RF admittance Level Switch
FRFS

RF admittance level switch FRFS series adopts advanced RF admittance technology and overcomes the defects that the capacitor level switch could not eliminate the effect by conductive hanging material. The instrument operates reliably and various technical indexes have archived the international level, which is widely used in control and alarm of liquid, pulp, powder, material level and two different liquid levels. In addition, this product have status indication at site, it is a high cost performance and stable level sensor.

Product series
**Structure principle**

RF admittance level sensor FRFS series consists of sensor unit and electronic unit. The sensor unit mainly includes three parts: measurement probe, shaded pole and ground terminal. The material level is reflected through the change of admittance between the probe and vessel wall. When the level reaches to the switch working point, the electronic unit makes response and driver replay acts, thus output switch signal. The shaded pole can prevent fault signal generated due to the handing on the electrode from occurring. Only when the level actually archives the set point can the switch control signal be output.

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**Technical parameter**

- **Power supply**: 220VAC, 50/60Hz / 24VDC, 100mA
- **Sensitivity**: 0.3pF or smaller
- **Operating temperature**: -20~180°C
- **Ambient temperature**: -40~80°C
- **Working pressure**: -0.1~2.5Mpa
- **Output**: DPDT relay (double pole double throw)
- **Contact rating**: 220VAC, 5A non-inductive, 3A inductive
- **Response time**: standard: 0.2S
- **Delay time**: 0.2~50S adjustable
- **Electric interface**: M20x1.5
- **Explosion-proof grade**: Flameproof: ExdIIBT4~T6, Intrinsic safety type: ExiaIICT4~T6
- **Protection grade**: IP65
- **Process connection**: Standard: 3/4"NPT thread/ 1"NPT thread
  - HG20592~20635-97 DN25 above, other flange standard
  - (Like GB - JB/T - HGG - ANSI - DIN etc)
- **Cable length**: the maximum distance from Split type sensor to electronic unit is 45m. If not specified by the user, the length when leaving factory is 3m.
- **Material contacts liquid**: 304/316SS and PTFE
- **Junction box material**: aluminum alloy

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**Electrode model selection**

<table>
<thead>
<tr>
<th>Electrode number</th>
<th>Electrode form &amp; typical application</th>
<th>Operating temperature &amp; operating pressure</th>
<th>Insertion depth</th>
<th>Material of electrode</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Used in liquid, light pulp, particles heavy hanging type</td>
<td>121°C / 1.38MPa</td>
<td>150 ~ 10000mm</td>
<td>SUS304 and PTFE</td>
</tr>
<tr>
<td>11</td>
<td>Used in stirred liquid, thick pulp, particles, high temperature type</td>
<td>121°C / 1.38MPa</td>
<td>150 ~ 10000mm</td>
<td>SUS304 and PTFE</td>
</tr>
<tr>
<td>21</td>
<td>Used in liquid, light pulp, particles anticorrosion type</td>
<td>180°C / 1.38MPa</td>
<td>150 ~ 10000mm</td>
<td>SUS304 and PTFE</td>
</tr>
<tr>
<td>31</td>
<td>Used in liquid, light pulp, particles</td>
<td>121°C / 1.38MPa</td>
<td>150 ~ 50000mm</td>
<td>PTFE</td>
</tr>
</tbody>
</table>
RF admittance level switch FRFS series selection tables

RF admittance level sensor (heavy hanging resistant, with switch status indication, independent terminal box)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>D:24VDC; A:220VAC; X: Universal power supply 24VDC/220VAC</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>0: Standard sensitivity (for conductive medium) 2: High sensitivity (for isolated medium, Σ &gt; 3.0)</td>
</tr>
<tr>
<td>Time delay</td>
<td>0: Without time delay (standard circuit unit) 1: With time delay (0.2~50S adjustable)</td>
</tr>
<tr>
<td>Flange/thread specification</td>
<td>L: 5kg/cm²; M: 10kg/cm²; N: 150Lbs; O: 300Lbs; P: 350Lbs; Q: 500Lbs; R: 650Lbs; S: Special size</td>
</tr>
<tr>
<td>Temperature range and supplement</td>
<td>/T0: -20<del>80°C; /T1: -20</del>180°C; /T2: -20<del>300°C; /T3: -20</del>800°C</td>
</tr>
</tbody>
</table>

Product features

Hanging resistant: Unique circuit design and sensor structure make the measurement not be affected by the sensor hanging material.
Free maintenance: No movable parts during measurement and no maintenance is required.
Strong adaptability: It can measure both liquid level and material level, process temperature ranges from -100°C to 800°C, pressure from vacuum to 5MPa. It can be used in locations where corrosion and impact exist.
Stability & reliability: Not subject to the change of measuring environment, with high stability and long service life.

Measuring principle

RF admittance level instrument is a kind of material level control technology developed from capacitive level measurement technology, which is more reliable, more accurate and more applicable to prevent hanging material. The admittance in RF admittance means the reciprocal of impedance in electricity, which is composed of resistive component, capacitive component and inductive component. The technology of RF admittance level control is to measure the admittance of the measured medium by high frequency radio waves.

The most important differences between RF admittance technology and capacitive technology is the diversity of measurement parameters and three-electrode technology. The diversification of the RF admittance measurement parameters is not only measuring the capacitance, but also the amount of resistance and inductance, making the measurement more accurate. The three-electrode technology consists of an electronic unit and a sensor, and a shielding electrode is added between the measuring electrode and the ground pole, so that protect the measuring electrode from the material.

Product application

Conductive and insulating liquid—— Oil field and chemical industry
Conductive and insulating pulp—— Paper making and metallurgy
Particles and power—— Food, feed stuffs, power, cement and so on