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УРОВНЕМЕРЫ

Технические характеристики
на

СТ801-LB/S-B, СТ801-LB/S-R,
СТ801-LB/S-RF

1. INTRODUCTION

The Level Transmitter CT801 Series is designed for measuring the level of all types of liquid products in all kinds of tanks such as ballast tanks, service tanks,..., from the hydrostatic pressure of an air-flow bubbling through a pipe which reaches the bottom of the tank. This pressure is transmitted to an electronic conditioner including a pressure sensor, providing an electrical analog output signal.

The CT801-LB/S provides an electric current from 4 to 20 mA in the 24 Vdc typical power supply loop. Two wires are necessary for the CT801-LB/S connection to the monitoring system.

The CT801 Series are fitted with a differential pressure sensor, so even if installed on a pressurised tank, the output signal is a direct function of the liquid height.

The CT801 Series are fitted with the following mechanical interface, for the best adaptation to all installation conditions :

- Suffix B : flange PN16 DN50
- Suffix R : female threaded coupling 1" BSP, with optional bracket
- Suffix R1/4 : female threaded coupling 1/4" BSP, with optional bracket

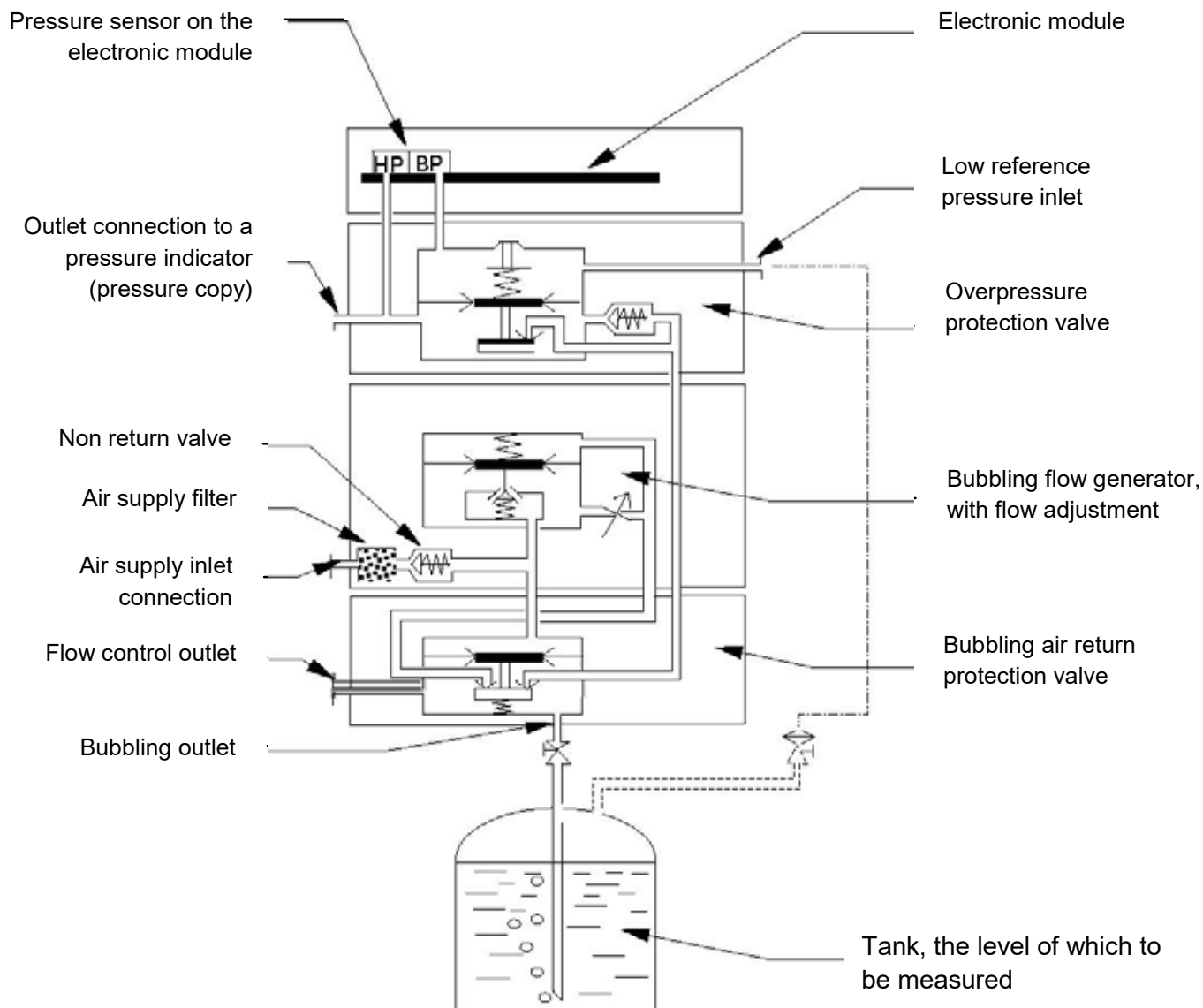
The Installation of the transmitter is described in the **MI5005 Installation Manual**.

The Maintenance of the transmitter is described in the **MM5005 Maintenance Manual**.

2. DESCRIPTION

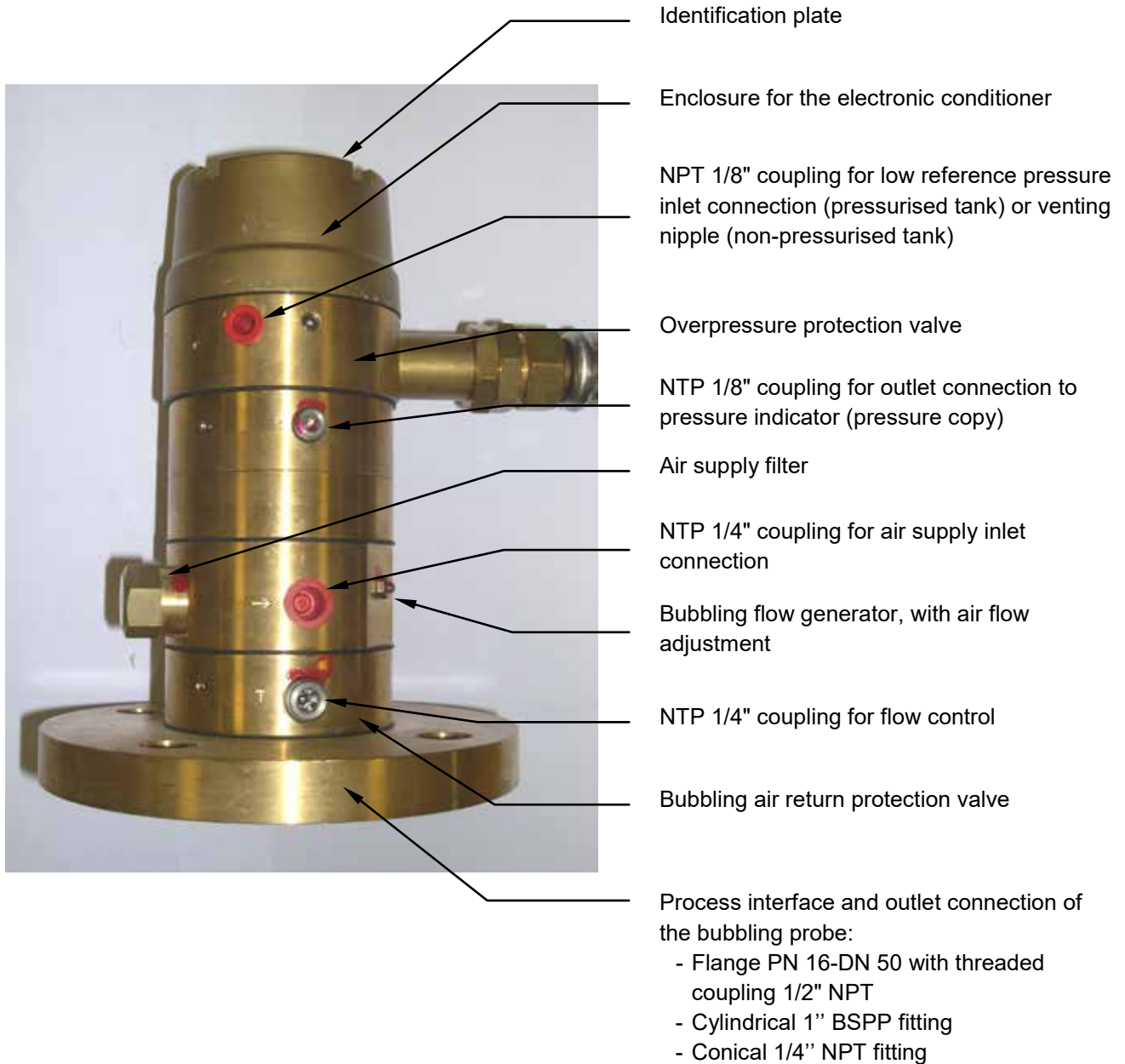
The CT801 Series is composed of **two main parts** : the **pneumatic bubbling flow modulator** and the **electronic signal conditioner**.

The operation principle is as follow :



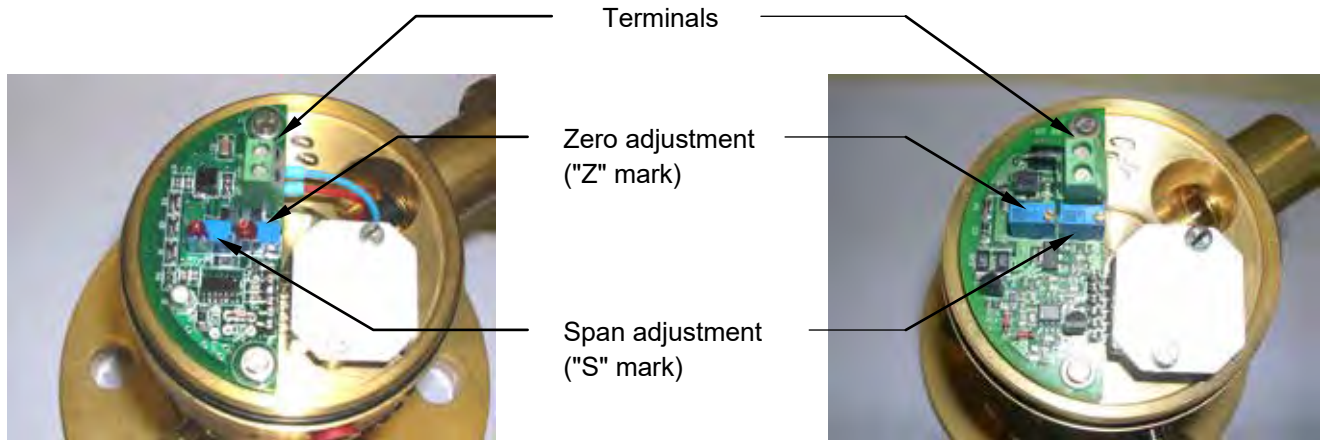
2.1 Pneumatic modulator

The pneumatic bubbling flow modulator common for all models is composed of :



2.2. Electric conditioner

The electronic conditioner board, including the pressure sensor, is placed in a solid housing on top of the pneumatic modulator, ensuring the compactness of the CT801 transmitter.



Type 34052

Type 35445

3. TECHNICAL SPECIFICATIONS

- Span :adjustable by potentiometers within the following ranges :

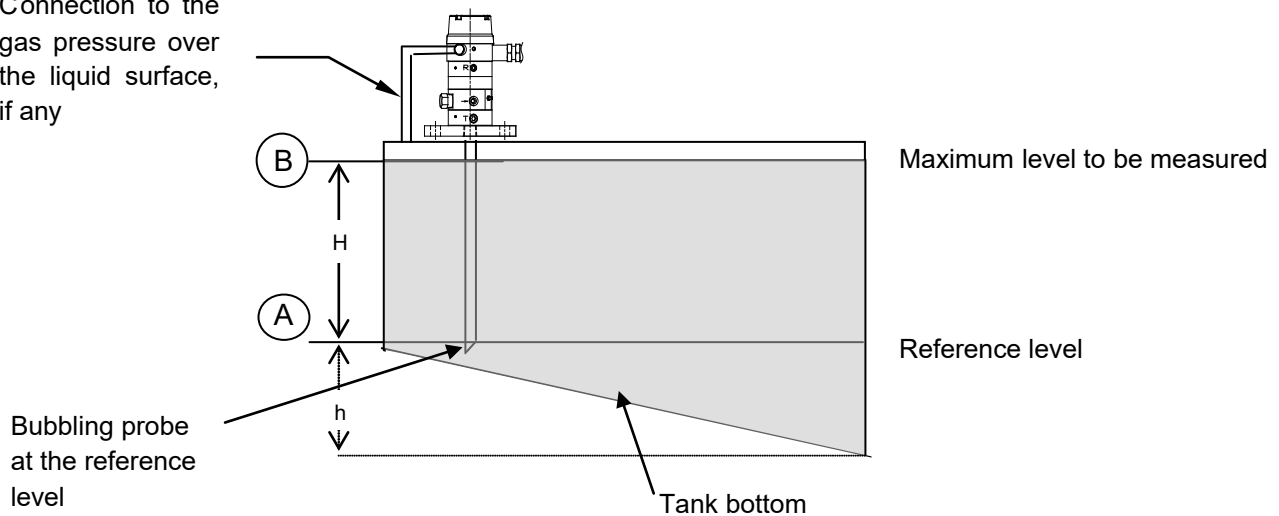
HYDROSTATIC PRESSURE MEASURING RANGE	ADMISSIBLE OVERPRESSURE
0-50/70 mbar	350 mbar
0-70/350 mbar	1000 mbar
0-350/1050 mbar	3000 mbar
0-1050/2100 mbar	6000 mbar
0-2100/4100 mbar	10 000 mbar

• Power supply :	Type 34052 : 12 to 28 Vdc (nominal 24 Vdc), with resistive load from 0 ohms at 12 Vdc to 800 ohms at 28 Vdc Type 35445 : 16 to 28 Vdc (nominal 24 Vdc), with resistive load from 0 ohms at 16 Vdc to 600 ohms at 28 Vdc
• Output signal :	current loop 4 - 20 mA
• Bubbling air supply :	4 to 10 bar, instrument quality (nominal 6 bar)
• Bubbling flow :	10 l/h, regulated
• Uncertainty :	0.3 % of nominal sensor range (linearity + hysteresis + repeatability)
• Temperature compensation range :	0 to +70°C
• Temperature drift :	< 0.015 %/°C within the compensation range
• Operational temperature :	-40°C to +85°C
• Storage temperature :	-50°C to +85°C
• Time drift :	0.1% of nominal range, non cumulative
• Protection degree of enclosure :	IP 66/67
• Material :	all Brass
• Environment :	acc. to IACS E10 Rev. 5 , for installation on deck

4. OPERATION

The bubbling flow of air from the CT801 is driven by a bubbling line to the bottom of the tank, at a level which is considered as the reference level, in order to meet the hydrostatic pressure of the liquid in the tank at that location. In the case of a pressurised tank, the pressure over the liquid surface is connected to the low pressure inlet of the CT801. So, the electric output signal of the CT801 transmitter is the direct function of the hydrostatic pressure of the liquid itself at the outlet of the bubbling line.

Connection to the gas pressure over the liquid surface, if any



Then, the calculation formula for getting the level from the hydrostatic pressure measured by the CT801 transmitter is :

Measured Level "H" = (hydrostatic pressure) / 9.81 / density x 100000 + Zero Line "h"

with :

- Measured level "H" in mm
- Pressure in mbar
- Density of the liquid in kg/m^3
- Zero line "h" in mm is the distance between the extremity of the bubbling line and the tank bottom

In the case of a pressurised tank, the hydrostatic pressure is the pressure of the liquid at the outlet of the bubbling probe, minus the pressure over the liquid surface, connected to the low pressure inlet connection of the CT801 transmitter.

Thanks to the bubbling air process, the CT801 transmitter can be placed anywhere, even below or far from the tank, since its location has no influence on the measurement process : due to the regulated low flow, the pressure drop in the bubbling line is negligible, no matter the line profile.

5. INSTALLATION

5.1 Mechanical installation

Refer to the Installation Manual MI5005E.

The CT801 transmitter can be placed anywhere. Select the mechanical interface for best installation :

- Flange model "B" : for deck or floor installation;
- Female coupling "R" : for wall installation using the optional bracket and a 1" bubbling line;
- Female coupling "R1/4" : for wall installation using the optional bracket and a 1/4" bubbling line;

**CAUTION:**

- When the CT801 is installed at a place lower than highest liquid surface level, it is essential to attach an isolating valve to the bubbling line in order to allow for the installation and removal of the transmitter, without any risk of liquid expansion.
This valve should be installed close to the transmitter, ensuring that **a dead volume of 0.5 litre is preserved between the CT801 and the valve.**
- The bubbling line must not show any low point, liable to retain liquid or condensation in the bubbling line.

**RECOMMENDATION:**

- It is strongly recommended to isolate the bubbling line by inserting a valve for checking or maintenance purposes.
- In case of use with muddy fluids (for instance ballast tanks), or when particles are able to obstruct the bubbling line in the tank, a three-way valve should be inserted into the bubbling line, on the transmitter side, being supplied with compressed air : when the measuring signal increases, possibly due to a partial obstruction in the bubbling line, this valve should be switched so helping to dispose the suspect obstruction. This valve can also be used to reduce the response time needed to reach the hydrostatic pressure equilibrium when starting the system.

5.2. Air supply

Refer to the Installation Manual MI5005E.

**IMPORTANT NOTE:**

The CT801 transmitter must be supplied with **instrument-quality air** at a pressure of 4 to 10 bar. Do not hesitate to contact Honeywell Marine for the provision of an air dryer and oil extractor.

**RECOMMENDATION:**

Incorporate a valve into the supply circuit, for best installation and maintenance conditions.

- Connect the air supply to NPT ¼" inlet coupling marked with an arrow (see § 2.1).

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