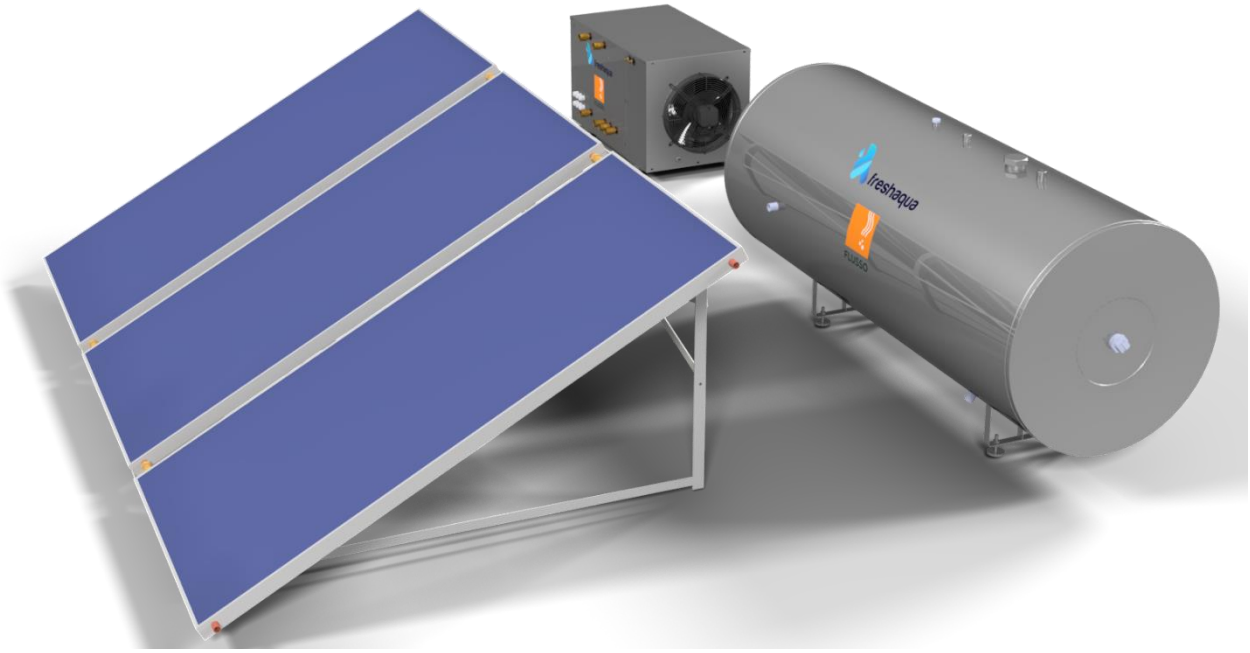
FLUSSO COMPLETE SOLAR SYSTEM WITH OVERHEATING CONTROL

Flusso Complete Solar System with Overheating Control is an innovative system for autonomous Domestic Hot Water (DHW) production that combines a **Flusso Horizontal Storage Tank**, a **Flusso Solar Station** for heat rejection and several Solar Collectors. The operation of the system is controlled via a **THALES AK 400** automation control unit which is responsible for avoiding overheating of the tank and the solar collectors.



PRODUCT MODELS

MODEL	FLUSSO SYSOL HOR-SC 400 INOX/SS	FLUSSO SYSOL HOR-SC 600 INOX/SS
Storage tank	FLUSSO BL HOR 400/1-1.4	FLUSSO BL HOR 600/1.4-1.8
Solar station	FLUSSO SOLAR STATION SC 12.1	

Storage tank

FLUSSO HORIZONTAL STORAGE TANK		
MODEL	FLUSSO BL HOR 400/1-1.4	FLUSSO BL HOR 600/1.4-1.8
Tank Capacity (lt)	**400**	**600**
Hot, Cold and Recirculation Water Connections	1''	1''
Heat Exchanger and Heat Pump Connections	1''	1''
Tank Length (mm)	1550	2050
Tank Diameter (mm)	800	800
Tank Weight (kg)	127	175

Solar station

FLUSSO SOLAR STATION	
MODEL	FLUSSO SOLAR STATION SC 12.1
Flow Rate (lt/min)	16
Flow Rate (m^3/h)	1
Nominal heat rejection capacity (kW)*	4
Fan diameter	Φ300
Fan flow rate (m^3/h)	1000
Connections	1''
Length (mm)	960
Width (mm)	550
Height (mm)	570
Weight (kg)	35

Freshaqua Ltd.

8 Zalokosta, GR 106 71, Athens Greece

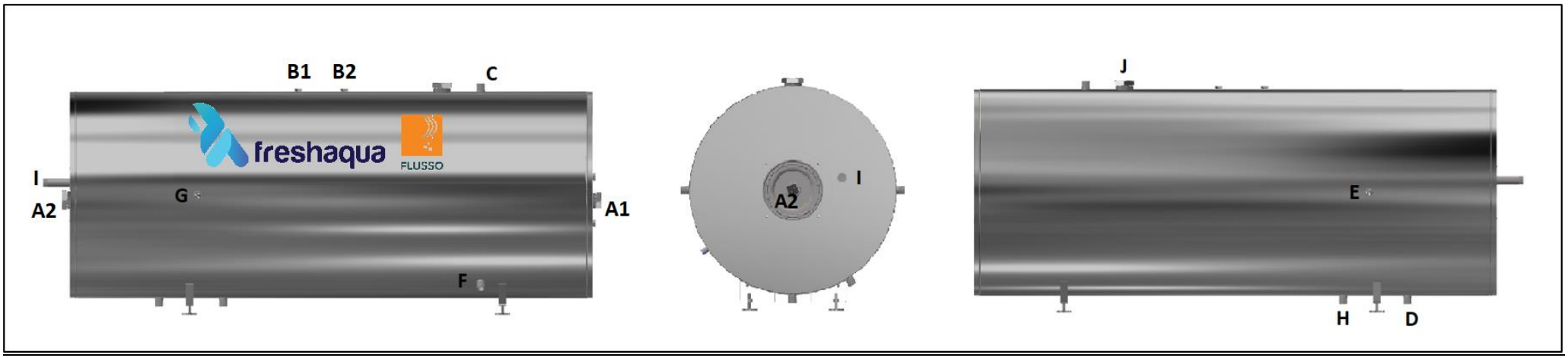
Email: info@freshaqua.gr

FLUSSO HORIZONTAL STORAGE TANK-TECHNICAL SPECIFICATIONS	
Auxiliary heat sources	Heat pump - Boiler
Tank material	INOX 316L
Tank insulation	Polyurethane foam (thickness: 85 mm, density: 45 kg/m^3)
Tank outer casing	INOX 304
Tank welding type	Automatic circular welding
Tank protection	Inactivation coating
Tank nominal operating pressure	6 bar
Tank maximum operating pressure	10 bar
Tank nominal operating temperature	90°C
Tank maximum operating temperature	100°C
Energy classification	B
Number of immersed heat exchangers	Two (2) (Solar field +Heat pump)
Solar field heat exchanger nominal operating pressure	3 bar
Solar field heat exchanger maximum operating pressure	6 bar
Heat pump heat exchanger nominal operating pressure	3 bar
Heat pump heat exchanger maximum operating pressure	6 bar
Heat exchangers material	INOX 316L
Heat exchangers welding type	Automatic circular welding
Heat exchangers protection	Inactivation coating

FLUSSO SOLAR STATION -TECHNICAL SPECIFICATIONS	
Casing material	INOX 304
Cooling element material	Copper with aluminum fins
Cooling element welding type	Automatic circular welding
Cooling element protection	Anti-scale protection
Nominal operating pressure	3 bar
Maximum operating pressure	6 bar
Nominal operating temperature	90°C
Maximum operating temperature	100°C
Solar field pump	Wilo/Grundfos PWM
Recirculation pump	Optional
Fan	230V
Three-way valve for overheating control	24V
Automation control system	Control panel THALES AK400 with 4.3” touch screen

Freshaqua Ltd.
8 Zalokosta, GR 106 71, Athens Greece
Email: info@freshaqua.gr

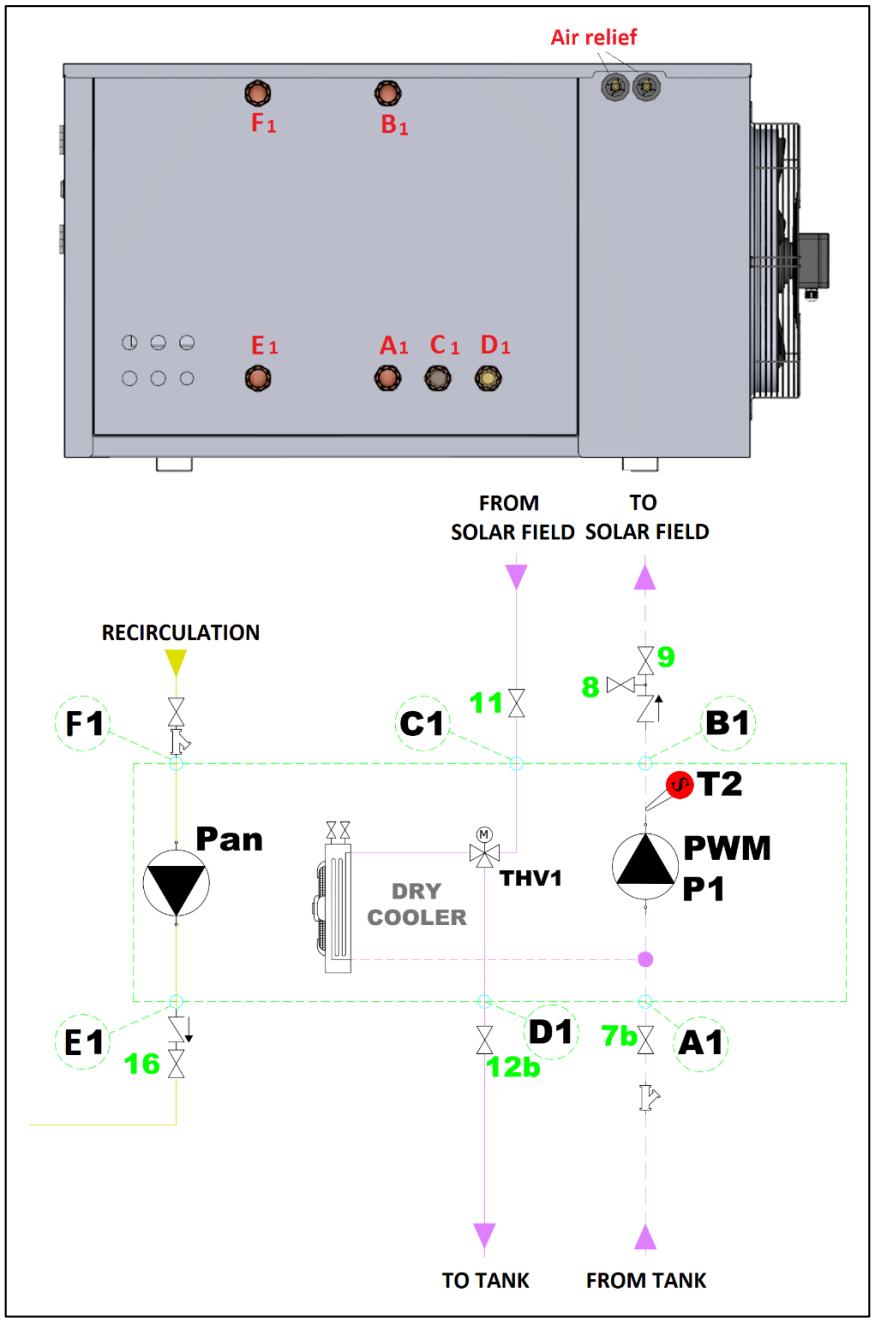
NOMENCLATURE AND HOLES DIAMETERS (STORAGE TANK)



HOLES	FLUSSO BL HOR		USE
	400/1-1.4	600/1.4-1.8	
A1	1 1/2" FEMALE		HEATING ELEMENT
A2	1 1/2" FEMALE		HEATING ELEMENT
B1	1/2" FEMALE		TEMPERATURE SENSOR FOR HEATING ELEMENTS
B2	1/2" FEMALE		TEMPERATURE SENSOR FOR HEAT PUMP
C	1" MALE		HOT WATER OUTLET/6 BAR SAFETY VALVE
D	1" MALE		COLD WATER INLET/DRAIN
E	1 " MALE		OTHER AUXILIARY SOURCE OUTLET
F	1 " MALE		OTHER AUXILIARY SOURCE INLET
G	1 " MALE		TO HEAT PUMP
H	1 " MALE		FROM HEAT PUMP
I	1 " MALE		RECIRCULATION RETURN
J	2" FEMALE		ANODE

Freshaqua Ltd.
8 Zalokosta, GR 106 71, Athens Greece
Email: info@freshaqua.gr

NOMENCLATURE AND HOLE DIAMETERS (SOLAR STATION)



HOLES	FLUSSO SOLAR STATION SC 12.1		USE
A1	1'' FEMALE	1 1/4" FEMALE	FROM TANK HEAT EXCHANGER
B1	1'' FEMALE	1 1/4" FEMALE	TO SOLAR COLLECTORS
C1	1'' FEMALE	1 1/4" FEMALE	FROM SOLAR COLLECTORS
D1	1'' FEMALE	1 1/4" FEMALE	TO TANK HEAT EXCHANGER
E1	1'' FEMALE	1" FEMALE	RECIRCULATION TO TANK
F1	1'' FEMALE	1" FEMALE	RECIRCULATION TO STATION

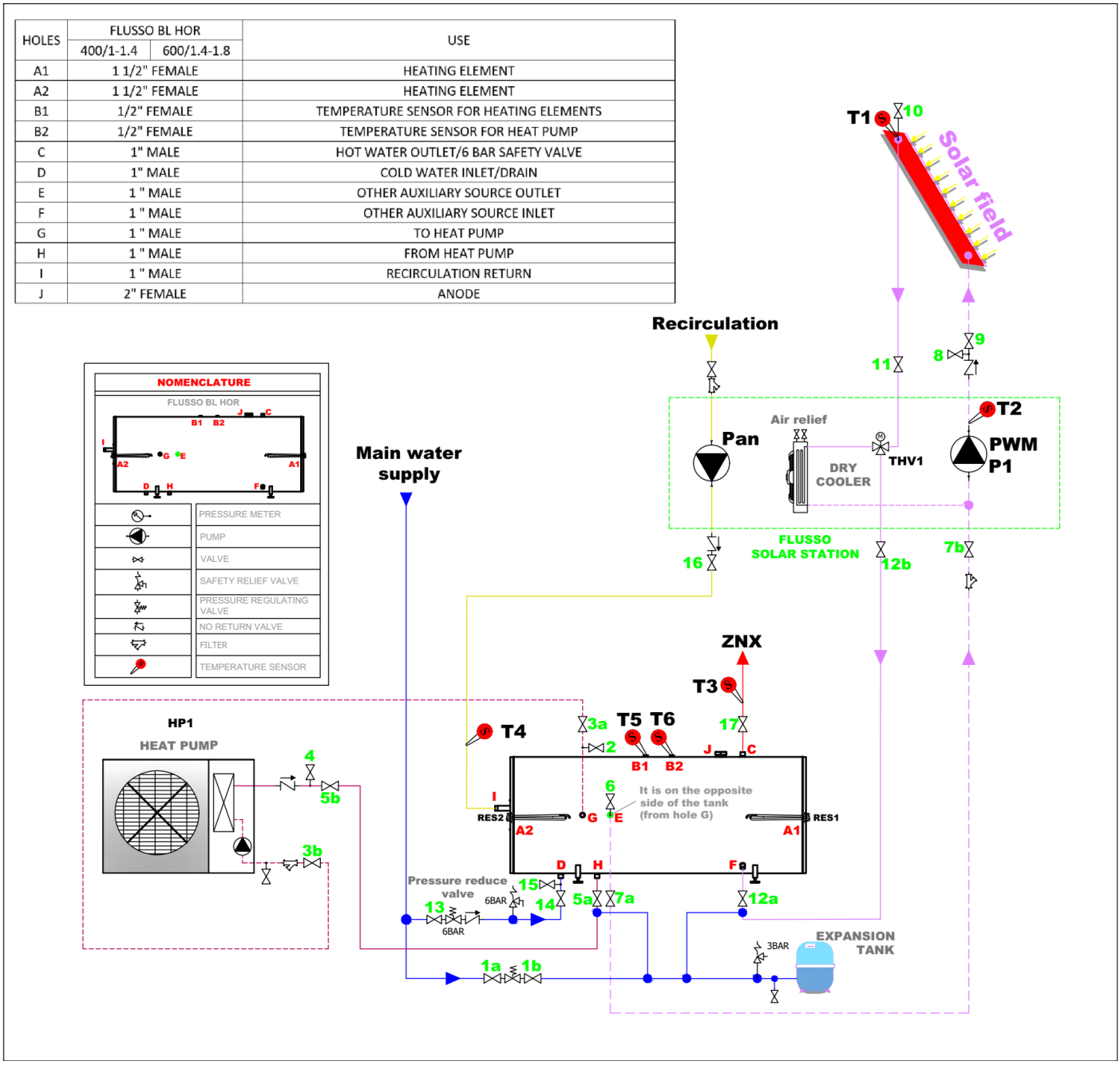
Freshaqua Ltd.

8 Zalokosta, GR 106 71, Athens Greece

Email: info@freshaqua.gr

PIPING AND INSTRUMENTATION DIAGRAM

HOLES	FLUSSO BL HOR		USE
	400/1-1.4	600/1.4-1.8	
A1	1 1/2" FEMALE		HEATING ELEMENT
A2	1 1/2" FEMALE		HEATING ELEMENT
B1	1/2" FEMALE		TEMPERATURE SENSOR FOR HEATING ELEMENTS
B2	1/2" FEMALE		TEMPERATURE SENSOR FOR HEAT PUMP
C	1" MALE		HOT WATER OUTLET/6 BAR SAFETY VALVE
D	1" MALE		COLD WATER INLET/DRAIN
E	1 " MALE		OTHER AUXILIARY SOURCE OUTLET
F	1 " MALE		OTHER AUXILIARY SOURCE INLET
G	1 " MALE		TO HEAT PUMP
H	1 " MALE		FROM HEAT PUMP
I	1 " MALE		RECIRCULATION RETURN
J	2" FEMALE		ANODE

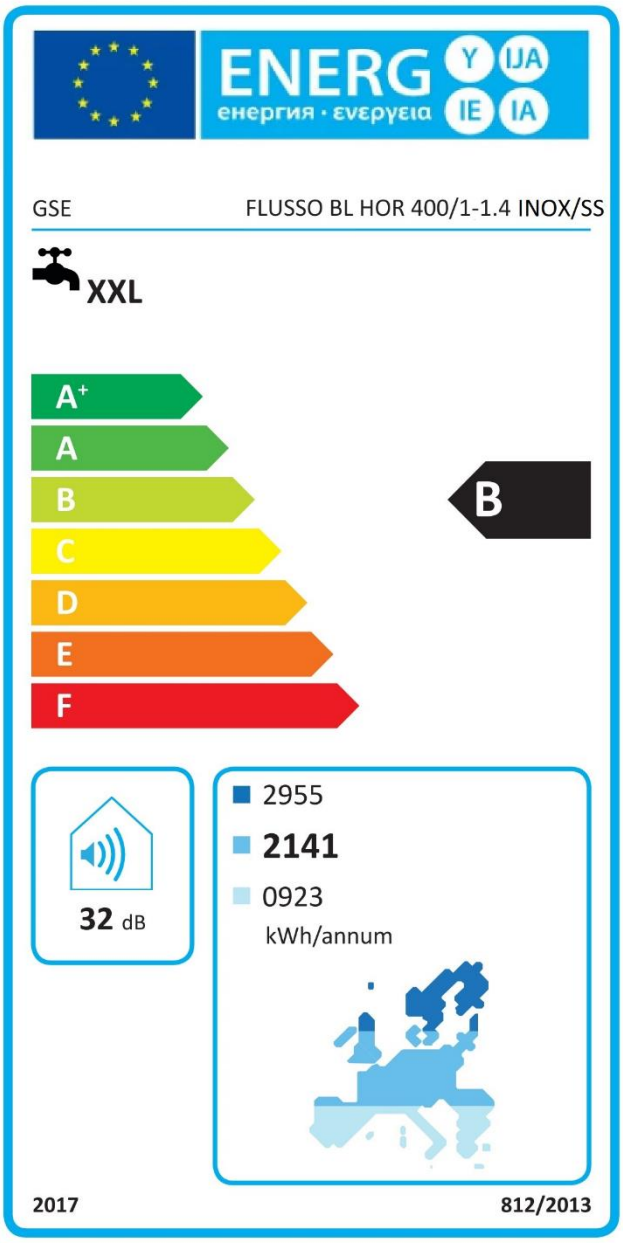


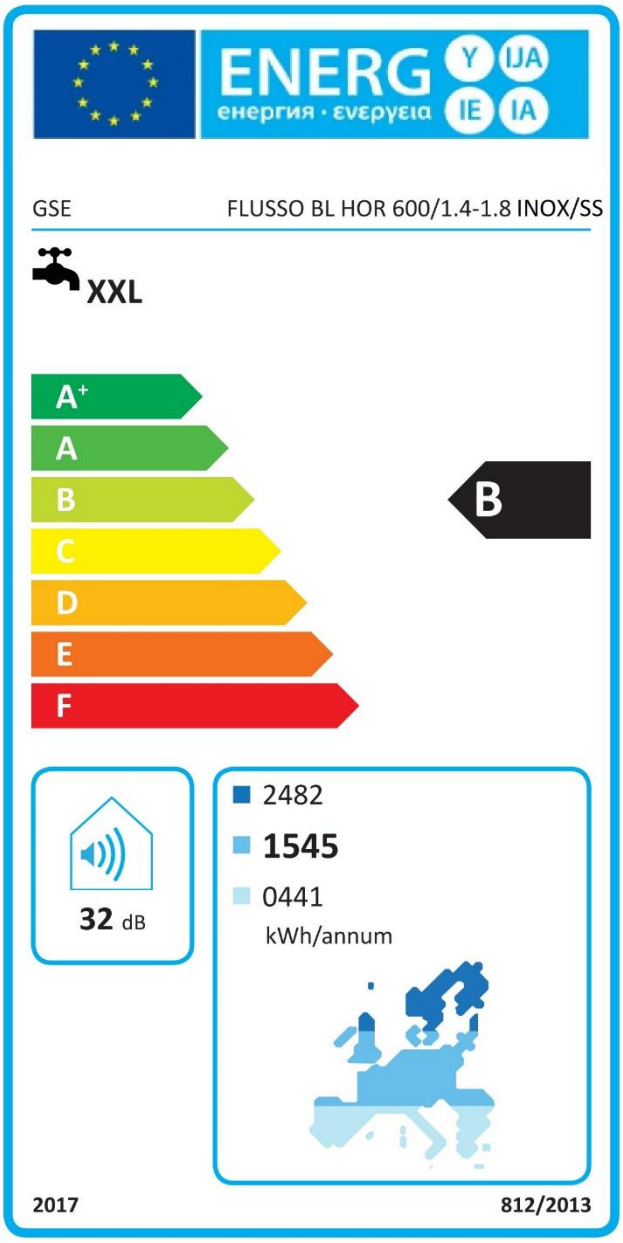
Freshaqua Ltd.

8 Zalokosta, GR 106 71, Athens Greece

Email: info@freshaqua.gr

ENERGY LABELS





Freshaqua Ltd.

8 Zalokosta, GR 106 71, Athens Greece

Email: info@freshaqua.gr

QUALITY CHARACTERISTICS

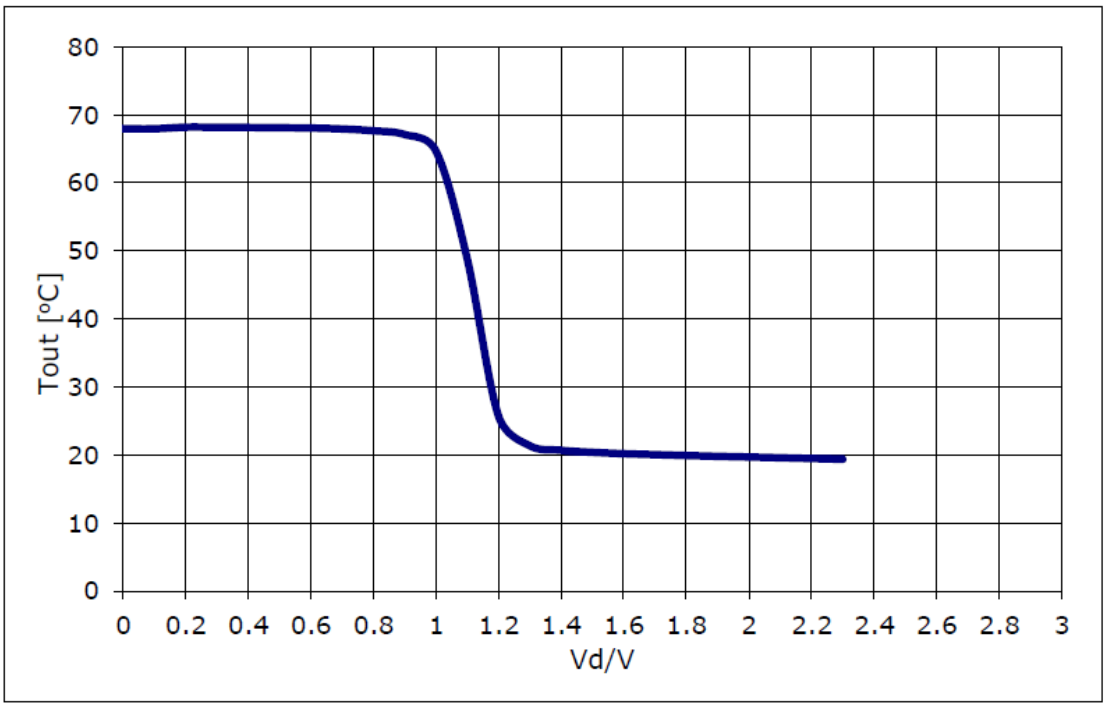
QUALITY CHARACTERISTIC	BENEFIT
Tank body and heat exchangers made of INOX 316L and casing made of INOX 304 stainless steel	**Corrosion resistance** **Maximizes the lifetime of the installation**
Special design and placement of the heat exchangers	**Fast charging of the entire water volume inside the tank** **Ideal thermal stratification of the tank** **Full utilization of the energy sources**
Corrugated formation of the heat exchangers	**Avoiding scale build-up** both at the inner and the outer surfaces of the heat exchangers **Enhancement of the heat transfer** due to the increased exchange area and the enhanced turbulence levels
Triple energy tank	**Charging autonomy**
Energy classification B	**Low thermal losses**
Innovative automation control system	**Optimum solar energy utilization** **Minimizing the use of auxiliary energy sources**
Integrated heat rejection system (overheating control)	**Overheating protection**
Full compatibility with existing hot water production and heating systems	**Utilization of existing equipment and systems**
Pre-built system **Small size** and **ergonomic design**	**Suitable for rooftop installation** **Easy installation and space saving** **Zero visual nuisance**
Housing of the water pumps within the box	**Protection from weather conditions**
Ergonomic design	**Easy installation and connections** **Space saving in engine rooms**
Low visual nuisance	**Ideal for hotel rooftops**

Freshaqua Ltd.
8 Zalokosta, GR 106 71, Athens Greece
Email: info@freshaqua.gr

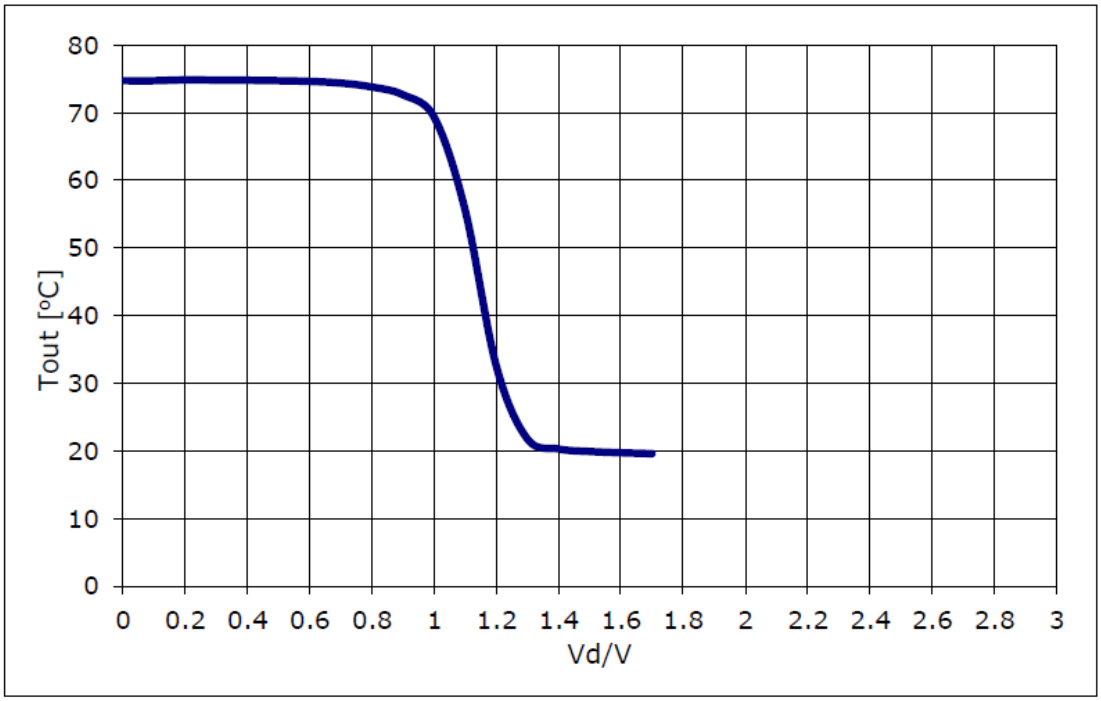
OPERATING CHARTS

1. Temperature distribution (Water supply: 600 lt/h)
(Test report from NATIONAL CENTER FOR SCIENTIFIC RESEARCH "DEMOKRITOS")

FLUSSO BL HOR 400/1-1.4

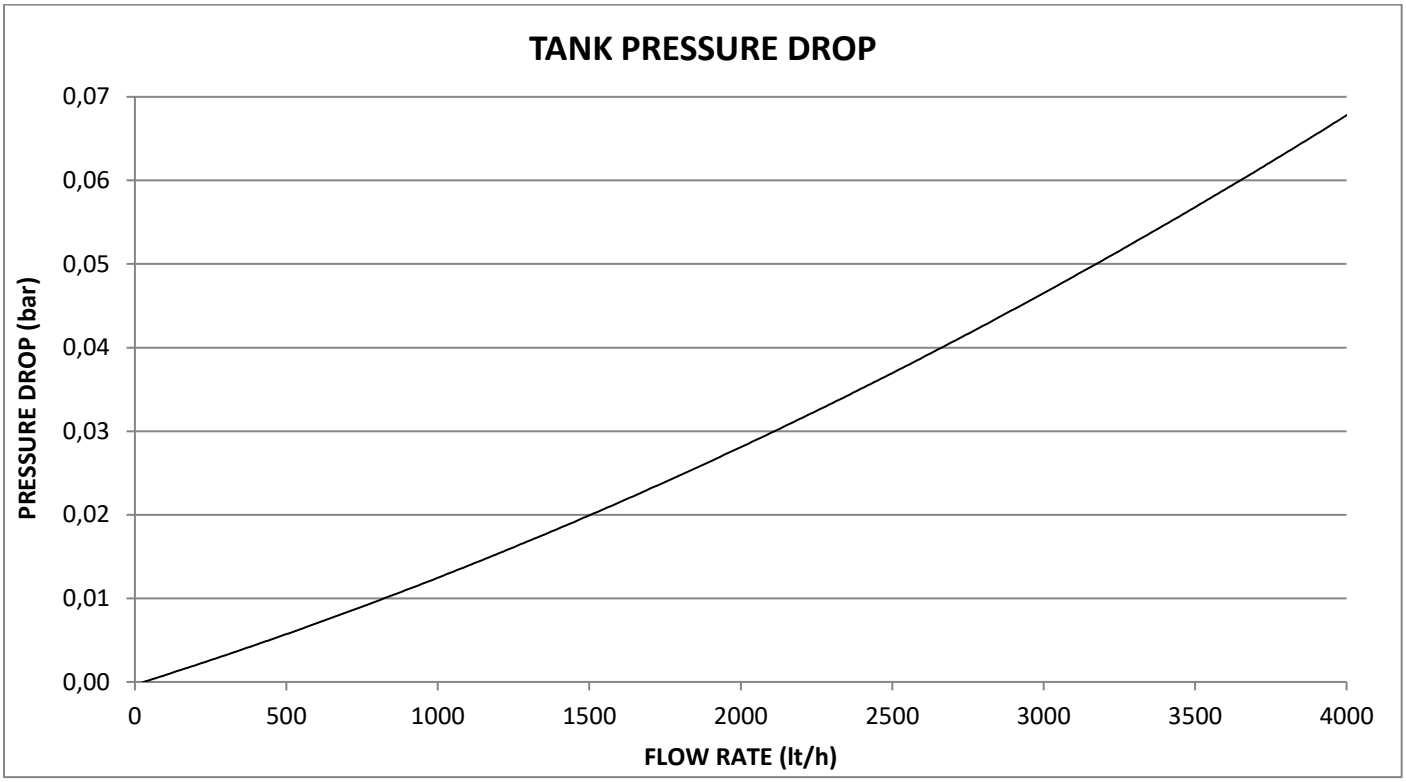


FLUSSO BL HOR 600/1.4-1.8



Freshaqua Ltd.
8 Zalokosta, GR 106 71, Athens Greece
Email: info@freshaqua.gr

2. Tank pressure drop
(Test report from NATIONAL CENTER FOR SCIENTIFIC RESEARCH "DEMOKRITOS")



3. Annual performances in several different Greek and European cities
(Test report from NATIONAL CENTER FOR SCIENTIFIC RESEARCH "DEMOKRITOS")

ANNUAL YIELD		MODELS	
		FLUSSO BL HOR 400/1-1.4 400 lt/day	FLUSSO BL HOR 600/1.4-1.8 600 lt/day
CITIES	ATHENS	80,90%	80,50%
	THESSALONIKI	75,30%	74,90%
	LARISA	72,60%	72,40%
	SANTORINI	86,50%	86,30%
	RHODES	81,90%	81,50%
	HERACLEION	75,30%	75,00%
	PATRA	68,90%	68,50%
	CORFU	64,50%	64,20%
	STOCKHOLM	48,10%	47,80%
	WÜRZBURG	51,70%	51,40%
	DAVOS	65,00%	64,50%

Freshaqua Ltd.
8 Zalokosta, GR 106 71, Athens Greece
Email: info@freshaqua.gr

4. Estimated average daily hot water yield (lt) of the system under typical consumption conditions (Test report from NATIONAL CENTER FOR SCIENTIFIC RESEARCH “DEMOKRITOS”)

FLUSSO SYSOL HOR-SC 400

Maximum Daily Water Consumption at 45°C (lt)

MAXIMUM DAILY WATER CONSUMPTION (lt)		CITIES										
		Athens	Thessaloniki	Larisa	Santorini	Rhodes	Heraklion	Patra	Corfu	Stockholm	Würzburg	Davos
MONTH	January	264	181	160	290	207	189	125	108	21	62	154
	February	274	278	229	284	253	219	182	162	84	86	245
	March	301	325	309	401	390	342	271	251	185	148	324
	April	424	392	399	480	486	445	401	376	287	359	355
	May	512	498	487	511	670	576	566	505	394	365	337
	June	647	626	596	637	837	754	736	660	448	442	335
	July	780	683	**683**	745	**860**	**817**	**810**	**731**	**454**	**469**	**359**
	August	**850**	**715**	680	**786**	**860**	802	756	679	399	368	346
	September	759	599	567	700	708	629	564	479	269	315	314
	Oktober	501	379	349	511	472	399	319	262	118	165	261
	November	298	232	211	362	265	232	166	137	35	76	186
	December	220	161	147	251	209	144	115	96	8	29	128

Freshaqua Ltd.
8 Zalokosta, GR 106 71, Athens Greece
Email: info@freshaqua.gr

FLUSSO SYSOL HOR-SC 600

Maximum Daily Water Consumption at 45°C (lt)

MAXIMUM DAILY WATER CONSUMPTION (lt)		CITIES										
		Athens	Thessaloniki	Larisa	Santorini	Rhodes	Heraklion	Patra	Corfu	Stockholm	Würzburg	Davos
MONTH	January	385	267	238	427	304	280	185	158	27	96	232
	February	398	409	337	417	371	322	267	237	121	124	367
	March	437	477	454	589	573	503	398	367	269	211	479
	April	621	574	585	705	713	654	587	551	418	516	521
	May	748	729	712	750	982	844	828	740	575	519	485
	June	946	916	872	935	1198	1087	1073	961	653	630	477
	July	1143	997	**996**	1084	1213	**1172**	**1164**	**1059**	**657**	**668**	**507**
	August	**1261**	**1045**	991	**1136**	**1215**	1151	1093	988	577	516	490
	September	1124	878	828	1022	1036	927	828	703	390	445	447
	Oktober	741	558	514	753	695	589	469	386	170	232	374
	November	436	344	313	534	391	344	246	204	48	108	272
	December	318	239	220	371	307	214	170	143	9	44	190

Freshaqua Ltd.
8 Zalokosta, GR 106 71, Athens Greece
Email: info@freshaqua.gr