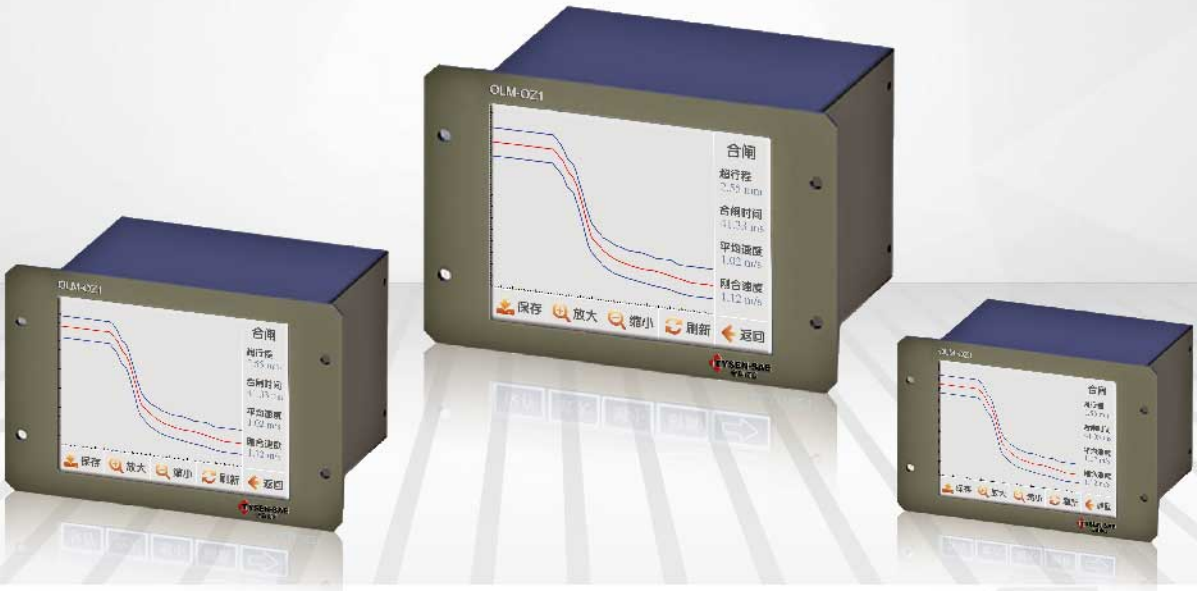
OLM-NZ1断路器机械特性在线监测装置

On-Line Monitoring Device for Mechanical Properties of OLM-NZ1 Circuit Breaker



产品特点

- 本装置自成一体,不影响断路器原有操作、控制的正常运行；
- 传感器寿命可以达到10万次；
- 实时反映断路器运行状态；
- 针对潜在故障进行预判并采用声光报警；
- 分合闸过程中的S/T曲线与出厂产品包络线比对,以判定断路器特性变化；
- 对断路器分合闸线圈进行实时监测并起保护作用,线圈电流异常时进行报警；
- 动作特性数据、图形自动保存,并与动作时间对应；
- 可带标准的RS485/232通信接口,采用 modbus通讯协议实现数据传送，各项监测参数都可以传送至后台终端。

Product Features

- This device is completely self-contained, and does not affect the normal operation of the original operation and control of the circuit breaker;
- The sensor life is up to 100, 000 cycles;
- Reflect the running state of the circuit breaker in real-time manner;
- Predict the potential failure and give sound and light alarm;
- Compare the S/T curve during opening/closing with the envelope of the manufactured products to determine any change in features of the circuit breaker;
- Make real-time monitoring on the opening and closing coils of the circuit breaker and play protective functions, and give alarm when the coil current is abnormal;
- Automatically save the data and graphics on operating characteristics, and correspond to the operation time;
- Allow with standard RS485/232 communication interface, and use modbus communication protocol to realize data transfer. All the monitoring parameters can be sent to the background terminal.

在线监测带来的变化

- 实现定期计划检修向状态检修的转变；
- 实时掌握设备特性状态,按需维修；
- 避免设备过度维修和带故障运行；
- 根据需要可将设备状态上传至集中控制室，远方监测断路器状态。

Changes brought by Online Monitoring

- Achieve transition from regular & scheduled maintenance to condition-based maintenance;
- Command the features and states of equipment in real-time manner, and offer maintenance service as required;
- Avoid excessive maintenance and running with fault;
- Upload the equipment status on as-needed basis to the centralized control room, and remotely monitor the status of circuit breaker.

使用环境条件

- 环境温度：
  最高温度：+45℃
  最低温度：-25 ℃（允许在-30℃储运）
- 环境湿度：
  日平均相对湿度：≤ 95%
  月平均相对湿度：≤ 90%
- 地震烈度不超过8级；
- 使用场所无滴水、无易燃和爆炸危险、无严重污秽、无化学腐蚀性气体以及无剧烈震动。

Environmental Conditions for Use

- Ambient temperature:
  Maximum temperature: + 45 ℃
  Minimum temperature: -25 ℃ (allowable for storage and transportation at -30 ℃)
- Environmental Humidity:
  Daily average relative humidity: ≤95%
  Monthly average relative humidity: ≤90%
- Earthquake intensity not more than M8;
- The place of use must not have any dripping, combustion and explosive hazards, severe contamination, chemical corrosive gases and severe vibration.



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监测内容及意义 Monitoring Content and Significance

- 监测项目：合闸时间位移曲线

可以准确反映断路器动触头合闸特性，并可与由标准曲线生成的包络线对照。

- Monitoring item: Time displacement curve for closing

It can accurately reflect the closing features of dynamic contact for circuit breaker, and compare with the envelope generated by standard curve.

- 监测项目：断路器超行程

确保刚分速度和分闸速度，确保触头压力符合产品要求。

- Monitoring item: Over-travel of circuit-breaker

Ensure the speed at instant of contacts separating and the opening speed, and make sure that the contact pressure meets the product requirements.

- 监测项目：断路器合闸时间

合闸时间的变化反映出机构的灵活性及机构磨损信息。

- Monitoring item: Circuit breaker closing time

The change in closing time reflects the information on the mechanism flexibility and the mechanism abrasion.

▶ 监测项目：断路器合闸平均速度

合闸平均速度反映着机构灵活性，同时通过平均速度可以发现合闸能量的变化，如果是弹簧机构，则可能是因为合闸弹簧的刚度降低造成。

▶ Monitoring item: Average closing speed of circuit breaker

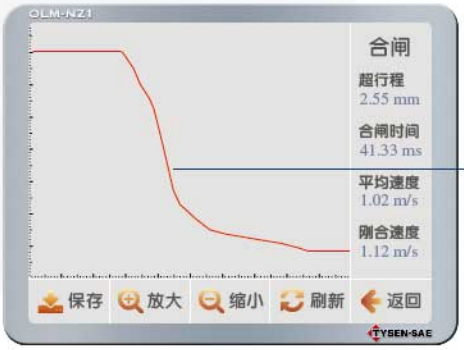
The average closing speed reflects the mechanism flexibility, while any change in closing energy can be found through the average speed. For spring mechanism, such change may be caused by decrease in the stiffness of closing spring.

▶ 监测项目：断路器刚合速度

可以精确计算出断路器在刚合瞬间的合闸速度，刚合速度过低，在关合短路故障时容易发生触头熔焊。

▶ Monitoring item: Speed at instant of circuit breaker closing

It can accurately calculate the closing speed at the instant of closing the circuit breaker. Over-low closing speed easily lead to welding fusion of contact when the making short-circuit has faults.



▶ 监测项目：分闸时间位移曲线

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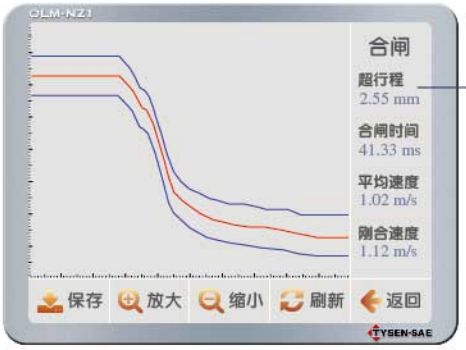
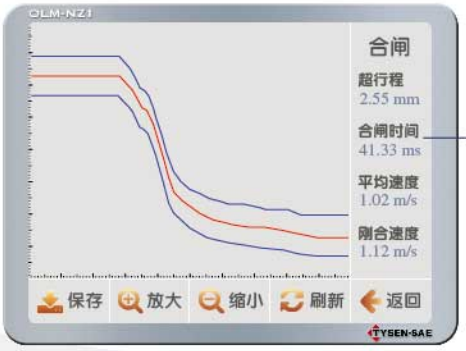


▶ 监测项目：断路器触头开距

断路器开距过小影响真空断口绝缘水平，也有可能造成断路器短路开断后的重燃，开距过大会影响真空灭弧室波纹管伸缩长度，从而降低真空灭弧室寿命。

▶ Monitoring item: Contact spacing of circuit breaker

Any over-small opening distance of circuit breaker will affect the vacuum fracture insulation level, but also may cause re-ignition upon short-circuit breaking of circuit breaker, while excessive opening distance will affect the extension length of the vacuum interrupter bellows, thereby reducing the life of the vacuum interrupter.

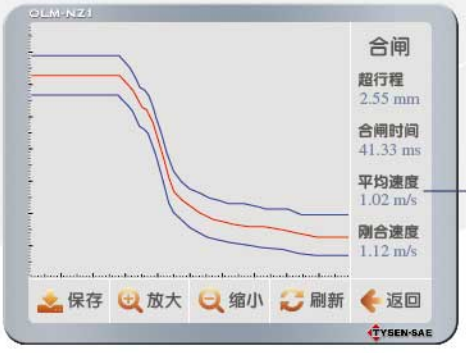


▶ 监测项目:断路器分闸时间

分闸时间的变化反映出机构的灵活性及机构磨损信息。

▶ Monitoring item: Circuit breaker opening time

The change in opening time reflects the information on the mechanism flexibility and the mechanism abrasion.

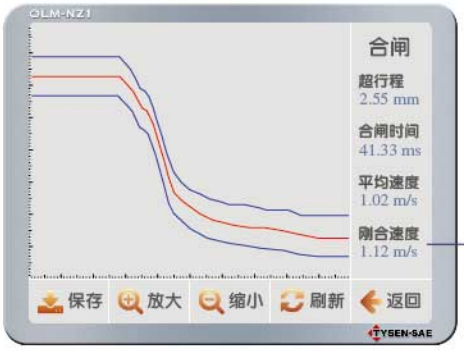


▶ 监测项目:断路器分闸平均速度

平均分闸速度反映出断路器在分闸过程中受力情况是否正常，平均速度过高，对断路器的机构强度以及操作振动问题将会比较突出，平均速度过低则会影响开断电流，因此要将平均速度调至合理的范围。

▶ Monitoring item: Average opening speed of circuit breaker

The average opening speed reflects whether the force situations on the circuit breaker are normal during the process of opening. Over-high average speed will aggravate the mechanism strength of the circuit breaker and the operating vibration problems, and over-low average speed will affect the breaking current. In summary, the average speed must be adjusted to a reasonable extent.



▶ 监测项目：断路器刚分速度

刚分速度是断路器能否成功开断短路电流最关键数据，刚分速度达不到要求会导致短路开断时燃弧时间过长，触头烧蚀加剧。

▶ Monitoring item: Speed at instant of circuit breaker opening

The speed at instant of opening is the most critical data to determine if the circuit breaker successfully breaks the short-circuit current. When the speed at instant of opening fails to meet the requirements, extended arcing time will be caused when the short-circuit breaks, and the ablation of contacts will be aggravated.

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