# Level Indicator - Transmitter

## *Type 850*

### Models :

- 850 Stainless steel indicator base / aluminium housing
- 850 Stainless steel indicator base / stainless steel housing
- 850 Indicator + alarms
- 850 Electronic transmitter
- 850 Electronic transmitter + alarms

### Features :

- Compact
- Accurate
- Robust design
- Economical
- 4-20mA Transmitter with a two wires connection
- Visual indication without any electrical power
- **Top or chamber mounting**

## DESCRIPTION

The Type 850 Level Indicator/Transmitter is designed to display and/or relay readings of the level of a fluid in a tank.

It consists of:

- An indicator unit (in an aluminium enclosure or, as an option, in a stainless steel enclosure) incorporating 1 or 2 alarms and/or 1 electronic transmitter;
- A float or plunger (made of stainless steel or other material, depending on the type of fluid);
- A connection fitting for attachment to the tank (flange or threaded connector) equipped with a sensing head containing the fitting for connection to the indicator unit.

## MEASUREMENT PRINCIPLE

The instrument is mounted in a vertical position. The fluid level is indicated by the float. The movement of the float is spring-assisted in order to provide a wide range of measurement, as a function of the scale to be measured and the density of the fluid. The level reading is transmitted by magnetic coupling to the dial pointer on the graduated dial of the indicator unit and to the alarm or relaying modules located inside the unit downwards.

## UTILIZATION

The level indicator type 850 is specially designed to measure levels of any liquid fluid. It is suitable for opaque, corrosive or dangerous fluids, used in most of industrial processes. Its robust stainless steel design allow very hard utilization conditions. This level indicator has a really compact design which include indicator + alarm assemblies.

# TECHNICAL SPECIFICATIONS

- **Accuracy** : ± 3 % of the full indicator scale
- **Scale ratio (level)**: 0 to 10
- **Range of levels:** 50 to 4000 mm (refer to the table "Range of Levels")
- **Range of densities:** Std > 0.6 (depending on the range of levels)
- **Details of the interface range available on request**
- **Connections**:

-Standard threaded, stainless steel: 1.5 inch or 2 inch or 2.5 inch (other on request)*

-Stainless steel flange > 32 nominal diameter

**Depending on the size of the float as a function of the ratio of level reading/specific gravity*

- **Operating pressure:** Nominal pressure 16 to 100 (connection to all nominal pressure tappings), up to NP420 on request.
- **Operating temperature:**

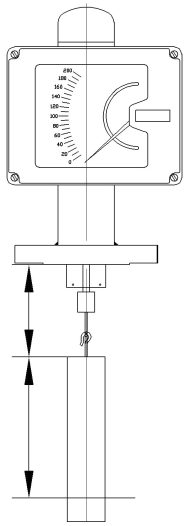
Standard: –60 °C to +150 °C (Without switch / transmitter)

-Heat shield required, depending on the equipment options.

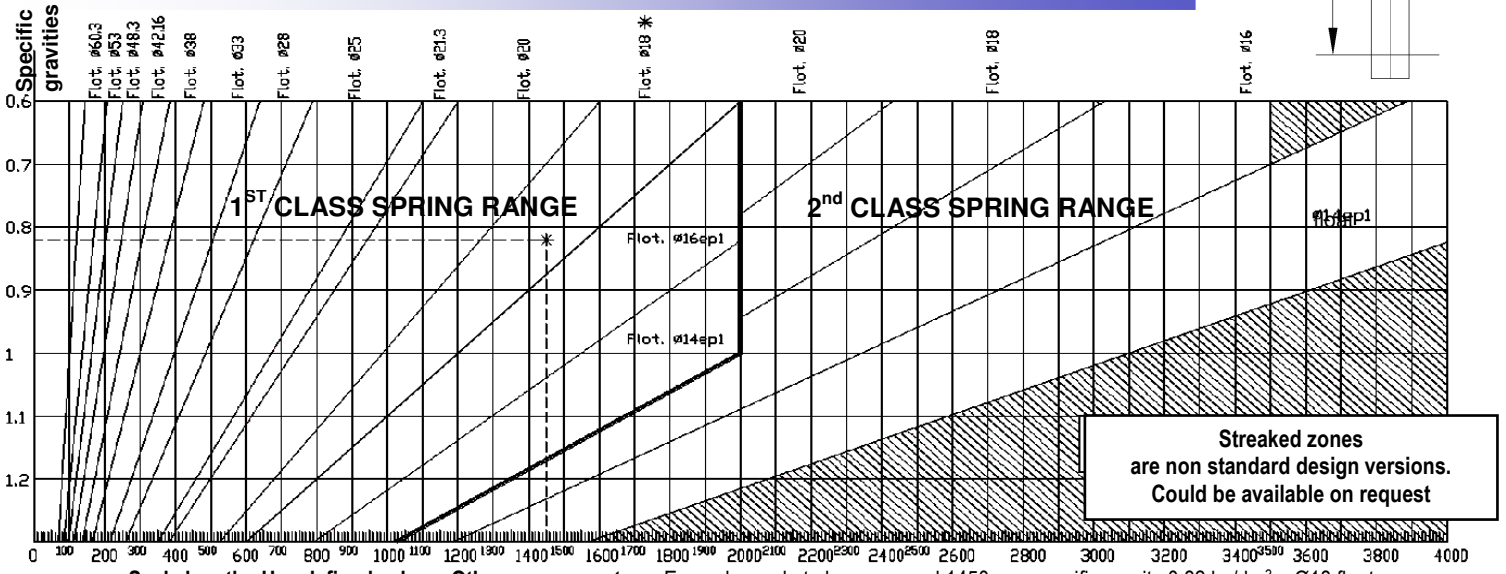
-High temperature versions available on request (150-250°C).

- **Turbulance protection tube (option)**
- **Mounting chamber (option)**
- **Materials:**

- wetted parts (body and float assembly)
Z2 CND Stainless steel (316L)
- indicator housing (IP65)
- aluminium version : mounting plate in aluminium alloy, front cover in cast aluminium alloy, epoxy/polyester paint
- stainless steel version : mounting plate and front cover in 316L stainless steel (not painted in standard).




# LEVELS RANGE




**Streaked zones are non standard design versions. Could be available on request**

**Scale length : Use defined values. Others on request**. Example: scale to be measured 1450mm, specific gravity 0,82 kg/dm$^3$ – Ø18 float

# ALARM CONTACTS

**Alarm type :**

- Proximity switch to NAMUR and DIN standards
- Two adjustable contacts (high and low alarm) over whole scale. Settings accesibles on dial with visual check indicator on flow scale. Can be associated with electronic transmitter.
- Repeatability : < 0,5% of max value.

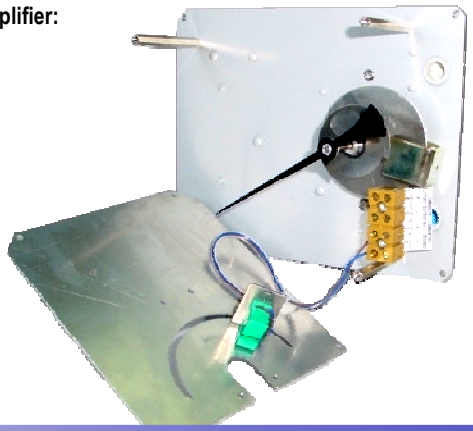
**Proximity switch characteristics:**

- 2 wired direct current detector
- rated voltage: 8V= (Ri ~1kΩ)
- operating voltage: 5 to 25V
- consumption
- with (or without) alarm: < 1mA
- Without (or with) alarm: > 3mA
- Control line resistance: < 100Ω
- ambient température range: -25 to 70°C
- intrinsically safe version :

. type NAMUR / ExiaIICT6Ga
. rated voltage: 8V= (Ri ~1kΩ)
. maximum voltage: < 15,5V
. max ambient temperature: 65°C

**Characteristics of associated relay amplifier:**

- Main supply: 220V 50/60Hz (115V~ or 24V= on request)
- Contact cut-off capacity : Maximum voltage: 250V/2A cosφ> 0,7 continue voltage: 40V/2A (ohmic)
- Mounted on symmetrical 35mm DIN rail or individual attachment by screws. Protection IP20.
- Ambiant temperature: -20 to +60°C
- Intrinsicaly safe version [Exia]IIC to CENELEC (No IS outputs).



# ELECTRONIC TRANSMITTER

As an option, the instrument can be equipped with an electronic transmitter. This is an electronic inverter with a contact-free capacitive detection function. The inverter is interlocked to the shaft of the indicator by means of a cam, the profile of which ensures that the output current is exactly proportional to the output. The standard version corresponds to an output current of between 4 and 20 mA in a 2-cable link. Other versions are available

### Standard version

- Output signal 4 to 20 mA (proportional to 0 to 100 % of the indicator scale)
  4 mA corresponds to zero on the scale (marked setting position –0).
  5.6 mA corresponds to 10 % of the scale (first measuring point 10 %)
  20 mA corresponds to 100 % of the scale (final measuring point 100 %)
- 2-cable transmission
  - Power supply voltage UB = 12 to 33 V DC
  - (ripple < 10 %, but not less than 12 V)
- Max. load in kΩ R1 = $\frac{UB - 12}{20}$ (i.e. 600 Ω for 24 V)
- Linearity: ± 0.4 %
- Ripple of the output current < 0.3 %
- Temperature fluctuation < 0.05 % per °C
- Permissible operating temperature: –25 °C to +70 °C

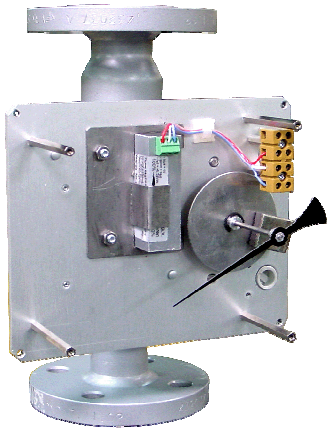
### INTRINSICALLY SAFE VERSION

(option to be specified when the order is placed)

- Protection system Ex ia IIC T6
- **II 2G Ex ia IIC T6-T5-T4 Ga/Gb**

up to an operating temperature of 65 °C

- Parameters applicable to IS:
- $C_{int} \leq 15$ nF, $L_{int} \leq 2$ µH
- Power supply to S1: UB voltage ≤ 30 V DC,
- short circuit current $I_{DC} \leq 160$ mA
- $P_{max} = 1$ W, $C_{int} \leq 10$ nF, $L_{int}$ approx. 0
- Certificate LCIE01ATEX6063X



# INSTRUMENT DESIGN

Each instrument comprises three main subassemblies: the connecting head, the indicator unit and the float. These elements are assembled and calibrated at the factory. For space and transportation reasons, the float may be supplied separately; it is simply secured in place by means of hooks.

Each instrument is allocated a unique serial number (stamped on the bracket welded to the header tube and printed on the dial of the indicator unit and on the float). It is essential to quote this number in the event of any request for information from the manufacturer's After-Sales Service.

If the instrument is dismantled and reassembled for any reason, the serial number on the barrel, the indicator unit and the float must be identical in order to ensure that the readings are accurate.

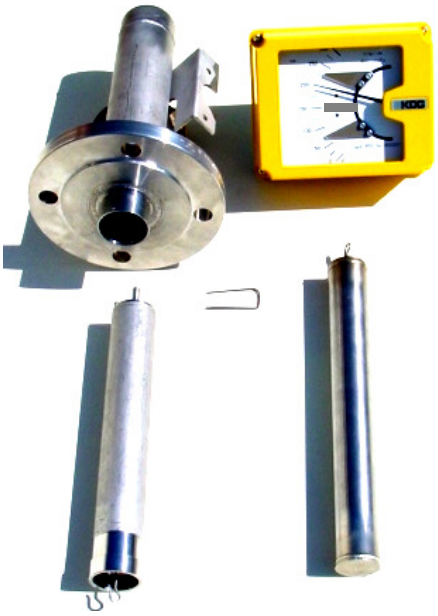
The connecting head incorporates a fitting for connection to the tank (threaded connector or flange) equipped with a tube to which the mounting bracket for the indicator unit is welded. Inside this tube, a block with a control magnet slides between thrust bearings. These movements are assisted by a spring.

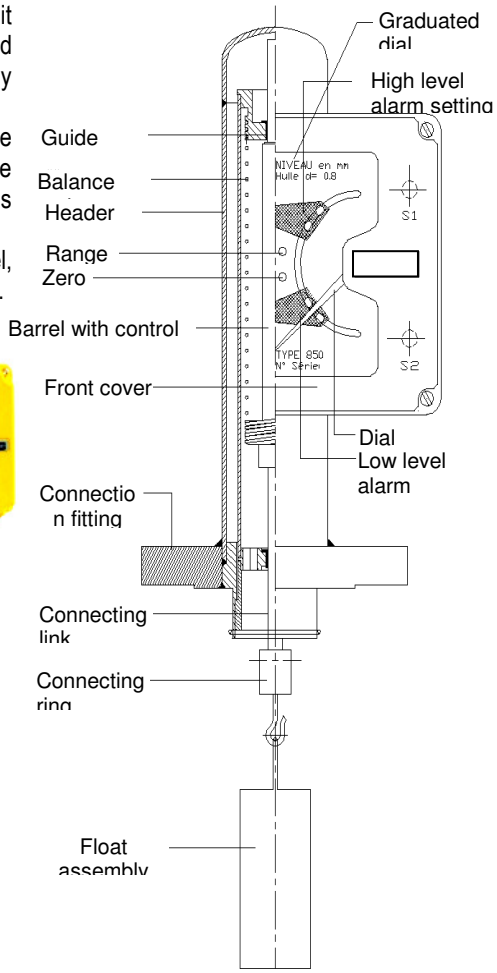
The upper end of the tube incorporates an access plug with an O-ring seal.

The indicator unit consists of a main shaft mounted on precision ball bearings on which are mounted the receiver magnet (inside the magnetic extension), the dial pointer, the eddy current brake and the cams controlling the alarms and/or the transmitter (inside the indicator unit).

The float, with a fast-fitting clip or a stainless steel cable connection, is adapted to suit the conditions of use. The length of the float is slightly greater than the scale to be measured and its diameter varies according to the scale (refer to the standard tables).

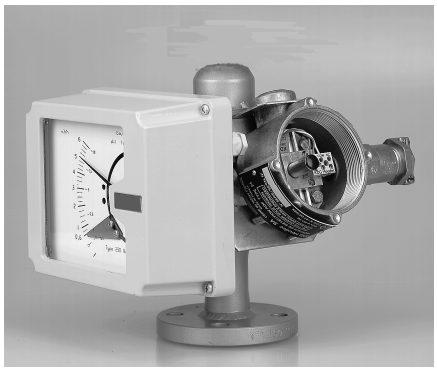
As an option, a float anti-balancing system can be mounted on the connecting flange.

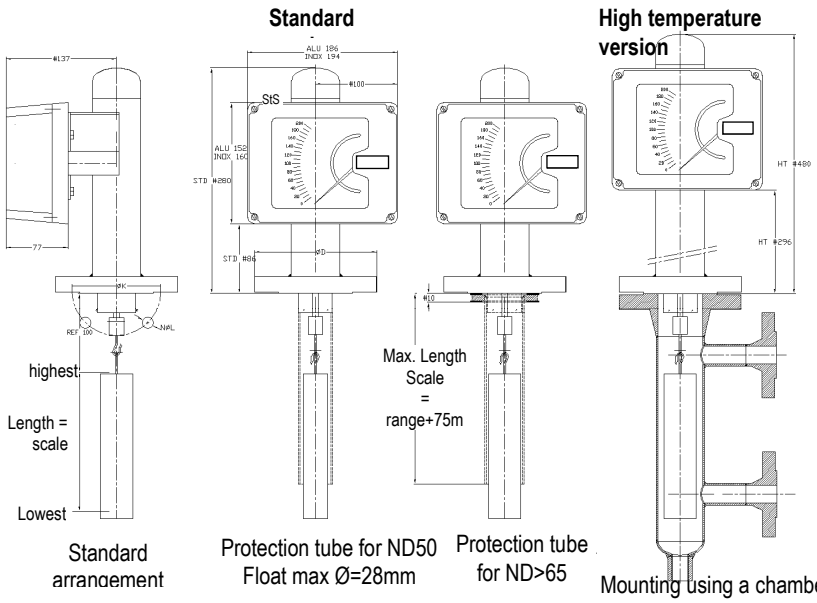





# FLAME-PROOF VERSION

- LCIE Certificate (LCIE01ATEX6060X) Ex d IIC T6 Gb
  **Ⓔx II 2 G Ex d IIC T6 Gb**
- Contact : Bi-stable Change over SPDT.
  - Maximum voltage : 220V
  - Maximum current : 1A
  - Maximum power : 60VA 30W resistive load
- Protection class: IP54 (IP65 on request)






# DIMENSIONS

**DIMENSIONS OF STANDARD FLANGED VERSIONS**

| DN | 50 | | 2" | | 65 | | 2"½ | | 80 3" | | 80 3" | | 100 4" | | 100 4" | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PN | 16 | 40 | 150 LBS | 300 LBS | 16 | 40 | 150 LBS | 300 LBS | 16 | 40 | 150 LBS | 300 LBS | 16 | 40 | 150 LBS | 300 LBS |
| ØD | 165 | 165 | 152.4 | 165.1 | 185 | 185 | 178 | 190 | 200 | 200 | 190 | 210 | 220 | 235 | 229 | 254 |
| ØK | 125 | 125 | 120.6 | 127 | 145 | 145 | 139.7 | 149.2 | 160 | 160 | 152.4 | 168.3 | 180 | 190 | 190.5 | 200 |
| ØL | 18 | 18 | 19 | 19 | 18 | 18 | 19 | 22.2 | 18 | 18 | 19 | 22.2 | 18 | 22 | 19 | 22.2 |
| N | 4 | 4 | 4 | 8 | 4 | 8 | 4 | 8 | 8 | 8 | 4 | 8 | 8 | 8 | 8 | 8 |

# ORDERING INFORMATION

***Instrument Type :850***

| Code | Case/housing Type |
|---|---|
| **850A** | STD Alu |
| **850AE** | STD Alu with high temperatures option |
| **850I** | STD Stainless steel |
| **850IE** | STD Stainless steel with high temperatures option |

| Code | Nominal Pressure (N.P.) |
|---|---|
| **XXX** | 16 - 40 - 20 - 50 - 100 |

| Code | Nominal Diameter |
|---|---|
| **C1** | Nominal Diameter 50 (2") |
| **C2** | Nominal Diameter 65 (2"½) |
| **C3** | Nominal Diameter 80 (3") |
| **C4** | Nominal Diameter 100 (4") |
| **C1** | G2" Cap NFE 03005 |

| Code | Protection tube |
|---|---|
| **K1** | For ND 50 |
| **K2** | For ND 65 |
| **K3** | For ND 80 |
| **K4** | For ND 100 |
| **K10** | For 2" threaded plug |

| Code | Measuring Scale |
|---|---|
| **M ---** | See table « Level range » |

| Code | Transmiter |
|---|---|
| **T1** | Std 4-20 mA Electronic Transmiter |
| **T2** | 4-20 mA Electronic Transmiter –CENELEC certified (I.S.) |

| Code | Alarms |
|---|---|
| **S1** | 1 contact, low position alarm basse (without relay) |
| **S2** | 1 contact, high position alarm haute (without relay) |
| **S3** | 2 contacts, low and high position alarms (without relay) |
| **S4** | 1 contact, low position alarm basse (with relay) |
| **S5** | 1 contact, high position alarm haute (with relay) |
| **S6** | 2 contacts, low and high position alarms (with relay) |

| Code | Options |
|---|---|
| **Z5** | Intrinsic safety for T and/or S codes |
| **Z7** | Instrinsic safety power +re-transmission |
| **Z9** | Epoxy Paint for indicator case |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **850A** | **40** | **C2** | **K2** | **M700** | **T1** | **S4** | **Z9** | **Example :** ( for a non standard process instruments, measuring scale, type of fluid, etc, should be defined while ordering) |

**REQUIRED DATA FOR QUOTATIONS / ORDERS**

- Type of fluid
- Specific gravity in normal use
- Temperature of the fluid
- Max. temperature of the fluid
- Max. operating pressure of the fluid
- Connection flange rating and size.

**COMMISSIONING AND SERVICING**

Precautions:

The instrument must be mounted in a correct vertical position

Keep the interior of the instrument as clean as possible

**SPARE PARTS**

- Float
- Case assembly
- Graduated dial

**Houdec Innovation S.A.S.**
Z.A. de la Tour– ABREST– France
Tel: +33 (0)4.70.59.81.81.
Fax: +33 (0)4.70.59.96.37.
Email : contact@houdec.com
**www.houdec.com**