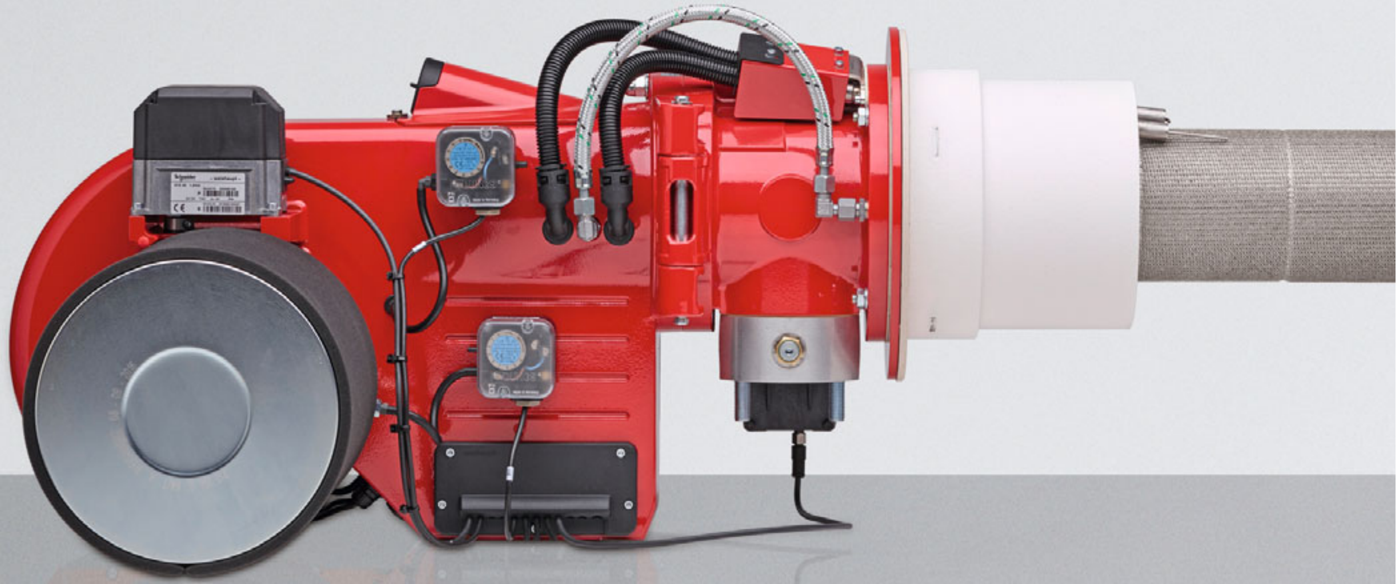
–weishaupt–

product

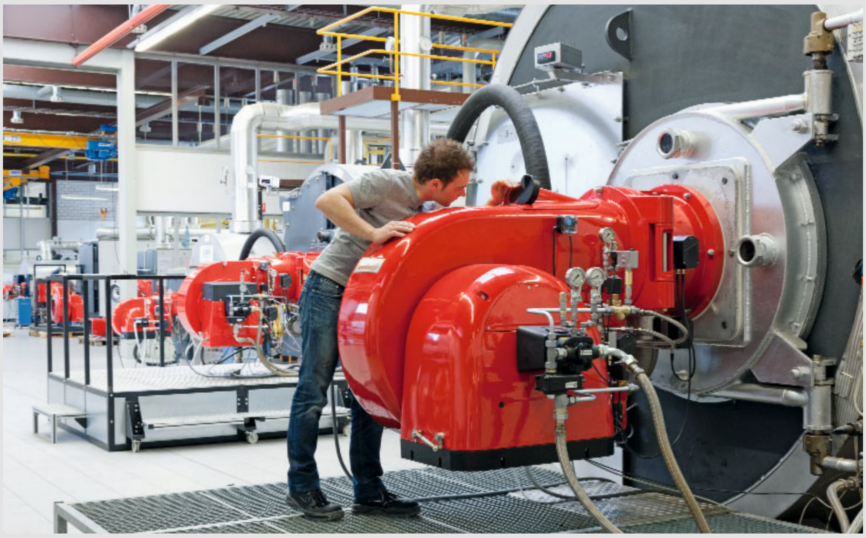
Information on Ultra-Low-NO_x gas burners



NO_x emissions < 30 mg/kWh

WM-G10 ZM-PLN and WM-G20 ZM-PLN monarch® burners (85–3000 kW)

A new class of emissions: Ultra-Low NO_x



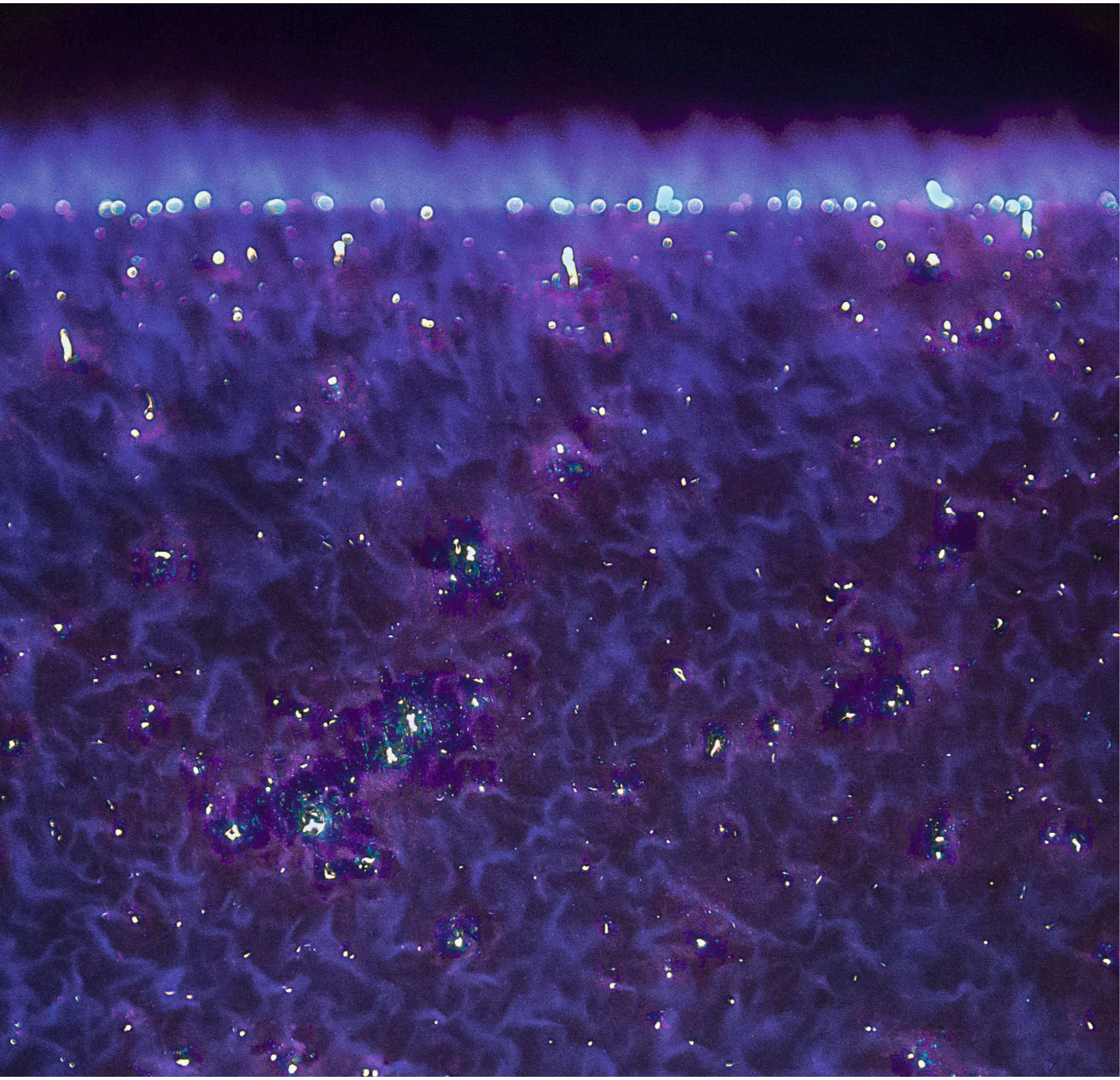
Test-firing chambers for medium and large-sized burners at the Weishaupt Research & Development Centre

For more than six decades, Weishaupt's monarch® series burners have been used on a wide variety of heat generators and industrial plant, and their success has helped underpin Weishaupt's outstanding reputation.

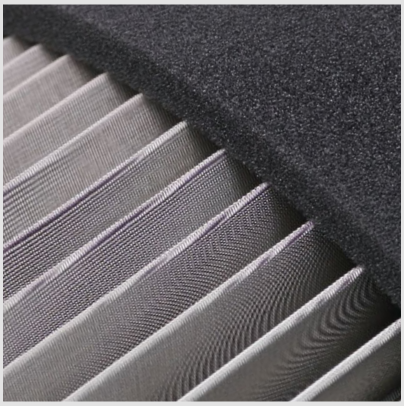
Their PLN-version burners stand ready for use in situations where the very lowest of emission levels are being demanded. PLN stands for Premix Low NO_x – a system that combines premixing with surface-stabilised combustion.

A further advantage of this type of combustion system is that it can be used on appliances with particularly small combustion chambers, as well as with more typical boilers.

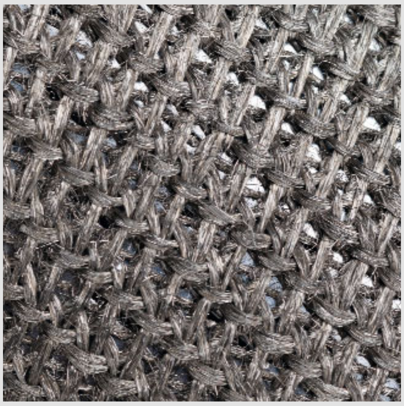
Homogeneous, surface-stabilised combustion



Weishaupt premix technology for extremely low NO_x emission limits



The metal gauze air filter is protected from dust by an additional pre-filter sleeve



A microweave mat made from a high-quality alloy permits the right amount of gas / air mix to pass

Weishaupt PLN-version burners can also be used in very small combustion chambers

Everywhere in the world, emission limits are becoming ever tighter, with a focus on NO_x emissions in particular. Weishaupt has therefore developed a new generation of burners designed to fulfil these demands.

Weishaupt burners have always been particularly efficient and environmentally friendly. Premix engineering is used to achieve NO_x emissions below 30 mg/kWh.

Premixing followed by surface-stabilised combustion has been state of the art for many years in small condensing boilers. It is environmentally friendly, reliable, and efficient. Extending these benefits to typical heat generators with larger outputs was the developmental goal for the PLN-version burners.

Special gas / air mix

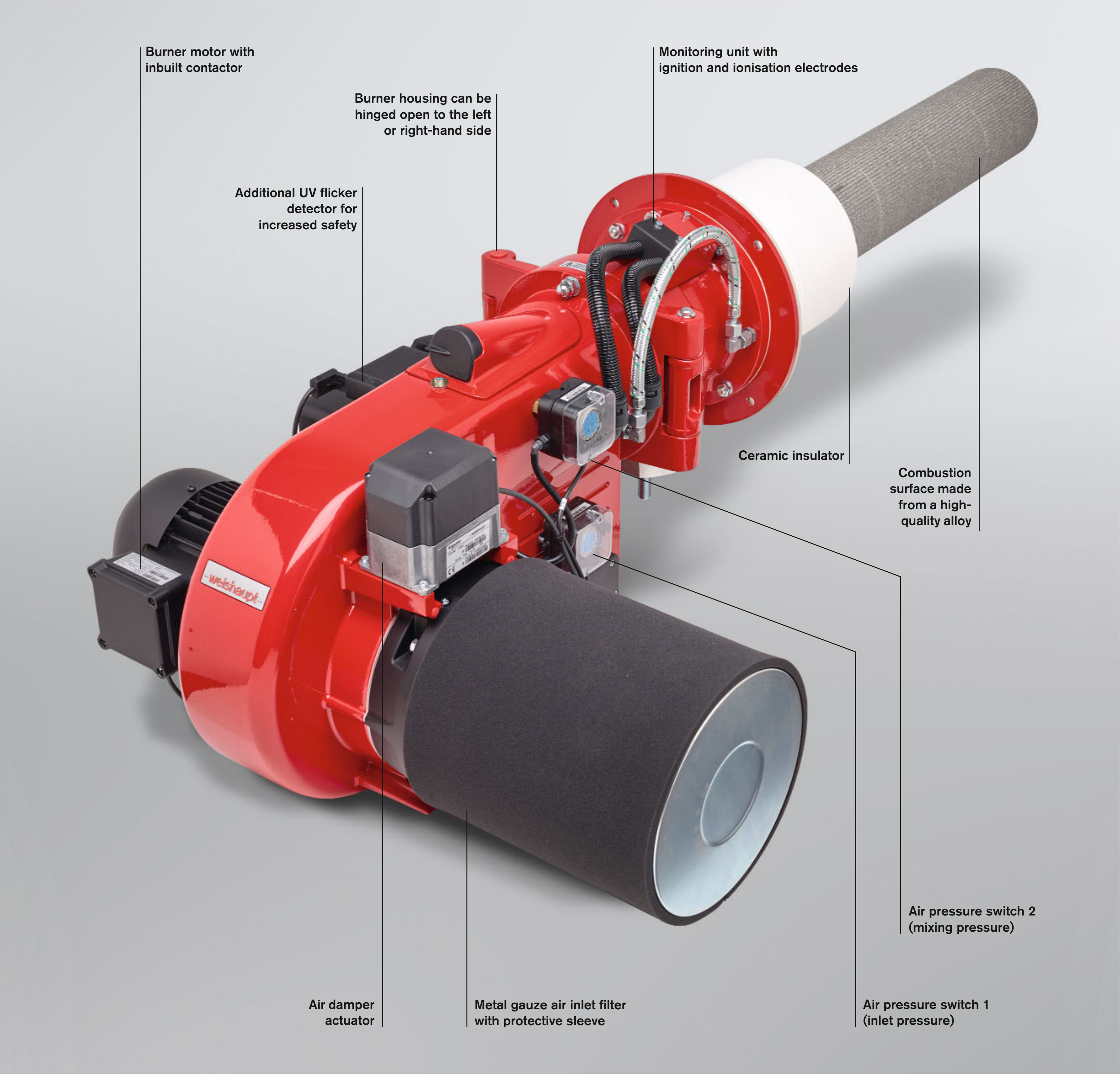
Stabilised surface combustion relies on an homogeneous gas / air mixture. For that reason, a completely new mixing assembly was developed for the PLN-version burners. A key feature is the separated gas and air feeds, with the two media not being brought together before the burner tube. There, a uniform mix is produced from the gas flowing out through the distributor and the combustion air that has been set in rotation by the swirl plate.

Stabilised surface combustion

The gas / air mix, which is under pressure, permeates the microweave alloy mat and combusts at its surface. The flame carpet thereby created has flame temperatures below 1200 °C and so the formation of thermal NO_x is inhibited. NO_x emission levels below 30 mg/kWh are now also a reality for medium-capacity burners.

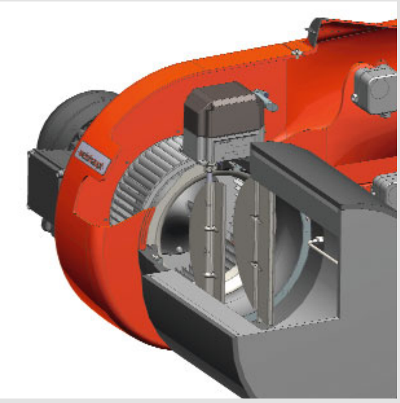
One substantial benefit of this technology is to be found in the combustion chamber requirements. These can be considerably smaller than those found in typical boilers.

Weishaupt's PLN-version premix burners also have similar turndowns to their forced-draught stablemates. The electronic compound regulation provided by the W-FM 50, W-FM 100 and W-FM 200 combustion managers can achieve turndown ratios of 7:1 with these burners.

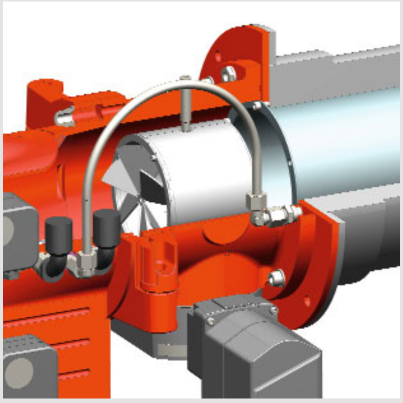


Burner motor with
inbuilt contactor
Monitoring unit with
ignition and ionisation electrodes
Burner housing can be
hinged open to the left
or right-hand side
Additional UV flicker
detector for
increased safety
Ceramic insulator
Combustion
surface made
from a high-
quality alloy
Air pressure switch 2
(mixing pressure)
Air damper
actuator
Metal gauze air inlet filter
with protective sleeve
Air pressure switch 1
(inlet pressure)

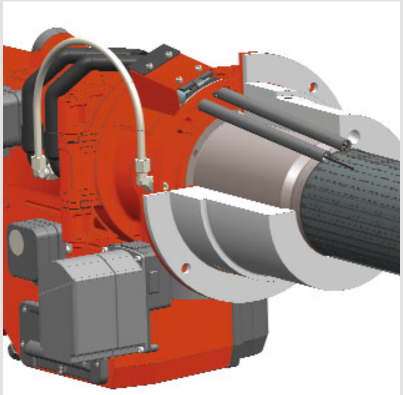
Simple and safe from installation to operation



The air damper control has been designed to be particularly aerodynamic



The special mixing of gas and air is conducive to reliable ignition behaviour



A ceramic insulator provides optimal heat shielding to the mixing assembly and electrode unit

Ignition and monitoring
The ignition electrode and the ionisation electrode are brought together as a monitoring unit. The electrodes are fed through the ceramic insulator to protect them from the heat and are also air cooled.

Optimal safety and reliability
The PLN-version burners are especially equipped with two monitoring systems. An ionisation electrode monitors the combustion surface, while an infra-red flicker detector secures the premix chamber and the burner tube.

Uninterrupted monitoring
The air volume, and thus the cleanliness of the air filter, is continuously monitored during burner operation by an additional air pressure switch. The necessary air volume is thereby always guaranteed.

Clean combustion air
The combustion surface's alloy microweave mat is only able to distribute the gas / air mixture evenly if its pores are not blocked by particles. Weishaupt therefore employs a special metal gauze air filter. An additional pre-filter sleeve is used to keep larger dust particles at bay. This sleeve can be washed or replaced as required.

Simple installation / easy servicing
During installation, the burner flange is mounted on the heat exchanger first, before the combustion surface is inserted. Likewise, with the burner hinged open, it is possible to replace the combustion surface without completely dismounting the burner from the heat exchanger.

The burner is installed in five easy steps:

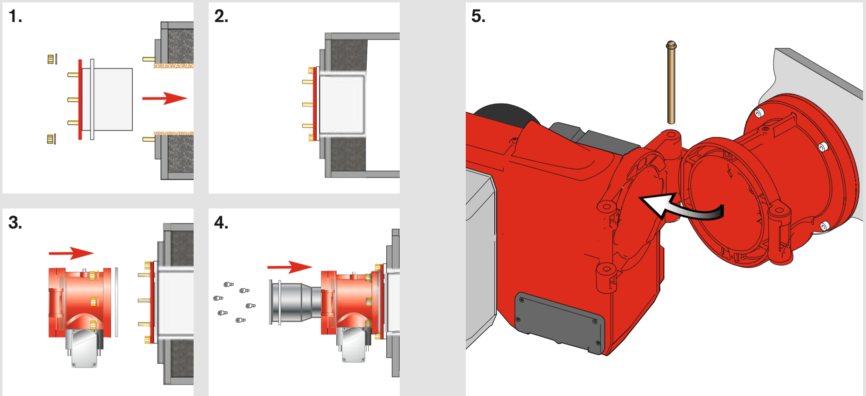
1. Installation of the ceramic insulator.

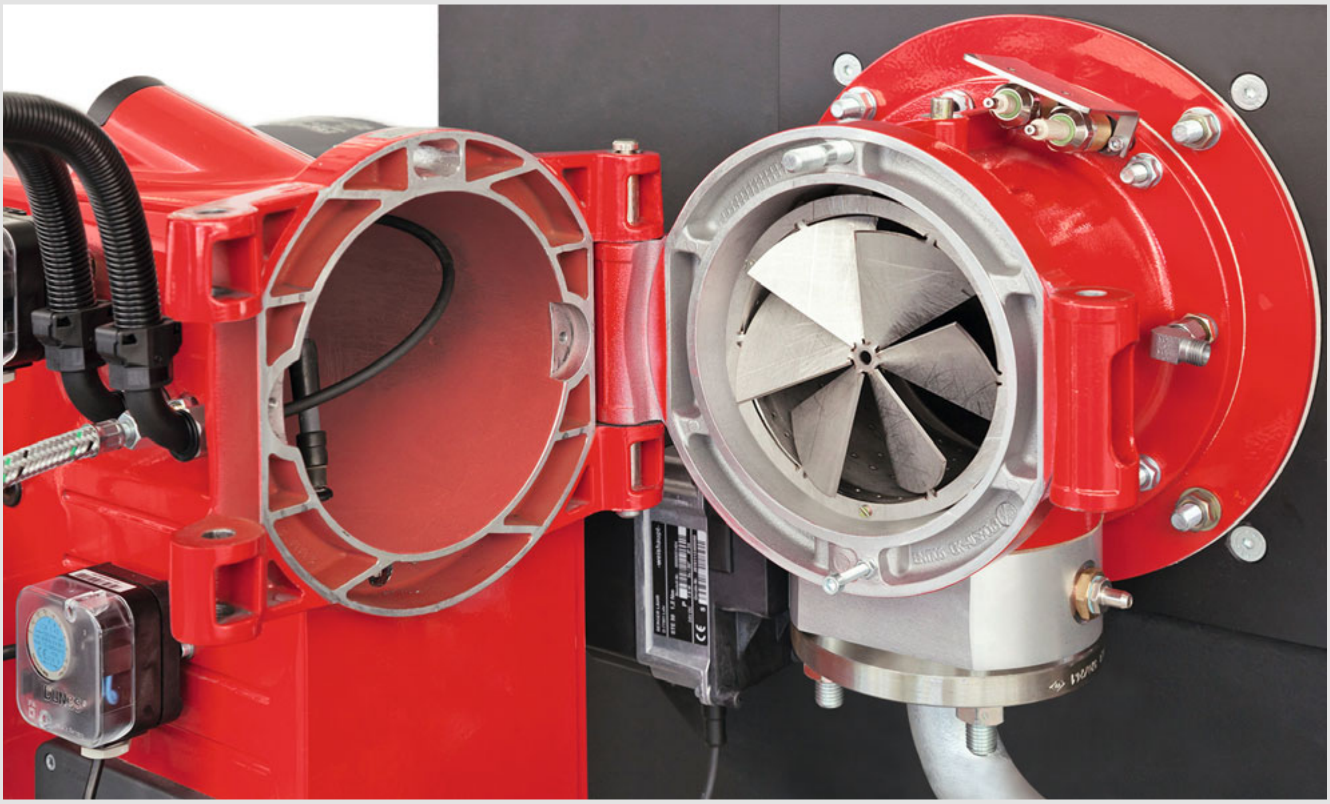
2. Checking of the insertion depth and insulation of the aperture between the burner and the refractory

3. Mounting of the hinged flange.

4. Insertion of the combustion surface (optional installation aid available)

5. Attachment of the burner to the hinged flange.





The burner hinges a full 90°, enabling the combustion surface to be withdrawn through the mounted burner flange

Specification, control, and model designation

Fuels
Natural gas
LPG

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

Applications
Weishaupt PLN-version burners are suitable for intermittent firing and continuous firing on:
- EN 303-compliant heat generators
- LTHW boilers
- HTHW boilers < 130 °C
- Steam boilers [1]
- Air heaters < 100 °C
- Thermal fluid heaters [1]
- Certain process applications [1]

Permissible ambient conditions
- Ambient temperature -15 to + 40 °C
- 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. Service intervals will be reduced in accordance with the more extreme operational conditions.

International Protection rating
IP 54 per EN 60529.

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,

GAD Gas Appliance Directive
2009/142/EC
Applied standards:
- EN 676 : 2008

PED[2] Pressure Equipment Directive
2014/68/EU
Applied standards:
- EN 267 Annex K,
- EN 676 Annex K,
- Conformity assessment procedure: Module B

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

Control
Weishaupt PLN-version burners are suitable for gas firing, and for sliding-two-stage or modulating operation, depending on the method of load control employed.

The output of a modulating burner is matched – within its operating range – to current heat demand. That makes the burner suitable for a wide range of applications.

Installation position
The burner is suitable for horizontal and vertical mounting on the heat generator. The manufacturer's instructions should be observed.

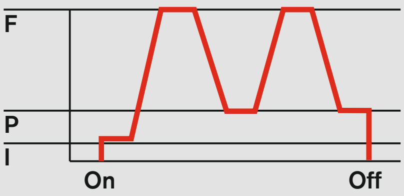
1) Please enquire.
2) With the appropriate choice of equipment.

Gas-fired operation

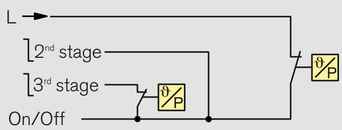
Sliding-two-stage control

- 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-free between load points

Sliding-two-stage



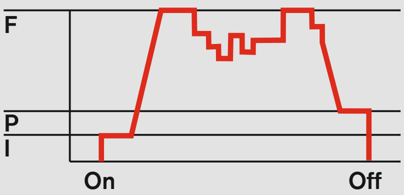
Control [1)]

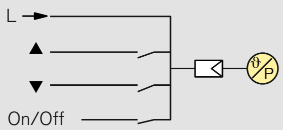


Modulating control

- An electronic load controller causes actuators to make infinitely variable load adjustments in response to heat demand.
- Available modulation control options:
  - W-FM 50 with an optional separate load controller
  - 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.

Modulating





F = Full load (nominal load),
P = Partial load (minimum load)
I = Ignition load

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

Model designation

WM -G 10 / 3 -A ZM-PLN

- PLN: Premix Low NO_x
- ZM = Sliding-two-stage / modulating
- A: Mark
- 3: Capacity
- 10: Size
- G = Gas
- WM: Weishaupt monarch® burner series

Digital combustion management: Efficient and reliable

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

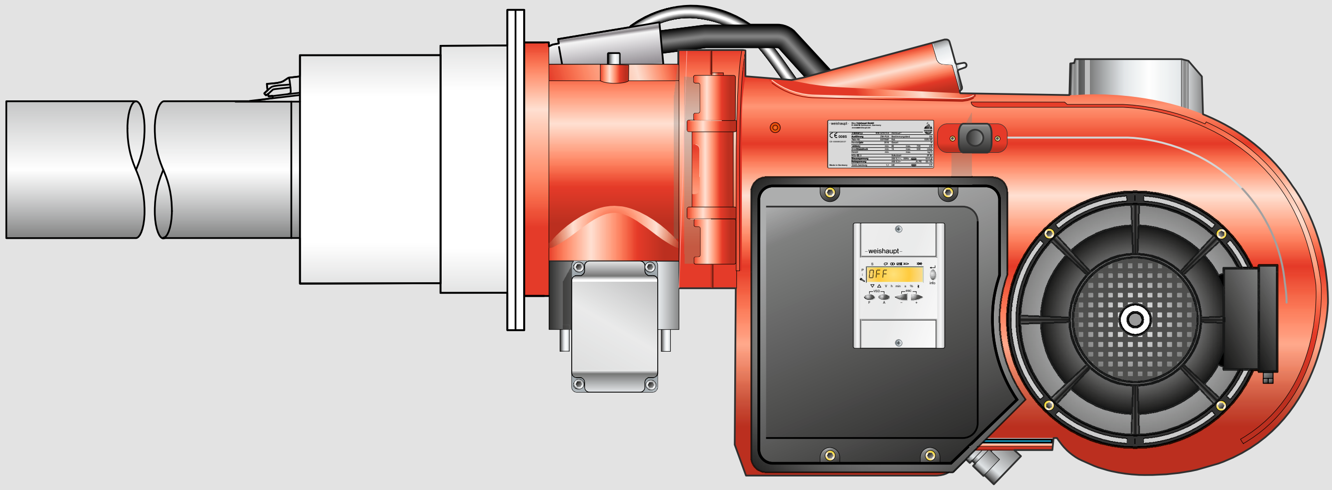
Weishaupt PLN-version gas burners are equipped as standard with electronic compound regulation and digital combustion management. The latest combustion technologies demand a precise and continually reproducible dosing of fuel and combustion air. This optimises combustion efficiency and saves fuel.

Simple operation
Setting and control of the burner is achieved using the 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, depending on the type of combustion manager employed, either a language-neutral display or a clear text display with a choice of languages. An English / Chinese dual-screen version is available as an option with the latter should a Chinese-character display be desired.

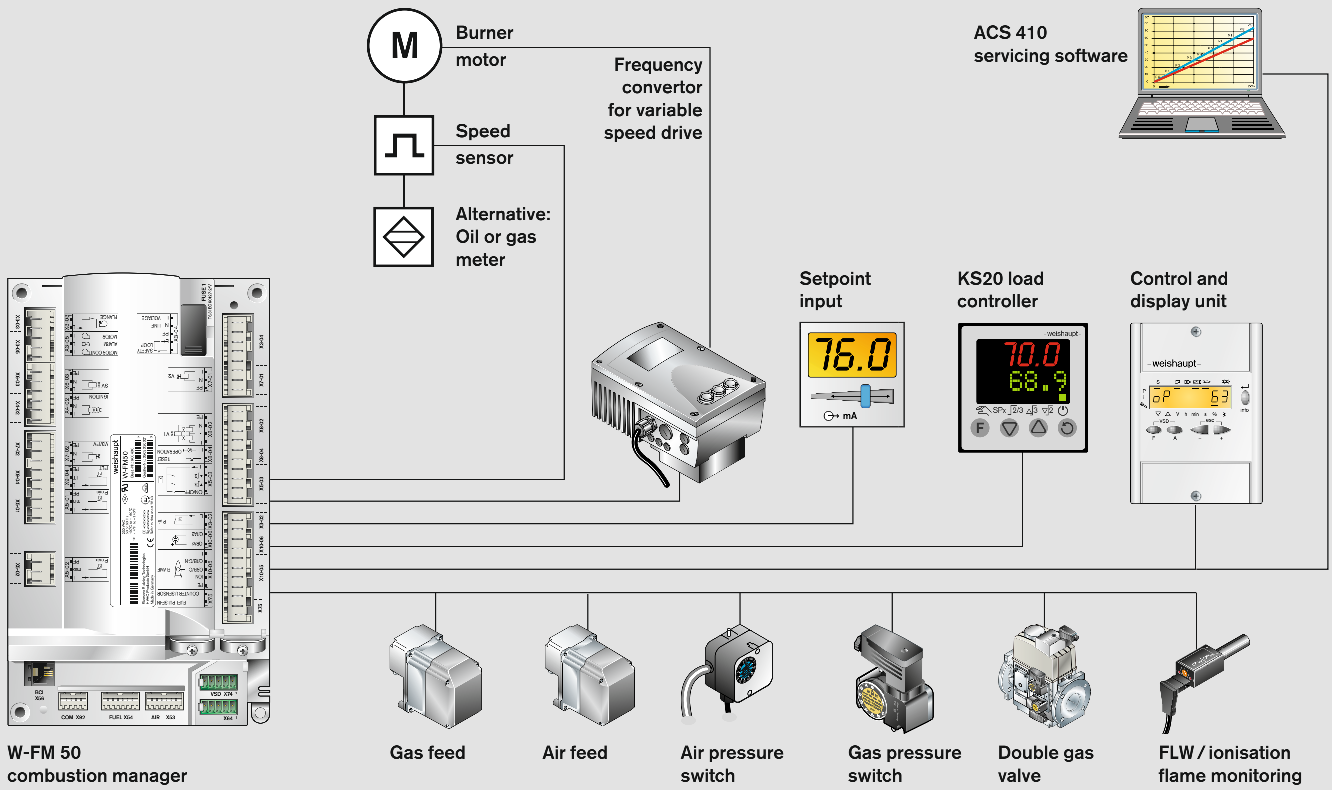
Variable speed drive reduces electrical consumption and facilitates a soft start of the combustion air fan. The use of VSD will also reduce noise emissions by a considerable amount.

Features – digital combustion management	W-FM 50	W-FM 100	W-FM 200
Single-fuel operation	●	●	●
Dual-fuel operation	–	●	●
Intermittent firing	●	●	●
Continuous firing >24 h	●	●	●
Variable speed drive	●	–	●
O_2 trim	–	–	●
CO monitoring	–	–	○
Combined O_2/CO control	–	–	○
ION/LFW flame sensor for continuous firing	●	●	●
Maximum number of actuators	2	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	–	○	●
0/2–10 V and 0/4–20 mA setpoint input for temperature / pressure	–	○	●
Configurable 0/4–20 mA analogue output	–	○	●
Language-neutral ABE control unit	●	–	–
ABE control unit with 20 available languages (any one ABE limited to 6)	–	●	●
Dual-language / script ABE control unit (Chinese / English)	–	○	○
Removable ABE control unit (max. length of connecting line)	20 m	100 m	100 m
Fuel consumption meter (switchable)	● [1)]	–	●
Combustion efficiency display	–	–	●
eBUS / Modbus RTU interface	●	●	●
PC-supported commissioning	●	●	●

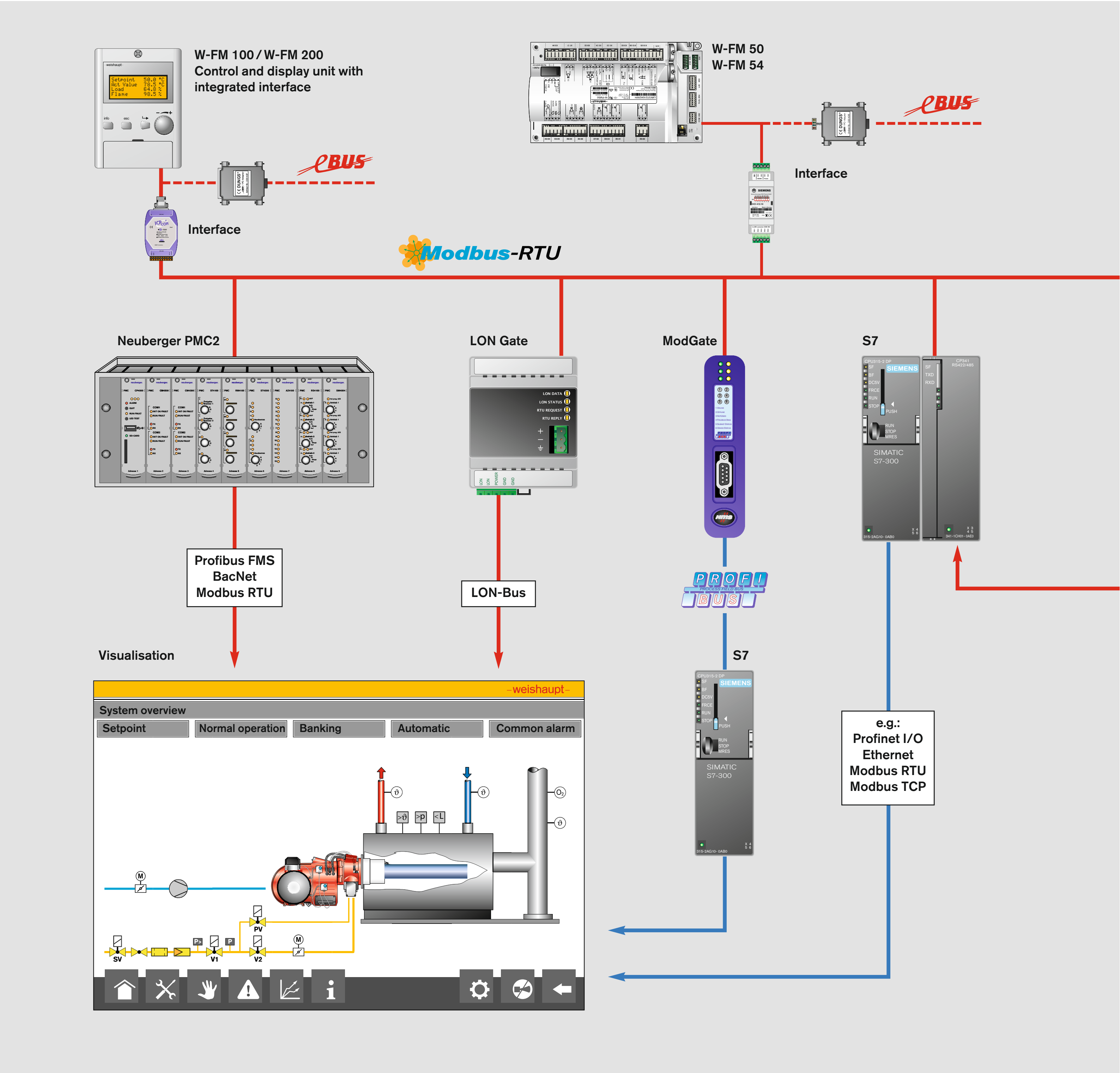
● Standard ○ Optional [1)] Not in conjunction with VSD

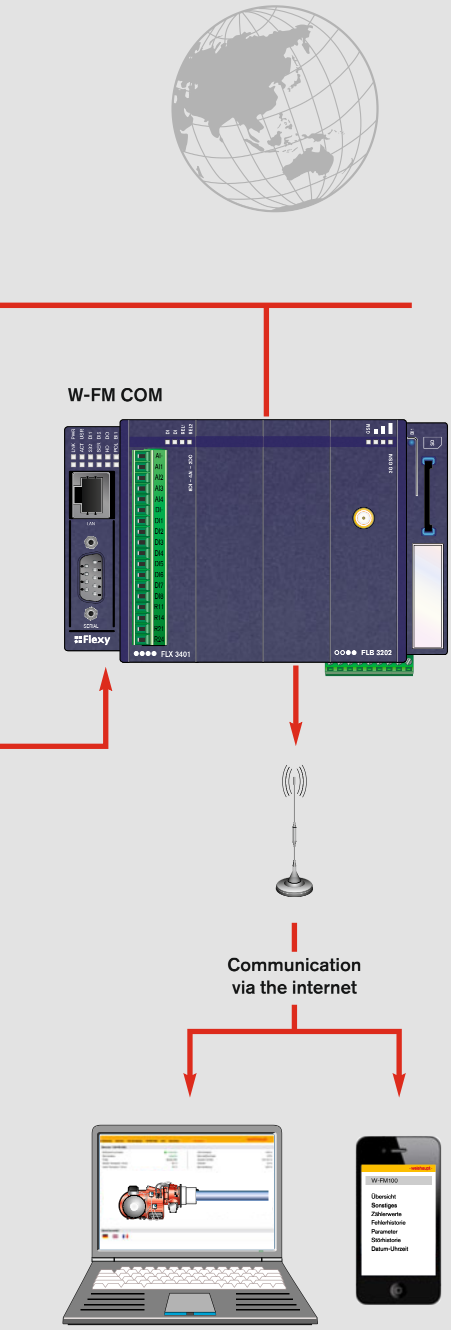


Burner with digital
combustion management



Flexible communications:
Compatible with building management systems





Remote monitoring made easy via tablet or laptop

The digital combustion manager is the basis of communications with other superordinate systems. This is generally achieved using the eBus or Modbus protocols.

All the usual burner and boiler functions can be monitored and controlled through a direct connection with a building management system.

A graphical HMI is available as an option to provide a user-friendly overview of the boiler. The touchscreen display allows numerous functions to be adjusted and monitored, such as system parameters and setpoints of individual and multi-boiler plant and ancilliary equipment.

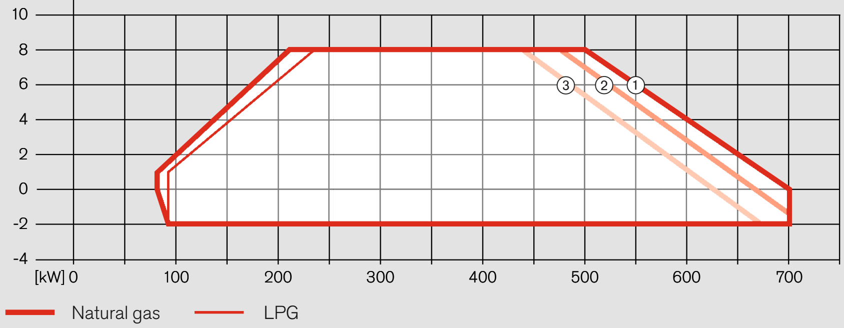
The controls specialists, Neuberger, who are a part of the Weishaupt Group, are able to design and implement complex control solutions.

Further optional components enable connections to be made to systems using commonplace industrial standards, such as Profibus-DP, LON-Bus, and Modbus RTU, and network protocols such as Profinet I/O, Modbus TCP, BacNet, etc.

A recent addition to Weishaupt's portfolio is the W-FM COM communications module. It transmits data securely over the internet so that it can be called up and displayed in a browser window on a computer, tablet, or smartphone, facilitating accurate service planning for example. Even away from the internet you can be kept up to date with the operation of the burner: In the event of a safety shutdown or other predefined trigger, an SMS text message is sent automatically.

Burner selection / gas valve train sizing WM-G10, version ZM-PLN

[mbar]		
Burner type	**WM-G10/2-A ZM-PLN**	
Combustion head	WM10/2- PLN	
Capacity range	Natural gas	85–700 kW
	LPG	95–700 kW



WM-G10/2-A, version ZM-PLN

Burner rating [kW]	Low-pressure supply $P_i \leq 300$ mbar Min. flow pressure before the gas ball valve **Nominal valve train diameter** **¾"**	**1"**	**1½"**	**2"**	**65**	High-pressure supply P_o = 140 / 100 / 50 mbar Min. flow pressure before the FRS governor **Nominal valve train diameter** **¾"**	**1"**	**1½"**	P_r Setting pressure at the FRS governor **Nominal valve train diameter** **¾"**	**1"**	**1½"**	**2"**	**65**
Natural gas E LHV = 10.35 kWh/m³; d = 0.606													
300	33	–	–	–	–	36	25	21	11	–	–	–	–
350	42	21	–	–	–	43	27	22	14	8	–	–	–
400	52	25	–	–	–	50	30	24	18	9	–	–	–
450	64	30	16	–	–	59	33	25	22	10	8	–	–
500	78	36	19	–	–	69	37	28	26	12	10	–	–
550	93	43	22	15	–	81	42	31	32	15	13	9	–
600	110	50	26	17	15	94	47	34	39	18	15	10	10
700	149	66	33	22	19	122	59	41	53	25	21	14	13
Natural gas LL LHV = 8.83 kWh/m³; d = 0.641													
300	44	22	–	–	–	44	27	22	15	7	–	–	–
350	57	27	15	–	–	54	31	24	19	9	8	–	–
400	72	33	18	–	–	65	35	26	24	11	9	–	–
450	89	40	20	–	–	78	40	29	30	13	11	–	–
500	109	48	24	–	–	92	45	32	37	16	13	–	–
550	131	57	28	17	–	109	52	36	45	20	16	10	–
600	155	68	32	20	17	127	59	40	53	24	19	12	11
700	210	90	42	25	21	–	75	49	72	32	26	17	15
LPG* LHV = 25.89 kWh/m³; d = 1.555													
300	18	–				26	21		7	–			
350	22	–				28	22		8	–			
400	26	–				31	23		9	–			
450	31	–				35	24		11	–			
500	37	20				39	26		13	7			
550	44	23				44	28		16	9			
600	51	26				50	31		19	11			
700	68	34				63	37		26	14			

The LHV is referenced to 0 °C and 1013 mbar atmospheric pressure. All pressures are in mbar.
* The LPG charts are based on propane, but may also be used for butane.

Determining load point dependent on excess air
(See example on page 19)

	NO_x [mg/kWh] N. Gas	LPG	Setting O_2	λ	P_F factor [1)]
①	80	150	5 %	1.28	1.24
②	30	60	7 %	1.46	1.61
③	20	–	8 %	1.56	1.84

[1)] The correction factor is based on the combustion chamber resistance (P_F) at 3 % O_2.

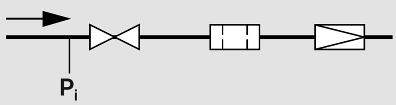
NO_x reference conditions:

Air temperature	= 20 °C
Air humidity	= 10 g/kg
LHV, natural gas E	= 10.35 kWh/m³
LHV, propane	= 25.89 kWh/m³

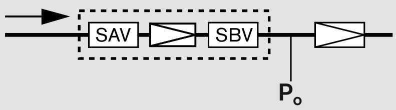
LHV referenced to 0 °C and 1013 mbar atmospheric

- Measurement at every load point
- No averaging
- No measurement uncertainty/tolerance
- Three-pass combustion chamber

Low-pressure supply

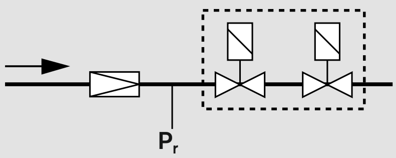


High-pressure supply



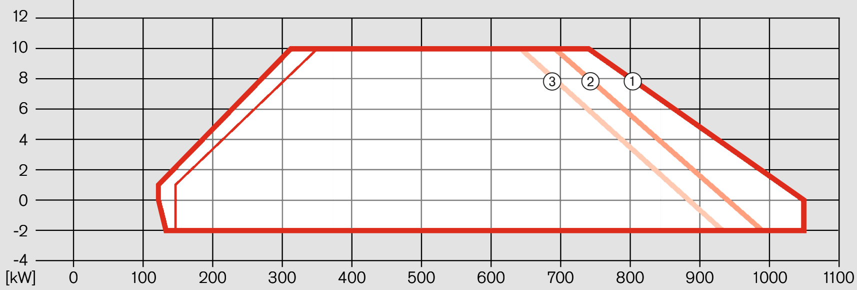
The high-pressure regulator should have a spring selected that enables the available outlet pressure (P_o = 140 / 100 / 50 mbar) to be adjusted.

Setting pressure at the FRS governor



[mbar]

Burner type	**WM-G10/3-A ZM-PLN**	
Combustion head	WM-G10/3+4 PLN	
Capacity range	Natural gas	130–1050 kW
	LPG	150–1050 kW



Natural gas — LPG

WM-G10/3-A, version ZM-PLN

Burner rating [kW]	**Low-pressure supply** $P_i \leq 300$ mbar Min. flow pressure before the gas ball valve **Nominal valve train diameter** ¾”	1”	1½”	2”	65	80	**High-pressure supply** P_o = 140 / 100 / 50 mbar Min. flow pressure before the FRS governor **Nominal valve train diameter** ¾”	1”	1½”	P_r Setting pressure at the FRS governor **Nominal valve train diameter** ¾”	1”	1½”	2”	65	80
Natural gas E LHV = 10.35 kWh/m³; d = 0.606															
500	76	34	17	–	–	–	68	35	26	25	11	9	–	–	–
550	91	40	20	–	–	–	79	40	28	30	13	10	–	–	–
600	107	47	23	–	–	–	91	44	31	35	15	12	–	–	–
650	125	54	26	16	–	–	104	49	33	42	18	14	8	–	–
700	145	62	29	18	–	–	119	55	37	49	21	17	10	–	–
800	188	81	38	22	18	17	–	68	44	64	28	22	14	12	12
900	237	101	46	27	22	20	–	83	52	81	35	28	18	16	15
1000	291	123	56	32	26	24	–	98	61	100	43	34	22	19	18
1050	–	135	61	35	28	26	–	107	65	–	47	38	24	21	20
Natural gas LL LHV = 8.83 kWh/m³; d = 0.641															
500	107	46	21	–	–	–	90	43	29	34	14	11	–	–	–
550	128	55	25	–	–	–	106	49	33	42	17	13	–	–	–
600	152	64	29	17	–	–	123	56	36	50	20	16	9	–	–
650	178	75	33	19	–	–	–	63	40	59	24	18	11	–	–
700	206	86	39	22	17	16	–	72	45	68	28	22	13	11	10
800	268	112	50	27	22	20	–	90	55	90	37	29	17	15	14
900	–	141	61	33	26	24	–	110	65	–	47	37	22	19	18
1000	–	172	74	40	31	28	–	131	77	–	58	45	26	23	21
1050	–	189	81	43	33	30	–	–	83	–	63	50	29	25	23
LPG* LHV = 25.89 kWh/m³; d = 1.555															
500	36	–	–				39	25	22	13	–	–			
550	42	–	–				43	27	22	14	–	–			
600	48	–	–				48	29	23	16	–	–			
650	55	26	–				53	30	24	19	9	–			
700	64	30	17				59	33	26	22	10	9			
800	83	39	21				73	39	30	29	14	12			
900	104	48	25				89	46	34	37	18	15			
1000	127	58	30				107	54	38	46	22	19			
1050	139	63	33				116	57	40	50	25	21			

The LHV is referenced to 0 °C and 1013 mbar atmospheric pressure. All pressures are in mbar.
* The LPG charts are based on propane, but may also be used for butane.

Capacity graphs for gas burners certified in accordance with EN 676.

Stated ratings are based on an air temperature of 20 °C and an installation at sea level. For installations at higher altitudes, a reduction in capacity of 1 % per 100 m above sea level should be taken into account.

Stated flow pressures are based on a combustion chamber resistance of 0 mbar. The combustion chamber pressure of the heat generator must be added to the figure determined from the above chart when sizing the gas valve train.

For low-pressure supplies, EN 88-compliant governors with safety diaphragms are used.

For high-pressure supplies, an EN 334-compliant high-pressure regulator should be selected from the following technical booklets:
- Regulators up to 4 bar, Print No. 83001202
- Regulators with safety devices, Print No. 83197902

Refer to the burner's rating plate for the maximum connection pressure.

Maximum Operating Pressure (MOP)
The supplier must safeguard the gas flow pressure such that it cannot exceed the MOP of the burner's gas valve train.

Rating of low-pressure gas valve trains (LP)
Normally, low-pressure valve trains 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.

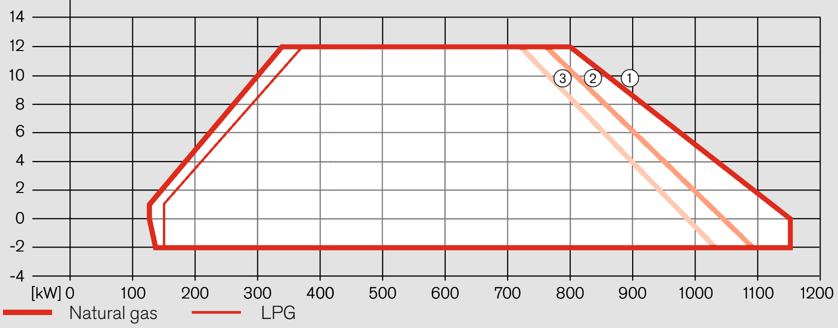
Rating of high-pressure gas valve trains (LP)
Normally, high-pressure valve trains are used for gas flow pressures above 300 mbar.

Double gas valve assemblies

Screwed	
R ¾	W-MF507
R 1	W-MF512
R 1½	W-MF512
R 2	DMV525/12
Flanged	
DN 65	DMV5065/12
DN 80	DMV5080/12
DN 100	DMV5100/12

Burner selection / gas valve train sizing WM-G10, version ZM-PLN

[mbar]	Burner type	WM-G10/4-A ZM-PLN	
	Combustion head	WM-G10/3+4 PLN	
	Capacity range	Natural gas	130–1150 kW
		LPG	150–1150 kW



WM-G10/4-A, version ZM-PLN

Burner rating [kW]	Low-pressure supply $P_i \leq 300$ mbar Min. flow pressure before the gas ball valve **Nominal valve train diameter** **1”**	**1½”**	**2”**	**65**	**80**	**100**	High-pressure supply $P_o = 140/100/50$ mbar Min. flow pressure before the FRS governor **Nominal valve train diameter** **1”**	**1½”**	P_r Setting pressure at the FRS governor **Nominal valve train diameter** **1”**	**1½”**	**2”**	**65**	**80**	**100**
Natural gas E LHV = 10.35 kWh/m³; d = 0.606														
500	34	17	–	–	–	–	35	26	11	9	–	–	–	–
550	40	20	–	–	–	–	40	28	13	10	–	–	–	–
600	47	23	–	–	–	–	44	31	15	12	–	–	–	–
650	54	26	16	–	–	–	49	34	18	14	9	–	–	–
700	62	29	18	–	–	–	55	37	21	17	10	–	–	–
800	81	38	23	19	17	16	68	44	28	22	14	12	12	12
900	101	47	28	23	21	20	83	53	36	29	18	16	15	15
1000	124	57	33	27	24	23	99	61	44	35	22	19	19	18
1100	148	67	38	31	28	27	116	71	52	42	26	23	22	21
Natural gas LL LHV = 8.83 kWh/m³; d = 0.641														
500	46	21	–	–	–	–	43	29	14	11	–	–	–	–
550	54	25	–	–	–	–	49	33	17	13	–	–	–	–
600	64	29	16	–	–	–	56	36	20	15	9	–	–	–
650	74	33	18	–	–	–	63	40	23	18	10	–	–	–
700	85	37	20	16	–	–	70	43	27	21	11	9	–	–
800	111	48	26	21	18	17	88	53	36	28	16	14	13	12
900	140	61	33	25	23	21	109	64	46	36	21	18	17	16
1000	172	74	39	30	27	25	131	76	57	45	26	22	21	20
1100	206	88	46	36	31	29	–	89	69	54	31	26	25	24
LPG* LHV = 25.89 kWh/m³; d = 1.555														
500	19	–					25	22	7	–				
550	21	–					27	22	7	–				
600	24	–					29	23	8	–				
650	27	15					31	24	9	8				
700	29	16					32	24	9	8				
800	37	20					38	28	13	11				
900	47	24					45	33	17	14				
1000	57	29					53	37	21	18				
1100	68	34					60	42	26	21				

The LHV is referenced to 0 °C and 1013 mbar atmospheric pressure. All pressures are in mbar.
* The LPG charts are based on propane, but may also be used for butane.

Determining load point dependent on excess air
(See example on page 19)

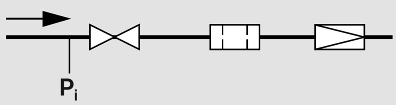
	NO_x [mg/kWh] N. Gas	LPG	Setting O_2	λ	P_F factor [1]
①	80	150	5 %	1.28	1.24
②	30	60	7 %	1.46	1.61
③	20	–	8 %	1.56	1.84

[1] The correction factor is based on the combustion chamber resistance (P_F) at 3 % O_2.

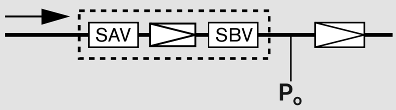
NO_x reference conditions:
Air temperature = 20 °C
Air humidity = 10 g/kg
LHV, natural gas E = 10.35 kWh/m³
LHV, propane = 25.89 kWh/m³
LHV referenced to 0 °C and 1013 mbar atmospheric

- Measurement at every load point
- No averaging
- No measurement uncertainty/tolerance
- Three-pass combustion chamber

Low-pressure supply

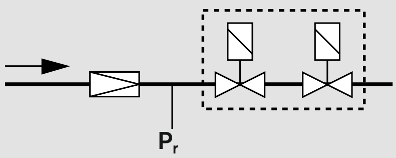


High-pressure supply



The high-pressure regulator should have a spring selected that enables the available outlet pressure (P_o = 140 / 100 / 50 mbar) to be adjusted.

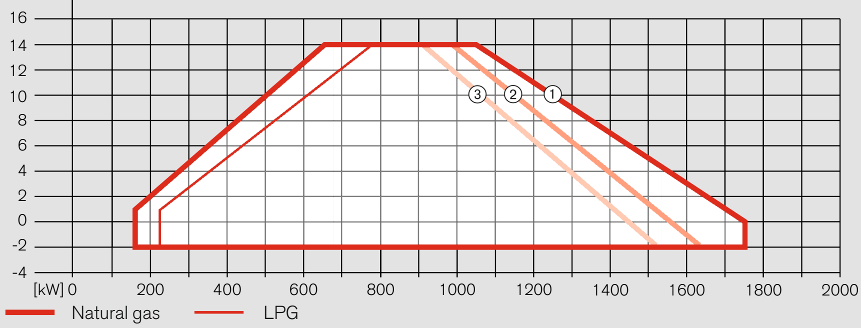
Setting pressure at the FRS governor



Burner selection / gas valve train sizing WM-G20, version ZM-PLN

[mbar]

Burner type	**WM-G20/2-A ZM-PLN**
Combustion head	WM-G20/3+4 PLN
Capacity range	Natural gas 180–1750 kW
	LPG 220–1750 kW



WM-G20/2-A, version ZM-PLN

Burner rating [kW]	Low-pressure supply P_i ≤ 300 mbar – Min. flow pressure before the gas ball valve – Nominal valve train diameter 1"	1½"	2"	65	80	100	High-pressure supply P_o = 140 / 100 / 50 mbar – Min. flow pressure before the FRS governor – Nominal valve train diameter 1"	1½"	2"	P_r – Setting pressure at the FRS governor – Nominal valve train diameter 1"	1½"	2"	65	80	100
Natural gas E LHV = 10.35 kWh/m³; d = 0.606															
800	71	28	–	–	–	–	59	35	18	18	12	–	–	–	–
900	89	35	–	–	–	–	71	40	19	23	16	–	–	–	–
1000	109	42	–	–	–	–	84	47	21	29	20	–	–	–	–
1100	131	50	21	–	–	–	99	54	22	35	25	9	–	–	–
1200	156	59	25	–	–	–	115	61	24	42	30	11	–	–	–
1300	182	68	28	18	–	–	133	69	25	50	35	13	9	–	–
1400	210	79	32	20	15	–	–	78	27	58	41	15	10	9	–
1500	241	89	36	22	17	–	–	88	29	66	47	17	12	10	–
1600	273	101	40	24	18	15	–	97	31	75	53	20	13	11	9
1750	–	119	46	28	21	17	–	113	33	–	63	23	15	13	11
Natural gas LL LHV = 8.83 kWh/m³; d = 0.641															
800	101	39	–	–	–	–	79	44	20	27	19	–	–	–	–
900	128	49	21	–	–	–	97	52	22	34	24	9	–	–	–
1000	157	59	25	–	–	–	116	62	24	43	30	11	–	–	–
1100	189	71	29	18	–	–	138	72	26	52	36	14	9	–	–
1200	224	84	34	21	16	–	–	83	28	61	43	16	11	9	–
1300	262	97	39	24	18	15	–	94	30	72	51	19	13	11	9
1400	–	112	44	27	20	17	–	107	33	–	59	22	14	12	11
1500	–	128	50	30	22	18	–	120	35	–	67	25	16	14	12
1600	–	144	56	33	24	20	–	135	38	–	76	28	18	15	13
1750	–	170	64	38	28	22	–	–	42	–	91	33	21	18	15
LPG* LHV = 25.89 kWh/m³; d = 1.555															
800	33	–	–				33	24	17	8	–	–			
900	40	–	–				39	26	18	11	–	–			
1000	49	22	–				45	30	19	14	10	–			
1100	59	26	–				52	33	20	17	13	–			
1200	69	30	–				59	37	21	20	15	–			
1300	81	34	18				66	40	22	24	18	9			
1400	93	39	20				75	44	23	27	21	10			
1500	106	44	22				83	49	25	31	23	12			
1600	120	49	24				93	53	26	36	27	13			
1750	142	57	27				108	61	28	42	31	15			

The LHV is referenced to 0 °C and 1013 mbar atmospheric pressure. All pressures are in mbar.
* The LPG charts are based on propane, but may also be used for butane.

Capacity graphs for gas burners certified in accordance with EN 676.

Stated ratings are based on an air temperature of 20 °C and an installation at sea level. For installations at higher altitudes, a reduction in capacity of 1 % per 100 m above sea level should be taken into account.

Stated flow pressures are based on a combustion chamber resistance of 0 mbar. The combustion chamber pressure of the heat generator must be added to the figure determined from the above chart when sizing the gas valve train.

For low-pressure supplies, EN 88-compliant governors with safety diaphragms are used.

For high-pressure supplies, an EN 334-compliant high-pressure regulator should be selected from the following technical booklets:
- Regulators up to 4 bar, Print No. 83001202
- Regulators with safety devices, Print No. 83197902

Refer to the burner's rating plate for the maximum connection pressure.

Maximum Operating Pressure (MOP)
The supplier must safeguard the gas flow pressure such that it cannot exceed the MOP of the burner's gas valve train.

Rating of low-pressure gas valve trains (LP)
Normally, low-pressure valve trains 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.

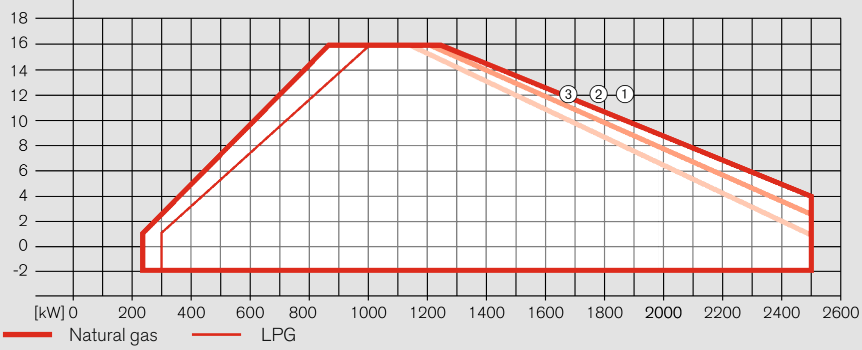
Rating of high-pressure gas valve trains (LP)
Normally, high-pressure valve trains are used for gas flow pressures above 300 mbar.

Double gas valve assemblies

Screwed	
R ¾	W-MF507
R 1	W-MF512
R 1½	W-MF512
R 2	DMV525/12
Flanged	
DN 65	DMV5065/12
DN 80	DMV5080/12
DN 100	DMV5100/12

Burner selection / gas valve train sizing WM-G20, version ZM-PLN

Burner type	WM-G20/3-A ZM-PLN	
Combustion head	WM-G20/3 PLN	
Capacity range	Natural gas	250–2500 kW
	LPG	300–2500 kW



WM-G20/3-A, version ZM-PLN

Burner rating [kW]	Low-pressure supply P_i ≤ 300 mbar – Min. flow pressure before the gas ball valve – Nominal valve train diameter 1"	1½"	2"	65	80	100	High-pressure supply P_o = 140 / 100 / 50 mbar – Min. flow pressure before the FRS governor – Nominal valve train diameter 1"	1½"	2"	P_r – Setting pressure at the FRS governor – Nominal valve train diameter 1"	1½"	2"	65	80	100
Natural gas E LHV = 10.35 kWh/m³; d = 0.606															
1050	120	46	20	–	–	–	92	50	22	32	23	9	–	–	–
1200	156	59	25	–	–	–	115	61	24	42	30	11	–	–	–
1350	196	73	30	19	–	–	–	74	26	53	38	14	9	–	–
1500	240	89	36	22	17	–	–	87	29	66	46	17	11	9	–
1700	–	113	44	27	20	16	–	108	32	–	59	22	14	12	10
1900	–	140	54	32	24	19	–	131	37	–	74	27	18	15	13
2100	–	170	65	38	28	22	–	–	42	–	90	33	22	18	16
2300	–	203	77	45	33	26	–	–	47	–	108	40	26	22	19
2500	–	239	90	52	38	30	–	–	53	–	128	47	31	26	22
Natural gas LL LHV = 8.83 kWh/m³; d = 0.641															
1050	173	65	27	18	–	–	127	67	25	47	34	13	9	–	–
1200	225	84	34	21	17	–	–	83	28	62	44	17	11	9	–
1350	283	105	42	26	20	16	–	101	32	78	55	21	14	12	10
1500	–	128	51	31	23	19	–	121	36	–	68	26	17	15	13
1700	–	164	64	38	28	23	–	–	42	–	87	33	22	19	16
1900	–	203	78	46	34	27	–	–	48	–	109	41	27	23	20
2100	–	247	94	56	41	32	–	–	56	–	133	50	33	28	25
2300	–	–	112	66	48	38	–	–	64	–	–	60	40	34	30
2500	–	–	132	77	56	44	–	–	73	–	–	71	47	40	35
LPG* LHV = 25.89 kWh/m³; d = 1.555															
1050	53	23	–	–			48	31	19	15	11	–	–		
1200	68	29	–	–			58	35	20	19	14	–	–		
1350	85	35	–	–			69	41	21	24	18	–	–		
1500	104	42	20	–			82	47	23	29	21	10	–		
1700	132	52	24	17			100	56	25	38	27	12	9		
1900	163	64	29	20			122	66	27	47	34	15	11		
2100	198	77	34	23			–	77	30	57	41	18	13		
2300	237	91	39	26			–	90	33	68	49	21	16		
2500	279	107	45	30			–	103	36	80	58	25	18		

The LHV is referenced to 0 °C and 1013 mbar atmospheric pressure. All pressures are in mbar.
* The LPG charts are based on propane, but may also be used for butane.

Determining load point dependent on excess air
(See example on page 19)

	NO_x [mg/kWh] N. Gas	LPG	Setting O_2	λ	P_F factor [1)]
①	80	150	5 %	1.28	1.24
②	30	60	7 %	1.46	1.61
③	20	–	8 %	1.56	1.84

1) The correction factor is based on the combustion chamber resistance (P_F) at 3 % O_2.

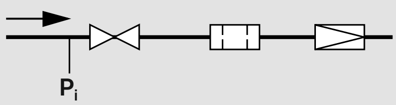
NO_x reference conditions:

Air temperature	= 20 °C
Air humidity	= 10 g/kg
LHV, natural gas E	= 10.35 kWh/m³
LHV, propane	= 25.89 kWh/m³

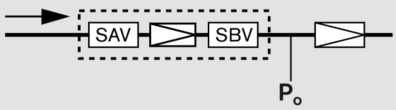
LHV referenced to 0 °C and 1013 mbar atmospheric

- Measurement at every load point
- No averaging
- No measurement uncertainty/tolerance
- Three-pass combustion chamber

Low-pressure supply

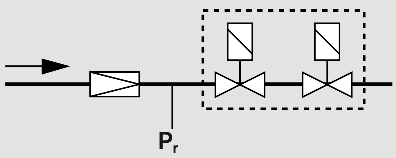


High-pressure supply

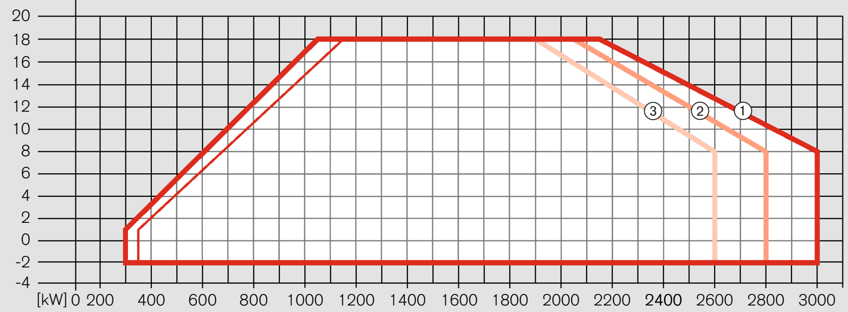


The high-pressure regulator should have a spring selected that enables the available outlet pressure (P_o = 140 / 100 / 50 mbar) to be adjusted.

Setting pressure at the FRS governor



[mbar]			
Burner type	**WM-G20/4-A ZM-PLN**		
Combustion head	WM-G20/4 PLN		
Capacity range	Natural gas	300–3000 kW	
	LPG	350–3000 kW	



WM-G20/4-A, version ZM-PLN

Burner rating [kW]	Low-pressure supply $P_i \leq 300$ mbar Min. flow pressure before the gas ball valve **Nominal valve train diameter** 1”	1½”	2”	65	80	100	125	High-pressure supply P_o = 140 / 100 / 50 mbar Min. flow pressure before the FRS governor **Nominal valve train diameter** 1”	1½”	2”	P_r Setting pressure at the FRS governor **Nominal valve train diameter** 1”	1½”	2”	65	80	100	125
Natural gas E LHV = 10.35 kWh/m3; d = 0.606																	
1250	169	64	26	17	–	–	–	124	65	25	46	32	12	8	–	–	–
1450	225	84	34	21	16	–	–	–	83	28	62	44	16	11	9	–	–
1650	290	107	42	26	19	16	–	–	103	32	80	56	21	14	12	10	–
1850	–	133	52	31	23	19	17	–	125	36	–	71	26	17	15	13	12
2050	–	163	63	37	27	22	20	–	–	41	–	87	32	21	18	15	15
2250	–	195	74	44	32	25	23	–	–	46	–	104	39	25	21	18	18
2500	–	239	91	53	38	30	28	–	–	53	–	128	48	31	26	22	22
2750	–	–	108	63	45	35	32	–	–	61	–	–	57	37	31	27	26
3000	–	–	128	74	52	41	37	–	–	70	–	–	68	44	37	32	31
Natural gas LL LHV = 8.83 kWh/m3; d = 0.641																	
1250	243	90	36	22	17	–	–	–	78	29	66	47	17	11	9	–	–
1450	–	119	47	28	21	17	16	–	103	34	–	63	23	15	13	11	11
1650	–	153	59	35	26	21	19	–	132	39	–	81	30	19	16	14	14
1850	–	191	73	43	31	25	23	–	–	45	–	102	38	24	20	18	17
2050	–	233	88	51	37	29	26	–	–	52	–	125	46	30	25	21	20
2250	–	–	105	60	43	34	31	–	–	59	–	–	55	35	29	25	24
2500	–	–	128	73	52	40	36	–	–	69	–	–	67	43	36	31	30
2750	–	–	153	87	61	47	43	–	–	80	–	–	81	52	43	37	35
3000	–	–	181	102	71	55	50	–	–	92	–	–	96	61	51	44	42
LPG* LHV = 25.89 kWh/m3; d = 1.555																	
1250	73	30	–	–	–			60	36	–	20	14	–	–	–		
1450	96	38	–	–	–			76	43	–	26	19	–	–	–		
1650	123	48	21	–	–			94	52	23	34	24	10	–	–		
1850	153	59	25	17	–			114	61	25	43	30	12	9	–		
2050	187	71	30	20	16			137	72	27	52	37	15	10	9		
2250	–	85	35	23	18			–	84	30	63	45	18	13	11		
2500	–	104	43	27	21			–	100	33	78	55	22	15	13		
2750	–	125	51	32	25			–	118	37	94	67	27	19	16		
3000	–	147	60	37	29			–	138	42	112	80	32	22	19		

The LHV is referenced to 0 °C and 1013 mbar atmospheric pressure. All pressures are in mbar.
* The LPG charts are based on propane, but may also be used for butane.

Capacity graphs for gas burners certified in accordance with EN 676.

Stated ratings are based on an air temperature of 20 °C and an installation at sea level. For installations at higher altitudes, a reduction in capacity of 1 % per 100 m above sea level should be taken into account.

Stated flow pressures are based on a combustion chamber resistance of 0 mbar. The combustion chamber pressure of the heat generator must be added to the figure determined from the above chart when sizing the gas valve train.

For low-pressure supplies, EN 88-compliant governors with safety diaphragms are used.

For high-pressure supplies, an EN 334-compliant high-pressure regulator should be selected from the following technical booklets:
- Regulators up to 4 bar, Print No. 83001202
- Regulators with safety devices, Print No. 83197902

Refer to the burner's rating plate for the maximum connection pressure.

Maximum Operating Pressure (MOP)
The supplier must safeguard the gas flow pressure such that it cannot exceed the MOP of the burner's gas valve train.

Rating of low-pressure gas valve trains (LP)
Normally, low-pressure valve trains 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.

Rating of high-pressure gas valve trains (LP)
Normally, high-pressure valve trains are used for gas flow pressures above 300 mbar.

Double gas valve assemblies

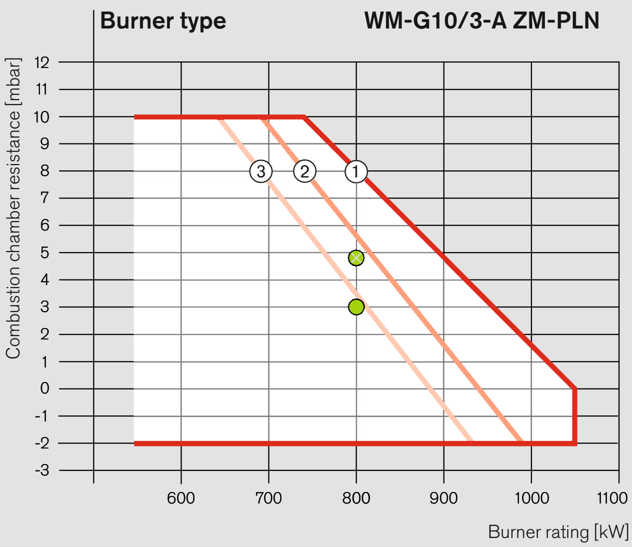
Screwed	
R 1	W-MF512
R 1½	W-MF512
R 2	DMV525/12
Flanged	
DN 65	DMV5065/12
DN 80	DMV5080/12
DN 100	DMV5100/12
DN 125	VGD40.125

Example calculation

Determining load point with regard to the required level of NO_x emissions

Example:

Burner firing rate	800 kW
Combustion chamber resistance:	
● Per manufacturer, with 3 % O_2	3.0 mbar
⊗ For 30 mg/kWh, with 7 % O_2 (3 mbar • 1.61)	4.8 mbar
Installation altitude	0 m asl



Determining load point dependent on excess air

	NO_x [mg/kWh] N. Gas	LPG	Setting O_2	λ	P_F factor [1)]
①	80	150	5 %	1.28	1.24
②	30	60	7 %	1.46	1.61
③	20	–	8 %	1.56	1.84

[1)] The correction factor is based on the combustion chamber resistance (P_F) at 3 % O_2.

NO_x reference conditions:

Air temperature	= 20 °C
Air humidity	= 10 g/kg
LHV, natural gas E	= 10.35 kWh/m^3
LHV, propane	= 25.89 kWh/m^3

LHV referenced to 0 °C and 1013 mbar atmospheric

- Measurement at every load point
- No averaging
- No measurement uncertainty/tolerance
- Three-pass combustion chamber

Note:
Boiler room ventilation must be increased appropriately to take account of the additional air required for low-NO_x combustion.

Scope of delivery

Scope of delivery

Description		WM-G10 ZM-PLN	WM-G20 ZM-PLN
Burner housing, hinged flange, housing cover, Weishaupt burner motor, air inlet housing, fan wheel, combustion head, ignition unit, ignition cable, ignition electrodes, combustion manager with control unit, flame sensor, actuators, flange gasket, limit switch on hinged flange, fixing screws, air filter with sleeve		●	●
Digital combustion manager	W-FM 50 W-FM 54 / 100 / /200	● ○	● ○
Valve proving via the combustion manager		●	●
Class-A double gas valve assembly		●	●
Gas butterfly valve		●	●
Air pressure switch		●	●
Low gas pressure switch		●	●
Preset, capacity-based mixing assembly		●	●
Actuators for compound regulation of fuel and air via W-FM: Air damper actuator Gas butterfly valve actuator		 ● ●	 ● ●
DOL motor contactor fitted to motor [1)]		●	●
IP 54 protection		●	●

EN 676 stipulates that ball valves, gas filters, and gas pressure regulators form part of the burner supply (see Weishaupt accessories list).
Please enquire or see the special equipment section of this brochure for further burner executions.

● Standard
○ Optional

Order Numbers

WM-G10 gas burners, version ZM-PLN

Burner type	Version	Valve train size	Order No.
WM-G10/2-A	ZM-PLN	R ¾	217 124 10
		R 1	217 124 11
		R 1½	217 124 12
		R 2	217 124 13
		DN 65	217 221 14
WM-G10/3-A	ZM-PLN	R ¾	217 125 10
		R 1	217 125 11
		R 1½	217 125 12
		DN 65	217 125 13
		DN 80	217 125 14
WM-G10/4-A	ZM-PLN *	R 1	217 126 11
		R 1½	217 126 12
		R 2	217 126 13
		DN 65	217 126 14
		DN 80	217 126 15
		DN 100	217 126 16

CE-PIN: CE 0085BQ0027

* Equipped with VSD as standard

WM-G20 gas burners, version ZM-PLN

Burner type	Version	Valve train size	Order No.
WM-G20/2-A	ZM-PLN	R 1	217 221 11
		R 1½	217 221 12
		R 2	217 221 13
		DN 65	217 221 14
		DN 80	217 221 15
		DN 100	217 221 16
		DN 125	217 221 17
WM-G20/3-A	ZM-PLN	R 1	217 222 11
		R 1½	217 222 12
		R 2	217 222 13
		DN 65	217 222 14
		DN 80	217 222 15
		DN 100	217 222 16
		DN 125	217 222 17
WM-G20/4-A	ZM-PLN *	R 1	217 223 11
		R 1½	217 223 12
		R 2	217 223 13
		DN 65	217 223 14
		DN 80	217 223 15
		DN 100	217 223 16
		DN 125	217 223 17

CE-PIN: CE 0085BQ0027

Special equipment
WM-G10 and WM-G20, version ZM-PLN

Version ZM-PLN		WM-G10 ZM-PLN	WM-G20 ZM-PLN
High gas pressure switch [1] (Screwed W-MF / DMV for low-pressure supplies)	GW 50 A6/1 GW 150 A6/1 GW 500 A6/1	250 033 30 250 033 31 250 033 32	250 033 30 250 033 31 250 033 32
High gas pressure switch [1] (Flanged DMV / VGD for low-pressure supplies)	GW 50 A6/1 GW 150 A6/1 GW 500 A6/1	150 017 49 150 017 50 150 017 51	150 017 49 150 017 50 150 017 51
ST 18/7 and ST 18/4 plug connections (W-FM 50 / 100 / 200)		250 030 22	250 030 22
ST 18/7 plug connection (W-FM 50 with KS20)		250 031 06	250 031 06
Burner-mounted KS20 controller (W-FM 50) [1]		250 033 15	250 033 15
W-FM 100 in lieu of W-FM 50 [1]	burner-mounted	250 030 74 [4]	250 030 74 [4]
	loose	250 031 45 [4]	250 031 43 [4]
Integral load controller & analogue signal convertor for W-FM 100		110 017 18 [4]	110 017 18 [4]
W-FM 200 in lieu of W-FM 50 with integral load controller, analogue signal convertor, and VSD module, with optional fuel metering	burner-mounted	250 030 75 [4]	250 030 75 [4]
	loose	250 030 48 [4]	250 030 48 [4]
VSD with integral frequency convertor (W-FM 50 / 200 required) [2] incl. inductive proximity switch and LGW 10 in lieu of LGW 50		210 030 11	210 030 40
VSD with separate frequency convertor (W-FM 200 required) (See accessories list for frequency convertor)		210 030 12 [4]	210 030 41 [4]
WM-D90 motor with 230 V contactor and overload protection [3]		250 030 86	–
WM-D112 motor with 230 V contactor and overload protection [3]		–	250 030 95
ABE with Chinese-character display, loose (W-FM 100 / 200)		110 018 53 [4]	110 018 53 [4]
Special voltage (on application only)		250 031 02	250 031 02
110 V control voltage		250 031 72	250 031 72
Spacer ring with gasket		250 035 13	250 035 14
Installation aid		250 104 000 22	–
Installation aid case set for WM20		–	250 204 000 62
Installation aid case set for WM10 and WM20		250 204 000 92	250 204 000 92

Country-specific executions and special voltages on application

[1] Required for PED (2014/68/EU) compliance.

[2] Standard on WM-G10/4 ZM-PLN and WM-G20/4 ZM-PLN.

[3] The necessary motor protection can be provided either by a motor protection switch (supplied and fitted into a panel by others), or with integral motor overload protection (see special equipment).

[4] Available from 2018-Q1.

Technical data

Gas burners		WM-G10/2-A ZM-PLN	WM-G10/3-A ZM-PLN	WM-G10/4-A ZM-PLN
Burner motor	Weishaupt type	WM-D 90/90-2/1K0	WM-D 90/110-2/1K5	WM-D 90/110-2/1K5
Motor power output	kW	0.9	1.5	1.9
Nominal current	A	2.2	3.2	3.7
Nominal frequency	Hz	50	50	50
Motor protection switch or overload protection with motor prefusing 1)	type (e.g.) A minimum	PKE12/XTU - 4 10 A gG / T (by others)	PKE12/XTU - 4 16 A gG / T (by others)	PKE12/XTU - 4 16 A gG / T (by others)
Speed	rpm	2900 at 50 Hz	2900 at 50 Hz	3120 at 55 Hz (with FC)
Combustion manager Prefusing	type A	W-FM 50 / 100 16 A B	W-FM 50 / 100 16 A B	W-FM 50 / 100 16 A B
Flame monitoring	type	ION	ION	ION
Air damper / gas actuator	type	STE 50 / SQM 45	STE 50 / SQM 45	STE 50 / SQM 45
NOx Class per EN 676	ZM-PLN	3	3	3
Mass (excl. double gas valve and fittings)	kg	approx. 74	approx. 75	approx. 75

Gas burners		WM-G20/2-A ZM-PLN	WM-G20/3-A ZM-PLN	WM-G20/4-A ZM-PLN
Burner motor	type Weishaupt	WM-D 112/140-2/3K0	WM-D 112/170-2/4K5	WM-D 112/170-2/7K0
Motor power output	kW	3.0	4.5	7.0
Nominal current	A	6.5	9.2	15.0
Nominal frequency	Hz	50	50	50
Motor protection switch or overload protection with motor prefusing 1)	type (e.g.) A minimum	PKE12/XTU-12 25 A gG/T (by others)	PKE12/XTU-12 35 A gG/T (by others)	PKE32/XTU-32 25 A gG/T (by others)
Speed	rpm	2950 at 50 Hz	2930 at 50 Hz	3520 at 60 Hz (with FC)
Combustion manager Prefusing	type A	W-FM 50 16 AB	W-FM 50 16 AB	W-FM 50 16 AB
Flame monitoring	type	ION	ION	ION
Air damper / gas actuator	type	STE 50/SQM45	STE 50/SQM45	STE 50/SQM45
NOx Class per EN 676	ZM / ZM-LN	3	3	3
Mass (excl. double gas valve and fittings)	kg	approx. 95	approx. 100	approx. 110

1) The necessary motor protection can be provided either by a motor protection switch (supplied and fitted into a panel by others), or with integral motor overload protection (see special equipment).

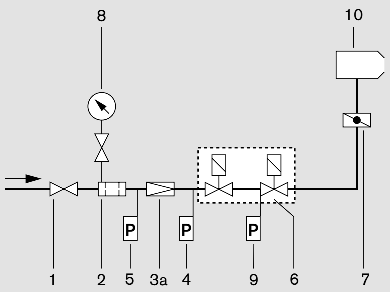
Voltages and frequencies:
The burners are equipped as standard for three-phase alternating current, 400 V, 3 ~, 50 Hz. Other voltages and frequencies are available on application.

Standard burner motor:
Insulation Class F, IP 55 protection.
IE3 Premium Efficiency.

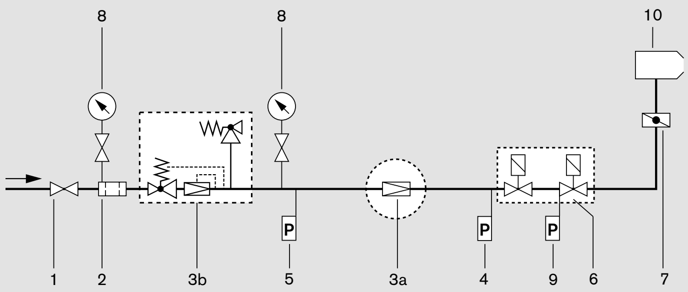
-weishaupt-

Fuel systems

Low-pressure gas supply (LP)



High-pressure gas supply (HP)



Layout of the valve train
On boilers with hinged doors, the valve train must be mounted on the opposite side to the boiler-door hinges.

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

Break points in the valve train
Break points in the valve train should be provided to enable the door of the heat generator to be swung open. The main gas line is best separated at the compensator.

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

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.

Use of high-pressure regulators
A high-pressure regulator should be selected from the following technical booklets:
- Regulators up to 4 bar, Print No. 83001202
- Regulators with safety devices, Print No. 83197902

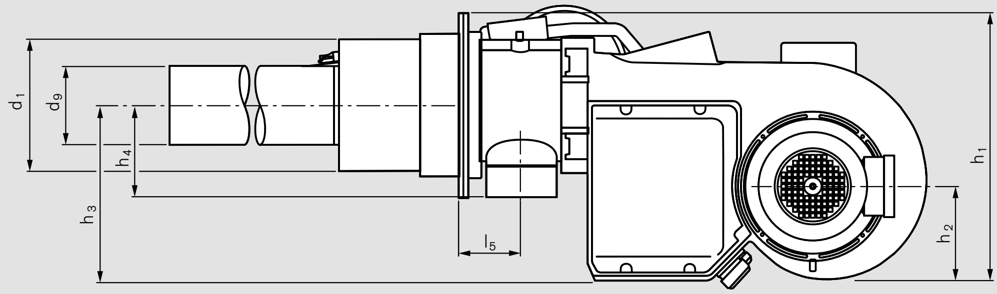
For PLN burners, the high-pressure regulator selected (3b) is used as a pressure reducing station with safety functions. The high-pressure regulator should be set for the maximum outlet pressure calculated, while the load-specific regulated pressure is set on the low-pressure regulator (3a).

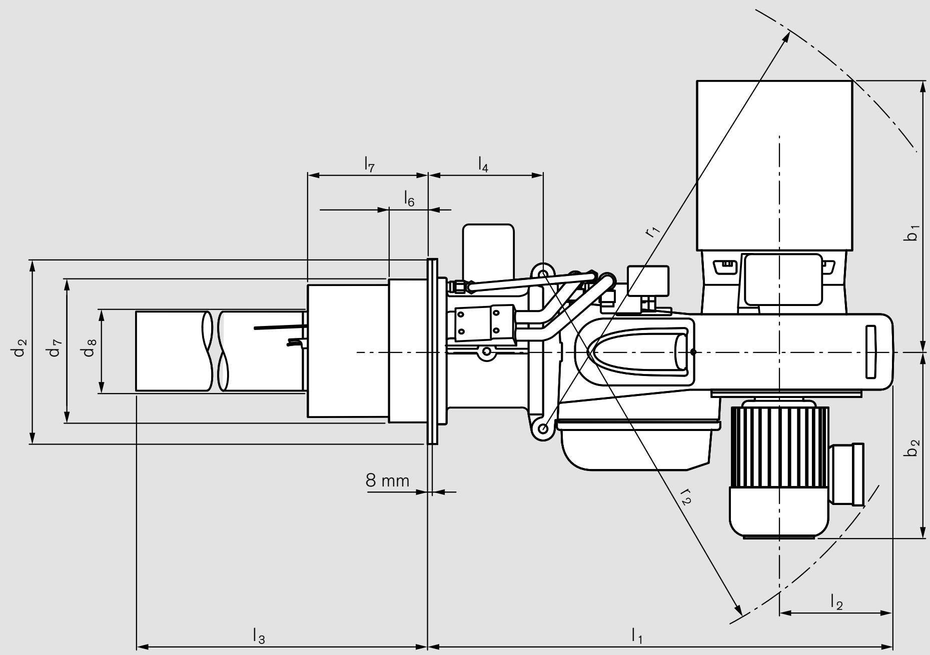
1 Ball valve *
2 Gas filter *
3a Pressure regulator (LP) *
3b Pressure regulator (HP) *
4 High gas pressure switch *
5 Low gas pressure switch
6 Double gas valve assembly
7 Gas butterfly valve
8 Pressure gauge with push-button valve *
9 Valve-proving pressure switch
10 Burner

* Not included in burner price

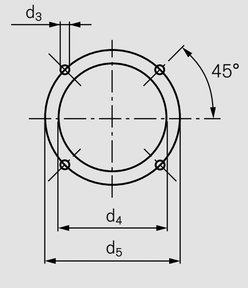
Dimensions and Minimum combustion chamber sizes

WM-G10 and WM-G20 gas burners, version ZM-PLN

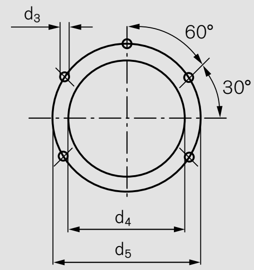




Mounting-plate drilling dimensions



WM-G10 ZM-PLN

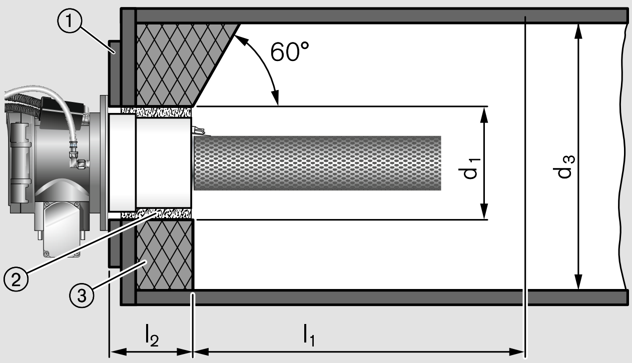


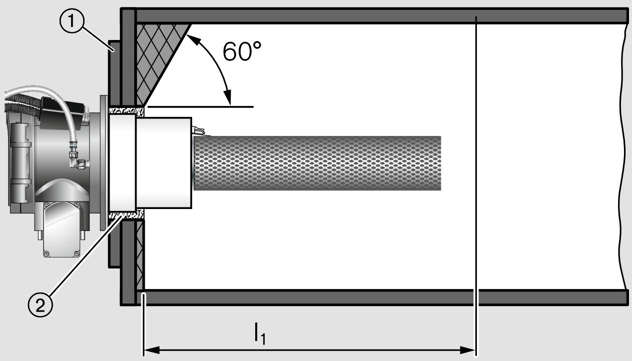
WM-G20 ZM-PLN

Burner type	Dimensions in mm l_1	l_2	l_3	l_4	l_5	l_6	l_7	b_1	b_2	h_1	h_2	h_3	h_4	r_1	r_2	d_1	d_2	d_3	d_4	d_5	d_6	d_7	d_8	d_9
WM-G10/2-A ZM-PLN	833	205	834	208	108	68	213	481	307	478	167	313	162	826	682	234	330	M12	260	298	255	253	147	145
WM-G10/3-A ZM-PLN	833	205	1198	208	108	68	213	481	335	478	167	313	162	826	698	234	330	M12	260	298	255	253	147	145
WM-G10/4-A ZM-PLN	833	205	1198	208	108	68	213	481	335	478	167	313	162	826	698	234	330	M12	260	298	255	253	147	145
WM-G20/2-A ZM-PLN	1010	254	1023	238	128	78	213	545	424*	625	217	400	226	1040	869	335	450	M12	370	400	365	360	251	248
WM-G20/3-A ZM-PLN	1010	254	1423	238	128	78	213	545	447*	625	217	400	226	1040	883	335	450	M12	370	400	365	360	251	248
WM-G20/4-A ZM-PLN	1010	254	1623	238	128	78	213	545	521	625	217	400	226	1040	951	335	450	M12	370	400	365	360	251	248

* Projection of frequency convertor approx. 20 mm

Heat generator without spacer ring





Minimum combustion chamber sizes

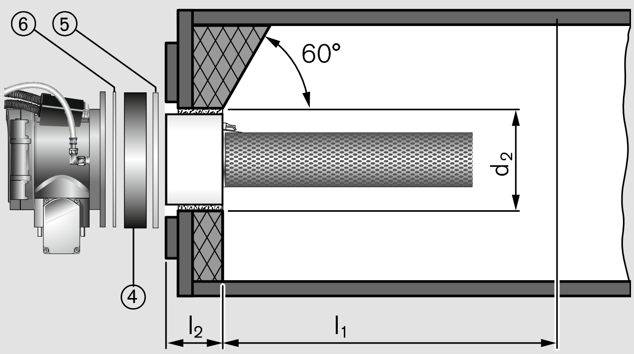
WM-G10 ZM-PLN

d_1	Minimum boiler aperture without spacer ring	260 mm
d_2	Minimum boiler aperture with spacer ring	244 mm
d_3	Minimum combustion chamber diameter	350 mm
l_1	Minimum combustion chamber length	
	WM10/2	840 mm
	WM10/3	1200 mm
	WM10/4	1200 mm
l_2	Maximum boiler door depth, including refractory / insulation,	
	without spacer ring	220 mm
	with spacer ring and gasket	145 mm

WM-G20 ZM-PLN

d_1	Minimum boiler aperture without spacer ring	370 mm
d_2	Minimum boiler aperture with spacer ring	345 mm
d_3	Minimum combustion chamber diameter	450 mm
l_1	Minimum combustion chamber length	
	WM20/2	1230 mm
	WM20/3	1630 mm
	WM20/4	1830 mm
l_2	Maximum boiler door depth, including refractory / insulation,	
	without spacer ring	220 mm
	with spacer ring and gasket	145 mm

Heat generator with spacer ring



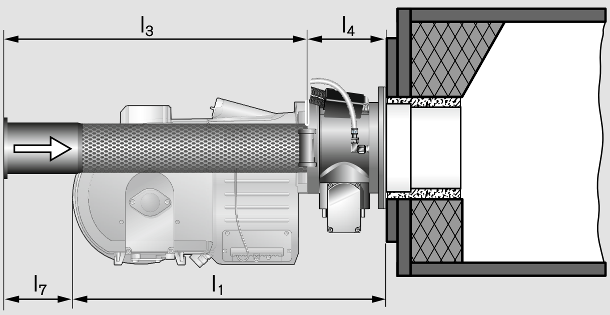
Legend

① Mounting plate
(WM-G20 ZM-PLN: Depth ≥ 8 mm for installations with spacer ring)
② Aperture
③ Refractory / insulation
④ Spacer ring with gasket, WM-G10 ZM-PLN (74 mm)
Spacer ring with gasket, WM-G20 ZM-PLN (72 mm)
(Optional for boilers with narrow burner apertures)
⑤ Flange gasket (8 mm)
⑥ Gasket, WM-G10 ZM-PLN (2 mm)
Gasket, WM-G20 ZM-PLN (8 mm)

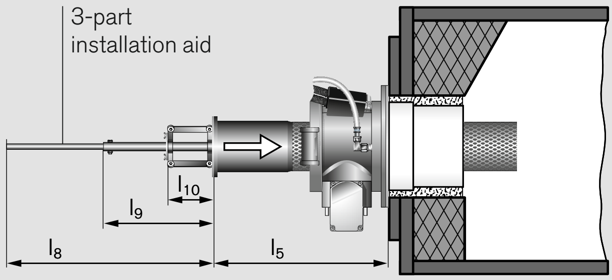
Note:
The boiler door refractory / insulation may be tapered (≥ 60°).

Dimensions for inserting and withdrawing the burner tube

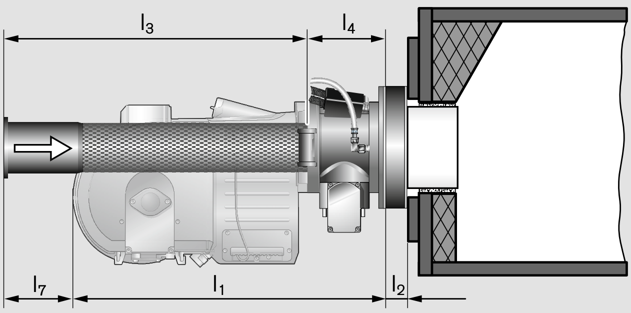
WM-G ZM-PLN without spacer ring



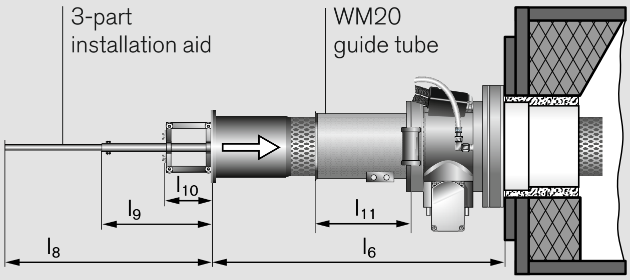
Installation aid – minimum clearance without spacer ring



WM-G ZM-PLN with spacer ring



Installation aid – minimum clearance with spacer ring



Burner type	Dimensions in mm l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9	l_{10}	l_{11}
WM-G10/2-A ZM-PLN	833	74	852	208	1060	1134	227	585	305	155	–
WM-G10/3-A ZM-PLN	833	74	1216	208	1424	1498	591	585	305	155	–
WM-G10/4-A ZM-PLN	833	74	1216	208	1424	1498	591	585	305	155	–
WM-G20/2-A ZM-PLN	1010	72	1044	238	1592	1664	582	585	305	155	310
WM-G20/3-A ZM-PLN	1010	72	1444	238	1992	2064	982	585	305	155	310
WM-G20/4-A ZM-PLN	1010	72	1640	238	2188	2260	1178	585	305	155	310

That's reliability

Heating system production in Sennwald

Neuberger building automation in Rothenburg

Borehole drilling by BauGrund Süd

The Weishaupt Group has over 3000 employees and is a market leader for burners, condensing boilers, heat pumps, solar energy, and building automation.

Since 2009 the business, which was founded in 1932, has been structured as a holding for three companies operating in the fields of energy technology, energy recovery, and energy management.

The core division is Max Weishaupt GmbH, which is located in the south-west German town of Schwendi, and which is where all burners are manufactured. It is also the group's administrative headquarters, and home to the group's own Research and Development Institute.

Heating systems are manufactured by Weishaupt's sister company, Pyropac, which is located in the Swiss town of Sennwald.

Neuberger building automation, sited in Rothenburg ob der Tauber in Germany, has been a group subsidiary since 1995.

Germany's Bad Wurzach is home to the geothermal engineering company, BauGrund Süd, which has been part of the Weishaupt Group since 2009.

weishaupt

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