

– weishaupt –

product

Information on oil, gas and dual fuel burners



WM 50 oil, gas and dual fuel version

WM50 monarch® burners (2,750 – 37,500 MBH) • powerful and versatile

Progress and tradition: The latest monarch[®] burner



The Monarch[®] Trademark has represented performance and quality in burner industry for over 50 years

For over five decades, Weishaupt monarch[®] series burners have been used at various heating and industrial process applications. Over this period of time, they have built an excellent reputation for Weishaupt.

The latest monarch[®] series is writing the next chapter in this success story. Its combination of ultra-modern technology and compact construction helps to make this burner universally adaptable to various applications.

Digital.

Digital combustion management system ensures economical and reliable burner operation. The controls are easy to use.

Compact.

The aerodynamic housing and special air intake geometry enable higher capacity with smaller dimensions.

Quiet.

The latest monarch® burners' compact monobloc housing provides a lot of power, thanks to the specially developed fan unit.



Digital

Digital combustion management means optimum combustion results, always repeatable operating points and easy to operate.

Weishaupt WM 50 series oil, gas and dual fuel burners are equipped with electronic fuel air ratio controller and digital combustion manager as standard. Modern heating applications require precise and continuously repeatable proper mixture of fuel and air. Only this way, optimum combustion values can be guaranteed over extended periods of time.

Simple operation

Programming of burner function is performed via the display and control unit. The unit is connected to the combustion manager via a BUS system.

Flexible communication possibilities

The integrated interface makes it possible to receive and send all required information and control commands from and to the BMS system. If required, a modem can be installed so that remote monitoring and remote diagnostic function can be activated.

Communication with remote control system or with BMS system

The system supports several communication protocols for connecting to BMS system if data has to be exchanged between burners and other heating systems with PLC devices.

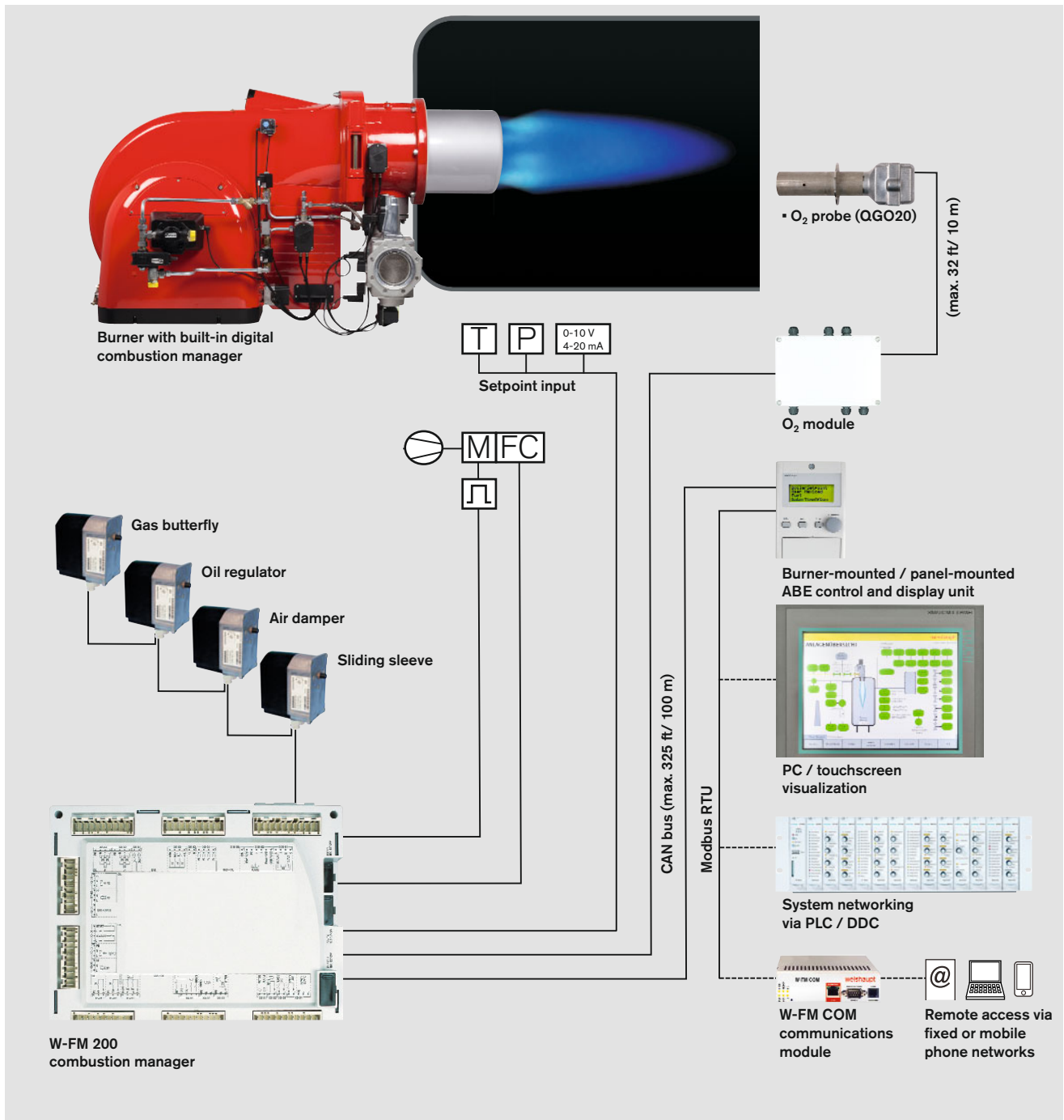
For control and management functions, Weishaupt offers ProGraf NT – a software product that provides real time solution to meet all requirements.

Advantages of new technology

Digital combustion management makes burner operation user friendly and reliable. The most important benefits are:

- No additional burner controls are required since this function is already taken care by the combustion manager. Fuses and eventually mains dis-connect switch are the only additional items required.
- Less installation work means less errors: the burners are tested as a complete unit at the factory.
- Commissioning and service work take less time. The initial presetting of the burner is carried out at the factory. On site, only the site specific operating points have to be adjusted.

System overview Digital Combustion Management	W-FM 100	W-FM 200
Combustion manager for intermittent operation	●	●
Combustion manager for continuous operation	●	●
Flame sensor for intermittent operation	ION/QRI/QRB	ION/QRI/QRB
Flame sensor for continuous operation	ION/QRI/QRA73	ION/QRI/QRA73
Number of actuator (max.)	4 pcs	6 pcs
Actuator with stepping motor	●	●
Compatible with Variable Speed Drive operation		○
O ₂ -Trim (optional)		○
Single fuel operation	●	●
Dual fuel operation	●	●
Valve proving system for gas valves	●	●
Integrated self tuning PID-Modulating controller for Temperature or Pressure	●	●
Removable ABE control unit (max. distance)	325 ft (100 m)	325 ft (100 m)
Fuel meter interface		●
Combustion efficiency display (w/ optional sensor)		●
eBUS / MOD BUS interface	●	●
PC interface	●	●
● Standard ○ Optional		



Typical schematic of burner with W-FM 200

Compact and Quiet

The newly developed Weishaupt monarch® WM 50 burner is compact, efficient and quiet. It is the continuation of the 50 years success history of the legendary monarch® series.

Advanced blower fan technology

Right from early development phase of this new burner generation, future oriented blower fan technology has been utilized to achieve a compact, streamlined design and low operating noise.

Innovative air damper control

The newly developed air damper control provides a high degree of linearity over the entire operating range.

Reduced noise level

Right from the earliest developmental stage of this new burner generation, particular emphasis was placed on low operational noise level.

Quick commissioning, easy maintenance

All WM 50 burners are equipped with a modulating sliding sleeve driven by a dedicated stepping motor. Position adjustment is to be performed via commissioning program in the combustion manager.

Despite its compact design all components such as oil nozzles, mixing head, air damper and combustion manager are easily accessible. Therefore maintenance and service work can be performed easily and quickly. The standard hinged flange provides easy access for service/ maintenance works.

Matching to various combustion chamber geometries can be performed directly on the burner. The flame and the ignition process can be observed via the integrated viewing port.

Flexible control capability

Weishaupt WM 50 burners are suitable for sliding-two-stage or modulating operation, depending on the type of modulating controller. Throughout its operating range burner's output is matched to the heat demand.

These multiple control options make the WM 50 universally adaptable to various applications. Thus results in a smooth, trouble free start and reliable operation.

NR version

WM 50 burners come standard with NR mixing head assembly for gas and dual fuel burners.

Compliance to certain emission requirement is also dependant on combustion chamber geometry, volume loading and design of the combustion system.

Suitable fuels

Natural gas
Propane
Light Oil #2 according to ASTM D396

Different type of fuel requires written confirmation from Weishaupt.

Applications

Weishaupt WM 50 oil, gas and dual fuel burners are suitable to be used for the following:

- Installation on heat exchanger
- Hot water boiler
- Steam boiler and high pressure hot water boiler
- Intermittent and continuous operation
- Hot air generator

The combustion air must be free from any aggressive substances (Halogen, Chloride, Fluoride, etc) and contamination (dust, building materials, vapours, etc). For many cases an external air ducting to the burner is recommended as an option.

Permissible ambient conditions:

- Ambient temperature
-10 to +40 °C (14 to 104F)
-15 to +40 °C (5 to 104F)
- Air humidity: max. 80 % relative humidity, no condensation
- Suitable only for indoor operation
- For installation in unheated rooms under some circumstances special solutions are required (contact Weishaupt)

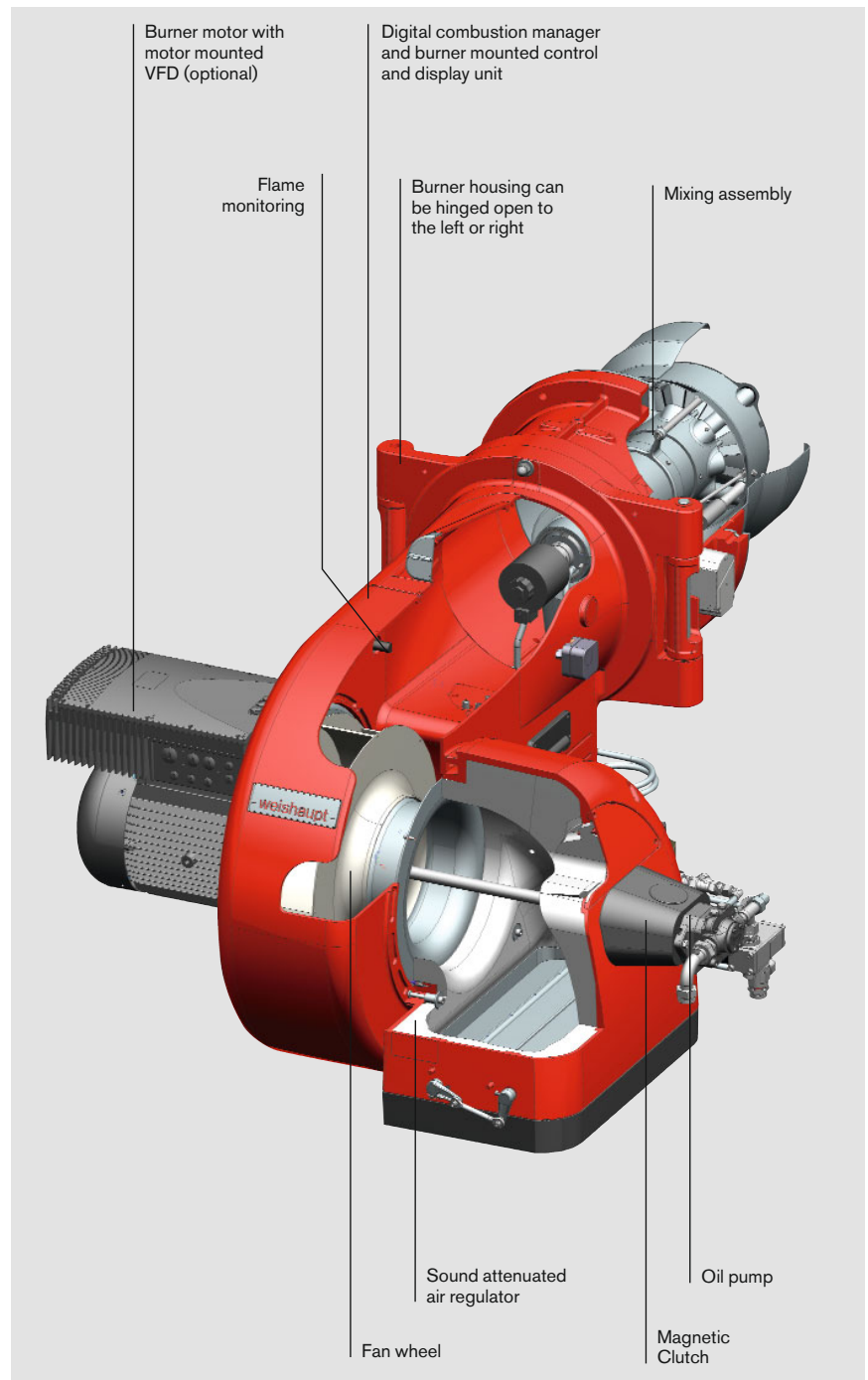
Any discrepancy from the above described applications requires written confirmation from Weishaupt Corporation. The maintenance interval could be shortened according to conditions where the burners are installed.

Approvals

WM 50 series burners are in compliance with most European and North American applicable standards.

The most important advantages at a glance:

- Digital combustion management with electronic fuel air ratio controller
- Quiet operation due to air inlet equipped with sound absorbing material as standard
- High performance blower due to specially designed blower geometry and air damper control system
- All WM 50 burners are equipped with modulating sliding sleeve to match required firing rate
- Protection class IP 54 as standard
- Electromagnetic clutch included as standard on dual fuel burners (WM-GL50)
- Easy access to all components, such as: mixing head, air damper and combustion manager
- Safe operation with sliding two stage/modulating operation as standard depending on type of modulating controller
- Computer aided function test of each individual burner in factory
- Excellent price to performance ratio
- Worldwide service network



WM-GL50 version ZM-R-NR

Overview of operating modes

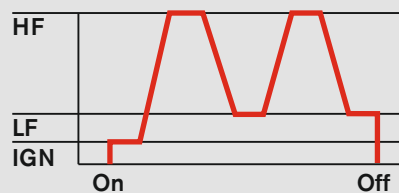
Burner's nomenclature

Operation with oil

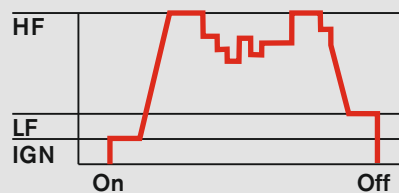
Sliding-two-stage or modulating operation (R)

- Burner ignites at dedicated ignition position by opening oil solenoid valves
- A digital stepping motor drives the oil regulator to high fire
- Capacity regulation between low and high fire achieved by opening and closing of the oil regulator
- Modulating operation:
 - W-FM 100 with integral load controller
 - W-FM 200

sliding two stage



modulating



HF = Highfire
 LF = Lowfire
 IGN = Ignition

Operation with gas

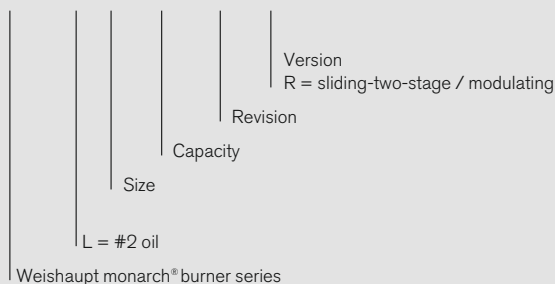
Sliding-two-stage or modulating operation (ZM)

- Stepping motors adjust the capacity between low and high fire depending on the heat demand
- There is a gradual change between both operating points. There are no sudden, large changes in fuel throughput.
- Modulating operation:
 - W-FM 100 with integral load controller
 - W-FM 200

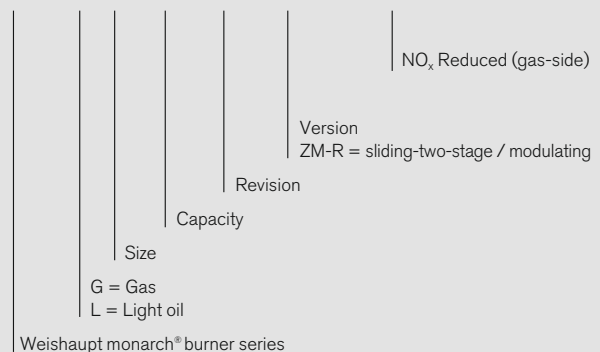
Fuel Version	Oil		Gas	
	sliding-two-stage	modulating	sliding-two-stage	modulating
ZM-NR			●	●
ZM-R-NR	●	●	●	●

Nomenclatures

WM - L 50 / 2 -A / R



WM - GL50 / 2 -A / ZM - R - NR



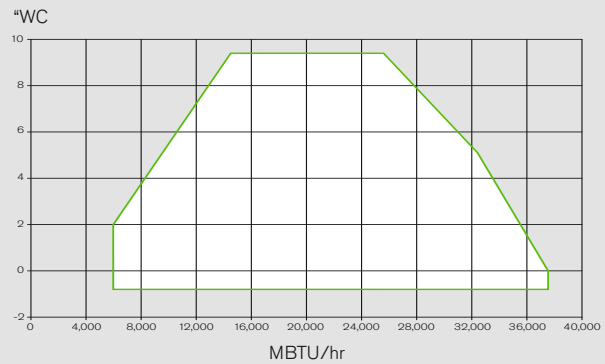
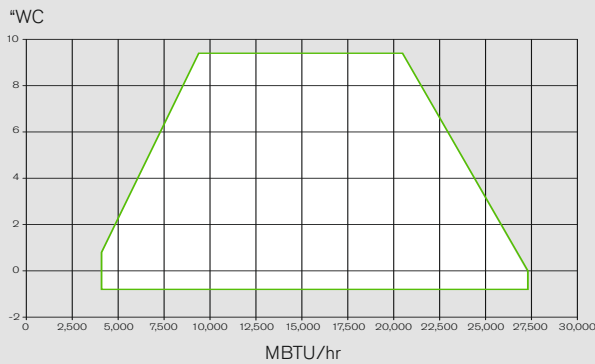
Burner selection WM-L50, version R

Burner model
Combustion head
Capacity MBTU/h

WM-L50/1-A /R
WM-G(L)50/1, 281K x 75
#2 Oil 4,100 – 27,300

Burner model
Combustion head
Capacity MBTU/h

WM-L50/2-A /R
WM-G(L)50/2, 345K x 100
#2 Oil 5,975 – 37,540



Burner order numbers

Burner model	Version	Order No.
WM-L50/1-A	R	215 520 10
WM-L50/2-A	R	211 520 20

The firing rates are based on an installation altitude of 1,640 ft (500 m). A reduction of burner capacity of 1 % for every 325 ft (100 m) should be taken into consideration in case of installation altitude above 0 ft.

Voltages and frequencies:

The burners are equipped with three phase motor in 208 - 600 V, 60 Hz as standard. Different voltage and frequency are available upon request.

Standard burner motor:

Insulation class F, protection IP 54.

Burner selection

WM-G(L)50, versions ZM-NR and ZM-R-NR

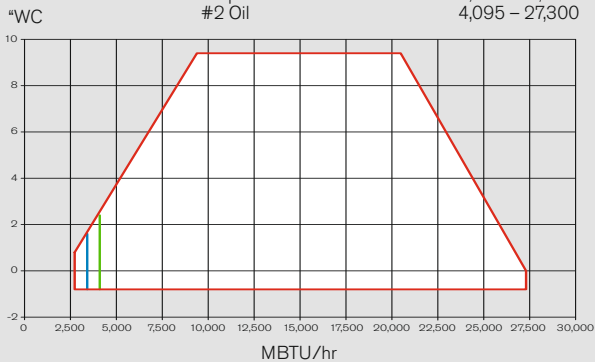
Burner model WM-G50/1-A ZM-NR
WM-GL50/1-A ZM-R-NR

Combustion head WM-G(L)50/1, 281K x 75

Capacity MBTU/h Natural gas 2,730 – 27,300

Propane 3,415 – 27,300

#2 Oil 4,095 – 27,300



— Natural gas
— LPG
— Light oil

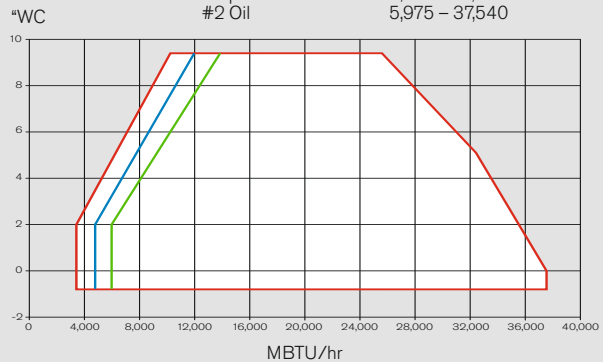
Burner model WM-G50/2-A ZM-NR
WM-GL50/2-A ZM-R-NR

Combustion head WM-G(L)50/2, 345K x 100

Capacity MBTU/h Natural gas 3,415 – 37,540

Propane 4,780 – 37,540

#2 Oil 5,975 – 37,540



The firing rates are based on an installation altitude of 0 ft (0 m). A reduction of burner capacity of 1 % for every 325 ft (100 m) should be taken into consideration in case of installation altitude above 0 ft.

Voltages and frequencies:

The burners are equipped with three phase motor in 208 - 600 V, 60 Hz as standard. Different voltage and frequency are available upon request.

Standard burner motor:

Insulation class F, protection IP 54.

Burner order numbers

Burner model	Version	Order No.
WM-G50/1-A	ZM-NR	217 520 13
WM-G50/2-A	ZM-NR	217 520 14

Burner model	Version	Order No.
WM-GL50/1-A	ZM-R-NR	218 520 13
WM-GL50/2-A	ZM-R-NR	218 520 14

Standard scope of supply

Description	WM-L50 R	WM-G50 ZM-NR	WM-GL50 ZM-R-NR
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 display and operating unit, flame sensor, actuators, flange gasket, limit switch on hinged flange, mounting studs	●	●	●
Digital combustion manager W-FM 100 W-FM 200	● ○	● ○	● ○
Two main gas safety shut off valves	–	●	●
Gas butterfly valve	–	●	●
Air pressure switch	○	●	●
Low and high gas pressure switches	–	●	●
Modulating sliding sleeve	●	●	●
Actuators for electronic fuel air ratio controller W-FM:			
Air damper stepping motor	●	●	●
Gas butterfly valve stepping motor	–	●	●
Oil regulator stepping motor	●	–	●
Sliding sleeve stepping motor	●	●	●
Oil pressure switch in return	●	–	●
Burner mounted oil pump	●	–	●
Oil hoses	●	–	●
2 oil solenoid valves, oil regulator, nozzle head with solenoid valve, premounted spill type nozzle and safety shut-off device	●	–	●
Electromagnetic clutch	○	–	●
IP 54 protection	●	●	●

● Standard
○ Optional

Accessories

WM-L50, version R and WM-G50, version ZM-NR

Version R		WM-L50/1-A	WM-L50/2-A
Combustion head extension	by 6" (150 mm)	on request	on request
	by 12" (300 mm)	on request	on request
Air inlet flange for duct connection, with additional air pressure switch		on request	on request
Air pressure switch		on request	on request
W-FM 100 supplied loose		210 032 08	210 032 08
W-FM 200 in lieu of W-FM 100 with built in modulating controller, analog signal convertor and VFD module with optional fuel metering	fitted	210 032 09	210 032 09
	loose	210 032 10	210 032 10
Low and high oil pressure switches in supply line		on request	on request
QRI flame sensor in lieu of QRB		210 030 24	210 030 24
VFD with motor mounted frequency drive (W-FM 200 required)		on request	on request
VFD with remote frequency drive (W-FM 200 required)		on request	on request
Special voltage		on request	on request
Version ZM-NR		WM-G50/1-A	WM-G50/2-A
Combustion head extension	by 6" (150 mm)	on request	on request
	by 12" (300 mm)	on request	on request
Solenoid valve for air pressure switch test for continuous-run fan or post-purge		250 030 21	250 030 21
Air inlet flange for duct connection, with additional air pressure switch		on request	on request
W-FM 100 supplied loose		210 032 08	210 032 08
W-FM 200 in lieu of W-FM 100 with built in modulating controller, analog signal convertor and VFD module with optional fuel metering	fitted	210 032 09	210 032 09
	loose	210 032 10	210 032 10
VFD with motor mounted frequency drive (W-FM 200 required)		on request	on request
VFD with remote frequency drive (W-FM 200 required)		on request	on request
Offset gas butterfly valve for vertical firing		on request	on request

Accessories

WM-GL50, version ZM-R-NR

Version ZM-R-NR		WM-GL50/1-A	WM-GL50/2-A
Combustion head extension	by 6" (150 mm)	on request	on request
	by 12" (300 mm)	on request	on request
Solenoid valve for air pressure switch test for continuous-run fan or post-purge		250 030 21	250 030 21
Air inlet flange for duct connection, with additional air pressure switch		on request	on request
Low and high oil pressure switches in supply line		on request	on request
W-FM 100 supplied loose		210 032 08	210 032 08
W-FM 200 in lieu of W-FM 100 with built in modulating controller, analog signal convertor and VFD module with optional fuel metering	fitted	210 032 09	210 032 09
	loose	210 032 10	210 032 10
VFD with motor mounted frequency drive (W-FM 200 required) ¹⁾		on request	on request
VFD with remote frequency drive (W-FM 200 required) ¹⁾		on request	on request
Offset gas butterfly valve for vertical firing		on request	on request

¹⁾ VFD with ZM-R-NR version burners: general conditions for VFD operation when firing on oil
 – Frequency: min. 35 Hz
 – Turndown: max. 5:1

Technical data

Oil burners

Oil burners		WM-L50/1-A	WM-L50/2-A
Burner motor	Weishaupt model	WM-D160/240-2/16K5	WM-D160/240-2/21K0
Rated power	HP (kW)	23 (17.2)	28 (21)
Full load amps (FLA)	A (@460 V)	30	34
Motor fuse (YΔ start)	A minimum	50A (external)	50A (external)
Speed (60 Hz)	rpm	3,580	3,550
Combustion manager	model	W-FM 100	W-FM 100
Flame monitoring	model	QRB	QRB
Oil actuator	model	SQM45	SQM45
Air/sliding sleeve actuator	model	SQM48	SQM48
Weight	lbs (kg)	1,004 (455)	1,037 (470)
Integral pump	model	T3	T3
Max. flow rate	GPH (l/h)	658 (2,490)	658 (2,490)
Oil hoses	DN / Length	1" / 50" (25 / 1300)	1" / 50" (25 / 1300)

Voltages and frequencies:

The burners are equipped with three phase motor in 208 - 600 V, 60 Hz as standard. Different voltage and frequency are available upon request.

Standard burner motor:

Insulation class F, protection IP 54.

Technical data

Gas and dual fuel burners

Gas burners		WM-G50/1-A	WM-G50/2-A
Burner motor	Weishaupt model	WM-D 160/240-2/14K5	WM-D 160/240-2/19K0
Rated power	HP (kW)	20 (15)	25.4 (19)
Full load amps (FLA)	A (@460 V)	26	31
Motor fuse (YΔ start)	A minimum	40A (external)	50A (external)
Speed (60 Hz)	rpm	3,570	3,560
Combustion manager	model	W-FM 100	W-FM 100
Flame monitoring	model	ION	ION
Gas actuator	model	SQM45	SQM45
Air/sliding sleeve actuator	model	SQM48	SQM48
Weight (excl. gas train)	lbs (kg)	915 (415)	948 (430)

Dual-fuel burners		WM-GL50/1-A	WM-GL50/2-A
Burner motor	Weishaupt model	WM-D 160/240-2/16K5	WM-D 160/240-2/21K0
Rated power	HP (kW)	23 (17.2)	28 (21)
Full load amps (FLA)	A (@460 V)	30	34
Motor fuse (YΔ start)	A minimum	50A (external)	50A (external)
Speed (60 Hz)	rpm	3,580	3,550
Combustion manager	model	W-FM 100	W-FM 100
Flame monitoring	model	QRI	QRI
Gas/oil actuator	model	SQM45	SQM45
Air/sliding sleeve actuator	model	SQM48	SQM48
Weight (excl. gas train)	lbs (kg)	1,015 (460)	1,048 (475)
Integral pump	model	T3	T3
Max. flow rate	GPH (l/h)	658 (2,490)	658 (2,490)
Oil hoses	DN / Length	1" / 50" (25 / 1300)	1" / 50" (25 / 1300)

Voltages and frequencies:

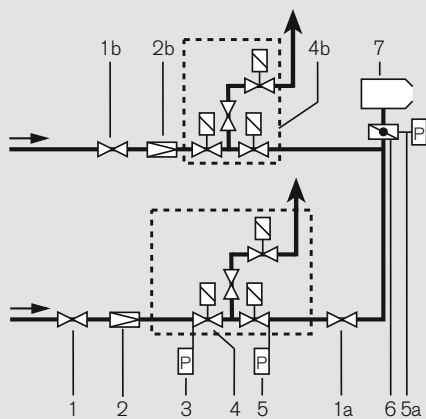
The burners are equipped with three phase motor in 208 - 600 V, 60 Hz as standard. Different voltage and frequency are available upon request.

Standard burner motor:

Insulation class F, protection IP 54.

Fuel systems

Gas train schematic*



- 1 Ball valve
- 1a Ball valve
- 1b Ball valve on pilot gas train
- 2 Gas pressure regulator
- 2b Pilot gas pressure regulator
- 3 Low gas pressure switch
- 4 2 main gas SSOVs and 1 N/O vent valve
- 4b 2 pilot gas SSOVs and 1 N/O vent valve
- 5 High gas pressure switch
- 5a High gas pressure switch
- 6 Gas butterfly valve
- 7 Burner

* The above schematic shows typical gas train configuration only. The actual gas train configuration shipped with burner might differ depending on applicable codes/ regulation and application.

Gas train arrangement

For boiler with hinged door the gas train must be installed on the opposite side of the boiler door hinge.

Gas train installation

Gas train must be mounted tension free. Do not compensate misalignment by over tightening. Distance between burner and gas valves should be as small as possible. Pay attention to the correct gas flow direction.

Gas train support

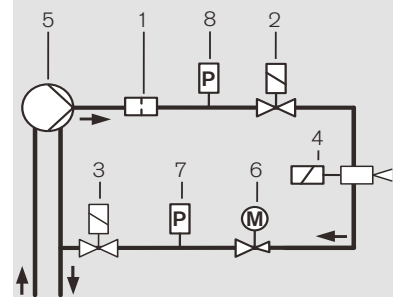
The gas train must be fixed and supported securely. They must not be allowed to vibrate during operation. Support suitable for the site should be fitted during installation.

Gas meter

For commissioning a gas meter is required to verify exact gas consumption.

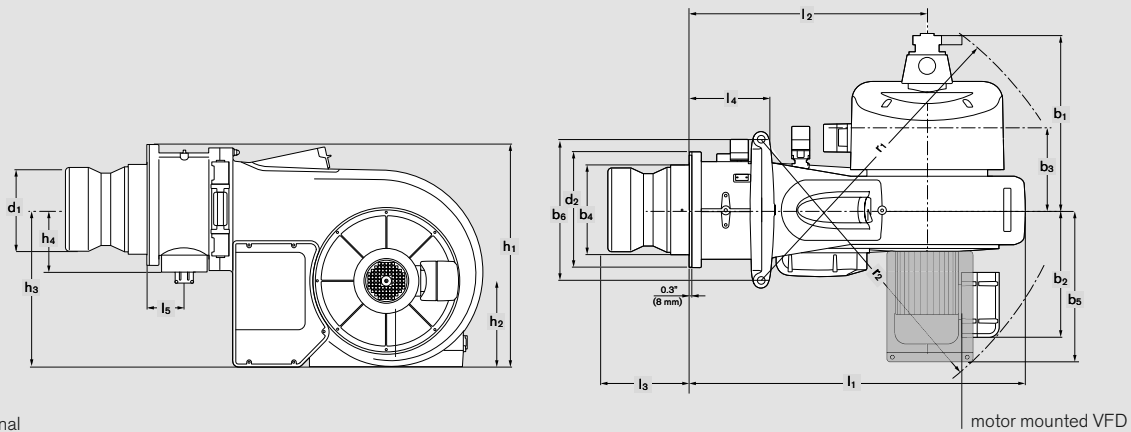
Oil function schematics

Version ZM-R



- 1 Strainer
- 2 Oil solenoid valve in supply line
- 3 Oil solenoid valve in return line
- 4 Nozzle head with spill type nozzle
- 5 Burner mounted oil pump
- 6 Oil regulator
- 7 High oil pressure switch in return line
- 8 Low/High oil pressure switch in supply line (optional)

Dimensions



Optional

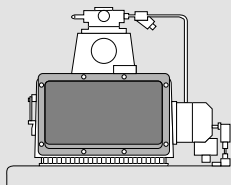
Burner model	Dimensions in inches and (mm)													
	l ₁	l ₂	l ₃	l ₄	l ₅	b ₁	b ₂	b ₃	b ₄	b ₅	b ₆	r ₁	r ₂ *	
WM-L50/1-A R	63.6 (1616)	45.1 (1146)	17.4 (442)	13.7 (348)	–	28.8 (731)	25.7 (654)	15.9 (403)	16.9 (430)	27.7 (704)	26.8 (680)	57.8 (1467)	57.1 (1450)	
WM-L50/2-A R	64.4 (1636)	45.9 (1166)	18.0 (457)	14.5 (368)	–	28.8 (731)	25.7 (654)	15.9 (403)	20.1 (510)	27.7 (704)	26.8 (680)	57.8 (1467)	57.1 (1450)	
WM-G50/1-A ZM-NR	63.6 (1616)	45.1 (1146)	17.4 (442)	13.7 (348)	7.0 (178)	24.8 (629)	25.7 (654)	15.9 (403)	16.9 (430)	27.7 (704)	26.8 (680)	57.8 (1467)	57.1 (1450)	
WM-G50/2-A ZM-NR	63.6 (1616)	45.9 (1166)	18.0 (457)	14.5 (368)	7.3 (186)	24.8 (629)	25.7 (654)	15.9 (403)	20.1 (510)	27.7 (704)	26.8 (680)	57.8 (1467)	57.1 (1450)	
WM-GL50/1-A ZM-R-NR	63.6 (1616)	45.1 (1146)	17.4 (442)	13.7 (348)	7.0 (178)	33.7 (856)	25.7 (654)	15.9 (403)	16.9 (430)	27.7 (704)	26.8 (680)	60.4 (1533)	57.1 (1450)	
WM-GL50/2-A ZM-R-NR	64.4 (1636)	45.9 (1166)	18.0 (457)	14.5 (368)	7.3 (186)	33.7 (856)	25.7 (654)	15.9 (403)	20.1 (510)	27.7 (704)	26.8 (680)	60.4 (1533)	57.1 (1450)	

All dimensions are approximate only. Weishaupt reserves the right to make changes in light of future developments.

* Without variable frequency drive (VFD)

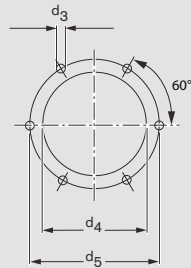
Dimensions

**Ducted air intake
bottom view**

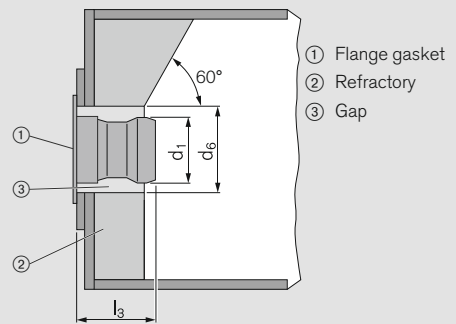


Boiler plate mounting dimensions

WM 50/1 and WM 50/2



Mounting to heat exchanger



Burner model	Dimensions in mm										Gas butterfly size
	h1	h2	h3	h4	d1	d2	d3	d4	d5	d6	
WM-L50/1-A R	41.7 (1058)	16.3 (414)	29.8 (758)	–	15.9 (403)	20.5 (520)	M16	17.1 (435)	18.5 (470)	17.3 (440)	–
WM-L50/2-A R	42.2 (1071)	16.3 (414)	29.8 (758)	–	19.1 (485)	24.8 (630)	M16	20.9 (530)	22.8 (580)	20.9 (530)	–
WM-G50/1-A ZM-NR	41.7 (1058)	16.3 (414)	29.8 (758)	11.9 (302)	15.9 (403)	20.5 (520)	M16	17.1 (435)	18.5 (470)	17.3 (440)	DN100
WM-G50/2-A ZM-NR	42.2 (1071)	16.3 (414)	29.8 (758)	13.9 (352)	19.1 (485)	24.8 (630)	M16	20.9 (530)	22.8 (580)	20.9 (530)	DN100
WM-GL50/1-A ZM-R-NR	41.7 (1058)	16.3 (414)	29.8 (758)	11.9 (302)	15.9 (403)	20.5 (520)	M16	17.1 (435)	18.5 (470)	17.3 (440)	DN100
WM-GL50/2-A ZM-R-NR	42.2 (1071)	16.3 (414)	29.8 (758)	13.9 (352)	19.1 (485)	24.8 (630)	M16	20.9 (530)	22.8 (580)	20.9 (530)	DN100

All dimensions are approximate only. Weishaupt reserves the right to make changes in light of future developments.

That is not a Facade. Weishaupt has been one of the leading company in heating and combustion industry since years with headquarter in Schwendi and branches all over the world. That is Reliability.



Weishaupt is Reliability.

The family business in Schwendi was established by Max Weishaupt in 1932. Represented in 55 countries by branch offices and subsidiaries Weishaupt is international leader in the areas of combustion technology and heating applications.

Trustworthy, quality, good customer service, innovation and experience are values on which the Pioneer Max Weishaupt established his company. All this combined in a word is reliability.

Therefore stands Weishaupt today.



– weishaupt –

Weishaupt Corporation
6280 Danville Road
Mississauga, ON L5T 2H7, Canada
Ph: (905) 564 0946
Fax: (905) 564 0949
www.weishaupt-corp.com

Weishaupt America Inc.
2587 Millenium Drive, Unit A
Elgin, IL 60124, USA
Ph: (847) 531 5800
Fax: (847) 531 5855
www.weishaupt-america.com

Print No. 83215216, July 2014
Printed in Germany. All rights reserved.



Regular maintenance reduces heating costs and environmental pollution. Only a properly adjusted burner can save energy and be environmentally friendly. Behind each Weishaupt burner stands the whole Weishaupt customer service organization. The outstanding efforts made in maintenance and service justify the enormous trust placed in Weishaupt's burners, for at Weishaupt, product and customer service belong together.

Weishaupt customer service is there for you all year round. Whenever you need help, be it the supply of spare parts, technical advice or a site visit. We are there when you need us.