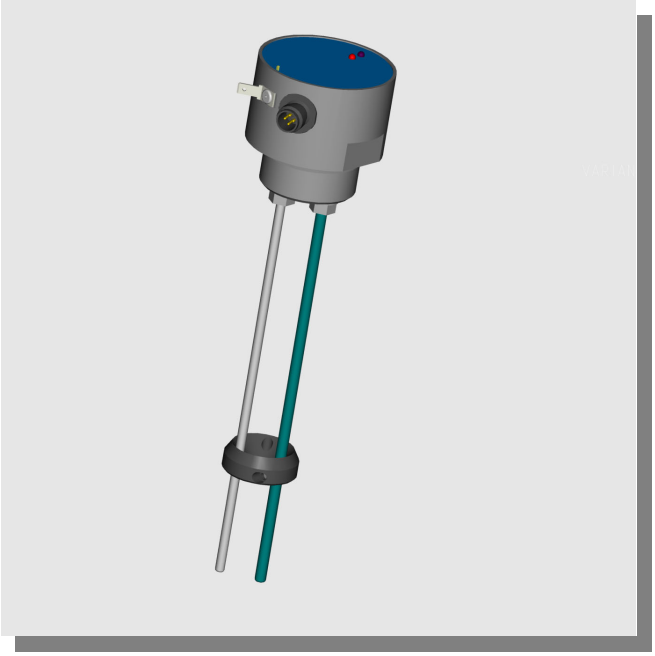
FISCHER MESS- UND REGELTECHNIK

# NC56 || Capacitive Level Sensor

The Model NC56 Capacitive Level Sensor can be used for level measurement of

- Clean water
- Waste water and sewage
- Diesel fuel
- Fire suppression foam

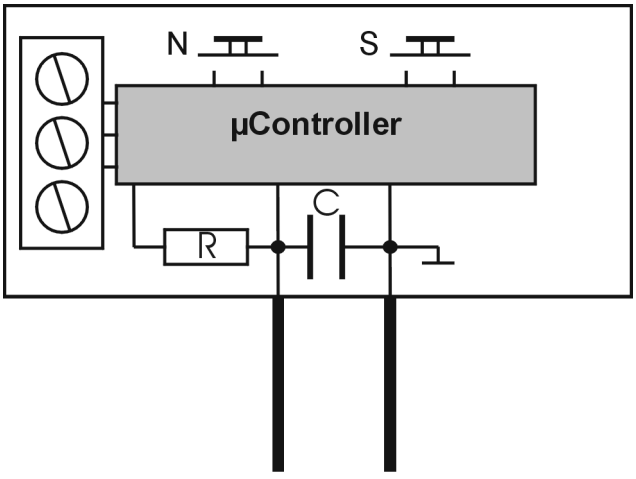
The NC56 can be applied to plastic or metal tanks, and configured for measuring level in ranges from 400 to 2000 mm.



**Principles of Operation**

Two parallel metal rods with a fixed distance between them form a capacitor when charged with an A.C. voltage. When these rods are immersed in a liquid medium, the capacitance value is a function of the immersed length. With the probes fixed vertically downward, the immersed length is proportional to the liquid level. The capacitance of the probes is therefore a function of the level. An electronic circuit module in NC56 Level Sensor converts the capacitance value to a level measurement and transmits as a linear standard electrical signal: 0-20 mA, 4-20 mA, 0-10 V DC, 0-5 V DC, 1-5 V DC or 2-10 V DC.

**Schematic Diagram**




**Features**

- Rugged design and construction, IP67
- Built-in electronic signal conversion
- Very easy level setting
- EC type approval

**Applications**

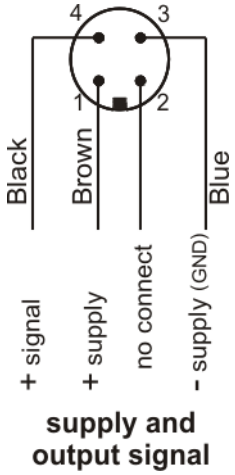
The Model NC56 Capacitive Level Sensor can be used in a variety of applications areas, for example:

- Manufacturing industries
- Process industries
- Environmental systems
- Vehicular applications
- Marine applications

# Specifications

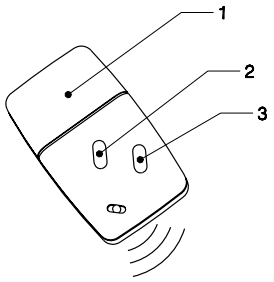
| | | | | | |
|---|---|---|---|---|---|
| **General** | | | | | |
| Sensing technique | Capacitance sensing | | | | |
| Level measuring range | 400 - 2000 mm (other ranges available against special order) | | | | |
| Operating pressure | 10 bar, max. | | | | |
| Temperature | Max. 80°C (ambient and media) | | | | |
| Number of electrodes | 2 (3 for diesel applications) | | | | |
| Process connection | Threaded G1¼" (M). With protective tube: G 2" (M) | | | | |
| Degree of protection | IP67 | | | | |
| **Electrical** | | | | | |
| Operating voltage | 9 - 32 V DC | 9 - 32 V DC | 12 - 32 V DC | 12 - 32 V DC | 12 - 32 V DC |
| Supply current (without signal) | approx. 30 mA | approx. 30 mA | approx. 30 mA | approx. 30 mA | approx. 30 mA |
| Output signal | 0 - 20 mA | 4 - 20 mA | 0 - 10 V DC | 0/1 - 5 V DC | 2 - 10 V DC |
| Output load impedance | $(U_B - 9\ V) / 20mA$ | $(U_B - 9\ V) / 20mA$ | > 5 k Ω | > 5 k Ω | > 5 k Ω |
| | $U_B$ = Operating voltage | | | | |
| **Electrical Connection** | Male M12 type round shell connector | | | | |
| **Materials** | | | | | |
| Housing | Plastic | | | | |
| Media: contact | Stainless steel 1.4404, ECTFE, shrinking plastic tube (polyolefine) | | | | |
| Approval | EC type-approval acc. to 72/245/EEC, 95/54/EC | | | | |
| | Type-approval No. e13*72/245*95/54*2182*00 | | | | |

**Connection Diagram**




### Installation

The NC56 Capacitive Level Sensor is installed vertically downward at the top of the vessel in which liquid level is to be measured. It is fitted into a G1¼-F threaded socket, located as close as possible to the center of the tank. The lower ends of the rods must be at least 10 mm above the tank bottom to avoid contact with any sludge that may be present. The electrode rods can be cut at site to a shorter length, if required, but must be of equal length.



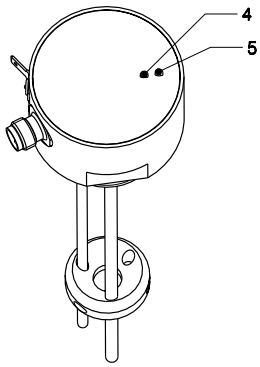

### Commissioning and Level Setting

The NC56 Capacitive Level Sensor can be put into operation after it is installed.

Detailed information regarding this is available in the Instruction Manual.

Level setting is done in two steps. First, the liquid in the tank is brought to the lowest operating level. The minimum level is set simply by pressing the "Min" button on the infrared remote control unit. The LED lamp on the top of the instrument starts blinking faster, then stays steadily on, indicating that the zero level is registered. The button is then released. The tank is then filled up to its highest operating level. The "Max" button on the infrared remote control unit is pressed as before, until the instrument's LED is continuously lit. The NC56 registers the maximum level and the level setting procedure is complete. The minimum or maximum limit level settings can be altered at any time, whenever the need arises, using the same procedure. If only one of limit setting needs to be changed, only one of two level setting buttons is used, after the liquid level in the tank is adjusted accordingly.

**For a downward characteristic (empty tank = high signal and filled tank = low signal) register the value for MAX with empty tank and the value for MIN with filled tank.**



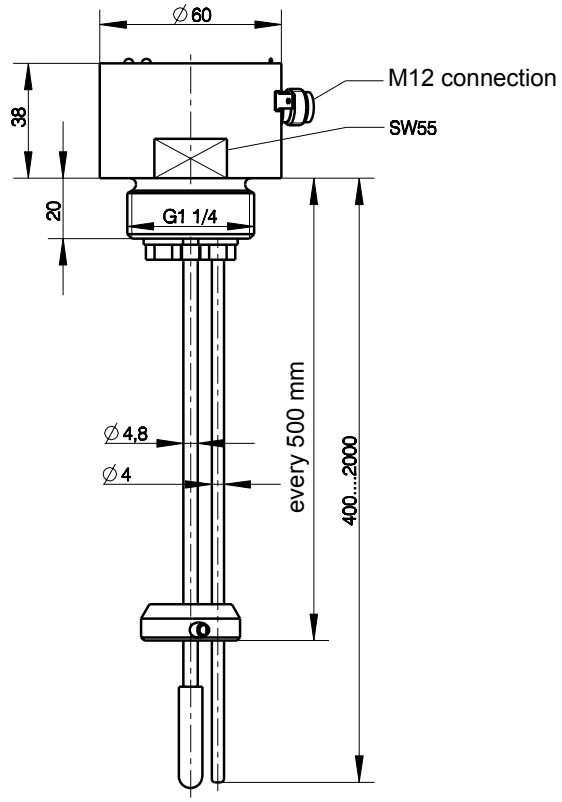

1. Infrared remote control
2. Button “Min“
3. Button “Max“
4. LED lamp
5. Infrared receiver

### Accessories

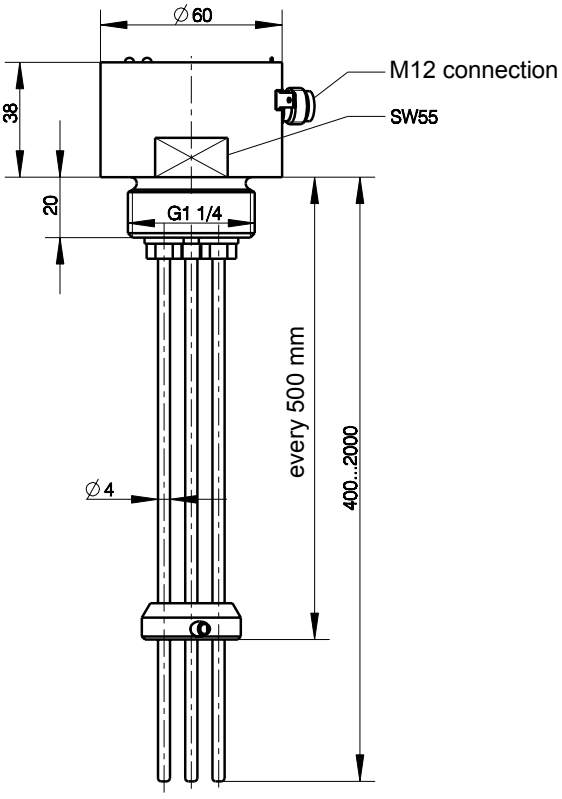
Infrared remote control unit model EU04.

# Dimensions (all units in mm unless otherwise stated)

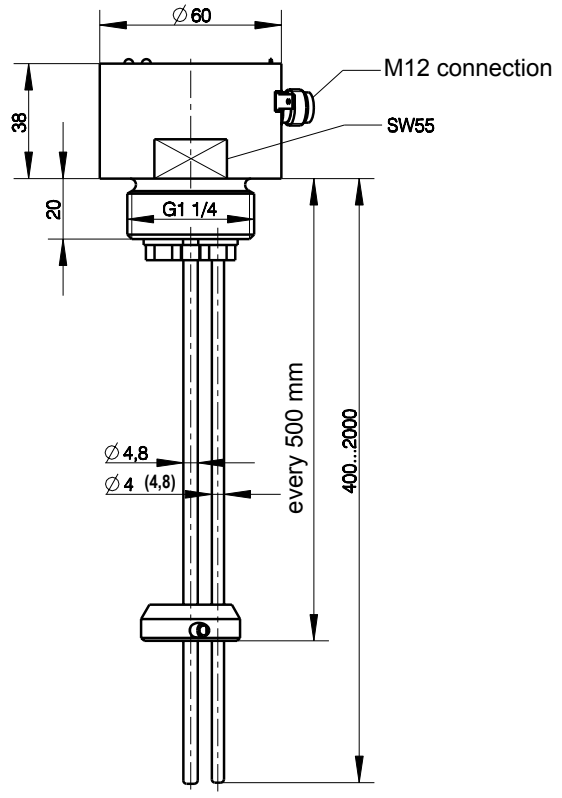
### Electrodes Configuration for Water / Waste Water



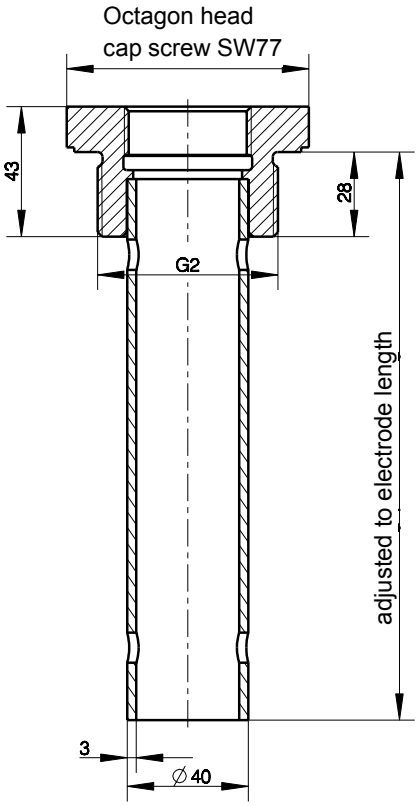

### Electrodes Configuration for Furnace Oil, Diesel




### Electrodes Configuration for Firefighting Foam / Sewage




### Protection Tube



# Ordering Code

| Capacitive Level Sensor | NC56 | | | | | | | | # | # | # | # |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Function**

Water / waste water
(1 electrode coated with shrinking plastic tube /
1 uncoated electrode, stainless steel 1.4404) ..... > 2

Diesel
(3 uncoated electrodes, stainless steel 1.4404) ..... > 3

Sewage
(1 electrode ECTFE coated /
1 uncoated electrode, stainless steel 1.4404) ..... > 4

Firefighting foam
(1 electrode ECTFE coated /
1 uncoated electrode, stainless steel 1.4404) ..... > 5

**Material Housing / Connection**

Plastic housing with G 1¼ " (M) for outside use ..... > O

Plastic housing and protective tube with G 2" (M)
for outside use ..... > P

Plastic housing and protective tube with G 2“ (M)
and boreholes for suction trucks, for outside use
**only with function 4 (sewage)** ..... > G

**Electrode Length (from housing bottom)**

400 - 2000 mm (in 50 mm steps) ..... > 0 4 0 0
..... >
..... >
..... >
..... > 2 0 0 0

**Signal Output**

0 - 20 mA linear, 3-wire (STANDARD) ..... > A
0 - 10 V DC linear, 3-wire (STANDARD) ..... > C
4 - 20 mA linear, 3-wire (STANDARD) ..... > P
0 - 5 V DC linear, 3-wire ..... > U
1 - 5 V DC linear, 3-wire ..... > D
2 - 10 V DC linear, 3-wire ..... > Z

**Supply Voltage**

9 - 32 VDC (only for current output) ..... > E
12 - 32 VDC (only for voltage output) ..... > F



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