

Plug Device

The invention relates to a socket device for connecting a plug, particularly in hazardous areas. The socket device may be a wall socket, a flange socket, a coupler or similar means. It comprises a housing, for example, with at least one flange socket having a socket insert with at least one bushing.

A corresponding material for such socket devices, in particular for the housings thereof, is polyamide, glass-fiber reinforced and impact-resistant polyester, stainless steel or a similar material. The corresponding flange socket may have two, three, four, five or also multiple poles. As a rule, such a flange socket is detachably closed by a protective cap. The socket device is particularly used in hazardous areas charged with gas or dust and fixed to a wall, the floor, a mesh cable tray, a tube or the like by a separate device holder.

The socket device serves to connect by means of the plug mobile or stationary apparatus in those areas, which are supplied with power by the socket device.

It is the object of the present invention to improve a socket device of the above-described type such that a user can decide in an easy and safe manner whether the socket device is ready for use.

This object is achieved by the features of patent claim 1. The solution according to the invention is particularly characterized in that at least one indicator lamp is visible on an exterior surface of the housing of the socket device. This lamp can indicate, for example, that the socket device is ready for the power supply. To realize such an indication it is generally sufficient if the indicator lamp is switched on or off. If the indicator lamp is switched on this is an indication that a corresponding power supply is provided by socket device.

To allow the indicator lamp to be seen in a simple manner from different positions, the indicator lamp may protrude at least partially from the housing's exterior.

If the socket device is used in hazardous areas it may be a further advantage when the indicator lamp comprises a particularly explosion-

protected and at least partially transparent or partially translucent cover. Thus, the indicator lamp, per se, has an explosion-protected configuration. The cover may be colored.

The socket device may be mounted in different ways; see the above embodiments. In this connection it may be favorable when the indicator lamp is disposed on an upper surface of the housing. The vision to this upper side is usually unobstructed so that it can already be decided from a greater distance whether the corresponding socket device is ready to be used for supplying power.

It is also possible that other parameters or information can be indicated by the indicator lamp. Such parameters, respectively, information indicate, for example, whether a corresponding three-phase alternating voltage or a corresponding three-phase alternating current is available, whether maintenance is required, whether the power supply was properly connected/disconnected, whether the required voltage is applied, and the like. All of these parameters and information can particularly also be indicated together with the operational readiness for the power supply when the indicator lamp can be operated with different colors and/or brightnesses. It is, for example, possible that the power supply is sufficient if the color of the indicator lamp is red, that a maintenance is required if the color of the indicator lamp is yellow, etc.

In addition, it is possible to indicate by varying the brightness, for example, that a corresponding socket device is ready for use, but is already occupied. In other words, the light of the indicator lamp may be brighter if it is ready for use and darker if it is occupied.

To allow the representation of different colors and in particular independently of each other, the indicator lamp may comprise two, three or more illuminants. These illuminants have different colors and can be varied, if necessary, with respect to their brightness.

Another possibility of varying the indicated information by means of the indicator lamp may be seen in a continuous and/or cyclic operation of the indicator lamp. Continuous operation means in this context that the indicator lamp is constantly illuminated while it is illuminated at a certain frequency or switched off in cyclic operation.

In this connection it may be further advantageous if different clock frequencies can be adjusted and/or preset in the cyclic operation. This means, for example, when the clock frequency is relatively low this may be an indication of the operational readiness of the socket device, and

this may indicate at the same time that the socket device is not occupied. If the clock frequency is very high this may indicate that the socket device is occupied.

To allow all corresponding switching measures to be carried out easily, particularly if several illuminants are provided or if the indicator lamp is cyclic-operated, the socket device may comprise a microcontroller.

In a further development of the socket device it may prove to be favorable when the microcontroller is addressable and programmable ex works and particularly in a wireless manner. This allows, by means of a corresponding programming prior to the delivery of the socket device, the representation of different functions by the indicator lamp. Also, the microcontroller may be directly addressable, for example, to retrieve and check the function of the indicator lamp and the programming thereof from a remote place.

Different illuminants for the indicator lamp are conceivable. An illuminant with a low power demand and long service life, which is likewise available in many colors, is a light-emitting diode (LED). Such an LED may be available as a single LED or also as a group of LEDs. This applies also to illuminants with different colors, which may also be realized by LEDs.

Advantageous embodiments of the invention will be explained in more detail below by means of the figures shown in the drawing.

In the drawing:

Fig. 1 shows a perspective lateral view of a first embodiment of a socket device according to the invention; and

Fig. 2 shows a perspective view at an angle from behind of a second embodiment of a socket device according to the invention.

Fig. 1 shows a perspective lateral view of a first embodiment. The corresponding socket device 1 comprises a flange socket 3 on a side pointing to the right, which can be closed by a protective cap 9. The corresponding flange socket 3 protrudes from a housing 2 of the socket device 1 and has, for example, a two-, three-, four-, five- or multi-pole configuration. The housing 2 is approximately box-shaped and has a housing exterior or surface 5. On this housing exterior 5, and in particular on an upper surface of the housing 2, an indicator lamp 4 is disposed next to a switch 11, which is particularly designed with an explosion-protected cover 6 for use in hazardous areas. The cover 6 has a dome-shaped and transparent portion in an upper region.

The indicator lamp 4 partially protrudes from the upper surface 7 of the housing. The housing further includes lateral mounting means 10, in particular for fixing it to mounting plates which generally serve to fix the socket device 1 to a wall, a mesh cable tray, a tube or the like.

A microcontroller 8, which is shown in dashed lines in Fig. 1, is disposed inside the housing 2.

The corresponding switch 11 serves to switch the socket device 1 on and off. A non-illustrated plug can be connected by the corresponding flange socket 3. The fixing of the plug and the corresponding activation of the voltage supply by the socket device 1 is usually accomplished by inserting the plug into the flange socket and then rotating the switch.

The indicator lamp 4 serves to indicate, for example, the operational readiness of the socket device with regard to a corresponding power supply. The indicator lamp may also indicate further information, respectively, parameters with regard to the socket device 1 in addition to this power supply readiness or also as an alternative to same. It can be indicated, for example, that a correct three-phase alternating voltage supply or alternating current supply is available. It can also be indicated that a maintenance of the socket device is necessary. It can furthermore be indicated, inter alia, that the required voltage is applied.

The indicator lamp comprises a corresponding illuminant. It is also possible to use two, three or more illuminants. One example for such an illuminant is an LED, i.e. a light-emitting diode. This LED has a low energy demand and a long service life. The color of the corresponding illuminant may be white or colored. Such LEDs are also usable as white, red, yellow or different-colored illuminants. It is furthermore possible that the indicator lamp is not continuously operated, i.e. emits light constantly, but that a periodic or cyclic illumination is realized. In other words, the indicator lamp is usable for continuous operation and/or cyclic operation. In connection with the cyclic operation different clock frequencies can be adjusted or preset. A corresponding adjustment or presetting can be accomplished by the microcontroller 8.

To correspondingly control or adjust the socket device this microcontroller can be addressable and programmable ex works and particularly in a wireless manner.

In particular if different-colored illuminants are used for the indicator lamp, or also if two or more indicator lamps are used, it is furthermore possible that several corresponding parameters, respectively, information are indicated independently of each other and simultaneously; see the statements set forth above with respect to those parameters and information.

Fig. 2 shows a perspective view at an angle from behind of a second embodiment of a socket device 1 according to the invention. This device substantially corresponds to the socket device according to Fig. 1, except for the arrangement of a switch 11 on the upper surface 7 of the housing 2. In this embodiment of the socket device, too, a corresponding indicator lamp 4 including an explosion-protected cover 6 is disposed on the upper surface 7 as part of the exterior 5 of the housing 2.

As explained above, the activation of the power supply using the socket device 1 is accomplished by rotating a corresponding plug in a socket insert. In this connection it is also possible that a correct direction of rotation can be acknowledged by the indicator lamp 4.

The statements set forth in connection with Fig. 1 apply analogously to the embodiment according to Fig. 2.

CLAIMS

1. Socket device (1) for connecting a plug, particularly in hazardous areas, wherein the socket device (1) is a wall socket, a flange socket, a coupler or similar means and comprises a housing (2) with at least one flange socket (3), **characterized in that** at least one indicator lamp (4) is visible on the exterior of the housing (5).
2. Socket device according to claim 1, **characterized in that** the indicator lamp (4) protrudes at least partially from the housing's exterior (5).
3. Socket device according to claim 1 or 2, **characterized in that** the indicator lamp (4) comprises a particularly explosion-protected and at least partially transparent or translucent cover (6).
4. Socket device according to one of the preceding claims, **characterized in that** the indicator lamp (4) is disposed on an upper surface (7) of the housing (2).
5. Socket device according to one of the preceding claims, **characterized in that** the indicator lamp (4) can be operated with different colors and/or brightnesses.
6. Socket device according to one of the preceding claims, **characterized in that** the indicator lamp (4) comprises two, three or more illuminants.
7. Socket device according to one of the preceding claims, **characterized in that** the indicator lamp (4) is usable in continuous and/or cyclic operation.
8. Socket device according to one of the preceding claims, **characterized in that** different clock frequencies can be adjusted and/or preset in the cyclic operation.
9. Socket device according to one of the preceding claims, **characterized in that** the socket device (1) comprises a microcontroller (8)
10. Socket device according to one of the preceding claims, **characterized in that** the microcontroller (8) is addressable and programmable ex works and particularly in a wireless manner.

11. Socket device according to one of the preceding claims, **characterized in that** the illuminant of the indicator lamp (4) comprises at least one LED (light-emitting diode).