

Product catalogue

Hot water solutions for every situation

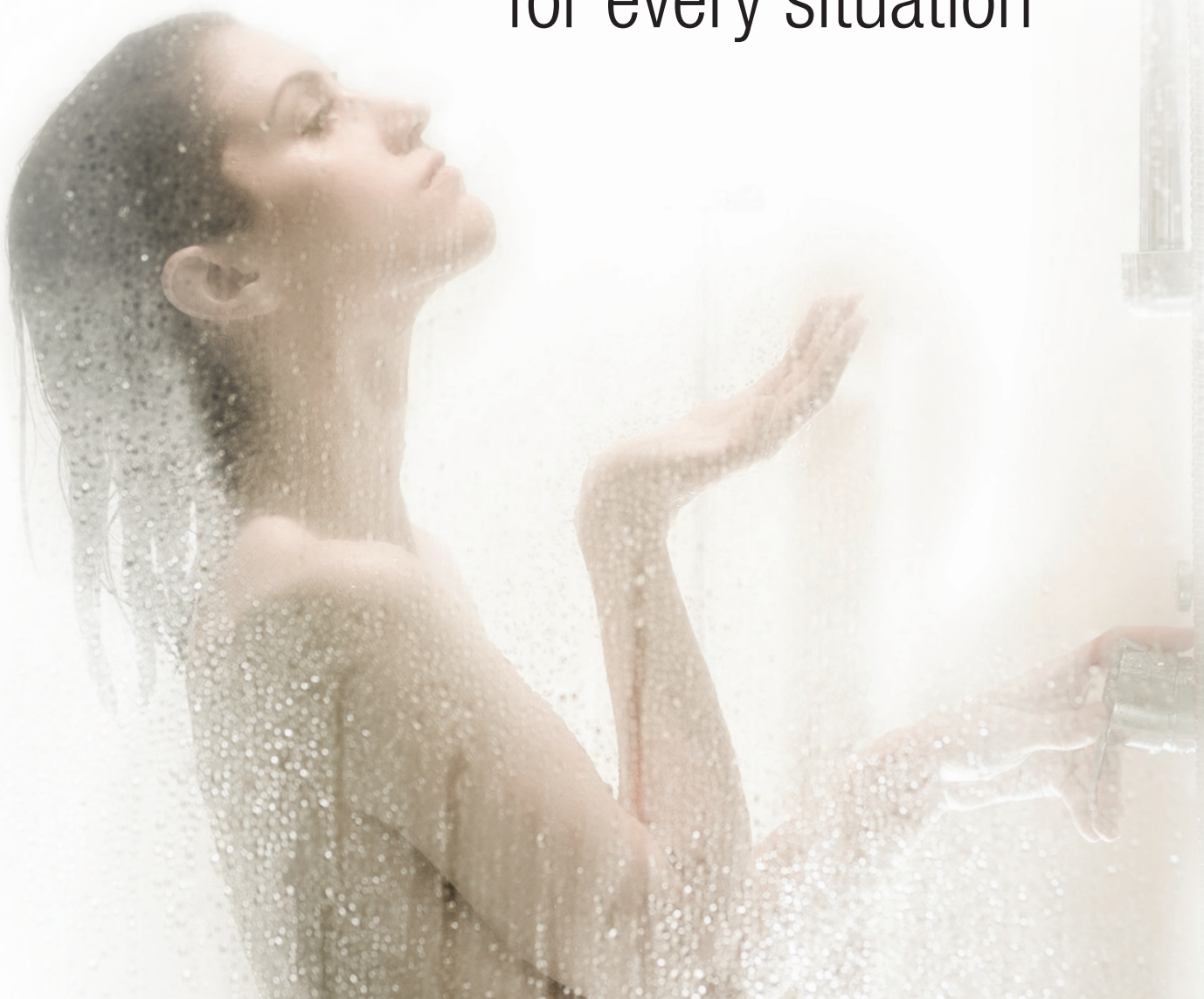










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Hot water solutions for every situation

Enjoy highly efficient hot water performance without compromising comfort



Why choose A.O. Smith?

1. Condensing product range.

We offer the most efficient range of condensing water heaters and boilers on the market. All of our products meet the European Energy Related Products (ErP) Directives for 2018. For you that efficiency means:

- a) Your savings will cover your initial investment costs in less time.
- b) You can be comforted by the knowledge that you've made a choice that's environmentally safe.

2. Direct fired water heaters.

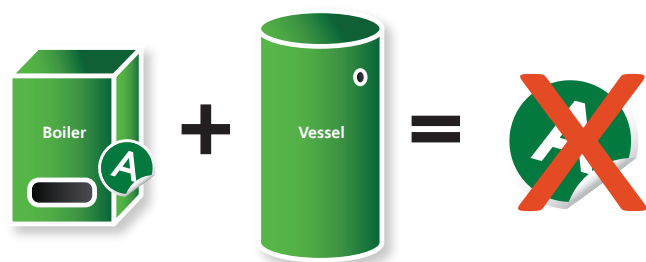
Our direct water heaters offer far more efficiency than standard boiler and separate hot water storage systems.

3. Solar enhanced systems.

By complementing standard systems with additional solar thermal options, A.O. Smith can dramatically enhance efficiency.

4. Complete service and aftercare.

A.O. Smith customers benefit from comprehensive customer care from the initial design right through to aftersales service. We are here to help for your first system, and for any subsequent replacement systems.



HIGH-EFFICIENCY CONDENSING WATER HEATERS



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SOLAR THERMAL ENERGY



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HIGH-EFFICIENCY CONDENSING BOILERS



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Our vision:

At A.O. Smith we are united behind a single vision. To be the leading producer and supplier of innovative, energy-efficient products for the water heating and water treatment industries. By pursuing this ambition, we are able to offer incomparable value to every customer, whether they be industrial, commercial or private. For our stakeholders we aim to deliver long-term business value and growth by adhering to the following key principles:

- We pursue our business goals with honesty and integrity
- We put caring for our customers as our first priority
- Through constant innovation, we seek to become a leading force in our category
- We invest in our people and pursue operational excellence
- We supplement organic business growth with relevant and strategic acquisition

History

Arthur's father, Charles Jeremiah Smith (pictured left) set up a blacksmith shop in Milwaukee in 1847 that soon grew out to be a successful family business.

Introduction

Who are A.O. Smith?

A.O. Smith Water Products Company B.V. manufactures water heaters and water equipment for both residential and industrial use. Although a subsidiary of the American A.O. Smith corporation, the company is based in the Netherlands. Our European Head Office has been situated in Veldhoven since 1972. The company takes its name from Arthur Oliver Smith, son of the original founder of the A.O. Smith Corporation.



ACSmith

Sustainability and innovation

Since the company's origins 140 years ago, A.O. Smith has been continually shaped by a focus on two key drivers. Sustainability and Innovation. Inventors of a patented glass-coating process to increase efficiency, A.O. Smith are industry leaders in maximizing the service life and quality of glass-lined water heating systems. Our patented PermaGlass Ultra Coat involves applying an enamel layer to a fully assembled heater. This pioneering process has been trademarked and is exclusive to A.O. Smith.

A.O. Smith provides products for a wide range of industries and uses. To maintain its market leader position, the company cultivates a spirit of continual innovation, constantly imagining new ways to enhance both production and application of its products. That relentless spirit of innovation permeates every aspect of design from the choice of components and materials, through to evaluating the efficiency of systems, and improving ease of use.

A.O. Smith specialises in solar thermal energy systems, condensing technologies and heating applications. We invest in energy-saving and efficient ways of supplying hot water.

We believe in the following key words:

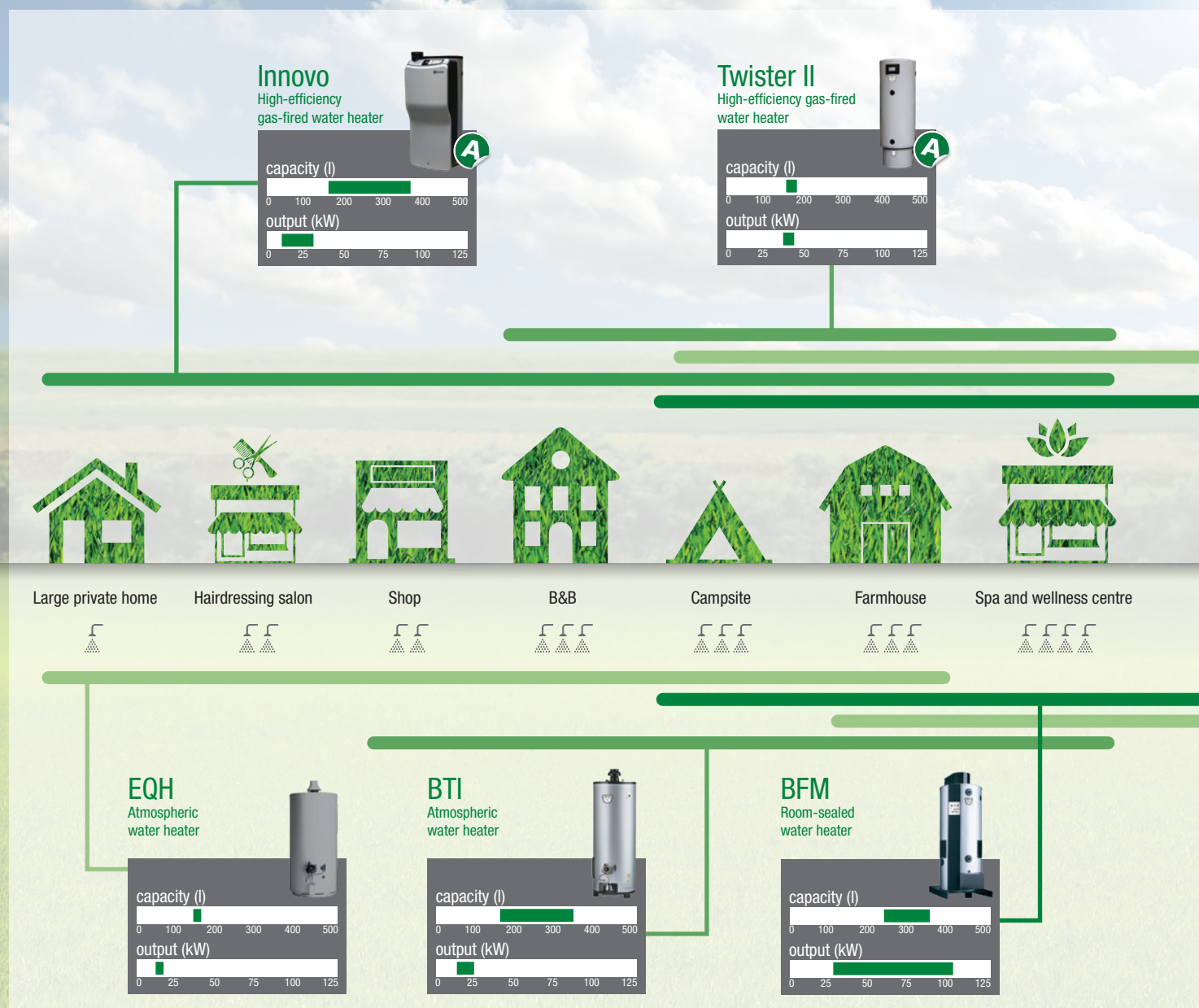
- Innovation
- Efficiency
- Partner & Advisor
- Complete customer service
- The best solution for each different use

Condensing technologies

For more than 20 years, A.O. Smith's main production focus has been on condensing water heaters. That expertise is the reason our systems are able to deliver such high levels of efficiency. Simple yet intelligent controls ensure that every system does its job effectively and efficiently

Research and development

An internal research and development department allows A.O. Smith to pioneer and produce new products entirely in-house. That capability allows us to produce highly customized systems in response to a customer's particular needs. Our team can work with you through the entire production cycle from orientation, to installation, to maintenance and service.



*This application and device overview offers a guide to existing solutions.
We would be happy to help you decide which option would represent the best option for your particular needs.*



**SMART
SIZE**

Online custom advice

Smart solutions with Smartsizes

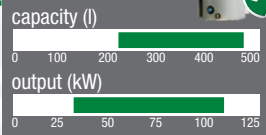
Smartsizes is a selection programme that helps you understand which configuration will best suit your specific requirements. Upon entering your specifications and needs, Smartsizes generates a proposal with your best possible solution.

This custom-built tool can help with every aspect of your project from an inventory to help with project planning, to the generation of visual designs so you can explore possibilities and recommendations. Our Technical Support Group and Customer Service teams are always on hand to help with any support you might need when using Smartsizes, or for any other matter. We're here to provide all the support and advice you will ever need, all free of charge.

TRY IT FOR YOURSELF AT WWW.AOSMITH.CO.UK

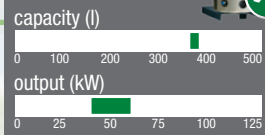
BFC Cyclone

High-efficiency gas-fired water heater



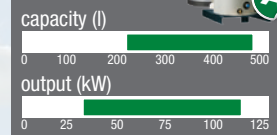
SGE

High efficiency gas-fired solar water heater



SGS

High efficiency gas-fired solar water heater



Sports club



School



Hospital



Hotel



Sport complex

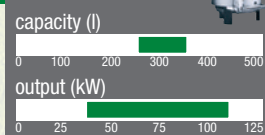


Factory



ADM(R/P)

Atmospheric gas-fired water heater



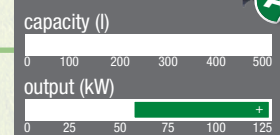
COF

Room-sealed water heater



UB Cascade

Heating system



For other applications and product combinations, we also have the following systems available:
DRE/EES/IT/ITE/ITS

Personal advice

Your perfect partner for every project






A.O. Smith are a firm believer in providing the highest possible standards of customer service. We are on hand to provide advice from the preliminary planning stages of your project, when many of the most important decisions are made. Which hot water system will best fit your particular needs? You can rely on the guidance of our highly experienced sales engineers to find your perfect answer.

A.O. Smith's support extends throughout your project to provide ongoing guidance about your system, and its proper maintenance. The high quality of our service is maintained by our in-house Technical Support Group. Whenever you need support, we'll be there.

ENERGY-EFFICIENT PERFORMANCE

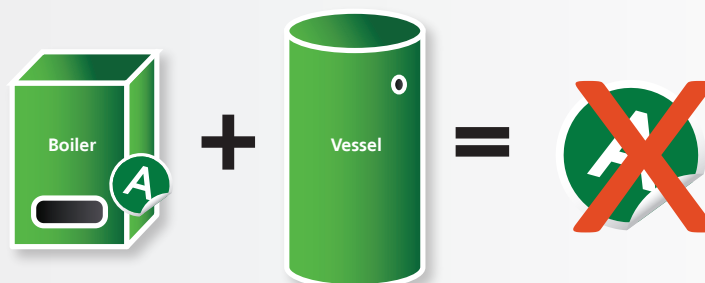
Direct versus indirect water heaters

In a **direct-fired domestic hot water system**, heat created by the burning process is transmitted directly to the water via a heat exchanger. Atmospheric systems and room-sealed high-efficiency condensing water heaters are both types of direct gas-fired water heater, but only a sealed heater uses smart design to condense combustion gases. In these systems residual heat is drawn from the flue gases to deliver the highest possible levels of efficiency.

CONDENSING HIGH-EFFICIENCY HOT WATER SOLUTIONS			INNOVO	
			Output	11.7 – 31.3 kW
			Capacity	160 – 380 litres
			ErP efficiency	up to 94% (XL-XXL)
			Max. temperature setpoint	85°C
			Water efficiency	up to 98%
				
TWISTER II			BFC CYCLONE	
			Output	34.9 – 45.1 kW
			Capacity	182 litres
			ErP efficiency	up to 93% (XXL)
			Max. temperature setpoint	85°C
			Water efficiency	up to 93%
				
			Output	31.0 – 121.8 kW
			Capacity	217 – 480 litres
			ErP efficiency	up to 93% (XXL-3XL)
			Max. temperature setpoint	80°C
			Water efficiency	up to 98%
				
SGE			SGS	
			Output	42.8 – 60.4 kW
			Capacity	370 litres
			ErP efficiency	up to 91% (XL-XXL)
			Max. temperature setpoint	80°C
			Water efficiency	up to 96%
				
			Output	31.0 – 121.8 kW
			Capacity	217 – 480 litres
			ErP efficiency	up to 93% (XXL-3XL)
			Max. temperature setpoint	80°C
			Water efficiency	up to 98%
				

The hot water solutions score well below the maximum NO_x emission in accordance with the ErP regulations (September 2018).

An **indirect** hot water system is created by combining several products, none designed individually as a water heater, but which together create a hot water system. Although it is natural to assume that a central heating boiler with a Class A classification should create a Class A water heating system, that assumption is inaccurate. The boiler's classification relates only to its heat producing ability, not to its performance as a water heater. If you want a truly energy-saving and highly efficient solution, a direct water heating solution is always a better idea.



Systems

Energy-efficient performance

Today's products need to be both durable and efficient. Guidelines for energy consumption within buildings are becoming increasingly demanding. Fortunately, A.O. Smith offers a range of product options that match current requirements, and many that exceed them.

Energy performance directive

The EU directive on the energy performance of buildings was implemented in 2002. It is intended to improve the energy efficiency of buildings, to reduce carbon emissions, and ultimately to reduce the impact of climate change. The directive was amended in 2010 to further improve the energy-saving performance of buildings.

One of the key aims of the directive is to make the performance of individual buildings transparent with the use of certificates to indicate energy ratings. For each building certification includes clear guidance on what improvements a building could make to further increase performance.

Efficiency

The efficiency of a water heating system is measured as a percentage. This percentage indicates how much energy is transferred to the water in the tank in comparison to the amount of energy used by the heating system. In the United Kingdom, this percentage is expressed in gross value. A rating can never exceed 100%, but the higher the percentage, the more efficient the system.

Ecodesign

Created as part of the EU's Ecodesign Directive, Ecodesign regulations oblige manufacturers to restrict the energy consumption of their products by setting minimum standards for energy efficiency. As a result of the EU's 2015 Energy Labelling Directive, the efficiency rating of individual products must be made clear to consumers using energy labels. From September 2018, the Ecodesign Directive will make NO_x standards more stringent for all products.

Solar & condensing systems

A.O. Smith water heaters deliver consistently high-efficiency ratings. The Innovo, Twister II and BFC Cyclone heaters all deliver ratings of between 95 – 98% (gross). Its SGE and SGS solar water heaters are amongst the most efficient in the market, delivering maximum solar contribution. They already operate safely within the new NO_x requirements



Solar and Condensing systems are distinguished visually with the use of these simple pictograms



Expanding the gas-fired water heater range

High-efficiency condensing water heaters



A consistent advocate for the benefits of condensing gas-fired water heaters, A.O. Smith was an early pioneer in the category. The BFC Cyclone, our first gas-fired high-efficiency water heater, launched in 1998. Since then, with recent introductions of the Innovo model, we have built a comprehensive range of condensing heaters to offer the ideal solution for every different situation.

Applications

The BFC Cyclone, Twister II, SGE and SGS water heaters have been developed to match the demands of **medium to large usage buildings**. The medium classification includes buildings such as dairy farms, camping grounds and sports centres, whilst the large classification covers buildings with high volume demands like schools and nursing homes. Our new Innovo system has been designed to meet the needs of smaller establishments with more modest requirements like hairdressing salons, car washes, B&B's and large private homes. Combined, this range offers ideal solutions for businesses and buildings of every size. Whatever your choice, efficient performance is guaranteed. All products in the range have been assigned at least a Class A label with many, like our solar systems, achieving up to an A+++, depending on the configuration.

Innovo

The Innovo range includes 9 room-sealed condensing gas-fired water heaters with capacities ranging from 11.7 to 31.3 kW, and volumes ranging from 160 to 380 litres. A load profile between XL and XXL can be attained depending on the appliance, while the ErP efficiency varies between 90 and 94% (gross value). The entire range has a maximum temperature setting of 85°C, and with a NO_x output of under 37 mg/kWh, already meets the new standards set by the European Directive to be implemented in September 2018.





HIGH-EFFICIENCY CONDENSING WATER HEATERS TECHNICAL SPECIFICATIONS BFC



BFC Cyclone Fully room-sealed condensing high-efficiency water heater (98%)

Nominal output 31.0 - 121.8 kW
Flue options B23, C13, C33, C43, C53, C63

- Automatic gas/air premix burning system, including burner modulation
- Standard low-maintenance powered anodes
- Whisper-quiet operating sound
- Varying water temperature setting from 40°C to 80°C with use of weekly timer
- Flexible flue options (maximum length 100m) allows systems to be placed almost anywhere
- Easy fault diagnosis and computer-controlled digital weekly timer
- Programmable for anti-legionella purge cycle
- Voltage-free contact for general fault indication to BMS



BFC 80-120

- Comes with a steel pallet base as standard to simplify transport and installation



Technical specifications		BFC 28	BFC 30	BFC 50	BFC 60	BFC 80	BFC 100	BFC 120
Nominal input (gross value) *	kW	32.2	33.3	52.2	63.3	86.6	105.5	128.8
Nominal input (nett value)	kW	29.0	30.0	47.0	57.0	78.0	95.0	116.0
Nominal output	kW	31.0	32.7	50.3	60.4	84.2	100.7	121.8
Gas consumption**	m³/h	3.1	3.2	5.0	6.0	8.3	10.1	12.3
Empty weight	kg	177	214	214	214	480	480	480
Efficiency (gross value)	%	96	98	96	95	97	95	95
Efficiency (nett value)	%	107	109	107	106	108	106	105
NO _x emissions*	mg/kWh GVC	24	32	36	37	34	36	37
Draw-off capacity								
Capacity	l	217	368	368	368	480	480	480
Max. temperature setting	°C	80	80	80	80	80	80	80
30 minutes	ΔT=44 °C l	430	550	730	840	1100	1300	1500
60 minutes	ΔT=44 °C l	730	870	1300	1500	1900	2300	2600
90 minutes	ΔT=44 °C l	1100	1200	1800	2100	2800	3200	3800
120 minutes	ΔT=44 °C l	1400	1500	2300	2700	3600	4200	5000
Continuous	ΔT=44 °C l/h	610	640	990	1200	1700	2000	2400
Heating-up time	ΔT=44 °C minutes	21	35	22	19	17	15	12
30 minutes	ΔT=50 °C l	360	450	620	720	910	1100	1300
60 minutes	ΔT=50 °C l	630	730	1100	1300	1700	2000	2300
90 minutes	ΔT=50 °C l	900	1100	1500	1800	2400	2800	3400
120 minutes	ΔT=50 °C l	1200	1300	2000	2300	3100	3700	4400
Continuous	ΔT=50 °C l/h	540	570	870	1100	1500	1800	2100
Heating-up time	ΔT=50 °C minutes	24	39	26	21	20	17	14
30 minutes	ΔT=55 °C l	320	390	540	630	800	920	1100
60 minutes	ΔT=55 °C l	560	650	940	1100	1500	1700	2100
90 minutes	ΔT=55 °C l	800	900	1400	1600	2200	2500	3000
120 minutes	ΔT=55 °C l	1100	1200	1800	2100	2800	3300	4000
Continuous	ΔT=55 °C l/h	490	520	790	950	1400	1600	2000
Heating-up time	ΔT=55 °C minutes	27	43	28	23	22	18	15
Dimensions								
Height	mm	1390	1925	1925	1925	2060	2060	2060
Depth	mm	705	705	705	705	1000	1000	1000
Width	mm	705	705	705	705	900	900	900
Height of cold water connection	mm	170	160	160	160	225	225	225
Height of hot water connection	mm	1390	1925	1925	1925	2060	2060	2060
Height of gas connection	mm	1285	1815	1815	1815	1855	1855	1855
Diameter of flue connection	mm	100/150	100/150	100/150	100/150	130/200	130/200	130/200
Cleaning opening	mm	95 x 70	95 x 70	95 x 70	95 x 70	95 x 70	95 x 70	95 x 70
Energy labelling								
Load profile		XXL	XXL	XXL	XXL	3XL	3XL	3XL
Energy labelling		A	A	A	A	-	-	-
Efficiency	%	91	91	91	90	93	93	92

* Gas data based on G20-20 mbar

** Gas consumption at 15 °C and 1013.25 mbar

Draw-off capacities are based on the maximum control temperature and cold water set at 10 °C



Innova Fully room-sealed condensing high-efficiency water heater (98%)

Nominal output 11.7 - 31.3 kW
Flue options B23, C13, C33, C43, C53, C63



- Automatic gas/air premix burning system, including burner modulation
- Standard low-maintenance powered anodes
- Flue lengths up to 75 metres depending on unit and flue gas system configuration
- Heat exchanger constructed to minimise limescale deposits
- External on-/off-switch
- Voltage-free contact for general fault indication to BMS
- Maximum set point of 85°C
- All components can be easily reached through front cover for simplified servicing and maintenance.
- Completely insulated, low standby losses
- Suitable for PP and aluminium flue gas exhaust materials
- Suitable for natural gas and butane/propane

Technical specifications		IR-12-160	IR-20-160	IR-12-200	IR-20-200	IR-24-245	IR-32-245	IR-24-285	IR-32-285	IR-32-380
Nominal input (gross value) *	kW	12.1	20.0	12.1	20.0	24.4	32.2	24.4	32.2	32.2
Nominal input (nett value)	kW	10.9	18.0	10.9	18.0	22.0	29.0	22.0	29.0	29.0
Nominal output	kW	11.7	19.1	11.9	19.1	23.5	30.7	23.8	31.0	31.3
Gas consumption**	m ³ /h	1.2	1.9	1.2	1.9	2.3	3.1	2.3	3.1	3.1
Flue gas discharge temperature	°C	42	61	42	61	57	65	57	65	65
Empty weight	kg	95	95	106	106	120	120	136	136	171
Efficiency (gross value)	%	96	95	98	95	96	95	97	96	97
Efficiency (nett value)	%	107	106	109	106	107	106	108	107	108
NO _x emissions*	mg/kWh GVC	22	30	22	30	33	37	33	37	37
Draw-off capacity										
Capacity	l	160	160	200	200	245	245	285	285	380
Max. temperature setting	°C	85	85	85	85	85	85	85	85	85
T _{cold} = 10 °C/T _{set} = 85 °C										
Immediate draw-off capacity ΔT=44 °C	l	140	150	250	260	300	300	380	390	510
30 minutes ΔT=44 °C	l	250	320	360	430	510	570	590	660	790
60 minutes ΔT=44 °C	l	360	510	470	620	740	870	820	960	1100
90 minutes ΔT=44 °C	l	480	690	590	810	970	1200	1100	1300	1400
120 minutes ΔT=44 °C	l	590	880	710	990	1200	1500	1300	1600	1800
Continuous ΔT=44 °C	l/h	230	380	240	380	470	610	470	610	620
Immediate draw-off capacity ΔT=50 °C	l	120	130	220	230	250	260	330	330	440
30 minutes ΔT=50 °C	l	210	270	310	380	440	500	510	570	680
60 minutes ΔT=50 °C	l	310	440	410	540	640	760	720	840	950
90 minutes ΔT=50 °C	l	410	600	510	710	840	1100	920	1200	1300
120 minutes ΔT=50 °C	l	510	770	610	870	1100	1300	1200	1400	1500
Continuous ΔT=50 °C	l/h	210	330	210	330	410	530	410	540	540
Immediate draw-off capacity ΔT=55 °C	l	100	110	190	200	220	230	290	300	390
30 minutes ΔT=55 °C	l	180	240	270	340	390	440	460	520	610
60 minutes ΔT=55 °C	l	270	390	370	490	570	690	650	760	860
90 minutes ΔT=55 °C	l	370	540	460	640	760	930	830	1000	1100
120 minutes ΔT=55 °C	l	460	690	550	790	940	1200	1100	1300	1400
Continuous ΔT=55 °C	l/h	190	300	190	300	370	490	380	490	500
Heating-up time ΔT=44 °C	minutes	27	17	41	27	25	20	31	24	31
Heating-up time ΔT=50 °C	minutes	31	19	47	30	29	22	35	27	36
Heating-up time ΔT=55 °C	minutes	34	21	52	33	32	24	39	30	39
Dimensions										
Height	mm	1270	1270	1545	1545	1545	1545	1745	1745	1745
Depth	mm	780	780	780	780	830	830	830	830	895
Width	mm	560	560	560	560	610	610	610	610	675
Height of cold water connection	mm	175	175	175	175	175	175	175	175	175
Height of hot water connection	mm	1270	1270	1545	1545	1545	1545	1745	1745	1745
Height of gas connection	mm	870	870	870	870	910	910	910	910	910
Diameter of flue connection	mm	80/125	80/125	80/125	80/125	80/125	80/125	80/125	80/125	80/125
Cleaning opening	mm	95x70	95x70	95x70	95x70	95x70	95x70	95x70	95x70	95x70
Energy labelling										
Load profile		XL	XL	XL	XL	XXL	XXL	XXL	XXL	XXL
Energy labelling		A	A	A	A	A	A	A	A	A
Efficiency	%	92	92	94	91	92	92	91	90	90

* Gas data based on G20-20 mbar

** Gas consumption at 15 °C and 1013.25 mbar

Draw-off capacities are based on the maximum control temperature and cold water set at 10 °C



HIGH-EFFICIENCY CONDENSING WATER HEATERS TECHNICAL SPECIFICATIONS TWISTER II



Twister II Fully sealed condensing high-efficiency water heater (93%)

Nominal output 35.9 - 46.2 kW
Flue options B23, C13, C33, C43, C53, C63

- Stainless-steel tank free of anodes to simplify maintenance
- Premix Low NO_x burner is extremely environmentally friendly
- Whisper-quiet operating noise delivered by specially designed blower and burner
- Light weight (79 kg) makes for easy installation
- Suitable for natural gas and propane
- Ideal for agricultural with a max setting of 85°C
- Suitable for PP and aluminum flue materials
- Easy-to-use graphic LCD touchscreen display



Technical specifications		TWI 35-200	heater system 45-200
Nominal input (gross value) *	kW	37.8	48.9
Nominal output	kW	34.9	45.1
Gas consumption**	m ³ /h	3.6	4.7
Empty weight	kg	79	79
Efficiency (gross value)	%	93	93
NO _x emissions*	mg/kWh GVC	53	53
Draw-off capacity			
Capacity	l	182	182
Max. temperature setting	°C	85	85
30 minutes ΔT=44 °C	l	670	730
60 minutes ΔT=44 °C	l	1100	1200
90 minutes ΔT=44 °C	l	1400	1700
120 minutes ΔT=44 °C	l	1800	2100
Continuous ΔT=44 °C	l/h	710	910
Heating-up time ΔT=44 °C	minutes	17	13
30 minutes ΔT=50 °C	l	560	620
60 minutes ΔT=50 °C	l	870	1100
90 minutes ΔT=50 °C	l	1200	1500
120 minutes ΔT=50 °C	l	1500	1900
Continuous ΔT=50 °C	l/h	620	800
Heating-up time ΔT=50 °C	minutes	18	14
30 minutes ΔT=55 °C	l	490	540
60 minutes ΔT=55 °C	l	770	900
90 minutes ΔT=55 °C	l	1100	1300
120 minutes ΔT=55 °C	l	1400	1700
Continuous ΔT=55 °C	l/h	570	730
Heating-up time ΔT=55 °C	minutes	19	15
Dimensions			
Height	mm	1655	1655
Depth	mm	660	660
Width	mm	560	560
Height of cold water connection	mm	400	400
Height of hot water connection	mm	1655	1655
Height of gas connection	mm	170	170
Diameter of flue connection	mm	80/125	80/125
Energy labelling			
Load profile		XXL	XXL
Energy labelling		A	A
Efficiency	%	93	91

* Gas data based on G20-20 mbar

** Gas consumption at 15 °C and 1013.25 mbar

Draw-off capacities are based on the maximum control temperature and cold water set at 10 °C



Our advice

Replace your atmospheric heater with condensing water heaters to deliver more value

Given the enormous added value delivered by condensing systems, A.O. Smith always recommend replacing atmospheric water heaters with condensing alternatives.

Achieving maximum possible energy savings is key to the design of any water heating system. When designing a building, and planning the installation of your water heater, A.O. Smith's hugely efficient gas-fired and solar water heaters can provide significant improvements to your Energy Performance Certificate (EPC) computation. Our condensing systems have been built to comply with the forthcoming ErP Ecodesign regulations (September 2018) and have been awarded the highest possible energy labels.

Using few sample calculations, we can visually demonstrate the speed with which you can make up your initial investment.

Opting for a condensing water heater has several immediate benefits:

- The time it takes to see a return on your investment is dramatically reduced by the efficiency of the system.
- That same efficiency delivers a very environmentally friendly solution to heating water.
- Your system is guaranteed to meet the increased efficiency requirements of the **ErP 2018** regulations.

A condensing water heater delivers savings of energy and cost. The following chart indicates anticipated payback times, providing a figure for the amount of time needed to regain the investment of changing from an atmospheric heater compared to a condensing alternative. Once this "break-even" point has been passed, you will enjoy huge savings compared to your original running costs.

If you'd like specific advice to understand the ideal solution for your particular case, please contact our sales engineers.



ATMOSPHERIC WATER HEATER	CONDENSING ALTERNATIVE	AVERAGE PAYBACK TIME (YEAR)
ADM	BFC Cyclone/Innovo	2.7
ADMR	BFC Cyclone/Innovo	1.8
BFM	Innovo	2.8

A condensing water heater not only provides energy savings, it also generates substantial cost savings. The chart on the next page gives you an indication of the possible payback periods. This is the time needed to earn back the investment in a condensing system with respect to an atmospheric system. As from this 'break-even point', you save continuously with respect to the old situation.

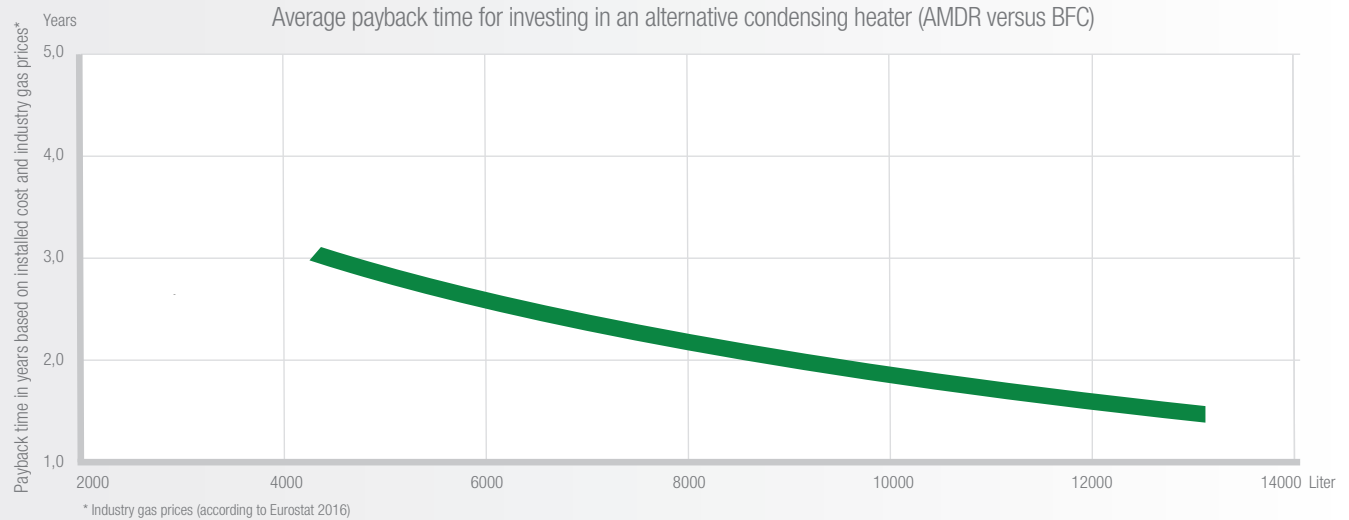
The numbers in the table above and on the next sheet are based on the data we have from the United Kingdom.

BASIC CALCULATION PRINCIPLES

- 2 peaks of 38°C a day, for 365 days
- Peak times fluctuate between 30-180 minutes
- Maximum set point of 75°C
- Maximum set point of condensing alternative > maximum set point of atmospheric system
- An under-capacity of 10% when compared to the atmospheric system is permitted

Example – condensing alternative for ADMR

- Draw-off capacity of the ADMR 80 is 2400 litres, with a peak of 60 minutes.
- Lower limit for the draw-off capacity of the condensing system is 2160 litres (2400 – 10%)
- The most efficient condensing system for this 60 minute draw-off capacity is the BFC 60 with 2260 litres.



CALCULATION EXAMPLE

Payback time

- The price of a BFC 60 is roughly equivalent to that of an ADMR 80.
- Flue gas exhaust material and extra installation costs increase investment price of the BFC 60 which makes the total investment 13% higher than the ADM 80.
- With two peaks per day, consumption totals 4800 litres at 38°C. This translates to 761 MJ per day, or 204 GJ per year.
- Based on an efficiency rating of 86%, and factoring standby loss of 547 W at 70°C, the ADMR 80 uses 7646 m³/year.
- Based on an efficiency rating of 95%, and factoring standby loss of 218 W at 70°C, the BFC 60 uses 5873 m³/year.
- The difference delivers a gas saving of 1773 m³/year. That equates to a **€ 508 per year**, based on an average UK industry gas price of € 0, 28/m³ as recorded by Eurostat.
- The BFC 60 delivers an average payback period of **1.7 years**.

* This calculation is based on industrial, typically lower gas prices. At a higher rate, the financial benefits of changing systems are even more pronounced.

These calculations only offer a general guide. To identify the best solution for you, we would be happy to calculate the payback time based on your specific figures. Nothing makes us happier than helping you save energy.



BENEFIT OPPORTUNITIES

When purchasing a condensing system, companies and private buyers are eligible for benefits. More information about these incentives can be found on page 88.





SYSTEM SOLUTIONS
DESIGNING WITH TRIAS ENERGETICA

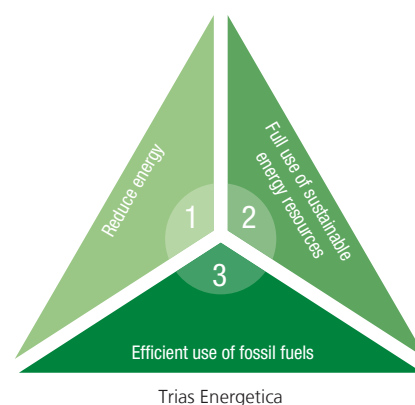


System solutions

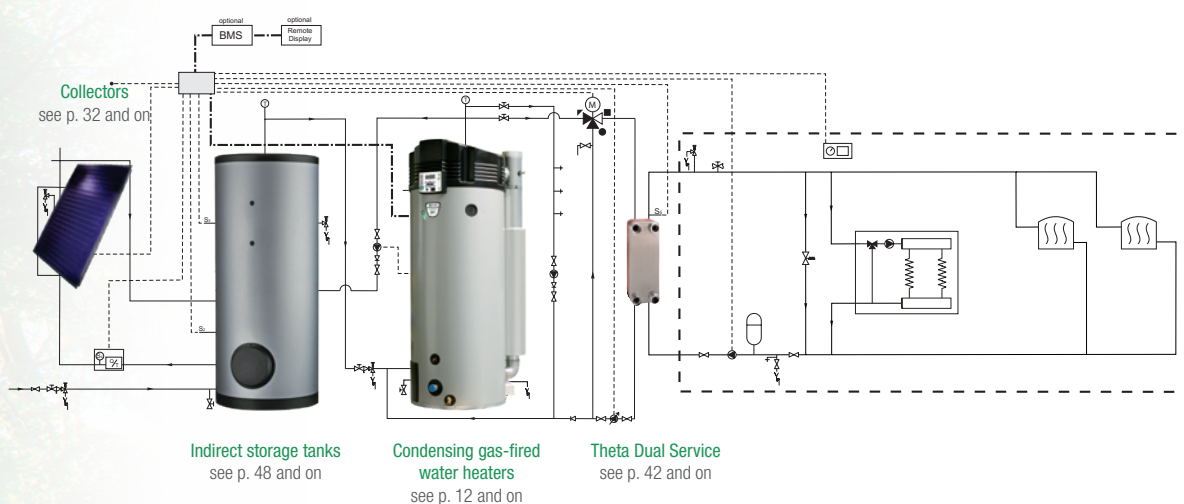
Designing with Trias Energetica

The Trias Energetica principle (Strategy developed by Delft University) is used to improve efficiency when designing sustainable structures. A.O. Smith use the three steps detailed in the model to optimize performance of their systems.

- 1 Minimise wastage by reducing energy consumption as much as possible
- 2 Make full use of sustainable energy resources
(e.g. A.O. Smith's solar optimized systems)
- 3 Use fossil fuels in the most efficient ways possible
(e.g. the enhanced efficiency provided by an A.O. Smith condensing heater)



By creating optimal combinations of individual products, A.O. Smith can build hot water systems that offer more efficient and sustainable solutions.



- Water is preheated using stored solar energy
- If this energy is not sufficient, a high-efficiency gas-fired water heater initiates to provide additional heat
- A Theta Dual Service component allows the system to provide both central heating and water heating, with thermal solar energy used to heat both
- To monitor the whole system, a BMS module can provide a link to a **building management system**



Meet our renewables

Solar thermal energy

Relying on energy generated by the sun, our renewables product line offers hugely efficient, extremely green solutions. By combining technologies within a single system, we can greatly reduce your gas consumption.

Maximum efficiency

In every system, the **intelligent operating system** can be programmed to adapt to individual preferences and draw-off needs. This operating system can be used to make optimal use of solar energy at all times. Even when sunshine is limited, efficiency is maximised. The SGS solar water heater can store an average 40% more solar energy in comparison with a traditional solar system.

Intelligent controller

Temperature of the sensors, pump status and output can all be viewed on a single display. Every function of the system can be controlled from this screen.

Long service life

Using a patented drainback system mounted below the solar collector, stagnation temperatures of the heat exchange medium are prevented. This design feature helps extend the service life of the entire system.

Solar water heaters

The showpiece models within our renewable product range are the **SGE** and **SGS** high-efficiency solar water heaters.

Ideal for medium-sized commercial requirements, where space is limited, the SGE solar heater exchanger integrates directly into a condensing water heater system.

The SGS combines with an IT, a storage tank with an internal heat exchanger. With a maximum storage capacity of 2800 litres, this powerful solution is perfect for large-scale, industrial requirements.

Installation possibilities

These solar systems may be installed on or inside a roof, or mounted with a frame on a wall or flat roof. The systems are delivered as a complete package to make installation easier.

Total solution

For maximum efficiency, A.O. Smith always advocate a total system solution. The renewable units are incorporated and delivered as part of a single, integrated system. By trusting us with design and delivery of the complete system, we can ensure all components work together perfectly, delivering maximum possible efficiency. We are the only partner you'll need for every hot water project.

Indirect solar systems

In addition to our combination solar and high-efficiency water heaters, A.O. Smith also supply indirect solar systems. These can be combined with an existing afterheater. These systems can combine with our gas-fired products, but are also compatible with our electric DRE series. For more information about this option, see page 70.

SOLAR WATER HEATER

Exploded view of the SGE



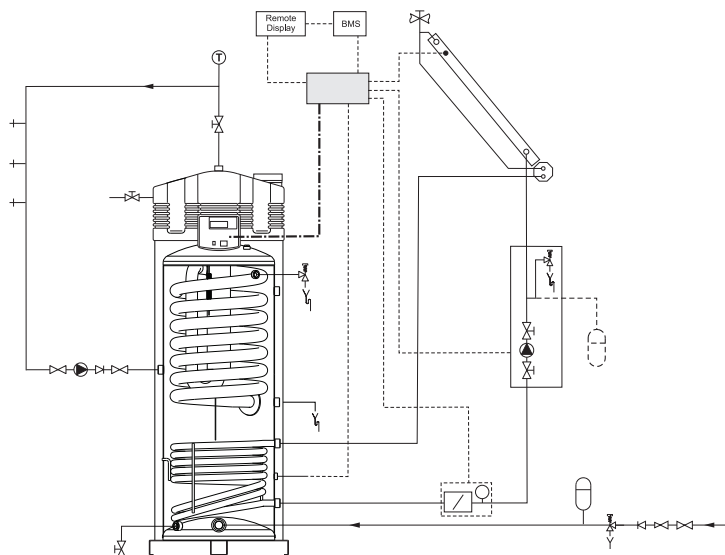


OPTIMAL SOLAR CONTRIBUTION

The SGE is a compact system with an integrated heat exchanger. Its small size does nothing to detract from a highly efficient performance. Collectors are connected to the lowest heat exchanger, allowing them to deliver all available heat to the water. When needed, the upper heat exchanger provides additional heat to increase water temperature.

The SGS must always be installed together with an IT storage tank, with an inbuilt heat exchanger. The collectors are connected to the IT's integrated heat exchanger to allow the transfer of all available heat to the tank. Should the water temperature in the SGS differ by more than 5°C from the water temperature in the IT, heat is automatically transferred to the SGS. When needed, the SGS will heat water to the set point.

Both systems are designed to maximise solar contributions. Supplementary gas heating is only used when a temperature above the limits of the solar system is required. In this way the system minimises your use and dependency on gas.



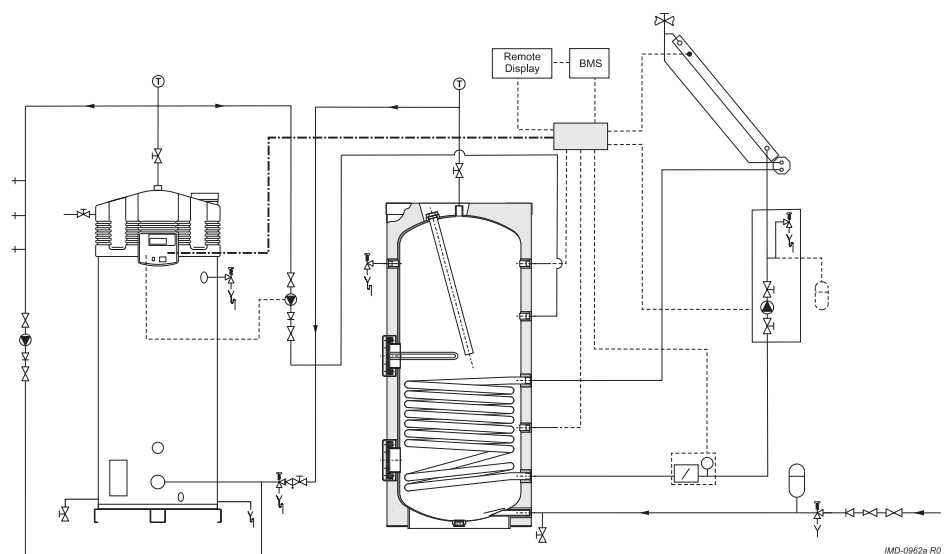
IMD-0809a R1

SGE

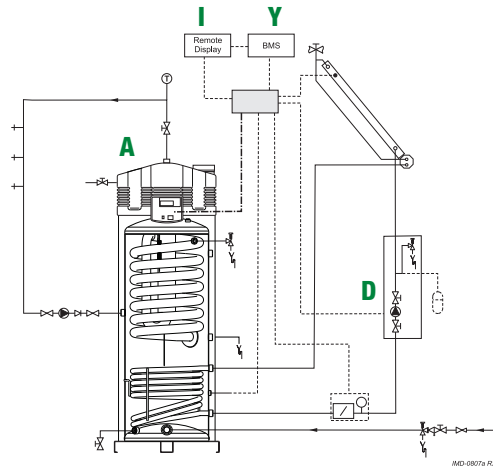
A highly efficient solar system delivered as a compact package. Applied condensation technology in the 44 kW and 63 kW models guarantees maximum solar contributions. Only one control is needed for the complete system.

SGS+IT(E)

The ideal solar system solution for large-scale usage. Maximum solar contributions are enhanced by condensing support from 31 kW to 122 kW and storage tank capacities of 385 to 2800 litres. For systems with more than 15 collectors, A.O. Smith can help you design a custom-built arrangement. To explore this option, please contact our Technical Support Group (see page 89).



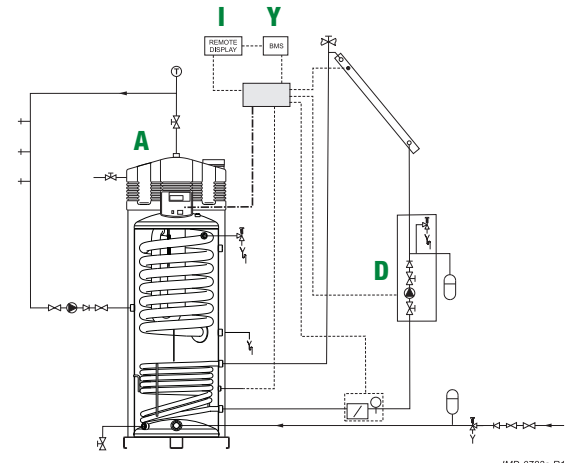
IMD-0962a R0



Also applicable as a vented system

SGE SOLAR SYSTEMS WITH DRAINBACK FUNCTION*

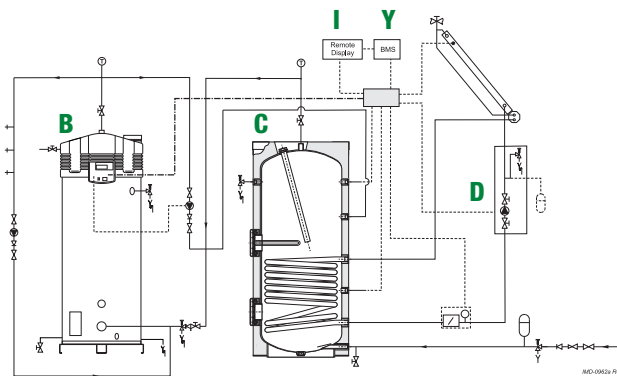
- SGE high-efficiency condensing solar water heater with integrated heat exchanger
- SGE is available in 44 and 63 kW versions with a capacity of 370 litres
- Compact, small-sized system
- When combined with the correct pump station, multiple collectors are possible
- Drainback feature prevents the system reaching stagnation temperatures
- When using a large pump station, always install an expansion vessel. A.O. Smith can advise on the size of vessel needed.



Also applicable as a vented system

SGE SOLAR SYSTEMS WITHOUT DRAINBACK FUNCTION*

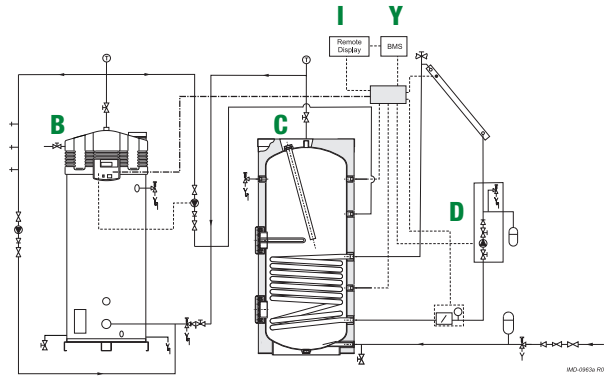
- SGE high-efficiency condensing solar water heater with integrated heat exchanger
- SGE is available in 44 and 63 kW versions with a capacity of 370 litres
- Compact, small-sized system
- When combined with the correct pump station, multiple collectors are possible
- Always use an expansion vessel when using a system without a drainback



Also applicable as a vented system

SGS + IT(E) SOLAR SYSTEMS WITH DRAINBACK FUNCTION*

- SGS condensing high-efficiency solar water heater combined with an IT(E) with integrated heat exchanger
- SGS is available from 31 and 122 kW with a capacity of 217-480 litres
- Always used in combination with an IT(E) indirect tank available in capacities from 385 to 1007 litre (or large IT tanks up to 2800 litres)
- Drainback feature prevents the system reaching stagnation temperatures
- Delivers a solar contribution of up to 40% more than standard systems
- When using a large pump station, always install an expansion vessel. A.O. Smith can advise on the size of vessel needed.



Also applicable as a vented system

SGS + IT(E) SOLAR SYSTEMS WITHOUT DRAINBACK FUNCTION*

- SGS condensing high-efficiency solar water heater combined with an IT(E) with integrated heat exchanger
- SGS is available from 31 and 131 kW with a capacity of 217-480 litres
- Always used in combination with an IT(E) indirect tank available in capacities from 385 to 1007 litre (or large IT tanks up to 2800 litres)
- When combined with the correct pump station, multiple collectors are possible
- Always use an expansion vessel when using a system without drainback
- Stores an average 40% more solar energy in comparison with standard systems

* Green letters on the installation drawings above indicate required components. The corresponding item number can be found on pages 30-32.



SGE

Fully room-sealed condensing high-efficiency solar water heater (96%)

Nominal output 42.8 - 60.4 kW
Flue options B23, C13, C33, C43, C53, C63



- Maximum solar contribution and comfortable heat levels are delivered by a fully integrated and intelligent solar controller
- Automatic gas/air premix burning system including burner modulation
- Low-maintenance inert anodes as standard
- Whisper-quiet operation
- One control and display unit for all system functions
- Easy fault diagnosis and computer-controlled digital weekly timer
- Programmable for anti-legionella purge cycle
- Very small footprint because of integrated solar heat exchanger
- Varying water temperature setting from 40°C to 80°C with use of weekly timer

Technical specifications		SGE 40	SGE 60
Nominal input (gross value) *	kW	44.4	63.3
Nominal input (nett value)	kW	40.0	57.0
Nominal output	kW	42.8	60.4
Gas consumption**	m ³ /h	4.2	6.0
Empty weight	kg	245	245
Efficiency (gross value)	%	96	95
Efficiency (nett value)	%	107	106
NO _x emissions*	mg/kWh GVC	29	31
Draw-off capacity			
Capacity	l	370	370
Max. temperature setting	°C	80	80
T _{set} = 65 °C/T _{cold} = 10 °C			
30 minutes	ΔT=44 °C l	470	630
60 minutes	ΔT=44 °C l	890	1300
90 minutes	ΔT=44 °C l	1400	1900
120 minutes	ΔT=44 °C l	1800	2400
Continuous	ΔT=44 °C l/h	840	1200
Heating-up time	ΔT=44 °C minutes	15	10
30 minutes	ΔT=50 °C l	400	530
60 minutes	ΔT=50 °C l	760	1100
90 minutes	ΔT=50 °C l	1200	1600
120 minutes	ΔT=50 °C l	1500	2100
Continuous	ΔT=50 °C l/h	740	1100
Heating-up time	ΔT=50 °C minutes	17	12
T _{set} = 80 °C/T _{cold} = 10 °C			
30 minutes	ΔT=55 °C l	340	470
60 minutes	ΔT=55 °C l	680	940
90 minutes	ΔT=55 °C l	1100	1500
120 minutes	ΔT=55 °C l	1400	1900
Continuous	ΔT=55 °C l/h	670	950
Heating-up time	ΔT=55 °C minutes	18	13
Dimensions			
Height	mm	2055	2055
Depth	mm	925	925
Width	mm	850	850
Height of cold water connection	mm	185	185
Height of hot water connection	mm	2055	2055
Height of gas connection	mm	1945	1945
Diameter of flue connection	mm	100/150	100/150
Cleaning opening	mm	95 x 70	95 x 70
Energy labelling			
Load profile		XXL	XXL
Energy labelling		A	A
Efficiency	%	89	91

* Gas data based on G20-20 mbar

** Gas consumption at 15 °C and 1013.25 mbar



SGS High-efficiency condensing solar water heater (98%)

Nominal output 31.0 - 121.8 kW
Flue options B23, C13, C33, C43, C53, C63



- Maximum solar contribution and comfortable heat levels delivered by a fully integrated intelligent solar controller
- Automatic gas/air premix burning system including burner modulation
- Delivered with low-maintenance inert anodes
- Whisper-quiet operation
- One control and display unit for all system functions
- Easy fault diagnosis and computer-controlled digital weekly timer
- Programmable for anti-legionella purge cycle
- One control and display unit for all system functions
- Compatible with IT storage tank of 385 to 2800 litres
- Varying water temperature setting from 40°C to 80°C with use of weekly timer

Technical specifications		SGS 28	SGS 30	SGS 50	SGS 60	SGS 80	SGS 100	SGS 120
Nominal input (gross value) *	kW	32.2	33.3	52.2	63.3	86.6	102.7	128.8
Nominal input (nett value)	kW	29.0	30.0	47.0	57.0	78.0	92.5	116.0
Nominal output	kW	31.0	32.7	50.3	60.4	84.2	98.1	121.8
Gas consumption**	m³/h	3.1	3.2	5.0	6.0	8.3	10.1	12.3
Empty weight	kg	196	239	239	239	405	405	405
Efficiency (gross value)	%	96	98	96	95	97	95	95
Efficiency (nett value)	%	107	109	107	106	108	106	105
NO _x emissions*	mg/kWh GVC	25	32	36	37	34	34	37
Draw-off capacity								
Capacity	l	217	368	368	368	480	480	480
Max. temperature setting	°C	80	80	80	80	80	80	80
T _{set} = 65 °C/T _{cold} = 10 °C								
30 minutes	ΔT=44 °C	l	370	440	630	730	940	1100
60 minutes	ΔT=44 °C	l	670	760	1200	1400	1800	2100
90 minutes	ΔT=44 °C	l	980	1100	1700	2000	2600	3100
120 minutes	ΔT=44 °C	l	1300	1400	2100	2500	3500	4100
Continuous	ΔT=44 °C	l/h	610	640	990	1200	1700	2000
Heating-up time	ΔT=44 °C	minutes	21	35	22	19	17	15
30 minutes	ΔT=50 °C	l	310	350	520	610	780	910
60 minutes	ΔT=50 °C	l	570	640	950	1200	1600	1800
90 minutes	ΔT=50 °C	l	840	920	1400	1700	2300	2700
120 minutes	ΔT=50 °C	l	1200	1200	1900	2200	3000	3600
Continuous	ΔT=50 °C	l/h	540	570	870	1100	1500	1800
Heating-up time	ΔT=50 °C	minutes	24	39	26	21	20	17
T _{set} = 80 °C/T _{cold} = 10 °C								
30 minutes	ΔT=55 °C	l	260	290	440	530	670	790
60 minutes	ΔT=55 °C	l	500	550	840	1000	1400	1600
90 minutes	ΔT=55 °C	l	750	800	1300	1500	2000	2400
120 minutes	ΔT=55 °C	l	990	1100	1700	2000	2700	3200
Continuous	ΔT=55 °C	l/h	490	520	790	950	1400	1600
Heating-up time	ΔT=55 °C	minutes	27	43	28	23	22	18
Dimensions								
Height	mm	1485	2015	2015	2015	2060	2060	2060
Depth	mm	925	925	925	925	1000	1000	1000
Width	mm	850	850	850	850	900	900	900
Height of cold water connection	mm	265	255	255	255	225	225	225
Height of hot water connection	mm	1485	2015	2015	2015	2060	2060	2060
Height of gas connection	mm	1380	1910	1910	1910	1855	1855	1855
Diameter of flue connection	mm	100/150	100/150	100/150	100/150	130/200	130/200	130/200
Cleaning opening	mm	95 x 70	95 x 70	95 x 70	95 x 70	95 x 70	95 x 70	95 x 70
Energy labelling								
Load profile		XXL	XXL	XXL	XXL	3XL	3XL	3XL
Energy labelling		A	A	A	A	-	-	-
Efficiency	%	90	90	90	90	93	92	92

* Gas data based on G20-20 mbar

** Gas consumption at 15 °C and 1013.25 mbar



ITE Indirect water heater

Nominal output 52 - 87 kW

- Nominal output: 52 to 87 kW
- Capacity 389 to 1024 litres
- Single-wall spiral heat exchanger
- Fitted with PermaGlas Ultra Coat enamel as standard
- Insulated access cover for comprehensive waterside maintenance
- Replaceable magnesium anode

Technical specifications		ITE 400	ITE 500	ITE 600	ITE 750	ITE 1000
Output coil	kW	78	68	72	80	87
Surface area coil	m ²	1.64	2.13	2.39	2.66	2.89
Water capacity coil	l	9.9	12.8	20.3	22.3	24.6
Flow rate coil (80-60 °C)	l/h	2236	2924	3096	3440	3741
Pressure drop solar coil	mbar	78	166	37	50	61
Max. working pressure tank	kPa (bar)	1000(10)	1000(10)	1000(10)	1000(10)	1000(10)
Max. working pressure coil	kPa (bar)	1600(16)	1600(16)	1600(16)	1600(16)	1600(16)
Max. operating temperature tank	°C	95	95	95	95	95
Max. operating temperature coil	°C	110	110	110	110	110
Anodes	-	1	1	1	1	1
Empty weight	kg	131	179	229	237	314
Draw-off capacity						
Capacity	l	389	478	652	734	1024
30 minutes $\Delta T=44$ °C	l	952	1206	1463	1638	2068
60 minutes $\Delta T=44$ °C	l	1461	1871	2167	2420	2919
90 minutes $\Delta T=44$ °C	l	1969	2536	2870	3201	3769
120 minutes $\Delta T=44$ °C	l	2477	3200	3574	3983	4619
Continuous $\Delta T=44$ °C	l/h	1016	1329	1407	1564	1700
Heating-up time $\Delta T=44$ °C	minutes	23	22	28	28	36
30 minutes $\Delta T=50$ °C	l	838	1062	1288	1441	1820
60 minutes $\Delta T=50$ °C	l	1285	1646	1907	2129	2568
90 minutes $\Delta T=50$ °C	l	1733	2231	2526	2817	3317
120 minutes $\Delta T=50$ °C	l	2180	2816	3145	3505	4065
Continuous $\Delta T=50$ °C	l/h	894	1170	1238	1376	1496
Heating-up time $\Delta T=50$ °C	minutes	26	25	32	32	41
30 minutes $\Delta T=55$ °C	l	762	965	1170	1310	1655
60 minutes $\Delta T=55$ °C	l	1169	1497	1733	1936	2335
90 minutes $\Delta T=55$ °C	l	1575	2028	2296	2561	3015
120 minutes $\Delta T=55$ °C	l	1982	2560	2859	3187	3695
Continuous $\Delta T=55$ °C	l/h	813	1063	1126	1251	1360
Heating-up time $\Delta T=55$ °C	minutes	29	27	35	35	45
Dimensions						
Height (including lid)	mm	1705	2040	1835	2000	2000
Diameter (including insulation)	mm	740	760	910	930	1100
Height of cold water connection	mm	70	70	85	85	95
Height of hot water connection	mm	1655	1995	1805	2000	1965
Energy labelling						
Load profile	-	C	C	-	-	-
Standby loss	W	100	104	165	171	192

Draw-off capacities are based on $T_{set} = 80$ °C and $T_{cold} = 10$ °C

A.O. Smith developed the IT for large-scale usage. If there is no need to integrate an electric resistance backup heating in the tank, the IT can serve as an alternative solution, independent of the needed volume. For more information, please refer to page 53.

DOMESTIC



INDUSTRY



EDUCATION



RECREATION AND HOSPITALITY



SPORTS CENTRES AND VENUES



MEDICAL AND HEALTH





D

LARGE PUMP STATION SYSTEM WITH DRAINBACK

○ Always install in combination with an expansion vessel to ensure the system is not compromised

Article number for SGE/SGS	0309977	0309981	0309985	0309989	0309993
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D

LARGE PUMP STATION SYSTEM WITHOUT DRAINBACK

○ Always install in combination with an expansion vessel to ensure the system is not compromised

Article number for SGE/SGS	0309978	0309982	0309986	0309990	0309994
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D

PUMP STATION

- Pump station module with integrated pump
- Number of collectors used depends on the piping
- Integrated flow meter and overpressure protection

Article number	0311590	0311591	0311691	0311589
Collectors*	1-7	8-15	1-7	8-15
Drainback system	Yes	Yes	No	No

* Dependent on the boost height



E

EXPANSION VESSEL

- Expansion vessel for high temperatures, specifically for solar systems
 - 25 to 80 litres capacity, depending on the number of solar collectors used
- For more information, please contact the Technical Support Group (see page 89)

Article number	0308875	0308876	0308877	0308878
Litres	25	35	50	80
Collectors*	1-4	5-6	7-11	12-15

* The number of collectors is an indication as to which expansion vessel should be used



F

GLYCOL

- Corrosion inhibiting and anti-frost agent Tyfocor L
- Suitable for systems with and without drainback
- 10 litre package, 40% mixed solution

Article number	0308803
Litres	10



I

REMOTE DISPLAY

Article number	0309999(S)
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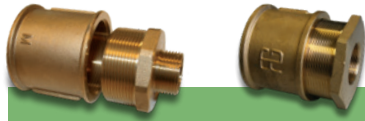


Y

BMS INTERFACE

- Programmed for ModBus protocol

Article number	0310013(S)
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ADAPTER NIPPLES

○ Set of 2 units

Description	IT 300	IT(E) 400	IT(E) 500	IT(E) 600	IT(E) 750	IT(E) 1000	IT 1500	IT 2000	IT 2500	IT 3000
Reducing Nipple Set 2" BSp F x R 1" M	-	0309754(S)	-	-	-	-	-	0309754(S)	-	-
Reducing Nipple Set 2" BSp F x R 1 1/2" M	-	0309755(S)	-	-	-	-	-	0309755(S)	-	-
Reducing Nipple Set 2 1/2" BSp F x R 1" BSp F	-	-	-	-	0309756(S)	-	-	-	-	-
Reducing Nipple Set 2 1/2" BSp F x R 1" BSp F	-	-	-	-	0309756(S)	-	-	-	-	-
Reducing Nipple Set 2 1/2" BSp F x R 1 1/2" BSp F	-	-	-	-	0309758(S)	-	-	-	-	-



CIRCULATION PUMP

- Without valves and check valve
- In the installation drawings, this pump is indicated with an 8

Article number	0305515(S)
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INSULATION MATERIAL

- Bird-proof, suitable for outside use

Article number	0309933(S)	0309934(S)
Dimensions	Ø 22 mm x 2 m	Ø 28 mm x 2 m



QT SENSOR

- Measures the solar contribution and displays this information on the screen of the control unit

Article number	0309285(S)
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FILLING PUMP

- Filling pump designed to simplify filling a solar system

Article number	0308814
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GLYCOL SGE SYSTEM

AMOUNT (LITRES)

- Quantities are based on capacity of the system, excluding the piping
- Quantities are calculated as an average. To make a calculation based on exact quantities, please contact our Technical Support Group (see page 89)

	SGE 40	SGE 60
1-2 collectors	50	50
3-5 collectors	60	60
6-11 collectors	70	70
12-15 collectors	80	80

GLYCOL SGS SYSTEM

AMOUNT (LITRES)

- Quantities are based on capacity of the system, excluding the piping
- Quantities are calculated as an average. To make a calculation based on exact quantities, please contact our Technical Support Group (see page 89)

	IT 300	IT(E) 400	IT(E) 500	IT(E) 600	IT(E) 750	IT(E) 1000	IT 1500	IT 2000	IT 2500	IT 3000
1-2 collectors	40	50	50	60	70	80	80	80	80	80
3-5 collectors	50	60	60	70	70	80	80	80	80	80
6-11 collectors	60	70	70	80	80	90	100	100	100	100
12-15 collectors	70	80	80	90	90	100	100	110	110	110

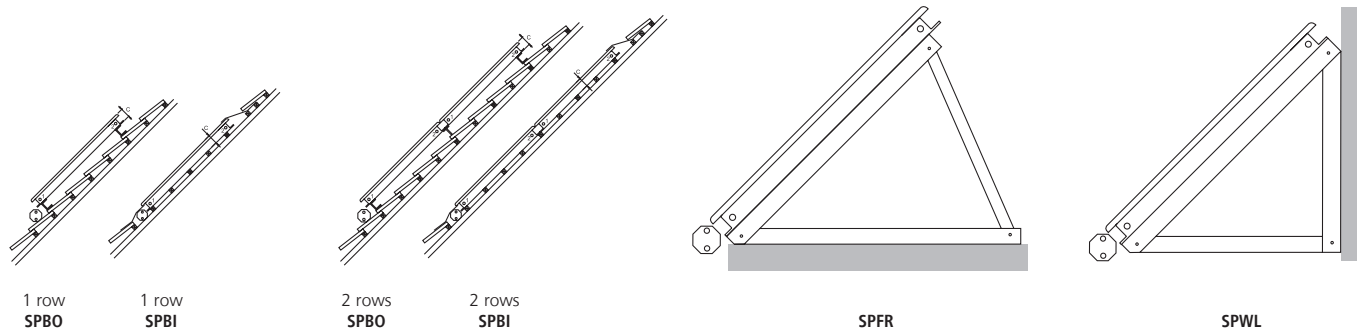


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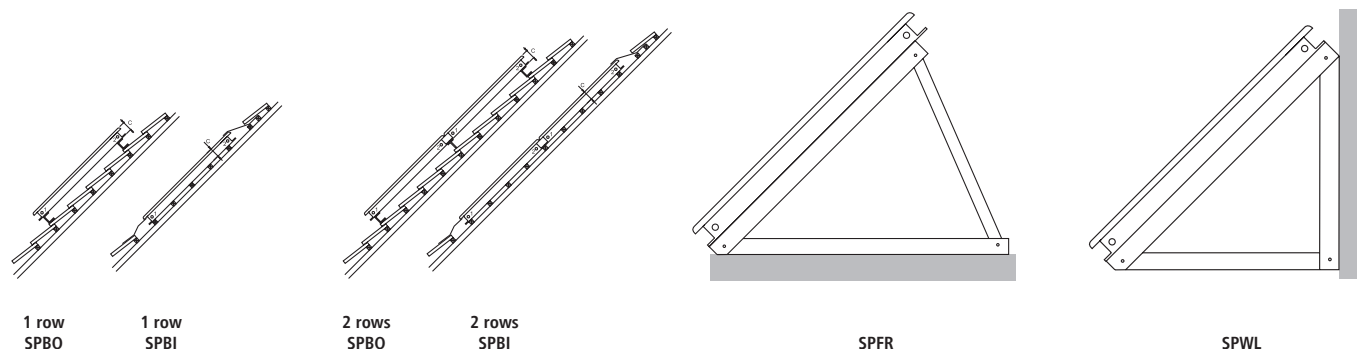
SOLAR COLLECTOR + DRAINBACK SYSTEM

- Approved by EN12975-2-2006 and Solar Keymark certified
- Temperature resistant up to 200°C
- Installation options: roof unit (SPBO), built into the roof (SPBI), flat-roof mounting console (SPFR), wall-mounted console (SPWL)
- Simple installation system even with multiple panels
- The system is supplied with all parts needed for complete installation. The entire package is available as a single order number
- Patented drainback system to prevent stagnation temperature is available as an accessory
- Sets are available in two versions: with copper absorber and meander, or with copper absorber and aluminum meander
- Can be set up with up to 15 collectors. For larger requirements, please contact our Technical Support Group (see page 89)

COLLECTORS WITH DRAINBACK SYSTEM



COLLECTORS WITHOUT DRAINBACK SYSTEM



SPECIFICATIONS

Collector type		Width	Height	Thickness	Weight	Liquid Capacity
copper/ copper	Vertical collector	116.7 cm	206.7 cm	11 cm	44 kg	2.2 L
	Horizontal collector	206.7 cm	116.7 cm	11 cm	44 kg	2.2 L
copper/ aluminium	Vertical collector	116.7 cm	206.7 cm	11 cm	43 kg	2.2 L
	Horizontal collector	206.7 cm	116.7 cm	11 cm	43 kg	2.2 L

Solar thermal energy

Solar collectors

Efficiency and environmentally friendly innovation are at the heart of our renewable product range. Our flagship products within this range are our solar collectors. A.O. Smith solar collectors are constructed of a full-plate absorber with an eco-friendly vacuum coating. The durable quality of this coating creates a collector that is built to last. Set in a protective frame, dirt and moisture are prevented from having any impact on performance. Cased in aluminum, the solar collectors have been designed to work in any environment.

Drainback system

To limit high temperature, and to extend the lifespan of your collector, an optional drainback module makes for a smart investment. The drainback module is mounted directly below the collectors to reduce the required pump capacity. This reduction helps reduce the **power consumption** of the fully modulating solar pump to an **absolute minimum**.

Mounting options

Our collectors are available in 4 installation options: on-roof and roof integrated for a pitched roof or using a frame to mount on a wall (only horizontal position) or flat roof (available in horizontal and vertical position). Wall and flat-roof mounting frame sets depend on the angle of positioning. Depending on construction requirements, flat-roof mounting frames may be ordered and used without concrete blocks. All sets are compatible with a drainback option. The solar collectors are delivered with all the tools and parts you need for installation. Whatever, and however you want your solar collectors set up, we can help you build the perfect solution.

Tailor-made solutions

With a broad range of collector sets, A.O. Smith can tailor-make solutions to match any anticipated DHW capacity.

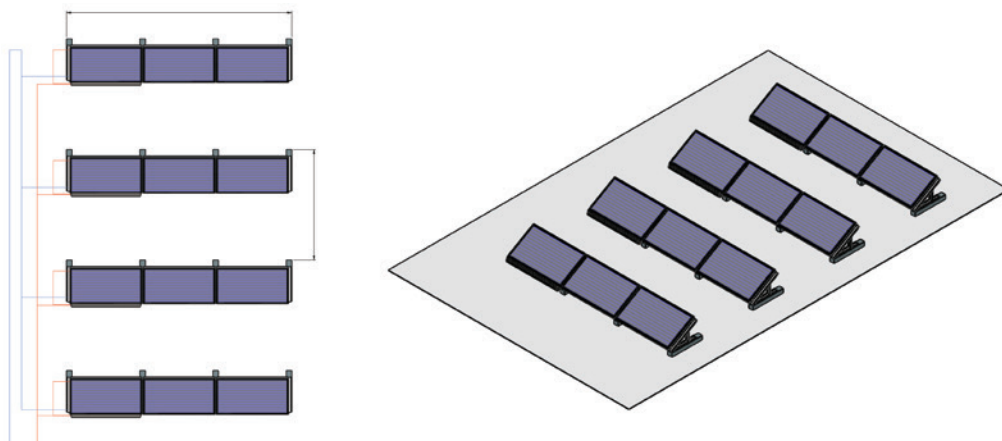
Certification

All A.O. Smith collectors are built to meet the highest standards and are Solar Keymark certified.



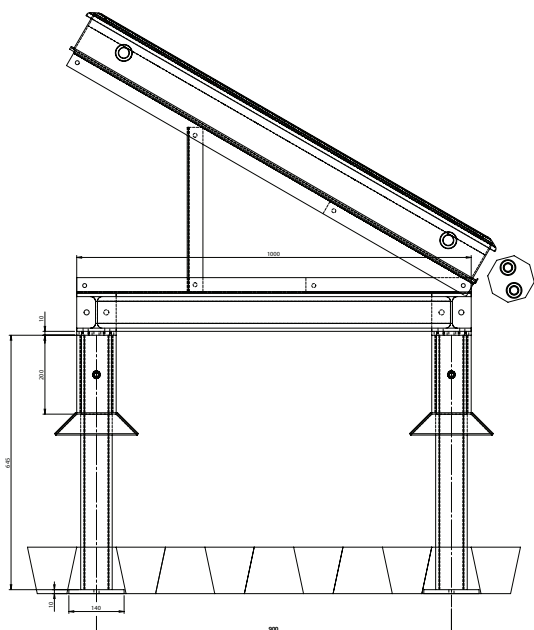
PLACING

To help you understand how best to position the collectors on your roof, we will provide you with accurate drawings. We take into account the available space, the best angles for performance of the collectors, and the movement of the sun. Once positioning has been decided, we will explain what piping is needed.



INSTALLATION

When installing the collectors on a roof, you can request detailed drawings of the proposed framework prior to installation. In cases where our standard frame set is not sufficient for the project, we can advise for custom built frame constructions (see example below).



Collector sets

Tailor-made solutions

With a wide range of solar collector sets, A.O. Smith can deliver the perfect solar solution for every possible project.

Tailored solar systems

When designing and installing your solar system, our single-minded goal is to maximise efficiency. To do that, we take into account the individual features of the building, and your anticipated hot water requirements.

Recommendation

Based on the details of your particular project, our experienced sales engineers can provide specific recommendations to help you get maximum value from your system. We can provide you with construction drawings, and we'll adapt plans to meet the needs of highly individual installations.

Technical drawings

Detailed technical drawings will help you decide the exact positioning of the collectors on your roof. We can offer a detailed proposal to suggest optimal installation, and advice to help with construction.

Wind loads

Wind load needs to be taken into consideration when purchasing and installing solar collectors. Standard A.O. Smith collector sets and flat-roof frames are built to endure up to wind force 7. The frame can be built to withstand more powerful winds by reinforcing construction with concrete blocks. More information about this option can be found in the collectors spec sheet in the library section of our website.

Transportation

Depending on the specifics of your particular installation, special transportation, or a crane, may be required to move and position the system. In these cases, A.O. Smith can handle the entire operation. We'll be there to help with every aspect of your ideal solar solution.



INSTALLATION

Installing solar collectors on a flat roof.



DRAINBACK SYSTEMS

One of the most innovative components in our solar product range is the optional drainback system. They extend the service life of the whole system by preventing stagnation temperatures. Mounted directly under the collectors, they also reduce the required pump capacity.



CONTROLLER

The indirect solar water heating system is controlled by a pump station module. The operating system features a modulating pump control and a display showing solar contributions.



SMART DISPLAY

Our systems are available with a smart display to monitor temperature in the collector, temperature of stored water, and the solar contribution. This option requires the installation of output sensors.

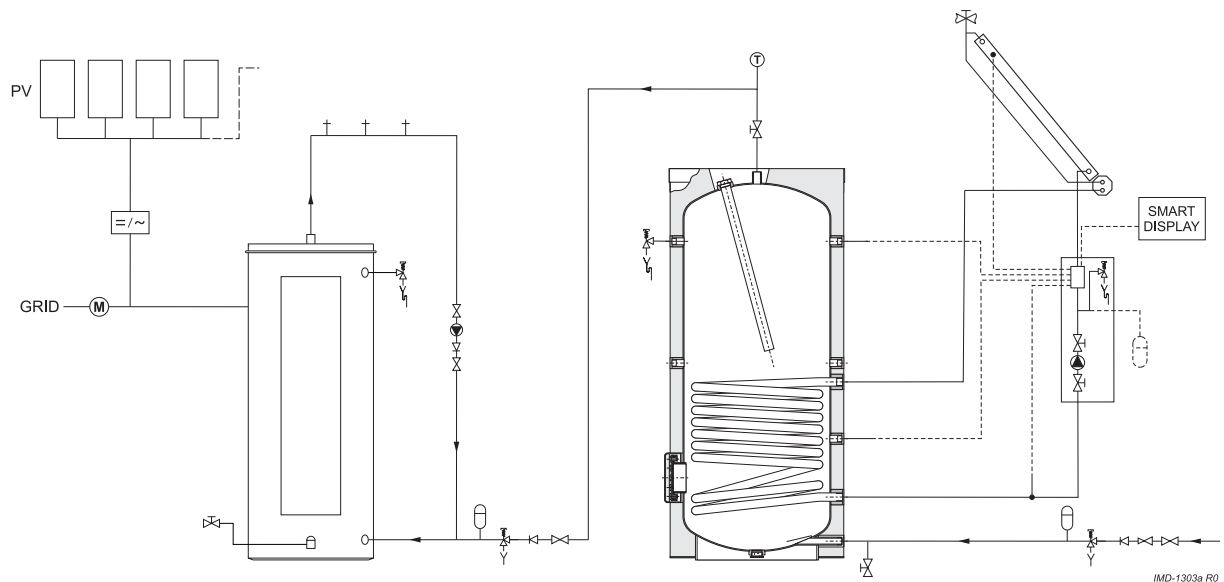


APPLICATIONS

When gas is not available, and to simplify installation, electric water heaters can offer an alternative solution. These systems can also be combined with solar energy or storage tanks to provide extra hot water storage to match demand.

The diagram below shows how a DRE can be combined with an IT to create a solar system. DREs are available with a power consumption of 9.0 to 54.0 kW, and in a range of sizes from 200 to 450 litres. In combination with an IT storage tank of between 300 to 2800 litres, you have the flexibility to create a system of any size. With so many variables to choose from, the possibilities are endless.

In the system detailed below, water is heated in the IT using solar heat. The hottest water is transferred into the bottom of the DRE. The DRE acts as an afterheater.



SOLAR COLLECTORS VS PV PANELS

In an “all electric” solution, energy used by the DRE for afterheating can be compensated totally, or in part, by electricity provided to the grid by PV panels.

Solar collectors are 4 times more effective at converting solar energy into heat than PV panels. That means PV panels, which convert solar energy into electricity, require up to 4 times more roof space to deliver the same amount of energy.



Solar thermal energy

Indirect solar system

Indirect solar systems use solar energy to compliment an alternatively powered water heater. These systems consist of a storage tank connected to a central heating boiler, a water heater (electric, gas-fired or oil-fired), or a combination boiler. By adding solar accessories, a system's energy savings can be hugely improved. Both the IT and ITS can be integrated in such system which is available with an optional drainback function.

Heat transfer

In both the IT(E) and the ITS, solar heat is transferred to the hot water supply through a heat exchanger. The ITS is equipped with two heat exchangers to allow the central heating boiler, water heater or combi boiler to transfer heat back to the ITS. This delivers a higher level of heating comfort.

Controller

An indirect solar water heating system is controlled with a pump station module. The pump activates in response to temperature readings in the collector and storage tank. Sensor temperatures and pump speed are displayed on the control. This control set-up comes as standard.

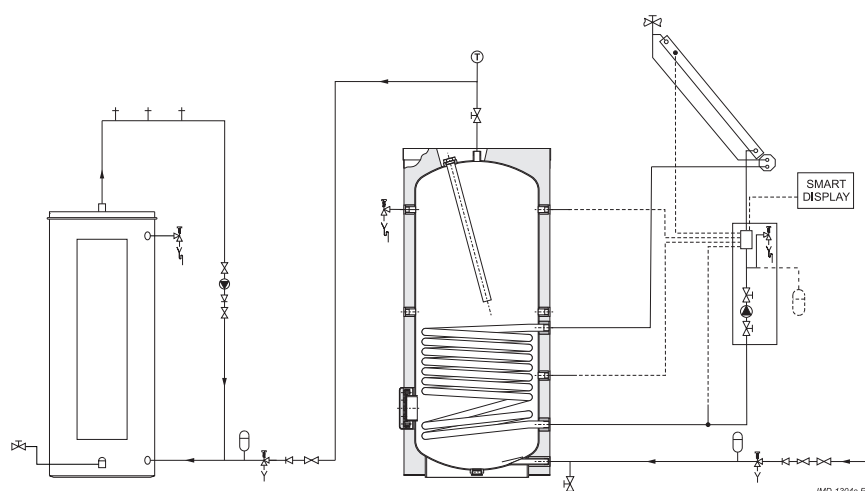
Composing systems

The choice of pump station is dictated by the number of collectors, and the length of the piping. A.O. Smith offers a range of regular and large pump stations to meet your needs. Depending on the set-up of your system, pumps are available with our innovative drainback function. By preventing stagnation temperatures, this innovation extends the lifespan of a system.

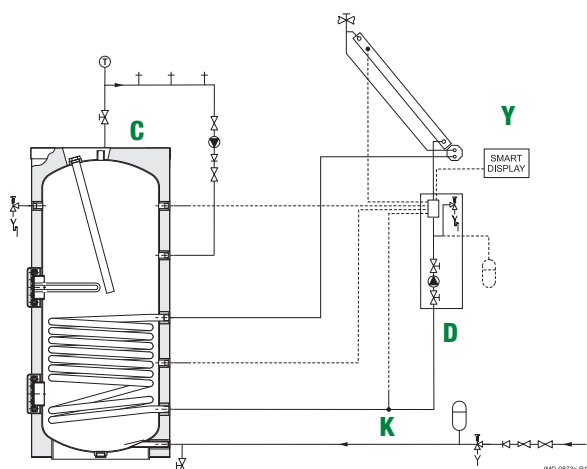
To help you find the perfect indirect solar system, the next few pages explain a number of potential system configurations, both with and without drainback.

No gas connection? PV system electricity available?

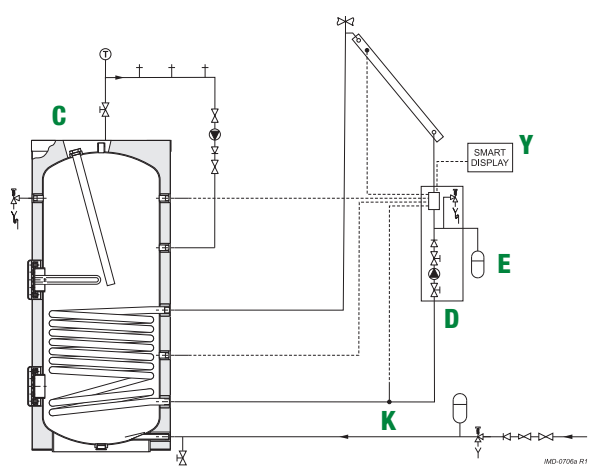
When a gas supply is not available, electric can be the only solution. A.O. Smith's extensive range of **electric range water heaters** are all compatible with our **solar thermal energy** products. If electricity can be generated by **PV panels**, this set-up offers a practical and sustainable solution.



An indirect solar system consisting of water heater, IT tank and solar collectors.



Also applicable as a vented system



Also applicable as a vented system

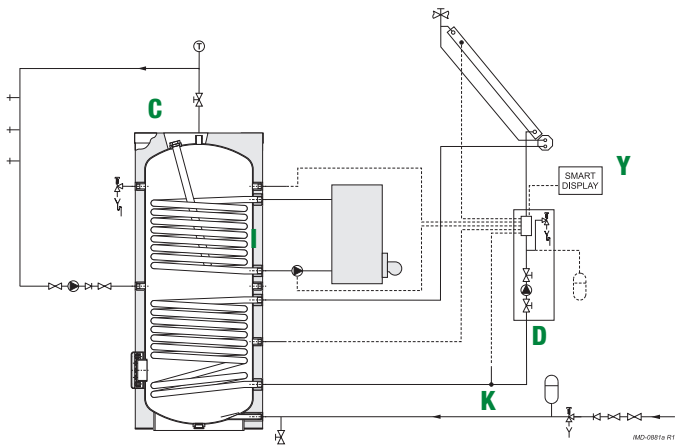
IT(E) INDIRECT SOLAR SYSTEM WITH DRAINBACK FUNCTION*

- Solar components connected to an existing water heater, central heating boiler, or combination boiler
- IT or ITE indirect tank with 1 heat exchanger available in capacities from 300 to 1024 litre (IT tank up to 2800 litres)
- When combined with the correct pump station, multiple collectors are possible
- Drainback system prevents stagnation temperatures
- When using a large pump station, always install an expansion vessel. A.O. Smith can advise on the size of vessel needed.

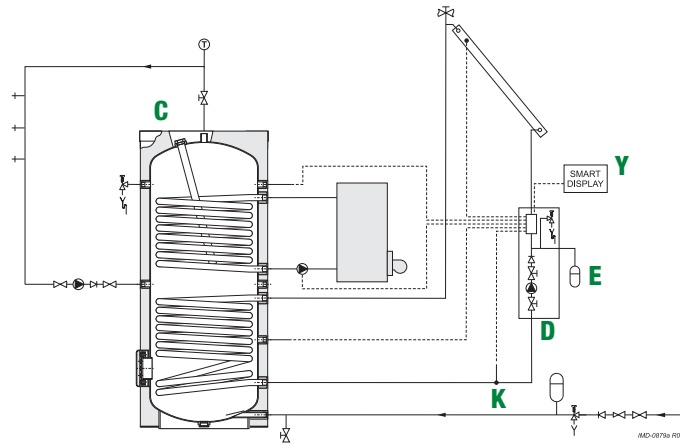
IT(E) INDIRECT SOLAR SYSTEM WITHOUT DRAINBACK SYSTEM*

- Solar components connected to an existing water heater, central heating boiler, or combination boiler
- IT or ITE indirect tank with 1 heat exchanger available in capacities from 300 to 1024 litre (IT tank up to 2800 litres)
- When combined with the necessary pump station, multiple collectors are available
- When using a large pump station, always install an expansion vessel. A.O. Smith can advise on the size of vessel needed.

* Green letters on the installation drawings above indicate required components. The corresponding item number can be found on pages 58/59 and 32.



Also applicable as a vented system



Also applicable as a vented system

ITS INDIRECT SOLAR SYSTEM WITH DRAINBACK SYSTEM*

- Solar components connected to an existing water heater, central heating boiler, or combination boiler
- ITS storage tank with two heat exchangers and a capacity of 300 to 1007 litres
- When combined with the correct pump station, multiple collectors are possible
- Drainback system prevents stagnation temperatures
- Heat is transferred from both the existing system and from the collectors for maximum heat comfort
- When using a large pump station, always install an expansion vessel. A.O. Smith can advise on the size of vessel needed

ITS INDIRECT SOLAR SYSTEM WITHOUT DRAINBACK SYSTEM*

- Solar components connected to an existing water heater, central heating boiler, or combination boiler
- ITS storage tank with single heat exchanger and a capacity of 300 to 1007 litres
- When combined with the necessary pump station, multiple collectors are available.
- Always use an expansion vessel in a system without drainback
- Heat is transferred from both the existing system and from the collectors for maximum heat comfort

* Green letters on the installation drawings above indicate required components. The corresponding item number can be found on pages 58/59 and 32.

Theta Dual Service

Hot water and heating in a single solution

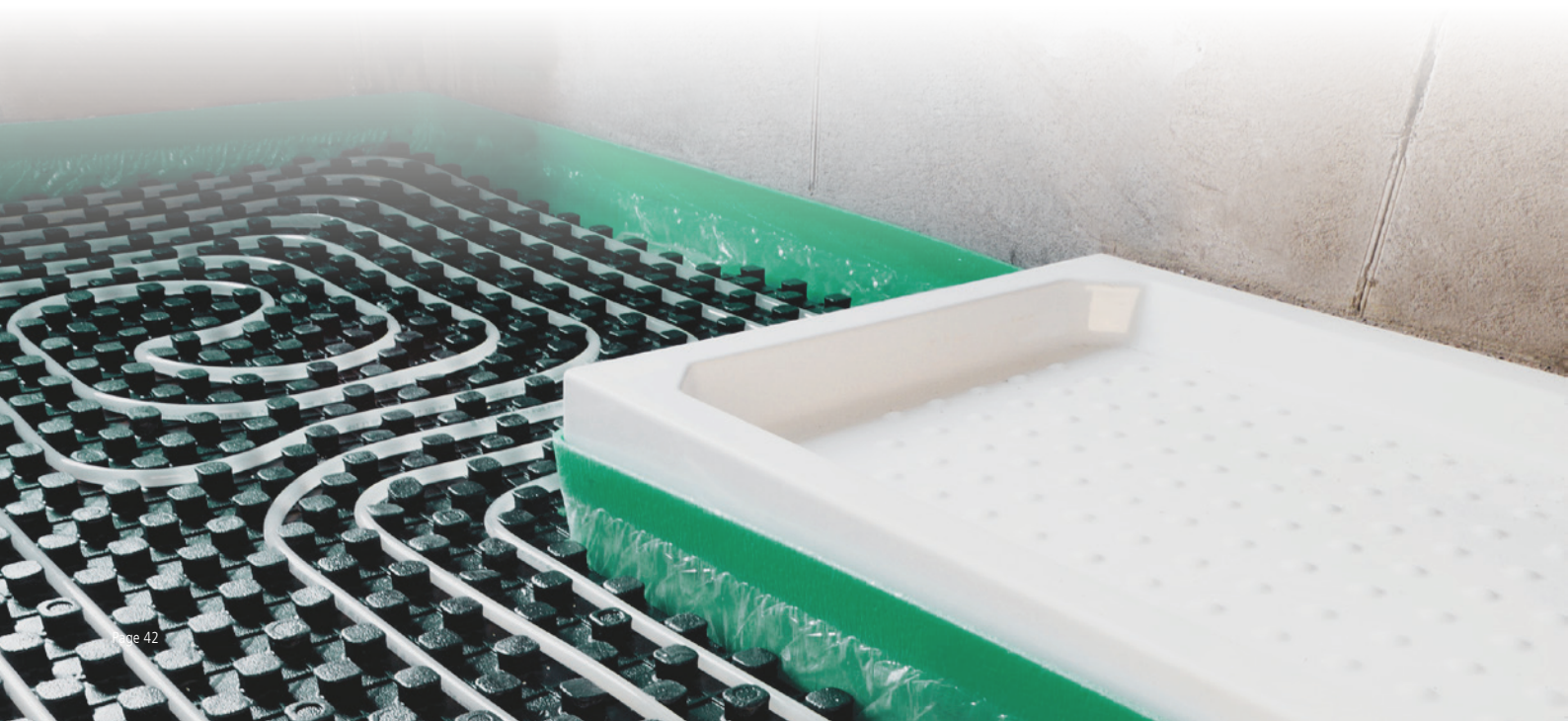
Using a Theta Dual Service module, our high-efficiency water heaters can be used for both hot water and central heating. The Theta Dual Service module is compatible with the BFC Cyclone, and the SGE and SGS solar systems. Using the Theta can provide a practical solution when you need hot water, and a modest amount of central heating.

The Theta Dual Service module combines a heat exchanger with a primary hot water pump, a three-way mixing valve, a control and all the required materials for connection. The intelligent control system manages hot water between the two functions to deliver high levels of efficiency, and comfortable heating levels.

Modulating

For a **normal radiator circuit** with a range of 50°C to 70°C, a set point of 70°C can be programmed. For **underfloor heating** with a standard range of 30°C to 40°C, the set point can be programmed at 40°C. The control system will manage the DHW pump and the three-way mixing valve to reach the set point. By reducing the pump speed, and using the three-way mixing valve, return water is mixed with water from the water heater to create a stable temperature source for the central heating.

By modulating the pump and controlling the three-way mixing valve, the central heating capacity can be reduced to a minimum when required. Colder, draw-off water is returned to the water heater contributing to the efficiency of the system. The intelligent control allows for different set points for hot water and central heating functions.



Theta Dual Service

Your benefits at a glance

Advantages for installers

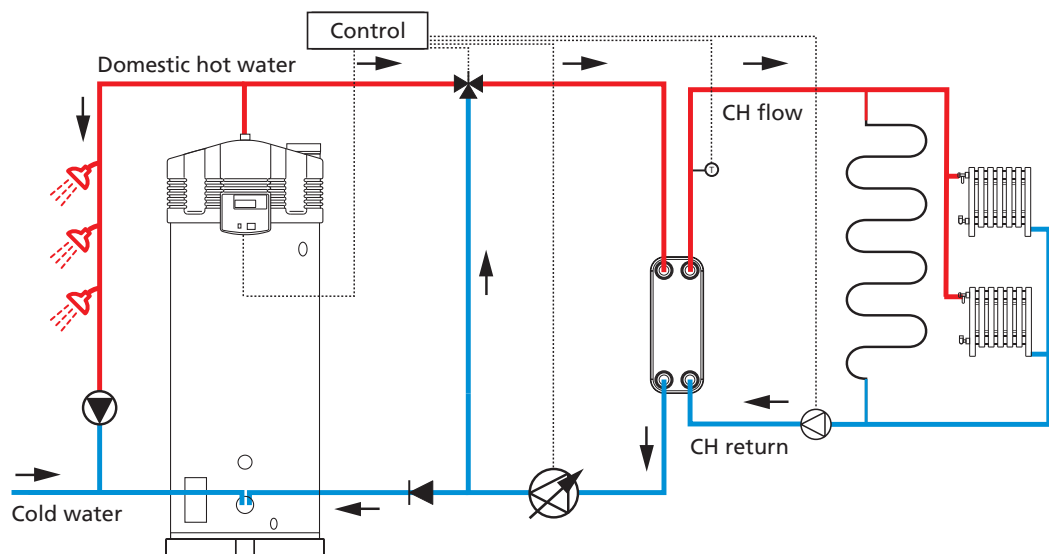
With an A.O. Smith Theta Dual Service, all hot water heating needs can be delivered by a single solution. A single flue gas exhaust and one connection for gas and water are all that is required.

With a single system for both functions, servicing and maintenance are hugely simplified.

Control of the entire system is delivered by a single controller. During installation, the controller makes it easy to set up the system to deliver optimum performance.

Advantages for the end user

When combined with a BFC Cyclone, SGE or SGS, all heating and hot water needs can be delivered by a single energy-saving, high-efficiency system. The systems are compact in size, and provide comfortable heating temperatures. Set-up costs are reduced without the need for a separate boiler, and running costs are minimised with the use of a high-efficiency condensing water heater.



MINI CAMPSITE

In the following example an SGE with 5 collectors has been set up with a Theta Dual Service module. Hot water provided by the SGE solar water heater is delivered to 8 showers, and all the basins in the camp's washrooms. Heat from the sun is converted to provide underfloor heating for a communal living space.

In this scenario both hot water and heating for guests are powered by solar energy. Given the exterior location of the campsite, and the popularity of camping during the summer, harnessing energy from the sun represents a logical and efficient solution.



DAIRY FARM

In this scenario, a typical dairy farm, hot water is needed to clean 2 milking robots and a 12,000 litre milk tank. To match that requirement, a BFC Cyclone and Theta Dual Service module have been installed. A heat plate exchanger provides underfloor heating for an area next to the stalls. As extremely hot water is needed to safely clean the robots and milk tank, the BFC Cyclone's ability to heat water up to 80°C makes it an obvious choice.



SPORTING VENUES AND LOCATIONS

In addition to hot water requirements for showers and bathrooms, many sports facilities choose to heat changing rooms and toilets.



FEATURES AND OPTIONS

- Module to combine central heating with a high-efficiency water heater
- Compatible with a condensing gas-fired water heater BFC Cyclone or solar water heaters SGE or SGS
- Modules for BFC Cyclone, SGE and SGS are tailored to the needs of the customer
- Ideal for applications with a relatively small heating demand compared to hot water demand
- Delivered as complete package including: plate heat exchanger, DHW pump, three-way mixing valve, control, temperature sensor incl. clip and connection materials.
- Maximum distance between the system and the plate heat exchanger is 5m (in a system with a pipe diameter of Ø 22mm)
- Initial investment, servicing and maintenance costs are considerably lower than a stand-alone boiler
- Options:
 - Remote Display for SGE and SGS which shows temperatures and solar contribution
 - BMS Interface for monitoring up to 50 parameters through a building management system
 - Insulation materials for the plate heat exchanger

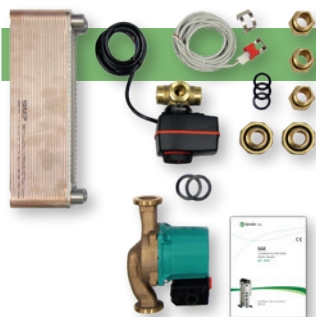


THETA MODULE FOR BFC

- Plate heat exchanger – single separation (a double separated heat exchanger can be delivered upon request)
- Control with communication cable
- Primary hot water pump
- Temperature sensor with cable incl. clip
- Three-way mixing valve, including cables
- Instruction manual

BFC MODULES

Art. No.	Controller	kW CV capacity	ΔT CV delivery system
TM 20 06	M	20	06
TM 20 10	M	20	10
TM 20 20	M	20	20
TM 30 06	M	30	06
TM 30 10	M	30	10
TM 30 20	M	30	20
TM 40 06	M	40	06
TM 40 10	M	40	10
TM 40 20	M	40	20



THETA MODULE FOR SGE & SGS

- Plate heat exchanger – single separation (a double separated heat exchanger can be delivered upon request)
- Primary hot water pump
- Temperature sensor with cable incl. clip
- Three-way mixing valve, including cables
- Instruction manual

SGE/SGS MODULES

Art. No.	kW CV capacity	ΔT CV delivery system
T 20 06	20	06
T 20 10	20	10
T 20 20	20	20
T 30 06	30	06
T 30 10	30	10
T 30 20	30	20
T 40 06	40	06
T 40 10	40	10
T 40 20	40	20

For installations that require more than 40 kW heating capacity, please contact A.O. Smith.



Systems

System capabilities

A.O. Smith offers a huge range of varied products. On their own, or working in combination, this product diversity allows us to create perfect hot water solutions for every conceivable scenario. Through ceaseless innovation, we are constantly evolving our product range. At any one time, our engineers are imagining new products, building new systems and adapting and improving existing designs.

Integration with a building management system

A number of appliances in our gas-fired product range are equipped with voltage-free contacts so they can be connected to a **building management system**. To improve this integration, we created the **BMS interface**. This interface can be combined with the latest generation BFC Cyclone, SGE and SGS systems.

The BMS interface converts information from the system and delivers it to a ModBus protocol building management system. The interface can monitor over 50 parameters including: temperatures within the system, **pump readings, burning hours** and **operating hours**.

A complete supplier & trusted partner

The hot water requirements of every building are different. A.O. Smith's broad product range includes a solution that is just right for you. Our expert advice can help you navigate the countless options available. We will take into account all contributing considerations, and match them with our product range to help you identify the best possible solution. We'll also identify all the components needed to implement that solution. When you work with us, you'll find everything you need to create your perfect system from a single, reliable partner.

BMS INTERFACE - MODULE FOR BUILDING MANAGEMENT SYSTEM

This interface feeds operating data from a SGE, SGS or BFC Cyclone into the software of your building management system. The module allows you to monitor every aspect of your hot water system.

The BMS interface converts operating data into a ModBus protocol, one of the most widespread protocols for building management software. The interface can monitor over 50 parameters including: temperatures within the system, pump readings, burning hours and operating hours.

If you would like to integrate the BMS interface into an existing SGE, SGS or BFC Cyclone system, please contact A.O. Smith for help. (see page 90)



REMOTE DISPLAY – SOLAR OUTPUT SCREEN

- Displays multiple key temperatures, solar contribution in Joules, and pump status
- Requires installation of a QT sensor
- Only applicable for SGE and SGS systems





Storage tanks and plate heat exchangers

Indirect water heaters

In addition to a range of water heaters in different sizes, A.O. Smith offers a range of storage tanks. Our storage tanks, available with and without integrated heat exchangers, are produced in a variety of sizes from 300 to 2800 litres. Storage tanks without heat exchangers are labeled "ST". "IT or ITE" is used for tanks with a single heat exchanger, and "ITS" for tanks with two exchangers. When creating a system, these storage tanks can be used in conjunction with a solar water heater, or with an A.O. Smith gas-fired system.

Storage tank without heat exchanger (ST)

The ST stores extra hot water to enlarge the capacity of the system. This is relevant in a system in which large amounts of hot water are tapped within a short period (dump load).

Storage tank with one or two heat exchangers (IT(E) & ITS)

Available in capacities of 300 to 2800 litres, A.O. Smith produces storage tanks with both single and double integrated heat exchangers. With their single heat exchanger, IT storage tanks can be used, for example, to transfer heat produced by a solar system. ITE also has a single heat exchanger but with the option for mounting an additional electric heating element as after-heater. With two heat exchangers, ITS tanks can be connected to create a second hot water generator, providing the system with an afterheater.

For easy maintenance, all storage tanks and indirect water heaters are made with clean-out doors. These doors make comprehensive waterside maintenance simple and efficient.

Plate heat exchangers (PHE)

A.O. Smith offers a range of double separated, plate heat exchangers. Capable of a high heat output, these exchangers are ideal in situations that require domestic hot water. The plate heat exchangers (PHE) are available in capacities of 50 kW to 275 kW. Insulation covers to minimise heat loss are available as an optimal accessory.

HEAT EXCHANGER

Spiral heat exchangers found in IT, ITE and ITS storage tanks.





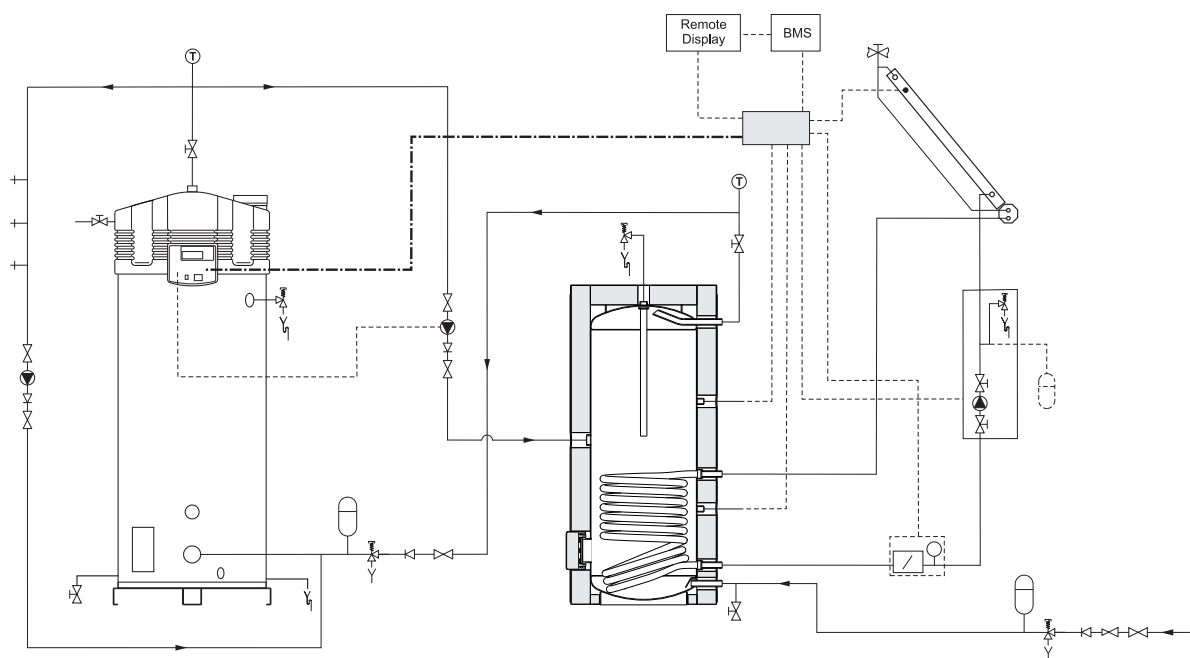
APPLICATIONS

Our indirect systems offer a variety of output ranges and capacities. That flexibility allows the systems to be used in several possible configurations.

1. Storage tank with solar water heater
2. Storage tank with central heating and plate heat exchanger
3. Storage tank with gas-fired water heater

STORAGE TANK WITH A SOLAR WATER HEATER

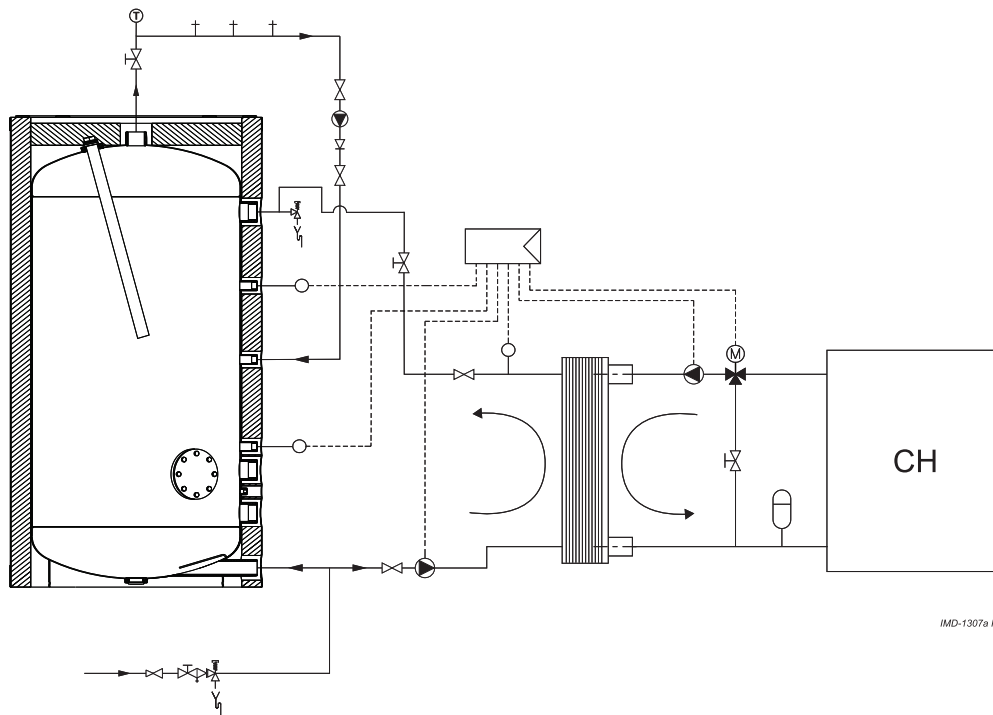
IT(E) and ITS storage tanks can be used in combination with a solar water heater (see pages 40/41). The IT(E) and ITS can also be used to add solar energy to an existing water heater system.



IMD-0954a R1

STORAGE TANK WITH A PLATE HEAT EXCHANGER FOR SPACE HEATING

By connecting the storage tank to a central heating system, the central heating boiler's capacity is increased, allowing it to contribute to the production of hot water. By making full use of the central heating system, hot water is produced at a fraction of the normal energy demands.

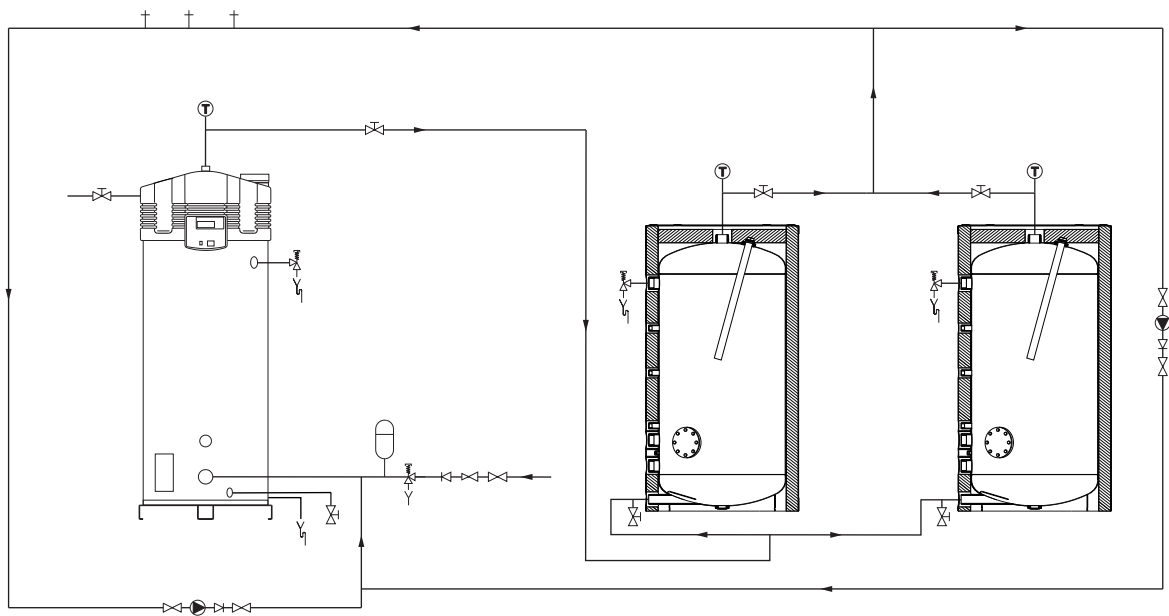


IMD-1307a R0



STORAGE TANK WITH A GAS-FIRED WATER HEATER

Storage tanks can also be added to a gas-fired system. In this set-up, the tanks are used to store the extra hot water needed during peak periods. The system can be adapted to meet higher volumes by using more than one tank.



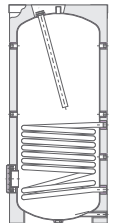
IMD-1020a R1



IT Indirect water heater for a wide range of applications

Nominal output 46 - 156 kW

- Capacity 300 to 2800 litres
- Single separation spiral heat exchanger
- Standard IT model is lined with PermaGlas Ultra Coat enamel
- Insulated ring base for easy installation
- Insulated clean-out door for comprehensive waterside maintenance
- Replaceable anode
- Standard system comes with a removable insulation jacket
- Options:
 - Flexible anode to installation in confined areas
 - Temperature and pressure valve with stainless-steel spring set to 99°C and a maximum water pressure of 10 bar
 - Analogue temperature gauge (0-120°C)



Technical specifications		IT 300	IT 400	IT 500	IT 600	IT 750	IT 1000	IT 1500	IT 2000	IT 2500	IT 3000
Capacity coil	kW	46	78	100	104	112	145	147	147	156	156
Surface coil	m ²	1.40	2.45	3.11	3.45	3.72	4.82	5.20	5.20	6.00	6.00
Capacity coil	l	8.8	14.8	18.8	29.3	31.6	40.9	40.0	40.0	45.0	45.0
Flow rate coil (80-60 °C)	l/h	1900	3354	4300	4472	4816	6235	6485	6485	6871	6871
Pressure drop coil	mbar	80	244	489	104	128	259	830	830	695	695
Max. working pressure tank	kPa (bar)	1000(10)	1000(10)	1000(10)	1000(10)	1000(10)	1000(10)	700(7)	700(7)	700(7)	700(7)
Max. working pressure coil	kPa (bar)	2500(25)	1600(16)	1600(16)	1600(16)	1600(16)	1600(16)	600(6)	600(6)	600(6)	600(6)
Max. operating temperature tank	°C	95	95	95	95	95	95	85	85	85	85
Max. operating temperature coil	°C	160	110	110	110	110	110	90	90	90	90
Anodes	-	1	1	1	1	1	1	3	3	3	3
Empty weight	kg	125	139	180	241	254	336	398	426	576	600
Draw-off capacity											
Capacity	l	300	385	473	643	725	1007	1550	1800	2550	2800
30 minutes ΔT=44 °C	l	786	1176	1482	1733	1908	2557	3266	3584	4618	4936
60 minutes ΔT=44 °C	l	1236	1938	2459	2749	3002	3974	4702	5020	6142	6460
90 minutes ΔT=44 °C	l	1686	2701	3436	3766	4097	5391	6139	6457	7667	7985
120 minutes ΔT=44 °C	l	2135	3463	4413	4782	5192	6808	7575	7894	9191	9509
Continuous ΔT=44 °C	l/h	899	1525	1955	2033	2189	2834	2873	2873	3049	3049
Heating-up time ΔT=44°C	minutes	20	15	15	19	20	21	32	38	50	55
30 minutes ΔT=50°C	l	692	1035	1304	1525	1679	2250	2874	3154	4063	4343
60 minutes ΔT=50 °C	l	1088	1706	2164	2420	2642	3497	4138	4418	5405	5685
90 minutes ΔT=50 °C	l	1483	2377	3024	3314	3605	4744	5402	5682	6747	7027
120 minutes ΔT=50 °C	l	1897	3047	3884	4208	4569	5991	6666	6946	8088	8368
Continuous ΔT=50 °C	l/h	791	1342	1720	1789	1926	2494	2528	2528	2683	2683
Heating-up time ΔT=50 °C	minutes	23	17	16	22	23	24	37	43	57	63
30 minutes ΔT=55 °C	l	629	941	1185	1386	1526	2046	2613	2867	3694	3949
60 minutes ΔT=55 °C	l	989	1551	1967	2200	2402	3179	3762	4016	4914	5168
90 minutes ΔT=55 °C	l	1348	2160	2749	3013	3278	4313	4911	5166	6133	6388
120 minutes ΔT=55 °C	l	1708	2770	3531	3826	4153	5447	6060	6315	7353	7608
Continuous ΔT=55 °C	l/h	719	1220	1564	1626	1751	2267	2299	2299	2439	2439
Heating-up time ΔT=55 °C	minutes	25	19	18	24	25	27	40	47	63	69
Dimensions											
Height (including lid)	mm	1650	1710	2045	1840	2035	2005	1930	2118	1989	2118
Diameter (including insulation)	mm	750	740	760	910	930	1100	1300	1300	1600	1600
Height of cold water connection	mm	110	70	70	85	85	95	135	135	185	185
Height of hot water connection	mm	1460	1655	1995	1805	2000	1965	1985	2175	2045	2070
Height cleaning opening	mm	280	330	330	420	420	450	450	450	530	530
Energy labelling											
Energy labelling	-	C	C	C	-	-	-	-	-	-	-
Standby loss	W	92	100	104	126	126	140	154	171	232	243

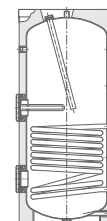
Draw-off capacities are based on Tset = 80 °C and Tcold = 10 °C



ITE Indirect water heater

Nominal output 52 - 87 kW

- Nominal output: 52 - 87 kW
- Capacity 389 - 1024 litres
- Single-wall spiral heat exchanger
- ITE standard fitted with PermaGlas Ultra Coat enamel
- Insulated access cover for comprehensive waterside maintenance
- Replaceable magnesium anode



Technical specifications		ITE 400	ITE 500	ITE 600	ITE 750	ITE 1000
Output coil	kW	78	68	72	80	87
Surface area coil	m ²	1.64	2.13	2.39	2.66	2.89
Water capacity coil	l	9.9	12.8	20.3	22.3	24.6
Flow rate coil (80-60 °C)	l/h	2236	2924	3096	3440	3741
Pressure drop solar coil	mbar	78	166	37	50	61
Max. working pressure tank	kPa (bar)	1000(10)	1000(10)	1000(10)	1000(10)	1000(10)
Max. working pressure coil	kPa (bar)	1600(16)	1600(16)	1600(16)	1600(16)	1600(16)
Max. operating temperature tank	°C	95	95	95	95	95
Max. operating temperature coil	°C	110	110	110	110	110
Anodes	-	1	1	1	1	1
Empty weight	kg	131	179	229	237	314
Draw-off capacity						
Capacity	l	389	478	652	734	1024
30 minutes $\Delta T=44$ °C	l	952	1206	1463	1638	2068
60 minutes $\Delta T=44$ °C	l	1461	1871	2167	2420	2919
90 minutes $\Delta T=44$ °C	l	1969	2536	2870	3201	3769
120 minutes $\Delta T=44$ °C	l	2477	3200	3574	3983	4619
Continuous $\Delta T=44$ °C	l/h	1016	1329	1407	1564	1700
Heating-up time $\Delta T=44$ °C	minutes	23	22	28	28	36
30 minutes $\Delta T=50$ °C	l	838	1062	1288	1441	1820
60 minutes $\Delta T=50$ °C	l	1285	1646	1907	2129	2568
90 minutes $\Delta T=50$ °C	l	1733	2231	2526	2817	3317
120 minutes $\Delta T=50$ °C	l	2180	2816	3145	3505	4065
Continuous $\Delta T=50$ °C	l/h	894	1170	1238	1376	1496
Heating-up time $\Delta T=50$ °C	minutes	26	25	32	32	41
30 minutes $\Delta T=55$ °C	l	762	965	1170	1310	1655
60 minutes $\Delta T=55$ °C	l	1169	1497	1733	1936	2335
90 minutes $\Delta T=55$ °C	l	1575	2028	2296	2561	3015
120 minutes $\Delta T=55$ °C	l	1982	2560	2859	3187	3695
Continuous $\Delta T=55$ °C	l/h	813	1063	1126	1251	1360
Heating-up time $\Delta T=55$ °C	minutes	29	27	35	35	45
Dimensions						
Height (including lid)	mm	1705	2040	1835	2030	2000
Diameter (including insulation)	mm	740	760	910	930	1100
Height of cold water connection	mm	70	70	85	85	95
Height of hot water connection	mm	1655	1995	1805	2000	1965
Energy labelling						
Load profile	-	C	C	-	-	-
Standby loss	W	100	104	165	171	192

Draw-off capacities are based on Tset = 80 °C and Tcold = 10 °C

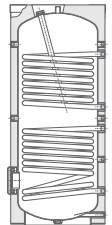
A.O. Smith developed the IT for large-scale usage. If there is no need to integrate an electric resistance backup heating in the tank, the IT can serve as an alternative solution, independent of the needed volume. For more information, please refer to page 53.

ITS

Dual coil indirect water heater for multiple possible uses

Nominal output 46 - 87 kW (bottom coil)/27 - 58 kW (top coil)

- Capacity 300 to 1007 litres
- Single-wall spiral heat exchangers
- Standard ITS model is lined with PermaGlas Ultra Coat enamel
- Insulated ring base for easy installation
- Insulated clean-out door for comprehensive maintenance
- Replaceable anode
- Standard system comes with a removable insulation jacket
- Options:
 - Flexible anode to installation in confined areas
 - Temperature and pressure valve with stainless-steel spring set to 99°C and a maximum water pressure of 10 bar
 - Analogue temperature gauge (0-120°C)



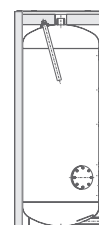
Technical specifications		ITS 300	ITS 400	ITS 500	ITS 600	ITS 750	ITS 1000
Capacity coil	kW	46	52	68	72	80	87
Surface coil	m²	1.40	1.64	2.13	2.39	2.66	2.89
Capacity coil	l	8.8	9.9	12.8	20.3	22.6	24.6
Flow rate coil (80-60 °C)	l/h	1900	2236	2924	3096	3440	3741
Pressure drop coil	mbar	80	78	166	37	50	61
Output coil	kW	26	37	42	40	56	58
Surface coil	m²	1.00	1.14	1.31	1.33	1.86	1.93
Capacity coil	l	6.3	6.9	7.9	11.3	15.8	16.4
Flow rate coil (80-60 °C)	l/h	1100	1591	1806	1720	2408	2494
Pressure drop coil	mbar	40	30	43	7	18	20
Max. working pressure tank	kPa (bar)	1000(10)	1000(10)	1000(10)	1000(10)	1000(10)	1000(10)
Max. working pressure coil	kPa (bar)	2500(25)	1600(16)	1600(16)	1600(16)	1600(16)	1600(16)
Max. operating temperature tank	°C	95	95	95	95	95	95
Max. operating temperature coil	°C	160	110	110	110	110	110
Anodes	-	1	1	1	1	1	1
Empty weight	kg	142	145	196	246	262	340
Draw-off capacity							
Capacity	l	300	382	470	641	718	1007
30 minutes ΔT=44 °C	l	1023	1269	1566	1801	2110	2557
60 minutes ΔT=44 °C	l	1735	2139	2641	2895	3439	3974
90 minutes ΔT=44 °C	l	2448	3009	3716	3990	4768	5391
120 minutes ΔT=44 °C	l	3160	3878	4791	5085	6097	6808
Continuous ΔT=44 °C	l/h	1425	1740	2150	2189	2658	2834
Heating-up time ΔT=44°C	minutes	13	13	13	18	16	21
30 minutes ΔT=50°C	l	900	1117	1378	1585	1857	2250
60 minutes ΔT=50 °C	l	1527	1882	2324	2548	3026	3497
90 minutes ΔT=50 °C	l	2154	2648	3270	3511	4196	4744
120 minutes ΔT=50 °C	l	2781	3413	4216	4474	5366	5991
Continuous ΔT=50 °C	l/h	1256	1531	1892	1926	2339	2494
Heating-up time ΔT=50 °C	minutes	14	15	15	20	18	24
30 minutes ΔT=55 °C	l	818	1015	1253	1441	1688	2046
60 minutes ΔT=55 °C	l	1388	1711	2113	2316	2751	3179
90 minutes ΔT=55 °C	l	1958	2407	2973	3192	3815	4313
120 minutes ΔT=55 °C	l	2528	3103	3833	4068	4878	5447
Continuous ΔT=55 °C	l/h	1140	1392	1720	1751	2127	2267
Heating-up time ΔT=55 °C	minutes	16	16	16	22	20	27
Dimensions							
Height (including lid)	mm	1650	1710	2045	1840	2035	2005
Diameter (including insulation)	mm	750	740	760	910	930	1100
Height of cold water connection	mm	110	70	70	85	85	95
Height of hot water connection	mm	1460	1655	1995	1805	2000	1965
Height cleaning opening	mm	280	330	330	420	420	450
Energy labelling							
Energy labelling	-	C	C	C	-	-	-
Standby loss	W	92	100	104	126	126	146

Draw-off capacities are based on Tset = 80 °C and Tcold = 10 °C and both heat exchangers (this is not always possible in practice)



ST Storage tank

- Capacity 300 to 2820 litres
- Standard ST model is lined with PermaGlas Ultra Coat enamel
- Standard system comes with a removable insulation jacket
- Insulated clean-out door for easy maintenance
- Replaceable anode
- Options:
 - Flexible anode for installation in confined areas
 - Temperature and pressure valve with stainless-steel spring set to 99°C and a maximum water pressure of 10 bar
 - Analogue temperature gauge (0-120°C)



Technical specifications		ST 300	ST 400	ST 500	ST 600	ST 750	ST 1000	ST 1500	ST 2000	ST 2500	ST 3000
Max. working pressure tank	kPa (bar)	1000(10)	1000(10)	1000(10)	1000(10)	1000(10)	1000(10)	700(7)	700(7)	700(7)	700(7)
Max. operating temperature tank	°C	95	95	95	95	95	95	95	95	95	95
Number of anodes	-	1	1	1	1	1	1	3	3	3	3
Empty weight	kg	99	99	131	179	201	325	325	350	485	520
Draw-off capacity											
Capacity	l	300	405	499	678	763	1055	1550	1880	2500	2820
Dimensions											
Height (including lid)	mm	1650	1705	2040	1835	2030	2000	1930	2118	2000	2128
Diameter (including insulation)	mm	750	720	720	910	910	1100	1200	1200	1500	1500
Height of cold water connection	mm	110	70	70	85	85	95	135	135	185	185
Height of hot water connection	mm	1460	1655	1995	1805	2000	1965	1985	2175	2045	2170
Height cleaning opening	mm	280	410	410	500	500	535	450	450	530	530
Energy labelling											
Energy labelling	-	C	C	C	-	-	-	-	-	-	-
Standby loss	W	92	100	104	126	126	175	300	354	400	458



PHE Copper soldered plate heat exchanger

Nominal output 50 - 275 kW

- Optimum security thanks to double separation-construction
- Nominal output of 50 kW to 275 kW
- Maximum working pressure of 25 bar
- Maximum working temperature of heat exchangers: 120°C
- Very easy installation
- Maintenance-friendly because there are no gaskets
- Available with additional insulation kit
- Different capacities available upon request

Technical specifications		PHE 50	PHE 75	PHE 100	PHE 150	PHE 175	PHE 225	PHE 250	PHE 275
Power	kW	50	75	100	150	175	225	250	275
Number of plates	-	20	24	30	40	50	60	70	80
Primary temperature	°C	80/60	80/60	80/60	80/60	80/60	80/60	80/60	80/60
Secondary temperature	°C	10/60	10/60	10/60	10/60	10/60	10/60	10/60	10/60
Primary flow	m³/h	2.15	3.23	4.30	6.46	7.53	9.69	10.77	11.85
Secondary flow	m³/h	0.86	1.29	1.72	2.58	3.01	3.87	4.30	4.74
Primary pressure drop	kPa	22.7	33.7	37.3	46.4	41.3	48.6	46.2	45.2
Secondary pressure drop	kPa	3.3	5.2	5.9	7.6	6.9	8.2	7.8	7.6
Max. permitted pressure drop	kPa	50	50	50	50	50	50	50	50
Max. working pressure heat exchangers	bar	25	25	25	25	25	25	25	25
Min. working temp. heat exchangers	°C	0	0	0	0	0	0	0	0
Max. working temp. heat exchangers	°C	120	120	120	120	120	120	120	120
Material plate	-	AISI 316 L	AISI 316 L	AISI 316 L	AISI 316 L	AISI 316 L	AISI 316 L	AISI 316 L	AISI 316 L
Soldering material	-	copper	copper	copper	copper	copper	copper	copper	copper
Empty weight	kg	5	6	7	8	10	12	14	15
Max. chlorine concentration (at 80 °C)	mg/kg	50	50	50	50	50	50	50	50
Primary capacity	l/duct	0.59	0.72	0.91	1.24	1.56	1.89	2.21	2.54
Secondary capacity	l/duct	0.65	0.78	0.98	1.30	1.63	1.95	2.27	2.60
Accessories									
Insulation package (art. no.)		0307623(S)	0307623(S)	0307625(S)	0307625(S)	0307627(S)	0307627(S)	0307629(S)	0307629(S)
Dimensions									
Height	mm	337	337	337	337	337	337	337	337
Width	mm	127	127	127	127	127	127	127	127
Depth	mm	61	71	85	109	133	157	181	205



INDIRECT WATER HEATERS PARTS

**D**

LARGE PUMP STATION SYSTEM WITH DRAINBACK

- Always install in combination with an expansion vessel to ensure the system is not compromised
- The control is also supplied

Item number for IT/ITE/ITS	0309975	0309979	0309983	0309987	0309991
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**D**

LARGE PUMP STATION SYSTEM WITHOUT DRAINBACK SYSTEM

- The control is also supplied

Item number for IT/ITE/ITS	0309976	0309980	0309984	0309988	0309992
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**D**

PUMP STATION

- Pump station module with integrated pump
- Number of collectors used depends on the piping
- Integrated flow meter and overpressure protection

Article number	0311594	0311595	0311692	0311593
Collectors*	1-7	8-15	1-7	8-15
Drainback system	Yes	Yes	No	No

* Dependent on the boost height

**E**

EXPANSION VESSEL

- Expansion vessel for high temperatures, specifically for solar systems
 - 25 to 80 litres capacity, depending on the number of solar collectors used
- For more information, please contact the Technical Support Group (see page 89)

Article number	0308875	0308876	0308877	0308878
Litres	25	35	50	80
Collectors*	1-4	5-6	7-11	12-15

* The number of collectors is an indication as to which expansion vessel should be used

**F**

GLYCOL

- Corrosion inhibiting and anti-frost agent Tyfocor L
- Suitable for systems with and without drainback
- 10 litre package, 40% mixed solution

Article number	0308803
Litres	10

**Y**

SMART DISPLAY - INFORMATION SCREEN

- Displays temperatures in the collector and the storage tank
- Displays solar contribution when combined with an output sensor

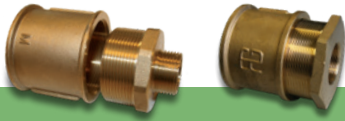
Article number	0309701(S)
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**K**

OUTPUT SENSOR

- Measures the temperature in the system incl. piping and visualizes the solar contribution through the smart display

	Article number
22 mm solder	0309691(S)
28 mm solder	0309703(S)



ADAPTER NIPPLES

○ Set of 2 units

Description	IT(E) 300	IT(E)/ITS 400	IT(E)/ITS 500	IT(E)/ITS 600	IT(E)/ITS 750	IT(E)/ITS 1000	IT 1500	IT 2000	IT 2500	IT 3000
Reducing Nipple Set 2" BSp F x R 1" M	-	0309754(S)	-	-	-	-	-	0309754(S)	-	-
Reducing Nipple Set 2" BSp F x R 1 1/2" M	-	0309755(S)	-	-	-	-	-	0309755(S)	-	-
Reducing Nipple Set 2 1/2" BSp F x R 1" BSp F	-	-	-	-	0309756(S)	-	-	-	-	-
Reducing Nipple Set 2 1/2" BSp F x R 1" BSp F	-	-	-	-	0309757(S)	-	-	-	-	-
Reducing Nipple Set 2 1/2" BSp F x R 1 1/2" BSp F	-	-	-	-	0309758(S)	-	-	-	-	-



T&P VALVE

Article number	0076527004(S)
Membership	¾"/10 bar



FILLING PUMP

○ Filling pump designed to simplify filling a solar system

Article number	0308814
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INSULATION MATERIAL

○ Bird-proof, suitable for outside use

Article number	0309933(S)	0309934(S)
Dimensions	Ø 22 mm x 2 m	Ø 28 mm x 2 m

GLYCOL IT(E) SYSTEM

AMOUNT (LITRES)

- Quantities are based on capacity of the system, excluding the piping
 ○ Quantities are calculated as an average. To make a calculation based on exact quantities, please contact our Technical Support Group (see page 89)

	IT 300	IT(E) 400	IT(E) 500	IT(E) 600	IT(E) 750	ITE 1000	IT 1500	IT 2000	IT 2500	IT 3000
1-2 collectors	40	50	50	60	70	80	80	80	80	80
3-5 collectors	50	60	60	70	70	80	80	80	80	80
6-11 collectors	60	70	70	80	80	90	100	100	100	100
12-15 collectors	70	80	80	90	90	100	100	110	110	110

GLYCOL ITS SYSTEM

AMOUNT (LITRES)

- Quantities are based on capacity of the system, excluding the piping
 ○ Quantities are calculated as an average. To make a calculation based on exact quantities, please contact our Technical Support Group (see page 89)

	ITS 300	ITS 400	ITS 500	ITS 600	ITS 750	ITS 1000
1-2 collectors	40	50	50	60	70	80
3-5 collectors	50	60	60	70	70	80
6-11 collectors	60	70	70	80	80	90
12-15 collectors	70	80	80	90	90	100



FROM ATMOSPHERIC TO HIGH-EFFICIENCY
GAS-FIRED ATMOSPHERIC WATER HEATERS



From atmospheric to high-efficiency Gas-fired atmospheric water heaters

Energy savings and comfort are both critical when selecting the ideal system for your hot water needs. From home use to large commercial applications, A.O. Smith offers a wide range of gas-fired systems to help you find the right solution. Our gas-fired heaters include both atmospheric and condensing systems.

New construction and large-scale renovation projects

Energy efficiency regulations for new buildings and renovations are becoming increasingly demanding. As directives like ErP and Ecodesign raise the required energy performance standards, A.O. Smith have put more emphasis on developing high-efficiency condensing water heaters. From situations with modest hot water demands to large-scale construction with high volumes of hot water needed, A.O. Smith have a condensing solution to match.

Replacement market

When you are replacing a hot water system, it is always worth exploring more efficient alternatives. Replacing an atmospheric system with a condensing hot water heater is a simple way to deliver increased efficiency.

For projects that demand a like-for-like replacement, or in the rare cases where building regulations restrict the installation of a condensing heater, we offer a wide range of gas-fired atmospheric water heaters.

To deliver our customers more long-term value, we naturally recommend a condensing water heater whenever possible. Our clients frequently replace old atmospheric systems with condensing alternatives like the BFC Cyclone and the Innovo. To calculate how much this change might save you, please refer to page 18 and 19.

Control and ease of use

At A.O. Smith we deliver pioneering, energy-saving technology in systems that are simple and easy to use. Control systems in our gas-fired heaters can be reduced to a simple on/off button, or built to offer automatic systems and advanced operating data including fault codes and history. Technological advances in all of our systems eradicates any threat from Legionnaires disease.

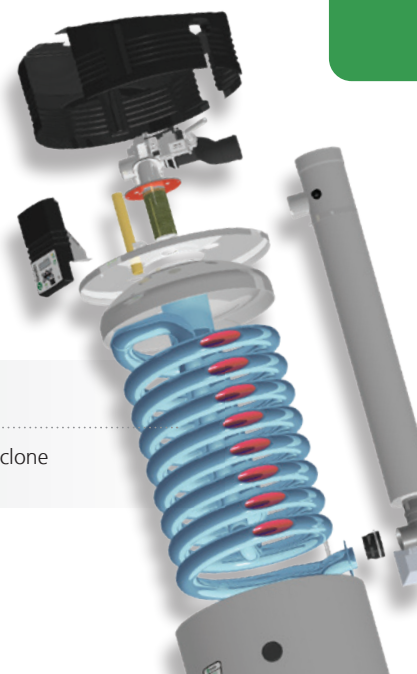
From installation, to maintenance, to daily use, everybody involved with your system will appreciate the brilliant simplicity of A.O. Smith designs.

Long service life

The heart of any water heating system is the hot water tank, where the transfer of heat takes place. A.O. Smith storage tanks are made from stainless, or highly durable steel, coated with our patented PermaGlas Ultra Coat glass-lining. The quality and durability of our materials guarantees **maximum service life**.

CONDENSING WATER HEATER

Exploded view of the BFC Cyclone





**A.O. SMITH'S ADVICE:
ALWAYS GO FOR CONDENSING**

In an atmospheric water heater, energy is lost through escaping heat from the flue gas. That loss makes it impossible to extract all the energy present in a m³ of gas. The maximum potential efficiency of an atmospheric system is 82% (gross).

Fully sealed to prevent heat loss from flue gases, a condensing water heater is designed to extract more energy from every m³ of gas. Condensing water heaters start with efficiencies of 90% (gross) onwards. Intelligent operating systems and advanced construction of the heat exchanger help to extract the maximum amount of energy from the minimum amount of gas.

Going for a condensing water heater will not only provide you with the highest possible energy rating, in the long term it will save you a lot of money. Even with the investment needed for more expensive models, the time it takes to recover the cost is surprisingly short. The average time taken to recover the initial investment for condensing water heater is between 1 - 3 years.



ATMOSPHERIC



CONDENSING – HIGH-EFFICIENCY

To find out more about the savings you could make, explore the **savings scenarios** on **pages 18 and 19**.



Available while stocks last

ADM

An extensive range of atmospheric heaters ideal for large hot water systems

Nominal output 32.3 - 109.8 kW
Flue options B11B5

- Efficient automatic hot surface igniter
- Removable control column with integrated controller for simple maintenance
- Frost protection
- Stainless-steel burner
- Suitable for natural gas and propane
- Standard conversion kit for propane (ADM 135) available upon request
- Two access covers allow for comprehensive waterside maintenance

Technical specifications		ADM 40	ADM 50	ADM 60	ADM 80	ADM 90	ADM 115	ADM 135
Nominal input (gross value) *	kW	42.2	56.5	66.4	82.5	98.3	126.6	143.4
Nominal input (nett value)	kW	38.0	50.9	59.8	74.3	88.5	114.0	129.1
Nominal output	kW	32.3	42.8	50.2	62.4	74.3	95.8	109.8
Gas consumption**	m³/h	4.0	5.4	6.3	7.9	9.4	12.1	13.7
Efficiency (gross value)	%	77	76	76	76	76	76	77
Efficiency (nett value)	%	85	84	84	84	84	84	85
Empty weight	kg	195	221	209	238	244	270	329
NO _x emissions*	mg/kWh GVC	240	235	235	229	283	311	276
Draw-off capacity								
Capacity	l	309	357	298	335	278	253	252
Max. temperature setting	°C	73	73	73	73	73	73	73
30 minutes ΔT=44 °C	l	638	785	783	933	972	1132	1254
60 minutes ΔT=44 °C	l	954	1203	1274	1543	1699	2068	2327
90 minutes ΔT=44 °C	l	1269	1621	1765	2153	2425	3004	3399
120 minutes ΔT=44 °C	l	1585	2039	2256	2763	3152	3940	4472
Continuous ΔT=44 °C	l	631	836	982	1220	1453	1872	2145
Heating-up time ΔT=44 °C	l	29	26	18	16	11	8	7
30 minutes ΔT=50 °C	l	561	691	689	821	856	996	1104
60 minutes ΔT=50 °C	l	839	1058	1121	1358	1495	1820	2047
90 minutes ΔT=50 °C	l	1117	1426	1553	1894	2134	2643	2991
120 minutes ΔT=50 °C	l	1395	1794	1985	2431	2774	3467	3935
Continuous ΔT=50 °C	l	556	735	864	1073	1279	1647	1888
Heating-up time ΔT=50 °C	l	33	29	21	19	13	9	8
30 minutes ΔT=55 °C	l	510	628	627	746	778	906	1003
60 minutes ΔT=55 °C	l/h	763	962	1019	1234	1359	1654	1861
90 minutes ΔT=55 °C	minutes	1015	1297	1412	1722	1940	2403	2719
120 minutes ΔT=55 °C	l	1268	1631	1805	2210	2521	3152	3577
Continuous ΔT=55 °C	l	505	669	785	976	1162	1497	1716
Heating-up time ΔT=55 °C	l	37	32	23	21	14	10	9
Dimensions								
Height	mm	1900	2100	1900	2100	2000	2085	2085
Depth	mm	800	800	800	800	800	800	800
Width	mm	1100	1100	1100	1100	1105	1105	1105
Height of cold water connection	mm	565	565	565	565	575	650	650
Height of hot water connection	mm	1605	1810	1605	1810	1640	1715	1715
Height of gas connection	mm	400	400	400	400	400	400	400
Diameter of flue connection	mm	150	150	180	180	225	225	225
Cleaning opening	mm	Ø 100	Ø 100	Ø 100	Ø 100	Ø 100	Ø 100	Ø 100
Energy labelling								
Load profile		XXL	XXL	XXL	XXL	3XL	3XL	3XL
Energy labelling		C	C	C	C	-	-	-
Efficiency	%	49	51	40	40	46	44	46

* Gas data based on G20-20 mbar

** Gas consumption at 15 °C and 1013.25 mbar

Draw-off capacities are based on the maximum control temperature and cold water set at 10 °C



Available while stocks last

ADMP

An extensive range of atmospheric heaters ideal for large hot water systems

Nominal output 32.3 - 95.8 kW
Flue options B11B5

- Efficient automatic hot surface igniter
- Removable control column with integrated controller for simple maintenance
- Frost protection
- Stainless-steel burner
- Suitable for natural gas and propane
- Standard conversion kit for propane (ADM 135) available upon request
- Two access covers allow for comprehensive waterside maintenance



Technical specifications		ADMP 40	ADMP 50	ADMP 60	ADMP 80	ADMP 90	ADMP 115
Nominal input (gross value) *	kW	42.2	56.5	66.4	82.5	98.3	126.6
Nominal input (nett value)	kW	38.0	50.9	59.8	74.3	88.5	114.0
Nominal output	kW	32.3	42.8	50.2	62.4	74.3	95.8
Gas consumption**	m ³ /h	4.0	5.4	6.3	7.9	9.4	12.1
Efficiency (gross value)	%	77	76	76	76	76	76
Efficiency (nett value)	%	85	84	84	84	84	84
Empty weight	kg	195	221	209	238	244	270
NO _x emissions*	mg/kWh GVC	240	235	235	229	283	311
Draw-off capacity							
Capacity	l	309	357	298	335	278	253
Max. temperature setting	°C	73	73	73	73	73	73
30 minutes $\Delta T=44$ °C	l	638	785	783	933	972	1132
60 minutes $\Delta T=44$ °C	l	954	1203	1274	1543	1699	2068
90 minutes $\Delta T=44$ °C	l	1269	1621	1765	2153	2425	3004
120 minutes $\Delta T=44$ °C	l	1585	2039	2256	2763	3152	3940
Continuous $\Delta T=44$ °C	l/h	631	836	982	1220	1453	1872
Heating-up time $\Delta T=44$ °C	minutes	29	26	18	16	11	8
30 minutes $\Delta T=50$ °C	l	561	691	689	821	856	996
60 minutes $\Delta T=50$ °C	l	839	1058	1121	1358	1495	1820
90 minutes $\Delta T=50$ °C	l	1117	1426	1553	1894	2134	2643
120 minutes $\Delta T=50$ °C	l	1395	1794	1985	2431	2774	3467
Continuous $\Delta T=50$ °C	l/h	556	735	864	1073	1279	1647
Heating-up time $\Delta T=50$ °C	minutes	33	29	21	19	13	9
30 minutes $\Delta T=55$ °C	l	510	628	627	746	778	906
60 minutes $\Delta T=55$ °C	l	763	962	1019	1234	1359	1654
90 minutes $\Delta T=55$ °C	l	1015	1297	1412	1722	1940	2403
120 minutes $\Delta T=55$ °C	l	1268	1631	1805	2210	2521	3152
Continuous $\Delta T=55$ °C	l/h	505	669	785	976	1162	1497
Heating-up time $\Delta T=55$ °C	minutes	37	32	23	21	14	10
Dimensions							
Height	mm	1900	2100	1900	2100	2000	2085
Depth	mm	800	800	800	800	800	800
Width	mm	1100	1100	1100	1100	1105	1105
Height of cold water connection	mm	565	565	565	565	575	650
Height of hot water connection	mm	1605	1810	1605	1810	1640	1715
Height of gas connection	mm	205	205	205	205	205	205
Diameter of flue connection	mm	150	150	150	150	225	225
Cleaning opening	mm	Ø 100	Ø 100	Ø 100	Ø 100	Ø 100	Ø 100
Energy labelling							
Load profile		XXL	XXL	XXL	XXL	3XL	3XL
Energy labelling		C	C	C	C	-	-
Efficiency	%	48	51	40	40	46	44

* Gas data based on G20-20 mbar

** Gas consumption at 15 °C and 1013.25 mbar

Draw-off capacities are based on the maximum control temperature and cold water set at 10 °C



Available while stocks last

ADMR

An extensive range of atmospheric heaters ideal for large hot water systems

Nominal output 32.3 - 95.8 kW
Flue options B11B5

- Standard flue gas valve to minimise standby loss
- Digital computer control for easy fault diagnosis
- Programmable for anti-legionella purge cycle
- Removable column
- Voltage-free contacts for general fault indication and on/off switch, compatible with building management system
- Safety guaranteed with a control, high limit and a safety thermostat
- Standard conversion kit for propane
- Easy to install, low-maintenance electric anodes available as an option



Technical specifications		ADMR 40	ADMR 50	ADMR 60	ADMR 80	ADMR 90	ADMR 115
Nominal input (gross value) *	kW	42.2	56.5	66.4	82.5	98.3	126.6
Nominal input (nett value)	kW	38.0	50.9	59.8	74.3	88.5	114.0
Nominal output	kW	32.3	42.8	50.2	62.4	74.3	95.8
Gas consumption**	m³/h	4.0	5.4	6.3	7.9	9.4	12.1
Efficiency (gross value)	%	77	76	76	76	76	76
Efficiency (nett value)	%	85	84	84	84	84	84
Empty weight	kg	195	221	209	238	244	270
NO _x emissions*	mg/kWh GVC	240	235	235	229	283	311
Draw-off capacity							
Capacity	l	309	357	298	335	278	253
Max. temperature setting	°C	80	80	80	80	80	80
30 minutes ΔT=44 °C	l	677	830	821	975	1008	1164
60 minutes ΔT=44 °C	l	993	1248	1312	1585	1734	2100
90 minutes ΔT=44 °C	l	1309	1666	1803	2195	2461	3036
120 minutes ΔT=44 °C	l	1624	2084	2294	2805	3187	3972
Continuous ΔT=44 °C	l/h	631	836	982	1220	1453	1872
Heating-up time ΔT=44 °C	minutes	29	26	18	16	11	8
30 minutes ΔT=50 °C	l	596	731	723	858	887	1025
60 minutes ΔT=50 °C	l	874	1098	1155	1395	1526	1848
90 minutes ΔT=50 °C	l	1152	1466	1587	1932	2165	2672
120 minutes ΔT=50 °C	l	1429	1834	2019	2469	2805	3495
Continuous ΔT=50 °C	l/h	556	735	864	1073	1279	1647
Heating-up time ΔT=50 °C	minutes	33	29	21	19	13	9
30 minutes ΔT=55 °C	l	542	664	657	780	806	931
60 minutes ΔT=55 °C	l	794	999	1050	1268	1387	1680
90 minutes ΔT=55 °C	l	1047	1333	1442	1756	1969	2429
120 minutes ΔT=55 °C	l	1299	1667	1835	2244	2550	3177
Continuous ΔT=55 °C	l/h	505	669	785	976	1162	1497
Heating-up time ΔT=55 °C	minutes	37	32	23	21	14	10
Dimensions							
Height	mm	1900	2100	1900	2100	2000	2085
Depth	mm	800	800	800	800	800	800
Width	mm	1100	1100	1100	1100	1105	1105
Height of cold water connection	mm	565	565	565	565	575	650
Height of hot water connection	mm	1605	1810	1605	1810	1640	1715
Height of gas connection	mm	400	400	400	400	400	400
Diameter of flue connection	mm	150	150	150	150	225	225
Cleaning opening	mm	Ø 100	Ø 100	Ø 100	Ø 100	Ø 100	Ø 100
Energy labelling							
Load profile		XXL	XXL	XXL	XXL	3XL	3XL
Energy labelling		B	B	B	B	-	-
Efficiency	%	62	62	61	61	58	57

* Gas data based on G20-20 mbar

** Gas consumption at 15 °C and 1013.25 mbar

Draw-off capacities are based on the maximum control temperature and cold water set at 10 °C



Available while stocks last

BFM

Wide range of forced draft, room-sealed heaters for use in any location

Nominal output 26.4 - 102.4 kW
Flue options C13, C33



- Removable column
- Voltage-free contacts for general fault indication and on/off switch, compatible with building management system
- Safety guaranteed with a control, high limit and a safety thermostat
- Standard conversion kit for propane
- Easy to install, low-maintenance electric anodes available as an option

Technical specifications		BFM 30	BFM 50	BFM 80	BFM 100	BFM 120
Nominal input (gross value) *	kW	32.2	52.2	83.3	113.3	127.7
Nominal input (nett value)	kW	29.0	47.0	75.0	102.0	115.0
Nominal output	kW	26.4	42.3	67.5	90.8	102.4
Gas consumption**	m ³ /h	3.1	5.0	7.9	10.8	14.0
Efficiency (gross value)	%	82	81	81	80	80
Empty weight	kg	230	245	245	320	320
NO _x emissions*	mg/kWh GVC	248	235	235	246	235
Draw-off capacity						
Capacity	l	309	298	298	253	253
Max. temperature setting	°C	73	73	73	73	73
30 minutes ΔT=44 °C	l	586	713	883	1088	1190
60 minutes ΔT=44 °C	l	844	1127	1543	1975	2190
90 minutes ΔT=44 °C	l	1102	1540	2203	2863	3191
120 minutes ΔT=44 °C	l	1360	1954	2862	3750	4191
Continuous ΔT=44 °C	l/h	516	827	1319	1774	2000
Heating-up time ΔT=44 °C	minutes	36	22	12	9	8
30 minutes ΔT=50 °C	l	516	628	777	958	1047
60 minutes ΔT=50 °C	l	743	992	1358	1738	1927
90 minutes ΔT=50 °C	l	970	1355	1938	2519	2808
120 minutes ΔT=50 °C	l	1197	1719	2519	3300	3688
Continuous ΔT=50 °C	l/h	454	728	1161	1561	1760
Heating-up time ΔT=50 °C	minutes	41	25	13	10	9
30 minutes ΔT=55 °C	l	469	571	707	871	952
60 minutes ΔT=55 °C	l	675	901	1235	1580	1752
90 minutes ΔT=55 °C	l	881	1232	1762	2290	2552
120 minutes ΔT=55 °C	l	1088	1563	2290	3000	3353
Continuous ΔT=55 °C	l/h	413	661	1055	1419	1600
Heating-up time ΔT=55 °C	minutes	45	27	14	11	9
Dimensions						
Height	mm	2000	2000	2020	2020	2020
Depth	mm	1000	1000	1000	1000	1000
Width	mm	755	755	755	755	755
Height of cold water connection	mm	600	600	590	590	590
Height of hot water connection	mm	1640	1640	1655	1655	1655
Height of gas connection	mm	600	600	600	600	760
Diameter of flue connection	mm	80/125	100/150	130/200	2x130	2x130
Cleaning opening	mm	Ø 100	Ø 100	Ø 100	Ø 100	Ø 100
Energy labelling						
Load profile		XXL	XXL	XXL	3XL	3XL
Energy labelling		B	B	B	-	-
Efficiency	%	60	62	60	67	67

* Gas data based on G20-20 mbar

** Gas consumption at 15 °C and 1013.25 mbar

Draw-off capacities are based on the maximum control temperature and cold water set at 10 °C



Available while stocks last

BTI

Atmospheric water heater designed for small/medium-sized commercial applications

Nominal output 12.7 - 20.4 kW
Flue options B11B5



- Control, high limit and energy cut-off thermostats to ensure safe operation
- Safety sensor to prevent flue spillage
- Stainless-steel burner for natural or propane
- Waterway access cover for comprehensive waterside tank maintenance
- Replaceable magnesium anode
- Delivered with conversion kit for propane
- Maximum control temperature: 80°C

Technical specifications		BTI 65	BTI 85	BTI 100
Nominal input (gross value) *	kW	18.1	25.1	26.7
Nominal input (nett value)	kW	16.3	22.6	24.0
Nominal output	kW	12.7	19.2	20.4
Gas consumption**	m ³ /h	1.7	2.4	2.5
Efficiency (gross value)	%	70	77	77
Efficiency (nett value)	%	78	85	85
Empty weight	kg	93	122	149
NO _x emissions*	mg/kWh GVC	155	136	136
Draw-off capacity				
Capacity	l	178	265	355
Max. temperature setting	°C	80	80	80
30 minutes ΔT=44 °C	l	310	464	575
60 minutes ΔT=44 °C	l	433	652	774
90 minutes ΔT=44 °C	l	557	840	974
120 minutes ΔT=44 °C	l	681	1027	1173
Continuous ΔT=44 °C	l/h	247	375	399
Heating-up time ΔT=44 °C	minutes	43	42	53
30 minutes ΔT=50 °C	l	272	408	506
60 minutes ΔT=50 °C	l	381	574	681
90 minutes ΔT=50 °C	l	490	739	857
120 minutes ΔT=50 °C	l	599	904	1032
Continuous ΔT=50 °C	l/h	218	330	351
Heating-up time ΔT=50 °C	minutes	49	48	61
30 minutes ΔT=55 °C	l	248	371	460
60 minutes ΔT=55 °C	l	347	521	619
90 minutes ΔT=55 °C	l	446	672	779
120 minutes ΔT=55 °C	l	545	822	938
Continuous ΔT=55 °C	l/h	198	300	319
Heating-up time ΔT=55 °C	minutes	54	53	67
Dimensions				
Height	mm	1680	1585	1780
Depth	mm	655	770	775
Width	mm	520	645	675
Height of cold water connection	mm	1540	1505	1685
Height of hot water connection	mm	1540	1505	1685
Height of gas connection	mm	340	340	340
Diameter of flue connection	mm	Ø 100	Ø 130	Ø 130
Cleaning opening	mm	95 x 70	95 x 70	95 x 70
Energy labelling				
Load profile		XL	XXL	XXL
Energy labelling		B	B	B
Efficiency	%	62	61	60

* Gas data based on G20-20 mbar

** Gas consumption at 15 °C and 1013.25 mbar

Draw-off capacities are based on the maximum control temperature and cold water set at 10 °C



Available while stocks last



COF

Wide range of water heaters designed for use with pressure jet oil and gas burners

Nominal output 50.4 - 147.0 kW
Flue options B23

- The delivered burners meet the combustion specifications for the installation
- Universal burner mounting plate
- Simple and easy accessible controls
- Waterway access cover for comprehensive waterside tank maintenance
- Replaceable magnesium anodes
- Voltage-free contact for general fault indication for BMS

Technical specifications		COF 199	COF 245	COF 315	COF 385	COF 455	COF 700
Nominal input (gross value) *	kW	66.6	83.3	99.9	127.7	149.9	194.3
Nominal input (nett value)	kW	60.0	75.0	90.0	115.0	135.0	175.0
Nominal output	kW	50.4	63.0	75.6	96.6	113.4	147.0
Gas consumption**	m ³ /h	6.3	7.9	9.5	12.2	14.3	18.5
Efficiency (gross value)	%	76	76	76	76	76	76
Efficiency (nett value)	%	84	84	84	84	84	84
Empty weight	kg	230	230	240	265	265	305
NO _x emissions*	mg/kWh GVC	76	79	81	86	90	97
Draw-off capacity							
Capacity	l	322	322	318	282	282	259
Max. temperature setting	°C	80	80	80	80	80	80
30 minutes ΔT=44 °C	l	853	964	1070	1209	1356	1623
60 minutes ΔT=44 °C	l	1346	1580	1808	2153	2465	3059
90 minutes ΔT=44 °C	l	1838	2195	2547	3097	3573	4496
120 minutes ΔT=44 °C	l	2331	2811	3286	4041	4681	5932
Continuous ΔT=44 °C	l/h	985	1231	1478	1888	2216	2873
Heating-up time ΔT=44 °C	minutes	20	16	13	9	8	5
30 minutes ΔT=50 °C	l	751	848	941	1064	1194	1428
60 minutes ΔT=50 °C	l	1184	1390	1591	1894	2169	2692
90 minutes ΔT=50 °C	l	1618	1932	2242	2725	3144	3956
120 minutes ΔT=50 °C	l	2051	2474	2892	3556	4119	5221
Continuous ΔT=50 °C	l/h	867	1084	1300	1662	1951	2528
Heating-up time ΔT=50 °C	minutes	22	18	15	10	9	6
30 minutes ΔT=55 °C	l	682	771	856	967	1085	1298
60 minutes ΔT=55 °C	l	1077	1264	1447	1722	1972	2447
90 minutes ΔT=55 °C	l	1471	1756	2038	2477	2858	3597
120 minutes ΔT=55 °C	l	1865	2249	2629	3233	3745	4746
Continuous ΔT=55 °C	l/h	788	985	1182	1510	1773	2299
Heating-up time ΔT=55 °C	minutes	25	20	16	11	10	7
Dimensions							
Height	mm	1900	1900	1900	1900	1900	1990
Depth	mm	725	725	725	725	725	725
Width	mm	705	705	705	705	705	705
Height of cold water connection	mm	685	685	685	640	640	765
Diameter of flue connection	mm	150	200	200	200	200	250
Cleaning opening	mm	95 x 70	95 x 70	95 x 70	95 x 70	95 x 70	95 x 70
Energy labelling							
Load profile		XXL	XXL	3XL	3XL	3XL	3XL
Energy labelling		B	B	-	-	-	-
Efficiency	%	66	66	69	65	65	63

* Gas data based on G20-20 mbar

** Gas consumption at 15 °C and 1013.25 mbar

Draw-off capacities are based on the maximum control temperature and cold water set at 10 °C



Available while stocks last

EQ/EQH

Atmospheric water heater with thermal flue spillage protection and piezo ignition

Nominal output 7.4 - 20.4 kW
Flue options B11B5

- Low noise level, suitable for installation in most locations, ring base construction
- Safety thermostat
- Safety sensor to prevent flue spillage
- Replaceable magnesium sacrificial anode
- Suitable for natural or propane



EQ 115/155/EQH 200

- Ring base for easy installation and lower heat losses

EQ 280/380

- Access covers for waterside tank maintenance

Technical specifications		EQ 115	EQ 155	EQH 200	EQ 280	EQ 380
Nominal input (gross value) *	kW	9.3	11.3	18.3	25.1	26.7
Nominal input (nett value)	kW	8.4	10.2	16.5	8.4	8.4
Nominal output	kW	7.4	9.0	14.0	19.2	20.4
Gas consumption**	m ³ /h	0.9	1.1	1.7	2.4	2.5
Efficiency (gross value)	%	79	79	76	77	77
Efficiency (nett value)	%	88	88	87	85	85
Empty weight	kg	47	52	75	117	144
NO _x emissions*	mg/kWh GVC	191	162	143	161	193
Draw-off capacity						
Capacity	l	109	144	181	265	355
Max. temperature setting	°C	71	71	71	71	71
30 minutes ΔT=44 °C	l	171	219	299	426	524
60 minutes ΔT=44 °C	l	243	306	435	614	723
90 minutes ΔT=44 °C	l	315	394	572	802	923
120 minutes ΔT=44 °C	l	388	482	709	989	1122
Continuous ΔT=44 °C	l/h	144	175	273	375	399
Heating-up time ΔT=44 °C	minutes	45	49	40	42	53
30 minutes ΔT=50 °C	l	150	192	263	375	461
60 minutes ΔT=50 °C	l	214	270	383	540	637
90 minutes ΔT=50 °C	l	277	347	504	705	812
120 minutes ΔT=50 °C	l	341	424	624	871	987
Continuous ΔT=50 °C	l/h	127	154	241	330	351
Heating-up time ΔT=50 °C	minutes	51	56	45	48	61
30 minutes ΔT=55 °C	l	137	175	239	341	419
60 minutes ΔT=55 °C	l	194	245	348	491	579
90 minutes ΔT=55 °C	l	252	315	458	641	738
120 minutes ΔT=55 °C	l	310	385	567	791	898
Continuous ΔT=55 °C	l/h	116	140	219	300	319
Heating-up time ΔT=55 °C	minutes	57	62	50	53	67
Dimensions						
Height	mm	1280	1370	1670	1585	1780
Depth	mm	545	595	605	735	765
Width	mm	465	515	515	645	675
Height of cold water connection	mm	1180	1270	1590	1505	1685
Height of hot water connection	mm	1180	1270	1590	1505	1685
Height of gas connection	mm	325	325	380	375	375
Diameter of flue connection	mm	80	80	100	130	130
Energy labelling						
Load profile		L	XL	XXL	XXL	XXL
Energy labelling		B	B	B	C	C
Efficiency	%	61	68	61	55	51

* Gas data based on G20-20 mbar

** Gas consumption at 15 °C and 1013.25 mbar

Draw-off capacities are based on the maximum control temperature and cold water set at 10 °C



HIGH POWER RATING
ELECTRIC WATER HEATERS



High power rating

Electric water heaters

When access to natural gas is not an option, or where a simplified installation is essential, A.O. Smith offers a wide range of electric water heaters. Our electric heaters deliver high power and a capacity of 115 to 450 litres in systems that take up less space. They can be used for residential, commercial or industrial requirements.

Voltages

The A.O. Smith electric water heater range caters to requirements of every size, from smaller industrial and domestic needs (single phase 230 volts) to large-scale industrial environments with heavy hot water demands (3 phase 400 volts).

Control

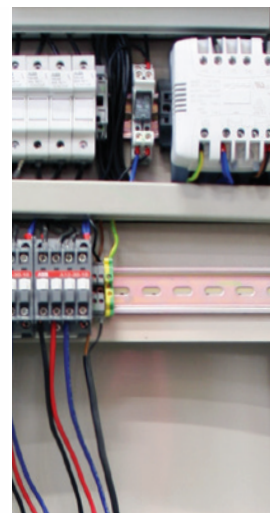
All models in our electric water heating range come with durable and replaceable incoloy heating elements. The systems are controlled by a control thermostat, a safety thermostat and a reset button.

Reliability

Our electric water heaters are simple to use and built for a long service life. Extremely easy to install, these heaters can be set up in almost any location. It's this flexibility that frequently makes them an ideal choice. All A.O. Smith electric water heaters, and every other product we make, meet with CE approval.

DRE – ELECTRIC WATER HEATER

Connection and control unit





DRE

Three phase electric water heater. Primarily for commercial use

Output 9.0 - 54.0 kW

- Capacity 200 to 300 litres
- 3-9 Incoloy heating elements with a maximum rating of 54.0 kw
- Each element is controlled using a control thermostat (adjustable from 49°C – 82°C) and a safety thermostat with a manual reset button
- Cascade control of the elements for steady and responsive heating
- All elements and thermostats are fuse-protected
- Corrosion is prevented with a PermaGlas Ultra Coat second-generation glass-coating
- Equipped with dry fire protection
- Replaceable magnesium anode

Technical specifications			DRE 52-9	DRE 52-18	DRE 52-36	DRE 80-9	DRE 80-18	DRE 80-36	DRE 80-54
Electrical power consumption		kW	9.0	18.0	36.0	9.0	18.0	36.0	54.0
Amperage		A	11-13	23-25	46-50	11-13	23-25	46-50	69-75
Number of electrical elements		-	3	3	6	3	3	6	9
Supply voltage			415 V(-15%/+10%)/50-60 Hz						
Draw-off capacity									
Capacity		l	200	200	200	300	300	300	300
Max. temperature setting		°C	82	82	82	82	82	82	82
30 minutes	ΔT=44 °C	l	341	420	578	472	551	709	868
60 minutes	ΔT=44 °C	l	429	596	930	560	727	1061	1395
90 minutes	ΔT=44 °C	l	517	772	1282	648	903	1413	1923
120 minutes	ΔT=44 °C	l	605	948	1634	736	1079	1765	2451
Continuous	ΔT=44 °C	l/h	176	352	704	176	352	704	1055
Heating-up time		ΔT=44°C min.	68	34	17	102	51	26	17
30 minutes	ΔT=50°C	l	300	370	509	415	485	624	764
60 minutes	ΔT=50 °C	l	377	525	819	493	640	934	1228
90 minutes	ΔT=50 °C	l	455	679	1128	570	795	1243	1692
120 minutes	ΔT=50 °C	l	532	834	1438	647	949	1553	2157
Continuous	ΔT=50 °C	l/h	155	310	619	155	310	619	929
Heating-up time		ΔT=50 °C min.	78	39	19	116	58	29	19
30 minutes	ΔT=55 °C	l	273	336	463	378	441	567	694
60 minutes	ΔT=55 °C	l	343	477	744	448	582	849	1116
90 minutes	ΔT=55 °C	l	414	618	1026	518	722	1130	1539
120 minutes	ΔT=55 °C	l	484	758	1307	589	863	1412	1961
Continuous	ΔT=55 °C	l/h	141	281	563	141	281	563	844
Heating-up time		ΔT=55 °C min.	85	43	21	128	64	32	21
Dimensions									
Height		mm	1460	1460	1460	1580	1580	1580	1580
Depth		mm	690	690	690	790	790	790	790
Width		mm	560	560	560	640	640	640	640
Height of cold water connection		mm	125	125	125	125	125	125	125
Height of hot water connection		mm	1460	1460	1460	1580	1580	1580	1580
Energy labelling									
Load profile			XL	XL	XL	XL	XL	XL	XL
Energy labelling			C	C	C	C	C	C	C
Efficiency		%	38	38	38	38	38	38	38

Draw-off capacities are based on the maximum control temperature and cold water set at 10 °C

EES

Vertical electric water heater for residential or small commercial applications

Output 3.0 kW

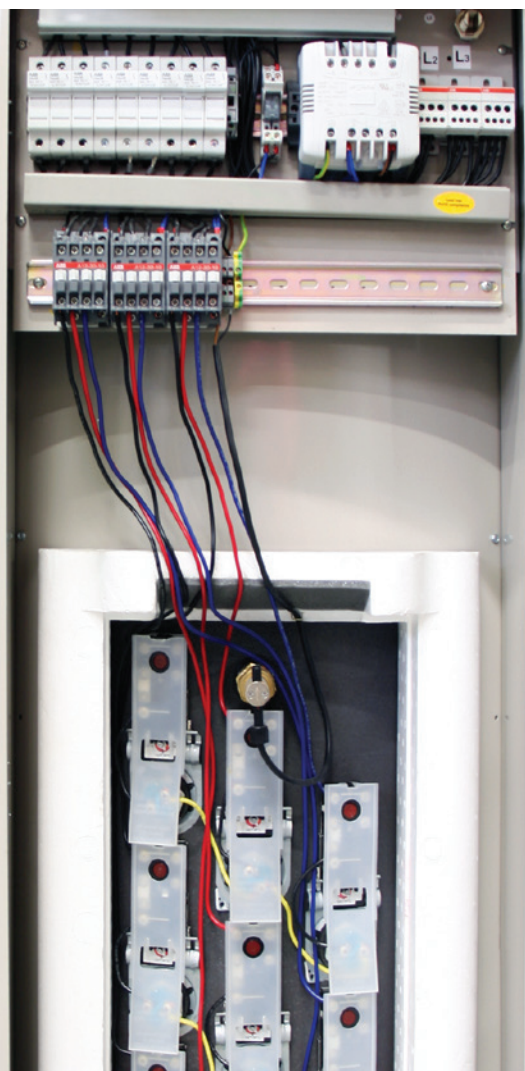
- Capacity: 115 to 450 litres
- Two replaceable Incoloy-sheathed elements
- Each element is provided with a control thermostat (adjustable: 43°C – 77°C)
- Safety thermostat with manual reset button
- Equipped with dry fire protection
- Automatic switch regulates one of the elements to transfer a maximum of 3 kW
- Corrosion is prevented with a PermaGlas Ultra Coat second-generation glass-coating
- Replaceable magnesium anode



Technical specifications			EES 30	EES 40	EES 52	EES 66	EES 80	EES 120
Electrical power consumption		kW	3.0	3.0	3.0	3.0	3.0	3.0
Amperage		A	11-13	11-13	11-13	11-13	11-13	11-13
Number of electrical elements		-	2	2	2	2	2	2
Supply voltage			240(-15%/+10%)/50Hz (+/-1Hz)					
Draw-off capacity								
Capacity		l	115	155	190	250	300	450
Max. temperature setting		°C	77	77	77	77	77	77
30 minutes	ΔT=44 °C	l	149	192	229	293	346	506
60 minutes	ΔT=44 °C	l	178	221	258	322	375	535
90 minutes	ΔT=44 °C	l	208	250	288	352	405	565
120 minutes	ΔT=44 °C	l	237	280	317	381	434	594
Continuous	ΔT=44 °C	l/h	59	59	59	59	59	59
Heating-up time ΔT=44 °C		min.	118	159	194	256	307	460
30 minutes	ΔT=50°C	l	131	169	201	258	305	445
60 minutes	ΔT=50 °C	l	157	194	227	284	330	471
90 minutes	ΔT=50 °C	l	183	220	253	309	356	497
120 minutes	ΔT=50 °C	l	208	246	279	335	382	523
Continuous	ΔT=50 °C	l/h	52	52	52	52	52	52
Heating-up time ΔT=50 °C		min.	134	180	221	291	349	523
30 minutes	ΔT=55 °C	l	119	153	183	234	277	405
60 minutes	ΔT=55 °C	l	143	177	207	258	300	428
90 minutes	ΔT=55 °C	l	166	200	230	281	324	452
120 minutes	ΔT=55 °C	l	190	224	253	305	347	475
Continuous	ΔT=55 °C	l/h	47	47	47	47	47	47
Heating-up time ΔT=55 °C		min.	147	198	243	320	384	576
Dimensions								
Height		mm	930	1110	1370	1530	1540	1620
Diameter		mm	Ø 520	Ø 520	Ø 520	Ø 560	Ø 610	Ø 710
Height of water connection		mm	110	110	110	110	110	110
Energy labelling								
Load profile			L	L	XL	XL	XL	XL
Energy labelling			C	C	C	C	D	D
Efficiency		%	39	38	38	38	37	37

Draw-off capacities are based on the maximum control temperature and cold water set at 10 °C





DRE

A key A.O. Smith design feature, connection panels are easy to access and sized to make installation easy. Each electrical element is built with its own control thermostat and a manual reset button.



DRY FIRE PROTECTION

Dry fire protection is a standard feature of our DRE systems. This feature safeguards the elements even if water levels fall below the set minimum.



APPLICATIONS

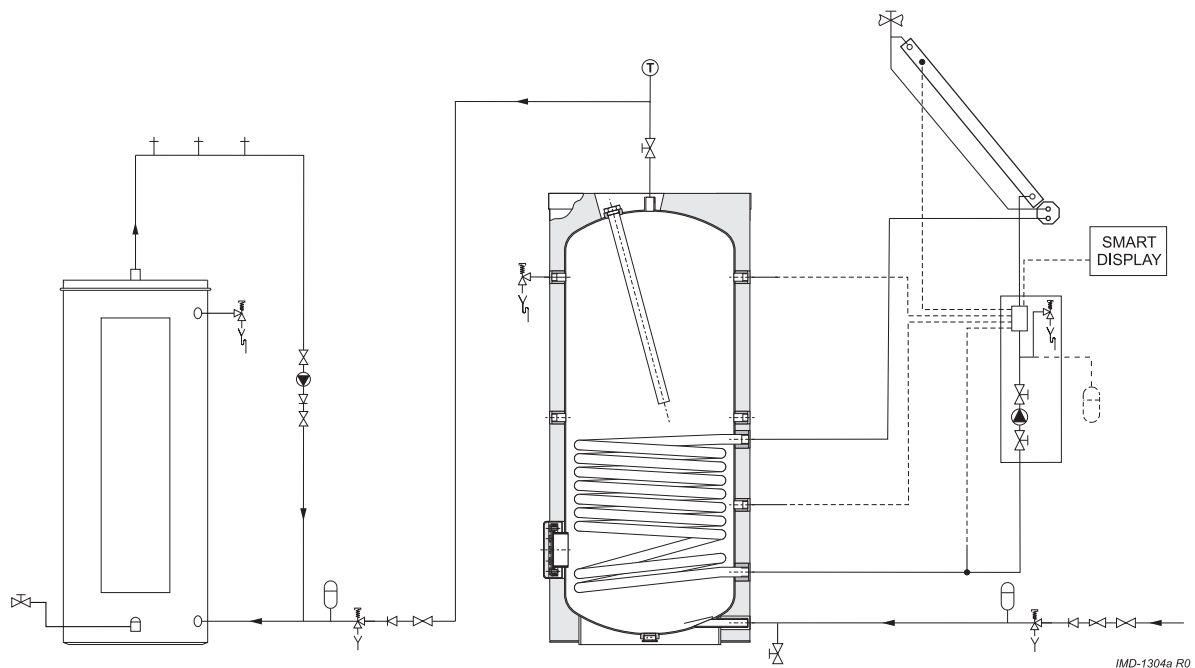
A lack of access to natural gas, or a need for simple installation are the most common reasons for choosing an electric water heater.

Our electric water heaters can combine with our **solar energy** systems and our **storage tanks** to increase efficiency and maximise the volume of hot water produced.

The diagram below shows a DRE electric water heater working in combination with an IT storage tank. DREs come in range of capacities from 200 to 450 litres with a power consumption range of between 9.0 kW and 54.0 kW. When combined with an IT storage tank of between 300 to 2800 litres, these variables can be configured to build a system of any required size. The variety of DRE and EES heaters available allows for infinite potential combinations.

In the system exemplified below, cold water in the IT storage tank is heated by solar energy. The hottest water is transferred from the IT to the base of the DRE. This water will only require a boost by the DRE for it to reach required temperature. In this set-up, the DRE is used only as an afterheater, therefore saving a huge amount of electricity.

To find the configuration best suited to your needs, you can rely on advice from A.O. Smith experts.





HEATING SYSTEMS
HIGH-EFFICIENCY CONDENSING BOILERS



Heating systems

High-efficiency condensing boilers

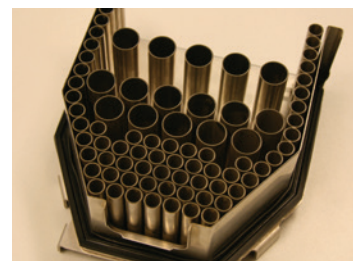
A.O. Smith's high-efficiency boilers complete our full range of available hot water solutions. The Upsilon central heating boilers are designed for use in medium to large-sized commercial applications.

Upsilon

The Upsilon range consists of 3 boilers: UB 70, UB 110 and UB 140. All boilers in this series are fitted with an electronic control which fully modulates to optimise performance. These boilers have a very low gas consumption, low emissions, NO_x class 6, and very high levels of efficiency (up to 110.3% (nett)). Put simply, the Upsilon is the ultimate heating solution for large commercial applications.

Cascade systems

The Upsilon can be installed individually, or in a cascade system of up to 8 boilers. These cascade systems can be mounted in three different ways: wall-mounted or frame-mounted side-by-side, or in line. An internal cascade manager helps to maintain an equal load across all of the boilers. Abiding by the plug and play principle, the cascade boiler system is quick and easy to install.



STAINLESS-STEEL HEAT EXCHANGER

- High condensation level
- Simple and easy to maintain





HIGH-EFFICIENCY CONDENSING BOILERS

TECHNICAL SPECIFICATIONS UPSILON

Upsilon Boiler

Nominal output	68.5 - 136.4 kW
Flue options	B23, B33, C13, C33, C43, C53, C63, C83, C93

- Efficiency rating of 110.3% in accordance with EN 677 (50/30°C part load)
- Built in A-level pump
- Fitted with 1 or 2 stainless-steel heat exchangers
- Fully modulating burner technology
- Concentric and parallel flue gas duct options
- Easy installation and access for maintenance
- Intelligent control system
- NO_x class 6 (In accordance with NEN-EN 15502 –A +A1)
- 0 – 10 volts, volt free on/off or OpenTherm connection possible
- Fitted with cascade manager as standard
- Up to 8 boilers can be combined in cascade configuration
- Built-in primary pump
- The UB 110 and UB 140 have built-in redundancy



Technical specifications		UB 70	UB 110	UB 140
Nominal input (gross value) *	kW	68.5	107.9	136.4
Modulation range (50/30 °C)	kW	9.9....65.0	16.8....102.3	19.8....130.0
Modulation range (80/60 °C)	kW	8.8....60.1	14.8....95.0	17.6....120.0
Gas consumption	m ³ /h	6.53	10.29	13.01
Efficiency in accordance with EN 677 (36/30 °C part load, Hi)	%	109.8	109.2	108.9
Efficiency in accordance with EN 677 (80/60 °C full load, Hi)	%	97.3	97.6	97.6
Efficiency in accordance with EN 677 (50/30 °C low load, Hi)	%	110.2	110.3	110.2
Efficiency in accordance with BED		****	****	****
Empty weight	kg	65	83	87
Maximum working pressure	kPa (bar)	400 (4)	400 (4)	400 (4)
Minimum working pressure	kPa (bar)	70 (0.7)	70 (0.7)	70 (0.7)
Flue gas discharge temperature (36/30 °C part load, Hi)	°C	30	30	30
Flue gas discharge temperature (80/60 °C full load, Hi)	°C	76	73	77
Number of engines		1	2	2
NO _x class		6	6	6
NO _x emissions*	mg/kWh GVC	31	31	31
Electrical data				
Power consumption	W	161	250	322
Power supply		230 (-15% + 10% VAC)/50 (± 1Hz)		
Dimensions				
Height	mm	1065	1065	1065
Depth	mm	460	460	460
Width	mm	660	660	660
Diameter of flue connection	mm	100/150	100/150	100/150
Standard UB cascade connections				
Gas pipe		1¼"	1¼"	1¼"
Flow pipe		1½"	1½"	1½"
Return pipe		1½"	1½"	1½"
Condensate drain pipe	mm	26	26	26
Connections in solo configuration*				
Gas pipe	mm	22	22	22
Flow pipe	mm	35	35	35
Return pipe	mm	35	35	35
Condensate drain pipe	mm	26	26	26
Energy labelling				
Energy labelling	-	A	-	-
Nominal heat output	kW	60	93	120
Season-bound efficiency	%	94	94	94

* Gas data based on G20-20 mbar

* When UB boilers are used in a solo configuration, the installation requires a boiler connection set. All connections are compression fittings. This set (art. no. 0310286) needs to be ordered.



THE CONTROL

An intelligent energy management system is offered as standard with the Upsilon boiler. In a cascade configuration, the cascade manager rotates the lead boiler. The control is also fitted with an external alarm. By adding an optional exterior temperature sensor, the system can be set up to respond to changes in the weather. The intelligent control system is very user-friendly thanks to the easy interaction.



THE HEAT EXCHANGER, THE HEART OF THE BOILER

- Built for a long service life
- Stainless-steel tubes for high condensation levels
- 'A' trademark components
- A great return on your investment is guaranteed



MAINTENANCE-FRIENDLY

At the heart of the Upsilon systems, the durable heat exchanger delivers a long service life. Unlike aluminum alternatives known to decline in efficiency over time, A.O. Smith exchangers are designed and built to maintain consistently high levels of performance. Thanks to the design of the exchanger, and the stainless-steel construction, intervals between required servicing are long.



The quality and design of the heat exchanger also ensures running costs for the boiler remain consistent throughout the heat exchanger's life cycle. The ratio of gas volume needed to heat produced will remain the same.

SMART CONTROLS

OpenTherm connection

An OpenTherm control is a digital controller which constantly communicates with the boiler in accordance to the OpenTherm-protocol. The controller continually calculates the desired flow water temperature and sends this to the boiler(s).

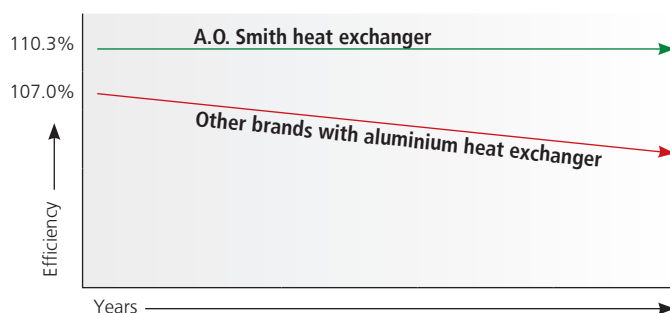
0 – 10 Volt Connection

When heat is required, a 0-10 Volt controller sends a variable voltage signal to the boiler. This signal is translated by the Upsilon boiler to a set value (desired flow water temperature or load) which is in turn sent via the data bus link to the boiler(s). The set value becomes higher or lower depending on the Voltage.

On/Off Contact

The On/Off contact is a volt-free switch to create a heat demand within a closed circuit.

EFFICIENCY COMPARISON: A.O. SMITH VS OTHER BRANDS

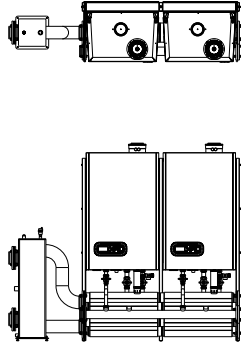


RUNNING COST COMPARISON: A.O. SMITH VS OTHER BRANDS

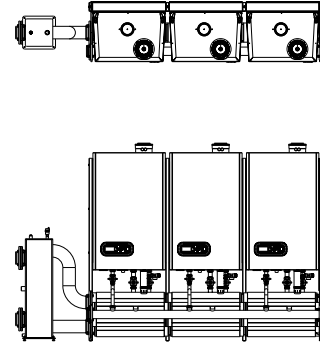




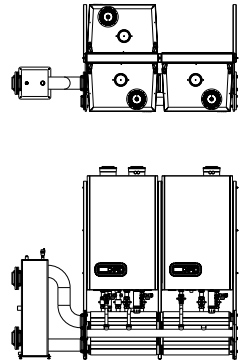
UPSILON CASCADE 2 BOILERS STANDING IN LINE



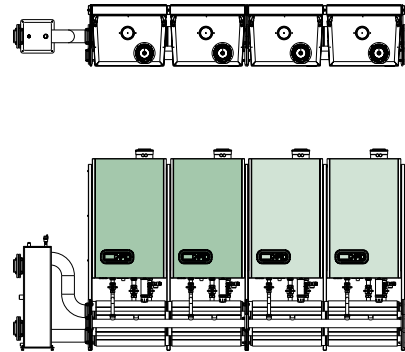
UPSILON CASCADE 3 BOILERS STANDING IN LINE



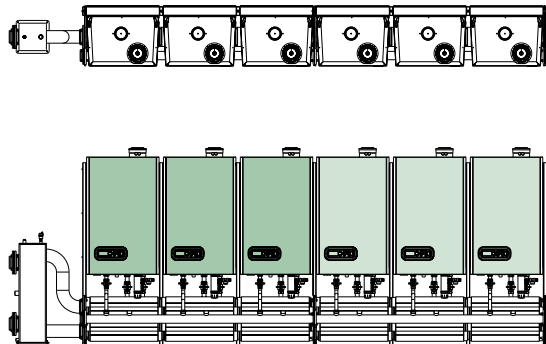
UPSILON CASCADE 3 BOILERS BACK-TO-BACK



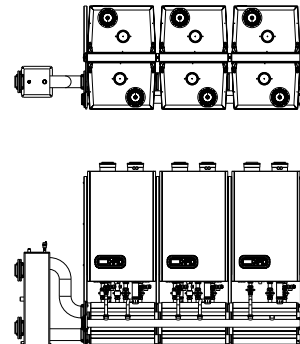
UPSILON CASCADE 4 BOILERS STANDING IN LINE



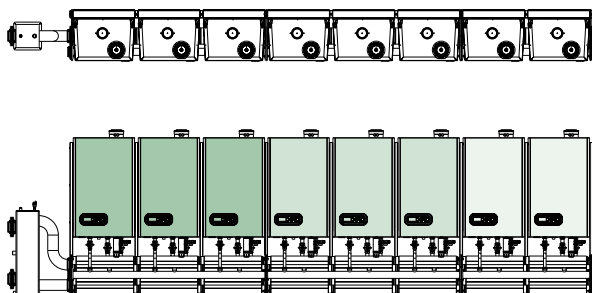
UPSILON CASCADE 6 BOILERS STANDING IN LINE



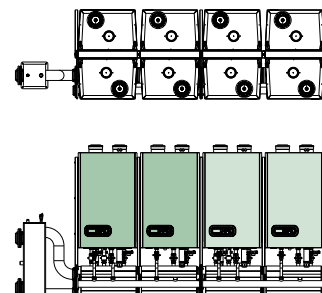
UPSILON CASCADE 6 BOILERS BACK-TO-BACK



UPSILON CASCADE 8 BOILERS STANDING IN LINE



UPSILON CASCADE 8 BOILERS BACK-TO-BACK



Upsilon

Cascade configurations

Based on the plug and play principle, the Upsilon cascade system is simple to install. The large number of available configurations make it possible to set the system up almost anywhere, either inside an existing building, or as part of a new build.

When delivering the system A.O. Smith provide a **full package** complete with everything you will need for installation. A hydraulic manifold connects the boiler support frames with the interconnecting pipework. Either a DN65 or DN100 low loss header will be supplied, depending on the installation. Optional insulation sets are available for the flow and return pipes.

The Upsilon cascade can be wall or frame-mounted. With frame mounting, the boilers can be placed back to back, or in a line. A.O. Smith will provide all parts required for mounting, including all parts needed to install and set up the cascade system.

The hydraulic systems are available in modules for 2 or 3 boilers fitted with double connections for back-to-back assemblies. Connection sets are fitted with gas flow valves, service valves, (with a connection for filling tap and emptying tap overflow), connections and return valves.

Each Upsilon boiler comes with a cascade manager as standard, making it easy to integrate all boilers in the system. Each boiler is fitted with a pump. No extra pumps are required in the primary circuit.

Upsilon cascade systems can be installed in variety of different layouts options. This flexibility allows the designer to **maximise available boiler room space**.

OPTIONS FOR UPSILON CASCADE CONFIGURATIONS

Heat output kW	OPTION 1			OPTION 2		
	Boiler type	Dimensions in line*	Dimensions back-to-back	Boiler type	Dimensions in line*	Dimensions back-to-back
		H x W x D	H x W x D		H x W x D	H x W x D
123	2 x UB 70	1715 x 1430 x 540				
185	3 x UB 70	1715 x 2130 x 540	1715 x 1430 x 1000	2 x UB 110	1715 x 1430 x 540	
247	4 x UB 70	1715 x 2830 x 540	1715 x 1430 x 1000	2 x UB 140	1715 x 1430 x 540	
309	5 x UB 70	1715 x 3530 x 540	1715 x 2130 x 1000	2 x UB 110 + 1 x UB 140	1715 x 2130 x 540	1715 x 1430 x 1000
370	6 x UB 70	1715 x 4230 x 540	1715 x 2130 x 1000	3 x UB 140	1715 x 2130 x 540	1715 x 1430 x 1000
432	7 x UB 70	1715 x 4930 x 540	1715 x 2830 x 1000	1 x UB 110 + 3 x UB 140	1715 x 2830 x 540	1715 x 1430 x 1000
494	8 x UB 70	1715 x 5630 x 540	1715 x 2830 x 1000	4 x UB 140	1715 x 2830 x 540	1715 x 1430 x 1000
194	2 x UB 110	1715 x 1430 x 540				
291	3 x UB 110	1715 x 2130 x 540	1715 x 1430 x 1000	1 x UB 70 + 2 x UB 140	1715 x 2130 x 540	1715 x 1430 x 1000
389	4 x UB 110	1715 x 2830 x 540	1715 x 1430 x 1000	1 x UB 70 + 3 x UB 140	1715 x 2830 x 540	1715 x 1430 x 1000
486	5 x UB 110	1715 x 3530 x 540	1715 x 2130 x 1000	4 x UB 140	1715 x 2830 x 540	1715 x 1430 x 1000
583	6 x UB 110	1715 x 4230 x 540	1715 x 2130 x 1000	1 x UB 110 + 4 x UB 140	1715 x 3530 x 540	1715 x 2130 x 1000
681	7 x UB 110	1715 x 4930 x 540	1715 x 2830 x 1000	1 x UB 70 + 5 x UB 140	1715 x 4230 x 540	1715 x 2130 x 1000
778	8 x UB 110	1715 x 5630 x 540	1715 x 2830 x 1000	1 x UB 70 + 6 x UB 140	1715 x 4930 x 540	1715 x 2830 x 1000
246	2 x UB 140	1715 x 1430 x 540				
369	3 x UB 140	1715 x 2130 x 540	1715 x 1430 x 1000			
492	4 x UB 140	1715 x 2830 x 540	1715 x 1430 x 1000			
615	5 x UB 140	1715 x 3530 x 540	1715 x 2130 x 1000			
738	6 x UB 140	1715 x 4230 x 540	1715 x 2130 x 1000			
861	7 x UB 140	1715 x 4930 x 540	1715 x 2830 x 1000			
984	8 x UB 140	1715 x 5630 x 540	1715 x 2830 x 1000			

* Width is excl. low loss header



LOW LOSS HEADER CONFIGURATIONS

A low loss header is always part of a cascade configuration. Selecting the relevant model is dependent on the capacity of the installation. A.O. Smith delivers a DN65 low loss header capable of up to 452 kW, and a DN100 low loss header up to 960 kW.

The header can be placed on the right or left-hand side of the cascade system. Usually the header is placed in line with the system. If required, the low loss header can be placed in a forward or backward angle of 90°. A set of bends is available for this option.



LOW LOSS HEADERS

Low loss headers come standard with adjustable feet, automatic air vent, assembly materials, drain valve, pocket for temperature sensor and a connection for a water pressure gauge or temperature sensor.

0310272	Low loss header DN65 to 452kW
0310273	Low loss header DN100 to 960kW



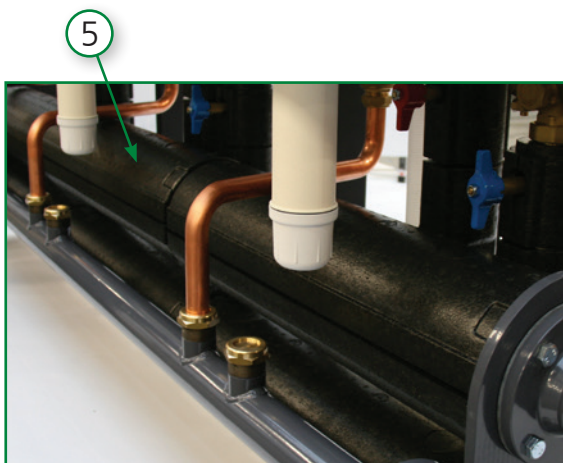
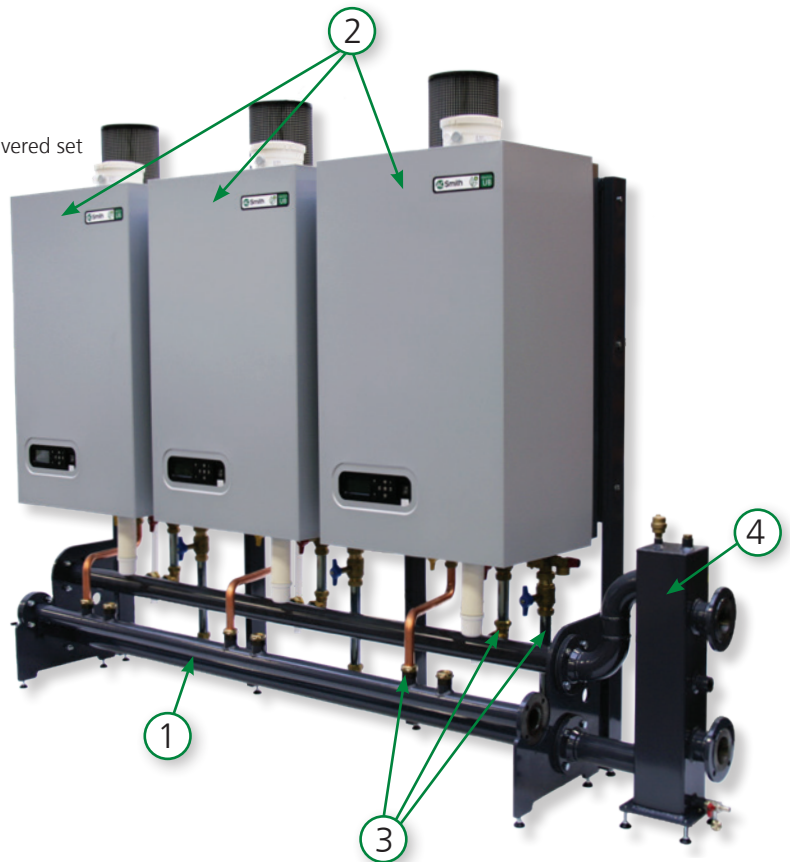
BENDS SET

The low loss header can be positioned at a 90° angle. A set of bends may be used for that purpose.

0310274	Bends set DN65 flow/return
0310275	Bends set DN100 flow/return

EASY ASSEMBLY

- ① Level the hydraulic group, gas line and build frame
- ② Hang the boilers
- ③ Connect the boilers to the hydraulics with the standard delivered set
- ④ Add your low loss header and secondary circuit
- ⑤ If required, insulate hydraulic group



INSULATION MATERIAL

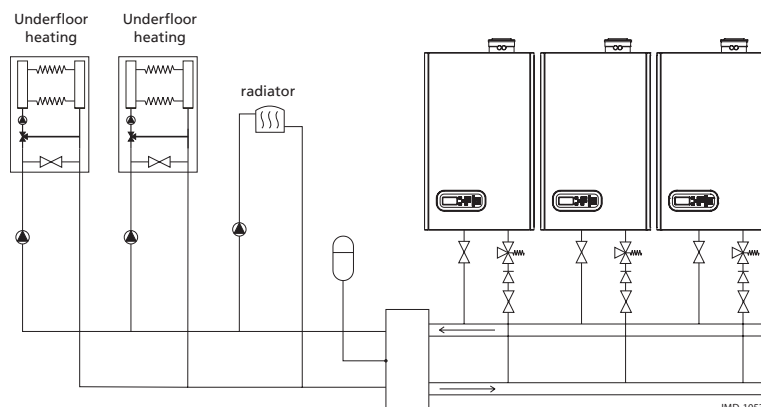
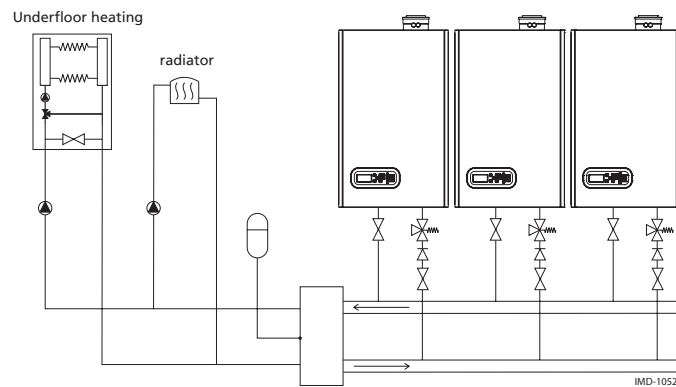
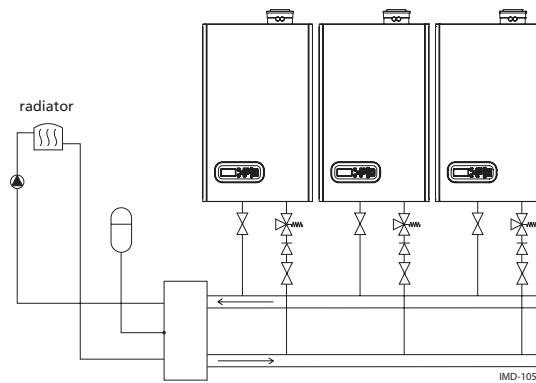


APPLICATIONS

The Upsilon cascade system can support several different requirements. The system can be used for central heating, through radiators, or for underfloor heating. It's also possible to provide hot water for both central heating and underfloor heating using a combined configuration. In this set-up, another low-temperature source can also be added to the configuration.

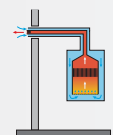
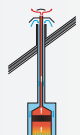
Instead of using a low loss header, it is also possible to use a plate heat exchanger. In this configuration, a closed circuit between the cascade system and the plate heat exchanger is created. This allows the system to continue to operate, regardless of very low or very high pressure in the secondary circuit.

The diagrams below demonstrate several optional uses of the Upsilon cascade system. To find the configuration suited to your exact needs, please contact your local sales engineer.



Water heaters

Flue gas exhaust options

	B23 	C11 - C13 	C31 - C33 	C43 	C53 	C83 
BFC Cyclone*	B23 single	C13 parallel/ concentric	C33 parallel/ concentric	C43 parallel/ concentric	C53 parallel	-
BFM 30/50/80		C13 concentric	C33 concentric			-
BFM 100/120		C13 parallel with concentric terminal	C33 parallel			
INNOVO*	B23 single	C13 parallel/ concentric	C33 parallel/ concentric	C43 parallel/ concentric	C53 parallel	-
TWISTER II*	B23 single	C13 parallel/ concentric	C33 parallel/ concentric	C43 parallel/ concentric	C53 parallel	-
SGE*	B23 single	C13 parallel/ concentric	C33 parallel/ concentric	C43 parallel/ concentric	C53 parallel	-
SGS*	B23 single	C13 parallel/ concentric	C33 parallel/ concentric	C43 parallel/ concentric	C53 parallel	-

* BFC Cyclone, Inno, SGE, SGS and Twister have also been certified for systems where the flue material is not supplied with the water heater (C63).
Note: a horizontal pipe must be installed under a slope of 5 cm per metre of pipe towards the system.



AIR SUPPLY AND GAS EXHAUST OPTIONS

All atmospheric water heaters (AMD, ADMP, BTI, COF, EQH) must be installed in accordance with local regulations and the ventilation rules (category B11BS).

The flue gas shown is part of a room-sealed system.



High-efficiency condensing boilers

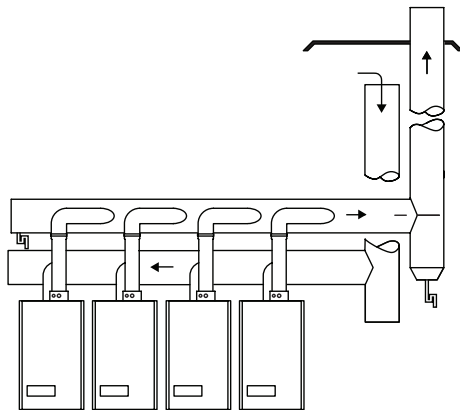
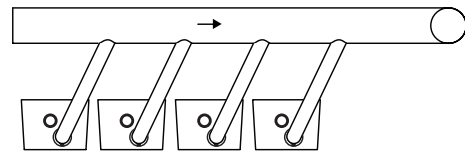
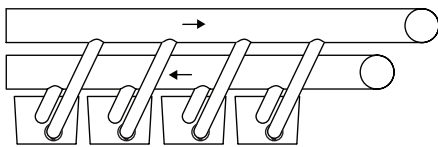
Flue options

Flue options

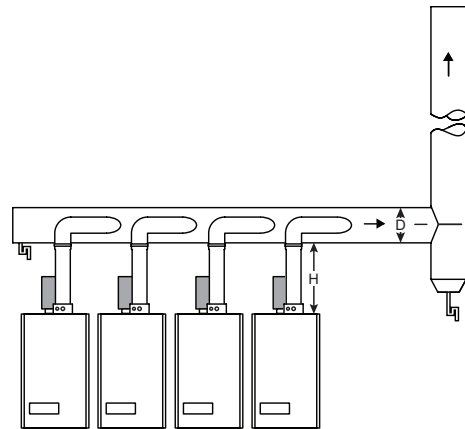
Upsilon boilers can be installed in an 'open' or 'closed' configuration. The relevant flue categories are; B23, B33, C13, C33, C43, C53, C63, C83 and C93. Both concentric and parallel connections are possible.

Three different flue configurations can be applied to the UB boiler:

- Individual flue
- Collective flue, negative pressure
- Collective flue, positive pressure



CLOSED MODEL



OPEN MODEL



Benefits

Rewards for sustainability

Both homeowners as businesses can benefit from incentives stimulating the use of high-efficiency (renewable) technology.

1. SEIA - Solar thermal for homeowners

Heating your water with solar thermal will reduce your energy consumption and cut down on greenhouse gas emission.

Who can apply ?

All homeowners, including landlords, whose homes were built and occupied before 2006 can apply. Homes built from 2006 onwards should have been constructed to the 2003 Building Regulations and should not need significant upgrades. This is defined as the date of the electricity meter is installed.

Grant value

€ 1200

More information can be found at the following website:
www.seai.ie/grants/home-grants

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2. SEIA - Project Assistance Grants for businesses

Businesses and public sector bodies seeking to develop energy-saving projects can apply for Project Assistance Grants. The aim is to reduce energy costs significantly and build good procurement practices.

Who can apply ?

Both private and public sectors, including buildings, industry, commercial applications, transport and utility services may apply.

Grant value

The funding level depends on the project type.

More information can be found at the following website:
www.seai.ie/grants/business-grants/project-assistance-grants

3. Home Renovation Incentive

The Home Renovation Incentive is a relief from Income Tax for homeowners, landlords and local authority tenants. You can claim the HRI Tax Credit for renovations and improvements to your home or rental property, such as plumbing and bathroom upgrades.

Grant value

The HRI allows you to claim a tax credit of 13.5% of the total cost of the work.

More information can be found at the following website:

<https://www.revenue.ie/en/property/home-renovation-incentive>





Quality

Superior product quality and complete customer satisfaction are the A.O. Smith promise.

Certificates

All of our products are CE certified for the total European market, and meet the European RoHS, WEEE and PED Directives.

The manufacturing processes that deliver our products meet established quality standards such as ISO 9001:2008. As an international company with a presence across the globe, we are careful to meet local requirements and standards. This includes collecting certificates needed to meet the criteria for local incentive programs.

Development and production processes

Innovation and product quality are at the heart of everything we do. One of the first manufacturers to introduce the condensing water heater, A.O. Smith has built a deserved reputation for pioneering technology and setting new standards in the water heater industry.



3D DESIGN

Using advanced 3D modelling software, our development department is able to create bespoke designs for highly individual projects.

Customer satisfaction and support

Customer service

A.O. Smith products are made to deliver maximum efficiency and lasting comfort for our customers. Delivering on that ambition means making sure those products continue to perform perfectly. A.O. Smith promise customer satisfaction throughout the entire life cycle of our products, from initial consultation during the purchasing process to aftersales support. We offer a suite of available services to make sure you are supported at every stage of the process.

System design

Before making a purchase decision, we can help you find the products, and design the configuration that will offer the most efficient solution for your particular needs.

Technical and commercial advice

Using the existing building specifications, we can provide technical and commercial advice to help you find the very best hot water solution. We guarantee an ideal solution for every different project.

Commissioning

Once installed, our commissioning service will help you get the very best out of your system. We will help you programme the system to deliver optimum levels of comfort and energy efficiency.

Gas and waterside maintenance

To get the longest lifespan possible from your system, and to sustain perfect performance, A.O. Smith recommend gas and waterside maintenance on an annual basis. Our maintenance team will check on every aspect of the system to let you enjoy a problem-free hot water solution year after year.

Effective descaling with Dscale

Descaling your water heater will extend the working life of the system, and ensure that the heating process and energy savings are optimized. To remove limescale effectively A.O. Smith developed their own powerful descaling product. Safe and easy to use, Dscale is made using natural, biodegradable acids.

For detailed instructions on descaling visit www.aosmith.co.uk.

Service

Can we help with a question? Would you like to place an order? Our friendly and informed Customer Service team, and our 24/7 Technical Support Group are always on hand to help with anything you might need. The experienced team can help you resolve faults, and send technical support to your location.

If you would like more detailed information about our services and maintenance, why not make an appointment? To book, get in touch with our team using the contact details below.



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At A.O. Smith, we believe contact should be personal.
That's why our dedicated Customer Service Team are available at all times to help.



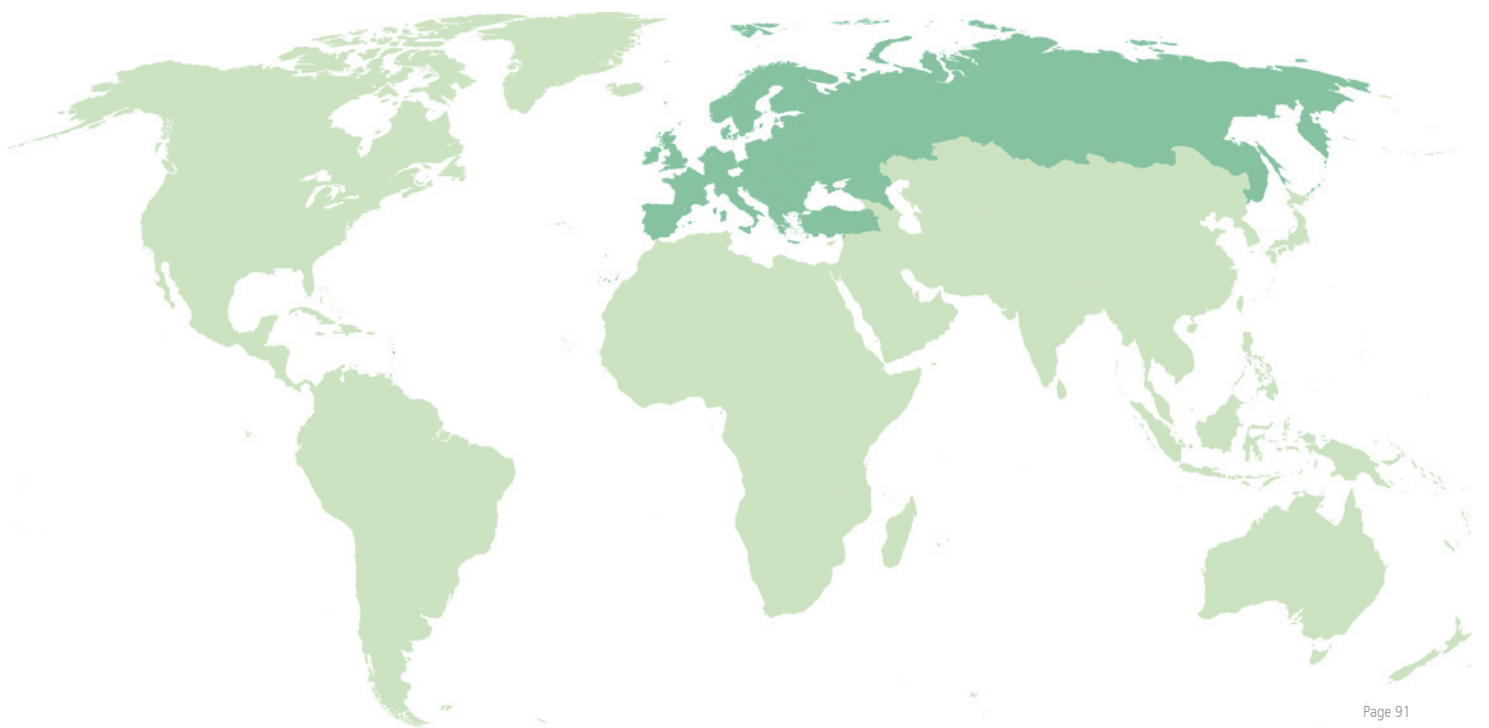
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A.O. Smith Water Product Company Europe

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