1.0 Connection of the drive motor to a frequency inverter

	NOTICE
	➢ Heed the technical information and information in the manufacturer's operating instructions when installing and commissioning the frequency inverter.

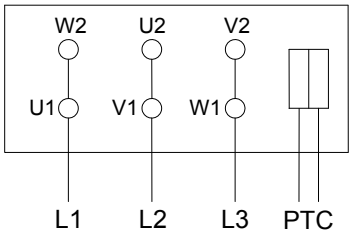
➢ Perform the connection of the frequency inverter and motor in accordance with the table.

- An incorrect motor connection causes considerable reduction in motor performance. The pump may possibly not start, or it might cause the drive to overheat.

Details motor type place (nominal motor voltage / circuit arrangement)	Line voltage of the frequency inverter	Output voltage of the frequency inverter	Motor connection
230 V ▲ / 400 V Y	1 x 230 V AC	3 x 0 to 230 V	Delta ▲
230 V ▲ / 400 V Y	3 x 400 V AC	3 x 0 to 400 V	Star Y
400 V ▲ / 690 V Y	3 x 400 V AC	3 x 0 to 400 V	Delta ▲

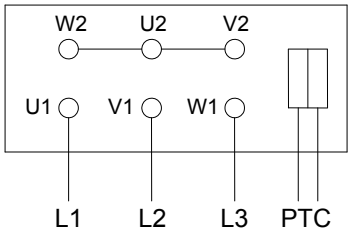
1.1 Standard three phase current squirrel cage motors with PTC thermistors

Delta connection (▲)



Motor terminal board

Star connection (Y)



Motor terminal board

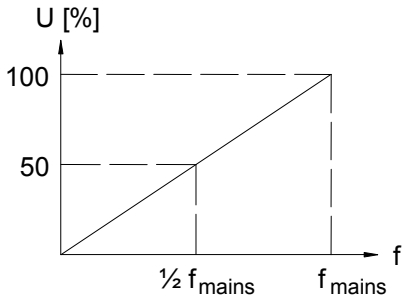
1.2 Self ventilated and force ventilated motors

➢ Self ventilated motors must be equipped with a PTC temperature monitoring device for speed control by means of a frequency inverter.
➢ Force ventilated motors may be loaded with nominal torque for the complete speed range.
➢ Connect force ventilators to a separate terminal board on the fan cover.
➢ Heed type plate details of the force ventilator or see separate terminal connection diagram.

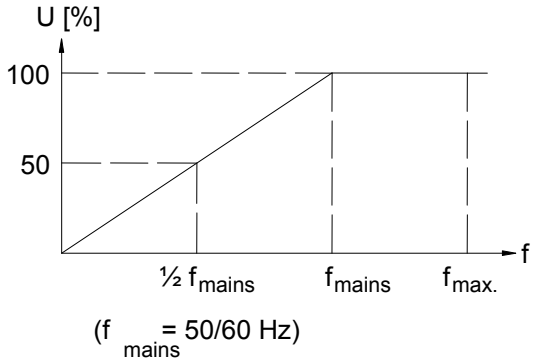
1.3 Setting up the frequency inverter

➢ The power output of the frequency inverter must correspond to the motor power.
  - Where applicable the power of the inverter can be customized to the motor rating by adjusting the parameters.
➢ The pump requires a higher torque to start (breakaway torque).
  - This required torque can only be achieved by frequency inverters, which make 1.5 times the rated current for the motor available for at least 30s.
  - The operating torque is approximately constant throughout the whole speed range where the conveying pressure remains constant.
➢ Head the following frequency inverter characteristic curves (Item 1.3.1, 1.3.2).
  - The quadratic characteristic curve, which is frequently designated the pump and ventilator characteristic curve, is **not** suitable for progressive cavity pumps

1.3.1 Linear voltage / frequency characteristic curve up to mains frequency



1.3.2 Linear voltage / frequency characteristic curve up to levels above the mains frequency



1.3.3 Linear voltage / frequency characteristic curve with the installation of a magnetic bias (StartBoost)

- If problems arise when starting the pump which make a higher breakaway torque necessary, these should be resolved by the adjustment of a magnetic bias. In the case of the magnetic bias the drive is supplied with current by the frequency inverter at just 0Hz.

NOTICE

Magnetisation current set too high
Damage to the motor due to overheating.

- Heed the frequency inverter manufacturer's instructions when setting the magnetic bias.

