

How well do you know variable frequency drives and drive systems?

Quiz questions with blue highlighted answers.

1. Nominal current of asynchronous motor with $\text{pf} = 0.88$ is 500 A (FLC).

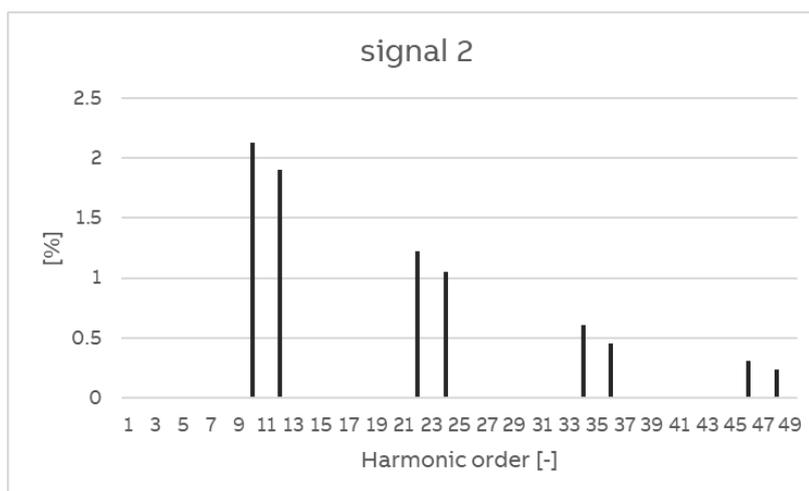
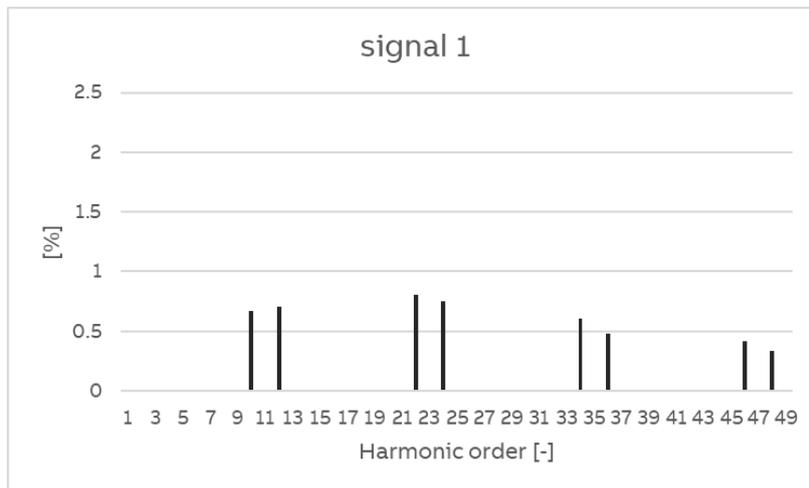
How much is the current at 50% loading?

- 220 A
- 265 A
- 330 A
- 500 A

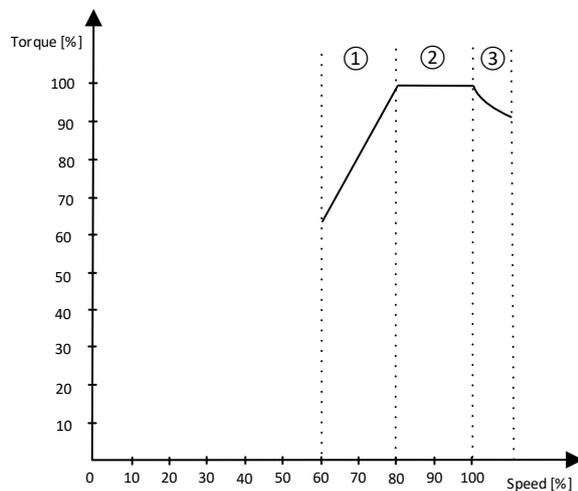
2. Spectrum of voltage and current harmonics is presented in figures below.

Which figure shows the current and which figure depicts the voltage?

- Signal 1 is voltage, signal 2 is current
- Signal 1 is current, signal 2 is voltage



3. What section of the torque-speed envelope below depicts the constant power range?
- section 1
 - section 2
 - **section 3**



4. What is the unit of total harmonic distortion (THD)?
- **%**
 - A/s
 - A/mm²
5. Motor runs with 64% torque at 80% of its nominal speed.
What is the current drawn from the supplying network in % of nominal input current?
- **approx. 50%**
 - approx. 67%
 - approx. 80%
6. What is the function of the DC bus inside the variable frequency drive?
- Smooth the DC voltage or DC current
 - Intermediate energy storage
 - **Both functions above**
7. AFE type of VFD is supplied from a 6.6 kV grid and feeds 6.6 kV asynchronous motor. What is the expected relationship between grid and motor current?
- Grid current is higher than the motor current
 - **Motor current is higher than the grid current**
 - Both currents are equal
8. What is the range of the time constant of a capacitor-based DC link (i.e. cap bank of voltage source inverter)?
- **several milliseconds (depending on model and topology)**
 - 2...5 seconds (depending on model and topology)
 - 15...30 minutes (depending on discharging resistor)
9. What is the typical efficiency of a medium voltage VFD at full load?
- 80...85%
 - 92...95%
 - **97...99%**

10. How many windings has an input transformer supplying a VFD with 24-pulse diode rectifier?
- 4 (four)
 - 5 (five)
 - twenty four (24)
11. What is the purpose of the shield (screen) of power cables in inverter fed motor applications?
- To minimize electromagnetic interference (EMI)
 - To provide a path for common mode currents
 - Both above answers
12. What is the typical range of modulation index of an inverter?
- 0...1.15
 - 0...63 Hz
 - 0...5 V/s
13. Nominal DC link voltage (mean value) of a 3-level inverter is 5'000 V. What is the approximate DC link voltage when the motor runs at 50% speed?
- 2'500 V
 - 4'200 V
 - 5'000 V
14. What technologies can be used to adjust the speed of driven load?
- VFD, steam turbine and clutch
 - VFD, gas turbine and fluid coupling
 - VFD, gas turbine and bypass valve
15. What stands the acronym FWP for in context of variable speed motors?
- First World Problem
 - Framework Programme
 - Field Weakening Point
16. Can you use VFD for motors in hazardous area?
- Yes, if the motor is equipped with corresponding warning labels.
 - Yes, if the motor is installed in an area with restricted access.
 - Yes, if the motor is properly designed and certified for specific inverter.
 - No, motors in hazardous area must not be supplied from VFDs.
17. What is the motivation of user to install a variable frequency drive?
- Significant energy savings
 - Improved process control
 - Inherent motor soft starting
 - One or more above items (depending on application)
18. What is the starting current of VFD fed motor?
- 200...350% of nominal current depending on total inertia and load torque
 - 150...250% of nominal current depending on motor construction and process dynamics
 - It depends on selected speed ramp and system inertia but normally far below nominal current

19. What types of motors are mostly used for variable speed applications?

- asynchronous, BLDC and SynRM motors
- [asynchronous, synchronous and PM motors](#)
- asynchronous, PM and BLDC motors

20. What is another (historical) name of a power switch or a power stack?

- transducer
- repeater
- gear
- [valve](#)

21. What is the most common cooling medium of liquid-cooled VFDs?

- inhibited mineral oil
- [deionized water](#)
- liquid nitrogen
- vegetable oil

Results

For each correct answer you receive one point.

0...6 points: Curious starter

Your journey in variable frequency drive systems just starts. In the first stage you can read our [blog](#) and watch our [YouTube](#) channel (<https://www.youtube.com/@MBDriveServices>) to learn some basics about VFDs and drive systems. Some of our [webinars](#) may help accelerate your learning curve.

7...11 points: Learning explorer

You know some basics of VFDs and drive systems. To build up your knowledge, you can purchase our [premium subscription](#) or dedicated [webinars](#).

12...16 points: Knowledge seeker

You have a good base to build upon with the potential to grow. Our [premium subscription](#), [publications](#) or [specific webinars](#) help you to reach your potential.

17...21 points: Quiz champion

Congratulations! You demonstrate deep understanding of the subject. To broaden your horizon you can purchase our [premium subscription](#), [publications](#) or specific [webinars](#) as learning never ends.

Regardless of your score, you can join our WhatsApp community. Just send an email to info@mb-drive-services.com with subject "WhatsApp group, your name and phone number.