler water. Decrease the temperature of the flue gas to ensure an optimal setting.

### 3. Boiler Body

The boiler has a completely welded, flame flue type, single block steel body. Possible thermal stresses are balanced thanks to homogeneous heat transfer. It has a long service life.

### 4. Feet

Single piece, robust steel feet that extend throughout the boiler. Easy to slide along piping to move the boiler.

### 5. Front Cover Insulation

Insulation with a high temperature resistant refractory material. Extended gas tightness life thanks to flexible thick filters.

### 6. Boiler Outer Protection Plates

Metallic grey, double coated special protective paint. Aesthetically appealing and modern look.

### 7. Body Insulation

Boiler stand-by losses are reduced to minimum thanks to perfectly insulated body.

### 8. Cover

The front cover can be opened in both directions. Easy installation, maintenance and cleaning. Independently adjustable sealing on the 4 edges thanks to specially designed hinge system. To protect from possible sealing damage, the cover is automatically pulled forward while loosening the hinge side.

### 9. Gas/Liquid Burner

No need for long nozzle, high pressure burners. It is fully compatible with all burners that are standards compliant.



The right to amend specifications under technologic developments is reserved

**ALARKO**



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