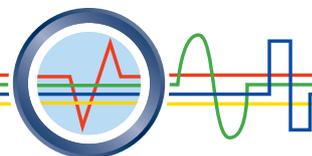


SHORE CONNECTION TRANSFORMER



PROJECTS
Wesemann

Moored ships receive their power supply in an increasing amount from the shore. As a result, there is no need for the onboard generator to continuously run, making a big difference in terms of emissions. A power supply connection to the shore is common practice for recreational boats and small yachts, and is increasingly used for larger ships, inland navigation, larger yachts, but also in the event of transport vessels, tankers, cruise ships, etc.

An onshore connection makes it possible to link up the ship's network to an onshore distribution network. Major problem in the event of a direct onshore connection is the high earth link that occurs with the onshore earth. Particularly in the event of aluminum ships this is cause for corrosion problems with the hull. Yet in the event of a steel hull too, the earth link causes major harmful leakage currents. Besides, in the event of a low-capacity power supply, as seen in mooring places for small yachts, connections for inland navigation vessels and suchlike, earth leakage protection is mandatory. The high leakage to earth via the hull can be reason for the earth leakage protection to trip, which is not desired.

ISOLATION TRANSFORMER

The solution to the two aforesaid problems is an isolation transformer. An isolation transformer separates the onshore network from that of the ship, and as such it separates the earth networks. The cable that is connected to the onshore power supply is protected by the onshore earth leakage protection and the isolating transformer, while the ship is earthed via the ship's earth. An onboard impedance or earth leakage protection safeguards the ship against earth faults. The isolating transfer does come with a disadvantage with regard to the overcurrent protection at some onshore power supply connections. Not only do the described low capacity onshore power supplies come with mandatory earth leakage protection, they are also fitted with automated protection devices with relatively low short-circuiting characteristics. A type-C or even type-B circuit breaker device is commonly used for this application.

A type-C device trips in the event of a short-circuit current ranging between 5 and 10x I_{nom} (nominal current), a type-B device even between 3 and 5x I_{nom} . The switching current of a transformer ranges between 20 and 25x I_{nom} . Depending on the moment of switching into circuit, there is a high risk that the device trips straight away. This depends on the capacity of the transformer and the current value of the protection device. If the capacity of the isolating transformer exceeds the current value of the automated protection device, it is definitely no longer possible to switch the transformer into circuit. In order to counteract this problem, a Shore Connection transformer can be used. This isolating transformer includes a facility that handles both the earth from the shore connection and the ship's earth, dividing the earth networks. This isolating transformer is furthermore fitted with a so-called pre-magnetisation circuit. The switching devices in combination with passive components ensure that the switching peak caused by switching the transformer into circuit is $<1x I_{nom}$. As a result, pre-protection by a low value type-B or type-C device is not a problem. Even a current protection with a value below the capacity of the transformer is not an issue. One thing to take into account of course is the selections between the onshore protection devices and those on the ship.



Wesemann specialise in the design and manufacture of power supplies and transformer systems. Wesemann are ISO 9001:2000 accredited by Lloyds Register's Quality Assurance.

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