Fall 2013
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Threaded IP67

Twist-Lock IP67

Breakaway IP67

A Watertight Nano Solution That Fits

In the world of circular connectors there are thousands of styles, sizes, configurations and functionality types available. IP67–rated connectors in particular are becoming more and more common in both standard and custom configurations. These assemblies focus around a watertight seal and are specifically designed to withstand shock, vibration, and corrosion in some of the world's harshest environments.

To better understand this new connector trend, designers must first understand exactly what the IP67 code entails. The IP stands for Ingress Protection.

What is ingress?

Well, for us non-English majors, this essentially means access.

Now on to the numbers. What do they stand for?

The numbers themselves correspond to a level of protection. Keep in mind, they're separate, so it's technically a '6' and a '7', as opposed to '67'. The '6' means that the connector won't allow dust to enter it and in turn offers complete protection to it, meanwhile, the '7' signifies that the connector won't be harmed if it is immersed in water up to one meter deep *(This distance is measured from the bottom of the device)* for 30 minutes or less. Something to keep in mind, this does not mean that the connector can operate underwater; it merely promises that the connector will work once it is removed.

Since their inception, IP67 type connectors have found themselves used within a number of applications such as: Future Soldier systems, GPS related equipment as well as many hand-held military tactical radios. These types of applications require a high level of protection from the elements.

Omnetics Connector Corporation has been manufacturing circular connector configurations for nearly 30 years, and in order to make these already robust connectors even more rugged and watertight, the process of injection over-molding was added to the internal process. Generally within this process a shielded polyurethane cable is used with a single shot overmold consisting of a polyurethane material. Polyurethane in particular was chosen due to its track record of overall ruggedness, durability, flexibility, and overall sealing properties. This material is also a halogenated flame retardant compound per UL 94 V0.

To ensure the integrity their customers have grown to expect, Omnetics uses their patented flex-pin gold plated contacts that are polarized and shrouded by a unique liquid crystal polymer insulator. The over-molded shells were specifically designed to assure a watertight seal. The cable jackets, strain relief system and cable surfaces are also specifically designed to have a good tactile feel and maintain flexibility while providing a secure grip.

Connector insulator sizes of 6, 11, 16 and 28 positions are available within the nano line (.025"/.64mm). Individual housing formats include in-line versions, as well as front, rear and protruding panel mount configurations. Meanwhile, three distinct locking options allow users to choose between; a standard threaded, a quarter-turn twist lock option, as well as a breakaway version ensuring the connection type matches your preference. Custom wire or cable designs are available as well as custom cable harnesses.

ELECTRICAL SPECIFICATIONS

Current:	1 amp per contact
Dielectric Withstanding Voltage (DWV):	250 Volt AC @ Sea Level
Insulation Resistance:	5,000 Megohms min. @ 100 VDC
Contact Resistance:	25 milliohms (25 mv) max @ 1.0 amp
Temperature:	-55°C to 85°C
Vibration:	20 G's, no discontinuity greater than 10 nano-seconds
Shock:	100 G's, no discontinuity greater than 10 nano-seconds

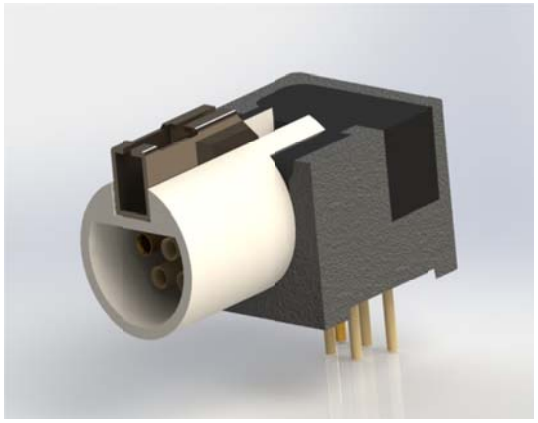
New Right Angle Micro Circular Option Is Here

Omnetics Connector Corporation has added another tail termination to its popular Micro 360° series. These low weight, ultra rugged circular connectors are currently available in four barrel sizes: 5, 12, 16, and 27 positions. Previous tail termination types had allowed customers to use this high Rel circular in soldercup, pre-wired and straight thru-hole options. Omnetics has since expanded two of these barrel sizes (5 & 12) to include a right angle thru-hole option.

"This new termination type can be mounted directly on a PC board at a right angle, and can be used as a miniature multi-pin I/O port on handheld devices," says Joe Held, international sales manager at Omnetics.

Since their inception in 1992, Omnetics circulars connectors have been specifically designed to save space and weight, while increasing interconnect reliability with Mil Spec components and materials. Continuously used in military, medical, and industrial applications,

Omnetics micro circular have proven their rugged reliability, and now have expanded their usage in an



attempt to save even more space on a board with the addition of the right angle thru-hole mounting capabilities.

This right angle micro circular product also includes the option to add stand-offs to the insulator as well depending on your particular application.

"This new termination type can be mounted directly on a PC board at a right angle, and can be used as a miniature multi-pin I/O port on handheld devices"

Introducing Omnetics Expedited 3D Models System

There are several key benefits of using 3D design and 3D modeling within todays interconnect world. Key benefits include simplicity, automation as well as interactive analysis for the designers themselves. Unfortunately for connector makers however, often lost in translation is the physical connector itself. Connectors, although vital to the components overall success are often the last aspect of the design to be rolled out. So connector companies like Omnetics Connector Corporation often find themselves on the hot seats as it relates to new custom, built to order solutions.

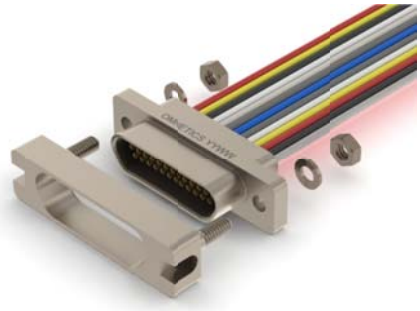
How can you design, create and build a custom connector harness in less than 8 weeks?

Easy, and it all starts up front with the initial design concept of a 3D model……

Omnetics 3D models are created as STEP Files (.stp) made to be imported into a variety of different CAD programs (ProE, Solidworks, Inventor, etc.). By making these models available same day and/or early within design stage, Omnetics quick turn customer service system is able to save engineers an abundance of time and effort on the front end of designs.

Custom 3D models can be created through Omnetics inside sales team, whereas, standard off the shelf parts are always available at: http://www.omnetics.com/Products/cots.asp. Here the STEP files are freely downloadable, therefore designers don't have to wait for samples and/or sales people to see if a particular connector will fit.

On top of the COTS and expedited custom 3D model program, Omnetics Connector Corporation has in conjunction developed an advanced online modeling tool that enables design engineers to dynamically create virtual 3D connector models, even for designs that have yet to be manufactured. This new online solution allows users to utilize a single interface to search for commercial, industrial, medical, military, aerospace and hi-reliability interconnect products. With the 3D modeling tool, design engineers can select from various output model formats, such as STEP, Pro/E, Shrinkwrap, STL and IGES, provided the requested product represents a standard configured item.



APPLICATION SPOTLIGHT

PATIENT SIMULATION

These days' robotic systems such as human patient simulators create a multiple-demand on connectors and cable manufactures with a growing emphasis to be small, rugged and flexible. These connector assemblies are generally found within the patient simulator itself, often fit into some of the most unimaginable spaces and configurations while offering both signal and current sources for miniature servos, motors and other electronic devices. These connectors' jobs are limitless these days, whether they are powering the physical heart, lungs and in some cases a full out wireless network built within the patient themself.

In fact, many of these modern day patient simulators are capable of crying, bleeding, and laughing, all the while communicating verbally through words. If that's not realistic enough for you, bowel movements coupled with the ability to give birth are now options in some of the newest, most realistic simulators on the market. These simulators are becoming more realistic each and every day, in an effort to teach basic skills, such as respiratory physiology, cardiovascular hemodynamics, and countless other advanced clinical skills. Through the use of these manikin like medical patients, students as well as military personnel are able to simulate OR and battlefield situations to not only anticipate the physiological effects of interventions, but also to serve as an avenue to enhance critical thinking and decision-making skills in patient care.

Many of these units are lined with micro and nano miniature connectors, all the while, these connectors themselves are creating a central nervous system of sorts. Through the use of these miniature connectors, pulses are brought to life and are

(Photo courtesy of Wikimedia commons)

physically recognizable, limbs are fully functionable, while physical speakers are wired and powered to broadcast heart and lung sounds over appropriate areas of the chest, so they can be heard with a correctly placed stethoscope.

In addition, many of these patient simulators utilize ultra-miniature sensors and transducers. These individual components (also in need of small interconnect solutions) enable physical communication within the control circuitry of this unique electronic environment. Fortunately for size constraints, few power lines are needed to handle higher current source requirements, leaving the remaining demand for many low level signal and feedback lines for robotic element maneuvering and control. Omnetics' micro and nano-connectors have matured along with the robotic industries. For more information go to: www.Omnetics.com

On the Road with Omnetics

November 9-13th:	Neuroscience 2013 - San Diego, CA
November 20-22nd:	Compamed - Duesseldorf, Germany
May 5-9th:	SPIE Defense & Sensing – Baltimore, MD
May 12-15th:	AUVSI – Orlando, FL
May 20-22nd:	SOFIC – Tampla, FL

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About Omnetics

Omnetics was founded in 1984 to deliver rugged, reliable interconnect solutions for the most demanding industries. The company has a fully integrated design and manufacturing plant in Minneapolis, Minnesota USA, where it produces micro and nano miniature interconnect products, featuring COTS, Standards and Custom connectors for industries such as Medical, Military, Aerospace, Defense and other technology oriented OEMs.

Twitter Trivia

Question: What's light as a feather, but even the strongest man cannot hold it for more than a few minutes?

Answer: Please follow us on Twitter (@Omnetics) for the answer #OmneticsTrivia

Follow us @Omnetics