

VFD INSTRUCTION for TR Motors with PE2 PA windings

- The VFD is used to reduce the starting current and to reduce the pressure “water hammer”.
- The VFD must be equipped with a RLC output filter to limit the voltage peaks and/or to reduce the dV/dt of the pulses generated by the inverter. The application of the filter will help to reduce the stress on the motor winding insulation (thermal and electrical). The filter can be installed at the inverter output to reduce the dV/dt value or at the motor terminals to attenuate the voltage peaks amplitude.
- Tesla suggests these MAX values for TR submersible motors

TR motors

Max. peak voltage: 850 V phase-phase

Max. dV/dt : 500 V/ μ s

- Normally the filters are also applied when the supply cable length of the motor is very long (length > 50 ft).
- Usually Tesla s.r.l. suggests the use of an input filter when the VFD is used in a residential area, to protect other devices connected to the same mains from the noise caused by the VFD.
- The flow rate must be always 1.6 ft/s.
- Frequency range: 30 Hz – 60 Hz
- Min start Frequency: 30Hz (2 Pole) 50Hz (4 Pole)
- Ramp-up time / Ramp down time : $|df/dt| > 30$ Hz/sec (where f indicates the frequency) to ensure the life of the thrust bearings.
- Drive carrier frequency has to be set in order to obtain a sufficiently smooth operation. The higher the carrier frequency, the smoother will be the operation. In any case a value of 4 kHz must not be exceeded because this would lead to apply to the winding a too high number of voltage spikes per second that would reduce motor insulation lifetime.
- Motor overload protection must trip within a time equal to or faster than how indicated by Class 10 overload curve and must trip within 115% of the nameplate Max. Amp.
- To control the temperature of the motor it is possible to apply the PT100 or PTC sensor.