SUPAflo EVO

Condensing Gas Fired Water Heater

Technical Document for SUPAflo Water Heater

Please read and understand these instructions before commencing installation and leave this manual with the customer for future reference.

Andrews. Built to perform.

ANDREWS
WATER HEATERS

Andrews SUPAflo EVO has been designed and manufactured to comply with current International standards of safety. In the interests of the health and safety of personnel and the continued safe, reliable operation of the equipment, safe working practices must be employed at all times. The attention of U.K. users is drawn to their responsibilities under the Health and Safety Regulations 1993.

All installation and service on the Andrews SUPAflo EVO must be carried out by properly qualified personnel, and therefore no liability can be accepted for any damage or malfunction caused as a result of intervention by unauthorised personnel.

The Andrews Water Heaters policy is one of continuous product improvement, and therefore the information in this manual, whilst completely up to date at the time of publication, may be subject to revision without prior notice.

Further information and assistance can be obtained from:

Customer support
Monday - Friday
8am - 5pm

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Email: service@baxicommercialdivision.co.uk
Website: www.andrewswaterheaters.co.uk
Twitter: @andrewsWH

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SUPAflo EVO Technical Documentation

1 General and Safety Information

1.1 General information

To ensure the continued, trouble-free operation of your heater at maximum efficiency, it is essential that correct installation, commissioning, operation and service procedures are carried out strictly in accordance with the instructions given in this manual. By law, installation and commissioning of the heater must be carried out by properly qualified personnel.

The SUPAflo EVO must be installed in accordance with the following requirements; The current BUILDING REGULATIONS.
The current WATER SUPPLY (WATER FITTINGS) REGULATIONS 1999.

Additionally, installation should be performed in accordance with all relevant requirements of the Local Authority and recommendations of the British Standards and Codes of Practice detailed below.

1.2 British standards and codes of practice

BS 5440	Part 1 1990 Specification for installations of flues
BS 6644	Installation of gas – flues hot water boilers of rated inputs between 60kW – 2MW
IM/11	Flues for commercial and industrial gas installations
IM/22	Installation guide for high efficiency condensing boilers
Clean Air Act	1993 Clean Air Act Memorandum

1.3 Health and safety regulations 1993

It is the duty of manufacturers and suppliers of products for use at work to ensure, so far as is practicable, that such products are safe and without risk to health when properly used and to make available to users, adequate information about their safe and proper operation.

Andrews Water Heaters should only be used in the manner and purpose for which they were intended and in accordance with the instructions in this manual. Although the heaters have been manufactured with paramount consideration to safety, certain basic precautions specified in this manual must be taken by the user.

It is imperative that all users of the heater must be provided with all the information and instruction necessary to ensure correct and safe operation.

2 Technical Data

2.1 Technical data

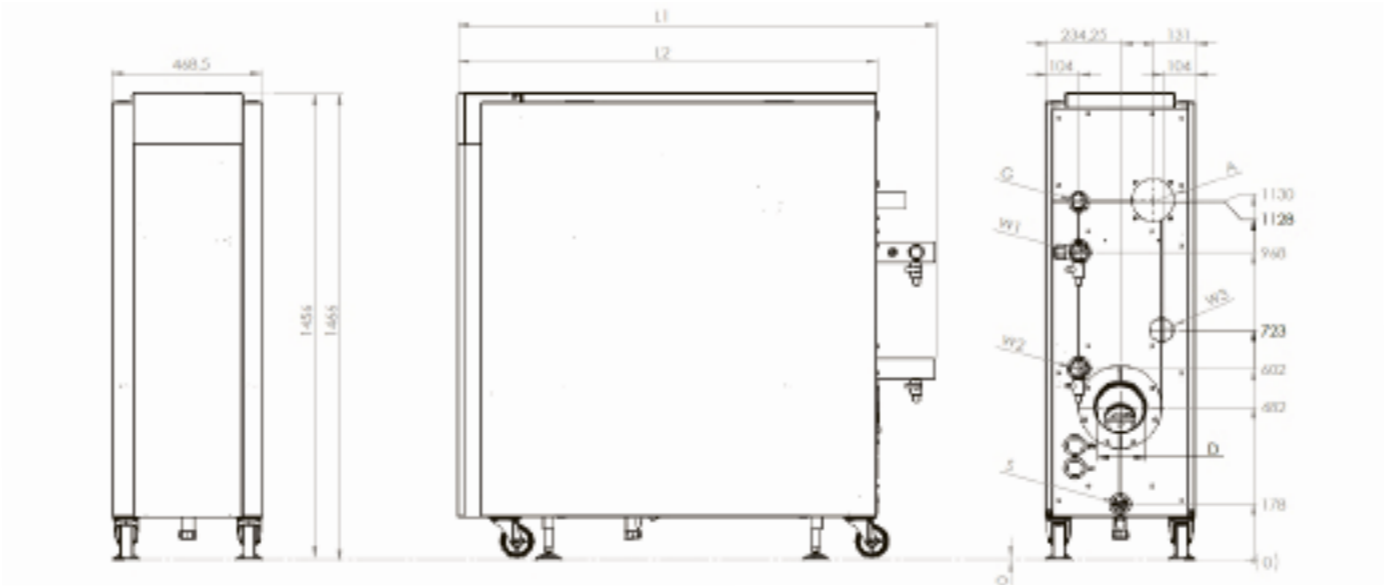
		SF61 EVO	SF62 EVO	SF63 EVO
Nominal heat output at 80/60ºC max/min	kW	142,3/31,3	190,4/42,0	237,6/47,0
Nominal heat output at 40/30ºC max/min	kW	151,2/35,4	202,3/47,4	252,3/53,4
Nominal heat input Hi max/min	kW	145,0/32,2	194,0/43,1	242,0/48,4
Efficiency at 80/60ºC	%	98,2	98,2	98,2
Efficiency at 40/30ºC	%	104,3	104,3	104,2
RAL 40/30 average	%	110,4	110,4	110,4
Max. condensate flow	l/h	9,2	12,4	15,4
Gas consumption G20 max/min (10,9 kWh/m3)	m3/h	13,3/3,0	17,8/4,0	22,2/4,4
Gas consumption G25 max/min (8,34 kWh/m3)	m3/h	17,4/3,9	23,3/5,2	29,0/5,8
Gas consumption G31 max/min (12,8 kWh/kg)	kg/h	11,3/2,5	15,2/3,4	18,9/3,8
Gas pressure G20	mbar	20		
Gas pressure G25	mbar	25		
Gas pressure G31	mbar	30/50		
Maximum gas pressure	mbar	50		
Max. temperature flue gas (high limit)	°C	90		
Flue gas temperature at 80/60ºC max/min	ºC	75/58	75/58	75/58
Flue gas temperature at 40/30ºC max/min	ºC	54/30	54/30	55/30
Flue gas quantity max/min	m3/h	188/43	251/57	313/64
CO2 level G20-G25 max/min	%	10,2/9,4 ± 0,2 (Limitation type 570 delta max/min ≥0,8)		
CO2 level G31 max/min	%	11,9/10,0 ± 0,2		
NOx level at 80/60 °C max/min	mg/kWh	38/19	38/19	36/18
CO level at 80/60 °C max/min	mg/kWh	14/3	14/3	14/5
Max. permissible flue resistance max/min	Pa	200/10	200/10	200/10
Water volume	l	26	31	33
Water pressure max/min	bar	8/1		
Max. water temperature (High limit thermostat)	ºC	100		
Maximum temperature setpoint	ºC	90		
Nominal water flow at dT=20K	m3/h	6,1	8,1	10,1
Hydraulic resistance at nominal flow rate	kPa	11,2	26,8	31,2
Electrical connection	V	230/400		
Frequency	Hz	50		
Mains connection fuse	A	16		
IP class	-	IP20		
Electrical consumption boiler max/min (without pump)	W	176/56	267/56	286/69
Electrical consumption speed controlled pump	W	190/9	190/9	310/12
Weight (empty)	kg	290	332	366
Sound Power Level (LWA)	dB	70,3	70,3	70,3
Ionisation current max/min	µA	10,6/4,4		
PH value condensate	-	3,2		
CE certification code	-	CE - 0063CQ3970		
Water connections	-	R2"	R2"	R2"
Gas connection	-	R1.1/2"	R1.1/2"	R1.1/2"
Flue gas connection (DN)	mm	150	150	200
Air intake connect. (room sealed use) (DN)	mm	130	130	130
Condensate connection	mm	32	32	32

		SF64 EVO	SF65 EVO	SF66 EVO	SF67 EVO
Nominal heat output at 80/60ºC max/min	kW	285,7/56,5	381,3/75,2	476,7/94,6	540,2/120,0
Nominal heat output at 40/30ºC max/min	kW	303,3/64,2	404,3/85,6	505,2/106,9	572,8/135,1
Nominal heat input Hi max/min	kW	291,0/58,2	388,0/77,6	485,0/97,0	550,0/122,2
Efficiency at 80/60ºC	%	98,2	98,3	98,3	98,2
Efficiency at 40/30ºC	%	104,2	104,2	104,2	104,2
RAL 40/30 average	%	110,4	110,4	110,4	110,3
Max. condensate flow	l/h	18,5	24,7	30,7	34,8
Gas consumption G20 max/min (10,9 kWh/m3)	m3/h	26,7/5,3	35,6/7,1	44,5/8,9	50,5/11,2
Gas consumption G25 max/min (8,34 kWh/m3)	m3/h	34,9/7,0	46,5/9,3	58,2/11,6	65,9/14,7
Gas consumption G31 max/min (12,8 kWh/kg)	kg/h	22,7/4,5	30,3/6,1	37,9/7,6	43,0/9,5
Gas pressure G20	mbar	20			
Gas pressure G25	mbar	25			
Gas pressure G31	mbar	30/50			
Maximum gas pressure	mbar	50			
Max. temperature flue gas (high limit)	°C	90			
Flue gas temperature at 80/60ºC max/min	ºC	75/58	75/59	75/59	76/58
Flue gas temperature at 40/30ºC max/min	ºC	55/30	56/30	56/30	56/30
Flue gas quantity max/min	m3/h	377/77	502/102	628/128	712/161
CO2 level G20-G25 max/min	%	10,2/9,4 ± 0,2 (Limitation type 570 delta max/min ≥0,8)			
CO2 level G31 max/min	%	11,9/10,0 ± 0,2			
NOx level at 80/60 °C max/min	mg/kWh	36/18	34/17	37/18	40/19
CO level at 80/60 °C max/min	mg/kWh	14/5	14/8	16/5	18/1
Max. permissible flue resistance max/min	Pa	160/10	400/10	300/10	400/10
Water volume	l	60	63	71	77
Water pressure max/min	bar	8/1			
Max. water temperature (High limit thermostat)	ºC	100			
Maximum temperature setpoint	ºC	90			
Nominal water flow at dT=20K	m3/h	12,2	16,3	20,3	23,1
Hydraulic resistance at nominal flow rate	kPa	11,9	32,3	34,3	57,1
Electrical connection	V	230/400			
Frequency	Hz	50			
Mains connection fuse	A	16			
IP class	-	IP20			
Electrical consumption boiler max/min (without pump)	W	230/69	486/69	620/64	676/61
Electrical consumption speed controlled pump	W	310/12	470/25	590/25	800/38
Weight (empty)	kg	434	496	540	595
Sound Power Level (LWA)	dB	70,3	77,3	77,3	77,3
Ionisation current max/min	µA	10,6/4,4			
PH value condensate	-	3,2			
CE certification code	-	CE - 0063CQ3970			
Water connections	-	DN65 PN16	DN65 PN16	DN65 PN16	DN65 PN16
Gas connection	-	R1.1/2"	R1.1/2"	R2"	R2"
Flue gas connection (DN)	mm	200	250	250	250
Air intake connect. (room sealed use) (DN)	mm	130	130	150	150
Condensate connection	mm	32	32	32	32

2.2 Dimensions

Fig. 1

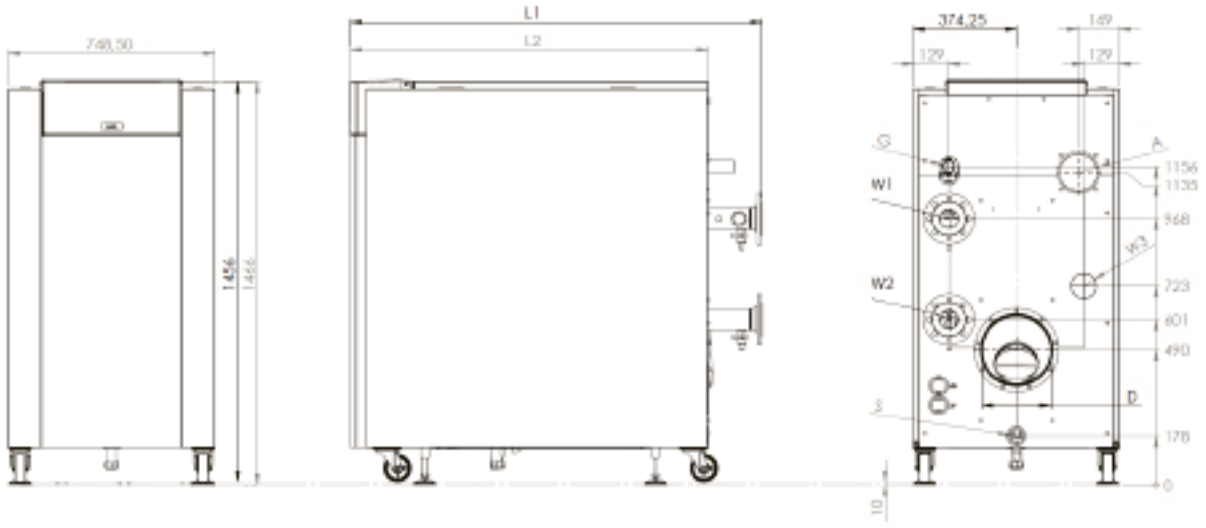
SF61 - SF62 - SF63 EVO



		SF61 EVO	SF62 EVO	SF63 EVO	SF64 EVO	SF65 EVO	SF66 EVO	SF67 EVO
L1	mm	1349	1499	1649	1348	1496	1646	1769
L2	mm	1165	1315	1465	1152	1302	1452	1602
A	mm	Ø 130					Ø 150	
G	mm	1.1/2”				2”		
D	mm	150		200		250		
S	mm	32						
W1-W2-W3	mm	R2”			DN65 PN16			

Fig. 2

SF64 - SF65 - SF66 - SF67 EVO



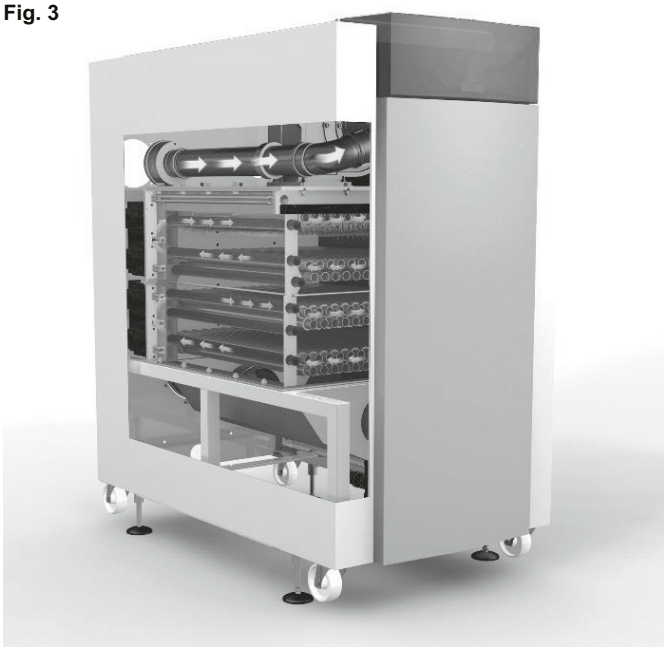
3 Product Description

3.1 General

This document is meant to be used in addition to the SUPAflo EVO central heating boiler documentation, in case of having an (industrial) water heater. This document only contains the differences in construction and application to the central heating boiler version. General information on the boiler (transport, commissioning, maintenance, etc.) can be found in the central heating boiler documentation.

3.2 Technical description

Fig. 3



The (industrial) water heater is applicable for direct heating of sanitary hot water without using hydraulic separation (f.e. plate heat exchanger) in the system. All metallic materials in contact with water are made of stainless steel 1.4404. For the water heater, all components in contact with water are WRAS compliant.

3.3 Water quality

3.3.1 (Industrial) Water heater

As there is always fresh water flowing through the water heater, there are restrictions to the maximum flow temperature related to the hardness of the water. The following table indicates the maximum flow temperatures for different water hardness values. Not respecting these values can lead to damage of the heat exchanger.

For standard sanitary hot water systems the following applies:

Water hardness [°dH]	Water hardness [°f]	Water hardness [ppm CaCO3]	Max temp setpoint [°C]
2,8 - 8,4	5 - 15	50 - 150	75
8,4 - 11,2	15 - 20	150 - 200	65
> 11,2	> 20	> 200	water treatment

pH-value should be between 7,0 – 9,5. Chloride level should not exceed 50mg/l.

For industrial hot water systems (higher flow temperatures) the following applies:

Water hardness [°dH]	Water hardness [°f]	Water hardness [ppm CaCO3]	Max temp setpoint [°C]
0 - 0,56	0 - 1	0 - 10	90
0,56 - 2,8	1 - 5	10 - 50	80
> 2,8	> 5	> 50	water treatment

pH-value should be between 7,0 – 9,5. Chloride level should not exceed 50mg/l.

3.4 Hot water production (water heater only)

The following table shows the tapping volumes which can be achieved with a water heater, based on a cold water inlet temperature of 10ºC.

Boiler type	Output at 80-60°C	flow 50°C	flow 60°C	flow 65°C	flow 70°C	flow 80°C	flow 90°C
	[kW]	[l/min]	[l/min]	[l/min]	[l/min]	[l/min]	[l/min]
SF61 EVO	142	51,1	40,8	37,1	34,0	29,2	25,5
SF62 EVO	190	68,3	54,7	49,7	45,5	39,0	34,2
SF63 EVO	238	85,6	68,5	62,2	57,1	48,9	42,8
SF64 EVO	286	102,8	82,3	74,8	68,6	58,8	51,4
SF65 EVO	381	137,0	109,6	99,6	91,3	78,3	68,5
SF66 EVO	477	171,5	137,2	124,7	114,3	98,0	85,8
SF67 EVO	540	194,2	155,3	141,2	129,4	111,0	97,1

3.5 Hydraulic connection

3.5.1 (Industrial) Water heater

The SUPAflo EVO (industrial) water heater must be installed in such a way, that a minimum water flow rate of 30% of the nominal flow rate can be assured at all times when the burner is switched on. The water heater can increase the water temperature by maximum 17K in a single cycle. This means that the water has to cycle through the water heater several times when f.e. cold water of 10ºC has to be heated up to 60ºC (3 times).

This is normally done by installing the water heater in combination with a buffer tank. The flow rate from the tank to the water heater and back can then be secured by the (primary) water heater pump.

The table below shows the nominal water flow data at a ΔT of 17K, plus the pump data of the (optional) pump kit for each type of water heater.

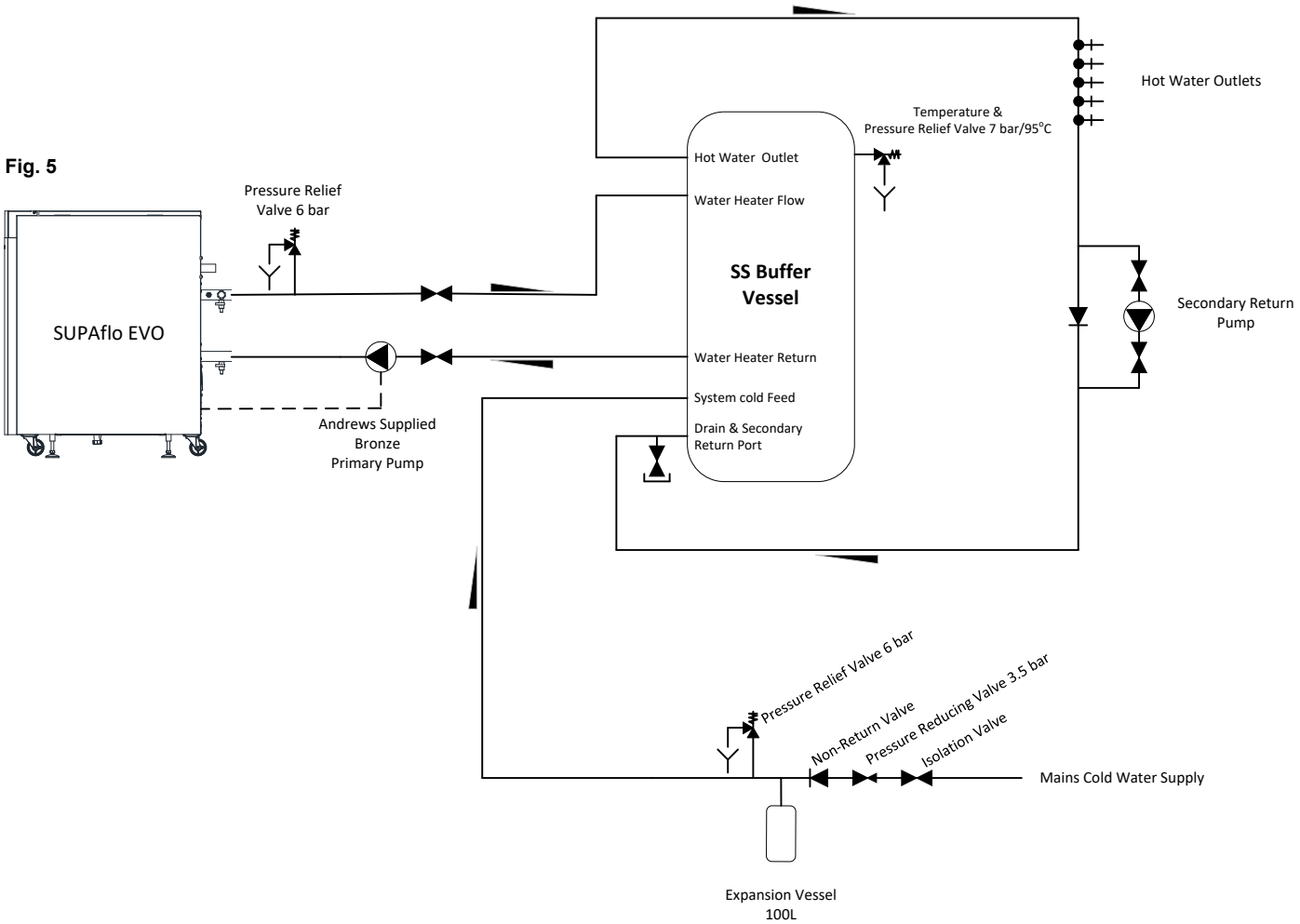
Boiler type	dT	Nominal flow	Boiler resistance	Pump type	Pump curve	Pump head	Available head
	[K]	[m3/h]	[kPa]	[-]	[-]	[kPa]	[kPa]
SF61 EVO	17	7,2	15	UPS 32-80B	3	37	22
SF62 EVO		9,5	37	UPS 32-120FB	3	62	25
SF63 EVO		12,0	43	UPS 40-120FB	3	66	23
SF64 EVO		14,4	16	UPS 40-120FB	3	34	18
SF65 EVO		19,2	44	UPS 50-120FB	3	66	22
SF66 EVO		24,0	47	UPS 65-120FB	3	61	14
SF67 EVO		27,2	79	UPS 65-180FB	3	106	27

4 System Examples

4.1 System Example: Water heater with a SS300/500/800/1000-10-2.5" single buffer vessel

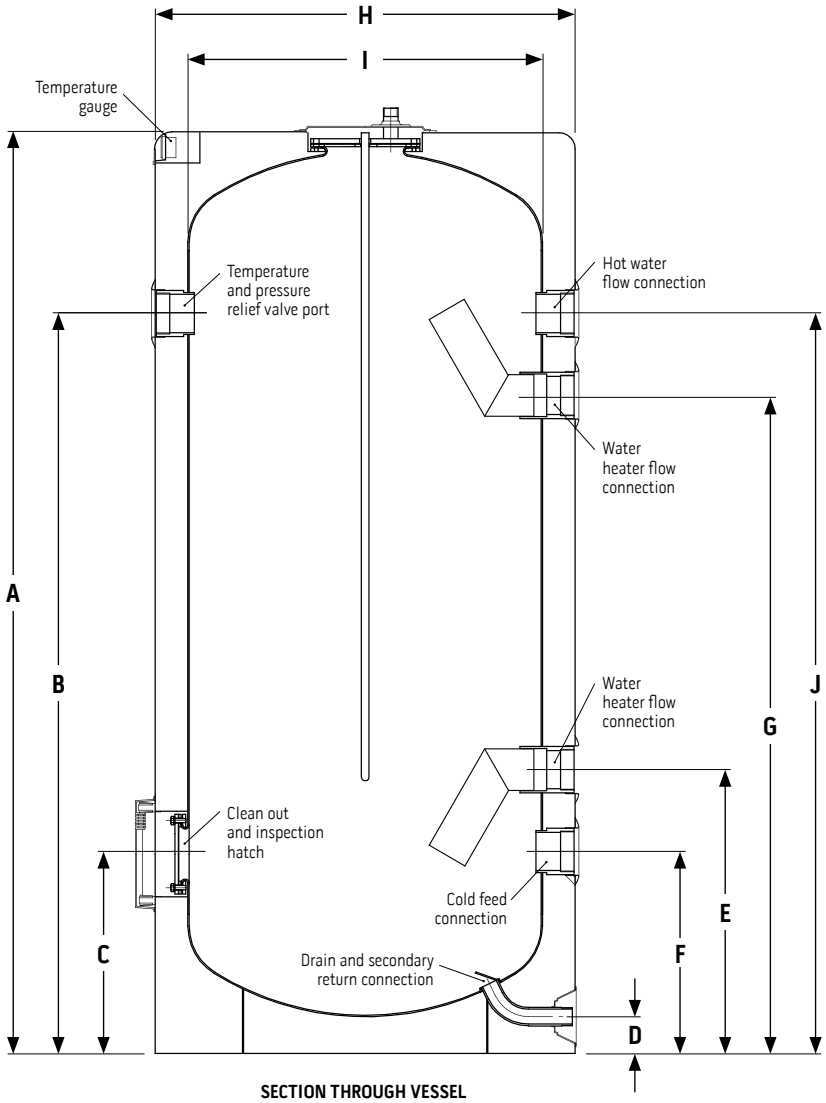
The SUPAflo EVO connected to an Andrews SS300/500/800/1000-10-2.5" single buffer vessel with a separate cold feed and secondary return / drain ports directly into the buffer vessel. The buffer vessel also has individual flow and return ports for the water heater. The location and size of these ports will prevent cycling of the water heater and allow the heater to operate efficiently. The primary pump will constantly circulate water through the water heater and buffer vessel to allow the water heater to respond swiftly to any demand and provide a stable water temperature within the vessel and system. We recommend not to reduce the diameter of the pipe-work between the buffer vessel and water heater as this may reduce the design flow rate across the water heater. The Andrews SS300/500/800/1000-10-2.5" single buffer vessel has has an individual port in the vessel to fit a temperature and pressure relief valve direct in the top rear side of the vessel.

Fig. 5



4.2 System Example: Water heater with a SS300/500/800/1000-10-2.5" single buffer vessel

	MODEL			
	BUFFER-SS300-2.5”	**BUFFER-SS500-2.5”**	**BUFFER-SS800-2.5”**	**BUFFER-SS1000-2.5”**
Height (mm)	1685	1690	1840	2250
Height to temperature and pressure relief valve port (mm)	1400	1356	1457	1867
Height to clean out and inspection hatch	323	370	347	347
Height to drain and secondary return connection (mm)	70	70	100	100
Height to water heater return connection (mm)	473	520	497	497
Height to cold feed connection (mm)	323	370	347	347
Height to water heater flow connection (mm)	1250	1206	1307	1717
Outside diameter (mm)	620	770	950	950
Cylinder diameter (mm)	500	650	790	790
Height to hot water flow connection (mm)	1400	1356	1457	1867



SECTION THROUGH VESSEL

Unvented Systems Kit

7820334: Unvented kit for SUPAflo EVO SF61 to SF63

Suitable for SF61 to SF63
- Pressure limiting valve 1 ½” 3.5 bar
- Non-return valve 1 ½”
- Expansion relief valve 6 bar 1¼” x 1½” DN32
- Expansion vessel 100L
- Temperature and pressure relief valve 2” DN40
- Straight tundish 1 ½” x 2”
- Straight tundish 2” x 2 ½”

7820335: Unvented kit for SUPAflo EVO SF64 to SF67

Suitable for SF64 to SF67
- Pressure limiting valve 2” 3.5 bar
- Non-return valve 2”
- Expansion relief valve 6 bar 1½” x 2” DN40
- Expansion Vessel 100L
- Temperature and pressure relief valve 2½” DN50
- Straight tundish 2” x 2 ½”
- Straight tundish 2 ½” x 3”

FM00866 EMS514880

Register now to activate your warranty **www.andrewswaterheaters.co.uk/register-a-warranty**.
Please make sure you attach proof of purchase for your warranty to be monitored.

All descriptions and illustrations provided in this document have been carefully prepared but we reserve the right to make changes and improvements in our products which may affect the accuracy of the information contained in this leaflet. All goods are sold subjects to our standard Conditions of Sale which are available on request.

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October 2022

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