IEC Appliance Outlet with Integrated Light Pipe Saves Valuable Space in Smart PDUs

New IEC appliance outlet provides status indication

SCHURTER's 6610 series appliance outlet according to IEC 60320-2-2, Style F, is now available with an integrated light pipe. The fiberglass light pipe indicates operational status, or other function status, as an optional feature to standard connectors. It is designed to channel light from LEDs on the pc board to the front of the connector. The new technology offers flexible design options including the number of light pipes, 1-4, as well as options for light pipe lengths and diameters. The flexibility of design allows for efficient customer-specific solutions, while enabling increased opportunity to signal status information from the power grid to the user.

SCHURTER's appliance outlets with integrated light pipe mounted in a PDU

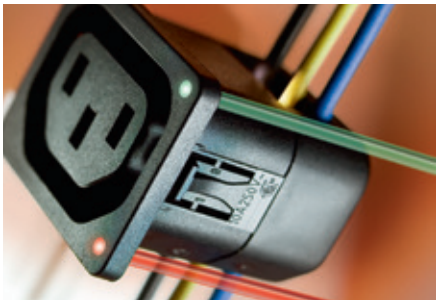
Trends in energy efficiency and reliability are largely impacting demand for more intelligent power systems. These systems communicate by gathering information about the grid's performance in an automated fashion. In fact, the term "smart grid" is already familiar to many users today. However, these trends tend to develop faster in larger scale grids, where load adjusting and balancing, as well peak curtailment and leveling times, are critical to power reliability, efficiency and the resulting costs savings. These sophisticated systems will only trickle down into our everyday lives if there are more solutions tailored to the users' ease of use. It is only then that simpler methods for taking advantage of intelligent power devices will be further enabled among mainstream users. The SCHURTER 6610 series provides such a solution in the form of a new appliance outlet. The concept is simple, yet clever, in that openings can be provided in the outlet's plastic flange, allowing for the installation of light pipes.

The light pipes installed in the outlet are designed to channel light coming from LEDs mounted on a printed circuit board to the surface of the outlet. Each outlet generally has its own circuitry and, depending on the complexity of the monitoring system, may require several types of indicating functions. The outlets are capable of providing up to four light pipes, one in each of the four corners of the connector. The side of the outlet with the ground pin provides extra space around the two corners, allowing for the most prominent and thus popular position.

Using intelligence more efficiently

A typical application consists of power distribution units used in data centers. Today, these units are most likely to have monitoring systems with indicating display panels or controls. These display panels are often centrally located. With SCHURTER's new appliance outlet, it becomes easier to extend the systems monitoring capabilities from the centralized display to each outlet. Service technicians are able to clearly see which systems are working properly, or respond to required maintenance adjustments. A connector could, for example, signal an outage with a red LED, or a critical power consumption pattern with a yellow LED. In this way, both repairs and preventive maintenance can be done more simply and efficiently.

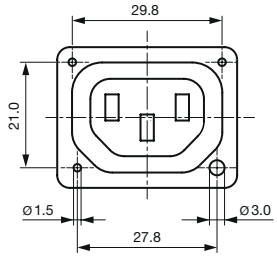
The integration of the light pipe into the appliance outlet brings about multiple advantages: For one, the many types and number of light pipes available make it possible to completely individualize circuitry that assigns unambiguous signals to each outlet, potentially each corner of the outlet. There's also the potential for substantial space and cost savings. The indicating light is located as close as possible to the outlet, instead of discretely mounted nearby the outlet, thus leading to a reduction in the strip size altogether, or increasing much needed space to add outlets to the strip. There's also an overall cost reduction that results from integrating the light indication into the outlet, whereby the need for drilling separate holes and other associated logistical and manufacturing steps are reduced or eliminated.



Light pipe assembled in 10 A outlet

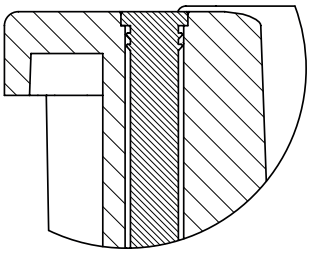
Customer specific solutions

The number, arrangement and diameter size of the openings for the light pipe provide flexible options for application specific requirements, also depending on the orientation of the power cord and its impact on visibility. The shape of the outlet and its flange determine the maximum diameters of the flange openings, and thus the selected fiberglass. It is possible to have diameters slightly larger than 3 mm, on the ground conductor side (beveled corners on the housing), as long as it is possible to adjust the punch radius to a correspondingly smaller degree (less than 2 mm) during connector manufacturing. On the line and neutral side of the outlet, it is possible to incorporate light pipe diameters up to a maximum of 1.5 mm.



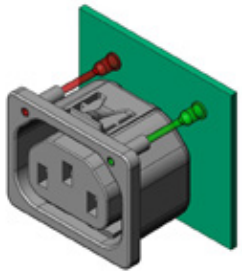
Holes for light pipes with a diameter of 3 or 1.5 mm are possible

Affixing the light pipe in the appliance outlet can also be done in several ways. For instance, the light pipe can be pressed-in and serrated seated into place. Such processes can be performed during the manufacturing of the fiberglass without an additional production step. It is also possible to have a cylindrical opening with a stud hole in the appliance outlet. Light pipes with a dome head are particularly easy to install; they can be inserted into the opening from the front. This allows integration at a later stage when the appliance outlets have already been assembled in the PDU.



Light pipes with seating grooves

There is also great flexibility in aligning the LED with the light pipe. Rigid light pipes, with large diameters, can simply be inserted into the appliance outlet from the front, and then sufficiently positioned over the LED to generate a clearly visible light signal. Another option is to use a molded LED guide that encasing the LED.



Layout on a PCB with light pipe guides encasing LEDs

This high level of flexibility truly allows a solution that matches with customer requirements. It also allows for efficient assembly, even in the case of very long distribution units. The new appliance outlet from SCHURTER thus opens up an ideal approach to making practical use of the intellegent capabilities already existing in power distribution systems today. Contact SCHURTER with your specific outlet and light pipe design requirements to take advantage of these opportunities.

Efficient assembly and additional safety

In addition to the special benefits that appliance outlets with integrated light pipes offer, you should also consider the advantages of SCHURTER's connector range overall. The series 6610 appliance outlet, for instance, has insulation displacement connector terminals (IDC). The outlets can be wired in banks L, N & E or N & E with the L wired independently. The two, or three, conductors can be pressed simultaneously in the IDC terminals. The cover remains locked, providing equal protection of the contacts, while at the same time making the wiring and hence assembly more efficient and cost-effective.

10A outlet with IDC-terminals

V-Lock mating cordsets [1] are also available. Designed to prevent the unintentional disconnection of power from the connector, the V-Lock cordset interlocks with a special cam in an opening at the appliance outlet. The interlock can be released later with the push of a finger on the unlocking button. The system works without any extra expensive components.

V-Lock cord retaining system

SCHURTER's 6610 appliance outlet with light pipe, together with its broad range of IEC inlet and outlets, offer safe and efficient ways to make good use of the intelligent power monitoring technology available around the world today.

Components suitable for power strips:

Model	Description	Link
6610	10A appliance outlet with IDC	[2]
6600-3	10A appliance outlet with screw-on mounting	[3]
6600-4	10A appliance outlet with snap-in mounting	[4]
4797	16A appliance outlet	[5]

Links

[1] v-lock.schurter.com
[2] www.schurter.ch/en/datasheet/6610.pdf
[3] www.schurter.ch/en/datasheet/6600-3.pdf
[4] www.schurter.ch/en/datasheet/6600-4.pdf
[5] www.schurter.ch/en/datasheet/4797.pdf

Headquarters in Lucerne

Company

SCHURTER continues to be a progressive innovator and manufacturer of electronic and electrical components worldwide. Our products ensure safe and clean supply of power, while making equipment easy to use. We offer a broad range of standard products including circuit protection, connectors, EMC products, switches and input systems, as well as electronic manufacturing services. Moreover, SCHURTER is ready to work with our customers to meet their application specific requirements, not covered in our standard range. You can rely on SCHURTER's global network of companies and partners to guarantee a high level of local service and product delivery.

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