MICROWAVE LEVEL SWITCH
For Solids & Liquids

This range of Microwave level switches provides a simple non contact, non intrusive option suitable for many applications on both liquids and solids. An installation comprises of a transmitter and a receiver which are mounted facing one another at distances up to a maximum of 40 m apart.

In operation the transmitter emits a continuous low power, microwave beam to the receiver and an output relay is energised or de-energised when this beam is obstructed by the material being monitored. The switch trigger point is determined by the amount of microwave energy received and can therefore be adjusted to cater for different products and different sensitivity settings depending upon the application.

Typical applications for detecting presence and no presence of materials include flow and no flow conditions, point level detection, blocked chute detection and also proximity switch detection for reversing vehicles such as quarry trucks and rail cars.

FEATURES

NON CONTACT PRINCIPLE
The switches can be installed behind various window materials such as Teflon or polypropylene to maintain the integrity of the vessel or chute even if they need to be removed!

HIGH PENETRATION AND SURFACE COATING IMMUNITY
The microwaves easily penetrate any surface contaminants which makes the switches ideal for applications with high build up on the tank or silo walls. This switch is also immune to problems with airborne contaminants such as dust or steam.

SIMPLE INSTALLATION AND SET UP
A wide beam angle on the transmitter sensor enables alignment to be carried out easily for the two sensors. The received power level is also clearly indicated by a bank of 15 LEDs which enable clear visual indication of the state of power received and where the switch set point is (see opposite).

TOTAL SAFETY FOR OPERATORS AND SITE PERSONNEL
This device requires no special procedures for its operation and use as power limitations are well below any required industry standards.

NEW HETERODYNE DETECTION PRINCIPLE
Many older microwave switches employ a diode detection technology but this new range uses the Heterodyne detection principle which has the ability to obtain a proportional output to the power received. This enables the switch to increase its operating range and penetrability without having to increase the power of the transmitted microwave signal.

EASY RETROFIT TO NEW AND EXISTING TANKS
A wide range of flanges and a standard 1” BSPP process thread make this range extremely easy to retrofit to new and old installations utilising existing process connections.

ADVANTAGES and BENEFITS

♦ Non-contact technology with no moving parts reduces maintenance costs
♦ Versatile technology for liquids, slurries, solids, pellets and powders
♦ Long measuring range up to 40m with adjustable sensitivity to suit most applications
♦ Simple to install and commission leading to reduced installation costs
♦ Immune to coatings on tank walls improving reliability and reduces maintenance costs
♦ Non invasive technology, with no long probes to insert, internal product build up is reduced
♦ Chemical resistant window options for corrosive applications
SIMPLE COMMISSIONING WITH LED ADJUSTMENT

The sensitivity is adjusted visually using the 15 LED indicator array. The received power level and sensitivity set-point are indicated on the receiver by a bank of 15 Ds. The received power is clearly indicated by the brightest LED. Then by a simple adjustment screw the relay set point (dimmer LED) can be adjusted either way. This system allows for a very clear visual sensitivity adjustment and greatly simplifies maintenance and commissioning as the switch positions and sensitivity are seen at a glance. Multiple switches can be inserted into the same vessel and are then allocated a channel identification number between 1-4 to stop any cross talk between individual switches.

HIGH VIBRATION & HAZARDOUS APPLICATIONS ISOLATED, NON-INVASIVE MOUNTING

Sensors may be protected from high temperatures, hazardous materials, vibration and shock by providing detecting windows through which the microwaves can pass. Detecting windows should be made of non metallic materials such as ceramic, glass, Teflon or polypropylene. With these materials there is minimal loss of microwave energy between the two sensors. The detecting windows should be at least 60mm in diameter as microwaves pass more easily through larger apertures. The distance between the window and the sensing face should be less than 200mm.

Mounting Options

Standard

Flange

Flange with insert

Standard 1” BSPP process connection directly into the bank socket. Suitable for low abrasion application.

Flange with 1” BSPP process connection through a flange socket with Teflon window. The angle of the tank wall will have little or no effect on the transmitter.

Flange process connection with optional polypropylene plug sandwiched between flanges but flush with tank wall. This provides additional sensor protection.

APPLICATIONS FOR ALL INDUSTRIES

QUARRY  WATER&WASTE  PROCESS  CHEMICAL  MINING
### SPECIFICATION

**Model reference**

<table>
<thead>
<tr>
<th>Component</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmitter</td>
<td>HYC-MWS-ST-2-24V</td>
</tr>
<tr>
<td>Receiver</td>
<td>HYC-MWS-SR-2-24V</td>
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</tbody>
</table>

**Power supply**

<table>
<thead>
<tr>
<th>Component</th>
<th>Voltage</th>
<th>Variation</th>
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</thead>
<tbody>
<tr>
<td>Transmitter</td>
<td>24VDC</td>
<td>±10%</td>
</tr>
<tr>
<td>Receiver</td>
<td>24VDC</td>
<td>±10%</td>
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</table>

**Power consumption**

<table>
<thead>
<tr>
<th>Component</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmitter</td>
<td>1W, 42mA</td>
</tr>
<tr>
<td>Receiver</td>
<td>2W, 83mA</td>
</tr>
</tbody>
</table>

**Operating range**

- Up to 40 metre
  
  *(Note: Operating distance may vary depending upon installation).*

**Frequency & transmission power**

- Approx. 24GHz, less than 100mW (E.I.R.P)

**Received power level**

- Indicated by 1 of 15 LED indicators
  
  *(Note: Indicator is fully illuminated)*

**Sensitivity-set-point**

- Indicated by 1 of 15 LED indicators
  
  *(Note: Indicator is half illuminated)*

**Beam angle**

- Approx. 20° deg θ (inclusive angle)

**Relay contact**

- 1C (SPDT) relay contact 30VDC, 2A

**Response time**

- 10msec.

**Adjustable time delay**

- 0.1 ~ 10sec. adjustable

**Delay time from power on to function**

- Transmitter: Approx. 50msec.
- Receiver: Approx. 5sec

**Operating ambient temperature**

- -10°C ~ +55°C
  
  *(Note: Optional hardware is available for high temperature applications.)*

**Storage ambient temperature**

- -20°C ~ +70°C

**Continuous maximum pressure**

- 0.5MPa (75psi)

**Enclosure rating**

- IP65 protection

**Enclosure construction**

- Diecast aluminum

**Weight**

- Transmitter: 1kg
- Receiver: 1kg

**CE Certification standard**

- EN300440-2
- EN301489-1/3

  *In accordance with: R & TTE Directive, EMC Directive*

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**TRANSMITTER AND RECEIVER SENSOR DIMENSIONS**

[Diagram of sensor dimensions]

*Dimensions may change without prior notice*