





Motor Repair Electrical Engineering Maintenance



■ The Dynamic MotorAnalyzer-Class Online Monitoring



■ Dynamic MotorAnalyzer Tester for checking the running motor	54
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The Dynamic MotorAnalyzer-Class

Dynamic MotorAnalyzer | Online Monitoring



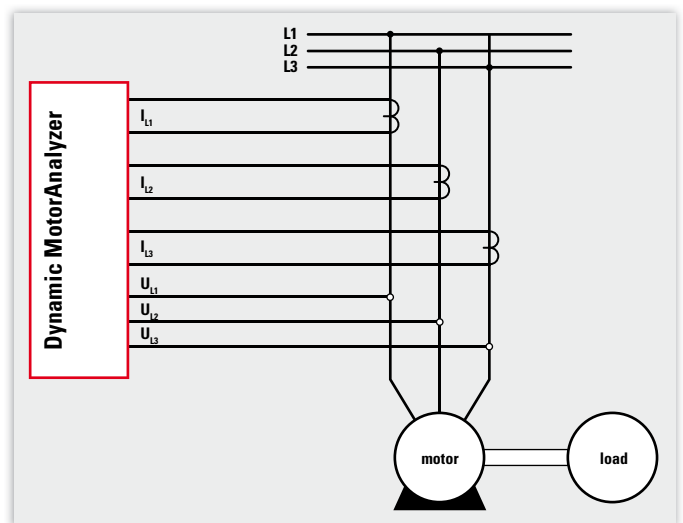
- USB
- WLAN
- Bluetooth
- VGA
- DVI

Highlights

- measuring the electric performance parameters
- motor analysis without special know-how
- motor voltage measuring range up to 700Veff channels
- current clamps measuring range 5A/100A (switchable)
- optional current clamps up to 1000A and higher
- Windows®-software for evaluating measuring signals from the measuring module
- graphic display of all measuring signals on the screen
- data base for storing the results
- network operation via WLAN
- multilingual operating interface
- Dynamic MotorAnalyzer combined with EncoderAnalyzer is possible
- optionally battery operation of the complete measuring case
- measuring case with storing space for all measuring leads and current tongs
- worldwide voltage supply 110V...250V / 47...63Hz
- accessory: additional measuring modules and transmitters

For us the dynamic motor analysis means checking the running motor in its working environment. For this the electric parameters are measured and out of these among other the mechanical parameters are calculated. The aim is to receive an analysis of the electric motor, its mains supply, and its loading conditions only based on the 6 electric measuring values.

The Dynamic MotorAnalyzer is the ideal tool for this. It is a perfect extension to our winding testers MotorAnalyzer and MTC2.



A typical application should show you the use of the Dynamic MotorAnalyzer:

It often happens that motors become hot during the operation. This may be caused by various reasons. It may be due to the mains

power supply, the motor itself, or its load. It is often difficult to find the reason for the fault as the motor is often installed in a position that is difficult to access. It is often easier to access the motor input lead. The electric parameters can be measured here. However, commercial multimeters are not able to do this. They are too slow and do not detect dynamic processes. Thus the operator is hardly able to find the reason for the overheating quickly and precisely without appropriate measuring technology.

The SCHLEICH Dynamic MotorAnalyzer provides valuable service here. It facilitates the motor check enormously – without demanding profound special knowledge of the operator.

Functioning principle

The Dynamic MotorAnalyzer consists of two components: the measuring module and the analysis software that is to be installed on a PC.

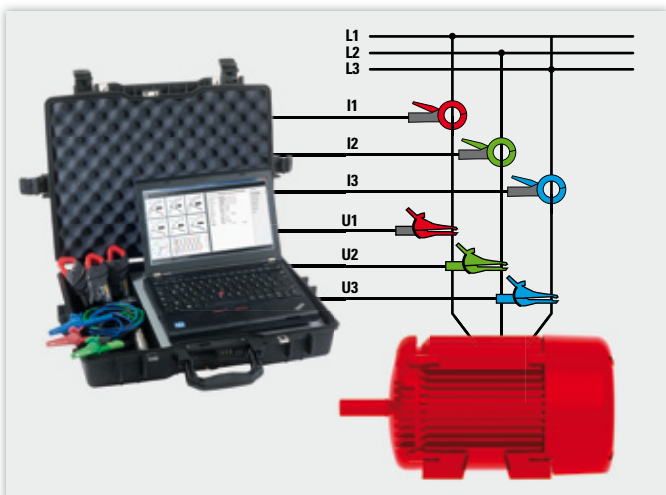
The measuring module performs the measurements. For this it detects many million measuring values at the running electric motor and transfers them to the PC. The communication between the measuring module and the PC is done in high-speed via a Gigabit-Ethernet connection. The measuring values are automatically analyzed via the analysis software. At the end of the analysis the software shows the result on the screen.

The results are displayed in a well-arranged and structured way in numerical values and for a better understanding also in a chart like at an oscilloscope.

The test results are stored in a database. A detailed test report can be printed if required.

Connecting the motor

The motor to be tested is connected to the measuring module via measuring leads. For connecting the measuring leads two solid industrial measuring sockets are available.



The three current clamps have to be clamped around the three phases of the motor input lead and the three voltages are to be tapped. That is all. The measuring can now start.

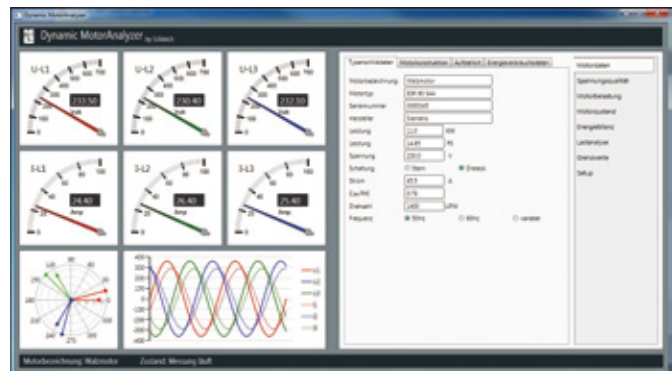
The Dynamic MotorAnalyzer checks at first if all measuring leads are connected correctly. If there is a fault it assists via graphic and text how to connect them correctly.

Analysis software

The quick, intelligent measuring technology and the user-friendly, intuitive analysis software are perfectly combined to each other. Only a few setting clicks and selections are sufficient for configuring the test for the connected motor. An assistant supports the operator regarding the input of the type plate data and the setting. Thus setting faults are avoided.

The comprehensive evaluations lead to clear, understandable results. A special detailed knowledge is not necessary when using the analysis software.

The software calculates all additional electric and mechanical values based on the 6 electric parameters.



The Dynamic MotorAnalyzer-Class

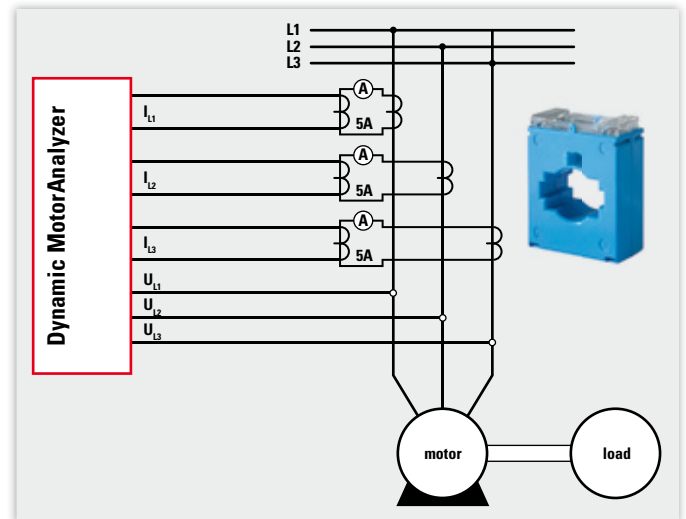
Dynamic MotorAnalyzer | Online Monitoring

Determining and displaying diverse measuring values

1. 3-phase current consumption of the motor
2. 3-phase voltage supply of the motor
3. mains analysis
4. conversion of linked voltages
5. frequency
6. voltage nonsymmetry according to NEMA
7. current nonsymmetry according to NEMA
8. harmonic wave percentage of voltage and current
9. harmonic analysis / distortion of voltage and current
10. total harmonic distortion (DHC) of voltage and current
11. spectrum of voltages
12. spectrum of currents
13. peak values during the start-up
14. dynamic recording and analyzing the start up
15. peak values during the running operation
16. apparent power, reactive power, active power
17. $\cos \varphi$
18. level of capacity
19. rotary speed determination without rotary speed meter
20. torque
21. machine operating point
22. overload factor
23. efficiency factor
24. efficiency calculation
25. current energy cost calculation according to NEMA
26. squirrel cage analysis
27. test regarding mechanical defects like e.g. nonsymmetric loads
28. continuous measuring
29. peak measurings (transient analysis) at switching processes at a motor
30. triggering definable events
31. recording all measuring values for an arbitrary period
32. and more

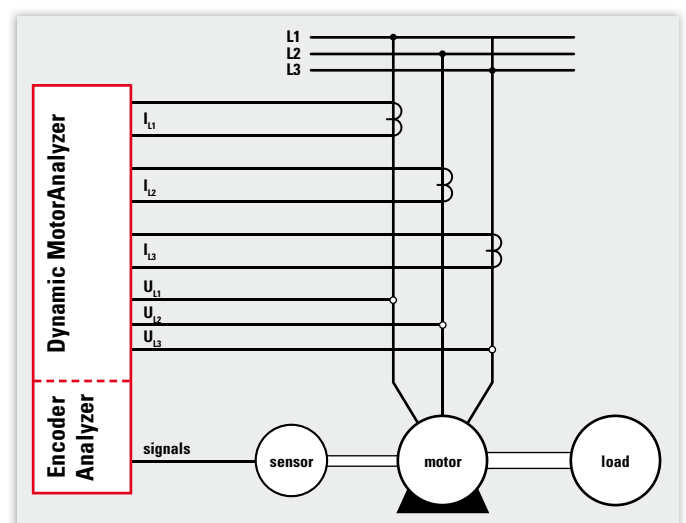
Measuring at motors with current converters

Owing to the current clamps that can be switched to 5A the current can be easily measured also in motor input leads with current converters. Only the conversion ratio of the current converter has to be entered in the analysis software. After that the software converts the measuring values correspondingly.



Dynamic MotorAnalyzer combined with EncoderAnalyzer

An international innovation is the combination of both functions in one tester. Thus SCHLEICH offers a very high additional value of the Dynamic MotorAnalyzer. In addition to the dynamic tests you can also check and compare various rotary encoder systems



For all technical information regarding the EncoderAnalyzer please look at page 48

Cabinets

Case cabinet with Dynamic MotorAnalyzer including two measuring connections and integrated laptop

The high-quality laptop operates with a Windows® operating system. The WLAN-compatible laptop features a low-reflection display. It is connected to the Dynamic MotorAnalyzer via a docking station. Owing to this station the high-quality laptop can be taken off the case and used for other tasks. The case features a combination lock to protect its valuable content. The case's top is equipped with foam material. It ensures that the laptop is safely pushed against the docking station at closed case cover.

All components and the laptop charging unit are stored in this case. The case also offers storing space for the measuring leads and current tongs. The Dynamic MotorAnalyzer and the laptop are supplied with mains voltage via a central mains socket.

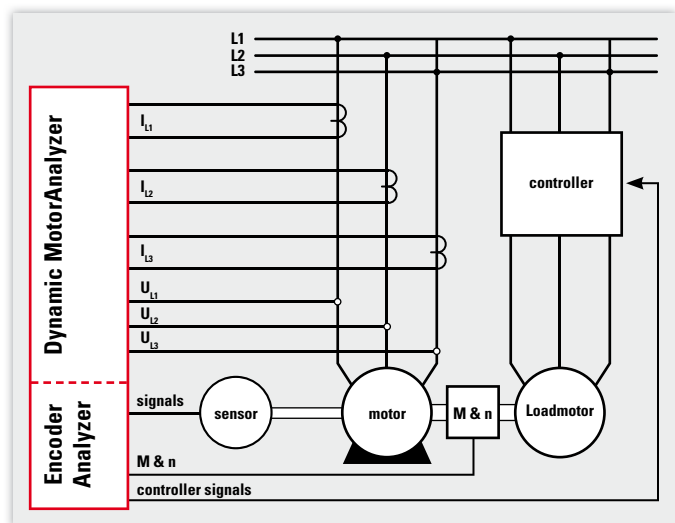
As additional accessory a useful shoulder strap is available. With this strap the Dynamic MotorAnalyzer can be comfortably carried on the shoulder.

Dimensions: 550 x 450 x 125 mm



Test station for electric motors

With the Dynamic MotorAnalyzer the repairman can also perform measurements at a load test system. Thus torque and rotary speed characteristics can be recorded. For this the Dynamic MotorAnalyzer provides additional measuring inputs, an analog control output, and digital control outputs. Via the inputs the torque and rotary speed signals can be measured by the torque measuring shaft. In combination with the electric input parameters the system precisely supplies all information on the motor.



Example of a test bench for an asynchronous machine
The load motor has a higher capacity than the motor to be tested (DUT) and acts as the actuator here. Thus it forces the test object in any arbitrary rotary speed. The load motor is set to the various rotary speed points (operating points) either by the analysis software or manually by means of the variable frequency device (controller). At these operating points the system determines the respective electric and mechanical parameters. Based on them all relevant parameters of the motor to be tested can be calculated.

