



VEM-02 Point Switch Force Meter



The measured force between the point machine and the points is an important feature of the cooperation of the point machine with the points. The setting and remaining forces give a picture about the state of the turnout while the force measured in the brake during running gives information about the power of the point machine and the trailing force features the fastening of the points. The regular force measurements make possible to diagnose the point machine and switch interconnection and to recognize the failures and the point setting problems.

Formerly the switch force meters recorded the measured data in an analogous way. Because of the non-sufficient accuracy of the reading it became necessary to design an apparatus which can record the measurement diagrams not only graphically but also capable of displaying the measured maximum force values numerically along with the other identification data necessary for the documentation.

During designing the VEM-02 the main viewpoint was the fast evaluation possibility of the measurements on site. In this way immediate decisions can be made if any intervention is needed on the examined point switch or point machine. For this reason the apparatus is equipped with a built-in printer by which the main parameters of measurements can be documented (place and date of the measurement, number of the points, maximum measured value), or if necessary, full diagrams can be indicated. By means of the analyses of the curves on site the features of occasional failures can be determined and the most effective measures can be taken.

The apparatus also works as a data collection system; the software ensures the selection of the measured and stored diagrams, so the documentation of the measured data can be submitted afterwards. One solution for this is its own printer.

Our company developed software VDS for WINDOWS that runs under WIN 95-WIN NT.

Main functions of the software are as follows:

- Reception of the data from the switch force meter (serial port)
- Selection among the previously loaded data, the curves can be observed, in addition, other data can be attached to them
- The previously loaded data can be methodized by a flexible database manager and other pieces of information may be attached to them

- Analysis and comparison of graphs, the curves can be diminished, magnified and overlapped; time markers can be set up.
- Diversity of graph printings as follows: one at a time, several at the same time with any kind of magnification

VEM apparatus is not only used for data collection, the collected data may be processed by means of a computer.

VEM-02 with VDS software is widely used in the course of the maintenance and regular supervision works of the point machines and also for a regeneration of activities.

The apparatus was introduced in 1993.

Main mechanical features:

The apparatus is put in a firm metal case.

Main electrical features:

1. Measuring head:

An A/D converter built in the measuring head directly ensures the low sensibility to disturbances and the low noise level, so increasing the measuring accuracy. The strain gauges and the applied electric circuits ensure the operation in an extended temperature range up to -20°C. Since the data transmission is digital between the head and the apparatus, the noise taken up by the measuring cable has no effect on the measurement accuracy.

2. Measuring apparatus:

It processes the data coming from the measuring head. The data storing capacity satisfies the usual practical requirements. The capacity can be expanded without limitation because the data can be loaded in a portable computer in case of site measurements.

The apparatus displays the measured maximum value for fast evaluation on site, but printing and evaluation of whole diagrams is also possible. After the measurements the stored data can be analyzed by means of data-processing software made for PC. The data of the point switches can be methodized, the operation of the different points can be compared accurately and the parameter changes of points can be traced.

It makes the maintenance and reparation works much easier.

Advantages:

- **The expense of the apparatus is recovered within a year because of cost reduction of maintenance works on point machines, the maintenance works can be scheduled, therefore, the total amount of the maintenance works can be reduced significantly**
- **Light portable construction**
- **Low-noise sensitivity as a consequence increased measuring accuracy**
- **Point switch diagnostics by software**
- **Indicating graphic measurement diagrams**
- **Data storage possibility by means of a computer to indicate the changes of the states of the point switches and point machines**