

EMS-FF-FL75

Flush skid, 75 L/min, 20 GPM secondary class

Rack and in-row loop flushing with staged 100 → 50 → 25 µm filtration and inlet and outlet instrumentation

EMS-FF-FL75 is the 75 L/min flow class, matched to the published 20 GPM CDU secondary-flow class for rack and in-row loops. It circulates at maximum TCS design flow or higher so flush-fluid velocity meets or exceeds the maximum fluid velocity during normal operation, and it stages filtration at 100 µm, then 50 µm, then 25 µm until the cleanliness target is reached. The failure it exists to catch is a skid that circulates below operating velocity, moving fluid without moving the particulate that settles at the velocities the loop will actually see.

ORDERING INFORMATION

Part number	EMS-FF-FL75
Flow class	75 L/min
Published class matched	20 GPM CDU secondary flow
Serves	Rack and in-row loops
Staged filtration	100 µm → 50 µm → 25 µm
Strainer guard	500 µm class at each unit inlet
Instrumentation	Inlet and outlet pressure and flow
Design envelope	6.9 bar (100 psig) and 60 °C (140 °F)

FLOW AND DUTY

Parameter	Value	Notes
Flow class	75 L/min	Matched to the published 20 GPM CDU secondary-flow class
Serves	Rack and in-row loops	Commercial CDU secondary flows run from 20 GPM on a rack unit to 450 GPM on a 2.35 MW unit; the skid class is matched to the loop it flushes
Flush velocity rule	Flush-fluid velocity must meet or exceed the maximum fluid velocity during normal system operation	The rule decides whether the skid is adequate, not the flow figure alone
Circulation rule	At maximum TCS design flow or higher, without over-pressuring the system	Circulation above design flow is the point of the skid
System design envelope	6.9 bar (100 psig) nominal operating pressure and 60 °C (140 °F) fluid temperature	Published envelope of the technology cooling pipework being flushed
Pump and filter arrangement	Pump with staged filter housings in series	Stage change-out is manual and belongs to the commissioning procedure; the skid is plumbed to bypass the CDU

COMMISSIONING STAGING AND CLEANLINESS TARGET

Parameter	Value	Notes
Staged filtration	100 µm, then 50 µm, then 25 µm	Commissioning staging: a procedure, not the protection rating of the filter that runs in the loop afterwards

Parameter	Value	Notes
Micron category of the staging ladder	Commissioning staging	It is not a protection rating and it is not a strainer rating at a unit inlet
Stop condition	ISO 16232 class CCC = C(C13/D9/E-N00)	≤5 000 particles per 1 000 cm ² at 15–25 µm, ≤350 at 25–50 µm and 0 at ≥50 µm
Coarser reference level	A(C16/D12-N00)	≤50 000 particles per 1 000 cm ² at 15–25 µm, ≤3 500 at 25–50 µm and 0 at ≥50 µm, for buyers comparing an existing specification
Verification method	Internal rinsing extraction, filtration analysis, light-optical analysis with a zoom microscope at 10–50 µm depth of field	A 2 µm mesh filter is required to collect the extract and the test-liquid kinematic viscosity must be ≤5 mm ² /s The 10–50 µm figure is a microscope depth of field: it is not a protection rating, a commissioning staging step or an inlet strainer rating.
Why verification is needed	Cold-plate microchannel widths run about 100–300 µm, and a hard particle larger than half the channel width materially raises the chance of blockage	Blockage occurs at a channel entrance or bend The 100–300 µm figure is a cold-plate channel dimension: it is not a protection rating, a commissioning staging step or an inlet strainer rating.
Component-level cleanliness basis	ISO 16232 / VDA 19.1	Supply-chain thresholds tighten from 100 µm and 200 µm toward 50 µm and below
Flush before IT install	Flush before IT equipment is installed	Flushing afterwards risks clogging the tight channels in cold plates

STRAINERS, LOAD BANKS AND ISOLATION

Parameter	Value	Notes
Strainer guard	500 µm class at each unit inlet	Strainer rating: a coarse guard that protects the pump and valves, not a filtration stage
Optional inline strainer	Within 10 ft (≈3 m) of the unit's entering-fluid connection	Published placement for the optional guard
Facility-water strainer guidance	35 to 40 mesh (500 to 400 µm)	Guidance for plate-and-frame heat exchangers on the facility side A strainer rating, not a commissioning staging step.
In-unit secondary filtration	Published at 50 µm / 35 mesh	A different number doing a different job from the 500 µm inlet guard In-unit secondary filtration is a protection rating.
CDU exclusion	The CDU is not used as the flush pump	Using the CDU for the initial flush increases the risk of contaminants reaching its heat exchanger and may void warranty, so the skid is plumbed to bypass it
Load-bank duty	Heat applied separately through water-cooled load banks catalogued at 30 kW, 100 kW, 108 kW, 250 kW, 500 kW and up to 1 MW	Filters must be installed on a load bank's discharge, and a previously used unit is best isolated behind a heat exchanger
Drying rule	If the final fill will not happen within 24 hours of draining, dry the entire technology cooling system	Dry the system to minimise biological growth
Shipped pipework	Dry-nitrogen charge note for shipped pipework	Applied to pipework shipped after the flush

INSTRUMENTATION AND PRESSURE TEST

Parameter	Value	Notes
Instrumentation	Inlet and outlet pressure and flow	Published instrument set on the skid classes
Pressure test after flush	Hold for 10 minutes with a recorded pressure drop of ≤ 0.02 MPa	Applies to the distributed-CDU secondary pipework and the air-to-liquid heat exchanger being flushed, plus a visual leak check at working pressure
Hydrostatic safety basis	1.5× the rated maximum working pressure per IEC 62368-1	Relief valves are set below the rated maximum
Chemical cleaners	Avoided	Corrosivity and residue risk in the heat-transfer fluid
Flush-water removal	Residual flush water must be removed before the final glycol fill	Remaining fluid reduces system performance

APPLICATIONS

- Flushing rack and in-row loops before IT equipment is installed
- Staged commissioning clean-up at or above operating velocity
- Pressure testing the flushed pipework while the skid is connected
- Load-bank heat cycles applied separately from the flush

INCLUDED IN THE DELIVERED SET

- Pump with staged filter housings in series, 100 μm , 50 μm and 25 μm elements
- Inlet and outlet pressure and flow instrumentation
- 500 μm class strainer guard arrangement at each unit inlet
- Hose set and connections to bypass the CDU during the flush
- Commissioning record sheets for staging, pressure test and cleanliness

COMPATIBLE WITH

- EMS-FF-C120, EMS-FF-C200 and EMS-FF-C500 fill carts
- EMS-FF-FS20, EMS-FF-FS60 and EMS-FF-FS150 filtration skids for continuous duty afterwards
- EMS-CL-PG15 to EMS-CL-PG55 coolants for the fill that follows the flush
- EMS-TL-SDP differential-pressure transmitter for a recorded pressure drop

SCOPE

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

FLUSH SKID LADDER BY FLOW CLASS

Parameter	Value	Notes
EMS-FF-FL75	75 L/min · 20 GPM secondary class	Rack and in-row loops
EMS-FF-FL340	340 L/min · 90 GPM secondary class	Row and room loops
EMS-FF-FL1300	1 300 L/min · 340 GPM secondary class	TCS-wide flush before IT install

NOTES

- The 100 → 50 → 25 μm ladder is commissioning staging, a procedure. It is not the protection rating of the operating filter and it is not the 500 μm class strainer rating at a unit inlet.

- The flush-fluid velocity rule is the constraint that decides adequacy: velocity must meet or exceed the maximum fluid velocity during normal system operation.
- The CDU is excluded from the flush boundary. Using it as the flush pump increases the risk of contaminants reaching its heat exchanger and may void warranty.
- The pressure-test figures apply to the flushed pipework and heat exchanger, not to the skid itself.
- 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-FL75
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Typical lead time confirmed on order acknowledgement.	2026-09-19