

HCX/E+STL

ELESA Original design

Column level indicators with MIN level electrical sensor and temperature electrical probe



• Material

Transparent polyamide based (PA-T) technopolymer. Highly resistant to shocks, solvents, oils with additives, aliphatic and aromatic hydrocarbons, petrol, naphtha, phosphoric esters. Avoid contact with alcohol or detergents containing alcohol.

• Screw, nuts and washers

Zinc-plated steel.

• Packing rings

NBR synthetic rubber O-Ring.

• Float

Polyamide based (PA) expanded technopolymer, black colour, with a built-in magnetic element to activate the electric contact when the oil level drops to a minimum; alarm threshold located at about 50 mm from the centre of the lower nut (in presence of mineral oil type CB68, according to ISO 3498, at 23°C).

• Sensor bracket

Watertight in polyamide based (PA) technopolymer, black colour, with a built-in relay (reed) with two conductors wired to the two-pin connector. Two executions available:

- HCX/E+STL-N.A.: with electrical contact normally open.
- HCX/E+STL-N.C.: with electrical contact normally closed.

• Temperature electrical probe

Zinc-plated steel screw with built-in probe. The probe is made out of a platinum resistor whose ohmic resistance changes according to the temperature.

• Swivelling two-pin connectors

With built-in cable glands and contact holders. Front or side output (right or left) including protection against water sprays (protection class IP 65 according to IEC 529 table (see page 503) that can be increased during installation with the necessary adjustments. Flat NBR synthetic rubber packing rings.

• Contrast screen

White lacquered aluminium. The housing, in the appropriate external rear slot, guarantees the best protection from direct contact with fluid, avoiding yellowing effect due to the prolonged action of the fluid at high temperatures.

It can be removed before installation to fit marks and words (for example MAX-MIN).

• Assembly

- When nuts can be fitted from the inside of the reservoir, by means of the supplied set screws and nuts.
- When nuts cannot be fitted from the inside of the reservoir and the walls are thick enough, by means of the supplied set screws, without nuts, by tapping the two holes in the reservoir walls.
- When nuts cannot be fitted from the inside of the reservoir and the walls are not thick enough, by means of the supplied set screws and the Fast Mounting Kit (see page 1040).

To ensure the best sealing of the O-rings it is recommended to apply the maximum torque on the nuts as reported in the table and a roughness of the gasket application surface $R_a = 3 \mu\text{m}$.

• Maximum continuous working temperature

90°C (with oil).

Features and performances

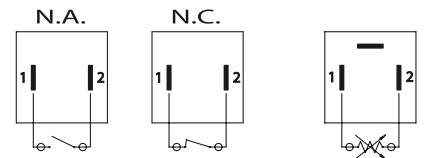
This column level indicator generates an electric signal when the oil goes down to the minimum level allowed and an analogic electric signal of the oil temperature.

Assembled using ultrasound welding to guarantee a perfect seal. Entirely in transparent material: maximum fluid level visibility even from side positions.

Technical data

In laboratory tests carried out with mineral oil for hydraulic systems type CB68 (according to ISO 3498) with gradually increasing pressure, at 23°C, the weld stood up to 13 bar.

In any case we suggest to verify the suitability of the product under the actual working conditions. If you need to use the indicator with other oils or fluids and under different pressure and temperature conditions, please contact ELESA Technical Department or carry out tests in order to guarantee a proper use.



Electric characteristics	MIN level sensor	Temperature probe
Power supply	AC / DC	DC
Electric contacts	N.A. normally open N.C. normally closed	-
Maximum applicable voltage	150 Vac, 200 Vdc	5 Vdc
Maximum opening current	1 A resistive loads	-
Maximum rated capacity	1.5 A (power on contact 10W)	2 mA
Cable gland	Pg 7 (for cables in sheath with Ø 6 or 7 mm)	
Conductors cross-section	Max 1.5 mm ²	

Do not mount this indicator in proximity to magnetic fields.

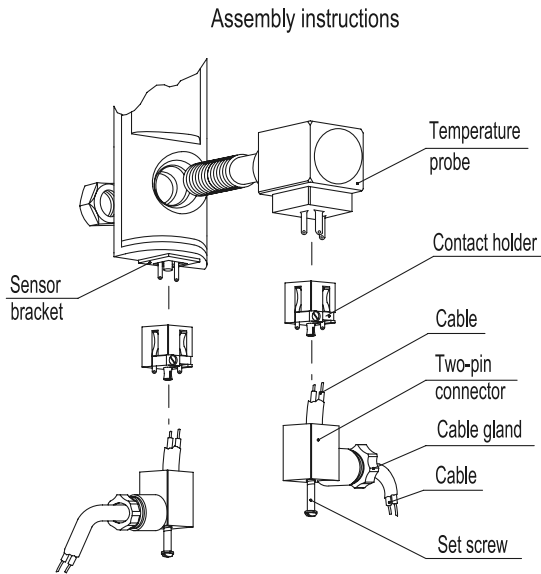
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Accessories for hydraulic systems

Two-pin connectors assembly instructions

1. Remove the connectors from the indicator by unscrewing the set screw placed in the bottom, take the contact holders out and loosen the cable glands.
2. Slip on the two-pole cable into the connectors (standard connectors) and connect the wires to the terminals nr. 1 and nr. 2 of the relative contact holders.
3. Assemble by pressing the contact holders into the relative connectors in the required position.
4. Screw the connectors to the indicator and then tighten the cable glands.



Functioning of the MIN level electrical sensor

Execution HCX/E+STL-N.A.: the electrical circuit is closed when the minimum level is reached.

Execution HCX/E+STL-N.C.: the electrical circuit is open when the minimum level is reached.

Functioning of the temperature electrical probe

The working principle of the temperature probe is to measure the variation of resistance of a platinum element: 100 ohm = 0°C, 138.4 ohm = 100°C.

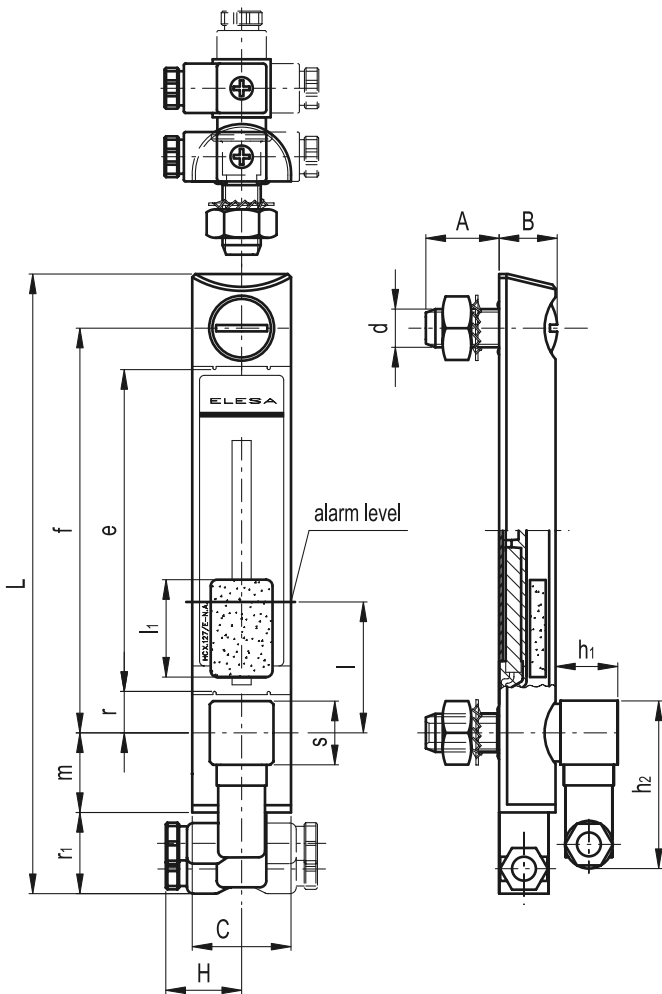
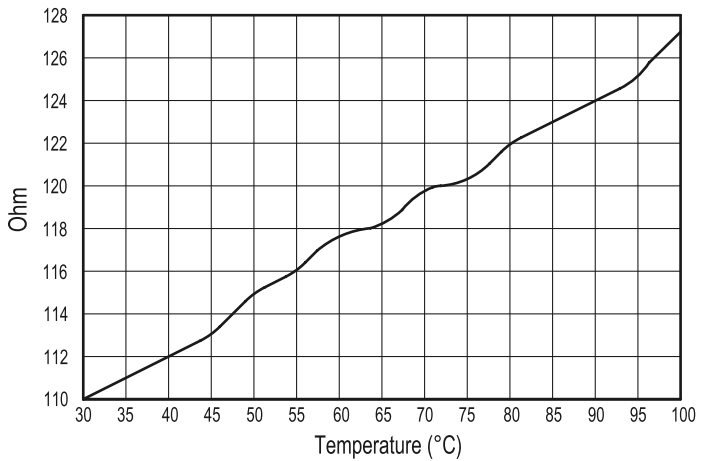
The function between temperature (T) and resistance (R) is approximately linear over a small temperature range: for example, if you assume that it is linear over the 0° to 100°C range, the error at 50°C is 0.4°C. For precision measurement, it is necessary to linearise the resistance to give an accurate temperature. The most recent definition of the function between resistance and temperature is International Temperature Standard 90 (ITS-90). The function between resistance and temperature, obtained in laboratory tests, measuring directly the resistance value on the contacts is shown in the graph.

We suggest, anyway, to set the system in order to compensate both heat dissipation and cable resistance.

A 1°C temperature change will cause a 0.384 ohm change in resistance, so even a small error in measurement of the resistance (for example, the resistance of the wires leading to the sensor) can cause a large error in the measurement of the temperature.

Because of the low signal levels, it is important to keep any cables away from electric cables, motors, switchgear and other devices that may emit electrical noise. Using screened cable, with the screen grounded at one end, may help to reduce interference. When using long cables, it is necessary to check that the measuring equipment is able to handle the cable resistance.

Resistance / temperature conversion graph



Standard Elements		Main dimensions															⚖	
Code	Description	f	d	A	B	C	H	L	e	l	h ₁	m	r	r ₁	h ₂	s	g	
11156	HCX.127-E-STL-N.A.-M12	127	M12	23	18	31	27	195	101	50	40	25	13	26	21	54	22x22	236
11157	HCX.127-E-STL-N.C.-M12	127	M12	23	18	31	27	195	101	50	40	25	13	26	21	54	22x22	236