Rotary converter wikipedia

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Rotary converters were used to convert alternating current (AC) to direct current (DC), or DC to AC power, before the advent of chemical or solid state power rectification and inverting. They were commonly used to provide DC power for commercial, industrial and railway electrification from an AC power source.[1]

The device can be reversed and DC applied to the field and commutator windings to spin the machine and produce AC power. When operated as a DC to AC machine it is referred to as an inverted rotary converter.

AC replaced DC in most applications and eventually the need for local DC substations diminished along with the need for rotary converters. Many DC customers converted to AC power, and on-site solid-state DC rectifiers were used to power the remaining DC equipment from the AC supply.

A rotary phase converter, abbreviated RPC, is an electrical machine that converts power from one polyphase system to another, converting through rotary motion. Typically, single-phase electric power is used to produce three-phase electric power locally to run three-phase loads in premises where only single-phase is available.

A three-phase induction motor can be run at two-thirds of its rated horsepower on single-phase power applied to a single winding, once spun up by some means. A three-phase motor running on a single phase cannot start itself because it lacks the other phases to create a rotation on its own, much like a crank that is at dead center.

A three-phase induction motor that is spinning under single-phase power applied to terminals L1 and L2 will generate an electric potential (voltage) across terminal L3 in respect with L1 and L2. However, L1 to L3 and L2 to L3 will be 120 degrees out of phase with the input voltage, thus creating three-phase power. However, without current injection, special idler windings, or other means of regulation, the voltage will sag when a load is applied.

Power-factor correction is a very important consideration when building or choosing an RPC. This is desirable because an RPC that has power-factor correction will consume less current from the single-phase service supplying power to the phase converter and its loads.

A major concern with three phase power is that each phase be at similar voltages. A discrepancy between phases is known as phase imbalance. As a general guideline, unbalanced three-phase power that exceeds 4% in voltage variation can damage the equipment that it is meant to operate.

K?lm?n Kand? recognized that the electric traction system must be supplied by single-phase 50 Hz power from the standard electric network, and it must be converted in the locomotive to three-phase power for traction motors.

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