

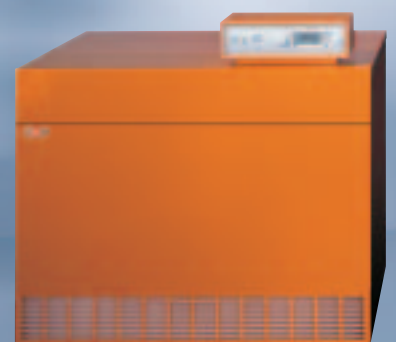


The competence brand for energy saving systems

## Commercial / industrial boilers up to 1017 kW



Steel boilers MKS  
Steel boilers with burner MUS  
Cast iron boilers MK-1/MK-2  
Cast iron boilers with burner MU-1  
Gas-fired boilers NG-31E/NG-31ED





MU-S

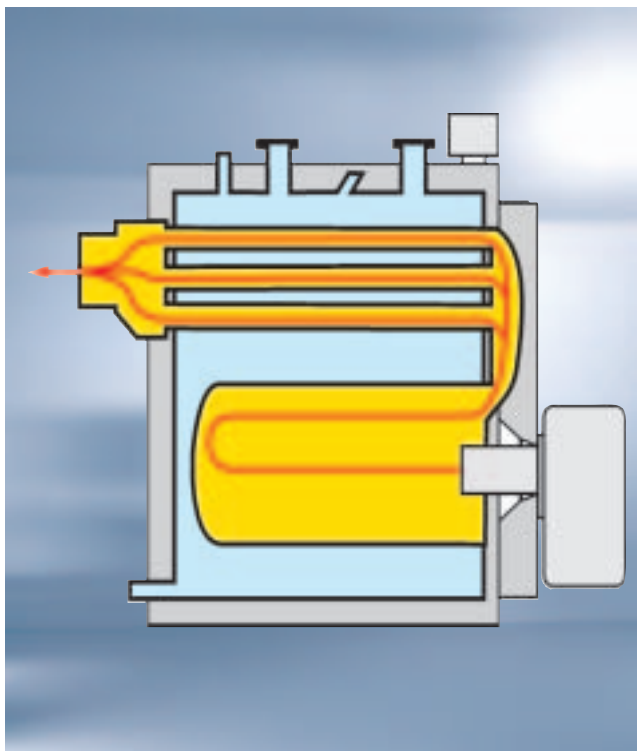
MKS

Steel boiler for pressure firing in accordance with DIN 4702/EN 303 and valid EC directives, for low temperature operation

## Steel boiler MKS/MUS

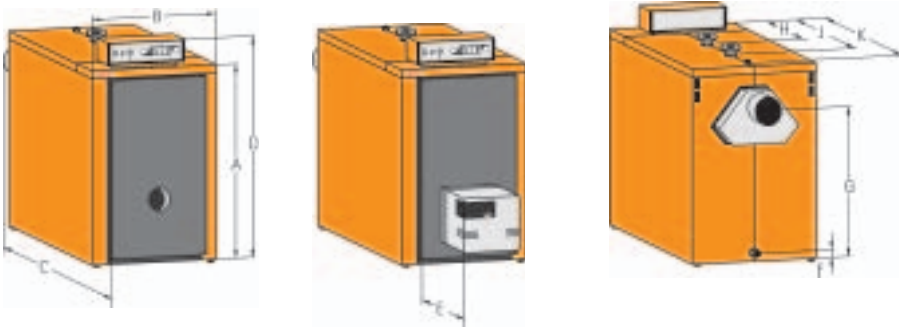
MUS with forced draught oil burner 70–100 kW

MKS without forced draught oil burner 70–550 kW



- MUS with forced draught oil burner for two-stage operation, design approved in accordance with DIN EN 267 for domestic fuel oil, ex-works adjusted during operation, with special mixing device for low NO<sub>x</sub>-emissions
- High normative efficiency: up to 94%
- Large heat exchanger surfaces made of smooth tubing for condensation-free low-temperature operation
- Stainless steel turbulators inserted into heat exchanger surfaces, low flue-gas temperatures
- Fully water-jacketed combustion chamber, no sizzling and expansion noises
- Full-width boiler door opening to left or right, easy cleaning
- Snug-fitted thermal insulation, 100 mm thick, very low radiation losses
- Powder-painted casing with supreme finish, easy to assemble
- Pre-wired control system, plug-in system for easy installation
- Six-year guarantee on boilers, two-year guarantee on electrical and moving parts

# Technical Data



TYPE	MUS/MKS	85	100	140	190	250	340	420	500
Output range MKS	kW	70-100	85-120	110-160	160-230	200-300	280-380	360-460	420-550
Recommended range MKS	kW	70-85	85-100	110-140	160-190	200-250	280-340	360-420	420-500
Output range MUS	kW	70-85	85-100	-	-	-	-	-	-
Adjusted output MUS	kW	85	100	-	-	-	-	-	-
Height/height without casing	A mm	1180/1155	1180/1155	1180/1155	1346/1320	1346/1320	1526/1500	1526/1500	1526/1500
Width /width without casing	B mm	794/600	794/600	794/600	974/780	974/780	1034/840	1034/840	1034/840
Length	C mm	1410	1410	1760	1948	1948	2065	2065	2065
Total height with control system	D mm	1335	1335	1335	1500	1500	1678	1678	1678
Depth burner hood	E mm	420	420	-	-	-	-	-	-
Filling, draining	F mm	203	203	203	172	172	178	178	178
Flue-gas pipe connection	G mm	922	922	922	1048	1048	1177	1177	1177
Heating return	H mm	324	324	324	367	367	430	430	430
Heating flow	J mm	724	724	1074	1117	1117	1184	1184	1184
Expansion flow	K mm	874	874	1224	1407	1407	1474	1474	1474
Flue-gas pipe diameter	mm	178	178	195	195	195	250	250	300
Foundation	mm	1500x950	1500x950	2000x800**	2000x1000**	2000x1000**	2200x1200**	2200x1200**	2200x1200**
Filling, draining, expansion return	R	1½"	1½"	1½"	1½"	1½"	1½"	1½"	1½"
Heating return	Flange DN	65	65	65	80	80	100	100	100
Heating flow	Flange DN	65	65	65	80	80	100	100	100
Expansion flow, vent (ext. thread)	R	1¼"	1¼"	1¼"	1½"	1½"	2"	2"	2"
Water capacity of boiler	Ltr.	216	213	288	508	494	697	665	635
Gas capacity of boiler	Ltr.	140	143	206	333	346	428	445	460
Heating surface area	m²	3,5	3,8	5,2	8,0	8,4	10,6	12,5	14,2
Flue-gas resistance <sup>1)</sup>	mbar	0,3	0,4	0,8	1,1	1,4	2,0	2,0	2,0
Heating water resistance (at Δt = 20K) <sup>1)</sup>	mbar	1,2	1,7	3,5	4,5	5,5	9,0	14,0	19,0
Max. boiler overpressure (gauge)	bar	4	4	4	4	4	4	4	4
Max. permissible temperature <sup>2)</sup>	°C	120	120	120	120	120	120	120	120
Relative stand-by loss	%	0,7	0,7	0,6	0,5	0,5	0,4	0,4	0,3
Flue-gas temperature <sup>1)</sup>	°C	145-165	145-165	145-165	145-165	145-165	150-170	150-165	155-170
Flue-gas temperature 1st stage	°C	120	120	120	120	120	120	120	120
Flue-gas mass flow <sup>1)</sup> (Fuel oil EL CO <sub>2</sub> = 13%)	kg/h	127-142	142-168	184-235	269-319	336-421	472-572	605-706	706-839
Flue-gas mass flow <sup>1)</sup> (Natural gas E CO <sub>2</sub> = 9,5%)	kg/h	125-151	151-178	196-249	285-338	356-446	497-605	641-749	749-889
Flue-gas mass flow <sup>1)</sup> (Natural gas LL CO <sub>2</sub> = 9,0%)	kg/h	129-157	157-185	203-259	296-351	371-461	518-626	666-778	778-925
Flue-gas mass flow <sup>1)</sup> (LPG CO <sub>2</sub> = 11%)	kg/h	120-146	146-172	189-240	274-326	343-428	479-583	619-720	720-857
Weight	Boiler kg	406	413	524	730	772	908	975	1035
	Burner kg	20	20	-	-	-	-	-	-
Electricity supply	230 V/50 Hz/10 A								
CE ID number	CE-0085AR0034								

<sup>1)</sup> Figures for upper/lower boiler output in recommended range with a CO<sub>2</sub> content of 13% and a mean boiler water temperature of 60°C.

<sup>2)</sup> Overheat safety cutout convertible: 120°C/110°C/100°C.

The dimensions of the chimney have to be selected in accordance with DIN 4705. If the flue-gas temperature is below 160°C the boilers have to be connected either to highly insulated chimneys (heat transfer resistance group in accordance with DIN 18160 part1) or any other approved humidity resistant flue-gas systems.

\*\*Foundation to be provided on site

Height of feet/adjustment screws 20 mm ± 10 mm to be taken into account!



MU-1

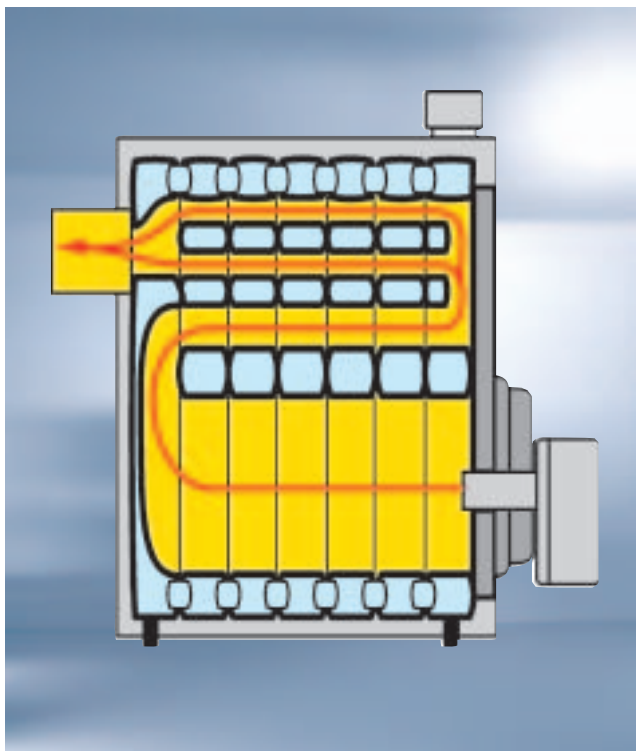
MK-1

Cast-iron boiler for pressure firing in accordance with DIN 4702/EN 303 and valid EC directives, for low-temperature operation.

## Cast iron boiler MU-1/MK-1

MU-1 with forced draught oil burner 50-110 kW

MK-1 without forced draught oil burner 50-300 kW



- MU-1 with forced draught oil burner for two-stage operation, design approved in accordance with DIN EN 267 for domestic fuel oil, ex-works adjusted during operation, with special mixing device for low NO<sub>x</sub>-emissions
- High normative efficiency: up to 94%
- Boiler elements made of durable, corrosion-resistant cast-iron
- Ideally proportioned combustion chamber
- Cast-iron boiler door opens left/right across entire front, easy cleaning
- Amply dimensioned thermal insulation
- Powder-painted casing with supreme finish, easy to assemble
- Pre-wired control system, plug-in system for easy installation
- Six-year guarantee on boilers, two-year guarantee on electrical and moving parts

### Delivery standards

Boiler body assembled as standard, split on request.  
Casing, control system and small items boxed for shipment.

# Technical Data



TYPE	MU-1/MK-1	80	110	140	180	220	260
Output range MK-1	kW	50-100	80-130	110-170	140-210	180-250	220-300
Recommended range MK-1	kW	50-80	80-110	110-140	140-180	180-220	220-260
Recommended range MU-1	kW	50-80	80-110	-	-	-	-
Adjusted output MU-1	kW	80	110	-	-	-	-
Height/height without casing	A mm	1220/1148	1220/1148	1220/1148	1220/1148	1220/1148	1220/1148
Width/width without casing	B mm	825/585	825/585	825/585	825/585	825/585	825/585
Length	C mm	1125	1285	1445	1605	1765	1925
Total height with control system	D mm	1380	1380	1380	1380	1380	1380
Depth burner hood	E mm	420	420	-	-	-	-
Filling, draining	F mm	120	120	120	120	120	120
Boiler return	G mm	160	160	160	160	160	160
Flue-gas pipe connection	H mm	860	860	860	860	860	860
Boiler flow	J mm	1070	1070	1070	1070	1070	1070
Expansion flow, vent (ext. thread)	K mm	1110	1110	1110	1110	1110	1110
Flue-gas pipe diameter	mm	179	179	179	179	179	179
Recommended foundation	mm	1300x850	1300x850	1500x950	1800x1000*	2000x1000*	2200x1000*
Filling, draining, expansion return	Rp	1"	1"	1"	1"	1"	1"
Boiler return, expansion return	Flange DN	65	65	65	65	65	65
Boiler flow	Flange DN	65	65	65	65	65	65
Safety unit, vent	Rp	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"
Water capacity of boiler	Ltr.	104	125	147	168	190	211
Gas capacity of boiler	Ltr.	155	195	235	275	315	355
Heating surface area	m <sup>2</sup>	4,4	5,6	6,8	8,0	9,2	10,4
Flue-gas resistance <sup>1)</sup>	mbar	0,11	0,18	0,4	0,5	0,8	1,2
Heat. water resist. (at Δt = 20K) <sup>1)</sup>	mbar	3	5	8	11	17	26
Max. boiler overpressure (gauge)	bar	4	4	4	4	4	4
Max. permissible flow temperature <sup>2)</sup>	°C	120	120	120	120	120	120
Relative stand-by loss	%	0,74	0,64	0,55	0,45	0,33	0,19
Flue-gas temperature <sup>1)</sup>	°C	145-175	150-175	155-175	155-175	155-175	155-175
Flue-gas temperature 1st stage	°C	130	130	130	130	130	130
Flue-gas mass flow <sup>1)</sup> (Fuel oil EL CO <sub>2</sub> = 13%)	kg/h	84-134	134-185	185-235	235-302	302-370	370-436
Flue-gas mass flow <sup>1)</sup> (Nat. gas E CO <sub>2</sub> = 9,5%)	kg/h	89-142	142-196	196-249	249-320	320-392	392-464
Flue-gas mass flow <sup>1)</sup> (Nat. gas LL CO <sub>2</sub> = 9,0%)	kg/h	92-147	147-202	202-258	258-331	331-407	407-479
Flue-gas mass flow <sup>1)</sup> (LPG CO <sub>2</sub> = 11%)	kg/h	86-138	138-189	189-241	241-310	310-378	378-447
Weight	Boiler kg	505	600	704	809	903	999
	Burner kg	20	20	-	-	-	-
CE ID number	CE-0085AR0034						
Electricity supply	230 V/50 Hz/10 A						

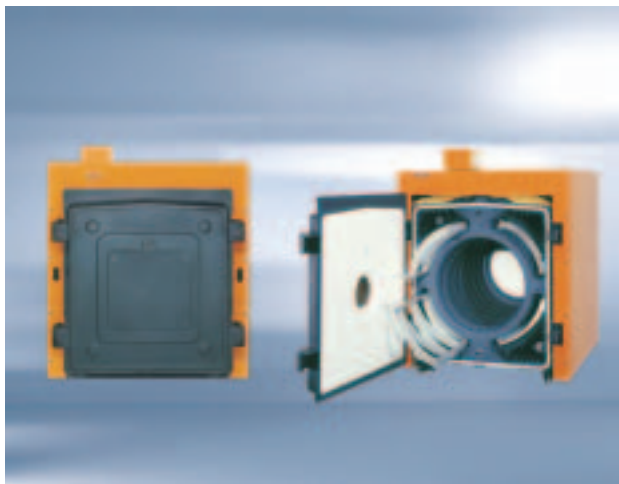
<sup>1)</sup> Figures for upper/lower boiler output in recommended range with a CO<sub>2</sub> content of 13% and a mean water temperature of 60°C.

<sup>2)</sup> Overheat safety cutout convertible 120°C/110°C/100°C.

The dimensions of the chimney have to be selected in accordance with DIN 4705. If the flue-gas temperature is below 160°C the boilers have to be connected either to highly insulated chimneys (heat transfer resistance group in accordance with DIN 18160 part1) or any other approved humidity resistant flue-gas systems.

\* Foundation to be provided on site

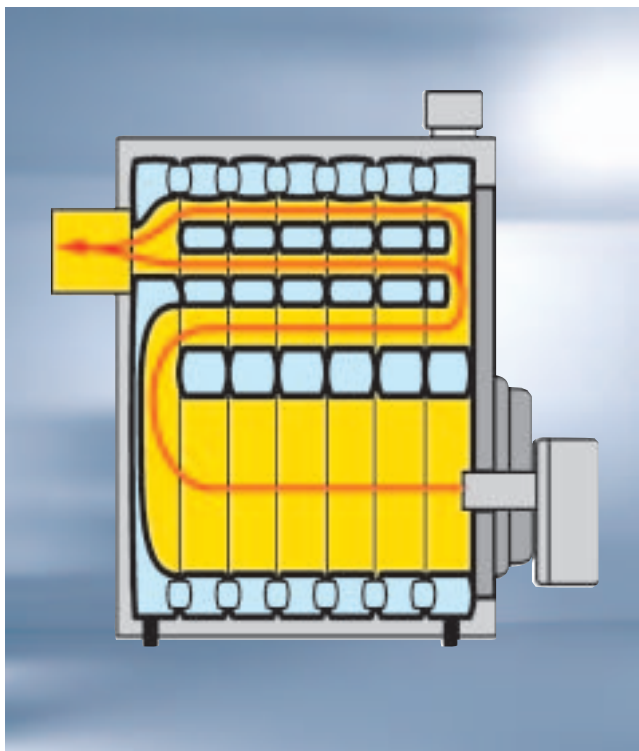
Height of feet/adjustment screws 20 mm ± 10 mm to be taken into account!



Cast-iron boiler for pressure firing in accordance with DIN 4702/EN 303 and valid EC directives, for low-temperature operation.

## Cast iron boiler MK-2

MK-2 without forced draught oil burner 320-1017 kW



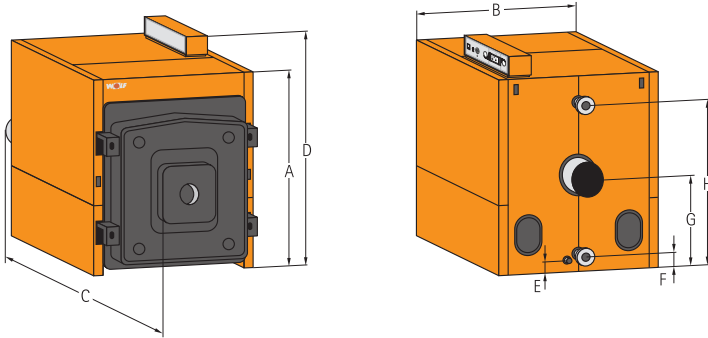
- Stainless steel turbulators integrated in flue-gas passes
- High normative efficiency: up to 94%
- Boiler elements made of durable, corrosion-resistant cast-iron
- Ideally proportioned combustion chamber
- Cast-iron boiler door opens left/right across entire front, easy cleaning
- Amply dimensioned thermal insulation
- Powder-painted casing with supreme finish, easy to assemble
- Pre-wired control system, plug-in system for easy installation
- Six-year guarantee on boilers, two-year guarantee on electrical and moving parts

### Delivery standards

Boiler body generally split into single sections, grouped and secured for shipment.

Casing, control system and small items boxed for shipment.

# Technical Data



TYPE	MK-2	320	380	440	500	560	670	780	900	1020
Output MK-2	kW	320	378	436	494	552	669	785	901	1017
Height/Height without casing	A mm	1300/1150	1300/1150	1300/1150	1300/1150	1300/1150	1300/1150	1300/1150	1300/1150	1300/1150
Width/width without casing	B mm	1130/930	1130/930	1130/930	1130/930	1130/930	1130/930	1130/930	1130/930	1130/930
Length	C mm	1409	1537	1665	1784	1921	2305	2561	2817	3076
Total height with control system	D mm	1470	1470	1470	1470	1470	1470	1470	1470	1470
Filling, draining	E mm	90	90	90	90	90	90	90	90	90
Boiler return	F mm	145	145	145	145	145	145	145	145	145
Flue-gas pipe connection	G mm	585	585	585	585	585	585	585	585	585
Boiler flow	H mm	1045	1045	1045	1045	1045	1045	1045	1045	1045
Flue-gas pipe diameter	mm	350/250*	350/250*	350/250*	350/250*	350	350	350	350	350
Recommended foundation	mm	1130x1412**	1130x1540**	1130x1665**	1130x1785**	1130x1925**	1130x2310**	1130x2565**	1130x2820**	1130x3080**
Filling, draining, expansion return	Rp	1"	1"	1"	1"	1"	1"	1"	1"	1"
Boiler return, expansion return	Flange DN	100	100	100	100	100	100	100	100	100
Boiler flow	Flange DN	100	100	100	100	100	100	100	100	100
Water capacity of boiler	Ltr.	219	247	275	302	330	386	441	496	552
Gas capacity of boiler	Ltr.	504	564	624	684	744	864	984	1104	1224
Heating surface area	m <sup>2</sup>	17,5	19,8	22,1	24,4	26,7	31,3	35,9	40,5	45,1
Flue-gas resistance <sup>1)</sup>	mbar	1,85	2,3	2,7	3,1	3,5	4,4	5,4	5,7	6,0
Heat. water resist. (at Δt = 20K) <sup>1)</sup>	mbar	15	21	29	39	52	77	77	108	145
Max. boiler overpressure (gauge)	bar	6	6	6	6	6	6	6	6	6
Max. permissible flow temperature <sup>2)</sup>	°C	120	120	120	120	120	120	120	120	120
Relative stand-by loss	%	0,11	0,11	0,11	0,10	0,09	0,09	0,09	0,08	0,08
Flue-gas temperature <sup>1)</sup>	°C	190	190	190	180	180	180	180	180	180
Flue-gas temperature 1st stage	°C	140	140	140	140	140	140	140	140	140
Flue-gas mass flow <sup>1)</sup> (Fuel oil EL CO <sub>2</sub> = 13%)	kg/h	537	634	732	829	926	1123	1317	1512	1707
Flue-gas mass flow <sup>1)</sup> (Nat. gas E CO <sub>2</sub> = 9,5%)	kg/h	564	666	768	871	973	1179	1384	1588	1792
Flue-gas mass flow <sup>1)</sup> (Nat. gas LL CO <sub>2</sub> = 9,0%)	kg/h	592	699	806	914	1021	1238	1452	1667	1881
Flue-gas mass flow <sup>1)</sup> (Flüssiggas CO <sub>2</sub> = 11%)	kg/h	545	644	743	842	940	1139	1337	1535	1732
Weight	Boiler kg	1551	1710	1868	2049	2206	2533	2857	3172	3489
CE ID number	CE-0645B00118									
Electricity supply	230 V/50 Hz/10 A									

<sup>1)</sup> Figures for upper/lower boiler output in recommended range with a CO<sub>2</sub> content of 13% and a mean water temperature of 60°C.

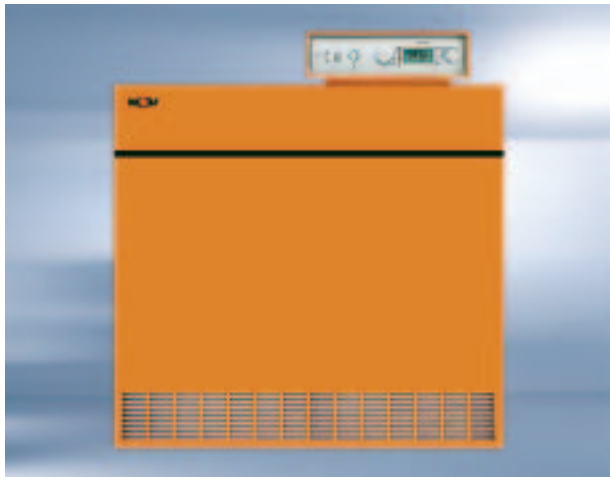
<sup>2)</sup> Overheat safety cutout convertible 120°C/110°C/100°C.

The dimensions of the chimney have to be selected in accordance with DIN 4705. If the flue-gas temperature is below 160°C the boilers have to be connected either to highly insulated chimneys (heat transfer resistance group in accordance with DIN 18160 part1) or any other approved humidity resistant flue-gas systems.

\*Reduction from Ø 350 mm to Ø 250 mm included in delivery

\*\* Foundation to be provided on site

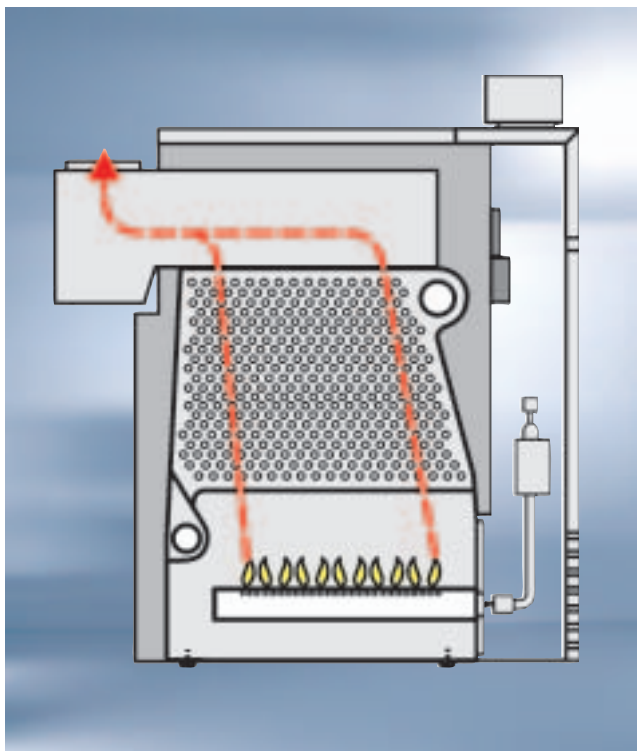
Height of feet/adjustment screws 20 mm ± 10 mm to be taken into account!



Gas-fired boiler in accordance with valid EC directives with intermitted ignition.

## Gas-fired boiler NG-31E

NG-31E with atmospheric burner 40-110 kW



- Gas-fired boiler in accordance with valid EC directives with intermittent ignition and atmospheric burner for natural gas E, natural gas LL and LPG propane/butane (category II<sub>2ELL3B/P</sub>) type (construction type) B<sub>11</sub> or B<sub>11BS</sub> (with flue-gas monitoring as accessory) Capacity range 40-110 kW
- Ultra-low-pollutant combustion without flame cooling
- DVGW-Quality label
- High normative efficiency: up to 95%
- Pre-wired control system, plug-in system for easy installation
- Nubbed cast-iron block to maximize the heat exchanger surface area
- Snug-fitted thermal insulation, amply dimensioned
- Combustion chamber with water jacket for minimum radiation heat losses
- Two-stage gas burner of heat resistant stainless steel
- Six-year guarantee on boilers, two-year guarantee on electrical and moving parts

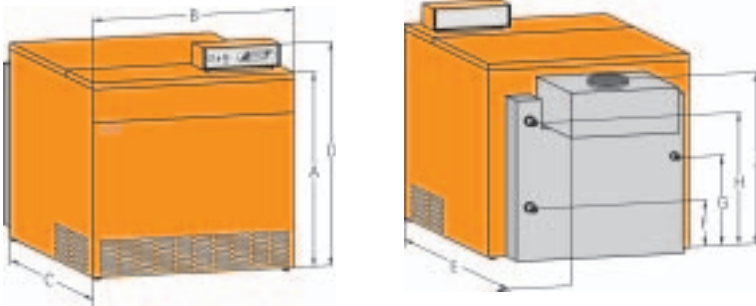
### Delivery standards

Cast-iron block fully assembled, complete with gas burner. Casing, draught security device and small items on pallet with cast-iron block.

Control system boxed separately.



# Technical Data



TYPE	NG-31E	70	90	110
Output 1st burner stage <sup>1)</sup>	kW	40,2	50,5	59,9
Charge 1st burner stage <sup>1)</sup>	kW	42,5	53,5	63,3
Output 1st + 2nd burner stage <sup>1)</sup>	kW	70,0	90,0	110,0
Charge 1st + 2nd burner stage <sup>1)</sup>	kW	75,6	97,0	117,9
Height/height without casing	A mm	970/650	970/650	970/650
Width/width without casing	B mm	1025/880	1195/1050	1365/1220
Depth/depth without casing	C mm	750/740	750/740	750/740
Total height with control system	B mm	1120	1120	1120
Depth with draught security device	E mm	1030	1030	1030
Boiler return	F mm	220	220	220
Gas connection	G mm	550	550	550
Boiler flow	H mm	605	605	605
Draught safeguard	J mm	870	870	870
Flue-gas pipe internal diameter	mm	200	225	250
Foundation	mm	1300x850	1300x850	1500x950
Boiler return	R	1½"	1½"	1½"
Gas connection	Rp	1"	1"	1"
Boiler flow	R	1½"	1½"	1½"
Number of sections		9	11	13
Water capacity of boiler	Ltr.	37	45	53
Heat. water resist. (bei Δt = 20K)	mbar	8	12	18
Max. boiler overpressure (gauge)	bar	4	4	4
Max. permissible flow temperature <sup>2)</sup>	°C	120	120	120
Relative stand-by loss	%	1,5	1,4	1,3
Required pressure of heat generator	Pa	3	3	3
Gas connecting pressure Nat. gas E and Nat. gas LL	mbar	20	20	20
Gas connecting pressure LPG propane and butane	mbar	50	50	50
Flue-gas temperature <sup>3) 4)</sup>	°C	63 / 93	64 / 97	67 / 97
Flue-gas mass flow <sup>4)</sup>	g/s	43 / 53	58 / 72	69 / 88
CO <sub>2</sub> content at nominal capacity Natural gas E <sup>4)</sup>	%	3,9 / 5,8	3,6 / 5,4	3,6 / 5,4
Weight	Boiler kg	318	381	444
Electricity supply		230 V/50 Hz/10 A		
CE ID number		CE-0085AS0012		

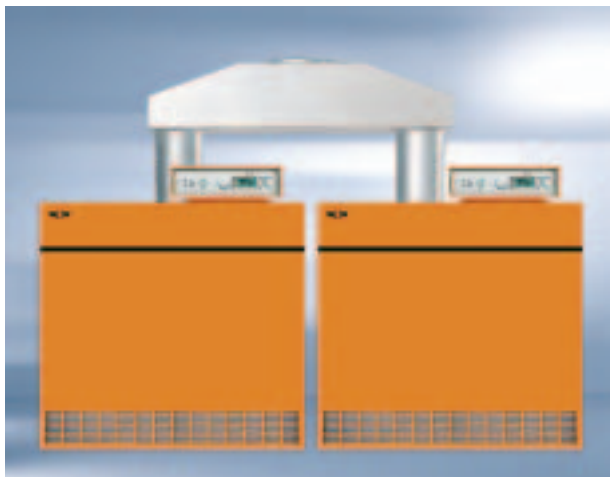
<sup>1)</sup> The unit is provided primarily for LPG type butane. With pure propane the values are lower by about 12%.

<sup>2)</sup> Overheat safety cutout convertible: 120°C/110°C/100°C.

<sup>3)</sup> For flue-gas temperatures lower than 80°C a humidity resistant chimney is required.

<sup>4)</sup> Figures for min. output 1st burner stage/max. output 1st + 2nd burner stage.

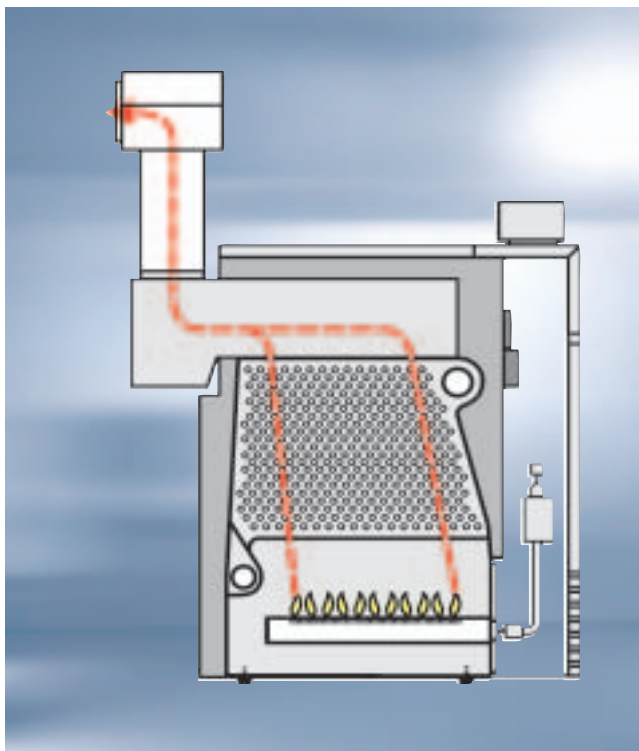
Height of feet/adjustment screws 20mm ±10mm to be taken into account!



Gas-fired boiler in accordance with valid EC directives with intermittent ignition.

## Gas-fired boiler NG-31ED

NG-31E with atmospheric burner 40-220 kW



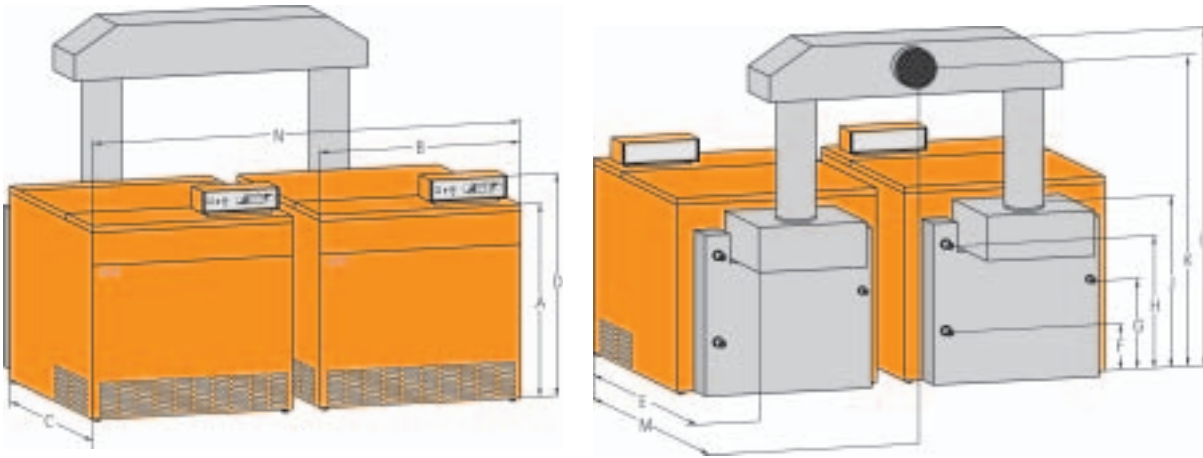
- Gas-fired boiler in accordance with valid EC directives with intermittent ignition and atmospheric burner for natural gas E, natural gas LL und LPG propane/butane (category II<sub>2ELL3B/P</sub>) type (construction type) B<sub>11</sub> or B<sub>11BS</sub> (with flue-gas monitoring as accessory) Capacity range 40-220 kW
- Ultra-low-pollutant combustion without flame cooling
- DVGW-Quality label
- High normative efficiency: up to 95%
- Pre-wired control system, plug-in system for easy installation
- Nubbed cast-iron block to maximize the heat exchanger surface area
- Snug-fitted thermal insulation, amply dimensioned
- Combustion chamber with water jacket for minimum radiation heat losses
- Both boilers with two-stage gas burner of heat resistant stainless steel
- Six-year guarantee on boilers, two-year guarantee on electrical and moving parts

### Delivery standards

Cast-iron block fully assembled, complete with gas burner. Casing, draught security device and small items on pallet with cast-iron block.

Flue-gas collector with flue-gas connection and control system boxed separately.

# Technical Data



TYPE	NG-31ED	140	180	220
Output 1st boiler + 1st burner stage <sup>1)</sup>	kW	40,2	50,5	59,9
Charge 1st boiler + 1st burner stage <sup>1)</sup>	kW	42,5	53,5	63,3
Output 1st + 2nd boiler and 1st + 2nd burner stage <sup>1)</sup>	kW	140,0	180,0	220,0
Charge 1st +2nd boiler and 1st + 2nd burner stage <sup>1)</sup>	kW	151,2	194,0	235,8
Height/height without casing	A mm	970/650	970/650	970/650
Width/width without casing	B mm	1025/880	1195/1050	1365/1220
Depth/depth without casing	C mm	750/740	750/740	750/740
Height with control system	B mm	1120	1120	1120
Depth with draught security device	E mm	1030	1030	1030
Boiler return	F mm	220	220	220
Gas connection	G mm	550	550	550
Boiler flow	H mm	605	605	605
Draught safeguard	J mm	870	870	870
Flue-gas pipe connection	K mm	1470	1495	1520
Total height	L mm	1630	1680	1730
Depth with flue-gas collector	M mm	1030	1030	1055
Total width	N mm	2100	2440	2780
Flue-gas pipe internal diameter	mm	250	300	350
Foundation	mm	2 Pieces 1300x850	2 Pieces 1300x850	2 Pieces 1500x950
Boiler return <sup>2)</sup>	R	1½"	1½"	1½"
Gas connection <sup>2)</sup>	Rp	1"	1"	1"
Boiler flow <sup>2)</sup>	R	1½"	1½"	1½"
Number of sections <sup>2)</sup>		9	11	13
Water capacity of boiler	Ltr.	2 x 37	2 x 45	2 x 53
Heating water resistance (at Δt = 20K) <sup>2)</sup>	mbar	8	12	18
Max. permissible flow temperature	bar	4	4	4
Max. boiler overpressure (gauge) <sup>3)</sup>	°C	120	120	120
Relative stand-by loss	%	1,5	1,4	1,3
Required pressure of heat generator	Pa	5	5	5
Gas connecting pressure Nat. gas E and Nat. gas LL	mbar	20	20	20
Gas connecting pressure LPG propane and butane	mbar	50	50	50
Flue-gas temperature <sup>4) 5)</sup>	°C	63 / 93	64 / 97	67 / 97
Flue-gas mass flow <sup>5)</sup>	g/s	43 / 105	58 / 144	69 / 176
CO <sub>2</sub> content at nominal capacity Natural gas E <sup>5)</sup>	%	3,9 / 5,8	3,6 / 5,4	3,6 / 5,4
Weight	Boiler kg	2 x 318	2 x 381	2 x 444
Electricity supply		230 V/50 Hz/10 A		
CE ID number		CE-0085AS0012		

<sup>1)</sup>The unit is provided primarily for LPG type butane. With pure propane the values are lower by about 12%.

<sup>2)</sup>Values refer to single boilers.

<sup>3)</sup>Overheat safety cutout convertible: 120°C/110°C/100°C.

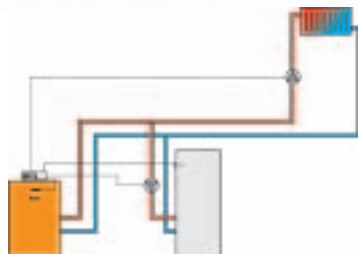
<sup>4)</sup>For flue-gas temperatures lower than 80°C a humidity resistant chimney is required.

<sup>5)</sup>Figures for 1st boiler and 1st burner stage / 1st and 2nd boiler and 1st and 2nd burner stage.

Height of feet/adjustment screws 20mm ±10mm to be taken into account!

# Control systems for boilers and boilers with vertical hot water storages (HWS)

## Control system R31-STAV

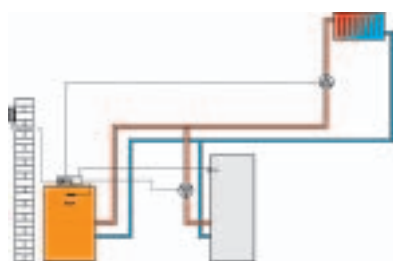


Boiler temperature manually adjustable; second burner stage cut-in is load-dependent.

**Equipment:** Operating switch, burner fault indicator, boiler thermometer, boiler temperature controller adjustable from 38-78/90°C, overheat safety cutout convertible for 120/110/100°C, 2 operating-hours counters, overheat safety cutout test button, summer/winter switch.

**Connection of HWS:** HWS-control with hot water priority, connection for HWS-thermostat (SP1).

## Control system R32 DigiCompact



Weather-compensated control system for one boiler circuit with heating and timer programs; control of 2-stage and modulating burners (3-point-control)

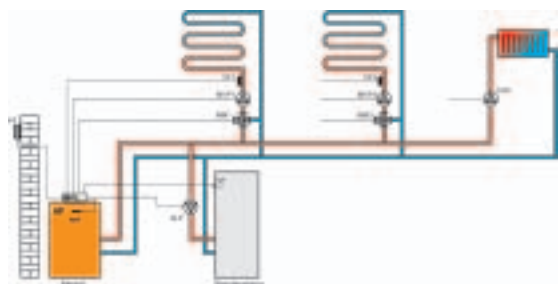
**Equipment:** Operating switch, overheat safety cutout convertible 120/110/100°C, fuse medium blow 6.3A, 3-channel-digital timer, increased occupancy program, summer/winter mode selector, program selection switch, flue-gas test, automatic mode, heating or economy mode over 24 h, summer mode, manual mode, heating off; connection for remote control; frost protection.

Hinged front panel open: time of day/day of week setting, selection of one of the three preprogrammed (modifiable) timer programs, automatic summer/winter changeover.

Display of temperatures and faults. Programming and test functions for the heating contractor.

**Connection of HWS:** Electronic HWS-control with hot water priority, separate timer program for HWS charging; anti-Legionella function; connection for s.h.w.-circulation pump.

## Control system R33 DigiComfort



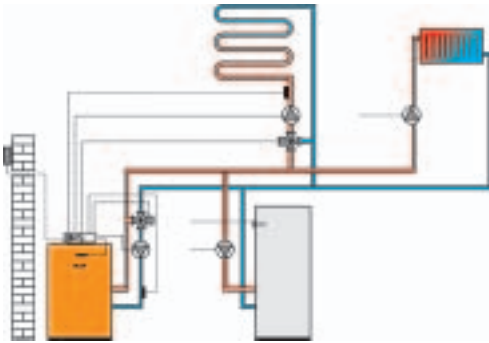
Weather-compensated control system for one boiler circuit and two mixing valve circuits each with separate heating and timer programs; control of 2-stage and modulating burners (3-point-control)

**Equipment:** Operating switch, manual/automatic switch, burner fault display, boiler temperature thermometer, boiler temperature control for manual mode, Overheat safety cutout convertible 120/110/100°C, frost protection, fuse slow blow 6,3 A, temperature selection, program selection switch, 4-channel-digital timer with 3 programmed (modifiable) standard programs, automatic summer/winter changeover, user-activated optimization functions for heating curve and heating circuit, counters for operating hours and burner starts, function indication, connections for 3 heating circuit pumps, connection for radio clock module and digital remote control for each heating circuit. Communication interface for diagnosis and PC connection.

Settings for inclination of both boiler and mixing valve circuit curve, reduced mode, heating curve offset, flow temperature minimum and maximum limitation.

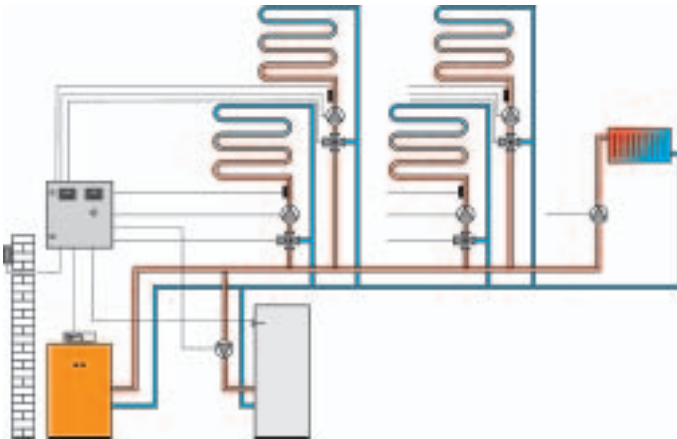
**Connection of HWS:** Electronic HWS-control with hot water priority, separate timer program for HWS charging; anti-Legionella function; connection for s.h.w.-circulation pump.

# Control systems for boilers and boilers with vertical hot water storages (HWS)

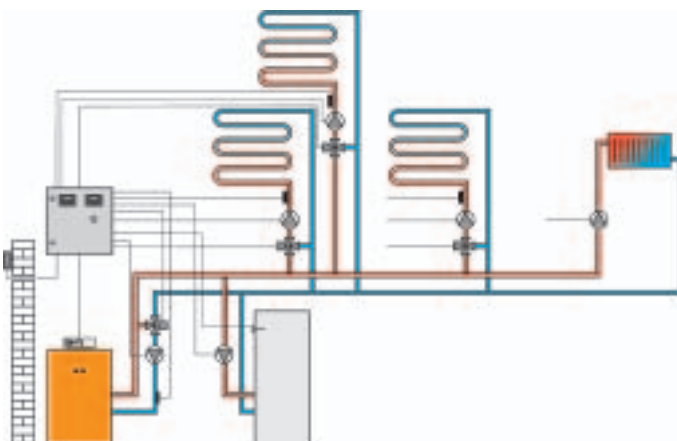


**Installation example:** Control system R33 DigiComfort with one mixing valve circuit and return temperature boost.

## Control System R33/4 DigiComfort



same as R33 DigiComfort, with additional control for 4 mixing valve circuits, wiring board (H/W/D 600/380/210 mm), with operating switch for OFF, Auto and emergency mode (instead of manual/automatic switch), 2 control modules, connections for 5 heating circuit pumps.



**Installation example:** Control system R33/4 DigiComfort with 3 mixing valve circuits and return temperature boost.

**Notice:** Twin boiler installations require two control systems. The two control systems work independently. It is possible to combine two different control systems, depending on the installation configuration.

# RK-2 DigiCascade / RK-4 DigiCascade

## Control system for twin boiler installations (4 stages)

### Functions:

- weather-compensated cascade control for 2 two-stage boilers (4 stages) fitted in wiring board, and 2 basic control systems with security facilities fitted on the boilers each.
- Load-dependent boiler or burner stage cut-in/cut-out
- Automatic boiler sequence switch-over according to operating hours
- 2 return temperature boosts via mixing valve
- 2 direct heating circuits
- 2 mixing valve circuits
- max. 2 hot water storages with anti-Legionella function
- Plain language display optional in „German, English, French or Italian“.
- 3 timer programs per heating circuit individually programmable
- 8 operating modes available, either individually for each heating circuit or for common use
- ECO (economic) - ABS (reduced mode) function
- Room temperature thermostat function (only with remote control)
- Start-up mode
- Floor pavement drying mode
- Optimization functions (adaption)
- Adjustable boiler temperature
- Sensor recognition and error message
- Diagnostic system (5 error messages memorized via error code)
- Functional test
- Measurement of emissions
- Overheat safety cutout (STB) - functional test
- Connection facility for safety devices
- Switch for manual/automatic operation
- Separate reset functions
- Counters for burner starts and operating hours (1st and 2nd stages)
- Connection of remote control via 2-wire bus
- Control system may be extended via 2-wire bus
- 4 variable outputs programmable for: solar circuit, s.h.w.-circulation pumps, feeding pump, bypass pump, stratification storage tank pump, collective error message, electric heating etc.
- 5 variable inputs programmable for: flue gas sensor, 2nd outside sensor, demanding contact, external modem etc.

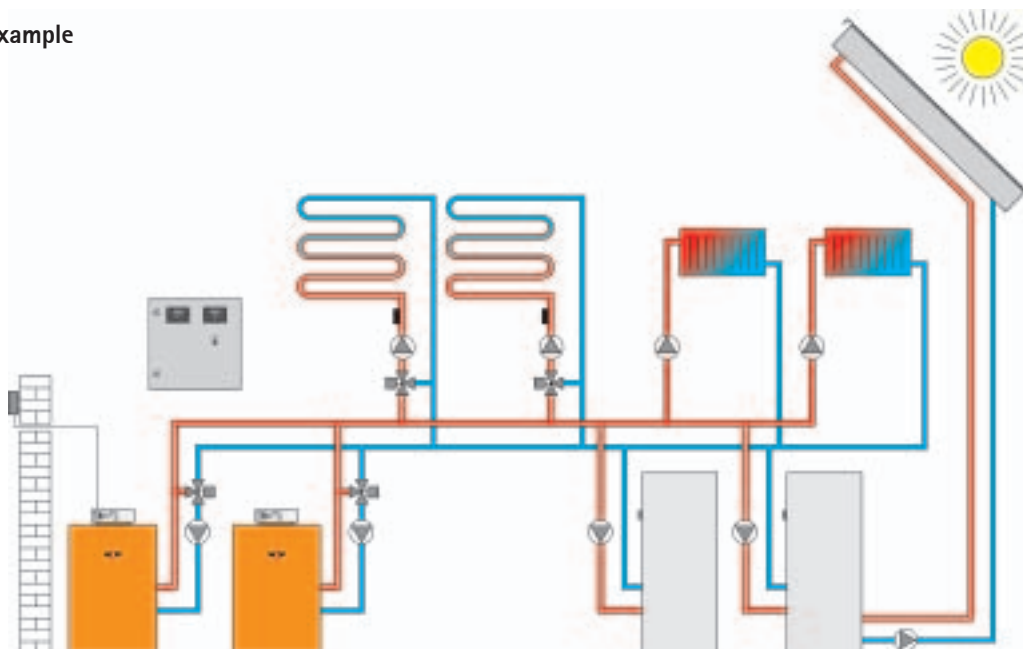
### Accessories:

- **Remote control RS-Theta**
  - Uniform handling of both remote control and cascade controller
  - Access to all heating parameters of a controller, except specific levels of the installation as hydraulics, boiler data or cascade characteristics
  - Room sensor can be switched off
  - Room thermostat function
- **Telephone remote contact**
  - 2 voice-operated channels
- **Electronic HWS-sensor**
- **Temperature limitation thermostat** for floor heating
- **Flue gas temperature sensor** for service display
- **Solar circuit kit**
  - Sensor- and sensor well for both HWS and solar panel
- **Calorimetry kit**
  - with electron. heat calculator, flow meter, sensor and sensor well for flow and return

### RK-4 DigiCascade

idem RK-2 DigiCascade, but with 3 direct heating circuits, 4 mixing valve circuits, 3 hot water storages, 6 variable outputs, 8 variable inputs.

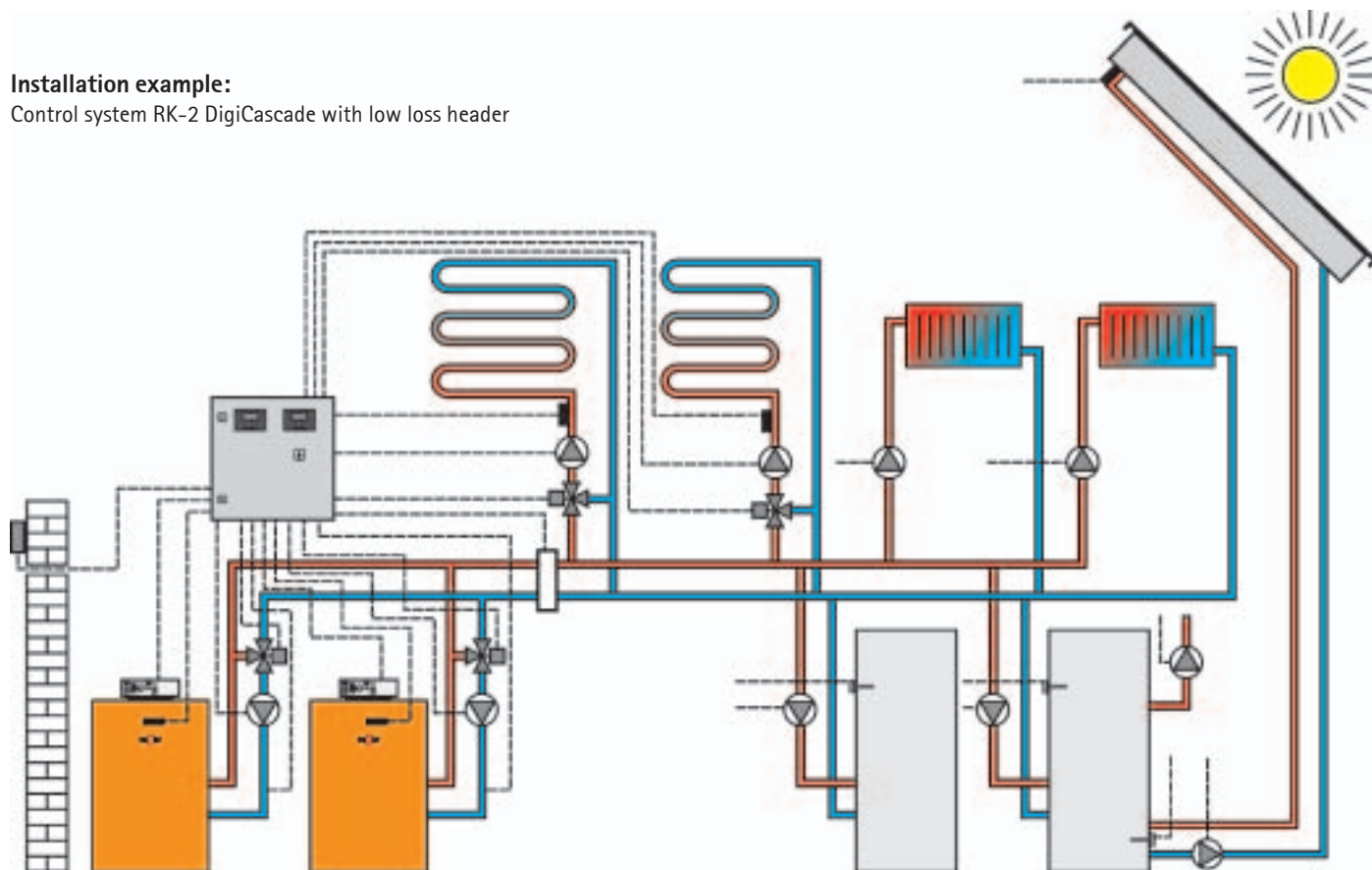
### Installation example



# Installation examples RK-2 DigiCascade/RK-4 DigiCascade

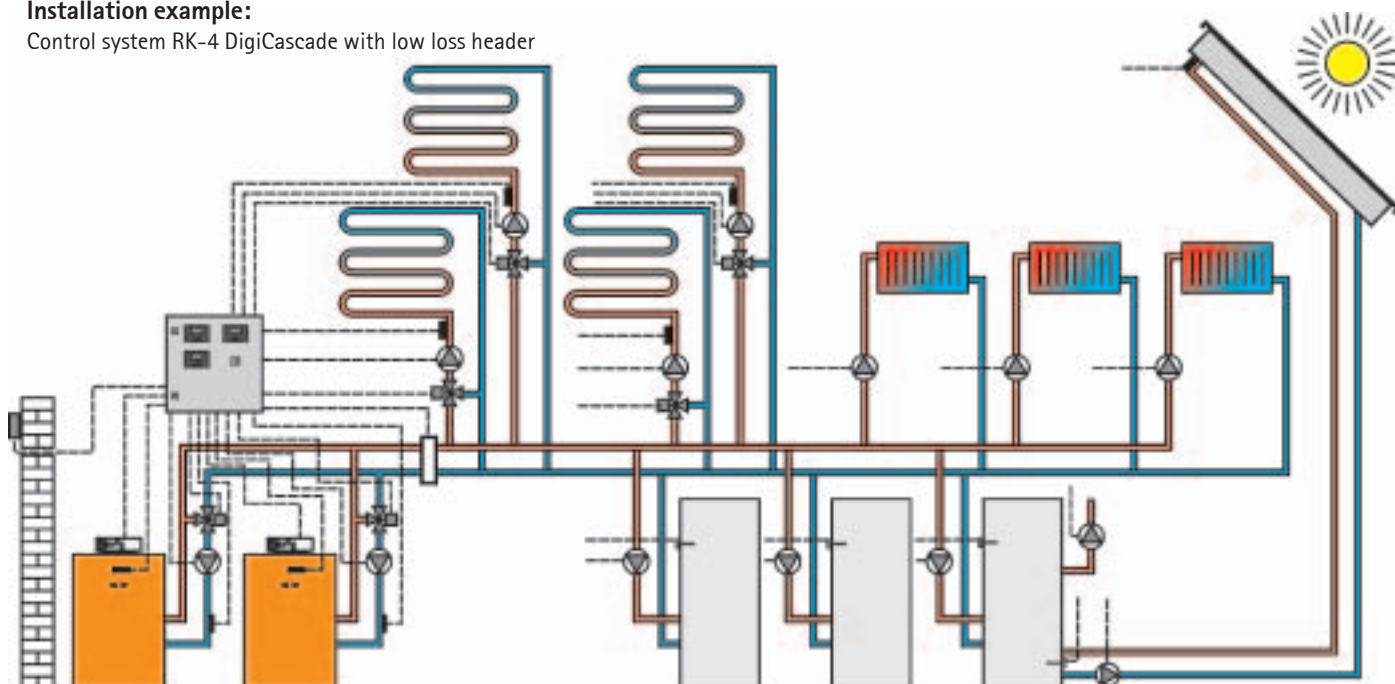
## Installation example:

Control system RK-2 DigiCascade with low loss header



## Installation example:

Control system RK-4 DigiCascade with low loss header



# Specification

Item	Pcs.	<b>Unit MUS for low temperature operation</b>	Unit price	Total price
		<p>in accordance with DIN 4702 / EN 303 as well as with valid CE-regulations, type approval to TRD 702 (Steam Boiler Ordinance), for hot water heating systems with heating circuit pumps in accordance with DIN 4751, suitable for continuously reducing boiler temperature to 38°C.</p> <p>Boiler body made of steel, boiler door for left and right opening with sight glass and blow-off connection, sheet steel casing with powder coating, insulation material, cleaning brush.</p> <p>Forced draught oil burner in accordance with DIN EN 267, for domestic fuel oil EL in accordance with DIN 51603, design approved, 2 fuel oil hoses included, ex-works adjusted during operation.</p> <p>Boiler type: MUS ..... Width ..... mm</p> <p>Output range kW ..... Height ..... mm</p> <p>Manufacture Wolf Depth ..... mm</p> <p>Weight ..... kg</p>		
		<p><b>Oil/gas-fired steel boiler MKS for low temperature operation</b></p> <p>in accordance with DIN 4702 / EN 303 as well as with valid CE-regulations, type approval to TRD 702 (Steam Boiler Ordinance), for hot water heating systems with heating circuit pumps in accordance with DIN 4751, suitable for continuously reducing boiler temperature to 38°C with oil-fired boilers and 50°C with gas-fired boilers.</p> <p>Boiler body made of steel, boiler door for left and right opening with sight glass and blow-off connection, sheet steel casing with powder coating, insulation material, cleaning brush.</p> <p>Boiler type: MKS ..... Width ..... mm</p> <p>Output range kW ..... Height ..... mm</p> <p>Manufacture Wolf Depth ..... mm</p> <p>Weight ..... kg</p>		
		<p><b>Unit MU-1 for low temperature operation</b></p> <p>in accordance with DIN 4702 / EN 303 as well as with valid CE-regulations, type approval to TRD 702 (Steam Boiler Ordinance), for hot water heating systems with heating circuit pumps in accordance with DIN 4751, suitable for continuously reducing boiler temperature to 38°C.</p> <p>Boiler body with three-pass system made of durable cast iron, boiler door for left and right opening made of cast iron with sight glass and blow-off connection, sheet steel casing with powder coating, insulation material, cleaning brush.</p> <p>Forced draught oil burner in accordance with DIN EN 267, for domestic fuel oil EL in accordance with DIN 51603, design approved, 2 fuel oil hoses included, ex-works adjusted during operation.</p> <p>Boiler type: MU-1 ..... Width ..... mm</p> <p>Output range kW ..... Height ..... mm</p> <p>Manufacture Wolf Depth ..... mm</p> <p>Weight ..... kg</p>		



# Specification

Item	Pcs.	<b>Oil/gas-fired cast iron boiler MK-1/MK-2 for low temperature operation</b>	Unit price	Total price
		<p>in accordance with DIN 4702 / EN 303 as well as with valid CE-regulations, type approval to TRD 702 (Steam Boiler Ordinance), for hot water heating systems with heating circuit pumps in accordance with DIN 4751, suitable for continuously reducing boiler temperature to 38°C with oil-fired boilers and 50°C with gas-fired boilers.</p> <p>Boiler body with three-pass system made of durable cast iron, boiler door for left and right opening made of cast iron with sight glass and blow-off connection, sheet steel casing with powder coating, insulation material, cleaning brush.</p>		
		<p>Boiler type: MK-1/MK-2 ..... Width ..... mm</p>		
		<p>Output range kW ..... Height ..... mm</p>		
		<p>Manufacture Wolf ..... Depth ..... mm</p>		
		<p>Weight ..... kg</p>		
		<b>Gas-fired boiler NG-31 E in accordance with DIN EN 297 / DIN EN 437</b>		
		<p>for low temperature operation, type approval to TRD 702 (Steam boiler ordinance), CE-label in accordance with valid CE-regulations.</p> <p>High performance cast iron body in segments with water-cooled combustion chamber, vertical cast iron segments, vertical flue-gas passes, overall insulation with highly efficient mineral wool. Draught safeguard fitted, with vertical flue-gas connection, 2-stage atmospheric pre-mix burner of stainless steel for natural gas E, natural gas LL und LPG Propane/Butane. Ex-works equipped for natural gas E.</p> <p>Control system with burner control unit and intermittent ignition for a maximum ignition reliability, gas governor and two gas combination valves opening gradually, with measuring nipple for connecting pressure. Sheet steel casing with powder coating.</p>		
		<p>Boiler type: NG-31E ..... Width ..... mm</p>		
		<p>Output range kW ..... Height ..... mm</p>		
		<p>Manufacture Wolf ..... Depth ..... mm</p>		
		<p>Weight ..... kg</p>		
		<b>Gas-fired boiler NG-31ED in accordance with DIN 297/DIN EN 437</b>		
		<p>for low temperature operation, type approval to TRD 702 (Steam boiler ordinance), CE-label in accordance with valid CE-regulations.</p> <p>High performance cast iron body in segments with water-cooled combustion chamber, vertical cast iron segments, vertical flue-gas passes, overall insulation with highly efficient mineral wool. Draught safeguard fitted, with horizontal flue-gas connection, 2-stage atmospheric pre-mix burner of stainless steel for natural gas E, natural gas LL und LPG Propane/Butane. Ex-works equipped for natural gas E.</p> <p>Control system with burner control unit and intermittent ignition for a maximum ignition reliability, gas governor and two gas combination valves opening gradually, with measuring nipple for connecting pressure. Sheet steel casing with powder coating, flue-gas collector flame-aluminized with two flue-gas connections.</p>		
		<p>Boiler type: NG-31ED ..... Width ..... mm</p>		
		<p>Output range kW ..... Height ..... mm</p>		
		<p>Manufacture Wolf ..... Depth ..... mm</p>		
		<p>Weight ..... kg</p>		

# Specification

Item	Pcs.		Unit price	Total price
		<b>Control systems for steel/cast iron/gas boilers</b>		
		R31-STAV	Boiler temperature manually adjustable, suitable for 2-stage burners with load-dependent cut-in/out of second burner stage, HWS connection.	
		R32 DigiCompact	Weather-compensated control system for one boiler circuit with heating and timer programs via 3-channel digital timer, control of 2-stage and modulating burners (3-point-control), frost protection, automatic summer/winter mode changeover.	
		R33 DigiComfort	Weather-compensated control system for one boiler circuit and two mixing valve circuits each with separate heating and timer programs via 4-channel digital timer, control of 2-stage and modulating burners (3-point-control), frost protection, automatic summer/winter mode changeover; communication interface.	
		R33/4 DigiComfort	Same as R33 DigiComfort, with additional control for 4 mixing valve circuits, wiring board with operating switch for OFF, Auto and emergency mode, 2 control modules, connection for 5 heating circuit pumps.	
		RK-2 DigiCascade	Weather-compensated cascade control for 2 two-stage boilers (4 stages) fitted in wiring board, 2 basic control systems with security facilities, load-dependent boiler or burner stage cut-in/cut-out, automatic boiler sequence switch-over according to operating hours, 2 return temperature boosts via mixing valve, 2 direct heating circuit pumps, 2 weather-compensated mixing valve controls, 2 HWS controls, s.h.w-pump control via timer or interval programming, anti-legionella function, start-up mode, plain language display optional in „German, English, French or Italian“, 3 timer programs per heating circuit individually programmable, automatic floor pavement drying mode, 8 operating modes available, either individually for each heating circuit or for common use, constant boiler temperature adjustable, variable outputs programmable for i.e. feeding pump, stratification storage tank pump, electric heating etc., variable inputs programmable for sensors and contacts, integrated solar control with programmable functions, diagnostic system, selection of operating modes via modem (accessory), collective error message (5 messages memorized via error code), flue-gas monitoring, room thermostat function (only with remote control), sensor recognition and error message, functional test, connection possibility for security facilities, switch for emergency function, counters for burner starts and operating hours (1st and 2nd stages), connection of remote control via 2-wire bus; control system may be extended via 2-wire bus.	
		RK-4 DigiCascade	Same as RK-2 DigiCascade, but with 3 direct heating circuits, 4 mixing valve circuits, 3 hot water storages.	

# Specification

Item	Pcs.	<b>Accessories for steel/cast iron/gas boilers</b> (any accessory has to be ordered separately for each boiler)	Unit price	Total price
		Electronic boiler sensor for weather-compensated control systems, required for HWS-connection.		
		Terminal box for low-water protection, safety pressure relief, extraneous-pressure monitor.		
		Return temperature controller for boosting pump.		
		Room thermostat/room thermostat clock for R31-STAV to control the heating circuit pump depending on the required room temperature and time with daily and weekly program.		
		Remote control for R32 DigiCompact with program and temperature selection.		
		Radio clock module for R33 DigiComfort and R33/4 DigiComfort.		
		Digital remote control for R33/DigiComfort and R33/4 DigiComfort with program and temperature selection and information display.		
		Flow sensor for R33 DigiComfort, required for second mixing valve circuit.		
		Accessories for RK-2/RK-4 DigiCascade: Remote control RS-Theta Telephone remote contact with 2 voice-operated channels Temperature limitation thermostat for floor heating Flue gas temperature sensor for service display Solar circuit kit, sensor and sensor well for both HWS and solar panel Calorimetry kit with electronic heat calculator, flow meter, sensor and sensor well for flow and return.		
		Flue-gas pipe 500 mm / 1000 mm long	for .....	
		Flue-gas pipe bend 45° / 90° with soot door	for .....	
		Compression tool	for .....	
		<b>For NG-31E/NG-31ED</b>		
		Motorized flue-gas flap		
		Conversion kit for natural gas LL		
		Conversion kit for propane/butane		
		Flue-gas monitoring		
		Gas ball valve with thermal shut-off valve (TAE)		



The competence brand for energy saving systems

The extensive scope of supply of Wolf, being a professional system provider, comprises overall solutions for new works, refurbishment or modernization. The range of Wolf control systems fulfills every need of heating comfort. The products are easy to handle and they work reliably and energy saving. Photo-voltaic and solar systems may be integrated as well in existing installations within a short period. Any Wolf product may be installed and serviced quickly and without problems.

Wolf GmbH, Postfach 1380, 84048 Mainburg, Tel.: +498751 / 74-0, Fax: +498751 / 74-1600, Internet: [www.wolf-heiztechnik.de](http://www.wolf-heiztechnik.de)

#### System configuration Shopping-Center

##### System component air handling

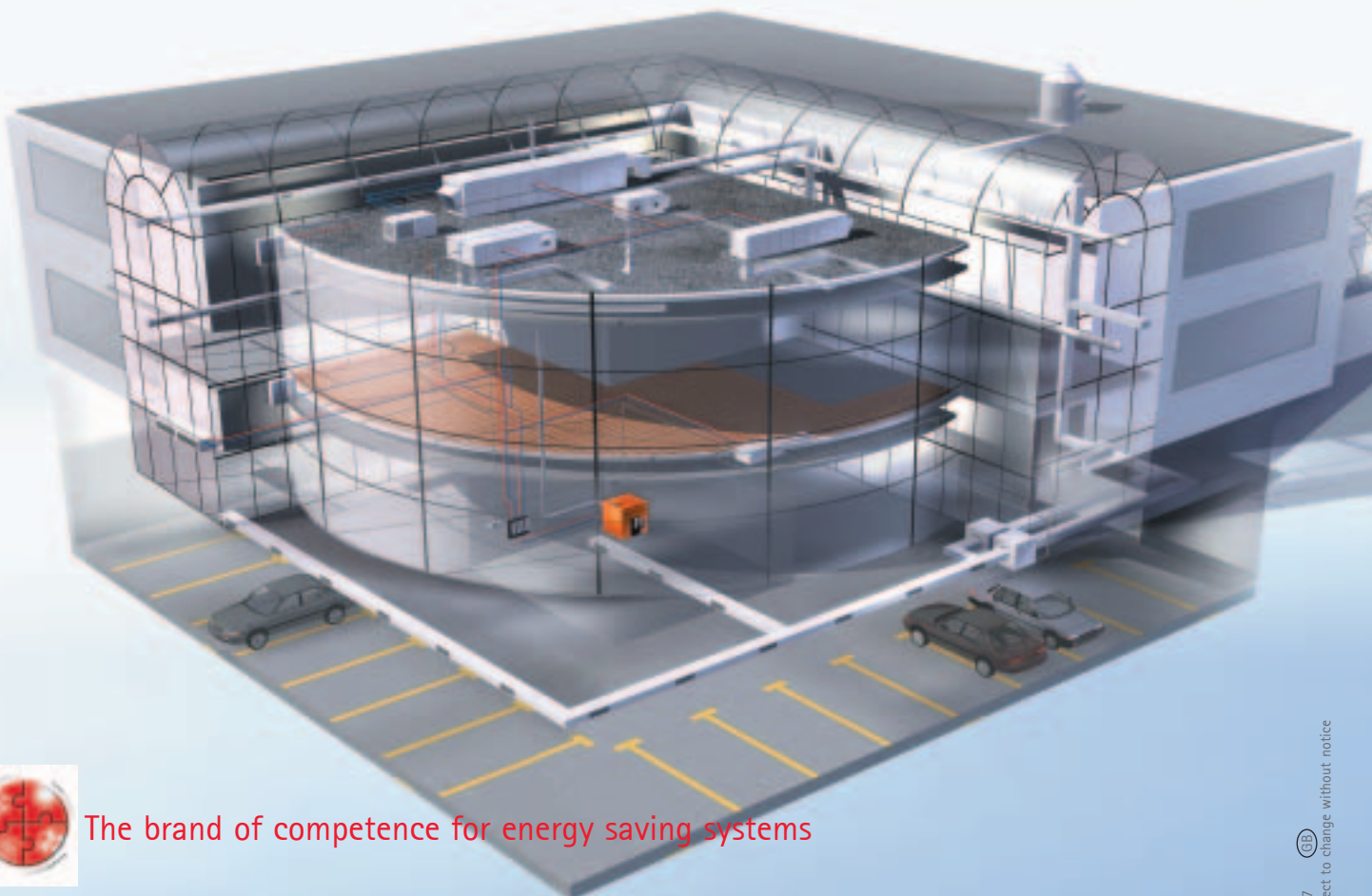
- KGW Gigant
- KGW Gigant with integrated refrigeration unit
- KGG Car park exhaust unit
- KGW Gigant kitchen extract unit
- KGW Standard
- KG Standard, ceiling void unit

##### System component ventilation

- ER Smoke extract fan
- TL Warm air curtain with mountingbracket, white
- Fan coil unit
- LH Unit heater
- DigiPro Control system

##### System component heating

- MK 2 cast iron boiler



The brand of competence for energy saving systems

Part no.: 48 00 385