

EMS-TL-SDP

Differential-pressure transmitter, 1 kPa to 10 MPa nominal ranges

Two-wire 4–20 mA differential-pressure transmitter with HART, for filter duty and loop pressure-drop control

EMS-TL-SDP is specified on full scale, not on reading: $\pm 0.075\%$ FS standard and $\pm 0.05\%$ FS high accuracy across nominal ranges from 1 kPa to 10 MPa, with 0–100 kPa for filter duty and 0–400 kPa for loop duty on the kit ladder. Long-term stability is $\pm 0.1\%$ of maximum range per 12 months, and the static-pressure effect runs $\pm 1\%$ of URL per 6.9 MPa on the lowest range against $\pm 0.25\%$ on most others. The failure it exists to catch is a range chosen on a rack loop and reused on a high-static facility loop, where the static-pressure effect quietly exceeds the accuracy claim.

ORDERING INFORMATION

Part number	EMS-TL-SDP
Nominal ranges	1 kPa, 6 kPa, 40 kPa, 100 kPa, 400 kPa, 1 MPa, 4 MPa, 10 MPa
Kit ranges	0–100 kPa filter duty; 0–400 kPa loop duty
Accuracy	$\pm 0.075\%$ FS standard; $\pm 0.05\%$ FS high accuracy
Output	4–20 mA two-wire with HART
Supply	10.5–45 V DC
Process connection	1/4-18 NPT or 1/2-14 NPT
Wetted diaphragm	316L stainless steel

RANGE AND ACCURACY

Parameter	Value	Notes
Nominal ranges	1 kPa, 6 kPa, 40 kPa, 100 kPa, 400 kPa, 1 MPa, 4 MPa, 10 MPa	Range is selected from this ladder; a compressed range is not the same instrument as a small nominal range
Kit ranges	0–100 kPa filter duty; 0–400 kPa loop duty	Filter health and loop pressure-drop control are the two duties on the kit ladder
Accuracy, standard	$\pm 0.075\%$ FS	Percent of full scale, not percent of reading
Accuracy, high-accuracy build	$\pm 0.05\%$ FS	Percent of full scale
Accuracy options	0.065 % FS, 0.1 % FS, 0.2 % FS, 0.5 % FS	Options on the same transmitter family; each is a percent of full scale figure
Accuracy basis	Percent of full scale (span)	A $\pm 0.075\%$ FS figure on a 400 kPa range is a wider absolute error than the same figure on a 10 kPa working span
Range compression	10:1 standard, 100:1 optional	Compression puts a small working span inside a large nominal range at the cost of turndown margin
Long-term stability	$\pm 0.1\%$ of maximum range per 12 months	Transmitter drift only; installation effects are excluded

EFFECTS AND LIMITS

Parameter	Value	Notes
Static pressure limit	6.89 MPa on the lowest range; 13.8 MPa mid-range; 31.0 MPa on the high-static version	The lowest range is the one that carries the tightest static limit
Static-pressure effect	±1 % URL per 6.9 MPa on the low range; ±0.25 % on the others	The trap on a high-static facility loop: the same range that reads well on a rack loop carries a larger zero shift here Stated as a percent of the upper range limit and as a percent of span, not as a percent of reading.
Temperature effect, low range	±[0.05 % URL + 0.25 % span] per 28 °C	Total effect over the stated temperature change, not per degree Stated as a percent of the upper range limit and as a percent of span, not as a percent of reading.
Temperature effect, other ranges	±[0.025 % URL + 0.125 % span] per 28 °C	Total effect over the stated temperature change Stated as a percent of the upper range limit and as a percent of span, not as a percent of reading.
Media temperature, silicone fill	–40 to +104 °C	Fill fluid determines the media temperature limit
Media temperature, inert fill	–18 to +71 °C	Inert fill is the option where the standard fill fluid is not acceptable

ELECTRICAL AND PROCESS CONNECTION

Parameter	Value	Notes
Output	4–20 mA two-wire with HART	Digital overlay on the analog loop
Supply	10.5–45 V DC	Two-wire loop supply
Process connection	1/4-18 NPT or 1/2-14 NPT	Selected at order
Wetted parts	316L stainless steel diaphragm	Free iron and plain carbon steel are excluded from the loop
Seals	FKM, PTFE, Viton or NBR	Seal is selected against the fluid chemistry
Loop duty comparison	Rack CDU TCS pressure drop is controlled over 30–150 kPa (4.4–21.8 psi)	A 400 kPa range covers that band; a range that is too wide spends its accuracy on span that is never used

FILTER AND LOOP DUTY

Parameter	Value	Notes
Filter change-out trigger	35 psid (≈2.4 bar) across the element	Differential pressure is the filter's only real-time health signal
Filter terminal limit	60 psid (4.1 bar) at 20 °C	Terminal differential across the element
Clean starting point	0.17 bar (2 psid) on a 2 µm element	The operating window between clean and terminal is the reason the channel exists The 2 µm figure is the element's protection rating.
Instrumentation placement	Both sides of every filter and strainer external to the units	Mechanical gauges or electronic sensors on both sides is the published practice
Point-list integration	Wire to the same gateway point list as flow and ΔT	The differential-pressure trend then lands beside the flow and temperature channels

APPLICATIONS

- Filter health monitoring on the 0–100 kPa range

- Loop pressure-drop control on the 0–400 kPa range
- Vessel and strainer differential pressure on filtration skids
- Any loop point where a small working span sits inside a larger nominal range

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, universal input channels with an external resistor for 4–20 mA
- EMS-FF-FS20, EMS-FF-FS60 and EMS-FF-FS150 filtration skids
- EMS-TL-SF and EMS-TL-SFU flow instruments

SCOPE

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

DIFFERENTIAL-PRESSURE LADDER

Parameter	Value	Notes
1 kPa, 6 kPa, 40 kPa	Low ranges	Lowest range carries the 6.89 MPa static limit and the ± 1 % URL per 6.9 MPa static-pressure effect
100 kPa	Filter duty on the kit ladder	0–100 kPa; ± 0.075 % FS standard
400 kPa	Loop duty on the kit ladder	0–400 kPa; covers the 30–150 kPa rack TCS pressure-drop band
1 MPa, 4 MPa, 10 MPa	High ranges	Mid-range static limit 13.8 MPa; high-static version 31.0 MPa

NOTES

- Every accuracy figure on this datasheet is percent of full scale. None of them is a percent of reading figure, and the two bases are not interchangeable.
- Range compression changes the absolute error: a ± 0.075 % FS figure is quoted against the nominal range, so a 100:1 compressed span carries a wider absolute error than an uncompressed one.
- The static-pressure effect is the range-selection trap: ± 1 % URL per 6.9 MPa on the lowest range against ± 0.25 % on most others.
- Media temperature depends on the fill fluid: silicone fill –40 to +104 °C, inert fill –18 to +71 °C.
- 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-SDP
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