

EMS-TL-K100

Loop telemetry kit, single rack up to 100 kW

Matched temperature pair, flow, differential pressure, level and leak channel supplied as one part number for a rack-class loop

Loop supply-to-return temperature difference is often only 5–10 °F, so two unmatched sensors each accurate to ± 1 °F put almost 50 % uncertainty on the number a capacity calculation is built from, which is why the kit ships one matched, calibrated pair on one record as one part number. K100 covers a single rack up to 100 kW at 10–100 L/min with a DN25 electromagnetic flow run, a 0–100 kPa differential-pressure channel for filter duty, an optical point-switch level channel and one leak channel. The failure it exists to catch is a loop that is instrumented yet cannot be verified, because the measurement chain carries more error than the quantity measured.

ORDERING INFORMATION

Part number	EMS-TL-K100
Loop class	Single rack, up to 100 kW
Loop flow covered	10–100 L/min
Kit contents	Matched PT100 pair, one flow run, DP 0–100 kPa, level point switch, 1 leak channel
Temperature range	–40 to +150 °C
Flow accuracy	± 0.5 % of reading standard, over 20–100 % of flow
Gateway	Ordered separately: EMS-TL-G10, EMS-TL-G25 or EMS-TL-G50
Documentation	Datasheet PDF and one calibration record for the pair

KIT IDENTIFICATION AND LOOP SIZING

Parameter	Value	Notes
Kit part number	EMS-TL-K100	One part number; the channels below ship as one delivered set
Loop class	Single rack, up to 100 kW	The ladder is sized by loop class, not by sensor count
Loop flow range to be covered	10–100 L/min	Published rack-class TCS flow; the flow run is sized inside this band
Kit boundary	Instruments and consumables for the loop	No coolant distribution units and no cold plates
Gateway	Not included on this code	Add EMS-TL-G10, G25 or G50 where the loop has no BMS point list of its own

TEMPERATURE CHANNEL (MATCHED PAIR)

Parameter	Value	Notes
Temperature channel	Matched supply-and-return pair, thin-film PT100	Both elements calibrated together on one record and shipped as one pair
Temperature accuracy	IEC 60751 Class A element tolerance, class name only	The class tolerance in degrees is not published: the research did not verify it from a retrieved primary document

Parameter	Value	Notes
Differential-temperature uncertainty	Two unmatched ± 1 °F sensors put almost 50 % uncertainty on a 5–10 °F difference	That is the reason the pair is calibrated together; separate tolerances add
Temperature measuring range	–40 to +150 °C	Industrial envelope of the element; the in-service loop sits far inside it
Channel naming	Supply and return as two separate channels	Production CDU practice carries water-inlet and water-return as two plug-in channels
Replacement rule	Order the pair, not one sensor	Replacing one sensor of a pair returns the loop to two independent tolerances

FLOW CHANNEL

Parameter	Value	Notes
Flow channel	Electromagnetic flow meter, DN25 kit default	Principle is selected for the fluid, not from the catalogue
Flow range at DN25	0.5–18 m³/h (≈ 8–300 L/min), turndown $\approx 36:1$	DN25 covers the whole 10–100 L/min rack class with margin
Flow accuracy	± 0.5 % of reading standard; ± 0.2 % of reading special	Percent of reading, not percent of full scale. Specified over 20–100 % of flow at 10 m/s
Minimum fluid conductivity	5 $\mu\text{S/cm}$	ASHRAE technology-cooling band is 0.2–20 $\mu\text{S/cm}$, so a de-ionised loop can sit below the meter 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
Straight-run requirement	5× DN upstream and 3× DN downstream	Omitting the runs adds about 1.5 % of reading, three times the meter's own standard accuracy claim
Flow accuracy basis	ISO 20456:2020-03	Reference basis stated by the meter documentation

DIFFERENTIAL PRESSURE, LEVEL AND LEAK CHANNELS

Parameter	Value	Notes
Differential-pressure channel	0–100 kPa, filter duty	A 0–400 kPa range for loop pressure-drop control is added from EMS-TL-K300 upward
Differential-pressure accuracy	± 0.075 % FS standard; ± 0.05 % FS high accuracy	Percent of full scale, not percent of reading
Differential-pressure stability	± 0.1 % of maximum range per 12 months	Transmitter drift only; installation effects are excluded
Level channel	Optical reflective-prism point switch	Analogue reservoir level is added on EMS-TL-K800; reservoir, condensate and leakage level are three separate jobs
Leak channel	1 channel	2-wire rope detects; 4-wire rope detects and locates; ropes and probes cross-list from the EMS-LD- line
Alarm logic	Two-of-two for automatic intervention	Either the tray point sensor or the rope raises the alarm; both together permit intervention

MATERIALS, SUPPLY AND ENVIRONMENT

Parameter	Value	Notes
Wetted materials	316L stainless steel, peroxide-cured EPDM	Brass only where dezincification resistance is verified to ISO 6509 at $\leq 100 \mu\text{m}$ depth; sulfur-cured EPDM is discouraged. The $100 \mu\text{m}$ figure is a dezincification penetration depth under ISO 6509: it is not a protection rating, a commissioning staging step or an inlet strainer rating.
Supply	24 VAC/DC at the gateway; 10–36 V DC or 90–260 V AC at the flow transmitter	Two supplies because the flow transmitter and the gateway are separate devices
Gateway operating envelope	–20 to 60 °C, 5–95 % RH non-condensing	Applies to the EMS-TL-G enclosure; no enclosure IP rating is published for it
Fluid this kit is specified for	Glycol-premix or facility-water loop	Conductivity 50–300 $\mu\text{S/cm}$ and pH 7.0–9.0 on this loop type; a de-ionised loop takes the ultrasonic flow instrument EMS-TL-SFU

APPLICATIONS

- Rack-level instrumentation where the supply-to-return difference carries the capacity claim
- Filter health on a 0–100 kPa differential-pressure range
- Single-point leak supervision at a tray, sump or manifold
- Loops without a BMS point list, where the EMS-TL-G gateway line supplies the head end

CHANNELS DELIVERED

- Temperature: matched supply-and-return PT100 pair on one calibration record
- Flow: electromagnetic run, DN25 default, 0.5–18 m^3/h
- Differential pressure: 0–100 kPa for filter duty, $\pm 0.075 \%$ FS standard
- Level: optical reflective-prism point switch
- Leak: one channel, 4-wire rope detects and locates

COMPATIBLE WITH

- EMS-TL-ST and EMS-TL-STC temperature pairs
- EMS-TL-SF and EMS-TL-SFU flow instruments
- EMS-TL-SDP differential-pressure transmitter
- EMS-TL-SL level devices and EMS-TL-SK leak channel input module
- EMS-TL-G10, EMS-TL-G25 and EMS-TL-G50 gateways
- EMS-LD- rope and probe codes for the leak channel

SCOPE

- Instrumentation for the loop: coolant distribution units and cold plates are outside this scope

KIT LADDER BY LOOP CLASS

Parameter	Value	Notes
EMS-TL-K100	Single rack, up to 100 kW · 10–100 L/min	Matched pair, one flow run, DP 0–100 kPa, level point switch, 1 leak channel
EMS-TL-K300	Row, 100–300 kW · 20 GPM (≈ 75 L/min) secondary class	Adds DP 0–400 kPa and a second leak channel

Parameter	Value	Notes
EMS-TL-K800	Row, up to 800 kW · 90 GPM (≈340 L/min) secondary class	Adds analogue reservoir level
EMS-TL-K2300	Room, 2.3 MW class · up to 340 GPM (≈1 300 L/min) secondary	Adds 4 leak channels and a second flow run

COMPONENTS IN THE KIT

Parameter	Value	Notes
EMS-TL-ST	Matched supply-and-return PT100 pair	Thermowell or compression fitting
EMS-TL-STC	Matched clamp-on surface pair	Retrofit where the pipe cannot be opened
EMS-TL-SF	Electromagnetic flow meter	DN25 default, 0.5–18 m³/h
EMS-TL-SFU	Ultrasonic flow meter	No minimum conductivity; for de-ionised loops
EMS-TL-SDP	Differential-pressure transmitter	100 kPa filter duty, 400 kPa loop duty
EMS-TL-SL	Liquid level	Point switch plus analogue reservoir on demand
EMS-TL-SK	Leak channel input module	2-wire detects; 4-wire detects and locates

NOTES

- The kit is our own configuration of the documented sensor, transmitter and gateway models listed under Components in the kit; every row above belongs to those models.
- Temperature accuracy is sold as pairing, not as a tolerance figure. The element class is named as IEC 60751 Class A and the class tolerance in degrees is not published.
- Flow accuracy is percent of reading and differential-pressure accuracy is percent of full scale; the two bases are not interchangeable and are labelled as such on every row.
- A de-ionised loop that sits below the 5 µS/cm conductivity floor takes the ultrasonic flow instrument EMS-TL-SFU in place of the electromagnetic run.
- Pipework design envelope for the loops these kits serve: 6.9 bar (100 psig) nominal operating pressure and 60 °C (140 °F) fluid temperature.
- 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-K100
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