Catalogue No.	KJ

technika grzewcza

boiler servicing: +48 77 40 34 530
controller service: +48 61 43 77 690
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e-mail: elster@post.pl

Operation and installation manual
Warranty Card

Please read the instructions before installation and use of the product.

Water boiler for central heating GT- ☐ kW

☐ with cast iron grate

☐ with water-cooled grate

☐ standard version

☐ with draught regulator

☐ with fan and controller

Controller	Fan
☐ LX EKO pid	☐ MM
☐ LX EKO pid - 2	☐ EW
☐ ST-32 pid	

Galmet
TECHNIKA GRZEWCZA

DEKLARACJA ZGODNOŚCI

P. P. U. H. "GALMET" S. D. R. GALARA S.J.

ul. Raciborska 36
48 – 100 Głubczyce

Oświadcza, że kotły węglowe naszej produkcji typu:

GT- KW 7-30
GT- KWR 7-30
GT- KWU 20-50
GT- KWRU 20-100

Do których odnosi się niniejsza deklaracja są wytwarzane zgodnie z niżej wymienionymi dyrektywami;

- **89/106/EWG**
- **89/336/EEC**
- **98/37/EC**

oraz normami;

- **PN-EN-12809:2002**
- **PN-EN-303-5:2002**
- **PN-EN-80204-1:2001**

Potwierdzeniem tego jest znak

CE

umieszczony na urządzeniu

Ponadto kotły nasze spełniają kryteria standardu energetyczno – ekologicznego stawiane kotłom niskotemperaturowym na paliwa stałe. Potwierdzeniem tego są badania niezależnej jednostki badawczej GIG w Katowicach .

PPUH "GALMET" s.j.
48-100 Głubczyce, ul. Raciborska 36
mgr inż. Michał Homoncik
V-ce Dyrektor d.s Technicznych

Głubczyce 15-03-2009

GŁÓWNY INSTYTUT GÓRNICTWA

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Rachunek bankowy: Bank Pekao S.A. O/Katowice nr 65 1240 4227 1111 0000 4841 8133
Regon 000023461 NIP: 6340126016 KRS: 0000090660 GIG jest płatnikiem VAT

Posiadamy certyfikowany Zintegrowany System Zarządzania (jakość, bhp, środowisko) spełniający wymagania norm: PN-EN ISO 9001:2001 PN-N-18001:2004 PN-EN ISO 14001:2005

Główny Instytut Górnictwa jest Jednostką Notyfikowaną nr 1453

ŚWIADECTWO BADAŃ nr 08/2008

kotłów wodnych rusztowych typu GT – KWR 10 - 300

producent : **P.P.U.H. „GALMET" S. D. R. GALARA spółka jawna**
ul. Raciborska 36
48 – 100 Głubczyce

l.p.	wyszczególnienie	j.m.	wynik
1.	Paliwo : **węgiel kamienny kostka**		
	- uziarnienie	mm	5 – 55
	-wartość opałowa	MJ/kg	26 – 32
	-zaw. siarki,	%	0,35 – 0,50
	- zaw. popiołu,	%	< 3,0
	- zaw. wilgoci	%	< 3,0
2.	**Sprawność kotła** (brutto) wg. PN –EN 12952 - 15	%	77,8
3.	**Stężenia substancji pyłowych i gazowych** emitowanych do powietrza w warunkach umownych przeliczone na zawartość tlenu O_2 = 6 % :		
	- pył	mg/m^3	320 - 530
	- dwutlenku siarki	mg/m^3	710 - 840
	- dwutlenku azotu	mg/m^3	340 - 370
	- tlenek węgla	mg/m^3	3100 - 20800

Kotły wodne rusztowe **typu GT – KWR 10 – 300** o mocy 10 - 300 kW zostały zbadane przez Zakład Oszczędności Energii i Ochrony Powietrza, Laboratorium Badań Środowiska Pracy i Ochrony Powietrza posiadające Certyfikat Akredytacji Laboratorium Badawczego PCA nr AB 301 oraz Zakład Oceny Jakości Paliw Stałych posiadające Certyfikat Akredytacji PCA nr AB 069.

Kotły wodne rusztowe **typu GT – KWR 10 - 300** odpowiadają wymaganiom w zakresie emisji substancji gazowych i pyłowych zawartych w normie PN – EN 303 – 5 : 2002, (Część 5 : Kotły grzewcze na paliwa stałe z ręcznym i automatycznym zasypem paliwa o mocy nominalnej do 300 kW - Terminologia, wymagania, badania i oznakowanie.)

dr inż. Eugeniusz Ostrowski
Przeglądy Efektywności Przemysłowej i Ochrony Środowiska
Uprawnienia M.O.Ś.Z.N. i L. świadectwo nr 11
pieczątka i podpis kierownika pracy

Zakładu Oszczędności Energii i Ochrony Powietrza
doc. dr hab. inż. Krzysztof Stańczyk
pieczątka i podpis kierownika jednostki organizacyjnej GIG

Katowice, 22.08.2008r.

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Dear Customer and Boiler User, this manual contains all the information necessary for the use and maintenance of our boiler.

PLEASE READ THE MANUAL CAREFULLY.

1 GENERAL INFORMATION

The manual is meant to familiarize the user with the operation of a solid fuel boiler. Every user should read the manual for the boiler and controller before installation and use. It contains recommendations for proper handling and use of the boiler. Failure to comply with the rules and guidelines presented in this manual releases the boiler manufacturer from all liability and warranty obligations. Boilers are equipped with a thermometer and, optionally, a draught regulator, or a fan and an electronic "LUKSUS" controller, which controls the operation of the boiler (fan and pumps installed in the heating system). The boiler should be operated only by an adult. A complete cleaning of the boiler should be done at least once a month during the heating season. The boilers are built with a fixed **water-cooled grate** - KWR, and a removable **cast iron grate** - KW. Satisfaction with the use of the boiler can be achieved only when appropriate fuel with a high calorific value and adequate granulation is used.

1.1 Application

Steel boilers of the GT-KW, GT-KWR, GT-KWRU, GT-KWRUZ types are intended for heating single-family houses equipped with hydronic central heating **of an open type system** with gravitational or forced circulation. The system, within which the boiler operates, must be equipped with safety features in accordance with the requirements of the PN-91/B-02413 standard, with a maximum operating temperature of 95°C. Boilers are not subject to registration with the district Technical Inspection Office.

Selecting boiler power depending on the insulation of the building

Boiler type	Room height **[m]**	Room surface area **[m^2]**	Room cubic capacity **[m^3]**
KW - 7	2.5	48 ÷ 70	120 ÷ 175
KW - 10	2.5	68 ÷ 100	170 ÷ 250
KWR - 11	2.5	74 ÷ 110	185 ÷ 275
KW - 15	2.5	106 ÷ 150	255 ÷ 375
KWR - 17	2.5	116 ÷ 170	290 ÷ 425
KW - 20	2.5	136 ÷ 200	340 ÷ 500
KWR – 22	2.5	150 ÷ 220	375 ÷ 550
KWRUz – 22	2.5	150 ÷ 220	375 ÷ 550
KWR - 25	2.5	166 ÷ 250	415 ÷ 625
KWR - 27	2.5	180 ÷ 270	450 ÷ 675
KWRU - 37	2.5	270 ÷ 370	675 ÷ 925
KWRU - 50	2.5	370 ÷ 500	925 ÷ 1250
KWRU - 60	2.5	400 ÷ 600	1000 ÷1500
KWRUz-70	2.5	470 ÷ 700	1175 ÷1750
KWRU - 99	2.5	700 ÷ 1000	1700 ÷ 2500

(for demand for heat equal to **60 – 40 W/m^3**)

1.2 Fuel

The basic fuel is hard coal, chestnut size, as per PN-82/G-97001÷3 When burning alternative fuels, one should anticipate a change in boiler thermal efficiency approximately proportional to the change in calorific value. Burning time with one refill of fuel depends on the type of fuel (it's longest when burning mixtures), the required power output of the boiler and controller settings.

1.3 Dimensions and operating parameters

1.3.1 KW boilers - boilers with cast iron grate

Boiler type		KW	KW	KW	KW	KW
Rated power output	kW	**7**	**10**	**15**	**20**	**25**
Basic fuel			chestnut coal			
Water capacity of boiler	dm^3	30	40	51	66	76
Boiler heating surface	m^2	0.7	1.0	1.5	2.1	2.6
Boiler weight	kg	127	165	210	265	300
Required chimney capacity	Pa	22				
Min. chimney height	m	5				
Chimney size	mm	140x140	140 x 210			
Operating temperature range	°C	50 ÷ 90				
Thermal efficiency	%	80				
Exhaust gas temperature	°C	250				
Connections	”	1.25	1.5			
Boiler height *	mm	880	960	1110	1260	1360
Boiler width*	mm	340	410	410	500	500
Boiler depth*	mm	630	760	870	870	1000
Flue height from the floor	mm	650	735	880	1040	1140
Flue dimensions ***	mm	150 x 150				
Perm. working pressure	MPa	0.2				
Controller power consumption**	W	4				
Fan power consumption **	W	5÷40				15-80
Cast iron grate length	mm	270	320	370	420	420
Number of grate elements	pcs	9	10	9	11	15

* without controller and fan

** applies to boiler with fan and controller *** external dimensions b x h

1.3.2 Dimensions and operating parameters of KWR boilers - boilers with water-cooled grate

Boiler type		KWR	KWR	KWR	KWR
Rated power output	kW	**11**	**17**	**22**	**27**
Basic fuel		chestnut coal			
Water capacity of boiler	dm^3	44	56	68	78
Boiler heating surface	m^2	1.1	1.7	2.3	2.7
Boiler weight	kg	168	215	272	306
Required chimney capacity	Pa	22			
Min. chimney height	m	5			
Chimney size	mm	140 x 210			
Operating temperature range	°C	50 ÷ 90			
Thermal efficiency	%	80			
Exhaust gas temperature	°C	250			
Connections	”	1.5			
Boiler height *	mm	960	1110	1260	1360
Boiler width*	mm	410	410	500	500
Boiler depth*	mm	760	870	870	1000
Flue height from the floor	mm	735	880	1040	1140
Flue dimensions ***	mm	150 x 150			180x180
Perm. working pressure	MPa	0.2			
Controller power consumption**	W	4			
Fan power consumption **	W	5÷ 40			15-80
Grate length	mm	300	350	400	410

* without controller and fan
** applies to boiler with fan and controller
*** external dimensions b x h

1.3.3 Dimensions and operating parameters of KWRU boilers - boilers with water grate and vertical water heat exchanger channel

Boiler type		**KWRUz**	KWRU	KWRU	KWRU	**KWRUz**	KWRU
Rated power output	kW	**22**	**37**	**50**	**60**	**70**	**99**
Basic fuel		chestnut coal					
Water capacity of boiler	dm^3		110	163	180	220	300
Boiler heating surface	m^2	2.2	3.7	5.0	6.2	7.2	9.9
Boiler weight	kg	290	380	425	500	950	1420
Required chimney capacity	Pa	22					
Min. chimney height	m	6	6	8	9	8	10
Chimney size	mm	140x210	210x210	240x240	250x250	250x250	300x300
Operating temperature range	°C	50 ÷ 90					
Thermal efficiency	%	80					
Exhaust gas temperature	°C	250					
Connections	”	1.5	1.5	2	2.5	2.5	3
Boiler height *	mm	1120	1220	1390	1480	1540	1550
Boiler width*	mm	465	580	650	750	750	910
Boiler depth*	mm	980	1190	1340	1560	1590	2050
Flue height from the floor	mm	885	1025	1070	1260	1290	1230
Flue dimensions ***	mm	150x150	180x180	200x200	250x250	250x250	300x300
Perm. working pressure	MPa	0.2					
Controller power consumption**	W	4					
Fan power consumption **	W	12 ÷ 40		15 ÷ 80			
Grate length	mm	320	450	540	640	540	800

* without controller and fan
** applies to boiler with fan and controller
*** external dimensions b x h
Fuel firing of KWRUZ boilers can be done through the upper door, in the case of using buckwheat size coal, insert grate bars made from heat-resistant sheet metal between the water-cooled grate.

2 TECHNICAL DESCRIPTION OF THE BOILER

2.1 Water wall of KW, KWR, KWRU boilers

The heat exchanger in heating boilers is made **of furnace sheet metal with a thickness of 5÷ 8mm. Depending on the power output of the boiler** (5mm for 37kW, 6mm for 60kW, 7mm - 75kW, 8mm - 100kW). From the outside the water wall uses sheet metal that is 4mm thick (5mm for boilers above 75kW).

KW boilers are equipped with a removable cast iron grate, whose elements can be replaced when they become deformed.

KWR boilers are equipped with a fixed water-cooled grate, which enables them to transfer heat from the fuel burned more efficiently. Exhaust gases flow from the firebox to the exhaust channels, pass alongside the vertical water heat exchanger tubes and dissipate heat through the steel walls and into the water. In boilers with bottom combustion (labeled "d") a cast iron plate is installed, which stops the flow of exhaust gases from the combustion chamber to the flue. Exhaust gases then flow behind the firebox water heat exchanger (extended exhaust) and the fuel on the grate burns gradually, allowing stable control over the boiler's power output.

KWRUZ boilers are equipped with a fixed water-cooled grate, which enables them to take heat from the fuel burning on the hearth more efficiently. Exhaust gases flow from the firebox to the exhaust channels behind the chamber, pass the vertical water heat exchanger and dissipate heat through the steel walls and into the water. With these boilers it is possible to achieve combustion from the bottom by ignition from the top through the fuel loading hatch. The air from the fan passes over the cold fuel and only the upper part of it burns. The boiler's power output is reduced by the area of the chamber walls occupied by the cold fuel. Fuel burns gradually allowing for stable control over the power output of the boiler. The boiler achieves maximum power output when fuel burns directly on the grate. Before lighting, move the lever to lift the rear flap of the vertical heat exchanger. When the chimney is warmed up (~ 1 minute), release the lever.

The construction of the boiler allows for efficient heat exchange through exhaust gas recirculation in the horizontal heat exchanger channels in KW and KWR boilers, and vertical heat exchanger channels in KWRU boilers. The reverse-convection channels can be cleaned through the front hatch of the boiler or the top cleaning hatch in KWRU boilers. In the case of KWRUZ boilers, cleaning of heat exchangers is done after the top cover of the boiler is removed.

Boilers can be equipped with:

- a thermostatic draught regulator for controlling the flow of air to the fuel, depending on the temperature in the boiler
- a fan and LUXUS controller for monitoring the boiler's operation (fan operation based on temperature) and circulation pumps installed in the heating system.

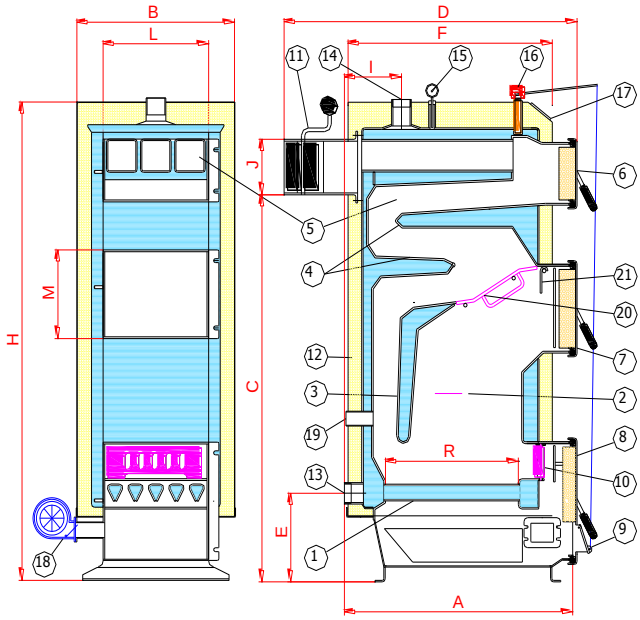
The LUKSUS controller is not equipped with a domestic hot water sensor and domestic hot water (DHW) pump hose as standard.

The fan can be mounted on the side of the boiler or in the air intake flap on the door of the ash pan.

Boilers with a power output up to 27kW use WPA07 fans, while those with a power output above 27kW use the WPA06 fan.

2.2 Boiler designs

- Coal-fired boilers **KW / KWR**

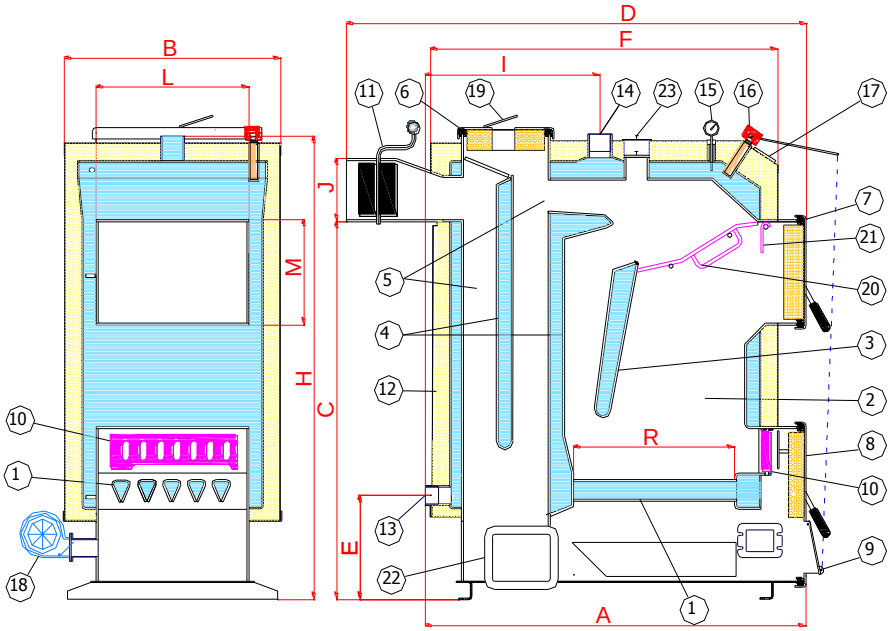


BOILER CONSTRUCTION - KWR

1.Water-cooled grate (cast iron KW)
2.Firebox
3.Chamber heat exchanger **
4.Vertical heat exchangers
5.Exhaust gas ducts
6.Cleaning hatch
7.Loading hatch
8.Ash hatch
9.Air flap
10.Grate hatch
11.Flue with damper
12.Boiler insulation
13.Cold water connection
14.Hot water connection
15.Thermometer
16.Regulator
17.Controller
18.Fan
19.Secondary air inlet*
20.Lower combustion flap *
21.Smoke closure
* for KWd, KWRd

BOILER TYPE	A	B	C	D	E	F	H	I	J	L	M	R
KW- 7	470	340	650	630	170	410	880	110	150	200	160	270
KW-10	550	410	735	750	180	480	960	150	150	260	170	320
KW-15	660	410	880	870	200	600	1110	160	150	260	200	370
KW-20	660	450	1050	870	250	600	1260	170	150	310	240	420
KW-25	670	500	1140	1000	250	600	1360	180	180	360	240	420
KWR-11	550	410	735	750	180	480	960	150	150	260	170	320
KWR-17	660	410	880	870	200	600	1110	160	150	260	200	370
KWR-22	660	450	1050	870	250	600	1260	170	150	310	240	420
KWR-27	670	500	1140	1000	250	600	1360	180	180	360	240	420

- Coal-fired boilers **KWRU**



1. Water-cooled grate / cast iron in KWU
2. Firebox
3. Chamber heat exchanger **
4. Vertical heat exchangers
5. Exhaust gas ducts
6. Cleaning hatch
7. Loading hatch
8. Ash hatch
9. Air flap
10. Grate hatch
11. Flue with damper
12. Boiler insulation
13. Cold water connection
14. Hot water connection
15. Thermometer
16. Regulator
17. Controller
18. Fan
19. Secondary air inlet
20. Lower combustion flap * , **
21. Smoke closure
22. Bottom cleaning hatch
23. Top cleaning hatch **

***** for KWRUd type boiler **** , not used in** KWRUz type boilers

BOILER TYPE	A	B	C	D	E	F	H	I	J	L	M	R
KWRuz22	**760**	**465**	**885**	**980**	**250**	**695**	**1120**	**345**	**150**	**310**	**240**	**320**
KWRu37	960	580	1025	1190	255	900	1220	410	180	420	270	450
KWRu50	1100	650	1070	1340	270	1025	1390	490	200	480	300	540
KWRu60	1200	750	1260	1560	285	1125	1460	490	250	580	300	640
KWRu99	1700	910	1230	2050	340	1640	1550	705	300	630	290	800
KWRuz70	**1275**	**750**	**1290**	**1590**	**340**	**1200**	**1540**	**585**	**250**	**580**	**300**	**540**

2.3 Hatches

The boiler comes equipped with steel hatches filled with heat-resistant fiberglass wool and gasket pressure adjustment.
Loading hatches are used for stoking fuel and cleaning the firebox and lower heat exchanger. They have a two layer insulation board with a thickness of 55mm, which protects the hatch from overheating, and an additional fire refractory plate.
Bottom combustion boilers have a cast iron plate inserted through the hatch, which directs exhaust gas from the heat exchanger to the heat exchanger channel. The plate is to be inserted and taken out in leather gloves only when the boiler is not in operation.
Cleaning hatches are used for cleaning the heat exchanger channels (all other hatches should be closed during cleaning).
Ash pan doors are used for removing ash and dust that are produced during combustion and for spreading embers over the grates through the cast iron hatch of the grate.
The hatch has a manual air intake flap operated using a screw or a controller mounted on the 3/4" connection on the boiler body.

2.4 Flue

The boiler has a welded flue with a rectangular cross-section with an adjustable damper. The flue can be screwed into the boiler with four M10 bolts and sealed with a cord gasket or it can be welded. At the bottom of the flue there is a cleaning hatch for removal of ash and soot from the flue. It is attached using M8 wing nuts.

2.5 Insulating panels

Insulation panels are mounted on the surface of the water wall and limit heat loss from the boiler. They are made of powder coated steel sheet and insulated with a 40mm layer of fiberglass wool.

2.6 Tools supplied with the boiler

- boiler cleaning kit
- ash drawer
- thermometer
- **draught regulator -** optional extra
- **controller with fan -** optional extra

3 BOILER INSTALLATION

3.1 Transporting the boiler

The boiler is delivered fully assembled on a pallet. Dismantling the hatches of the boiler is allowed in order to facilitate transport to the boiler room. The thermometer, fan or draught regulator and controller are to be found in the boiler drawer and are mounted by the installer.

3.2 Setting up the boiler

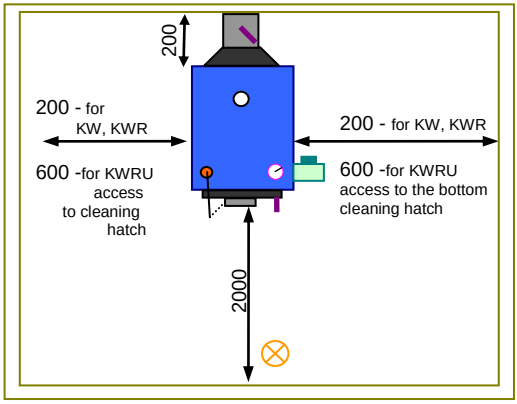
The boiler does not require a foundation. The boiler should be placed in a way that allows access for proper maintenance (cleaning the boiler - access to the top and bottom {for KWRU boilers} cleaning hatch).

Installation of the boiler should be performed in accordance with PN-87/B-024411. The room where the boiler is to be situated should have at least two 140x140mm vents (gravitational ventilation), with one situated 150mm above floor level and the other near the ceiling. The boiler room doors should open to the outside and be made of fireproof materials. The room should be dry with a sewer grate installed in the floor, water supply and an earthed electrical installation.

Lighting for the front side of the boiler is to be provided.

The socket for connecting the controller should have a safety contact and be placed at a safe distance from sources of heat and water.

The boiler should be placed in the boiler room, so that it is away from easily flammable items, fuel should be fenced off.



3.3 Connecting the boiler

The right height and diameter of the chimney have a significant impact on the proper operation of the boiler. Check that the chimney is made in accordance with the **PN-91/B-02413 standard.** The flue is to be connected to the chimney through a connection made of sheet metal, which must be mounted onto the flue outlet, fixed in the chimney and sealed. The connection (max length of 400mm) should rise slightly at an angle of at least -10% and have a cleaning hole. Under the connection, the chimney wall should have a tightly sealed cleaning hole to allow easy access for cleaning and removal of accumulated soot and ash. Providing water for the central heating from the water supply network is to be done using a downward facing valve installed onto a T-connector mounted on the cold water pipe.

INSTALL BOILER SO THAT IT CAN BE DISCONNECTED FROM THE SYSTEM!

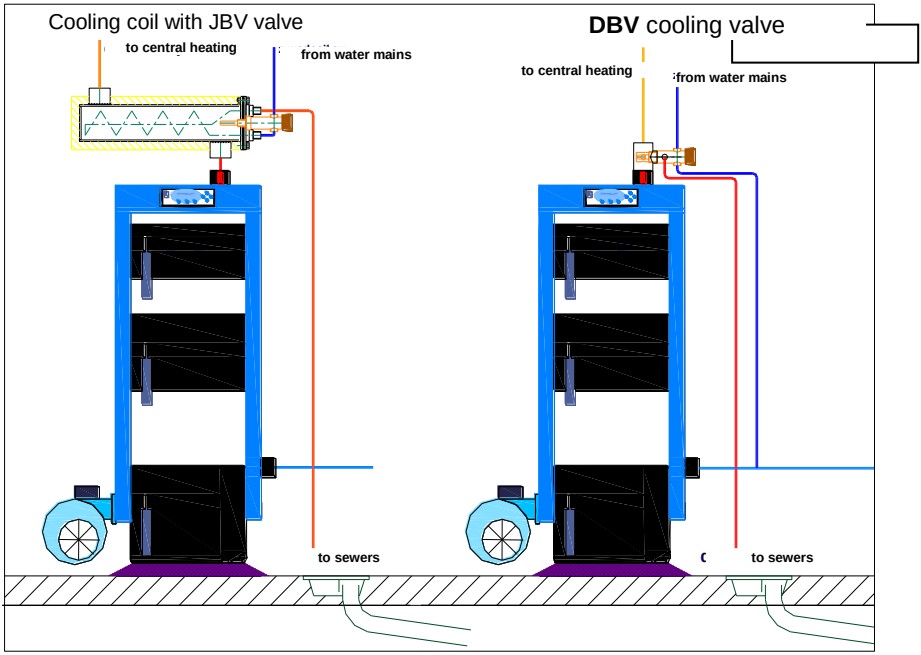
In the case of a boiler equipped with a fan:
- set the fan cover using the adjusting nut so that it is closed when the fan is not running.
- **install the fan sensor on the outlet pipe from the boiler!**
(black rectangular sensor mounted on a band together with the boiler temperature sensor).
- read the instruction manual for the **LUKSUS EKO** controller for installer and service crew mode - the controller is not equipped with a domestic hot water and exhaust sensor and hot domestic water pump hose as standard.
Boilers with built-in controllers have sockets for connecting pumps and sensors.

Due to a change in the regulations* boilers up to 30kW can be installed in closed central heating systems, provided that a DBV or JBV cooling valve is installed and water from the mains is provided in a continuous, uninterrupted manner!
In accordance with safety regulations and the instruction manual for DBV, JBV valves, their proper operation should be verified each day by turning the knob.

Installation of cooling coil and cooling valve on the boiler - option.

Cooling coil with JBV valve

DBV cooling valve



* REGULATION OF THE MINISTER OF INFRASTRUCTURE dated 12-03-2009-Journal of Laws of 07-04-2009

3.4 Central heating installation diagram

1. KW--, KWR--,KWRU boiler 2. Domestic hot water tank e.g. GWS-200 3. LUXUS controller 4. WPA 07 (06) fan 5. Adjustment screw for fan flap 6. Boiler overheat sensor 7. Boiler temperature sensor 8. DHW temperature sensor*	9. Differential valve 10. Central heating pump 11. DHW pump 12. Expansion vessel: 13. Overflow and bleed pipe 14. Indicator tube 15. Indicator tube valve 16. Drain valve 17. Sewage grille 18. Exhaust gas sensor *.

***** optional

4 BOILER USE AND MAINTENANCE

4.1 Starting combustion in the boiler

In order to light a fire in the boiler (without controller) follow these steps:
-place kindling or pieces of paper at the front of the boiler
-ignite the kindling, close the vertical grate hatch
-close ash hatch
-open gently flap in ash hatch
-open firebox hatch and add some coal. Once lit, fill the firebox with fuel so **that the flame is directed behind the heat exchangers in KW, KWR, KWRU boilers**
-determine the amount of air needed for full and complete combustion of this portion of coal by gently opening the flap on the lower hatch
-set the boiler temperature on the draught regulator, adjust the chain length, so that at the desired temperature e.g. 72^0C, the flap is closed and open when the temperature falls
-soot on the walls of the firebox indicates little amount of air and a low temperature in the boiler - less than 55^0C
-formation of slag in the firebox indicates intense burning with large amounts of air or fuel with a low ash melting point, and causes bending of cast iron grates (it is not recommended to burn fine coal and coal with a small amount of fuel on the cast iron grate and high power output of the boiler)
-in a boiler equipped with a fan and controller, adjust fan power to the boiler power output and fuel type. Up to 20kW maximum fan power is 20%. Select an appropriate blow-off for the burning process to last as long as possible and maintain the desired temperature. If a large volume of burning embers is present in the firebox, setting a lower temperature in the controller will not reduce the temperature immediately - the fan will be turned off until the boiler cools down. Until then, control the combustion process by, for example, opening the middle hatch to allow air to cool the embers and the boiler chamber.
-In boilers equipped with a lower combustion flap, adjust secondary air supply, so that exhaust gases are burned. If a fan is installed, cover secondary air intake and uncover the flue cover, so that exhaust gases do not escape (this situation usually occurs when the fan moves more air than the chimney is able to collect in the form of exhaust gases, or when exhaust ducts are dirty)
-In KWU, KWRU, KWRUz boilers adjust the flow of secondary air so that exhaust gases are burned. This manifests itself by the fact that flames can be seen in vertical channels
-In KWUz, KWRUz boilers it is possible to ignite the fuel through the loading door. The power output of the boiler is then decreased proportionally to the surface of the chamber occupied by the fuel. As fuel burns, the boiler's power output rises to its maximum value when the fuel burns on the grate. Adding fuel to the boiler without removing the hot embers will result in fuel burning from the bottom.

4.2 Adding fuel

Fuel must always be added when the layer of coal on the grate has burned to such a state that the embers take a pink colour and start to become covered with ash. Before adding fuel, the flue damper must absolutely be open and the fan turned off.

ATTENTION: It is forbidden to burn other fuels, which might cause the walls of the heat exchanger to become covered with tarry, difficult to remove deposits, as well as to maintain boiler temperatures below 50^{0}C, which is conducive to corrosive exhaust gases and reduces the efficiency of the boiler as the exchanger walls are covered with soot and ash.

4.3 Stopping boiler operation

The boiler can be extinguished through the cutting off of fuel or air supply. Wait until the fuel in the chamber has burned completely. In case of failure it is permissible to move the hot embers to the ash drawer, observing extreme caution (efficient exhaust ventilation, boiler room door open).

For the summer period, when the boiler is not in use, **clean the boiler** (firebox, heat exchanger channels, tubes) **of soot and ash.**

In addition, open all hatches.

After the summer break period, test circulation pumps mounted in the system and the fan before starting the boiler!

4.4 Cleaning the boiler

The boiler must be cleaned in order to ensure good heat exchange with the heat exchanger. In addition:

- open flue damper fully,
- turn off the controller (optional equipment),
- open the top cleaning hatch and brush clean the upper heat exchanger channel, then the bottom channel.
- move the ash drawer to the cleaning hatch and put ash in the drawer,
- close the upper hatch and open the middle hatch of the firebox
- clean upper heat exchanger channel from the sides and top, sweep ash from the chamber
- clean the walls of the firebox
- open firebox hatch and remove the ash drawer
- unscrew the upper hatch in KWRU boilers and clean the vertical channels, remove ash from rear channel through the lower cleaning hatches located on the side of the boiler,
- in KWRUZ boilers, clean air channels with fan turned on.

5 CONDITIONS FOR SAFE USE OF THE BOILER

A basic condition for safe operation is that the heating system is an open type installation built accordance with the requirements of relevant standards.

In order for operation to be safe, observe certain rules:

- It is prohibited to operate the boiler when the water level in the heating system is below the radiators, if the system is an up-feed one, or when the water level is below the expansion tank in a down-feed system
- The system should be open.
- The expansion tank properly insulated.
- The boiler requires monitoring and control to be done by an adult once every few hours.
- Wear gloves, protective eye-wear and a headdress when monitoring and controlling the boiler.
- Stand to the side when opening hatches.
- Provide good lighting in the boiler room
- Open hatches with an open flue damper!
- Maintain order in the boiler room. No items not connected with the maintenance of the boiler should be kept there.
- Take care of the boiler (frequent cleaning, ensuring hatches are tightly closed on the boiler, flue and chimney) and the connected water system.
- In systems with forced circulation, use a gravity by-pass with a differential valve. This ensures that in case of power failure the hot water from the boiler can flow to the radiators and cool down - if appropriate sizes of pipes and grades are used in the system.
- In closed systems, use a DBV valve mounted directly on the boiler outlet, connected to water pipes or use a cooling coil with a JBV valve, only if access to water from the mains is uninterrupted.
- Read the controller's manual carefully.

The amended Regulation of the Minister of Infrastructure on the technical conditions to be met by buildings and their location (Journal of Laws No. 56/2009 item 461), which shall come into force on 7 July 2009, allows continuous burning boilers with a power output up to **30** kW to be used in closed systems, provided that the boiler is equipped with a device for removal of excess heat.

6 IMPROPER FUNCTIONING OF THE BOILER

PROBLEMS	CAUSE	REMOVAL OF PROBLEMS
BOILER DOES NOT ACHIEVE PROPER POWER OUTPUT	- insufficient chimney draught - lack of inflow ventilation - dirty heat exchanger channels - bad fuel quality - wrong controller settings - wrong regulator setting	- check chimney size and flow - ventilate as per point 4.2 - clear the vertical and horizontal walls of the boiler and heat exchangers -every 3 days - change fuel or readjust (air volume and damper angle) - adjust settings as per instructions - change draught regulator settings
FUEL BURNS TOO FAST	- bad air adjustment - too strong chimney flue - too little fuel	- reduce the amount of air - **reduce the power of the blower** **- choose blow-off time and power** - check chimney size and flue - increase single fuel portion
FUEL DOES NOT BURN COMPLETELY	- bad air adjustment - insufficient chimney draught	- increase the amount of air -choose blow-off time and power - check chimney size and flue
SLAG FORMS	- too high temp. of burning - too low temperature of coal ash melting	- reduce the amount of air - change fuel
EXHAUST GAS OUTFLOW FROM BOILER	- dirty heat exchanger channels, tubes - closed flue damper - gaskets not tight	- clean the boiler heat exchanger - open damper - check the gasket and position of lid screws - check hatch and flue seals
LEAK OF WATER FROM BOILER	- sweating boiler - leaky water wall	- increase temperature to 70^0C - occurs when firing for the first time, especially in KWRU, KWU boilers - contact customer service

BEFORE CALLING CUSTOMER SERVICE PLEASE CLEAN THE EXHAUST GAS CHANNELS AND FIREBOX WALLS and provide entrance into boiler room, in case of replacement of boiler.

Before the heating season check the operation of pumps and blower.

7 WARRANTY CONDITIONS

1Warranty for correct operation of the central heating boiler, certified by a stamp from the installer and from the point of sale, and signature of the seller is granted for a period:
of **36** months from the date of purchase - for the boiler casing, but no longer than 36+12 months from date of manufacture *, valid throughout the territory of the Republic of Poland, Warranty for the controller, fan and draught regulator is granted for a period of 12 months.

2 The warranty shall be extended for the period from the day a repair has been requested to the date of notifying the buyer of the performance of the repair. This time is confirmed in the repair card and warranty card. The manufacturer is obliged to perform a warranty repair within 14 days from the date of notification by the purchaser.

3 The warranty card is the only document that entitles the purchaser to a free warranty repair. A warranty card without date stamps and signatures is invalid. Duplicates of the warranty will not be provided in case of loss.

4 The warranty expires in case of use of security not compliant with PN-91/B-02413: connection of the boiler in a closed system without adequate security and maintenance. Repairs performed during the warranty period by unauthorized persons, damage caused by failure to follow instructions.

5 Claims regarding the quality of the boiler should be reported to the manufacturer by sending a completed claim coupon filled out by the point of sale.

6 If the claim proves to be unjustified, the costs associated with the arrival of a representative are to be covered by the person making the claim.

7 The warranty does not cover cast iron components, boiler connections, the draught regulator and thermometer.

8 **The warranty will be declared invalid in case it is discovered that fuels are burned that cover the walls of the boiler with tarry, difficult to remove deposits, something that indicates boiler temperatures below 50^{o}C were maintained for longer periods of time.**

9 In case of lack of access to the boiler or the controls, the technician will not perform repair or maintenance activities and the user will be charged with travel costs.

10 The scope and method of the warranty repair is decided by the warrantor.

11 In case of damage to the controller, which exhibits itself in the continuous operation of the fan motor or pump, the claim will not be recognised, because this damage was caused by a short circuit in the given element. The fuse on the controller protects the components from overload, but not from a short circuit.

Date	Description	Chimney flue [Pa]	Signature of technician installer
	Installing the boiler		
	Commissioning of the boiler by an authorized installer		

Date of commissioning	Repair date	Repair date	Repair date
Name of installer Installation description	Description of repair	Description of repair	Description of repair
Installer's stamp	Stamp and signature of the technician	Stamp and signature of the technician	Stamp and signature of the technician
Name and address of the owner	Name and address of the owner	Name and address of the owner	Name and address of the owner
User signature	User signature	User signature	User signature

WARRANTY CARD

Galmet technika grzewcza

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fax +48 77 40 34 599
customer service: +48 77 40 34 530
e-mail: serwis@galmet.com.pl

Warranty Coupon 1	Warranty Coupon 2	Warranty Coupon 3	Notification coupon
Galmet technika grzewcza	Galmet technika grzewcza	Galmet technika grzewcza	Galmet technika grzewcza
Boiler type:	Boiler type:	Boiler type:	Boiler type:
Serial No.:	Serial No.:	Serial No.:	Serial No.:
No. of controller:	No. of controller:	No. of controller:	No. of controller:
No. of fan:	No. of fan:	No. of fan:	No. of fan:
Date of manufacture:	Date of manufacture:	Date of manufacture:	Date of manufacture:
Date of sale:	Date of sale:	Date of sale:	Date of sale: