

EMS-TL-SF

Electromagnetic flow meter, DN10–DN1000, DN25 kit default

Full-bore electromagnetic flow instrument for glycol-premix and facility-water loops, transmitter and sensor as one code

EMS-TL-SF requires a medium conductivity of at least 5 $\mu\text{S}/\text{cm}$ to work at all, which suits a glycol-premix or facility-water loop and excludes a de-ionised loop where the meter can read near zero without raising a fault. At the DN25 kit default it covers 0.5–18 m^3/h , about 8–300 L/min, with a turndown near 36:1 and an accuracy of $\pm 0.5\%$ of reading standard, specified over 20–100 % of flow at 10 m/s. The failure it exists to catch is a flow channel that is confidently wrong, either because the fluid is below the conductivity floor or because the specified straight pipe runs were omitted and the reading moved by about 1.5 % of reading.

ORDERING INFORMATION

Part number	EMS-TL-SF
Principle	Electromagnetic
Family line size	DN10–DN1000
Kit default line size	DN25
Range at DN25	0.5–18 m^3/h ($\approx 8\text{--}300$ L/min)
Accuracy	$\pm 0.5\%$ of reading standard; $\pm 0.2\%$ of reading special
Minimum medium conductivity	5 $\mu\text{S}/\text{cm}$
Enclosure rating	Transmitter IP66 (IP67 option); sensor IP67 (IP68 option)

MEASUREMENT

Parameter	Value	Notes
Principle	Electromagnetic	Full-bore magnetic flow measurement; no moving parts in the fluid path
Family line size	DN10–DN1000	Kit default DN25
Range at DN25	0.5–18 m^3/h ($\approx 8\text{--}300$ L/min)	Turndown $\approx 36:1$ at this line size
Flow accuracy, standard	$\pm 0.5\%$ of reading	Percent of reading, not percent of full scale. Specified over 20–100 % of flow at 10 m/s
Flow accuracy, special	$\pm 0.2\%$ of reading	Percent of reading; same specified flow band and the same 10 m/s reference velocity
Accuracy basis	ISO 20456:2020-03	Reference basis stated by the meter documentation
Minimum medium conductivity	5 $\mu\text{S}/\text{cm}$	Below this the meter cannot measure. ASHRAE's technology-cooling band is 0.2–20 $\mu\text{S}/\text{cm}$, so a de-ionised loop can sit under the floor and read near zero without raising a fault
Velocity band	0.3–10 m/s	Low-flow cut-off about 0.1 m/s; optimal accuracy near 2–4 m/s
Turndown and the fluid	Turndown and low-flow cut-off move with glycol concentration	Viscosity at 20 °C runs 1.68 mPa·s at 15 % propylene glycol, 2.48 mPa·s at 25 % and 8.20 mPa·s at 55 %, so a meter specified at 15 % does not behave the same at 55 %

INSTALLATION AND PROCESS CONDITIONS

Parameter	Value	Notes
Straight runs	5× DN upstream and 3× DN downstream	Omitting them adds about 1.5 % of reading against a ±0.5 % of reading accuracy claim
Maximum static pressure	1.6 MPa standard	Liner and process connection determine the final figure
Liner by temperature	Hard rubber –5...90 °C; neoprene 0...80 °C; PTFE –25...90 °C	Liner is selected against the fluid temperature band
Electrodes	316L standard; Hastelloy or tantalum optional	Selected against the fluid chemistry
Process connection	Flanged, per line size	Mating flange and gasket confirmed on order acknowledgement
Loop type this instrument suits	Glycol premix or facility water	Conductivity 50–300 µS/cm and pH 7.0–9.0 on this loop type; a de-ionised loop takes EMS-TL-SFU
Known failure mode	Sensor fouling and calibration drift	Category maintenance tables carry a flowmeter contamination row; a contaminated electrode reads low before it reads zero

ELECTRICAL AND ENCLOSURE

Parameter	Value	Notes
Analog output	4–20 mA	Two-wire or four-wire per configuration
Pulse output	0.1–3000 Hz	Scaled to the configured full-scale flow
Digital communication	Modbus RTU over RS-485	Register map supplied with the meter
Supply	90–260 V AC, 15 VA, or 10–36 V DC, 15 W	Two supply variants; confirm the site supply on order
Transmitter enclosure rating	IP66 standard, IP67 option	Published rating for the transmitter housing
Sensor enclosure rating	IP67 standard, IP68 option	Published rating for the sensor body and cable entry

APPLICATIONS

- Loop flow measurement on glycol-premix and facility-water loops
- Filter and CDU-secondary flow verification where the fluid is above 5 µS/cm
- Loops where the DP transmitter is already in place and flow is the missing variable

COMPATIBLE WITH

- EMS-TL-K100, EMS-TL-K300, EMS-TL-K800 and EMS-TL-K2300 kits
- EMS-TL-G10, EMS-TL-G25 and EMS-TL-G50 gateways
- EMS-TL-SDP differential-pressure transmitter
- EMS-CL-PG15 to EMS-CL-PG55 coolants, which keep the loop above the conductivity floor

SCOPE

- Flow instrument only: coolant distribution units and cold plates are outside this scope

FLOW INSTRUMENT LADDER

Parameter	Value	Notes
EMS-TL-SF	Electromagnetic, DN10–DN1000 family	Needs $\geq 5 \mu\text{S/cm}$; $\pm 0.5 \%$ of reading standard
EMS-TL-SFU	Ultrasonic transit-time, DN25–DN600 family	No minimum conductivity; clamp-on or in-line
EMS-TL-SDP	Differential-pressure transmitter	1 kPa to 10 MPa nominal ranges; $\pm 0.075 \%$ FS standard

NOTES

- Flow accuracy is percent of reading, not percent of full scale, and it applies only over 20–100 % of flow at 10 m/s; outside that band the figure is not claimed.
- The $5 \mu\text{S/cm}$ conductivity floor is the dividing line in this product line. Glycol raises conductivity, so a premix loop usually sits inside the meter's window and a de-ionised loop does not.
- A de-ionised or low-glycol loop takes the ultrasonic instrument EMS-TL-SFU, which has no minimum conductivity requirement.
- The published straight-run rule is part of the accuracy budget: without $5\times$ DN upstream and $3\times$ DN downstream the reading moves about 1.5 % of reading.
- 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-Trade Cooling · ems-cool.com Typical lead time confirmed on order acknowledgement.	EMS-TL-SF Rev. A 2026-09-19
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