

## TECHNICAL BULLETIN

# Why Factory Assembled Power Whips

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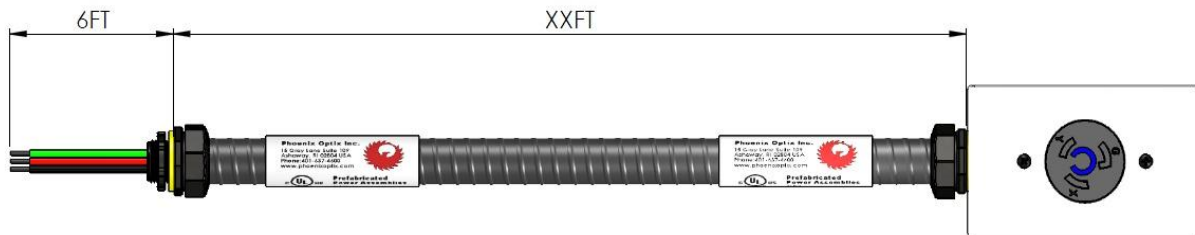


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# Why Factory Assembled Power Whips

Modern data centers face a wide spectrum of challenges in their mission-critical environment. Since power requirements are always changing, most data centers utilize power outlets on ends of flexible conduit called 'power whips'. Distributing electrical power to sensitive data processing equipment in cabinets is safe and reliable with factory assembled power whips. Assembly performed in a factory setting offers tremendous advantages over wiring done in the field.



(Factory assembled power whip shown with NEMA twist lock power receptacle)

## UL Listed

Underwriters Laboratories (UL) is recognized as the standard in safety and compliance. The UL label indicates that the agency has investigated the "Prefabricated Power assembly" to ANSI/NFPA 70 "National Electrical Code" (NEC) 2011 Edition. Since ANSI/NFPA 70 is a code, compliance is *mandatory*. Power whips assembled in the field may use UL listed parts, but they are not listed as an assembly with UL. Field assembled whips are just assembled parts, and would not have a file number or control number labeled on the assembly. Electrical inspectors and data center managers have an increased confidence level when they can see a UL label on a factory assembled product.



## Testing

When power whips are assembled on site, conditions are marginal, where very little inspection or testing can be performed.

In a factory environment, conditions are optimized for the assembly of the components, and a QA inspection process is in place to prevent any errors.

After visual inspection of the assembly, additional factory 'bench testing' is performed. These tests are designed to ensure that the user/installer does not get subjected to electrical shock by using a piece of equipment that has hazardous voltages, or high fault current, as a result of an electrical fault. These tests include dielectric strength, insulation resistance, ground continuity, phase rotation and leakage current. This is accomplished by an instrument that delivers high potential voltage (hipot tester). The hipot test is nondestructive and determines the adequacy of electrical insulation for the overvoltage transients which normally occur. Insulation resistance testing is mandatory in some safety standards, including IEC 60065 and UL 6500. As the voltage is gradually applied, the operator can monitor current flow to detect a potential insulation breakdown before it occurs. Any weakness which is not visible to the eye, such as pin holes in the insulation, will be revealed in this process. For safety and reliability, the power whips are tested to twice the rated voltage, plus 1000 volts.

This factory process insures that the power whip assemblies have been thoroughly examined and 'pre-stressed' with data center operating conditions prior to being deployed in an actual live environment.



Hipot tester used on the factory production floor

## **Advantages of a factory assembled product**

- Safety
- Reliability
- UL listed as a product and clearly labeled
- Thoroughly tested and documented
- ISO registered facility provides a consistent level of quality
- Economical – more cost effective than field assembly
- UL listed product does not have to be securely fastened every 4.5 ft per NEC article 645.50
- Pre-packaged and ready to install!!