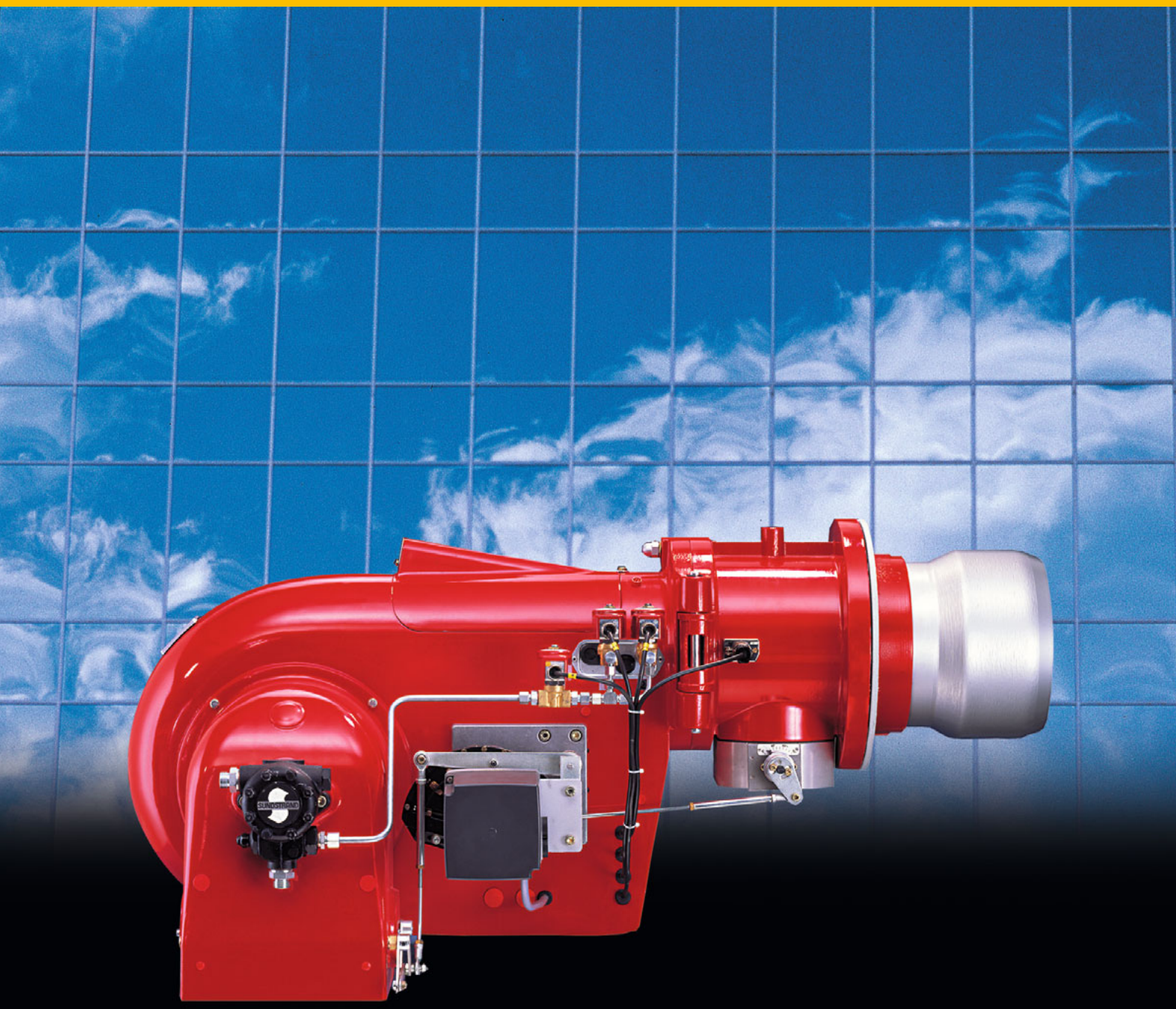
–weishaupt–

product

Information on gas and dual-fuel burners



Gas and dual-fuel burners, 1-11

monarch® burners, sizes 1-11 (60 – 4750 kW) • simply reliable

Description

Weishaupt G, GL and RGL burners fulfill all demands for operational safety, ease of installation and reliablilty. The burners are economical and environmentally friendly. They are CE type-tested and comply with EN 267 (oil-side), EN 676 (gas-side), and the Gas Appliance Directive (90/396/EEC).

The burners are notable for a variety of interesting features:

- Large capacity and range of applications
- Automatic sequence of operations
- Combustion-chamber pre-purging
- Reliable flame monitoring
- Stable fan characteristics – good combustion behaviour
- Quiet operation
- Burner housing can be hinged open
- Simple installation, adjustment and maintenance thanks to readily accessible components
- Easily converted for other gas types
- Dual-fuel burners benefit from manual or automatic fuel changeover. No conversion of the burner is required
- Automatic air closure on burner shutdown

Construction
The burner is of monobloc construction. Its motor drives the combustion air fan and, on dual-fuel burners, the burner-mounted oil pump. All the fuel and air regulation components are clearly arranged and readily accessible. The burners can be hinged open to the left or right-hand side, simplifying work on the combustion head, diffuser, nozzles and electrodes.

Fuels
Natural Gas E
Natural Gas LL
LPG B/P
Fuel oil EL (<6 mm^2/s at 20 °C) in accordance with DIN 51 603, part 1

Please enquire regarding the suitability of other fuels.

Applications
The burners can be used on heat exchangers such as hot water boilers, steam boilers, or air heaters, and for certain process applications. As the burners are capable of overcoming high combustion chamber resistances, they are primarily used on heavy-duty boilers.

Regulation
Depending on the fuel, burner size, and customer requirements, the compound regulation of air and fuel can be:

- Two-stage (Z)
- Sliding-two-stage (ZM)
- Oil-side three-stage (TM)
- Modulating (ZM); the standard sliding-two-stage burner can modulate when equipped with a 42 s servomotor and a suitable PID controller.

The servomotor on two-stage burners (Z) has an 8 s running time, effecting rapid control of burner throughput. A cam band provides for the compound regulation of the air damper and gas butterfly valve. This simultaneous control of gas and air prevents start and change-over impacts in the combustion chamber and gas line.

The servomotor on sliding-two-stage and modulating burners (ZM) has a 20 s or 42 s running time, providing for a slower change in burner throughput. A cam band provides for the compound regulation of the air damper and gas butterfly valve.

With sliding-two-stage regulation, the burner has fixed partial and full-load setpoints, and the burner moves to one position or the other depending on the heat demand. There are no rapid changes of fuel throughput.

With modulating regulation, the burner's output, within its operating range, is continuously regulated to match to the current heat demand.

Ignition load for gas-fired burners
Gas-fired burners start at ignition load, which ensures that only a small quantity of gas is released into the combustion chamber. After a time delay, gas is released for the main flame.

Controlled shutdown from partial load
The type of burner controllers used and the setting of the 2nd-stage or modulating control setpoints enable a controlled shutdown of the burner to be effected from partial load, thereby avoiding pressure surges in the gas line.

Flame monitoring
The inbuilt or panel-mounted burner controller automatically sequences burner operations, using its flame sensor to monitor the flame and its stability. Flame monitoring on gas burners utilises the ionisation principal, while the flame on dual-fuel burners is monitored by means of a UV cell.

Electromagnetic clutch for dual-fuel burners (additional cost item)
The clutch automatically disconnects the oil pump from the burner motor when the burner is firing on gas. This protects the pump from unnecessary wear and tear.

Safe operation
All gas-firing Weishaupt burners are equipped with gas and air-pressure switches, and with a Class-A double solenoid valve assembly. These safety devices shut off the gas supply to the burner if:

- The gas supply pressure is too low
- The combustion air supply fails
- The power supply fails
- Commanded by limiters
- Commanded by the flame sensor

Gas valve trains
EN 676 stipulates that gas-fired burners must be fitted with two solenoid valves. Accordingly, Weishaupt gas and dual-fuel burners are equipped as standard with a Class-A double solenoid valve assembly. Weishaupt also recommends the use of a gas valve proving system (mandatory from 1200 kW). Details on valve proving and other gas valve train components, such as filters and pressure regulators, can be found in our accessories list.

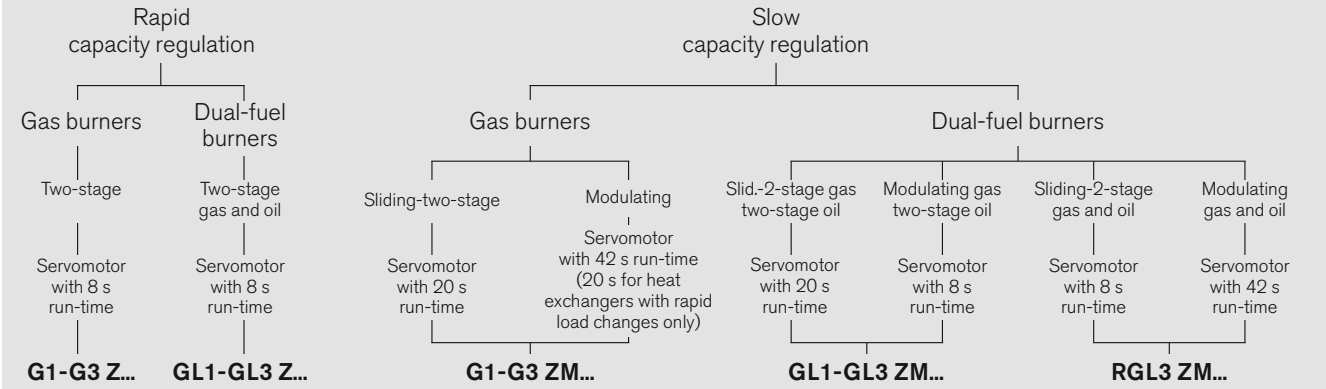
Conversion to other gas types
The constuction of Weishaupt LPG and natural-gas-fired burners is identical. When converting from the one gas to another, only the recommissioning of the burner is required.

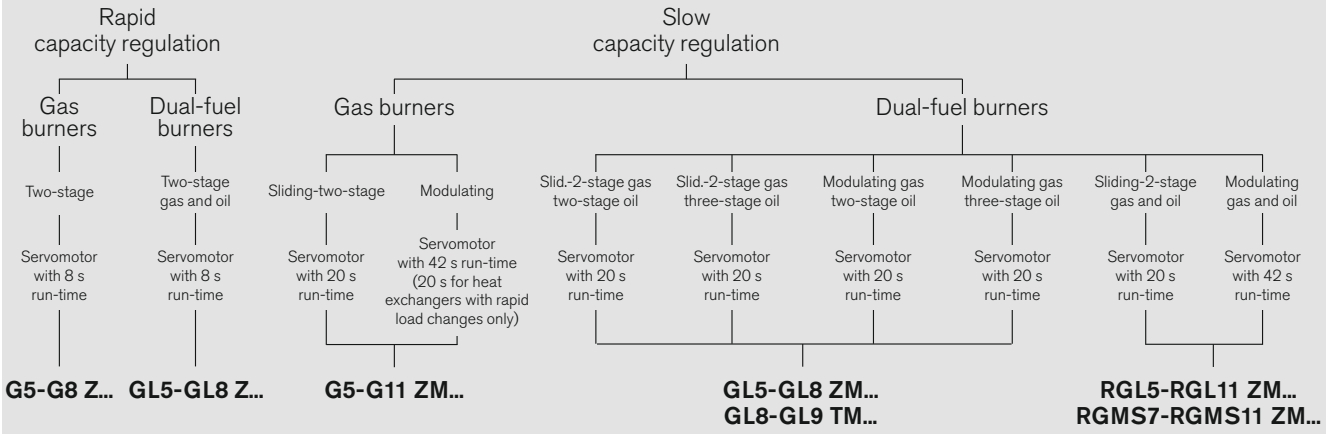
Sound absorbers
Weishaupt W-SH-type sound absorbers can be employed to reduce burner noise levels. For further details, please see print No. 83001302.

Permissible ambient conditions
- Ambient temperature during operation: -15 to +40 °C
- Humidity: max. 80 % relative humidty, no condensation
- Suitable for operation indoors only
- For plant in unheated areas, certain further measures may be required (please enquire)

Model overview

Weishaupt gas and dual-fuel burners





Model designation

Model designation

Gas burners

Type G 1 / 1 – E, version

- G: Fuel = Gas
- 1: Size
- 1: Capacity
- E: Mark
- Z / ZM: Regulation
  - Z = Two-stage (servomotor with 8 s run-time)
  - ZM = Sliding-two-stage or modulating (servomotor with 20 s or 42 s run-time)
- D: Electrics D = 3 ~ AC

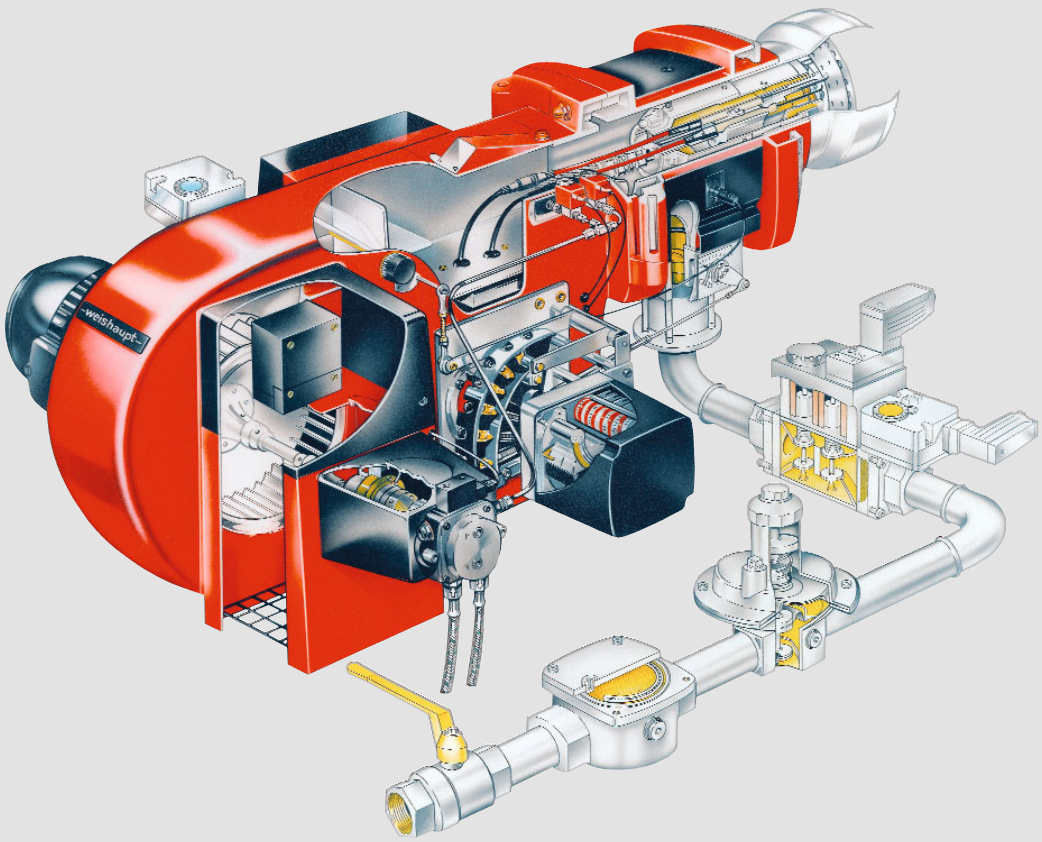
Dual-fuel burners

Type G L 3 / 1 – E, version

- G: Fuel = Gas
- L: Fuel = Fuel oil EL
- 3: Size
- 1: Capacity
- E: Mark
- Z / ZM: Regulation
  - Z = Two-stage (gas and oil-side) (servomotor with 8 s run-time)
  - ZM = Sliding-two-stage or modulating (gas-side) Two-stage (oil-side) (servomotor with 20 s run-time)
- D: Electrics D = 3 ~ AC

Type RGL3/1-E, version ZMD

- R = Variably regulated burner
- ZM = Sliding-two-stage (servomotor with 20 s run-time) or modulating (servomotor with 42 s run-time)



Gas-side burner regulation

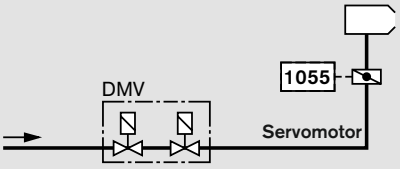
Gas-fired operation

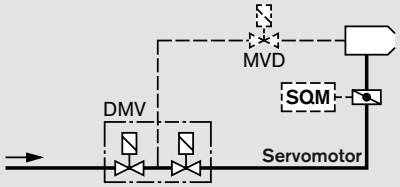
Two-stage (Z)

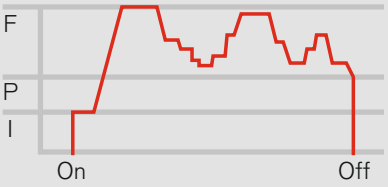
- When the burner starts, gas is released by opening the solenoid valves. The gas butterfly valve releases sufficient gas for ignition load.
- The servomotor drives the gas butterfly valve (8 s run-time) to adjust burner capacity between partial load and full load.

Sliding-two-stage or modulating (ZM)

- When the burner starts, gas is released by opening the solenoid valves. The gas butterfly valve releases sufficient gas for ignition load. Burner sizes 8 to 11 have an additional pilot-line solenoid valve. When the burner starts, the pilot line solenoid valve opens. After 10 s, the main gas solenoid valve opens and the pilot-line solenoid valve closes again.
- A slow running servomotor (20 s or 42 s run-time) drives the gas butterfly valve to its full-load position.
- The servomotor drives the gas butterfly valve to adjust burner capacity between partial load and full load.
- Sliding-two-stage burners have a 20 s servomotor run-time. Modulating burners have a 42 s servomotor run-time and differing electrical controls.







Above: two-stage
Centre: sliding-two-stage
Below: modulating

F = full load, P = partial load, I = ignition load

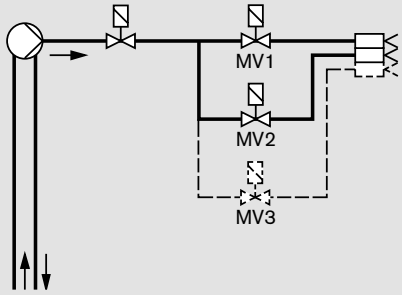
Oil-side burner regulation

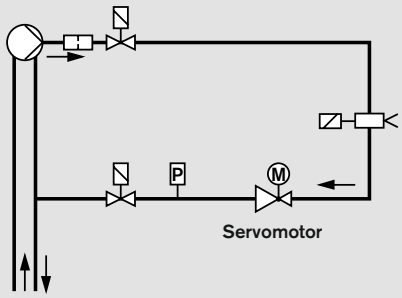
Oil-fired operation

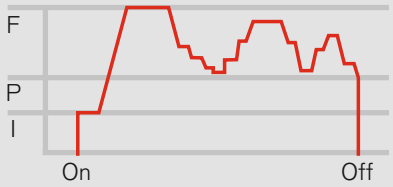
Two-stage (Z)
- When the burner starts, oil is released by opening solenoid valve 1. The burner fires at partial load.
- When solenoid valve 2 opens the burner fires at full load.
- Capacity is controlled by the opening and closing of solenoid valve 2.

Three-stage (TM)
- When the burner starts, oil is released by opening solenoid valve 1. The burner fires at partial load.
- When solenoid valve 2 opens the burner fires at intermediate load..
- When solenoid valve 3 opens the burner fires at full load.
- Capacity is controlled by the opening and closing of solenoid valve 3, or solenoid valves 2 and 3

Sliding-two-stage or modulating (ZM)
- The oil solenoid valve (RGL5 to RGL7) / oil nozzle needle (RGL8 to RGL11) releases sufficient oil for ignition load.
- A slow running servomotor gradually drives the oil regulator to its full-load position.
- The servomotor drives the oil regulator to adjust burner capacity between partial load and full load.
- Sliding-two-stage burners have a 20 s servomotor run-time. Modulating burners have a 42 s servomotor run-time and differing electrical controls.







Above: two/three-stage
Centre: sliding-two-stage
Below: modulating

F = full load, INT = intermedite load
P = partial load, I = ignition load

Gas valve train sizing
Burner sizes 1 to 7

Burner size 1

Burner rating kW	Low-pressure supply (with FRS). Flow pressure in mbar into shut-off valve, p_e max = 300 mbar					High-pressure supply (with HP regulator). Flow pressure in mbar into double solenoid valve				
	Nominal valve-train diameter					**Nominal valve-train diameter**				
	¾"	**1"**	**1½"**	**2"**	**65**	**¾"**	**1"**	**1½"**	**2"**	**65**
	Nominal diameter of gas butterfly					Nominal diameter of gas butterfly				
	25	25	25	25	25	25	25	25	25	25
Natural gas E, H_i = 37.26 MJ/mn³ (10.35 kWh/mn³), d = 0.606, W_i = 47.84 MJ/mn³										
150	14	–	–	–	–	7	–	–	–	–
200	21	10	–	–	–	11	–	–	–	–
220	25	11	–	–	–	13	–	–	–	–
250	31	13	8	–	–	16	6	–	–	–
280	37	15	9	8	–	20	7	5	5	–
300	42	17	10	9	–	23	7	6	6	5
320	47	18	11	9	8	25	8	6	6	5
340	52	20	12	10	9	28	9	7	6	6
Natural gas LL, H_i = 31.79 MJ/mn³ (8.83 kWh/mn³), d = 0.641, W_i = 39.67 MJ/mn³										
150	18	9	–	–	–	9	–	–	–	–
200	28	12	–	–	–	15	5	–	–	–
220	33	14	9	–	–	18	6	–	–	–
250	42	16	10	8	–	22	7	5	5	–
280	51	19	11	9	8	27	8	6	6	5
300	58	22	12	10	9	31	9	7	6	6
320	65	24	13	10	9	35	10	7	7	6
340	73	26	14	11	9	39	11	8	7	6
LPG B/P, H_i = 93.20 MJ/mn³ (25.89 kWh/mn³), d = 1.555, W_i = 74.73 MJ/mn³										
150	–	–	–	–	–	–	–	–	–	–
200	11	–	–	–	–	6	–	–	–	–
220	13	–	–	–	–	7	–	–	–	–
250	16	8	–	–	–	8	–	–	–	–
280	18	9	–	–	–	10	–	–	–	–
300	20	10	–	–	–	11	–	–	–	–
320	23	11	–	–	–	12	5	–	–	–
340	25	12	8	–	–	14	6	–	–	–

Burner size 3

Burner rating kW	Low-pressure supply (with FRS). Flow pressure in mbar into shut-off valve, p_e max = 300 mbar						High-pressure supply (with HP regulator). Flow pressure in mbar into double solenoid valve					
	Nominal valve-train diameter						**Nominal valve-train diameter**					
	¾"	**1"**	**1½"**	**2"**	**65**	**80**	**¾"**	**1"**	**1½"**	**2"**	**65**	**80**
	Nominal diameter of gas butterfly						Nominal diameter of gas butterfly					
	25	25	40	40	40	40	25	25	40	40	40	40
Natural gas E, H_i = 37.26 MJ/mn³ (10.35 kWh/mn³), d = 0.606, W_i = 47.84 MJ/mn³												
300	41	16	9	–	–	–	22	6	–	–	–	–
350	54	20	10	8	–	–	29	8	5	–	–	–
400	69	25	12	9	–	–	37	10	6	6	–	–
450	86	30	14	11	9	–	46	12	7	7	6	5
500	105	36	16	12	9	9	56	14	8	8	6	6
550	126	42	18	13	10	9	68	17	9	9	7	6
600	149	49	21	15	11	10	80	19	10	10	8	7
650	174	56	23	16	12	11	93	22	11	11	9	8
Natural gas LL, H_i = 31.79 MJ/mn³ (8.83 kWh/mn³), d = 0.641, W_i = 39.67 MJ/mn³												
300	57	21	10	8	–	–	30	8	–	–	–	–
350	76	26	12	10	–	–	40	10	6	6	–	–
400	98	33	15	11	9	–	52	13	7	7	6	5
450	123	40	18	13	10	9	65	16	8	8	6	6
500	150	49	20	14	11	9	80	19	10	9	7	6
550	181	58	23	16	12	10	96	22	11	10	8	7
600	214	68	27	18	13	11	114	26	13	12	9	8
650	250	78	30	20	14	12	133	29	14	13	10	9
LPG B/P, H_i = 93.20 MJ/mn³ (25.89 kWh/mn³), d = 1.555, W_i = 74.73 MJ/mn³												
300	19	9	–	–	–	–	10	–	–	–	–	–
350	25	11	–	–	–	–	13	–	–	–	–	–
400	32	13	8	–	–	–	17	6	–	–	–	–
450	39	16	9	–	–	–	21	7	–	–	–	–
500	47	19	11	9	–	–	26	8	6	6	5	–
550	56	21	12	10	8	8	30	10	6	6	6	5
600	66	25	13	11	9	9	36	11	7	7	6	6
650	76	28	14	12	10	9	42	12	8	8	7	7

The combustion chamber pressure in mbar must be added to the minimum gas pressure determined from the sizing chart.

For burners firing town gas, please enquire.

For low-pressure supplies, EN 88-compliant governors with safety diaphragms are used. The maximum permissible supply pressure into the shut-off valve for low pressure installations is 300 mbar.

For high-pressure supplies, EN 334-compliant high-pressure regulators should be selected from the brochure "Pressure regulators with safety devices for Weishaupt gas and dual-fuel burners". This brochure details high-gas-pressure sets suitable for supply pressures of up to 4 bar.

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

Burner size 5

Burner rating kW	Low-pressure supply (with FRS). Flow pressure in mbar into shut-off valve, p_e max = 300 mbar						High-pressure supply (with HP regulator). Flow pressure in mbar into double solenoid valve					
	Nominal valve-train diameter						**Nominal valve-train diameter**					
	1”	**1½”**	**2”**	**65**	**80**	**100**	**1”**	**1½”**	**2”**	**65**	**80**	**100**
	Nominal diameter of gas butterfly						Nominal diameter of gas butterfly					
	25	40	50	50	50	50	25	40	50	50	50	50
Natural gas E, H_i = 37.26 MJ/mn³ (10.35 kWh/mn³), d = 0.606, W_i = 47.84 MJ/mn³												
500	35	16	11	9	–	–	14	8	7	5	–	–
600	49	20	14	10	9	8	19	10	9	7	6	6
700	64	26	17	12	10	9	25	12	11	8	7	7
800	82	32	20	14	11	10	31	15	13	10	8	8
900	102	39	24	16	13	12	38	18	15	11	9	9
1000	124	46	28	18	14	13	46	21	18	13	10	10
1125	155	56	32	20	15	13	56	25	21	14	11	10
1250	188	67	37	22	16	14	68	29	24	15	12	11
Natural gas LL, H_i = 31.79 MJ/mn³ (8.83 kWh/mn³), d = 0.641, W_i = 39.67 MJ/mn³												
500	48	20	13	10	8	–	18	9	8	6	5	5
600	67	27	17	12	10	9	25	12	11	8	7	6
700	90	34	21	14	11	10	33	16	13	10	8	7
800	115	43	25	16	13	12	43	19	16	11	9	9
900	144	52	30	19	15	13	53	23	20	13	11	10
1000	176	63	36	22	16	14	64	28	23	15	12	11
1125	220	77	43	25	18	15	79	33	27	17	13	12
1250	270	93	50	28	20	16	95	39	31	19	14	12
LPG B/P, H_i = 93.20 MJ/mn³ (25.89 kWh/mn³), d = 1.555, W_i = 74.73 MJ/mn³												
500	18	10	–	–	–	–	7	–	–	–	–	–
600	23	12	9	–	–	–	10	6	6	–	–	–
700	30	15	11	9	8	–	13	8	7	6	5	5
800	38	17	13	10	9	9	16	9	8	7	6	6
900	46	21	14	11	10	9	19	11	9	8	7	7
1000	56	24	16	12	11	10	22	12	11	9	8	7
1125	69	28	18	13	11	11	27	14	12	9	8	8
1250	83	33	21	15	12	11	32	16	14	10	9	8

Burner size 7

Burner rating kW	Low-pressure supply (with FRS). Flow pressure in mbar into shut-off valve, p_e max = 300 mbar							High-pressure supply (with HP regulator). Flow pressure in mbar into double solenoid valve						
	Nominal valve-train diameter							**Nominal valve-train diameter**						
	1”	**1½”**	**2”**	**65**	**80**	**100**	**125**	**1”**	**1½”**	**2”**	**65**	**80**	**100**	**125**
	Nominal diameter of gas butterfly							Nominal diameter of gas butterfly						
	40	40	50	65	65	65	65	40	40	50	65	65	65	65
Natural gas E, H_i = 37.26 MJ/mn³ (10.35 kWh/mn³), d = 0.606, W_i = 47.84 MJ/mn³														
800	74	31	15	10	9	8	–	23	18	8	6	6	5	5
900	92	38	17	12	10	9	9	29	22	10	7	6	6	6
1000	113	45	20	13	11	10	9	35	26	11	8	7	7	6
1100	135	54	23	15	12	10	10	41	31	13	9	8	7	7
1200	160	63	26	16	13	11	11	48	36	15	10	9	8	8
1400	215	83	33	20	15	13	12	64	47	18	12	10	9	9
1600	279	106	41	24	18	15	14	82	60	23	14	12	11	10
1750	–	126	47	27	20	16	15	98	71	26	16	14	12	11
Natural gas LL, H_i = 31.79 MJ/mn³ (8.83 kWh/mn³), d = 0.641, W_i = 39.67 MJ/mn³														
800	105	42	18	12	10	9	8	32	24	10	7	6	6	6
900	131	52	22	14	11	10	9	39	29	12	8	7	7	6
1000	160	63	25	16	12	11	10	48	35	14	9	8	7	7
1100	193	75	29	18	14	12	11	57	42	16	11	9	8	8
1200	228	87	34	20	15	12	12	67	49	18	12	10	9	9
1400	–	117	44	25	18	14	13	90	65	24	14	12	11	10
1600	–	150	55	30	21	17	15	116	84	29	17	14	12	12
1750	–	178	64	34	24	18	16	138	99	34	19	16	13	13
LPG B/P, H_i = 93.20 MJ/mn³ (25.89 kWh/mn³), d = 1.555, W_i = 74.73 MJ/mn³														
800	34	16	9	–	–	–	–	11	9	5	–	–	–	–
900	42	19	11	8	–	–	–	14	11	6	5	–	–	–
1000	50	23	12	9	8	–	–	17	13	7	6	5	5	5
1100	60	26	13	10	9	8	8	20	15	8	6	6	6	6
1200	70	30	15	11	10	9	9	23	18	9	7	6	6	6
1400	93	39	18	13	11	10	10	30	23	11	8	8	7	7
1600	120	49	22	15	13	11	11	38	29	13	10	9	8	8
1750	142	57	25	17	14	12	12	44	33	15	11	10	9	9

The combustion chamber pressure in mbar must be added to the minimum gas pressure determined from the sizing chart.

For burners firing town gas, please enquire.

For low-pressure supplies, EN 88-compliant governors with safety diaphragms are used. The maximum permissible supply pressure into the shut-off valve for low pressure installations is 300 mbar.

For high-pressure supplies, EN 334-compliant high-pressure regulators should be selected from the brochure “Pressure regulators with safety devices for Weishaupt gas and dual-fuel burners”. This brochure details high-gas-pressure sets suitable for supply pressures of up to 4 bar.

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

Gas valve train sizing
Burner sizes 8 to 11

Burner size 8

Burner rating kW	Low-pressure supply (with FRS). Flow pressure in mbar into shut-off valve, p_e max = 300 mbar						High-pressure supply (with HP regulator). Flow pressure in mbar into double solenoid valve					
	Nominal valve-train diameter						**Nominal valve-train diameter**					
	1½"	**2"**	**65**	**80**	**100**	**125**	**1½"**	**2"**	**65**	**80**	**100**	**125**
	Nominal diameter of gas butterfly						Nominal diameter of gas butterfly					
	40	50	65	65	65	65	40	50	65	65	65	65
Natural gas E, H_i = 37.26 MJ/mn³ (10.35 kWh/mn³), d = 0.606, W_i = 47.84 MJ/mn³												
1100	53	22	14	11	9	9	29	12	8	7	6	6
1200	62	25	15	12	10	9	34	13	9	7	7	6
1300	71	28	17	13	11	10	40	15	10	8	7	7
1400	82	31	18	14	11	11	46	17	11	9	8	8
1600	105	39	22	16	13	12	58	21	13	11	9	9
1800	131	48	26	19	14	13	73	25	15	12	10	10
2000	160	57	31	21	16	15	89	30	17	14	12	11
2250	200	70	37	25	18	16	111	36	20	16	13	12
Natural gas LL, H_i = 31.79 MJ/mn³ (8.83 kWh/mn³), d = 0.641, W_i = 39.67 MJ/mn³												
1100	73	28	17	12	10	9	41	15	9	8	7	7
1200	86	32	19	14	11	10	48	17	10	9	7	7
1300	100	37	21	15	12	11	56	19	11	10	8	8
1400	115	42	23	16	13	12	64	22	13	10	9	8
1600	148	53	28	19	15	13	82	27	15	12	10	10
1800	185	65	34	23	17	15	103	33	18	14	12	11
2000	227	78	40	26	19	16	125	40	21	16	13	12
2250	285	96	48	31	21	18	–	49	25	19	15	14
LPG B/P, H_i = 93.20 MJ/mn³ (25.89 kWh/mn³), d = 1.555, W_i = 74.73 MJ/mn³												
1100	25	13	9	8	–	–	14	7	5	5	–	–
1200	29	14	10	9	8	–	17	8	6	6	5	5
1300	33	16	11	9	9	8	19	9	7	6	6	6
1400	38	17	12	10	9	9	22	10	7	7	6	6
1600	48	21	14	11	10	10	27	12	8	8	7	7
1800	59	25	16	13	11	11	34	14	10	9	8	8
2000	71	29	18	14	12	12	41	16	11	10	9	9
2250	88	35	21	16	14	13	50	20	13	11	10	10

Burner size 9

Burner rating kW	Low-pressure supply (with FRS). Flow pressure in mbar into shut-off valve, p_e max = 300 mbar							High-pressure supply (with HP regulator). Flow pressure in mbar into double solenoid valve						
	Nominal valve-train diameter							**Nominal valve-train diameter**						
	1½"	**2"**	**65**	**80**	**100**	**125**	**150**	**1½"**	**2"**	**65**	**80**	**100**	**125**	**150**
	Nominal diameter of gas butterfly							Nominal diameter of gas butterfly						
	50	50	65	80	80	80	80	50	50	65	80	80	80	80
Natural gas E, H_i = 37.26 MJ/mn³ (10.35 kWh/mn³), d = 0.606, W_i = 47.84 MJ/mn³														
1600	99	38	21	15	12	11	10	53	20	12	10	8	8	8
1800	124	47	25	18	13	12	11	66	24	14	11	9	9	9
2000	151	56	30	20	15	13	13	81	29	16	13	10	10	10
2200	182	66	35	23	17	15	14	97	34	19	14	12	11	11
2400	215	78	40	26	18	16	15	114	40	21	16	13	12	12
2800	289	103	51	32	22	19	17	–	52	27	20	15	14	14
3200	–	131	64	38	26	21	19	–	66	33	23	18	16	16
3500	–	155	74	44	29	24	21	–	77	38	27	20	18	17
Natural gas LL, H_i = 31.79 MJ/mn³ (8.83 kWh/mn³), d = 0.641, W_i = 39.67 MJ/mn³														
1600	140	52	27	18	14	12	11	75	26	15	11	9	9	8
1800	176	64	33	21	15	13	13	93	32	17	13	10	10	9
2000	216	77	39	25	17	15	14	114	39	20	15	12	11	11
2200	259	92	45	28	19	16	15	137	46	23	17	13	12	12
2400	–	108	52	32	21	18	16	–	54	27	19	15	13	13
2800	–	143	68	40	26	21	19	–	71	34	24	1	16	15
3200	–	184	86	49	31	25	22	–	90	42	29	20	18	17
3500	–	218	101	57	34	27	24	–	106	49	33	23	20	19
LPG B/P, H_i = 93.20 MJ/mn³ (25.89 kWh/mn³), d = 1.555, W_i = 74.73 MJ/mn³														
1600	45	20	13	11	9	9	9	25	11	8	7	6	6	6
1800	56	24	15	12	10	10	9	30	13	9	8	7	7	7
2000	67	28	17	13	11	11	10	37	16	10	9	8	8	8
2200	80	33	20	15	12	11	11	44	18	12	10	9	8	8
2400	94	38	22	16	13	12	12	51	21	13	11	10	9	9
2800	125	49	27	20	15	14	14	68	26	16	13	11	11	11
3200	161	61	33	23	18	16	15	87	33	19	15	13	12	12
3500	191	71	38	26	20	17	17	103	38	22	17	14	14	13

The combustion chamber pressure in mbar must be added to the minimum gas pressure determined from the sizing chart.

For burners firing town gas, please enquire.

For low-pressure supplies, EN 88-compliant governors with safety diaphragms are used. The maximum permissible supply pressure into the shut-off valve for low pressure installations is 300 mbar.

For high-pressure supplies, EN 334-compliant high-pressure regulators should be selected from the brochure "Pressure regulators with safety devices for Weishaupt gas and dual-fuel burners". This brochure details high-gas-pressure sets suitable for supply pressures of up to 4 bar.

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

Burner size 10

Burner rating kW	Low-pressure supply (with FRS). Flow pressure in mbar into shut-off valve, p_e max = 300 mbar **Nominal valve-train diameter** **1½"**	**2"**	**65**	**80**	**100**	**125**	**150**	High-pressure supply (with HP regulator). Flow pressure in mbar into double solenoid valve **Nominal valve-train diameter** **1½"**	**2"**	**65**	**80**	**100**	**125**	**150**
	Nominal diameter of gas butterfly 50	50	65	80	80	80	80	Nominal diameter of gas butterfly 50	50	65	80	80	80	80
Natural gas E, H_i = 37.26 MJ/m³ (10.35 kWh/m³), d = 0.606, W_i = 47.84 MJ/m³														
2000	151	55	29	19	14	13	12	80	28	16	12	10	9	9
2200	181	66	34	22	16	14	13	96	33	18	13	11	10	10
2400	214	77	39	25	17	15	14	113	39	20	15	12	11	11
2600	250	89	44	28	19	16	15	132	45	23	17	13	12	12
2800	288	102	50	31	21	18	16	–	51	26	19	14	13	13
3200	–	130	63	37	24	20	18	–	65	32	22	17	15	15
3600	–	162	77	45	28	23	21	–	80	38	26	19	17	17
3950	–	193	90	52	32	26	23	–	94	44	30	21	19	18
Natural gas LL, H_i = 31.79 MJ/m³ (8.83 kWh/m³), d = 0.641, W_i = 39.67 MJ/m³														
2000	215	76	38	24	17	14	13	113	38	20	14	11	10	10
2200	259	91	45	27	18	16	14	136	45	23	16	12	11	11
2400	–	107	52	31	20	17	16	–	53	26	18	14	12	12
2600	–	124	59	35	23	19	17	–	61	30	21	15	14	13
2800	–	142	67	39	25	20	18	–	70	33	23	16	15	14
3200	–	183	85	48	29	24	21	–	89	41	28	19	17	16
3600	–	229	105	58	35	27	23	–	110	50	33	22	20	19
3950	–	273	124	68	39	30	26	–	131	59	38	25	22	21
LPG B/P, H_i = 93.20 MJ/m³ (25.89 kWh/m³), d = 1.555, W_i = 74.73 MJ/m³														
2000	67	28	17	13	11	10	10	36	15	10	8	7	7	7
2200	79	32	19	14	12	11	10	43	17	11	9	8	8	8
2400	93	37	21	16	13	12	11	50	20	12	10	9	9	8
2600	108	42	24	17	14	12	12	58	23	14	11	10	9	9
2800	124	48	27	19	15	13	13	67	26	15	12	10	10	10
3200	160	60	32	22	17	15	14	86	32	18	14	12	12	11
3600	200	74	39	26	19	17	16	107	39	22	17	14	13	13
3950	240	87	45	29	21	19	17	128	45	25	19	15	14	14

Burner size 11

Burner rating kW	Low-pressure supply (with FRS). Flow pressure in mbar into shut-off valve, p_e max = 300 mbar **Nominal valve-train diameter** **1½"**	**2"**	**65**	**80**	**100**	**125**	**150**	High-pressure supply (with HP regulator). Flow pressure in mbar into double solenoid valve **Nominal valve-train diameter** **1½"**	**2"**	**65**	**80**	**100**	**125**	**150**
	Nominal diameter of gas butterfly 65	65	65	80	100	100	100	Nominal diameter of gas butterfly 65	65	65	80	100	100	100
Natural gas E, H_i = 37.26 MJ/m³ (10.35 kWh/m³), d = 0.606, W_i = 47.84 MJ/m³														
3200	–	123	61	36	23	19	17	–	58	30	21	15	13	13
3400	–	138	68	40	24	20	18	–	64	34	23	16	14	14
3600	–	154	75	43	26	21	19	–	71	37	25	17	15	15
3800	–	170	83	47	28	22	20	–	79	40	27	18	16	15
4000	–	187	91	51	30	24	21	–	86	44	29	20	17	16
4400	–	225	107	60	34	27	23	–	103	51	34	22	19	18
4800	–	265	126	69	39	30	25	–	121	60	38	25	21	20
5100	–	298	140	77	42	32	27	–	135	66	42	27	23	21
Natural gas LL, H_i = 31.79 MJ/m³ (8.83 kWh/m³), d = 0.641, W_i = 39.67 MJ/m³														
3200	–	174	84	47	28	22	19	–	80	40	26	17	15	14
3400	–	195	93	52	30	23	20	–	89	44	29	19	16	15
3600	–	217	103	57	32	25	21	–	99	49	32	20	17	16
3800	–	241	114	62	35	26	23	–	109	54	34	22	19	17
4000	–	266	125	68	38	28	24	–	120	58	37	23	20	18
4400	–	–	149	80	43	32	27	–	–	69	43	26	22	21
4800	–	–	175	93	49	36	29	–	–	80	50	30	25	23
5100	–	–	196	103	54	39	32	–	–	89	55	32	26	24
LPG B/P, H_i = 93.20 MJ/m³ (25.89 kWh/m³), d = 1.555, W_i = 74.73 MJ/m³														
3200	157	57	31	21	15	14	13	82	28	17	13	11	10	10
3400	176	63	34	23	16	14	14	92	31	19	14	11	11	11
3600	196	70	37	24	17	15	14	103	34	20	15	12	11	11
3800	218	77	41	26	19	16	15	114	38	22	17	13	12	12
4000	240	84	44	28	20	17	16	126	41	24	18	14	13	12
4400	289	100	52	32	22	19	17	–	49	27	20	15	14	14
4800	–	117	60	37	24	21	19	–	56	31	23	17	16	15
5100	–	131	66	40	26	22	20	–	63	34	25	18	17	16

The combustion chamber pressure in mbar must be added to the minimum gas pressure determined from the sizing chart.

For burners firing town gas, please enquire.

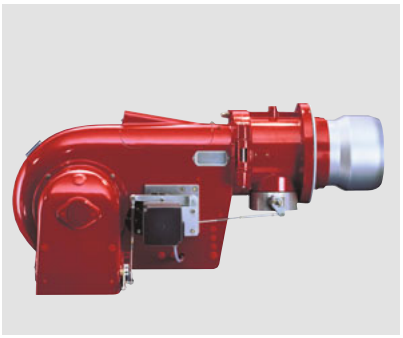
For low-pressure supplies, EN 88-compliant governors with safety diaphragms are used. The maximum permissible supply pressure into the shut-off valve for low pressure installations is 300 mbar.

For high-pressure supplies, EN 334-compliant high-pressure regulators should be selected from the brochure "Pressure regulators with safety devices for Weishaupt gas and dual-fuel burners". This brochure details high-gas-pressure sets suitable for supply pressures of up to 4 bar.

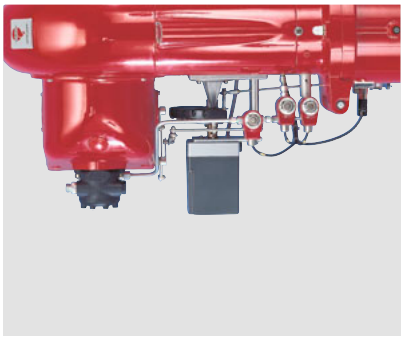
Refer to the burner's rating plate for the maximum connection pressure.

Scope of delivery

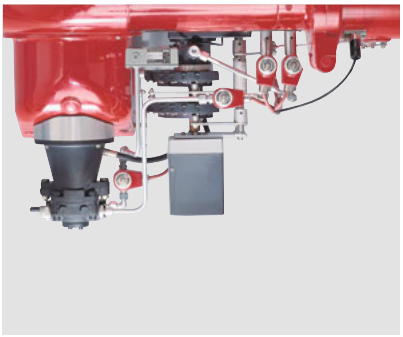
Two-stage gas burner (G... ZD)



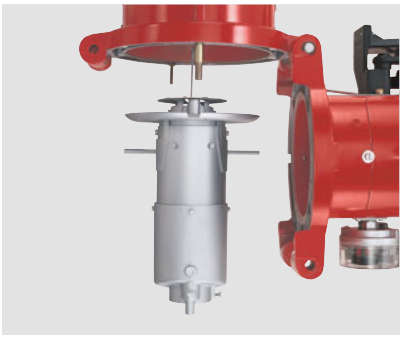
Slidig-two-stage/modulating gas burner (G... ZMD)



Regulating assembly, sliding-two-stage gas / two-stage oil burner (GL... ZMD)

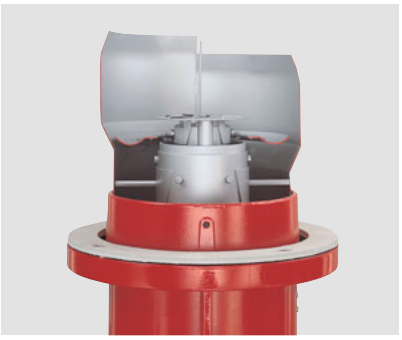


Regulating assembly, sliding-two-stage gas and oil burner (RGL... ZMD)

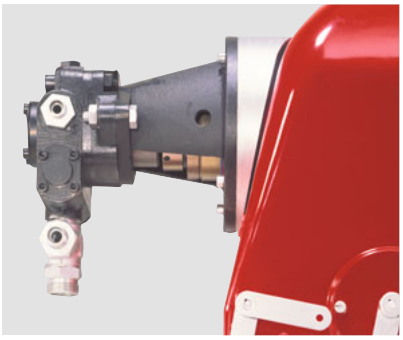


Hinged flange for servicing-friendly combustion head access

Gas burner with inbuilt switchgear



Flame tube can be adjusted to suit heat exchanger



Electromagnetic clutch

Pressure-side air regulation

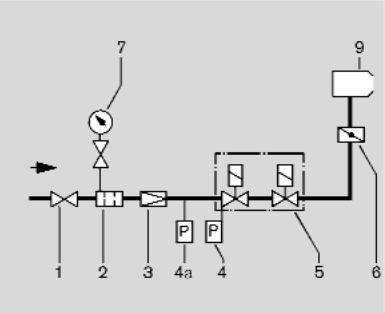
Burners with integral switchgear (extra cost)
The necessary electrical components are fitted to the burner (control and motor fuses by others). Burner-mounted hours counters are also available.

Scope of delivery:
1 first-stage switch with “Burner On” lamp
1 second-stage switch
1 contactor
1 overload relay
1 auxillary contactor
1 terminal strip

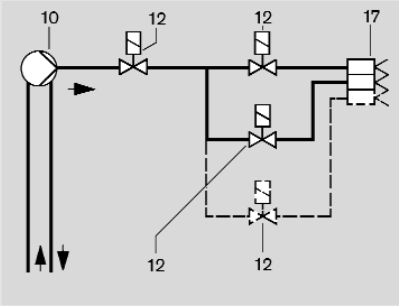
Burners without integral switchgear
The burner is equipped with a terminal strip. All electrical components have to be mounted in a separate control panel.

Scope of delivery:
1 terminal strip

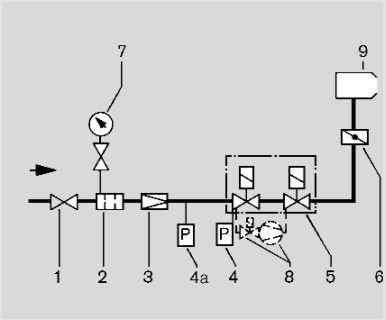
Fuel systems

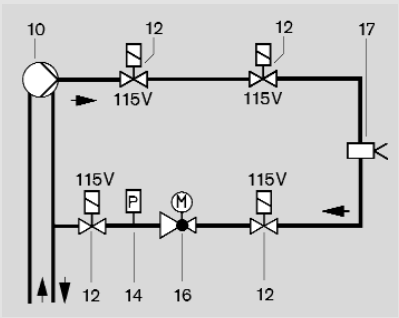


Burner sizes 5 to 7 (gas-side) **with DMV solenoid valves**

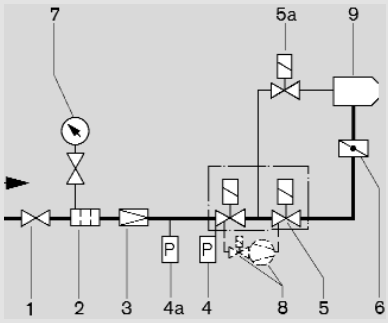


GL5 to GL8 dual fuel burners (two-stage oil-side)
GL8 to GL9 dual fuel burners (three-stage oil-side)

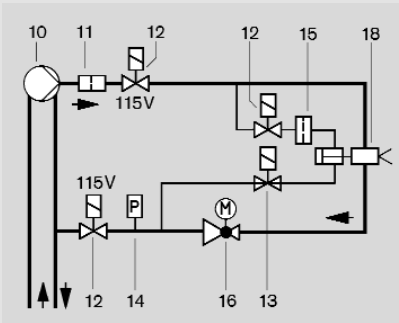




RGL5 to RGL7 dual-fuel burners
(sliding-two-stage/modulating oil-side)



Burner sizes 8 to 11 (gas-side) **with DMV solenoid valves** and VPS valve proving



RGL8 to RGL11 dual-fuel burners
(sliding-two-stage/modulating oil-side)

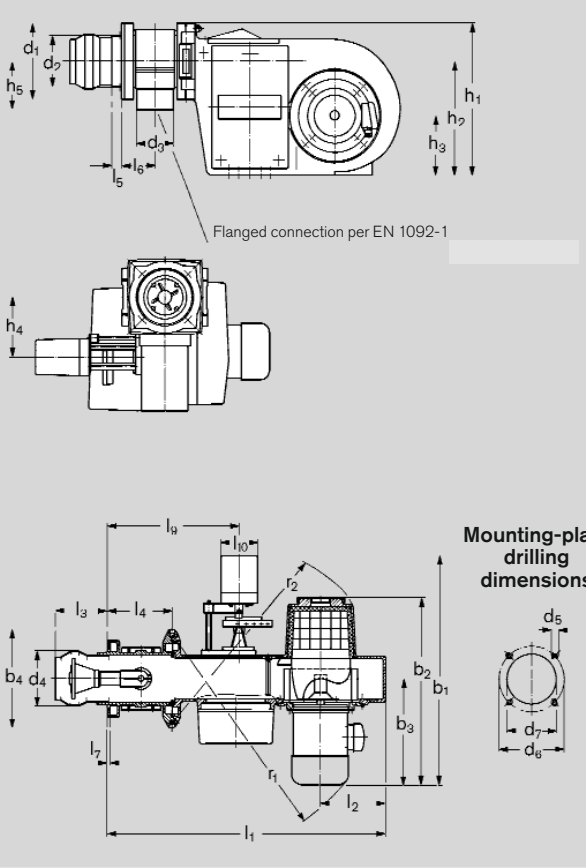
Legend

1	Ball valve *
2	Gas filter *
3	Pressure regulator (LP) *
4	Low-gas-pressure switch
4a	High-gas-pressure switch (for TRD) *
5	Double solenoid valve (DMV)
5a	Pilot-line solenoid valve
6	Gas butterfly valve
7	Pressure gauge with push-button valve *
8	VPS valve proving *
9	Burner
10	Oil pump
11	Strainer
12	Oil solenoid valve, normally closed
13	Oil solenoid valve, normally open
14	Oil-pressure switch
15	Restricting orifice
16	Oil regulator
17	Nozzles for stage 1, 2, or 3 depending on regulation
18	Nozzle assembly with shut-off device

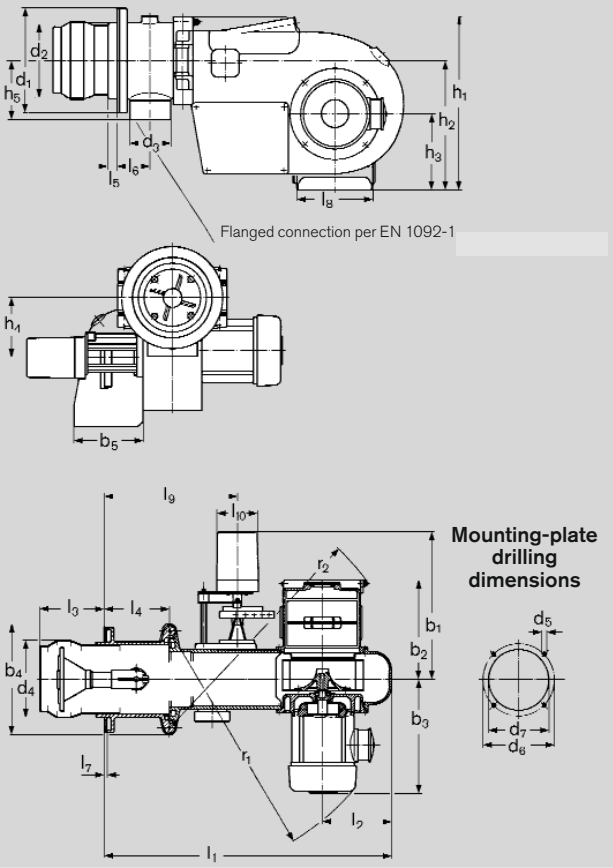
* Not included in burner price

Dimensions

Sizes 1 and 3



Sizes 5 to 11



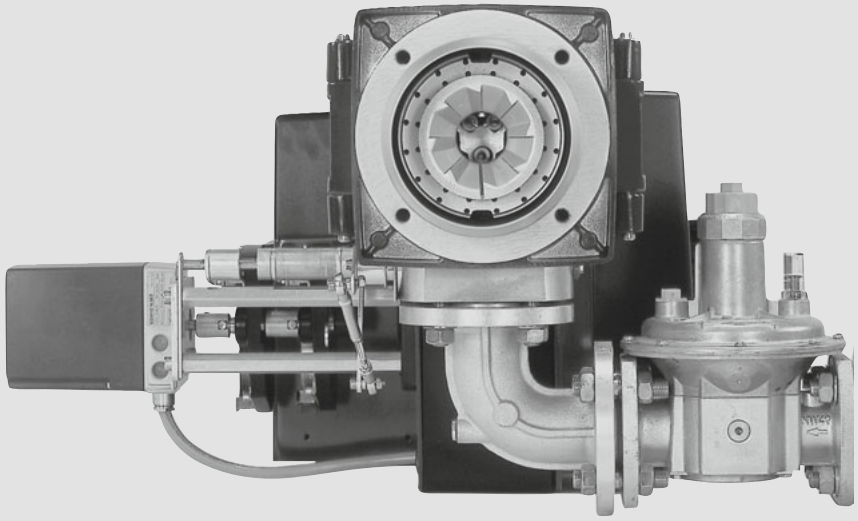
Burner size	Dimensions in mm															
	l_1	l_2	l_3	l_4	l_5	l_6	l_7	l_8	l_9 ①	l_9 ②	l_{10} ①	l_{10} ②	b_1 ①③	b_1 ②	b_2	b_3
1	685	168	129	168	35	88	8	–	312	342	110	120	543	653	501	275
3	805	188	132	188	28	98	8	–	392	382	110	120	570	680	529	295
5	868	200	177	208	42	108	8	238	451	421	110	120	275	390	275	305
7	965	225	257	228	52	118	8	251	514	484	110	120	305	415	326	330
8	965	225	230	228	52	118	8	251	484	514	110	120	229	–	326	370
9	1158	300	233	248	62	128	8	391	–	523	–	120	515	–	357	425
10	1158	300	233	248	62	128	8	391	–	523	–	120	553	–	395	464
11	1198	300	271	288	82	148	8	391	–	563	–	120	545	–	385	484

	b_4	b_5	h_1	h_2	h_3	h_4	h_5	d_1	d_2	d_3	d_4	d_5	d_6 ④	d_7	r_1	r_2
1	248	–	388	290	150	175	130	195	129	DN25	127	M8	160-170	135	550	590
3	280	–	430	325	170	175	140	220	154	DN40	160	M10	186	165	650	670
5	312	200	494	373	220	195	162	260	195	DN50	200	M10	235	210	680	725
7	355	229	560	415	245	195	182	330	235	DN65	250	M12	298	270	720	800
8	355	229	560	415	245	195	182	330	235	DN65	265	M12	298	270	740	840
9	490	229	675	482	260	200	212	380	300	DN80	325	M12	330	305	960	1065
10	490	229	675	482	260	200	212	380	300	DN80	325	M12	330	305	960	1065
11	490	229	675	482	260	200	272	450	340	DN100	380	M12	400	385/360 ⑤	990	1065

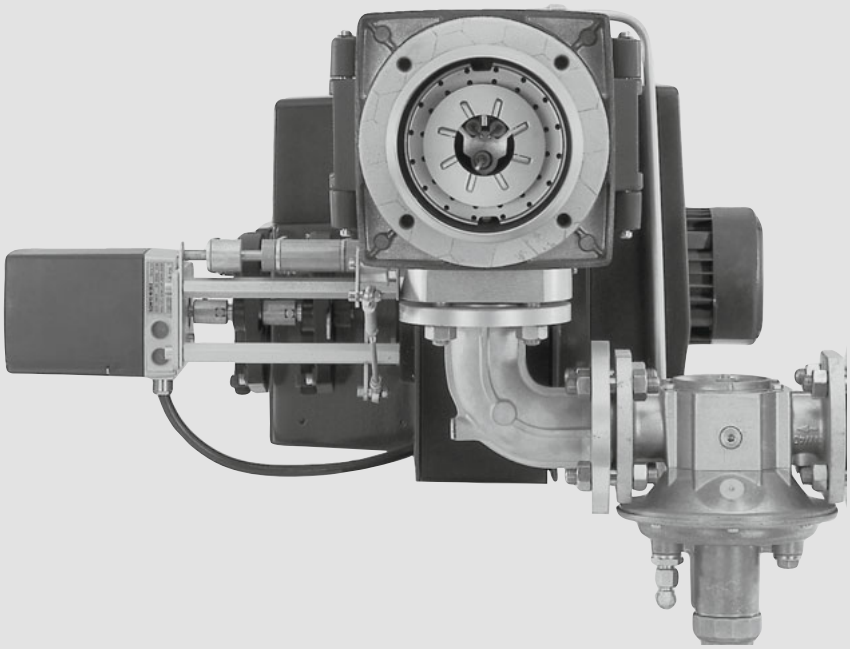
① Z-version burners
② ZM-version burners
③ Dimension applies to RGL-type burners – It should be reduced by 70 mm (ZM-version) or 180 mm (Z-version) on G and GL-type burners.
④ EN 226 revised standard bolier/burner connection dimensions. Boilers rated from 72 – 150 kW now have a PCD of 170 mm.
⑤ Burner head can only be removed with boiler mounting plate.

High-turndown gas burners
Sizes 1 to 7, versions ZMA and ZMI

ZMA-version burner



ZMI-version burner (no CE-PIN)



Description

ZMA and ZMI version Weishaupt gas burners were developed especially with industrial applications in mind. These burners, with their large turn-down ranges, are designed for use on process plant.

The burners are notable for a variety of interesting features:

- Large capacity and range of applications
- Automatic sequence of operations
- Combustion-chamber pre-purging
- Reliable flame monitoring
- Stable fan characteristics – good combustion behaviour
- Quiet operation
- Burner housing can be hinged open
- Simple installation, adjustment and maintenance thanks to readily accessible components

Fuels

Burner version	Gas type
ZMA	Natural gas E, LL
ZMI	Natural gas E, LL LPG B/P

Regulation

Depending on the fuel, burner size, and customer requirements, the compound regulation of air and fuel can be:

- Sliding-two-stage
- Modulating; the standard sliding-two-stage burner can modulate when equipped with a 45 s servomotor and a suitable PID controller)

The servomotor on sliding-two-stage and modulating burners has a maximum running time of 45 s, providing for a slower change in burner throughput. A cam-band provides for the compound regulation of the air damper and gas butterfly valve.

With sliding two stage regulation, the burner has fixed partial and full-load setpoints, and the burner moves to one position or the other depending on the heat demand. There are no rapid changes of fuel throughput.

With modulating regulation, the burner's output, within its operating range, is continuously regulated to match to the current heat demand.

Zero governor

The ZMI versions of Weishaupt gas burners are additionally equipped with a zero governor, which is fitted as close to the burner head as possible in order to eliminate the effect of any valve train pressure losses.

The zero governor is connected to the burner's airflow upstream of the fan by an impulse line.

A higher pressure from the burner's fan results in a higher gas pressure at the outlet of the zero governor. A lower fan pressure results in a lower gas pressure at the outlet of the zero governor.

ZMA-version burners are not additionally equipped with a zero governor; rather the usual governor is fitted as close to the burner head as possible. When connected to a high-pressure gas supply, the low-pressure governor is required in addition to a high-pressure regulator set.

Air regulation

The special air damper on ZMA and ZMI-version gas burners is almost tight in the closed position. This makes the large turndown possible.

Permissible ambient conditions

- Suitable for operation indoors only
- For plant in unheated areas, certain further measures may be required (please enquire)

Notes on operation

ZMA and ZMI-version burners are only suitable for use on process plant if the following fundamental conditions are met:

- The flame must not be impeded in the combustion chamber by process-specific flue-gas recirculation or by secondary air.
- A flue-gas sampling point must be available prior to dilution by any other sources.
- A flame viewing port must be available.
- A gas-flow meter/throughput indicator is essential for setting the burner.

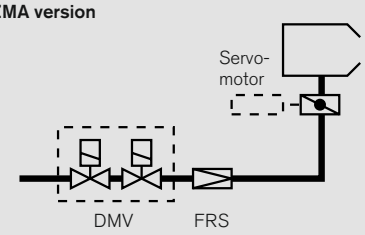
Gas-side burner regulation

Gas-fired operation

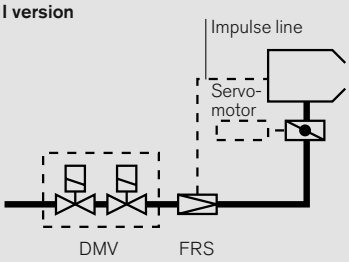
Sliding-two-stage or modulating

- When the burner starts, gas is released by opening the solenoid valves. The gas butterfly valve releases sufficient gas for ignition load.
- A slow-running servomotor (42 s run-time) drives the gas butterfly valve to its full-load position.
- The servomotor drives the gas butterfly valve to adjust burner capacity between partial load and full load. The zero governor or FRS pressure regulator is immediately upstream of the gas butterfly valve
- Sliding-two-stage burners and modulating burners have differing electrical controls.

ZMA version



ZMI version



Above: sliding-two-stage
Below: modulating

F = full load, P = partial load, I = ignition load

Gas valve train sizing
Burner sizes 1 and 3, version ZMA

Burner size 1

Burner rating [kW]	Setting press. at gas butterfly [mbar]	Low pressure supply (Flow pressure in mbar into shut-off valve, p_e, max = 300 mbar) **Nominal valve-train diameter** **¾"** **1"** **1½"** **2"** Nominal diameter of gas butterfly				High pressure supply (Flow pressure in mbar into double solenoid valve) **Nominal valve-train diameter** **¾"** **1"** **1½"** **2"** Nominal diameter of gas butterfly			
		25	25	25	25	25	25	25	25
Natural gas E, H_i = 37.26 MJ/m³ (10.35 kWh/m³), d = 0.606									
150	2	12	–	–	–	10	7	6	5
200	3	18	10	–	–	15	9	7	6
220	3	21	11	–	–	18	10	7	7
250	4	26	13	8	–	22	11	8	7
280	4	31	15	9	8	26	13	9	8
300	5	35	17	10	9	29	14	10	9
320	5	39	18	11	9	32	15	10	9
340	5	43	20	12	10	36	17	11	10
Natural gas LL, H_i = 31.79 MJ/m³ (8.83 kWh/m³), d = 0.641									
150	3	15	9	–	–	13	8	6	6
200	3	24	12	–	–	20	10	8	7
220	4	28	14	9	–	23	12	8	7
250	4	35	16	10	8	29	14	9	8
280	5	42	19	11	9	35	16	11	9
300	5	48	22	12	10	40	18	11	10
320	6	54	24	13	10	44	19	12	10
340	6	60	26	14	11	49	21	13	11

Burner size 3

Burner rating [kW]	Setting press. at gas butterfly [mbar]	Low pressure supply (Flow pressure in mbar into shut-off valve, p_e, max = 300 mbar) **Nominal valve-train diameter** **¾"** **1"** **1½"** **2"** **65** **80** Nominal diameter of gas butterfly						High pressure supply (Flow pressure in mbar into double solenoid valve) **Nominal valve-train diameter** **¾"** **1"** **1½"** **2"** **65** **80** Nominal diameter of gas butterfly					
		40	40	40	40	40	40	40	40	40	40	40	40
Natural gas E, H_i = 37.26 MJ/m³ (10.35 kWh/m³), d = 0.606													
300	3	30	12	9	–	–	–	25	10	8	7	6	6
350	4	40	15	10	8	–	–	32	12	10	8	7	7
400	4	51	19	12	9	–	–	41	14	11	9	8	7
450	5	63	22	14	11	9	–	50	16	13	10	8	8
500	5	76	26	16	12	9	9	61	19	15	11	9	8
550	6	91	31	18	13	10	9	72	21	17	13	10	9
600	6	107	36	21	15	11	10	85	25	19	14	11	10
650	7	125	41	23	16	12	11	99	28	22	16	12	10
Natural gas LL, H_i = 31.79 MJ/m³ (8.83 kWh/m³), d = 0.641													
300	4	42	16	10	8	–	–	34	12	10	8	7	6
350	4	55	20	12	10	–	–	44	14	12	9	8	7
400	5	71	24	15	11	9	–	56	17	14	11	8	8
450	5	88	30	18	13	10	9	70	21	16	12	9	8
500	6	108	35	20	14	11	9	85	24	19	14	10	9
550	6	129	42	23	16	12	10	102	28	22	15	11	10
600	7	153	48	27	18	13	11	120	32	25	17	12	11
650	8	178	56	30	20	14	12	–	37	28	19	13	11

The combustion chamber pressure in mbar must be added to the minimum gas pressure / setting pressure determined from the above chart.

Stated nett calorific values (H_i) are based on 0 °C and 1013.25 mbar.

For low-pressure supplies, EN 88-compliant governors with safety diaphragms are used. The maximum permissible supply pressure into the shut-off valve for low-pressure installations is 300 mbar.

For high-pressure supplies, EN 334-compliant high-pressure regulators should be selected from the brochure "Pressure regulators with safety devices for Weishaupt gas and dual-fuel burners". This brochure details high-gas-pressure sets suitable for supply pressures of up to 4 bar.

Valve trains
It should be noted that, depending on the burner and valve train size, the governor may foul against the front of the heat exchanger (see dimension I7, page).

The setting pressure with screwed valve trains can only be measured at full load at the gas butterfly valve.

With flanged valve trains, the setting pressure can also be measured at the flanged bend.

Gas valve train sizing
Burner sizes 5 and 7, version ZMA

Burner size 5

Burner rating [kW]	Setting press. at gas butterfly [mbar]	Low pressure supply (Flow pressure in mbar into shut-off valve, p_e, max = 300 mbar) Nominal valve-train diameter							High pressure supply (Flow pressure in mbar into double solenoid valve) Nominal valve-train diameter						
		¾"	1"	1½"	2"	65	80	100	¾"	1"	1½"	2"	65	80	100
		Nominal diameter of gas butterfly							Nominal diameter of gas butterfly						
		50	50	50	50	50	50	50	50	50	50	50	50	50	50
Natural gas E, H_i = 37.26 MJ/m³ (10.35 kWh/m³), d = 0.606															
500	5	74	24	12	11	9	–	–	58	16	11	11	8	8	7
550	5	88	28	13	12	9	8	–	69	18	12	12	9	8	8
600	5	104	32	15	14	10	9	8	81	21	14	13	10	9	8
650	6	121	36	17	15	11	9	9	95	23	15	14	10	9	9
700	6	139	41	19	17	12	10	9	109	26	17	16	11	10	9
800	7	180	52	22	20	14	11	10	–	33	20	19	13	11	10
900	8	226	64	27	24	16	13	12	–	40	23	22	15	12	11
940	8	246	70	29	25	17	13	12	–	43	25	24	15	13	12
Natural gas LL, H_i = 31.79 MJ/m³ (8.83 kWh/m³), d = 0.641															
500	5	104	32	15	13	10	8	–	82	20	13	13	9	8	8
550	5	125	37	17	15	11	9	8	98	24	15	14	10	9	8
600	6	148	43	19	17	12	10	9	115	27	17	16	11	10	9
650	6	172	50	21	19	13	11	10	134	31	19	18	12	10	9
700	7	199	57	24	21	14	11	10	–	35	21	20	13	11	10
800	8	258	72	29	25	16	13	12	–	44	25	24	15	12	11
900	9	–	90	35	30	19	15	13	–	53	30	28	17	14	12
940	9	–	97	37	33	20	15	13	–	58	32	30	18	14	13

Burner size 7

Burner rating [kW]	Setting press. at gas butterfly [mbar]	Low pressure supply (Flow pressure in mbar into shut-off valve, p_e, max = 300 mbar) Nominal valve-train diameter						High pressure supply (Flow pressure in mbar into double solenoid valve) Nominal valve-train diameter					
		1"	1½"	2"	65	80	100	1"	1½"	2"	65	80	100
		Nominal diameter of gas butterfly						Nominal diameter of gas butterfly					
		65	65	65	65	65	65	65	65	65	65	65	65
Natural gas E, H_i = 37.26 MJ/m³ (10.35 kWh/m³), d = 0.606													
800	5	47	24	14	10	9	8	27	21	13	9	8	8
900	6	58	29	17	12	10	9	33	26	15	11	9	9
1000	6	70	35	19	13	11	10	39	30	17	12	10	9
1100	7	83	41	22	15	12	10	46	36	20	13	11	10
1200	8	98	47	25	16	13	11	54	41	23	14	12	11
1400	9	131	62	32	20	15	13	71	54	28	17	14	12
1600	10	169	78	39	24	18	15	90	68	35	20	16	14
1750	11	201	92	46	27	20	16	106	80	40	23	18	15
Natural gas LL, H_i = 31.79 MJ/m³ (8.83 kWh/m³), d = 0.641													
800	6	65	32	18	12	10	9	36	28	16	11	9	9
900	6	81	39	21	14	11	10	44	34	19	12	10	9
1000	7	98	47	25	16	12	11	53	41	22	14	11	10
1100	8	118	55	29	18	14	12	63	48	25	15	13	11
1200	8	139	65	33	20	15	12	74	56	29	17	14	12
1400	10	186	85	42	25	18	14	98	74	37	21	16	14
1600	11	241	109	53	30	21	17	126	94	46	25	19	16
1750	12	286	129	61	34	24	18	–	111	53	28	21	17

The combustion chamber pressure in mbar must be added to the minimum gas pressure / setting pressure determined from the above chart.

Stated nett calorific values (H_i) are based on 0 °C and 1013.25 mbar.

For low-pressure supplies, EN 88-compliant governors with safety diaphragms are used. The maximum permissible supply pressure into the shut-off valve for low-pressure installations is 300 mbar.

For high-pressure supplies, EN 334-compliant high-pressure regulators should be selected from the brochure "Pressure regulators with safety devices for Weishaupt gas and dual-fuel burners". This brochure details high-gas-pressure sets suitable for supply pressures of up to 4 bar.

Valve trains
It should be noted that, depending on the burner and valve train size, the governor may foul against the front of the heat exchanger (see dimension I7, page).

The setting pressure with screwed valve trains can only be measured at full load at the gas butterfly valve.

With flanged valve trains, the setting pressure can also be measured at the flanged bend.

Gas valve train sizing
Burner size 1, version ZMI

Burner size 1

Burner rating [kW]	Setting press. at gas butterfly [mbar]	Low pressure supply (Flow pressure in mbar into shut-off valve, $p_{e,}$ max = 300 mbar) **Nominal valve-train diameter** ¾" 1" 1½" Nominal diameter of gas butterfly 25 25 25			High pressure supply (Flow pressure in mbar into double solenoid valve) **Nominal valve-train diameter** ¾" 1" 1½" Nominal diameter of gas butterfly 25 25 25		
Natural gas E, H_i = 37.26 MJ/m³ (10.35 kWh/m³), d = 0.606							
150	2	15	8	–	10	7	6
200	3	23	12	–	15	9	7
220	3	27	13	8	18	10	7
250	4	33	16	10	22	11	8
280	4	41	19	11	26	13	9
300	5	46	21	12	29	14	10
320	5	52	23	13	32	15	10
340	5	58	25	14	36	17	11
Natural gas LL, H_i = 31.79 MJ/m³ (8.83 kWh/m³), d = 0.641							
150	3	19	10	–	13	8	6
200	3	31	15	9	20	10	8
220	4	37	17	10	23	12	8
250	4	46	21	11	29	14	9
280	5	56	25	13	35	16	11
300	5	64	27	14	40	18	11
320	6	72	30	16	44	19	12
340	6	81	34	17	49	21	13
LPG B/P, H_i = 93.20 MJ/m³ (25.89 kWh/m³), d = 1.555							
150	2	–	–	–	–	–	–
200	3	11	–	–	6	–	–
220	3	13	–	–	7	–	–
250	3	16	–	–	8	–	–
280	4	18	–	–	10	–	–
300	4	20	–	–	11	–	–
320	4	23	–	–	12	–	–
340	4	25	–	–	14	–	–

The combustion chamber pressure in mbar must be added to the minimum gas pressure / setting pressure determined from the above chart.

Stated nett calorific values (H_i) are based on 0 °C and 1013.25 mbar.

For low-pressure supplies, EN 88-compliant governors with safety diaphragms are used. The maximum permissible supply pressure into the shut-off valve for low-pressure installations is 300 mbar.

For high-pressure supplies, EN 334-compliant high-pressure regulators should be selected from the brochure "Pressure regulators with safety devices for Weishaupt gas and dual-fuel burners". This brochure details high-gas-pressure sets suitable for supply pressures of up to 4 bar.

Valve trains
It should be noted that, depending on the burner and valve train size, the governor may foul against the front of the heat exchanger (see dimension I7, page).

The setting pressure with screwed valve trains can only be measured at full load at the gas butterfly valve.

With flanged valve trains, the setting pressure can also be measured at the flanged bend.

Gas valve train sizing
Burner sizes 3 and 5, version ZMI

Burner size 3

Burner rating [kW]	Setting press. at gas butterfly [mbar]	Low pressure supply (Flow pressure in mbar into shut-off valve, $p_{e,}$ max = 300 mbar) **Nominal valve-train diameter** **¾"** **1"** **1½"** **2"** Nominal diameter of gas butterfly 40 40 40 40				High pressure supply (Flow pressure in mbar into double solenoid valve) **Nominal valve-train diameter** **¾"** **1"** **1½"** **2"** Nominal diameter of gas butterfly 40 40 40 40			
Natural gas E, H_i = 37.26 MJ/m³ (10.35 kWh/m³), d = 0.606									
300	3	42	16	10	–	25	10	8	7
350	4	55	21	13	9	32	12	10	8
400	4	71	26	15	10	41	14	11	9
450	5	88	31	18	12	50	16	13	10
500	5	107	38	21	13	61	19	15	11
550	6	129	44	24	15	72	21	17	13
600	6	152	52	27	17	85	25	19	14
650	7	178	60	31	19	99	28	22	16
Natural gas LL, H_i = 31.79 MJ/m³ (8.83 kWh/m³), d = 0.641									
300	4	58	22	13	9	34	12	10	8
350	4	78	28	16	10	44	14	12	9
400	5	100	35	19	12	56	17	14	11
450	5	125	43	23	14	70	21	16	12
500	6	153	52	27	16	85	24	19	14
550	6	184	61	32	18	102	28	22	15
600	7	218	72	36	21	120	32	25	17
650	8	255	83	42	23	–	37	28	19
LPG B/P, H_i = 93.20 MJ/m³ (25.89 kWh/m³), d = 1.555									
300	2	19	9	–	–	10	–	–	–
350	3	25	11	–	–	13	–	–	–
400	4	31	13	–	–	17	6	–	–
450	4	39	15	–	–	21	7	–	–
500	5	47	18	–	–	25	8	–	–
550	5	55	21	–	–	30	9	–	–
600	6	65	24	–	–	35	10	–	–
650	6	76	27	–	–	41	12	–	–

The combustion chamber pressure in mbar must be added to the minimum gas pressure / setting pressure determined from the above chart.

Stated nett calorific values (H_i) are based on 0 °C and 1013.25 mbar.

For low-pressure supplies, EN 88-compliant governors with safety diaphragms are used. The maximum permissible supply pressure into the shut-off valve for low-pressure installations is 300 mbar.

For high-pressure supplies, EN 334-compliant high-pressure regulators should be selected from the brochure "Pressure regulators with safety devices for Weishaupt gas and dual-fuel burners". This brochure details high-gas-pressure sets suitable for supply pressures of up to 4 bar.

Valve trains
It should be noted that, depending on the burner and valve train size, the governor may foul against the front of the heat exchanger (see dimension I7, page).

The setting pressure with screwed valve trains can only be measured at full load at the gas butterfly valve.

With flanged valve trains, the setting pressure can also be measured at the flanged bend.

Burner size 5

Burner rating [kW]	Setting press. at gas butterfly [mbar]	Low pressure supply (Flow pressure in mbar into shut-off valve, $p_{e,}$ max = 300 mbar) Nominal valve-train diameter ¾"	1"	1½"	2"	65	80	100	High pressure supply (Flow pressure in mbar into double solenoid valve) Nominal valve-train diameter ¾"	1"	1½"	2"	65	80	100
		Nominal diameter of gas butterfly 50	50	50	50	50	50	50	Nominal diameter of gas butterfly 50	50	50	50	50	50	50
Natural gas E, H_i = 37.26 MJ/m³ (10.35 kWh/m³), d = 0.606															
500	5	105	35	17	12	9	–	–	58	16	11	11	8	8	7
550	5	126	41	19	14	10	8	–	69	18	12	12	9	8	8
600	5	149	48	22	16	11	9	8	81	21	14	13	10	9	8
650	6	173	55	25	17	12	10	9	95	23	15	14	10	9	9
700	6	200	63	28	19	13	10	9	109	26	17	16	11	10	9
800	7	260	81	34	24	15	12	11	–	33	20	19	13	11	10
900	8	–	101	42	28	17	13	12	–	40	23	22	15	12	11
940	8	–	109	45	30	18	14	12	–	43	25	24	15	13	12
Natural gas LL, H_i = 31.79 MJ/m³ (8.83 kWh/m³), d = 0.641															
500	5	149	48	21	15	10	9	–	82	20	13	13	9	8	8
550	5	180	57	25	17	11	9	9	98	24	15	14	10	9	8
600	6	213	67	29	20	13	10	9	115	27	17	16	11	10	9
650	6	249	77	33	22	14	11	10	134	31	19	18	12	10	9
700	7	288	89	37	25	15	12	10	–	35	21	20	13	11	10
800	8	–	114	46	30	18	13	12	–	44	25	24	15	12	11
900	9	–	142	57	37	21	15	13	–	53	30	28	17	14	12
940	9	–	155	61	40	22	16	14	–	58	32	30	18	14	13
LPG B/P, H_i = 93.20 MJ/m³ (25.89 kWh/m³), d = 1.555															
500	4	46	17	9	–	–	–	–	24	7	–	–	–	–	–
550	4	54	20	11	–	–	–	–	29	8	5	–	–	–	–
600	4	64	22	12	–	–	–	–	34	9	6	–	–	–	–
650	5	74	26	13	–	–	–	–	39	10	6	–	–	–	–
700	5	85	29	14	–	–	–	–	45	11	7	–	–	–	–
800	6	109	36	17	–	–	–	–	58	14	9	–	–	–	–
900	6	137	44	20	–	–	–	–	72	17	10	–	–	–	–
940	7	149	48	21	–	–	–	–	79	18	11	–	–	–	–

The combustion chamber pressure in mbar must be added to the minimum gas pressure / setting pressure determined from the above chart.

Stated nett calorific values (H_i) are based on 0 °C and 1013.25 mbar.

For low-pressure supplies, EN 88-compliant governors with safety diaphragms are used. The maximum permissible supply pressure into the shut-off valve for low-pressure installations is 300 mbar.

For high-pressure supplies, EN 334-compliant high-pressure regulators should be selected from the brochure "Pressure regulators with safety devices for Weishaupt gas and dual-fuel burners". This brochure details high-gas-pressure sets suitable for supply pressures of up to 4 bar.

Valve trains
It should be noted that, depending on the burner and valve train size, the governor may foul against the front of the heat exchanger (see dimension I7, page).

The setting pressure with screwed valve trains can only be measured at full load at the gas butterfly valve.

With flanged valve trains, the setting pressure can also be measured at the flanged bend.

Gas valve train sizing
Burner size 7, version ZMI

Burner size 7

Burner rating [kW]	Setting press. at gas butterfly [mbar]	Low pressure supply (Flow pressure in mbar into shut-off valve, $p_{e,}$ max = 300 mbar) Nominal valve-train diameter					High pressure supply (Flow pressure in mbar into double solenoid valve) Nominal valve-train diameter				
		1½"	**2"**	**65**	**80**	**100**	**1½"**	**2"**	**65**	**80**	**100**
		Nominal diameter of gas butterfly					Nominal diameter of gas butterfly				
		65	65	65	65	65	65	65	65	65	65
Natural gas E, H_i = 37.26 MJ/m³ (10.35 kWh/m³), d = 0.606											
800	5	32	17	11	9	8	21	13	9	8	8
900	6	39	20	13	10	9	26	15	11	9	9
1000	6	47	24	15	11	10	30	17	12	10	9
1100	7	56	27	16	13	11	36	20	13	11	10
1200	8	66	31	18	14	12	41	23	14	12	11
1400	9	87	40	23	17	13	54	28	17	14	12
1600	10	112	51	27	19	15	68	35	20	16	14
1750	11	132	59	31	22	17	80	40	23	18	15
Natural gas LL, H_i = 31.79 MJ/m³ (8.83 kWh/m³), d = 0.641											
800	6	44	22	13	10	9	28	16	11	9	9
900	6	54	26	16	12	10	34	19	12	10	9
1000	7	66	31	18	13	11	41	22	14	11	10
1100	8	78	36	20	15	12	48	25	15	13	11
1200	8	92	42	23	16	13	56	29	17	14	12
1400	10	122	54	29	20	15	74	37	21	16	14
1600	11	157	69	35	23	18	94	46	25	19	16
1750	12	187	81	40	26	19	111	53	28	21	17
LPG B/P, H_i = 93.20 MJ/m³ (25.89 kWh/m³), d = 1.555											
800	4	17	10	8	–	–	12	9	7	7	7
900	4	20	12	9	–	–	14	10	8	7	7
1000	5	23	14	10	9	–	16	11	9	8	8
1100	5	27	15	11	9	9	19	12	10	9	8
1200	6	31	17	12	10	9	21	14	10	9	9
1400	7	41	21	14	12	10	27	16	12	11	10
1600	8	51	26	17	13	12	33	20	14	12	11
1750	9	60	30	19	15	13	38	22	15	13	12

The combustion chamber pressure in mbar must be added to the minimum gas pressure / setting pressure determined from the above chart.

Stated nett calorific values (H_i) are based on 0 °C and 1013.25 mbar.

For low-pressure supplies, EN 88-compliant governors with safety diaphragms are used. The maximum permissible supply pressure into the shut-off valve for low-pressure installations is 300 mbar.

For high-pressure supplies, EN 334-compliant high-pressure regulators should be selected from the brochure "Pressure regulators with safety devices for Weishaupt gas and dual-fuel burners". This brochure details high-gas-pressure sets suitable for supply pressures of up to 4 bar.

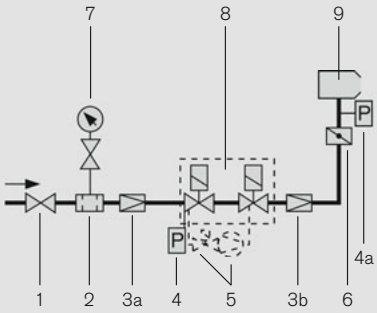
Valve trains
It should be noted that, depending on the burner and valve train size, the governor may foul against the front of the heat exchanger (see dimension I7, page).

The setting pressure with screwed valve trains can only be measured at full load at the gas butterfly valve.

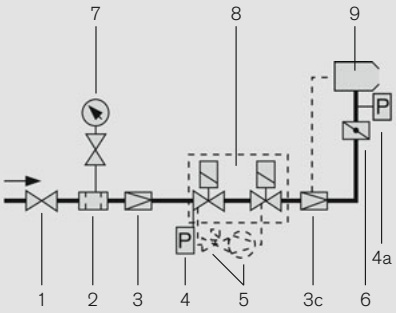
With flanged valve trains, the setting pressure can also be measured at the flanged bend.

Fuel system

Layout of the valve train



ZMA-version burners **with DMV solenoid valves** and VPS valve proving



ZMI-version burners **with DMV solenoid valves** and VPS valve proving

Legend

1 Ball valve *
2 Gas filter *
3 Pressure regulator, (LP) * or (HP) *
3a Pressure regulator (HP only)
3b Pressure regulator (LP)
3c Zero governor with impulse line
4 Low-gas-pressure switch.
4a High-gas-pressure switch (for TRD)
5 VPS valve proving *
6 Gas butterfly valve
7 Pressure gauge with push-button valve *
8 Double solenoid valve (DMV)
9 Burner

* Not included in burner price

Valve trains with DMV
EN 676 stipulates that gas-fired burners must be fitted with two solenoid valves. Accordingly, Weishaupt gas and dual-fuel burners are equipped as standard with a Class-A double solenoid valve assembly.

Valve trains with DMV and VPS
Weishaupt also recommends the use of a gas valve proving system (mandatory from 1200 kW). Details on valve proving and other gas valve train components, such as filters and pressure regulators, can be found in our accessories list.

Following a set program, the VPS valve proving system checks the tightness of the DMV valves before the burner starts. Further information can be found in the Weishaupt accessories list.

Installation examples

The installation examples above show the optimal arrangement of screwed and flanged gas valve trains.

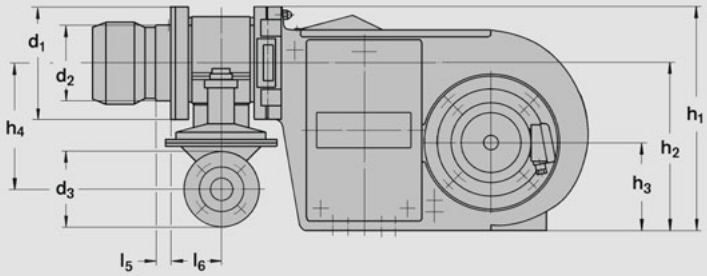
Layout of the valve train
On boilers with hinged doors, the valve train must be mounted on the opposite side to the boiler-door hinges. The pilot-line solenoid valve can be connected to either side of the burner.

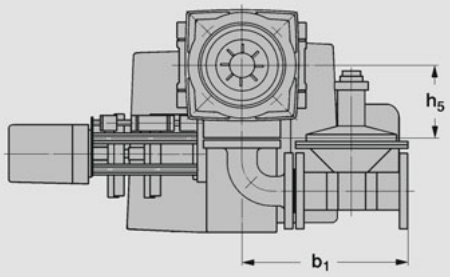
Break points in the valve train
Break points in the valve train should be provided to enable the door of the heat exchanger to be swung open. The main gas line is best separated at the compensator.

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.

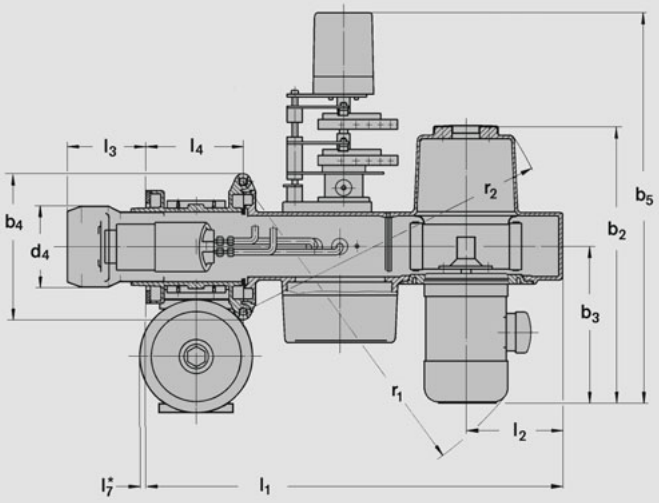
Gas meter
A gas meter must be installed to measure gas consumption during commissioning.

Dimensions

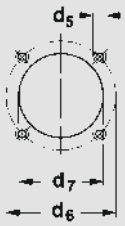




Measurements from "Gas connection dimensions", print No. 1121



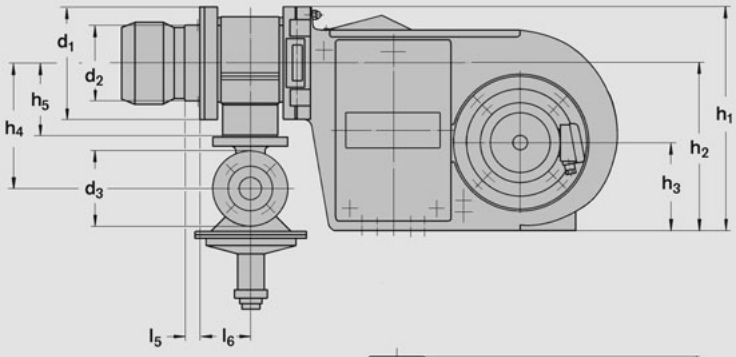
Mounting-plate drilling dimensions

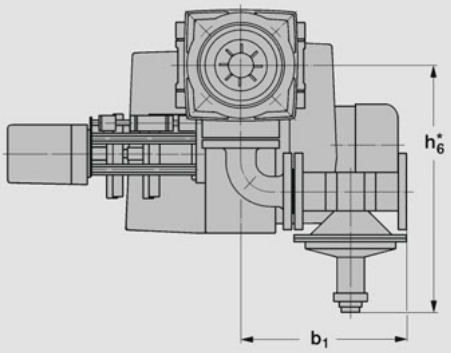


* If the protrusion of the zero governor may foul the appliance mounting plate, then a spacer ring must be interposed between the plate and the burner flange (see accessories list). It should be noted that combustion head dimension l_3 is thereby reduced by the depth of the spacer ring.

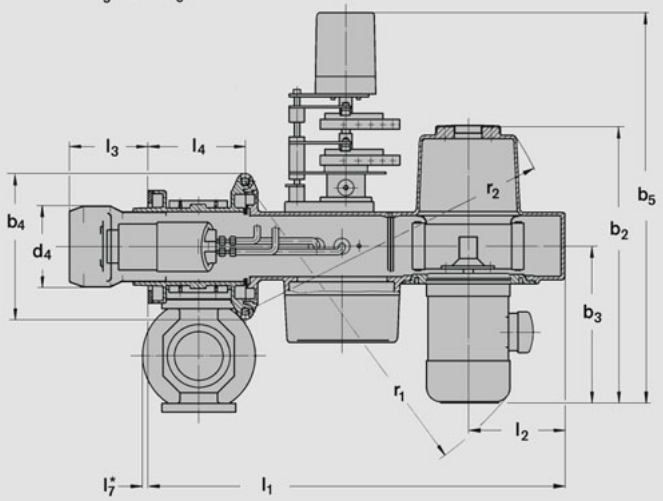
Burner size	Dimensions in mm l_1	l_2	l_3	l_4	l_5	l_6	l_7* with DN 1"	1½"	2"	65	80	100	h_1	h_2	h_3	h_4	h_5
1	687	169	112	168	36	88	–	10	37	55	55	87	388	290	150	220	130
3	807	189	158	188	28	98	–	–	27	45	45	77	435	325	170	250	140
5	868	200	199	208	42	108	–	–	17	35	35	67	494	373	220	285	162
7	964	225	231	228	57	118	–	–	7	25	25	57	561	420	250	325	182
	b_2	b_3	b_4	b_5	r_1	r_2	d_1	d_2	d_3	d_4	d_5	d_6	d_7				
1	491	281	250	728	566	604	195	129	DN25	130	M8	160-170	135				
3	531	313	280	767	657	645	220	154	DN40	160	M10	186	165				
5	546	266	312	728	664	709	260	192	DN50	200	M12	235	210				
7	664	336	355	819	796	795	330	232	DN65	250	M14	298	275				

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

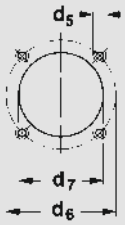




Measurements from "Gas connection dimensions", print No. 1121



Mounting-plate drilling dimensions



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Burner size	Dimensions in mm l_1	l_2	l_3	l_4	l_5	l_6	l_7* with DN 1"	1½"	2"	65	80	100	h_1	h_2	h_3	h_4	h_5
1	687	169	112	168	36	88	–	10	37	55	55	87	388	290	150	220	130
3	807	189	158	188	28	98	–	–	27	45	45	77	435	325	170	250	140
5	868	200	199	208	42	108	–	–	17	35	35	67	494	373	220	285	162
7	964	225	231	228	57	118	–	–	7	25	25	57	561	420	250	325	182

	l_6* bei DN 1"	1½"	2"	65	80	b_2	b_3	b_4	b_5	r_1	r_2
1	377	421	483	530	530	491	281	250	728	566	604
3	407	461	513	560	560	531	313	280	767	657	645
5	442	496	548	595	595	546	266	312	728	664	709
7	482	536	588	635	635	664	336	355	819	796	795

	d_1	d_2	d_3	d_4	d_5	d_6	d_7
1	195	129	DN25	130	M8	160-170	135
3	220	154	DN40	160	M10	186	165
5	260	192	DN50	200	M10	235	210
7	330	232	DN65	250	M12	298	275

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