Buildings, industry, and infrastructure

Pluggable installation systems simplify power distribution

The market for flexible installation applications is growing – technical building services are increasingly being used in industrial and semi-industrial applications. Electronic consumers – such as lights or drives – need to be supplied with power, while renewable forms of energy and intelligent energy management ensure that further needs are covered. Phoenix Contact's installation systems meet the high demands for IP67 installations in terms of size, approvals, and usability (figure 1).

Figure 1 Easy lighting connection – A pluggable installation system simplifies power distribution in buildings and infrastructure facilities

The complexity of energy supply systems is constantly increasing because the number of electrical junctions is growing larger. The junction boxes familiar from building technology and the associated terminal points with socket terminals or installation terminal blocks continue to be widely used. In many applications, however, installation connectors are much more suitable. Particularly when the degree of protection must be higher than IP20,

installation connectors with a degree of protection higher than IP65 are suitable for protecting the connection points of electrical cables against water and dust. The high IP degree of protection makes installation connectors ideal for wiring applications in the building sector, as well as for wind turbine generators, in tunnel construction, and outdoor lighting.

Time savings of up to 80%

For conductor connection, users can select among various common connection technologies: spring, screw, or insulation displacement technology. Insulation displacement technology eliminates the need for wire pretreatment, which results in time savings of up to 80 percent. This time advantage not only means shorter building construction times, but lower labor costs as well. And using connectors makes power distribution systems significantly more flexible in comparison to standard fixed installations with junction boxes and the associated terminal blocks. With the pluggable versions, these systems can be expanded as necessary and they easily adapt to new requirements.

Phoenix Contact tailored its QPD, IPD, and PRC series to meet exactly these demands. The series were specially developed for energy distribution systems and device connections. Thanks to their high degree of protection of IP67, all three series are suitable for harsh ambient conditions in industrial environments and the infrastructure sector. The difference between the three series lies in the connection technology. The QPD series features a quick insulation displacement connection, the IPD series features a simple spring connection, and the PRC series features the widely used screw connection technology. This means that users can select the best solution for their particular application.

Screw technology is by far the best-known connection technology in the market. However, the proportion of

Installation connector advantages

Time savings of up to 80 percent for conductor connections

Quick and easy assembly without special tools
Flexible power distribution thanks to fixed, pluggable connections

High level of reliability, thanks to robust design with IP66/IP68/IP69K degrees of protection

connections made with spring or insulation displacement technology is constantly growing, thanks to the advantages in terms of technology, time, and cost savings. Easy installation is a further aspect that speaks in favor of the spring and insulation displacement fast connection technologies. Particularly in the case of installation situations that are difficult to access, errors can be avoided and the systems ensure that the installation is stable and safe in the long term.

A panel feed-through for device housings, cable connectors, and T- and H-distributors are also available for the QPD insulation displacement connector system. Three sizes cover a conductor cross-section range of 0.5 mm² to 6 mm². In terms of performance, the 6 mm² variant enables a current carrying capacity of 40 A and a nominal voltage of 690 V.

Conductor connection can be very easy

Quickon fast connection technology makes it easy to connect conductors. It is based on IDC (insulation displacement connection) technology and is designed for applications in which cables must be connected efficiently on-site. The connection can be released again at any time, and the components can be reused repeatedly. This connection system enables users to connect multi-position cables in just a few steps. The fast connection technology automatically provides contact and strain relief when tightening. Thanks to its quick and easy handling, the Quickon fast connection system can reduce connection times by up to 80%.

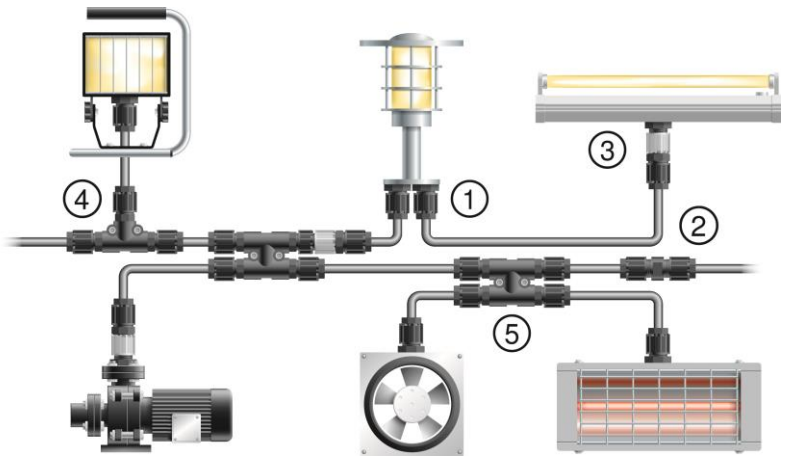

Figure 2 Installation system topology: All the essential components for power distribution in machines, systems, and buildings spread out over a wide area are included

The QPD series features all major components for power distribution, and is particularly suitable for applications with limited installation space. The range (figure 2) includes:

(1) Panel feed-throughs

Panel feed-throughs are cable glands that can be connected from the outside – using these means that devices no longer need to be opened to connect the cables. This ensures that the protection class specified by the manufacturer is maintained.

(2) Cable connectors

Cable connectors can be used to lengthen or repair cables. When combined with connectors, cable connectors can be used as flexible coupling connections.

(3) Connectors

Connectors with a leading PE contact are ideal for quick device replacement in service situations or for installations with pre-assembled cables. They are also coded to prevent incorrect connections.

(4) T-distributors

Installing a branch line for consumers is made easy when using the compact T-distributors.

(5) H-distributors

H-distributors are compact, robust junction boxes that can be connected quickly. The four connections are connected in parallel to each other, which also enables use as a 4-way distributor.

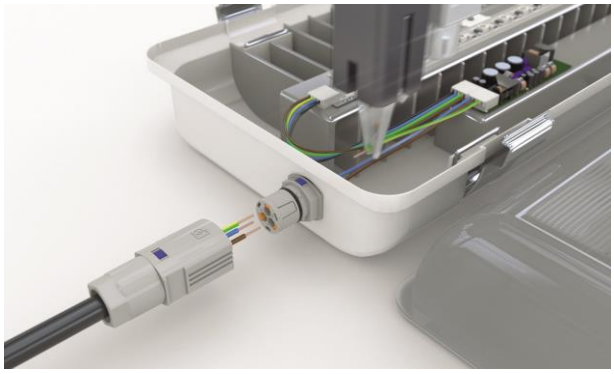

Figure 3 Robot-supported wiring: Thanks to Push-in connection on the device side, automated wiring is possible

Phoenix Contact has now added the IPD connector series, which features the increasingly widespread Push-in connection technology, to its product range. All connectors in the series are designed for device connections with the IP68 degree of protection. This means the series is suitable for use in very harsh conditions. On the device side, the spring direct connection technology enables robots to be used for factory-side wiring, and on the field side, the use of 3- and 5-position cables up to 2.5 mm². With these features, the series meets established industry standards and is qualified for use in outdoor applications and wet environments (figure 3).

Installations in industrial systems and infrastructure facilities

Industrial systems and infrastructure facilities that are spread across a wide area place additional requirements on the components used. In maintenance cases, pluggable connection solutions make it easier to replace defective system parts. Features that apply to industrial environments can also be used in infrastructure applications. Whether for building, street, or tunnel lighting, the modular QPD system features ideal solutions for consistent and robust power distribution (figure 4).

Figure 4 Tunnel lighting in IDC technology: The installation system functions reliably, even under extreme conditions

In addition to the technical aspects, requirements on the design are becoming increasingly more important. Because panel feed-throughs are connected directly to the device, their appearance must match that of the device. For devices that are in accessible areas – as is the case with lighting technology, for example – the design requirements are particularly demanding. Therefore, Phoenix Contact developed and designed the new IPD series especially for lighting connection applications. Thanks to the IP68 protection class, the series is ideal for all applications in wet and harsh environments. The stylish design of the IPD system is also suitable for innovative new outdoor lighting systems. Furthermore, the connectors in the series are easy to connect, thanks to direct connection technology – which simplifies the work of installers in the field and helps to prevent errors.

More information: www.phoenixcontact.net/webcode/#0541

If you are interested in publishing this article, please contact Becky Smith: marketing@phoenixcontact.co.uk or telephone 0845 881 2222.