

# EMS-FF-FS150

## Coolant filtration skid, 150 L/min side-stream

Continuous side-stream polishing for room and plant loops, up to the multi-bag vessel class

EMS-FF-FS150 diverts 5–15 % of circulating loop volume at 150 L/min for room and plant loops, up to the multi-bag vessel class, with a vessel working pressure up to 150 psi ( $\approx 10.3$  bar) and a flow capacity up to 150 GPM ( $\approx 34$  m<sup>3</sup>/h) per bag hole. It carries a differential-pressure instrument on both sides of the vessel, because that reading is the change-out trigger at 35 psid ( $\approx 2.4$  bar) and the only real-time health signal the filter gives. The failure it exists to catch is a plant-scale loop where particulate abrasion of the seal face moves on a weeks timescale while the leak it eventually causes takes months to appear.

### ORDERING INFORMATION

|                         |                                                              |
|-------------------------|--------------------------------------------------------------|
| Part number             | EMS-FF-FS150                                                 |
| Side-stream flow        | 150 L/min                                                    |
| Typical loop served     | Room and plant loops, up to the multi-bag vessel class       |
| Diverted fraction       | 5–15 % of circulating loop volume                            |
| Turnover                | Full fluid turnover every 6–12 hours                         |
| Vessel working pressure | Up to 150 psi ( $\approx 10.3$ bar)                          |
| Vessel flow capacity    | Up to 150 GPM ( $\approx 34$ m <sup>3</sup> /h) per bag hole |
| Differential pressure   | Instrument on both sides of the vessel                       |

### SIDE-STREAM DUTY AND SIZING

| Parameter                      | Value                                                                                                                        | Notes                                                                                                                 |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Side-stream flow               | 150 L/min                                                                                                                    | Matched to room and plant loops at the 5–15 % split                                                                   |
| Diverted fraction              | 5–15 % of circulating loop volume                                                                                            | Filtered offline and returned, so the loop is polished without shutting down operations                               |
| Turnover                       | About 10 % of loop volume per hour gives a full fluid turnover every 6–12 hours                                              | Turnover is the sizing figure, not the vessel volume                                                                  |
| Sizing multiplier, side-stream | A side-stream filter can go to 10× smaller than the smallest passage                                                         | A full-flow inline filter sits about 2× smaller and demands excessive energy and footprint                            |
| Sizing state                   | Design flow and differential pressure must be taken at the loaded or dirty state                                             | Differential pressure is significantly higher than the clean figure; sizing at clean conditions under-sizes the pump  |
| Loop position                  | Position 2 of the five loop positions: side-stream filtration                                                                | Positions 1, 3, 4 and 5 are incoming-water bulk removal, heat-exchanger protection, unit-inlet guard and final polish |
| Seal-life mechanism            | Particulate abrasion of the seal face moves on a weeks timescale, while the leak it eventually causes takes months to appear | That gap is what the differential-pressure trend buys                                                                 |

### PROTECTION RATING AND MEDIA

| Parameter              | Value                                                                                            | Notes                                                                                                                                                       |
|------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Protection rating rule | <b>Absolute rating 7–10× smaller than the finest channel dimension</b>                           | For a 50 µm passage that is a 5 µm filter; the rating is absolute, not nominal                                                                              |
| Micron category        | <b>Protection rating: the rating the operating element holds to protect the cold plate</b>       | It is not a commissioning staging step and it is not an inlet strainer rating                                                                               |
| Target for the IT side | <b>Suspended solids &lt;5 µm at the cold plate and &lt;10 µm at a rear-door heat exchanger</b>   | Published targets this vessel's element is selected against A suspended-solids target, not a filter rating; the element is selected on a protection rating. |
| Medium options         | <b>Metal filter cloth 5–40 µm calibratable, or 100–200+ µm plain weave</b>                       | 316L construction Media ratings of the element; the rating selected for the loop is the protection rating.                                                  |
| Element options        | <b>Replaceable high-flow cartridges down to 1 µm</b>                                             | Backwash types down to 10 µm Cartridge ratings are protection ratings.                                                                                      |
| Practical warning      | <b>5 µm elements clog quickly</b>                                                                | Prefiltration goes upstream of a 5 µm element The 5 µm figure is a protection rating.                                                                       |
| Element rating basis   | <b>ISO 16889:2008 multi-pass, with a beta ratio of 75 or greater at the target particle size</b> | $\beta \geq 75$ is about 98.7 % capture at that size                                                                                                        |

## BETA RATIO AND EFFICIENCY

| Parameter                 | Value                                                                                             | Notes                                                                                                                       |
|---------------------------|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Beta ratio definition     | <b>Upstream particle count divided by the downstream count at a stated size</b>                   | Efficiency is $(\beta-1)/\beta$                                                                                             |
| Recommended floor         | <b><math>\beta \geq 75</math> for the smallest particle to be filtered</b>                        | About 98.7 % capture at that size; a $\beta=75$ filter at 50 µm passes one particle at or above 50 µm for every 75 entering |
| Practical bands           | <b>Poor elements <math>\beta</math> 2–10; high-quality assemblies <math>\beta</math> 200–2000</b> | Published bands for comparing elements                                                                                      |
| Rated media retention     | <b>Absolute-rated media up to 99.98 %; nominal-rated media specified at 90 %</b>                  | The two ratings are different claims and are not interchangeable                                                            |
| Validity of a beta figure | <b>Only at the stated size and only for a new element</b>                                         | A beta figure without its size is not a comparison                                                                          |

## VESSEL, INSTRUMENTATION AND MAINTENANCE

| Parameter                             | Value                                                                       | Notes                                                                                                    |
|---------------------------------------|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Vessel working pressure               | <b>Up to 150 psi (<math>\approx 10.3</math> bar)</b>                        | Published vessel rating                                                                                  |
| Flow capacity                         | <b>Up to 150 GPM (<math>\approx 34</math> m<sup>3</sup>/h) per bag hole</b> | Vessel capacity of the bag class; the skid's side-stream flow is set at 150 L/min                        |
| Configuration                         | <b>Up to 12-round multi-bag</b>                                             | Standard configuration of the vessel family                                                              |
| Connection size                       | <b>Not verified in the retrieved material</b>                               | Quoted on request against the vessel data sheet                                                          |
| Differential-pressure instrumentation | <b>Instrument on both sides of the vessel</b>                               | Mechanical gauges or electronic sensors on both sides of every filter and strainer external to the units |
| Change-out trigger                    | <b>35 psid (<math>\approx 2.4</math> bar) across the element</b>            | Differential pressure is the only real-time health signal the filter gives                               |

| Parameter                      | Value                                                        | Notes                                                                                                                            |
|--------------------------------|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Terminal limit                 | <b>60 psid (4.1 bar) at 20 °C</b>                            | Terminal differential limit across the element                                                                                   |
| Clean starting point           | <b>0.17 bar (2 psid) on a 2 µm element</b>                   | The window between clean and terminal is the whole reason the channel exists The 2 µm figure is the element's protection rating. |
| Instrument range for this duty | <b>0–100 kPa, ±0.075 % FS on the standard build</b>          | Percent of full scale, not percent of reading                                                                                    |
| Telemetry integration          | <b>Wire the transmitter to the loop telemetry point list</b> | The differential-pressure trend then lands beside flow and $\Delta T$                                                            |

## APPLICATIONS

- Continuous side-stream polishing on room and plant loops
- Multi-bag vessel duty where the side-stream flow is at the top of the skid ladder
- Filter state management through a differential-pressure trend rather than a calendar
- Seal-life protection through particulate control ahead of the leak

## INCLUDED IN THE DELIVERED SET

- Side-stream pump and multi-bag vessel with the selected protection-rated element
- Differential-pressure instrument on both sides of the vessel
- 316L wetted construction with the selected media
- Connection kit for the side-stream take-off and return
- Element selection record stating the protection rating and its basis

## COMPATIBLE WITH

- EMS-TL-SDP differential-pressure transmitter
- EMS-TL-K800 and EMS-TL-K2300 telemetry kits
- EMS-FF-FL1300 flush skid for the one-time commissioning clean
- EMS-CL-PG15 to EMS-CL-PG55 coolants

## SCOPE

- The skid polishes the loop; it is not the box that distributes coolant to racks. No coolant distribution units and no cold plates

## FILTRATION SKID LADDER BY SIDE-STREAM FLOW

| Parameter    | Value            | Notes                                                  |
|--------------|------------------|--------------------------------------------------------|
| EMS-FF-FS20  | <b>20 L/min</b>  | Rack and in-row loops, 5–15 % split                    |
| EMS-FF-FS60  | <b>60 L/min</b>  | Row loops and small rooms                              |
| EMS-FF-FS150 | <b>150 L/min</b> | Room and plant loops, up to the multi-bag vessel class |

## NOTES

- The micron figure on this datasheet is a protection rating: an absolute rating 7–10× smaller than the finest channel dimension. It is not a commissioning staging step and it is not the 500 µm class strainer rating at a unit inlet.
- Beta ratio is quoted with its particle size and applies to a new element only; the vessel's 150 GPM per bag hole capacity is a vessel figure and not the skid's side-stream flow.
- Differential pressure is percent of full scale on the standard 0–100 kPa instrument, and the change-out decision is made on the trend rather than on a single reading.
- Connection size is not verified in the retrieved material and is quoted on request.

- Certification names are published on the badge cards; approval documents are shown on request.
- Scope: no coolant distribution units and no cold plates.

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|---------------------------------------------------------------------|---------------------|
| <b>Full specification sheet and current pricing</b>                 | <b>EMS-FF-FS150</b> |
| EMS-Trade Cooling · <a href="https://ems-cool.com">ems-cool.com</a> | Rev. A              |
| Typical lead time confirmed on order acknowledgement.               | 2026-09-19          |