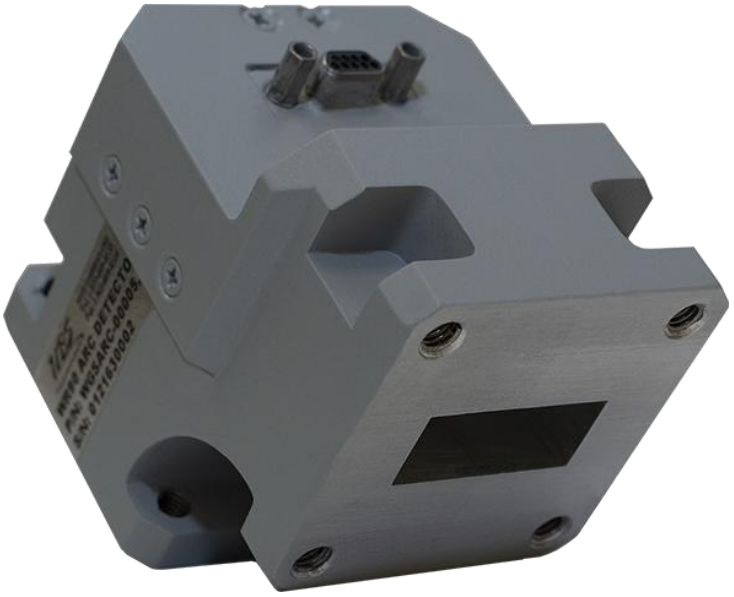
Unique Broadband Systems
a DOL Technologies Inc. Company

Model: ARC90-E-A-6-6-G-TN

WR90 Arc Detector

Typical Application

- **SATCOM**
- **Broadcast**
- **Radars**
- **Monitoring and control of visible arcs inside High-Power Waveguide Systems**



Product Features

- **Wide spectral responsivity**
- **Fast time response**
- **Optics withstanding high temperature inside waveguide**
- **High electromagnetic coupling between waveguide and detectors' cavity**

Product Description

An Arc Detector is used to protect expensive RF power source and high-power waveguide devices from the arcing process, which can occur in waveguide systems. Power breakdown in waveguides can occur as a result of an excessive voltage gradient at some point where there is a discontinuity in the wall surface. A minor imperfection, a junction where the coupling flanges do not meet properly, or improper positioning of tuning elements in waveguide device cavities can all contribute to the problem. In any event, such a breakdown is accompanied by arcing, i.e. an electrical discharge producing visible light, as well as a change in the transmission characteristics of the waveguide which reflects a corresponding change in the loading on the microwave power source. The breakdown may be progressive, with the arc being small at first, then rapidly becoming larger as the air or other gas in the vicinity become ionized. If the resulting load change becomes large enough, the power source will be damaged.

The Arc Detector is an opto-electronic device which detects infrared and visible arcs in high-power waveguide transmission lines. In response to a visible arc in the waveguide facing the detector device, the Arc detector produces a signal (“Alarm”) which may be used to shut down the system.

The Arc Detector can be incorporated into one assembly with other waveguide devices such as waveguide directional couplers, magic tees, circulators, waveguide filters, diplexers, power source’s waveguide launcher, etc.

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WR90 Arc Detector

Product Specifications

Electrical	
Waveguide Size	WR90
Operating Frequency Range	8.2 - 12.5 GHz
Peak Power Average Power	100 kW 10 kW
VSWR (typical)	1.1:1 max
Insertion Loss	0.05 dB max
Spectral Responsivity	320nm – 1050nm (visible light and near-infrared spectrum)
Electromagnetic Coupling (between waveguide main line and detector's cavity)	> 85 dB
Optical Sensitivity (typical)	Maximum toward Port 2; partially toward Port 1
Flange 1 (port 1. INPUT)	COVER, threaded holes, M4
Flange 2 (port 2, OUTPUT)	COVER, threaded holes, M4
Output (interface) connector	Micro D-sub Connector, Plug 9 pins (Male)
DC Supply Voltage	Typical +12V (Min=4.3V /Max=25V)
Supply Current	35 mA (max)
Output Voltage	TTL 3.3V, Fault/Fired Alarm (Vo) = 0~0.5Volts, non-latched
Response Time	less than 10 µsec
Pressure Sealed to:	30 PSI
Operating Temperature Range	- 40°C + 85°C
Weight	235g

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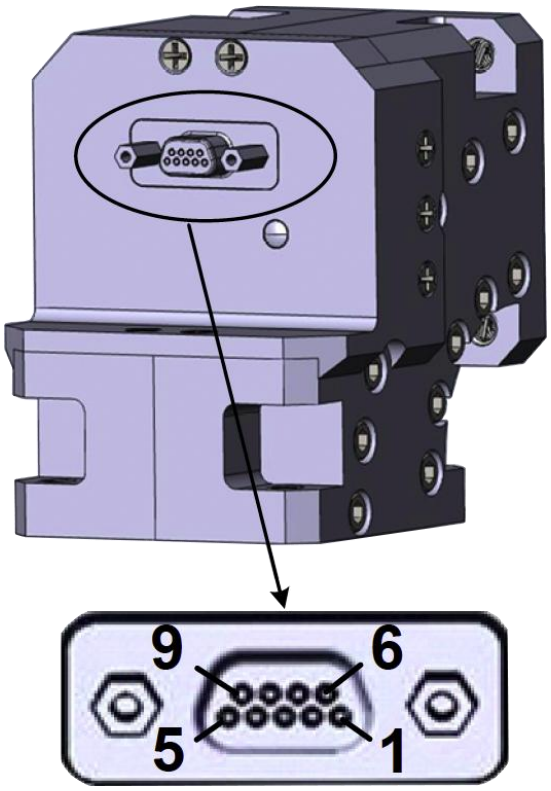
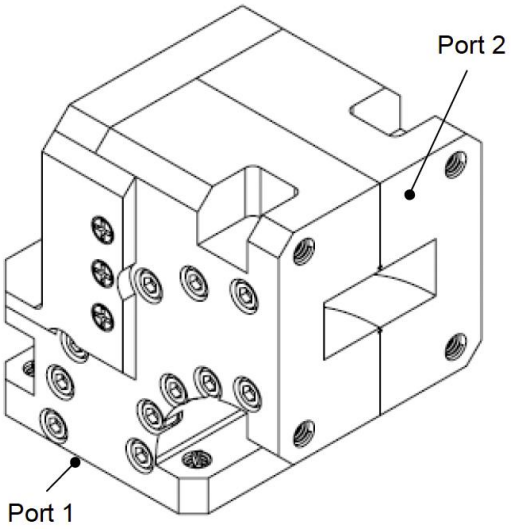
WR90 Arc Detector



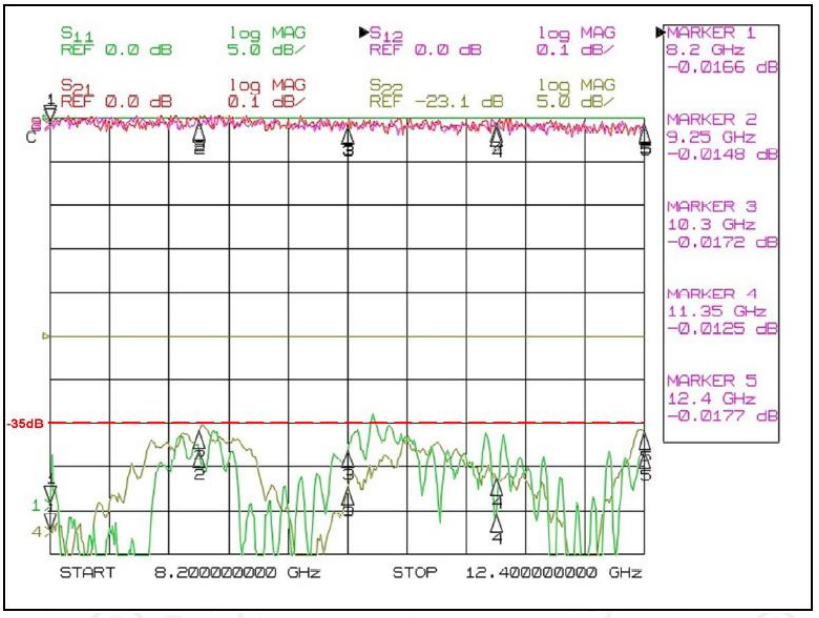
micro D-sub connector

micro D-sub Description

Pin No	Function	Description
1	GND	Ground
2	OUTPUT	In the initial state (NO ARC present), the output has a Logic 1 (3.3V) state. When the arc detector is armed, the output is in Logic 0 (0.1-0.35V) state and pulls the line voltage toward ground.
3	ENABLE/ DISABLE	TTL logic Input internally pulled-up to 3.3V. Constant Logic 0 can be used to disable "Alarm" indication of Arc detector.
4	DISABLE	Self Test Input (TTL, 3.3V) is used for testing internal circuits' operation from optical receiver to output. If the low voltage (I = 20mA) at “Self test” pin is applied, the output (pin 2) is to be in an “Alarm” state .
5,6,7,8	GND	Ground
9	+V	Power voltage +12VDC (Min=+4.3V / Max= +25V), internal circuit can withstand -20V reverse voltage and +30V positive transients



Typical Plots of Insertion and Return Loss



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