

Overview of burner regulation

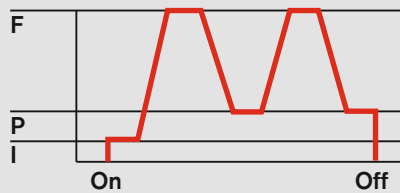
Model designation

Gas and oil-fired operation

Sliding-two-stage regulation

- Two-term switching (e.g. temperature or pressure stat) causes actuators to drive the burner to partial load or full load in response to heat demand. Combustion remains CO and smoke-free between load points.

Sliding-two-stage

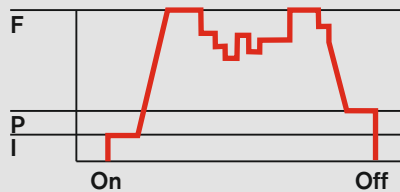


- Modulating operation:
 - W-FM 100 with load controller
 - W-FM 200
- Alternatively, a PID controller can be fitted into the control panel

Modulating regulation

- An electronic load controller causes actuators to make infinitely variable load adjustments in response to heat demand.

Modulating

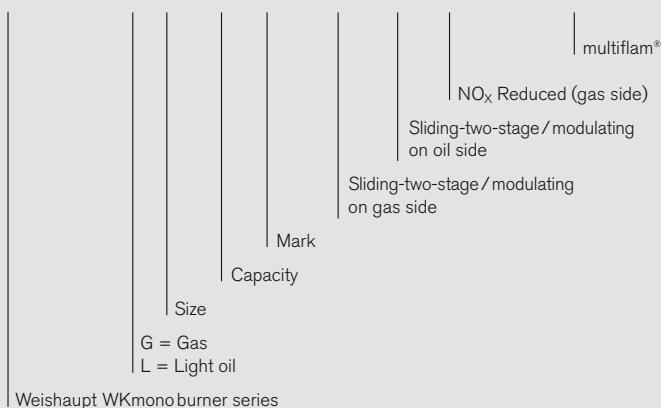


- F = Full load (nominal load)
- P = Partial load (minimum load)
- I = Ignition load

Burner version	Gas		Oil	
	sliding-two-stage	modulating	sliding-two-stage	modulating
ZM-NR	●	●	–	–
R	–	–	●	●
ZM-R-NR	●	●	●	●
ZM-3LN	●	●	–	–
R-3LN	–	–	●	●
ZM-R-3LN	●	●	●	●

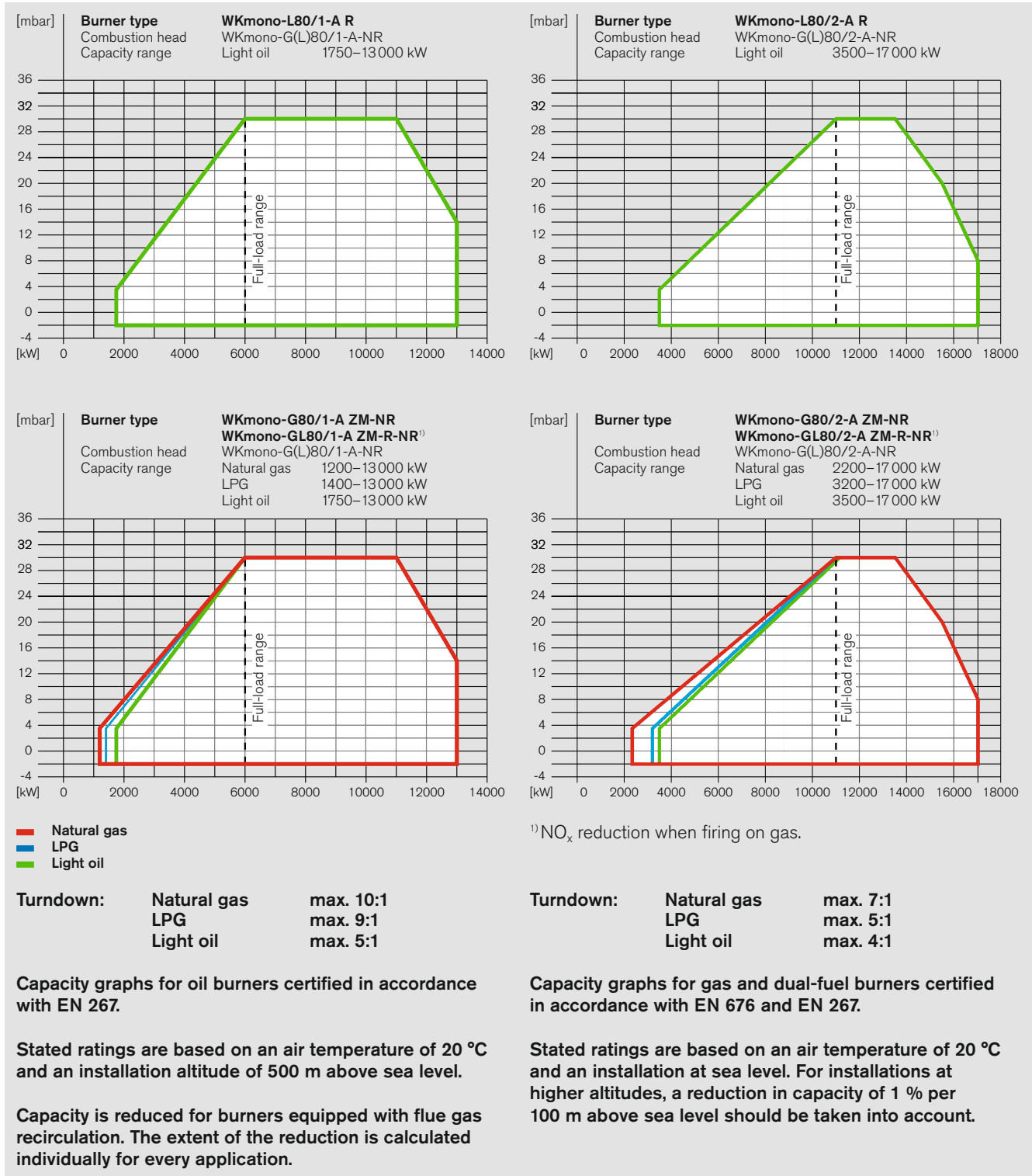
Model designation

WKmono – GL 80 / 1 – A / ZM – R – NR ...– 3LN



Burner selection

WKmono 80, versions R, ZM-NR, and ZM-R-NR¹⁾



Oil burners, version R

Burner type	Version	Order No.
WKmono-L80/1-A	R	281 814 10
WKmono-L80/2-A	R	281 824 10

DIN CERTCO: 5G1057

Gas burners, version ZM-NR

Burner type	Version	Valve train size	Order No.
WKmono-G80/1-A	ZM-NR	DN 100	287 814 16
		DN 125	287 814 17
		DN 150	287 814 18
WKmono-G80/2-A	ZM-NR	DN 100	287 824 16
		DN 125	287 824 17
		DN 150	287 824 18

CE-PIN: CE-0085 CQ 4017

Dual-fuel burners, version ZM-R-NR

Burner type	Version	Valve train size	Order No.
WKmono-GL80/1-A	ZM-R-NR	DN 100	288 814 16
		DN 125	288 814 17
		DN 150	288 814 18
WKmono-GL80/2-A	ZM-R-NR	DN 100	288 824 16
		DN 125	288 824 17
		DN 150	288 824 18

DIN CERTCO: 5G1056M

CE-PIN: CE-0085 CQ 4017

Fuel systems

Gas and dual-fuel burners (gas side)

Limits				LP1	LP2	LP3	HP	
							Standard	So
Gas flow pressure before the ball valve at max. burner load				≤ 300 ¹⁾ mbar	≤ 300 ¹⁾ mbar	300–500 mbar	300–10 000 ²⁾ mbar	
Regulated gas pressure p _o				≤ 200 mbar	≤ 250 mbar	≤ 360 mbar	≤ 210 mbar	210–350 mbar
Maximum operating pressure (MOP) for the gas supply (Setting of the SSV in the transfer station)				500 mbar	500 mbar	700 mbar	1 000 / 5 000 / 10 000 / 16 000 ³⁾ mbar	
Minimum MOP requirement for components (Low-pressure side of the valve train)				500 mbar	500 mbar	700 ⁴⁾ mbar	500 mbar	500 mbar
Nominal valve train size	Gas valve assembly type	WKmono 80/1	WKmono 80/2	Low-pressure supply with FRS regulator	Low-pressure supply with SKP25 regulator on VGD valve block	Low-pressure supply with SKP25 regulator on VGD valve block	High-pressure supply with HP regulator	
DN 100	DMV 5100/12	●	●	●			●	●
DN 125	VGD 40.125	●		●			●	
			●	●	●	● ⁴⁾	●	●
DN 150	VGD 40.150	●		●			●	
			●	●	●	● ⁴⁾	●	●

1) Exceptions

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

²⁾ Dependent on the MOP of the high-pressure gas regulator

³⁾ Specific MOP depends on high-pressure gas regulator type

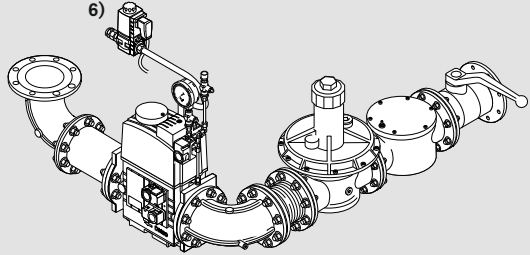
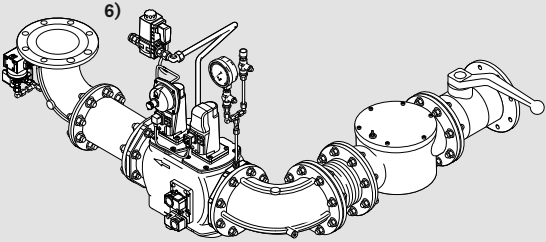
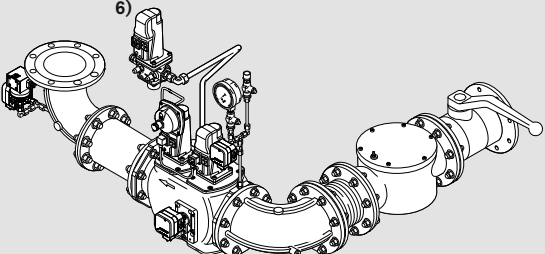
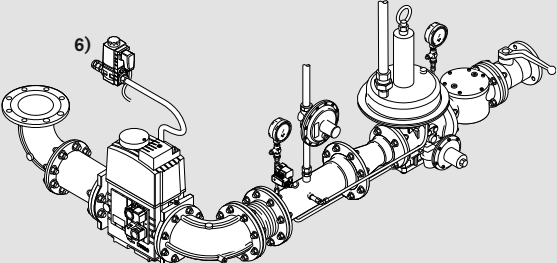
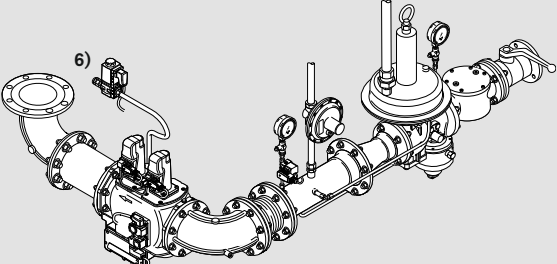
⁴⁾ Requires the use of a VGD double gas valve assembly, pressure switches and ignition gas valves rated for ≥ 700 mbar.

⁵⁾ **MOP** – **M**aximum **O**perating **P**ressure

⁶⁾ WKmono 80/1 burners ignite from the main gas line, there is no pilot.

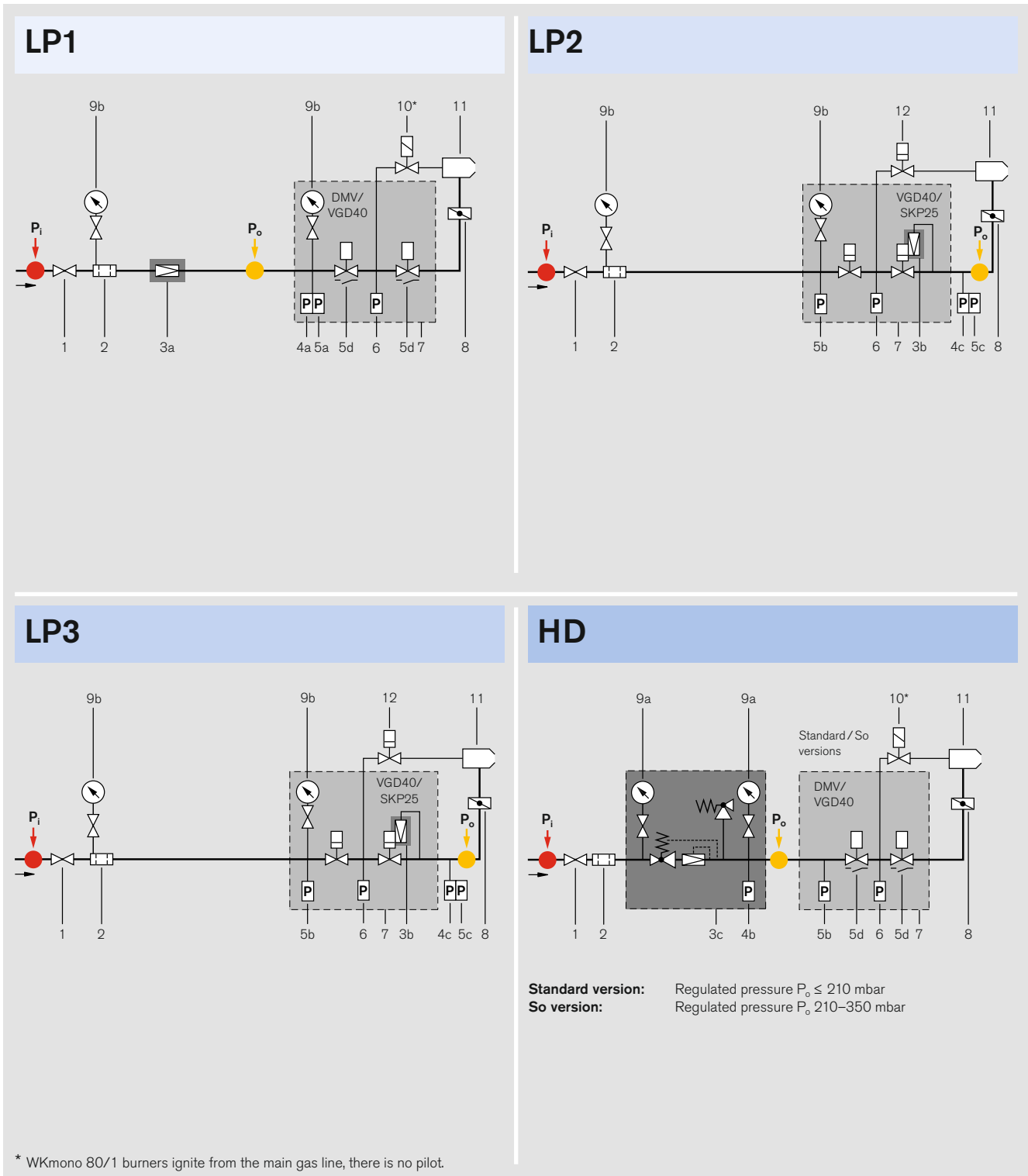
Valve train selection

Details

<p>LP1</p>	<p>Low-pressure gas supply with FRS regulator Used when:</p> <ul style="list-style-type: none"> – The gas flow pressure at maximum burner load is ≤ 300 mbar.¹⁾ – The regulated gas pressure P_0 plus the combustion chamber resistance does not exceed 200 mbar – The MOP ⁵⁾ does not exceed 500 mbar 	
<p>LP2</p>	<p>Low-pressure gas supply with SKP 25 regulator For VGD valve assemblies. Used when:</p> <ul style="list-style-type: none"> – The gas flow pressure at maximum burner load is ≤ 300 mbar.¹⁾ – The regulated gas pressure P_0 plus the combustion chamber resistance does not exceed 250 mbar – The MOP ⁵⁾ does not exceed 500 mbar 	
<p>LP3</p>	<p>Low-pressure gas supply with SKP 25 regulator For VGD valve assemblies. Used when:</p> <ul style="list-style-type: none"> – The gas flow pressure at maximum burner load is in the range of 300–500 mbar – The regulated gas pressure P_0 plus the combustion chamber resistance does not exceed 360 mbar – The MOP ⁵⁾ does not exceed 700 mbar 	
<p>HP Standard</p>	<p>High-pressure gas supply Used when:</p> <ul style="list-style-type: none"> – The gas flow pressure at maximum burner load is > 300 mbar. – The regulated gas pressure P_0 plus the combustion chamber resistance does not exceed 210 mbar – The MOP ⁵⁾ does not exceed 1, 2, 4, or 5 bar, depending on regulator type <p>Refer to Print No. 83001202 for component layout</p>	
<p>HP So</p>	<p>High-pressure gas supply Used when:</p> <ul style="list-style-type: none"> – The gas flow pressure at maximum burner load is > 500 mbar. – The regulated gas pressure P_0 plus the combustion chamber resistance is in the range of 210–350 mbar – The MOP ⁵⁾ does not exceed 4, 5, 10, or 16 bar, depending on regulator type <p>Refer to Print No. 83001202 for component layout</p>	

Fuel systems

Gas and dual-fuel burners (gas side)



- 1 Ball valve
- 2 Gas filter
- 3a Low-pressure FRS regulator
- 3b Low-pressure SKP25 regulator
- 3c High-pressure regulator incl. SSV / SRV
- 4a High gas pressure switch (mounted on the valve assembly inlet)
- 4b High gas pressure switch (mounted on the outlet side of the assembly)
- 4c High gas pressure switch (mounted on the elbow)
- 5a Low gas pressure switch (mounted on the valve assembly inlet)
- 5b Low gas pressure switch (mounted on the valve assembly inlet)
- 5c Additional low gas pressure switch in conjunction with VGD40 and SKP15 & 25 (mounted on the elbow)
- 5d "Open" position indicator switch in conjunction with VGD40 and 2x SKP15
- 6 Valve proving pressure switch (mounted on the valve assembly)
- 7 Double gas valve assembly
- 8 Gas butterfly valve
- 9a Pressure gauge with push-button valve (standard)
- 9b Pressure gauge with push-button valve (accessory)
- 10 SV-D ignition gas solenoid valve
- 11 Burner
- 12 VGG10 ignition gas valve with SKP15



General actuator/coil



Electromagnetic coil



Hydraulic actuator



Burner

p_i Inlet pressure before the ball valve

p_o Outlet pressure after the regulator



Pressure regulator



Shutoff assembly

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.

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. See 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.

Compensator

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

Optional thermal shutoff (when required by local regulations)

A separate component with HTB seals fitted before the ball valve on flanged valve trains.

Gas valve train sizing

WKmono-G(L)80, versions ZM-NR & ZM-R-NR

WKmono-G(L)80/1-A, versions ZM-NR and ZM-R-NR

Burner rating kW	Low-pressure supply (LP1) (flow pressure in mbar into shut-off valve)			High-pressure supply (HP) (flow pressure in mbar into gas valve assembly)		
	Nominal valve train diameter			Nominal valve train diameter		
	100	125	150	100	125	150
	Nominal diameter of gas butterfly			Nom. diameter of gas b'fly		
	150	150	150	150	150	150

Natural gas E LHV = 10.35 kWh/Nm ³ ; d = 0.606						
6000	72	57	51	51	46	44
6500	78	61	53	54	48	46
7000	86	66	57	58	51	48
7500	95	72	62	64	55	52
8000	105	79	67	70	60	57
9000	128	96	80	84	72	68
10000	156	116	97	103	88	82
11000	189	140	117	124	106	100
12000	226	168	141	150	128	121
13000	268	200	168	179	154	145

Natural gas LL LHV = 8.83 kWh/Nm ³ ; d = 0.641						
6000	87	66	56	58	50	47
6500	99	75	63	66	56	53
7000	113	84	71	74	63	60
7500	128	95	79	83	71	67
8000	143	106	88	93	79	74
9000	178	131	109	115	98	92
10000	218	159	132	141	119	111
11000	261	191	158	169	143	133
12000	-	226	186	200	169	158
13000	-	264	218	235 So	198	185

LPG* LHV = 25.89 kWh/Nm ³ ; d = 1.555						
6000	54	49	46	44	42	41
6500	57	50	46	45	43	42
7000	59	51	47	46	43	42
7500	61	52	48	47	43	42
8000	64	53	48	48	44	43
9000	69	56	50	50	45	43
10000	79	62	54	55	49	47
11000	95	75	65	67	59	57
12000	111	87	76	78	70	67
13000	128	101	87	91	80	76

So → High-pressure regulator for $p_o \leq 350$ mbar.
 * The LPG charts are based on propane, but may also be used for butane.

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.

Flanged

DN 100	DMV 5100/12
DN 125	VDG 40.125
DN 150	VDG 40.150

WKmono-G(L)80/2-A, versions ZM-NR and ZM-R-NR

Burner rating kW	Low-pressure supply (LP1) (flow pressure in mbar into shutoff valve)			High-pressure supply (HP) (flow pressure in mbar into gas valve assembly)		
	Nominal valve train diameter			Nominal valve train diameter		
	100	125	150	100	125	150
	Nominal diameter of gas butterfly			Nom. diameter of gas b'fly		
	150	150	150	150	150	150

Natural gas E LHV = 10.35 kWh/Nm³; d = 0.606

11 000	177	129	106	113	95	88
11 500	187	134	109	117	97	90
12 000	197	139	112	121	100	92
12 500	208	145	115	125	102	94
13 000	219	151	119	130	105	96
13 500	230	157	122	135	107	98
14 000	242	163	126	139	110	100
14 500	254	170	130	144	113	102
15 000	267	176	134	149	116	104
16 000	293	190	142	160	122	108
17 000	–	213	158	179	136	120

Natural gas LL LHV = 8.83 kWh/Nm³; d = 0.641

11 000	250	179	146	158	132	122
11 500	264	187	150	163	135	124
12 000	278	194	155	169	138	127
12 500	293	202	159	175	141	129
13 000	–	210	164	181	144	131
13 500	–	219	169	187	148	134
14 000	–	228	174	194	152	136
14 500	–	237	179	201	155	139
15 000	–	246	184	208	159	142
16 000	–	266	195	223 So	167	147
17 000	–	297	217	248 So	186	163

LPG* LHV = 25.89 kWh/Nm³; d = 1.555

11 000	147	127	118	119	112	109
11 500	151	130	119	121	113	110
12 000	156	132	121	123	114	111
12 500	160	135	123	125	116	112
13 000	165	137	124	127	117	113
13 500	170	140	126	130	118	114
14 000	175	143	128	132	120	115
14 500	181	146	130	134	121	117
15 000	186	149	132	136	123	118
16 000	197	155	135	141	126	120
17 000	210	162	140	147	129	123

So → High-pressure regulator for p₀ ≤ 350 mbar.
* The LPG charts are based on propane, but may also be used for butane.

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.

WKmono-G(L)80/2-A, versions ZM-NR and ZM-R-NR

Burner rating kW	Low-pressure supply (LP2, LP3) (flow pressure in mbar into shutoff valve)		SKP25 setting press. (Pressure in mbar at the flanged bend)
	Nominal valve train diameter		
	125	150	
	Nominal diameter of gas butterfly		
	150	150	

Natural gas E LHV = 10.35 kWh/Nm³; d = 0.606

11 000	110	98	77
11 500	113	101	77
12 000	117	103	78
12 500	121	106	79
13 000	125	109	79
13 500	129	111	80
14 000	133	114	81
14 500	137	117	81
15 000	141	120	82
16 000	150	126	83
17 000	168	141	92

Natural gas LL LHV = 8.83 kWh/Nm³; d = 0.641

11 000	152	135	105
11 500	157	139	106
12 000	162	142	106
12 500	167	145	107
13 000	172	149	108
13 500	178	153	108
14 000	183	156	109
14 500	189	160	109
15 000	195	164	110
16 000	208	173	111
17 000	231	192	123

LPG* LHV = 25.89 kWh/Nm³; d = 1.555

11 000	119	115	104
11 500	121	116	105
12 000	123	117	106
12 500	125	119	106
13 000	127	120	107
13 500	129	121	107
14 000	131	123	108
14 500	133	124	108
15 000	135	126	109
16 000	139	129	110
17 000	144	133	111

Flanged

DN 100	DMV 5100/12
DN 125	VDG 40.125
DN 150	VDG 40.150

Scope of delivery

Description	WKmono-L80 version R	WKmono-G80 version ZM-NR	WKmono-GL80 version ZM-R-NR
Burner housing, housing cover, 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, fixing screws	●	●	●
Digital combustion manager W-FM 100 W-FM 200	● ○	● ○	● ○
Valve proving via the combustion manager	–	●	●
Class-A double gas valve assembly	–	●	●
Gas butterfly valve	–	●	●
Air pressure switch	●	●	●
Low gas pressure switch High gas pressure switch	– –	● ●	● ●
Regulating sleeve in the mixing assembly	●	●	●
Actuators for compound regulation of fuel and air via W-FM: Air damper actuator Gas butterfly valve actuator Oil regulator actuator Mixing assembly actuator	● – ● ●	● ● – ●	● ● ● ●
Oil pressure switch in return Oil pressure switch in supply	● ●	– –	● ●
MDK80 safety shutoff device with solenoid nozzle assembly, solenoid and preinstalled regulating nozzle, 2 oil solenoid shutoff valves, oil regulator	●	–	●
Oil pump fitted to burner	–	–	–
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

Special equipment WKmono 80, versions R, ZM-NR, and ZM-R-NR

Burner	WKmono-L80 version R	WKmono-G80 version ZM-NR	WKmono-GL80 version ZM-R-NR
W-FM 100 supplied loose	○	○	○
Integral load controller and analogue signal convertor for W-FM 100	○	○	○
W-FM 200 in lieu of W-FM 100, with integral load controller, analogue signal convertor, and VSD module (burner mounted)	○	○	○
W-FM 200 in lieu of W-FM 100, with integral load controller, analogue signal convertor, and VSD module (supplied loose)	○	○	○
W-FM 200 with extended O ₂ trim / CO control functionality	○	○	○
110 V control voltage	○	○	○
W-FC 4.0 flame monitoring	○	○	○
W-FC 5.0 flame monitoring	○	○	○
ABE with Chinese-character display, supplied loose	○	○	○
VSD with separate frequency convertor (W-FM 200 required) (See accessories list for frequency convertor)	○	○	○
Pt1000 air temperature sensor for combustion efficiency display with W-FM 200 and O ₂ trim	○	○	○
Solenoid valve for air pressure switch test with continuous-run fan or post-purge	○	○	○
Low-pressure variant 2 (LP2)	–	○	○
Low-pressure variant 3 (LP3)	–	○	○
0–40 bar pressure gauge with ball valve in supply	○	–	○
0–40 bar pressure gauge with ball valve in return	○	–	○
Separate pump station	○	–	○
Inverted air inlet (air supply from above)	○	○	○
Air inlet positioned at an angle other than 0° or 180°	Please enquire	Please enquire	Please enquire
Air inlet with LGW air pressure switch for ducted extraneous air supply	○	○	○
Combustion head extension			
by 150 mm	○	○	○
by 300 mm	○	○	○

Please enquire regarding further special equipment, or refer to the price list.

Country-specific executions and special voltages on application.

Technical data

WKmono 80, versions R, ZM-NR, and ZM-R-NR

Fuel-independent		WKmono 80/1-A	WKmono 80/2-A		
Burner motor 400 V, 3~, 50 Hz ¹⁾²⁾	type	AF 225M/2L - 24LS 45K0	AF 225M/2L - 24LS 45K0		
Motor power output	kW	45	45		
Nominal current	A	75	75		
Motor protection switch ²⁾ or motor prefusing ²⁾	Star-delta DOL	type (e.g.) A minimum A minimum	NZMN1-M80 100 A gG (by others) 160 A gG (by others)		
Speed (50 Hz)	rpm	2955	2955		
Combustion manager Prefusing	type A	W-FM 100 16 A B	W-FM 100 16 A B		
Air damper actuator	type	SQM48 (20 Nm)	SQM48 (20 Nm)		
Mixing assembly actuator	type	SQM48 (20 Nm)	SQM48 (20 Nm)		
Oil					
		WKmono-L80/1-A R	WKmono-L80/2-A R		
Ignition unit	type	W-ZG02 (2-pole)	W-ZG02 (2-pole)		
Flame monitoring	type	QRI	QRI		
Oil actuator	type	SQM48 (20 Nm)	SQM48 (20 Nm)		
NO _x Class per EN 267		2	2		
Mass	kg	865	925		
Maximum weight moment	kNm	10	10		
Oil solenoid valves 110–120 V DN 20 (supply) 20 W 110–120 V DN 20 (return) 20 W	type type	5406 NC 5407 NC	5406 NC 5407 NC		
Oil press. switch 0–25 bar (supply – 18 bar) 1–10 bar (return, light oil – 5 bar)	type type	DSB 158 DSB 146	DSB 158 DSB 146		
Gas					
		WKmono-G80/1-A ZM-NR	WKmono-G80/2-A ZM-NR		
Ignition unit	type	W-ZG02 (2-pole)	W-ZG02 (2-pole)		
Ignition gas valve	type	–	SV-D 507		
Ignition gas valve (LP3)	type	–	VGG10 with SKP15		
Flame monitoring	type	ION	ION		
Gas actuator	type	SQM45 (3 Nm)	SQM45 (3 Nm)		
NO _x Class per EN 676		3	3		
Mass (excl. double gas valve assembly and fittings)	kg	835	895		
Maximum weight moment	kNm	10	10		
Mass of the double gas valve assembly incl. ignition gas valve and connection pieces	DN kg	100 approx. 61	125 approx. 51	150 approx. 70	

Dual-fuel		WKmono-GL80/1-A ZM-R-NR	WKmono-GL80/2-A ZM-R-NR
Ignition unit	type	W-ZG03 (3-pole)	W-ZG02 (3-pole)
Ignition gas valve	type	–	SV-D 507
Ignition gas valve (LP3)	type	–	VGG10 with SKP15
Flame monitoring	type	QRI	QRI
Actuator	gas	SQM45 (3 Nm)	SQM45 (3 Nm)
	oil	SQM48 (20 Nm)	SQM48 (20 Nm)
NO _x Class per EN 676/EN 267		3/2	3/2
Mass (excl. double gas valve assembly and fittings)	kg	865	925
Maximum weight moment	kNm	10	10
Oil solenoid valves 110–120 V DN 20 (supply) 20 W	type	5406 NC	5406 NC
	110–120 V DN 20 (return) 20 W	type	5407 NC
Oil press. switch	0–25 bar (supply – 18 bar)	type	DSB 158
	1–10 bar (return, light oil – 5 bar)	type	DSB 146

Notes

¹⁾ The electrical motors are premium-efficiency IE3 motors in accordance with Commission Regulation (EC) No. 640/2009

²⁾ The necessary motor starter and protection must be fitted in a control panel.

Voltages and frequencies:

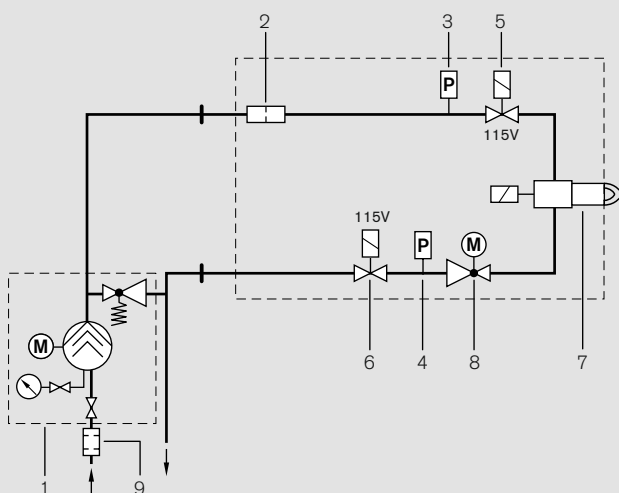
Other voltages and frequencies are available on application.

Standard burner motor:

Insulation Class F, IP 55 protection.

Oil-side fuel system

Versions R and ZM-R-NR



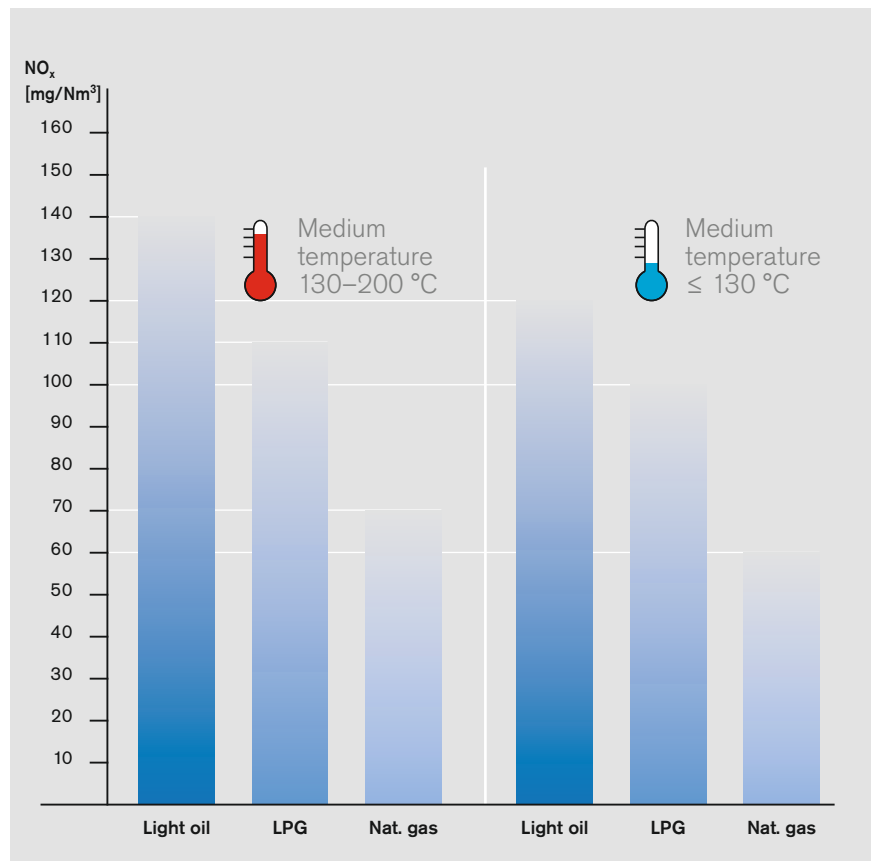
- 1 External pump with pressure maintenance
- 2 Strainer
- 3 Min. oil pressure switch
- 4 Max. oil pressure switch
- 5 Supply solenoid valve (fitted in direction of flow)
- 6 Return solenoid valve (fitted against direction of flow)
- 7 Solenoid nozzle assembly
- 8 Oil regulator
- 9 Filter

Emissions reduced by the multiflam[®] principle

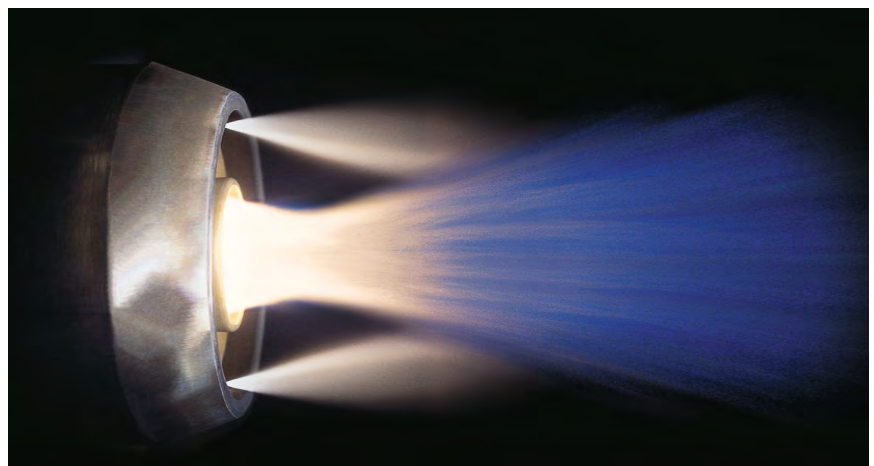
The multiflam[®] principle developed and patented by Weishaupt is an innovative way of reducing NO_x emissions from combustion plant to a minimal level.

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

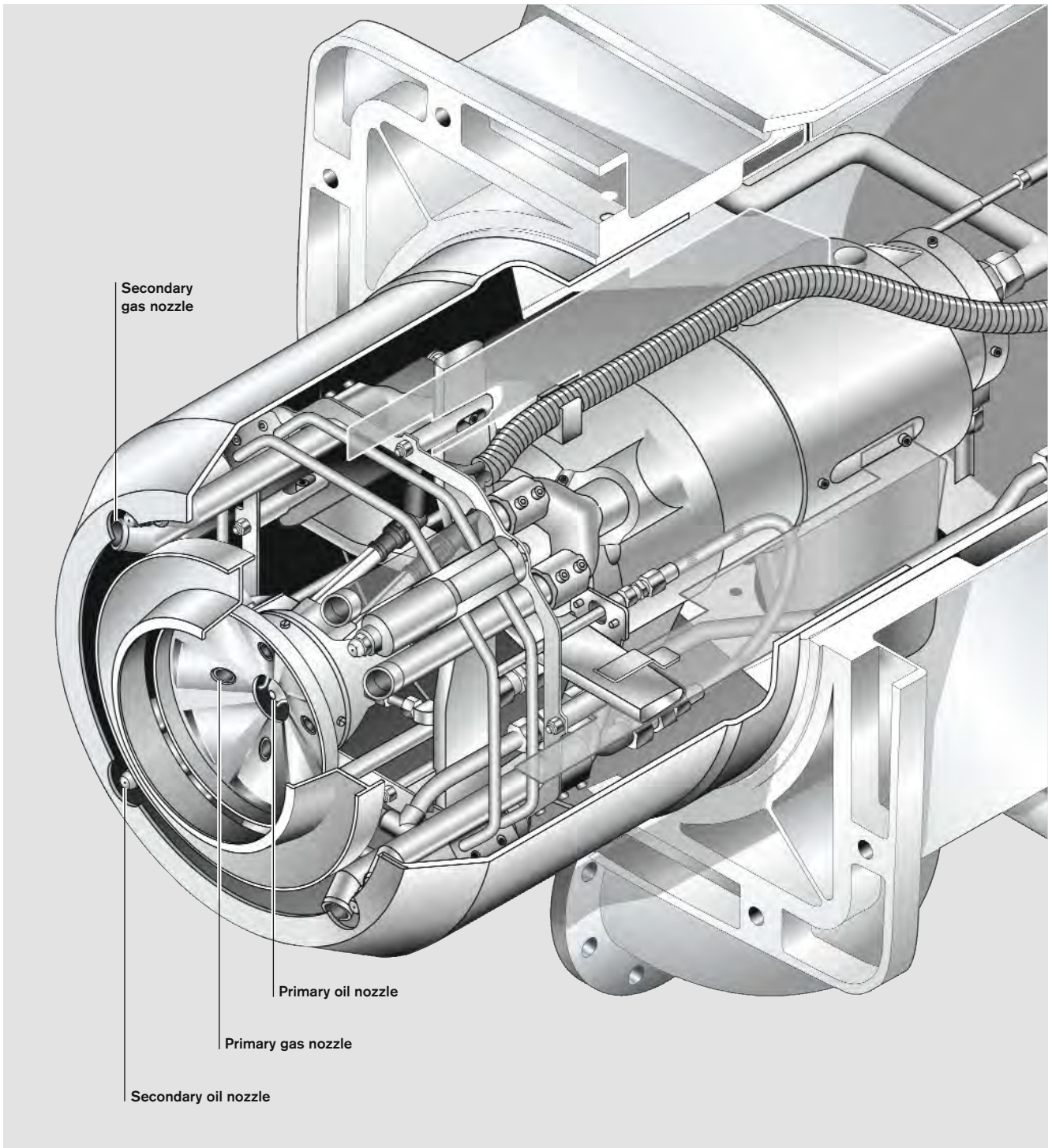
The wide range of ratings across which multiflam[®] burners are now available is equally outstanding. All the way from the WM 10 monarch[®] burner right up to the WK 80 industrial burner, there is now a multiflam[®] burner for outputs ranging from 120 up to 23 000 kW.



Guaranteed emission levels for 3LN-version WKmono 80 burners on three-pass/through-pass boilers, subject to Weishaupt's published constraints



WKmono 80 burners are also available in multiflam[®] execution



The multiflam® mixing assembly of a WKmono 80 burner