

The background image shows a close-up of a metal disconnector mechanism with two grey insulators. A black cable is connected to the base. In the foreground, a teal-colored rectangular Sicat DMS monitoring unit is mounted on a metal base. The Siemens logo is in the top left corner.

SIEMENS

Ingenuity for life

Sicat DMS

Disconnector monitoring system
for overhead contact line systems

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The Sicat® DMS disconnector monitoring system is designed to reliably detect and indicate the position of the switch in overhead contact line systems.

The position indication is generated by detecting the position of the moving contact of the main contact or of the earth contact, by means of a rotary encoder and an opto-mechanical position indicator. This is communicated through the system infrastructure to the control station.

Features

- Monitoring directly on disconnectors which rules out indication errors due to
 - disconnector failure
 - linkage failure
 - linkage destruction due to vandalism or
 - failures in operated mechanism
- Low space required
- Long service life due to simple construction as well as robust and environment resistant materials

Variants

Sicat DMS-E – Disconnecter monitoring system with rotary encoder

- Cost-saving variant
- Easy to retrofit
- Sensor system on earth potential
- Integration into control of drive mechanisms or external evaluation unit

- Contactless measuring method, therefore no influence on disconnector
- Design adaptation of the rotary encoder units to the respective disconnector type
- Safety integrity Level (SIL) 1 on request

The contactless rotary encoder detects angular displacements by means of a parallel position encoder magnet. It is therefore wear-free and does not affect the function of the disconnector.

Features

- Switch position indication „ON“ and „OFF“ due to signal generated by rotary encoder at base of disconnector
- Sensor system on earth potential

The field vectors detected by the encoder are converted into a voltage signal and transmitted to the evaluation unit via a cable connection.

In the case of drive mechanisms in the Sicat 8WL6243 and 8WL6244 series with permanently power supply, the signals are evaluated in the control of the evaluation unit integrated in the drive mechanism.

This evaluation unit processes the signals from the rotary encoder unit of the disconnector and from the limit switches in the driven mechanism and provides feedback to SCADA.

In the case of manually or motor operated disconnectors, the signal is processed in an external evaluation unit and is forwarded with floating contacts to SCADA.



Sicat DMS-E: Rotary encoder unit on Sicat 8WL6144 disconnector



Integration into control of operated mechanism with permanent power supply

Technical data Sicat DMS-E

Power supply	<ul style="list-style-type: none"> • Via control of drive mechanism • Evaluation unit in external housing 8WL6142-1 • Evaluation unit in external housing 8WL6142-0 	Nominal voltage 24 V DC 230 V AC
Permissible temperature	<ul style="list-style-type: none"> • Sensor • Evaluation unit integrated in control of drive mechanism • Evaluation unit in external housing 	-40...+85 °C -40...+50 °C -40...+50 °C
External evaluation unit for wall or pole installation	Dimensions (W x H x D)	370 x 111 x 180 mm
Data acquisition	<ul style="list-style-type: none"> • Sensor • Position encoder 	Magnetic rotary encoder Permanent magnet
Evaluation by	<ul style="list-style-type: none"> • Control of drive mechanism combined with limit switches in drive mechanism (for operated mechanisms with permanent power supply of type Sicat 8WL6243 and 8WL6244*) • Control 8WL6255 in evaluation unit in external housing (for manually or motor-operated mechanisms) 	
Communication	<ul style="list-style-type: none"> • Via position indication of operated mechanism to SCADA • Customer specific (e.g. for manually operated mechanisms with potential free signalling contact) 	

* other types on request

Types and application areas

Rotary encoder*	For disconnector		Nominal voltage Sensor		Evaluation unit	
	3 kV DC 8WL6134	25 kV AC 8WL6144	U _n 5 V	U _n 24 V	in drive mechanism 8WL6243, 8WL6244*	in ext. housing 8WL6142-0 /-1 (control 8WL6255-7A/-7B)
8WL6136-0	■		■		■	
8WL6136-0A	■			■		■
8WL6144-7		■	■		■	
8WL6144-7D (SIL 1)		■		■		■

* other types on request

Sicat DMS-O – Disconnector monitoring system with opto-mechanical position indicator

Only direct monitoring of the correct insertion at the main contact rules out indication errors due to burn-off of main contacts or due to insulator failure.

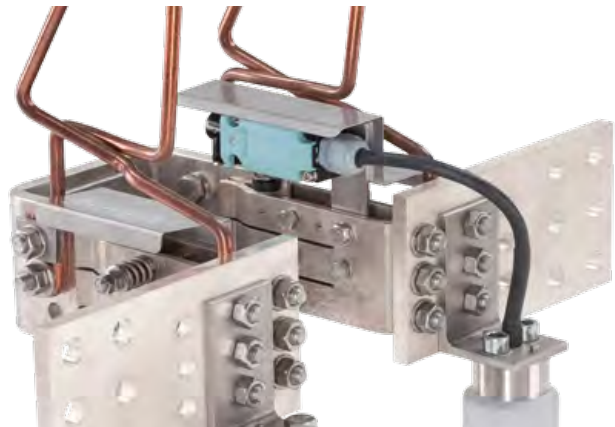
Features

- Switch position indication „ON“ due to signals generated by opto-mechanical position indicator directly at contact set of disconnector
- Sensor system at contact line potential

Sicat DMS-O consists of the opto-mechanical position indicator on the contact set beneath the protective cover.

The optical signal of the switch position indication „ON“ is transmitted via a fiber optic cable guided through the composite insulator to the operated mechanism or to an external evaluator. There the signal is converted to potential-free signalling contacts. The “OFF” indication must be generated by means of Sicat DMS-E.

- For very high safety demands
- Sensor system on contact line potential
- Standardized communication interface and potential free signalling contact



Sicat DMS-O: Opto-mechanical position indicator on Sicat 8WL6144 disconnector

Technical data Sicat DMS-O		
Power supply	<ul style="list-style-type: none"> • Fiber optic electronic • Multi voltage power supply unit 	24 V DC 95...250 V DC and 85...264 V AC
Data acquisition	<ul style="list-style-type: none"> • Sensor • Signal transmission 	Opto-mechanical position indicator Fiber optic cable guided through composite insulators
Evaluation by	Fiber optic electronic, switching output NO or NC	
Communication	Standardized interface optical / electrical (with potential free signalling contacts)	
Suitable for	<ul style="list-style-type: none"> • Disconnectors up to 3 kV DC • Disconnectors up to 15 / 25 kV AC 	Sicat 8WL6134 Sicat 8WL6144

Tests

EMC tests acc. to EN 50121-5

Rotary encoder of rotary encoder unit

Function test

Permanent operation cycles test for rotary encoder
> 50,000 operation cycles

References

The Sicat DMS disconnecter monitoring system is in operation at following public transport companies:

- Germany:
Berliner Verkehrsbetriebe (BVG), HAVAG Halle,
Magdeburger VB, VB Karlsruhe, RNV Mannheim, divers
projects for Deutsche Bahn AG
- Austria:
GVB Grazer Verkehrsbetriebe
- Great Britain:
Transport Initiatives Edinburgh



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