FUEL OIL CONDENSING BOILERS

GTU C 220: fuel oil condensing boilers from 40 to 85 kW for hot water central heating only











PROJECT

The GTU C 220 are fuel oil condensing cast iron boilers with sealed pressurised combustion chamber and a tubular corrosion-resistant exchanger condenser on the flue gases in ceramic.

They are available with 2 different control panels which can control the 2-stage burner which is fitted with the boilers:

- **B2 basic control panel:** used to operate the installation by regulating the temperature with the boiler thermostat . It can control a direct circuit and a DHW circuit (sensor optional),
- DIEMATIC 3 control panel + AD217 additional package: includes electronic programmable regulation to modulate the boiler temperature according to the outside temperature. It is capable of automatically operating a central heating installation with a direct circuit, a circuit with mixing valve (outlet sensor downstream of the valve in option) and a DHW circuit (DHW sensor in option).

CONDITIONS OF USE Max. working pressure: 3 bar Max. working temperature: 100°C Thermostat adjustable from 30 to 90°C Safety thermostat: 110°C

CLASSIFICATION B₂₃ - B_{23P}



PRESENTATION

GTU C 220 boilers are oil-fired condensing boilers with an output of 40.0 to 85.0 kW at $50/30^{\circ}$ C and an **annual efficiency of up to** 104%.

- Main heating body in Eutectic cast iron with pressurised humid combustion chamber with integral 3-path flue gas discharge. This combustion chamber design ensures a low NOx level and is perfectly adapted for use with low NOx burners.
- Cast iron baffles are fitted as standard to all emissions flues.
- Full insulation of the heating body with glass-wool covered on both sides with a protective fabric guaranteeing that it will be hard wearing and easy to put in place.
- Easy boiler maintenance thanks to:
- A hinged door for sweeping, which can be accessed by simply removing the front panel;
- The modularity of the baffles, which can be removed and cleaned on the ground;
- A flue gas channel design that allows the use of a suction nozzle. This system allows full cleaning of the heating body.
- Reversible burner door (opens to the left or right) with thick insulation (ceramic fibre) fitted with a flame viewport.

- Steel casing coated on both sides with kiln-fired epoxy polyester paint with 2 integrated cable ways (low voltage and very low voltage) in the side panels.
- 2-stage oil burner with post-ventilation and low pollution emissions (NOx < 100 mg/kWh at 50/30 °C – NOx Class: 3 in accordance with EN 15034).
- Recuperator-condenser on the flue gases with exchange surfaces in ceramic, which is impervious to corrosion.
- Condensates evacuation by connecting the flexible pipe to the high capacity siphon, which is integrated under the condenser inside the boiler casing.
- Adjustable feet to allow for the adjustment of the flue gas connections between boiler and condenser.
- Choice of 2 control panels with DWH priority function:
- B2: operation by boiler thermostat for controlling a direct circuit: see page 5,
- D + AD 217: DIEMATIC 3 + PCB 2-stage/modulating/3 way valve allowing in more the control of a circuit with a mixing valve (outlet sensor optional): see page 6.

MODELS AVAILABLE

				Control panel			
Boiler		Nominal output at 50/30 °C					
		kW	Mcal/h	B2 see p. 5	D + AD 217 IDIEMATIC 3 + PCB AD 2171 see p. 6		
		40.0-50.0	34.5-43.1	GTU C 225 B2	GTU C 225 D + AD 217		
6TU C 222_00001	For heating only. (DHW production by independent tank)	50.0-67.0	43.1-57.8	GTU C 226 B2	GTU C 226 D + AD 217		
		67.0-85.0	57.8-73.3	GTU C 227 B2	GTU C 227 D + AD 217		

TECHNICAL SPECIFICATIONS

BOILER SPECIFICATIONS

Condensing boiler Min. flow temperature: 30°C Min. return temperature: 20°C Max. operating temperature: 100°C Max. operating pressure: 3 bar Thermostat adjustable: 30 to 90°C Safety thermostat: 110°C Classification: B₂₃, B_{23P} NOx classification: 3

Model	GTU C	225	226	227
Nominal output 50/30°C	kW	50	67	85
Efficiency at% PCI 100% at average temp. 70°C	%	96.1	96.6	96.4
output and°C 100% at return temp. 30°C	%	102.0	102.2	101.7
water temp. 30% at return temp. 30°C	%	102.7	102.6	102.0
Water flow at $\Delta t = 20$ K	m³/h	2.15	2.88	3.66
Stand-by losses at $\Delta t = 30$ K	W	198	215	237
% losses through the walls	%	84	86	88
Auxiliary electrical power (without circul. pump) at Pn with DIEMATIC 3 control panel	W	60	90	120
Usefull output at 50/30°C	kW	40.0-50.0	50.0-67.0	67.0-85.0
Usefull output at 80/60°C	kW	37.7-47.1	47.1-63.3	63.1-80.6
Water content		50	60	67
Water resistance at Δ t: 20 K (1)	mbar	50	145	233
Combustion chamber: Ø 309 equiv./depth	mm	309/573	309/700	309/827
volume		42	51	60
Flue gas temperature	°C	< 70	< 65	< 70
Flue gas mass	kg/h	75	101	129
Maximum pressure available at the nozzle	mbar	0.4	0.6	0.8
Flue gas circuit volume		78	96	110
Weight empty (with DIEMATIC 3 control panel)	kg	297	347	386

(1) At nominal stage, CO₂: 12,5% with domestic fuel



TECHNICAL SPECIFICATIONS

Main dimensions (mm and inches)



CHOICE OF CONTROL PANEL AND OPTIONS

Choice of options according to the control panel type and the connected circuits								
Boiler self-sanding or boiler 1 of a cascade				scade	Boiler 2 to 10	of a cascade		
							by addition	onal boiler
Control panel	Circuit type	DHW	direct	2 x direct	valve or direct + 1 valve	2 x valve or direct + 2 x with valve	valve	2 x with valve
B2	GTUC 220 B2	AD 212	As standard	2 x AD 140, 137 or 200	no	no	no	no
D + AD 217	GTUC 220 D + AD 217	AD 212	As standard	1 x AD 199	1 x AD 199	1 x AD 199 + 1 x FM 48	1 x AD 199	1 x AD 199 + 1 x FM 48

B2 CONTROL PANEL

The B2 control panel, which can be fitted to all boilers in the GTU C 220 range, is used to control 2-stage burners and includes the control and safety devices used to operate the installation by regulating the temperature with the boiler thermostat. It is factory fitted with domestic hot water production priority: DHW sensor or delivered as an option (package AD 212) for GTU C 220s connected to an independent DHW calorifier. 3 room temperature thermostats can also be delivered as options; when the B2 control panel is used with 2 room temperature thermostats, it can control 2 direct circuits.



B2 CONTROL PANELS OPTIONS



Domestic hot water sensor - Package AD 212

This is used to regulate the boiler with domestic hot water temperature priority.

It is fitted as standard to the GT 2200. The connector provided is used to deactivate the Titan

Programmable wire-controlled room thermostat -Package AD 247

This thermostat handles the regulation and weekly programming of heating by activating the burner and in accordance with the following 3 modes of operation:

- Automatic: according to programming (4 programmes to choose from), automatically switches the installation to "comfort" or "low" mode. The comfort and low temperatures can be adjusted between 5 and 30 °C.

Programmable wireless room thermostat - Package AD 200

This radio transmission thermostat handles the regulation and weekly programming of heating by activating the burner and according to the same modes of operation as the programmable room thermostat in package AD 247. It is delivered with a receiver box to be affixed to the wall close to the boiler.

Active System® function if a DHW calorifier with magnesium anode protection is connected.

- Permanent: maintains the desired temperature all the time (between 5 and 30 °C).
- Holidays: intended for long absences, maintains the desired temperature (between 5 and 30 °C) for a predetermined duration (1 to 99 days). **Characteristics:**
- power supply: 2 LR6 batteries provided
- static differential: +/-0.3 K
- connection using 2 wires



- **Characteristics**
- power supply: 2 LR6 batteries provided
- static differential: +/-0.3 K
- radio wave transmission, therefore no wires, transmission radius: 75 m unobstructed or from the cellar to the loft up to 2 floors
- connection of the receiver box to the boiler control panel by means of the prefitted 2-wire cable



Non-programmable room thermostat - Package AD 140

This room thermostat is used to regulate the room temperature between 6 and 30 °C by activating the burner.

- **Characteristics:** - static differential: +/-0.4 K
- connection using 2 wires

D + AD 217: DIEMATIC 3 CONTROL PANEL WITH AD 217 ADDITIONAL PACKAGE

The DIEMATIC 3 control panel is a very advanced control panel, which includes electronic programmable regulation to modulate the boiler temperature by activating the **2-stage burner** according to the outside temperature and also to the room temperature, if a CDI 2 or CDR D. iSystem interactive remote control (optional) is connected.

D control panel is capable of automatically operating a central heating installation with a direct circuit without mixing valve (which can even be configured as a swimming pool circuit). Connection of a domestic hot water sensor enables the programming and regulation of a DHW circuit by activating a control unit on the load pump; DHW circulation loop can be handled thanks to an auxiliary contact which includes its own programming. Apart from controlling the 2-stage burner, the 2-stage/ modulating/3 WV PCB includes as standard the control and programme for 1 circuit with mixing valve: to do so, simply connect it to an outlet sensor – package AD 199 (optional). In an installation with a second valve circuit, the D control panel can be further complemented with a "PCB + sensor for 1 mixing valve" – package FM48 (optional) – in addition to the AD 217 PCB. In a cascade installation with up to 10 boilers, D control panels + AD 217 can be used to control injection pumps and gate valves. D control panel also provides antifreeze protection for the heating system water if the owner is absent (absence programmable up to 1 year in advance for a period of up to 99 days). Furthermore, the control system included an "anti-legionella" protection option.

Control panel



DIEMATIC 3 control module, flap closed



DIEMATIC 3 control module, flap open

Manual "Summer" shutdown key: heating is shut down but DHW production continues



D + AD 217: DIEMATIC 3 CONTROL PANEL WITH AD 217 ADDITIONAL PACKAGE

Options for D (DIEMATIC 3) control panel with AD 217 additional package

Domestic hot water sensor - Package AD 212 This is used to regulate the boiler with domestic hot





water temperature priority.

Outlet sensor downstream of the valve - Package AD 199 This sensor is required if using the "2 st./mod./3WV PCB" for controlling the first circuit with mixing valve.



2 st./mod./3WV PCB - Package AD 217



two-direction electrothermal or electromechanical motor. The valve circuit and its circulating pump can mixing valve

Note: D control panels with AD 217 PCB can be fitted with 1 outlet sensor downstream of the valve (package AD 199) + 1 PCB + sensor option for 1

The connector provided is used to deactivate the

Titan Active System[®] function if a DHW calorifier with magnesium anode protection is connected.

downstream of the valve (package AD 199) must be ordered separately, however.

In the case of the CDR D. iSystem, the data are

transmitted by radio waves from the place where

the CDR D. iSystem is installed to the transmitter/

receiver box placed close to the boiler.

EM 51



AD 284











The connection of a simplified remote control is used to override certain instructions from the D control panel from the room in which it is installed: programme override (permanent comfort or low)

Flue gas sensor - Package FM 47

This enables the user to read the display on the flue gas temperature table and control the state of cleanliness of the heating exchange surfaces in the

Radio outside temperature sensor - Package AD 251 Boiler radio module (radio transmitter) - Package AD 252

The radio outside temperature sensor can be delivered as optional equipment for systems in which the installation of the external wire connection sensor delivered with DIEMATIC 3 control panels would be too complex. If this sensor is used:

BUS connecting cable (length 12 m) - Package AD 134

It is used to make the connection between 2 boilers fitted with the D control panel in a cascade

and set room temperature override (\pm 3.5°C). It is also used to enable the self-adaptability of the heating curve for the circuit concerned (1 remote control per circuit).

heating body. In the case of cascade installations, each of the boilers can be connected to a flue gas sensor.

- With a wire connection remote control (FM 51 or FM 52), it is necessary to order the "Boiler radio module" as well
- With a radio remote control (AD 284), ordering a 2nd "Boiler radio module" is not necessary

installation, or to connect a DIEMATIC VM iSystem control unit.

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These are used to override all instructions from the D control panel from the room in which they are installed. In addition, they enable the selfadaptability of the heating regime for the circuit concerned (one CDI 2 or CDR D. iSystem per circuit).

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D + AD 217: DIEMATIC 3 CONTROL PANEL WITH AD 217 ADDITIONAL PACKAGE

Options for D (DIEMATIC 3) CONTROL PANEL WITH AD 217 ADDITIONAL PACKAGE



Sensors for buffer tank - Package AD 160 Includes 1 DHW sensor and 1 heating sensor for managing a buffer tank with a boiler fitted with a DIEMATIC 3 control panel.

Dip sensor with tube - Package AD 218

This dip sensor (NTC 147) is delivered with an IP54 junction box and a 1/2" sensor tube, length under head 120 mm. It is used instead of the attachable sensors provided with the PCB and valve options.

It can also be used on the header pipe when connecting 2 boilers in cascade.

BOILER OPTIONS





ME 115



ME 116



Domestic hot water production

De Dietrich B... series independent hot water tanks with a capacity of 150 to 1000 litres can be used for domestic hot water production for individual and collective dwellings as well as for industrial and commercial premises. They are lined with food quality standard high quartz content vitrified enamel

BP/BL..., UNO/2 and TRIO calorifier/boiler connection kit - Package EA 117

As a general rule, the DHW calorifier can be placed to the right or left of the boiler according to the details given in the technical instructions for the boiler. The connection kits include an air vent, a nonreturn valve, a load pump and all the pipes required to make the connection. and protected by a anode (magnesium for BL/ BP... and B 650, "Correx" imposed current for B 800/1000). The specifications and performances of these tanks are given in the various technical leaflets.

Attention: do not forget to order the DHW sensor, package AD 212.

Condensates neutralization box - Package ME 115 Refill carbon filter and marble granules for neutralization box ME 115 - Package ME 116 Lift pump for neutralization box - Package FM 158

This neutralisation box comes with a carbon and marble granule filter.

The flow of condensates between the boiler and the neutralisation box must be by gravity.

The condensates resulting from the combustion of oil are acidic (pH 2). Installation of a condensates neutralisation box before discharge into the wastewater network is strongly recommended. During annual maintenance operations, the efficiency of the granules must be checked by measuring the pH: replacement of the carbon filter and the granules is necessary if the pH is lower than 6.5.





GTUC120_F0007A

INFORMATION REQUIRED FOR INSTALLATION

INSTALLATION IN BOILER ROOMS

The figures shown in red are the minimum recommended dimensions (in meters) to guarantee easy access around the boiler. **Note:** To facilitate sweeping of the flue gas nozzle in the boiler's heating body, we recommend allowing access to the left of the boiler (looking at the boiler from the front).

GTU	C 225	C 226	C 227
L (mm)	1734	1921	2068

VENTILATION OF THE BOILER ROOM

This must comply with the prevailing national regulations. The location of air inlets in relation to the high ventilation openings must ensure that air is renewed in the entire volume of the boiler room.





In order to avoid damage to boilers, it is necessary to prevent the contamination of combustion air by chloride and/or fluoride compounds, which are particularly corrosive.

These compounds are present, for example, in aerosol spray cans, paints, solvents, cleaning products, washing powders/liquids, detergents, glues, snow clearing salts, etc.

It is therefore necessary:

- To avoid sucking in air discharged from premises using such products: hairdressers, dry cleaners, industrial premises (solvents), premises containing refrigeration systems (risk of leaking refrigeration fluid), etc.

- To avoid the storage of such products close to boilers.

Please note that, if the boiler and/or its peripherals become corroded by chloride and/or fluoride compounds, our contractual warranty cannot be invoked.

BURNER RECOMMENDATION ACCORDING TO HEIGHT ABOVE SEA LEVEL

GTU C 220s come as standard with the following M 200 N/P burners with post-ventilation: GTU C 225 226 227

GTU C		225	226	227
Burner type		M 225 N/P	M 226 N/P	M 227 N/P
Burner presetting 1 st /2 nd stage	kW	35/47	48/66	60/85

As burner output diminishes with height, it may be necessary to replace the burner delivered with the boiler with a more powerful burner; see opposite the table of burner recommendations according to height above sea level.

CHIMNEY CONNECTION: CLASSIFICATION TYPE B23P

GTU C 220 boilers are characterised by:

- High performances leading to very low flue gas temperatures;

- Positive pressure at the flue gas nozzle.

For this reason, it is necessary to use leak proof pipes resistant to acidic condensates (stainless steel or PPS) which enable their evacuation.

		Ø 125 mm			
		Rigid	Flex		
L _{max} (m)	20	17		
V	Ø	160	160		
∧ _{mini}	Ø	140	140		

Important:

In the case of a cascade installation, it is necessary to fit one flue gas pipe per boiler.



This must comply with the prevailing national regulations.



GTU C 220_F0004

GRUC220_F0006

INFORMATION REQUIRED FOR INSTALLATION

Hydraulic connection

Connection to the heating only or heating and domestic hot water hydraulic circuit is done always bearing in mind that a condenser through which flues gases from the boiler pass must at all times be irrigated in order not to rise in the form of steam regardless of the service handled: heating only, heating and domestic hot water, domestic hot water only.

See opposite a curve that shows the efficiency of the GTU C 226 according to the return temperatures, the exchanger-condenser passed through by the entire flow rate.

Important:

The examples presented below cannot cover the full range of installation scenarios. Their purpose is to draw the attention to the basic rules to be followed.

A certain number of control and safety devices are represented but, in the last resort, it is up to the experts, consultant engineers and design departments to make the final decision on the control and safety devices to be used in the boiler room.

INSTALLATION EXAMPLES

Installation of GTU C 220 with 1 direct circuit

D

In all events, it is necessary to abide by the codes of practice and the local and national regulations in force.





① Development of efficiency according to the return temperatures (variable depending on the outside temperature).



3TUC220_F0007

Captions

- 1 Heating flow
- 2 Heating return
- 3 3-bar safety valve4 Manometer
- 7 Automatic air vent
- 8 Manual air vent
- 9 Valve
- 10 3-way mixing valve
- 11 Heating pump

- 13 Decoupling cylinder
- 16 Expansion tank
- 17 Drainage valve
- **18** Filling the heating circuit
- 21 Outside temperature sensor
- 22 Control unit boiler sensor 23 Outlet temp sensor dowr
- **23** Outlet temp. sensor downstream of the mixing valve
- or the mixing volve
- 24 Primary input on the DHW calorifier exchanger
- 25 Primary output on the DHW calorifier exchanger
- 26 DHW load pump
- **27** Non-return valve
- 28 Domestic cold water inlet
- 29 Pressure reducer
- 30 Sealed safety device
- 33 DHW temperature sensor
 - 36 Motorised gate valve39 Injection pump
 - 44 Thermostat limiting the
 - 4 Inermostar limiting the temperature to 65°C with manual reset for underfloor heating

32 DHW loop pump (optional)

- 46 3-way 2-position directional valve
- 50 Disconnector

INSTALLATION EXAMPLES

Installation of GTU C 220 with 1 direct circuit + 1 circuit with mixing valve. DHW production with DIETRISOL solar system



Installation of 2 boilers GTU C 220 in cascade, with 1 direct circuit, 4 circuits with mixing valve and 1 DHW circuit, all behind a decoupling cylinder



- **51** Thermostatic valve
- 52 Differential valve (only with
- module fitted with a 3-speed pump) 56 DHW circulation loop return
- 61 Thermometer
- **65** Low temperature circuit (radiator or underfloor heating)
- 75 Domestic water pump
- 81 Electrical resistance
- 84 Stop cock with unlockable nonreturn valve85 Primary solar circuit pump (for
- connection to DIEMASOL solar
- regulation) 87 Safety valve calibrated to 6 bars
- 88 Solar circuit expansion tank
- **89** Container for solar fluid
- r----P

(= 10 x Ø pipe) **109** Thermostatic mixer tap

90

112a Solar collector sensor

Antithermosiphon lyre

- 123 Cascade outlet sensor
- 126 Solar control unit
 - 130 Manual air vent (Airstop)131 Collector field

(1) PCB delivered as standard

 \triangle no outside sensor with B2 control panels

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DESCRIPTION

GTU C 220

OIL-FIRED CONDENSING BOILER

Model GTU C 22... Useful output range (80/60°): kW Useful output range (50/30°): kW Boiler + condenser water content: litres Operating pressure: 3 bar Max. temperature: 90°C Maximum pressure at the nozzle: mbar Floor space required: ____ (L) x ___ (W) mm Number of sections (boiler): ____ Weight empty: ... kg

DESCRIPTON

The condensing generator is composed of: **Boiler**

- Low temperature boiler with main heating body in Eutectic cast iron with pressurised humid combustion chamber with integral 3-path flue gas discharge.
- Cast iron baffles are fitted as standard to all emissions flues
- Full insulation of the heating body with glass-wool covered on both sides with a protective fabric
- Flue gas circuit tightness guaranteed by very thick woven silicone cord
- Water circuit tightness guaranteed by bi-spherical nipples
- Reversible burner door (opens to the right or left) with thick insulation
- Casing in steel coated on both sides with kiln-baked epoxy polyester paint
- Maintenance of the boiler is facilitated by:
- A hinged door for sweeping
- Detachable baffles
- A flue gas channel design that allows the use of a suction nozzle

Burner

 2-stage oil burner with post-ventilation and low pollution emissions (NOx < 100 mg/kWh at 50-30°C), tested and preset while hot, delivered with 2 supply hoses

Condenser

- Condensing heat exchanger on the flue gases with exchange surfaces in ceramic piping fitted with inspection hatches.
- Large capacity condensates evacuation siphon integrated under the condenser inside the boiler casing.
- Adjustable feet

Choice of 2 control panels:

- **B2 control panel:** used to control a direct circuit and a domestic hot water circuit (DHW sensor optional).
- DIEMATIC 3 control panel + AD 217: Control system programmable according to the outside temperature, with integrated digital display in the boiler control panel.

S.A.S. with corporate capital of 22 487 610 \in

Equipment: Low NOx oil burner with post-ventilation. Ø flue nozzle: 125 mm Ø boiler flow/return: 1 1/4"

The boilers will be delivered as an assembled body tested in the factory or, on request, in separate sections to be assembled in situ. The condensing unit composed of the ceramic condenser with the siphon, the casing, the burner and the accessories, is delivered in separate packaging.

Principles of the DIEMATIC 3 control panel:

The control, monitoring and regulation of the heating equipment will be provided by a regulator enabling control of:

- The 2-stage boiler
- 1 independently programmable, domestic, accumulating or semi-accumulating, domestic hot water tank
- 1 swimming pool circuit or a second DHW production circuit
- 1 domestic hot water loop pump
- 1 to 2 low temperature circuits controlled by an independently programmable mixing valve
- Cascades comprising up to 10 boilers

If the house is empty, antifreeze protection of the installation and the room temperature is provided.

Characteristics:

Digital controller with displays in plain English (no codes) Menu scrolling in both directions

Day and night set point controls, heating curves allowing parallel shifts by direct touch, without needing to enter the scrolling menu.

Electrical connection of the burner by pin connector cable. The control panel is delivered with electromechanical equipment for the control panel, which can take priority over the control system (manual operation)

Boiler options:

- Condensates neutralisation system
- Boiler/DHW tank connecting kit

B2 control panel options:

- Non-programmable room temperature thermostat
- Programmable room temperature thermostat connected by wire
- Programmable room temperature thermostat with wireless connection
- DHW sensor

D control panel + AD 217 options:

- Flow sensor downstream of the valve
- Domestic hot water sensor
- Dip flow sensor + sensor tube
- PCB + sensor for 1 mixing valve
- Flue gas temperature sensor
- Remote control with room temperature sensor
- Interactive wire- or radio-controlled remote control
- Outside radio-controlled sensor
- Boiler radio module (transmitter/receiver)
- Connecting cable length 40 m for wall support
- BUS cable extension



DE DIETRICH THERMIQUE

