

EMS-FF-FS20

Coolant filtration skid, 20 L/min side-stream

Continuous side-stream polishing for rack and in-row loops, with differential pressure on both sides of the vessel

EMS-FF-FS20 diverts 5–15 % of circulating loop volume through a side-stream vessel at 20 L/min, which polishes the fluid without shutting down operations and turns the whole loop volume over every 6–12 hours at about 10 % of loop volume per hour. The element is selected on a protection rating: an absolute rating 7–10× smaller than the finest channel dimension, so a 50 µm passage takes a 5 µm filter. The failure it exists to catch is a filter that is changed on a calendar rather than on its differential-pressure trend, at a change-out trigger of 35 psid (≈2.4 bar) that nobody is watching.

ORDERING INFORMATION

Part number	EMS-FF-FS20
Side-stream flow	20 L/min
Typical loop served	Rack and in-row loops, 5–15 % split
Diverted fraction	5–15 % of circulating loop volume
Turnover	Full fluid turnover every 6–12 hours
Vessel working pressure	Up to 150 psi (≈10.3 bar)
Differential pressure	Instrument on both sides of the vessel
Change-out trigger	35 psid (≈2.4 bar) across the element

SIDE-STREAM DUTY AND SIZING

Parameter	Value	Notes
Side-stream flow	20 L/min	Matched to rack and in-row 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
Why side-stream	Full-flow inline filtration of an entire facility flow demands excessive energy and a large physical footprint	The side-stream split exists to avoid that
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

PROTECTION RATING AND MEDIA

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

BETA RATIO AND EFFICIENCY

Parameter	Value	Notes
Beta ratio definition	Upstream particle count divided by the downstream count at a stated size	Efficiency is $(\beta-1)/\beta$
Recommended floor	$\beta \geq 75$ for the smallest particle to be filtered	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	Poor elements β 2–10; high-quality assemblies β 200–2000	Published bands for comparing elements
Rated media retention	Absolute-rated media up to 99.98 %; nominal-rated media specified at 90 %	The two ratings are different claims and are not interchangeable
Validity of a beta figure	Only at the stated size and only for a new element	A beta figure without its size is not a comparison

VESSEL, INSTRUMENTATION AND MAINTENANCE

Parameter	Value	Notes
Vessel working pressure	Up to 150 psi (≈ 10.3 bar)	Published vessel rating
Flow capacity	Up to 150 GPM (≈ 34 m³/h) per bag hole	Vessel capacity of the bag class; the skid's side-stream flow is set at 20 L/min
Configuration	Up to 12-round multi-bag	Standard configuration of the vessel family
Connection size	Not verified in the retrieved material	Quoted on request against the vessel data sheet
Differential-pressure instrumentation	Instrument on both sides of the vessel	Mechanical gauges or electronic sensors on both sides of every filter and strainer external to the units

Parameter	Value	Notes
Change-out trigger	35 psid (≈ 2.4 bar) across the element	Differential pressure is the only real-time health signal the filter gives
Terminal limit	60 psid (4.1 bar) at 20 °C	Terminal differential limit across the element
Clean starting point	0.17 bar (2 psid) on a 2 μm element	The window between clean and terminal is the whole reason the channel exists The 2 μ m figure is the element's protection rating.
Instrument range for this duty	0–100 kPa, ± 0.075 % FS on the standard build	Percent of full scale, not percent of reading
Telemetry integration	Wire the transmitter to the loop telemetry point list	The differential-pressure trend then lands beside flow and ΔT

APPLICATIONS

- Continuous side-stream polishing on a rack or in-row loop
- Keeping suspended solids under the cold-plate target without shutting the loop down
- Filter state management through a differential-pressure trend rather than a calendar
- Post-commissioning duty after a flush skid has done the one-time clean

INCLUDED IN THE DELIVERED SET

- Side-stream pump and 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-K100, EMS-TL-K300, EMS-TL-K800 and EMS-TL-K2300 telemetry kits
- EMS-FF-FL75 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	20 L/min	Rack and in-row loops, 5–15 % split
EMS-FF-FS60	60 L/min	Row loops and small rooms
EMS-FF-FS150	150 L/min	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 $\times$ smaller than the finest channel dimension. It is not a commissioning staging step and it is not the 500 μ m class strainer rating at a unit inlet.
- Beta ratio is quoted with its particle size and applies to a new element only; an efficiency figure without a beta ratio and a size is not comparable.

- 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.

Full specification sheet and current pricing	EMS-FF-FS20
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Typical lead time confirmed on order acknowledgement.	2026-09-19