Trilogy of Wireless Power Transfer

Application

BASIC PRINCIPLES, WPT SYSTEMS AND APPLICATION

3 Application

Part 3: Application

Application

Once the technology, which is driven by consumer products (5 – 15 W), is established, many kinds of applications over a wide range of industries are set to follow. It is then possible to charge a variety of devices in the area of mobile communications technology (smartphones, tablets, fitness trackers, smart watches, etc.) using a single charging device. At the present time this cannot be done because of all the various connectors, so wireless power transfer represents progress in convenience and mobility for our customers.

Fig. 3.1: Possible different applications for wireless power transfer

Energy is already transmitted wireless to charge batteries e.g. in electrical toothbrushes, beard trimmers, and electric razors. New applications, such as hairdryers or styling irons, are possible and avoid annoying cords and therefore increase safety and convenience of use significantly.

Fig. 3.2: Wireless charged electrical tooth brush

In our kitchens various appliances (power class 200 W – 2.4 kW) could be powered via wireless power transfer. Applications such as rice cookers, water boilers, bread makers, mixers, egg boilers and frying pans could be operated directly without having a chargeable battery as a power supply.

3 Application

Fig. 3.3: Example for a blender

Medical Technology

In medical technology, wireless power transfer is used to supply energy to implants and wireless endoscopes, for bio-monitoring (heart frequency, ECG, temperature, blood pressure, neural activity), blood composition (oxygen saturation, blood glucose, carbon dioxide, pH), stimulation (pacemakers, muscle stimulation, neuro-stimulators), monitoring and adjustment (activity, bladder pressure, implanted insulin pumps) and also for medical instruments. Today charge contacts may be corroded by very aggressive disinfection agents. If completely encapsulated, these devices can be sterilized and wireless power transfer poses no major challenges for the casing technology, because open contacts are no longer necessary.

Fig. 3.4: Various medical applications

Industrial Sector

In the industrial sector, wireless power offers the solution for many problems that occur today in devices with charging contacts in dirty, dusty or explosion-prone environments. This increases not only the reliability and robustness of industrial applications, but also their safety, durability which thereby reduces maintenance costs. Wireless power transfer can be used in autonomous transport systems, suspension tracks, cranes, conveyor systems or for supplying sensors and actuators in pressure containers and tanks.

Fig. 3.5: Example of an industrial application for wireless power transfer

If helmet lamps and gas detectors have integrated wireless power transfer, this can prevent contact sparks in mining, refineries and chemical production. Wireless power transfer works very well under water and can be used with diving robots, diving torches and underwater cameras.

Fig. 3.6: Helmet light

This is very important for the water tightness at great depths because the casings can be completely enclosed.