–weishaupt–

product

Information on duobloc industrial burners

WK-series industrial burners

WK40 to WK80 industrial burners • 300–32 000 kW

WK 40 (up to 3 MW)

WK 50 (up to 6 MW)

WK 70 (up to 13 MW)

60 years of reliability

For more than six decades, Weishaupt burners have proven themselves on a wide variety of heat generators and process plant. Their success stems from Weishaupt's relentless demand for high-quality materials and workmanship, and from uncompromising quality control standards.

Weishaupt continually establishes new benchmarks with its well-engineered products, facilitated by the ever-constant efforts of its own in-house Research and Development Centre.

Weishaupt WK-series burners have been designed especially for industrial use. The modular design of the burners and their very large capacity range – 300 to 32 000 kW – means they are ideally suited to a broad spectrum of special applications.

All Weishaupt burners are manufactured at the company's main plant in Schwendi in southwestern Germany. Not only does this extremely modern production facility serve as a beacon of safety, precision, and cleanliness, it also allows for a rapid response when assembling small, medium and large-sized burners.

Experienced employees and the high proportion of in-house production allow Weishaupt to meet its own demands for the highest levels of quality.

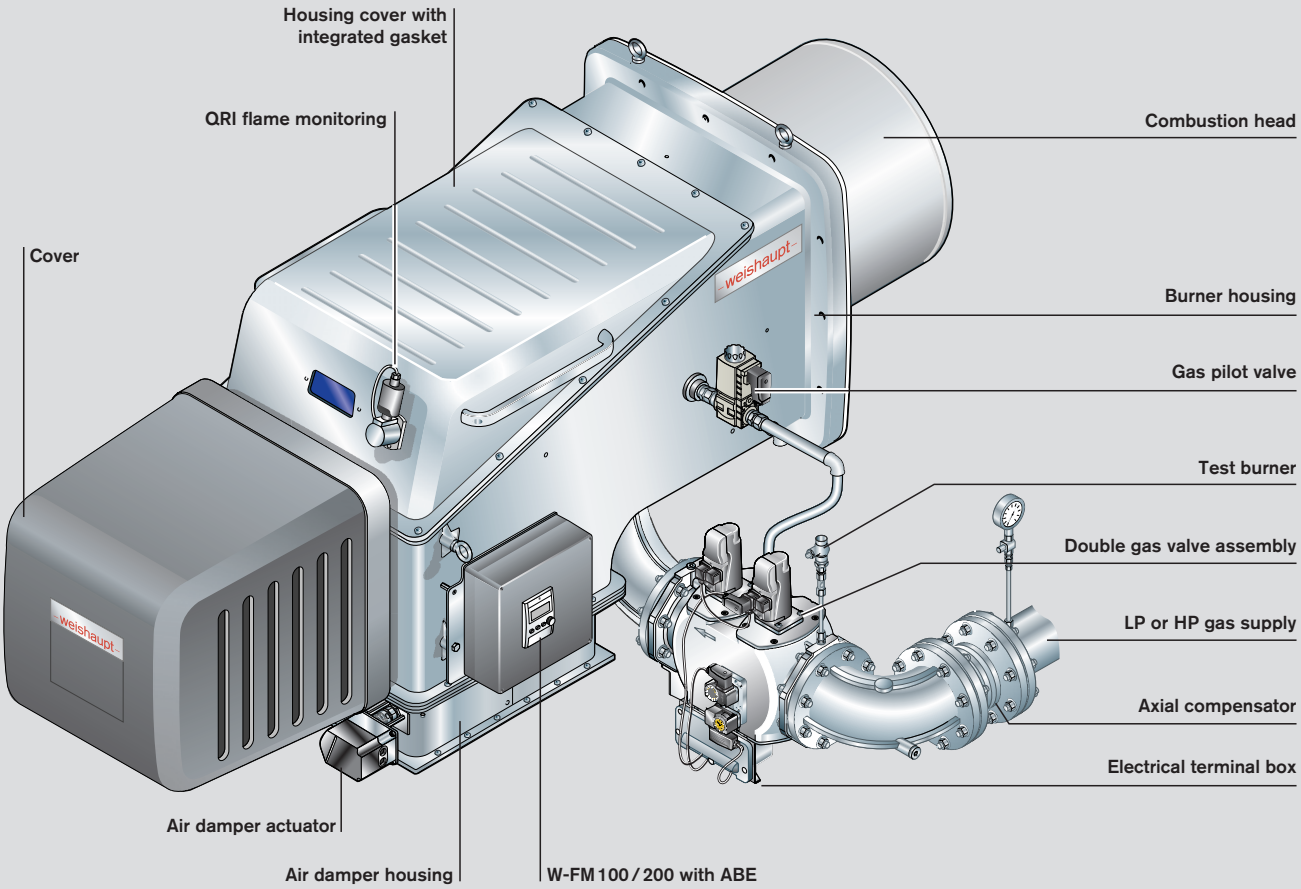
High quality is reflected by Weishaupt's ISO 9001-2015 certification, which covers the development, production, sale, and servicing of burners and control panels.

Weishaupt offers individualised solutions for the supply of fuel and the control of burners and boilers. Of course, its product range also runs the gamut of modern instrumentation and control equipment, including fully comprehensive solutions for complex building automation projects.

Future-oriented, economical, flexible.

WK 80 (up to 32 MW)

The powerful duobloc burner: Modular design for ratings up to 32 MW



WK-series burners can be matched to a wide variety of applications – even under the hardest of conditions

Modular principle
Weishaupt WK-series industrial burners are of modular design. That means the fan, pump station, and preheater station are all selected independently of the burner. This concept offers a high degree of flexibility in matching to the most diverse applications.

Insulated burner housing
The burner housing is fitted with internal insulation (optional extra on the ambient-air versions of the WK 40 and 50), which reduces the surface temperature of the housing. The insulation also provides effective noise reduction.

Heat recovery with the use of preheated combustion air
Many industrial processes create high flue gas temperatures due to the high temperature of the medium used. A heat exchanger in the flue can be used to re-claim a large amount of energy from these hot flue gases. Weishaupt WK-series burners can be operated with combustion air temperatures of up to 250 °C, which increases efficiency by up to 10 %.

Accessibility
The controls assembly on a WK-series burner is generously dimensioned. The components and fuel lines are clearly laid out, ensuring excellent accessibility for maintenance work. A cover, which can be rotated by 90°, provides optimal ventilation and cooling of an HFO-firing burner's components.

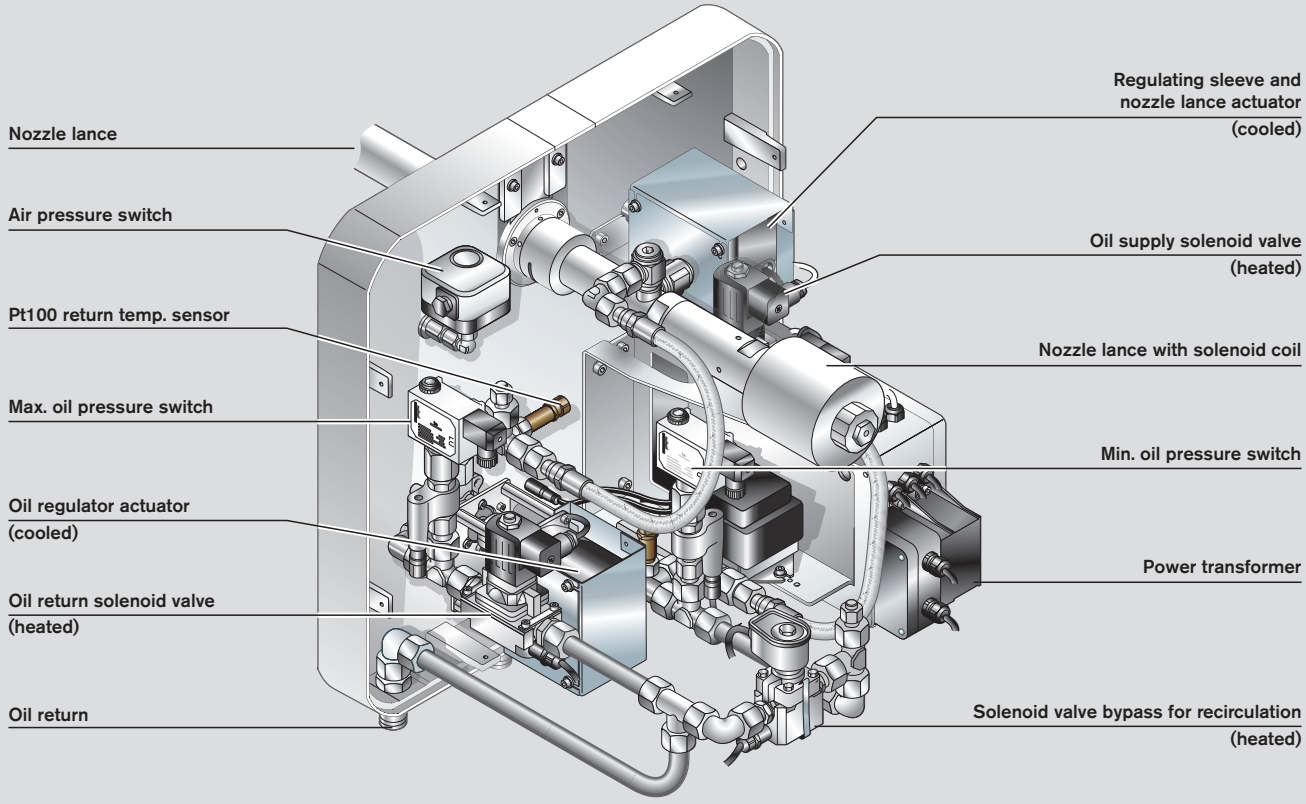
Maintenance-friendly
The higher-capacity burners have an integrated rail system and servicing position that makes it very much easier to insert and remove the mixing assembly.

Nozzle lance and regulating sleeve
WK 80 burners have a nozzle lance and regulating sleeve whose positions are adjusted by an actuator in response to the current firing rate. This ensures optimal flame stability and mixing energy throughout the entire turndown range.

Nozzle head shutoff device
At burner shutdown, or when changing over from oil to gas operation, safety shutoff devices in the nozzle head shut off the oil flow directly in the nozzle orifice, preventing the escape of any oil.

Ignition load
The W-FM combustion manager has parameters that allow for a special setting of the ignition load position. This makes reliable ignition possible under the most varied of conditions.

Controlled shutdown from partial load
Controlled shutdown of the burner always takes place from the partial-load position, thus preventing impact on the gas main or in the combustion chamber.



Controls assembly for a heavy-oil burner

Digital combustion management: Precise, simple, and reliable

Setting via the ABE control and display unit

O_2 trim saves fuel through a continual and extremely efficient optimisation of the combustion air. Control is effected by a system with a Lambda probe, which continually measures the oxygen content of the flue gas.

CO monitoring executes a safety shut-down of the burner if a predefined CO limit is exceeded, thereby ensuring the very highest degree of safety.

Combined CO control / O_2 trim ensures an ultimate degree of safety. CO emissions are continually monitored and, if the defined limit is exceeded, the burner is operated with an increased amount of excess air for a short period of time before the O_2 trim returns the burner to its preset O_2 set-point. Should external influences prevent a non-critical condition from being reached, then the burner will undergo a controlled shutdown.

Digital combustion management means optimal combustion figures, continuously reproducible setpoints, and ease of use.

All Weishaupt WK-series burners are equipped with digital combustion management and electronic compound regulation as standard. Modern combustion technologies demand the precise and continually reproducible dosing of fuel and combustion air. This optimises combustion efficiency and saves fuel.

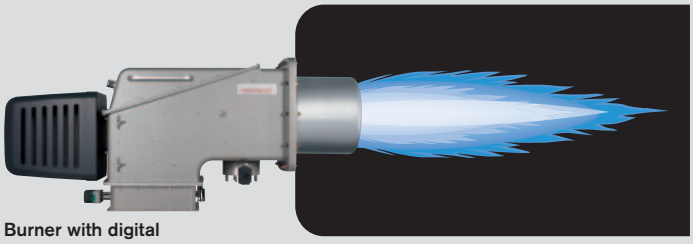
Simple operation
Setting and control of the burner is achieved using a control and display unit. This is linked to the combustion manager via a bus system, enabling the user-friendly setting of the burner. The control and display unit has a clear text display with a choice of languages. An English/Chinese dual-screen version is available as an option should a Chinese-character display be desired.

Measures for saving energy and increasing safety and reliability

Variable speed drive provides multiple benefits. It facilitates a soft start of the burner fan, keeping the start current to a minimum. Fan speed is matched to the combustion air volume during operation, which saves electrical energy and reduces noise emissions.

Features – digital combustion management	W-FM 100	W-FM 200
Single-fuel operation	●	●
Dual-fuel operation	●	●
Continuous firing >24 h	●	●
Variable speed drive available	–	●
O_2 trim available	–	●
CO monitoring	–	O
Combined O_2 trim and CO control	–	O
Temperature-compensated flue gas recirculation	–	O
LPG ignition unit control (WKMS40–70)	●	●
LPG ignition burner control (WK(G)MS80)	–	●
Gas oil ignition burner control (WKMS80)	●	●
ION/QRI/QRA 73 flame sensor for continuous firing	●	●
W-FC 4.0 flame monitoring	●	●
W-FC 5.0 flame monitoring	–	●
Maximum number of actuators	4	6
Gas valve proving	●	●
Integrated PID controller with automatic adaption. Pt / Ni temperature sensor, 0 / 2–10 V, and 0 / 4–20 mA inputs for temperature / pressure	O	●
0 / 2–10 V and 0 / 4–20 mA setpoint input for temperature / pressure	O	●
Configurable 0 / 4–20 mA analogue output	O	●
ABE control unit with 20 available languages (any one ABE limited to 6)	●	●
Dual-language / script ABE control unit (Chinese / English)	O	O
Removable ABE control unit (max. length of connecting bus line)	< 100 m	< 100 m
Fuel consumption meter (switchable)	–	●
Combustion efficiency display	–	●
eBUS / Modbus RTU interface	●	●
PC-supported commissioning	●	●

● Standard
O Optional



Burner with digital combustion management

O_2 probe

Temperature sensor

CO probe

Setpoint input

CO module

Fan motor

Speed sensor

O_2 module

Up to six actuators for
– Gas feed
– Air feed
– Oil feed
– Regulating sleeve (air)
– FGR air damper
– FGR butterfly valve

Frequency convertor for variable speed drive

Internal load control

Pulse input for fuel metering

Autonomous CO monitoring (without O_2 module)

CAN bus

Burner-mounted / panel-mounted control and display unit

ACS 450 servicing software

W-FM 200 combustion manager

Temp. / press. sensor

Air pressure switch

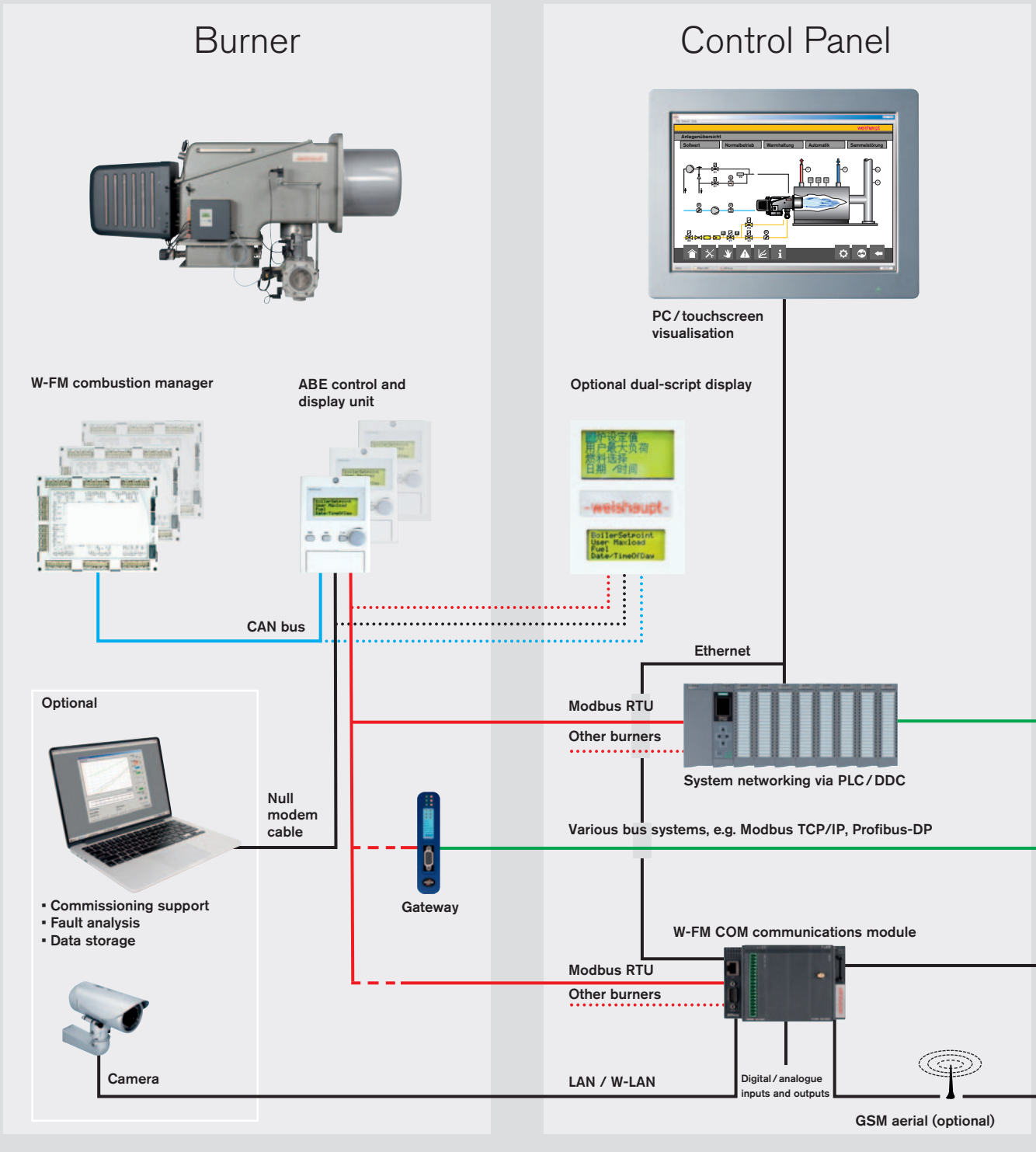
Gas pressure switch

Oil pressure switch

Double gas valve

Oil valves

Limitless communications: flexible, reliable and simple



BMS

SCADA
Supervisory Control
and Data Acquisition

Various bus systems

Various bus systems

GSM / web server

Worldwide

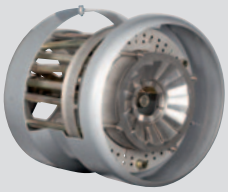
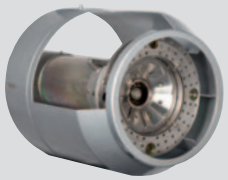
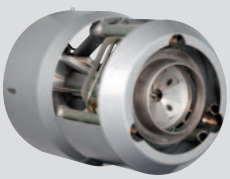
Laptop / tablet

Email
SMS

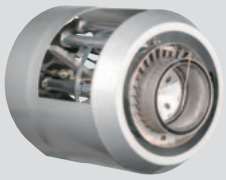
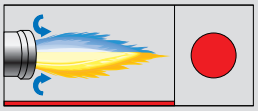
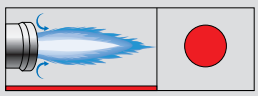
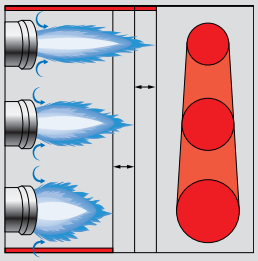
Smartphone

- Monitoring and alarms
- Read process and meter values
- Adjust setpoints
- Read fault and lockout history
- Controllable digital inputs and outputs

The right mixing assembly for every application

Mixing assembly type	Flame geometry	Burner type	Load-dependent air regulation in the M.A.[3]	Fuels				NO_x Class [1]		
								EN 676		EN 267
Maintenance-friendly construction: On all burner versions, the standard-length combustion head (i.e. the flame tube and mixing assembly) can be inserted and withdrawn through the service opening in the burner housing. To further assist removal, the mixing assemblies on WK80 burners are guided by rail.	Length — Diameter			Natural gas	LPG	Gas oil	Heavy oil	Natural gas	LPG	Oil (gas oil)
ZM(H) Mixing assembly for gas, oil, and dual-fuel burners. For plant with no particular NO_x requirements.		WK 40	✓	○	○	○	○	–	–	–
		WK 50/1	✓	–	–	○	○	–	–	–
		WK 50/2	✓	–	–	○	○	–	–	–
		WK 70/1	✓	–	–	●	○	–	–	1
		WK 70/3	✓	–	–	●	○	–	–	1
		WK 80/3	✓	–	–	●	○	–	–	1
ZM(H)-**NR** Mixing assembly for gas and dual-fuel burners. Gas-side NO_x reduction compared to ZM version.		WK 50/1	✓	○	○	○	○	–	–	–
		WK 50/2	✓	●	●	●	○	3	–	2
		WK 70/1	✓	●	●	●	○	2	3	2
		WK 70/3	✓	●	●	●	○	3	3	1
		WK 80/3	✓	●	●	●	○	3	3	1
ZM(H)-**LN** Low-NO_x mixing assembly for gas burners. Further reduction in NO_x emissions compared to 1LN-version burners.		WK 40	–	○	–	–	–	–	–	–
		WK 70	–	●	–	–	–	3	–	–
ZM(H)-**1LN** Low-NO_x mixing assembly for gas and dual-fuel burners. For plant with gas and oil-side NO_x requirements.		WK 50/1	–	○	○	○	–	–	–	–
		WK 50/2	–	○	○	○	–	–	–	–
		WK 70	–	●	●	●	–	3	3	2
ZM(H)-**3LN** Low-NO_x mixing assembly for gas, oil, and dual-fuel burners. For plant with low gas and oil-side NO_x requirements.		WK 40	✓	○	○	○	–	–	–	–
		WK 50/1	✓	○	○	○	–	–	–	–
		WK 50/2	✓	○	○	○	–	–	–	–
		WK 70	✓	●	●	●	–	3	3	3
		WK 80/1	✓	●	●	●	–	3	3	3
		WK 80/2	✓	○	–	○	–	–	–	–

[1] Combustion-air temperatures < 40 °C
[2] Minimum requirements for the combustion chamber geometry must be agreed with Weishaupt's headquarters
[3] M.A. = mixing assembly

Mixing assembly type	Flame geometry	Burner type	Load-dependent air regulation in the M.A.[3]	Fuels				NO_x Class [1]		
	Length / Diameter							EN 676		EN 267
				Natural gas	LPG	Gas oil	Heavy oil	Natural gas	LPG	Oil (gas oil)
ZM(H)-**4LN** Low-NO_X mixing assembly for gas burners equipped with flue gas recirculation. For plant with extremely low NO_X limits. Lowest NO_X emissions in comparison with all other versions. 		WK 70/1 WK 70/2 WK 80/1 WK 80/2	✓ ✓ ✓ ✓	● ● ● ●	– – – –	– – – –	– – – –	3 3 3 3	– – – –	– – – –
ZM(H) - **1SF** Swirl-flame mixing assembly for gas, oil, and dual-fuel burners. Swirl-flame mixing assembly for extremely short combustion chambers in water tube boilers. 		WK 50/2 WK 70/1 WK 80/3	✓ ✓ ✓	○ ○ ○	– – –	○ ○ ○	○ ○ ○	– – –	– – –	– – –
ZM(H) - **3SF** Swirl-flame mixing assembly for longer combustion chambers. Flame length is comparable to the NR version.		WK 80/6	✓	○	–	–	–	–	–	–
ZM(H) - **VSF** Swirl-flame mixing assembly for gas burners. Swirl-flame mixing assembly for extremely short combustion chambers and for elongated, D-type combustion chambers with low cross-sectional loads. Internal fittings (circular blanks) can be used to optimise flame geometry. [2] 		WK 80/4 WK 80/5	✓ ✓	● ●	● –	– –	– –	3 2	3 –	– –

● With type approval ○ Without type approval ● Type approval planned

EN emission classes

Fuel	Natural Gas (EN 676)			LPG (EN 676)			Gas Oil (EN 267)		
Emission Class	**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**
NO_x emissions in mg/kWh	≤ 170	≤ 120	≤ 80	≤ 230	≤ 180	≤ 140	≤ 250	≤ 185	≤ 120

Use

Fuels
Natural gas
LPG
Class D gas oil per BS 2869 / IS 251
Class A2 gas oil per BS 2869 / IS 251
10 % biodiesel blends (B10)
MFO / HFO (< 50 mm²/s at 100 °C)

The suitability of fuels of differing quality must be confirmed in advance with Weishaupt.

Applications
Weishaupt WK-series burners are suitable for intermittent and continuous firing on:
- LTHW boilers
- HTHW boilers
- Steam boilers
- Air heaters
- Thermal fluid heaters
- Certain process applications

Installation positions
When installed horizontally, the burner can be mounted on the heat generator in 90° rotational increments (combustion air inlet from above, below, or either side). The burner can also be installed vertically, to fire either upwards or downwards.
(See the planning and installation handbook for details and exceptions, print No. 83112402)

Permissible ambient conditions
- Ambient temperature
  -15 to + 40 °C for gas firing
  -10 to + 40 °C for oil firing
- Combustion air temperature up to 250 °C for ZMH-version burners
- Maximum 80 % relative humidity, no condensation
- The combustion air must be free of aggressive substances (halogens, chlorides, fluorides etc.) and impurities (dust, debris, vapours, etc.)
- Adequate ventilation is required for operation in enclosed spaces
- For plant in unheated areas, certain further measures may be required

Use of the burner for other applications or in ambient conditions not detailed above is not permitted without the prior written agreement of Max Weishaupt GmbH. Burner service intervals will be reduced to accord with the more extreme operational conditions.

Protection Class
IP 54

Standards compliance
The burners are tested by an independent body and fulfil the applicable requirements of the following European Union directives and applied standards:

EMC EMC Directive 2014/30/EU
Applied standards
- EN 61000-6-1 : 2007
- EN 61000-6-2 : 2005
- EN 61000-6-4 : 2007

LVD Low-Voltage Directive 2014/35/EU
Applied standards
- EN 60335-1 : 2010
- EN 60335-2-102 : 2010

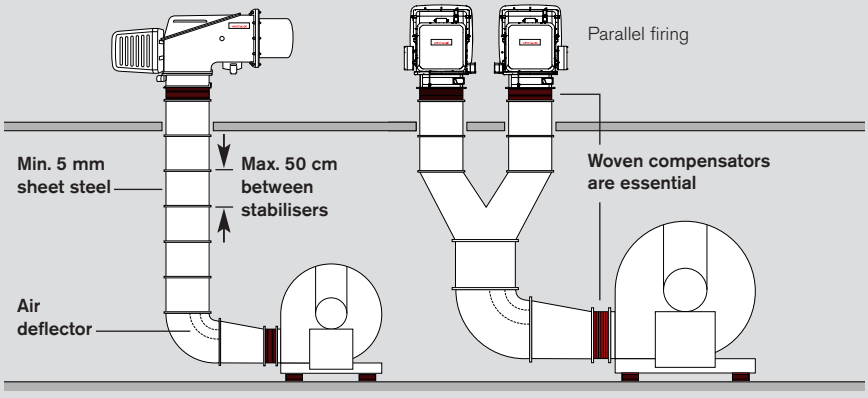
MD Machinery Directive 2006/42/EC
Applied standards
- EN 267 Annex J,
- EN 676 Annex J,

GAR Gas Appliances Regulation 2016/426/EU
Applied standards
- EN 676 : 2008

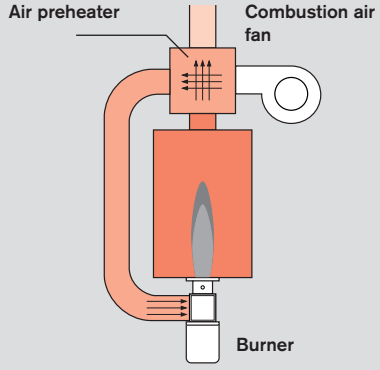
PED[1)] Pressure Equipment Directive 2014/68/EU
Applied standards
- EN 267 Annex K,
- EN 676 Annex K,
- Conformity assessment procedure: Module B

[1)] With the selection of appropriate equipment.

The burners are labelled with
- CE Mark
- CE-PIN per 2009/142/EC
- Identification No. of the notified body

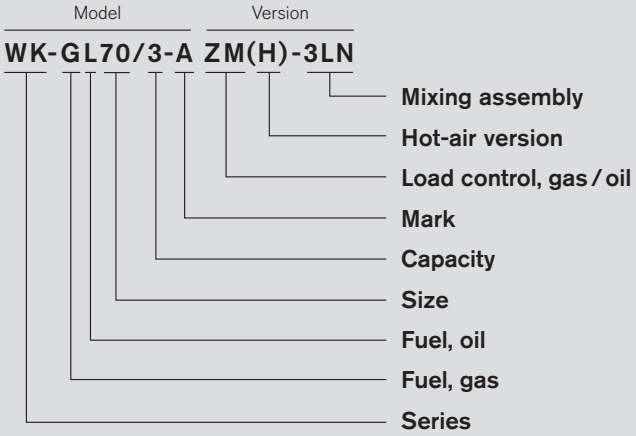


Combustion air ducting



Combustion air temperatures up to 250 °C

Model designation



Details	Code	Meaning	Associated fuel
Series	WK	Weishaupt duobloc burner	
Fuel	G L, MS	Gas (Natural gas, LPG, … Oil (Gas oil, HFO, …	
Load control	ZM	Sliding-two-stage / modulating	Gas / oil Gas / oil
Mixing assembly	– NR LN 1LN 3LN 4LN 1SF 3SF VSF	Standard NO_x-reduced gas firing Low NO_x Low NO_x Multiflam® Ultra-low NO_x with FGR Swirlflame Swirlflame Variable swirlflame	Gas / oil Gas / oil Gas Gas / oil Gas / oil Gas Gas / oil Gas Gas
Suffix	H	Hot-air version	Gas / oil

Overview of burner regulation

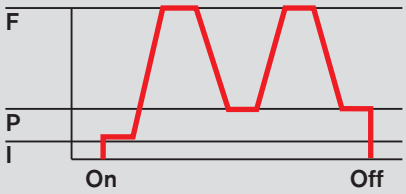
Gas and oil-fired operation
Weishaupt WK-series burners can have sliding-two-stage or modulating operation when firing gas or oil, depending on the method of load control employed.

Sliding-two-stage regulation (ZM, R)
- Two-term switching (e.g. temperature or pressure stat) causes actuators to drive the burner to partial load or full load in response to heat demand.

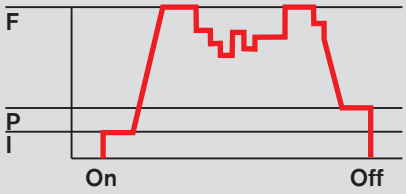
  Combustion remains CO and smoke-free between load points.

Modulating regulation (ZM, R)
- An electronic load controller causes actuators to make infinitely variable load adjustments in response to heat demand.
- Modulating operation:
  – W-FM 100 with an optional integral load controller
  – W-FM 200 with its standard integral load controller
- Alternatively, a PID controller can be fitted into the control panel.

Sliding-two-stage

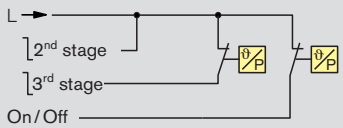


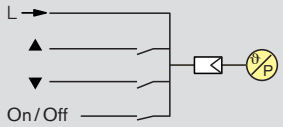
Modulating



F = Full load (nominal load)
P = Partial load (minimum load)
Z = Ignition load

Control [1)]





[1)] Alternatively, staged control can also be effected by an electronic PID controller. In this case, appropriate temperature sensors or pressure transducers will be required.

Maximum turndown

Oil burners

Burner	Version [1] ZM(H)	Gas oil	MFO / HFO
WK 40–WK 50	Standard	3:1	3:1
WK 70–WK 80	Standard	5:1	3.5:1
WK 40–WK 80	3LN	5:1	–
WK 50–WK 80	1SF	4:1	3:1

[1] Not every mixing assembly version is available for each burner size.

Gas burners

Burner	Version [1] ZM(H)	Natural gas	LPG [2]
WK 40	Standard	4:1	4:1
WK 40–WK 70	NR / LN / 1LN / 3LN / 4LN	8:1	6:1
WK 50–WK 70	1SF	8:1	6:1
WK 80	3LN / 4LN / VSF / 3SF	8:1	6:1

[1] Not every mixing assembly version is available for each burner size.
[2] Not every mixing assembly version is suitable for LPG.

Dual-fuel burners

Burner	Version [1] ZM(H)	Natural gas	LPG [2]	Gas oil	MFO / HFO [3]
WK 40–WK 50	Standard / NR / 3LN	4:1	4:1	3:1	3:1
WK 70–WK 80	Standard / NR / 1LN / 3LN	8:1	6:1	5:1	3.5:1
WK 70–WK 80	1SF	8:1	6:1	4:1	3:1

[1] Not every mixing assembly version is available for each burner size. [2] Not every mixing assembly version is suitable for LPG. [3] Not with multiflam® 3LN burners.

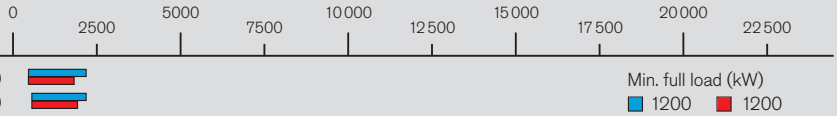
Constraints:
Without excess air limitations. Combustion values not guaranteed through the entire turndown range. All operational points must lie within the burner's capacity chart. Higher turndowns may be achievable in certain cases (subject to agreement with Weishaupt's headquarters).

Overview of capacities
Oil burners

Standard version

WKL and WKMS gas oil and MFO / HFO burners

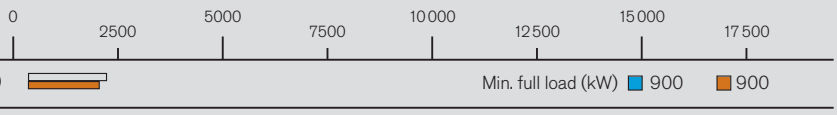
Burner type	Version	Fuel	Rating kW	/
WK 40/1-A	ZM(H)	Gas oil	450 – 2200 / 1800	
		M / HFO	550 – 2200 / 1800	
WK 40/2-A	ZM(H)	Gas oil	650 – 3000 / 2500	
		M / HFO	750 – 3000 / 2500	
WK 50/1-B	ZM(H)	Gas oil	712 – 4000 / 3200	
		M / HFO	1012 – 4000 / 3200	
WK 50/2-A	ZM(H)	Gas oil	1125 – 6000 / 5000	
		M / HFO	1700 – 6000 / 5000	
WK 70/1-B	ZM(H)	Gas oil	1200 – 7700 / 6100	
		M / HFO	1800 – 7700 / 6100	
WK 70/3-A	ZM(H)	Gas oil	1800 – 12 000 / 9600	
		M / HFO	2150 – 12 000 / 9600	
WK 80/3-A	ZM(H)	Gas oil	3200 – 22 000 / 17 600	
		M / HFO	3800 – 22 000 / 17 600	



3LN multiflam® version

WKL gas oil burners (WKGL-based)

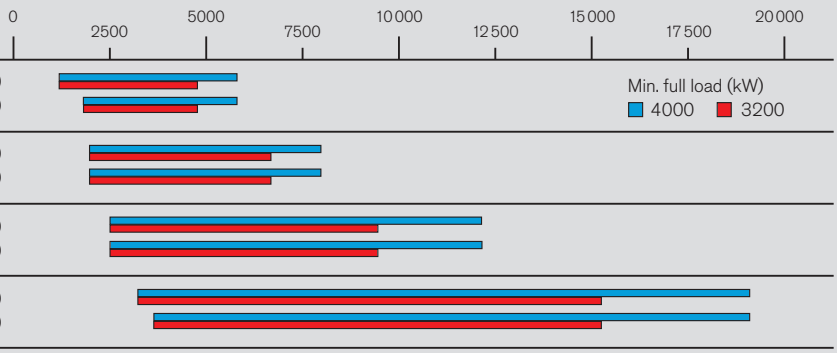
Burner type	Version	Fuel	Rating kW	/
WK 40/2-A	ZMH-3LN	Gas oil	360 – 2200 / 2080	
WK 50/1-A	ZMH-3LN	Gas oil	540 – 3500 / 3300	
WK 50/2-A	ZMH-3LN	Gas oil	600 – 5000 / 4700	
WK 70/0-A	ZM(H)-3LN	Gas oil	1190 – 7000 / 6600	
WK 70/1-B	ZM(H)-3LN	Gas oil	1550 – 10 000 / 9450	
WK 70/3-A	ZM(H)-3LN	Gas oil	1790 – 13 000 / 12 300	
WK 80/1-A	ZM(H)-3LN	Gas oil	2380 – 17 000 / 16 000	



1SF version

WKL and WKMS gas oil and MFO / HFO burners

Burner type	Version	Fuel	Rating kW ■ / ■
WK 50/2-A	ZM(H)-1SF	Gas oil	1125 – 6000 / 4800
		M / HFO	1700 – 6000 / 4800
WK 70/1-B	ZM(H)-1SF	Gas oil	1800 – 8000 / 6400
		M / HFO	1800 – 8000 / 6400
WK 70/2-A	ZM(H)-1SF	Gas oil	2500 – 12 000 / 9600
		M / HFO	2500 – 12 000 / 9600
WK 80/3-A	ZM(H)-1SF	Gas oil	3200 – 19 000 / 15 200
		M / HFO	3200 – 19 000 / 15 200



Burner-selection criteria:
The minimum full-load rating within a burner's capacity range corresponds to the maximum rating of the next-smallest size of the same version burner. Please refer to the planning and installation handbook for fan selection and arrangement, gas valve trains, special equipment, technical data, and dimensions.

- Ambient combustion air with temperatures up to 40 °C
- Ambient combustion air with temperatures up to 40 °C
- Preheated combustion air with temperatures up to 250 °C
- Preheated combustion air with temperatures up to 100 °C

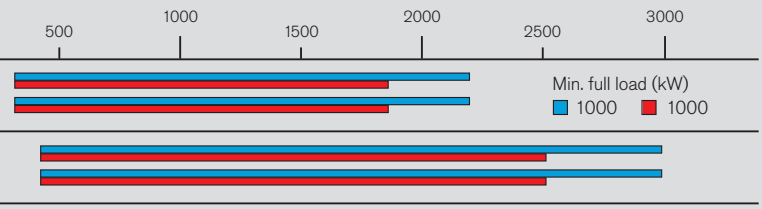
Burner ratings can be interpolated linearly for combustion air temperatures between 40 °C and 100 °C / 250 °C.

Overview of capacities
Gas burners

Standard version

WKG natural gas and LPG burners

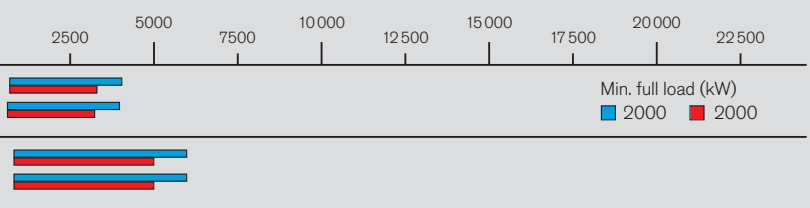
Burner type	Version	Fuel	Rating kW	
				■ / ■
WK 40/1-A	ZM(H)	Nat. gas	300 – 2200 / 1800	
		LPG	300 – 2200 / 1800	
WK 40/2-A	ZM(H)	Nat. gas	400 – 3000 / 2500	
		LPG	400 – 3000 / 2500	



NR version

WKG natural gas and LPG burners

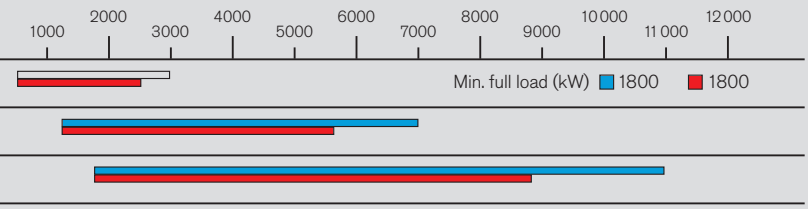
Burner type	Version	Fuel	Rating kW	
				■ / ■
WK 50/1-B	ZM(H)-NR	Nat. gas	600 – 4000 / 3200	
		LPG	600 – 4000 / 3200	
WK 50/2-A	ZM(H)-NR	Nat. gas	800 – 6000 / 5000	
		LPG	800 – 6000 / 5000	
WK 70/1-B	ZM(H)-NR	Nat. gas	1100 – 7700 / 6100	
		LPG	1100 – 7700 / 6100	
WK 70/3-A	ZM(H)-NR	Nat. gas	1400 – 12 000 / 9600	
		LPG	2000 – 12 000 / 9600	
WK 80/3-A	ZM(H)-NR	Nat. gas	2200 – 22 000 / 17 600	
		LPG	3200 – 22 000 / 17 600	



LN version

WKG natural gas burners

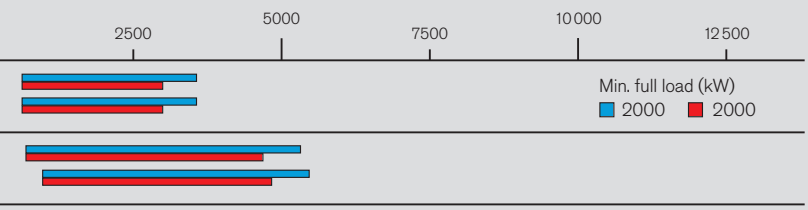
Burner type	Version	Fuel	Rating kW ■ / ■
WK 40/2-A	ZMH-LN	Nat. gas	500 – 3000 / 2500
WK 70/1-B	ZM(H)-LN	Nat. gas	1200 – 7000 / 5600
WK 70/2-A	ZM(H)-LN	Nat. gas	1750 – 11 000 / 8800



1LN version

WKG natural gas and LPG burners

Burner type	Version	Fuel	Rating kW ■ / ■
WK 50/1-B	ZM(H)-1LN	Nat. gas	600 – 3600 / 3000
		LPG	600 – 3600 / 3000
WK 50/2-A	ZM(H)-1LN	Nat. gas	800 – 5500 / 4800
		LPG	950 – 5500 / 4800
WK 70/1-B	ZM(H)-1LN	Nat. gas	900 – 7000 / 5600
		LPG	1000 – 7000 / 5600
WK 70/2-A	ZM(H)-1LN	Nat. gas	1100 – 12 000 / 9600
		LPG	1400 – 12 000 / 9600



Burner-selection criteria:
The minimum full-load rating within a burner's capacity range corresponds to the maximum rating of the next-smallest size of the same version burner. Please refer to the planning and installation handbook for fan selection and arrangement, gas valve trains, special equipment, technical data, and dimensions.

- ■ Ambient combustion air with temperatures up to 40 °C
- □ Ambient combustion air with temperatures up to 40 °C
- ■ Preheated combustion air with temperatures up to 250 °C

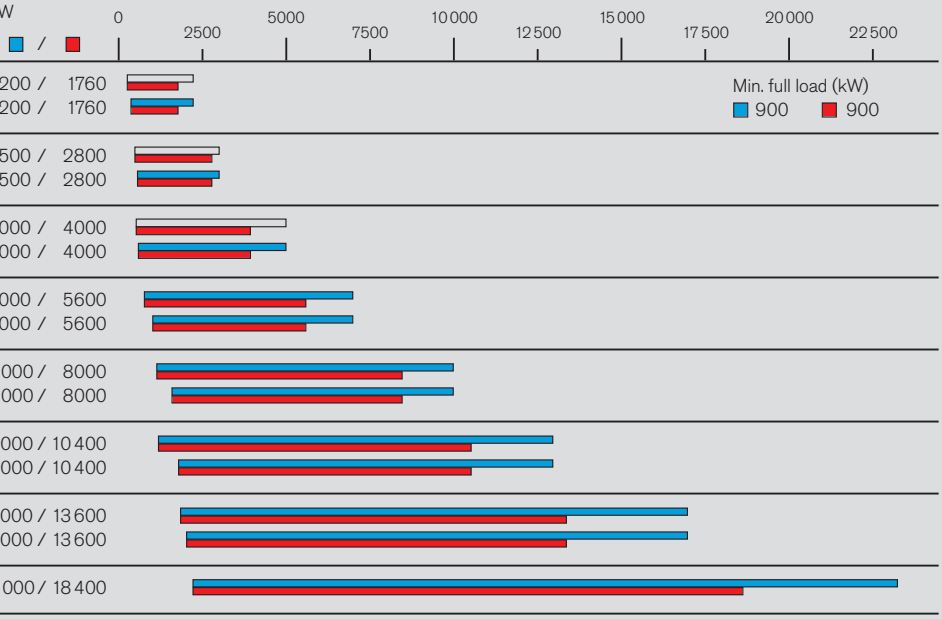
Burner ratings can be interpolated linearly for combustion air temperatures between 40 °C and 250 °C.

Overview of capacities
Gas burners

3LN multiflam® version

WKG natural gas and LPG burners

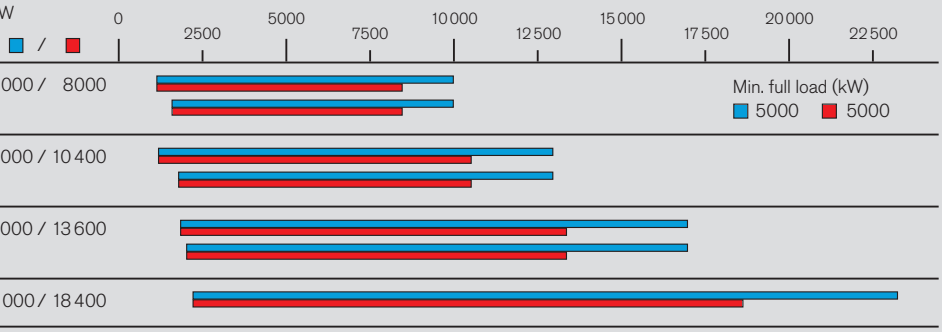
Burner type	Version	Fuel	Rating kW ■ / ■
WK 40/2-A	ZMH-3LN	Nat. gas	300 – 2200 / 1760
		LPG	360 – 2200 / 1760
WK 50/1-A	ZMH-3LN	Nat. gas	450 – 3500 / 2800
		LPG	540 – 3500 / 2800
WK 50/2-A	ZMH-3LN	Nat. gas	500 – 5000 / 4000
		LPG	600 – 5000 / 4000
WK 70/0-A	ZM(H)-3LN	Nat. gas	750 – 7000 / 5600
		LPG	1000 – 7000 / 5600
WK 70/1-B	ZM(H)-3LN	Nat. gas	1000 –10 000 / 8000
		LPG	1550 –10 000 / 8000
WK 70/3-A	ZM(H)-3LN	Nat. gas	1100 –13 000 / 10 400
		LPG	1750 –13 000 / 10 400
WK 80/1-A	ZM(H)-3LN	Nat. gas	1800 –17 000 / 13 600
		LPG	2000 –17 000 / 13 600
WK 80/2-A	ZM(H)-3LN	Nat. gas	2200 –23 000 / 18 400



4LN version (flue gas recirculation)

WKG natural gas and LPG burners

Burner type	Version	Fuel	Rating kW ■ / ■
WK 70/1-A	ZM(H)-4LN	Nat. gas	1000 –10 000 / 8000
WK 70/3-A	ZM(H)-4LN	Nat. gas	1300 –13 000 / 10 400
WK 80/1-A	ZM(H)-4LN	Nat. gas	1700 –17 000 / 13 600
WK 80/2-A	ZM(H)-4LN	Nat. gas	2200 –23 000 / 18 400



1SF version

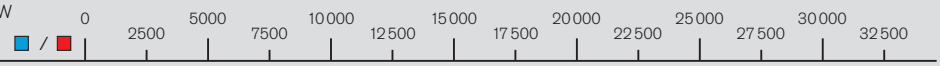
WKG natural gas burners

Burner type	Version	Fuel	Rating kW	
WK 50/2-A	ZM(H)-1SF	Nat. gas	800 – 6000 / 4800	Min. full load (kW) 4000 / 3200
WK 70/1-B	ZM(H)-1SF	Nat. gas	1000 – 8000 / 6400	
WK 70/2-A	ZM(H)-1SF	Nat. gas	1300 – 12000 / 9600	

3SF version

WKG natural gas burners

Burner type	Version	Fuel	Rating kW	
WK 80/6	ZM(H)-3SF	Nat. gas	3200 – 32000 / 25600	Min. full load (kW) 26000 / 20800



VSF version

WKG natural gas and LPG burners

Burner type	Version	Fuel	Rating kW	
WK 80/4-A	ZM(H)-VSF	Nat. gas	2200 – 22000 / 17600	Min. full load (kW) 12000 / 9600
		LPG	3200 – 22000 / 17600	
WK 80/5-A	ZM(H)-VSF	Nat. gas	2700 – 27000 / 21600	22000 / 17600

Burner-selection criteria:
The minimum full-load rating within a burner's capacity range corresponds to the maximum rating of the next-smallest size of the same version burner. Please refer to the planning and installation handbook for fan selection and arrangement, gas valve trains, special equipment, technical data, and dimensions.

Note for 4LN burners:
The hot-air version (ZMH-4LN) must be used if the mixing temperature of the combustion air and flue gas is greater than 60 °C.

- Ambient combustion air with temperatures up to 40 °C
- Ambient combustion air with temperatures up to 40 °C
- Preheated combustion air with temperatures up to 250 °C

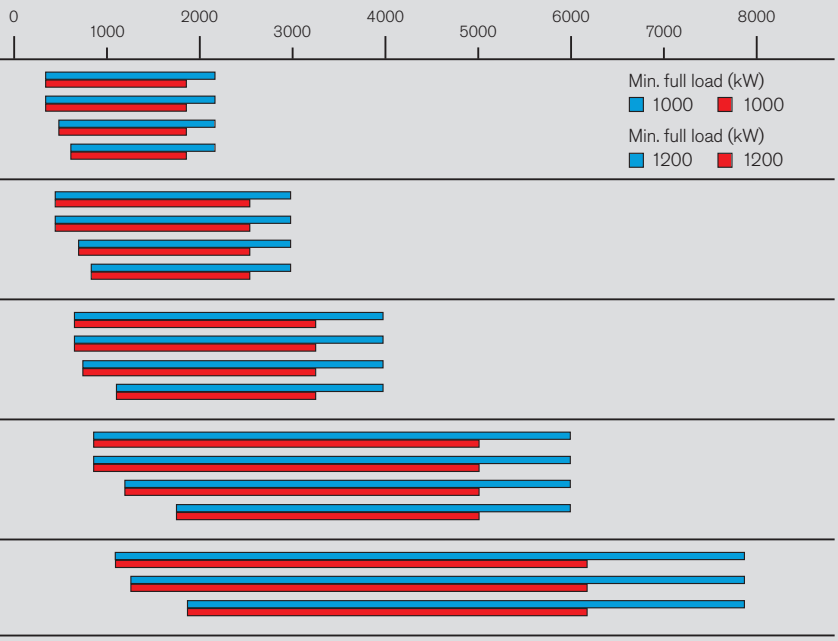
Burner ratings can be interpolated linearly for combustion air temperatures between 40 °C and 250 °C.

Overview of capacities
Dual-fuel burners

Standard version

WKGL / WKGMS dual-fuel burners

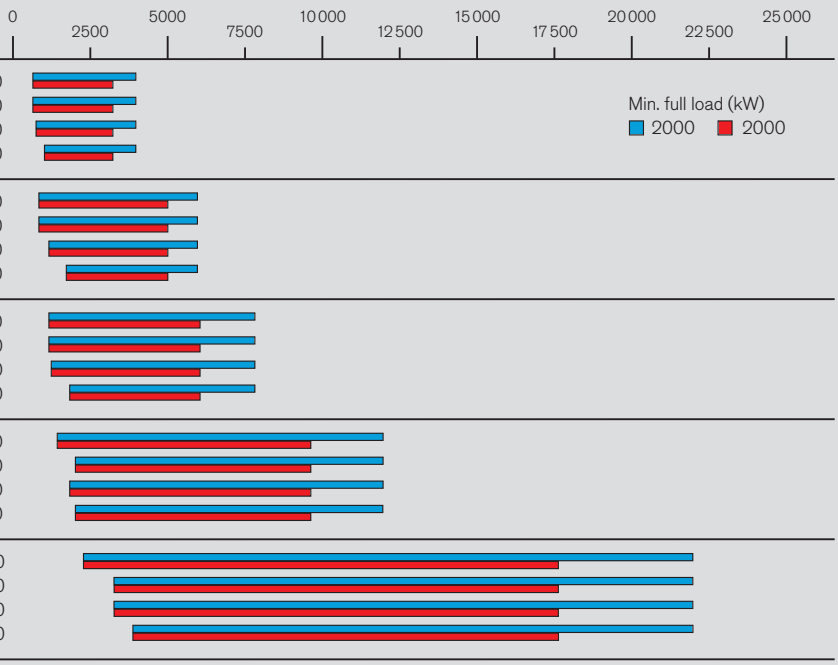
Burner type	Version	Fuel	Rating kW /
WK 40/1-A	ZM(H)	Nat. gas	300 – 2200 / 1800
		LPG	300 – 2200 / 1800
		Gas oil	450 – 2200 / 1800
		M/HFO	550 – 2200 / 1800
WK 40/2-A	ZM(H)	Nat. gas	400 – 3000 / 2500
		LPG	400 – 3000 / 2500
		Gas oil	650 – 3000 / 2500
		M/HFO	750 – 3000 / 2500
WK 50/1-B	ZM(H)	Nat. gas	600 – 4000 / 3200
		LPG	600 – 4000 / 3200
		Gas oil	712 – 4000 / 3200
		M/HFO	1012 – 4000 / 3200
WK 50/2-A	ZM(H)	Nat. gas	800 – 6000 / 5000
		LPG	800 – 6000 / 5000
		Gas oil	1125 – 6000 / 5000
		M/HFO	1700 – 6000 / 5000
WK 70/1-B	ZM(H)	Nat. gas	900 – 7000 / 6100
		Gas oil	1200 – 7000 / 6100
		M/HFO	1800 – 7000 / 6100



NR version

WKGL / WKGMS dual-fuel burners

Burner type	Version	Fuel	Rating kW	
				0 2500 5000 7500 10000 12500 15000 17500 20000 22500 25000
				/
WK 50/1-B	ZM(H)-NR	Nat. gas	600 – 4000 / 3200	
		LPG	600 – 4000 / 3200	
		Gas oil	712 – 4000 / 3200	
		M / HFO	1000 – 4000 / 3200	
WK 50/2-A	ZM(H)-NR	Nat. gas	800 – 6000 / 5000	
		LPG	800 – 6000 / 5000	
		Gas oil	1125 – 6000 / 5000	
		M / HFO	1700 – 6000 / 5000	
WK 70/1-B	ZM(H)-NR	Nat. gas	1100 – 7700 / 6100	
		LPG	1100 – 7700 / 6100	
		Gas oil	1100 – 7700 / 6100	
		M / HFO	1800 – 7700 / 6100	
WK 70/3-A	ZM(H)-NR	Nat. gas	1400 – 12000 / 9600	
		LPG	2000 – 12000 / 9600	
		Gas oil	1800 – 12000 / 9600	
		M / HFO	2000 – 12000 / 9600	
WK 80/3-A	ZM(H)-NR	Nat. gas	2200 – 22000 / 17600	
		LPG	3200 – 22000 / 17600	
		Gas oil	3200 – 22000 / 17600	
		M / HFO	3800 – 22000 / 17600	



Burner-selection criteria:
The minimum full-load rating within a burner's capacity range corresponds to the maximum rating of the next-smallest size of the same version burner. Please refer to the planning and installation handbook for fan selection and arrangement, gas valve trains, special equipment, technical data, and dimensions.

- Ambient combustion air with temperatures up to 40 °C
- Preheated combustion air with temperatures up to 250 °C

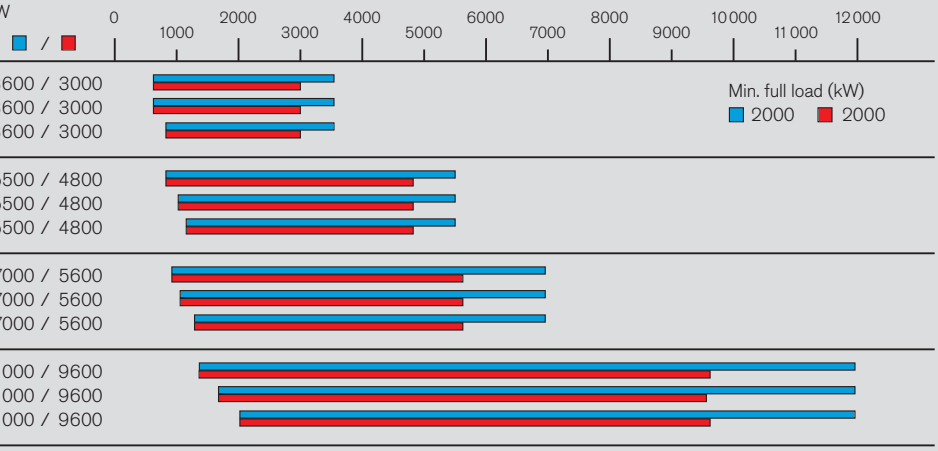
Burner ratings can be interpolated linearly for combustion air temperatures between 40 °C and 250 °C.

Overview of capacities
Dual-fuel burners

1LN version

WKGL dual-fuel burners

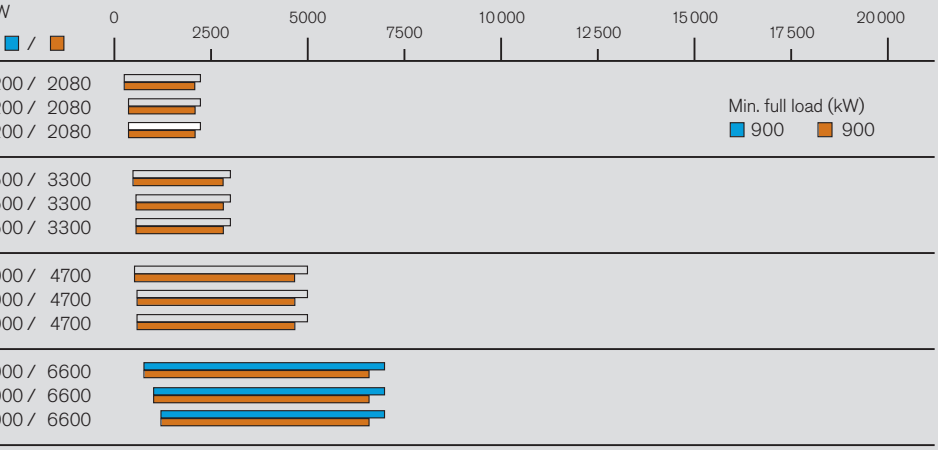
Burner type	Version	Fuel	Rating kW
WK 50/1-B	ZM(H)-1LN	Nat. gas	600 – 3600 / 3000
		LPG	600 – 3600 / 3000
		Gas oil	800 – 3600 / 3000
WK 50/2-A	ZM(H)-1LN	Nat. gas	800 – 5500 / 4800
		LPG	950 – 5500 / 4800
		Gas oil	1125 – 5500 / 4800
WK 70/1-B	ZM(H)-1LN	Nat. gas	900 – 7000 / 5600
		LPG	1000 – 7000 / 5600
		Gas oil	1370 – 7000 / 5600
WK 70/2-A	ZM(H)-1LN	Nat. gas	1100 – 12000 / 9600
		LPG	1400 – 12000 / 9600
		Gas oil	1900 – 12000 / 9600



3LN multiflam® version

WKGL dual-fuel burners

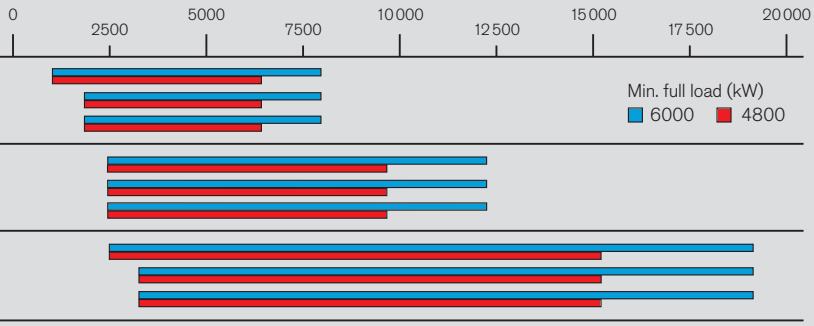
Burner type	Version	Fuel	Rating kW
WK 40/2-A	ZMH-3LN	Nat. gas	300 – 2200 / 2080
		LPG	360 – 2200 / 2080
		Gas oil	360 – 2200 / 2080
WK 50/1-A	ZMH-3LN	Nat. gas	450 – 3500 / 3300
		LPG	540 – 3500 / 3300
		Gas oil	540 – 3500 / 3300
WK 50/2-A	ZMH-3LN	Nat. gas	500 – 5000 / 4700
		LPG	600 – 5000 / 4700
		Gas oil	600 – 5000 / 4700
WK 70/0-A	ZM(H)-3LN	Nat. gas	750 – 7000 / 6600
		LPG	1000 – 7000 / 6600
		Gas oil	1190 – 7000 / 6600
WK 70/1-B	ZM(H)-3LN	Nat. gas	1000 – 10000 / 9400
		LPG	1550 – 10000 / 9400
		Gas oil	1550 – 10000 / 9400
WK 70/3-A	ZM(H)-3LN	Nat. gas	1100 – 13000 / 12300
		LPG	1750 – 13000 / 12300
		Gas oil	1790 – 13000 / 12300
WK 80/1-A	ZM(H)-3LN	Nat. gas	1800 – 17000 / 16000
		LPG	2000 – 17000 / 16000
		Gas oil	2380 – 17000 / 16000



1SF version

WKGL / WKGMS dual-fuel burners

Burner type	Version	Fuel	Rating kW ■ / ■
WK 70/1-B	ZM(H)-1SF	Nat. gas	1000 – 8000 / 6400
		Gas oil	1800 – 8000 / 6400
		M / HFO	1800 – 8000 / 6400
WK 70/2-A	ZM(H)-1SF	Nat. gas	1300 – 12000 / 9600
		Gas oil	2500 – 12000 / 9600
		M / HFO	2500 – 12000 / 9600
WK 80/3-A	ZM(H)-1SF	Nat. gas	2500 – 19000 / 15200
		Gas oil	3200 – 19000 / 15200
		M / HFO	3200 – 19000 / 15200



Burner-selection criteria:
The minimum full-load rating within a burner's capacity range corresponds to the maximum rating of the next-smallest size of the same version burner. Please refer to the planning and installation handbook for fan selection and arrangement, gas valve trains, special equipment, technical data, and dimensions.

- Ambient combustion air with temperatures up to 40 °C
- Ambient combustion air with temperatures up to 40 °C
- Preheated combustion air with temperatures up to 250 °C
- Preheated combustion air with temperatures up to 100 °C

Burner ratings can be interpolated linearly for combustion air temperatures between 40 °C and 100 °C / 250 °C.

Fuel systems
Gas and dual-fuel burners (gas side)

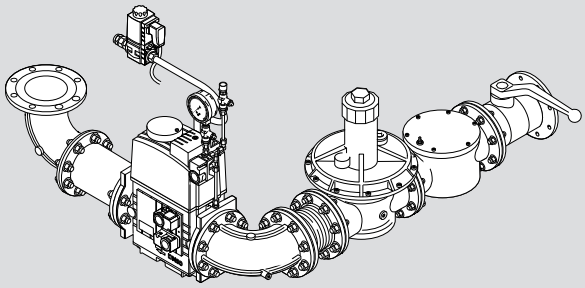
Limits						LP1	LP2	LP3	HP		
									Standard	So	SoH
Gas flow pressure into shutoff valve at max. burner load						≤ 300 [1] mbar	≤ 300 [1] mbar	300–500 mbar	300–10 000 [2] mbar		
Regulated gas pressure p_o						≤ 200 mbar	≤ 250 mbar	≤ 360 mbar	≤ 210 mbar	> 210–350 mbar	350–500 mbar
Maximum operating pressure (MOP) of the gas supply						500 mbar	500 mbar	700 mbar	1000 / 5000 / 10 000 / 16 000 [3] mbar		
Minimum MOP rating for components downstream of the gas pressure regulator						500	500 mbar	700 [4] mbar	500 mbar	500 mbar	700 [4] mbar
Nominal valve train size	Gas valve assembly type	Burner size				Low-pressure supply with **FRS regulator**	Low-pressure supply with **SKP25 regulator** on the VGD valve assembly	Low-pressure supply with **SKP25 regulator** on the VGD valve assembly	High-pressure supply with **HP regulator**		
		WK 40	WK 50	WK 70	WK 80						
1½"	W-MF 512	●				●			●		
2"	DMV 525/12	●	●			●			●		
DN 65	DMV 5065/12	●	●	●		●			●		
DN 80	DMV 5080/12	●	●	●		●			●		
DN 100	DMV 5100/12	●	●	●	●	●			●		
DN 125	VGD 40.125	●	●	●		●			●		
					●	●	●	● [4]	●	●	● [4]
DN 150	VGD 40.150		●	●		●			●		
					●	●	●	● [4]	●	●	● [4]

[1] See page 23 for exceptions.
[2] Dependent on the MOP of the high-pressure gas regulator.
[3] Specific MOP depends on high-pressure gas regulator type.
[4] Requires the use of pressure switches and ignition gas valves rated for ≥ 700 mbar.

Valve train selection
Low-pressure (LP) gas supply details

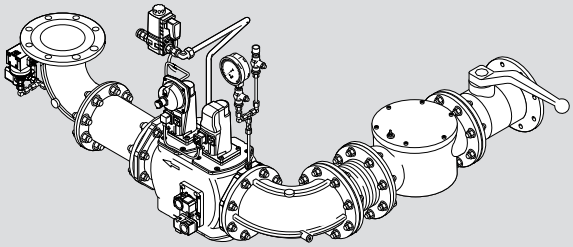
LP1

Low-pressure gas supply with FRS regulator
Used when:
- The gas flow pressure at maximum burner load is ≤ 300 mbar.[1)]
- The regulated pressure p_o together with the combustion chamber resistance does not exceed 200 mbar.
- The MOP [2)] does not exceed 500 mbar.



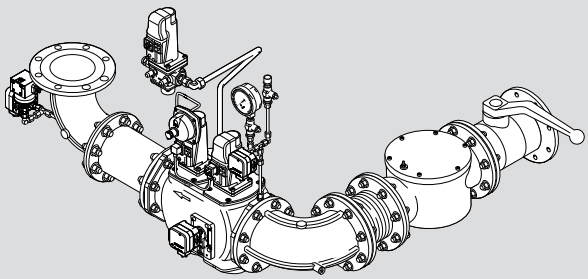
LP2

Low-pressure gas supply with SKP25 regulator
For VGD valve assemblies. Used when:
- The gas flow pressure at maximum burner load is ≤ 300 mbar.[1)]
- The regulated pressure p_o together with the combustion chamber resistance does not exceed 250 mbar.
- The MOP [2)] does not exceed 500 mbar.



LP3

Low-pressure gas supply with SKP25 regulator
For VGD valve assemblies. Used when:
- The gas flow pressure at maximum burner load is in the range of 300–500 mbar.
- The regulated pressure p_o together with the combustion chamber resistance does not exceed 360 mbar.
- The MOP [2)] does not exceed 700 mbar.



Layout of the valve train (vertical burner installation)
The "offset gas butterfly and valve assembly" option is very strongly recommended because of the increased heat radiation due to vertical boiler design and the high temperatures of media such as thermal fluid.

Support of the valve train
The gas valve train should be properly supported in accordance with the site conditions. See the Weishaupt accessories list for various valve train support components.

Compensator
To enable a tension-free mounting of the valve train, the fitting of a compensator is strongly recommended.

Gas meter
A gas meter must be installed to measure gas consumption during commissioning and servicing.

Optional thermal shutoff (when required by local regulations)
Integrated into the ball valve of screwed valve trains. A separate component with HTB seals fitted before the ball valve on flanged valve trains.

Safeguarding of the high-pressure gas supply in the event of a failure
The supplier must safeguard the gas flow pressure such that, in the event of failure, it cannot exceed the MOP [2)] of the burner's gas valve train.

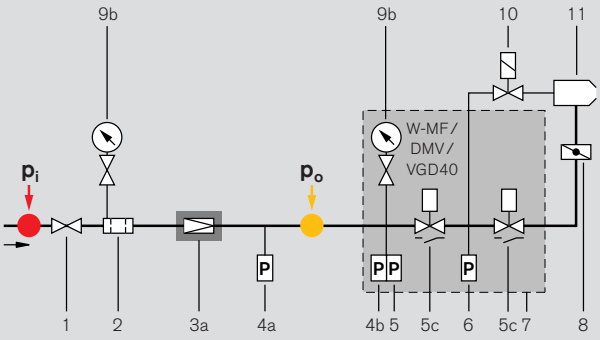
[1)] **Exceptions**
Normally, valve train layouts LP1 and LP2 are used for gas flow pressures up to a maximum of 300 mbar. This allows for pressure losses between the transfer station and the valve train. Furthermore, it is assumed that the transfer station utilises components (SSV, SRV, regulator) that are not of the highest class of accuracy. In individual cases, following consideration and approval by Weishaupt's headquarters, a gas flow pressure of up to 360 mbar can be approved if the appropriate conditions exist.

[2)] MOP = Maximum Operating Pressure

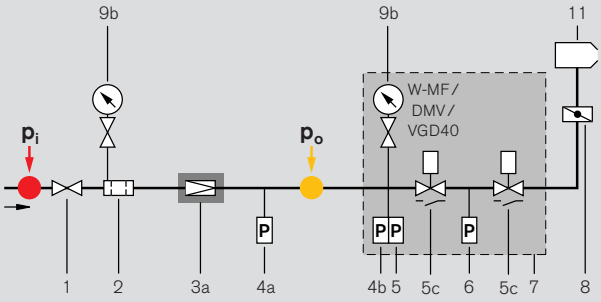
Fuel systems
Gas and dual-fuel burners (gas side)

LP1

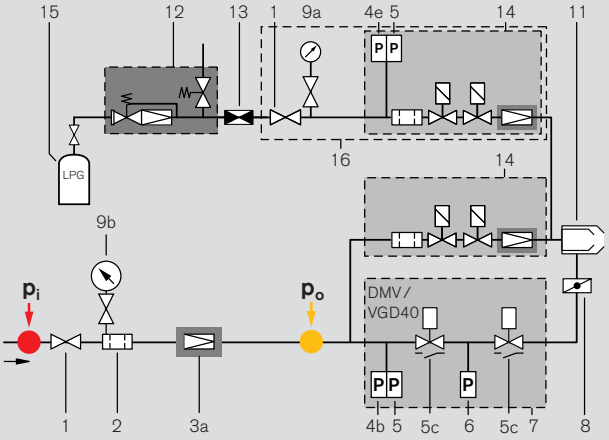
Gas side, WKG(L) 40–80, WKGMS 40–70
versions ZM / NR / 1LN / 3LN / 1SF / VSF



Gas side, WKG 40–70
version LN

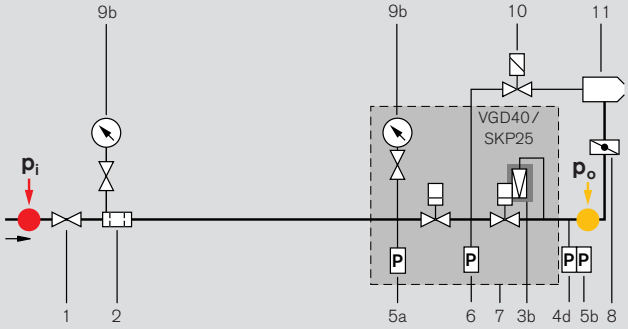


Gas side, WKGMS 80
versions ZM / NR / 1SF

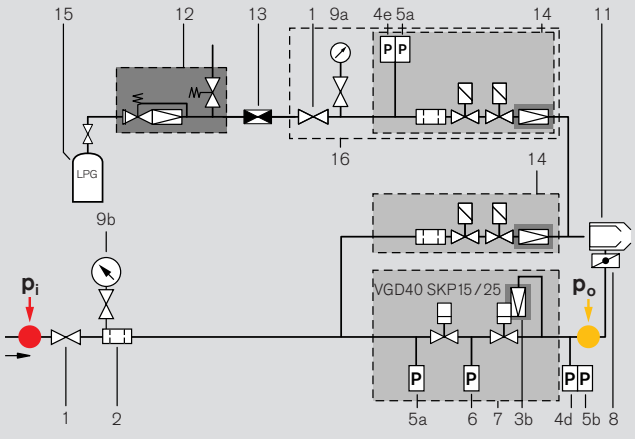


LP2

Gas side, WKG(L) 80
versions NR / 3LN / 1SF / VSF / 3SF

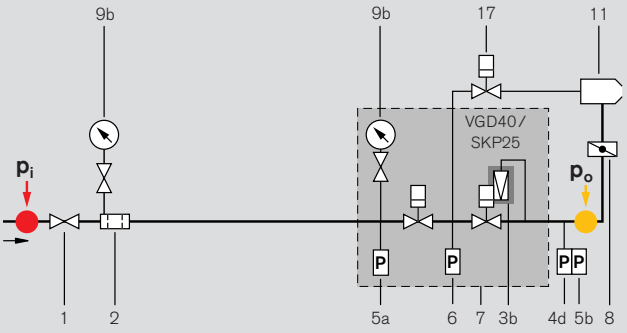


Gas side, WKGMS 80
versions NR / 1SF



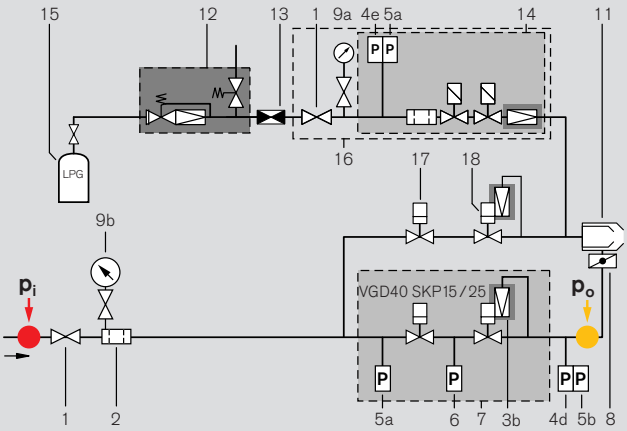
LP3

Gas side, WKG(L) 80 versions NR / 3LN / 1SF / VSF / 3SF



1 Ball valve
2 Gas filter
3a Low-pressure FRS regulator
3b Low-pressure SKP25 regulator
4a High gas pressure switch on screwed valve trains (mounted immediately after the regulator)
4b High gas pressure switch on flanged valve trains (mounted on the valve assembly inlet)
4d High gas pressure switch on flanged valve train (mounted on the elbow)
4e High gas pressure switch (mounted on the LPG ignition burner assembly)
5 Low gas pressure switch
5a Low gas pressure switch (mounted on the valve assembly inset)
5b Additional low gas pressure switch in conjunction with VGD40 and SKP15 & 25 (mounted on the elbow)
5c "Open" position indicator switch in conjunction with VGD40 and 2x SKP15
6 Valve proving pressure switch (mounted on the valve assembly)
7 Double gas valve assembly
8 Gas butterfly valve
9a Pressure gauge with push-button valve (standard)
9b Pressure gauge with push-button valve (accessory)
10 SV-D ignition gas solenoid valve
11 Burner
12 LPG pressure regulator (accessory)
13 Hose rupture protection (accessory)
14 W-MF SE multi-function assembly
15 LPG tank (by others)
16 Sub-assembly fitted to burner at works
17 VGG10 ignition gas valve with SKP15
18 VGG10 ignition gas valve with SKP25

Gas side, WKGMS 80 versions NR / 1SF



Note:
See pages 36–37 for optional ignition arrangements.

General actuator/coil

Electromagnetic coil

Hydraulic actuator

Burner with separate ignition burner (variants D–F, page 31)

p_i = Inlet pressure before the ball valve

p_o = Outlet pressure after the regulator

Pressure regulator

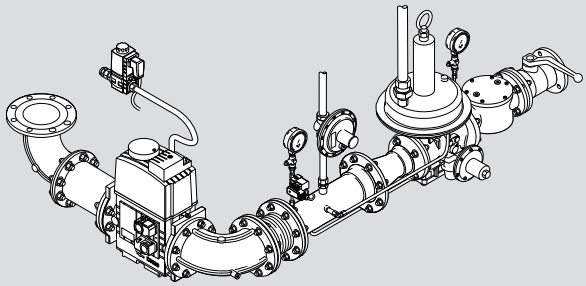
Shutoff assembly

Valve train selection
High-pressure (HP) gas supply details

HP Standard

High-pressure gas supply, standard version
Used when:
- The gas flow pressure at maximum burner load is > 300 mbar.
- The regulated pressure p_o together with the combustion chamber resistance does not exceed 210 mbar.
- The MOP [5] does not exceed 1000, 2500, 4000, or 5000 mbar, depending on regulator type.

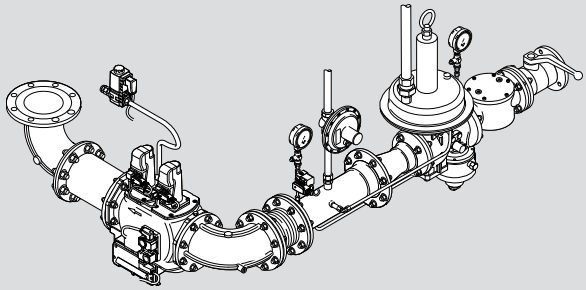
Refer to Print No. 83**0012**02 for component layout.



HP So

High-pressure gas supply, So version
Used when:
- The gas flow pressure at maximum burner load is > 500 mbar.
- The regulated pressure p_o together with the combustion chamber resistance is in the range of 210–350 mbar.
- The MOP [5] does not exceed 4000, 5000, 10 000, or 16 000 mbar, depending on regulator type.

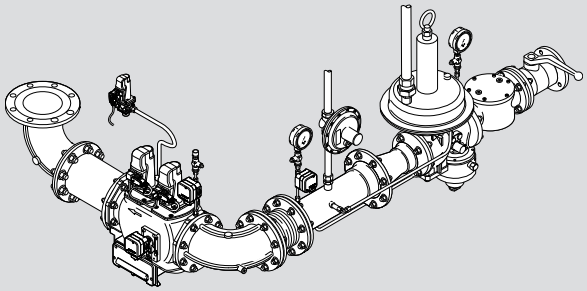
Refer to Print No. 83**5259**02 for component layout.



HP SoH

High-pressure gas supply, SoH version
Used when:
- The gas flow pressure at maximum burner load is > 500 mbar.
- The regulated pressure p_o together with the combustion chamber resistance is in the range of 350–500 mbar.
- The MOP [5] does not exceed 4000, 5000, 10 000, or 16 000 mbar, depending on regulator type.

Refer to Print No. 83**5259**02 for component layout.



Layout of the valve train (vertical burner installation)
The "offset gas butterfly and valve assembly" option is very strongly recommended because of the increased heat radiation due to vertical boiler design and the high temperatures of media such as thermal fluid.

Support of the valve train
The gas valve train should be properly supported in accordance with the site conditions. See the Weishaupt accessories list for various valve train support components.

Compensator
To enable a tension-free mounting of the valve train, the fitting of a compensator is strongly recommended.

Gas meter
A gas meter must be installed to measure gas consumption during commissioning and servicing.

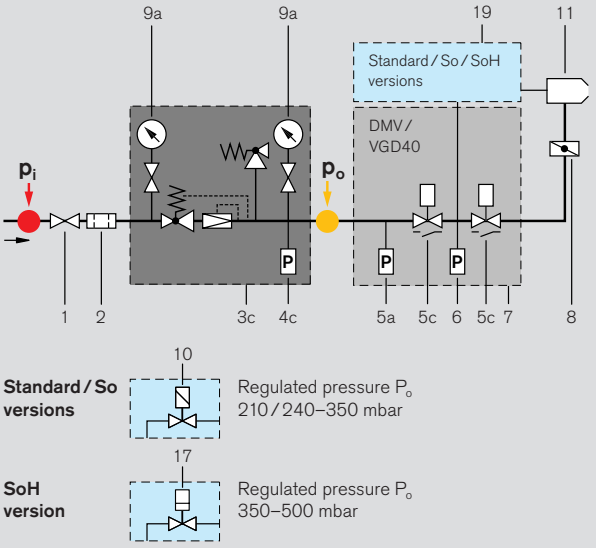
Optional thermal shutoff (when required by local regulations)
Integrated into the ball valve of screwed valve trains. A separate component with HTB seals fitted before the ball valve on flanged valve trains.

Safeguarding of the high-pressure gas supply in the event of a failure
The supplier must safeguard the gas flow pressure such that, in the event of failure, it cannot exceed the MIP [2] of the burner's gas valve train.

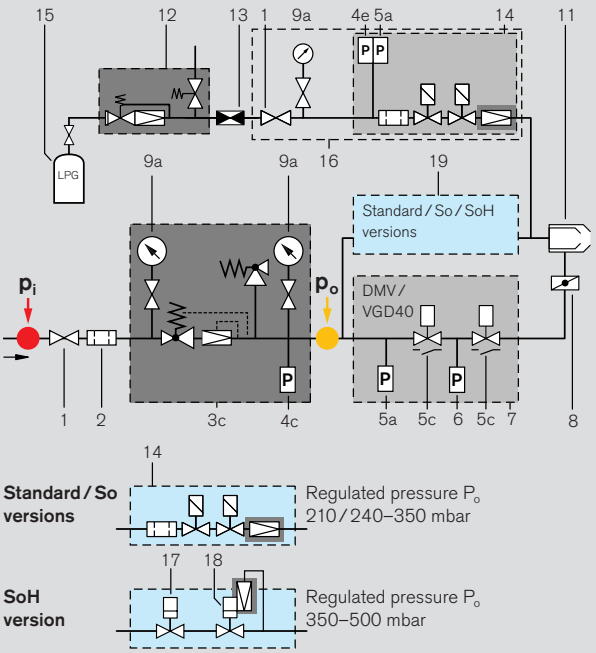
[1] MOP = Maximum Operating Pressure
[2] MIP = Maximum Incidental Pressure (= MOP x 1.1)

HP Standard / So / SoH

Gas side, WKG(L) 40–80, WKGMS 40–70 versions ZM / NR / 1LN / 3LN / 1SF / VSF / 3SF



Gas side, WKGMS 80 versions NR / 1SF



1 Ball valve
2 Gas filter
3c High-pressure regulator incl. SSV / SRV
4c High gas pressure switch on screwed and flanged valve trains (mounted on the outlet side of the assembly)
4e High gas pressure switch (mounted on the LPG ignition burner assembly)
5a Low gas pressure switch (mounted on the valve assembly inset)
5b Additional low gas pressure switch in conjunction with VGD40
5c "Open" position indicator switch in conjunction with VGD40 and 2x SKP15
6 Valve proving pressure switch (mounted on the valve assembly)
7 Double gas valve assembly
8 Gas butterfly valve
9a Pressure gauge with push-button valve (standard)
10 SV-D ignition gas solenoid valve
11 Burner
12 LPG pressure regulator (accessory)
13 Hose rupture protection (accessory)
14 W-MF SE multi-function assembly
15 LPG bottle (by others)
16 Sub-assembly fitted to burner at works
17 VGG10 ignition gas valve with SKP15
18 VGG10 ignition gas valve with SKP25
19 Standard / So / SoH version ignition assembly variants

Note:
See pages 36–37 for optional gas ignition arrangements.

General actuator/coil

Electromagnetic coil

Hydraulic actuator

Burner with separate ignition burner (variants D–F, page 31)

P_i = Inlet pressure before the ball valve

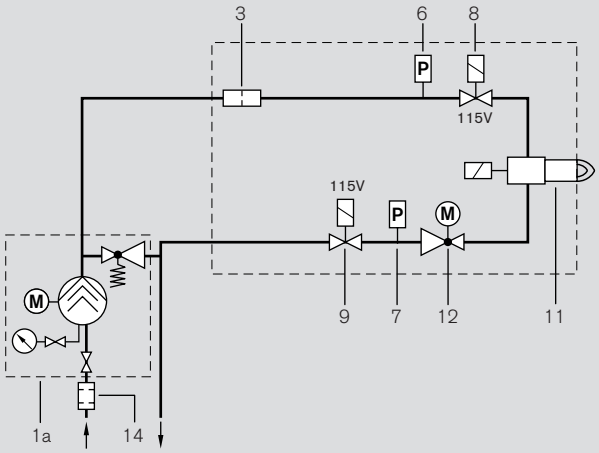
P_o = Outlet pressure after the regulator

Pressure regulator

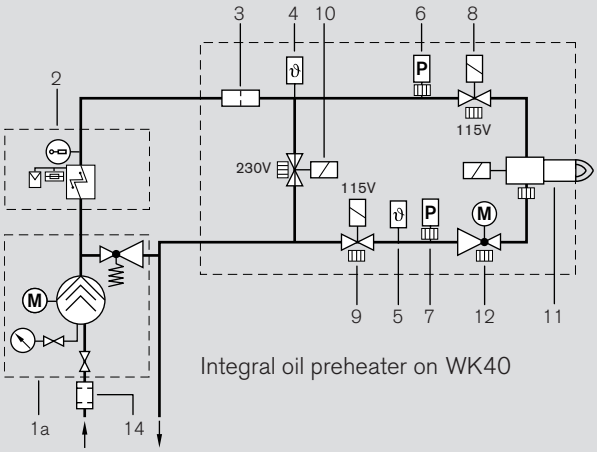
Shutoff assembly

Fuel systems
Oil and dual-fuel burners (oil side)

WKL 40–80

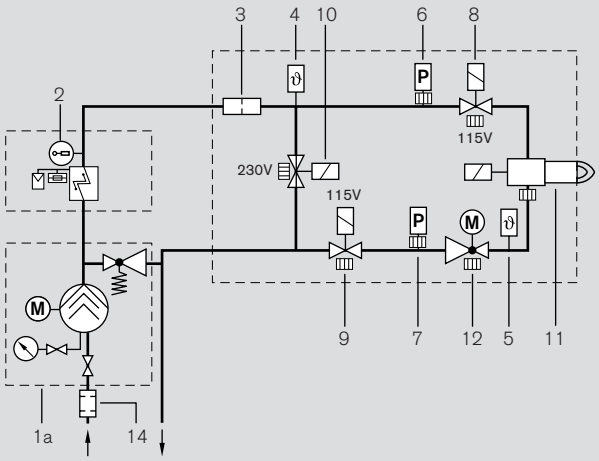


WKL 40–50

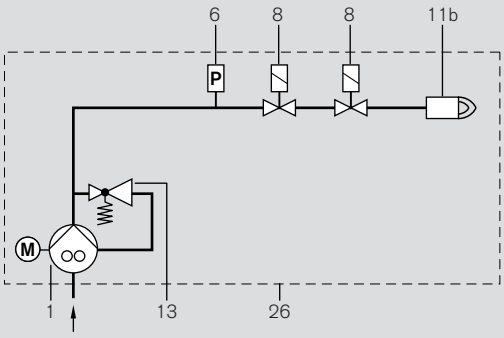


Integral oil preheater on WK40

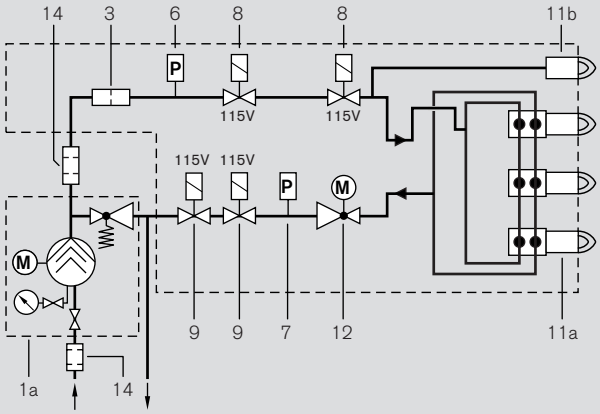
WKMS 70–80



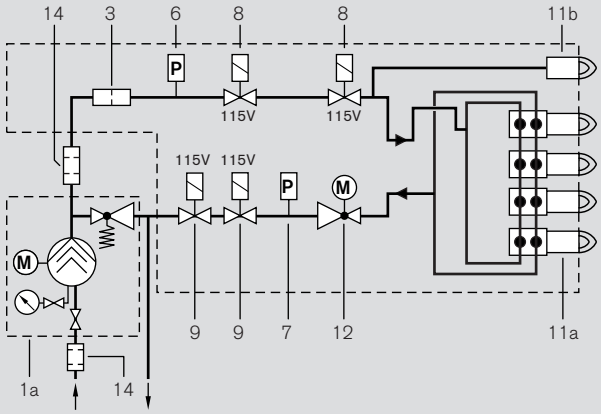
Gas oil ignition burner, WKMS 80



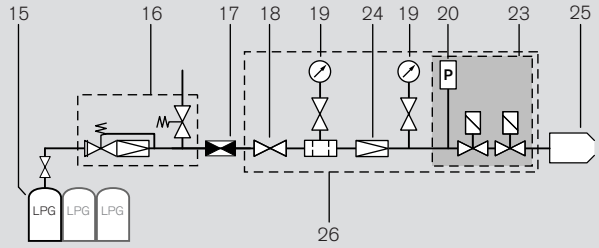
WKL 40–50 multiflam®



WKL 70–80 multiflam®

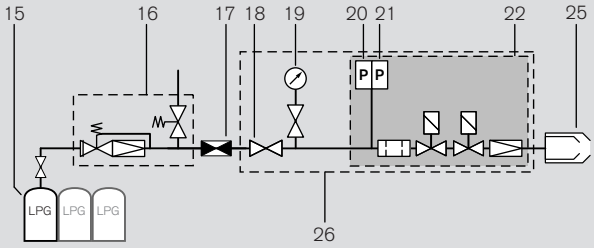


LPG ignition pilot, WKMS 40–70



Oil-firing burner with gas ignition

LPG ignition burner, WKMS 80

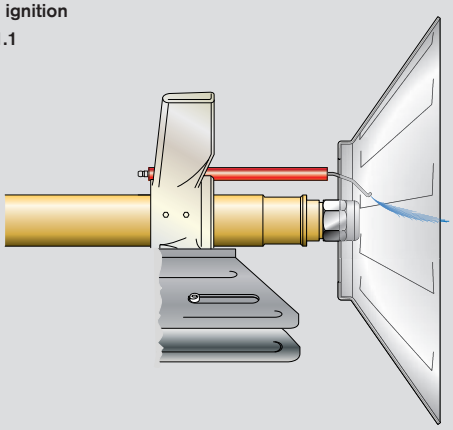


Oil-firing burner with gas ignition

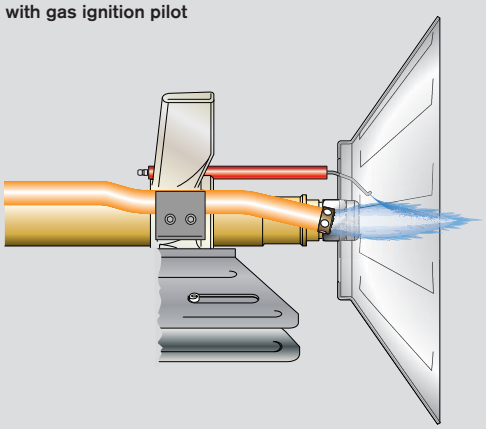
1 Oil pump
1a External pump station with pressure maintenance
2 Oil preheater
3 Strainer
4 Temperature sensor in supply
5 Temperature sensor in return
6 Low-pressure switch
7 High-pressure switch
8 Solenoid valve in supply (fitted in the direction of flow)
9 Solenoid valve in return (fitted against the direction of flow)
10 Bypass solenoid valve (normally open)
11 Solenoid valve assembly
11a Nozzle head with secondary nozzles
11b Nozzle head with primary nozzle
12 Oil regulator
13 Pressure regulating valve
14 Filter
15 LPG bottle (supplied by others)
16 LPG pressure regulator (accessory)
17 Hose rupture protection (accessory)
18 Ball valve
19 Pressure gauge with push-button valve
20 Low gas pressure switch
21 High gas pressure switch
22 W-MF SE multi-function assembly
23 DMV gas solenoid valve assembly
24 FRS gas pressure regulator
25 Burner
26 Sub-assembly fitted to burner at works

Perfect ignition
Helping safety and environmental protection

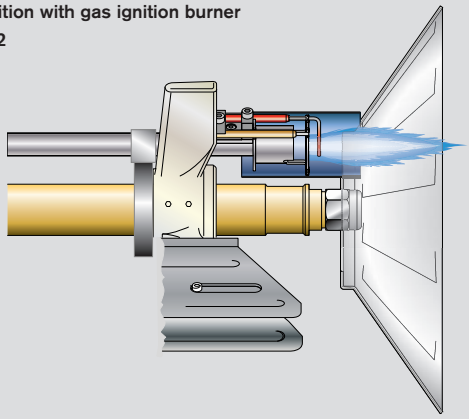
Direct oil ignition
Version 1.1



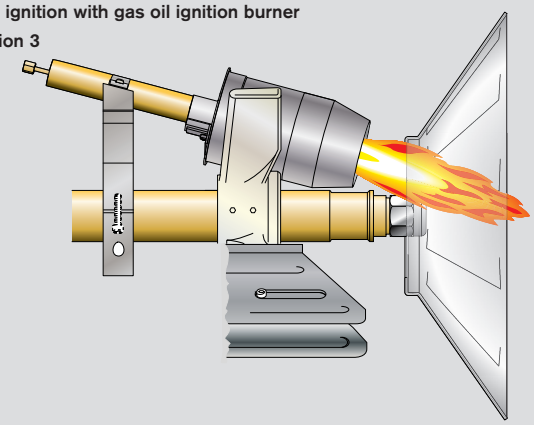
HFO ignition with gas ignition pilot
Version 1.2



HFO ignition with gas ignition burner
Version 2



HFO ignition with gas oil ignition burner
Version 3



The reliable ignition of a broad range of fuel types and volumes calls for the use of suitable ignition devices and appropriate control programs.

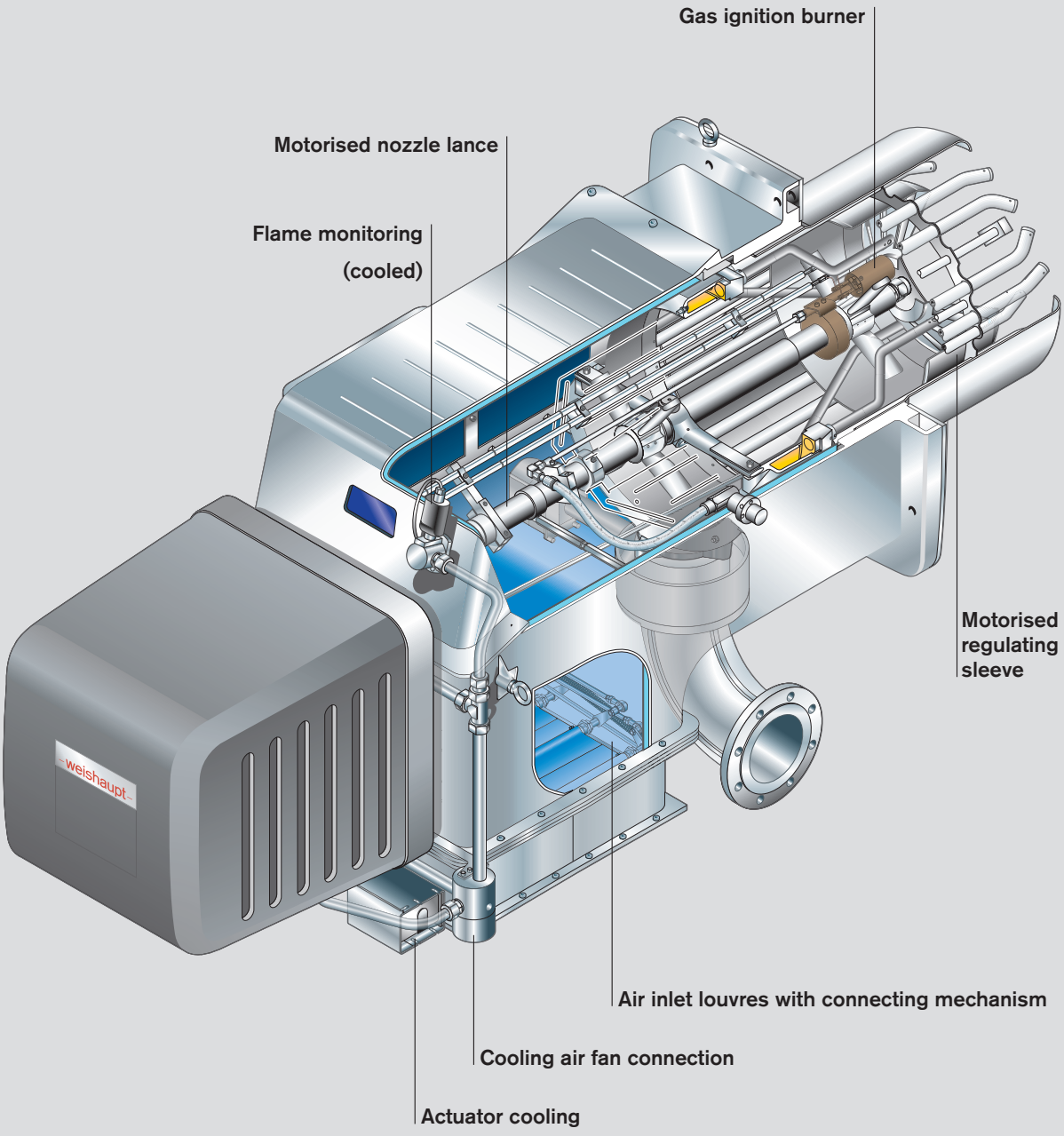
The W-FM 200 combustion manager has various control variants which affect at what point an ignition spark is created and when fuel valves open and close.

Gaseous and low-viscosity liquid fuels are easily ignited. Modern electronic ignition units and high-voltage electrodes are used to create an electric arc, and the heat of that spark sets fire to the gas or to the oil vapour.

Igniting high-viscosity liquid fuels with minimal emissions, however, requires a different type of ignition system. Weishaupt offers several special units, from which the best-suited for any given application can be selected.

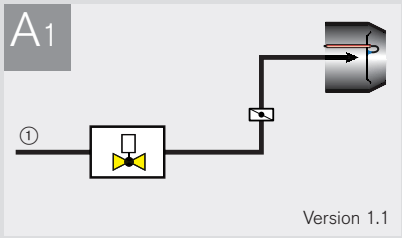
The key issue is always which fuels are available. Dual-fuel burners can make use of their gas ignition pilot when firing heavy oil. Furthermore, by equipping the system with two ignition gas lines, there is always a choice to be made between either natural gas or LPG ignition as required.

For the WKMS80 single-fuel burner there is a choice of two ignition burners. The gas version is a self-contained ignition burner with diffuser, flame tube, ignition electrode and flame monitoring. Depending on the installation it can be fired using either LPG or natural gas. The oil version is used when, for example, regulations preclude the use of gas. It too is a complete burner unit comprising oil pump, oil nozzle, igniter, diffuser, and flame tube. The ignition burner is fired using gas oil and has a rating of approximately 50 kW. Its flame ignites the pre-warmed, high-viscosity oil quickly, cleanly, and reliably.

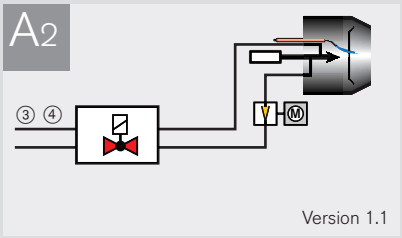


WK-series dual-fuel burner in hot-air execution with gas ignition burner

Fuel systems
General overview of ignition variants



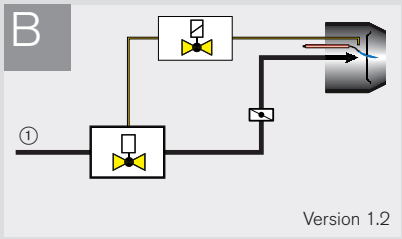
Gas: Ignition via electrode



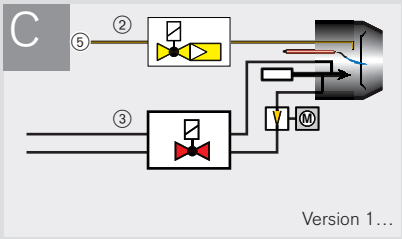
Oil: Ignition via electrode (standard)

① Main gas
② LPG
③ High-viscosity liquid fuel
④ Low-viscosity liquid fuel

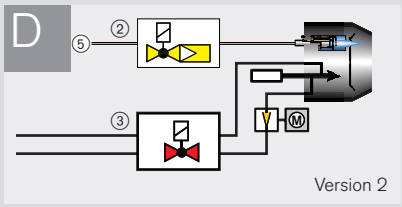
Details regarding the valves and governors used on different sizes and versions of WK-series burners are available upon enquiry.



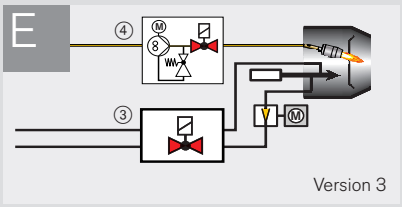
Gas: Ignition via ignition gas pilot
WKGL / WKGMS burners in combination with A2



HFO: Ignition via LPG ignition unit
WKGMS burners in combination with B



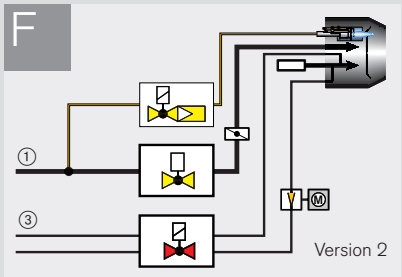
HFO: Ignition via LPG ignition burner



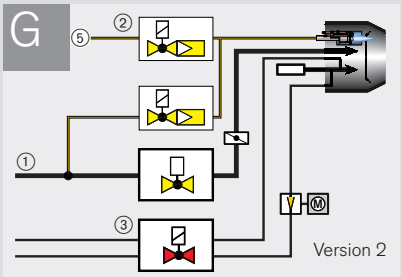
HFO: Ignition via gas oil ignition burner

Accessory for LPG ignition

⑤ **Complete set**
(Part No. 271 805 26 012) comprising:
⑥ Pressure regulator for 11 / 33 kg LPG bottle
⑦ Hose rupture protection
⑧ 3 m hose



Dual-fuel: Gas and HFO ignition via main gas ignition burner



Dual-fuel: Gas and HFO ignition via main gas ignition burner with additional HFO ignition via LPG

Ignition variants by burner size and version

Variant	WK 40 WKL	WKMS	WKG	WKGL	WKGMS	Variant
A1			● 3)	●	●	A2 + B
A2	●	●				
B			●		○	B + C
C		○				

● Standard
○ Optional
3) WKG40 ZMH-LN ignites from the main gas line

Variant	WK 50 WKL	WKMS	WKG	WKGL	WKGMS	Variant
A1				●	●	A2 + B
A2	●	●				
B			●		○	B + C
C		○				

● Standard
○ Optional

Variant	WK 70 WKL	WKMS		WKG	WKGL	WKGMS		Variant
			70/2-A vers. 1SF				70/2-A vers. 1SF	
A1				● 3)	●	●	●	A2 + B
A2	●	●	●					
B				●		○		B + C
C		○						
D			○ 1)					D
F							○ 1)	F
G							○ 1)	G

● Standard
○ Optional
1) W-FM 200 combustion manager required
3) WKG70 ZM(H)-LN ignites from the main gas line

Variant	WK 80 WKL	WKMS		WKG	WKGL	WKGMS		Variant
		17.5 MW <	17.5 MW >			17.5 MW <	17.5 MW >	
A1								A1
A2	●	○ 2)			● 4)	○ 2)		A2 + B
B				●				
D		● 1)	● 1)					D
E			●					E
F						○ 1)	○ 1)	F
G						● 1)	● 1)	G

● Standard
○ Optional
1) W-FM 200 combustion manager required
2) 1SF version excluded

Flame monitoring
for demanding safety requirements

Testing and optimisation using a software tool

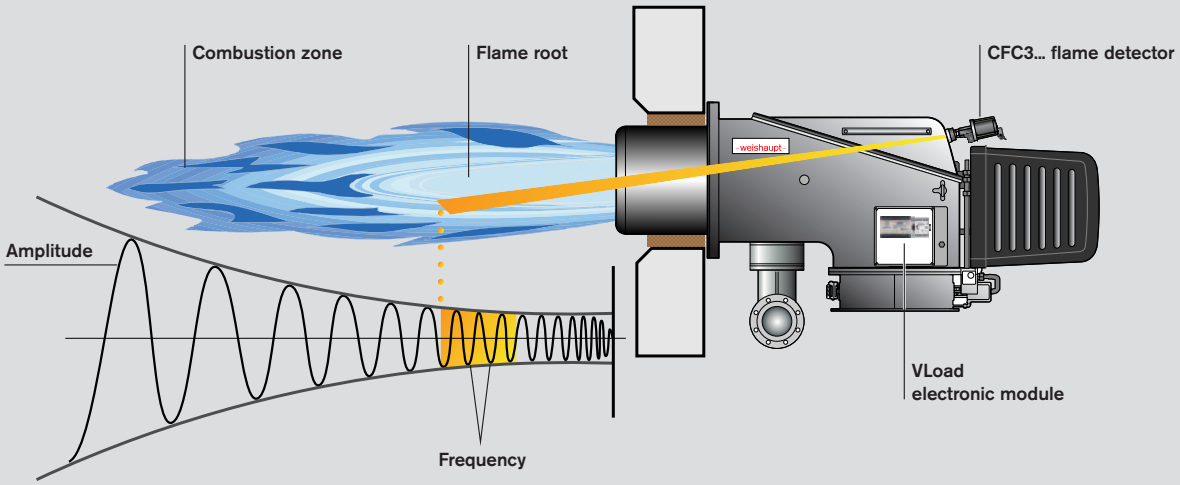
Flame monitoring plays a crucial role when it comes to reliability and safety.

Determination of the best method of flame monitoring takes into account not only the burner and the fuel to be combusted, but also how the system operates and the conditions inside the combustion chamber.

Heat generators with one flame per combustion chamber are easier to monitor than those with multiple flames. In the latter case, it also depends whether the flames are firing into the combustion chamber from the same or opposing directions.

Biomass plant and waste incinerators need a flame monitoring system that is not affected by extraneous flames.

Weishaupt offers flame monitoring systems for gas, oil, and dual-fuel burners operating under the widest range of conditions.



The constructive alignment of the CFC3... allows the detection range to be optimised

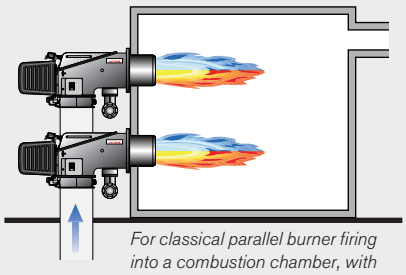
W-FC: Weishaupt Flame Control

Weishaupt Flame Control (W-FC) is a reliable flame monitoring system that is designed to meet demanding safety requirements and comply with the EN 298 standard for continuous operation.

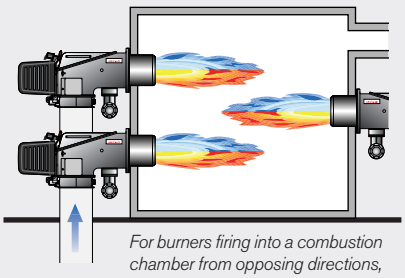
W-FC 4.0 is for plant with multiple burners firing from the same direction into a single combustion chamber. The W-FC assembly utilises flame frequency to monitor each flame separately via a load-independent on and off threshold for each fuel. The CFC3... flame detector functions in series with the QRA73 flame sensor on the W-FM 100 or W-FM 200 combustion manager.

Note: If a turndown in excess of 4:1 or single-burner operation is required, the higher-specification W-FC 5.0 must be selected.

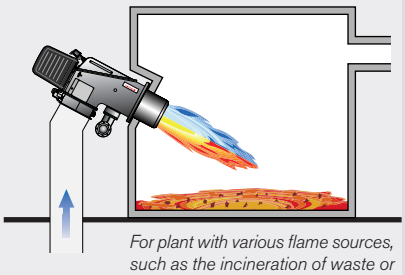
W-FC 5.0 is for plant with multiple burners firing from different directions into a single combustion chamber, and for process plant with various flame sources. The W-FC assembly monitors each flame separately via up to ten load-dependent switching thresholds for each fuel. The VLoad electronic module and its user-friendly software establishes a distinct differentiation from extraneous light sources specific to that plant. The CFC3... flame detector functions in parallel with the QRA73 flame sensor on the W-FM 200 combustion manager.



For classical parallel burner firing into a combustion chamber, with a maximum turndown of 4:1

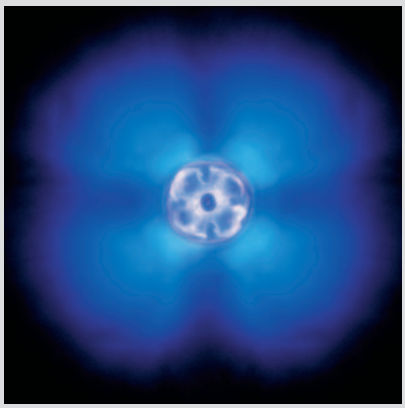


For burners firing into a combustion chamber from opposing directions, and for individual / staged firing of multiple burners

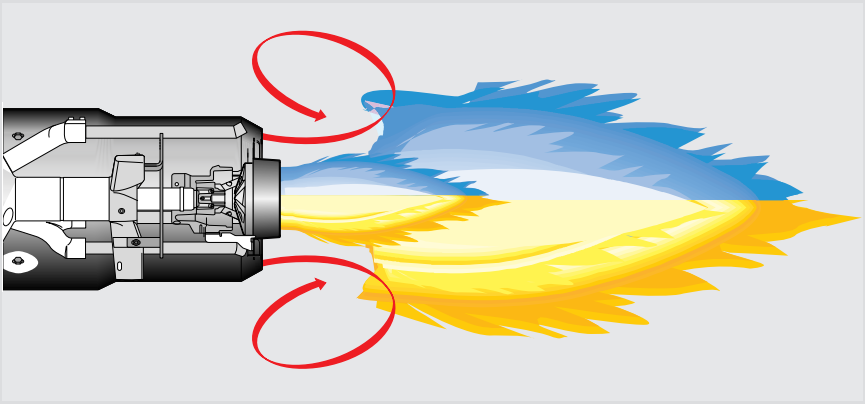


For plant with various flame sources, such as the incineration of waste or biomass, process plant, etc.

3LN-version burners:
Emissions reduced by the multiflam® principle



Flame image showing efficient combustion



Schematic representation of the primary and secondary flames with internal recirculation

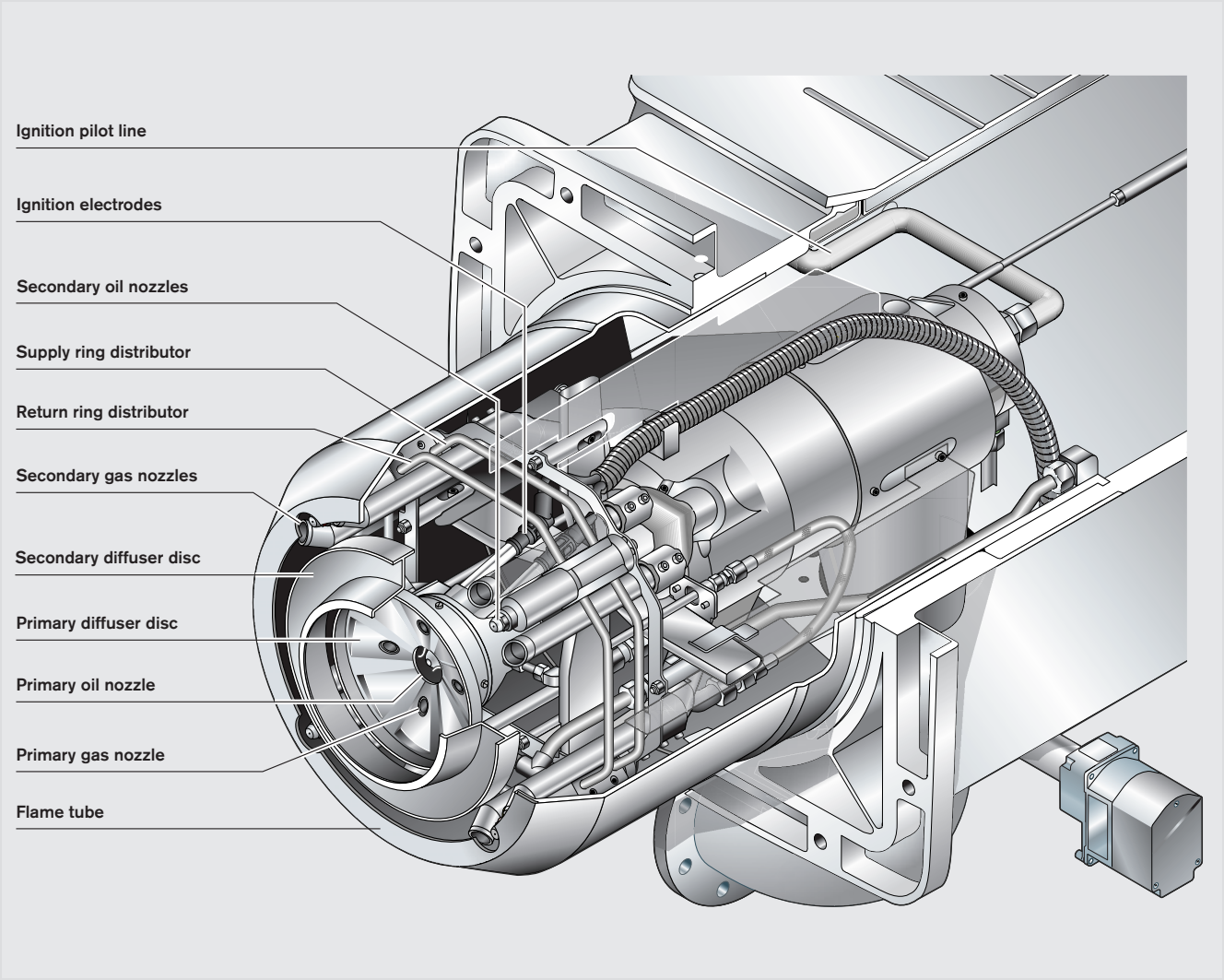
The multiflam® principle developed and patented by Weishaupt is an innovative way of reducing NO_x emissions from combustion plant to a minimal level.

At the heart of Weishaupt's multiflam® technology lies a special mixing assembly design. Fuel is distributed among several nozzles and combusted in a primary and a secondary flame. Temperature in the flame's core is considerably reduced, resulting in an effective reduction of nitrogen oxides.

The wide range of ratings across which multiflam® burners are now available is equally outstanding. All the way from the WM 10 monarch®-series burner right up to the WK 80 industrial-series burner, there is now a multiflam® burner for outputs ranging from 120 up to 23 000 kW.

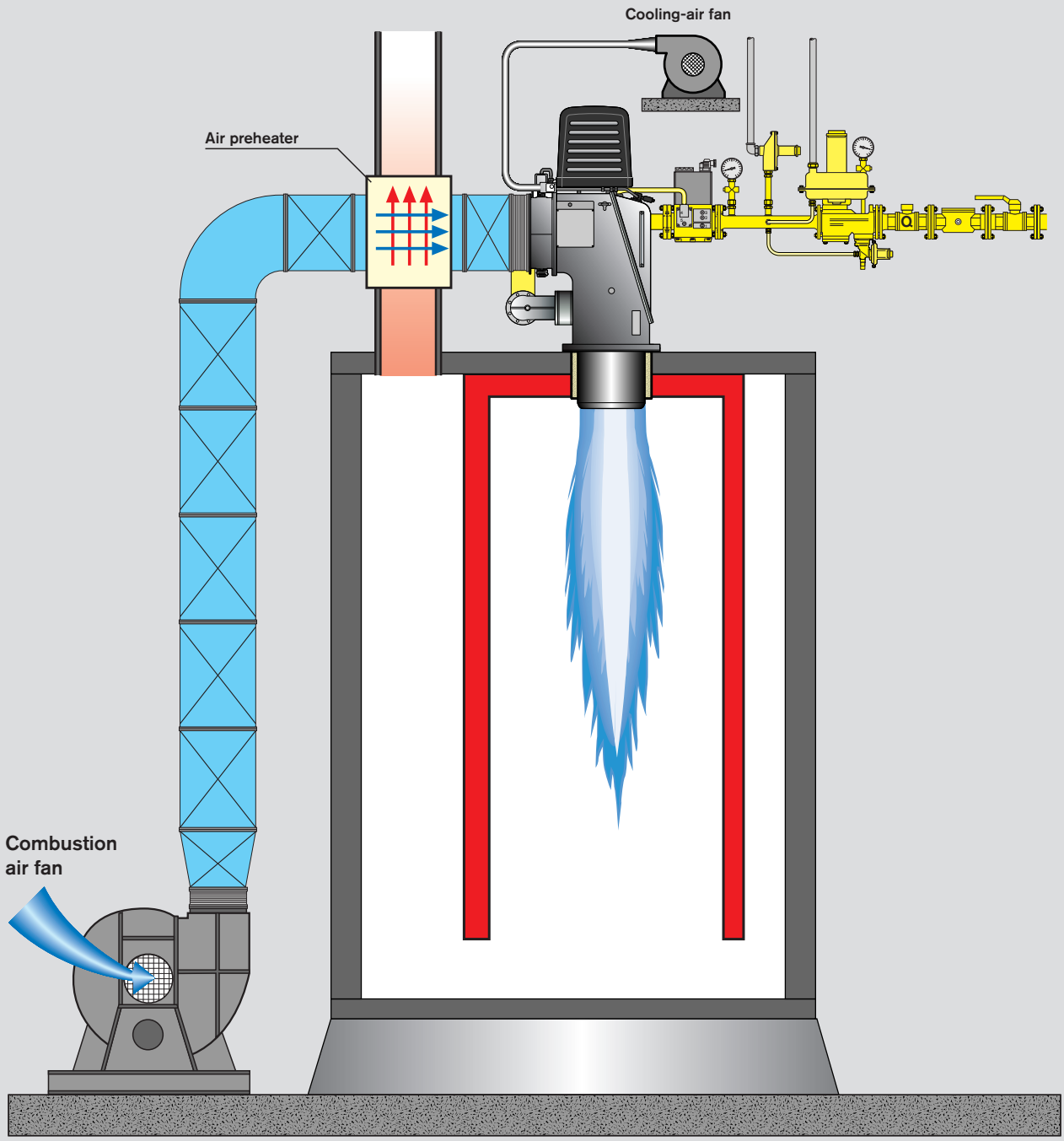
Weishaupt multiflam® burners have been proving themselves in the field for 20 years. As fully fledged gas, oil, and dual-fuel burners, they are always the first choice for achieving low NO_x emission limit values without resorting to external measures.

However, the achievement of good combustion figures depends on more than just the burner. There are numerous additional parameters, such as the design of the heat generator, and the geometry and the thermal loading of its combustion chamber, that also play an important role. Furthermore, the medium temperature, combustion air temperature, and the air humidity are decisive. When the NO_x emissions for a particular application are guaranteed, the guarantee will always be with reference to certain constraints and system parameters.



The multiflam® mixing assembly of a dual-fuel burner

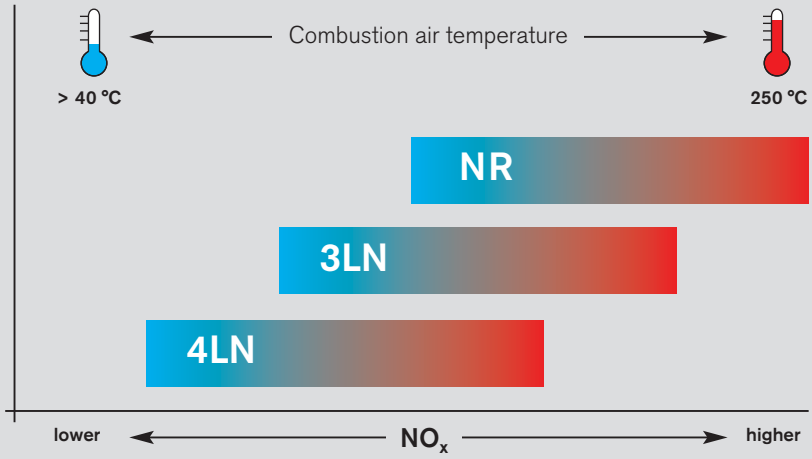
Efficiency increases of up to 10 percent with 250 °C hot-air WK-series burners



The principle of heat recovery with combustion air preheated up to a maximum of 250 °C.

Reduction in oxides of nitrogen with 250 °C hot-air multiflam® burners

Cooling air for actuators and flame monitoring



NO_x emissions on hot-air WK-series burners, comparing NR and multiflam® 3LN-version burners without flue gas recirculation and 4LN-version burners with flue gas recirculation

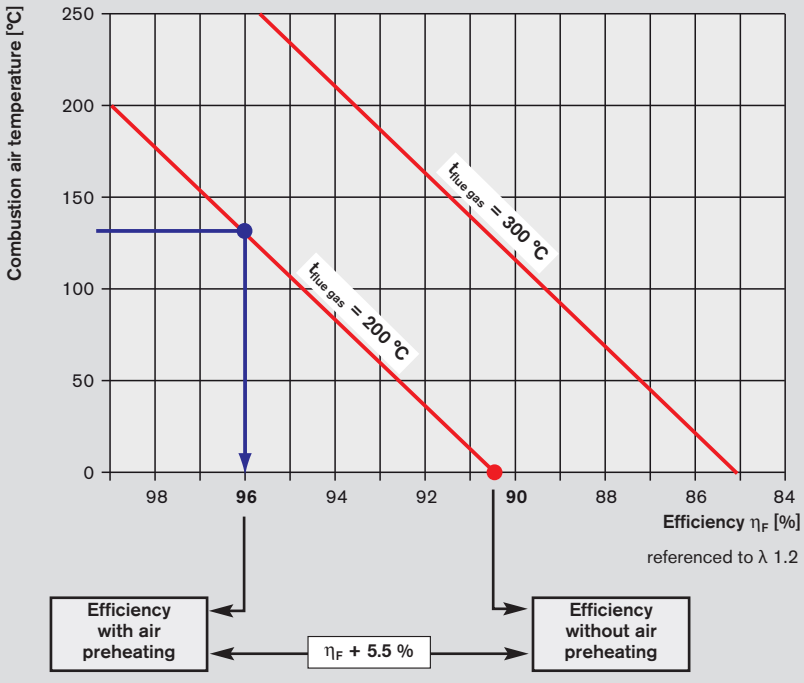
Weishaupt 3LN (multiflam®) and 4LN-version burners can now operate with preheated combustion air.

Heat generators with very high medium temperatures can exploit less of the heat in the flue gases. Consequently, flue gas temperatures are always higher than the medium temperature. Without additional heat exchangers, a lot of energy will be lost to the atmosphere and wasted. One way of utilising this energy is through the use of hot-air versions of the WK-series duobloc burners.

A cross-flow heat exchanger between the combustion air duct and the flue gas system draws heat from the hot flue gas and transfers it to the combustion air. Using this method, combustion air can be heated to temperatures of up to 250 °C, making efficiency increases of up to 10 percent possible.

Despite these extreme conditions, the burners can achieve NOx values in the range of 100–150 mg/Nm³.

Improved efficiency with combustion air preheating



The 4LN-version mixing assembly of a WK-series burner – A further development of the well-proven 3LN-version multiflam® mixing assembly

Very high capacity, ultra-low emissions: The 4LN-version WK-series burners

Weishaupt 4LN-version gas burners are an innovative development that enables the world's most stringent NO_x emission limits to be met.

This further development brings about the general integration of external flue gas recirculation. The mixing assembly of the burner is based on familiar multiflam® technology that has been especially optimised for the admixture of flue gas.

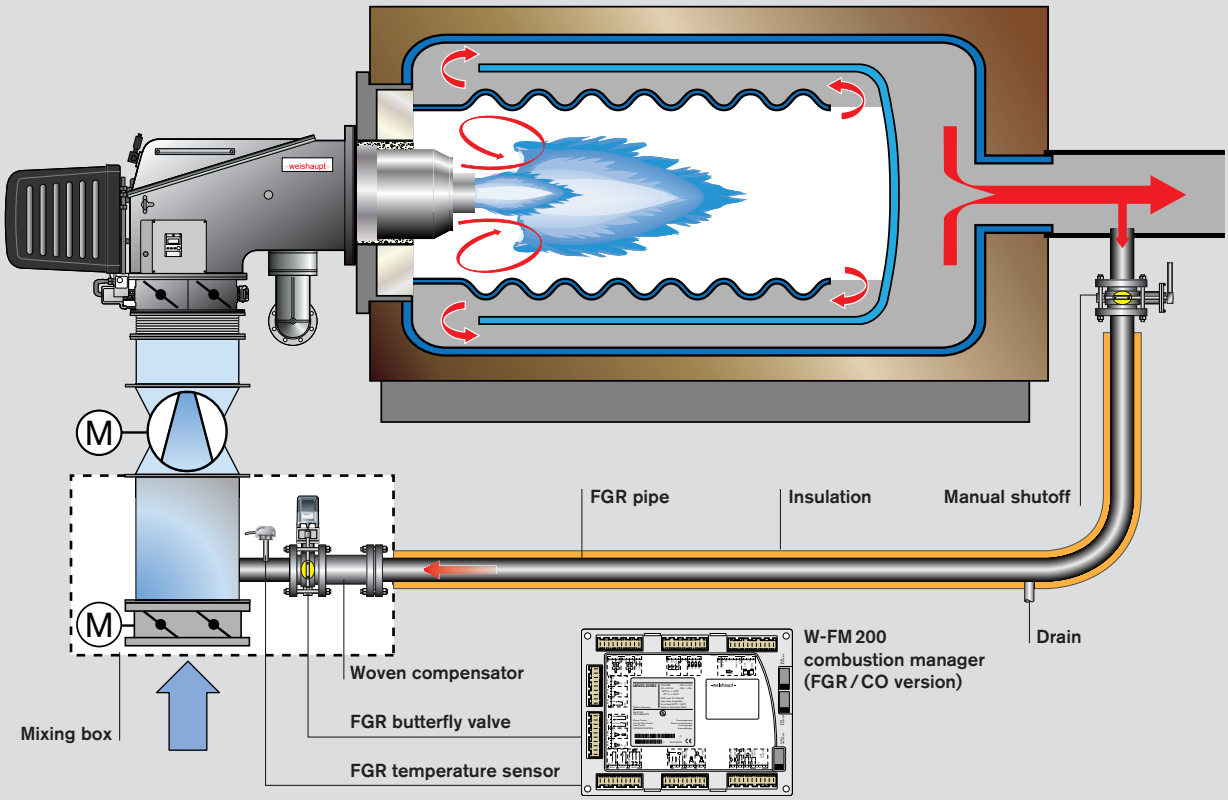
Results from the lab and the field prove that this technology can always meet NO_x limits of 30 mg/kWh (natural gas E), provided certain conditions are met.

The Weishaupt FGR system does not require an additional fan to feed the flue gas to the burner.

The flue gases are instead drawn in by the combustion air fan. Low pressure develops in the mixing box, which allows flue gas to flow down the FGR pipe and into the fan. The burner's combustion manager controls the FGR butterfly valve, thus ensuring the flue gas volume is precisely dosed.

Servicing remains as simple as ever.

Only the fan is equipped with additional FGR components. The burner remains unchanged, making it easier to handle during commissioning and maintenance works. That saves both time and money.



General arrangement of a flue gas recirculation system with WK-series burner and mixing box

Combustion air fan with mixing box for the Weishaupt flue gas recirculation system

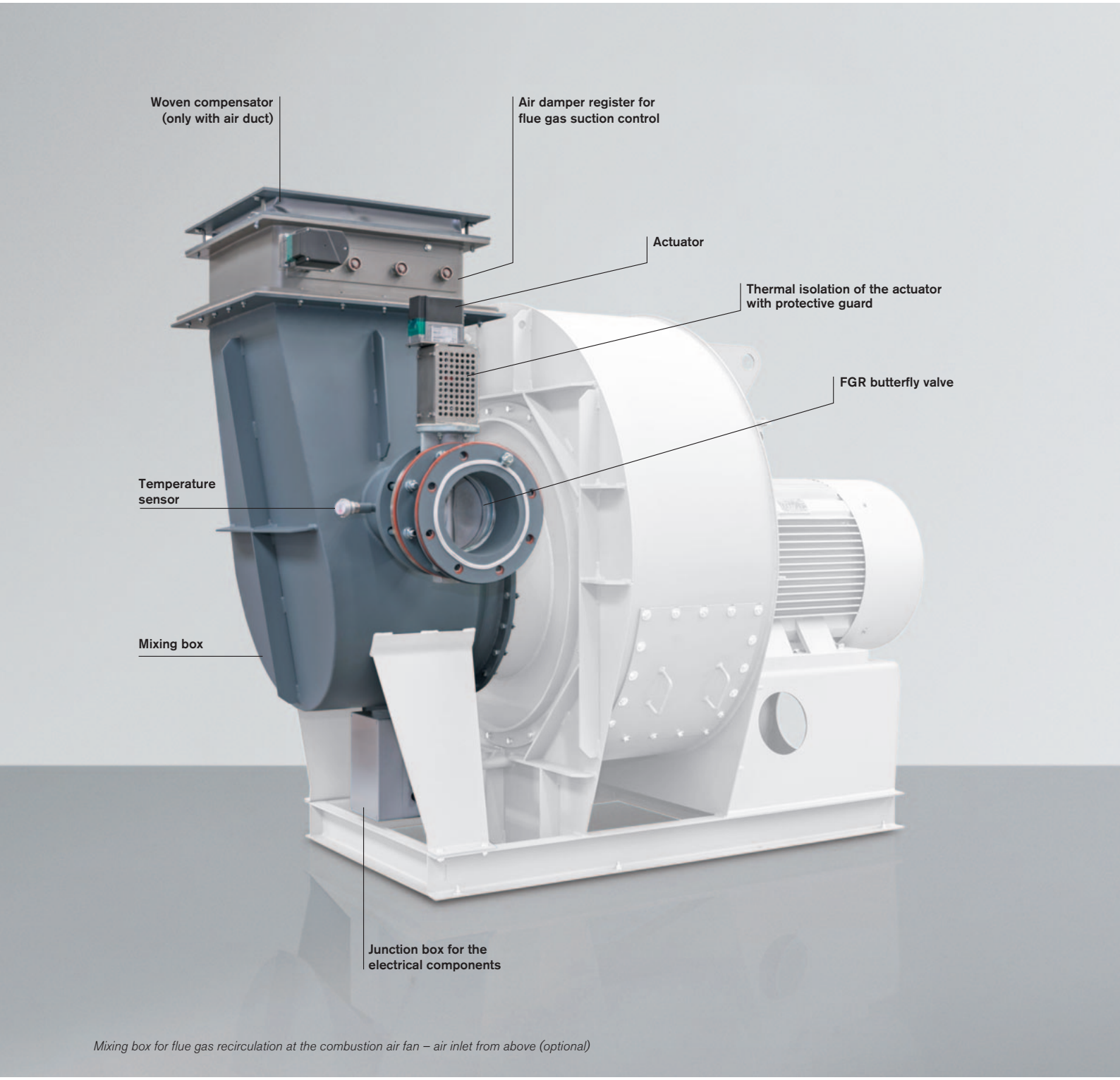
Weishaupt mixing box
Weishaupt and its combustion air fan manufacturer worked together to develop the mixing box. It is fitted directly to the combustion air fan and forms a compact assembly with fixed dimensions. The mixing box consists of a housing with an integrated air damper register for suction control, a flanged connection for easy installation of the FGR butterfly valve, and a sleeve with inbuilt temperature sensor.

Benefits:
- Precise site plans can be drawn up.
- The manufacture of fully encapsulating sound absorbers can proceed without the need for on-site measurements.
- The fan is supplied fully pre-assembled.
- Installation times are reduced.
- The crucial factor for functionality – everything is in the right place.

Variable speed drive
Small details guarantee uncompromising quality and so Weishaupt goes a step further with its optional VSD too, which includes additional features such as:
- Fan motor with direction of rotation detection
- Earthed motor connections to prevent EMC interference
- Insulated motor bearings from 45 kW to prevent leakage current

Mixing box – Execution is dependent on the air feed arrangement

Fan motor with speed sensor for VSD



Mixing box for flue gas recirculation at the combustion air fan – air inlet from above (optional)

The right control panel: Individually made to your specifications

Every control panel is individually designed and built in the separate control panel production area

Weishaupt has been designing and manufacturing bespoke control panels of all kinds ever since the company was founded, not only for your typical heating system but also for complex building automation systems, and for thermal process plant.

The core areas for Weishaupt control panels are:

Burners
Burner and control panel from the same manufacturer, matched to each other at the factory:
- Manufactured to European and other international standards
- Digital combustion management with eBUS and Modbus interfacing (can be expanded to other bus protocols)
- Safety-oriented PLC control

Boilers
Safety-related requirements to comply with EN standards and country-specific regulations greatly affect the controls needed.

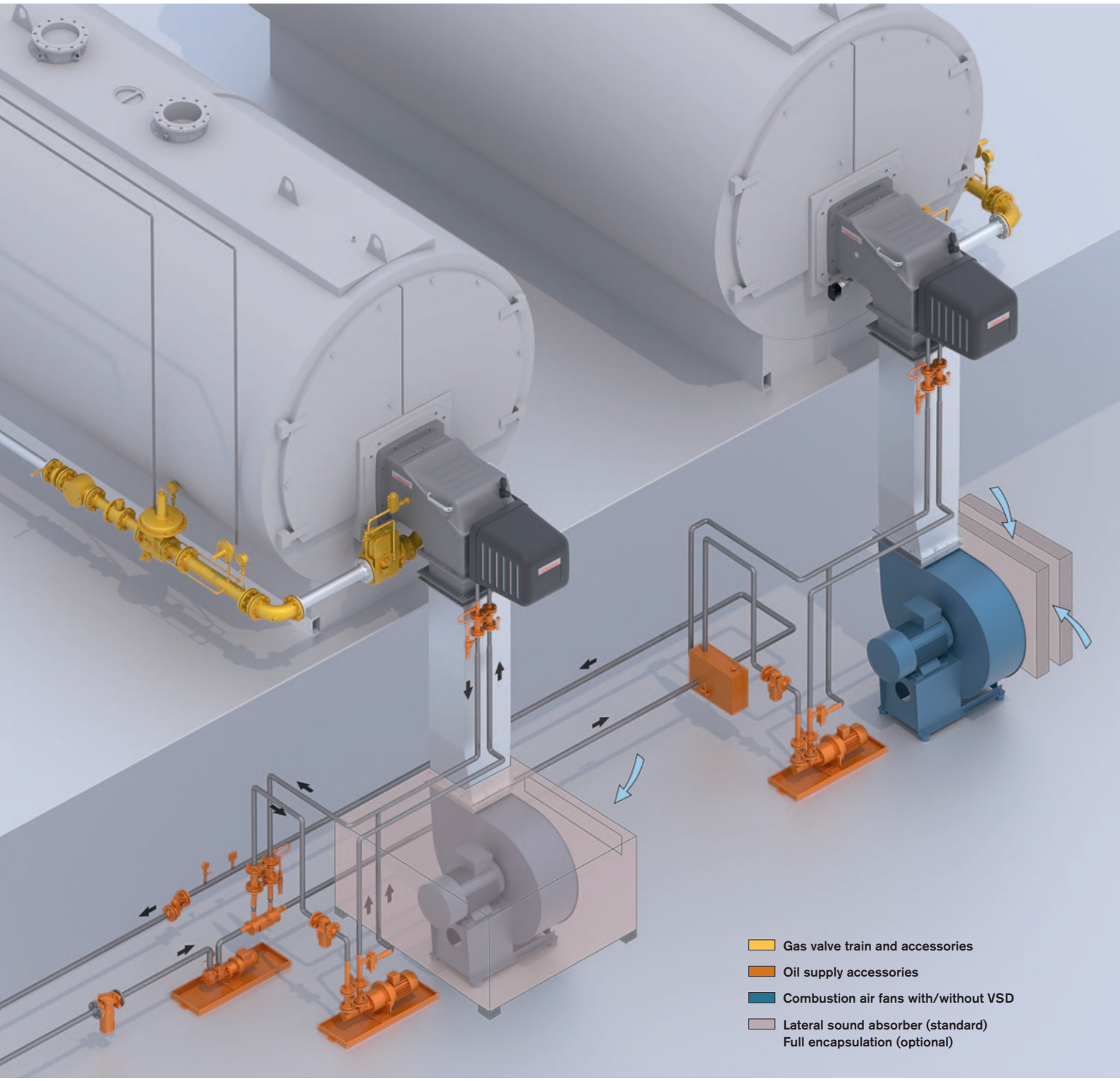
Weishaupt offers solutions for:
- LTHW boilers
- MTHW and HTHW boilers
- Steam boilers
- Boiler sequencing
- Optimisation of multi-boiler systems (Weishaupt MBC system)

Thermal process plant
Thermal process technology calls for numerous controls and regulators in addition to all of the appropriate burner controls. Typical applications include:
- Thermal fluid heaters
- Salt heaters
- Dryers
- Paint ovens
- Smelters

Marine
This highly specialised field places very particular demands on the equipment.

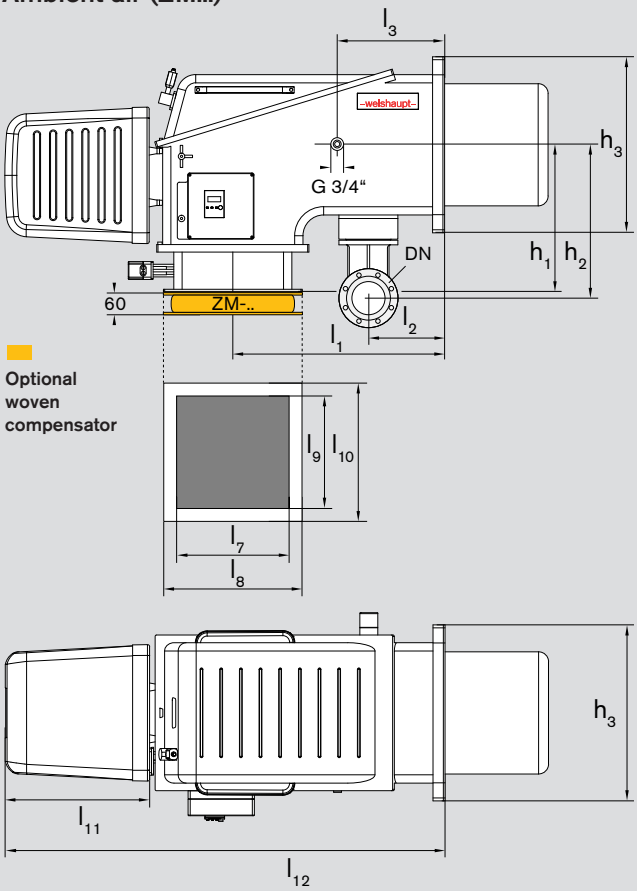
Weishaupt offers solutions that comply with the requirements of all of the usual classification societies (DNV-GL, LRS, ABS, RS, PRS, BV etc.) for the control of:
- Auxillary boiler systems
- Inert gas processing
- Heating

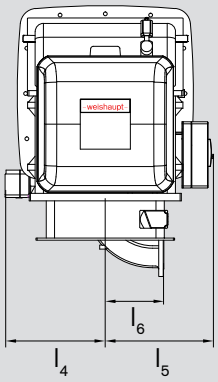
Weishaupt system technology: Perfectly matched components



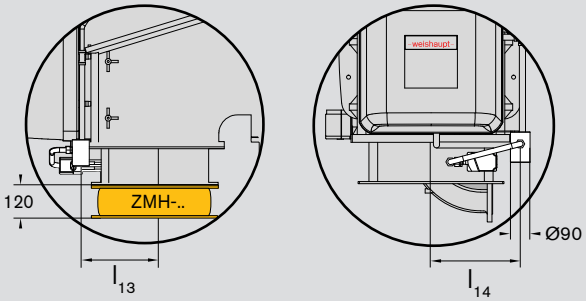
Key dimensions at a glance

Ambient air (ZM...)

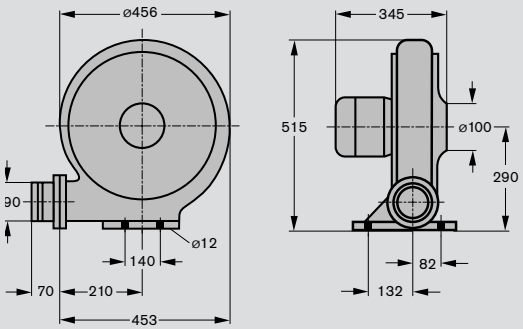




Hot air (ZMH...)



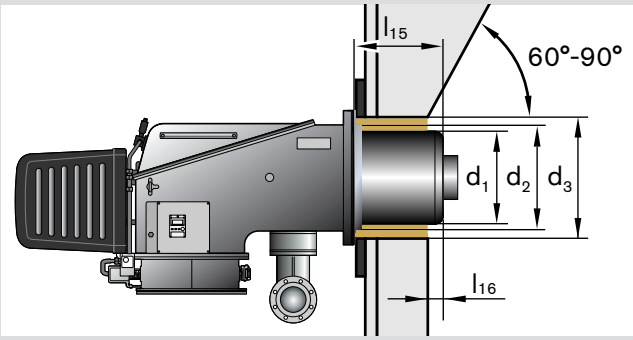
RD2 cooling-air fan



Type	DN	l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	l_{10}	l_{11}	l_{12}	l_{13}	l_{14}	h_1	h_2	h_3
WK 40	65	388	116	116	313	340	140	226	336	264	368	452	1046	231	255	444	384	400
WK 50	80	528	158	158	373	404	165	270	403	370	495	452	1212	258	311	518	464	540
WK 70	100	730	188	313	454	466	205	418	548	500	630	650	1689	300	360	628	589	700
WK 80	150	1023	368	522	486	524	283	556	670	556	670	697	2124	393	410	708	741	850

Weishaupt reserve the right to make changes in light of future developments. Additional burner dimensions and oil-side connection details are available on request.

Heat generator preparation



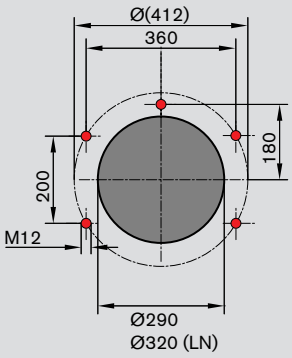
The space between the combustion head and the refractory should be filled with a resilient, non-solid insulating material, such as Cerafelt.

Maintenance-friendly combustion head:
On all burner versions, the standard-length combustion head can be inserted and withdrawn through the service opening in the burner housing.

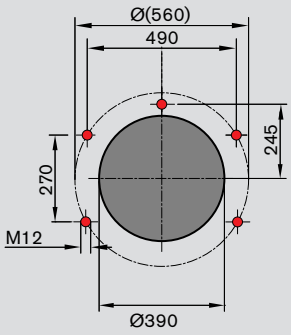
[1] Please enquire regarding combustion head extensions.

Type	Size.	Vers. ZM(H)...	d_1	d_2	d_3	l_{15} [1]	l_{16}
WK...	40/1		250	280	290	260	≥ 0
WK...	40/2		261	280	290	260	≥ 0
WK...	40/2	LN	296	280	320	424	≥ 0
WKG(L)	40/2	3LN	256	280	290	412	≥ 50
WK...	50/1	NR/1LN	290	380	390	307	≥ 0
WKG(L)	50/1	3LN	296	380	390	380	≥ 50
WK...	50/2	NR	350	380	390	337	≥ 0
WKG(L)	50/2	1LN	350	380	390	452	≥ 0
WKL(MS)	50/1		290	380	390	337	≥ 0
WKL(MS)	50/2		350	380	390	392	≥ 0
WKG(L)	50/2	3LN	344	380	390	501	≥ 50
WK...	50/2	1SF	350	380	390	337	≥ 0
WK...	70/1	NR	400	518	530	347	≥ 0
WK...	70/3	NR	480	518	530	462	≥ 0
WKG	70/1	LN	406	518	530	457	≥ 0
WKG(L)	70/1	1LN	406	518	530	439	≥ 0
WKG(L)	70/2	LN/1LN	480	518	530	477	≥ 0
WKG(L)	70/0	3LN	409	518	530	472	≥ 60
WKG(L)	70/1	3LN/4LN	444	518	530	475	≥ 60
WKG(L)	70/3	3LN/4LN	480	518	530	475	≥ 60
WK...	70/1	1SF	400	518	530	347	≥ 0
WK...	70/2	1SF	480	518	530	362	≥ 0
WKL(MS)	70/1		400	518	530	417	≥ 0
WKL(MS)	70/2		480	518	530	422	≥ 0
WK...	80/3	NR	590	590	640	500	≥ 0
WKG(L)	80/1	3LN/4LN	540	558	640	510	≥ 70
WKG(L)	80/2	3LN/4LN	540	558	640	510	≥ 70
WK...	80/3	1SF	600	600	640	480	≥ 0
WKG	80/4	VSF	590	590	640	500	≥ 0
WKG	80/5	VSF	590	590	640	500	≥ 0
WKG	80/6	3SF	618	618	650	500	≥ 0

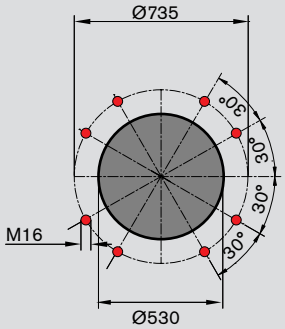
Mounting-plate drilling dimensions



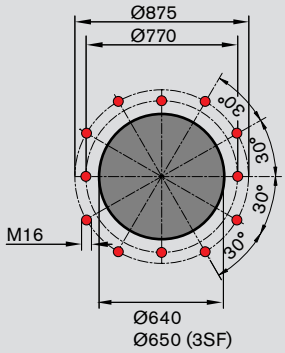
WK 40



WK 50



WK 70



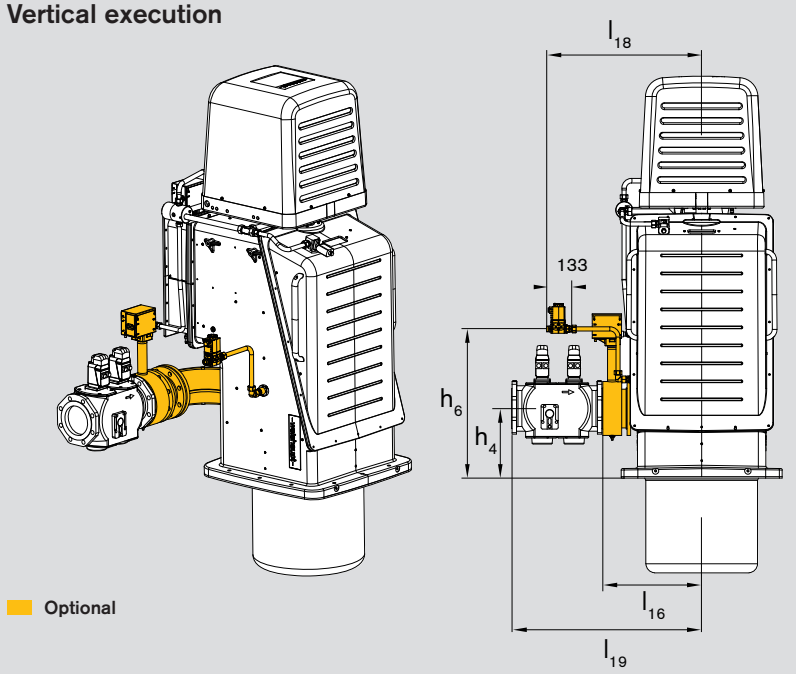
WK 80

Overview of options, installation positions, and weights

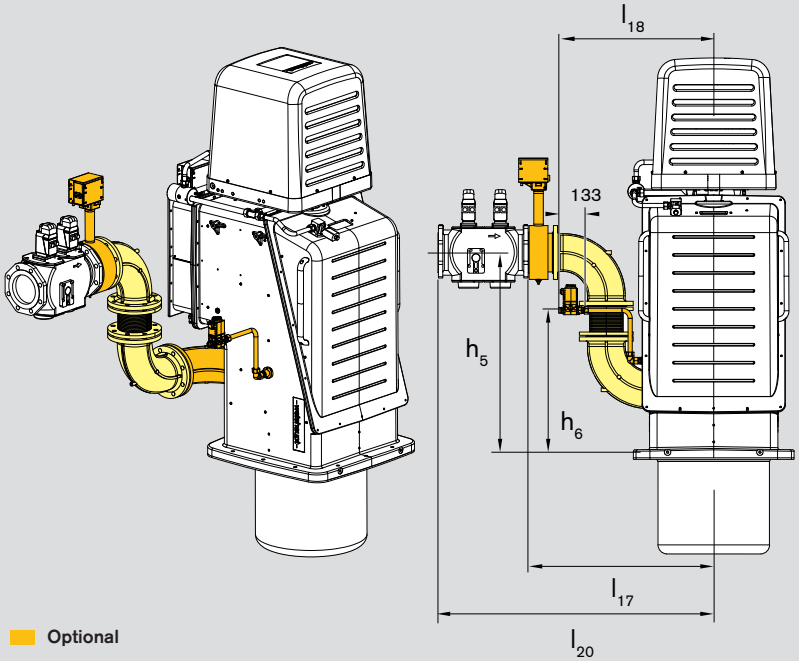
Vertically firing Weishaupt burners (based on ZMH burners) have been especially designed for use on vertical plant, such as steam boilers, thermal fluid heaters, and process applications.

Reliable operation: The safety-critical components, such as the gas butterfly valve and its actuator, gas valve assembly, and gas pressure switches, are securely located away from high-temperature zones to ensure their reliable operation. The offset position of the ignition gas valve protects it from high levels of radiant heat from the heat exchanger.

Vertical execution



Optional



Optional

Extended option (with accessory components)

Vertical-execution dimensions

	Burner flange to butterfly valve outlet DN	Gas valve assembly DN	l_{16} [1]	l_{17}	l_{18}	l_{19} [1]	l_{20}	h_4	h_5	h_6
WK.. 40	65	1 1/2”	492	686	641	841 [2]	1035 [2]	116	502	382
		2”	492	686	641	881 [2]	1075 [2]	116	502	382
		65	492	686	641	784	978	116	502	382
		80	492	686	641	991 [2]	1185 [2]	124	510	382
		100	–	686	641	–	1237 [2]	–	521	382
		125	–	686	641	–	1317 [2]	–	533	382
WK.. 50	80	2”	469	801	697	862 [2]	1192 [2]	158	594	424
		65	469	801	697	948 [2]	1280 [2]	166	601	424
		80	469	801	697	781	1113	158	594	424
		100	469	801	697	1030 [2]	1362 [2]	169	605	424
		125	469	801	697	1105 [2]	1437 [2]	182	617	424
WK.. 70	100	65	589	1001	760	1080 [2]	1492 [2]	207	723	579
		80	589	1001	760	1110 [2]	1522 [2]	199	715	579
		100	589	1001	760	941	1353	188	704	579
		125	589	1001	760	1227 [2]	1639 [2]	201	717	579
		150	589	1001	760	1320 [2]	1732 [2]	215	731	579
WK.. 80	150	100	522	976	815	1123 [2]	1577 [2]	395	1121	788
		125	522	976	815	1160 [2]	1630 [2]	382	1108	788
		150	522	976	815	1004	1458	368	1094	788

[1] Including horizontal intermediate flange (not shown) [2] Including concentric reducer (not shown)

Burner [7] (kg)

	WKG	WKL	WKMS	WKGL	WKGMS
WK.. 40	120	140 [3] / 125 [5]	165 [3,4] / 130 [5,6]	150 [3] / 135 [5]	170 [3,4] / 140 [5,6]
WK.. 50	165	160	165	165	170
WK.. 70	290	290	300	310	320
WK.. 80	440	420	430	460	470

[3] Burner-mounted oil pump [4] Burner-mounted oil preheater [5] Separate oil pump [6] Separate oil preheater
[7] Masses are approximate and exclude gas valve trains

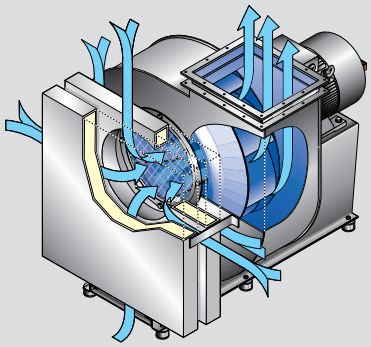
Gas valve train [8] (kg)

	1½”	2”	DN 65	DN 80	DN 100	DN 125	DN 150
WK.. 40	13	14	26	32	44	–	–
WK.. 50	–	14	30	31	46	41	–
WK.. 70	–	–	33	37	46	43	52
WK.. 80	–	–	–	–	59	54	50

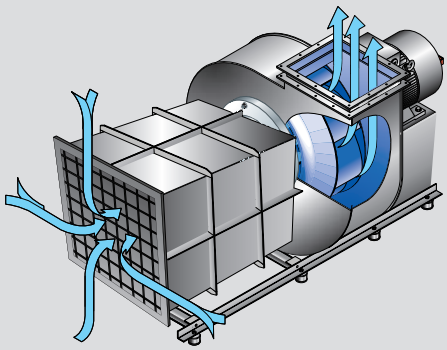
[8] Masses are approximate and encompass the double gas valve assembly (incl. gas ignition pilot, if applicable) and connecting pipework to the gas butterfly valve.

Combustion air fans:
Sound attenuation and housing arrangement

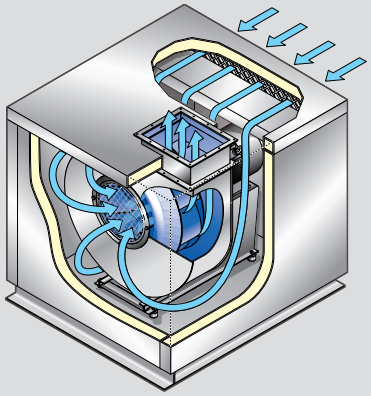
Lateral sound absorber



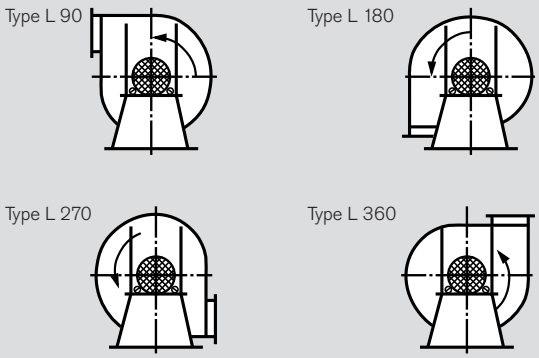
Air inlet sound absorber

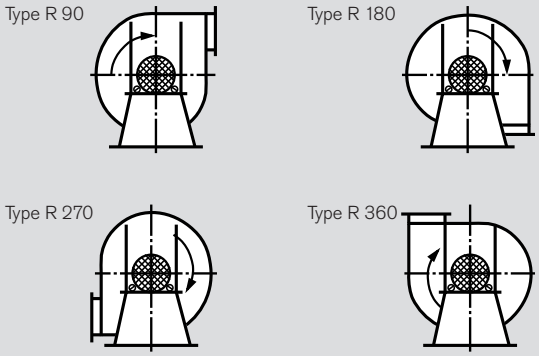


Full encapsulation



Combustion air fan housing arrangement





Air outlets at other angles are available on request.

Note:
The housing arrangement is to be considered as viewed from the drive side of the fan. Subsequent alteration of the alignment of the fan to its base is not possible, as the two parts are welded together during manufacture.

Burners rated up to 32 MW are tested on the world's largest test firing chamber in the R&D Centre

Burner sound absorber
Dimensionally accurate production for the best possible attenuation

Xi'an, central China: The seven WKG gas burners in this heating centre provide more than 50 000 residents in the Zi Wei garden district with 115 MW of heat

–weishaupt–

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Print No. 831598**02**, February 2019

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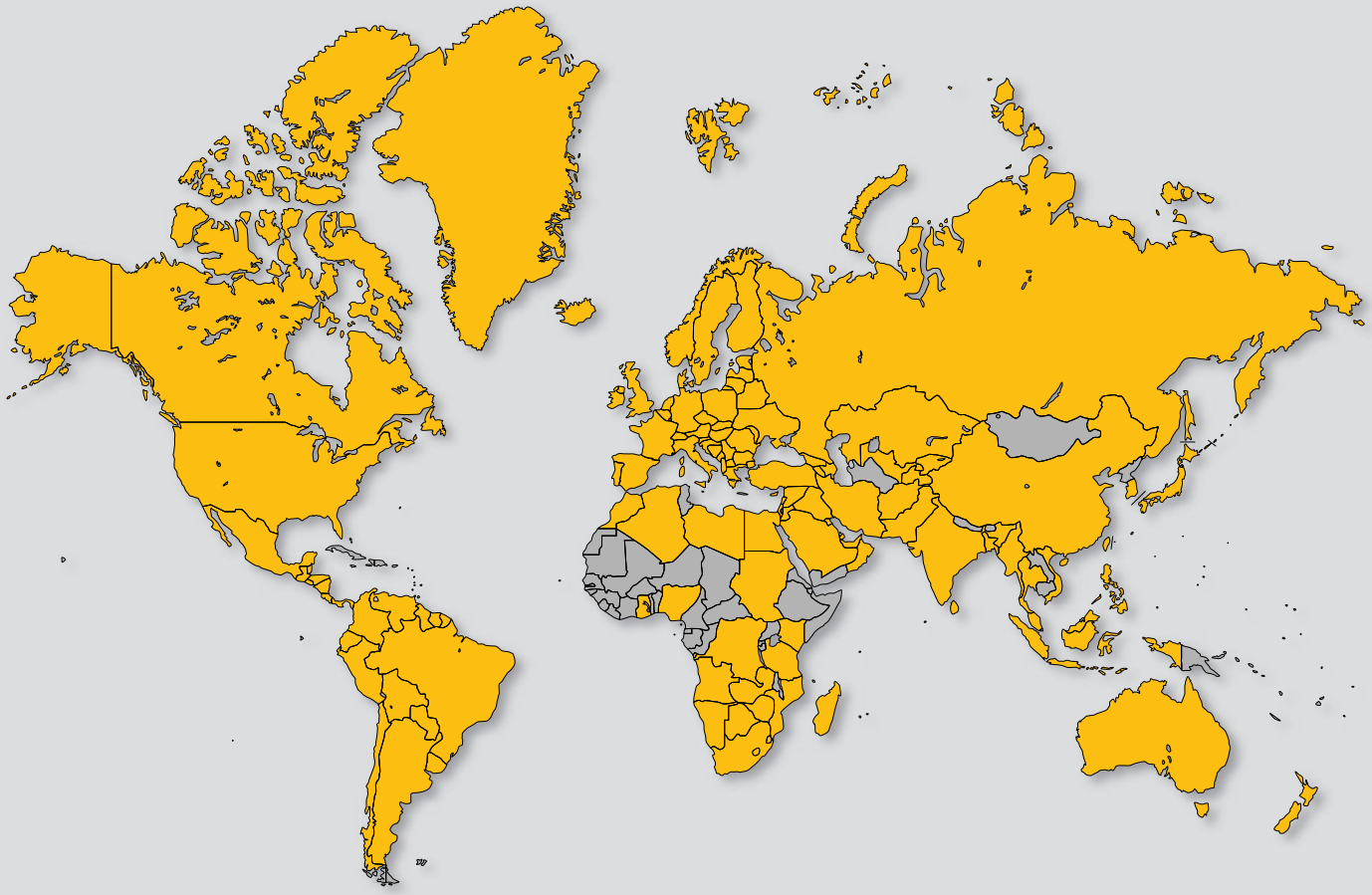

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Iran
Iraq
Ireland
Israel
Italy
Japan
Jordan
Kazakhstan
Kenya
Korea (S.)
Kuwait
Kyrgyzstan
Latvia
Lebanon
Lesotho
Libya
Liechtenstein
Lithuania
Luxembourg
Madagascar
Malaysia
Malta
Mauritius
Mexico
Moldova
Monaco
Montenegro
Morocco
Mozambique
Myanmar
Namibia
Netherlands
New Zealand
Nicaragua
Nigeria
North Macedonia
Norway
Oman
Pakistan
Panama
Paraguay
Peru
Philippines
Poland
Portugal
Qatar
Romania
Russia
San Marino
Saudi Arabia
Serbia
Singapore
Slovakia
Slovenia
South Africa
Spain
Sri Lanka
Sudan
Suriname
Sweden
Switzerland
Syria
Taiwan
Tajikistan
Tanzania
Thailand
Turkey
UAE
Ukraine
United Kingdom
Uruguay
USA
Uzbekistan
Vatican City
Venezuela
Vietnam
Zambia
Zimbabwe