

EFG ENERGY OPTIMISING SYSTEMS

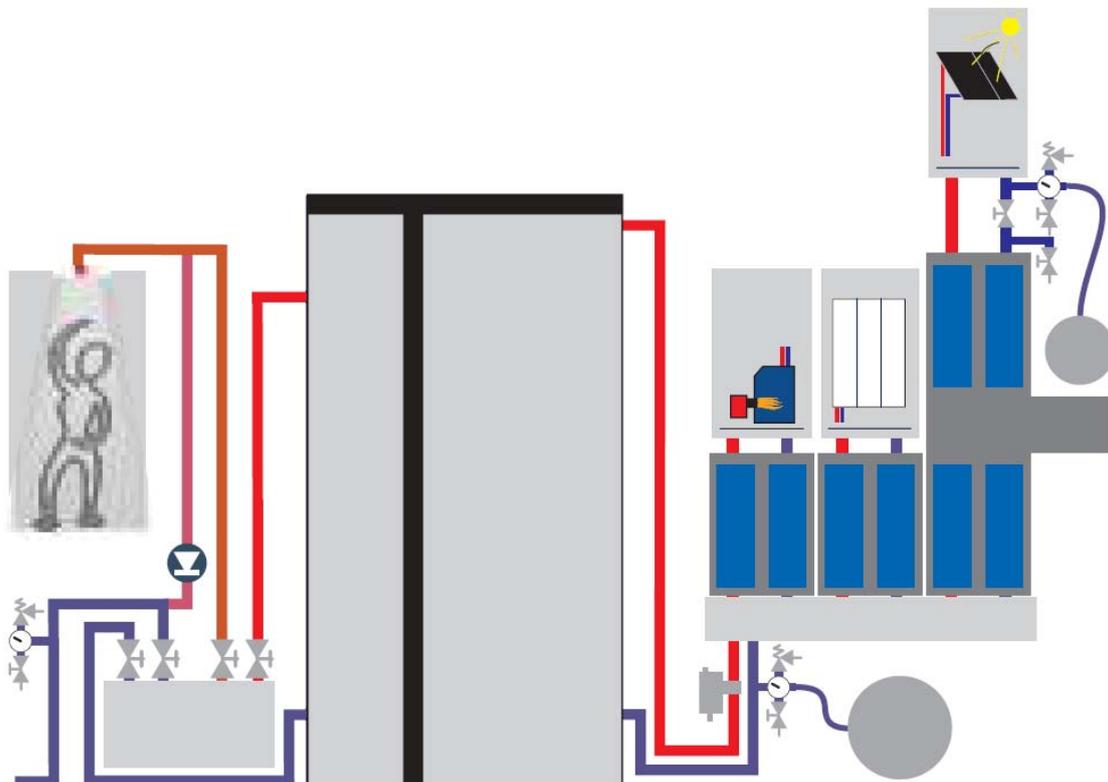
High-performance energy control systems for maximum performance from solar collectors and other renewable and non-renewable heat sources

Maximum comfort, minimum energy costs

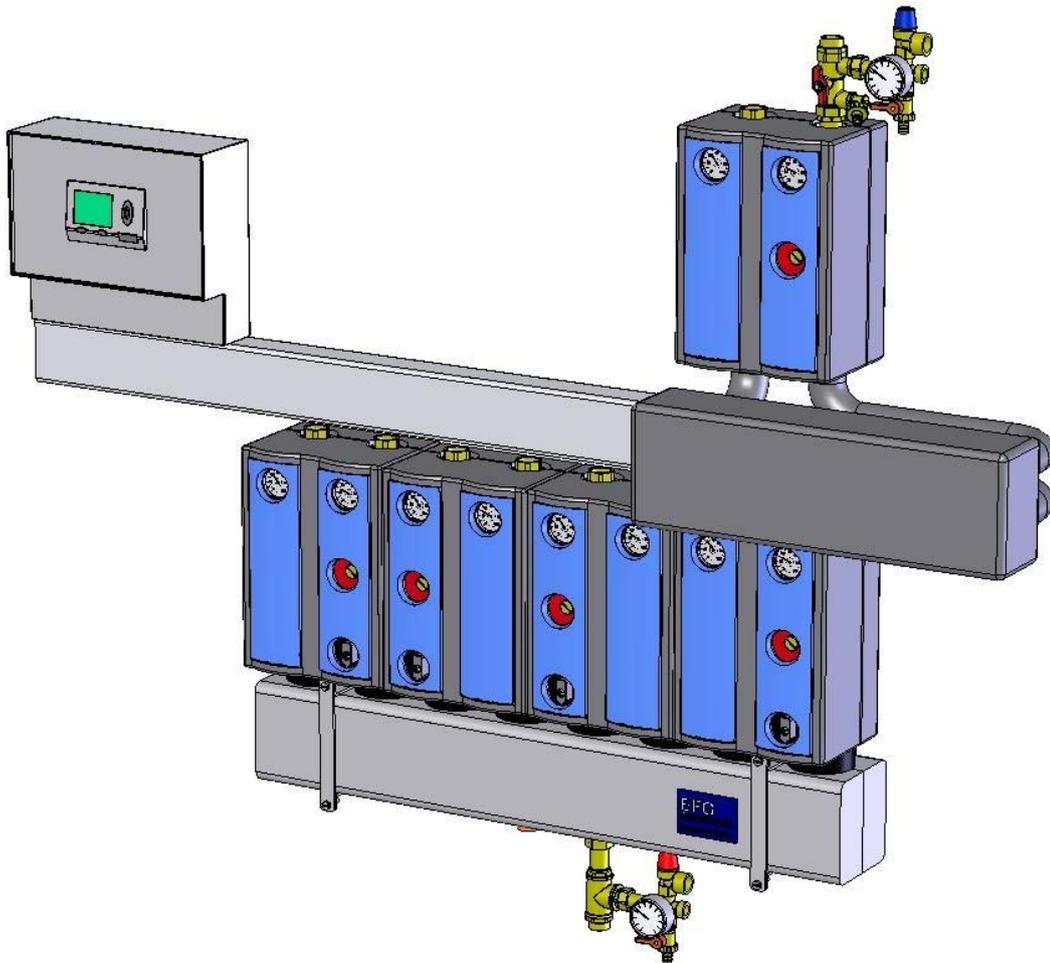
Around 85% of domestic energy consumption is for water and space heating. With gas, electricity and oil prices rising increasingly steeply, a state-of-the-art EFG Energy Optimising System from Construction Resources can make large savings on energy costs and at the same time improve comfort. These savings will apply for any fuel, but they will be multiplied if solar collectors are included in the system, and even more if low-temperature in-wall and under-floor heating is used instead of radiators.

An EFG system is modular and consists of a number of components:

- a stratifying heat store
- a module that produces domestic hot water
- one or two modules that distribute central heating around the building
- one or more modules to bring in heat from up to 3 heat sources
- a wall-mounted system manifold on which these modules are fitted
- a user-programmable computer-based controller that links all these components together and regulates their operation.



EFG Energy Optimising Systems are flexible and completely modular. Fully factory assembled, pre-wired and pre-tested, they are reliable, durable, and “plug and play” - exceptionally easy to install. They will maximise the effectiveness of any type of heat source, whether renewable or non-renewable, and will optimise the production of domestic hot water and the distribution of any form of central heating.



Make sure that you gain the super-high performance that EFG systems and Consumers Association-top-rated Azur solar collectors will bring you. Azur collectors are approved for the LCBP (Low Carbon Buildings Programme) grant scheme. Current grant levels for England and Wales are £400 for any solar-thermal installation and £1500 for a wood-fired boiler, but grant levels are higher in Scotland and Northern Ireland. A special low rate of VAT – 5% instead of 17.5% - applies to installed systems using renewable energy. Regrettably, DIY installations are not eligible: for components only, the standard VAT rate applies.

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THE EFG SPEEDPOWER STRATIFYING HEAT STORE

The core of an EFG system is a SpeedPower stratifying heat store. This is a very well insulated steel cylinder, big enough to store all the heat that solar collectors can produce. It also acts as the central store for heat produced by any other heat source attached to the system, whether running on renewable or non-renewable energy.

The heat store contains only heating water. Its patented stratifying input system ensures that the hottest water is fed into the top zone of the store – to generate domestic hot water on demand – and is not simply swirled together with the lower-temperature water lower down.

Keeping the stored water stratified by temperature is central to the performance of the system. Also important is keeping the water hot as long as possible – long enough to cover 2 or 3 days without sunshine. The SpeedPower heat stores are fitted with a 100mm layer of super-performing melamine-resin insulation, which is 40% more effective than 100mm of standard insulation.

Attached to the outside of the cylinder at different heights underneath the insulating cover are 4 heat sensors. These constantly communicate the water temperature in different zones of the heat store to the system controller.

SpeedPower heat stores come in 3 standard models for normal domestic use: **SPS 800**, **SPS 900**, and **SPS 1000**, with capacities of 800, 900 and 1000 litres respectively. Multiple heat stores can be connected together in parallel if greater capacity is required. Larger single heat stores are also available to special order for bigger installations in buildings such as hotels, sports centres, offices, etc.

The standard heat stores are all 990mm in diameter including insulation, so for installation they need an opening at least 790mm wide. The insulation cover is clipped on once the cylinder is in position. The 3 models are 1900mm, 2070mm and 2210mm high, and stand on the floor. All inlet and outlet pipes are aligned on one side of the cylinder to allow an easy, tidy installation.

An expansion vessel must be fitted to the heat store, with 1/10th of its capacity.

Prices excluding VAT

SPS 800	including 100mm melamine-resin insulation	£ 2213.00
SPS900	including 100mm melamine-resin insulation	£ 2313.00
SPS1000	including 100mm melamine-resin insulation	£ 2421.00

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THE EFG DOMESTIC HOT WATER MODULE

For maximum user comfort and safety the **EFG domestic hot water module** generates hot water instantly, at a constant flow rate and at a constant temperature chosen by the user. Since the module operates at mains pressure, no expensive booster pumps are needed for showers or baths.

No domestic hot water is stored in an EFG system. Instead, a modulating pump and a high-efficiency stainless steel plate heat exchanger inside this module produce hot water only when required. When a hot tap is opened, fresh cold water from the main is pumped through the module's heat exchanger, where it is instantly heated by hot heating water pumped from the top of the heat store.

The top 250-litre zone of the SpeedPower stratifying heat store is maintained by the system controller at whatever temperature is required to generate the domestic hot water. The system controller minimises the use of non-renewable energy by only switching on a back-up heat source (a gas condensing boiler, for example) if there is not enough solar or other renewable heat stored at the temperature needed to generate the domestic hot water.

To minimise energy use, the user can set different hot water temperatures for different times – for example 55°C from 6am to 11pm, but otherwise only 35°C.

An important special feature of the EFG domestic hot water module is protection against legionnaires' disease. Legionella bacteria multiply in water stored at between 20°C and 50°C, in such areas as domestic hot water systems and cooling towers. They are transmitted via aerosols - the inhalation of mist droplets containing the bacteria. Some people die from legionnaires' disease in Britain each year, and many others suffer serious adverse health effects: the elderly and people with a compromised immune system are particularly at risk.

By not storing any domestic hot water and producing it only instantly on demand, from fresh mains water, the EFG system removes any risk of legionella infection. In other systems where domestic hot water **is** stored, it needs to have the risk of legionella eliminated by expensively heating the whole cylinder to between 70 and 80°C (158 to 176°F) to disinfect it.

To avoid any risk of lime-scale building up in the heat exchanger, the EFG domestic hot water module is positioned on the floor. This means that after each heating cycle fresh cold water flows into the heat exchanger, protecting the plates from the risk of scaling if left standing in hot water.

Prices excluding VAT

WWM-S 20	20 litres per minute continuous output	£ 1549.00
WWM-S 30	20 litres per minute continuous output	£ 1661.00
WWM-S 40	20 litres per minute continuous output	£ 1917.00

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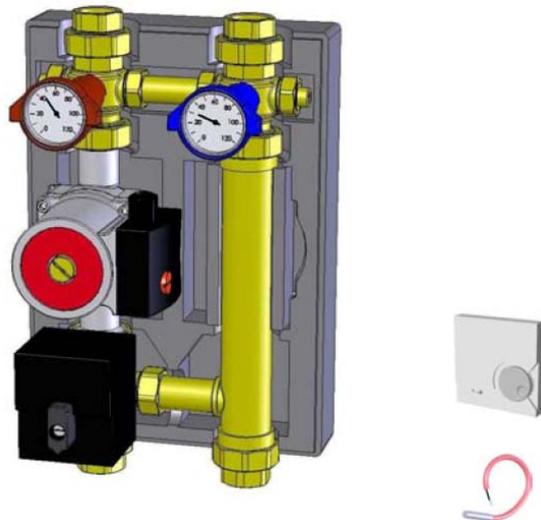
THE EFG HEAT OUTPUT MODULE

The **EFG heat output module** takes heat from the SpeedPower heat store, mixes it to the correct temperature, then pumps it around a central heating circuit. It is designed for quick and easy installation and reliable operation.

This universal output module can supply heat at any temperature required to any form of heat emitter, whether in-wall radiant heating, under-floor heating, skirting heating, ducted channel heating or conventional radiators. It can also distribute heated water to a pool or jacuzzi.

When required, it can also distribute cool water to a ceiling cooling system, or a wall heating system switched to cooling during summer. Other applications include feeding a drying installation, a heat or cool store, an air heating system, or a soil-warming system in a greenhouse.

The heat output module contains a modular circulation pump, a special 3-way mixing valve, a motorised valve with 2-minute opening and closing time, 2 shut-off ball valves with integrated thermometer gauges, a compact pipe-work system, and connectors for direct mounting onto an EFG wall-mounted system manifold.



The module comes fully assembled, wired and factory-tested in a two-part insulating cover.

Flow and return temperature sensors are ready-mounted inside the module. Pump and mixer valve power cables and both temperature sensor cables are terminated with the appropriate plug to fit directly into the right socket on the system controller. All cables are 7 metres long. An adjustable thermostatic room control for wall mounting is supplied with the module.

The EFG heat output module is available with 4 different maximum output ratings: up to 25kW, 40kW, 60kW, or 80kW.

Prices excluding VAT

WAM-E-25	up to 25kW	£ 598.00
WAM-E-40	up to 40kW	£ 606.00
WAM-E-60	up to 60kW	£ 693.00
WAM-E-80	up to 80kW	£ 704.00

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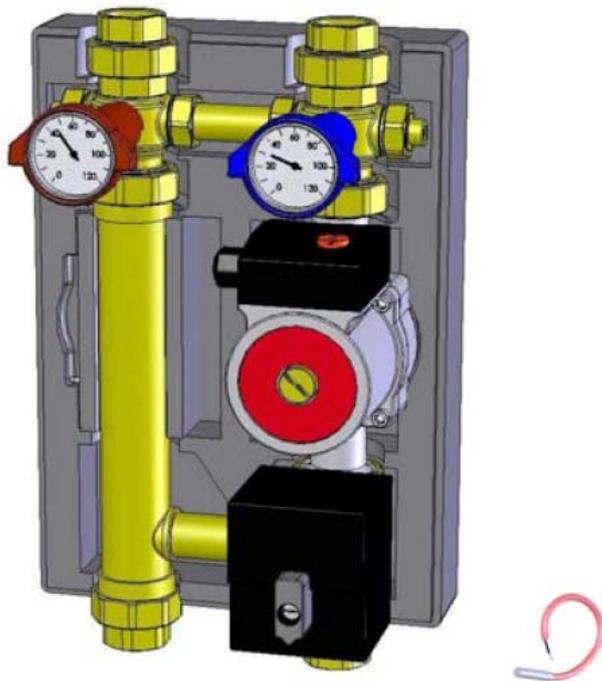
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THE EFG HEAT INPUT MODULE

The **EFG heat input module** feeds heat into the SpeedPower stratifying heat store. It is designed for quick and easy installation and reliable operation.

This universal heat input module can make the connection between the heat store and any type of heat source, whether wood, gas, oil or solid-fuel boiler, fireplace or stove back-burner, heat-recovery ventilation system, heat pump or combined heat and power CHP system. Boilers may be with or without return circuit boosting.



The module contains a modular circulation pump, a special 3-way mixing valve, a motorised valve with 2-minute opening and closing time, 2 shut-off ball valves with integrated thermometer gauges, a compact pipework system, and connectors for direct mounting onto an EFG wall-mounted system manifold.

This heat input module is fully assembled, wired and mounted in a 2-part removable insulated cover. It is tested hydraulically and electrically in the factory.

A return temperature sensor is ready-mounted inside the module, and an operating temperature sensor is supplied for reading the internal temperature of the heat source. Pump and mixer valve power cables and both temperature sensor cables are terminated with the appropriate plug to fit directly into the right socket on the system controller. All cables are 7 metres long.

The EFG heat input module is available with 4 different output ratings: 25kW, 40kW, 60kW, 80kW.

Prices excluding VAT

WEM-E 25	up to 25 kW	£ 598.00
WEM-E 40	up to 40 kW	£ 608.00
WEM-E 60	up to 60 kW	£ 693.00
WEM-E 80	up to 80 kW	£ 705.00

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THE EFG SOLAR HEAT MODULE

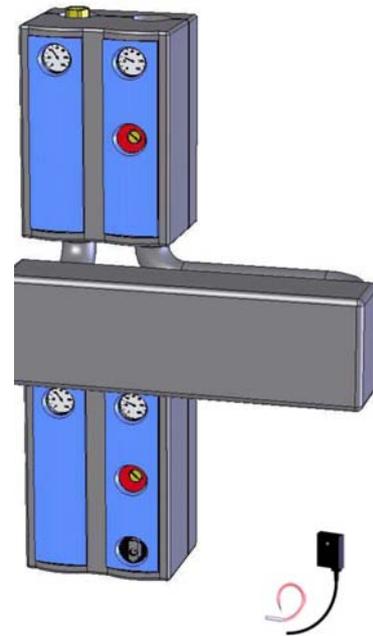
The **EFG solar heat module** feeds heat into the SpeedPower heat store from an array of solar collectors of up to 80 square metres. It is designed for quick and easy installation and reliable operation.

The water pumped through the solar collectors needs to contain anti-freeze in case of low winter temperatures, so it has to be kept in a closed circuit. The solar heat module contains a high-efficiency flat plate heat exchanger which transfers the solar heat from this closed circuit to cooler water pumped in from the SpeedPower heat store.

The module is made up of 3 insulated sections, supplied fully assembled and factory tested for direct mounting onto the EFG wall-mounted system manifold. The upper section contains the circulation pump and flow and return temperature gauges for the solar circuit.

The middle section contains the stainless-steel flat-plate heat exchanger.

The lower section is identical to the EFG heat source module, and contains a modulating circulation pump, a special 3-way mixing valve, a motorised mixing valve with 2-minute opening and closing time, 2 shut-off ball valves with integrated thermometer gauges and compact pipe assembly.



The solar heat module comes fully wired and electrically tested. As well as the ready-mounted flow temperature sensor, a solar radiation sensor is also included for outdoor mounting, to display the current solar intensity. Power and sensor cables are 7 metres long.

A safety, isolation and flushing kit operating at 3 bar is included as standard with this module. This includes a connector for the high-temperature expansion vessel (not included) which is required for the solar circuit. A 6 bar version of this kit is also optionally available.

Prices excluding VAT

WTM-E-15	up to 15kW	£ 1563.00
WTM-E-25	up to 25kW	£ 1640.00
WTM-E-40	up to 40kW	£ 1733.00
WTM-E-60	up to 60kW	£ 1843.00

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EFG SYSTEM CONTROLLERS

EFG system controllers are computer-based units which provide weather-compensated regulation for EFG domestic hot water and central heating systems and allow user and installer programming of all system parameters.

All the temperature sensors in the system plug into the controller, and it regulates all power output to pumps and valves. If there is a boiler in the system that can be switched on and off, it is the system controller which will do the switching.

The user interface display panel on the controller allows the user to change any of the default settings in the controller for of variable operating times and temperatures for the components in the system.

As with all other elements of the EFG system, the controller is set up to give maximum ease and reliability of installation. All sensor cables from the EFG system modules are pre-fitted with individually numbered plugs which fit into the correspondingly numbered sockets on the controller.

System controllers are available for a range of different heat sources, and one or 2 central heating circuits. The heat sources fall into 3 categories, indicated by a letter in the table below: solar (S), regulatable (R) or non-regulatable (N).

Controller N-1S	non-switchable boiler +solar +1 heating circuit
Controller N-2S	non-switchable boiler +solar +2 heating circuits
Controller R-1S	switchable boiler +solar +1 heating circuit
Controller R-2S	switchable boiler +solar +2 heating circuits
Controller R-1	switchable boiler + 1heating circuit
Controller RN-1S	switchable boiler +non-switchable boiler +solar +1 heating circuit
Controller RN-2	switchable boiler +non-switchable boiler +2 heating circuits

Prices excluding VAT

Standard price for all RMS contoller variants

£ 1409.00

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THE EFG SYSTEM MANIFOLD

The **EFG system manifold** is mounted on the wall to allow fast, clean and professional installation of an EFG heating system.

The 4 different manifold sizes allow from 2 to 5 EFG system modules to be connected directly to the upper system connectors, and a SpeedPower stratifying heat store to the lower system connectors.

The system manifold consists of 2 thermally separated steel distribution channels. Non-contiguous pipes, each with aluminium-encased polyurethane insulation, are fed through to the appropriate channel from the flow and return connectors. 2 strong mounting brackets (supplied with all fixings) allow the manifold to be securely fixed to the wall.

The manifold is pressure-tested in the factory. Internally it is untreated, externally it is coated.

EFG System manifold dimensions:

	<i>Number of modules</i>	<i>width mm</i>	<i>height mm</i>	<i>depth mm</i>
SV-2	2	500	160	160
SV-3	3	750	160	160
SV-4	4	1000	160	160
SV-5	5	1250	160	160

Prices excluding VAT

SV-2	system manifold for 2 modules + heat store	£ 487.00
SV-3	system manifold for 3 modules + heat store	£ 527.00
SV-4	system manifold for 4 modules + heat store	£ 580.00
SV-5	system manifold for 5 modules + heat store	£ 630.00

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