

POWERSENSE[®]

TECHNICAL DATASHEET FOR THE DISCOS[®] OUTDOOR COMBINED SENSOR - FOR MOUNTING ON MV OVERHEAD LINES

DESCRIPTION

The DISCOS[®] Outdoor Combined Sensor is part of the DISCOS[®] System. The DISCOS[®] Outdoor Sensor measures the current and voltage amplitude and the phase angle on the MV power grid.

The DISCOS[®] Outdoor Sensor offers:

- Easy, safe and quick installation using a standard hot stick
- Silicon polymer housing with specific design for outdoor application
- Maximum safety based on a full range of tests.



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. The DISCOS[®] Outdoor Combined Sensor is available for both copper and aluminium overhead lines.

TECHNICAL SPECIFICATIONS

Main electrical characteristics

Nominal voltage	<24 kV
Current range	5-20,000 AAC
Insulation voltage	20 kV
Arcing distance	10" - 180 mm
Leakage distance	33" - 565 mm
Weight	max: 3 kg

Measuring accuracy*

Voltage measurement	1%	
Current measurement	+/-2 A	5-100 A
	2%	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
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* 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

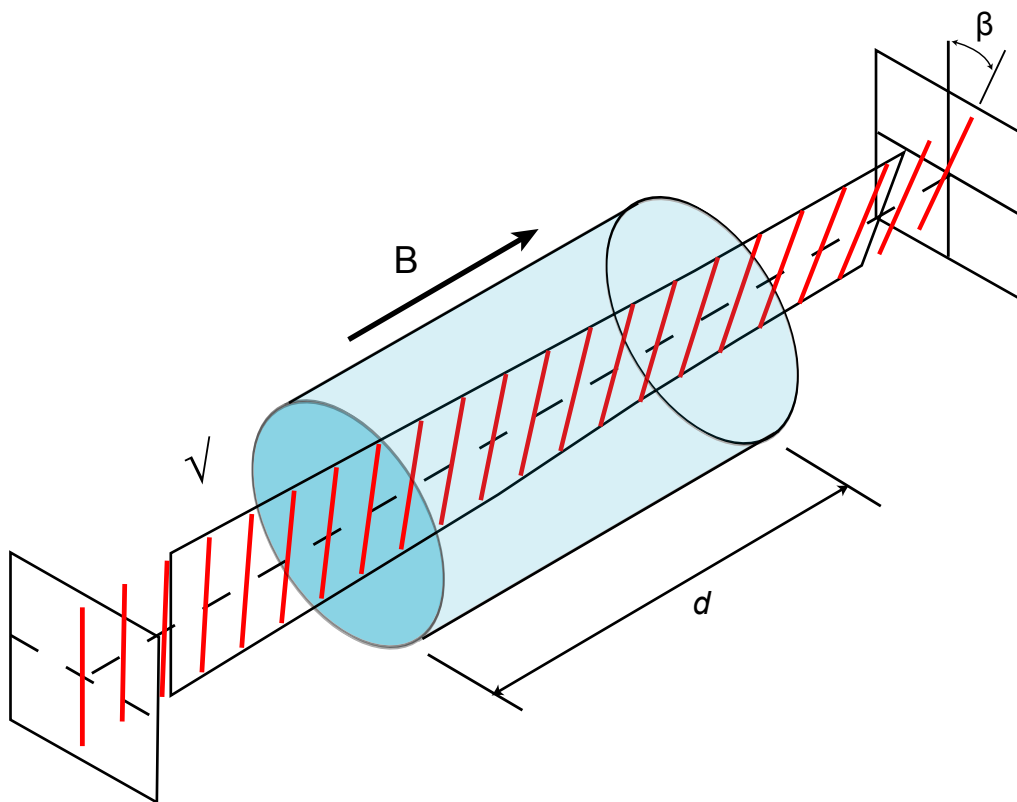
The optical fibre

The core of the fibre is PMMA-Polymethacrylat (acrylic), and the cladding material is polymethyl-methacrylate, which is a thermoplastic 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: $\beta = \sqrt{B}d$ where β 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. $\sqrt{}$ 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.



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