

# Torque determination without torque measuring shaft



**Input of motor specs.**

File Options Help

Motor type plate

Nominal output power	250.0	W
Nominal speed	1410.0	1/min
Nominal frequency	50.0	Hz
Nom. Line/Line voltage	230.0	V
Nominal current	1.4	A
Nominal powerfactor	0.71	

Communication

Send to LMG

Start logging

Reset

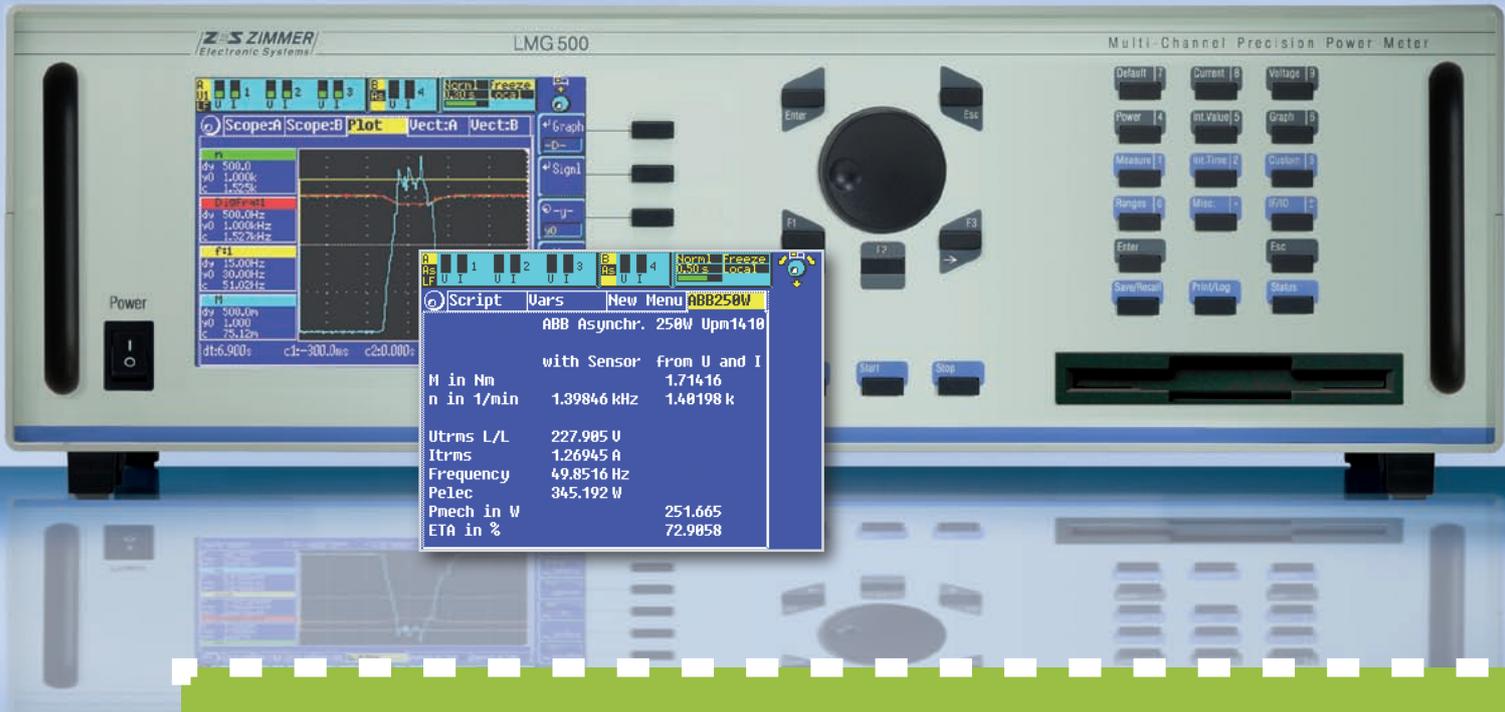
Storing

Save to file

Load from file

Additional specifications

Stator line/line copper resistance	22.0	Ohm
Number of poles	4.0	



- Precision Power Meter Series LMG calculates torque and speed of three-phase asynchronous motors from motor current and voltage

**Measuring of torque in the control cabinet!**

# Torque determination without torque measuring shaft

1. The knowledge about torque of motors often allows deep insight of the driven process. With mechanically operated stirring and mixing units you can appoint the viscosity of the ready mix by the driving torque. Taking samples for analysing and therewith breaking process will be omitted.

2. Production flow can be controlled more effectively if efficiency degree of the driving motor is known. Especially with pump drives the hydraulic operation point can be set through the fed mechanical power.

3. To avoid down times maintenance should only be done if possible when the admissible limit of deterioration is reached. The exact identification of the deterioration through change of bearing friction is essential for the use of this maintenance concept.

The above mentioned examples show the huge possible advantages of torque and power measurement at any drives. A classical torque shaft is often not convenient for this application. Fitting of a mechanical measure shaft demands more costs and in most cases you can not retrofit it because of shortage in space. A mobile monitoring set demounting the drive also doesn't serve avoiding downtime.

Therewith the huge application field for priceless and portable torque and power measurement in middle accuracy has been made available: An elegant mathematical operation in the software of precision power meter LMG450 and LMG500 by ZES ZIMMER calculates the torque shaft of asynchronous machines and the actual rotation speed regarding slip. For this you don't need any mechanical encroachment and no calibration of the uncoupled motor. The voltage and current measuring for regular power is fully sufficient for the measurement. Current measuring can also be done without assembly work by use of high precision current clamps.

To determine torque with typical 2% allowance you only need to insert nominal motor data from the type plate into a input mask of the LMG. The torque and revolution determination functions at mains and also with frequency inverters and therewith it is universally useable.

The mechanic data are calculated continuous in every measuring cycle (beginning at 50ms) from the latest measurement and are available over interface and display. This also enables the analyses of the dynamic performance (vibrations, resonance's) in the operating range of asynchronous motors.

Determination of torque and rotation speed of motors acc. IEC 38, fed by frequency inverters or directly by 3-phase net. Calculation by means of electrical measurements of LMG and catalogue data of motor without any use of mechanical torque and speed sensors. Measurement inaccuracy between no-load operation and 1.5 fold nominal torque typical below 2% of nominal torque resp. of rotation speed.

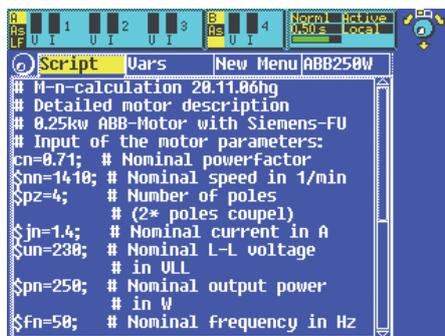


Fig. 1 Input values of 250W-Motor  
To be filled into the input mask of the LMG internal script editor: ratings (nominal datas) of the type label of the motor, the ohmic stator resistance (copper resistance) measured between its terminals.

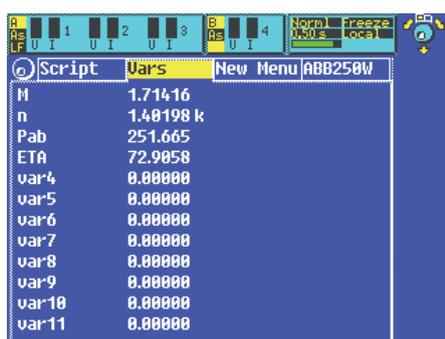


Fig. 2 Overview display  
This display shows the overview to control all input values and also it calculates the mechanical and all other quantities of the running measurement.

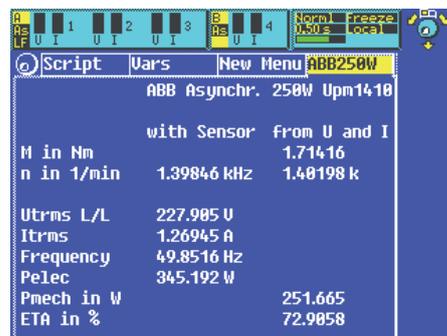


Fig. 3 Customer-specific range  
User defined menus have access to all calculated and measured quantities. Here an example with the importance values for a user.

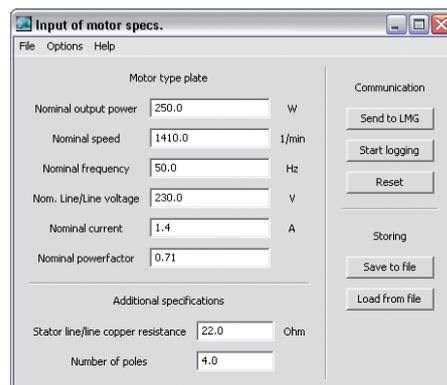


Fig. 4 Optional parameter input on the PC:  
For comfortable input of the motor data's and also for the administration of a lot of different motor data sets a PC program is provided. The PC isn't needed anymore after data input and the motor data's have been send to the LMG.

Subject to technical changes, especially to improve the product, at any time without prior notification.