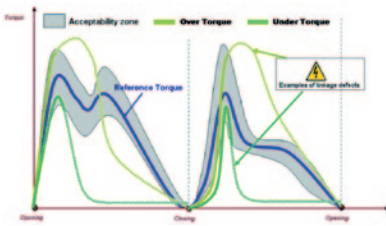


S-TORQUE



PREVENTION OF MECHANICAL FAILURES - TORQUE & POSITION MONITORING



S-TORQUE included in MR41E or MR164E is recommended for condition monitoring of all disconnector and switch brands to guarantee safe opening and closing by real time torque & position monitoring of complete equipment (active parts, mechanism and auxiliaries).

- Early detection of torque variation and position issues
- Detect and prevent failures of disconnectors, linkage
- Improved safety: redundancy of position, torque and auxiliary switch indication ensure to get the right information and avoid critical situations
- Minimise unplanned outages, and avoid major repair costs or collateral damage
- Condition based maintenance: optimize (anticipate / postpone) inspection and maintenance period
- Reliability-centered maintenance / Predictive maintenance lessons learned enabled by S-Torque technical database
- Increase equipment lifetime: easy upgrade of "old" equipment with operating drive MR41E / MR164E with S-TORQUE option

BENEFITS

- Simple, no assembly on site required
- Robust design
- Cost effective
- Increased equipment reliability and availability
- Improved network safety: equipment stops automatically if critical issue appears, reducing equipment risk and guaranteeing operation within safe limits
- Reduced failure rates (estimated 70%)
- Reduced maintenance costs (estimated 30%)
- Quick and easy recording of the reference curves: 3 minutes operation on site (using S-OFT software).

FEATURES

MONITORING

Detection and prevention	<ul style="list-style-type: none"> • Disconnector failure • Linkage failure • Linkage destruction due to vandalism • Failures in operating mechanism • Misalignment
Torque monitoring	<ul style="list-style-type: none"> • Detection of the mechanical assembly «signature» of each disconnector or load break switch during opening or closing operation of the equipment. • Torque signature is repeated for each operation. • Each mechanical variation is detected by torque variation.
Position monitoring	<ul style="list-style-type: none"> • Precise indication of the position : 90 measurement points during opening or closing • Redundancy with operating mechanism auxiliary contacts • Combined real time analysis of equipment torque and position • Ensure operation completion
Information output	<ul style="list-style-type: none"> • Reading dedicated torque curves on local software (S-OFT) : • each disconnector assembly with its linkage and operating mechanism has its own torque opening and closing signature (no "standard" torque curve set in factory)

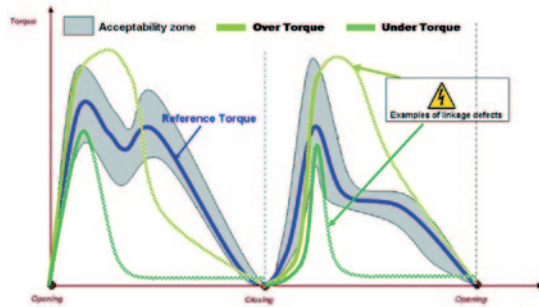
SECURITY / ALARMS

Network safety	<ul style="list-style-type: none"> • According to customers needs, equipment can be automatically stopped when critical issue appears, reducing equipment risk and guaranteeing operation within safe limits 	
Local alarm	On local 3-digit display	Option S-LUX : additional visual alarm with continuous or flashing red light on the operating mechanism
Remote alarm	Output relay	Option S-COM : digital information via secured protocol (Modbus RTU/TCP, IEC61850....)

S-TORQUE



OVERVIEW OF TORQUE MONITORING



EXAMPLE OF CUSTOMIZATION			
overtorque level reached + operating time ≤ 10"	Warning	Switch can still operate	Inspection should be done during the next planned maintenance
overtorque level reached + operating time > 10"	Critical alarm	Switch must not be operated.	Inspection must be done immediately
undertorque level reached	Critical alarm	Switch must not be operated.	Inspection must be done immediately

S-TORQUE : monitoring screen and example of security configurations

TECHNICAL FEATURES

GENERAL FEATURES	
Compatibility	Embedded in MR41E / MR164E smart operating drives with possible upgrade of existing drives Suitable for disconnectors and switches of any size Undertorque alarms available according to switch type and installation (contact us for more details).
Easy local access	Access to torque curves of each disconnector installation with linkage and operating mechanism Access to last operation curves, compared with reference curve (using S-OFT software)
Reliability	Self-diagnostic to detect internal failure
Flexibility	Setting parameters can be fully customized : Torque detection sensitivity Alarm levels : +X% (overtorque) and -Y% (undertorque) Different alarm levels for opening and closing Acceptability zone : 10% to 200% of reference curve Customizable settings configuration
Operating life time	up to 50 000 cycles

INSTALLATION FEATURES	
Easy installation	Delivered with operating mechanism (factory installed) No assembly required on site No external sensors No wire connexion No power supply Maintenance free solution
Setting information	Torque reference curve 1st measure to be completed on site, after complete installation and adjustment of switching equipment. Quick and easy recording / reset of reference curves : 3 minutes operation on-site Setting by SDCEM field technician or by your maintenance team (using S-OFT software)

ASSOCIATED SOLUTIONS

IMPROVED RELIABILITY - COST-EFFECTIVE OPERATION & MAINTENANCE



MR41E
Universal Smart Drive



S-COM
Remote control board



S-OFT
Portable Diagnostic Tool

