



# SENSORS & FITTINGS

Sencom sensors, pH sensors, differential pH/ORP sensors, conductivity sensors & Versatile fittings

# SENCOM digital pH and ORP sensors



| Model | Serial No. | Calibration Date | Calibration Value | Calibration Type | Calibration Status |
|-------|------------|------------------|-------------------|------------------|--------------------|
| 5.21  | 152        | 23.0             |                   |                  |                    |
| 5.21  | 152        | 23.0             |                   |                  |                    |
| 5.21  | 152        | 23.0             |                   |                  |                    |
| 5.21  | 152        | 23.0             |                   |                  |                    |

Calibration data automatically uploaded



Insensitive for environmental conditions



Perform off-line calibration reducing process impact



Reduce maintenance time

The SENCOM smart sensors enable improved maintenance management and diagnostics, further enhancing the simplicity and reliability that Yokogawa is renowned for. In addition, SENCOM has its own permanent calibration memory, allowing it to be calibrated in the workshop, test room or laboratory before returning it to the field. This results in an improved accuracy with reduced operating costs, shorter downtime, and improved safety.

SENCOM sensors maintain specific measurement and calibration data. This information can be exchanged between the sensor and a transmitter such as Yokogawa's FLEXA family.

Dedicated SENCOM SPS24 management software is also available for use with a Windows PC. Utilising historical measurement, calibration and diagnostic data from the sensor, the SPS24 data management system provides users with the tools necessary to predict maintenance and calibration frequency and estimate sensor life. The calibration information can be managed, analysed and conveniently documented by the SENCOM SPS24 software.

## Convenient calibration

## Enhances reliability



# Durable and versatile

The “Four in one” FU20 combination sensors show how Yokogawa applies the motto “Simple is best” to sensor technology. This wide body sensor features four separate sensing elements in one unbreakable Ryton body : pH, Reference, Temperature and ORP

Installation is simple with the integrated industrial 3/4" tapered thread. The large volume gelled electrolyte and the double junction reference system slows down depletion and poisoning therefore extending the lifetime.

This measuring system is targeted at those applications where simplicity will result in accurate and reliable pH or ORP measurements.

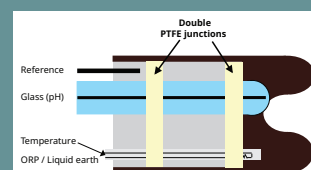
## Best sensor for most applications



Simultaneous pH and ORP measurement



Direct in-line, immersion or offline installation

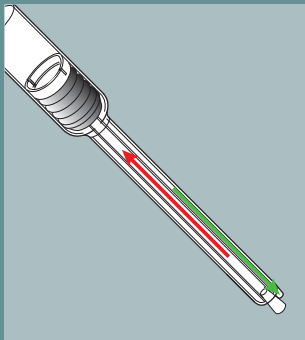


Double junction to resist pollution

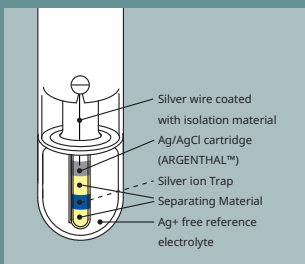


Flat surface membrane type for applications with solids or slurries

# Automatic pressure compensation



Automatic pressure compensation



Silver-ion trap, creating a long lasting and stable reference



Up-side-down mounting possible



Suitable for UPW and harsh applications

## Build in Bellow system

The Yokogawa FU24 is a 'four in one' pH sensor designed to offer virtually maintenance-free operation and long sensor lifetime – especially in harsh applications involving severe pressure fluctuations.

The new sensor incorporates a patented Yokogawa-designed bellows system which automatically compensates for the effect of pressure fluctuations. Such pressure variations can be highly detrimental to sensor operation.

In the FU24 sensor, pressure fluctuations are automatically compensated by the built-in bellow up to 10 bar, making the sensor virtually insensitive to pressure variations. A positive overpressure maintained by the tension in the bellows generates a steady flow out of the sensor.

The steady flow out of the sensor is especially useful in Ultra pure water applications, where it can be used down to 0,056  $\mu\text{S}/\text{cm}$ .





# Long lifetime in harsh applications

## Virtually Maintenance free

The differential pH/ORP sensor, FU20-FTS, is unique, offering maintenance free operation without any reference problems. The FU20-FTS is designed for difficult applications where conventional sensors are ineffective.

This sensor is suitable for applications where Sodium-, Potassium- or Calcium-salt is present. The salt sensitive glass will generate a stable reference voltage and the pH glass will respond to any pH changes.

When using this sensor problems that are typically experienced with a conventional reference electrodes are eliminated. For example aging and pollution of the liquid junction. This will increase the sensors lifetime significantly, which results in higher efficiency and a more reliable pH measurement.

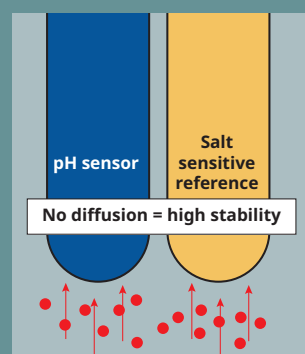


No reference electrode or junction



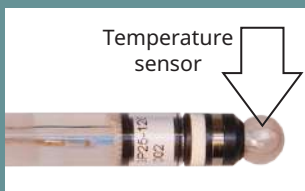
Maintenance free pH sensor

## Long lifetime in harsh applications



No diffusion = high stability

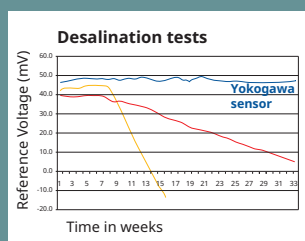
# Most reliable 12 mm pH sensor



Highly accurate temperature compensation



Integrated large Titanium liquid earth



High reliability

Having a stable, reliable and accurate measurement is of vital importance for pH measurement and control. The SC25 pH sensor has been developed and designed to make sure that this sensor will deliver these results in every application.

## High degree of stability

The build-in temperature sensor is located close to the pH measuring glass. This will result in an increased accuracy of the temperature compensation and as a consequence also the pH measurement. The integrated large Titanium liquid earth will improve the stability measurement countering any stray or groundloop currents that can destroy the reference sensor.

Tests in our laboratory have demonstrated that even after more than 50 weeks desalting in a waterbath of 70°C the sensor still was performing within specifications, making it one of the most reliable sensors of this type on the market today.

## Build-in titanium liquid earth



# High precision conductivity

## High Accuracy and reliability

The measurement of specific conductivity in aqueous solutions is becoming increasingly important for the determination of impurities in water or the concentration measurement of dissolved chemicals.

The accuracy of the measurement is strongly influenced by temperature variations, polarization effects at the surface of the contacting electrodes, cable capacitances, etc. Yokogawa has designed a full range of precision sensors and instruments to cope with these measurements, even under extreme conditions.

## Fast sensor response



Sensors for ultra-pure water applications



High precision cell constant (Field calibration not necessary)



High pressure/ temperature specifications



Wide range of sensors to suit most process conditions



# Extreme Conductivity measurements



Useable up to 40 Bar



Robust design for increased safety



Useable up to 250°C

## High Pressure & High Temperature

The Yokogawa high temperature conductivity sensors SX42 have a stainless steel body and a ceramic insulation, especially designed to withstand high temperatures and pressures.

A special treatment of the electrodes ensures optimal resistance against polarisation.



## Best choice

The conductivity cells have extremely high temperature and pressure ratings:

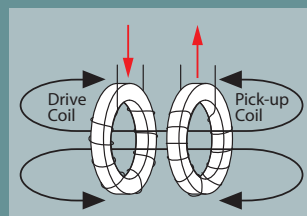
- threaded types can handle 16 bar at 200°C
- flanged types can handle 40 bar at 250°C.



# Wide conductivity measuring range

Yokogawa's Inductive Conductivity sensor has a wide measuring range. It starts at pure water of one microSiemens up to highly concentrated chemical solutions of 2 Siemens. The sensor is seamlessly molded in PEEK and a Teflon body. Both materials have a high degree of chemical resistance and are immune from the effects of fouling, coating, and polarization makes the sensor virtually maintenance free.

A inductive conductivity sensor consists of two separate coils. The accuracy of the sensor depends on the accuracy of these coils. Yokogawa uses coils that are matched, this improves the accuracy significantly. The ISC40 from Yokogawa is at this moment the most accurate inductive conductivity sensor on the market : 0.5% of reading plus 0.5 uS/cm for any conductivity value.



High accuracy through matched coils



The erosion/abrasion resistant PEEK (Poly Ether Ether Ketone)



The ultimate material in terms of chemical resistance: PFA



For applications in hydrofluoric acid and oxidizing concentrated acids (nitric, sulfuric, oleum).

## Maintenance free construction

# Robust and versatile fittings



Wide choice of construction materials



Easy mounting, service and removal of sensors



Available with flange adapters and ball valves



Stainless steel construction for sanitary applications

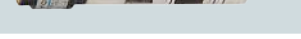
Yokogawa has invested considerable design and development time in producing a full range of fittings with particular emphasis on designs that reduce installation and maintenance time and consequently save operation costs.

A high degree of standardization makes it possible to mount electrodes with DIN dimensions directly into a fitting. For most other types a mounting kit (accessory) is available.

A wide choice of construction materials gives the user the optimal solution for any process considering chemical resistance, pressure and temperature specifications.

## Reduce installation and maintenance time



| pH/ORP<br>Sensor<br>selection<br>guide                                             | Properties |                |                              |                      |                  |                           | Petrochemical          |                                                 |                                         |                                   |                                       | Chemical                               |       | Power          |                                      |                       | Various          |                   |            |              |          |              |          |       |                |                |   |
|------------------------------------------------------------------------------------|------------|----------------|------------------------------|----------------------|------------------|---------------------------|------------------------|-------------------------------------------------|-----------------------------------------|-----------------------------------|---------------------------------------|----------------------------------------|-------|----------------|--------------------------------------|-----------------------|------------------|-------------------|------------|--------------|----------|--------------|----------|-------|----------------|----------------|---|
|                                                                                    | pH range   | ORP range (mV) | Minimum Conductivity (µS/cm) | Pressure range (bar) | Temperature (°C) | High process Temperatures | High process Pressures | Sour water Stripper (also Quench (tower) water) | After sour water stripper to demin tank | Cooling tower (corrosion control) | API Separator (waste water treatment) | Mono and Tri ethylene glycol (meg/teg) | Brine | Electroplating | Scrubber (Cleaning often necessary!) | Waste water treatment | Fluegas scrubber | Boiler feed water | Condensale | Fish farming | Seawater | Pulp & paper | Scrubber | Sugar | Aeration Basin | Neutralisation |   |
|    | 4-14       |                |                              | 0-10                 | 0-120            | ●                         | ●                      | ●                                               |                                         |                                   |                                       |                                        | ●     |                |                                      |                       |                  |                   |            |              |          | ●            | ●        |       | ●              |                |   |
|    | 0-14       |                | >10                          | 0-10                 | 0-130            | ●                         |                        |                                                 |                                         |                                   | ●                                     | ●                                      | ●     |                | ●                                    | ●                     | ●                |                   |            |              |          |              |          |       |                |                |   |
|    | 0-14       | -1500/1500     | >50                          | 0-10                 | 0-105            |                           | ●                      |                                                 |                                         |                                   | ●                                     |                                        |       |                | ●                                    |                       |                  |                   |            |              | ●        | ●            | ●        |       |                | ●              | ● |
|    | 0-14       | -1500/1500     | >10                          | 0-10                 | 0-105            |                           | ●                      |                                                 |                                         |                                   | ●                                     |                                        |       |                | ●                                    | ●                     | ●                |                   |            |              | ●        | ●            | ●        |       |                | ●              |   |
|   | 0-14       |                | >50                          | 0-5                  | 0-110            |                           |                        |                                                 |                                         |                                   | ●                                     |                                        |       |                |                                      |                       |                  |                   |            |              |          | ●            |          |       |                | ●              |   |
|  | 0-14       |                | >50                          | 0-5                  | 10-120           | ●                         |                        |                                                 |                                         |                                   | ●                                     |                                        |       |                | ●                                    | ●                     | ●                |                   |            |              |          | ●            |          | ●     |                |                |   |
|  | 0-14       |                | >50                          | 0-5                  | -10- 100         |                           |                        |                                                 |                                         |                                   | ●                                     |                                        |       |                |                                      |                       |                  |                   |            |              |          |              |          |       |                | ●              |   |
|  | 0-14       |                | >0.05                        | 0-10                 | 0 - 100          | ●                         |                        | ●                                               | ●                                       | ●                                 | ●                                     | ●                                      |       |                | ●                                    | ●                     | ●                | ●                 | ●          |              |          |              |          | ●     |                |                |   |
|  |            | -1500/1500     | >50                          | 0-10                 | 0 - 100          | ●                         |                        |                                                 |                                         |                                   |                                       |                                        |       | ●              |                                      |                       |                  |                   |            |              |          |              | ●        |       |                |                |   |







**YOKOGAWA MIDDLE EAST & AFRICA B.S.C.(c)**

P.O. Box 10070, Manama  
Building 577, Road 2516, Busaiteen 225, Muharraq, Bahrain  
<http://www.yokogawa.com/bh/>

**YOKOGAWA CHINA CO., LTD.**

3F Tower D Cartelo Crocodile Building  
No. 568 West Tianshan Road, Shanghai 200335, China  
<http://www.yokogawa.com/cn/>

**YOKOGAWA ENGINEERING ASIA PTE. LTD.**

5 Bedok South Road, Singapore 469270, Singapore  
<http://www.yokogawa.com/sg/>

**YOKOGAWA EUROPE B.V.**

Euroweg 2, 3825 HD Amersfoort, The Netherlands  
<http://www.yokogawa.com/eu/>

**YOKOGAWA CORPORATION OF AMERICA**

2 Dart Road, Newnan, Georgia 30265, USA  
<http://www.yokogawa.com/us/>

**YOKOGAWA ELECTRIC CORPORATION**

World Headquarters  
9-32, Nakacho 2-chome, Musashino-shi, Tokyo 180-8750, Japan  
<http://www.yokogawa.com/>

**Trademarks**

All brand or product names of Yokogawa Electric Corporation in this bulletin are trademarks or registered trademarks of Yokogawa Electric Corporation. All other company brand or product names in this bulletin are trademarks or registered trademarks of their respective holders.

Represented by:



Representante Oficial  
Tel: +54 11 4932-2322  
Email: [ventas@cvcontrol.com.ar](mailto:ventas@cvcontrol.com.ar)  
[www.cvcontrol.com.ar](http://www.cvcontrol.com.ar)