

Length of Motor Cables

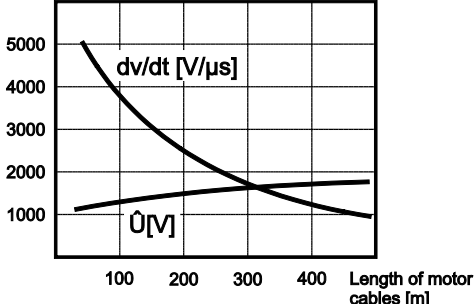
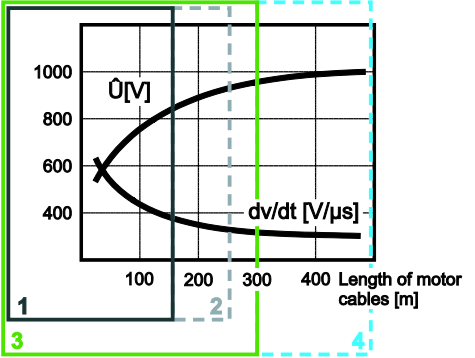
Because of the permitted mains disturbances, the allowed overvoltages at the motor, the occurring bearing currents and the permitted heat losses the distance between inverter and motor(s) is limited. The maximum distance heavily depends on the used motors (insulation material), the type of motor cable used (shielded/unshielded), the cable laying (cable channel, underground installation, ...) as well as from the used options.

Dynamic voltage load of the motor

Overvoltages at the motor terminals result from reflection in the motor cable. Basically the motors are stressed with measurable higher voltage peaks from a motor cable length of 10 m. With the length of the motor cable also the value of overvoltage increases.

The steep edges of the switching impulses at the output side of the frequency inverter lead to a further load of the motors. The slew rate of the voltage is typically over 5 kV/μs but it decreases with the length of the motor cable.

The ATV660 frequency inverters are equipped with a dv/dt filter choke (at higher types a "dv/dt filter choke" is already integrated), which significantly reduces the load of the motors and so it is in accordance with the allowed limits.

Typical load of the motor	Description
	<p>Load of the motor with overvoltage and slew rate when using conventional frequency inverters without integrated dv/dt filter chokes.</p>
	<p>Reduced load of the motor by using Altivar Process Drive Systems with integrated dv/dt filter chokes 150 m (at higher types a "dv/dt filter choke" is already integrated).</p> <ol style="list-style-type: none"> 1 When using a shielded motor cable 2 When using an unshielded motor cable 3 When using a shielded motor cable and a "dv/dt filter choke 300 m". 4 When using an unshielded motor cable and a "dv/dt filter choke 300 m".