

froling

Product data S4 Turbo



All errors and omissions excepted.

T6360224_en | Edition 18/06/2024

1 Technical specifications

1.1 S4 Turbo 22-28

Description		S4 Turbo (F) ¹⁾	
		22	28
Rated heat output	kW	22	28
Boiler efficiency (NCV)	%	94.3	93.6
Electrical connection	230V / 50Hz / fused C16A		
Weight of boiler incl. insulation and control	kg	645	650
Total boiler capacity (water)	L	115	115
Water pressure drop (ΔT = 10 / 20 K)	mbar	12.0 / 3.1	12.0 / 2.6
Minimum boiler return temperature	°C	60	
Maximum permitted operating temperature		90	
Permitted operating pressure	bar	3	
Airborne sound level	dB(A)	< 70	
Permitted fuel as per EN 17225	Part 5: Firewood class A2 / D15 L50		
Fuel loading door dimensions (width / height)	mm	380 / 360	
Fuel loading chamber capacity	L	145	
Combustion time ²⁾ - beech	h	5.9 – 8.4	4.6 – 6.6
Combustion time ²⁾ - spruce		4.2 – 5.9	3.3 – 4.6
Test book number		PB 026	PB 027
Boiler class as per EN 303-5:2012		5	
1. With regards to the approval of drawings for “S4 Turbo xx F” type boilers, the test results on the heating technology requirements of the “S4 Turbo xx” wood chip boiler according to EN 303-5 can be used.			
2. Values specified for combustion time are guideline values at nominal load and will vary depending on water content (15-25%) and fill level (80-100%)			

Product data in accordance with the regulations (EU) 2015/1187 and 2015/1189

Model identifier		S4 Turbo (F) ¹⁾	
		22	28
Heating up mode		manual	manual
Condensing boiler		No	No
Solid fuel boiler for combined heat and power		No	No
Combined heating system		No	No
Storage tank volume		↻ "Storage tank" [► 7]	
Preferred fuel		Firewood, moisture content $\leq 25 \%$	
Useful heat delivered at rated heat output (P_n)	kW	22.0	28.0
Fuel efficiency at rated heat output (η_n)	%	86.7	85.3
Auxiliary current consumption at rated heat output ($e_{l_{max}}$)	kW	0.050	0.053
Auxiliary current consumption in standby mode (P_{SB})	kW	0.006	0.010
Energy efficiency class of the boiler		A+	A+
Energy efficiency index (EEI) of the boiler		122	120

Model identifier		S4 Turbo (F) ¹⁾	
		22	28
Heating space annual rate of use η_s	%	83	82
Temperature controller used		Lambdatronic S 3200	
Class of the temperature controller		II	II
Contribution of the temperature controller to the energy efficiency index of a combined system	%	2	2
Energy efficiency index (EEI) of the combined boiler and controller ²⁾		124	122
Energy efficiency class of the combined boiler and controller ²⁾		A+	A+
Annual space heating emissions of dust (PM) ³⁾	mg/m ³	13	16
Annual space heating emissions of gaseous organic compounds (GOC) ³⁾	mg/m ³	5	4
Annual space heating emissions of carbon monoxide (CO) ³⁾	mg/m ³	40	30
Annual space heating emissions of nitrogen oxides (NOx) ³⁾	mg/m ³	130	126

1. With regards to the approval of drawings for "S4 Turbo xx F" type boilers, the test results on the heating technology requirements of the "S4 Turbo xx" wood chip boiler according to EN 303-5 can be used.

2. The information on the energy efficiency index EEI of the combined boiler and controller and the energy efficiency class of the combined boiler and controller applies only if the Fröling control components supplied as standard with the respective boiler are used.

3. The specified emission values refer to dry flue gas with an oxygen content of 10 % and under standard conditions at 0°C and 1013 millibars. The evaluation values reported are rounded to the nearest whole number. Values labelled with "<" represent the relative detection limit of the measuring methods or measuring device configurations used.

1.2 S4 Turbo 32 - 40

Description		S4 Turbo (F) ¹⁾		
		32 ²⁾	34	40
Rated heat output	kW	32	34	40
Boiler efficiency (NCV)	%	92,6	92.9	93.0
Electrical connection		230V / 50Hz / fused C16A		
Weight of boiler incl. insulation and control	kg	730	735	745
Total boiler capacity (water)	L	175	175	175
Water pressure drop ($\Delta T = 10 / 20$ K)	mbar	6.0 / 1.6	6.0 / 1.6	6.0 / 1.6
Minimum boiler return temperature	°C	60		
Maximum permitted operating temperature		90		
Permitted operating pressure	bar	3		
Airborne sound level	dB(A)	< 70		
Permitted fuel as per EN 17225		Part 5: Firewood class A2 / D15 L50		
Fuel loading door dimensions (width / height)	mm	380 / 360	380 / 360	380 / 360
Fuel loading chamber capacity	L	190	190	190
Combustion time ³⁾ - beech	h	4.1 - 6.1	3.9 – 5.7	3.9 – 5.7
Combustion time ³⁾ - spruce		3.0 – 4.3	2.8 – 4.0	2.8 – 4.0
Test book number		PB 115	PB 028	PB 029
Boiler class as per EN 303-5:2012		5	5	5

1. With regards to the approval of drawings for "S4 Turbo xx F" type boilers, the test results on the heating technology requirements of the "S4 Turbo xx" wood chip boiler according to EN 303-5 can be used.

Description	S4 Turbo (F) ¹⁾		
	32 ²⁾	34	40

2. S4 Turbo 32 only available in Italy

3. Values specified for combustion time are guideline values at nominal load and will vary depending on water content (15-25%) and fill level (80-100%)

Product data in accordance with the regulations (EU) 2015/1187 and 2015/1189

Model identifier		S4 Turbo (F)		
		32	34	40
Heating up mode		manual	manual	manual
Condensing boiler		No	No	No
Solid fuel boiler for combined heat and power		No	No	No
Combined heating system		No	No	No
Storage tank volume		↪ "Storage tank" [► 7]		
Preferred fuel		Firewood, moisture content ≤ 25 %		
Useful heat delivered at rated heat output (P _n)	kW	32.0	34.0	40.0
Fuel efficiency at rated heat output (η _n)	%	84.0	84.1	84.2
Auxiliary current consumption at rated heat output (e _{l,max})	kW	0.067	0.055	0.055
Auxiliary current consumption in standby mode (P _{SB})	kW	0.014	0.014	0.014
Energy efficiency class of the boiler		A+	A+	A+
Energy efficiency index (EEI) of boiler		118	118	120
Heating space annual rate of use η _s	%	80	81	81
Temperature controller used		Lambdatronic S 3200		
Class of the temperature controller		II	II	II
Contribution of the temperature controller to the energy efficiency index of a combined system	%	2	2	2
Energy efficiency index (EEI) of the combined boiler and controller ²⁾		120	120	122
Energy efficiency class of the combined boiler and controller ²⁾		A+	A+	A+
Annual space heating emissions of dust (PM) ³⁾	mg/m ³	18	18	16
Annual space heating emissions of gaseous organic compounds (GOC) ³⁾	mg/m ³	4	4	6
Annual space heating emissions of carbon monoxide (CO) ³⁾	mg/m ³	22	21	82
Annual space heating emissions of nitrogen oxides (NO _x) ³⁾	mg/m ³	135	122	163

1. With regards to the approval of drawings for "S4 Turbo xx F" type boilers, the test results on the heating technology requirements of the "S4 Turbo xx" wood chip boiler according to EN 303-5 can be used.
2. The information on the energy efficiency index EEI of the combined boiler and controller and the energy efficiency class of the combined boiler and controller applies only if the Fröling control components supplied as standard with the respective boiler are used.
3. The specified emission values refer to dry flue gas with an oxygen content of 10 % and under standard conditions at 0°C and 1013 millibars. The evaluation values reported are rounded to the nearest whole number. Values labelled with "<" represent the relative detection limit of the measuring methods or measuring device configurations used.

1.3 S4 Turbo 50 - 60

Description		S4 Turbo	
		50	60
Nominal heat output	kW	49.9	60

Description		S4 Turbo	
		50	60
Boiler efficiency (NCV)	%	93.9	94.9
Electrical connection		230V / 50Hz / fused C16A	
Weight of boiler incl. insulation and control	kg	793	803
Total boiler capacity (water)	L	170	170
Water pressure drop ($\Delta T = 10 / 20 \text{ K}$)	mbar	15.0 / 5.0	23.0 / 8.0
Minimum boiler return temperature	°C	60	
Maximum permitted operating temperature		90	
Permitted operating pressure	bar	3	
Airborne sound level	dB(A)	< 70	
Permitted fuel as per EN 17225		Part 5: Firewood class A2 / D15 L50	
Fuel loading door dimensions (width / height)	mm	380 / 360	380 / 360
Fuel loading chamber capacity	L	200	200
Combustion time ¹⁾ - beech	h	3.4 – 4.9	2.8 – 4.1
Combustion time ¹⁾ - spruce		2.4 – 3.5	2.0 – 2.9
Test book number		PB 039	PB 040
Boiler class as per EN 303-5:2012		5	

1. Values specified for combustion time are guideline values at nominal load and will vary depending on water content (15-25%) and fill level (80-100%)

Product data in accordance with the regulations (EU) 2015/1187 and 2015/1189

Model identifier		S4 Turbo	
		50	60
Heating up mode		manual	manual
Condensing boiler		No	No
Solid fuel boiler for combined heat and power		No	No
Combined heating system		No	No
Storage tank volume		↻ "Storage tank" [► 7]	
Preferred fuel		Firewood, moisture content $\leq 25 \%$	
Useful heat delivered at rated heat output (P_n)	kW	50.0	60.0
Fuel efficiency at rated heat output (η_n)	%	85.3	86.3
Auxiliary current consumption at rated heat output ($e_{l_{max}}$)	kW	0.109	0.162
Auxiliary current consumption in standby mode (P_{SB})	kW	0.014	0.010
Energy efficiency class of the boiler		A+	A+
Energy efficiency index (EEI) of boiler		120	119
Heating space annual rate of use η_s	%	81	81
Temperature controller used		Lambdatronic S 3200	
Class of the temperature controller		II	II
Contribution of the temperature controller to the energy efficiency index of a combined system	%	2	2

Model identifier		S4 Turbo	
		50	60
Energy efficiency index (EEI) of the combined boiler and controller ¹⁾		122	121
Energy efficiency class of the combined boiler and controller ¹⁾		A+	A+
Annual space heating emissions of dust (PM) ²⁾	mg/m ³	21	26
Annual space heating emissions of gaseous organic compounds (GOC) ²⁾	mg/m ³	6	6
Annual space heating emissions of carbon monoxide (CO) ²⁾	mg/m ³	84	86
Annual space heating emissions of nitrogen oxides (NOx) ²⁾	mg/m ³	165	171
<p>1. The information on the energy efficiency index EEI of the combined boiler and controller and the energy efficiency class of the combined boiler and controller applies only if the Fröling control components supplied as standard with the respective boiler are used.</p> <p>2. The specified emission values refer to dry flue gas with an oxygen content of 10 % and under standard conditions at 0°C and 1013 millibars. The evaluation values reported are rounded to the nearest whole number. Values labelled with "<" represent the relative detection limit of the measuring methods or measuring device configurations used.</p>			

2 Storage tank

Observe the regional regulations for using a storage tank!

Certain subsidy guidelines prescribe compulsory requirements for the installation of storage tanks. Up-to-date information about individual subsidy guidelines can be found at www.froeling.com.

Channelling the heat generated by the Firewood boiler to a storage tank can bring major advantages, such as

- better utilisation of fuel
- more user-friendly operation in terms of reloading intervals
- maximum independence from instantaneous heating requirements
- minimal dirt in boiler and flue gas system

As the boiler's minimum continuous heat output is 30% above the nominal heat output, we as boiler manufacturer are obliged under EN 303-5:2021, Section 4.4.6 to advise that the Firewood boiler S4 Turbo must always be connected to a storage tank with adequate storage capacity.

The storage tank capacity can be calculated using the following formula according to EN 303-5:2021:

$$V_{Sp} = 15 T_B \times P_N (1 - 0.3 \times P_H / P_{min})$$

V_{Sp}	Storage tank capacity in litres
P_N	Nominal heat output of boiler in kW
T_B	Burn-off period of boiler in hours ¹⁾
P_H	Heating load of building in kW
P_{min}	Minimum heat output of boiler in kW ²⁾

1. Sample combustion times for various fuels are provided in the technical data
2. The boiler's minimum output is the lowest value of the output range in the technical data. If there is no minimum heat output specified, use the nominal heat output ($P_{min} = P_N$)

For the correct dimensions of the storage tank and the line insulation (for instance to ÖNORM M 7510 or guideline UZ37) please consult your installer or Fröling.

Recommended storage tank capacity:

	Unit	S4 Turbo			
		22 - 28	32 - 40	50	60
Recommended storage tank capacity ¹⁾	[l]	2000	2500	3000	3400
1. Values for calculating the capacity can be found in the technical data or the technical data with partial load inspection (if available)					

Certain countries have recommended storage capacities; these are listed below. The specified values apply when the nominal heat output of the boiler corresponds to the heating requirements of the building and a maximum of 50% of the nominal heat output can be dissipated to the building being heated under partial load conditions.

The exact design of the storage tank capacity is in accordance with the locally applicable guidelines and regulations:

Austria According to the relevant Austrian laws governing energy technology, which are based on Art. 15a B-VG "Agreement on protective measures for small furnaces" (2012):

No storage tank is required on manually fed biomass boilers that have been positively tested at both nominal load and partial load (below 50% of nominal load) to ensure they adhere to the emissions limits specified in that agreement.

Germany The first BImSchV (Ordinance on small and medium-sized heating plants of 26 January 2010, BGBl. I P. 38) stipulates a minimum water heat storage tank volume of 55 litres per kilowatt of rated heat output; a water heat storage tank with a volume of 12 litres per litre of fuel loading chamber is recommended.

Switzerland In accordance with the Swiss Federal Ordinance on Air Pollution Control (LRV 2018), appendix 3, paragraph 523 "Special requirements for boilers", hand-fed boilers up to 500 kW rated heat output must be fitted with a minimum heat storage tank volume of 12 litres per litre of fuel loading chamber. The volume may not fall below 55 litres per kW rated heat output.

Hot water tank in accordance with Commission Regulation (EU) 2015/ 1189 (Ecodesign Requirements)

The boiler should be operated with a hot water tank. The storage capacity = $45 \times P_r \times (1 - 2.7/P_r)$ or 300 litres, whichever is greater, where the rated heat output of P_r is given in kW. The resulting storage capacity is below the abovementioned recommended storage tank capacity.

Manufacturer's address

Fröling Heizkessel- und Behälterbau GesmbH

Industriestraße 12
A-4710 Grieskirchen
+43 (0) 7248 606 0
info@froeling.com

Zweigniederlassung Aschheim

Max-Planck-Straße 6
85609 Aschheim
+49 (0) 89 927 926 0
info@froeling.com

Froling srl

Via J. Ressel 2H
I-39100 Bolzano (BZ)
+39 (0) 471 060460
info@froeling.it

Froling SARL

1, rue Kellermann
F-67450 Mundolsheim
+33 (0) 388 193 269
froling@froeling.com



www.froeling.com

