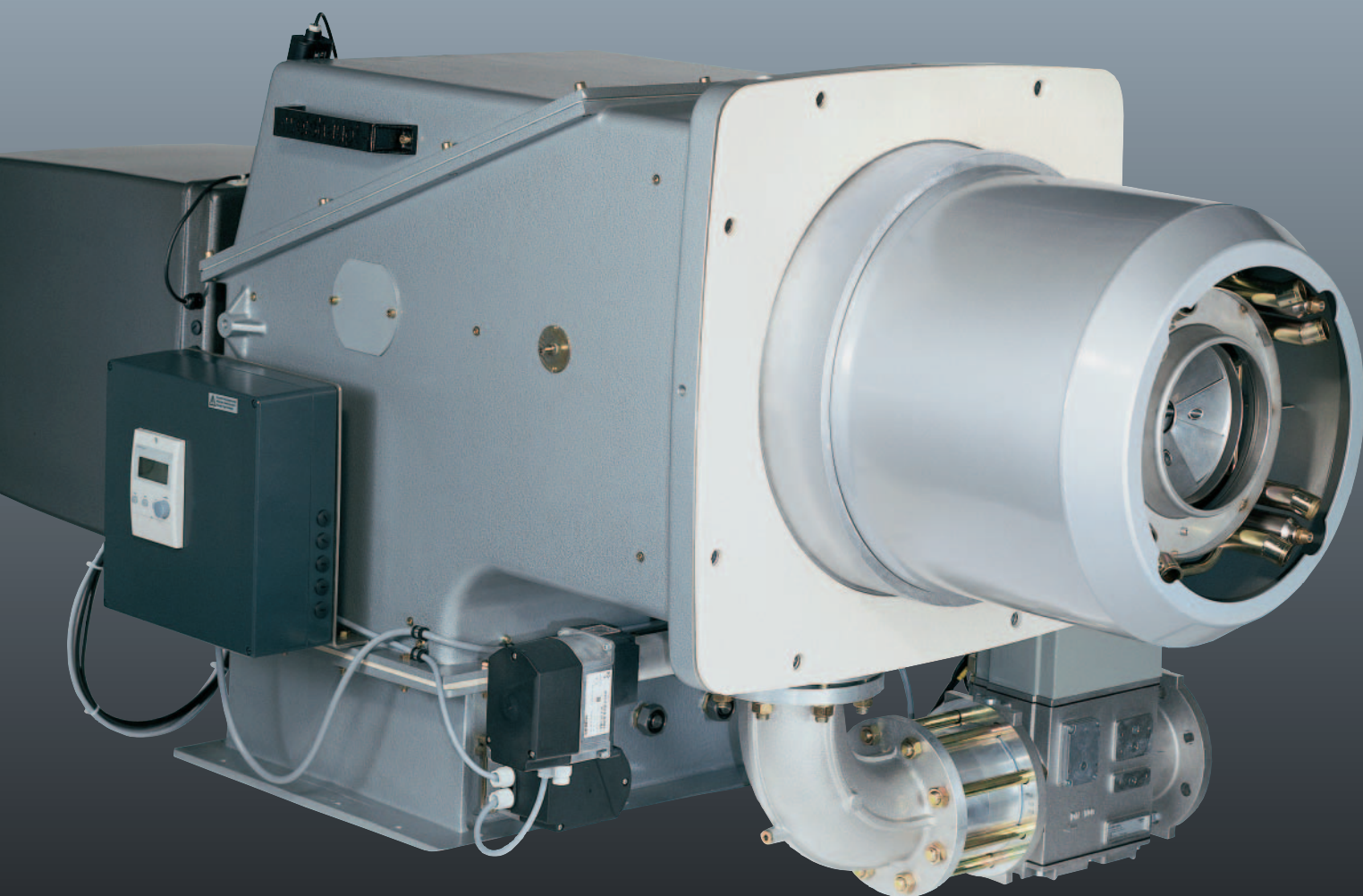


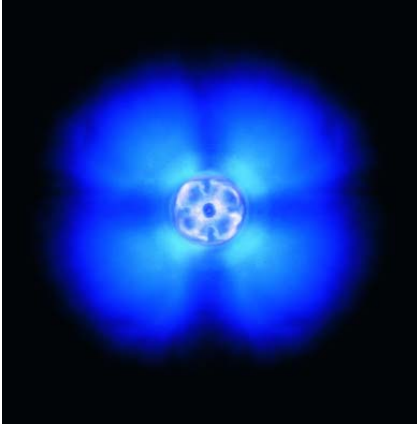
Weishaupt WKGL70 dual fuel burner Version 3LN (Low NO_x) multiflam®

1/2003 GB

–weishaupt–



Description



Weishaupt WK series industrial burners have been especially designed for industrial capacity ranges. The 'construction kit' principle enables these burners to be matched to numerous special applications.

The 3LN version of the Weishaupt WKGL70 burner enables a reduction in emissions that, until recently, would not have been considered possible for ratings up to 12 MW.

Modern, proven combustion technology

The patented fuel distribution principle has opened a new chapter in the history of LowNO_x burners.

A small proportion of the fuel is combusted centrally with a yellow-coloured core or primary flame. Simultaneously, the larger part of the fuel is sprayed from the combustion head via the concentrically arranged atomising nozzles into the fast moving combustion air.

This fuel/air mixture mixes in the combustion chamber with hot, recirculated combustion gases. The heat causes the finely atomised fuel to begin to gasify. The mixture ignites and is fully combusted in the main flame. Along with the core flame, a narrow continuous main flame is formed, which is almost blue like a gas flame.

Weishaupt multiflam® burners have proved themselves well during hard, daily operation. In Switzerland particularly, which has Europe's most stringent emission limits, there are many Weishaupt multiflam® burners in use already on combustion plant.

Exemplary emission figures

Weishaupt multiflam® technology enables even industrial sized burners to reduce emissions to levels that for years were considered to be unachievable. With suitable combustion chamber conditions, Weishaupt multiflam® burners can considerably undercut all the emission limits for larger combustion plant currently in force worldwide.

Digital combustion management

The W-FM 100 and W-FM 200 combustion managers ensure the simple and safe operation of combustion plant.

All important functions, such as fuel and air feed or flame monitoring are controlled with digital precision. The aim is the optimisation of operational functions, the maximisation of economy, and the minimisation of emissions. Thanks to digital combustion management such an optimisation is available today at limited cost. The outlay for installation and service is substantially lower than with conventional technologies.

For example, a separate control panel for the burner switchgear is no longer necessary. Furthermore, remote operation, diagnosis and monitoring of the plant can be realised. That makes things safer and simpler for the operator.

Applications

The burners can be used with heat exchangers such as hot water boilers, steam boilers, air heaters, and for certain process applications.

Low NO_x operation

The dimensions and volume loading of the combustion chamber are critical for Low NO_x emissions. The various NO_x levels and the combustion chamber requirements can be found in the publication "Conditions for attaining the NO_x emission values for Weishaupt burners".

The burner is not suitable for use on reverse flame boilers.

Saving energy with speed control and O₂ trim

Electrical consumption is a cost factor for large plant. Speed control utilises a frequency converter to vary the speed of the fan to match the amount of combustion air to the current fuel throughput.

This enables a considerable saving of electrical energy, particularly at partial load.

O₂ trim ensures optimal combustion, efficiency by continually monitoring the flue gases, thus reducing fuel consumption.

Both speed control and O₂ trim are effected by the W-FM 200 digital combustion manager.

Fuels

- Light fuel oil EL - DIN 51603-1
- Natural Gases E and LL - EN 437

Installation sites

In standard execution (materials, construction, protection), the burners are suitable for use indoors at temperatures between -15°C and +40°C and with a maximum relative humidity of 80%.

Certification

The burners have been independently tested and comply with the following European standards and EC directives:

- EN 267 / 676
(Best, Class 3 emission levels for light oil and natural gas)
- Machinery Directive 98/37/EC
- Electromagnetic Compatibility Directive 89/336/EEC
- Low Voltage Directive 73/23/EEC
- Gas Appliance Directive 90/396/EEC
- Pressure Vessel Directive 97/23/EC

Outstanding service

Weishaupt maintains an extensive global sales and service network. Customer service is available every day around the clock. In-house training by Weishaupt ensures the high standard of their service engineers.

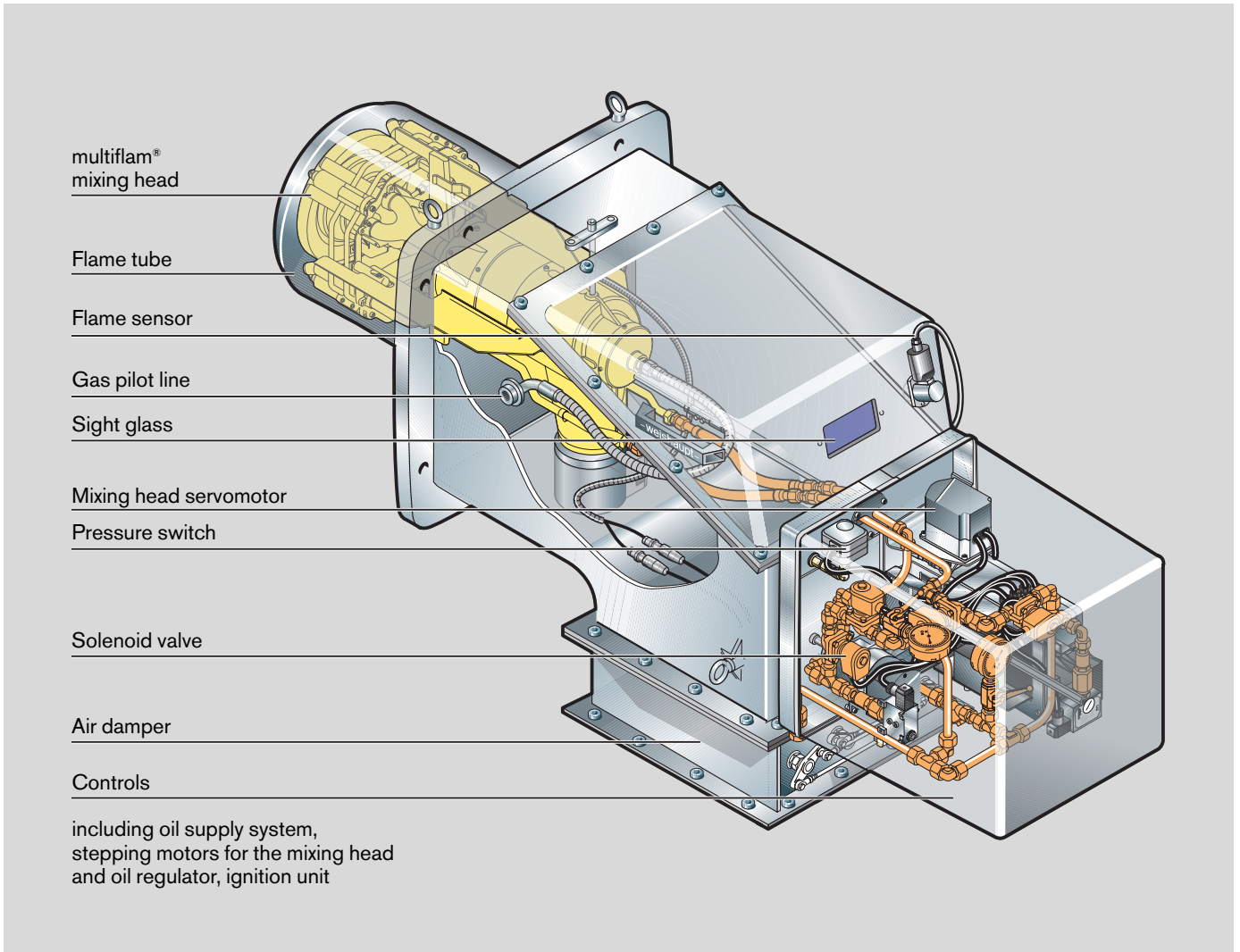
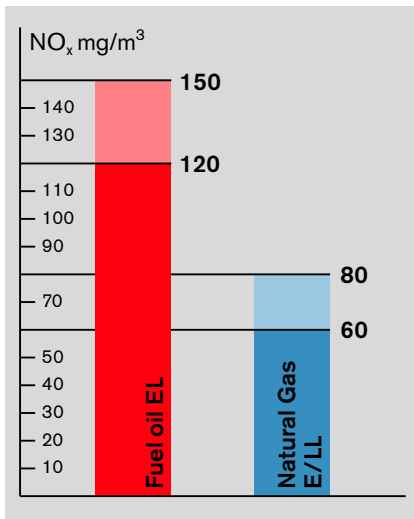


Diagram of Weishaupt WKGL70 burner



Out performance of the most stringent emission levels

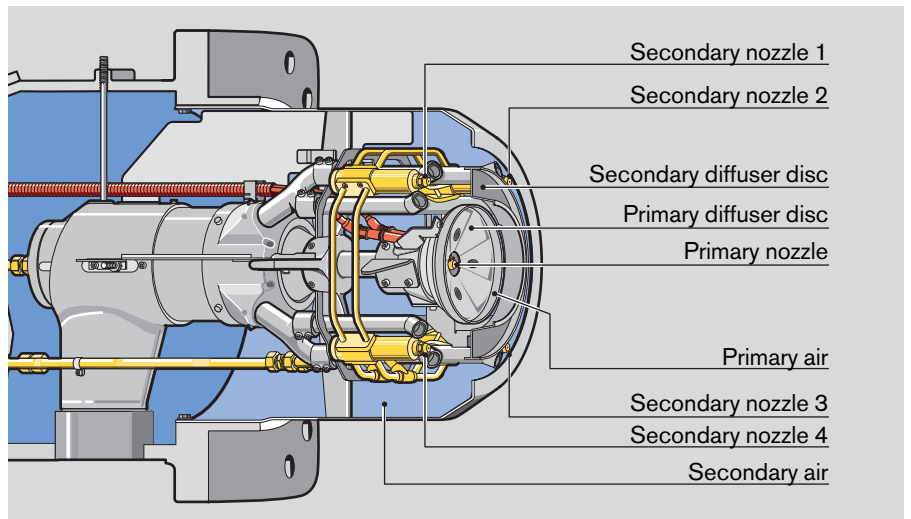


Diagram of the mixing head

The advantages of digital combustion management



Control and Display Unit

Digital combustion management means optimal combustion figures, continually reproducible setting figures, and ease of use.

Weishaupt burners are equipped with electronic compound and digital combustion management since modern combustion technologies demand a precise, continually reproducible dosing of fuel and combustion air. Only in this way can optimal combustion figures be ensured over extended periods.

If required, the burners can also be equipped with O₂ trim and speed control.

Error free operation via a clear text display.

Setting and control of the burner functions is achieved using a control and display unit with a clear text display. The CDU is linked to the combustion manager via a safety bus system and can be placed anywhere the user chooses within 100 m of the burner.

Flexible communication possibilities

The inbuilt interface enables all necessary information and functions to be relayed to a BMS system. If required, a modem enables a telephone connection to be installed for remote operation (e.g. oil/gas change-over, adjustment of setting values) and remote diagnosis.

Communication with external systems via Bus.

If data has to be exchanged between burners and other heating systems with PLC devices, Weishaupt E-Gate acts as a gateway and translates the eBus protocol into the standard Profibus DP protocol.

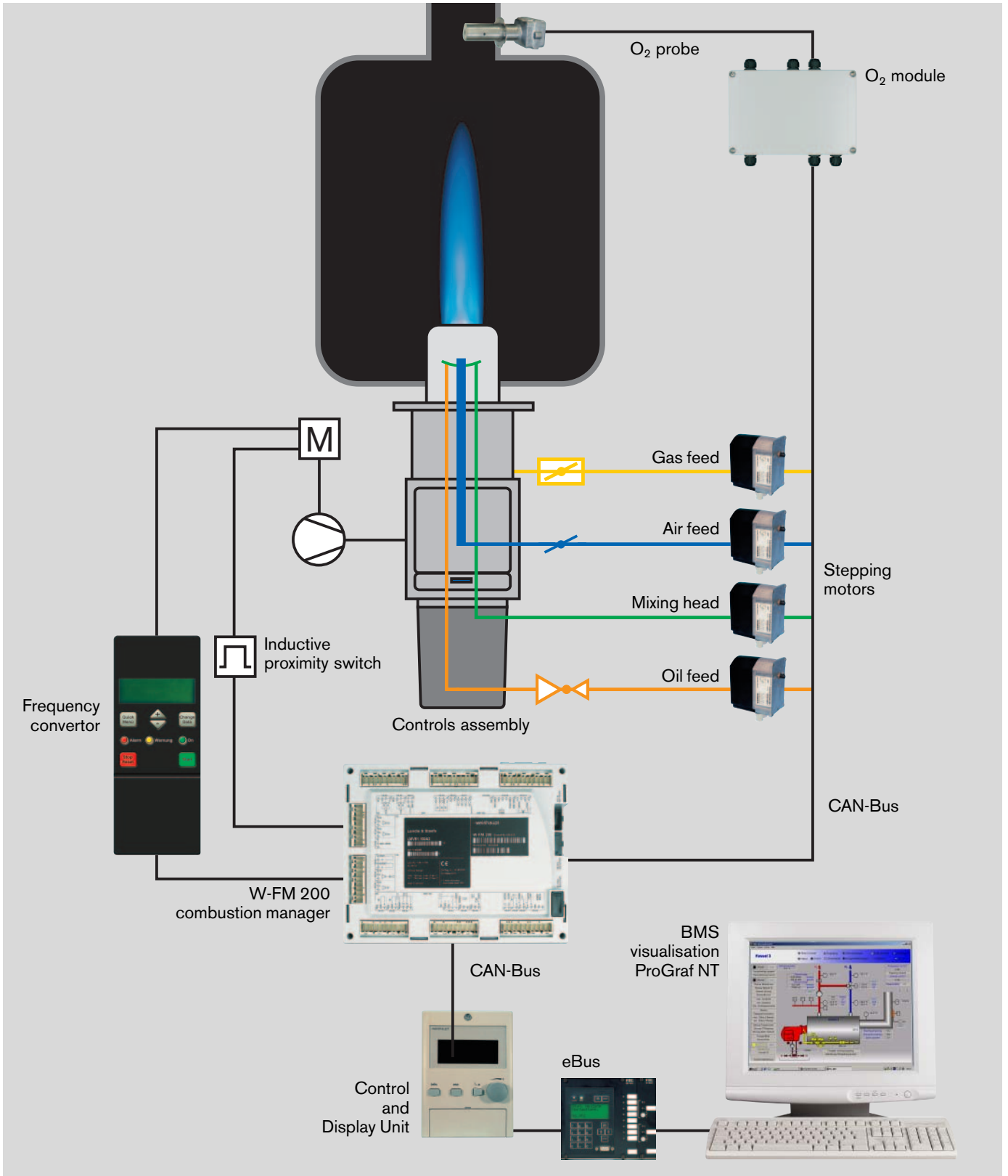
Integration with building management

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

The price advantage of new technology

With improved technology and ease of use, combustion plant is becoming even more economical.

- No additional burner controls are required, since this effected by the combustion manager. Contactors and burner motor fuses are the only additional items required.
- Less installation work means fewer errors: the burners are tested as a complete unit at the factory.
- No additional costs for valve proving.
- If required, the W-FM 100 can be fitted with a capacity regulator and speed control module. No separate equipment is required. The capacity regulator and speed control module are included as standard with the W-FM 200.
- Commissioning and service work takes less time. The initial pre-setting of the burner is carried out at the factory. On site, only the site specific load points have to be determined.
- To facilitate O₂ trim, only an O₂ probe and O₂ module have to be installed and connected with the W-FM 200 via the internal safety bus.



Capacity overview

Capacity overview

Burner type	Version	Fuel	Capacity range kW	kg/h	Capacity range (kW)					
					0	2000	4000	6000	8000	10000
WKGL70/1-B	3LN	Nat. Gas	1000 – 10000	130 – 840						
		Oil	1550 – 10000							
WKGL70/2-A	3LN	Nat. Gas	1100 – 12000	150 – 1007						
		Oil	1800 – 12000							

The full-tone and half-tone areas together show the total ratings range. When sizing burners ensure that the required nominal rating lies within one of the full-tone areas.

The stated oil throughputs refer to light oil EL with a calorific value of 11.91 kWh/kg.

Nat. Gas = Natural gas E/LL

Turndown on dual fuel burners

Oil side: < 1:4 Gas side: < 1:8 The lower rating must lie with the capacity range of the burner.

Type overview

Burner type	Version	Regulation	Capacity	Oil throughput	Combustion head	DIN CERTCO Reg. No.
Dual fuel burner for light oil up to 6 mm ² /s at 20°C in accordance with DIN 51 603 part 1, natural gases E & LL in accordance with EN 437						
WKGL70/1-B	3LN	modulating	1000 - 10000 kW	130 - 840 kg/h	G70/2-3LN	CE-0085AS0410
WKGL70/2-A	3LN	modulating	1100 - 12000 kW	150 - 1007 kg/h	WK70/2-3LN	CE-0085AS0410

Technical equipment

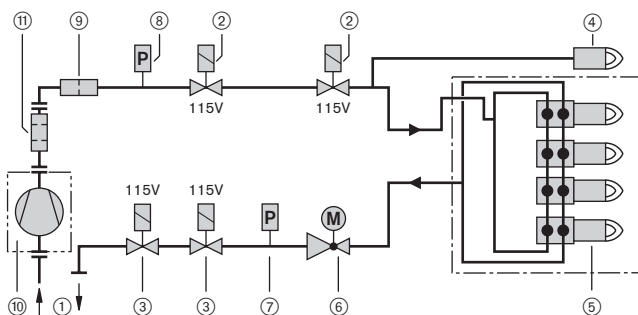
Technical equipment	Digital combustion manager	Servomotor	Ignition unit	Oil solenoid valve	Flame sensor	Weight
WKGL70/1-B WKGL70/2-A	W-FM100 or W-FM200	Air damper: SQM48/20Nm Oil regulator: SQM45 Gas butterfly: SQN45 Mixing head: SQM48/35Nm	Ignition transformer 2 x 7000 V	Flow: 321H2522 Return: 121G2520	QRI	310 kg

Electrical data

Mains voltage	Frequency	Capacity at start	Capacity in operation	Nominal load	W-FM internal fusing	External fusing
230 V	50 Hz	0.5 kW	0.3 kW	1.5 A	6.3 A Slow	10 A Slow

Nominal load of the fan motor: see planning documents for Weishaupt WK40 to WK70 burners, print N°. 83112402

Burner fuel system (oil side)



- ① Oil supply
- ② Solenoid valve supply (fitted in flow direction)
- ③ Solenoid valve return (fitted against flow direction)
- ④ Nozzle head with simplex nozzle and inbuilt shut off valve (primary nozzle)
- ⑤ Nozzle head HDK30 with spillback return nozzle (secondary nozzle)
- ⑥ Oil regulating valve
- ⑦ Oil return line pressure switch
- ⑧ Oil flow line pressure switch
- ⑨ Strainer
- ⑩ Separate pump station with pressure regulator
- ⑪ Filter (30 bar, 0.1 mm mesh) install near burner

WKGL70/1-B, vers. 3LN

Burner rating [kW]	Burner resistance (air) [mbar]	Low pressure supply (flow pressure in mbar before shut off valve) $P_{e,max} = 300$ mbar Nominal diameter of valve trains 65 80 100 125 150 Nominal diam. of gas butterfly valve 100 100 100 100 100	High pressure supply (flow pressure in mbar before solenoid valve) Nominal diameter of valve trains 65 80 100 125 150 Nom. diam. of gas butterfly valve 100 100 100 100 100
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Natural Gas E, $H_i = 37.26$ MJ/m³ (10.35 kWh/m³), $d = 0.606$

5000	29	191	95	55	39	32	119	62	40	30	27
6000	29	-	137	80	57	46	173	90	59	45	40
7000	30	-	186	108	76	62	-	123	80	61	54
8000	34	-	-	139	97	79	-	159	104	78	70
9500	37	-	-	156	109	89	-	179	116	87	78
9000	40	-	-	173	120	98	-	200	129	97	86
9500	44	-	-	-	133	108	-	-	143	107	95
10000	49	-	-	-	145	118	-	-	157	117	103

Natural Gas LL, $H_i = 31.79$ MJ/m³ (8.83 kWh/m³), $d = 0.641$

5000	29	-	134	77	53	43	171	87	56	41	36
6000	29	-	194	111	77	62	-	127	82	61	54
7000	30	-	-	151	104	85	-	174	112	84	74
8000	34	-	-	-	135	110	-	-	146	109	96
8500	37	-	-	-	152	123	-	-	164	122	108
9000	40	-	-	-	-	137	-	-	183	136	121
9500	44	-	-	-	-	152	-	-	-	151	134
10000	49	-	-	-	-	-	-	-	-	167	147

Burner type	Version	DIN-DVGW Reg. No. and type test No.	Valve train	Order No.
WKGL70/1-B 3LN		CE-0085AS0410	DN 65	278 703 34
			DN 80	278 703 44
			DN 100	278 703 54
			DN 125	278 703 64
WKGL70/2-A 3LN		CE-0085AS0410	DN 100	278 704 54
			DN 125	278 704 64
			DN 150	278 704 74

Fuel requirement at full load	Pump type	Max. pump supply rate
up to 500 kg/h	SPF / SPZ 20-38	1404 l/h
up to 600 kg/h	SPF / SPZ 20-46	1890 l/h
600 - 1007 kg/h	SPF / SPZ 40-38	3156 l/h

This arrangement for the pump selection differs from the WK planning documents

WKGL70/2-A, vers. 3LN

Burner rating [kW]	Burner resistance (air) [mbar]	Low pressure supply (flow pressure in mbar before shut off valve) $P_{e,max} = 300$ mbar Nominal diameter of valve trains 65 80 100 125 150 Nominal diam. of gas butterfly valve 100 100 100 100 100	High pressure supply (flow pressure in mbar before solenoid valve) Nominal diameter of valve trains 65 80 100 125 150 Nom. diam. of gas butterfly valve 100 100 100 100 100
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Natural Gas E, $H_i = 37.26$ MJ/m³ (10.35 kWh/m³), $d = 0.606$

9000	33	-	-	166	114	91	-	193	123	90	79
9500	36	-	-	-	126	101	-	-	136	100	88
10000	40	-	-	-	139	112	-	-	151	111	97
10500	43	-	-	-	153	123	-	-	166	122	107
11000	47	-	-	-	159	126	-	-	174	125	109
11500	52	-	-	-	-	147	-	-	199	146	129
12000	56	-	-	-	-	-	-	-	-	159	140

Natural Gas LL, $H_i = 31.79$ MJ/m³ (8.83 kWh/m³), $d = 0.641$

8000	28	-	-	185	124	99	-	-	135	98	85
9000	33	-	-	-	156	123	-	-	170	123	107
9500	36	-	-	-	-	137	-	-	189	136	119
10000	40	-	-	-	-	151	-	-	-	150	131
10500	43	-	-	-	-	-	-	-	-	165	143
11000	47	-	-	-	-	-	-	-	-	180	156
11500	52	-	-	-	-	-	-	-	-	196	170
12000	56	-	-	-	-	-	-	-	-	-	184

Burner resistance dependent on the burner rating at full load, with combustion air at a temperature of 20°C. The figures given for calorific value H_i are based on 0°C and 1013 mbar.

Note: The combustion chamber pressure in mbar must be added to the minimum gas pressure required. Please select combustion air fans from the WK40 - 70 Planning Documents (print No. 83112402).

For low pressure supplies, pressure regulating devices with safety membrane in accordance with EN 88 are used. The maximum permissible supply pressure before the shut off valve is 300 mbar. For high pressure supplies, high pressure regulating devices in accordance with EN 3380 can be selected from the brochure 'Pressure regulating units with safety assemblies for Weishaupt gas and dual fuel burners'. This details high gas pressure sets suitable for supply pressures of up to 4 bar.

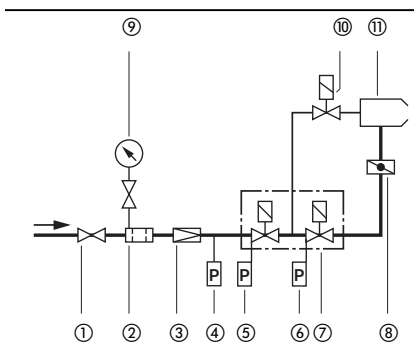
Voltagages and frequencies:

As standard, the burners are suitable for three phase alternating current 400 V, 3 ~, 50 Hz. Other voltages and frequencies available on request at no extra cost.

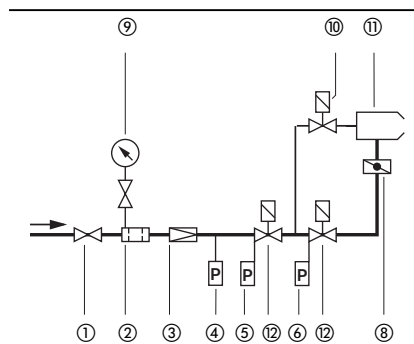
Standard burner motor:

Isolation class B_{trop} , IP 54 protection. Additional price for isolation class F motors available on request.

With DMV and W-FM 100 valve proving



With 2 solenoid valves and W-FM 100/200 valve proving



- ① Isolating cock
- ② Gas filter
- ③ Governor
- ④ High gas pressure switch (for TRD)
- ⑤ Low gas pressure switch
- ⑥ W-FM 100 valve proving
- ⑦ Double gas solenoid valve (DMV)
- ⑧ Gas butterfly valve
- ⑨ Gas pressure gauge and cock
- ⑩ Pilot line gas solenoid valve
- ⑪ Burner
- ⑫ Single gas solenoid valve

Dimensions

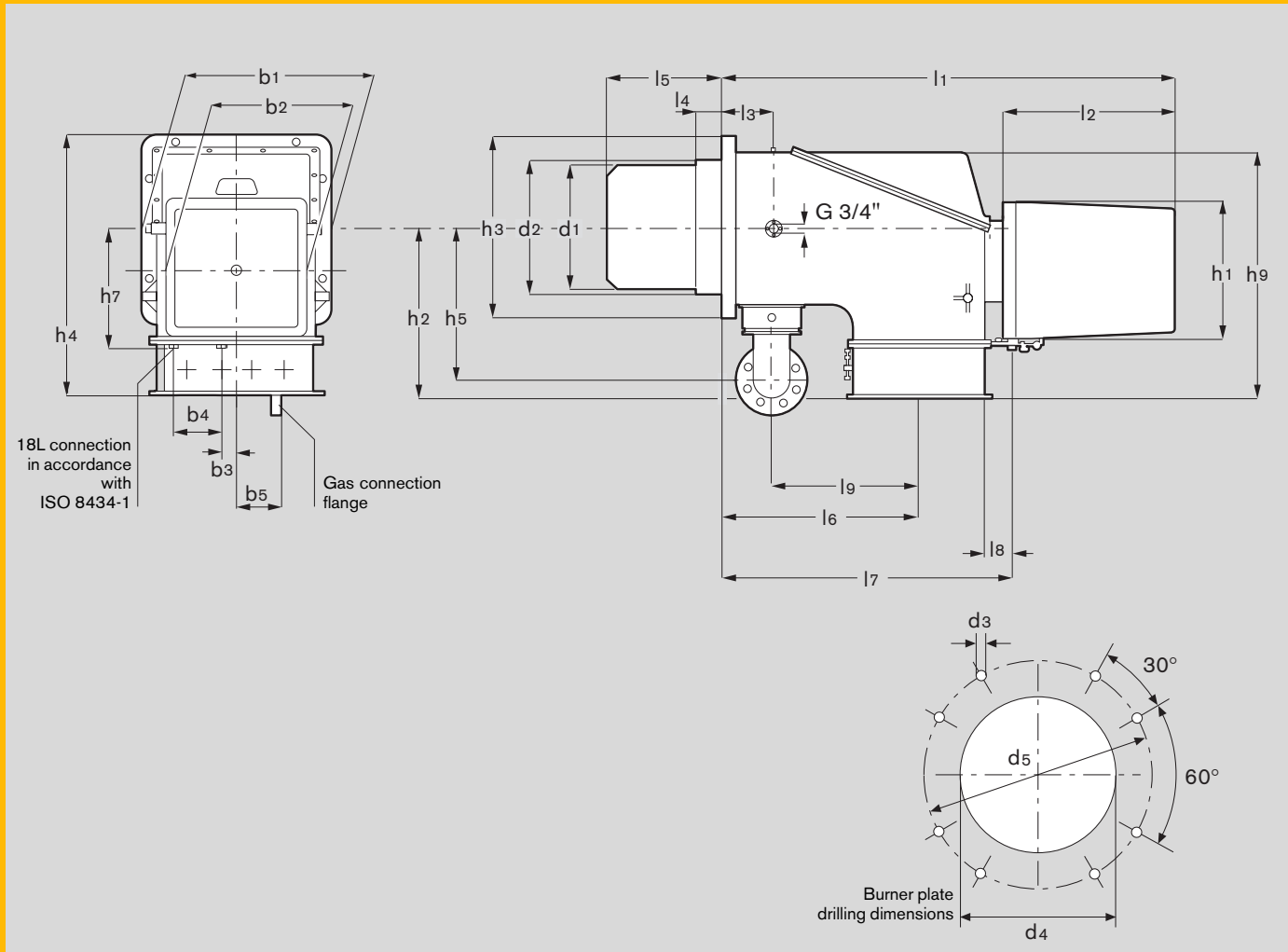
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Print No. 83204602, december 2004
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Burner type	l1	l2	l3	l4	l5	l6	l7	l8	l9	b1	b2	b3	b4	b5
WKGK70/1-B, 3LN 1690	650	315	90	475	730	1034	44	542	700	510	58	160	205	
WKGK70/2-A, 3LN 1690	650	315	90	475	730	1034	44	542	700	510	58	160	205	

Burner type	h1	h2	h3	h4	h5	h7	h9
WKGK70/1-B, 3LN 510	628	700	978	589	450	915	
WKGK70/2-A, 3LN 510	628	700	978	589	450	915	

Combustion head	d1	d2	d3	d4	d5
G70/2-3LN	444	520	M16	530	735
WK70/2-3LN	480	520	M16	530	735

All measurements are approximate. Weishaupt reserve the right to make alterations in light of future developments.