

Instruction for



SIZING TOOL

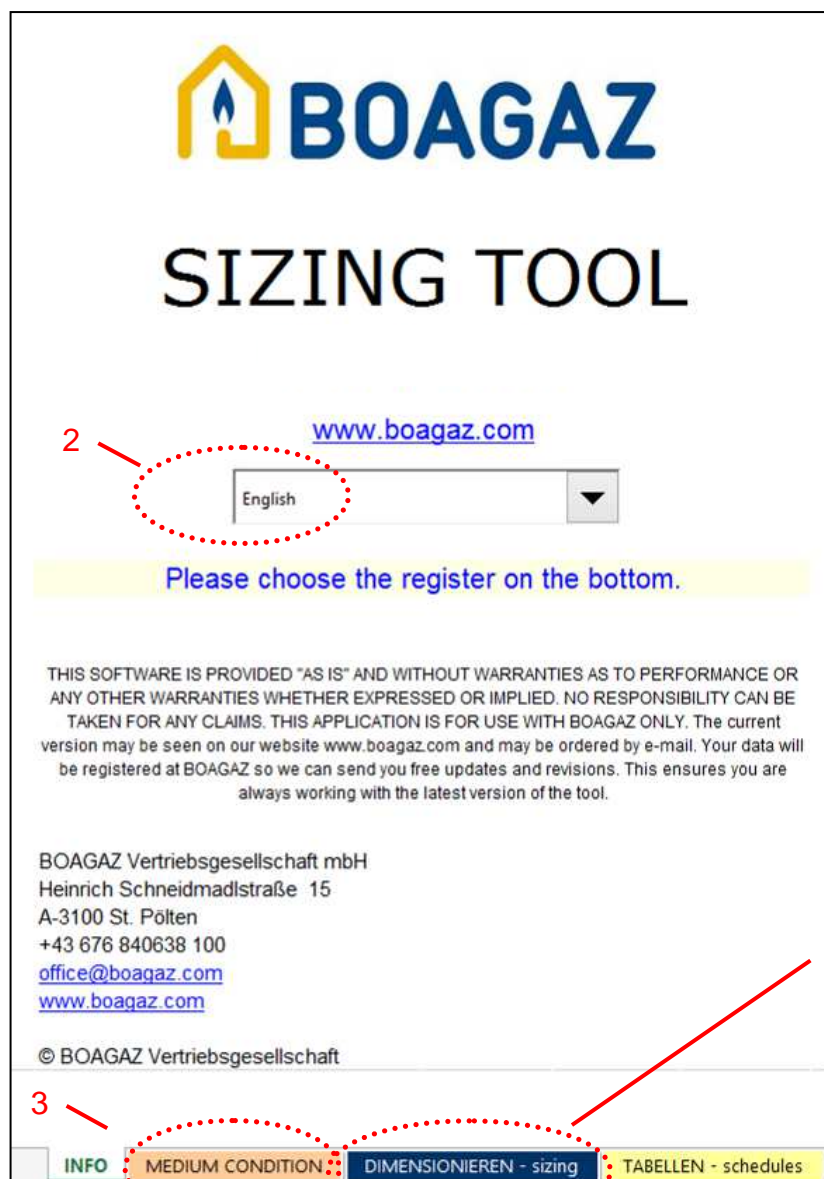
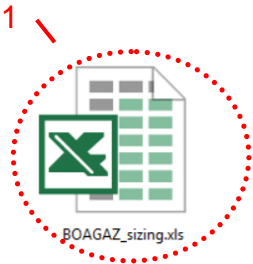
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a) Open the file

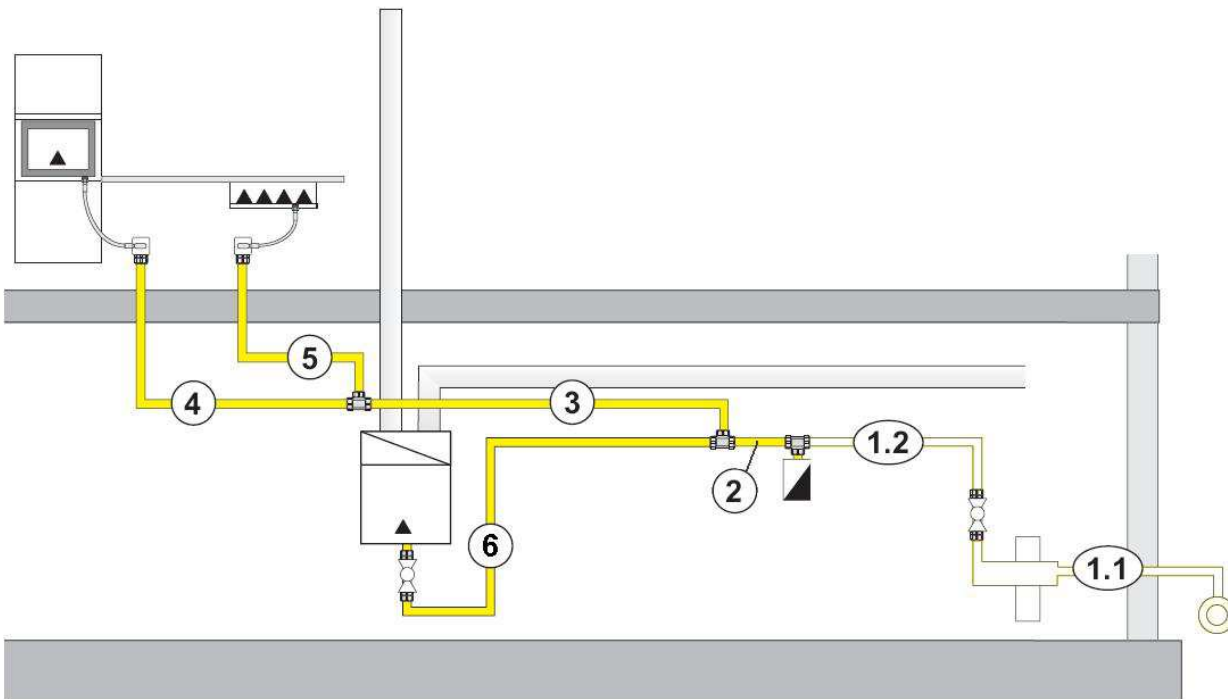
1. Open the "BOAGAZ_sizing_tool"-file with a double click on your computer. (Enable macros)
2. Select your language.
3. Choose register MEDIUM CONDITION and modify your medium data and the maximum pressure drop according to your application
4. Choose register "DIMENSIONIEREN sizing"

Note

There is also a register "presizing". But the step of pre-dimensioning may also be left out. This is a big advantage by using this software. After you defined you installation, you could easy change dimensions. The program calculates automatically all pressure drops new.

 A screenshot of the BOAGAZ SIZING TOOL interface. At the top is the BOAGAZ logo. Below it, the text 'SIZING TOOL' is displayed. A link to 'www.boagaz.com' is shown. A language dropdown menu is set to 'English', with a red dotted circle around it and a red arrow labeled '2' pointing to it. Below the language menu is a yellow highlighted box with the text 'Please choose the register on the bottom.' A disclaimer text follows. Contact information for BOAGAZ Vertriebsgesellschaft mbH is provided, including address, phone, email, and website. At the bottom, there is a navigation bar with four buttons: 'INFO', 'MEDIUM CONDITION', 'DIMENSIONIEREN - sizing', and 'TABELLEN - schedules'. A red arrow labeled '3' points to the 'MEDIUM CONDITION' button, and a red arrow labeled '4' points to the 'DIMENSIONIEREN - sizing' button. A red dotted circle highlights both the 'MEDIUM CONDITION' and 'DIMENSIONIEREN - sizing' buttons.

b) Example for sizing



Appliances

4 Burners	= 1.0 m ³ /h
Oven	= 0.3 m ³ /h
Heater	= 16kW → 1.8 m ³ /h

$$\dot{V}_{A,heater} = \frac{\dot{Q}_A}{H_{uB}} \frac{16 \text{ kW} \cdot \text{m}^3}{9.04 \text{ kWh}} = 1.8 \text{ m}^3 / \text{h}$$

Part list

The house service connection is a common PE pipe, series 5 at 20mbar.

- 1.1 Pipe 22.5 m, 1 saddle clamp, 4 bow 45°, 1 house service connection, gas flow controller
→ 0.4 mbar pressure drop (conventional calculation, not visible in this calculation)
- 1.2 Pipe 6.5 m, 4 Bow 90°
→ 0.2 mbar pressure drop (conventional calculation, not visible in this calculation)
- Z gas meter G2.5 (0.8 mbar)
- 2 BOAGAZ® Tubing 1.0 m
- 3 BOAGAZ® Tubing 6.0 m, 1 bow 90°, T_{branch}, 3 m difference of height (uplift)
- 4 BOAGAZ® Tubing 3.0 m, 1 bow 90°, T_{straight}, Fitting connection with thread
- 5 BOAGAZ® Tubing 1.5 m, 2 bow 90°, T_{branch}, Fitting connection with thread
- 6 BOAGAZ® Tubing 8.5 m, 3 bow 90°, T_{straight}, Fitting connection with thread

c) Sizing

Step	Example																																																																																													
1	Indicate the gas meter's pressure drop. 0.3 mbar (acc. to manufacturer's specification)	<table border="1"> <tr> <td>Gas installation</td> <td>Gas meter (G)</td> <td>Special fitting</td> </tr> <tr> <td>House service connection:</td> <td>Product:</td> <td></td> </tr> <tr> <td>House installation: BOAGAZ®</td> <td>Type/Dimension:</td> <td></td> </tr> <tr> <td>Position of gas meter:</td> <td>Pressure drop: 0.30 mbar</td> <td></td> </tr> </table>	Gas installation	Gas meter (G)	Special fitting	House service connection:	Product:		House installation: BOAGAZ®	Type/Dimension:		Position of gas meter:	Pressure drop: 0.30 mbar																																																																																	
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2	Either the pressure drop of the house service pipe is calculated separately using the conventional method and the result is directly filled into the sheet. 1.1 = 0.44mbar 1.2 = 0.19mbar (see standard SVGW G1:2009, section 5)	<table border="1"> <tr> <td>14</td> <td></td> <td></td> <td></td> </tr> <tr> <td>15</td> <td>Pressure drop for section 1.1 (see separate calculation)</td> <td>0.4mbar</td> <td></td> </tr> <tr> <td>16</td> <td>Pressure drop for section 1.2 (see separate calculation)</td> <td>0.2mbar</td> <td></td> </tr> <tr> <td>17</td> <td>(input of pressure drop value for not BOAGAZ elements (mbar))</td> <td></td> <td></td> </tr> <tr> <td>18</td> <td>(input of pressure drop value for not BOAGAZ elements (mbar))</td> <td></td> <td></td> </tr> </table>	14				15	Pressure drop for section 1.1 (see separate calculation)	0.4mbar		16	Pressure drop for section 1.2 (see separate calculation)	0.2mbar		17	(input of pressure drop value for not BOAGAZ elements (mbar))			18	(input of pressure drop value for not BOAGAZ elements (mbar))																																																																										
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3	Put in the flow rate of each section. (Optionally may be put in the power in kW instead of flow rates. Select in this case top right "Calculation by power rating")	<table border="1"> <thead> <tr> <th rowspan="2">Section</th> <th colspan="2">Flow</th> <th rowspan="2">DN</th> <th rowspan="2">CSST length</th> <th rowspan="2">Difference in altitude</th> <th colspan="2">1. additional meter (equivalent length)</th> </tr> <tr> <th>m³/h</th> <th>DN</th> <th>pcs</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>3.1</td> <td>DN20</td> <td>1.0m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>1.3</td> <td>DN15</td> <td>6.0m</td> <td>3.0m</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>0.3</td> <td>DN15</td> <td>3.0m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>1.0</td> <td>DN20</td> <td>1.5m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>6</td> <td>1.8</td> <td>DN15</td> <td>8.5m</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>7</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>8</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>9</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Section	Flow		DN	CSST length	Difference in altitude	1. additional meter (equivalent length)		m ³ /h	DN	pcs	Type	1								2	3.1	DN20	1.0m					3	1.3	DN15	6.0m	3.0m				4	0.3	DN15	3.0m					5	1.0	DN20	1.5m					6	1.8	DN15	8.5m					7								8								9															
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5	Specify the length of each single pipe section. ② = 1.0 m ③ = 6.0 m, 3m ④ = 3.0 m ⑤ = 1.5 m ⑥ = 8.5 m	② DN20 ③④⑤⑥ DN15																																																																																												
6	Put in all separate resistances (equivalent length) for each single pipe section. See part list e.g. 4 bows 90° Input: 4 in the first column	<table border="1"> <thead> <tr> <th rowspan="2">Section</th> <th colspan="2">Flow</th> <th rowspan="2">DN</th> <th rowspan="2">CSST length</th> <th rowspan="2">Difference in altitude</th> <th colspan="2">1. additional meter (equivalent length)</th> <th colspan="2">2. additional meter (equivalent length)</th> <th colspan="2">3. additional meter (equivalent length)</th> </tr> <tr> <th>m³/h</th> <th>DN</th> <th>pcs</th> <th>Type</th> <th>pcs</th> <th>Type</th> <th>pcs</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>3.1</td> <td>DN20</td> <td>1.0m</td> <td></td> <td></td> <td>1x</td> <td>Joint with Thread</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>1.3</td> <td>DN15</td> <td>6.0m</td> <td>3.0m</td> <td></td> <td>1x</td> <td>90° Bend</td> <td></td> <td>1x</td> <td>Tee branch</td> <td>0.69m</td> </tr> <tr> <td>4</td> <td>0.3</td> <td>DN15</td> <td>3.0m</td> <td></td> <td></td> <td>1x</td> <td>90° Bend</td> <td></td> <td>1x</td> <td>Tee straight</td> <td>0.18m</td> </tr> <tr> <td>5</td> <td>1.0</td> <td>DN15</td> <td>1.5m</td> <td></td> <td></td> <td>2x</td> <td>90° Bend</td> <td></td> <td>1x</td> <td>Tee branch</td> <td>0.69m</td> </tr> <tr> <td>6</td> <td>1.8</td> <td>DN15</td> <td>8.5m</td> <td></td> <td></td> <td>3x</td> <td>90° Bend</td> <td></td> <td>1x</td> <td>Tee straight</td> <td>0.18m</td> </tr> </tbody> </table>	Section	Flow		DN	CSST length	Difference in altitude	1. additional meter (equivalent length)		2. additional meter (equivalent length)		3. additional meter (equivalent length)		m ³ /h	DN	pcs	Type	pcs	Type	pcs	Type	1												2	3.1	DN20	1.0m			1x	Joint with Thread					3	1.3	DN15	6.0m	3.0m		1x	90° Bend		1x	Tee branch	0.69m	4	0.3	DN15	3.0m			1x	90° Bend		1x	Tee straight	0.18m	5	1.0	DN15	1.5m			2x	90° Bend		1x	Tee branch	0.69m	6	1.8	DN15	8.5m			3x	90° Bend		1x	Tee straight	0.18m
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7	To calculate the pressure drop for each appliance, write each section number in the gaps of the appliance's line. The order of entry does not matter Oven ④: Z, ①, ②, ③, ④, 13 Burner ⑤: Z, ①, ②, ③, ⑤, 13 Heater ⑥: Z, ①, ②, ⑥, 13	<table border="1"> <thead> <tr> <th colspan="8">Loss till appliance</th> </tr> <tr> <th colspan="6">Sections (G, 1, 2, 15..)</th> <th colspan="2">mbar</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>15</td> <td>16</td> <td>G</td> <td>2</td> <td>3</td> <td>4</td> <td></td> <td>1.52 ok</td> </tr> <tr> <td>15</td> <td>16</td> <td>G</td> <td>2</td> <td>3</td> <td>5</td> <td></td> <td>1.62 ok</td> </tr> <tr> <td>15</td> <td>16</td> <td>G</td> <td>2</td> <td>6</td> <td>17</td> <td></td> <td>2.73 !!!</td> </tr> </tbody> </table>	Loss till appliance								Sections (G, 1, 2, 15..)						mbar										15	16	G	2	3	4		1.52 ok	15	16	G	2	3	5		1.62 ok	15	16	G	2	6	17		2.73 !!!																																												
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8	Choose the proper dimension. If the dimension fits, no !!! should be visible anymore.																																																																																													

BOAGAZ Sizing for a BOAGAZ-Installation with: Natural Gas G20 (EN 437)

Definitions		Pressure specifications (20 - 500 mbar)		Gas installation		Gas meter (G)		Special fitting										
$H_{1,2}$	9.64 kWh/m ³	System pressure	20 mbar	House service connection:		Product:												
T	15 °C			House installation:	BOAGAZ®	Type/Dimension:												
P_b	1013 mbar	Max. allowed pressure drop	2.6 mbar	Position of gas meter:		Pressure drop:	0.30 mbar											
Flow	Section	m ³ /h	DN	CSST length	Difference in altitude	1. additional meter (equivalent length)		2. additional meter (equivalent length)		3. additional meter (equivalent length)		4. additional meter (equivalent length)		Σ	R in	R' (I+ΣI)	Loss till appliance	
						pcs	Type	pcs	Type	pcs	Type	pcs	Type					
1																		
2		3.1	DN20	1.0m		1x	Joint with Thread	0.26m						1.26	0.119	0.15		
3		1.3	DN15	6.0m	3.0m	1x	90° Bend	0.17m	1x	Tee branch				6.85	0.093	0.51		
4		0.3	DN15	3.0m		1x	90° Bend	0.17m	1x	Tee straight	0.69m			3.63	0.016	0.06	15 16 G 2 3 4	1.62
5		1.0	DN15	1.5m		2x	90° Bend	0.33m	1x	Tee branch	0.18m			2.81	0.055	0.15	15 16 G 2 3 5	1.72
6		1.8	DN20	8.5m		3x	90° Bend	0.72m	1x	Tee straight	0.69m			9.64	0.038	0.36	15 16 G 2 6 17	1.51
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15	Pressure drop for section 1.1 (see separate calculation)																	
16	Pressure drop for section 1.2 (see separate calculation)																	
17	Gas Tap																	
18	(input of pressure drop value for not BOAGAZ elements (mbar))																	