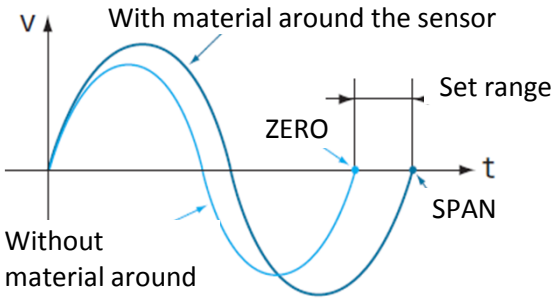
Liquid, Powder, Grain, Viscous material detection
Model CG Capacitance Type Level Sensor, Two Wire, CE Marked

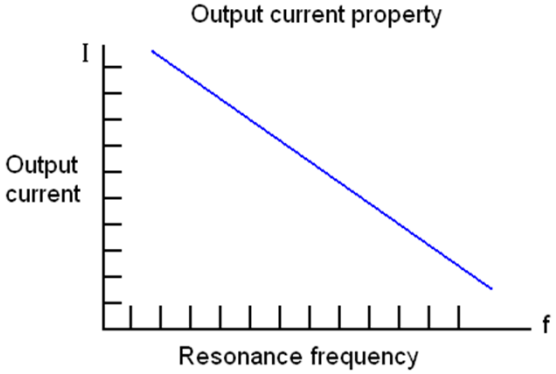
Product Overview

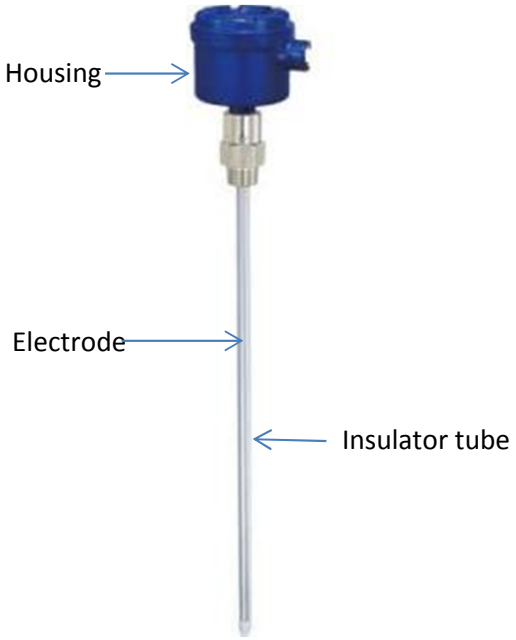
We, NOHKEN INC., has plenty of experience with capacitance level sensor for more than 30 years, and we consolidate all experience into CG400 series. CG400 series employ phase detection principle which the changing of resonance frequency is processed by microprocessor (digital circuit) and the changes in capacitance value is detected by changes in frequency value.

Principle of Operation

The basic oscillator circuit is of the parallel resonance circuit with L (coil) and C (capacitance between the electrodes). The oscillation frequency (f) of this circuit is : $f = 1/2\pi\sqrt{LC}$. The frequency without material around the sensor (f1) is: $f1 = 1/2\pi\sqrt{LC}$, where C is the capacitance without material around the sensor (zero point). With material around the sensor, the capacitance increases (C+ΔC), and the frequency (f2) is: $f2 = 1/2\pi\sqrt{L(C+\Delta C)}$, where C+ΔC is the capacitance with material around the sensor (span point). The sensor detects the frequency change from f1 to f2, and gives output (4 to 20mA) corresponding to the change. With the incorporated microcomputer, offset of output current and reversed output signals for ZERO/SPAN points are also available







Features

- **Easy Adjustment**

  ZERO and SPAN points are set by one push button.

  When the medium inside the tank is changed, adjusting one given point, and the sensor automatically calculates and outputs ZERO and SPAN values.

- **Wide range of sensitivity**

  The sensitivity is 30 to 2000pF.

  The sensor can be used in a wide range of applications without changing the circuit board.

  Example

Medium	Dielectric Constant
Kerosene	2.8
Ammonia	15 to 25
Isobutyl Alcohol	18.7 to 31.7
Methyl Alcohol	33 to 56.6
Water	48 to 80

- **Insensitive to buildup and noise**

  The sensor may not be affected by resistance of build up due to the phase detection principle.

  The sensor also may not be affected by the noise because it measures the resonance frequency.

  If the sensor is affected by buildup or noise, it automatically selects reasonable data, and outputs the signal correctly.

- **Improvement of function for buildup**

  The operational principle is different with conventional principle for detecting changes in voltage (frequency).

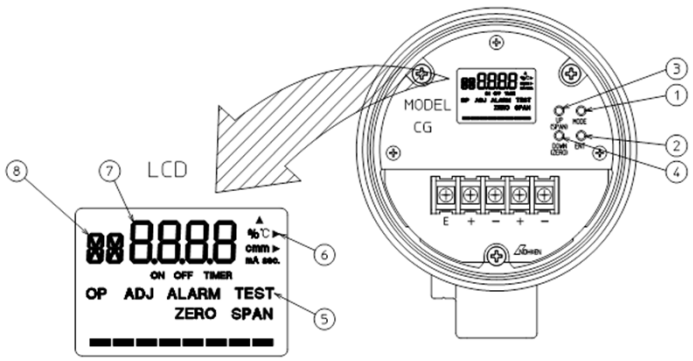
  The sensor may not be affected by resistance of adhesion due to the detection of changes in capacitance value to changes in frequency.

- **No need to adjust in actual liquid**

  The sensor shall operate normally to input same setting data in same detecting condition and same device.

  It is strong point for digital parameter setting.

Display



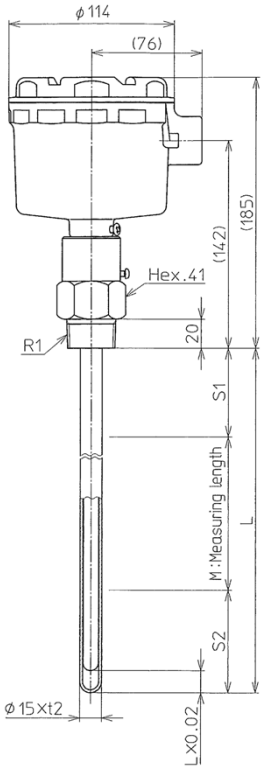
①	Mode key	Switches adjustment modes. Cancels entry.
②	Enter key	Accepts or saves entry.
③	Up key	Scrolls modes, values, paramaters.
④	Down key	Scrolls modes, values, paramaters.
⑤	Mode area	Displays current mode.
⑥	Unit area	Displays unit.
⑦	Value area	Displays measured or set value or parameter.
⑧	Maintenance mode area	Displays maintenance mode or parameter.

Specifications

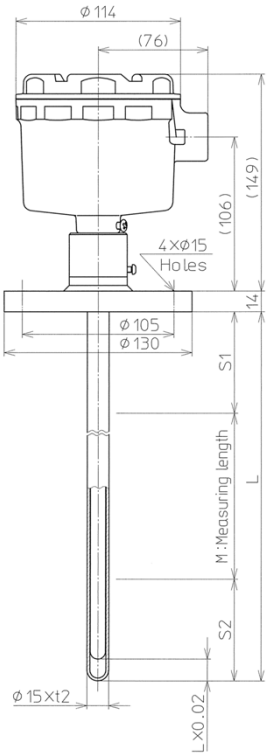
CG400 (**CE Marked**) series, Integral Type, Two wire

Model

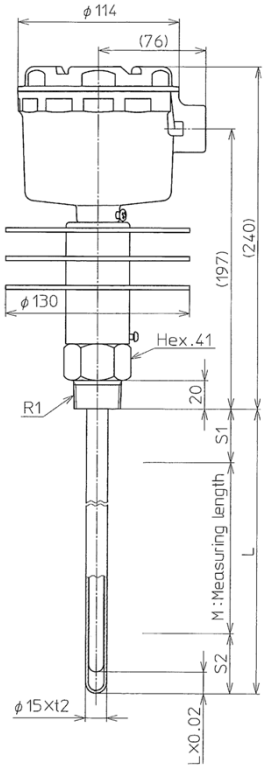
CG400BN



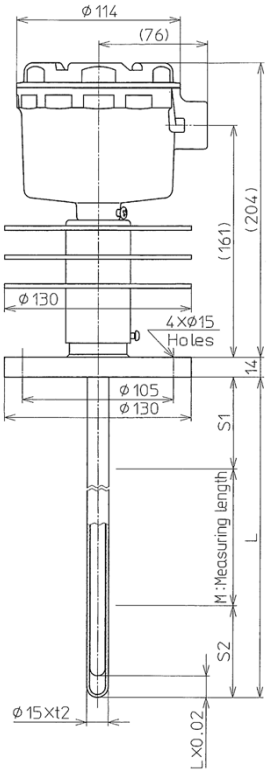
CG400FN

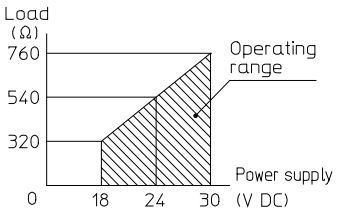


CG400BNT



CG400FNT



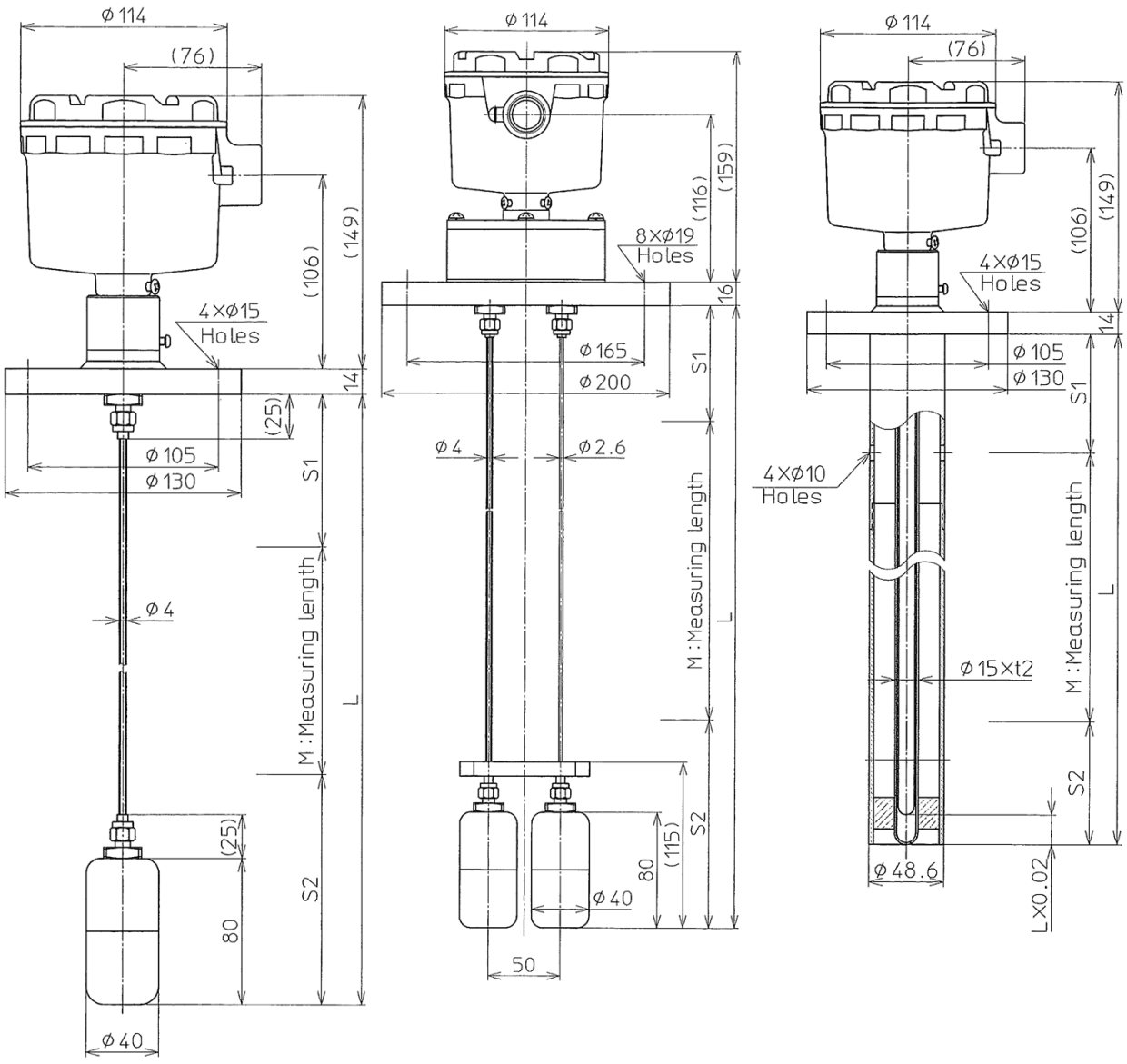
Medium	:	Liquid
Measuring range	:	From the tip of electrode to thread end or 10mm from flange face L=4000mm Max., Min. S1=0mm with thread or 10mm with flange, Min. S2=L×0.02
Sensitivity	:	30 to 2000 pF
Accuracy	:	±0.5 % F.S.
Power supply	:	18 to 30 V DC
Startup current	:	50mA DC Max (Approx. 0.5 second at start up, 25℃)
Output signal	:	4 to 20mA DC (Load Resistive 540Ω Max. at 24V DC)
Allowable load resistance		

Operating temperature	:	-20 to 60 ℃ for electrode (without dew), Heat proof up to 150℃ is available as an optional
	:	-25 to 65 ℃ for housing (without dew)
Operating pressure	:	100 kPa Max. (Except mounting part)
Protection class	:	IP68 (Electrode), IP65 (Housing)
Material	:	304SS electrode, PFA insulator tube, ADC12 (Acrylic painting) housing
Mounting	:	R 1" and JIS5K50A (STD), other size of thread and flange are available as an optional
Cable entry	:	G 3/4" or equivalent
Recommended cable	:	2-core shielded cable (Outer dimension: approx. Φ10mm)

* The specifications are subject to change without notice.

Special line-up

Model	CG400BHF	CG400BDHF	CG400BPF
	Wire type for metal tank	Wire type for plastic tank	Guard type for wavy liquid



Note: The tensile strength of wire for CG400BHF and CG400BDHF is 9.8 N Max.

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PROCESS AUTOMATION

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DECLARATION OF CONFORMITY

Manufacturer : NOHKEN INC.
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(Factory) 501-52, Hukusimamiyanomae, Sanda-city, Hyogo 669-1313, Japan
Product Category : Electrical Equipment for Measurement, Control and Laboratory Use (Industrial Location)
Product Name /Model : Continuous Capacitive Level Sensor
Model : CG400

We declare under our solo responsibility that the products mentioned above the provision of Directive and Standard as required and stated below.

Directive	Standard	Remarks
E M C : 2004/108/EC	EN61326-1:2006	
Low Voltage : 2006/95/EC		Not applicable
R o H S : 2011/65/EU		Not applicable

Manufacturer

NOHKEN INC.
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Y. Kobayashi
General Manager,
Quality Assurance Department

Signature : Y. Kobayashi

Date : Feb 21, 2014

"More Intellectual, more Aggressive and more Responsive"
Nohken Inc. is an ISO 9001 Certified Company.