# SK-WFS Well Plant Logging Instrument

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### Overview

- SK-WFS well plant logging instrument is a new generation of petroleum exploration and development equipment developed to meet the on-site logging needs of shale gas drilling based on years of accumulated professional technology, and relying on the advantages of the company' s scientific and technological talents and strong industrial foundation in Shanghai. It is leading in the overall design and manufacturing technology in China, and reaches the international advanced level.

- SK-WFS well plant logging instrument uses a set of logging instruments to achieve simultaneous logging of two or more wells on site. It is not only equipped with a conventional fast chromatograph and a CAN bus data acquisition system, but also is equipped with wireless sensors and a wellhead chromatography system, fully meeting the logging tasks in the well plant operation mode.

### Features

- A working area for logging personnel is available in the logging instrument room to make the working environment more comfortable.

- A chromatograph installed at the wellhead to reduce pipeline delay, and achieve faster gas measurement results.

- Wireless sensor systems to reduce field wiring and meet rapid installation in multiple wells

- Reduce on-site logging personnel and reduce logging costs.

- Dual servers at the well pad and base to meet the requirements of remote logging.

### Technical indicators

- **Power Unit**

| Isolating transformer | |
|---|---|
| Input voltage | 380V (480V, 440V, 220V optional) |
| Input frequency | 50Hz |
| Output voltage | 380V±5% |
| Output frequency | 50Hz |

| UPS uninterruptible power supply | |
|---|---|
| Input voltage | 220V±10% |
| Input frequency | 35~65Hz |
| Output voltage | 220V±2% |
| Output frequency | 50±1Hz |

| | |
|---|---|
| Power-on time | ⩾15min |

| Instrument room safety indicators |
|---|
| the insulation resistance between the phase line and the machine room grounding conductor is greater than 2M, and the instrument must be equipped with a good grounding device |

- **Gas analyzer**

| SK-3Q06 fast chromatograph | |
|---|---|
| Analysis cycle | 30, 90s (user-defined analysis of cycle time) |
| Test component | C1～nC5 |
| Minimum detection concentration | total hydrocarbon 1×10-6, hydrocarbon |
| Measuring range | total hydrocarbon 1×10-6～1, hydrocarbon component 1×10-6～1 |
| Methylethane separation degree | ⩾ 0.85, obvious separation under the condition of 1% methane mixture (C1/C2 300:1) |
| Noise | ⩽0.5% F.S/h |
| Baseline stability | ⩽1% F.S/h |
| Repeatability error | ⩽2.5% F.S |

| ChromWizard wellhead chromatograph | |
|---|---|
| Working area | positive pressure explosion-proof zone 1 and zone 2 |
| Length x width x height (cm) | (H)90×(W)80×(D)30 |
| Weight | 50kg (flameproof control box and positive pressure box are independent, with quick on site connection and installation) |
| Chromatography principle | catalytic combustion |
| Analysis cycle | 60 seconds (C1-C5) |
| Minimum detection concentration of component | 10ppm (C1) |
| Minimum detection concentration of total hydrocarbon | 10ppm (C1) |
| Carrier gas | air |
| Degassing method | conventional degasser |

| | |
|---|---|
| Wireless data transmission and support WITS data transmission | |
| Ambient temperature | -20 - +60 °C |

- **Sensor**

| Sensor (CAN bus, 7W01 wireless) | |
|---|---|
| Pump stroke sensor/rotary table speed sensor | range: 0-1920 strokes/minute |
| Rotary table torque sensor | range: 0~6MPa |
| Riser pressure sensor | range: 0~42MPa |
| Casing pressure sensor | range: 0~68MPa |
| Hook hanging load sensor | range: 0~6MPa |
| Drilling fluid temperature sensor | range: 0~125 °C |
| Drilling fluid density sensor | range: 0~3g/cm |
| Drilling fluid conductivity sensor | range: 0~50ms/cm, 0~300ms/cm |
| Drilling fluid outlet flow sensor | range: 0~100% (relative flow) |
| Drilling fluid pool volume sensor | range: 0~5m |
| Drawworks sensor | range: 0~9999, hook position setting: 0~50m |
| Hydrogen sulfide sensor | 0～100ppm, response time: T80＜30s |

- **SK-7W01 wireless sensor**

| SK-7W01 wireless sensor | |
|---|---|
| Network nodes | 64 |
| Transmission distance | 100m |
| Operating temperature | -30-60 °C |
| Explosion-proof certification | wireless node: Ex ia IIC T4<br>Wireless host: Ex nA IIC T4 |
| Battery powered continuous working time exceeds 3 months | |

- **Geological instrument**

| Carbonate analyzer | |
|---|---|
| Measurement range | 0~100% carbonate |
| Accuracy | 1% |

| Mudstone density tester | |
|---|---|
| Measurement range | 1~3g/cm$^3$ |
| Minimum sample weight | 0.05g |
| Resolution | 0.01g/cm$^3$ |

| Fluorescence meter | |
|---|---|
| Power supply | 220VAC, 50Hz |
| Power | 40W |

| Thermal vacuum distillation degasser | |
|---|---|
| Power supply | 220VAC, 50Hz |
| Heating power | 300W |
| System vacuum | ⩽1.3KPa |
| System tightness | after the vacuum degree reaches 1.3KPa, visually check the vacuum gauge for a drop of no more than 0.26KPa within 2 hours after the gas valve is cut off |
| Mud bottle volume | 250ml |

- **Electric degasser**

| Electric degasser | |
|---|---|
| Working voltage | three-phase380VAC |
| Power | 370W |
| Speed | 1400rpm |
| Explosion-proof grade | ExdIIBT4 |

- **Software system**

| Software system |
| --- |
| windows operating system |
| Chinese, English, Russian, and Spanish versions |
| Metric and English system and custom units conversion |
| Rich background application software |