

SIDESTREAM FILTRATION

CHW & LTHW · MTHW · Pre-Commission Cleaning · Glycol Water Mix

www.sigafiltration.co.uk

WHAT IS A SIDESTREAM FILTER?

A sidestream filter is a small filtration loop installed in parallel with a closed-loop heating or cooling circuit. It removes the suspended solids that accumulate over the operating life of the system — magnetite from ongoing corrosion, residual installation debris, scale, biofilm fragments, and breakdown products of water treatment chemistry — and protects the pipework, pumps, plate heat exchangers, control valves and downstream plant from premature wear and fouling.

Sidestream filtration complements rather than replaces a managed water treatment programme. BSRIA BG 50 Water Treatment for Closed Heating and Cooling Systems sets out the chemistry side; BSRIA BG 29/2021 Pre-Commission Cleaning of Pipework Systems recommends that a sidestream filter is installed to protect and prolong system life expectancy.

HOW DOES SIDESTREAM FILTRATION WORK?

A small fraction of the circulating system volume is diverted through the sidestream filter and returned to the loop. Sized correctly, this allows the entire system inventory to pass through the filter two to three times every 24 hours without imposing a full-flow pressure drop on the primary plant. The sidestream loop can be isolated for filter maintenance without interrupting normal operation of the main circuit.

WHY FILTER A CLOSED LOOP?

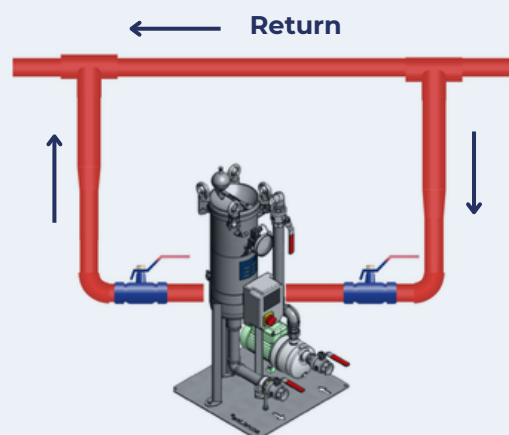
The textbook view of a closed loop is that contamination should be self-limiting: fill once with treated water, run indefinitely. Real systems do not behave this way.

Suspended particles erode pump seals, foul plate heat exchangers, jam control valves and DPCVs, blind off chiller evaporators, and shield biofilm from biocide. Without a sidestream filter, the water treatment chemistry is asked to do a job it was never designed for. Without the chemistry, the filter loads up faster than it should. The two work together.

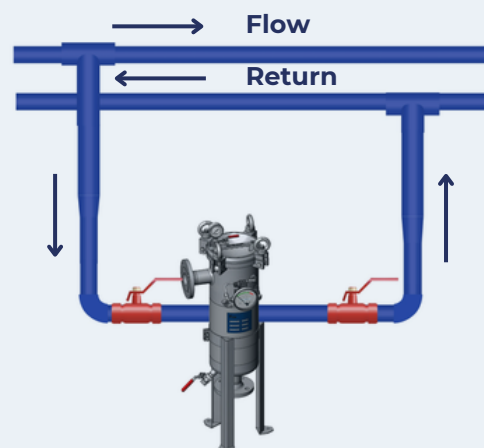


TYPICAL INSTALLATION

FLOWStream **With Pump**



FLUXStream **Without Pump**



WHERE SIDESTREAM FILTRATION IS USED

Siga sidestream filters are installed on four main types of closed-loop circuit. Each has a dedicated application page on our website with detailed selection guidance.

CHW & LTHW Circuits (chilled water 6–12°C, low-temperature hot water up to 85°C). Standard 304/316L stainless steel housings, EPDM seals, polypropylene felt bags and PP cartridges all suitable. Magnetite is the dominant contaminant, with biological fines a secondary concern on CHW.

MTHW Circuits (medium-temperature hot water, 95–120°C). Standard polypropylene media and plastic-collar bags are not suitable at these temperatures. Polyester felt with stainless steel snap rings or sewn-on flanges is required, and seal materials should be confirmed for the specific operating temperature.

Pre-Commission Cleaning (BSRIA BG 29/2021). High-velocity dynamic flushing of new installations to achieve handover cleanliness criteria. Mobile or skid-mounted bag filter rigs with progressive micron staging — typically 50µm reducing to 5µm as the system cleans up — reduce the volume of water sent to drain and accelerate the cleaning sequence.

Glycol Water Mix Circuits (typically 20–50% ethylene or propylene glycol). Used for freeze protection on chilled water systems with outdoor plant, ground source heat pumps, ice rinks, food and pharmaceutical process chillers, and data centre cooling. Higher viscosity affects filter sizing; glycol degradation produces black sludge distinct from magnetite and may indicate inhibitor depletion.

SIZING A SIDESTREAM FILTER

Sidestream filters are sized to deliver a target number of system turnovers per unit time. **For ongoing sidestream duty, the standard target is 2 to 3 system turnovers every 24 hours** — sufficient to keep the suspended solids load under control without imposing unnecessary parasitic load on the primary plant. Heavily contaminated retrofits and remedial cleaning duty may justify higher turnover rates for an initial polishing period.

The required sidestream flow rate is calculated from total system volume and target turnover:

$$\text{Sidestream flow rate (L/h)} = \frac{\text{Total system volume (L)} \times \text{Target turnovers per 24 h}}{24}$$

Primary circulating flow rate is not used as the sizing input. Primary flow is set by the heating or cooling duty divided by design ΔT , while system volume is set by pipework, plant and emitter selection — the two are independent. Sizing the sidestream from primary flow gives different turnover rates across otherwise similar projects and is not reliable.

Sizing inputs. The primary input is total system volume — calculated from M&E drawings as the sum of pipework volume, plant volume (boilers, chillers, heat exchangers, buffer vessels, expansion vessels) and emitter volume. Where actual volume is not readily available, an estimate based on installed boiler or chiller capacity at approximately 20 L/kW is a reasonable starting point for typical UK building services applications. The kW estimate is a useful fallback rather than a primary sizing tool: the relationship between installed capacity and system volume varies considerably across district heating networks, heat pump systems with buffer tanks, data centre cooling loops and industrial process applications, where actual volume is often substantially higher than 20 L/kW would suggest. Where the application falls outside conventional commercial HVAC, work from actual volume.

WORKED EXAMPLE**

Parameter	Value
Total System Volume	50,000 L
Design Target	2 - 3 SYSTEM TURNOVERS PER 24 HOURS
Required Sidestream Flow rate	4,200 to 6,250 L/h
Recommended model	FLS-5 or FLX-5 (5,000 L/h → 2.4 turnovers per 24 h)

SIZING A SIDESTREAM FILTER**

Example

Total system volume: 50,000 L
Required Flow rate: 4,200 - 6,250 L/h
Selected model FLS-5 or FLX-5

Total System Volume
= 50,000L



Sidestream flow rate = Total system volume (L) × target turnovers per 24 h (2 or 3) ÷ 24

Typical Target Turnovers: 2 - 3

FLOWSTREAM FLS – INTEGRATED UNIT WITH PUMP



PLUG & PLAY UNIT

What's Included:

- Integrated pump
- Filter Housing
- Blocked filter signal to BMS at 90% blockage
- Pump trip at 100% blockage (safety feature)
- Hard piped differential pressure gauge to indicate blocked filters
- Automatic Air Vent (AAV)
- Drain valve
- Mounted on platform

Suitable for:

- Designed for projects where a dedicated sidestream pump is required rather than relying on existing primary circuit capacity.
- The filter operates independently of the primary circuit pressure regime, which makes the FLS straightforward to retrofit on existing systems.

Typical Installation:

Both filter inlet and outlet connect to the system return line. The integrated pump draws water from the return, passes it through the filter and returns it to the same return line. (See Page 1 for schematic)

Compatible Filter Media:

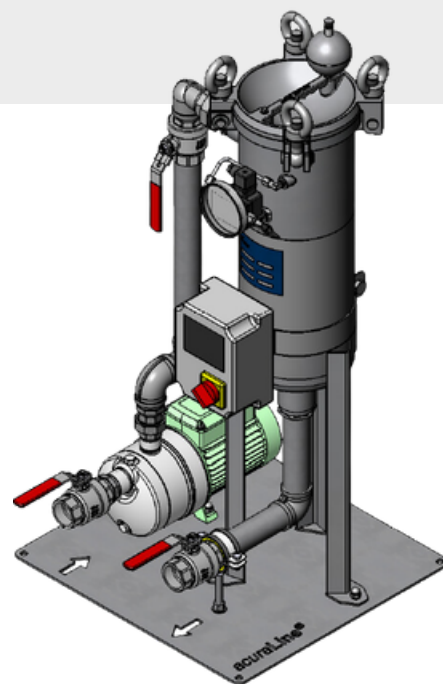
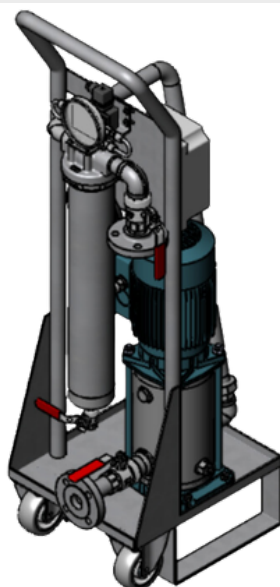
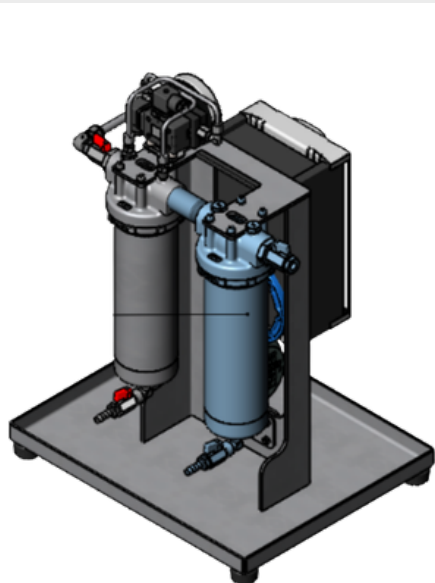
FLS-0.2 & FLS-0.5: 10" CLARISpun A filter element

FLS-1: 20" CLARISpun A filter element

FLS-5 & FLS-7: CLARIBag filter bag or acuraPleat high efficiency element Size 1

FLS-15 & FLS-30: CLARIBag filter bag or acuraPleat high efficiency element Size 2

Magnets: Optional on all models except for FLS-1



Model	System volume	Flow rate	Boiler/chiller rating (see note)	Pump voltage
FLS-0.2	up to 2,000 L	200 L/h	up to 100 kW	230 VAC
FLS-0.5	up to 5,000 L	500 L/h	up to 250 kW	230 VAC
FLS-1	up to 10,000 L	1,000 L/h	up to 500 kW	230 VAC
FLS-5	up to 50,000 L	5,000 L/h	up to 2,500 kW	230 VAC
FLS-7	up to 70,000 L	7,000 L/h	up to 3,500 kW	230 VAC
FLS-15	up to 150,000 L	15,000 L/h	up to 7,500 kW	400 VAC
FLS-30	up to 300,000 L	30,000 L/h	up to 15,000 kW	400 VAC

FLUXSTREAM FLX – FILTER WITHOUT PUMP



FULLY ASSEMBLED

What's Included:

- Filter Housing (without pump)
- Blocked filter signal to BMS
- Hard piped differential pressure gauge to indicate blocked filters
- Automatic Air Vent (AAV)
- Drain valve
- Mounted Bracket or adjustable legs depending on model

Suitable for:

- Installations where the system's existing flow-to-return pressure differential is sufficient to drive the sidestream loop, or where the customer prefers to specify a separate sidestream pump.
- Pre-commission cleaning rigs, where the contractor's flushing pump drives the loop.

Typical Installation:

Filter inlet connects to the flow (or supply) line and outlet connects to the return, with the differential pressure between flow and return driving water through the filter. (See Page 1 for schematic)

Compatible Filter Media:

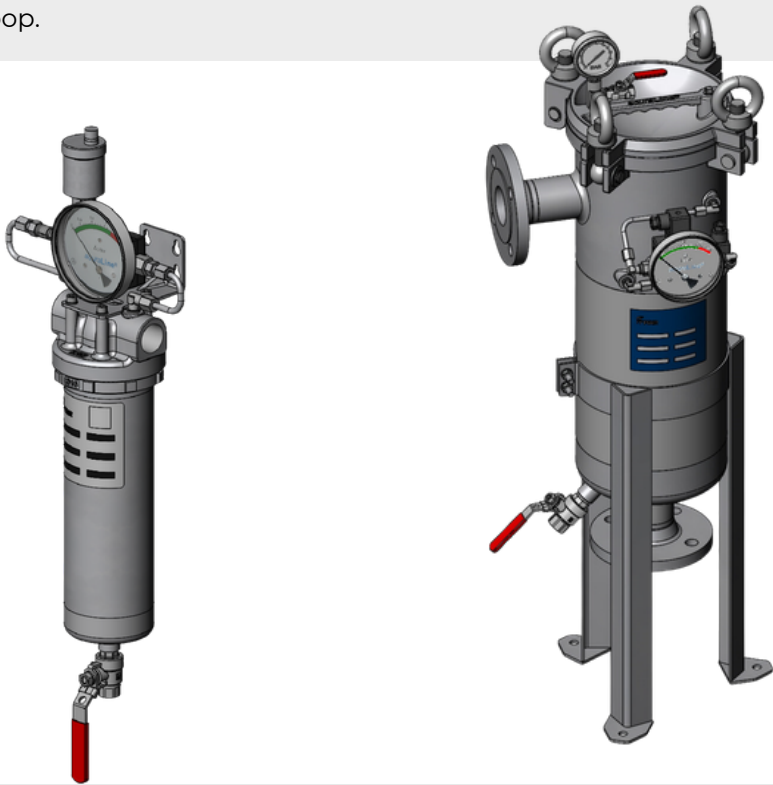
FLX-0.5: 10" CLARISpun A filter element

FLX-1: 20" CLARISpun A filter element

FLX-5: CLARIBag filter bag or acuraPleat high efficiency element Size 1

FLX-15 & FLX-30: CLARIBag filter bag or acuraPleat high efficiency element Size 2

Magnets: Optional on all models



Model	System volume	Flow rate	Boiler/chiller rating (see note)
FLX-0.5 (see footnote)	up to 5,000 L	up to 500 L/h	up to 250 kW
FLX-1	up to 10,000 L	1,000 L/h	up to 500 kW
FLX-5	up to 50,000 L	5,000 L/h	up to 2,500 kW
FLX-15	up to 150,000 L	15,000 L/h	up to 7,500 kW
FLX-30	up to 300,000 L	30,000 L/h	up to 15,000 kW



FLX-0.5 footnote: The FLX-0.5 uses the same 1FU 10" filter housing as the FLS-0.2 and FLS-0.5. Without an integrated pump, it can be specified for systems below 5,000 L (and below 250 kW) where the customer's existing pump capacity is sufficient to drive the sidestream flow rate. There is no FLX-0.2 — the FLX-0.5 covers this range.

****Sizing note:** Boiler/chiller ratings are indicative for typical UK building services applications based on a system volume of approximately 20 L per kW of installed plant capacity. This relationship is reliable for conventional commercial HVAC but breaks down for district heating networks, heat pump systems with significant buffer volumes, data centres and industrial process loads, where actual system volume per kW is often considerably higher. Where the application is non-standard, contact us with actual system volume rather than installed plant capacity.

Choosing the right sidestream filter

Removal efficiency. Most fouling problems in closed-loop systems are caused by accumulation of small particles over a long period. Removal efficiency at the rated micron is as important as the micron rating itself. acuraPleat high-efficiency cartridge elements remove 99% of particles at their rated pore size and provide an extended service life. CLARIBag felt bags deliver high dirt-holding capacity for cost-effective primary filtration.

Particle size. Filtration to 5µm with 99% efficiency is achievable on most CHW and LTHW systems without pump or flow modification. On heavily contaminated retrofits we recommend starting at 25µm or 50µm and stepping down progressively as the system runs cleaner.

Temperature resistance. CHW and LTHW operate within the standard polypropylene range and do not require special media. MTHW circuits require polyester felt media with stainless steel rings or Polyester Collar.

Differential pressure measurement. All Siga acuraLine filter housings are supplied with acuraDP gauges to indicate blocked filters. These gauges provide a clear visual indication and can be supplied with an external signal output. BMS signal is included as standard.

Magnetic filtration. Where ferrous corrosion products dominate the contamination load — which is the case on most LTHW and MTHW systems — an in-line magnet assembly in series with the bag or cartridge improves total capture without increasing element changeout frequency.

Installation and maintenance. Siga sidestream filters are operator-friendly and do not require specialist installation or maintenance. Units are supplied fully configured and ready to use.

Benefits of using our sidestream filters

- Ready to use out of the box — supplied fully assembled and configured
- Easy to use and maintain — designed for rapid operator familiarisation
- Stainless steel components — long service life
- Compact footprint — quick installation in plant rooms with limited space
- BMS-ready — blocked filter signal output included as standard

SOME OF OUR PROJECTS

Airbus Stevenage

Alexander Stadium Redevelopment,
Birmingham

Southwark Council London

Southampton Council

Trident Training Facility, Faslane

Amazon Warehouse, Milton Keynes

Iron Mountain LON-2 Data Centre

Nationwide Building Society, Swindon