POWERSENSE

TECHNICAL DATASHEET FOR THE DISCOS® OUTDOOR CURRENT SENSOR - FOR MOUNTING ON MV TRANSFORMER CONNECTIONS

DESCRIPTION

The DISCOS® Outdoor Current Sensor is part of the DISCOS® Opti module. The DISCOS® Sensor monitors the current amplitude and the phase angle on both the LV and MV side of the transformer.

MAIN OPERATIONAL PARAMETERS

Current measurement on lines with up to 36 kVAC
Dynamic range from 5-20,000 AAC
The sensor can be mounted on live overhead line without any additional precautions.

TECHNICAL SPECIFICATIONS

Main electrical characteristics		
Current range	5-20,000 AAC	
Measuring accuracy*		
Current measurement	+/-2 A 2%	 5-100 A 100 A-20,000 A
Ambient specifications		
Operational temperature	-40°C to +75°C	
Operating humidity (non condensing)	25%-90% RH at +40°C	
Operational life time		
Designed for	+50 years	

SENSOR CONSTRUCTION

Sensor housing	The sensor housing is where the glass rod, the polarization filters, the lens, the fibre enclosures and the silicone rings are placed. All materials are non-conductive and can therefore be mounted on live cables and cobber bars, without any additional precautions. The sensor housing and the sensor top are manufactured from temperature resistant materials, giving them a working temperature from -20ºC to +75ºC and an adiabatic heating to 250ºC in case of short circuits.

* In combination with the DISCOS® Opti module

DESIGNED FOR*

Emissions	EN 61000-6-3
Immunity	EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-8 EN 61000-4-11 EN 61000-6-2
Safety	IEC 61558-1 IEC 60502-4 IEC 61442 IEC 60694
CE mark	Complied
Approvals	CAN/CSA C22.2 No. 61010-1-04 IEC 61010-1: 2001 Class III, if no fuse IEC 61010-1: 2001 Class IV, if placed after fuse EN 61010-1: 2001 Class III, if no fuse EN 61010-1: 2001 Class IV, if placed after fuse

* When used in a DISCOS® System setup, the module has been designed to operate according to the following standards.

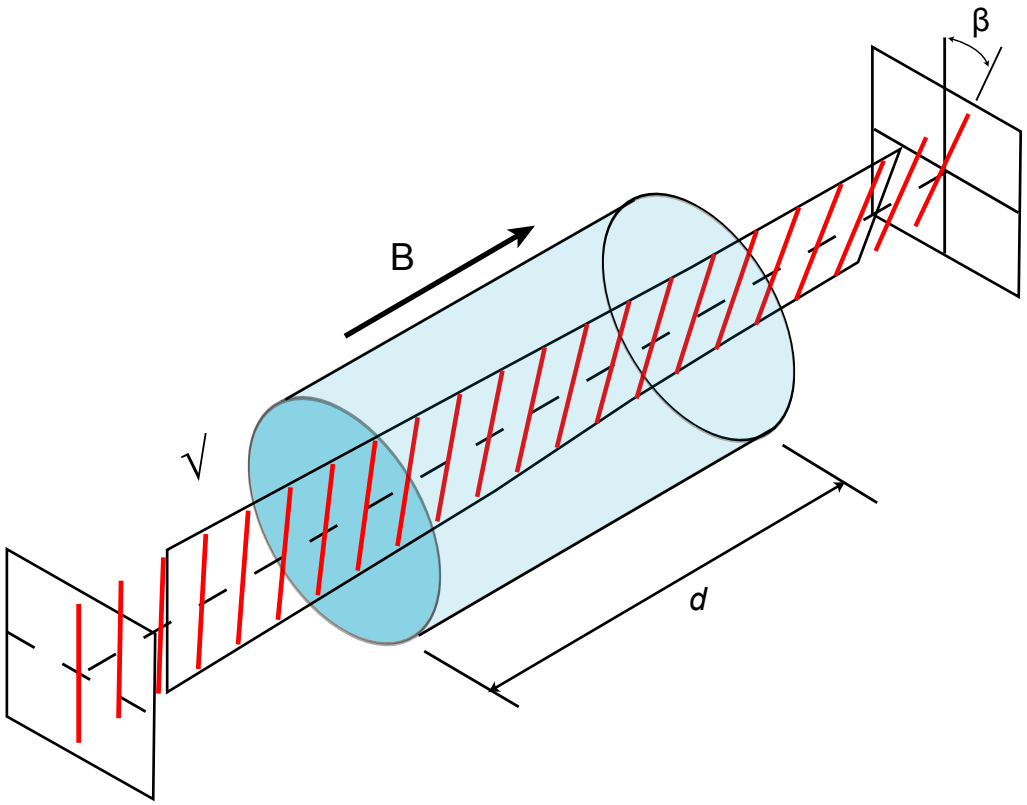
MATERIALS USED IN THE SENSOR PARTS

Sensor house	PEEK Zellamid 1500, Polyetheretherketone, a unique semi-crystalline, high temperature engineering thermoplastic, is an excellent material for a wide spectrum of applications in which thermal, chemical, and combustion properties are critical to performance
Sensor end pieces	PEEK Zellamid 1500, Polyetheretherketone, a unique semi-crystalline, high temperature engineering thermoplastic, is an excellent material for a wide spectrum of applications in which thermal, chemical, and combustion properties are critical to performance
Distance pieces	PEEK Zellamid 1500, Polyetheretherketone, a unique semi-crystalline, high temperature engineering thermoplastic, is an excellent material for a wide spectrum of applications in which thermal, chemical, and combustion properties are critical to performance
The lens	The lens is made of PMMA-Polymethacrylate (acrylic)
Fibre enclosures	Material ABS (Acrylnitrile-Butadiene-Styrene) The fibre enclosures makes sure that the optical fibre is placed correctly in front of the lens
Polarisation filters	The polarisation filters is a Vikuiti HN32
Glass rod	The glass rod is made of the glass type BK7

The optical fibre	The core of the fibre is PMMA-Polymethacrylat (acrylic), and the cladding material is polymethyl-methacrylate, which is a thermo-plastic weatherproof material. The material will absorb almost all UV rays and protect the light inside the fibre. The cord material is polyethylene.

HOW DOES IT WORK?

The Faraday effect	The DISCOS® System makes use of the Faraday principle, which states that the plane of a polarised incident light undergoes a rotation relative to the magnetic field applied. Since any electric current generates a magnetic field, the current may be measured by determining the angle of rotation of the polarisation plane. The relation between the angle of rotation of the polarization and the magnetic field in a diamagnetic material is: ß = √Bd where ß is the angle of rotation (in radians). B is the magnetic flux density in the direction of propagation (in teslas). d is the length of the path (in metres) where the light and the magnetic field interact. √ is the Verdet constant for the material.



The Faraday effect or the Faraday rotation is an interaction between light and a magnetic field. The rotation of the plane of polarization is proportional to the intensity of the component of the magnetic field in the direction of the beam of light.

POWERSENSE

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