

4...20 mA Analog threshold relay
High safety level operation SIL2 - SIL3

DSL1-35mA-NUC



- **Active or passive current input**
4...20 mA with or without sensor supply
- **1 adjustable threshold with multi-turn potentiometer**
And input loop breaking detection
- **Relay security selection by dip switches**
Relays activated over or below the threshold
- **2 electromechanical changeover contact outputs**
Independent relays
- **Traceability of internal components**
provided with the List of Manufacturing Operation and Individual control sheet (Nuclear application)
- **Operational Safety level : SIL2 / SIL3**
according to IEC 61508



The threshold detector DSL1-35mA-NUC is specially suited for security applications, its analog design ensures a high reliability and a perfect mastering of failure modes. It naturally finds its place in safety applications.

Input: 4...20 mA current, supports from 0 to 25 mA.
(with or without sensor supply)
Front face: One 10-turn potentiometer to adjust the tripping threshold, one green LED indicating the relay status
(LED on = coil relay energized)

Operation:

- The two output relays may be activated when the measurement (4 ... 20 mA signal) is below or over the threshold. (selection with internal dip switches)
- Ensure that the threshold sense (high or low threshold) is in adequation with the operational safety of installation.
- In all cases:
- The relays fall when the input signal is lost (current loop break detection) and on power supply loss.
- A fixed hysteresis of 1% permits to eliminate a possible beat phenomenon close to the threshold.

Feature:

- 35 mm width plastic enclosure with ventilation slots.
- Symmetrical and asymmetrical DIN rail mounting.
- Connection on screw terminal blocks (2.5 mm² section).
- Conformal coating
- Protection rating (enclosure/terminal blocks): IP20

Test and qualification

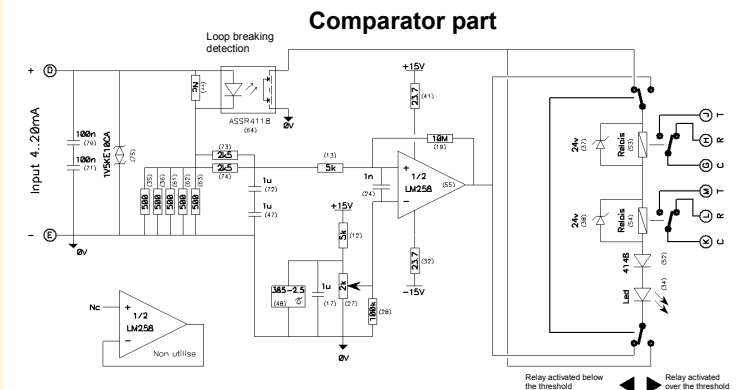
- Dielectric tests, IEC 61180-1 standard, RCCE 2016 guidelines (chapter VII 4230)
- Insulation resistance tests, RCCE 2016 guidelines (chapter VII 4240)
- Tests procedures for evaluating performance, standard IEC 61298-2, RCCE 2016 guidelines (chapter V 3230)
- Cyclic damp heat tests, according IEC 60068-2-30
- Dry heat tests, according to IEC 60068-2-2
- Sinusoidal vibration tests, according to IEC 60068-2-6 and IEC 60068-2-27, RCCE 2016 guidelines (chapter V4250)
- Accelerated oven aging (96 hrs burn-in)
- Full traceability of the tests and major components.

Recommendations

- warm-up time: none
- Horizontal or vertical mounting orientation (no spacing required)

Operational safety data:
Component type A, HFT = 0
λf : 231 fit (1/MTBF)
DC : 92.6 % (Diagnostic Coverage)
PFH : 17.1 fit (Probability of Failure per Hour)
SFF : 94.1 % (Safe Failure Fraction)

Synoptic: (comparator part)



Version and order code: [Request a quote](#)

- **DSL1-35mA-HV-NUC:** 1 threshold / 2 changeover relays
Threshold sense selectable and loop breaking detection
power supply 85...265Vac/dc
- **DSL1-35mA-LV-NUC:** 1 threshold / 2 changeover relays
Threshold sense selectable and loop breaking detection
power supply 20...85Vac/dc

Provided with the List of Manufacturing Operation and Individual control sheet (Nuclear application)
Included the traceability of internal components

- **DSL1-35mA-NUC:** 1 threshold / 2 changeover relays
(COMEX version)
Loop breaking detection
24Vdc power supply

- The 2 relays are activated when the input measurement (4..20mA) is below to the threshold setting in front face.

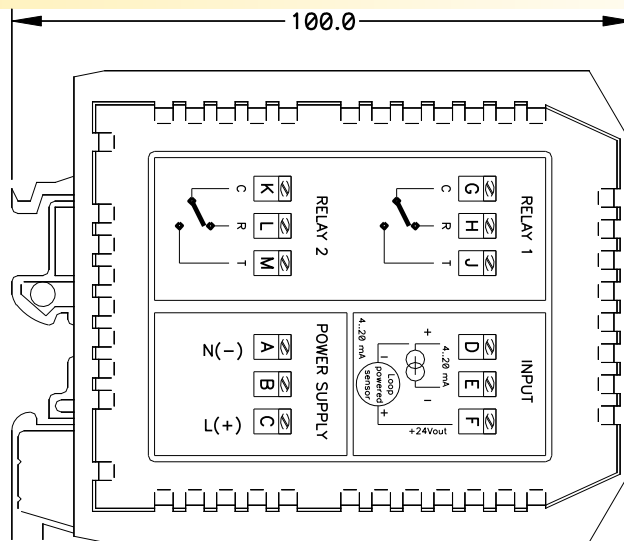
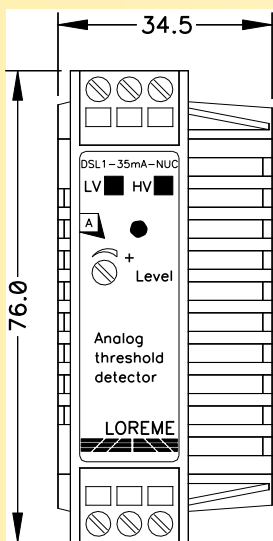
INPUT	
Current mA	4...20 mA
Permissible continuous overload	25 mA
Equivalent input impedance	175 Ohms @ 20 mA
Input drop out voltage	3.5 Vdc typical @ 20mA
Sensor power supply	24Vdc +/- 15% 25mA maxi
THRESHOLD	
Typical adjusting range	0... 25 mA
Accuracy of adjustment	<+/-0.2% (10 turns pot.)
Tripping repeatability	< +/- 0.1 %
Hysteresis	1% (~ 0.2mA)
Response time	< 20 ms
Long term stability	< 0.5% / year
Loop break detection	Input current = 0 mA
RELAY	
Potential free changeover contact	
Maximum voltage switching	220 Vdc, 250 Vac
Maximum current switching	2 A
Maximum power switching	60 W, 62.5 VA
Minimum voltage switching	100 µV
Initial contact resistance	<50 mΩ @ 10 mA/20 mV
Thermoelectric potential	10 µV
Impulse withstand voltage (1.2 / 50 µs)	
- between coil and contacts	2500 V
- between open contacts	1500 V
Minimum lifetime on resistive load	1 x 10 ⁵ operations

POWER SUPPLY	
DSL1-35mA-LV-NUC	20...85 Vac/dc power supply range consumption < 2 Watt, no polarity
DSL1-35mA-HV-NUC	85...265 Vac/dc power supply range consumption < 2 Watt, no polarity
ENVIRONMENT	
Operating Temperature	-25 to 60 °C
Storage Temperature	-40 to 85 °C
Influence	< 0.02 % / °C (% of full scale)
Humidity	85 % (not condensed)
Dielectric strength (supply/input/contact)	1500 Vrms (IEC 61180-1)
Insulation resistance	> 1 Gohms @ 500Vdc
Protection rating	IP20
Weight	~92 g
MTBF (CEI 62380)	> 4 000 000 Hrs @ 25°C
Life time	> 150 000 Hrs @ 30°C
Shock IEC 60068-2-27 (operating)	15 G / 11 ms
Bump IEC 60068-2-29 (transportation)	40 G / 6 ms
Vibration IEC 60068-2-6 (operating)	1 G / 10 - 150 Hz
Vibration CEI 60068-2-6 (transportation)	2 G / 10 - 150 Hz

Electromagnetic compatibility 2014/30/UE / Low Voltage Directive 2014/35/UE		
Immunity standard for industrial environments EN 61000-6-2		Emission standard for industrial environments EN 61000-6-4
EN 61000-4-2 ESD	EN 61000-4-8 AC MF	EN 55011 group 1 class A
EN 61000-4-3 RF	EN 61000-4-9 pulse MF	
EN 61000-4-4 EFT	EN 61000-4-11 AC dips	
EN 61000-4-5 CWG	EN 61000-4-12 ring wave	
EN 61000-4-6 RF	EN 61000-4-29 DC dips	



WIRING AND OUTLINE DIMENSIONS:

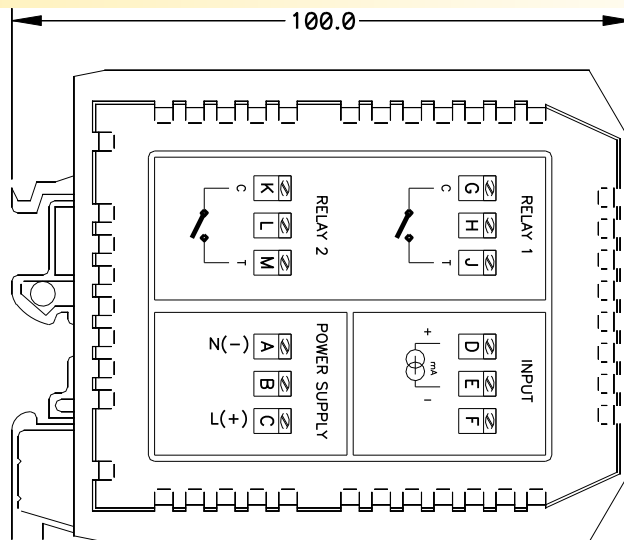
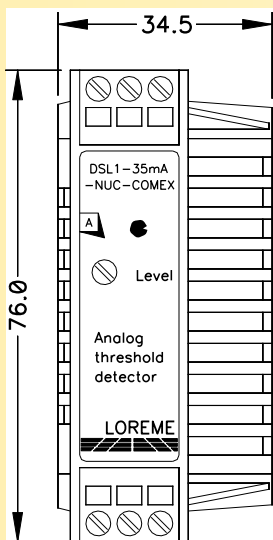


Standard version:
DSL1-35mA-LV-NUC
DSL1-35mA-HV-NUC
 Changeover contact relays output.
 The sense of threshold is selectable (high / low) with internal dip switch.
 (under the lateral right cover)

switch 1, 2: on, switch 3, 4: off →
 Relay is activated below threshold

switch 1, 2: off, switch 3, 4: on →
 Relay is activated above threshold

Power supply:
DSL1-35mA-LV-NUC voltage range :
 20...85Vac/dc
DSL1-35mA-HV-NUC voltage range :
 85...265Vac/dc



COMEX version: **DSL1-35mA-NUC**

- The two output relay are activated when the measure (4-20mA input signal) is below the setting threshold.

N.O output contacts only

Power supply: 24Vdc typical (admissible from 19 to 29 Vdc)